



Master Traffic Impact Study

Peak Innovation Park
Colorado Springs, Colorado

Prepared for:

Colorado Springs Airport

UFCS Airport, LLC

Kimley»»Horn



T R A F F I C I M P A C T S T U D Y

Peak Innovation Park

Colorado Springs, Colorado

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1.0 EXECUTIVE SUMMARY

Peak Innovation Park, a mixed-use development, is being developed on the southeast corner of the Milton E. Proby Parkway and Powers Boulevard (SH-21) intersection in Colorado Springs, Colorado. The project includes a total of eighteen (18) zone areas with office, industrial, and commercial buildings. For purposes of this traffic study, Peak Innovation Park was evaluated in three phases. Analysis was completed for the known development occurring identified as Phase I to be complete in 2022. A mid-point analysis horizon of 2030 with the known developments and 40 percent of the remaining area completed was identified as Phase II. Full Build Out of the development is expected to occur by 2045. These three separate horizons were studied to determine intersection and roadway configurations needed at all three planning horizons. At full project buildout, Peak Innovation Park is proposed to include the following:

- Zone P-1: 180,000 SF Business Park
- Zone P-2: 1,130,000 SF Business Park
- Zone P-3: 1,170,000 SF Business Park
- Zone P-4: 40,000 SF Business Park
10,000 SF Fast Food Restaurants with Drive Through Window
12 Fueling Position Gasoline Station with Convenience Market
- Zone P-5: 240 Room Hotels
690,000 SF Business Park
- Zone P-6: 265,000 SF Office Park
- Zone P-7: 300,000 SF Office Park
- Zone P-8: 90,000 SF Office Park
- Zone P-9: Project Rodeo (Client Data)
- Zone P-10: 1,550,000 SF Office Park
- Zone P-11: 375,000 SF Office Park
- Zone P-12: 405,000 SF Industrial Park
- Zone P-13: 12 Fueling Position Gasoline Station with Convenience Market
- Zone P-14: Project Jungle (Client Data)
- Zone P-15: 5,000 SF Fast Food Restaurant with Drive Through Window
- Zone P-16: 770,000 SF Industrial Park
- Zone P-17: 190,000 SF Office Park
- Zone P-18: 630,000 SF Industrial Park

The purpose of this study is to prepare a Master Traffic Impact Study for Peak Innovation Park. This study includes identifying project traffic generation characteristics, to identify potential project traffic related impacts on the local street system, and to develop mitigation measures required for the identified impacts. The following existing intersections were incorporated into this traffic study based on the City of Colorado Springs, El Paso County, and State of Colorado Department of Transportation (CDOT) requested scope:

- Milton E. Proby Parkway and Powers Boulevard (SH-21) (#1)
- Milton E. Proby Parkway and Peak Innovation Parkway (#3)
- Embraer Heights and Peak Innovation Parkway (#7)
- Embraer Heights and Bud Breckner Boulevard (#8)
- Powers Boulevard (SH-21) and Grinnell Boulevard (#12)
- Powers Boulevard (SH-21) and Peak Innovation Parkway (#13)
- Bradley Road and Grinnell Boulevard (#14)

In addition, 11 proposed internal intersections and project accesses were also included for evaluation.

Regional access to the development is provided by Interstate 25, US Highway 85 (US-85), Powers Boulevard (SH-21) and US Highway 24 (US-24). Primary access to the Park is provided by Powers Boulevard (SH-21), Milton E. Proby Parkway, and Grinnell Boulevard. Primary access through the development is and will be provided by Embraer Heights, Peak Innovation Parkway, and Integration Loop.

Direct access to the site is and will be provided by several internal intersections and access points, of which 11 were included within this study. Additional access is proposed and will likely require additional study when specific users are known. Within this study, the following access intersections were evaluated. A right-in/right-out access (#2) is proposed along the south side of Milton E Proby Parkway between Powers Boulevard and Peak Innovation Parkway. A right-in/right-out access (#4) is proposed along the south side of Milton E. Proby Parkway at a proposed extension of Bud Breckner Boulevard, to the east of Peak Innovation Parkway. A new intersection will be constructed at Peak Innovation Parkway and the proposed Integration Loop roadway (#5). A full movement middle access (#6) will be constructed along the north and south sides of Peak Innovation Parkway, south of Integration Loop and north of Embraer Heights. A full movement access (#9) will be constructed along Embraer Heights east of Bud

Breckner Boulevard. A new T-intersection (#10) will be constructed along Grinnell Boulevard at the proposed Integration Loop roadway. A new intersection along future Integration Loop (#11) will intersect with Peak Innovation Parkway south of Embraer Heights and north of Powers Boulevard (SH-21). Two full movement accesses (#15 and #16) will be constructed along Grinnell Boulevard north of Powers Boulevard and south of Integration Loop. Lastly, two right-in/right-out access intersections (#17 and # 18) will be constructed along the south side of Milton E Proby Parkway, between Peak Innovation Parkway and Bud Breckner Boulevard extension.

During the first phase of project buildout in 2022, Peak Innovation Park is expected to generate approximately 27,532 daily weekday trips with 3,173 of these trips expected to occur during the morning peak hour and 2,255 trips expected to occur during the afternoon peak hour. During the second phase of construction in 2030 (including Phase I development within these trip numbers), Peak Innovation Park project is anticipated to generate 52,764 daily weekday trips with 5,023 of these trips occurring during the morning peak hour and 3,826 trips occurring during the afternoon peak hour. During the full project buildout in 2045 (including both Phases 1 and 2), Peak Innovation Park project is anticipated to generate a total of 97,058 weekday external daily trips with 8,565 trips occurring during the morning peak hour and 6,788 trips occurring during the afternoon peak hour.

Distribution of site traffic on the street system was based on the area street system characteristics, existing traffic patterns, demographic information, anticipated surrounding development areas, and the proposed roadway network and access system for the project. Assignment of project traffic was based upon the trip generation described previously and the distributions developed. The traffic assignment was added to the background traffic volumes to determine future traffic with the project.

Based on the analysis presented in this report, Kimley-Horn believes remaining development of Peak Innovation Park will be successfully incorporated into the existing and future roadway network. Analysis of the existing street network, the proposed project development, and expected traffic volumes resulted in the recommended improvements summarized in the following table.

Peak Innovation Park Summary of Improvements

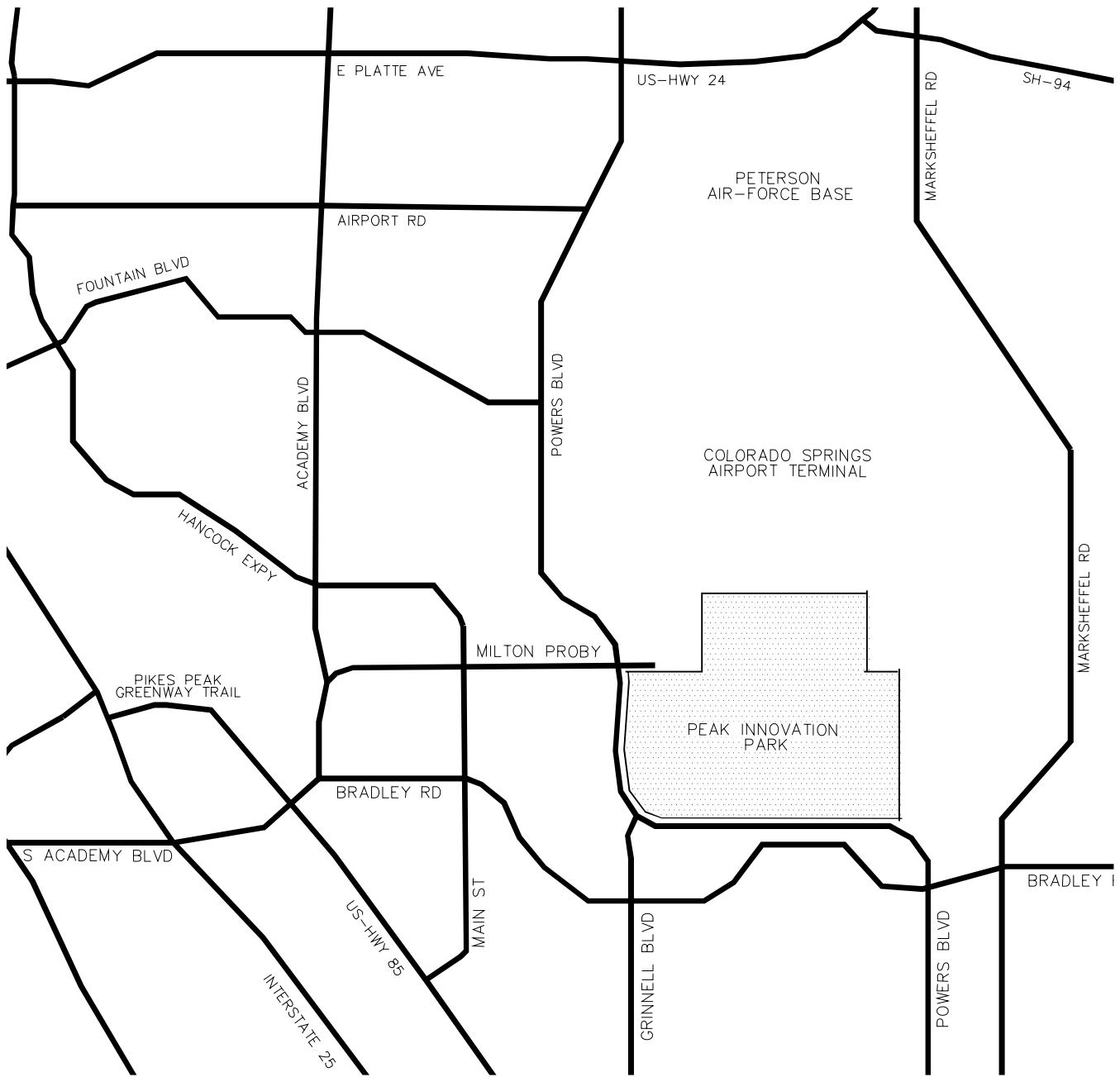
Intersection	Improvements	Planning Year
1. Milton E. Proby Parkway & Powers Boulevard (SH-21)	<ul style="list-style-type: none"> • Extend SB Dual Lefts (950-ft + 225-ft Taper) • Extend NB Right Turn Lane (600-ft + 225-ft Taper) • Extend NB Acceleration Lane (960-ft + 225-ft Taper) • Three NB Through Lanes 	2022
	<ul style="list-style-type: none"> • Three Through Lanes on EB, WB, and SB Approaches • Extend SB Dual Lefts (1,175-ft + 225-ft Taper) • Extend EB Dual Left (1,000 ft + 225-ft Taper) ~ or ~ • Grade Separated Interchange 	2030
	<ul style="list-style-type: none"> • Grade Separated Interchange 	2045
2. Milton E. Proby Parkway & Right-In/Right-Out Access	<ul style="list-style-type: none"> • Construct EB Right Turn Lane (320-ft + 180-ft Taper) 	2022
	<ul style="list-style-type: none"> • Three EB Through Lanes 	2030
	<ul style="list-style-type: none"> • Three WB Through Lanes • Construct EB Continuous Acceleration Lane 	2045
3. Milton E. Proby Parkway & Peak Innovation Parkway	<ul style="list-style-type: none"> • Traffic Signal • Construct SB Left Turn Lane (225-ft + 145-ft Taper) • Designate Single 300-ft EB Right Turn Lane 	2022
	<ul style="list-style-type: none"> • Designate Dual NB Left Turn Lanes (575-ft) • Continuous EB Right Turn Lane • Construct SB Right Turn (225-ft + 145-ft Taper) 	2030
	<ul style="list-style-type: none"> • Designate Triple NB Left Turn Lanes (575-ft) • Three EB & WB Through Lanes with Separate Rights • Construct EB Acceleration Lane for NB Free Right Turn (580-ft + 180-ft Taper or Continuous) • Extend SB Right Turn Lane (325-ft + 145-ft taper) • Extend WB Left Turn Lane (400-ft) 	2045
4. Milton E. Proby Parkway & Bud Breckner Boulevard	<ul style="list-style-type: none"> • Construct EB Right Turn Lane (320-ft + 180-ft Taper) 	2030
	<ul style="list-style-type: none"> • Three EB Through Lanes Absorbing Right Turn Lane 	2045
5. Integration Loop & Peak Innovation Parkway	<ul style="list-style-type: none"> • Roundabout (multi-lane) • Two NB & SB Through Lanes 	2022
	<ul style="list-style-type: none"> • Three NB & SB Through Lanes 	2045
6. Peak Innovation Parkway Access	<ul style="list-style-type: none"> • Two Through Lanes on Peak Innovation Parkway • Stop-Controlled Access (Northbound & Southbound) • Construct NB & SB Left Turn (150-ft) & Shared Through/Right 	2022
	<ul style="list-style-type: none"> • Traffic Signal • Construct NB Dual Left Turn Lanes (575-ft) 	2045
7. Embraer Heights & Peak Innovation Parkway	<ul style="list-style-type: none"> • Two NB & SB Through Lanes • Designate EB Left Turn (400-ft) & Right Turn (150-ft) • Designate NB Left Turn Lane • Designate EB & WB Through Lanes 	2022
	<ul style="list-style-type: none"> • Traffic Signal 	2030
	<ul style="list-style-type: none"> • Extend NB Left Turn Lane (425-ft) 	2045
8. Embraer Heights & Bud Breckner Boulevard	<ul style="list-style-type: none"> • New Northbound Stop-Controlled Approach • Construct NB Left Turn Lane (50-ft) • Construct WB Left Turn Lane (100-ft) • NB & SB Single Through Lanes 	2030
	<ul style="list-style-type: none"> • Roundabout (single lane) • EB Left Turn Lane & Shared Through/Right 	2045

Intersection	Improvements	Planning Year
	• SB Shared Left/Through & Right Turn Lane	
9. Embraer Heights Access	• NB & SB Stop Controlled Approaches	2030
10. Integration Loop Grinnell Boulevard	<ul style="list-style-type: none"> • Traffic Signal • Construct EB Dual Lefts on Grinnell Blvd (425-ft) • Construct NB Left Turn Lane on Integration Loop (300-ft) • Construct SB Right Turn Lane - Integration Loop (Cont.) 	2022
11. Integration Loop & Peak Innovation Parkway	• Two NB & SB Through Lanes	2022
	• Traffic Signal	
	• Construct EB & WB Left Turn Lanes (150-ft & 200-ft)	2030
	• Extend WB Left Turn Lane (400-ft)	2045
12. Powers Boulevard & Grinnell Boulevard	<ul style="list-style-type: none"> • Construct EB Dual Left Turn Lanes (975-ft + 300-ft Taper) • Extend WB Left Turn Lane (950-ft) • Construct WB Acceleration Lane (1,170-ft + 300-ft Taper) for Free SB Right Turn • Construct WB Right Turn Lane (700-ft + 300-ft Taper) • Construct Two NB & SB Through Lanes • Construct NB Dual Left Turn Lanes (525-ft) • Construct SB Dual Left Turn Lanes (400-ft) • Construct SB Right Turn Lane (250-ft) with Free Right • Construct SB Acceleration Lane (580') for EB Free Right 	2022
	• Construct WB Dual Left Turn Lanes (950-ft +300-ft Taper)	2030
	• Construct Three EB and WB Through Lanes	
	• Extend NB Right Turn Lane (300-ft)	2045
13. Powers Boulevard (SH-21) Peak Innovation Parkway	<ul style="list-style-type: none"> • Traffic Signal • Extend WB Right Turn Lane (800-ft+300-ft Taper) • Extend WB Acceleration Lane (1,380-ft +300-ft T) 	2022
	• Construct SB Dual Left Turn Lanes (500-ft)	
	• Extend EB Left Turn Lane (1,025-ft + 300-ft Taper)	2030
	• Extend EB Left Turn Lane (1,325-ft + 300-ft Taper)	2045
14. Bradley Road & Grinnell Boulevard	<ul style="list-style-type: none"> • Traffic Signal • Construct EB Left Turn Lane (300-ft + 145-ft Taper) 	2020
	• Construct EB Dual Left Turn Lanes (275-ft)	
	• SB Right Turn Protected-Overlap Phasing	2030
	• Extend EB Dual Left Turn Lanes (450-ft)	2045
15. Grinnell Boulevard South Access	<ul style="list-style-type: none"> • Two EB & WB Through Lanes on Grinnell Blvd • Construct EB & WB Left Turn Lanes (100-ft) • Construct NB Left Turn Lane (200') • Construct SB Left Turn Lane (50') • Continuous EB Right Turn Lane 	2022
	• Traffic Signal	2030
16. Grinnell Boulevard North Access	<ul style="list-style-type: none"> • Traffic Signal • Two EB & WB Through Lanes on Grinnell Blvd • Construct EB Dual Left Turn Lanes (175-ft) on Grinnell • Construct NB Dual Left Turn Lanes (100-ft) from Access • Construct SB Left Turn Lane (100-ft) from Access 	2022
17. Milton E Proby Parkway West RIRO Access	• Construct EB Right Turn Lane (320-ft + 180-ft Taper)	2022
	• Three EB Through Lanes	2045
18. Milton E Proby Parkway East RIRO Access	• Construct EB Right Turn Lane (320-ft + 180-ft Taper)	2022
	• Three EB Through Lanes	2045

2.0 INTRODUCTION

Kimley-Horn and Associates, Inc. (Kimley-Horn) has prepared this report to document the results of a Master Traffic Impact Study of future traffic conditions associated with Peak Innovation Park project located on the southeast corner of the Milton E. Proby Parkway and Powers Boulevard (SH-21) intersection in Colorado Springs, Colorado. A vicinity map illustrating the project location with respect to the surrounding area is shown in **Figure 1**. The project includes a total of eighteen (18) zone areas with office and commercial buildings. A site plan illustrating the proposed development is provided in **Appendix H**. For purposes of this traffic study, Peak Innovation Park was proposed to include the following:

- Zone P-1: 180,000 SF Business Park
- Zone P-2: 1,130,000 SF Business Park
- Zone P-3: 1,170,000 SF Business Park
- Zone P-4: 40,000 SF Business Park
10,000 SF Fast Food Restaurants with Drive Through Window
12 Fueling Position Gasoline Station with Convenience Market
- Zone P-5: 240 Room Hotels
690,000 SF Business Park
- Zone P-6: 265,000 SF Office Park
- Zone P-7: 300,000 SF Office Park
- Zone P-8: 90,000 SF Office Park
- Zone P-9: Project Rodeo (Client Data)
- Zone P-10: 1,550,000 SF Office Park
- Zone P-11: 375,000 SF Office Park
- Zone P-12: 405,000 SF Industrial Park
- Zone P-13: 12 Fueling Position Gasoline Station with Convenience Market
- Zone P-14: Project Jungle (Client Data)
- Zone P-15: 5,000 SF Fast Food Restaurant with Drive Through Window
- Zone P-16: 770,000 SF Industrial Park
- Zone P-17: 190,000 SF Office Park
- Zone P-18: 630,000 SF Industrial Park



PEAK INNOVATION PARK
VICINITY MAP

FIGURE 1

The purpose of this study is to prepare a Master Traffic Impact Study for Peak Innovation Park. This study includes identifying project traffic generation characteristics, to identify potential project traffic related impacts on the local street system, and to develop mitigation measures required for the identified impacts. The following existing intersections were incorporated into this traffic study based on the City of Colorado Springs, El Paso County, and State of Colorado Department of Transportation (CDOT) requested scope:

- Milton E. Proby Parkway and Powers Boulevard (SH-21) (#1)
- Milton E. Proby Parkway and Peak Innovation Parkway (#3)
- Embraer Heights and Peak Innovation Parkway (#7)
- Embraer Heights and Bud Breckner Boulevard (#8)
- Powers Boulevard (SH-21) and Grinnell Boulevard (#12)
- Powers Boulevard (SH-21) and Peak Innovation Parkway (#13)
- Bradley Road and Grinnell Boulevard (#14)

In addition, 11 proposed internal intersections and project accesses were also included for evaluation.

For purposes of this traffic study, Peak Innovation Park was evaluated in three phases. Analysis was completed for the known development occurring identified as Phase I to be complete in 2022. A mid-point analysis horizon of 2030 with the known developments and 40 percent of the remaining area completed was identified as Phase II. Full Build Out of the development is expected to occur by 2045. These three separate horizons were studied to determine intersection and roadway configurations needed at all three planning horizons.

3.0 EXISTING CONDITIONS

3.1 Existing Study Area

Peak Innovation Park includes a few developments, but primarily it is vacant and undeveloped land. Directly to the east, north, and south of the project site, more vacant land exists. North of the project, Colorado Springs Airport exists. West of the project, residential neighborhoods exist. More vacant land and residential land uses exist in all directions further surrounding the project site area. The land uses and roadway network surrounding the site within the project study area are shown within the aerial of **Figure 2**.

3.2 Existing Roadway Network

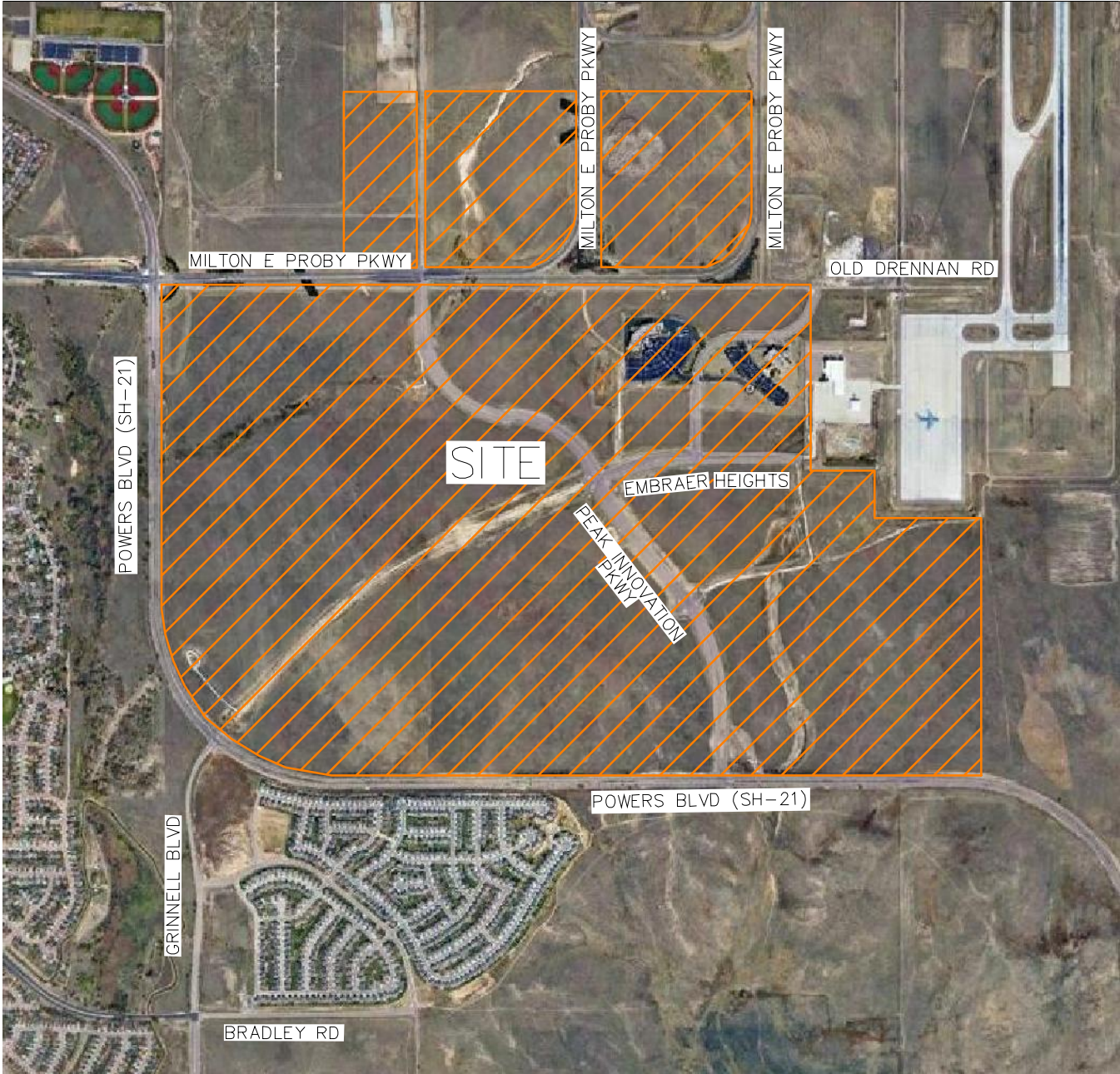
Regional access to the development is provided by Interstate 25, US Highway 85 (US-85), Powers Boulevard (SH-21) and US Highway 24 (US-24). Primary access to the Park is provided by Powers Boulevard (SH-21), Milton E. Proby Parkway, and Grinnell Boulevard. Primary access through the development is and will be provided by Embraer Heights, Peak Innovation Parkway, and Integration Loop. These primary roadways evaluated within the study are described as follows.

Milton E. Proby Parkway

Milton E. Proby Parkway is a four-lane divided roadway providing two through lanes of travel, eastbound and westbound, with a posted speed limit of 50 miles per hour through the study area. Milton E. Proby Parkway provides access to the Colorado Springs Airport. By the 2045 long-term horizon, it is anticipated that Milton E Proby Parkway will be improved to be a six-lane roadway providing three through lanes of travel in each direction through the study area.

Powers Boulevard (SH-21)

Powers Boulevard (SH-21) is a four-lane divided roadway providing two through lanes of travel, northbound and southbound, with a posted speed limit ranging from 55 to 65 miles per hour through the study area. By 2030, it is anticipated that Powers Boulevard will be improved to a six-lane roadway providing three through lanes of travel in each direction from Milton E Proby Parkway to Grinnell Boulevard.



PEAK INNOVATION PARK
SURROUNDING SITE AREA

FIGURE 2

Peak Innovation Parkway

Peak Innovation Parkway exists as a six-lane divided roadway providing three through lanes of travel, northbound and southbound, with a posted speed limit of 40 miles per hour throughout the study area. It is believed that Peak Innovation Parkway could be restriped and converted from providing three through lanes in each direction to providing two through lanes in each direction, south of the future Integration Loop northern intersection, through the Embraer Heights intersection, and south to Powers Boulevard with full buildout.

Embraer Heights

Embraer Heights is a four-lane divided roadway with a posted speed limit of 35 miles per hour in the study area. Embraer Heights provides two through lanes of travel in each direction, eastbound and westbound, with left turn lanes provided at major intersections. A temporary roadway currently exists at this intersection as the west leg which provides access to Project Jungle. This roadway will be removed when Grinnell Boulevard is extended to the north of Powers Boulevard (SH-21). Integration Loop is anticipated to also be constructed between Peak Innovation Parkway and the Grinnell Boulevard extension by this time.

Bud Breckner Boulevard

Bud Breckner Boulevard is a five-lane roadway that provides two through lanes in each direction with a shared two-way left turn lane. Bud Breckner Boulevard extends primarily northbound and southbound and has a posted speed limit of 30 miles per hour. It is anticipated that the roadway network surrounding Bud Breckner Boulevard will be reconfigured sometime in the future to include a right-in/right-out access along Milton E Proby Parkway.

Grinnell Boulevard

Grinnell Boulevard is a two-lane roadway that provides one through lane of travel in each direction, northbound and southbound, with a posted speed limit of 50 miles per hour throughout the study area. Grinnell Boulevard provides left and right turn lanes at major intersections.

Bradley Road

Bradley Road is two-lane roadway that provides one through lane of travel in each direction, eastbound and westbound, with a posted speed limit of 40 miles per hour throughout the study area east of Grinnell Boulevard. West of Grinnell Boulevard and the drainage canal, Bradley Road widens to a four-lane divided roadway.

The intersection of Milton E Proby Parkway and Powers Boulevard (SH-21) (#1) is signalized with protected-only left turn phasing on all four approaches. The eastbound, northbound, and southbound approaches provide dual left turn lanes, two through lanes, and channelized free right turn lanes. The westbound approach provides a left turn lane, two through lanes, and a channelized right turn lane with a shorter free acceleration lane.

The intersection of Milton E Proby Parkway and Peak Innovation Parkway (#3) is unsignalized with stop control on the northbound and southbound approaches. The eastbound approach provides a left turn lane, two through lanes, and dual channelized free right turn lanes. The westbound approach provides a left turn lane, two through lanes, and a right turn lane. The northbound approach provides a left turn lane, one through lane, and a channelized free right turn lane. The southbound approach provides a shared left turn/through lane and a separate right turn lane.

The intersection of Peak Innovation Parkway and Embraer Heights (#7) is unsignalized with stop control on the westbound Embraer Heights minor approach. The northbound approach provides three through lanes and a channelized right turn lane with yield control. The southbound approach provides a left turn lane, three through lanes and a right turn lane. The westbound approach provides a left turn and a channelized right turn lane with yield control. A new west leg has been constructed at this intersection to provide access to Project Jungle. This approach includes a left turn and right turn lane.

The intersection of Embraer Heights and Bud Breckner Boulevard (#8) is unsignalized with stop control on the southbound Bud Breckner Boulevard minor approach. The eastbound approach provides a left turn lane and two through lanes of travel. The westbound approach provides two through lanes of travel with the outside lane being a shared through/right turn lane. The southbound approach provides a left turn lane and a continuous channelized right turn lane with yield control.

The T-intersection of Powers Boulevard (SH-21) and Grinnell Boulevard (#12) is signalized with protected-permitted left turn phasing on the westbound Powers Boulevard approach. The eastbound Powers Boulevard approach provides two through lanes and a channelized right turn lane with yield control. The westbound Powers Boulevard approach provides a left turn lane and

two through lanes. The northbound Grinnell Boulevard approach provides a left turn lane and a channelized free right turn lane.

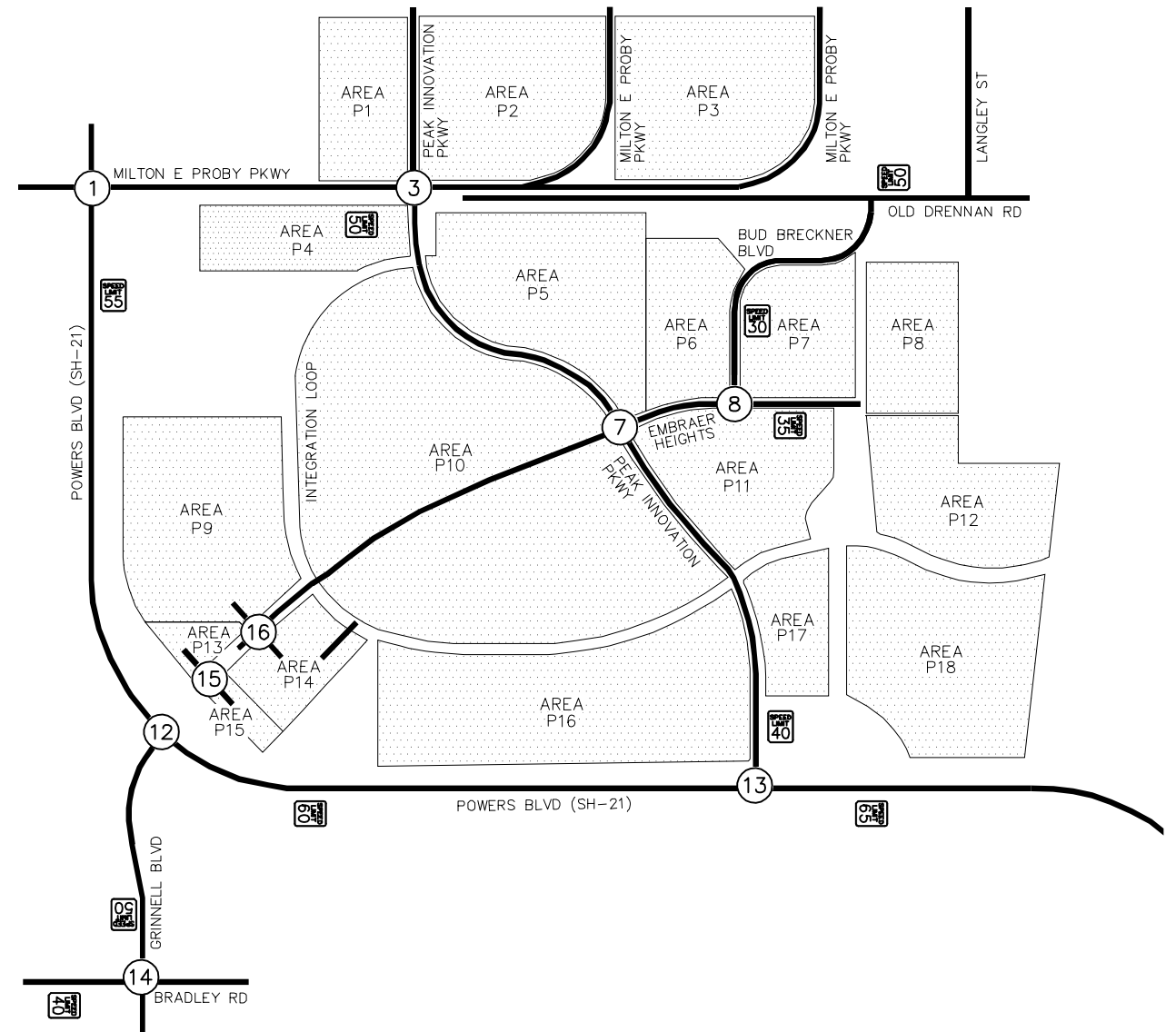
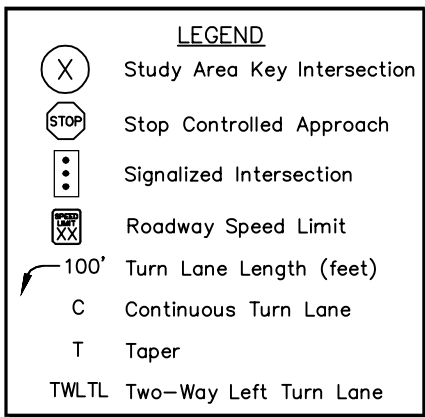
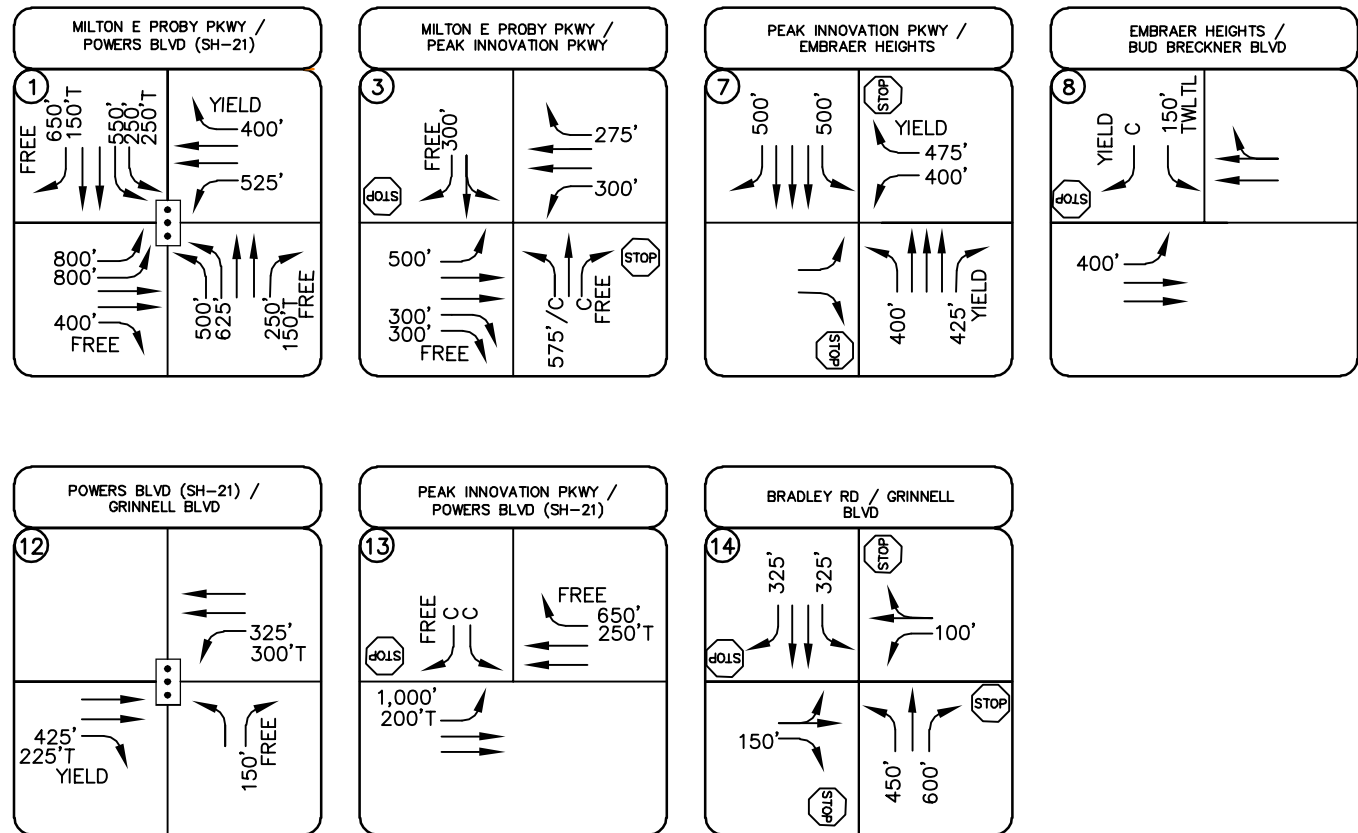
The T-intersection of Peak Innovation Parkway and Powers Boulevard (SH-21) (#13) is unsignalized with stop control on the southbound Peak Innovation Parkway approach. The eastbound approach provides a left turn lane and two through lanes. The westbound approach provides two through lanes and a channelized free right turn lane. The southbound approach provides a left turn lane and a separate channelized free right turn lane.

The intersection of Bradley Road and Grinnell Boulevard (#14) is unsignalized with All-Way Stop-Control (AWSC). The eastbound approach provides a shared left turn/through lane and a separate right turn lane. The westbound approach provides a separate left turn lane and a shared through/right turn lane. The northbound approach provides a left turn lane, one through lane, and a right turn lane. The southbound approach provides a left turn lane, two through lanes, and a right turn lane.

Existing intersection lane configurations are shown in **Figure 3**.

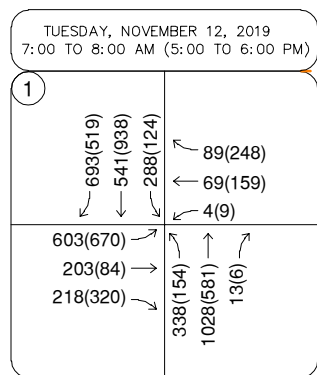
3.3 Existing Traffic Volumes

Existing peak hour turning movement counts were conducted at the key intersections on Tuesday, November 12, 2019. The counts were conducted in 15-minute intervals during the morning and afternoon peak hours of adjacent street traffic from 7:00 AM to 9:00 AM and 4:00 PM to 6:00 PM on this count date. Existing turning movement counts are shown in **Figure 4** with count sheets provided in **Appendix A**.

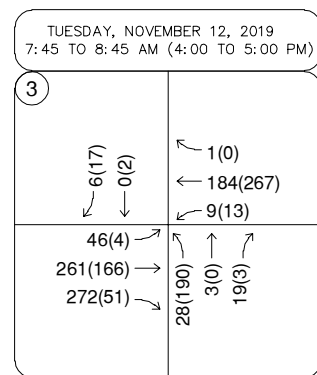


PEAK INNOVATION PARK
 EXISTING LANE CONFIGURATION AND CONTROL

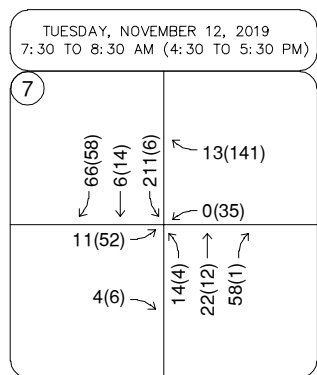
FIGURE 3



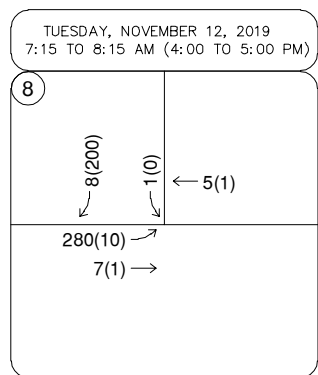
MILTON E PROBY PKWY / POWERS BLVD (SH-21)



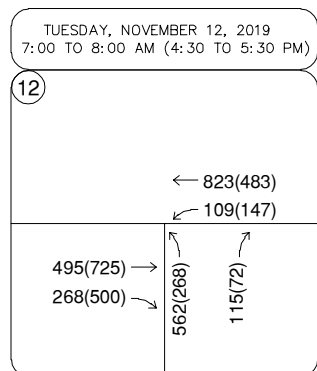
MILTON E PROBY PKWY / PEAK INNOVATION PKWY



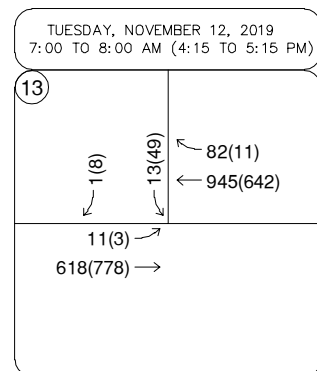
PEAK INNOVATION PKWY / EMBRAER HEIGHTS



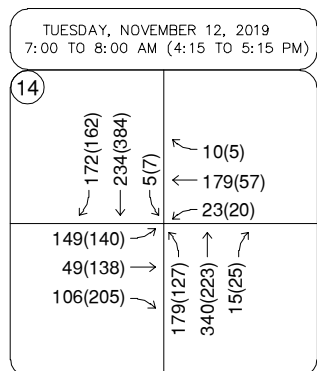
EMBRAER HEIGHTS / BUD BRECKNER BLVD



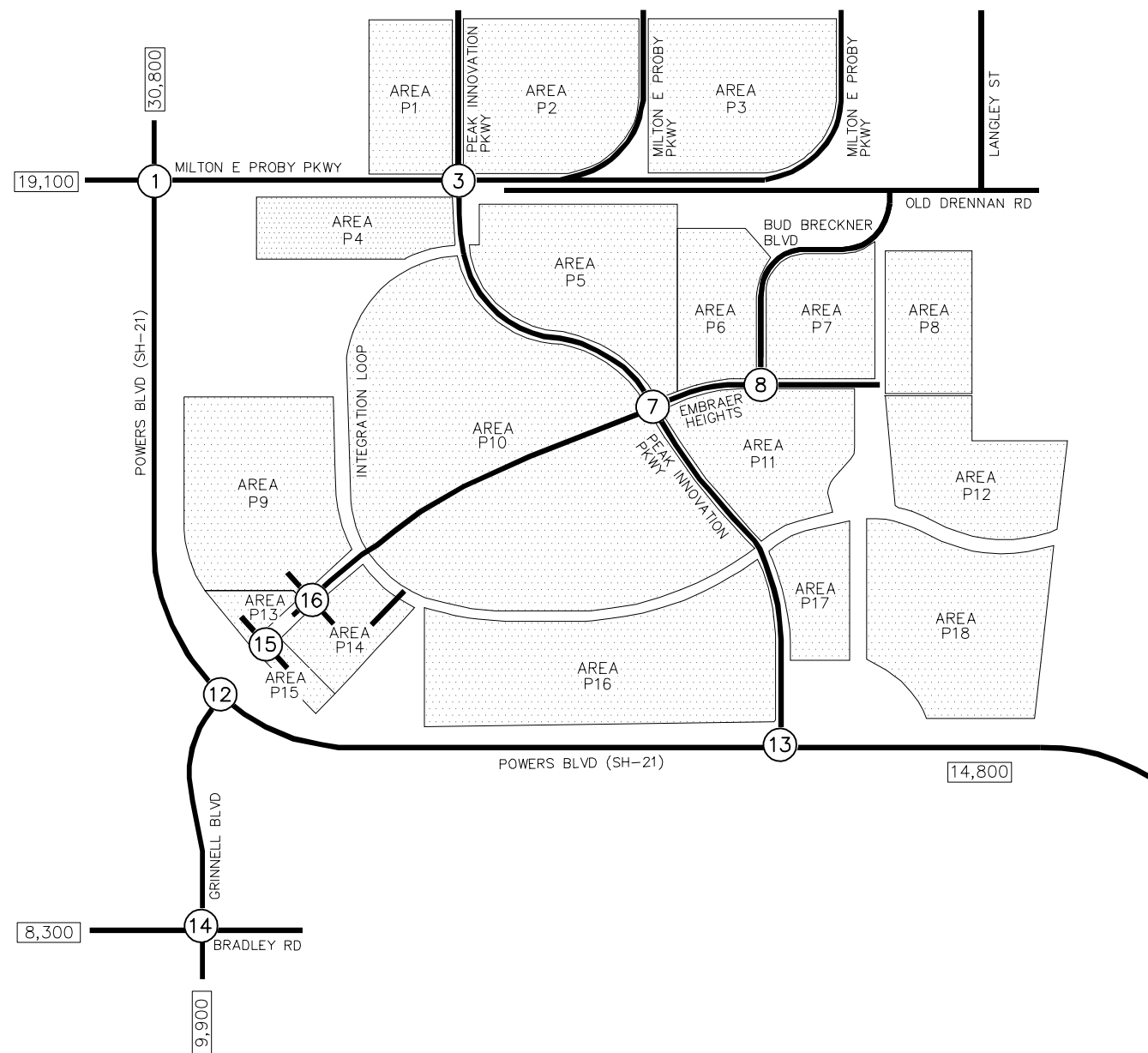
POWERS BLVD (SH-21) / GRINNELL BLVD



PEAK INNOVATION PKWY / POWERS BLVD (SH-21)



BRADLEY RD / GRINNELL BLVD



LEGEND

- (X) Study Area Key Intersection
- XXX(XXX) Weekday AM(PM) Peak Hour Traffic Volumes
- XX,X00 Estimated Daily Traffic Volume

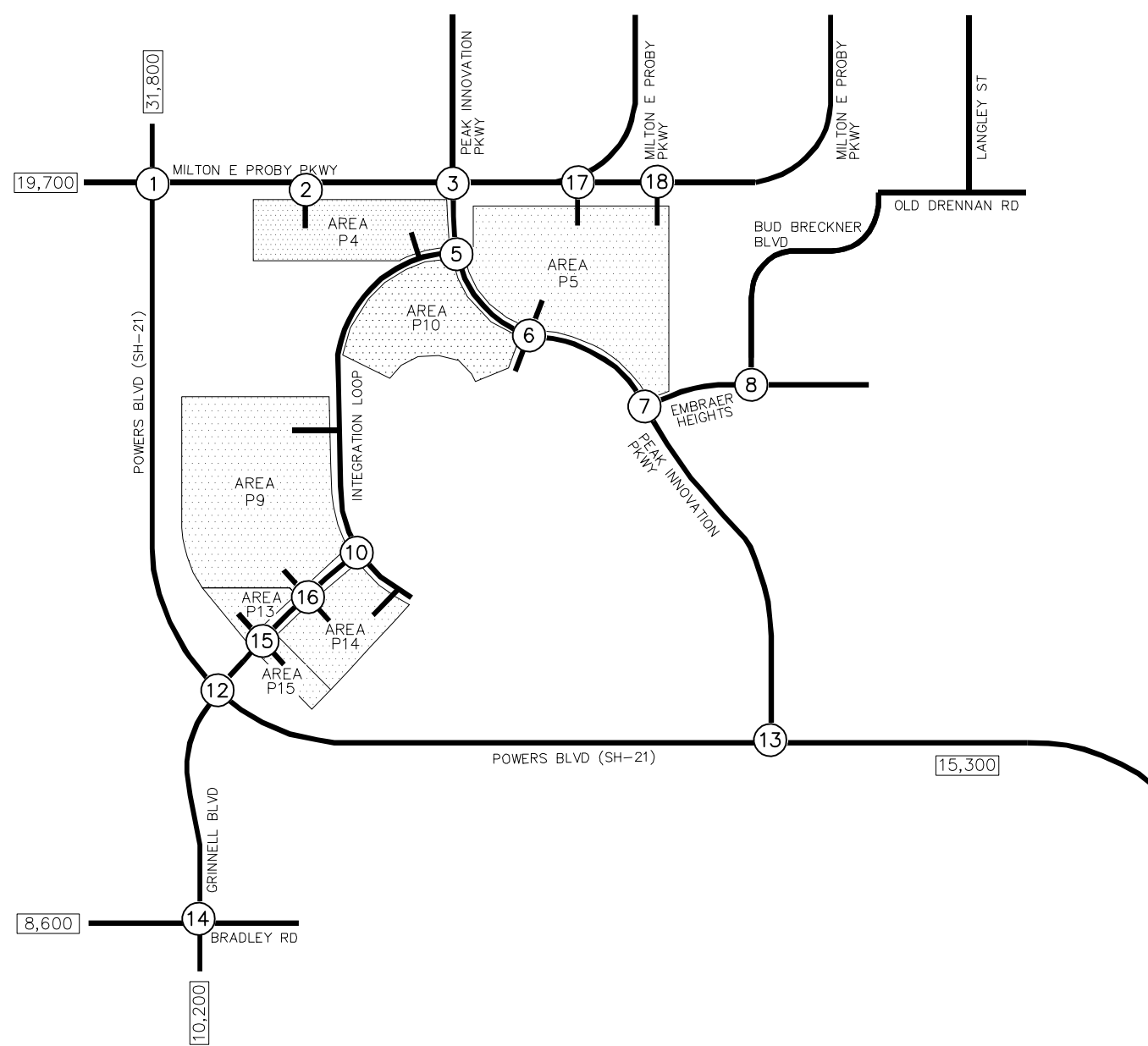
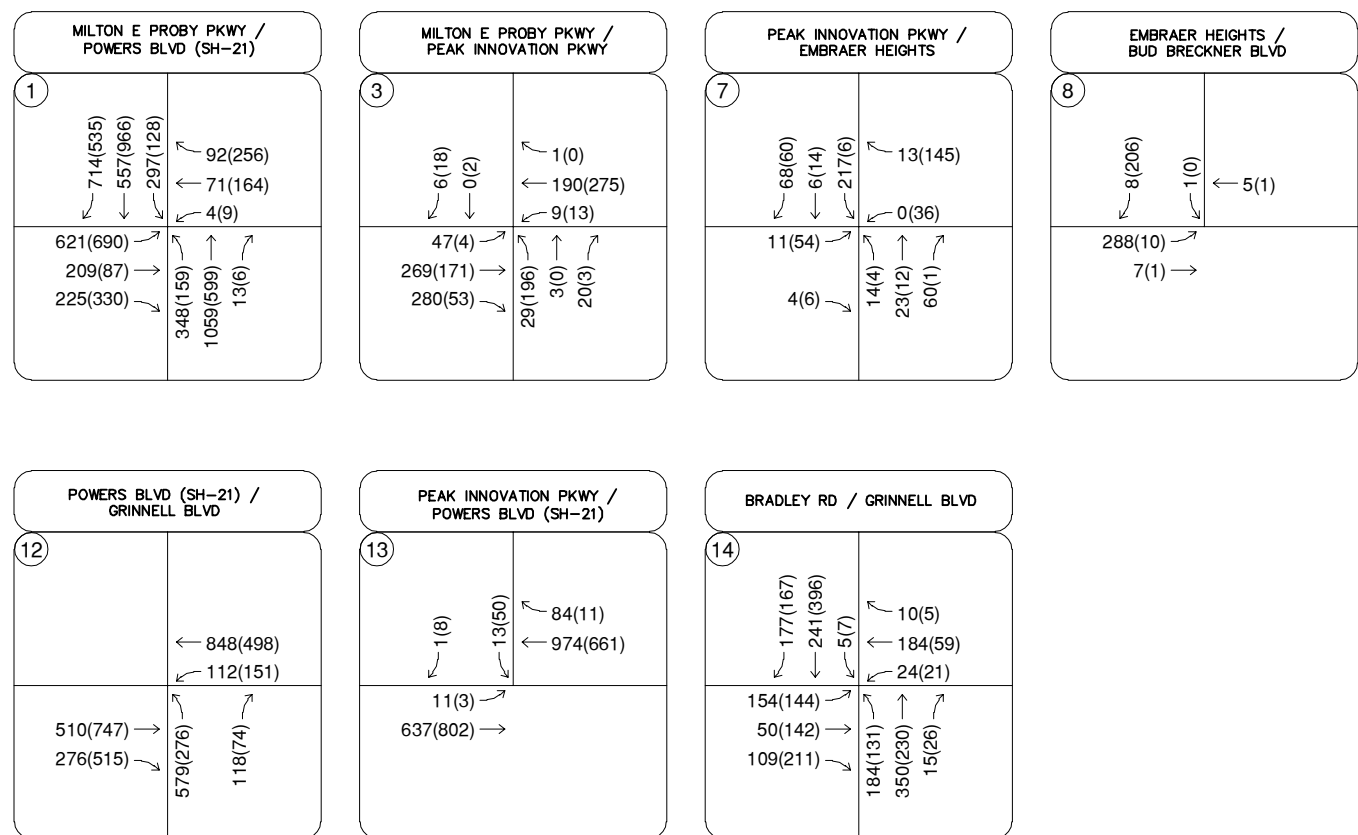
PEAK INNOVATION PARK
EXISTING TRAFFIC VOLUMES

FIGURE 4

3.4 Unspecified Development Traffic Growth

Based on information provided on the website for the Colorado Department of Transportation, the 20-year growth factor along SH-21 (Powers Boulevard) adjacent to the study area ranges from 1.07 to 1.29. This value equates to an annual growth rate ranging from approximately 0.34 to 1.28 percent per year. Traffic information from the CDOT Online Transportation Information System (OTIS), is included in **Appendix B**.

Based on this as well as correspondence with City of Colorado Springs, El Paso County, and CDOT staff, a one (1) percent annual growth rate was used to estimate future background traffic volume conditions within the study area. This annual growth rate of one percent was used to estimate traffic volumes at the key study intersections for 2022, 2030, and 2045 without construction of the project. The calculated background traffic volumes for 2022, 2030, and 2045 are shown in **Figure 5**, **Figure 6**, and **Figure 7** respectively.

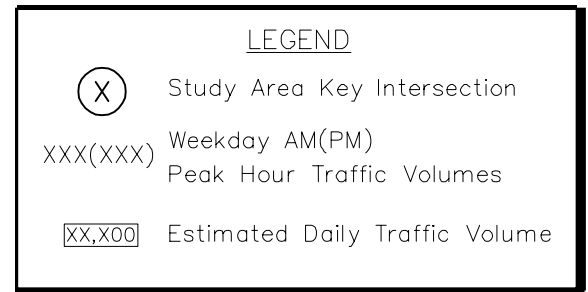
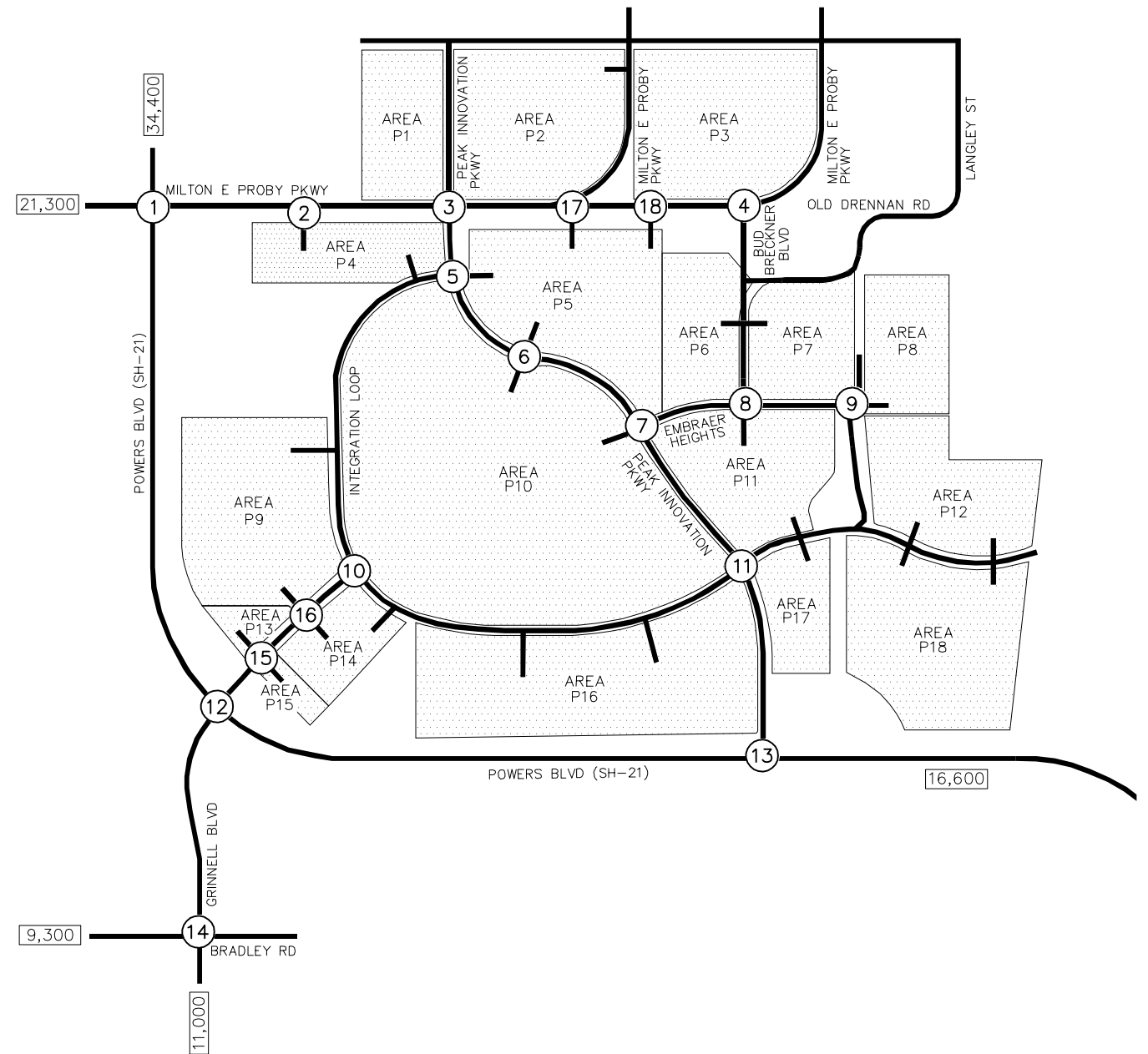
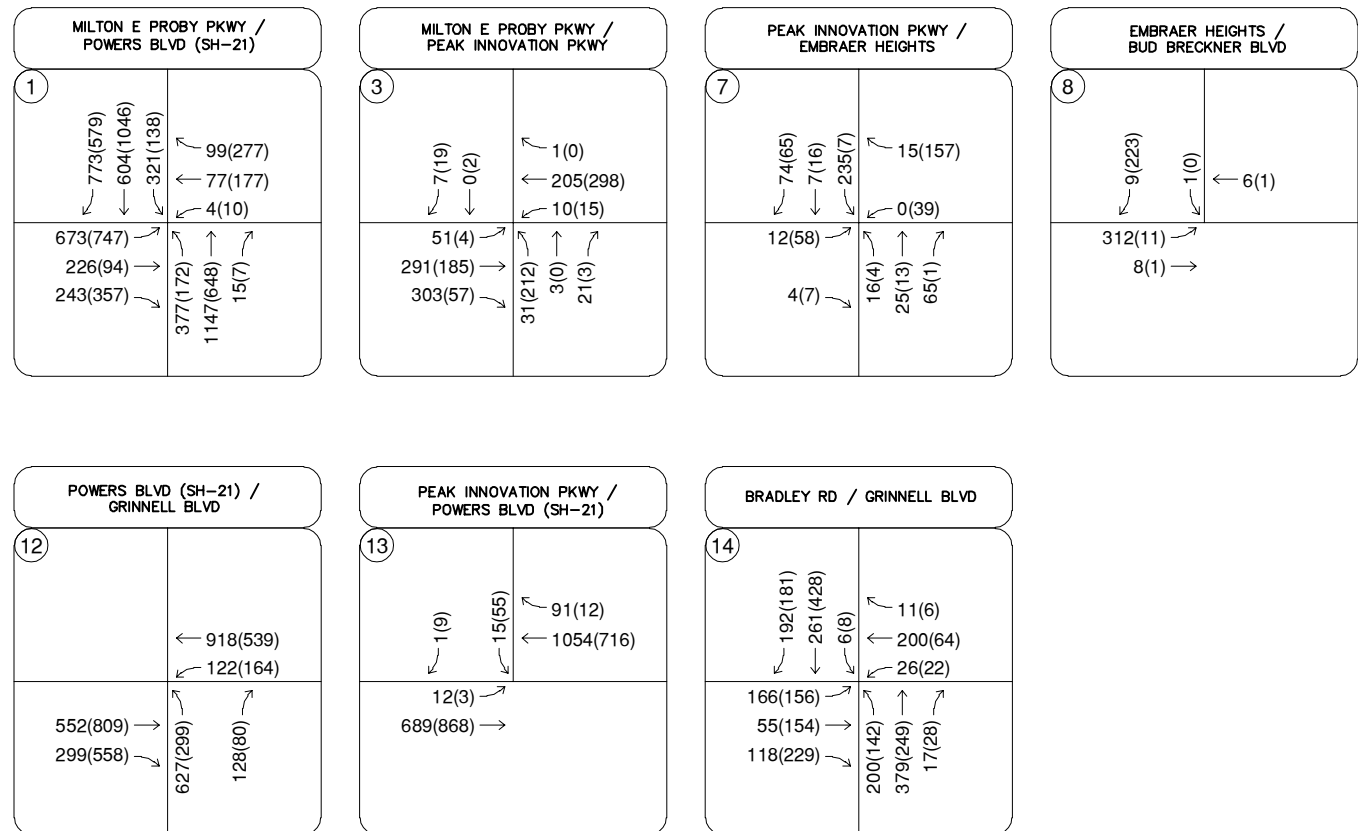


LEGEND

- (X) Study Area Key Intersection
- XXX(XXX) Weekday AM(PM) Peak Hour Traffic Volumes
- XX,X00 Estimated Daily Traffic Volume

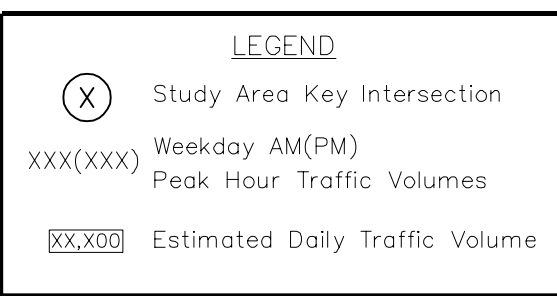
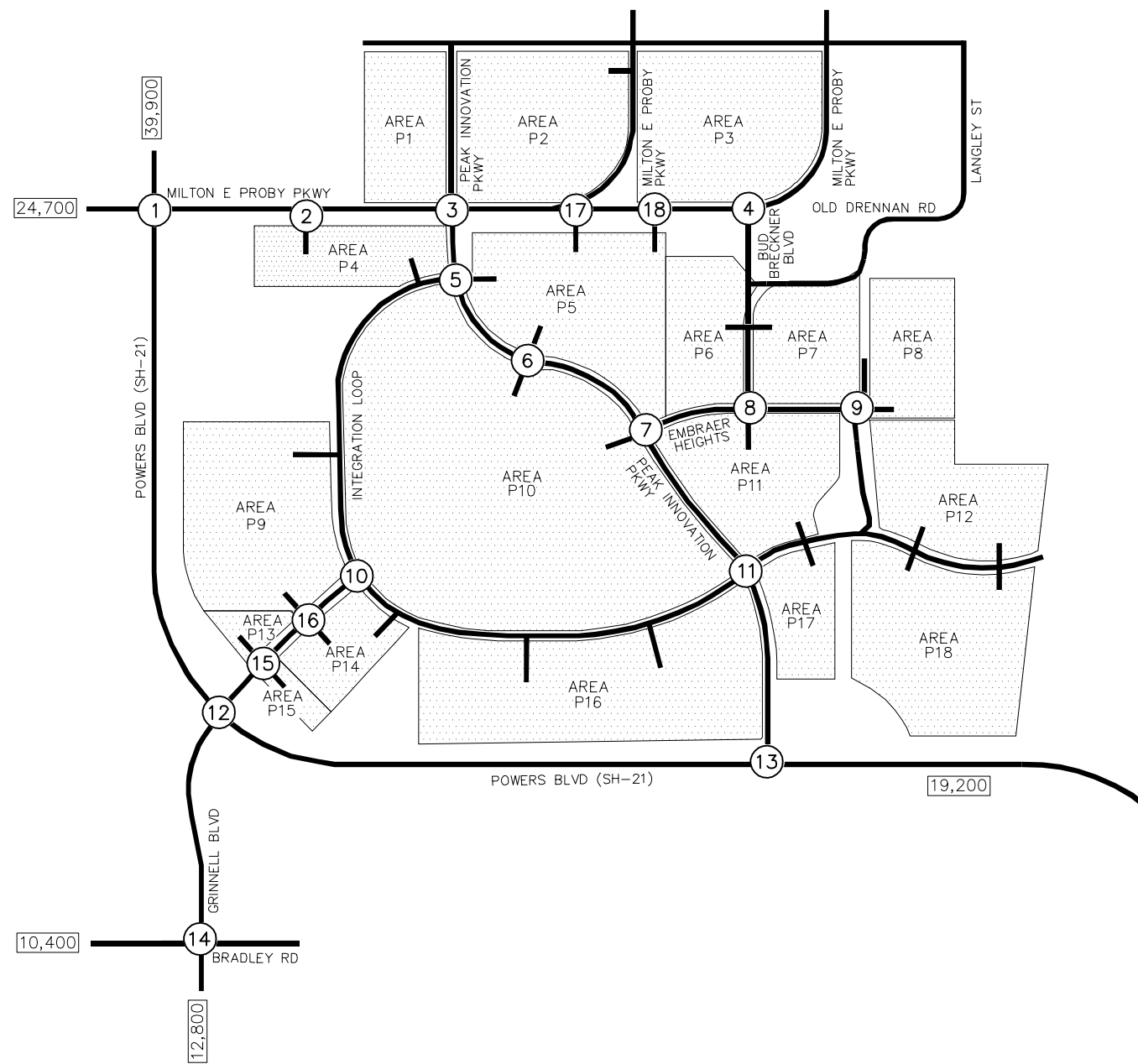
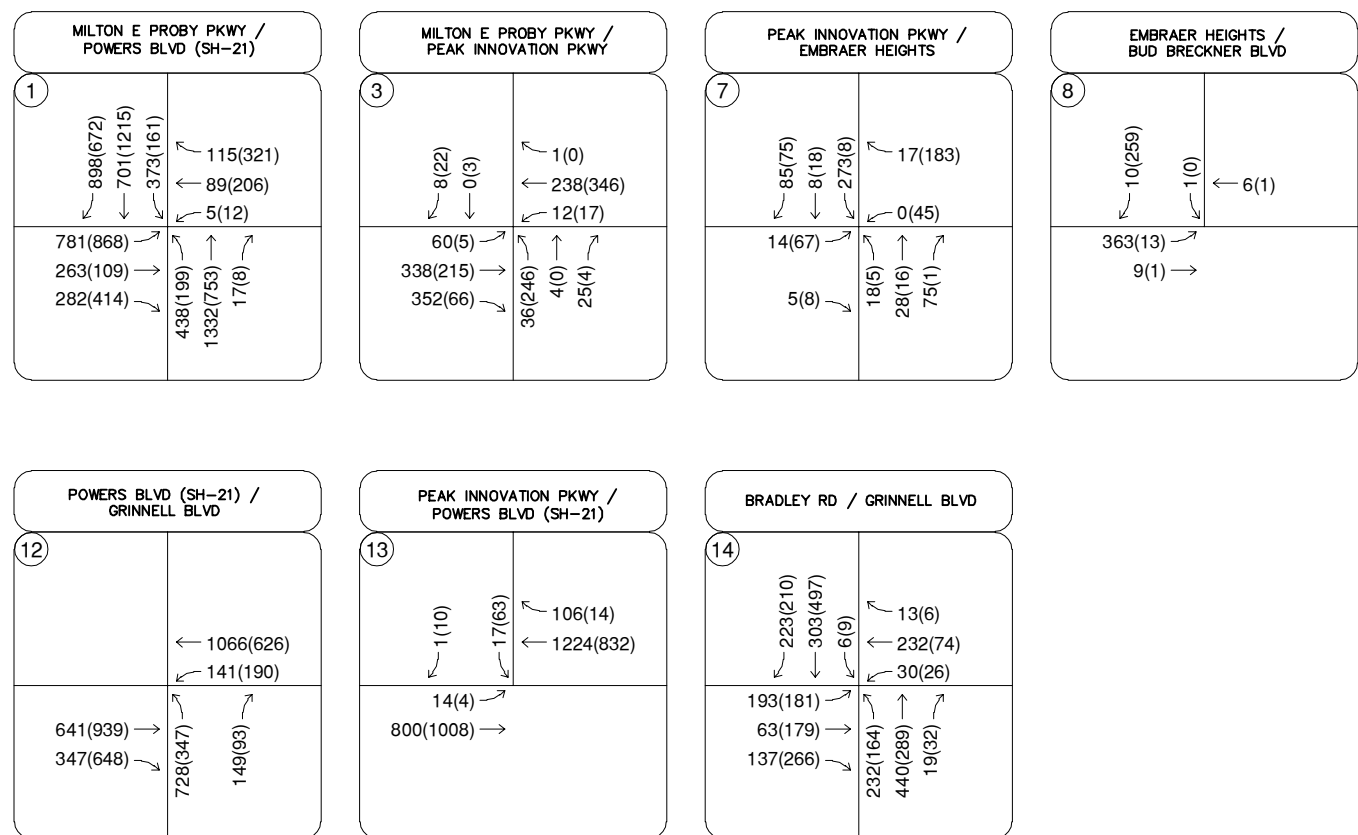
PEAK INNOVATION PARK
2022 BACKGROUND TRAFFIC VOLUMES

FIGURE 5



PEAK INNOVATION PARK
 2030 BACKGROUND TRAFFIC VOLUMES

FIGURE 6



PEAK INNOVATION PARK
 2045 BACKGROUND TRAFFIC VOLUMES

FIGURE 7

4.0 PROJECT TRAFFIC CHARACTERISTICS

4.1 Trip Generation

Site-generated traffic estimates are determined through a process known as trip generation. Rates and equations are applied to the proposed land use to estimate traffic generated by the development during a specific time interval. The acknowledged source for trip generation rates is the *Trip Generation Manual*¹ published by the Institute of Transportation Engineers (ITE). ITE has established trip rates in nationwide studies of similar land uses.

For purposes of this study, Peak Innovation Park was studied to completed in three phases. Phase I identified as the known developments occurring currently is anticipated to be completed in 2022 and will include full buildout of Zones P-4, P-9, P-13, P-14, and P-15, as well as partial buildout of Zones P-5 and P-10. A mid-point analysis horizon of 2030 with the known developments of the first phase plus 40 percent of the remaining area completed was identified as Phase II. Full buildout of Peak Innovation Park is anticipated to be completed by 2045.

As mentioned previously, the project includes a total of eighteen (18) zone areas with office, industrial, and commercial buildings. At full buildout, Peak Innovation Park was proposed to include the following:

- Zone P-1: 180,000 SF Business Park
- Zone P-2: 1,130,000 SF Business Park
- Zone P-3: 1,170,000 SF Business Park
- Zone P-4: 40,000 SF Business Park
10,000 SF Fast Food Restaurants with Drive Through Window
12 Fueling Position Gasoline Station with Convenience Market
- Zone P-5: 240 Room Hotels
690,000 SF Business Park
- Zone P-6: 265,000 SF Office Park
- Zone P-7: 300,000 SF Office Park
- Zone P-8: 90,000 SF Office Park
- Zone P-9: Project Rodeo (Client Data)
- Zone P-10: 1,550,000 SF Office Park

¹ Institute of Transportation Engineers, *Trip Generation Manual*, Tenth Edition, Washington DC, 2017.

- Zone P-11: 375,000 SF Office Park
- Zone P-12: 405,000 SF Industrial Park
- Zone P-13: 12 Fueling Position Gasoline Station with Convenience Market
- Zone P-14: Project Jungle (Client Data)
- Zone P-15: 5,000 SF Fast Food Restaurant with Drive Through Window
- Zone P-16: 770,000 SF Industrial Park
- Zone P-17: 190,000 SF Office Park
- Zone P-18: 630,000 SF Industrial Park

For this study, Kimley-Horn used the ITE Trip Generation Report average rate equations that apply to Industrial Park (ITE Code 130), Office Park (ITE 750), Business Park (ITE 770), Fast Food Restaurant with Drive-Through Window (ITE 934), and Gasoline Service Station with Convenience Market (ITE 945) for traffic associated with the development.

During the first phase of project buildout in 2022, Peak Innovation Park is expected to generate approximately 27,532 daily weekday trips with 3,173 of these trips expected to occur during the morning peak hour and 2,255 trips expected to occur during the afternoon peak hour. The project traffic generation for Phase I is shown in **Table 1**.

During the second phase of construction in 2030 (including Phase I development within these trip numbers), Peak Innovation Park project is anticipated to generate 52,764 daily weekday trips with 5,023 of these trips occurring during the morning peak hour and 3,826 trips occurring during the afternoon peak hour. The project traffic generation in 2030 is shown in **Table 2**.

With full project buildout in 2045 (including both Phases 1 and 2 in these trip numbers), Peak Innovation Park project is anticipated to generate a total of 97,058 weekday external daily trips with 8,565 trips occurring during the morning peak hour and 6,788 trips occurring during the afternoon peak hour. The project traffic generation at full buildout of Peak Innovation Park is shown in **Table 3**.

Of note, truck trip generation was calculated based on the ITE Trip Generation Supplement and was found to be approximately two percent of the peak hour trip generation volume for the overall project. The trip generation summary and all calculation worksheets are referenced in **Appendix C**.

Table 1 – Peak Innovation Park 2022 Phase I Buildout Trip Generation

Zone	Land Use	Quantity	Units	Weekday Vehicle Trips						
				Daily	AM Peak Hour			PM Peak Hour		
					In	Out	Total	In	Out	Total
P-4	Business Park (ITE 770)	40,000	SF	498	10	6	16	8	9	17
	Fast Food Restaurant w/ Drive Thru (ITE 934)	10,000	SF	4,710	205	197	402	170	157	327
	Gas Station w/ Convenience Market (ITE 945)	12	Fueling Positions	2,464	76	74	150	86	82	168
	<i>P-4 Total</i>				<i>7,672</i>	<i>291</i>	<i>277</i>	<i>568</i>	<i>264</i>	<i>248</i>
P-5	Hotel (ITE 310)	240	Rooms	2,006	67	46	113	73	71	144
	Business Park (ITE 770)	390,000	SF	4,852	95	61	156	75	89	164
	<i>P-5 Total</i>				<i>6,858</i>	<i>162</i>	<i>107</i>	<i>269</i>	<i>148</i>	<i>160</i>
P-9	Project Rodeo (Client Data)			3,956	644	519	1,163	312	238	550
P-10	Office Park (ITE 750)	300,000	SF	3,322	384	48	432	22	299	321
P-13	Gas Station w/ Convenience Market (ITE 945)	12	Fueling Positions	2,464	76	74	150	86	82	168
P-14	Project Jungle (Client Data)			904	222	168	390	171	62	233
P-15	Fast Food Restaurant w/ Drive Thru (ITE 934)	5,000	SF	2,356	103	98	201	85	78	163
Total Site Generated Trips				27,532	1,882	1,291	3,173	1,088	1,167	2,255

Table 2 – Peak Innovation Park 2030 Phase I and Phase II Trip Generation

Zone	Land Use	Quantity	Units	Weekday Vehicle Trips						
				Daily	AM Peak Hour			PM Peak Hour		
					In	Out	Total	In	Out	Total
P-1	Business Park (ITE 770)	72,000	SF	896	18	11	29	14	16	30
P-2	Business Park (ITE 770)	452,000	SF	5,624	110	71	181	87	103	190
P-3	Business Park (ITE 770)	468,000	SF	5,822	114	73	187	91	106	197
P-4	Business Park (ITE 770)	40,000	SF	498	10	6	16	8	9	17
	Fast Food Restaurant w/ Drive Thru (ITE 934)	10,000	SF	4,710	205	197	402	170	157	327
	Gas Station w/ Convenience Market (ITE 945)	12	Fueling Positions	2,464	76	74	150	86	82	168
	<i>P-4 Total</i>				7,672	291	277	568	264	248
P-5	Hotel (ITE 310)	240	Rooms	2,006	67	46	113	73	71	144
	Business Park (ITE 770)	390,000	SF	4,852	95	61	156	75	89	164
	<i>P-5 Total</i>				6,858	162	107	269	148	160
P-6	Office Park (ITE 750)	106,000	SF	1,174	136	17	153	8	105	113
P-7	Office Park (ITE 750)	120,000	SF	1,330	154	19	173	9	119	128
P-8	Office Park (ITE 750)	36,000	SF	400	46	6	52	3	36	39
P-9	Project Rodeo (Client Data)			3,956	644	519	1,163	312	238	550
P-10	Office Park (ITE 750)	620,000	SF	6,864	795	98	893	46	617	663
P-11	Office Park (ITE 750)	150,000	SF	1,662	192	24	216	11	150	161
P-12	Industrial Park (ITE 130)	162,000	SF	546	53	12	65	14	51	65
P-13	Gas Station w/ Convenience Market (ITE 945)	12	Fueling Positions	2,464	76	74	150	86	82	168
P-14	Project Jungle (Client Data)			2,410	222	168	390	171	62	233
P-15	Fast Food Restaurant w/ Drive Thru (ITE 934)	5,000	SF	2,356	103	98	201	85	78	163
P-16	Industrial Park (ITE 130)	308,000	SF	1,038	100	23	123	26	98	124
P-17	Office Park (ITE 750)	76,000	SF	842	97	12	109	6	75	81
P-18	Industrial Park (ITE 130)	252,000	SF	850	82	19	101	21	80	101
Total Site Generated Trips				55,368	3,430	1,650	5,080	1,419	2,452	3,871

Table 3 – Peak Innovation Park 2045 Full Buildout Trip Generation

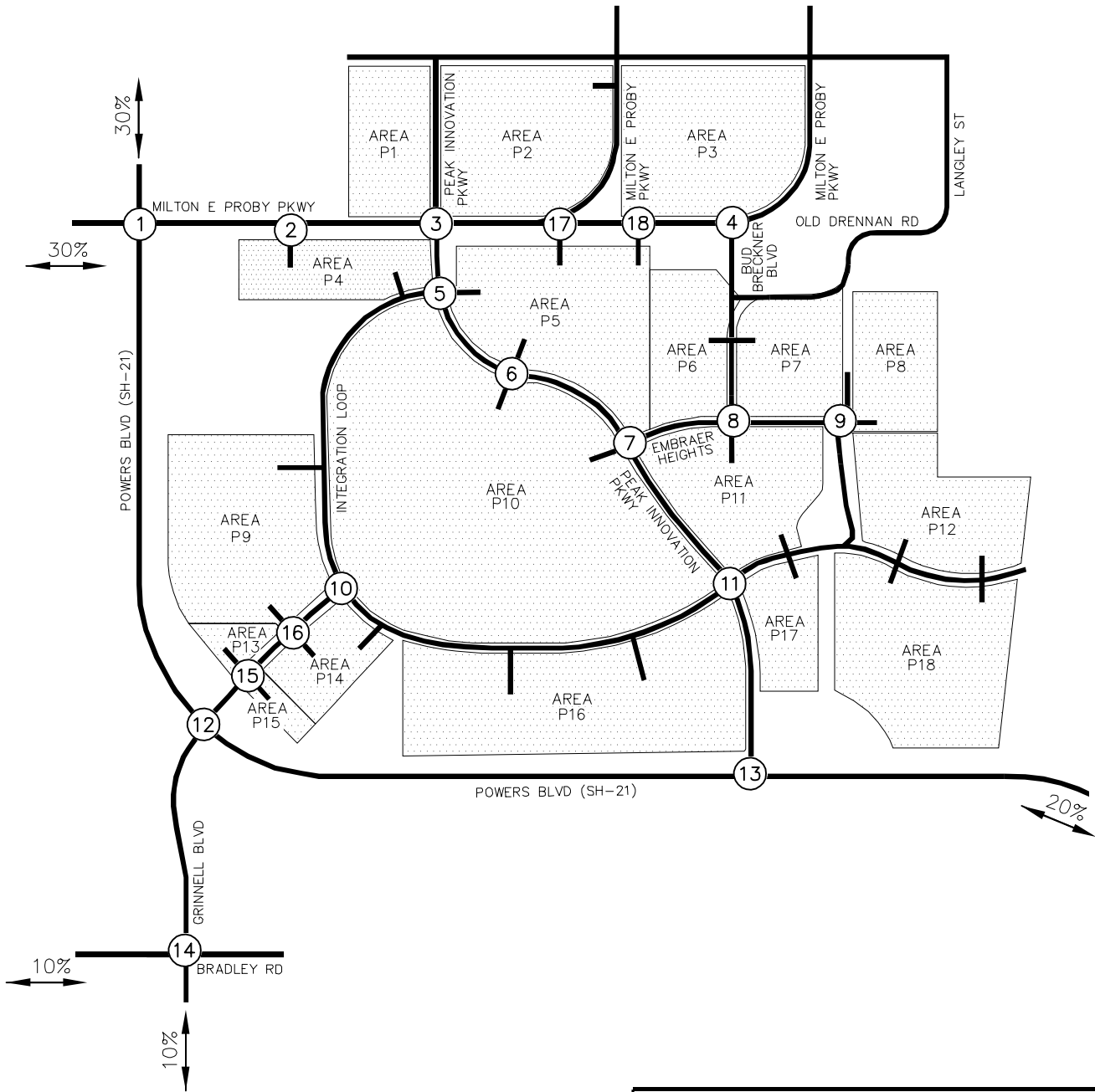
Zone	Land Use	Quantity	Units	Weekday Vehicle Trips						
				Daily	AM Peak Hour			PM Peak Hour		
					In	Out	Total	In	Out	Total
P-1	Business Park (ITE 770)	180,000	SF	2,240	44	28	72	35	41	76
P-2	Business Park (ITE 770)	1,130,000	SF	14,058	276	176	452	217	258	475
P-3	Business Park (ITE 770)	1,170,000	SF	14,556	285	183	468	226	265	491
P-4	Business Park (ITE 770)	40,000	SF	498	10	6	16	8	9	17
	Fast Food Restaurant w/ Drive Thru (ITE 934)	10,000	SF	4,710	205	197	402	170	157	327
	Gas Station w/ Convenience Market (ITE 945)	12	Fueling Positions	2,464	76	74	150	86	82	168
	<i>P-4 Total</i>				<i>7,672</i>	<i>291</i>	<i>277</i>	<i>568</i>	<i>264</i>	<i>248</i>
P-5	Hotel (ITE 310)	240	Rooms	2,006	67	46	113	73	71	144
	Business Park (ITE 770)	690,000	SF	8,584	168	108	276	133	157	290
	<i>P-5 Total</i>				<i>10,590</i>	<i>235</i>	<i>154</i>	<i>389</i>	<i>206</i>	<i>228</i>
P-6	Office Park (ITE 750)	265,000	SF	2,934	340	42	382	20	264	284
P-7	Office Park (ITE 750)	300,000	SF	3,322	384	48	432	22	299	321
P-8	Office Park (ITE 750)	90,000	SF	998	116	14	130	7	89	96
P-9	Project Rodeo (Client Data)			3,956	644	519	1,163	312	238	550
P-10	Office Park (ITE 750)	1,550,000	SF	17,160	1,986	246	2,232	116	1,543	1,659
P-11	Office Park (ITE 750)	375,000	SF	4,152	481	59	540	28	373	401
P-12	Industrial Park (ITE 130)	405,000	SF	1,366	131	31	162	34	128	162
P-13	Gas Station w/ Convenience Market (ITE 945)	12	Fueling Positions	2,464	76	74	150	86	82	168
P-14	Project Jungle (Client Data)			2,410	222	168	390	171	62	233
P-15	Fast Food Restaurant w/ Drive Thru (ITE 934)	5,000	SF	2,356	103	98	201	85	78	163
P-16	Industrial Park (ITE 130)	770,000	SF	2,596	249	59	308	65	243	308
P-17	Office Park (ITE 750)	190,000	SF	2,104	244	30	274	14	189	203
P-18	Industrial Park (ITE 130)	630,000	SF	2,124	204	48	252	53	199	252
Total Site Generated Trips				97,058	6,311	2,254	8,565	1,961	4,827	6,788

4.2 Project Access

Direct access to the site is and will be provided by several internal intersections and access points, of which 11 were included within this study. Within this study, the following access intersections were evaluated. A right-in/right-out access (#2) is proposed along the south side of Milton E Proby Parkway between Powers Boulevard and Peak Innovation Parkway. A right-in/right-out access (#4) is proposed along the south side of Milton E. Proby Parkway at a proposed extension of Bud Breckner Boulevard, to the east of Peak Innovation Parkway. A new intersection will be constructed at Peak Innovation Parkway and the proposed Integration Loop roadway (#5). A full movement middle access (#6) will be constructed along the north and south sides of Peak Innovation Parkway, south of Integration Loop and north of Embraer Heights. A full movement access (#9) will be constructed along Embraer Heights east of Bud Breckner Boulevard. A new T-intersection (#10) will be constructed along Grinnell Boulevard at the proposed Integration Loop roadway. A new intersection along future Integration Loop (#11) will intersect with Peak Innovation Parkway south of Embraer Heights and north of Powers Boulevard (SH-21). Two full movement accesses (#15 and #16) will be constructed along Grinnell Boulevard north of Powers Boulevard and south of Integration Loop. Lastly, two right-in/right-out access intersections (#17 and # 18) will be constructed along the south side of Milton E Proby Parkway, between Peak Innovation Parkway and Bud Breckner Boulevard.

4.3 Trip Distribution

Distribution of Peak Innovation Park traffic on the street system was based on the area street system characteristics, existing traffic patterns, existing and anticipated surrounding development areas and type, and the proposed access and roadway network system for the project. It is assumed that the Grinnell Boulevard extension to the north of Powers Boulevard would be constructed to serve Phase I. Likewise, with Project Rodeo and Phase I, Integration Loop is planned to be constructed between Peak Innovation Parkway and the Grinnell Boulevard extension. The southern section of Integration Loop is anticipated to occur when development occurs within that area and was therefore studied as being in place for the 2030 and 2045 horizons. The directional distribution of traffic is a means to quantify the percentage of site-generated traffic that approaches the site from a given direction and departs the site back to the original source. The external trip distribution percentages for the project are illustrated in **Figure 8**. Each individual development zone area is anticipated to have a unique trip distribution. Detailed trip distribution percentages at each of the eighteen development areas, including all study area intersections, is included in **Appendix D** (Figures A1 – A23).



LEGEND

- (X) Study Area Key Intersection
- XX% External Trip Distribution Percentages

PEAK INNOVATION PARK
 PROJECT TRIP DISTRIBUTION

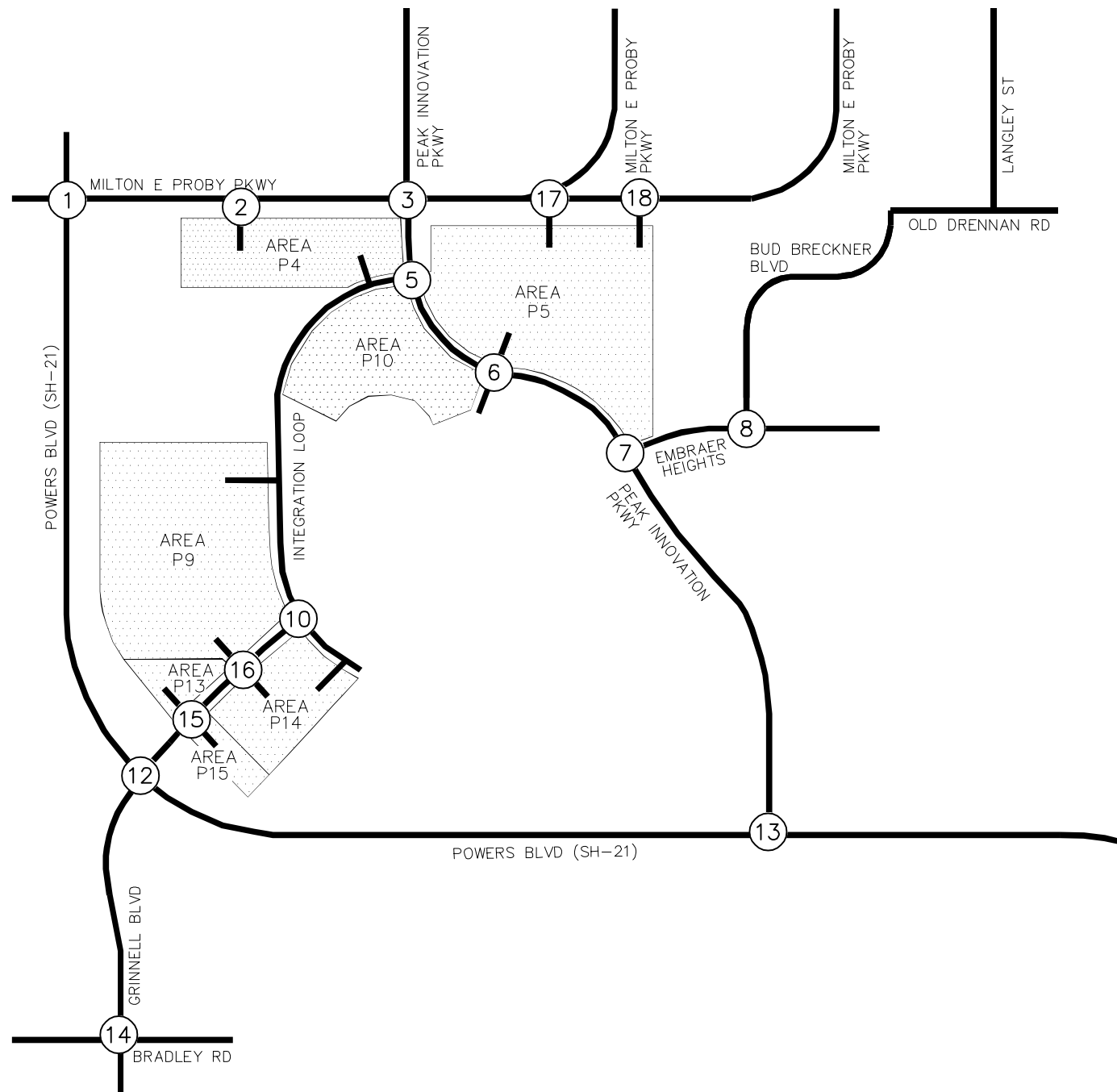
FIGURE 8

4.4 Traffic Assignment

Traffic assignment was obtained by applying the distributions from **Figure 8** and further detailed in **Appendix D** to the estimated traffic generation of the project shown in the previous trip generation tables. Traffic assignment for Phase I of the development in 2022 is shown in **Figure 9**. The traffic assignment for Phase I and Phase II of development in 2030 is shown in **Figure 10**, while the traffic assignment for full buildout in 2045 is shown in **Figure 11**.

4.5 Total (Background Plus Project) Traffic

Project traffic volumes were added to the background volumes to represent estimated traffic conditions for the study horizons. **Figure 12** illustrates the background plus project traffic volumes for Phase I in 2022 at the study key intersections. **Figure 13** illustrates the background plus project traffic volumes for Phase II in 2030 at the key study key intersections. The 2045 total full buildout traffic volumes for the study area are shown in **Figure 14**.



MILTON E PROBY PKWY / POWERS BLVD (SH-21)		MILTON E PROBY PKWY / RIRO ACCESS		MILTON E PROBY PKWY / PEAK INNOVATION PKWY	
1	<p>← 242(156)</p> <p>← 323(170)</p> <p>188(244)</p> <p>← 188(244)</p>	2	<p>← 378(488)</p>	3	<p>← 32(48)</p>
	<p>356(186) →</p> <p>210(141) ↓</p> <p>198(106) →</p> <p>198(106) →</p> <p>58(53) →</p>		<p>503(197) →</p> <p>233(211) ↓</p> <p>14(12) →</p>		<p>57(52) →</p> <p>461(157) ↓</p> <p>332(427) →</p>

PEAK INNOVATION PKWY / INTEGRATION LOOP	
5	<p>176(95) ↓</p> <p>260(40) ↓</p> <p>24(22) ↓</p> <p>21(32) →</p> <p>16(24) →</p> <p>5(8) →</p>
	<p>271(200) →</p> <p>24(22) →</p> <p>100(40) ↓</p> <p>36(71) →</p> <p>40(195) →</p> <p>8(7) →</p>

PEAK INNOVATION PKWY / ACCESS		PEAK INNOVATION PKWY / EMBRAER HEIGHTS		EMBRAER HEIGHTS / BUD BRECKNER BLVD	
6	<p>ACCESS</p> <p>11(16) ↓</p> <p>21(32) ↓</p> <p>32(30) →</p> <p>37(33) →</p> <p>96(6) →</p>	7	<p>94(165) ↓</p>	8	
	<p>16(15) →</p> <p>60(58) →</p> <p>288(17) ↓</p> <p>36(224) →</p> <p>12(75) →</p> <p>ACCESS</p>		<p>166(69) →</p>		

GRINNELL BLVD / INTEGRATION LOOP	
10	<p>359(259) ↓</p> <p>442(219) →</p> <p>183(141) ↓</p> <p>39(16) →</p> <p>10(15) →</p>

POWERS BLVD (SH-21) / GRINNELL BLVD		PEAK INNOVATION PKWY / POWERS BLVD (SH-21)		BRADLEY RD / GRINNELL BLVD		GRINNELL BLVD / SOUTH ACCESS	
12	<p>GRINNELL BLVD</p> <p>398(212) ↓</p> <p>251(211) ↓</p> <p>173(92) ↓</p> <p>209(130) →</p> <p>29(26) →</p> <p>7(23) →</p>	13	<p>7(23) ↓</p> <p>86(142) ↓</p> <p>138(60) →</p> <p>250(165) →</p>	14	<p>130(117) ↓</p> <p>130(117) ↓</p>	15	<p>ACCESS</p> <p>59(66) ↓</p> <p>15(16) ↓</p> <p>15(17) →</p> <p>627(359) →</p>
	<p>450(297) →</p> <p>29(26) →</p> <p>320(181) →</p> <p>27(8) →</p> <p>GRINNELL BLVD</p>		<p>27(8) →</p> <p>181(96) →</p>		<p>187(109) →</p> <p>187(109) →</p>		<p>61(69) →</p> <p>772(422) →</p> <p>147(119) →</p> <p>GRINNELL BLVD</p> <p>132(90) →</p> <p>ACCESS</p>

GRINNELL BLVD / NORTH ACCESS		MILTON E PROBY WEST RIRO ACCESS		MILTON E PROBY EAST RIRO ACCESS	
16	<p>ACCESS</p> <p>182(83) ↓</p> <p>26(12) ↓</p> <p>32(16) →</p> <p>346(238) →</p>	17	<p>16(15) →</p> <p>41(37) ↓</p> <p>16(24) →</p>	18	<p>16(24) →</p> <p>16(15) ↓</p> <p>16(24) →</p>
	<p>193(94) →</p> <p>579(328) →</p> <p>GRINNELL BLVD</p> <p>101(37) →</p> <p>ACCESS</p>				

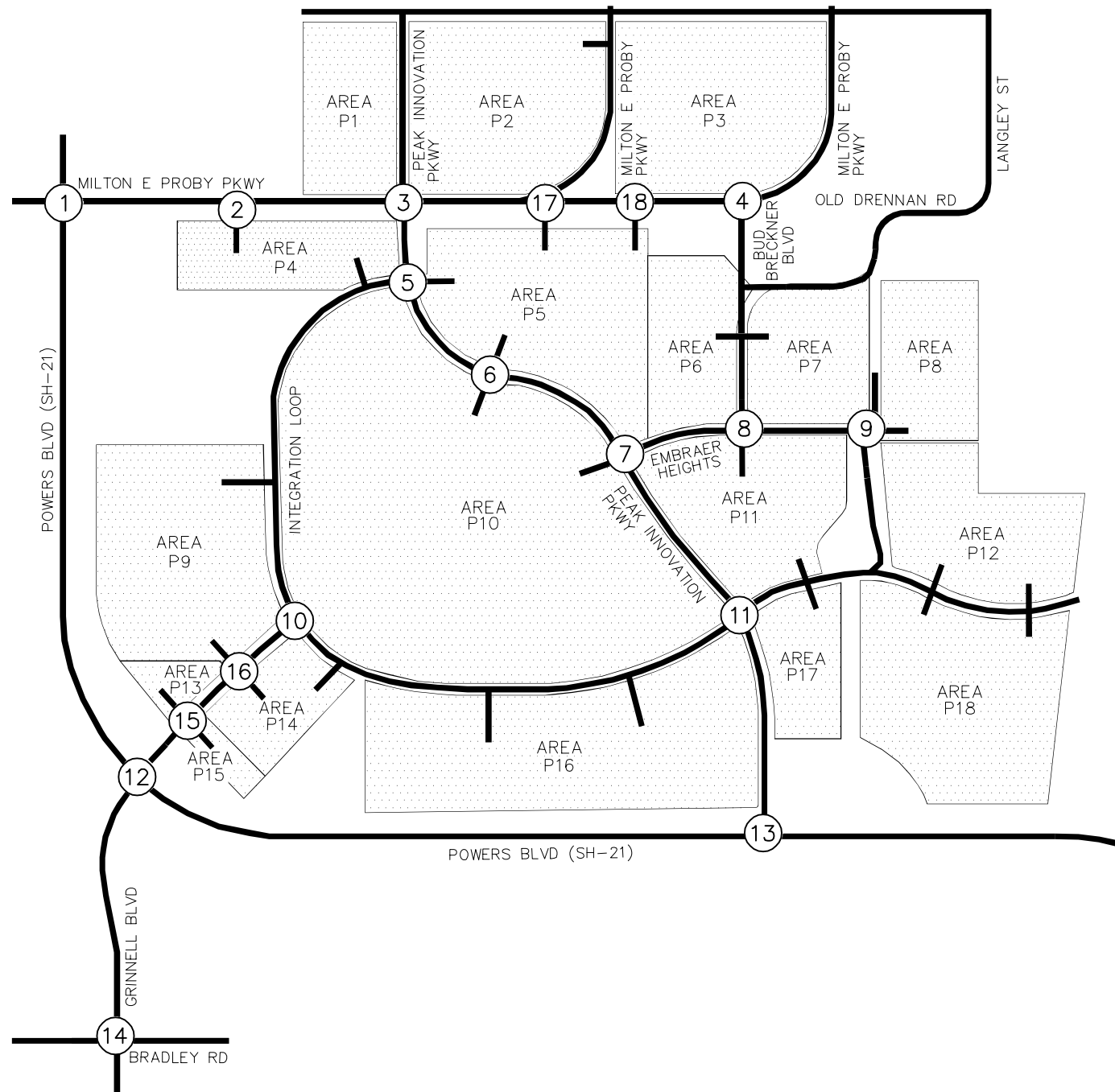
LEGEND

(X) Study Area Key Intersection

XXX(XXX) Weekday AM(PM)
Peak Hour Traffic Volumes

PEAK INNOVATION PARK
PHASE I 2022 PROJECT TRAFFIC ASSIGNMENT

FIGURE 9



<p>1 MILTON E PROBY PKWY / POWERS BLVD (SH-21)</p> <p>290(166) ↓ 717(271) ↓</p> <p>288(562) ↑ 288(562) ↑ 34(59) ↓</p> <p>745(285) → 262(152) ↓</p> <p>210(159) → 210(159) → 110(80) ↓</p>	<p>2 MILTON E PROBY PKWY / RIRO ACCESS</p> <p>← 613(1197)</p> <p>1351(436) → 218(198) ↓</p> <p>14(12) ↓</p>	<p>3 MILTON E PROBY PKWY / PEAK INNOVATION PKWY</p> <p>66(96) ↓ 13(18) ↓ 10(15) ↓</p> <p>5(5) ↓ 128(294) ↓ 15(22) ↓</p> <p>103(81) → 351(158) → 912(210) ↓</p> <p>420(807) → 13(10) ↓ 23(18) ↓</p>	<p>4 MILTON E PROBY PKWY / BUD BRECKNER BLVD</p> <p>160(159) → 178(14) ↓</p> <p>21(121) ↓</p>	<p>5 PEAK INNOVATION PKWY / INTEGRATION LOOP</p> <p>176(95) ↓ 728(123) ↓ 35(31) ↓</p> <p>31(46) ↑ 23(34) ↑ 8(11) ↑</p> <p>285(213) → 35(31) → 148(32) ↓</p> <p>59(133) → 139(577) → 12(10) ↓</p>
<p>6 PEAK INNOVATION PKWY / ACCESS</p> <p>15(23) ↓ 5(10) ↓ 35(52) ↓</p> <p>60(51) ↑ 146(388) ↑ 80(5) ↓</p> <p>24(21) → 448(110) → 398(24) ↓</p> <p>50(309) → 5(10) ↓ 10(62) ↓</p> <p>7 PEAK INNOVATION PARKWAY</p> <p>199(12) ↓ 205(209) ↓ 93(9) ↓</p> <p>13(75) ↑ 5(10) ↓ 11(64) ↓</p> <p>25(155) → 5(10) ↓ 15(93) ↓</p> <p>120(7) ↓ 253(221) ↓ 82(6) ↓</p>	<p>8 EMBRAER HEIGHTS / BUD BRECKNER BLVD</p> <p>9(54) ↓ 39(3) ↓ 37(6) ↓</p> <p>6(31) ↑ 5(24) ↓ 5(5) ↓</p> <p>69(4) → 30(5) ↓ 77(5) ↓</p> <p>10(60) → 5(30) ↓ 5(5) ↓</p>	<p>9 EMBRAER HEIGHTS / ACCESS</p> <p>5(5) ↓ 5(10) ↓ 6(2) ↓</p> <p>2(6) ↑ 11(54) ↑ 1(6) ↓</p> <p>2(2) → 64(9) → 5(5) ↓</p> <p>2(2) ↓ 5(10) ↓ 7(1) ↓</p>	<p>10 GRINNELL BLVD / INTEGRATION LOOP</p> <p>348(305) ↓ 28(25) ↓</p> <p>483(217) → 290(163) ↓</p> <p>GRINNELL BLVD</p> <p>115(129) ↓ 5(10) ↓</p>	
<p>11 PEAK INNOVATION PKWY / INTEGRATION LOOP</p> <p>15(4) ↓ 135(352) ↓ 78(11) ↓</p> <p>13(67) ↑ 6(28) ↓ 30(152) ↓</p> <p>4(15) → 33(4) → 89(85) ↓</p> <p>98(51) → 441(148) → 179(24) ↓</p>	<p>12 POWERS BLVD (SH-21) / GRINNELL BLVD</p> <p>GRINNELL BLVD</p> <p>407(246) ↓ 275(310) ↓ 121(66) ↓</p> <p>POWERS BLVD</p> <p>145(90) ↑ 27(70) ↓ 26(111) ↓</p> <p>485(307) → 64(11) → 34(59) ↓</p> <p>95(66) → 440(202) → 135(22) ↓</p> <p>GRINNELL BLVD</p>	<p>13 PEAK INNOVATION PKWY / POWERS BLVD (SH-21)</p> <p>38(167) ↓ 213(416) ↓</p> <p>512(189) ↑ 160(103) ↓</p> <p>200(33) → 121(66) ↓</p>	<p>14 BRADLEY RD / GRINNELL BLVD</p> <p>166(241) ↓ 166(241) ↓</p> <p>335(147) →</p> <p>335(147) ↓</p>	<p>15 GRINNELL BLVD / SOUTH ACCESS</p> <p>ACCESS</p> <p>56(62) ↓ 19(21) ↓</p> <p>19(22) ↑ 618(475) ↑ 5(4) ↓</p> <p>57(65) → 872(419) → 142(115) ↓</p> <p>GRINNELL BLVD</p> <p>127(86) ↓ 13(7) ↓</p> <p>ACCESS</p>
<p>16 GRINNELL BLVD / NORTH ACCESS</p> <p>ACCESS</p> <p>73(94) ↓ 21(10) ↓</p> <p>26(13) ↑ 161(245) ↓</p> <p>78(38) → 396(146) →</p> <p>34(13) ↓ 4(2) ↓</p> <p>GRINNELL BLVD</p> <p>ACCESS</p>	<p>17 MILTON E PROBY WEST RIRO ACCESS</p> <p>304(113) → 24(21) ↓</p> <p>10(14) ↓</p>	<p>18 MILTON E PROBY EAST RIRO ACCESS</p> <p>303(118) → 10(9) ↓</p> <p>10(14) ↓</p>		

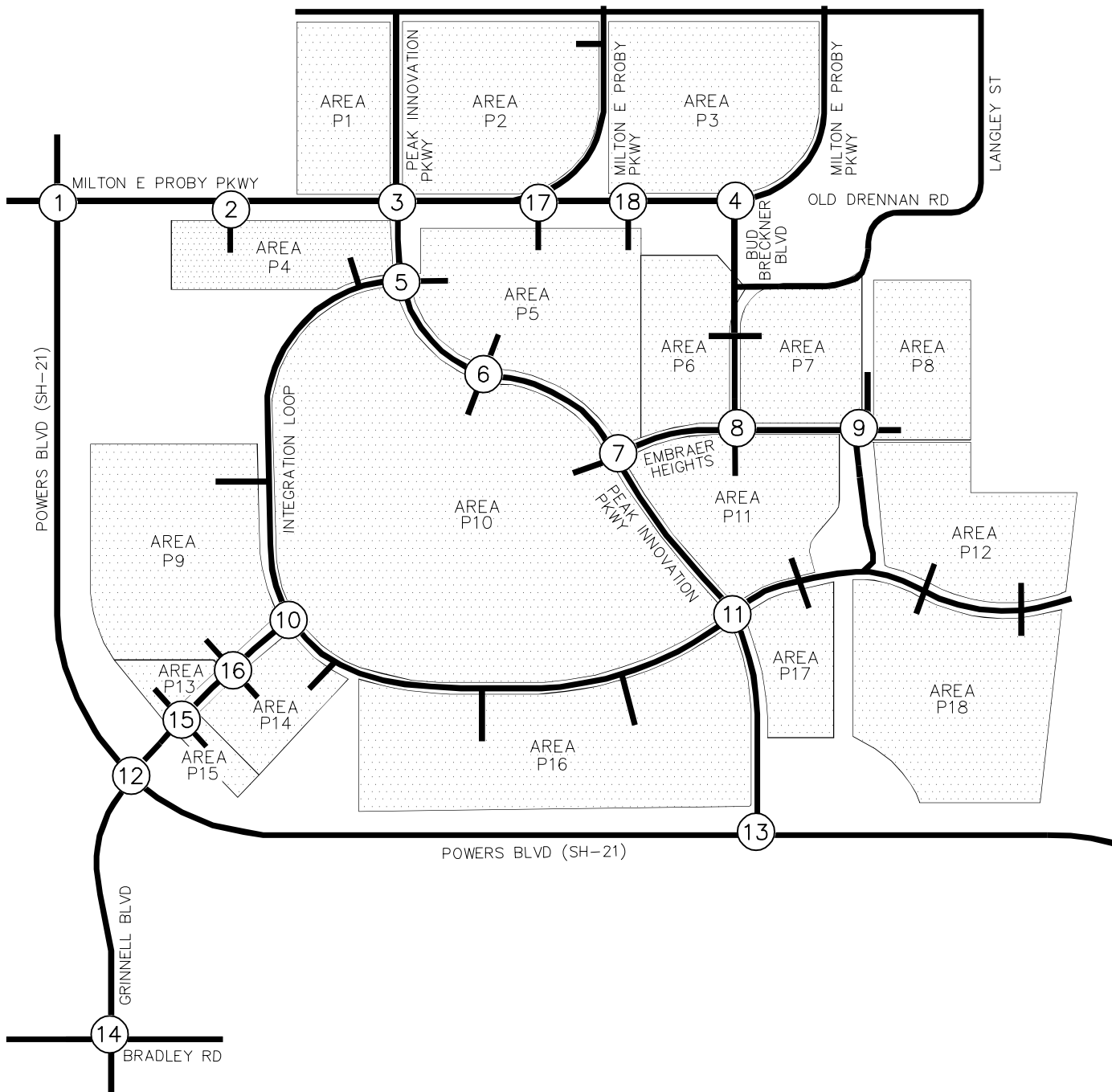
LEGEND

(X) Study Area Key Intersection

XXX(XXX) Weekday AM(PM)
Peak Hour Traffic Volumes

PEAK INNOVATION PARK
PHASE II 2030 PROJECT TRAFFIC ASSIGNMENT

FIGURE 10



1 MILTON E PROBY PKWY / POWERS BLVD (SH-21) ↓ 360(179) ↗ 1447(405) ↖ 437(1142) ↘ 437(1142) ↖ 83(146)	2 MILTON E PROBY PKWY / RIRO ACCESS ← 965(2466)	3 MILTON E PROBY PKWY / PEAK INNOVATION PKWY ↖ 163(239) ↗ 10(15) ↖ 31(45) ↖ 251(631) ↘ 10(15) ↘ 37(53)	4 MILTON E PROBY PKWY / BUD BRECKNER BLVD 331(294) → 443(34) ↓ 51(301) ↗	5 PEAK INNOVATION PKWY / INTEGRATION LOOP ↖ 176(95) ↗ 31(46) ↖ 1762(258) ↖ 23(34) ↘ 35(31) ↘ 8(11)
1467(417) → 340(167) ↓ 228(237) ↗ 228(237) ↖ 208(138) ↘	2901(761) → 218(198) ↓ 14(12) ↗	256(202) ↖ 753(287) → 1905(286) ↓ 552(1596) ↗ 32(25) ↖ 57(45) ↘	285(213) ↖ 35(31) → 326(42) ↓ 81(271) ↗ 325(1408) ↖ 12(10) ↘	
6 PEAK INNOVATION PKWY / ACCESS 15(23) ↓ 10(15) ↓ 41(61) ↓ 24(21) ↖ 1065(220) → 993(58) ↓ PEAK INNOVATION PARKWAY	7 PEAK INNOVATION PKWY / EMBRAER HEIGHTS ↖ 497(29) ↗ 32(186) ↖ 411(398) ↖ 10(15) ↘ 232(21) ↘ 26(159)	8 EMBRAER HEIGHTS / BUD BRECKNER BLVD ↖ 21(133) ↗ 15(77) ↖ 96(6) ↖ 12(59) ↘ 91(13) ↘ 5(5)	9 EMBRAER HEIGHTS / ACCESS 5(5) ↓ 10(15) ↓ 13(3) ↓ 2(2) ↖ 158(21) → 5(5) ↓ 2(2) ↖ 10(15) ↖ 17(1) ↘	10 GRINNELL BLVD / INTEGRATION LOOP ↖ 370(443) ↗ 28(25) 661(227) ↖ 413(188) ↓ GRINNELL BLVD 141(243) ↖ 15(20) ↗
11 PEAK INNOVATION PKWY / INTEGRATION LOOP ↖ 37(10) ↗ 32(167) ↖ 236(756) ↖ 14(68) ↘ 195(26) ↘ 74(379)	12 POWERS BLVD (SH-21) / GRINNELL BLVD GRINNELL BLVD 419(297) ↖ 811(511) ↖ 121(66) ↖ POWERS BLVD 145(90) ↖ 44(154) ↖ 52(260) ↖ 193(124) ↖ 689(223) ↖ 319(38) ↖ GRINNELL BLVD	13 PEAK INNOVATION PKWY / POWERS BLVD (SH-21) 81(401) ↖ 325(856) ↖ 1049(288) ↖ 160(103) ↖ 480(66) ↖ 121(66) ↖	14 BRADLEY RD / GRINNELL BLVD 221(460) ↖ 221(460) ↖ 602(196) ↖ 602(196) ↖	15 GRINNELL BLVD / SOUTH ACCESS ACCESS 56(62) ↖ 19(21) ↖ 57(65) ↖ 1174(454) ↖ 142(115) ↖ GRINNELL BLVD 127(86) ↖ 13(7) ↖ ACCESS
16 GRINNELL BLVD / NORTH ACCESS ACCESS 182(83) ↖ 52(24) ↖ 64(31) ↖ 401(612) ↖ 193(94) ↖ 989(364) ↖ GRINNELL BLVD 84(31) ↖ 8(3) ↖ ACCESS	17 MILTON E PROBY WEST RIRO ACCESS 758(281) → 59(52) ↓ 23(34) ↗	18 MILTON E PROBY EAST RIRO ACCESS 757(294) → 24(21) ↓ 23(34) ↗		

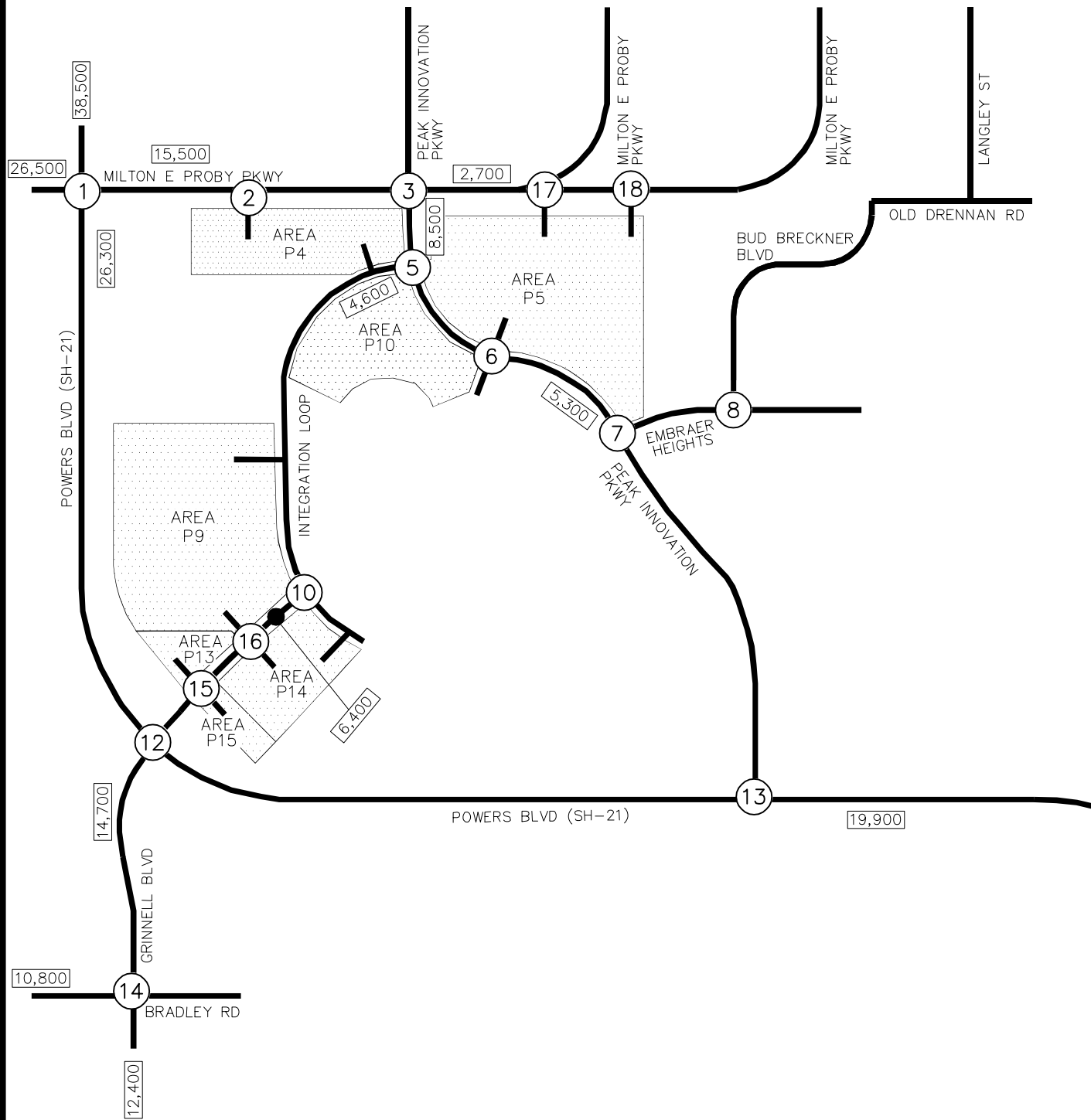
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(X) Study Area Key Intersection

XXX(XXX) Weekday AM(PM)
Peak Hour Traffic Volumes

PEAK INNOVATION PARK
FULL BUILDOUT 2045 PROJECT TRAFFIC ASSIGNMENT

FIGURE 11

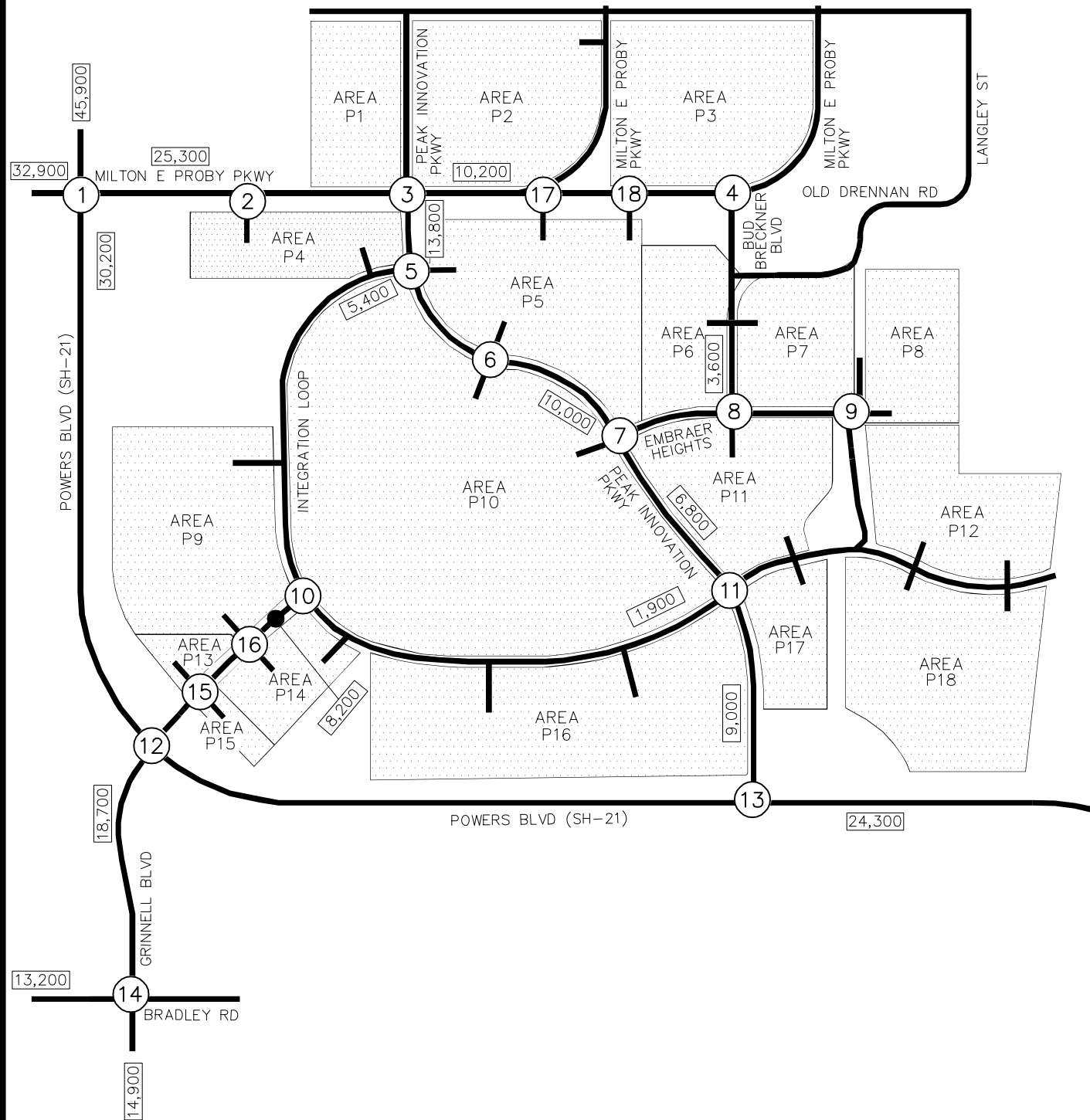


MILTON E PROBY PKWY / POWERS BLVD (SH-21) 1 714(635) 799(1122) 620(298) 280(500) 259(408) 4(9) 621(690) 565(273) 435(471) 546(265) 1257(705) 71(59)	MILTON E PROBY PKWY / RIRO ACCESS 2 ← 603(976) 1100(425) 233(211) 14(12)	MILTON E PROBY PKWY / PEAK INNOVATION PKWY 3 6(18) 0(2) 1(0) 222(323) 9(13) 47(4) 326(223) 741(210) 361(623) 3(0) 20(3)	PEAK INNOVATION PKWY / INTEGRATION LOOP 5 176(95) 550(108) 24(22) 21(32) 16(24) 5(8) 271(200) 24(22) 100(40) 36(71) 92(394) 8(7)
PEAK INNOVATION PKWY / ACCESS 6 ACCESS 11(16) 21(32) 32(30) 84(244) 96(6) 16(15) 352(138) 288(17) 36(224) 12(75) ACCESS	PEAK INNOVATION PKWY / EMBRAER HEIGHTS 7 68(60) 100(179) 217(6) 13(145) 0(36) 11(54) 4(6) 14(4) 189(81) 60(1)	EMBRAER HEIGHTS / BUD BRECKNER BLVD 8 8(206) 1(0) 5(1) 288(10) 7(1)	GRINNELL BLVD / INTEGRATION LOOP 10 359(259) 80(60) 442(219) 183(141) GRINNELL BLVD 39(16) 60(80)
POWERS BLVD (SH-21) / GRINNELL BLVD 12 GRINNELL BLVD 398(212) 251(211) 173(92) 209(130) 877(524) 119(174) 450(297) 510(747) 276(515) 608(302) 320(181) 145(82)	PEAK INNOVATION PKWY / POWERS BLVD (SH-21) 13 8(81) 99(192) 222(71) 1224(826) 38(11) 818(898)	BRADLEY RD / GRINNELL BLVD 14 307(284) 371(513) 5(7) 10(5) 184(59) 24(21) 341(253) 50(142) 109(211) 184(131) 537(339) 15(26)	GRINNELL BLVD / SOUTH ACCESS 15 ACCESS 59(66) 15(16) 15(17) 627(359) 61(69) 772(422) 147(119) GRINNELL BLVD 132(90) ACCESS
GRINNELL BLVD / NORTH ACCESS 16 ACCESS 182(83) 26(12) 32(16) 346(238) 193(94) 579(328) 101(37) GRINNELL BLVD ACCESS	MILTON E PROBY WEST RIRO ACCESS 17 304(189) 41(37) 16(24)	MILTON E PROBY EAST RIRO ACCESS 18 304(198) 16(15) 16(24)	

LEGEND

- (X) Study Area Key Intersection
- XXX(XXX) Weekday AM(PM) Peak Hour Traffic Volumes
- XX,X00 Estimated Daily Traffic Volume

PEAK INNOVATION PARK
 PHASE I 2022 BACKGROUND PLUS PROJECT TRAFFIC VOLUMES



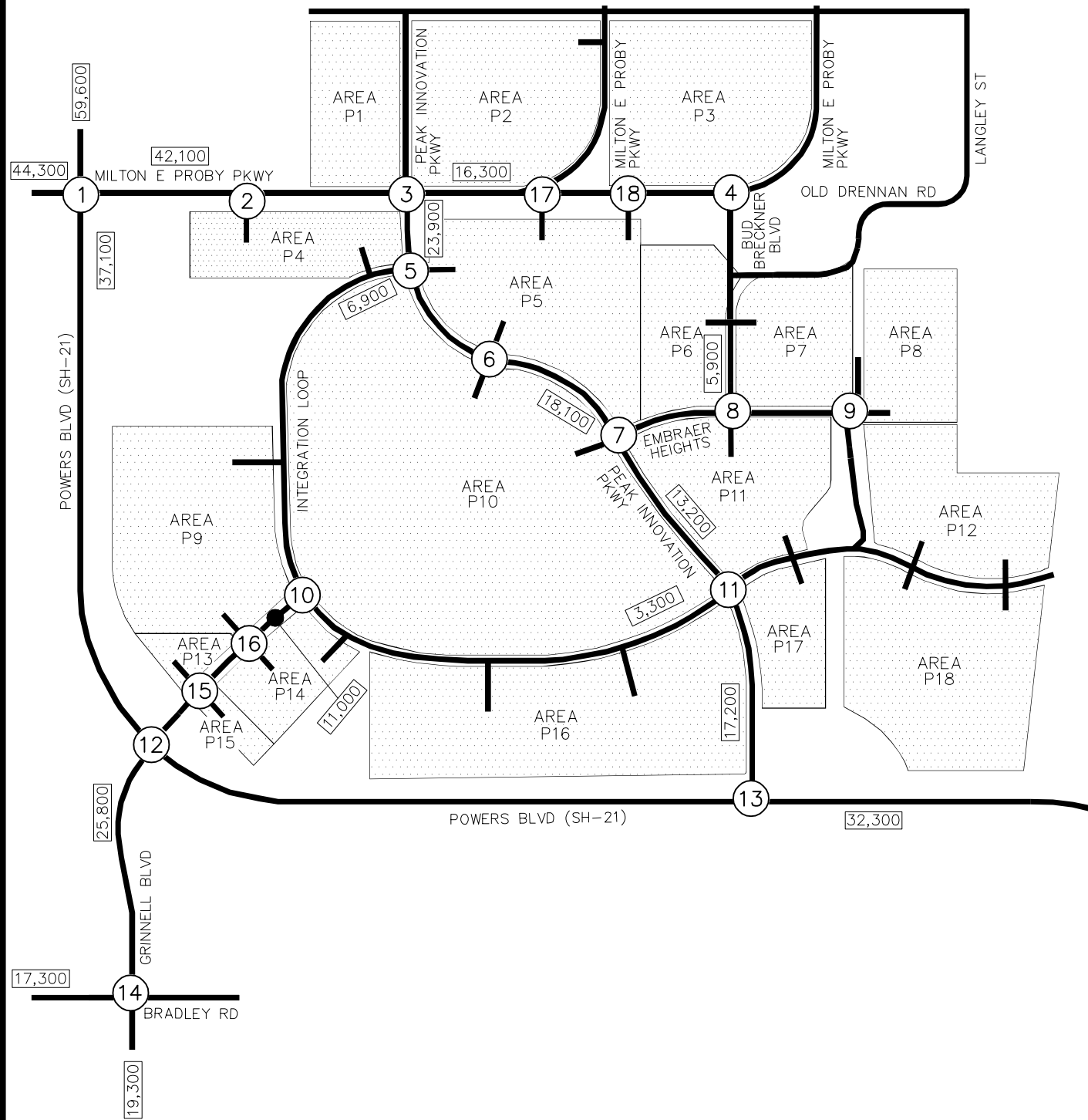
MILTON E PROBY PKWY / POWERS BLVD (SH-21) 1 773(579) ↓ 894(1212) ↓ 1038(409) ↓ 387(839) ↑ 365(739) ↑ 38(69) ↑ 673(747) → 971(379) → 505(509) → 587(831) ← 1357(807) ← 125(87) ←	MILTON E PROBY PKWY / RIRO ACCESS 2 ← 856(1726)	MILTON E PROBY PKWY / PEAK INNOVATION PKWY 3 73(115) ↓ 13(20) ↓ 10(15) ↓ 6(5) ↓ 333(592) ↓ 25(37) ↓ 154(85) ↓ 642(343) ↓ 1215(267) ↓ 451(1019) ↓ 16(10) ↓ 44(21) ↓	MILTON E PROBY PKWY / BUD BRECKNER BLVD 4 472(348) → 178(14) → 21(121) →	PEAK INNOVATION PKWY / INTEGRATION LOOP 5 176(95) ↓ 1042(197) ↓ 35(31) ↓ 31(46) ↓ 23(34) ↓ 8(11) ↓ 285(213) → 35(31) → 148(32) → 59(133) → 195(792) → 12(10) →
PEAK INNOVATION PKWY / ACCESS 6 ACCESS 15(23) ↓ 5(10) ↓ 35(52) ↓ 60(51) ↑ 197(617) ↑ 80(5) ↑ 24(21) → 764(197) → 398(24) → 50(309) → 5(10) → 10(62) → ACCESS	PEAK INNOVATION PKWY / EMBRAER HEIGHTS 7 279(77) ↓ 212(225) ↓ 328(16) ↓ 28(232) ↓ 5(10) ↓ 11(103) ↓ 37(213) → 5(10) → 19(100) → 136(11) → 278(234) → 147(7) →	EMBRAER HEIGHTS / BUD BRECKNER BLVD 8 18(277) ↓ 39(3) ↓ 38(6) ↓ 6(31) ↓ 11(25) ↓ 5(5) ↓ 381(15) → 38(6) → 77(5) → 10(60) → 5(30) → 5(5) →	EMBRAER HEIGHTS / ACCESS 9 5(5) ↓ 5(10) ↓ 6(2) ↓ 2(6) ↓ 11(54) ↓ 1(6) ↓ 2(2) → 64(9) → 5(5) → 2(2) → 5(10) → 7(1) →	GRINNELL BLVD / INTEGRATION LOOP 10 348(305) ↓ 100(80) ↓ 483(217) → 290(163) → 115(129) → 80(100) → INTEGRATION LOOP
PEAK INNOVATION PKWY / INTEGRATION LOOP 11 15(4) ↓ 151(416) ↓ 78(11) ↓ 13(67) ↑ 6(28) ↑ 30(152) ↑ 4(15) → 33(4) → 89(85) → 98(51) → 545(164) → 179(24) →	POWERS BLVD (SH-21) / GRINNELL BLVD 12 GRINNELL BLVD 407(246) ↓ 275(310) ↓ 121(66) ↓ 145(90) ↓ 945(609) ↓ 148(275) ↓ POWERS BLVD 485(307) → 616(820) → 333(617) → 722(365) → 440(202) → 263(102) → GRINNELL BLVD	PEAK INNOVATION PKWY / POWERS BLVD (SH-21) 13 39(176) ↓ 228(471) ↓ 603(201) ↓ 1214(819) ↓ 212(36) → 810(934) →	BRADLEY RD / GRINNELL BLVD 14 358(422) ↓ 427(669) ↓ 6(8) ↓ 11(6) ↓ 200(64) ↓ 26(22) ↓ 501(303) → 55(154) → 118(229) → 200(142) → 714(396) → 17(28) →	GRINNELL BLVD / SOUTH ACCESS 15 ACCESS 56(62) ↓ 19(21) ↓ 19(22) ↓ 618(475) ↓ 5(4) ↓ 57(65) → 872(419) → 142(115) → 127(86) → 13(7) → ACCESS
GRINNELL BLVD / NORTH ACCESS 16 ACCESS 182(83) ↓ 52(24) ↓ 64(31) ↓ 401(612) ↓ 193(94) → 989(364) → 84(31) → 8(3) → ACCESS	MILTON E PROBY WEST RIRO ACCESS 17 1070(470) → 59(52) → 23(34) →	MILTON E PROBY EAST RIRO ACCESS 18 1069(483) → 24(21) → 23(34) →		

LEGEND

- (X) Study Area Key Intersection
- XXX(XXX) Weekday AM(PM) Peak Hour Traffic Volumes
- XX,X00 Estimated Daily Traffic Volume

PEAK INNOVATION PARK
 PHASE II 2030 BACKGROUND PLUS PROJECT TRAFFIC VOLUMES

FIGURE 13



MILTON E PROBY PKWY / POWERS BLVD (SH-21) 1 898(672) ↓ 1061(1394) ↓ 1820(566) ↓ 552(1463) ↗ 526(1348) ↗ 88(158) ↗ 781(868) → 1730(526) → 622(581) → 666(436) ↖ 1560(990) ↖ 225(146) ↖	MILTON E PROBY PKWY / RIRO ACCESS 2 ← 1247(3080) 3651(1047) → 218(198) ↓ 14(12) ↘	MILTON E PROBY PKWY / PEAK INNOVATION PKWY 3 171(261) ↓ 31(48) ↓ 10(15) ↓ 11(15) ↗ 489(977) ↗ 49(70) ↗ 316(207) → 1091(502) → 2257(352) → 588(1842) ↖ 36(25) ↖ 82(49) ↖	MILTON E PROBY PKWY / BUD BRECKNER BLVD 4 694(513) → 443(34) ↓ 51(301) ↘	PEAK INNOVATION PKWY / INTEGRATION LOOP 5 176(95) ↓ 2126(343) ↓ 35(31) ↓ 31(46) ↗ 23(34) ↗ 8(11) ↗ 285(213) → 35(31) → 326(42) → 81(271) ↖ 390(1658) ↖ 12(10) ↖
PEAK INNOVATION PKWY / ACCESS 6 ACCESS 15(23) ↓ 10(15) ↓ 41(61) ↓ 79(66) ↗ 340(1161) ↗ 199(12) ↗ 24(21) → 1432(321) → 993(58) → 123(772) ↖ 10(15) ↖ 25(154) ↖ ACCESS	PEAK INNOVATION PKWY / EMBRAER HEIGHTS 7 582(104) ↓ 419(416) ↓ 419(416) ↓ 505(29) ↓ 49(369) ↗ 10(15) ↗ 26(204) ↗ 76(453) → 10(15) → 42(239) → 316(22) ↖ 506(430) ↖ 280(14) ↖	EMBRAER HEIGHTS / BUD BRECKNER BLVD 8 31(392) ↓ 96(6) ↓ 92(13) ↓ 15(77) ↗ 18(60) ↗ 5(5) ↗ 534(23) → 83(12) → 192(11) → 24(149) ↖ 12(75) ↖ 5(5) ↖	EMBRAER HEIGHTS / ACCESS 9 5(5) ↓ 10(15) ↓ 13(3) ↓ 3(13) ↗ 26(134) ↗ 2(13) ↗ 2(2) → 158(21) → 5(5) → 2(2) ↖ 10(15) ↖ 17(1) ↖	GRINNELL BLVD / INTEGRATION LOOP 10 370(443) ↓ 120(100) ↓ INTEGRATION LOOP 661(227) → 413(188) → GRINNELL BLVD 141(243) ↖ 100(120) ↖
PEAK INNOVATION PKWY / INTEGRATION LOOP 11 37(10) ↓ 254(830) ↓ 195(26) ↓ 32(167) ↗ 14(68) ↗ 74(379) ↗ 9(36) → 81(9) → 101(136) → 150(64) ↖ 1067(248) ↖ 446(60) ↖	POWERS BLVD (SH-21) / GRINNELL BLVD 12 GRINNELL BLVD 419(297) ↓ 311(511) ↓ 121(66) ↓ 145(90) ↗ 1110(780) ↗ 193(450) ↗ 537(320) → 800(966) → 430(794) → POWERS BLVD 921(471) ↖ 689(223) ↖ 468(131) ↖ GRINNELL BLVD	PEAK INNOVATION PKWY / POWERS BLVD (SH-21) 13 82(411) ↓ 342(919) ↓ 1155(302) ↗ 1384(935) ↗ 494(70) → 921(1074) →	BRADLEY RD / GRINNELL BLVD 14 444(670) ↓ 524(957) ↓ 6(9) ↓ 13(6) ↗ 232(74) ↗ 30(26) ↗ 795(377) → 63(179) → 137(266) → 232(164) ↖ 1042(485) ↖ 19(32) ↖	GRINNELL BLVD / SOUTH ACCESS 15 ACCESS 56(62) ↓ 19(21) ↓ 19(22) ↗ 666(727) ↗ 5(4) ↗ 57(65) → 1174(454) → 142(115) → GRINNELL BLVD 127(86) ↖ 13(7) ↖ ACCESS
GRINNELL BLVD / NORTH ACCESS 16 ACCESS 182(83) ↓ 52(24) ↓ 64(31) ↗ 401(612) ↗ 193(94) → 989(364) → 84(31) ↖ 8(3) ↖ ACCESS GRINNELL BLVD	MILTON E PROBY WEST RIRO ACCESS 17 1121(500) → 59(52) ↓ 23(34) ↘	MILTON E PROBY EAST RIRO ACCESS 18 1120(513) → 24(21) ↓ 23(34) ↘		

LEGEND

- (X) Study Area Key Intersection
- XXX(XXX) Weekday AM(PM) Peak Hour Traffic Volumes
- XX,X00 Estimated Daily Traffic Volume

PEAK INNOVATION PARK
 FULL BUILDOUT 2045 BACKGROUND PLUS PROJECT TRAFFIC VOLUMES

5.0 TRAFFIC OPERATIONS ANALYSIS AND RESULTS

Kimley-Horn’s analysis of traffic operations in the site vicinity was conducted to determine potential capacity deficiencies in the 2022, 2030, and 2045 development horizons at the identified key intersections. The acknowledged source for determining overall capacity is the current edition of the *Highway Capacity Manual*².

5.1 Analysis Methodology

Capacity analysis results are listed in terms of Level of Service (LOS). LOS is a qualitative term describing operating conditions a driver will experience while traveling on a particular street or highway during a specific time interval. It ranges from A (very little delay) to F (long delays and congestion). For intersections and roadways in this study area, common traffic engineering practice recommends overall intersection LOS D and movement/approach LOS E as the minimum desirable thresholds for acceptable operations. **Table 4** shows the definition of LOS for signalized and unsignalized intersections.

Table 4 – Level of Service Definitions

Level of Service	Signalized Intersection Average Total Delay (sec/veh)	Unsignalized Intersection Average Total Delay (sec/veh)
A	≤ 10	≤ 10
B	> 10 and ≤ 20	> 10 and ≤ 15
C	> 20 and ≤ 35	> 15 and ≤ 25
D	> 35 and ≤ 55	> 25 and ≤ 35
E	> 55 and ≤ 80	> 35 and ≤ 50
F	> 80	> 50

Definitions provided from the Highway Capacity Manual, Sixth Edition, Transportation Research Board, 2016.

Study area intersections were analyzed based on average total delay analysis for signalized and unsignalized intersections. Under the unsignalized analysis, the LOS for a two-way stop-controlled intersection is determined by the computed or measured control delay and is defined for each minor movement. LOS for a two-way stop-controlled intersection is not defined for the intersection as a whole. LOS for a signalized, roundabout, and four-way stop controlled intersection is defined for each approach and for the intersection. The intersection analysis was conducted using Synchro software with the analysis results reported using the Highway Capacity Manual (HCM) procedure.





² Transportation Research Board, *Highway Capacity Manual*, Sixth Edition, Washington DC, 2016.


















5.2 Intersection Operational Analysis


















Calculations for the LOS at the study key intersections are provided in **Appendix E**. The LOS analyses determine what improvements may be needed at the intersections and proposed accesses to handle background traffic growth and project related traffic in the three study horizons. The existing year analyses is based on the lane geometry and intersection control shown in **Figure 3**. **Table 5** provides the level of service operational results of all the study area intersections. Recommended improvements to mitigate current or future unacceptable operations were also incorporated into the analysis results. Intersection by intersection LOS results and recommended improvements discussion is provided after the LOS results tables.













CDOT provided Kimley-Horn with heavy vehicle (truck) percentage data for segments of Powers Boulevard and Milton E Proby Parkway within the study area. Truck percentages along Powers Boulevard are approximately eight (8) percent during the morning peak hour and six (6) percent during the afternoon peak hour. Likewise, truck percentages along Milton E Proby Parkway are approximately four (4) percent during the morning peak hour and three (3) percent during the afternoon peak hour. As such, these truck percentages were utilized in the Synchro analysis. In addition, Grinnell Boulevard and Bradley Road utilized the Milton E Proby Parkway truck percentages. As stated previously, truck trip generation was calculated based on the ITE Trip Generation Supplement and was found to be approximately two percent of the peak hour trip generation volume for the overall project; therefore, internal roadways to the project utilized a two percent truck usage.

Table 5 – Existing and Future Level of Service

Intersection	Movement	Control	2019 Existing		2022 Total		2030 Total		2045 Total	
			AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
			LOS (Delay)	LOS (Delay)	LOS (Delay)	LOS (Delay)	LOS (Delay)	LOS (Delay)	LOS (Delay)	LOS (Delay)
Milton E Proby Pkwy & Powers Blvd (SH-21) (#1)	Overall		58.4 E	49.8 D	63.9 E	64.9 E	95.8 F	64.1 E	264.1 F	135.1 F
Milton E Proby Pkwy & RIRO Access (#2)	Northbound Right		-	-	13.4 B	9.8 A	26.6 D	11.9 B	0.0 A	0.0 A
Milton E Proby Pkwy & Peak Innovation Parkway (#3)	Northbound Left		16.4 C	22.7 C	204.7 F	>300 F	-	-	-	-
	Northbound Through		17.2 C	0.0 A	19.9 C	0.0 A	-	-	-	-
	Eastbound Left		8.1 A	8.2 A	8.3 A	8.5 A	-	-	-	-

Intersection	Movement	Control	2019 Existing		2022 Total		2030 Total		2045 Total	
			AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
			LOS (Delay)	LOS (Delay)	LOS (Delay)	LOS (Delay)	LOS (Delay)	LOS (Delay)	LOS (Delay)	LOS (Delay)
	Westbound Left		7.9 A	7.6 A	8.1 A	7.8 A	-	-	-	-
	Southbound Left		0.0 A	14.7 B	0.0 A	17.0 C	-	-	-	-
	Southbound Right		0.0 A	0.0 A	0.0 A	0.0 A	-	-	-	-
Milton E Proby Pkwy & Peak Innovation Parkway (#3)	Overall		-	-	30.6 C	33.2 C	37.6 D	48.6 D	35.0 C	65.2 E
Old Drennan Rd & Bud Breckner Blvd (#4)	Northbound Approach		-	-	-	-	10.0 B	10.2 B	11.4 B	14.1 B
Peak Innovation Pkwy & Integration Loop (#5)	Northbound Left		-	-	9.9 A	9.2 A	-	-	-	-
	Eastbound Left		-	-	18.2 C	22.6 C	-	-	-	-
	Eastbound Thru/Right		-	-	11.0 B	11.9 B	-	-	-	-
Peak Innovation Pkwy & Integration Loop (#5) (continued)	Westbound Left		-	-	11.5 B	16.5 C	-	-	-	-
	Westbound Thru/Right		-	-	11.4 B	13.5 B	-	-	-	-
	Southbound Left		-	-	8.6 A	10.1 B	-	-	-	-
Peak Innovation Pkwy & Integration Loop (#5)	Overall		-	-	7.3 A	6.0 A	13.0 B	9.7 A	99.1 F	83.6 F
Peak Innovation Pkwy & Access (#6)	Northbound Left		-	-	18.5 C	15.6 C	25.9 D	34.2 D	-	-
	Northbound Thru/Right		-	-	9.5 A	9.0 A	14.6 B	10.5 B	-	-
	Eastbound Left		-	-	7.5 A	7.9 A	7.9 A	9.2 A	-	-
	Westbound Left		-	-	9.5 A	7.6 A	12.8 B	7.7 A	-	-
	Southbound Left		-	-	13.0 B	11.8 B	17.9 C	18.5 C	-	-
	Southbound Thru/Right		-	-	8.6 A	9.1 A	16.4 C	12.5 B	-	-
Peak Innovation Pkwy & Access (#6)	Overall		-	-	-	-	-	-	42.7 D	53.8 D
Peak Innovation Pkwy & Embraer Heights (#7)	Northbound Left		8.2 A	8.2 A	7.5 A	7.6 A	-	-	-	-
	Eastbound Left		15.4 C	11.0 B	21.0 C	13.1 B	-	-	-	-
	Eastbound Through		-	-	-	-	-	-	-	-
	Eastbound Right		9.0 A	9.0 A	8.6 A	8.9 A	-	-	-	-

Intersection	Movement	Control	2019 Existing		2022 Total		2030 Total		2045 Total	
			AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
			LOS (Delay)	LOS (Delay)	LOS (Delay)	LOS (Delay)	LOS (Delay)	LOS (Delay)	LOS (Delay)	LOS (Delay)
	Westbound Left		0.0 A	9.7 A	0.0 A	10.8 B	-	-	-	-
	Westbound Through		-	-	-	-	-	-	-	-
	Westbound Right		9.1 A	9.9 A	8.9 A	9.3 A	-	-	-	-
	Southbound Left		9.2 A	8.2 A	8.3 A	7.4 A	-	-	-	-
Peak Innovation Pkwy & Embraer Heights (#7)	Overall		-	-	-	-	7.2 A	24.9 C	14.4 B	31.8 C
Embraer Heights & Bud Breckner Blvd (#8)	Eastbound Left		7.7 A	7.2 A	7.8 A	7.2 A	8.0 A	7.4 A	-	-
	Westbound Left		-	-	-	-	7.5 A	7.3 A	-	-
	Northbound Left		-	-	-	-	23.4 C	11.2 B	-	-
	Northbound Thru/Right		-	-	-	-	14.5 B	9.7 A	-	-
Embraer Heights & Bud Breckner Blvd (#8) (continued)	Southbound Left		15.4 C	0.0 A	15.7 C	0.0 A	24.6 C	9.4 A	-	-
	Southbound Through		-	-	-	-	23.8 C	9.6 A	-	-
	Southbound Right		8.4 A	9.5 A	8.4 A	9.5 A	8.4 A	9.9 A	-	-
Embraer Heights & Bud Breckner Blvd (#8)	Overall		-	-	-	-	-	-	7.0 A	5.7 A
Embraer Heights & Access (#9)	Northbound Approach		-	-	-	-	9.1 A	9.5 A	9.8 A	10.4 B
	Eastbound Left		-	-	-	-	7.2 A	7.3 A	7.3 A	7.5 A
	Westbound Left		-	-	-	-	7.4 A	7.3 A	7.6 A	7.3 A
	Southbound Approach		-	-	-	-	9.1 A	9.3 A	10.1 B	10.2 B
Grinnell Blvd & Integration Loop (#10)	Overall		-	-	33.2 C	31.6 C	31.1 C	26.2 C	31.1 C	23.0 C
Peak Innovation Pkwy & Integration Loop (#11)	Overall		-	-	-	-	13.7 B	22.6 C	20.0 C	32.2 C
Powers Blvd (SH-21) & Grinnell Blvd (#12)	Overall		34.9 C	17.3 B	60.9 E	43.1 D	69.2 E	44.0 D	70.6 E	50.4 D
Powers Blvd (SH-21) & Peak Innovation Pkwy (#13)	Eastbound Left		11.2 B	9.1 A	12.6 B	9.9 A	-	-	-	-
	Southbound Left		24.6 C	18.7 C	71.9 F	68.5 F	-	-	-	-
	Southbound Right		0.0 A	0.0 A	0.0 A	0.0 A	-	-	-	-

Intersection	Movement	Control	2019 Existing		2022 Total		2030 Total		2045 Total	
			AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
			LOS (Delay)	LOS (Delay)	LOS (Delay)	LOS (Delay)	LOS (Delay)	LOS (Delay)	LOS (Delay)	LOS (Delay)
Powers (SH-21) & Peak Innovation Pkwy (#13)	Overall		-	-	14.1 B	18.2 B	23.6 C	22.0 C	54.5 D	31.4 C
Bradley Road & Grinnell Blvd (#14)	Overall		115.0 F	26.8 D	208.7 F	83.7 F	-	-	-	-
Bradley Road & Grinnell Blvd (#14)	Overall		-	-	42.2 D	28.6 C	34.2 C	27.6 C	48.7 D	30.6 C
Bradley Road & Grinnell Blvd (#14)	Overall		-	-	9.1 A	8.1 A	14.1 B	10.9 B	70.4 F	26.5 D
Grinnell Blvd South Access (#15)	Northbound Left		-	-	41.7 E	17.4 C	59.4 F	17.2 C	194.0 F	19.7 C
	Northbound Thru/Right		-	-	0.0 A	0.0 A	11.9 B	9.7 A	13.9 B	9.8 A
	Eastbound Left		-	-	8.0 A	7.7 A	8.1 A	7.9 A	8.1 A	8.2 A
	Westbound Left		-	-	0.0 A	0.0 A	10.8 B	8.7 A	12.7 B	8.8 A
	Southbound Left		-	-	15.3 C	12.6 B	16.9 C	13.1 B	20.4 C	14.2 B
	Southbound Thru/Right		-	-	9.6 A	9.1 A	9.6 A	9.4 A	9.8 A	10.0 B
Grinnell Blvd South Access (#15)	Overall		-	-	-	-	23.0 C	22.4 C	18.6 B	8.2 A
Grinnell Blvd North Access (#16)	Overall		-	-	31.3 C	27.3 C	23.0 C	19.4 B	26.7 C	18.9 B
Milton E Proby Pkwy West RIRO Access (#17)	Northbound Right				9.3 A	9.0 A	13.4 B	10.1 A	15.3 C	11.2 B
Milton E Proby Pkwy East RIRO Access (#18)	Northbound Right				9.3 A	9.0 A	13.3 B	10.2 B	15.3 A	11.3 A

Milton E Proby Parkway & Powers Boulevard (SH-21) (#1)

- This intersection is signalized with protected-only left turn phasing on all four approaches. This intersection currently operates acceptably at LOS E during the morning peak hour and LOS D during the afternoon peak hour with existing traffic. In 2022 with Phase I Peak Innovation Park project development and existing lane configurations, the intersection is anticipated to operate at LOS F during the morning peak hour and LOS E during the afternoon peak hour with a free westbound right turn.

Three northbound through lanes are needed at this intersection in 2022 in order to operate with LOS E during the morning peak hour.

- It is anticipated that Powers Boulevard (SH-21) and Milton E Proby Parkway will need to be improved to be six-lane roadways with three through lanes in each direction by 2030.
- With the improvements to Powers Boulevard (SH-21) and Milton E Proby Parkway this intersection may still operate with long delays if future volumes are realized in the 2030 and 2045 horizons. It is understood that this intersection will likely include a grade separate interchange in the future. CDOT and the City of Colorado Springs should continue to monitor future traffic volumes at this intersection to determine when further improvements are needed, likely in 2030 for the mid-term 10 to 15-year horizon.

Milton E Proby Parkway Western Right-In/Right-Out Access (#2)

- With construction of the Peak Innovation Park Area P4 development, a right-in/right-out access is proposed along the south side of Milton E Proby Parkway to the west of Peak Innovation Parkway.
- It is recommended that the proposed northbound access approach to Milton E Proby Parkway be stop controlled with the installation of a R1-1 “STOP” sign. To further identify the proposed access as a right-in/right-out driveway, it is recommended that a R3-2 No Left Turn sign be placed underneath the STOP sign and a R6-1(R) ONE WAY sign be installed within the existing center raised median along Milton E Proby Parkway.
- One vehicle of storage, 25 feet for passenger cars or 50 feet for trucks, of throat depth is recommended to be provided for the project access based on vehicle usage anticipated. With the recommended lane configuration and control, all movements at this intersection are anticipated to operate with acceptable LOS throughout the 2030 horizon.
- As mentioned previously, by the long term 2030 horizon, it is anticipated that Milton E Proby Parkway will provide three through lanes in the eastbound direction through this intersection. When this improvement occurs, it is recommended that a separate eastbound right turn deceleration lane be constructed to improve overall intersection operations.
- It is recommended that a northbound to eastbound right turn acceleration lane be constructed by the 2045 long term horizon. Separate right turn deceleration and acceleration lanes could be considered with project development in 2022 if desired. With

this improvement, the northbound right turn movement would operate as a free movement and would therefore have no delay.

Milton E Proby Parkway & Peak Innovation Parkway (#3)

- This intersection is unsignalized with stop control on the northbound and southbound Peak Innovation Parkway approaches. All movements at this intersection currently operate with LOS C or better during peak hours under existing conditions.
- With the existing lane configuration and control as well as the addition of Phase I project traffic, the northbound left turn movement at this intersection is anticipated to operate unacceptably with long delays in 2022. In order to improve intersection operations in 2022 with the first phase of development, signalization is recommended as well as a separate southbound left turn lane. Likewise, the existing eastbound dual right turn lanes should be converted to a single free eastbound right turn lane.
- In 2030, a third eastbound through lane along Milton E. Proby is recommended to be constructed up to this access. When this occurs, the eastbound right turn lane is recommended to become a continuous lane to serve as a drop or forced right turn.
- In 2045, with full project buildout, triple northbound left turn lanes may be needed in order to accommodate future traffic volumes. As mentioned previously, Milton E Proby Parkway is anticipated to provide three through lanes, eastbound and westbound through this intersection, by 2045. With the recommended lane configuration and control, this intersection is anticipated to operate with LOS E or better during peak hours throughout the long-term horizon.

Milton E. Proby Parkway and Bud Breckner Boulevard Right-In/Right-Out Access (#4)

- With the second phase of construction of Peak Innovation Park in 2030, a right-in/right-out access would be beneficial along the south side of Milton E. Proby Parkway, east of Peak Innovation Parkway at the Bud Breckner Boulevard roadway alignment extension.
- It is recommended that the proposed northbound access approach to Milton E. Proby Parkway be stop controlled with the installation of a R1-1 “STOP” sign. To further identify the proposed access as a right-in/right-out driveway, it is recommended that a R3-2 No Left Turn sign be placed underneath the STOP sign and a R6-1(R) ONE WAY sign be installed within the existing center raised median along Milton E. Proby Parkway. With

the recommended lane configuration and control, all movements at this intersection are anticipated to operate with acceptable LOS in 2030.

- By 2045, it is anticipated that eastbound Milton E. Proby Parkway will have three through lanes up to this intersection. It is recommended that the eastbound right turn lane become a continuous lane to serve as a drop or forced right turn.

Peak Innovation Parkway & Integration Loop (#5)

- With the initial phase of development for Peak Innovation Park in 2022 a new intersection will be constructed at Peak Innovation Parkway and the proposed Integration Loop roadway. It is recommended that this proposed intersection be constructed as a roundabout with two lanes and right turn yield lanes on the northbound and southbound Peak Innovation Parkway approaches and single lanes with right turn bypass lanes on the eastbound and westbound Integration Loop approaches. With the recommended lane configuration and control, this intersection is anticipated to operate with LOS B or better during peak hours throughout 2030 with the addition of project traffic.
- By 2045, if future volumes are realized, this intersection may operate unacceptably with long delays in the roundabout configuration. It was evaluated to include three northbound and southbound through lanes through the roundabout to provide the most optimal level of service. Therefore, the City of Colorado Springs should monitor future traffic volumes to determine if and when additional intersection improvements may be needed.

Peak Innovation Parkway & Middle Access (#6)

- With development of Area P5 of Peak Innovation Park a new access intersection will be constructed along Peak Innovation Parkway south of Integration Loop and north of Embraer Heights. It is recommended that this intersection include separate left and right turn lanes with two through lanes along Peak Innovation Parkway and separate left turn lanes with a shared through/right turn lane on the access approaches. Due to the configuration at the roundabout to the north, the third southbound lane could become a forced right turn lane at this access intersection.
- It is recommended that the proposed project exiting access approaches to Peak Innovation Parkway be stop controlled with the installation of a R1-1 "STOP" sign. It is

recommended that 150 feet of storage length be provided for the northbound and southbound left turn lanes. With the recommended lane configuration and control, all movements at this intersection are anticipated to operate acceptably with the addition of project traffic with LOS D or better during peak hours throughout 2030.

- By 2045, long delays may occur if future volumes are realized with stop control. Therefore, signalization is recommended at this intersection by the long-term horizon. Likewise, 475-foot northbound dual left turn lanes out of Area 10 may be needed for the access approach. With this improvement, this intersection is anticipated to operate with LOS D or better during peak hours throughout 2045.

Peak Innovation Parkway & Embraer Heights (#7)

- Currently, all movements at this intersection currently operate with LOS C or better during the peak hours.
- With the initial phase of development for Peak Innovation Park in 2022, all movements are expected to operate acceptably during the peak hours in 2022 with LOS C or better, evaluated with a conversion of Peak Innovation Parkway to two through lanes in each direction.
- By 2030, the eastbound and westbound minor approaches may operate unacceptably with long delays during the morning peak hour with the addition of project traffic. Therefore, it is recommended that this intersection be considered for signalization. With the recommended lane configuration and control, this intersection is anticipated to operate acceptably throughout 2045.

Bud Breckner Boulevard & Embraer Heights (#8)

- The intersection of Embraer Heights and Bud Breckner Boulevard is unsignalized with stop control on the southbound Bud Breckner Boulevard minor approach. All movements at this intersection currently operate with LOS C or better during the peak hours.
- A new south leg is anticipated to be constructed at this intersection to serve Area P11. With this, it is recommended that a 100-foot westbound left turn lane be constructed. The new northbound access approach should include a 50-foot left turn lane and shared through/right turn lane. With these lane configurations and the addition of project traffic, this intersection is anticipated to continue operating acceptably with LOS C or better during peak hours in 2030.

- By 2045, alternate control may be needed. It isn't anticipated that this intersection will warrant signalization, so a single lane roundabout may be considered. The southbound approach was studied to include a shared left turn/through lane and separate right turn lane, while the eastbound approach was evaluated with a left turn lane and shared through/right turn lane due to the north and west legs having three approach lanes today. With this configuration, the roundabout would operate at LOS A throughout 2045. This roundabout could be considered for construction when the access to Area P11 occurs.

Embraer Heights Eastern Access (#9)

- With the development of Peak Innovation Park, a new intersection will be constructed along Embraer Heights, east of Bud Breckner Boulevard. It is recommended that this intersection be unsignalized and the northbound and southbound access approaches to Embraer Heights be stop controlled with the installation of R1-1 "STOP" signs. A single shared lane on all four approaches will accommodate future project traffic.
- With the recommended lane configuration and control and the addition of project traffic, all movements at this intersection are anticipated to operate with LOS A during peak hours throughout 2030 and LOS B or better throughout the long-term 2045 horizon.

Grinnell Boulevard & Integration Loop (#10)

- With Phase I development of Peak Innovation Park, a new T-intersection will be constructed along the Grinnell Boulevard extension northeast of Powers Boulevard (SH-21) at Integration Loop. It is recommended that this intersection be signalized and the eastbound Grinnell Boulevard approach include dual left turn lanes a separate right turn lane. Integration Loop should include a separate northbound left turn lane and southbound right turn lane at the intersection.
- With the recommended lane configuration and control and the addition of project traffic, this intersection is anticipated to operate with LOS C during peak hours throughout the long-term 2045 horizon.

Peak Innovation Parkway & Integration Loop (#11)

- By the Phase II development of Peak Innovation Park in 2030 a new intersection will be constructed along Peak Innovation Parkway south of Embraer Heights and north of Powers Boulevard (SH-21). It is recommended that this intersection be constructed as a

signalized intersection or roundabout when warranted and the eastbound and westbound Integration Loop approaches include separate left turn lane and a shared through/right turn lanes. The Peak Innovation Parkway northbound and southbound approaches should be reconstructed to provide separate left and right turn lanes and two through lanes of travel. With the recommended lane configuration and control, all movements at this intersection are anticipated to operate acceptably with LOS C or better during peak hours through 2045.

Powers Boulevard (SH-21) & Grinnell Boulevard (#12)

- Presently, this signalized T-intersection operates with protected-permitted left turn phasing on the westbound Powers Boulevard (SH-21) approach. This intersection currently operates with LOS C or better during the peak hours.
- With the initial phase of development for Peak Innovation Park in 2022, a new north leg will be constructed at this intersection. The new north leg and associated movements will include eastbound dual left turn lanes, a westbound right turn lane, and two northbound and southbound through lanes. In addition, dual northbound left turn lanes and channelized free right turn lanes on all four approaches are also recommended to be constructed.
- By 2030 as mentioned previously, Powers Boulevard may need to provide three through lanes of travel in each direction to the north of Grinnell Boulevard. When this occurs, the eastbound right turn lane along Powers Boulevard is recommended to be converted to a continuous lane to serve as a drop or forced right turn lane. In addition, dual westbound left turn lanes are recommended in 2030. With these improvements, the intersection will operate at LOS E during the morning peak hour and LOS D during the afternoon peak hour in 2022 and 2030.
- By 2045, three through lanes in each direction along Powers Boulevard may be needed. With these improvements, the intersection may operate with a LOS E during the morning peak hour and LOS D during the afternoon peak hour if future projected traffic volumes are realized.

Powers Boulevard (SH-21) & Peak Innovation Parkway (#13)

- Currently, the T-intersection of Peak Innovation Parkway and Powers Boulevard (SH-21) is unsignalized with stop control on the southbound Peak Innovation Parkway approach.

All movements at this intersection currently operate with LOS C or better during the peak hours.

- In 2022, with two-way stop control as well as the addition of project traffic, the southbound left turn movement at this intersection may operate with long delays and LOS F. Therefore, signalization with a Continuous Green T configuration is recommended at this intersection in 2022 with the first phase of development. With this recommended control, this intersection is anticipated to operate with LOS B in 2022.
- By 2030, southbound dual left turn lanes are recommended in order to accommodate future traffic demands. With this improvement, this intersection is anticipated to operate acceptably throughout 2045.

Bradley Road & Grinnell Boulevard (#14)

- The intersection of Bradley Road and Grinnell Boulevard is unsignalized with All-Way Stop-Control (AWSC). This intersection currently operates with long delays and LOS F during the morning peak hour and LOS D during the afternoon peak hour under existing conditions. As directed by El Paso County, a four-hour vehicular volume signal warrant was evaluated at this intersection. The intersection of Bradley Road and Grinnell Boulevard meets the four-hour warrant with existing traffic. The signal warrant figure for this intersection is included in **Appendix F**. Therefore, signalization of this intersection is recommended for consideration today. When this occurs, it is recommended that the eastbound Bradley Road approach be reconfigured to provide a separate left turn lane, through lane, and right turn lane so that split phasing of the signal can be avoided. With this improvement, the eastbound and westbound Bradley Road approaches can operate with protected-permitted left turn phasing. With this recommended control, this intersection is anticipated to operate with LOS C during peak hours in 2022. For the 2030 and 2045 horizons, dual eastbound left turn lanes may be needed. With this configuration, the intersection will continue operating acceptably at LOS D or better during the studied peak hours. As directed, this intersection was also evaluated with roundabout control. If constructed as a roundabout, it would require two approach lanes be provided on all four legs. With roundabout control, this intersection is expected to operate with LOS B or better during the peak hours throughout the 2030 horizon. By 2045, this intersection may operate with long delays under roundabout control during the morning peak hour. Therefore, it is believed that signalization is the preferred control.

Grinnell Boulevard South Access (#15)

- With the initial phase of development for Peak Innovation Park in 2022 a new access intersection will be constructed along Grinnell Boulevard north of Powers Boulevard and south of Integration Loop. It is believed that this intersection can operate acceptably unsignalized with the first phase of development in 2022. It is recommended that R1-1 “STOP” signs be installed for the northbound and southbound access approaches. It is recommended that the eastbound and westbound Grinnell Boulevard approaches be constructed to provide separate left turn lanes and two through lanes of travel. The eastbound Grinnell Boulevard approach will also include a continuous right turn lane. It is recommended that the northbound and southbound access approaches be constructed to provide separate left turn lanes and a shared through/right turn lanes.
- By 2030, this intersection may ultimately need to be considered for signalization depending on the traffic volume generated by the use proposed within Lot 2 (Area P15). The signalization recommendation is considered for the 2030 horizon. With this improvement, the intersection will operate acceptably with LOS C or better during peak hours throughout 2045.

Grinnell Boulevard North Access (#16)

- With the initial phase of development for Peak Innovation Park in 2022 a new north access intersection will be constructed along Grinnell Boulevard north of Powers Boulevard and south of Integration Loop. The access along the south side of the roadway to area P14 will be exit only. It is recommended that this intersection be considered for signalization with development of these P13 and P14 projects. It is recommended that the eastbound Grinnell Boulevard approach be constructed to provide dual left turn lanes and two through lanes. The westbound Grinnell Boulevard approach is recommended to include two through lanes. It is recommended that the northbound exit only access approach be constructed to provide dual left turn lanes and a shared through/right turn lane. The southbound approach will include a left turn lane and shared through/right turn lane.
- With the recommended lane configuration and control, this intersection is anticipated to operate acceptably with LOS C or better during peak hours throughout 2045.

Milton E. Proby Parkway West and East Right-In/Right-Out Accesses (#17 & #18)

- With the first phase of construction of Peak Innovation Park in 2022, two right-in/right-out accesses are proposed along the south side of Milton E. Proby Parkway, east of Peak Innovation Parkway, for access into Area P5.
- It is recommended that the proposed northbound access approaches to Milton E. Proby Parkway be stop controlled with the installation of a R1-1 “STOP” signs at these two driveways. To further identify the proposed accesses as right-in/right-out driveways, it is recommended that R3-2 No Left Turn signs be placed underneath the STOP signs and R6-1(R) ONE WAY signs be installed within the existing center raised median along Milton E. Proby Parkway. With the recommended lane configuration and control, all movements at these two access intersections are anticipated to operate with acceptable LOS in 2030.
- By 2045, it is anticipated that eastbound Milton E. Proby Parkway will have three through lanes up to this intersection. It is recommended that an additional (fourth) eastbound right turn lane become a continuous lane to serve as a drop or forced right turn at both driveways.

5.3 CDOT Turn Bay Length Analysis

Since Powers Boulevard (SH-21) is a state owned and maintained facility, it is recommended that auxiliary turn lanes along SH-21 be constructed in accordance with the current CDOT State Highway Access Code (Access Code). CDOT categorizes SH-21 throughout the project area as F-W: Interstate System, Freeway Facility. According to the State Highway Access Code for category F-W roadways, the following thresholds apply for implementation of auxiliary turn lanes:

- A left turn deceleration lane and taper with storage length is required for any access with a projected daily left ingress turning volume greater than 10 vehicles per day (vpd).
- A right turn deceleration lane and taper is required for any access with a projected peak hour right ingress turning volume greater than 10 vehicles per hour (vph).
- A right turn acceleration lane and taper is required for any access with a projected peak hour right turning volume greater than 10 vph.

The following provides an auxiliary turn lane assessment for the three key intersections along Powers Boulevard (SH-21) that will be impacted by Peak Innovation Park project traffic on an

intersection by intersection basis. The storage bay recommendations have accounted for a two percent peak hour heavy vehicle factor for passenger car equivalents.

Powers Boulevard (SH-21) and Milton E. Proby Parkway (#1)

Based on traffic projections and the identified thresholds, auxiliary turn lane requirements were calculated for the Powers Boulevard (SH-21) and Milton E. Proby Parkway intersection. Powers Boulevard (SH-21) provides two through lanes of travel in each direction and has a posted speed limit of 55 miles through this study area intersection. As such, turn lane requirements along SH-21 are as follows:

- A southbound left turn deceleration lane **is** warranted. The left turn lane requirement is deceleration length plus storage length plus taper length. Based on the 55-mph speed limit, the required total southbound deceleration distance is 600 feet plus a 225-foot taper (based on an 18.5 to 1 taper). In addition, the dual left turn storage requirements are 325 feet in 2022, 550 feet in 2030, and 950 feet in 2045. To accommodate 2022 traffic, the dual left turn lane length is recommended to be 1,175 feet (a 600-foot deceleration length plus 350-foot dual left storage length plus a 225-foot taper length). Therefore, this should be planned to be 950-foot dual left turn lanes with 225-foot taper. To accommodate 2030 traffic, the dual left turn lane length is recommended to be 1,400 feet (a 600-foot deceleration length plus 575-foot dual left storage length plus a 225-foot taper length). Therefore, this should be planned to be 1,175-foot dual left turn lanes with 225-foot taper. To accommodate 2045 traffic, the dual left turn lane length is recommended to be 1,825 feet (a 600-foot deceleration length plus 1,000-foot dual left storage length plus a 225-foot taper length). Therefore, this should be planned to be 1,600-foot dual left turn lanes with 225-foot taper. However, this intersection is planned to be a grade separated interchange sometime in the future, and likely by 2045 if these future traffic volumes are realized. Therefore, the recommendations for 2022 and 2030 are more likely for application. It should be noted that this turn lane was calculated with a passenger car equivalent (PCE) of three (3) with the appropriate heavy vehicle usage.
- A northbound right turn deceleration lane **is** warranted. The right turn lane requirement is deceleration length plus taper length. The required northbound right turn deceleration lane length is 825 feet (a 600-foot deceleration lane plus a 225-foot taper).
- A northbound acceleration lane from the westbound right turn **is** warranted. The acceleration lane requirement is acceleration length plus bay taper length. The total

required westbound to northbound right turn acceleration length along Powers Boulevard is 1,185 feet (a 960-foot acceleration length plus a 225-foot taper).

Powers Boulevard (SH-21) and Grinnell Boulevard (#12)

Based on traffic projections and the identified thresholds, auxiliary turn lane requirements were calculated for the Powers Boulevard (SH-21) and Grinnell Boulevard intersection. Powers Boulevard (SH-21) provides two through lanes of travel in each direction and has a posted speed limit of 60 miles through this study intersection. As such, turn lane requirements along SH-21 are as follows:

- An eastbound left turn deceleration lane **is** warranted. The left turn lane requirement is deceleration length plus storage length plus taper length. Based on the 60-mph speed limit, the required total eastbound deceleration distance is 700 feet plus a 300-foot taper (based on a 25 to 1 taper). In addition, the dual left turn storage requirements are 250 feet in 2022, 250 feet in 2030, and 275 feet in 2045. Based on the minor differences in storage lengths over the study horizons, the dual left turn lane length is recommended to be 1,275 feet (a 700-foot deceleration length plus 275-foot dual left storage length plus a 300-foot taper length) to accommodate full buildout 2045 volumes. Therefore, this should be planned to be 975-foot dual left turn lanes with 300-foot taper. It should be noted that this turn lane was calculated with a PCE of three (3) with the appropriate heavy vehicle usage.
- A westbound right turn deceleration lane **is** warranted. The right turn lane requirement is deceleration length plus taper length. Based on a speed limit of 60 mph, the required total westbound right turn deceleration length is 1,000 feet (a 700-foot deceleration lane plus a 300-foot taper).
- A westbound acceleration lane from the southbound right turn **is** warranted. The acceleration lane requirement is acceleration length plus bay taper length. Based on a speed limit of 60 mph, the total required southbound to westbound right turn acceleration length is 1,470 feet (a 1,170-foot acceleration length plus a 300-foot taper length).

Powers Boulevard (SH-21) and Peak Innovation Parkway (#13)

Based on traffic projections and the identified thresholds, auxiliary turn lane requirements were calculated for the Powers Boulevard (SH-21) and Peak Innovation Parkway intersection. Powers Boulevard (SH-21) provides two through lanes of travel in each direction and has a posted speed limit of 65 miles through this study area intersection. As such, turn lane requirements along SH-21 are as follows:

- An eastbound left turn deceleration lane **is** warranted. The left turn lane requirement is a deceleration length plus storage length plus taper length. Based on the 65-mph speed limit, the required total eastbound deceleration distance is 800 feet plus a 300-foot taper (based on a 25 to 1 taper). In addition, the left turn storage requirements are 50 feet in 2022, 225 feet in 2030, and 525 feet in 2045. To accommodate 2022 traffic, the left turn lane length is recommended to be 1,150 feet (an 800-foot deceleration length plus 50-foot left storage length plus a 300-foot taper length). Therefore, this should be planned to be 850-foot left turn lane with 300-foot taper. To accommodate 2030 traffic, the left turn lane length is recommended to be 1,325 feet (an 800-foot deceleration length plus 225-foot left storage length plus a 300-foot taper length). Therefore, this should be planned to be 1,025-foot left turn lane with 300-foot taper. To accommodate 2045 traffic, the left turn lane length is recommended to be 1,625 feet (an 800-foot deceleration length plus 525-foot left storage length plus a 300-foot taper length). Therefore, this should be planned to be 1,325-foot left turn lane with 300-foot taper. It should be noted that this turn lane was calculated with a PCE of three (3) with the appropriate heavy vehicle usage.
- A westbound right turn deceleration lane **is** warranted. The right turn lane requirement is deceleration length plus taper length. Based on a speed limit of 65 mph, the required total westbound right turn deceleration length is 1,100 feet (an 800 feet deceleration lane plus a 300-foot taper length).
- A westbound acceleration lane from the southbound right turn **is** warranted. The acceleration lane requirement is acceleration length plus bay taper length. Based on a speed limit of 65 mph, the total required southbound to westbound right turn acceleration length is 1,680 feet (a 1,380-foot acceleration length plus a 300-foot taper length).

5.4 Queue Analysis

A queuing analysis was conducted for the study area intersections. Turn lanes are recommended to be constructed providing the recommended storage length based on the queuing analysis. Results were obtained from the 95th percentile queue lengths obtained from the Synchro analysis. Queue analysis worksheets at the signalized intersections are provided in **Appendix G**. Queue length calculations for unsignalized intersections are provided within the level of service operational sheets provided in **Appendix E**. Results of the queuing analysis and recommendations at the study area intersections are provided in **Table 6**.

Table 6 – Turn Lane Length Analysis Results

Intersection Turn Lane	Existing Turn Lane Length (feet)	2022 Calc. Queue Length (feet)	2022 Recommended Turn Lane Length (feet)	2030 Calc. Queue Length (feet)	2030 Recommended Turn Lane Length (feet)	2045 Calc. Queue Length (feet)	2045 Recommended Turn Lane Length (feet)
Milton E Proby Pkwy & Powers Boulevard (#1)					Grade Sep. or		
Eastbound Left	800' DL	514'	800' DL	1,235' #	1000' DL		GRADE SEPARATED INTERCHANGE
Eastbound Through	C	337'	C	2,873' #	C		
Eastbound Right	400'	FREE	400'	FREE	400'		
Westbound Left	525'	25'	525'	129'	525'		
Westbound Through	C	340'	C	365'	C		
Westbound Right	400'	FREE	400' #	FREE	400' #		
Northbound Left	500'/625' DL	377'	500'/625' DL	824' # A	500'/625' DL		
Northbound Through	C	570'	C	2,576' #	C		
Northbound Right	250'+150'T	FREE	600'+225'T	FREE	600'+225'T		
Southbound Left	550'/250' DL	463'	950'DL+225'T	1,113' #	1,175'DL+225'T		
Southbound Through	C	756'	C	3,012' #	C		
Southbound Right	650'	FREE	650'	FREE	650'		
Milton E Proby Pkwy & West RIRO Access (#2)							
Eastbound Right	DNE	FREE	320'+180'T	FREE	320'+180'T	FREE	320'+180'T
Northbound Right	DNE	25'	25'	25'	25'	FREE	25'
Milton E Proby Pkwy & Peak Innovation Pkwy (#3)							
Eastbound Left	500'	52'	500'	127'	500'	279' #	500'
Eastbound Right	300' DR	FREE	300' SR	FREE	300' SR	FREE	300' SR
Westbound Left	300'	25'	300'	48'	300'	394' #	400'
Westbound Right	275'	25'	275'	25'	275'	25' #	275'
Northbound Left	575' C	471'	575' C	537'	575' DL	687' #A	575' TL
Northbound Right	400'C	FREE	400'C	FREE	400'C	FREE	400'
Southbound Left	DNE	25'	225'+145'T	32'	225'+145'T	46' #	225'+145'T
Southbound Right	300'	FREE	-	FREE	225'+145'T	326' #	325'+145'T
Milton E Proby Pkwy & Bud Breckner RIRO (#4)							
Eastbound Right	DNE	DNE	DNE	FREE	320'+180'T	FREE	C
Northbound Right	DNE	DNE	DNE	25'	25'	60'	75'
Peak Innovation Pkwy & Middle Access (#6)							
Eastbound Left	450'	25'	450'	25'	450'	38'	450'
Eastbound Right	50'	25'	C	25'	C	883'	C
Westbound Left	300'	25'	300'	25'	300'	274'	300'
Westbound Right	400'	25'	400'	25'	400'	493'	400'
Northbound Left	DNE	50'	150'	155'	150'	579'	575' DL
Southbound Left	DNE	25'	150'	25'	150'	99'	150'
Peak Innovation Pkwy & Embraer Heights (#7)							
Eastbound Left	C	25'	400'	233'	400'	235'	400'
Eastbound Right	C	25'	150'	42'	150'	88'	150'
Westbound Left	400'	25'	400'	115'	400'	123'	400'
Westbound Right	475'	25'	475'	60'	475'	245'	475'
Northbound Left	400'	25'	400'	29'	400'	336'	400'
Northbound Right	425'	25'	425'	59'	425'	244'	C
Southbound Left	500'	25'	500'	25'	500'	487'	500'
Southbound Right	500'	25'	500'	216'	500'	333'	500'

Intersection Turn Lane	Existing Turn Lane Length (feet)	2022 Calc. Queue Length (feet)	2022 Recommended Turn Lane Length (feet)	2030 Calc. Queue Length (feet)	2030 Recommended Turn Lane Length (feet)	2045 Calc. Queue Length (feet)	2045 Recommended Turn Lane Length (feet)
Embraer Heights & Bud Breckner Blvd (#8)							
Eastbound Left	400'	25'	400'	25'	400'		
Southbound Left	150'	25'	150'	25'	150'	RAB	RAB
Southbound Right	C	25'	C	30'	C		
Westbound Left	DNE	-	DNE	25'	100'		
Northbound Left	DNE	-	DNE	25'	50'		
Grinnell Blvd & Integration Loop (#10)							
Eastbound Left	DNE	246'	425' DL	270'	425' DL	354'	425' DL
Eastbound Right	DNE	131'	C	186'	C	232'	C
Northbound Left	DNE	25'	300'	80'	300'	105'	300'
Southbound Right	DNE	25'	C	91'	C	124'	C
Peak Innovation Pkwy & Integration Loop (#11)							
Eastbound Left	DNE	-	DNE	25'	150'	27'	150'
Westbound Left	DNE	-	DNE	185'	200'	391'	400'
Northbound Left	450'	-	450'	25'	450'	54'	450'
Northbound Right	500'	-	500'	25'	500'	25'	500'
Southbound Left	450'	-	450'	25'	450'	179'	450'
Southbound Right	400'	-	400'	25'	400'	25'	400'
Powers Blvd (SH-21) & Grinnell Blvd (#12)							
Eastbound Left	DNE	297' #	975'DL+ 300'T	352' #	975'DL+ 300'T	209' #	975'DL+ 300'T
Eastbound Through	C	380'	C	421'	C	376'	C
Eastbound Right	425'	FREE	425'	FREE	C	FREE	C
Westbound Left	325'	234'	950' + 300'T	173' #	950'DL+ 300'T	262'	950'DL+ 300'T
Westbound Through	C	495'#	C	563'#	C	385'#	C
Westbound Right	DNE	FREE	700'+300' T	FREE	700'+300'T	FREE	700'+300'T
Northbound Left	150'	276' #	525' DL	470' #	525' DL	509'	525' DL
Northbound Through	DNE	152' A	C	303' #	C	313' #	C
Northbound Right	150'	FREE	150'	FREE	150'	FREE	300'
Southbound Left	DNE	125' #	400'DL	99' #	400'DL	102' #	400'DL
Southbound Through	DNE	143'#	C	194'	C	325'	C
Southbound Right	DNE	FREE	250'	FREE	250'	FREE	250'
Peak Innovation Pkwy & Powers Blvd (#13)							
Eastbound Left	1000'+200'T	66'	1000'+200'T	274'	1,025'+300' T	776' #	1,325'+300' T
Eastbound Through	C	35'	C	34'	C	325'	C
Westbound Through	C	419'	C	557'	C	625'#	C
Westbound Right	650'+250'T	FREE	800'+300'T	FREE	800'+300'T	FREE	800'+300'T
Southbound Left	C	208'	C	267'	500' DL	487'	500' DL
Southbound Right	C	FREE	C	FREE	C	FREE	C
Bradley Rd & Grinnell Blvd (#14)							
Eastbound Left	DNE	394'	300'	263' DL	275' DL	441'	450' DL
Eastbound Right	150'	60'	150'	64'	150'	105'	150'
Westbound Left	100'	27'	100'	32'	100'	33'	100'
Northbound Left	450'	128'	450'	174'	450'	261'	450'
Northbound Right	600'	25'	600'	25'	600'	25'	600'
Southbound Left	325'	25'	325'	25'	325'	25'	325'

Intersection Turn Lane	Existing Turn Lane Length (feet)	2022 Calc. Queue Length (feet)	2022 Recommended Turn Lane Length (feet)	2030 Calc. Queue Length (feet)	2030 Recommended Turn Lane Length (feet)	2045 Calc. Queue Length (feet)	2045 Recommended Turn Lane Length (feet)
Southbound Right	325'	56'	325'	25'	325'	226'	325'
Grinnell Blvd & South Access (#15)							
Eastbound Left	DNE	25'	100'	36'	100'	38'	100'
Eastbound Right	DNE	25'	C	37'	C	30'	C
Westbound Left	DNE	25'	100'	25'	100'	25'	100'
Northbound Left	DNE	100'	200'	144'	200'	166'	200'
Southbound Left	DNE	25'	50'	34'	50'	39'	50'
Grinnell Blvd & North Access (#16)							
Eastbound Left	DNE	113'	175' DL	128'	175' DL	131'	175' DL
Northbound Left	DNE	71'	100' DL	62'	100' DL	63'	100' DL
Southbound Left	DNE	44'	100'	79'	100'	79'	100'
Milton E Proby Pkwy & West RIRO Access (#17)							
Eastbound Right	DNE	DNE	320'+180'T	FREE	320'+180'T	FREE	C
Northbound Right	DNE	25'	25'	25'	25'	43'	50'
Milton E Proby Pkwy & East RIRO Access (#18)							
Eastbound Right	DNE	DNE	320'+180'T	FREE	320'+180'T	FREE	C
Northbound Right	DNE	25'	25'	25'	25'	25'	25'

DL = Dual Left Turn Lanes; DNE = Does Not Exist; C = Continuous Turn Lane; FREE = Free Right Turn Lane; DR = Dual Right Turn Lanes; SR = Single Right Turn Lanes; TL = Triple Left Turn Lanes; # = Acceleration Lane for Free Movements Recommended; T = Taper Length; RAB = Roundabout; A = Average Queue Length

= SimTraffic Simulation Observation Queue after one hour due to Synchro 95th Percentile Queue reporting Maximum Length

All proposed auxiliary turn lanes should be constructed with the storage lengths as provided in **Table 6** above.

It is recommended that dual left turn lanes with 575 feet of length be provided on the northbound approach of the Milton E Proby Parkway and Peak Innovation Parkway (#3) intersection by 2030. By 2045, triple left turn lanes with 575 feet of length should be provided at this intersection of Milton E Proby Parkway and Peak Innovation Parkway (#3). It should be noted that 687 feet of left turn storage is calculated in 2045 at this location; however, it is anticipated that 575 feet will be the maximum length available based on the location of the proposed roundabout to the south at the intersection of Integration Loop and Peak Innovation Parkway (#5).

The Peak Innovation Parkway and Middle Access intersection (#6) should provide northbound dual left turn lanes with 575 feet of length by 2045.

An eastbound left turn should be provided with the maximum length possible which consists of approximately 300 feet at the Bradley Road and Grinnell Boulevard (#14) intersection. This spacing limitation is due to the canal located to the west of this intersection. By 2030, it is expected that Bradley Road will be widened west of Grinnell Boulevard through this canal area to match the widened section west of this canal. With this future roadway widening along Bradley Road, eastbound dual left turn lanes are expected to be needed with 275 feet of length at the intersection of Bradley Road and Grinnell Boulevard (#14). By 2045, these eastbound dual left turn lanes may need to provide 450 feet of length; therefore, constructing these eastbound dual left turn lanes with the ultimate length of 450 feet should be taken under consideration when Bradley Road is widened to the west of Grinnell Boulevard.

Long through movement queues at the intersection of Milton E. Proby Parkway and Powers Boulevard (#1) in 2030 indicate that a grade separated interchange may be beneficial by the 2030 horizon.

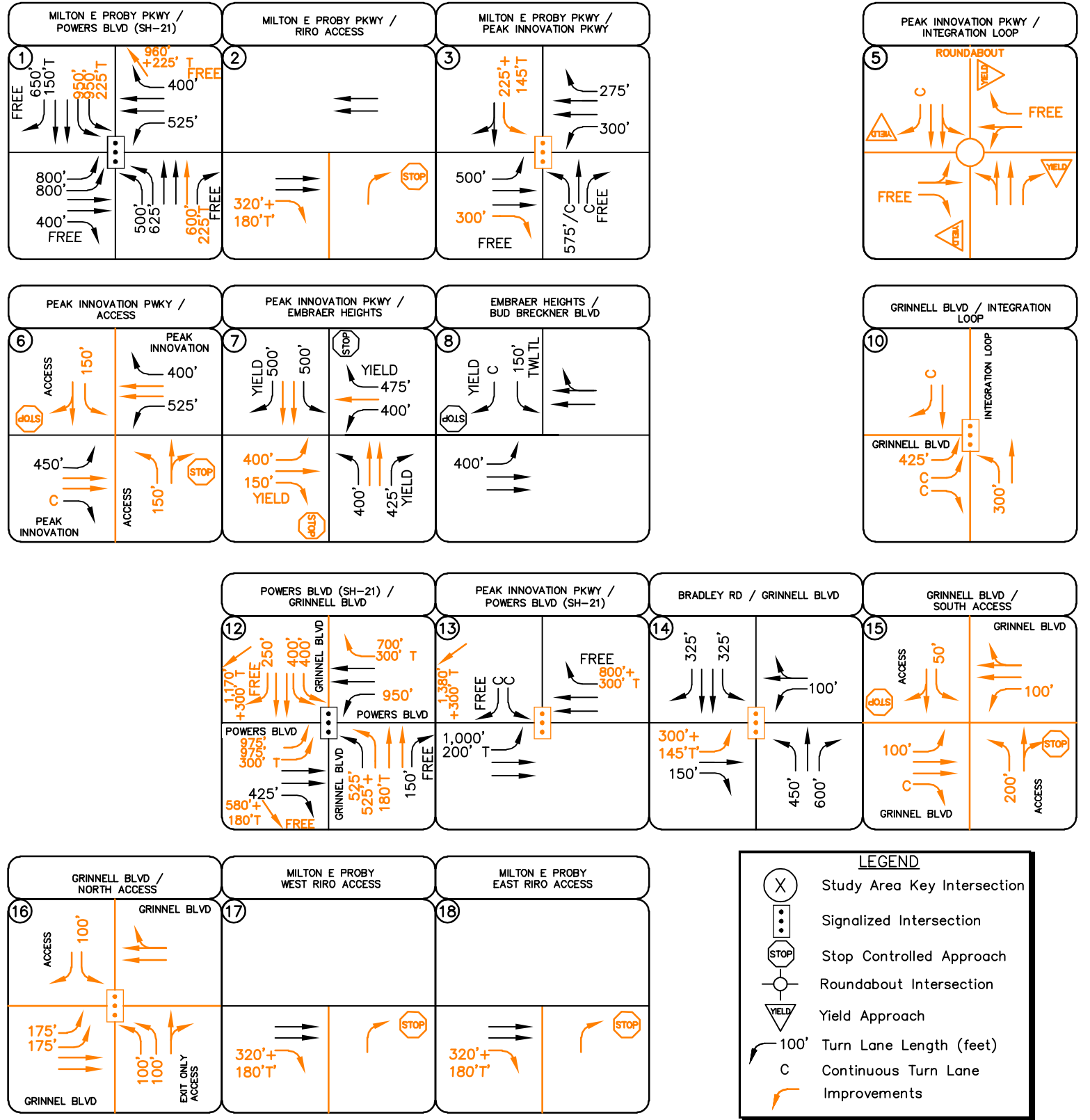
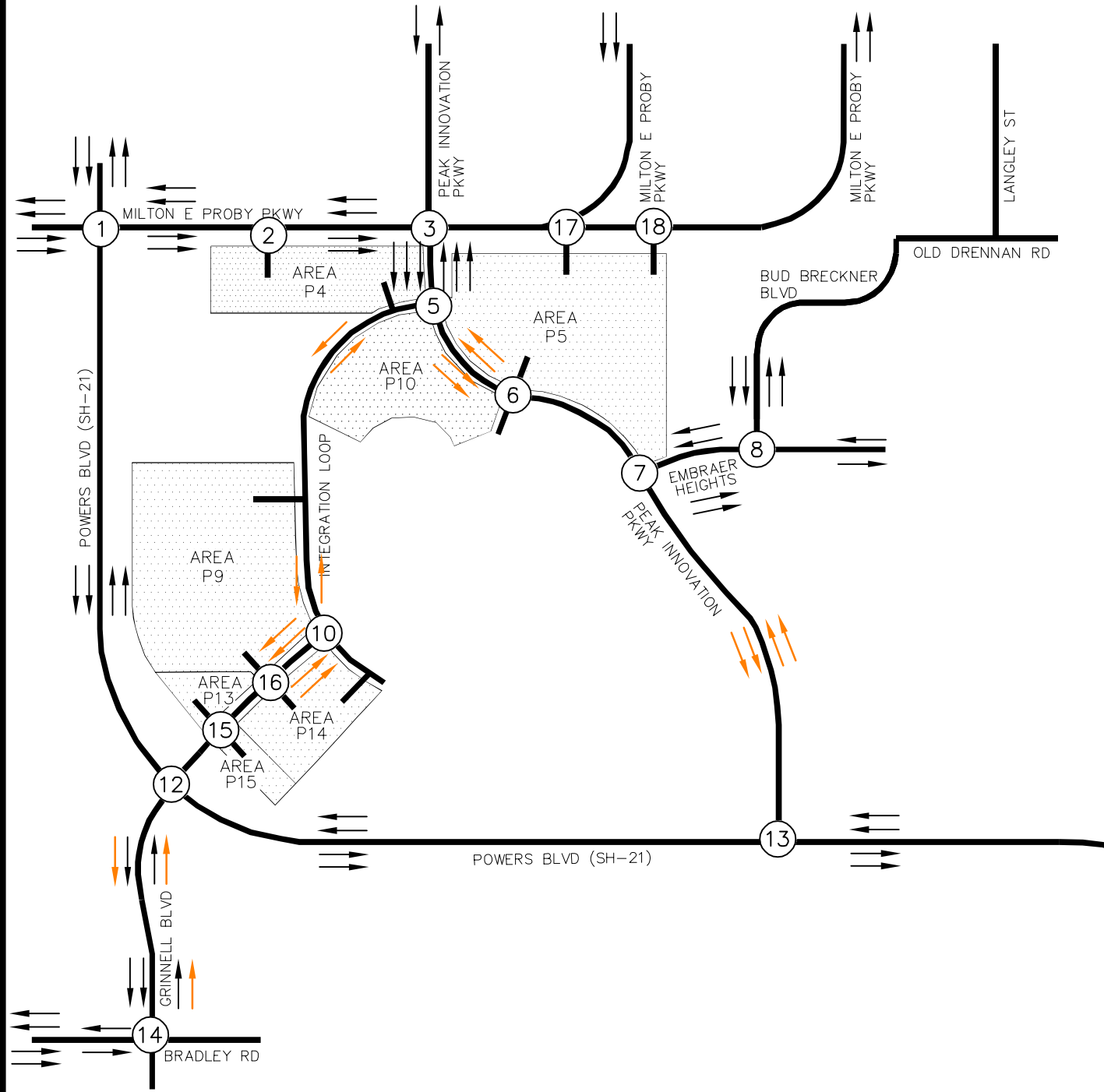
5.5 Improvement Summary

Based on the analysis presented in this report, Kimley-Horn believes the remaining development of Peak Innovation Park will be successfully incorporated into the existing and future roadway network. Based on the results of the intersection operations and queuing analysis, improvements were identified as being needed at key study intersections throughout the long term 2045 twenty-five-year planning horizon. These improvements are summarized in **Table 7** and **Figure 15** for the 2022 horizon, **Figure 16** for the 2030 horizon, and **Figure 17** for the 2045 horizon.

Table 7 – Peak Innovation Park Summary of Improvements

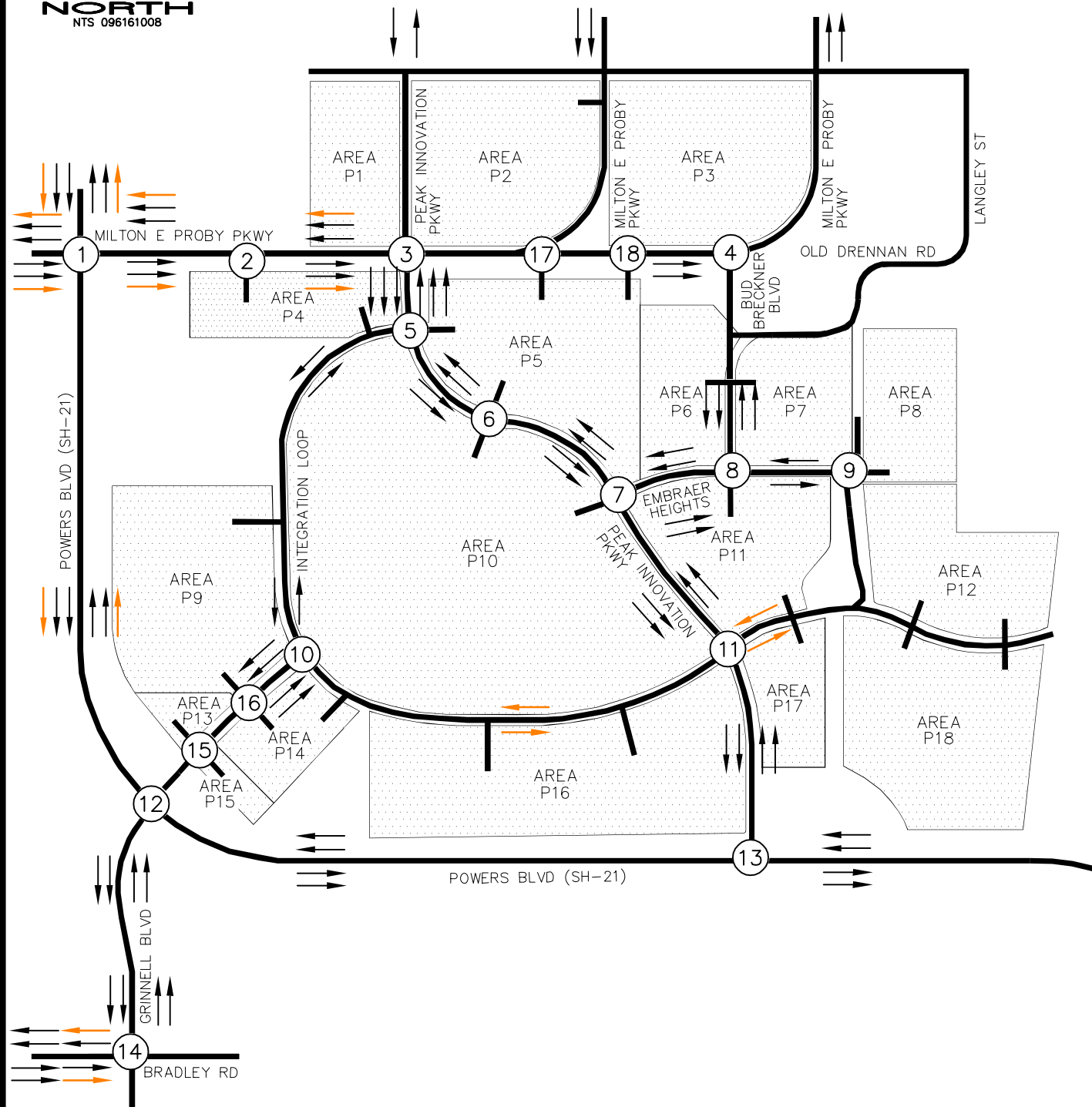
Intersection	Improvements	Planning Year
1. Milton E. Proby Parkway & Powers Boulevard (SH-21)	<ul style="list-style-type: none"> • Extend SB Dual Lefts (950-ft + 225-ft Taper) • Extend NB Right Turn Lane (600-ft + 225-ft Taper) • Extend NB Acceleration Lane (960-ft + 225-ft Taper) • Three NB Through Lanes 	2022
	<ul style="list-style-type: none"> • Three Through Lanes on EB, WB, and SB Approaches • Extend SB Dual Lefts (1,175-ft + 225-ft Taper) • Extend EB Dual Left (1,000 ft + 225-ft Taper) ~ or ~ • Grade Separated Interchange 	2030
	<ul style="list-style-type: none"> • Grade Separated Interchange 	2045
2. Milton E. Proby Parkway & Right-In/Right-Out Access	<ul style="list-style-type: none"> • Construct EB Right Turn Lane (320-ft + 180-ft Taper) 	2022
	<ul style="list-style-type: none"> • Three EB Through Lanes 	2030
	<ul style="list-style-type: none"> • Three WB Through Lanes • Construct EB Continuous Acceleration Lane 	2045
3. Milton E. Proby Parkway & Peak Innovation Parkway	<ul style="list-style-type: none"> • Traffic Signal • Construct SB Left Turn Lane (225-ft + 145-ft Taper) • Designate Single 300-ft EB Right Turn Lane 	2022
	<ul style="list-style-type: none"> • Designate Dual NB Left Turn Lanes (575-ft) • Continuous EB Right Turn Lane • Construct SB Right Turn (225-ft + 145-ft Taper) 	2030
	<ul style="list-style-type: none"> • Designate Triple NB Left Turn Lanes (575-ft) • Three EB & WB Through Lanes with Separate Rights • Construct EB Acceleration Lane for NB Free Right Turn (580-ft + 180-ft Taper or Continuous) • Extend SB Right Turn Lane (325-ft + 145-ft taper) • Extend WB Left Turn Lane (400-ft) 	2045
4. Milton E. Proby Parkway & Bud Breckner Boulevard	<ul style="list-style-type: none"> • Construct EB Right Turn Lane (320-ft + 180-ft Taper) 	2030
	<ul style="list-style-type: none"> • Three EB Through Lanes Absorbing Right Turn Lane 	2045
5. Integration Loop & Peak Innovation Parkway	<ul style="list-style-type: none"> • Roundabout (multi-lane) • Two NB & SB Through Lanes 	2022
	<ul style="list-style-type: none"> • Three NB & SB Through Lanes 	2045
6. Peak Innovation Parkway Access	<ul style="list-style-type: none"> • Two Through Lanes on Peak Innovation Parkway • Stop-Controlled Access (Northbound & Southbound) • Construct NB & SB Left Turn (150-ft) & Shared Through/Right 	2022
	<ul style="list-style-type: none"> • Traffic Signal • Construct NB Dual Left Turn Lanes (575-ft) 	2045
7. Embraer Heights & Peak Innovation Parkway	<ul style="list-style-type: none"> • Two NB & SB Through Lanes • Designate EB Left Turn (400-ft) & Right Turn (150-ft) • Designate NB Left Turn Lane • Designate EB & WB Through Lanes 	2022
	<ul style="list-style-type: none"> • Traffic Signal 	2030
	<ul style="list-style-type: none"> • Extend NB Left Turn Lane (425-ft) 	2045
8. Embraer Heights & Bud Breckner Boulevard	<ul style="list-style-type: none"> • New Northbound Stop-Controlled Approach • Construct NB Left Turn Lane (50-ft) • Construct WB Left Turn Lane (100-ft) • NB & SB Single Through Lanes 	2030
	<ul style="list-style-type: none"> • Roundabout (single lane) • EB Left Turn Lane & Shared Through/Right 	2045

Intersection	Improvements	Planning Year
	• SB Shared Left/Through & Right Turn Lane	
9. Embraer Heights Access	• NB & SB Stop Controlled Approaches	2030
10. Integration Loop Grinnell Boulevard	• Traffic Signal • Construct EB Dual Lefts on Grinnell Blvd (425-ft) • Construct NB Left Turn Lane on Integration Loop (300-ft) • Construct SB Right Turn Lane - Integration Loop (Cont.)	2022
11. Integration Loop & Peak Innovation Parkway	• Two NB & SB Through Lanes	2022
	• Traffic Signal • Construct EB & WB Left Turn Lanes (150-ft & 200-ft)	2030
	• Extend WB Left Turn Lane (400-ft)	2045
12. Powers Boulevard & Grinnell Boulevard	• Construct EB Dual Left Turn Lanes (975-ft + 300-ft Taper) • Extend WB Left Turn Lane (950-ft) • Construct WB Acceleration Lane (1,170-ft + 300-ft Taper) for Free SB Right Turn • Construct WB Right Turn Lane (700-ft + 300-ft Taper) • Construct Two NB & SB Through Lanes • Construct NB Dual Left Turn Lanes (525-ft) • Construct SB Dual Left Turn Lanes (400-ft) • Construct SB Right Turn Lane (250-ft) with Free Right • Construct SB Acceleration Lane (580') for EB Free Right	2022
	• Construct WB Dual Left Turn Lanes (950-ft +300-ft Taper)	2030
	• Construct Three EB and WB Through Lanes • Extend NB Right Turn Lane (300-ft)	2045
13. Powers Boulevard (SH-21) Peak Innovation Parkway	• Traffic Signal • Extend WB Right Turn Lane (800-ft+300-ft Taper) • Extend WB Acceleration Lane (1,380-ft +300-ft T)	2022
	• Construct SB Dual Left Turn Lanes (500-ft) • Extend EB Left Turn Lane (1,025-ft + 300-ft Taper)	2030
	• Extend EB Left Turn Lane (1,325-ft + 300-ft Taper)	2045
14. Bradley Road & Grinnell Boulevard	• Traffic Signal • Construct EB Left Turn Lane (300-ft + 145-ft Taper)	2020
	• Construct EB Dual Left Turn Lanes (275-ft) • SB Right Turn Protected-Overlap Phasing	2030
	• Extend EB Dual Left Turn Lanes (450-ft)	2045
15. Grinnell Boulevard South Access	• Two EB & WB Through Lanes on Grinnell Blvd • Construct EB & WB Left Turn Lanes (100-ft) • Construct NB Left Turn Lane (200') • Construct SB Left Turn Lane (50') • Continuous EB Right Turn Lane	2022
	• Traffic Signal	2030
16. Grinnell Boulevard North Access	• Traffic Signal • Two EB & WB Through Lanes on Grinnell Blvd • Construct EB Dual Left Turn Lanes (175-ft) on Grinnell • Construct NB Dual Left Turn Lanes (100-ft) from Access • Construct SB Left Turn Lane (100-ft) from Access	2022
17. Milton E Proby Parkway West RIRO Access	• Construct EB Right Turn Lane (320-ft + 180-ft Taper)	2022
	• Three EB Through Lanes	2045
18. Milton E Proby Parkway East RIRO Access	• Construct EB Right Turn Lane (320-ft + 180-ft Taper)	2022
	• Three EB Through Lanes	2045



PEAK INNOVATION PARK
 PHASE I 2022 RECOMMENDED LANE CONFIGURATIONS AND CONTROL

FIGURE 15



PEAK INNOVATION PARK
PHASE II 2030 RECOMMENDED LANE CONFIGURATIONS AND CONTROL

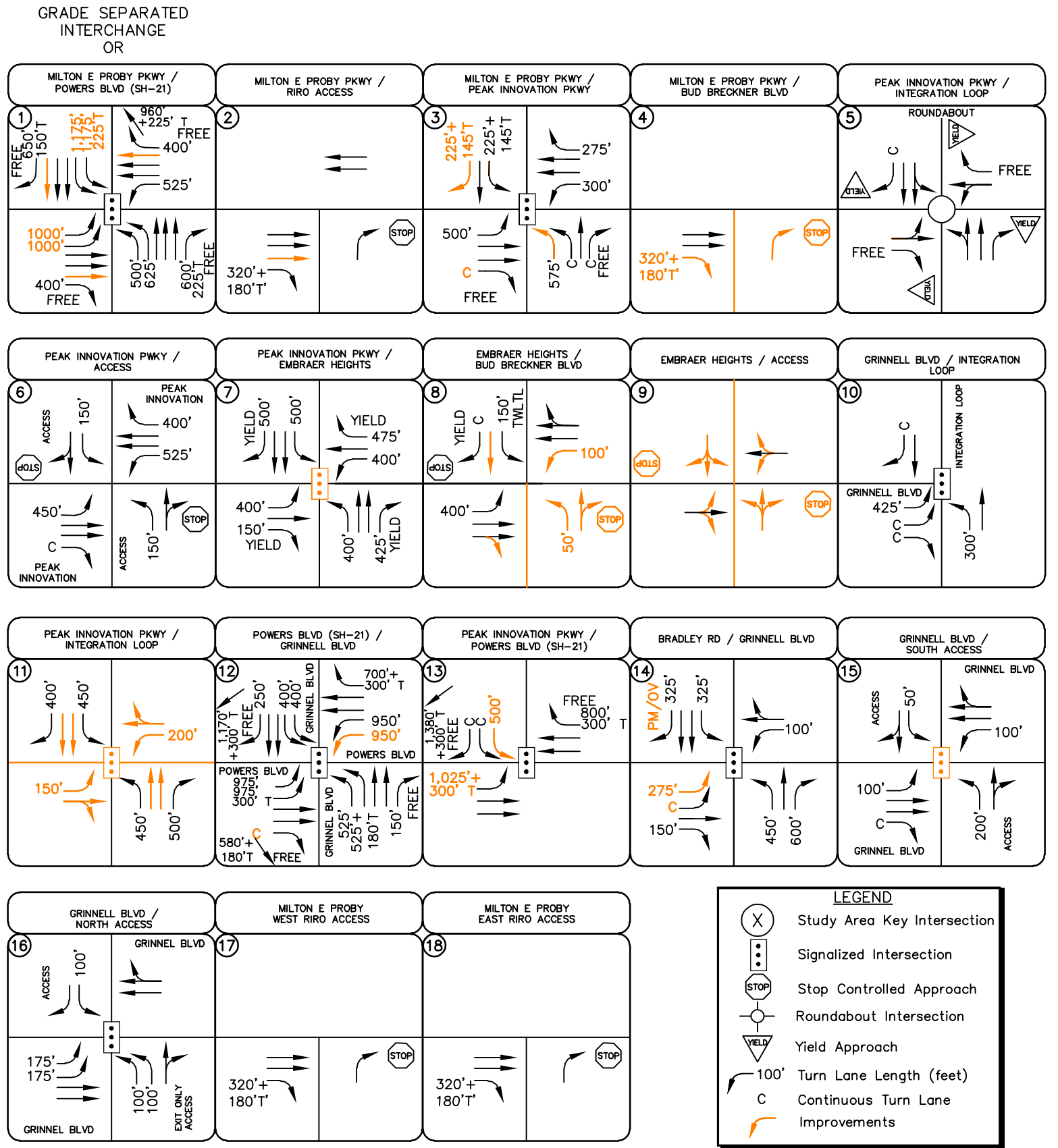
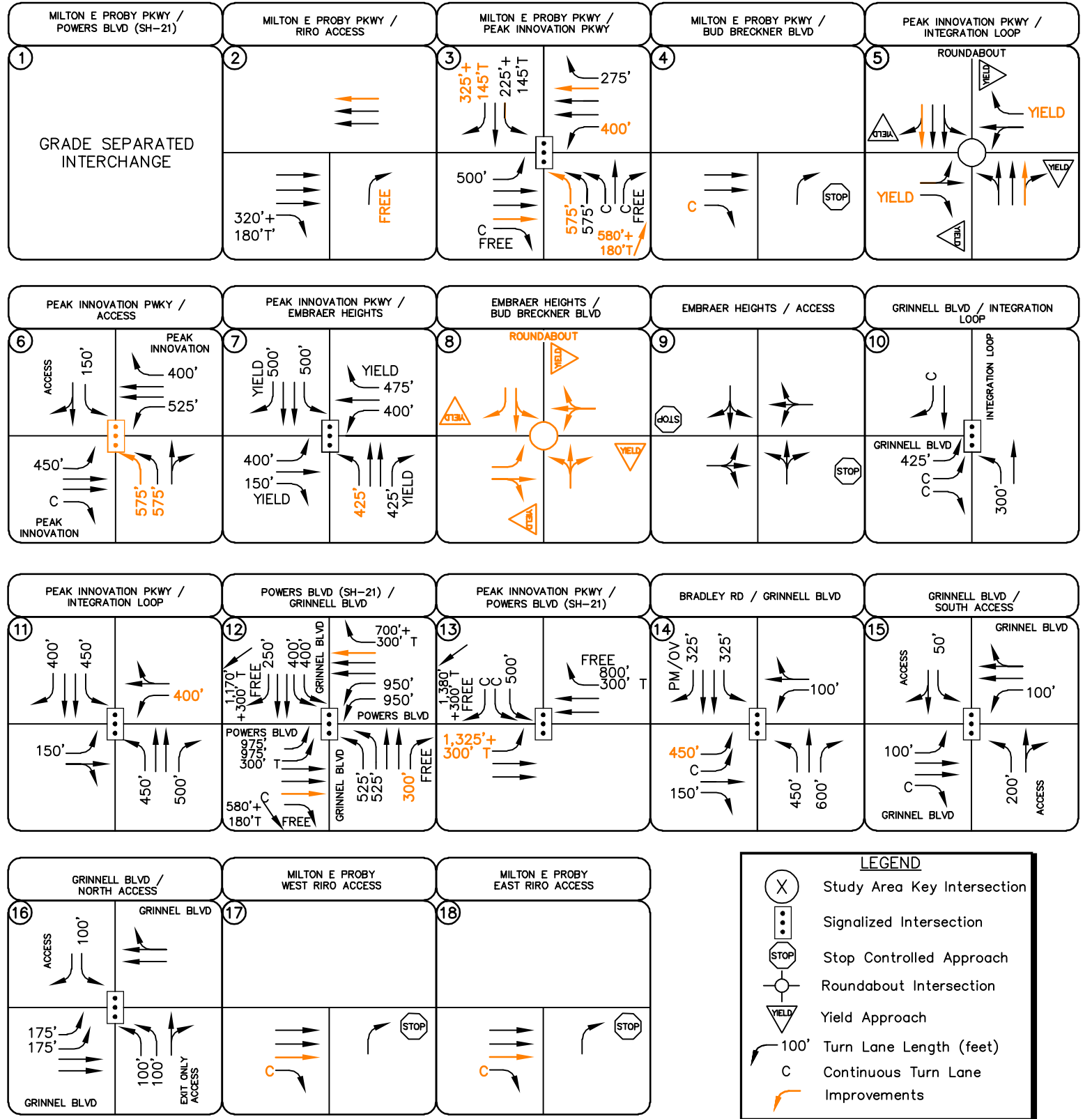
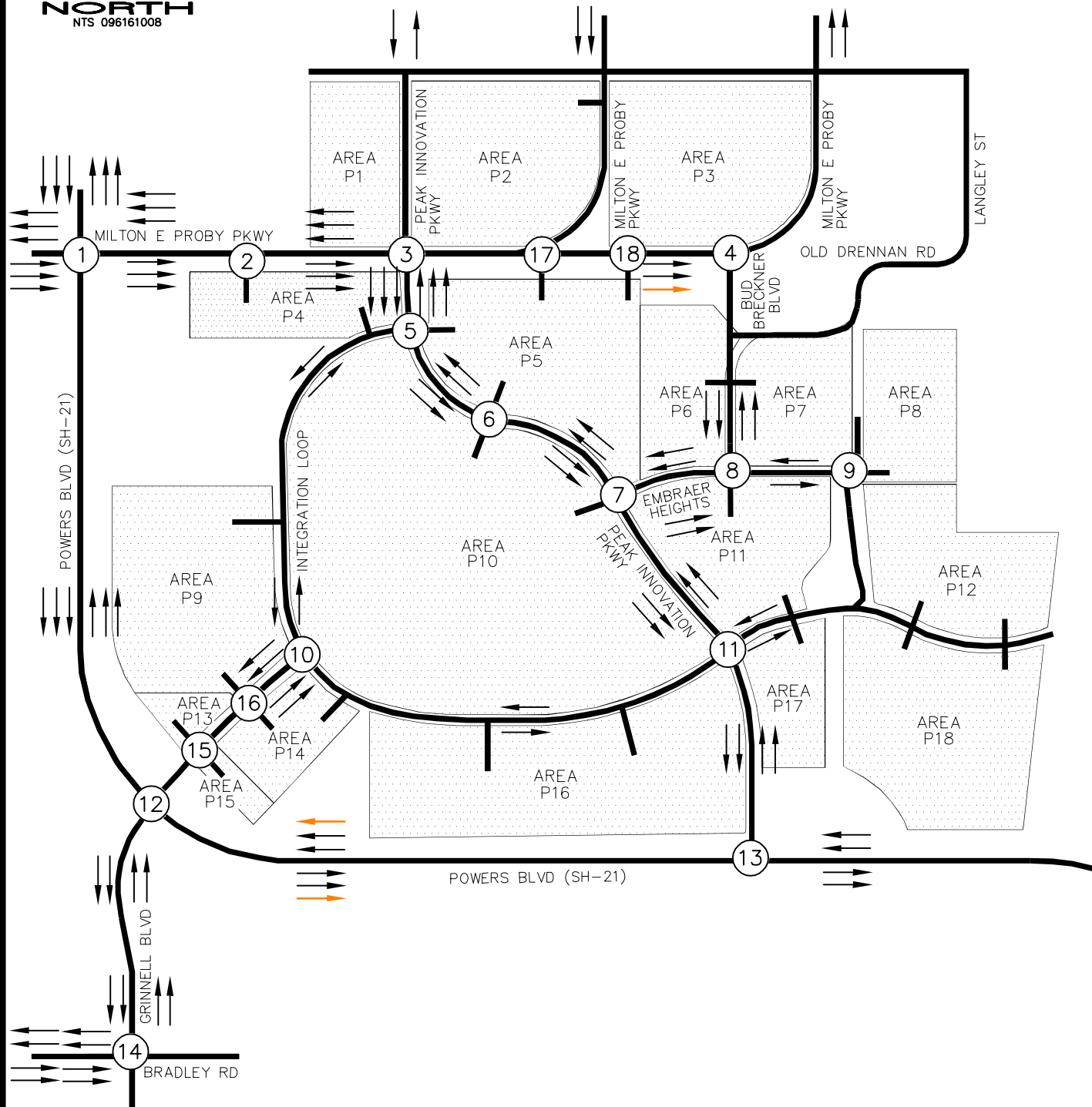


FIGURE 16



LEGEND

- (X) Study Area Key Intersection
- Signalized Intersection
- STOP Stop Controlled Approach
- Roundabout Intersection
- YIELD Yield Approach
- 100' Turn Lane Length (feet)
- C Continuous Turn Lane
- Improvements

PEAK INNOVATION PARK
 FULL BUILDOUT 2045 RECOMMENDED LANE CONFIGURATIONS AND CONTROL

APPENDICES

APPENDIX A

Intersection Count Sheets



Ridgeview Data
Collection

Colorado Springs, CO
Peak Innovation Park
AM Peak
Milton E Proby & Powers Blvd (SH-21)

File Name : Milton and Powers AM
Site Code : IPO 467
Start Date : 11/12/2019
Page No : 1

Groups Printed- Automobiles

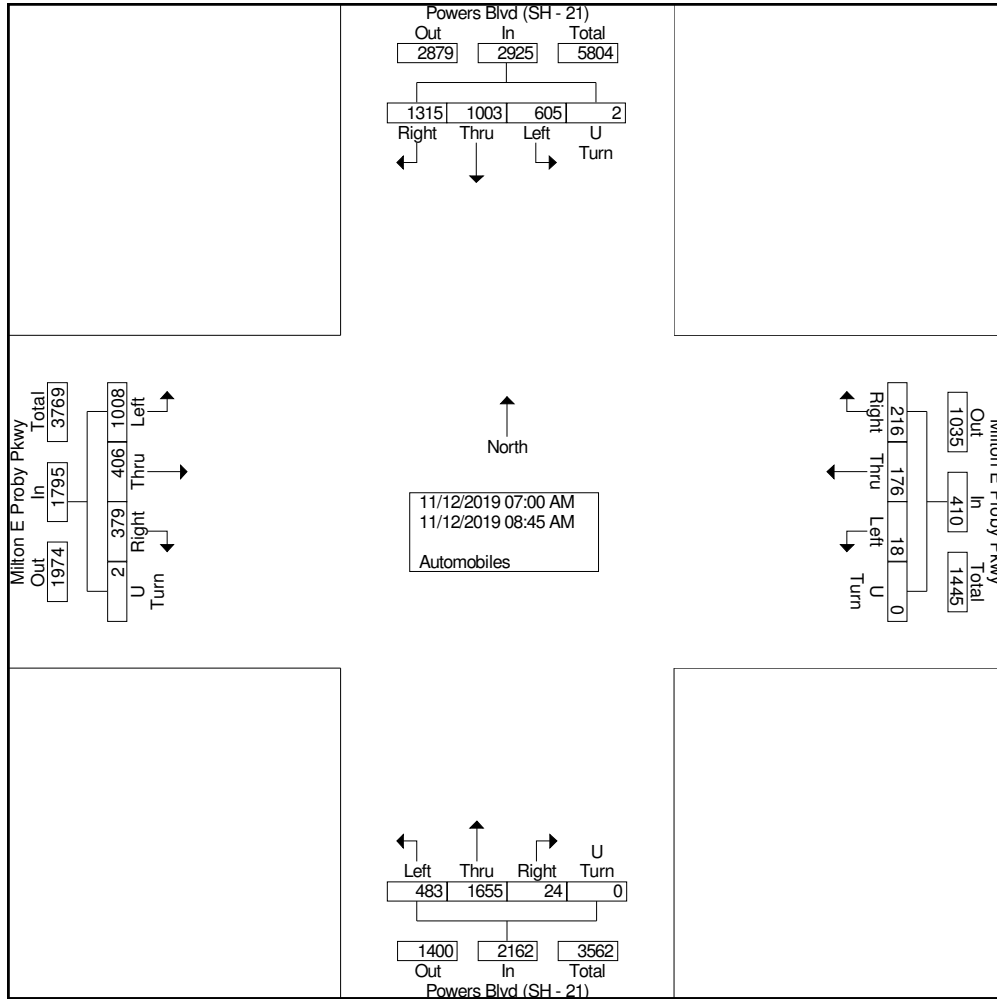
Start Time	Milton E Proby Pkwy Eastbound					Milton E Proby Pkwy Westbound					Powers Blvd (SH - 21) Northbound					Powers Blvd (SH - 21) Southbound					Int. Total
	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	
07:00 AM	129	39	48	0	216	0	10	23	0	33	80	224	3	0	307	61	115	190	0	366	922
07:15 AM	188	49	61	1	299	1	19	22	0	42	93	329	2	0	424	63	134	176	1	374	1139
07:30 AM	168	48	53	0	269	1	26	28	0	55	95	273	6	0	374	73	146	163	0	382	1080
07:45 AM	118	67	56	0	241	2	14	16	0	32	70	202	2	0	274	91	146	164	0	401	948
Total	603	203	218	1	1025	4	69	89	0	162	338	1028	13	0	1379	288	541	693	1	1523	4089
08:00 AM	85	59	45	0	189	2	20	30	0	52	37	186	2	0	225	86	127	148	0	361	827
08:15 AM	91	56	30	1	178	3	20	19	0	42	43	145	5	0	193	83	132	177	0	392	805
08:30 AM	108	42	41	0	191	7	44	42	0	93	39	175	1	0	215	78	101	176	0	355	854
08:45 AM	121	46	45	0	212	2	23	36	0	61	26	121	3	0	150	70	102	121	1	294	717
Total	405	203	161	1	770	14	107	127	0	248	145	627	11	0	783	317	462	622	1	1402	3203
Grand Total	1008	406	379	2	1795	18	176	216	0	410	483	1655	24	0	2162	605	1003	1315	2	2925	7292
Apprch %	56.2	22.6	21.1	0.1		4.4	42.9	52.7	0		22.3	76.5	1.1	0		20.7	34.3	45	0.1		
Total %	13.8	5.6	5.2	0	24.6	0.2	2.4	3	0	5.6	6.6	22.7	0.3	0	29.6	8.3	13.8	18	0	40.1	



Ridgeview Data
Collection

Colorado Springs, CO
Peak Innovation Park
AM Peak
Milton E Proby & Powers Blvd (SH-21)

File Name : Milton and Powers AM
Site Code : IPO 467
Start Date : 11/12/2019
Page No : 2



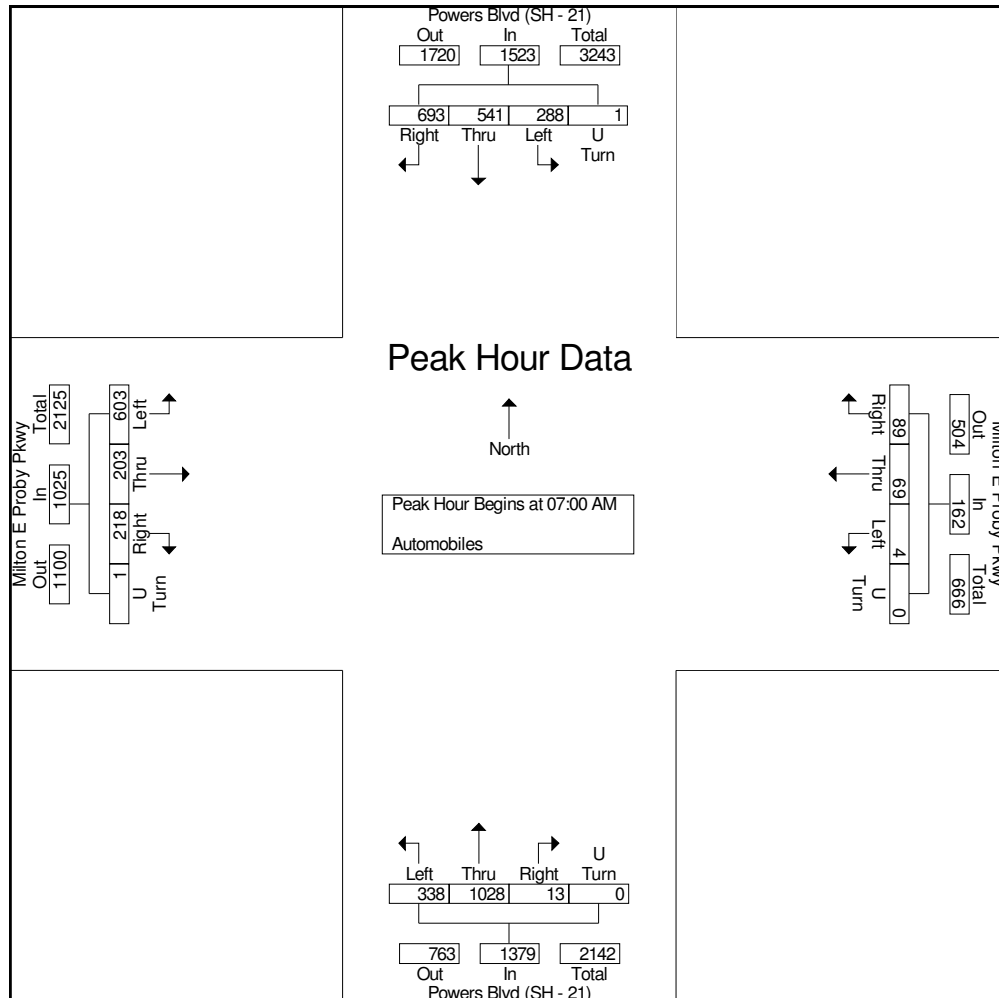


Ridgeview Data
Collection

Colorado Springs, CO
Peak Innovation Park
AM Peak
Milton E Proby & Powers Blvd (SH-21)

File Name : Milton and Powers AM
Site Code : IPO 467
Start Date : 11/12/2019
Page No : 3

Start Time	Milton E Proby Pkwy Eastbound					Milton E Proby Pkwy Westbound					Powers Blvd (SH - 21) Northbound					Powers Blvd (SH - 21) Southbound					Int. Total
	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	129	39	48	0	216	0	10	23	0	33	80	224	3	0	307	61	115	190	0	366	922
07:15 AM	188	49	61	1	299	1	19	22	0	42	93	329	2	0	424	63	134	176	1	374	1139
07:30 AM	168	48	53	0	269	1	26	28	0	55	95	273	6	0	374	73	146	163	0	382	1080
07:45 AM	118	67	56	0	241	2	14	16	0	32	70	202	2	0	274	91	146	164	0	401	948
Total Volume	603	203	218	1	1025	4	69	89	0	162	338	1028	13	0	1379	288	541	693	1	1523	4089
% App. Total	58.8	19.8	21.3	0.1		2.5	42.6	54.9	0		24.5	74.5	0.9	0		18.9	35.5	45.5	0.1		
PHF	.802	.757	.893	.250	.857	.500	.663	.795	.000	.736	.889	.781	.542	.000	.813	.791	.926	.912	.250	.950	.897





Ridgeview Data
Collection

Colorado Springs, CO
Peak Innovation Park
PM Peak
Milton E Proby & Powers Blvd (SH-21)

File Name : Milton and Powers PM
Site Code : IPO 467
Start Date : 11/12/2019
Page No : 1

Groups Printed- Automobiles

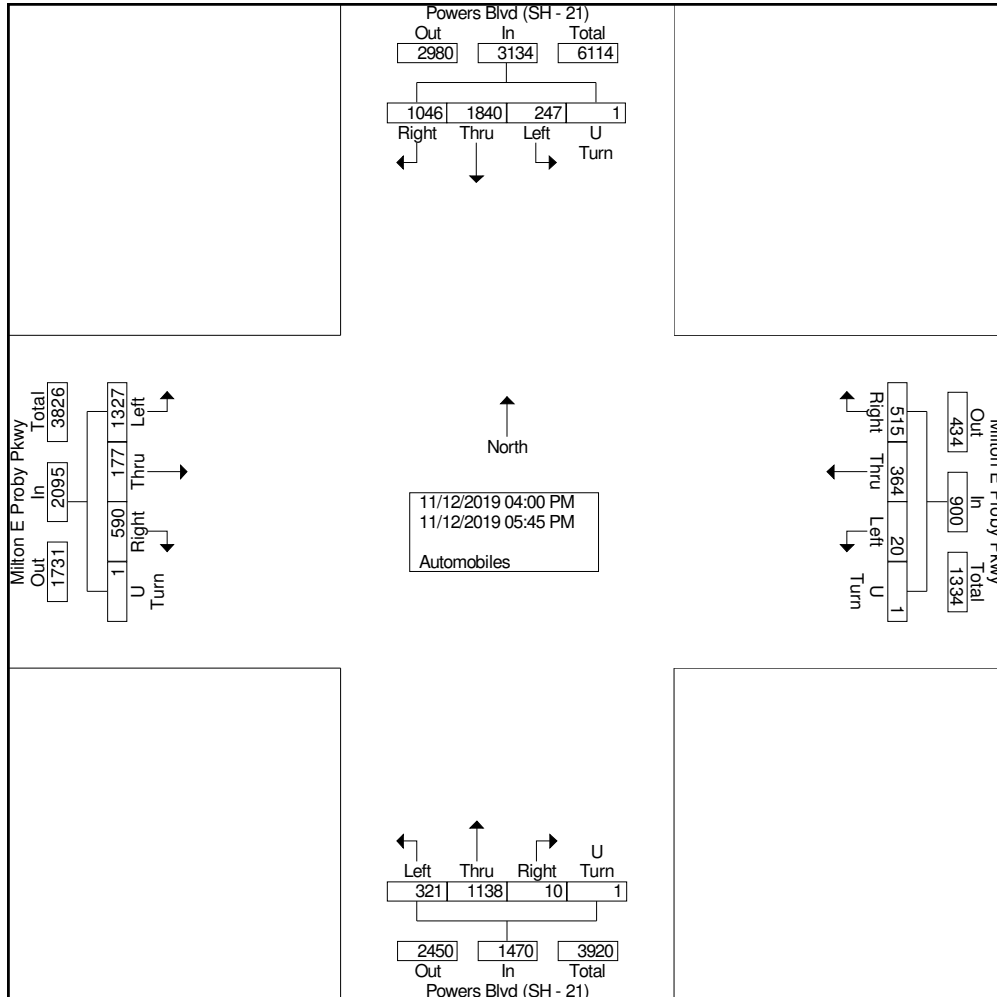
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	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	
04:00 PM	180	18	74	0	272	6	75	106	0	187	34	133	1	0	168	33	222	115	0	370	997
04:15 PM	165	26	53	0	244	2	29	51	0	82	50	143	1	0	194	31	242	149	0	422	942
04:30 PM	162	25	68	0	255	2	43	59	0	104	47	130	1	0	178	33	246	133	0	412	949
04:45 PM	150	24	75	0	249	1	58	51	1	111	36	151	1	1	189	26	192	130	0	348	897
Total	657	93	270	0	1020	11	205	267	1	484	167	557	4	1	729	123	902	527	0	1552	3785
05:00 PM	180	21	87	1	289	1	38	65	0	104	50	155	2	0	207	25	237	145	0	407	1007
05:15 PM	184	21	76	0	281	1	19	62	0	82	36	142	3	0	181	37	234	133	0	404	948
05:30 PM	166	29	91	0	286	5	40	64	0	109	31	130	1	0	162	38	207	137	1	383	940
05:45 PM	140	13	66	0	219	2	62	57	0	121	37	154	0	0	191	24	260	104	0	388	919
Total	670	84	320	1	1075	9	159	248	0	416	154	581	6	0	741	124	938	519	1	1582	3814
Grand Total	1327	177	590	1	2095	20	364	515	1	900	321	1138	10	1	1470	247	1840	1046	1	3134	7599
Apprch %	63.3	8.4	28.2	0		2.2	40.4	57.2	0.1		21.8	77.4	0.7	0.1		7.9	58.7	33.4	0		
Total %	17.5	2.3	7.8	0	27.6	0.3	4.8	6.8	0	11.8	4.2	15	0.1	0	19.3	3.3	24.2	13.8	0	41.2	



Ridgeview Data Collection

Colorado Springs, CO
Peak Innovation Park
PM Peak
Milton E Proby & Powers Blvd (SH-21)

File Name : Milton and Powers PM
Site Code : IPO 467
Start Date : 11/12/2019
Page No : 2



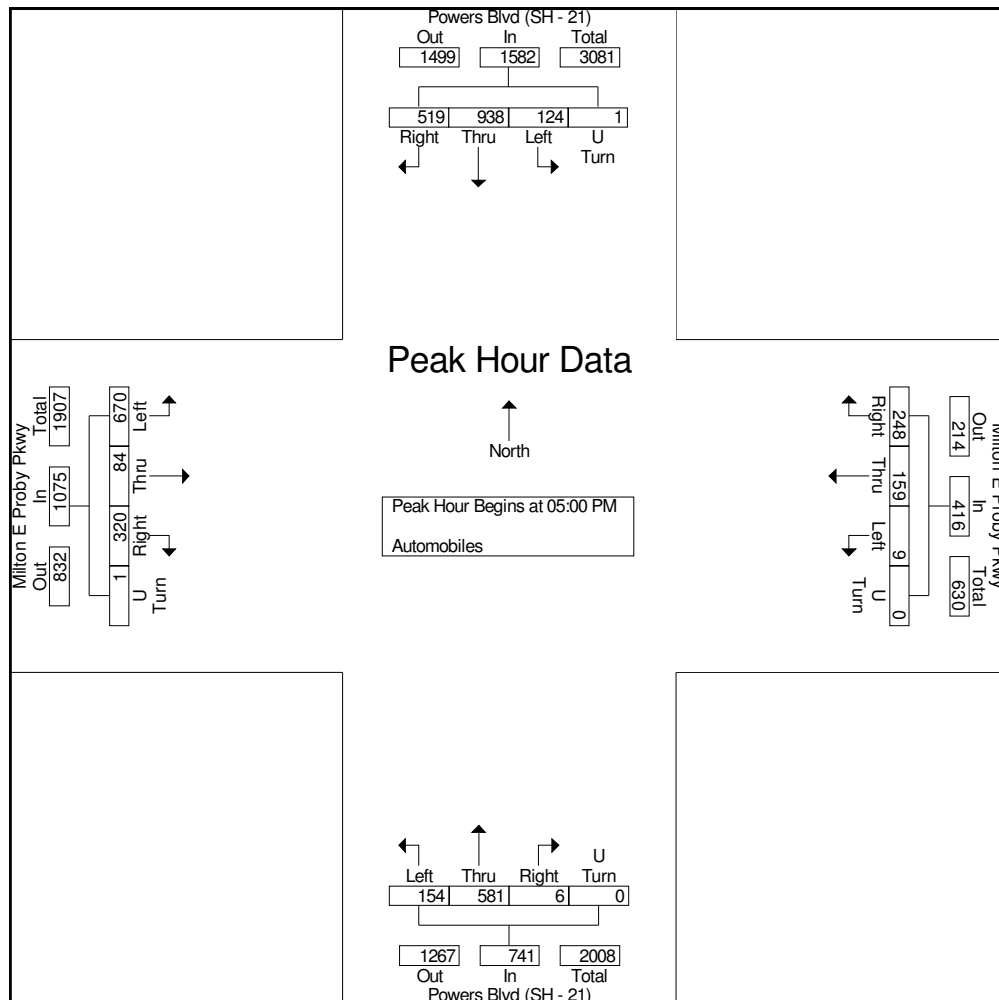


Ridgeview Data
Collection

Colorado Springs, CO
Peak Innovation Park
PM Peak
Milton E Proby & Powers Blvd (SH-21)

File Name : Milton and Powers PM
Site Code : IPO 467
Start Date : 11/12/2019
Page No : 3

Start Time	Milton E Proby Pkwy Eastbound					Milton E Proby Pkwy Westbound					Powers Blvd (SH - 21) Northbound					Powers Blvd (SH - 21) Southbound					Int. Total
	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	180	21	87	1	289	1	38	65	0	104	50	155	2	0	207	25	237	145	0	407	1007
05:15 PM	184	21	76	0	281	1	19	62	0	82	36	142	3	0	181	37	234	133	0	404	948
05:30 PM	166	29	91	0	286	5	40	64	0	109	31	130	1	0	162	38	207	137	1	383	940
05:45 PM	140	13	66	0	219	2	62	57	0	121	37	154	0	0	191	24	260	104	0	388	919
Total Volume	670	84	320	1	1075	9	159	248	0	416	154	581	6	0	741	124	938	519	1	1582	3814
% App. Total	62.3	7.8	29.8	0.1		2.2	38.2	59.6	0		20.8	78.4	0.8	0		7.8	59.3	32.8	0.1		
PHF	.910	.724	.879	.250	.930	.450	.641	.954	.000	.860	.770	.937	.500	.000	.895	.816	.902	.895	.250	.972	.947





Ridgeview Data
Collection

Colorado Springs, CO
Peak Innovation Park
AM Peak
Milton E Proby & Peak Innovation Pkwy

File Name : Milton and Peak Innovation AM
Site Code : IPO 467
Start Date : 11/12/2019
Page No : 1

Groups Printed- Automobiles

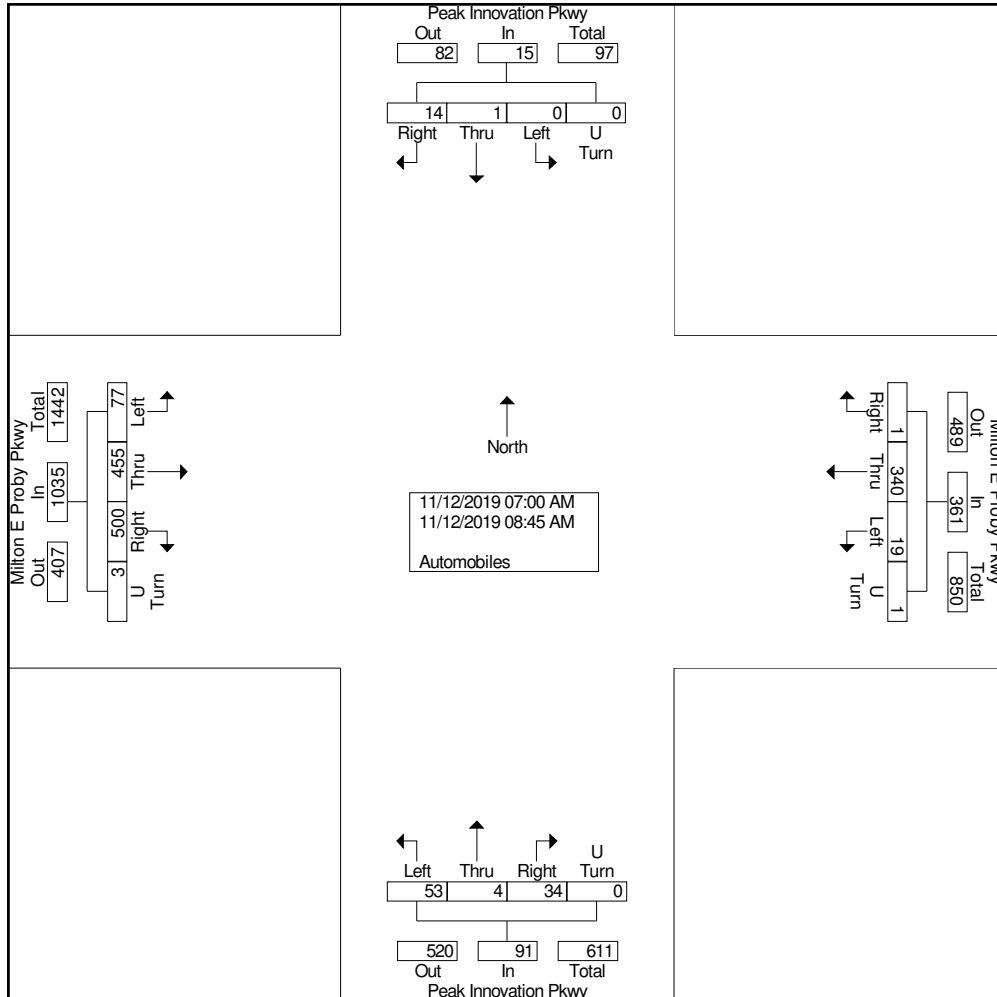
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	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	
07:00 AM	8	50	41	0	99	3	25	0	0	28	6	1	5	0	12	0	1	1	0	2	141
07:15 AM	5	39	63	1	108	2	36	0	0	38	6	0	5	0	11	0	0	6	0	6	163
07:30 AM	10	51	65	0	126	3	39	0	0	42	11	0	1	0	12	0	0	1	0	1	181
07:45 AM	15	59	77	0	151	1	31	0	1	33	4	0	8	0	12	0	0	1	0	1	197
Total	38	199	246	1	484	9	131	0	1	141	27	1	19	0	47	0	1	9	0	10	682
08:00 AM	10	76	70	2	158	3	39	0	0	42	7	1	5	0	13	0	0	2	0	2	215
08:15 AM	10	69	68	0	147	1	34	1	0	36	7	0	2	0	9	0	0	1	0	1	193
08:30 AM	11	57	57	0	125	4	80	0	0	84	10	2	4	0	16	0	0	2	0	2	227
08:45 AM	8	54	59	0	121	2	56	0	0	58	2	0	4	0	6	0	0	0	0	0	185
Total	39	256	254	2	551	10	209	1	0	220	26	3	15	0	44	0	0	5	0	5	820
Grand Total	77	455	500	3	1035	19	340	1	1	361	53	4	34	0	91	0	1	14	0	15	1502
Apprch %	7.4	44	48.3	0.3		5.3	94.2	0.3	0.3		58.2	4.4	37.4	0		0	6.7	93.3	0		
Total %	5.1	30.3	33.3	0.2	68.9	1.3	22.6	0.1	0.1	24	3.5	0.3	2.3	0	6.1	0	0.1	0.9	0	1	



Ridgeview Data
Collection

Colorado Springs, CO
Peak Innovation Park
AM Peak
Milton E Proby & Peak Innovation Pkwy

File Name : Milton and Peak Innovation AM
Site Code : IPO 467
Start Date : 11/12/2019
Page No : 2



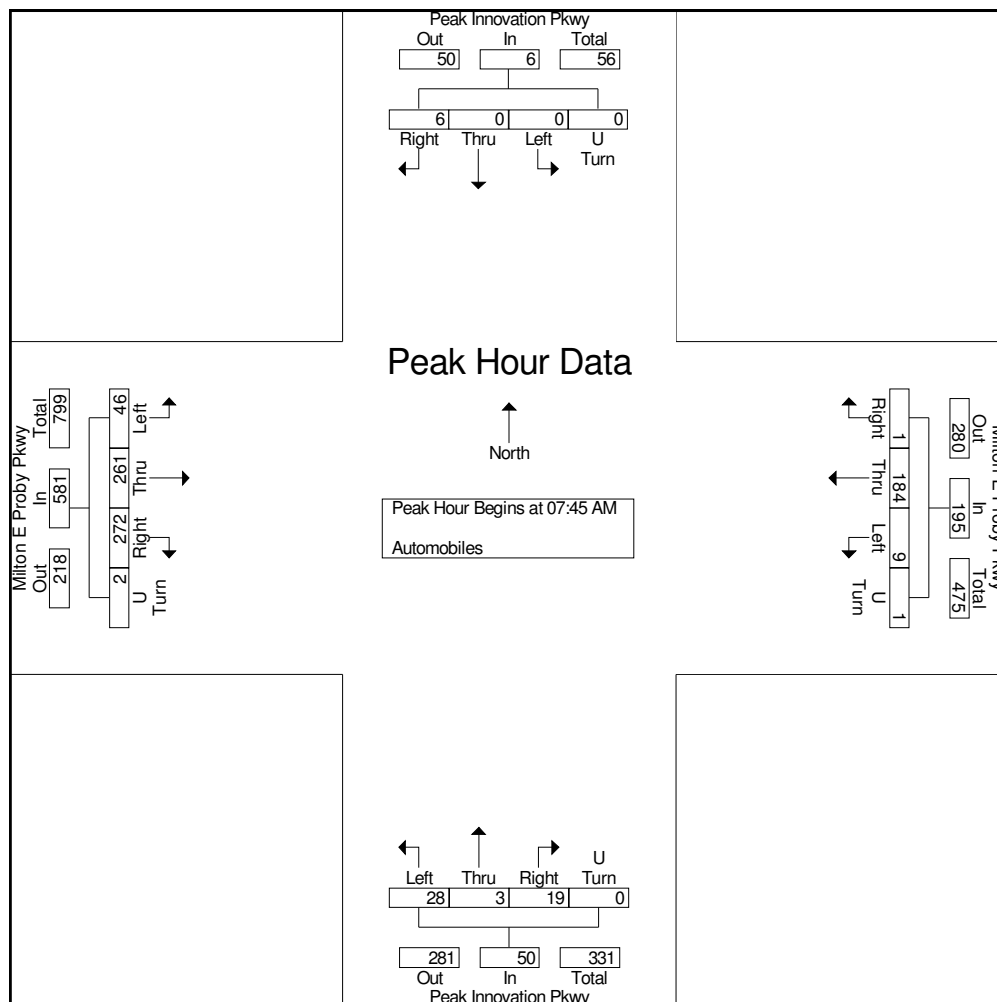


Ridgeview Data
Collection

Colorado Springs, CO
Peak Innovation Park
AM Peak
Milton E Proby & Peak Innovation Pkwy

File Name : Milton and Peak Innovation AM
Site Code : IPO 467
Start Date : 11/12/2019
Page No : 3

Start Time	Milton E Proby Pkwy Eastbound					Milton E Proby Pkwy Westbound					Peak Innovation Pkwy Northbound					Peak Innovation Pkwy Southbound					Int. Total
	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	15	59	77	0	151	1	31	0	1	33	4	0	8	0	12	0	0	1	0	1	197
08:00 AM	10	76	70	2	158	3	39	0	0	42	7	1	5	0	13	0	0	2	0	2	215
08:15 AM	10	69	68	0	147	1	34	1	0	36	7	0	2	0	9	0	0	1	0	1	193
08:30 AM	11	57	57	0	125	4	80	0	0	84	10	2	4	0	16	0	0	2	0	2	227
Total Volume	46	261	272	2	581	9	184	1	1	195	28	3	19	0	50	0	0	6	0	6	832
% App. Total	7.9	44.9	46.8	0.3		4.6	94.4	0.5	0.5		56	6	38	0		0	0	100	0		
PHF	.767	.859	.883	.250	.919	.563	.575	.250	.250	.580	.700	.375	.594	.000	.781	.000	.000	.750	.000	.750	.916





Ridgeview Data
Collection

Colorado Springs, CO
Peak Innovation Park
PM Peak
Milton E Proby & Peak Innovation Pkwy

File Name : Milton and Peak Innovation PM
Site Code : IPO 467
Start Date : 11/12/2019
Page No : 1

Groups Printed- Automobiles

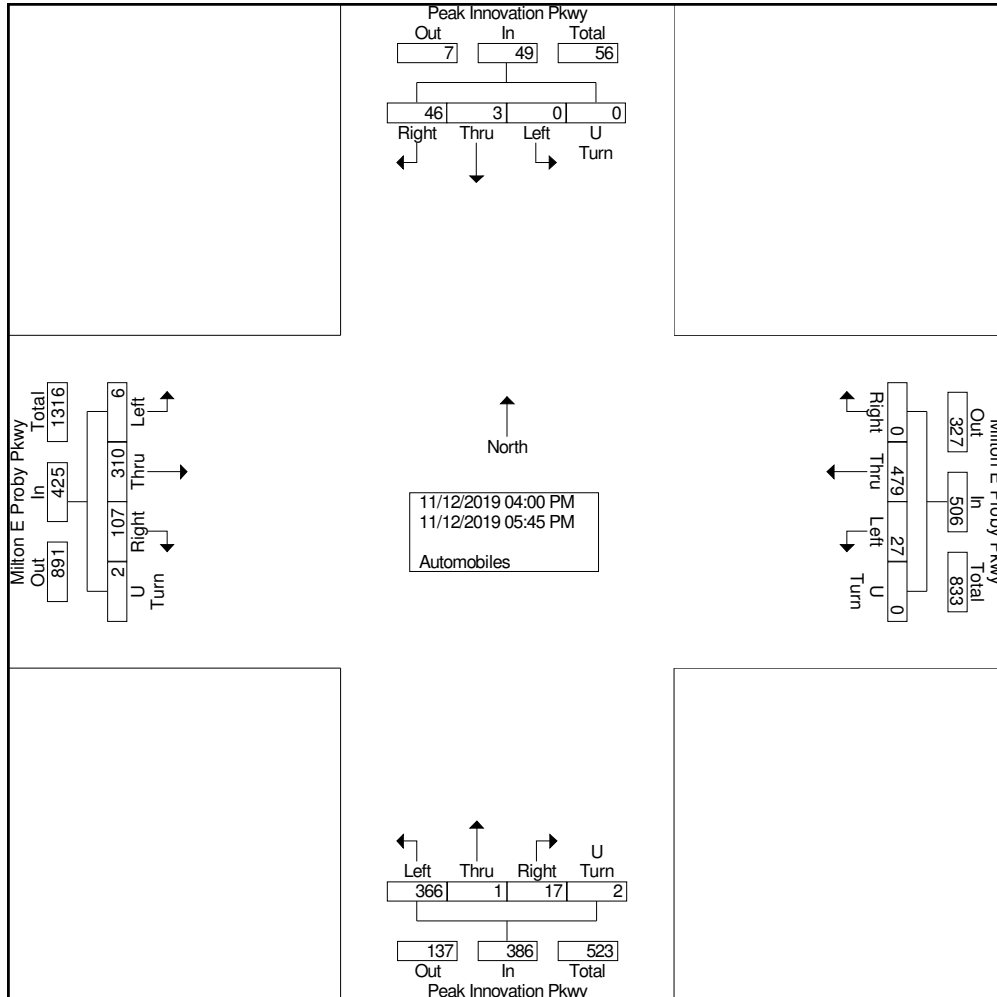
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	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	
04:00 PM	1	38	7	0	46	2	106	0	0	108	71	0	2	2	75	0	1	5	0	6	235
04:15 PM	1	47	12	0	60	4	50	0	0	54	29	0	0	0	29	0	1	2	0	3	146
04:30 PM	2	39	23	0	64	4	58	0	0	62	46	0	0	0	46	0	0	9	0	9	181
04:45 PM	0	42	9	1	52	3	53	0	0	56	44	0	1	0	45	0	0	1	0	1	154
Total	4	166	51	1	222	13	267	0	0	280	190	0	3	2	195	0	2	17	0	19	716
05:00 PM	0	31	14	0	45	3	37	0	0	40	60	1	4	0	65	0	1	11	0	12	162
05:15 PM	1	46	16	0	63	5	26	0	0	31	45	0	2	0	47	0	0	8	0	8	149
05:30 PM	1	49	13	0	63	4	69	0	0	73	37	0	4	0	41	0	0	7	0	7	184
05:45 PM	0	18	13	1	32	2	80	0	0	82	34	0	4	0	38	0	0	3	0	3	155
Total	2	144	56	1	203	14	212	0	0	226	176	1	14	0	191	0	1	29	0	30	650
Grand Total	6	310	107	2	425	27	479	0	0	506	366	1	17	2	386	0	3	46	0	49	1366
Apprch %	1.4	72.9	25.2	0.5		5.3	94.7	0	0		94.8	0.3	4.4	0.5		0	6.1	93.9	0		
Total %	0.4	22.7	7.8	0.1	31.1	2	35.1	0	0	37	26.8	0.1	1.2	0.1	28.3	0	0.2	3.4	0	3.6	



Ridgeview Data
Collection

Colorado Springs, CO
Peak Innovation Park
PM Peak
Milton E Proby & Peak Innovation Pkwy

File Name : Milton and Peak Innovation PM
Site Code : IPO 467
Start Date : 11/12/2019
Page No : 2



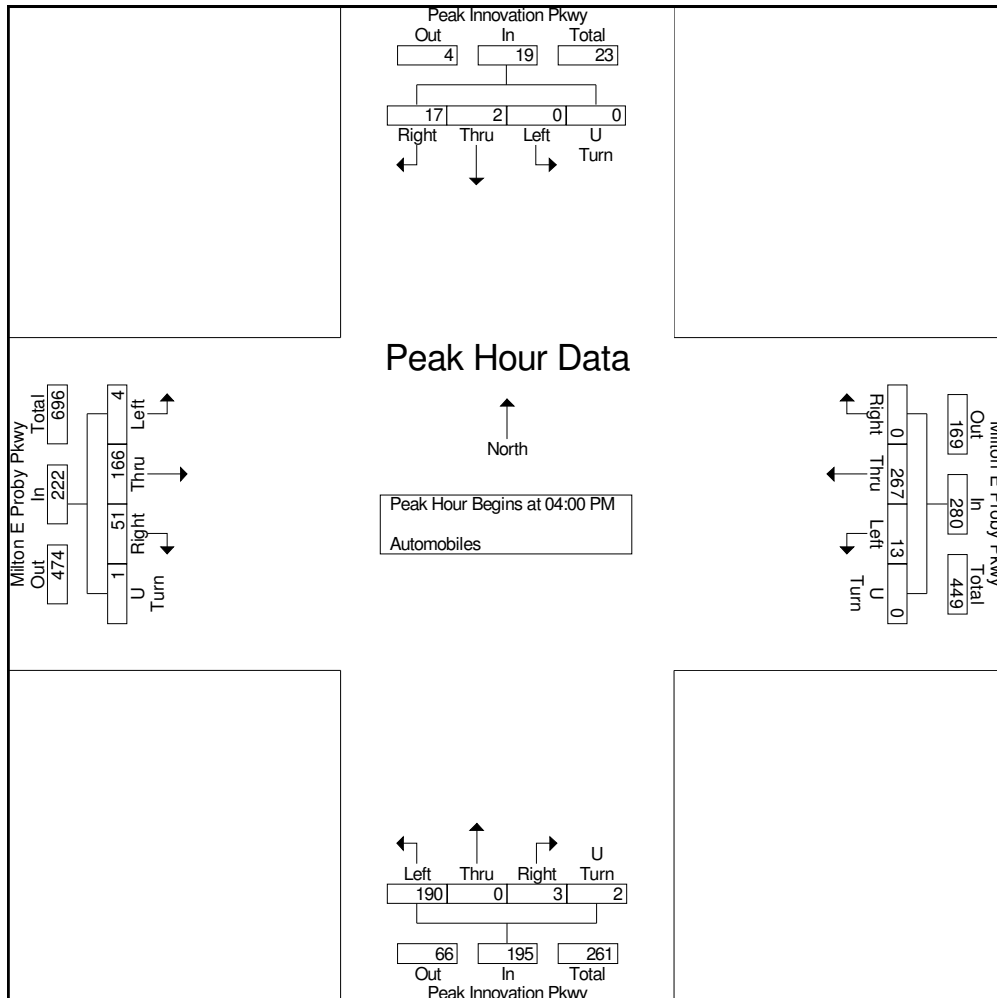


Ridgeview Data
Collection

Colorado Springs, CO
Peak Innovation Park
PM Peak
Milton E Proby & Peak Innovation Pkwy

File Name : Milton and Peak Innovation PM
Site Code : IPO 467
Start Date : 11/12/2019
Page No : 3

Start Time	Milton E Proby Pkwy Eastbound					Milton E Proby Pkwy Westbound					Peak Innovation Pkwy Northbound					Peak Innovation Pkwy Southbound					Int. Total
	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	1	38	7	0	46	2	106	0	0	108	71	0	2	2	75	0	1	5	0	6	235
04:15 PM	1	47	12	0	60	4	50	0	0	54	29	0	0	0	29	0	1	2	0	3	146
04:30 PM	2	39	23	0	64	4	58	0	0	62	46	0	0	0	46	0	0	9	0	9	181
04:45 PM	0	42	9	1	52	3	53	0	0	56	44	0	1	0	45	0	0	1	0	1	154
Total Volume	4	166	51	1	222	13	267	0	0	280	190	0	3	2	195	0	2	17	0	19	716
% App. Total	1.8	74.8	23	0.5		4.6	95.4	0	0		97.4	0	1.5	1		0	10.5	89.5	0		
PHF	.500	.883	.554	.250	.867	.813	.630	.000	.000	.648	.669	.000	.375	.250	.650	.000	.500	.472	.000	.528	.762





Ridgeview Data
Collection

Colorado Springs, CO
Peak Innovation Park
AM Peak
Embraer Heights & Peak Innovation Pkwy

File Name : Embraer and Peak Innovation AM
Site Code : IPO 467
Start Date : 11/12/2019
Page No : 1

Groups Printed- Automobiles

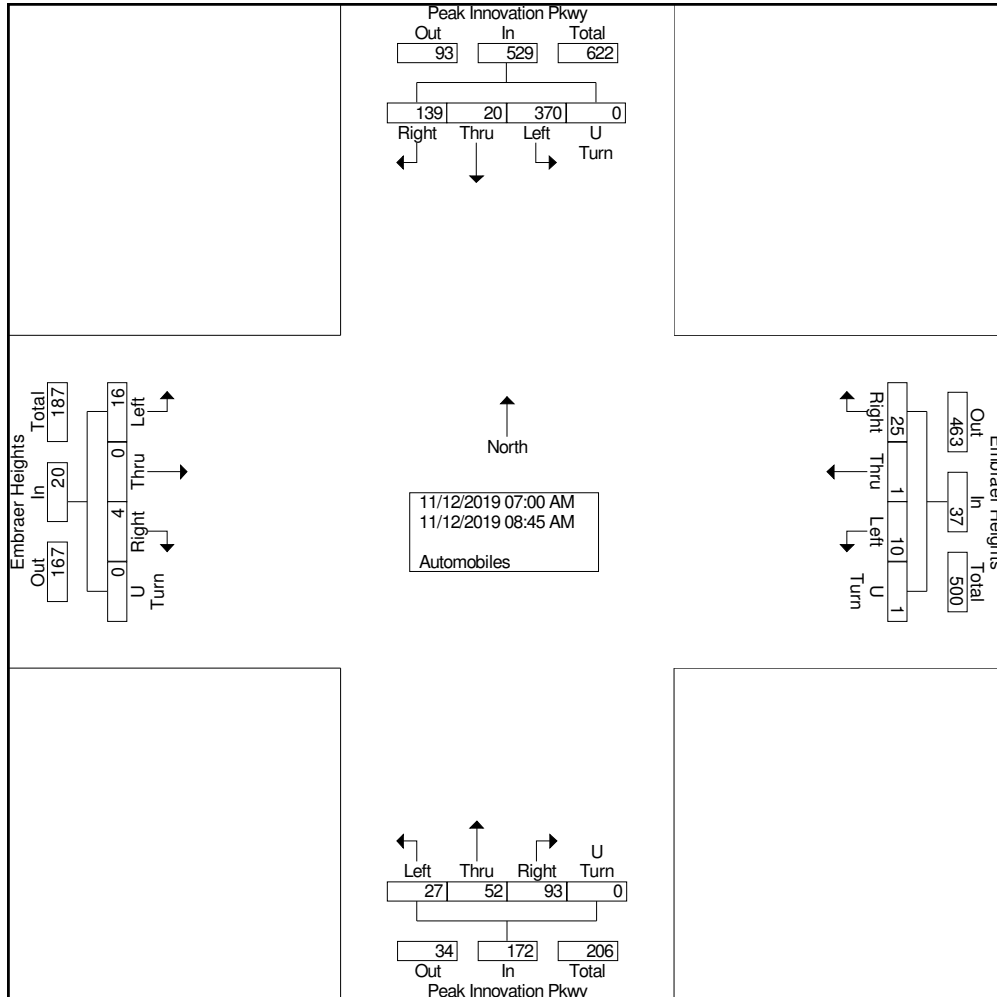
Start Time	Embraer Heights Eastbound					Embraer Heights Westbound					Peak Innovation Pkwy Northbound					Peak Innovation Pkwy Southbound					Int. Total
	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	
07:00 AM	1	0	0	0	1	0	0	3	0	3	2	8	12	0	22	43	4	2	0	49	75
07:15 AM	1	0	0	0	1	3	0	1	0	4	0	10	7	0	17	59	2	6	0	67	89
07:30 AM	3	0	0	0	3	0	0	5	0	5	3	3	17	0	23	54	3	7	0	64	95
07:45 AM	4	0	2	0	6	0	0	0	0	0	3	9	19	0	31	63	1	17	0	81	118
Total	9	0	2	0	11	3	0	9	0	12	8	30	55	0	93	219	10	32	0	261	377
08:00 AM	2	0	1	0	3	0	0	4	0	4	3	7	15	0	25	49	1	21	0	71	103
08:15 AM	2	0	1	0	3	0	0	4	1	5	5	3	7	0	15	45	1	21	0	67	90
08:30 AM	1	0	0	0	1	2	0	7	0	9	4	10	8	0	22	29	5	29	0	63	95
08:45 AM	2	0	0	0	2	5	1	1	0	7	7	2	8	0	17	28	3	36	0	67	93
Total	7	0	2	0	9	7	1	16	1	25	19	22	38	0	79	151	10	107	0	268	381
Grand Total	16	0	4	0	20	10	1	25	1	37	27	52	93	0	172	370	20	139	0	529	758
Apprch %	80	0	20	0		27	2.7	67.6	2.7		15.7	30.2	54.1	0		69.9	3.8	26.3	0		
Total %	2.1	0	0.5	0	2.6	1.3	0.1	3.3	0.1	4.9	3.6	6.9	12.3	0	22.7	48.8	2.6	18.3	0	69.8	



Ridgeview Data
Collection

Colorado Springs, CO
Peak Innovation Park
AM Peak
Embraer Heights & Peak Innovation Pkwy

File Name : Embraer and Peak Innovation AM
Site Code : IPO 467
Start Date : 11/12/2019
Page No : 2



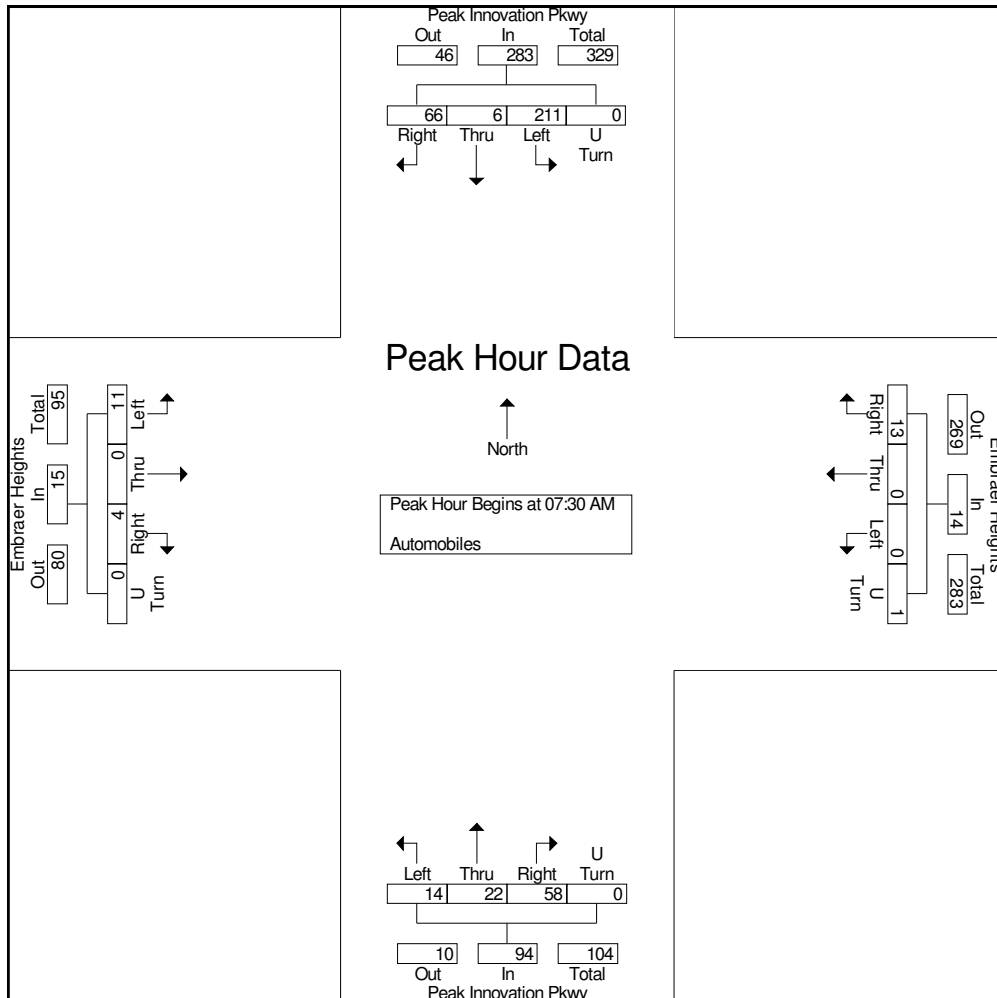


Ridgeview Data
Collection

Colorado Springs, CO
Peak Innovation Park
AM Peak
Embraer Heights & Peak Innovation Pkwy

File Name : Embraer and Peak Innovation AM
Site Code : IPO 467
Start Date : 11/12/2019
Page No : 3

Start Time	Embraer Heights Eastbound					Embraer Heights Westbound					Peak Innovation Pkwy Northbound					Peak Innovation Pkwy Southbound					Int. Total
	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	3	0	0	0	3	0	0	5	0	5	3	3	17	0	23	54	3	7	0	64	95
07:45 AM	4	0	2	0	6	0	0	0	0	0	3	9	19	0	31	63	1	17	0	81	118
08:00 AM	2	0	1	0	3	0	0	4	0	4	3	7	15	0	25	49	1	21	0	71	103
08:15 AM	2	0	1	0	3	0	0	4	1	5	5	3	7	0	15	45	1	21	0	67	90
Total Volume	11	0	4	0	15	0	0	13	1	14	14	22	58	0	94	211	6	66	0	283	406
% App. Total	73.3	0	26.7	0		0	0	92.9	7.1		14.9	23.4	61.7	0		74.6	2.1	23.3	0		
PHF	.688	.000	.500	.000	.625	.000	.000	.650	.250	.700	.700	.611	.763	.000	.758	.837	.500	.786	.000	.873	.860





Ridgeview Data
Collection

Colorado Springs, CO
Peak Innovation Park
PM Peak
Embraer Heights & Peak Innovation Pkwy

File Name : Embraer and Peak Innovation PM
Site Code : IPO 467
Start Date : 11/12/2019
Page No : 1

Groups Printed- Automobiles

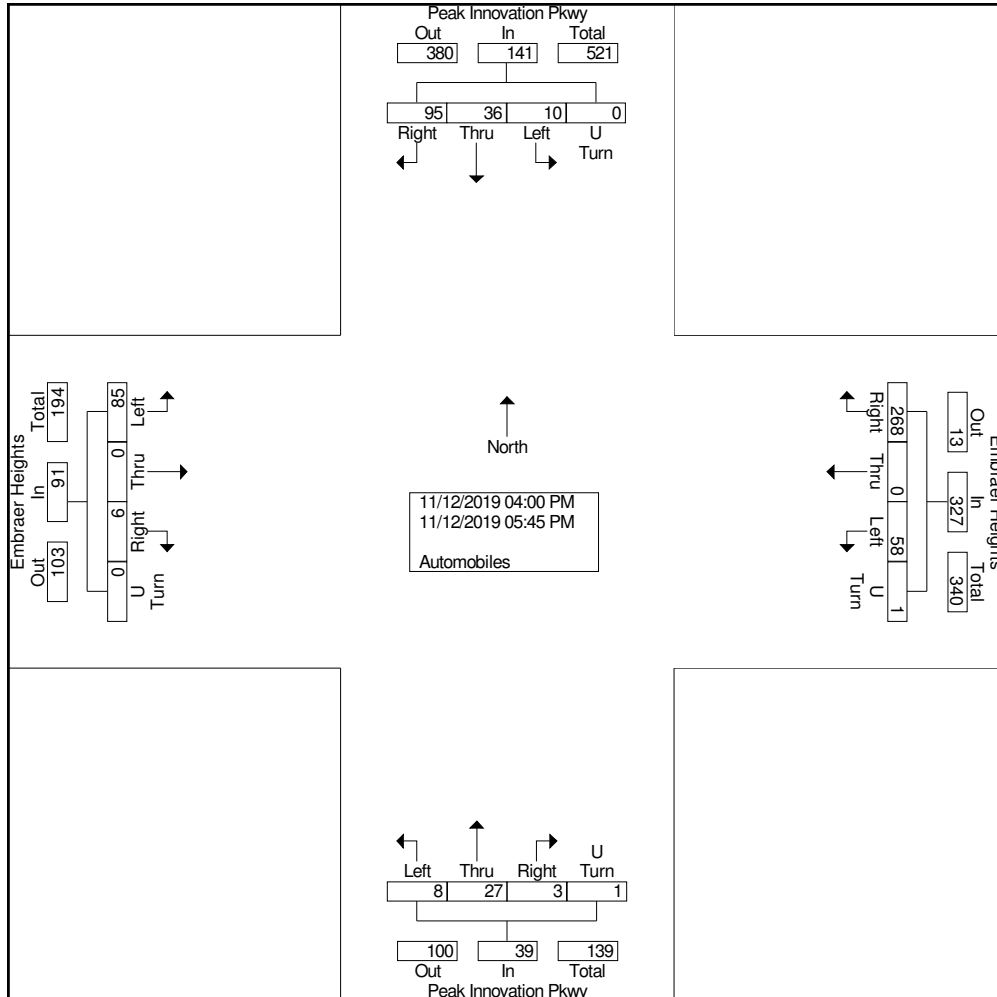
Start Time	Embraer Heights Eastbound					Embraer Heights Westbound					Peak Innovation Pkwy Northbound					Peak Innovation Pkwy Southbound					Int. Total
	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	
04:00 PM	0	0	0	0	0	12	0	60	0	72	1	5	0	0	6	2	7	3	0	12	90
04:15 PM	5	0	0	0	5	8	0	23	0	31	0	1	2	0	3	1	8	9	0	18	57
04:30 PM	5	0	0	0	5	13	0	43	0	56	0	1	0	0	1	4	4	16	0	24	86
04:45 PM	12	0	3	0	15	7	0	40	1	48	0	2	0	1	3	2	1	12	0	15	81
Total	22	0	3	0	25	40	0	166	1	207	1	9	2	1	13	9	20	40	0	69	314
05:00 PM	18	0	1	0	19	9	0	32	0	41	1	5	1	0	7	0	4	14	0	18	85
05:15 PM	17	0	2	0	19	6	0	26	0	32	3	4	0	0	7	0	5	16	0	21	79
05:30 PM	10	0	0	0	10	3	0	25	0	28	1	4	0	0	5	0	4	13	0	17	60
05:45 PM	18	0	0	0	18	0	0	19	0	19	2	5	0	0	7	1	3	12	0	16	60
Total	63	0	3	0	66	18	0	102	0	120	7	18	1	0	26	1	16	55	0	72	284
Grand Total	85	0	6	0	91	58	0	268	1	327	8	27	3	1	39	10	36	95	0	141	598
Apprch %	93.4	0	6.6	0		17.7	0	82	0.3		20.5	69.2	7.7	2.6		7.1	25.5	67.4	0		
Total %	14.2	0	1	0	15.2	9.7	0	44.8	0.2	54.7	1.3	4.5	0.5	0.2	6.5	1.7	6	15.9	0	23.6	



Ridgeview Data
Collection

Colorado Springs, CO
Peak Innovation Park
PM Peak
Embraer Heights & Peak Innovation Pkwy

File Name : Embraer and Peak Innovation PM
Site Code : IPO 467
Start Date : 11/12/2019
Page No : 2



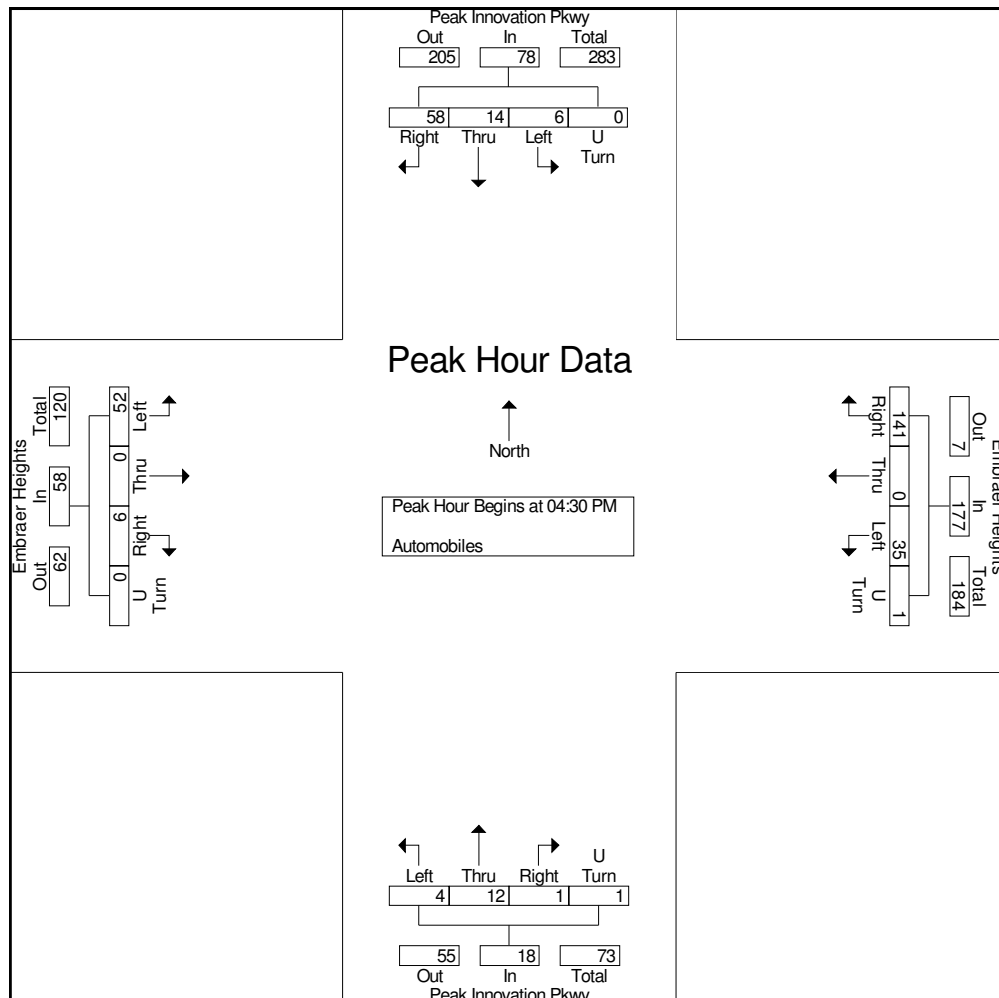


Ridgeview Data
Collection

Colorado Springs, CO
Peak Innovation Park
PM Peak
Embraer Heights & Peak Innovation Pkwy

File Name : Embraer and Peak Innovation PM
Site Code : IPO 467
Start Date : 11/12/2019
Page No : 3

Start Time	Embraer Heights Eastbound					Embraer Heights Westbound					Peak Innovation Pkwy Northbound					Peak Innovation Pkwy Southbound					Int. Total
	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	5	0	0	0	5	13	0	43	0	56	0	1	0	0	1	4	4	16	0	24	86
04:45 PM	12	0	3	0	15	7	0	40	1	48	0	2	0	1	3	2	1	12	0	15	81
05:00 PM	18	0	1	0	19	9	0	32	0	41	1	5	1	0	7	0	4	14	0	18	85
05:15 PM	17	0	2	0	19	6	0	26	0	32	3	4	0	0	7	0	5	16	0	21	79
Total Volume	52	0	6	0	58	35	0	141	1	177	4	12	1	1	18	6	14	58	0	78	331
% App. Total	89.7	0	10.3	0		19.8	0	79.7	0.6		22.2	66.7	5.6	5.6		7.7	17.9	74.4	0		
PHF	.722	.000	.500	.000	.763	.673	.000	.820	.250	.790	.333	.600	.250	.250	.643	.375	.700	.906	.000	.813	.962





Ridgeview Data
Collection

Colorado Springs, CO
Peak Innovation Park
AM Peak
Embraer Heights & Bud Breckner Blvd

File Name : Embraer and Bud Breckner AM
Site Code : IPO 467
Start Date : 11/12/2019
Page No : 1

Groups Printed- Automobiles

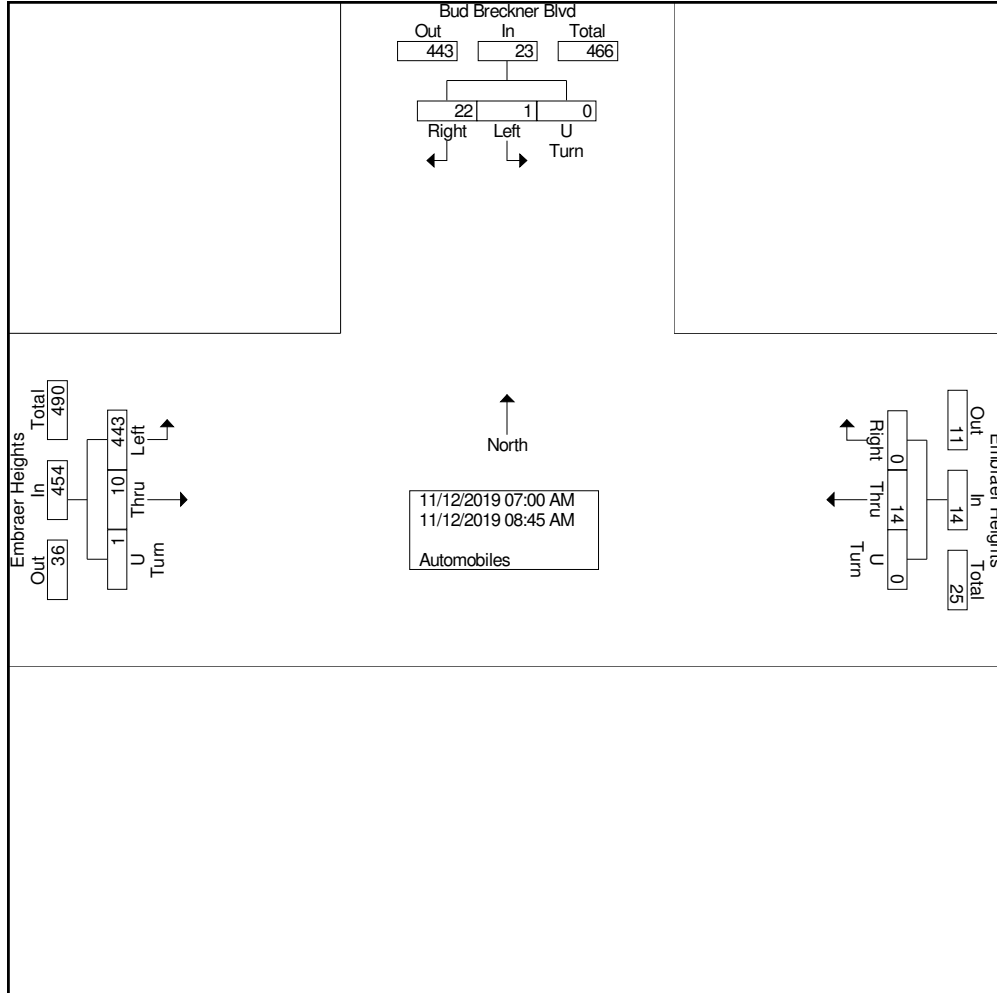
Start Time	Embraer Heights Eastbound				Embraer Heights Westbound				Bud Breckner Blvd Southbound				Int. Total
	Left	Thru	U Turn	App. Total	Thru	Right	U Turn	App. Total	Left	Right	U Turn	App. Total	
07:00 AM	48	1	0	49	1	0	0	1	0	2	0	2	52
07:15 AM	67	0	0	67	4	0	0	4	0	1	0	1	72
07:30 AM	72	1	0	73	1	0	0	1	1	3	0	4	78
07:45 AM	72	6	0	78	0	0	0	0	0	0	0	0	78
Total	259	8	0	267	6	0	0	6	1	6	0	7	280
08:00 AM	69	0	0	69	0	0	0	0	0	4	0	4	73
08:15 AM	48	1	0	49	1	0	0	1	0	5	0	5	55
08:30 AM	34	0	1	35	4	0	0	4	0	5	0	5	44
08:45 AM	33	1	0	34	3	0	0	3	0	2	0	2	39
Total	184	2	1	187	8	0	0	8	0	16	0	16	211
Grand Total	443	10	1	454	14	0	0	14	1	22	0	23	491
Apprch %	97.6	2.2	0.2		100	0	0		4.3	95.7	0		
Total %	90.2	2	0.2	92.5	2.9	0	0	2.9	0.2	4.5	0	4.7	



Ridgeview Data
Collection

Colorado Springs, CO
Peak Innovation Park
AM Peak
Embraer Heights & Bud Breckner Blvd

File Name : Embraer and Bud Breckner AM
Site Code : IPO 467
Start Date : 11/12/2019
Page No : 2



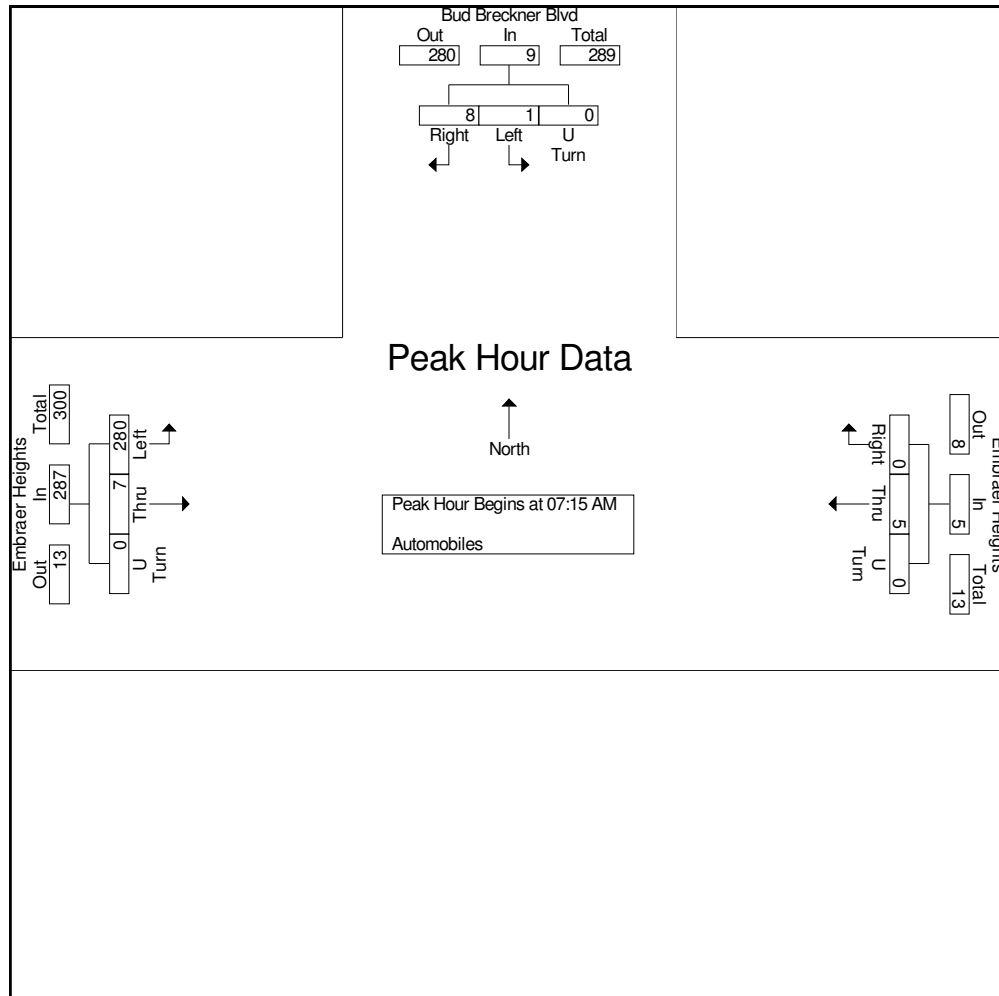


Ridgeview Data
Collection

Colorado Springs, CO
Peak Innovation Park
AM Peak
Embraer Heights & Bud Breckner Blvd

File Name : Embraer and Bud Breckner AM
Site Code : IPO 467
Start Date : 11/12/2019
Page No : 3

Start Time	Embraer Heights Eastbound				Embraer Heights Westbound				Bud Breckner Blvd Southbound				Int. Total
	Left	Thru	U Turn	App. Total	Thru	Right	U Turn	App. Total	Left	Right	U Turn	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:15 AM													
07:15 AM	67	0	0	67	4	0	0	4	0	1	0	1	72
07:30 AM	72	1	0	73	1	0	0	1	1	3	0	4	78
07:45 AM	72	6	0	78	0	0	0	0	0	0	0	0	78
08:00 AM	69	0	0	69	0	0	0	0	0	4	0	4	73
Total Volume	280	7	0	287	5	0	0	5	1	8	0	9	301
% App. Total	97.6	2.4	0		100	0	0		11.1	88.9	0		
PHF	.972	.292	.000	.920	.313	.000	.000	.313	.250	.500	.000	.563	.965





Ridgeview Data
Collection

Colorado Springs, CO
Peak Innovation Park
PM Peak
Embraer Heights & Bud Breckner Blvd

File Name : Embraer and Bud Breckner PM
Site Code : IPO 467
Start Date : 11/12/2019
Page No : 1

Groups Printed- Automobiles

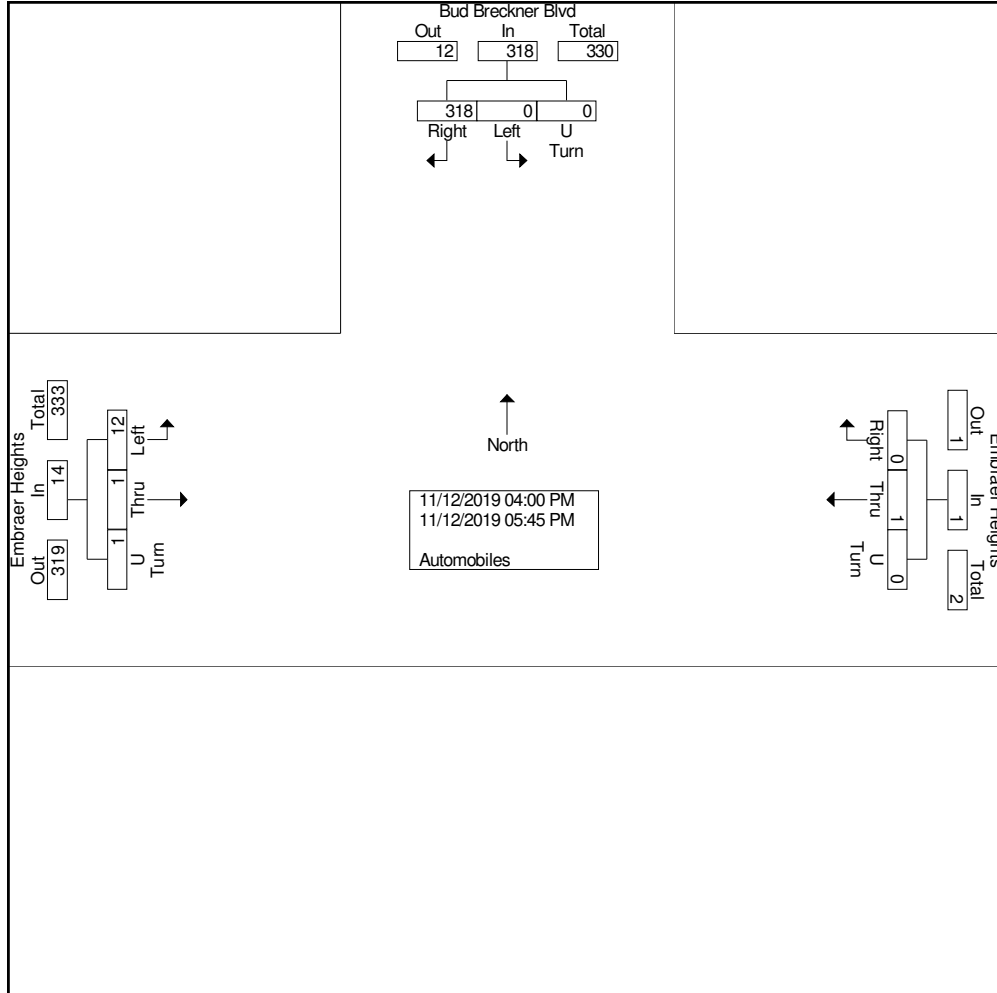
Start Time	Embraer Heights Eastbound				Embraer Heights Westbound				Bud Breckner Blvd Southbound				Int. Total
	Left	Thru	U Turn	App. Total	Thru	Right	U Turn	App. Total	Left	Right	U Turn	App. Total	
04:00 PM	2	0	0	2	0	0	0	0	0	68	0	68	70
04:15 PM	3	0	0	3	0	0	0	0	0	32	0	32	35
04:30 PM	3	1	0	4	1	0	0	1	0	52	0	52	57
04:45 PM	2	0	1	3	0	0	0	0	0	48	0	48	51
Total	10	1	1	12	1	0	0	1	0	200	0	200	213
05:00 PM	1	0	0	1	0	0	0	0	0	46	0	46	47
05:15 PM	0	0	0	0	0	0	0	0	0	28	0	28	28
05:30 PM	0	0	0	0	0	0	0	0	0	27	0	27	27
05:45 PM	1	0	0	1	0	0	0	0	0	17	0	17	18
Total	2	0	0	2	0	0	0	0	0	118	0	118	120
Grand Total	12	1	1	14	1	0	0	1	0	318	0	318	333
Apprch %	85.7	7.1	7.1		100	0	0		0	100	0		
Total %	3.6	0.3	0.3	4.2	0.3	0	0	0.3	0	95.5	0	95.5	



Ridgeview Data
Collection

Colorado Springs, CO
Peak Innovation Park
PM Peak
Embraer Heights & Bud Breckner Blvd

File Name : Embraer and Bud Breckner PM
Site Code : IPO 467
Start Date : 11/12/2019
Page No : 2



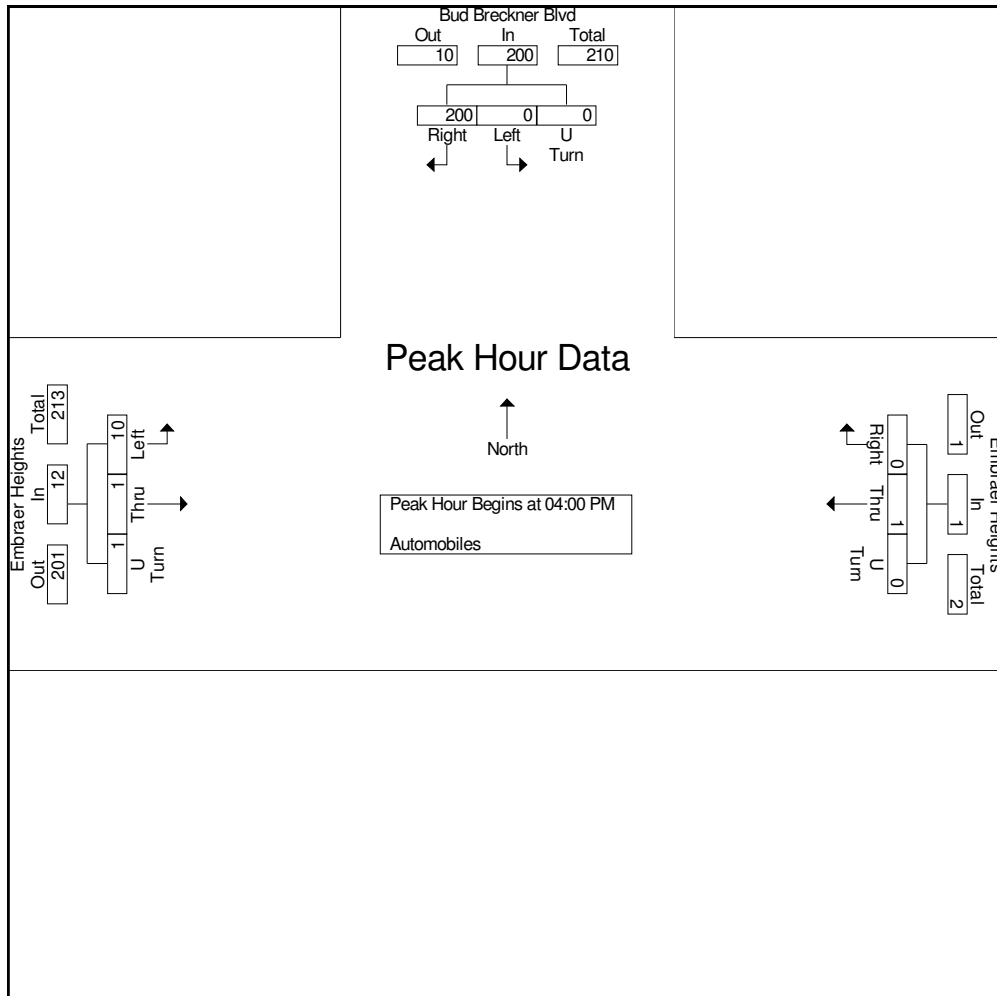


Ridgeview Data
Collection

Colorado Springs, CO
Peak Innovation Park
PM Peak
Embraer Heights & Bud Breckner Blvd

File Name : Embraer and Bud Breckner PM
Site Code : IPO 467
Start Date : 11/12/2019
Page No : 3

Start Time	Embraer Heights Eastbound				Embraer Heights Westbound				Bud Breckner Blvd Southbound				Int. Total
	Left	Thru	U Turn	App. Total	Thru	Right	U Turn	App. Total	Left	Right	U Turn	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:00 PM													
04:00 PM	2	0	0	2	0	0	0	0	0	68	0	68	70
04:15 PM	3	0	0	3	0	0	0	0	0	32	0	32	35
04:30 PM	3	1	0	4	1	0	0	1	0	52	0	52	57
04:45 PM	2	0	1	3	0	0	0	0	0	48	0	48	51
Total Volume	10	1	1	12	1	0	0	1	0	200	0	200	213
% App. Total	83.3	8.3	8.3		100	0	0		0	100	0		
PHF	.833	.250	.250	.750	.250	.000	.000	.250	.000	.735	.000	.735	.761





Ridgeview Data
Collection

Colorado Springs, CO
Peak Innovation Park
AM Peak
Powers Blvd (SH-21) & Grinnell Blvd

File Name : Powers and Grinnell AM
Site Code : IPO 467
Start Date : 11/12/2019
Page No : 1

Groups Printed- Automobiles

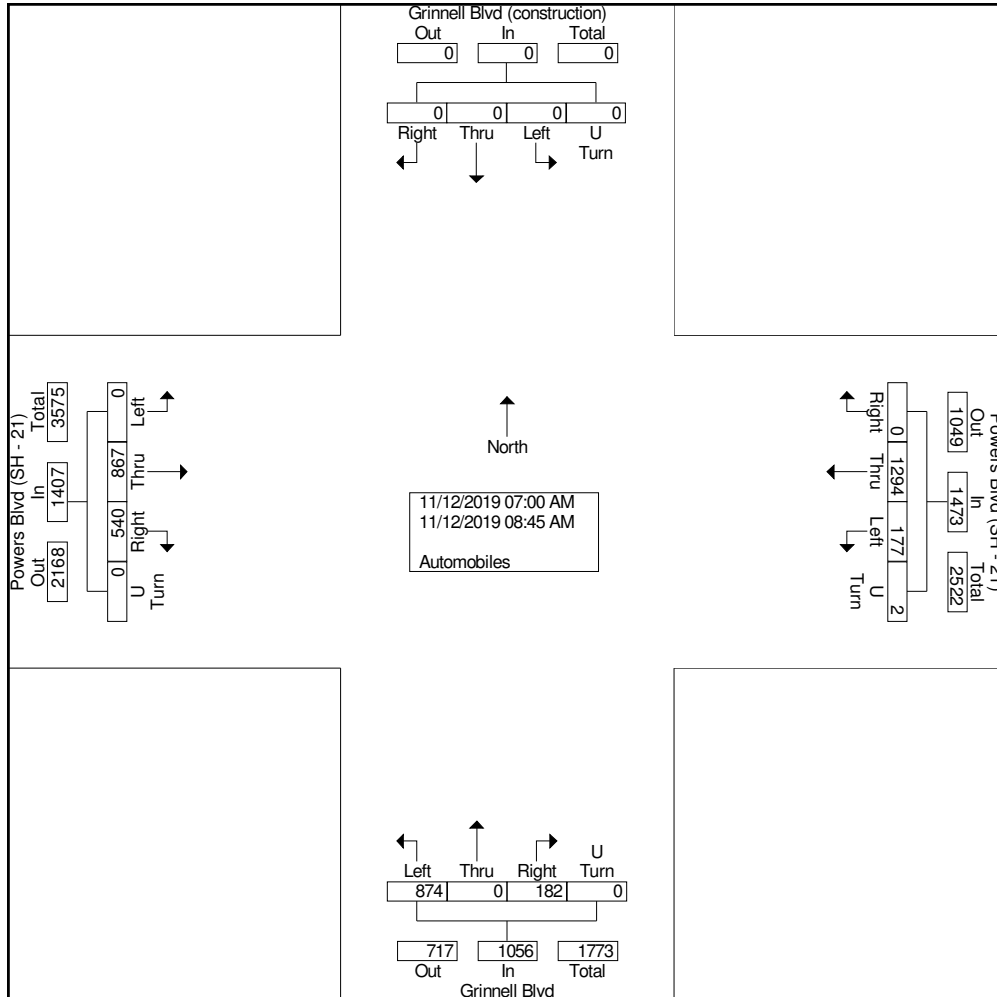
Start Time	Powers Blvd (SH - 21) Eastbound					Powers Blvd (SH - 21) Westbound					Grinnell Blvd Northbound					Grinnell Blvd (construction) Southbound					Int. Total
	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	
07:00 AM	0	98	62	0	160	36	189	0	1	226	138	0	43	0	181	0	0	0	0	0	567
07:15 AM	0	126	65	0	191	21	279	0	0	300	175	0	36	0	211	0	0	0	0	0	702
07:30 AM	0	142	70	0	212	24	216	0	0	240	149	0	20	0	169	0	0	0	0	0	621
07:45 AM	0	129	71	0	200	28	139	0	0	167	100	0	16	0	116	0	0	0	0	0	483
Total	0	495	268	0	763	109	823	0	1	933	562	0	115	0	677	0	0	0	0	0	2373
08:00 AM	0	89	67	0	156	19	118	0	0	137	92	0	14	0	106	0	0	0	0	0	399
08:15 AM	0	103	73	0	176	21	112	0	1	134	89	0	11	0	100	0	0	0	0	0	410
08:30 AM	0	92	70	0	162	18	136	0	0	154	72	0	22	0	94	0	0	0	0	0	410
08:45 AM	0	88	62	0	150	10	105	0	0	115	59	0	20	0	79	0	0	0	0	0	344
Total	0	372	272	0	644	68	471	0	1	540	312	0	67	0	379	0	0	0	0	0	1563
Grand Total	0	867	540	0	1407	177	1294	0	2	1473	874	0	182	0	1056	0	0	0	0	0	3936
Apprch %	0	61.6	38.4	0		12	87.8	0	0.1		82.8	0	17.2	0		0	0	0	0		
Total %	0	22	13.7	0	35.7	4.5	32.9	0	0.1	37.4	22.2	0	4.6	0	26.8	0	0	0	0	0	



Ridgeview Data Collection

Colorado Springs, CO
Peak Innovation Park
AM Peak
Powers Blvd (SH-21) & Grinnell Blvd

File Name : Powers and Grinnell AM
Site Code : IPO 467
Start Date : 11/12/2019
Page No : 2



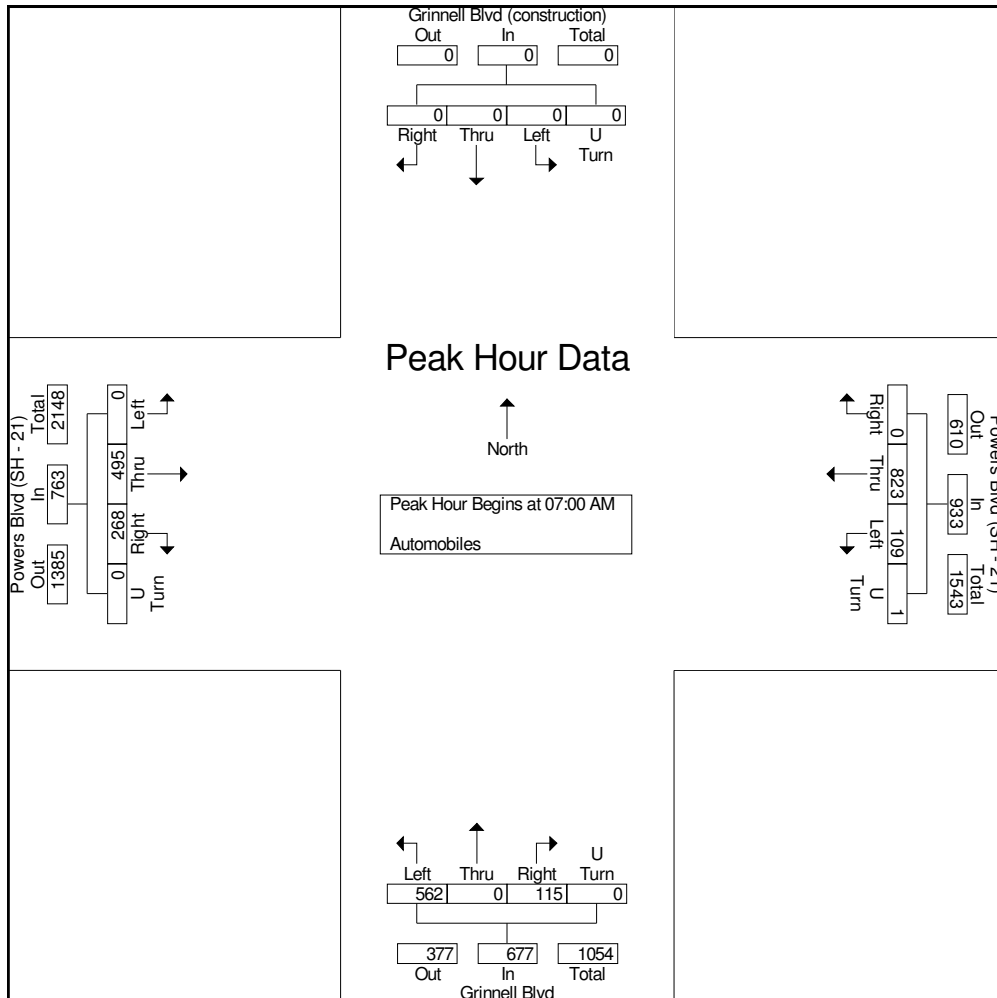


Ridgeview Data
Collection

Colorado Springs, CO
Peak Innovation Park
AM Peak
Powers Blvd (SH-21) & Grinnell Blvd

File Name : Powers and Grinnell AM
Site Code : IPO 467
Start Date : 11/12/2019
Page No : 3

Start Time	Powers Blvd (SH - 21) Eastbound					Powers Blvd (SH - 21) Westbound					Grinnell Blvd Northbound					Grinnell Blvd (construction) Southbound					Int. Total
	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	0	98	62	0	160	36	189	0	1	226	138	0	43	0	181	0	0	0	0	0	567
07:15 AM	0	126	65	0	191	21	279	0	0	300	175	0	36	0	211	0	0	0	0	0	702
07:30 AM	0	142	70	0	212	24	216	0	0	240	149	0	20	0	169	0	0	0	0	0	621
07:45 AM	0	129	71	0	200	28	139	0	0	167	100	0	16	0	116	0	0	0	0	0	483
Total Volume	0	495	268	0	763	109	823	0	1	933	562	0	115	0	677	0	0	0	0	0	2373
% App. Total	0	64.9	35.1	0		11.7	88.2	0	0.1		83	0	17	0		0	0	0	0		
PHF	.000	.871	.944	.000	.900	.757	.737	.000	.250	.778	.803	.000	.669	.000	.802	.000	.000	.000	.000	.000	.845





Ridgeview Data
Collection

Colorado Springs, CO
Peak Innovation Park
PM Peak
Powers Blvd (SH-21) & Grinnell Blvd

File Name : Powers and Grinnell PM
Site Code : IPO 467
Start Date : 11/12/2019
Page No : 1

Groups Printed- Automobiles

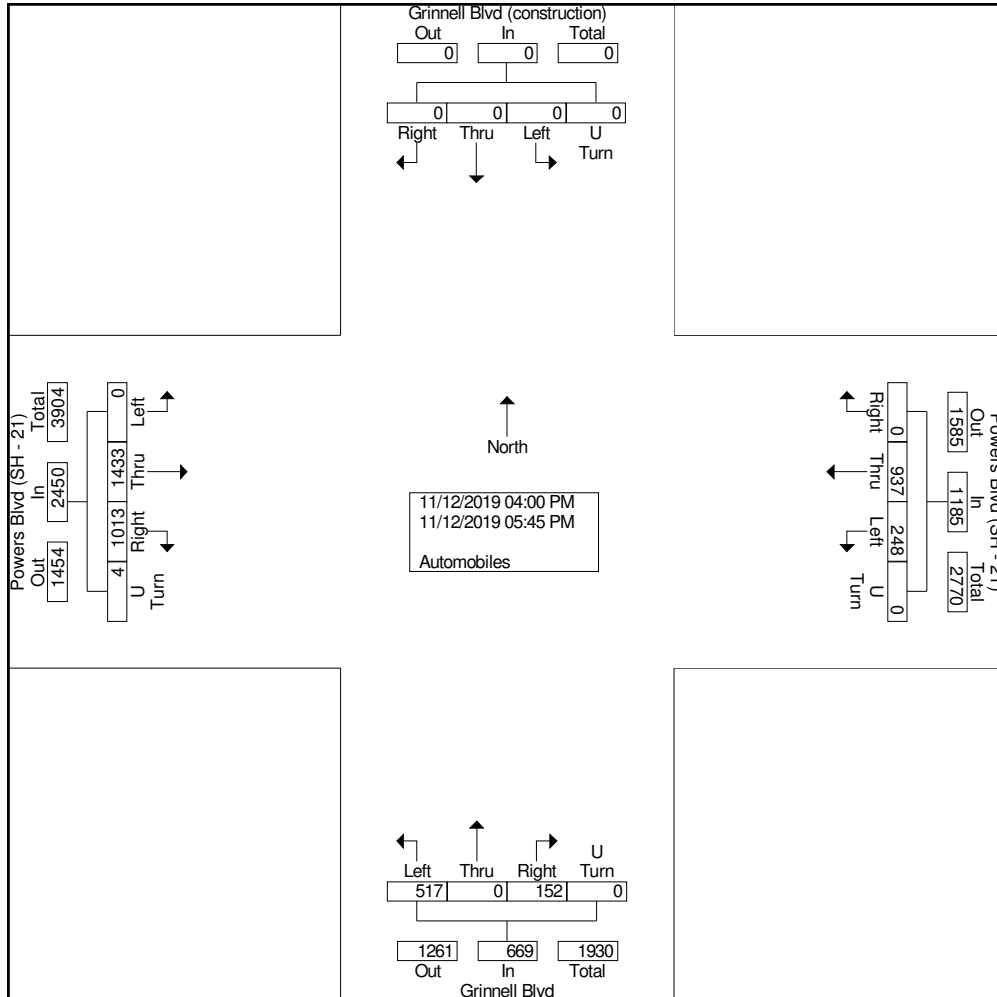
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	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	
04:00 PM	0	187	121	0	308	21	93	0	0	114	59	0	28	0	87	0	0	0	0	0	509
04:15 PM	0	163	124	0	287	35	124	0	0	159	67	0	24	0	91	0	0	0	0	0	537
04:30 PM	0	172	139	0	311	40	111	0	0	151	62	0	14	0	76	0	0	0	0	0	538
04:45 PM	0	162	106	1	269	36	141	0	0	177	68	0	22	0	90	0	0	0	0	0	536
Total	0	684	490	1	1175	132	469	0	0	601	256	0	88	0	344	0	0	0	0	0	2120
05:00 PM	0	199	134	0	333	32	127	0	0	159	66	0	24	0	90	0	0	0	0	0	582
05:15 PM	0	192	121	3	316	39	104	0	0	143	72	0	12	0	84	0	0	0	0	0	543
05:30 PM	0	176	128	0	304	22	118	0	0	140	54	0	11	0	65	0	0	0	0	0	509
05:45 PM	0	182	140	0	322	23	119	0	0	142	69	0	17	0	86	0	0	0	0	0	550
Total	0	749	523	3	1275	116	468	0	0	584	261	0	64	0	325	0	0	0	0	0	2184
Grand Total	0	1433	1013	4	2450	248	937	0	0	1185	517	0	152	0	669	0	0	0	0	0	4304
Apprch %	0	58.5	41.3	0.2		20.9	79.1	0	0		77.3	0	22.7	0		0	0	0	0		
Total %	0	33.3	23.5	0.1	56.9	5.8	21.8	0	0	27.5	12	0	3.5	0	15.5	0	0	0	0	0	



Ridgeview Data Collection

Colorado Springs, CO
Peak Innovation Park
PM Peak
Powers Blvd (SH-21) & Grinnell Blvd

File Name : Powers and Grinnell PM
Site Code : IPO 467
Start Date : 11/12/2019
Page No : 2



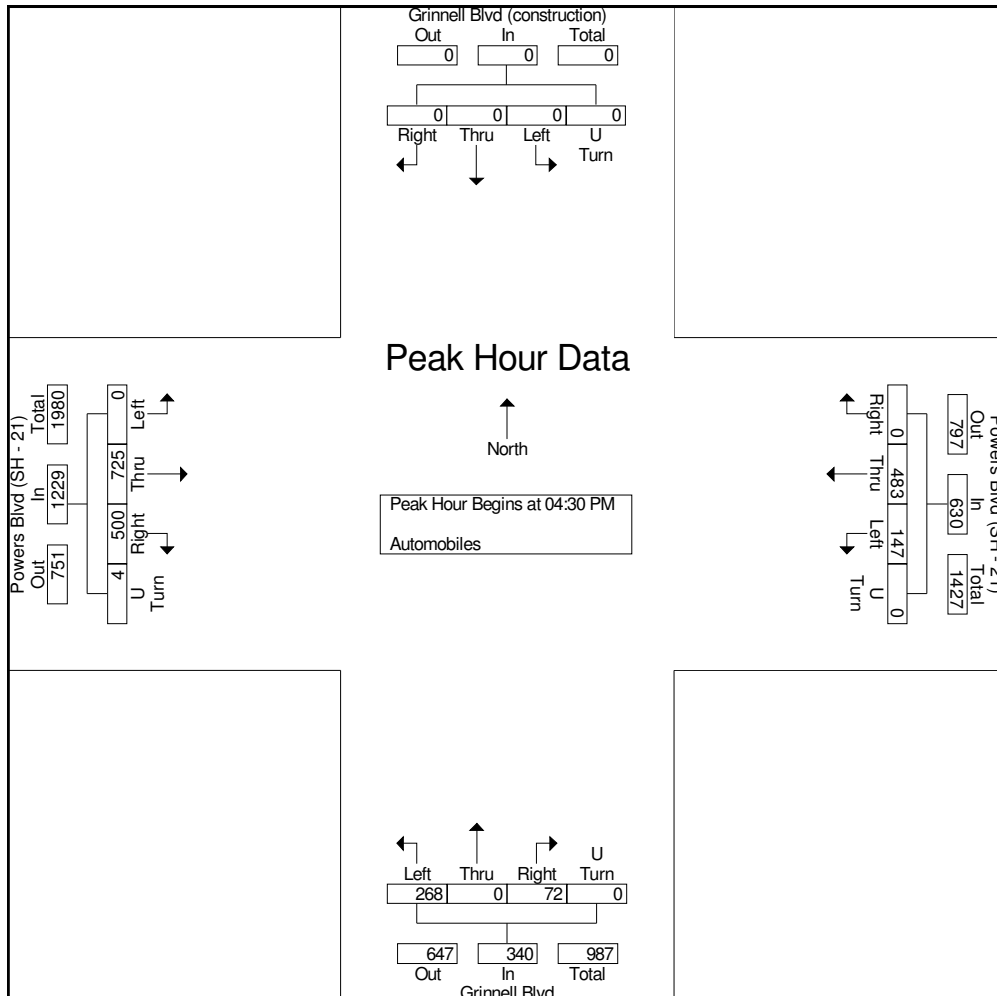


Ridgeview Data
Collection

Colorado Springs, CO
Peak Innovation Park
PM Peak
Powers Blvd (SH-21) & Grinnell Blvd

File Name : Powers and Grinnell PM
Site Code : IPO 467
Start Date : 11/12/2019
Page No : 3

Start Time	Powers Blvd (SH - 21) Eastbound					Powers Blvd (SH - 21) Westbound					Grinnell Blvd Northbound					Grinnell Blvd (construction) Southbound					Int. Total
	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	0	172	139	0	311	40	111	0	0	151	62	0	14	0	76	0	0	0	0	0	538
04:45 PM	0	162	106	1	269	36	141	0	0	177	68	0	22	0	90	0	0	0	0	0	536
05:00 PM	0	199	134	0	333	32	127	0	0	159	66	0	24	0	90	0	0	0	0	0	582
05:15 PM	0	192	121	3	316	39	104	0	0	143	72	0	12	0	84	0	0	0	0	0	543
Total Volume	0	725	500	4	1229	147	483	0	0	630	268	0	72	0	340	0	0	0	0	0	2199
% App. Total	0	59	40.7	0.3		23.3	76.7	0	0		78.8	0	21.2	0		0	0	0	0		
PHF	.000	.911	.899	.333	.923	.919	.856	.000	.000	.890	.931	.000	.750	.000	.944	.000	.000	.000	.000	.000	.945





Ridgeview Data
Collection

Colorado Springs, CO
Peak Innovation Park
AM Peak
Powers Blvd & Peak Innovation Pkwy

File Name : Powers and Peak Innovation AM
Site Code : IPO 467
Start Date : 11/12/2019
Page No : 1

Groups Printed- Automobiles

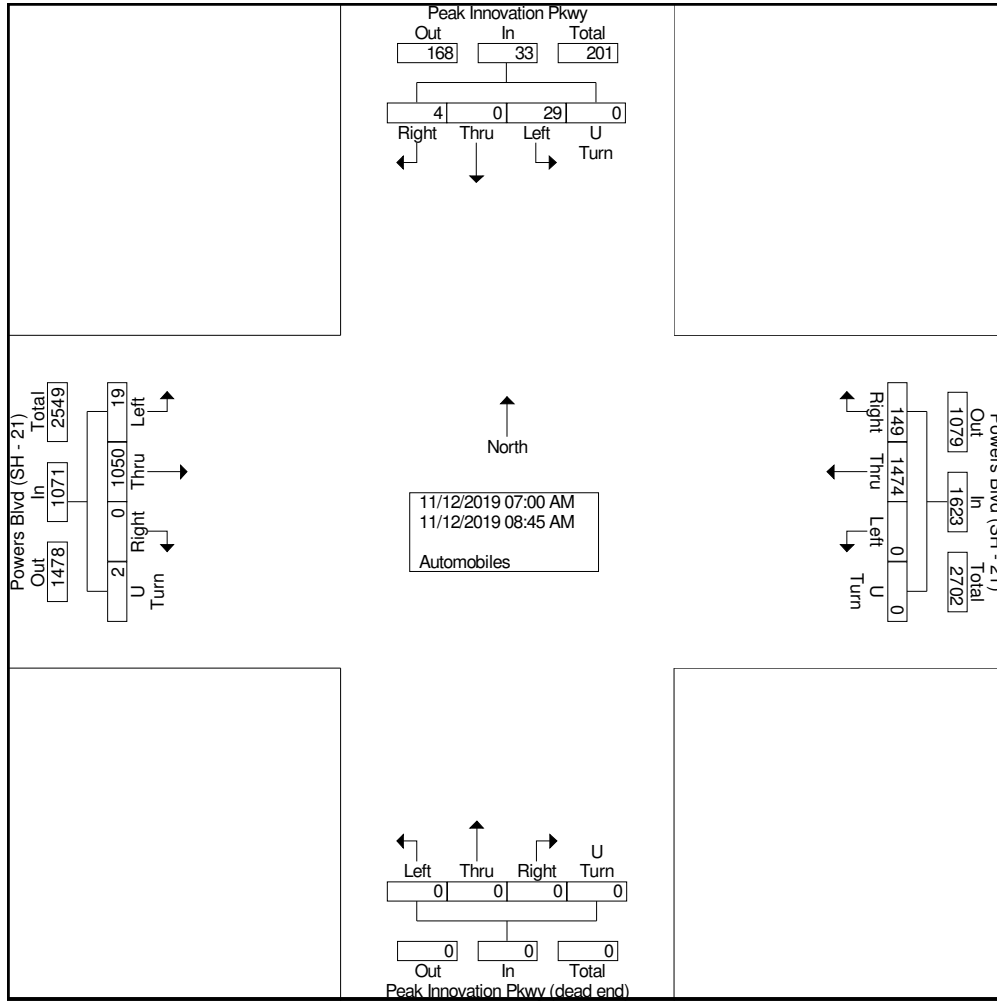
Start Time	Powers Blvd (SH - 21) Eastbound					Powers Blvd (SH - 21) Westbound					Peak Innovation Pkwy (dead end) Northbound					Peak Innovation Pkwy Southbound					Int. Total
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07:00 AM	3	143	0	1	147	0	257	19	0	276	0	0	0	0	0	4	0	0	0	4	427
07:15 AM	2	162	0	0	164	0	293	14	0	307	0	0	0	0	0	5	0	0	0	5	476
07:30 AM	3	167	0	0	170	0	230	21	0	251	0	0	0	0	0	3	0	0	0	3	424
07:45 AM	3	146	0	1	150	0	165	28	0	193	0	0	0	0	0	1	0	1	0	2	345
Total	11	618	0	2	631	0	945	82	0	1027	0	0	0	0	0	13	0	1	0	14	1672
08:00 AM	1	103	0	0	104	0	143	23	0	166	0	0	0	0	0	3	0	0	0	3	273
08:15 AM	1	107	0	0	108	0	133	15	0	148	0	0	0	0	0	1	0	1	0	2	258
08:30 AM	2	102	0	0	104	0	144	19	0	163	0	0	0	0	0	6	0	0	0	6	273
08:45 AM	4	120	0	0	124	0	109	10	0	119	0	0	0	0	0	6	0	2	0	8	251
Total	8	432	0	0	440	0	529	67	0	596	0	0	0	0	0	16	0	3	0	19	1055
Grand Total	19	1050	0	2	1071	0	1474	149	0	1623	0	0	0	0	0	29	0	4	0	33	2727
Apprch %	1.8	98	0	0.2		0	90.8	9.2	0		0	0	0	0		87.9	0	12.1	0		
Total %	0.7	38.5	0	0.1	39.3	0	54.1	5.5	0	59.5	0	0	0	0	0	1.1	0	0.1	0	1.2	



Ridgeview Data Collection

Colorado Springs, CO
Peak Innovation Park
AM Peak
Powers Blvd & Peak Innovation Pkwy

File Name : Powers and Peak Innovation AM
Site Code : IPO 467
Start Date : 11/12/2019
Page No : 2



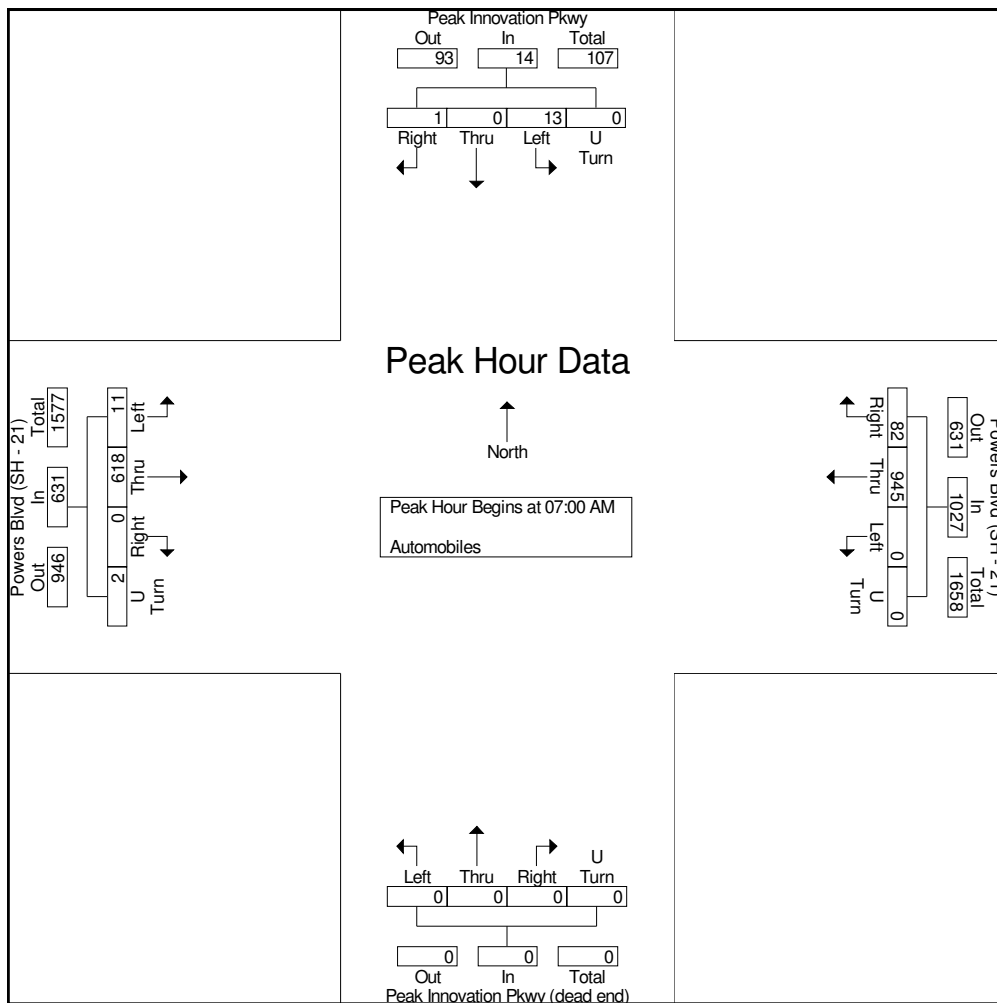


Ridgeview Data
Collection

Colorado Springs, CO
Peak Innovation Park
AM Peak
Powers Blvd & Peak Innovation Pkwy

File Name : Powers and Peak Innovation AM
Site Code : IPO 467
Start Date : 11/12/2019
Page No : 3

Start Time	Powers Blvd (SH - 21) Eastbound					Powers Blvd (SH - 21) Westbound					Peak Innovation Pkwy (dead end) Northbound					Peak Innovation Pkwy Southbound					Int. Total
	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	3	143	0	1	147	0	257	19	0	276	0	0	0	0	0	4	0	0	0	4	427
07:15 AM	2	162	0	0	164	0	293	14	0	307	0	0	0	0	0	5	0	0	0	5	476
07:30 AM	3	167	0	0	170	0	230	21	0	251	0	0	0	0	0	3	0	0	0	3	424
07:45 AM	3	146	0	1	150	0	165	28	0	193	0	0	0	0	0	1	0	1	0	2	345
Total Volume	11	618	0	2	631	0	945	82	0	1027	0	0	0	0	0	13	0	1	0	14	1672
% App. Total	1.7	97.9	0	0.3		0	92	8	0		0	0	0	0		92.9	0	7.1	0		
PHF	.917	.925	.000	.500	.928	.000	.806	.732	.000	.836	.000	.000	.000	.000	.000	.650	.000	.250	.000	.700	.878





Ridgeview Data
Collection

Colorado Springs, CO
Peak Innovation Park
PM Peak
Powers Blvd & Peak Innovation Pkwy

File Name : Powers and Peak Innovation PM
Site Code : IPO 467
Start Date : 11/12/2019
Page No : 1

Groups Printed- Automobiles

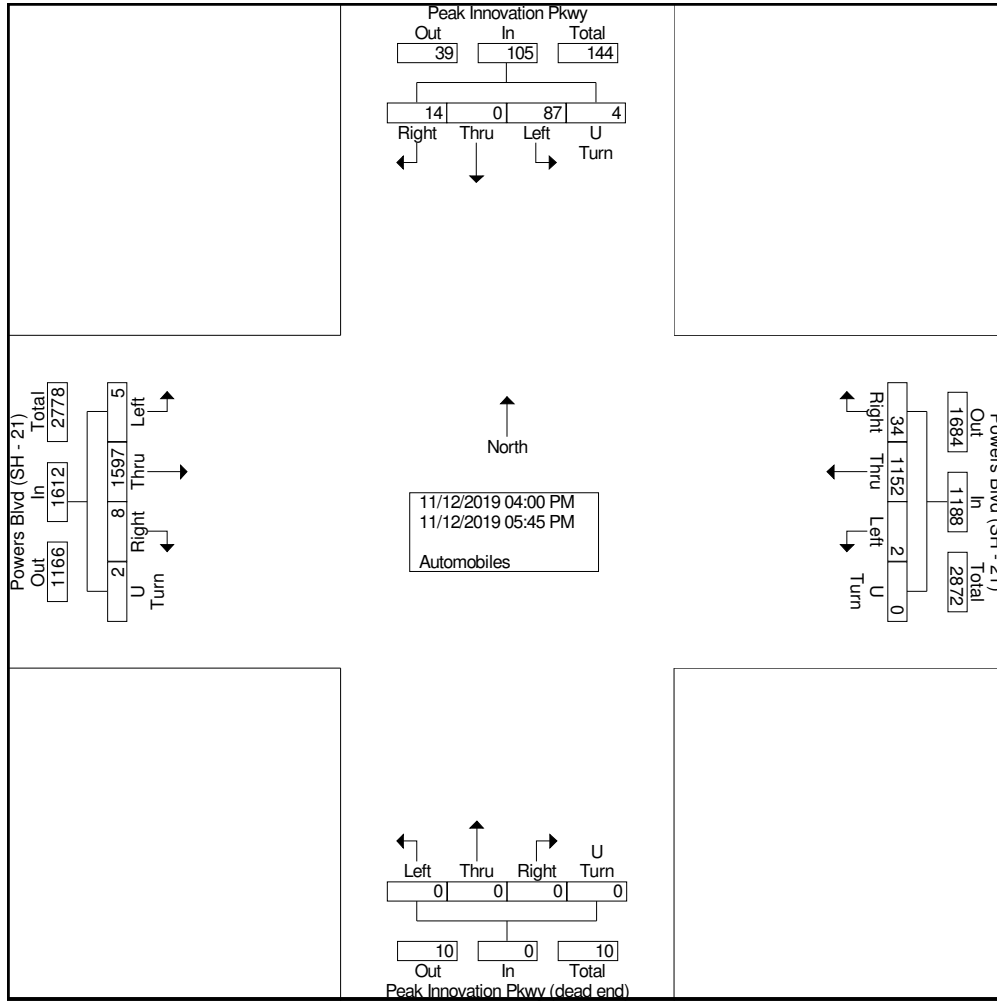
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	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	
04:00 PM	0	227	0	0	227	1	107	4	0	112	0	0	0	0	0	16	0	1	4	21	360
04:15 PM	1	196	2	0	199	1	169	2	0	172	0	0	0	0	0	13	0	2	0	15	386
04:30 PM	1	179	1	0	181	0	142	0	0	142	0	0	0	0	0	14	0	2	0	16	339
04:45 PM	0	181	1	0	182	0	177	3	0	180	0	0	0	0	0	10	0	2	0	12	374
Total	2	783	4	0	789	2	595	9	0	606	0	0	0	0	0	53	0	7	4	64	1459
05:00 PM	1	222	1	0	224	0	154	6	0	160	0	0	0	0	0	12	0	2	0	14	398
05:15 PM	1	213	1	0	215	0	142	9	0	151	0	0	0	0	0	11	0	3	0	14	380
05:30 PM	0	183	0	0	183	0	149	4	0	153	0	0	0	0	0	8	0	1	0	9	345
05:45 PM	1	196	2	2	201	0	112	6	0	118	0	0	0	0	0	3	0	1	0	4	323
Total	3	814	4	2	823	0	557	25	0	582	0	0	0	0	0	34	0	7	0	41	1446
Grand Total	5	1597	8	2	1612	2	1152	34	0	1188	0	0	0	0	0	87	0	14	4	105	2905
Apprch %	0.3	99.1	0.5	0.1		0.2	97	2.9	0		0	0	0	0		82.9	0	13.3	3.8		
Total %	0.2	55	0.3	0.1	55.5	0.1	39.7	1.2	0	40.9	0	0	0	0	0	3	0	0.5	0.1	3.6	



Ridgeview Data Collection

Colorado Springs, CO
Peak Innovation Park
PM Peak
Powers Blvd & Peak Innovation Pkwy

File Name : Powers and Peak Innovation PM
Site Code : IPO 467
Start Date : 11/12/2019
Page No : 2



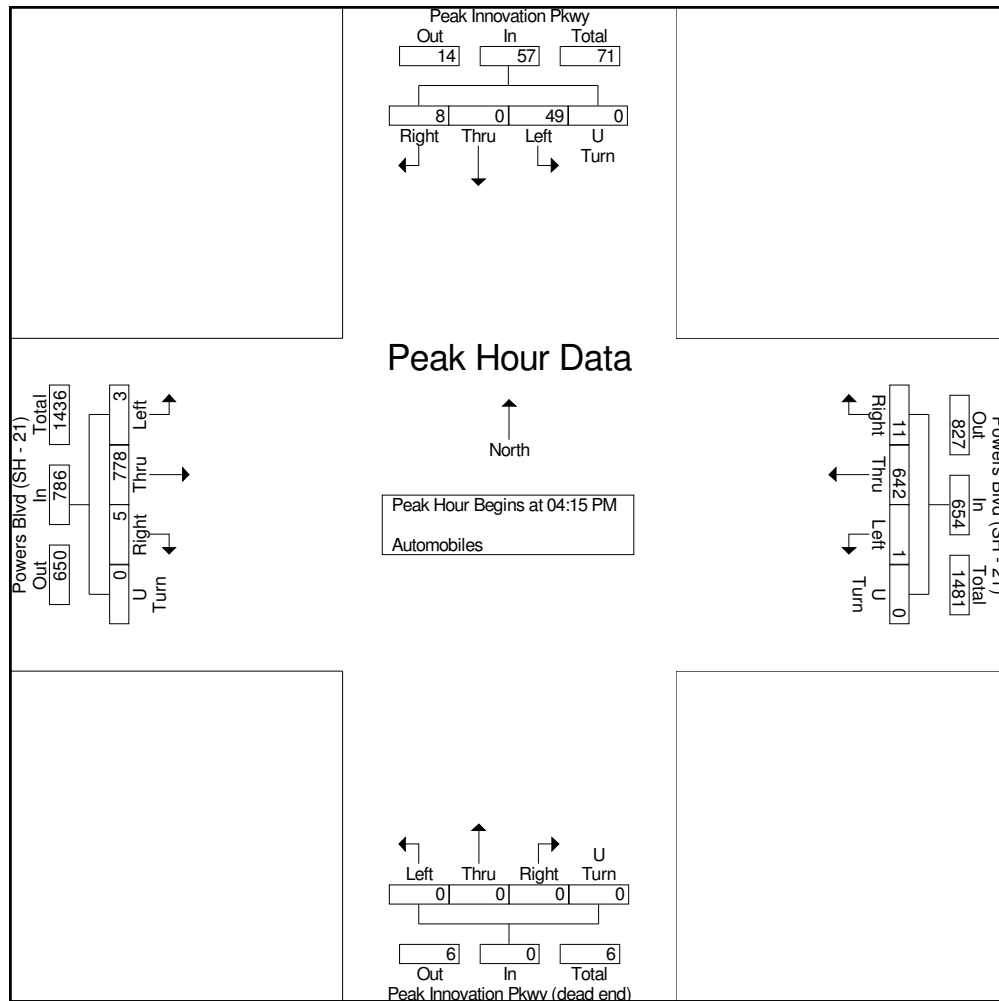


Ridgeview Data
Collection

Colorado Springs, CO
Peak Innovation Park
PM Peak
Powers Blvd & Peak Innovation Pkwy

File Name : Powers and Peak Innovation PM
Site Code : IPO 467
Start Date : 11/12/2019
Page No : 3

Start Time	Powers Blvd (SH - 21) Eastbound					Powers Blvd (SH - 21) Westbound					Peak Innovation Pkwy (dead end) Northbound					Peak Innovation Pkwy Southbound					Int. Total
	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	1	196	2	0	199	1	169	2	0	172	0	0	0	0	0	13	0	2	0	15	386
04:30 PM	1	179	1	0	181	0	142	0	0	142	0	0	0	0	0	14	0	2	0	16	339
04:45 PM	0	181	1	0	182	0	177	3	0	180	0	0	0	0	0	10	0	2	0	12	374
05:00 PM	1	222	1	0	224	0	154	6	0	160	0	0	0	0	0	12	0	2	0	14	398
Total Volume	3	778	5	0	786	1	642	11	0	654	0	0	0	0	0	49	0	8	0	57	1497
% App. Total	0.4	99	0.6	0		0.2	98.2	1.7	0		0	0	0	0		86	0	14	0		
PHF	.750	.876	.625	.000	.877	.250	.907	.458	.000	.908	.000	.000	.000	.000	.000	.875	.000	1.0	.000	.891	.940





Ridgeview Data
Collection

Colorado Springs, CO
Peak Innovation Park
AM Peak
Grinnell Blvd and Bradley Rd

File Name : Grinnell and Bradley AM
Site Code : IPO 467
Start Date : 11/12/2019
Page No : 1

Groups Printed- Automobiles

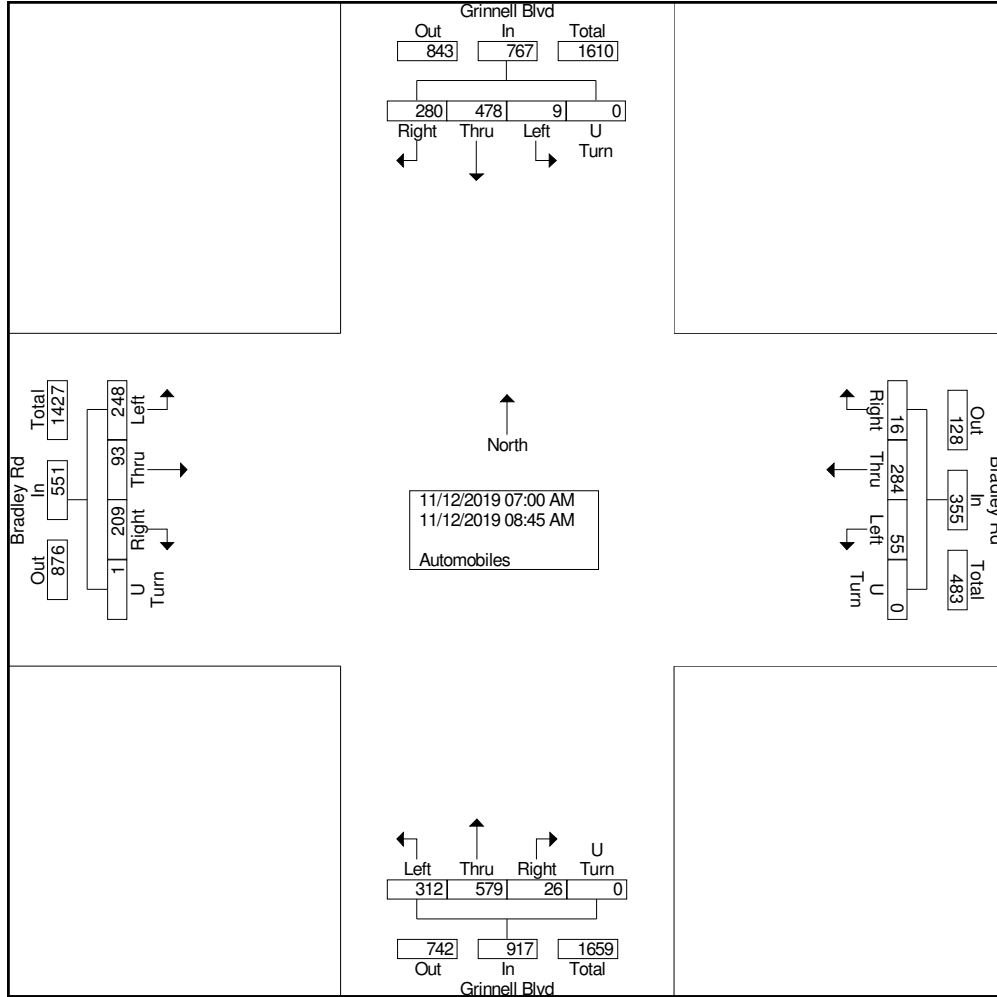
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	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	
07:00 AM	47	9	27	0	83	11	47	4	0	62	37	80	4	0	121	0	62	59	0	121	387
07:15 AM	54	13	19	0	86	3	53	5	0	61	59	91	7	0	157	0	63	33	0	96	400
07:30 AM	29	16	28	0	73	5	40	1	0	46	38	100	3	0	141	3	50	38	0	91	351
07:45 AM	19	11	32	0	62	4	39	0	0	43	45	69	1	0	115	2	59	42	0	103	323
Total	149	49	106	0	304	23	179	10	0	212	179	340	15	0	534	5	234	172	0	411	1461
08:00 AM	21	11	24	0	56	7	29	1	0	37	37	70	2	0	109	0	69	20	0	89	291
08:15 AM	25	16	28	0	69	11	37	2	0	50	47	63	2	0	112	1	66	28	0	95	326
08:30 AM	31	8	28	1	68	5	23	2	0	30	24	57	4	0	85	1	54	43	0	98	281
08:45 AM	22	9	23	0	54	9	16	1	0	26	25	49	3	0	77	2	55	17	0	74	231
Total	99	44	103	1	247	32	105	6	0	143	133	239	11	0	383	4	244	108	0	356	1129
Grand Total	248	93	209	1	551	55	284	16	0	355	312	579	26	0	917	9	478	280	0	767	2590
Apprch %	45	16.9	37.9	0.2		15.5	80	4.5	0		34	63.1	2.8	0		1.2	62.3	36.5	0		
Total %	9.6	3.6	8.1	0	21.3	2.1	11	0.6	0	13.7	12	22.4	1	0	35.4	0.3	18.5	10.8	0	29.6	



Ridgeview Data Collection

Colorado Springs, CO
Peak Innovation Park
AM Peak
Grinnell Blvd and Bradley Rd

File Name : Grinnell and Bradley AM
Site Code : IPO 467
Start Date : 11/12/2019
Page No : 2



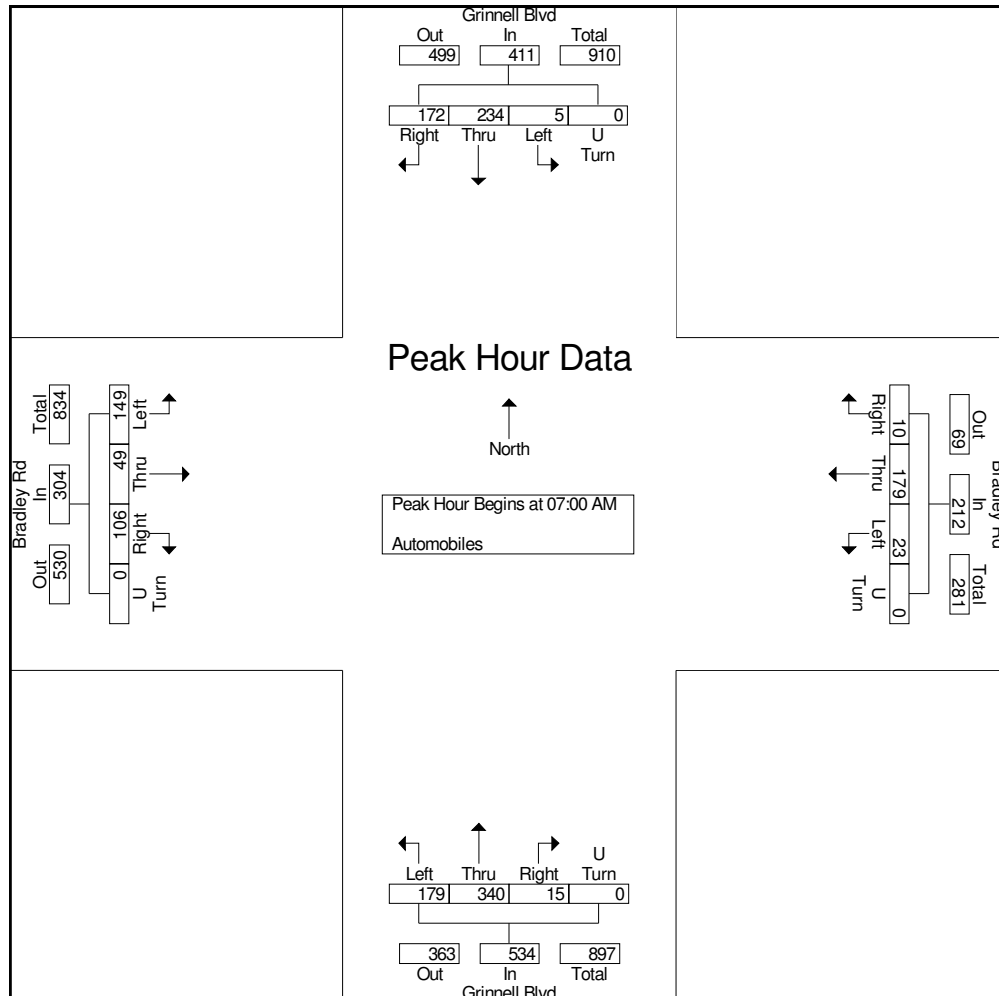


Ridgeview Data
Collection

Colorado Springs, CO
Peak Innovation Park
AM Peak
Grinnell Blvd and Bradley Rd

File Name : Grinnell and Bradley AM
Site Code : IPO 467
Start Date : 11/12/2019
Page No : 3

Start Time	Bradley Rd Eastbound					Bradley Rd Westbound					Grinnell Blvd Northbound					Grinnell Blvd Southbound					Int. Total
	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	47	9	27	0	83	11	47	4	0	62	37	80	4	0	121	0	62	59	0	121	387
07:15 AM	54	13	19	0	86	3	53	5	0	61	59	91	7	0	157	0	63	33	0	96	400
07:30 AM	29	16	28	0	73	5	40	1	0	46	38	100	3	0	141	3	50	38	0	91	351
07:45 AM	19	11	32	0	62	4	39	0	0	43	45	69	1	0	115	2	59	42	0	103	323
Total Volume	149	49	106	0	304	23	179	10	0	212	179	340	15	0	534	5	234	172	0	411	1461
% App. Total	49	16.1	34.9	0		10.8	84.4	4.7	0		33.5	63.7	2.8	0		1.2	56.9	41.8	0		
PHF	.690	.766	.828	.000	.884	.523	.844	.500	.000	.855	.758	.850	.536	.000	.850	.417	.929	.729	.000	.849	.913





Ridgeview Data
Collection

Colorado Springs, CO
Peak Innovation Park
PM Peak
Grinnell Blvd and Bradley Rd

File Name : Grinnell and Bradley PM
Site Code : IPO 467
Start Date : 11/12/2019
Page No : 1

Groups Printed- Automobiles

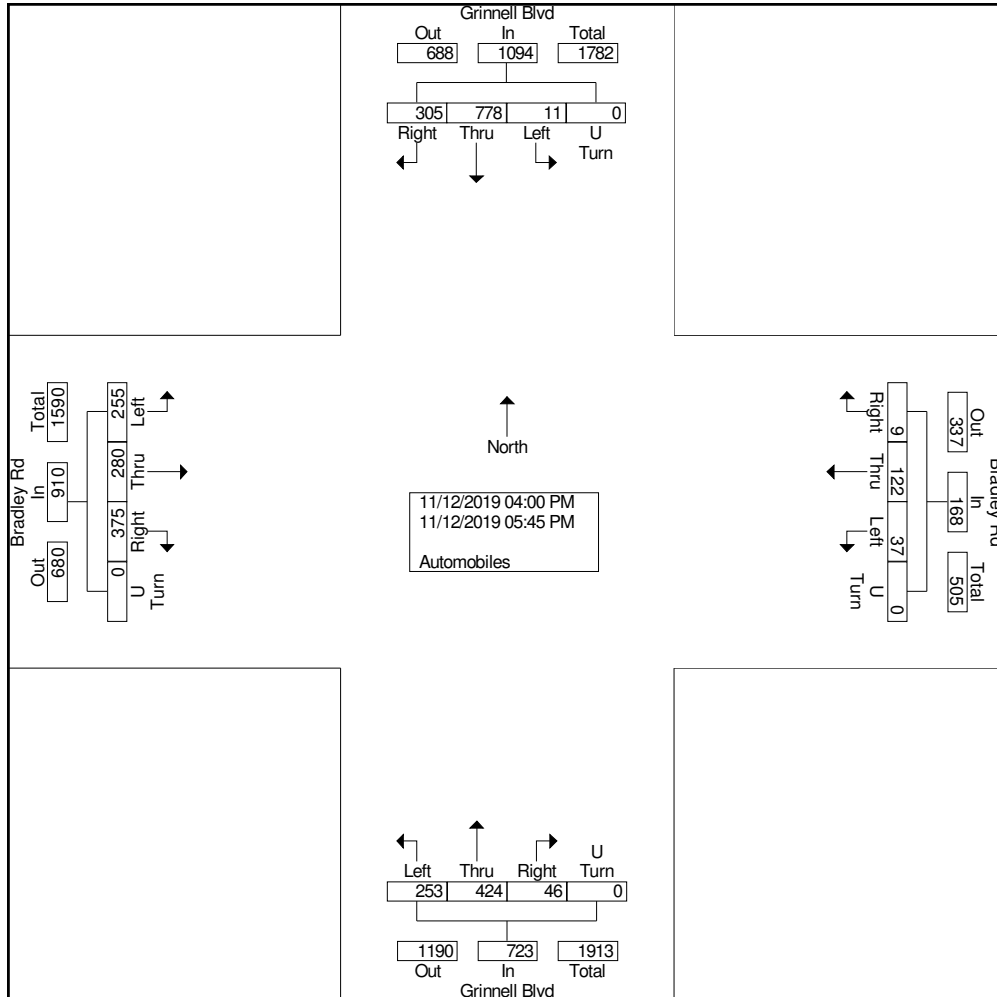
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	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	
04:00 PM	34	33	37	0	104	5	19	0	0	24	40	59	2	0	101	1	93	32	0	126	355
04:15 PM	35	39	51	0	125	5	10	0	0	15	26	50	4	0	80	1	99	42	0	142	362
04:30 PM	29	31	51	0	111	2	16	3	0	21	35	53	7	0	95	1	98	48	0	147	374
04:45 PM	43	33	48	0	124	5	13	2	0	20	32	55	4	0	91	1	81	41	0	123	358
Total	141	136	187	0	464	17	58	5	0	80	133	217	17	0	367	4	371	163	0	538	1449
05:00 PM	33	35	55	0	123	8	18	0	0	26	34	65	10	0	109	4	106	31	0	141	399
05:15 PM	22	37	43	0	102	5	14	1	0	20	28	45	5	0	78	1	100	41	0	142	342
05:30 PM	32	38	49	0	119	4	17	0	0	21	33	41	6	0	80	2	96	30	0	128	348
05:45 PM	27	34	41	0	102	3	15	3	0	21	25	56	8	0	89	0	105	40	0	145	357
Total	114	144	188	0	446	20	64	4	0	88	120	207	29	0	356	7	407	142	0	556	1446
Grand Total	255	280	375	0	910	37	122	9	0	168	253	424	46	0	723	11	778	305	0	1094	2895
Apprch %	28	30.8	41.2	0		22	72.6	5.4	0		35	58.6	6.4	0		1	71.1	27.9	0		
Total %	8.8	9.7	13	0	31.4	1.3	4.2	0.3	0	5.8	8.7	14.6	1.6	0	25	0.4	26.9	10.5	0	37.8	



Ridgeview Data Collection

Colorado Springs, CO
Peak Innovation Park
PM Peak
Grinnell Blvd and Bradley Rd

File Name : Grinnell and Bradley PM
Site Code : IPO 467
Start Date : 11/12/2019
Page No : 2



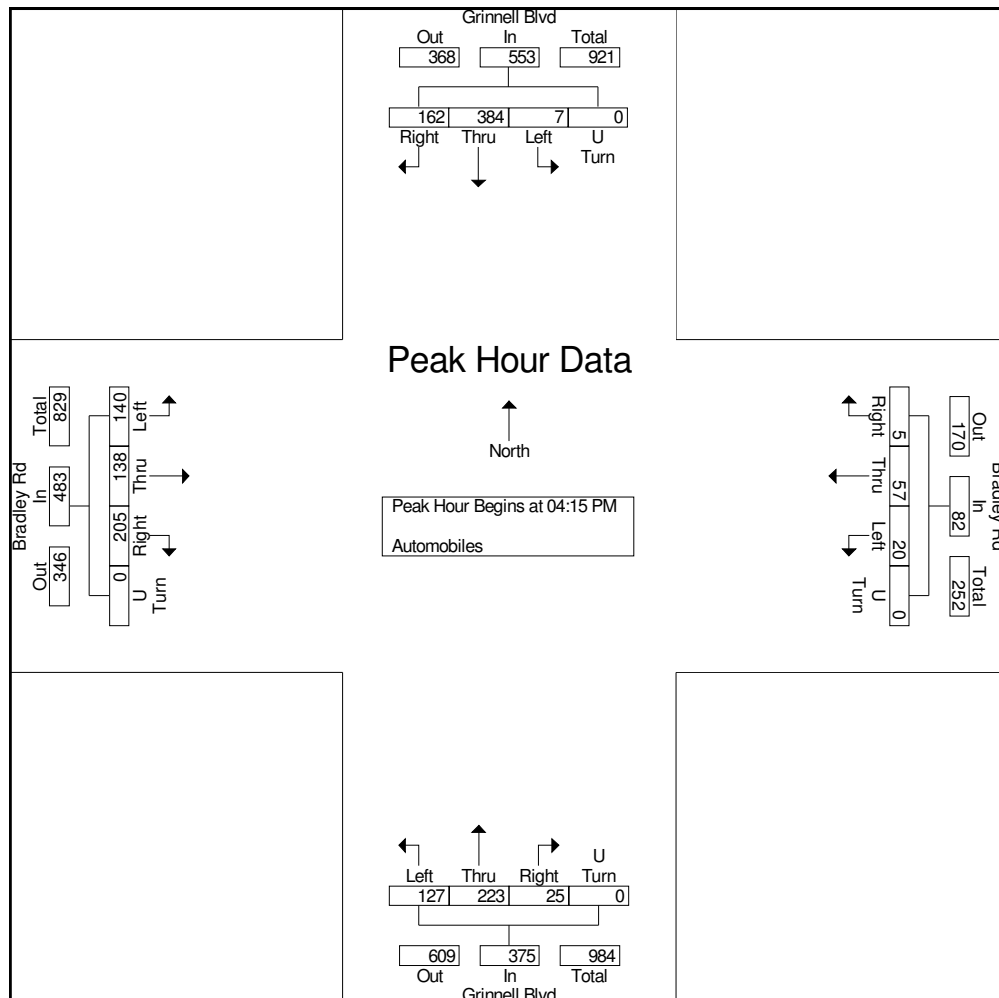


Ridgeview Data
Collection

Colorado Springs, CO
Peak Innovation Park
PM Peak
Grinnell Blvd and Bradley Rd

File Name : Grinnell and Bradley PM
Site Code : IPO 467
Start Date : 11/12/2019
Page No : 3

Start Time	Bradley Rd Eastbound					Bradley Rd Westbound					Grinnell Blvd Northbound					Grinnell Blvd Southbound					Int. Total
	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	35	39	51	0	125	5	10	0	0	15	26	50	4	0	80	1	99	42	0	142	362
04:30 PM	29	31	51	0	111	2	16	3	0	21	35	53	7	0	95	1	98	48	0	147	374
04:45 PM	43	33	48	0	124	5	13	2	0	20	32	55	4	0	91	1	81	41	0	123	358
05:00 PM	33	35	55	0	123	8	18	0	0	26	34	65	10	0	109	4	106	31	0	141	399
Total Volume	140	138	205	0	483	20	57	5	0	82	127	223	25	0	375	7	384	162	0	553	1493
% App. Total	29	28.6	42.4	0		24.4	69.5	6.1	0		33.9	59.5	6.7	0		1.3	69.4	29.3	0		
PHF	.814	.885	.932	.000	.966	.625	.792	.417	.000	.788	.907	.858	.625	.000	.860	.438	.906	.844	.000	.940	.935



APPENDIX B

CDOT Traffic Projections

Peak Innovation Park - CDOT Traffic Projections

ROUTE	REFPT	ENDREFPT	LENGTH	AADT	AADTYR	YR20FACTOR	DHV	LOCATION
021A	132.941	136.607	3.756	15000	2018	1.07	10	ON POWERS BLVD S/O DRENNAN RD
021A	136.607	138	1.377	26000	2018	1.29	8	ON POWERS BLVD N/O DRENNAN RD

Annual Growth: 0.34%
 1.28%

APPENDIX C

Trip Generation Worksheets

Peak Innovation Park 2022 Phase 1 Buildout Trip Generation Summary

Zone	Land Use	Quantity	Units	Weekday Vehicle Trips						
				Daily	AM Peak Hour			PM Peak Hour		
					In	Out	Total	In	Out	Total
P-4	Business Park (ITE 770)	40,000	Square Feet	498	10	6	16	8	9	17
	Fast Food Restaurant w/ Drive Thru (ITE 934)	10,000	Square Feet	4,710	205	197	402	170	157	327
	Gas Station w/ Convenience Market (ITE 945)	12	Fueling Positions	2,464	76	74	150	86	82	168
	<i>P-4 Total</i>			<i>7,672</i>	<i>291</i>	<i>277</i>	<i>568</i>	<i>264</i>	<i>248</i>	<i>512</i>
P-5	Hotel (ITE 310)	240	Rooms	2,006	67	46	113	73	71	144
	Business Park (ITE 770)	390,000	Square Feet	4,852	95	61	156	75	89	164
	<i>P-5 Total</i>			<i>6,858</i>	<i>162</i>	<i>107</i>	<i>269</i>	<i>148</i>	<i>160</i>	<i>308</i>
P-9	Project Rodeo (Client Data)			3,956	644	519	1,163	312	238	550
P-10	Office Park (ITE 750)	300,000	Square Feet	3,322	384	48	432	22	299	321
P-13	Gas Station w/ Convenience Market (ITE 945)	12	Fueling Positions	2,464	76	74	150	86	82	168
P-14	Project Jungle (Client Data)			904	222	168	390	171	62	233
P-15	Fast Food Restaurant w/ Drive Thru (ITE 934)	5,000	Square Feet	2,356	103	98	201	85	78	163
Total Site Generated Trips				27,532	1,882	1,291	3,173	1,088	1,167	2,255



Project Peak Innovation Park: P-4
 Subject Trip Generation for Business Park
 Designed by JRP Date November 06, 2019 Job No. 096161008
 Checked by _____ Date _____ Sheet No. 1 of 1

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Average Rates

Land Use Code - Business Park (770)

Independant Variable - 1000 Square Feet Gross Floor Feet (X)

Gross Floor Area = **40,000**

X = 40.0

T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (700 Series Page 281)

(T) = 0.40 (X)		Directional Distribution:	61% ent.	39% exit.
(T) = 0.40 *	(40.0)	T = 16	Average Vehicle Trip Ends	
		10 entering	6	exiting
		10 + 6	= 16	

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (700 Series Page 282)

(T) = 0.42 (X)		Directional Distribution:	46% ent.	54% exit.
(T) = 0.42 *	(40.0)	T = 17	Average Vehicle Trip Ends	
		8 entering	9	exiting
		8 + 9	= 17	

Weekday (700 Series Page 280)

Average Weekday		Directional Distribution:	50% ent.	50% exit.
(T) = 12.44 (X)		T = 498	Average Vehicle Trip Ends	
(T) = 12.44 *	(40.0)	249 entering	249	exiting
		249 + 249	= 498	

Project Peak Innovation Park: P-4
 Subject Trip Generation for Fast-Food Restaurant with Drive-Through Window
 Designed by ACK Date November 14, 2019 Job No. 096161008
 Checked by _____ Date _____ Sheet No. 1 of 1

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Average Rate Equations

Land Use Code - Fast Food Restaurant With Drive-Through Window (934)

Independent Variable - 1000 Square Feet Gross Floor Area (X)

Gross Floor Area = **10,000** Square Feet

X = 10.000

T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (900 Series page 158)

Average Weekday		Directional Distribution:	51% ent.	49% exit.
T = 40.19 (X)		T = 402	Average Vehicle Trip Ends	
T = 40.19 *	10.000	205 entering	197	exiting
		205 + 197 =	402	

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (900 Series page 159)

Average Weekday		Directional Distribution:	52% ent.	48% exit.
T = 32.67 (X)		T = 327	Average Vehicle Trip Ends	
T = 32.67 *	10.000	170 entering	157	exiting
		170 + 157 =	327	

Weekday (900 Series page 157)

Average Weekday		Directional Distribution:	50% entering, 50% exiting	
T = 470.95 (X)		T = 4710	Average Vehicle Trip Ends	
T = 470.95 *	10.000	2355 entering	2355	exiting
		2355 + 2355 =	4710	

Saturday Peak Hour of Generator (900 Series page 163)

		Directional Distribution:	51% ent.	49% exit.
T = 54.86 (X)		T = 549	Average Vehicle Trip Ends	
T = 54.86 *	10.000	280 entering	269	exiting
		280 + 269 =	549	

Non Pass-By Trip Volumes (Per ITE Trip Generation Handbook, 3rd Edition September 2017)

AM Peak Hour =	51%	Non-Pass By	PM Peak Hour =	50%	Non-Pass By
	IN	Out	Total		
AM Peak	105	100	205		
PM Peak	85	79	164		
Daily	1178	1178	2356		PM Peak Hour Rate Applied to Daily

Pass-By Trip Volumes (Per ITE Trip Generation Handbook, 3rd Edition September 2017)

AM Peak Hour =	49%	Pass By	PM Peak Hour =	50%	Pass By
	IN	Out	Total		
AM Peak	100	97	197		
PM Peak	85	79	164		
Daily	1177	1177	2354		PM Peak Hour Rate Applied to Daily

Project Peal Peak Innovation Park: P-4
 Subject Trip Generation for Gasoline/Service Station with Convenience Market
 Designed by ACK Date November 14, 2019 Job No. 096161008
 Checked by _____ Date _____ Sheet No. 1 of 1

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Average Rate Equations

Land Use Code - Gasoline/Service Station with Convenience Market (945)

Independant Variable - Vehicle Fueling Positions (X)

Vehicle Fueling Positions= **12** Positions
 X = 12
 T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (900 Series page 369)

Average Weekday Directional Distribution: 51% ent. 49% exit.
 T = 12.47 (X) T = 150 Average Vehicle Trip Ends
 T = 12.47 * 12 76 entering 74 exiting
 76 + 74 = 150

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (900 Series page 370)

Average Weekday Directional Distribution: 51% ent. 49% exit.
 T = 13.99 (X) T = 168 Average Vehicle Trip Ends
 T = 13.99 * 12.000 86 entering 82 exiting
 86 + 82 = 168

Weekday (900 Series page 368)

Average Weekday Directional Distribution: 50% entering, 50% exiting
 T = 205.36 (X) T = 2464 Average Vehicle Trip Ends
 T = 205.36 * 12.000 1232 entering 1232 exiting
 1232 + 1232 = 2464

Non Pass-By Trip Volumes (Per ITE Trip Generation Handbook, 3rd Edition September 2017)

PM Peak Hour = 44% Non-Pass By	AM Peak Hour = 38% Non-Pass By
IN Out Total	
AM Peak 29 28 57	
PM Peak 38 36 74	
Daily 542 542 1084	PM Peak Hour Rate Applied to Daily

Pass-By Trip Volumes (Per ITE Trip Generation Handbook, 3rd Edition September 2017)

PM Peak Hour = 56% Pass By	AM Peak Hour = 62% Pass By
IN Out Total	
AM Peak 47 46 93	
PM Peak 48 46 94	
Daily 690 690 1380	PM Peak Hour Rate Applied to Daily

Project Peak Innovation Park: P-5
 Subject Trip Generation for Hotel
 Designed by JRP Date January 20, 2020 Job No. 096161008
 Checked by _____ Sheet No. 1 of 1

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Average Rate Equations

Land Use Code -Hotel (310)

Independent Variable - Rooms (X)

$$X = 240$$

T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (Series 300 Page 3)

(T) = 0.47 (X)		Directional Distribution:	59% ent.	41% exit.
(T) = 0.47 *	(240.0)	T = 113	Average Vehicle Trip Ends	
		67 entering	46	exiting
		67 + 46	=	113

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (Series 300 Page 4)

T = 0.60 X		Directional Distribution:	51% ent.	49% exit.
T = 0.60 *	240	T = 144	Average Vehicle Trip Ends	
		73 entering	71	exiting
		73 + 71	=	144

Weekday (Series 300 Page 2)

Average Weekday		Directional Distribution:	50% entering, 50% exiting	
(T) = 8.36 (X)		T = 2006	Average Vehicle Trip Ends	
(T) = 8.36 *	(240.0)	1003 entering	1003	exiting
		1003 + 1003	=	2006

Saturday (300 Series Page 7)

T = 8.19 X		Directional Distribution:	50% ent.	50% exit.
T = 8.19 *	240	T = 1966	Average Vehicle Trip Ends	
		983 entering	983	exiting
		983 + 983	=	1966

Saturday Peak Hour of Generator (300 Series Page 8)

Average Weekday		Directional Distribution:	56% entering,	44% exiting
(T) = 0.72 (X)		T = 172	Average Vehicle Trip Ends	
(T) = 0.72 *	(240.0)	86 entering	86	exiting
		86 + 86	=	172



Project Peak Innovation Park: P-5
 Subject Trip Generation for Business Park
 Designed by JRP Date November 06, 2019 Job No. 096161008
 Checked by _____ Date _____ Sheet No. 1 of 1

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Average Rates

Land Use Code - Business Park (770)

Independent Variable - 1000 Square Feet Gross Floor Feet (X)

Gross Floor Area = **390,000**

X = 390.0

T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (700 Series Page 281)

(T) = 0.40 (X)		Directional Distribution:	61% ent.	39% exit.
(T) = 0.40 *	(390.0)	T =	156	Average Vehicle Trip Ends
		95	entering	61 exiting
		95	+	61 = 156

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (700 Series Page 282)

(T) = 0.42 (X)		Directional Distribution:	46% ent.	54% exit.
(T) = 0.42 *	(390.0)	T =	164	Average Vehicle Trip Ends
		75	entering	89 exiting
		75	+	89 = 164

Weekday (700 Series Page 280)

Average Weekday		Directional Distribution:	50% ent.	50% exit.
(T) = 12.44 (X)		T =	4852	Average Vehicle Trip Ends
(T) = 12.44 *	(390.0)	2426	entering	2426 exiting
		2426	+	2426 = 4852

AR Sortable 640K FC

TRAFFIC DATA FOR ENTITLEMENT USE

Headcount

	Total	IB/OB Split
Headcount - Day Shift	1120	560
Headcount Night Shift	1022	511

Shift Structure

	Start	End
Day Shift Inbound	7:00:00 AM	5:30:00 PM
Day Shift Outbound	7:30:00 AM	6:00:00 PM
Night Shift Inbound	6:00:00 PM	6:30:00 AM
Night Shift Outbound	6:30:00 PM	7:00:00 AM

Adjustment below accounts for mass transit and carpool users.
Adjust as needed for jurisdiction
Net Cars Factor 81%

Traffic Schedule

Cars				Trucks				Total Vehicles			
Average Weekday - Non-Peak				Average Weekday - Non-Peak				Cars + Trucks Average Weekday			
Time	In	Out	Total	Time	In	Out	Total	Time	In	Out	Total
00:00	4	7	11	00:00	9	9	18	00:00	12	15	27
01:00	2	4	6	01:00	15	15	30	01:00	17	18	35
02:00	6	15	21	02:00	6	6	12	02:00	11	18	29
03:00	9	15	24	03:00	12	12	24	03:00	19	24	43
04:00	20	32	52	04:00	6	6	12	04:00	22	32	54
05:00	42	54	96	05:00	9	9	18	05:00	43	53	96
06:00	32	14	46	06:00	2	2	4	06:00	28	13	41
06:15	84	13	97	06:15	2	2	4	06:15	70	13	83
06:30	145	67	212	06:30	2	2	4	06:30	119	56	176
06:45	195	111	306	06:45	2	2	4	06:45	160	92	252
07:00	192	185	377	07:00	3	3	6	07:00	159	153	311
07:15	250	265	515	07:15	3	3	6	07:15	206	218	423
07:30	37	76	113	07:30	3	3	6	07:30	33	65	98
07:45	8	17	25	07:45	3	3	6	07:45	9	17	26
08:00	29	20	49	08:00	12	12	24	08:00	35	28	64
09:00	19	11	30	09:00	21	21	42	09:00	36	30	66
10:00	23	19	42	10:00	12	12	24	10:00	31	27	58
11:00	44	46	90	11:00	13	13	26	11:00	49	50	99
12:00	12	20	32	12:00	13	13	26	12:00	23	29	52
13:00	15	16	31	13:00	8	8	16	13:00	20	21	41
14:00	13	29	42	14:00	8	8	16	14:00	19	31	50
15:00	34	43	77	15:00	8	8	16	15:00	36	43	78
16:00	51	37	88	16:00	9	9	18	16:00	50	39	89
17:00	30	37	67	17:00	2	2	4	17:00	26	32	58
17:15	57	17	74	17:15	2	2	4	17:15	48	16	64
17:30	126	146	272	17:30	2	2	4	17:30	104	120	224
17:45	163	84	247	17:45	2	2	4	17:45	134	70	204
18:00	204	281	485	18:00	2	2	4	18:00	167	230	397
18:15	197	190	387	18:15	2	2	4	18:15	162	156	317
18:30	26	127	153	18:30	2	2	4	18:30	23	105	128
18:45	6	47	53	18:45	2	2	4	18:45	7	40	47
19:00	21	40	61	19:00	7	7	14	19:00	24	39	63
20:00	9	9	18	20:00	11	11	22	20:00	18	18	37
21:00	17	17	34	21:00	8	8	16	21:00	22	22	44
22:00	20	24	44	22:00	11	11	22	22:00	27	30	58
23:00	3	6	9	23:00	8	8	16	23:00	10	13	23
	2,142	2,142	4,286		242	242	484		1,979	1,976	3,956

Peak Innovation Park:
P9 Project Rodeo Trip Generation Summary

Morning Peak Hour of Generator/Adjacent Street			
	Enter	Exit	Total
06:30-07:30	644	519	1,163
06:30	119	56	175
06:45	160	92	252
07:00	159	153	312
07:15	206	218	424

Afternoon Peak Hour of Adjacent Street			
	Enter	Exit	Total
17:00-18:00	312	238	550
17:00	26	32	58
17:15	48	16	64
17:30	104	120	224
17:45	134	70	204

Evening Peak Hour of Generator			
	Enter	Exit	Total
17:30-18:30	567	576	1,143
17:30	104	120	224
17:45	134	70	204
18:00	167	230	397
18:15	162	156	318



Project Peak Innovation Park: P-10
 Subject Trip Generation for Office Park
 Designed by JRP Date November 06, 2019 Job No. 096161008
 Checked by _____ Date _____ Sheet No. 1 of 1

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Average Rates

Land Use Code - Office Park (750)

Independant Variable - 1000 Square Feet Gross Floor Feet (X)

Gross Floor Area = **300,000**

X = 300.0

T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (700 Series Page 234)

(T) = 1.44 (X)		Directional Distribution:	89% ent.	11% exit.
(T) = 1.44 *	(300.0)	T =	432	Average Vehicle Trip Ends
			384 entering	48 exiting
			384 +	48 = 432

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (700 Series Page 235)

(T) = 1.07 (X)		Directional Distribution:	7% ent.	93% exit.
(T) = 1.07 *	(300.0)	T =	321	Average Vehicle Trip Ends
			22 entering	299 exiting
			22 +	299 = 321

Weekday (700 Series Page 233)

Average Weekday		Directional Distribution:	50% ent.	50% exit.
(T) = 11.07 (X)		T =	3322	Average Vehicle Trip Ends
(T) = 11.07 *	(300.0)		1661 entering	1661 exiting
			1661 +	1661 = 3322

1 Fill in all cells which are red.

Project Peak Innovation Park: P-13
 Subject Trip Generation for Gasoline/Service Station with Convenience Market
 Designed by ACK Date November 14, 2019 Job No. 096161008
 Checked by _____ Date _____ Sheet No. 1 of 1

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Average Rate Equations

Land Use Code - Gasoline/Service Station with Convenience Market (945)

Independant Variable - Vehicle Fueling Positions (X)

Vehicle Fueling Positions= **12** Positions
 X = 12
 T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (900 Series page 369)

Average Weekday	Directional Distribution:	51% ent.	49% exit.
T = 12.47 (X)	T = 150	Average Vehicle Trip Ends	
T = 12.47 * 12	76 entering	74	exiting
	76 + 74 = 150		

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (900 Series page 370)

Average Weekday	Directional Distribution:	51% ent.	49% exit.
T = 13.99 (X)	T = 168	Average Vehicle Trip Ends	
T = 13.99 * 12.000	86 entering	82	exiting
	86 + 82 = 168		

Weekday (900 Series page 368)

Average Weekday	Directional Distribution:	50% entering, 50% exiting	
T = 205.36 (X)	T = 2464	Average Vehicle Trip Ends	
T = 205.36 * 12.000	1232 entering	1232	exiting
	1232 + 1232 = 2464		

Non Pass-By Trip Volumes (Per ITE Trip Generation Handbook, 3rd Edition September 2017)

PM Peak Hour = 44% Non-Pass By	AM Peak Hour = 38% Non-Pass By
IN Out Total	
AM Peak 29 28 57	
PM Peak 38 36 74	
Daily 542 542 1084	PM Peak Hour Rate Applied to Daily

Pass-By Trip Volumes (Per ITE Trip Generation Handbook, 3rd Edition September 2017)

PM Peak Hour = 56% Pass By	AM Peak Hour = 62% Pass By
IN Out Total	
AM Peak 47 46 93	
PM Peak 48 46 94	
Daily 690 690 1380	PM Peak Hour Rate Applied to Daily

Project Peak Innovation Park: P-15
 Subject Trip Generation for Fast-Food Restaurant with Drive-Through Window
 Designed by ACK Date November 14, 2019 Job No. 096161008
 Checked by _____ Date _____ Sheet No. 1 of 1

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Average Rate Equations

Land Use Code - Fast Food Restaurant With Drive-Through Window (934)

Independant Variable - 1000 Square Feet Gross Floor Area (X)

Gross Floor Area = **5,000** Square Feet

X = 5.000

T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (900 Series page 158)

Average Weekday		Directional Distribution:	51% ent.	49% exit.
T = 40.19 (X)		T = 201	Average Vehicle Trip Ends	
T = 40.19 *	5.000	103 entering	98	exiting
		103 + 98 (*) =	201	

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (900 Series page 159)

Average Weekday		Directional Distribution:	52% ent.	48% exit.
T = 32.67 (X)		T = 163	Average Vehicle Trip Ends	
T = 32.67 *	5.000	85 entering	78	exiting
		85 + 78 =	163	

Weekday (900 Series page 157)

Average Weekday		Directional Distribution:	50% entering, 50% exiting	
T = 470.95 (X)		T = 2356	Average Vehicle Trip Ends	
T = 470.95 *	5.000	1178 entering	1178	exiting
		1178 + 1178 =	2356	

Saturday Peak Hour of Generator (900 Series page 163)

		Directional Distribution:	51% ent.	49% exit.
T = 54.86 (X)		T = 274	Average Vehicle Trip Ends	
T = 54.86 *	5.000	140 entering	134	exiting
		140 + 134 =	274	

Non Pass-By Trip Volumes (Per ITE Trip Generation Handbook, 3rd Edition September 2017)

AM Peak Hour =	51%	Non-Pass By	PM Peak Hour =	50%	Non-Pass By
	IN	Out	Total		
AM Peak	53	50	103		
PM Peak	43	39	82		
Daily	589	589	1178	PM Peak Hour Rate Applied to Daily	

Pass-By Trip Volumes (Per ITE Trip Generation Handbook, 3rd Edition September 2017)

AM Peak Hour =	49%	Pass By	PM Peak Hour =	50%	Pass By
	IN	Out	Total		
AM Peak	50	48	98		
PM Peak	43	39	82		
Daily	589	589	1178	PM Peak Hour Rate Applied to Daily	

Peak Innovation Park 2030 Phase 2 Buildout Trip Generation Summary

Zone	Land Use	Quantity	Units	Weekday Vehicle Trips						
				Daily	AM Peak Hour			PM Peak Hour		
					In	Out	Total	In	Out	Total
P-1	Business Park (ITE 770)	72,000	Square Feet	896	18	11	29	14	16	30
P-2	Business Park (ITE 770)	452,000	Square Feet	5,624	110	71	181	87	103	190
P-3	Business Park (ITE 770)	468,000	Square Feet	5,822	114	73	187	91	106	197
P-4	Business Park (ITE 770)	40,000	Square Feet	498	10	6	16	8	9	17
	Fast Food Restaurant w/ Drive Thru (ITE 934)	10,000	Square Feet	4,710	205	197	402	170	157	327
	Gas Station w/ Convenience Market (ITE 945)	12	Fueling Positions	2,464	76	74	150	86	82	168
	<i>P-4 Total</i>				7,672	291	277	568	264	248
P-5	Hotel (ITE 310)	240	Rooms	2,006	67	46	113	73	71	144
	Business Park (ITE 770)	390,000	Square Feet	4,852	95	61	156	75	89	164
	<i>P-5 Total</i>				6,858	162	107	269	148	160
P-6	Office Park (ITE 750)	106,000	Square Feet	1,174	136	17	153	8	105	113
P-7	Office Park (ITE 750)	120,000	Square Feet	1,330	154	19	173	9	119	128
P-8	Office Park (ITE 750)	36,000	Square Feet	400	46	6	52	3	36	39
P-9	Project Rodeo (Client Data)			3,956	644	519	1,163	312	238	550
P-10	Office Park (ITE 750)	620,000	Square Feet	6,864	795	98	893	46	617	663
P-11	Office Park (ITE 750)	150,000	Square Feet	1,662	192	24	216	11	150	161
P-12	Industrial Park (ITE 130)	162,000	Square Feet	546	53	12	65	14	51	65
P-13	Gas Station w/ Convenience Market (ITE 945)	12	Fueling Positions	2,464	76	74	150	86	82	168
P-14	Project Jungle (Client Data)			2,410	222	168	390	171	62	233
P-15	Fast Food Restaurant w/ Drive Thru (ITE 934)	5,000	Square Feet	2,356	103	98	201	85	78	163
P-16	Industrial Park (ITE 130)	308,000	Square Feet	1,038	100	23	123	26	98	124
P-17	Office Park (ITE 750)	76,000	Square Feet	842	97	12	109	6	75	81
P-18	Industrial Park (ITE 130)	252,000	Square Feet	850	82	19	101	21	80	101
Total Site Generated Trips				52,764	3,395	1,628	5,023	1,402	2,424	3,826



Project Peak Innovation Park: P-1
 Subject Trip Generation for Business Park
 Designed by JRP Date November 06, 2019 Job No. 096161008
 Checked by _____ Date _____ Sheet No. 1 of 1

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Average Rates

Land Use Code - Business Park (770)

Independant Variable - 1000 Square Feet Gross Floor Feet (X)

Gross Floor Area = **72,000**

X = 72.0

T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (700 Series Page 281)

(T) = 0.40 (X)		Directional Distribution:	61% ent.	39% exit.
(T) = 0.40 *	(72.0)	T = 29	Average Vehicle Trip Ends	
		18 entering	11 exiting	
		18 + 11 = 29		

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (700 Series Page 282)

(T) = 0.42 (X)		Directional Distribution:	46% ent.	54% exit.
(T) = 0.42 *	(72.0)	T = 30	Average Vehicle Trip Ends	
		14 entering	16 exiting	
		14 + 16 = 30		

Weekday (700 Series Page 280)

Average Weekday		Directional Distribution:	50% ent.	50% exit.
(T) = 12.44 (X)		T = 896	Average Vehicle Trip Ends	
(T) = 12.44 *	(72.0)	448 entering	448 exiting	
		448 + 448 = 896		



Project Peak Innovation Park: P-2
 Subject Trip Generation for Business Park
 Designed by JRP Date November 06, 2019 Job No. 096161008
 Checked by _____ Date _____ Sheet No. 1 of 1

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Average Rates

Land Use Code - Business Park (770)

Independant Variable - 1000 Square Feet Gross Floor Feet (X)

Gross Floor Area = **452,000**

X = 452.0

T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (700 Series Page 281)

(T) = 0.40 (X)		Directional Distribution:	61% ent.	39% exit.
(T) = 0.40 *	(452.0)	T =	181	Average Vehicle Trip Ends
			110 entering	71 exiting
			110 +	71 = 181

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (700 Series Page 282)

(T) = 0.42 (X)		Directional Distribution:	46% ent.	54% exit.
(T) = 0.42 *	(452.0)	T =	190	Average Vehicle Trip Ends
			87 entering	103 exiting
			87 +	103 = 190

Weekday (700 Series Page 280)

Average Weekday		Directional Distribution:	50% ent.	50% exit.
(T) = 12.44 (X)		T =	5624	Average Vehicle Trip Ends
(T) = 12.44 *	(452.0)		2812 entering	2812 exiting
			2812 +	2812 = 5624



Project Peak Innovation Park: P-3
 Subject Trip Generation for Business Park
 Designed by JRP Date November 06, 2019 Job No. 096161008
 Checked by _____ Date _____ Sheet No. 1 of 1

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Average Rates

Land Use Code - Business Park (770)

Independant Variable - 1000 Square Feet Gross Floor Feet (X)

Gross Floor Area = **468,000**

X = 468.0

T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (700 Series Page 281)

(T) = 0.40 (X)		Directional Distribution:	61% ent.	39% exit.
(T) = 0.40 *	(468.0)	T =	187	Average Vehicle Trip Ends
			114 entering	73 exiting
			114 +	73 = 187

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (700 Series Page 282)

(T) = 0.42 (X)		Directional Distribution:	46% ent.	54% exit.
(T) = 0.42 *	(468.0)	T =	197	Average Vehicle Trip Ends
			91 entering	106 exiting
			91 +	106 = 197

Weekday (700 Series Page 280)

Average Weekday		Directional Distribution:	50% ent.	50% exit.
(T) = 12.44 (X)		T =	5822	Average Vehicle Trip Ends
(T) = 12.44 *	(468.0)		2911 entering	2911 exiting
			2911 +	2911 = 5822



Project Peak Innovation Park: P-4
 Subject Trip Generation for Business Park
 Designed by JRP Date November 06, 2019 Job No. 096161008
 Checked by _____ Date _____ Sheet No. 1 of 1

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Average Rates

Land Use Code - Business Park (770)

Independant Variable - 1000 Square Feet Gross Floor Feet (X)

Gross Floor Area = **40,000**

X = 40.0

T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (700 Series Page 281)

(T) = 0.40 (X)		Directional Distribution:	61% ent.	39% exit.
(T) = 0.40 *	(40.0)	T = 16	Average Vehicle Trip Ends	
		10 entering	6	exiting
		10 + 6	= 16	

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (700 Series Page 282)

(T) = 0.42 (X)		Directional Distribution:	46% ent.	54% exit.
(T) = 0.42 *	(40.0)	T = 17	Average Vehicle Trip Ends	
		8 entering	9	exiting
		8 + 9	= 17	

Weekday (700 Series Page 280)

Average Weekday		Directional Distribution:	50% ent.	50% exit.
(T) = 12.44 (X)		T = 498	Average Vehicle Trip Ends	
(T) = 12.44 *	(40.0)	249 entering	249	exiting
		249 + 249	= 498	

Project Peak Innovation Park: P-4
 Subject Trip Generation for Fast-Food Restaurant with Drive-Through Window
 Designed by ACK Date November 14, 2019 Job No. 096161008
 Checked by _____ Date _____ Sheet No. 1 of 1

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Average Rate Equations

Land Use Code - Fast Food Restaurant With Drive-Through Window (934)

Independent Variable - 1000 Square Feet Gross Floor Area (X)

Gross Floor Area = **10,000** Square Feet

X = 10.000

T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (900 Series page 158)

Average Weekday		Directional Distribution:	51% ent.	49% exit.
T = 40.19 (X)		T = 402	Average Vehicle Trip Ends	
T = 40.19 *	10.000	205 entering	197	exiting
		205 + 197 =	402	

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (900 Series page 159)

Average Weekday		Directional Distribution:	52% ent.	48% exit.
T = 32.67 (X)		T = 327	Average Vehicle Trip Ends	
T = 32.67 *	10.000	170 entering	157	exiting
		170 + 157 =	327	

Weekday (900 Series page 157)

Average Weekday		Directional Distribution:	50% entering, 50% exiting	
T = 470.95 (X)		T = 4710	Average Vehicle Trip Ends	
T = 470.95 *	10.000	2355 entering	2355	exiting
		2355 + 2355 =	4710	

Saturday Peak Hour of Generator (900 Series page 163)

		Directional Distribution:	51% ent.	49% exit.
T = 54.86 (X)		T = 549	Average Vehicle Trip Ends	
T = 54.86 *	10.000	280 entering	269	exiting
		280 + 269 =	549	

Non Pass-By Trip Volumes (Per ITE Trip Generation Handbook, 3rd Edition September 2017)

AM Peak Hour =	51%	Non-Pass By	PM Peak Hour =	50%	Non-Pass By
	IN	Out	Total		
AM Peak	105	100	205		
PM Peak	85	79	164		
Daily	1178	1178	2356		PM Peak Hour Rate Applied to Daily

Pass-By Trip Volumes (Per ITE Trip Generation Handbook, 3rd Edition September 2017)

AM Peak Hour =	49%	Pass By	PM Peak Hour =	50%	Pass By
	IN	Out	Total		
AM Peak	100	97	197		
PM Peak	85	79	164		
Daily	1177	1177	2354		PM Peak Hour Rate Applied to Daily

Project Peal Peak Innovation Park: P-4
 Subject Trip Generation for Gasoline/Service Station with Convenience Market
 Designed by ACK Date November 14, 2019 Job No. 096161008
 Checked by _____ Date _____ Sheet No. 1 of 1

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Average Rate Equations

Land Use Code - Gasoline/Service Station with Convenience Market (945)

Independant Variable - Vehicle Fueling Positions (X)

Vehicle Fueling Positions= **12** Positions
 X = 12
 T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (900 Series page 369)

Average Weekday		Directional Distribution:	51% ent.	49% exit.
T = 12.47 (X)		T = 150	Average Vehicle Trip Ends	
T = 12.47 *	12	76 entering	74 exiting	
		76 + 74 = 150		

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (900 Series page 370)

Average Weekday		Directional Distribution:	51% ent.	49% exit.
T = 13.99 (X)		T = 168	Average Vehicle Trip Ends	
T = 13.99 *	12.000	86 entering	82 exiting	
		86 + 82 = 168		

Weekday (900 Series page 368)

Average Weekday		Directional Distribution:	50% entering,	50% exiting
T = 205.36 (X)		T = 2464	Average Vehicle Trip Ends	
T = 205.36 *	12.000	1232 entering	1232 exiting	
		1232 + 1232 = 2464		

Non Pass-By Trip Volumes (Per ITE Trip Generation Handbook, 3rd Edition September 2017)

PM Peak Hour =	44%	Non-Pass By	AM Peak Hour =	38%	Non-Pass By
	IN	Out	Total		
AM Peak	29	28	57		
PM Peak	38	36	74		
Daily	542	542	1084	PM Peak Hour Rate Applied to Daily	

Pass-By Trip Volumes (Per ITE Trip Generation Handbook, 3rd Edition September 2017)

PM Peak Hour =	56%	Pass By	AM Peak Hour =	62%	Pass By
	IN	Out	Total		
AM Peak	47	46	93		
PM Peak	48	46	94		
Daily	690	690	1380	PM Peak Hour Rate Applied to Daily	

Project Peak Innovation Park: P-5
 Subject Trip Generation for Hotel
 Designed by JRP Date January 20, 2020 Job No. 096161008
 Checked by _____ Sheet No. 1 of 1

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Average Rate Equations

Land Use Code -Hotel (310)

Independent Variable - Rooms (X)

$$X = 240$$

T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (Series 300 Page 3)

(T) = 0.47 (X)		Directional Distribution:	59% ent.	41% exit.
(T) = 0.47 *	(240.0)	T =	113	Average Vehicle Trip Ends
		67	entering	46 exiting
		67	+	46 = 113

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (Series 300 Page 4)

T = 0.60 X		Directional Distribution:	51% ent.	49% exit.
T = 0.60 *	240	T =	144	Average Vehicle Trip Ends
		73	entering	71 exiting
		73	+	71 = 144

Weekday (Series 300 Page 2)

Average Weekday		Directional Distribution:	50% entering,	50% exiting
(T) = 8.36 (X)		T =	2006	Average Vehicle Trip Ends
(T) = 8.36 *	(240.0)	1003	entering	1003 exiting
		1003	+	1003 = 2006

Saturday (300 Series Page 7)

T = 8.19 X		Directional Distribution:	50% ent.	50% exit.
T = 8.19 *	240	T =	1966	Average Vehicle Trip Ends
		983	entering	983 exiting
		983	+	983 = 1966

Saturday Peak Hour of Generator (300 Series Page 8)

Average Weekday		Directional Distribution:	56% entering,	44% exiting
(T) = 0.72 (X)		T =	172	Average Vehicle Trip Ends
(T) = 0.72 *	(240.0)	86	entering	86 exiting
		86	+	86 = 172



Project Peak Innovation Park: P-5
 Subject Trip Generation for Business Park
 Designed by JRP Date November 06, 2019 Job No. 096161008
 Checked by _____ Date _____ Sheet No. 1 of 1

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Average Rates

Land Use Code - Business Park (770)

Independent Variable - 1000 Square Feet Gross Floor Feet (X)

Gross Floor Area = **390,000**

X = 390.0

T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (700 Series Page 281)

(T) = 0.40 (X)		Directional Distribution:	61% ent.	39% exit.
(T) = 0.40 *	(390.0)	T =	156	Average Vehicle Trip Ends
		95 entering	61 exiting	
		95 + 61 =	156	

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (700 Series Page 282)

(T) = 0.42 (X)		Directional Distribution:	46% ent.	54% exit.
(T) = 0.42 *	(390.0)	T =	164	Average Vehicle Trip Ends
		75 entering	89 exiting	
		75 + 89 =	164	

Weekday (700 Series Page 280)

Average Weekday		Directional Distribution:	50% ent.	50% exit.
(T) = 12.44 (X)		T =	4852	Average Vehicle Trip Ends
(T) = 12.44 *	(390.0)	2426 entering	2426 exiting	
		2426 + 2426 =	4852	



Project Peak Innovation Park: P-6
 Subject Trip Generation for Office Park
 Designed by JRP Date November 06, 2019 Job No. 096161008
 Checked by _____ Date _____ Sheet No. 1 of 1

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Average Rates

Land Use Code - Office Park (750)

Independent Variable - 1000 Square Feet Gross Floor Feet (X)

Gross Floor Area = **106,000**

X = 106.0

T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (700 Series Page 234)

(T) = 1.44 (X)

(T) = 1.44 * (106.0)

Directional Distribution: 89% ent. 11% exit.

T = 153 Average Vehicle Trip Ends

136 entering 17 exiting

136 + 17 = 153

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (700 Series Page 235)

(T) = 1.07 (X)

(T) = 1.07 * (106.0)

Directional Distribution: 7% ent. 93% exit.

T = 113 Average Vehicle Trip Ends

8 entering 105 exiting

8 + 105 = 113

(*) TRIP END WAS CHANGED BY 1 TO SATISFY THE TOTAL

Weekday (700 Series Page 233)

Average Weekday

(T) = 11.07 (X)

(T) = 11.07 * (106.0)

Directional Distribution: 50% ent. 50% exit.

T = 1174 Average Vehicle Trip Ends

587 entering 587 exiting

587 + 587 = 1174

1 Fill in all cells which are red.



Project Peak Innovation Park: P-7
 Subject Trip Generation for Office Park
 Designed by JRP Date November 06, 2019 Job No. 096161008
 Checked by _____ Date _____ Sheet No. 1 of 1

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Average Rates

Land Use Code - Office Park (750)

Independent Variable - 1000 Square Feet Gross Floor Feet (X)

Gross Floor Area = **120,000**
 X = 120.0
 T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (700 Series Page 234)

(T) = 1.44 (X)		Directional Distribution:	89% ent.	11% exit.
(T) = 1.44 *	(120.0)	T =	173	Average Vehicle Trip Ends
		154	entering	19 exiting
		154	+	19 = 173

(*) TRIP END WAS CHANGED BY 1 TO SATISFY THE TOTAL

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (700 Series Page 235)

(T) = 1.07 (X)		Directional Distribution:	7% ent.	93% exit.
(T) = 1.07 *	(120.0)	T =	128	Average Vehicle Trip Ends
		9	entering	119 exiting
		9	+	119 = 128

Weekday (700 Series Page 233)

Average Weekday		Directional Distribution:	50% ent.	50% exit.
(T) = 11.07 (X)		T =	1330	Average Vehicle Trip Ends
(T) = 11.07 *	(120.0)	665	entering	665 exiting
		665	+	665 = 1330

1 Fill in all cells which are red.



Project Peak Innovation Park: P-8
 Subject Trip Generation for Office Park
 Designed by JRP Date November 06, 2019 Job No. 096161008
 Checked by _____ Date _____ Sheet No. 1 of 1

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Average Rates

Land Use Code - Office Park (750)

Independent Variable - 1000 Square Feet Gross Floor Feet (X)

Gross Floor Area = **36,000**

X = 36.0

T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (700 Series Page 234)

(T) = 1.44 (X)

(T) = 1.44 * (36.0)

Directional Distribution: 89% ent. 11% exit.

T = 52 Average Vehicle Trip Ends

46 entering 6 exiting

46 + 6 = 52

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (700 Series Page 235)

(T) = 1.07 (X)

(T) = 1.07 * (36.0)

Directional Distribution: 7% ent. 93% exit.

T = 39 Average Vehicle Trip Ends

3 entering 36 exiting

3 + 36 = 39

Weekday (700 Series Page 233)

Average Weekday

(T) = 11.07 (X)

(T) = 11.07 * (36.0)

Directional Distribution: 50% ent. 50% exit.

T = 400 Average Vehicle Trip Ends

200 entering 200 exiting

200 + 200 = 400

1 Fill in all cells which are red.

AR Sortable 640K FC

TRAFFIC DATA FOR ENTITLMENT USE

Headcount

	Total	IB/OB Split
Headcount - Day Shift	1120	560
Headcount Night Shift	1022	511

Shift Structure

	Start	End
Day Shift Inbound	7:00:00 AM	5:30:00 PM
Day Shift Outbound	7:30:00 AM	6:00:00 PM
Night Shift Inbound	6:00:00 PM	6:30:00 AM
Night Shift Outbound	6:30:00 PM	7:00:00 AM

Adjustment below accounts for mass transit and carpool users.
Adjust as needed for jurisdiction
Net Cars Factor 81%

Traffic Schedule

Cars				Trucks				Total Vehicles			
Average Weekday - Non-Peak				Average Weekday - Non-Peak				Cars + Trucks Average Weekday			
Time	In	Out	Total	Time	In	Out	Total	In	Out	Total	
00:00	4	7	11	00:00	9	9	18	00:00	12	15	27
01:00	2	4	6	01:00	15	15	30	01:00	17	18	35
02:00	6	15	21	02:00	6	6	12	02:00	11	18	29
03:00	9	15	24	03:00	12	12	24	03:00	19	24	43
04:00	20	32	52	04:00	6	6	12	04:00	22	32	54
05:00	42	54	96	05:00	9	9	18	05:00	43	53	96
06:00	32	14	46	06:00	2	2	4	06:00	28	13	41
06:15	84	13	97	06:15	2	2	4	06:15	70	13	83
06:30	145	67	212	06:30	2	2	4	06:30	119	56	176
06:45	195	111	306	06:45	2	2	4	06:45	160	92	252
07:00	192	185	377	07:00	3	3	6	07:00	159	153	311
07:15	250	265	515	07:15	3	3	6	07:15	206	218	423
07:30	37	76	113	07:30	3	3	6	07:30	33	65	98
07:45	8	17	25	07:45	3	3	6	07:45	9	17	26
08:00	29	20	49	08:00	12	12	24	08:00	35	28	64
09:00	19	11	30	09:00	21	21	42	09:00	36	30	66
10:00	23	19	42	10:00	12	12	24	10:00	31	27	58
11:00	44	46	90	11:00	13	13	26	11:00	49	50	99
12:00	12	20	32	12:00	13	13	26	12:00	23	29	52
13:00	15	16	31	13:00	8	8	16	13:00	20	21	41
14:00	13	29	42	14:00	8	8	16	14:00	19	31	50
15:00	34	43	77	15:00	8	8	16	15:00	36	43	78
16:00	51	37	88	16:00	9	9	18	16:00	50	39	89
17:00	30	37	67	17:00	2	2	4	17:00	26	32	58
17:15	57	17	74	17:15	2	2	4	17:15	48	16	64
17:30	126	146	272	17:30	2	2	4	17:30	104	120	224
17:45	163	84	247	17:45	2	2	4	17:45	134	70	204
18:00	204	281	485	18:00	2	2	4	18:00	167	230	397
18:15	197	190	387	18:15	2	2	4	18:15	162	156	317
18:30	26	127	153	18:30	2	2	4	18:30	23	105	128
18:45	6	47	53	18:45	2	2	4	18:45	7	40	47
19:00	21	40	61	19:00	7	7	14	19:00	24	39	63
20:00	9	9	18	20:00	11	11	22	20:00	18	18	37
21:00	17	17	34	21:00	8	8	16	21:00	22	22	44
22:00	20	24	44	22:00	11	11	22	22:00	27	30	58
23:00	3	6	9	23:00	8	8	16	23:00	10	13	23
	2,142	2,142	4,286		242	242	484		1,979	1,976	3,956

Peak Innovation Park:
P9 Project Rodeo Trip Generation Summary

Morning Peak Hour of Generator/Adjacent Street			
	Enter	Exit	Total
06:30-07:30	644	519	1,163
06:30	119	56	175
06:45	160	92	252
07:00	159	153	312
07:15	206	218	424

Afternoon Peak Hour of Adjacent Street			
	Enter	Exit	Total
17:00-18:00	312	238	550
17:00	26	32	58
17:15	48	16	64
17:30	104	120	224
17:45	134	70	204

Evening Peak Hour of Generator			
	Enter	Exit	Total
17:30-18:30	567	576	1,143
17:30	104	120	224
17:45	134	70	204
18:00	167	230	397
18:15	162	156	318



Project Peak Innovation Park: P-10
 Subject Trip Generation for Office Park
 Designed by JRP Date November 06, 2019 Job No. 096161008
 Checked by _____ Date _____ Sheet No. 1 of 1

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Average Rates

Land Use Code - Office Park (750)

Independent Variable - 1000 Square Feet Gross Floor Feet (X)

Gross Floor Area = **620,000**

X = 620.0

T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (700 Series Page 234)

(T) = 1.44 (X)

(T) = 1.44 * (620.0)

Directional Distribution: 89% ent. 11% exit.

T = 893 Average Vehicle Trip Ends

795 entering 98 exiting

795 + 98 = 893

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (700 Series Page 235)

(T) = 1.07 (X)

(T) = 1.07 * (620.0)

Directional Distribution: 7% ent. 93% exit.

T = 663 Average Vehicle Trip Ends

46 entering 617 exiting

46 + 617 = 663

(*) TRIP END WAS CHANGED BY 1 TO SATISFY THE TOTAL

Weekday (700 Series Page 233)

Average Weekday

(T) = 11.07 (X)

(T) = 11.07 * (620.0)

Directional Distribution: 50% ent. 50% exit.

T = 6864 Average Vehicle Trip Ends

3432 entering 3432 exiting

3432 + 3432 = 6864

1 Fill in all cells which are red.



Project Peak Innovation Park: P-11
 Subject Trip Generation for Office Park
 Designed by JRP Date November 06, 2019 Job No. 096161008
 Checked by _____ Date _____ Sheet No. 1 of 1

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Average Rates

Land Use Code - Office Park (750)

Independent Variable - 1000 Square Feet Gross Floor Feet (X)

Gross Floor Area = **150,000**

X = 150.0

T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (700 Series Page 234)

(T) = 1.44 (X)

(T) = 1.44 * (150.0)

Directional Distribution: 89% ent. 11% exit.

T = 216 Average Vehicle Trip Ends

192 entering 24 exiting

192 + 24 = 216

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (700 Series Page 235)

(T) = 1.07 (X)

(T) = 1.07 * (150.0)

Directional Distribution: 7% ent. 93% exit.

T = 161 Average Vehicle Trip Ends

11 entering 150 exiting

11 + 150 = 161

Weekday (700 Series Page 233)

Average Weekday

(T) = 11.07 (X)

(T) = 11.07 * (150.0)

Directional Distribution: 50% ent. 50% exit.

T = 1662 Average Vehicle Trip Ends

831 entering 831 exiting

831 + 831 = 1662

1 Fill in all cells which are red.

Project Peak Innovation Park: P-12
 Subject Trip Generation for Industrial Park
 Designed by JRP Date November 05, 2019 Job No. 096161008
 Checked by _____ Date _____ Sheet No. 1 of 1

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Average Rate Equations

Land Use Code - Industrial Park (130)

Independant Variable - 1000 Square Feet Gross Floor Feet (X)

Gross Floor Area = **162,000**

X = 162.0

T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (100 Series Page 22)

		Directional Distribution:	81% ent.	19% exit.
T = 0.40 (X)		T = 65	Average Vehicle Trip Ends	
T = 0.40 *	162	53 entering	12	exiting
		53 + 12 =	65	

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (100 Series Page 23)

		Directional Distribution:	21% ent.	79% exit.
T = 0.40 (X)		T = 65	Average Vehicle Trip Ends	
T = 0.40 *	162	14 entering	51	exiting
		14 + 51 =	65	

Weekday (100 Series Page 21)

		Directional Distribution:	50% entering,	50% exiting
T = 3.37 (X)		T = 546	Average Vehicle Trip Ends	
T = 3.37 *	162	273 entering	273	exiting
		273 + 273 =	546	

Project Peak Innovation Park: P-13
 Subject Trip Generation for Gasoline/Service Station with Convenience Market
 Designed by ACK Date November 14, 2019 Job No. 096161008
 Checked by _____ Date _____ Sheet No. 1 of 1

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Average Rate Equations

Land Use Code - Gasoline/Service Station with Convenience Market (945)

Independant Variable - Vehicle Fueling Positions (X)

Vehicle Fueling Positions= **12** Positions
 X = 12
 T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (900 Series page 369)

Average Weekday Directional Distribution: 51% ent. 49% exit.
 T = 12.47 (X) T = 150 Average Vehicle Trip Ends
 T = 12.47 * 12 76 entering 74 exiting

 76 + 74 = 150

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (900 Series page 370)

Average Weekday Directional Distribution: 51% ent. 49% exit.
 T = 13.99 (X) T = 168 Average Vehicle Trip Ends
 T = 13.99 * 12.000 86 entering 82 exiting

 86 + 82 = 168

Weekday (900 Series page 368)

Average Weekday Directional Distribution: 50% entering, 50% exiting
 T = 205.36 (X) T = 2464 Average Vehicle Trip Ends
 T = 205.36 * 12.000 1232 entering 1232 exiting

 1232 + 1232 = 2464

Non Pass-By Trip Volumes (Per ITE Trip Generation Handbook, 3rd Edition September 2017)

PM Peak Hour = 44% Non-Pass By	AM Peak Hour = 38% Non-Pass By
IN Out Total	
AM Peak 29 28 57	
PM Peak 38 36 74	
Daily 542 542 1084	PM Peak Hour Rate Applied to Daily

Pass-By Trip Volumes (Per ITE Trip Generation Handbook, 3rd Edition September 2017)

PM Peak Hour = 56% Pass By	AM Peak Hour = 62% Pass By
IN Out Total	
AM Peak 47 46 93	
PM Peak 48 46 94	
Daily 690 690 1380	PM Peak Hour Rate Applied to Daily

Project Peak Innovation Park: P-15
 Subject Trip Generation for Fast-Food Restaurant with Drive-Through Window
 Designed by ACK Date November 14, 2019 Job No. 096161008
 Checked by _____ Date _____ Sheet No. 1 of 1

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Average Rate Equations

Land Use Code - Fast Food Restaurant With Drive-Through Window (934)

Independant Variable - 1000 Square Feet Gross Floor Area (X)

Gross Floor Area = **5,000** Square Feet

X = 5.000

T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (900 Series page 158)

Average Weekday		Directional Distribution:	51% ent.	49% exit.
T = 40.19 (X)		T =	201	Average Vehicle Trip Ends
T = 40.19 *	5.000	103	entering	98 exiting
		103	+	98 (*) = 201

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (900 Series page 159)

Average Weekday		Directional Distribution:	52% ent.	48% exit.
T = 32.67 (X)		T =	163	Average Vehicle Trip Ends
T = 32.67 *	5.000	85	entering	78 exiting
		85	+	78 = 163

Weekday (900 Series page 157)

Average Weekday		Directional Distribution:	50% entering,	50% exiting
T = 470.95 (X)		T =	2356	Average Vehicle Trip Ends
T = 470.95 *	5.000	1178	entering	1178 exiting
		1178	+	1178 = 2356

Saturday Peak Hour of Generator (900 Series page 163)

		Directional Distribution:	51% ent.	49% exit.
T = 54.86 (X)		T =	274	Average Vehicle Trip Ends
T = 54.86 *	5.000	140	entering	134 exiting
		140	+	134 = 274

Non Pass-By Trip Volumes (Per ITE Trip Generation Handbook, 3rd Edition September 2017)

AM Peak Hour =	51%	Non-Pass By	PM Peak Hour =	50%	Non-Pass By
	IN	Out	Total		
AM Peak	53	50	103		
PM Peak	43	39	82		
Daily	589	589	1178	PM Peak Hour Rate Applied to Daily	

Pass-By Trip Volumes (Per ITE Trip Generation Handbook, 3rd Edition September 2017)

AM Peak Hour =	49%	Pass By	PM Peak Hour =	50%	Pass By
	IN	Out	Total		
AM Peak	50	48	98		
PM Peak	43	39	82		
Daily	589	589	1178	PM Peak Hour Rate Applied to Daily	

Project Peak Innovation Park: P-16
 Subject Trip Generation for Industrial Park
 Designed by JRP Date November 05, 2019 Job No. 096161008
 Checked by _____ Date _____ Sheet No. 1 of 1

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Average Rate Equations

Land Use Code - Industrial Park (130)

Independant Variable - 1000 Square Feet Gross Floor Feet (X)

Gross Floor Area = **308,000**

X = 308.0

T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (100 Series Page 22)

		Directional Distribution:	81% ent.	19% exit.
T = 0.40 (X)		T = 123	Average Vehicle Trip Ends	
T = 0.40 *	308	100 entering	23	exiting
		100 + 23 =	123	

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (100 Series Page 23)

		Directional Distribution:	21% ent.	79% exit.
T = 0.40 (X)		T = 124	Average Vehicle Trip Ends	
T = 0.40 *	308	26 entering	98	exiting
		26 + 98 =	124	

Weekday (100 Series Page 21)

		Directional Distribution:	50% entering,	50% exiting
T = 3.37 (X)		T = 1038	Average Vehicle Trip Ends	
T = 3.37 *	308	519 entering	519	exiting
		519 + 519 =	1038	



Project Peak Innovation Park: P-17
 Subject Trip Generation for Office Park
 Designed by JRP Date November 06, 2019 Job No. 096161008
 Checked by _____ Date _____ Sheet No. 1 of 1

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Average Rates

Land Use Code - Office Park (750)

Independent Variable - 1000 Square Feet Gross Floor Feet (X)

Gross Floor Area = **76,000**

X = 76.0

T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (700 Series Page 234)

(T) = 1.44 (X)

(T) = 1.44 * (76.0)

Directional Distribution: 89% ent. 11% exit.

T = 109 Average Vehicle Trip Ends

97 entering 12 exiting

97 + 12 = 109

(*) TRIP END WAS CHANGED BY 1 TO SATISFY THE TOTAL

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (700 Series Page 235)

(T) = 1.07 (X)

(T) = 1.07 * (76.0)

Directional Distribution: 7% ent. 93% exit.

T = 81 Average Vehicle Trip Ends

6 entering 75 exiting

6 + 75 = 81

(*) TRIP END WAS CHANGED BY 1 TO SATISFY THE TOTAL

Weekday (700 Series Page 233)

Average Weekday

(T) = 11.07 (X)

(T) = 11.07 * (76.0)

Directional Distribution: 50% ent. 50% exit.

T = 842 Average Vehicle Trip Ends

421 entering 421 exiting

421 + 421 = 842

1 Fill in all cells which are red.

Project Peak Innovation Park: P-18
 Subject Trip Generation for Industrial Park
 Designed by JRP Date November 05, 2019 Job No. 096161008
 Checked by _____ Date _____ Sheet No. 1 of 1

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Average Rate Equations

Land Use Code - Industrial Park (130)

Independant Variable - 1000 Square Feet Gross Floor Feet (X)

Gross Floor Area = **252,000**

X = 252.0

T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (100 Series Page 22)

		Directional Distribution:	81% ent.	19% exit.
T = 0.40 (X)		T = 101	Average Vehicle Trip Ends	
T = 0.40 *	252	82 entering	19	exiting
		82 + 19 =	101	

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (100 Series Page 23)

		Directional Distribution:	21% ent.	79% exit.
T = 0.40 (X)		T = 101	Average Vehicle Trip Ends	
T = 0.40 *	252	21 entering	80	exiting
		21 + 80 =	101	

Weekday (100 Series Page 21)

		Directional Distribution:	50% entering,	50% exiting
T = 3.37 (X)		T = 850	Average Vehicle Trip Ends	
T = 3.37 *	252	425 entering	425	exiting
		425 + 425 =	850	

Peak Innovation Park 2045 Full Buildout Trip Generation Summary

Zone	Land Use	Quantity	Units	Weekday Vehicle Trips						
				Daily	AM Peak Hour			PM Peak Hour		
					In	Out	Total	In	Out	Total
P-1	Business Park (ITE 770)	180,000	Square Feet	2,240	44	28	72	35	41	76
P-2	Business Park (ITE 770)	1,130,000	Square Feet	14,058	276	176	452	217	258	475
P-3	Business Park (ITE 770)	1,170,000	Square Feet	14,556	285	183	468	226	265	491
P-4	Business Park (ITE 770)	40,000	Square Feet	498	10	6	16	8	9	17
	Fast Food Restaurant w/ Drive Thru (ITE 934)	10,000	Square Feet	4,710	205	197	402	170	157	327
	Gas Station w/ Convenience Market (ITE 945)	12	Fueling Positions	2,464	76	74	150	86	82	168
	<i>P-4 Total</i>			<i>7,672</i>	<i>291</i>	<i>277</i>	<i>568</i>	<i>264</i>	<i>248</i>	<i>512</i>
P-5	Hotel (ITE 310)	240	Rooms	2,006	67	46	113	73	71	144
	Business Park (ITE 770)	690,000	Square Feet	8,584	168	108	276	133	157	290
	<i>P-5 Total</i>			<i>10,590</i>	<i>235</i>	<i>154</i>	<i>389</i>	<i>206</i>	<i>228</i>	<i>434</i>
P-6	Office Park (ITE 750)	265,000	Square Feet	2,934	340	42	382	20	264	284
P-7	Office Park (ITE 750)	300,000	Square Feet	3,322	384	48	432	22	299	321
P-8	Office Park (ITE 750)	90,000	Square Feet	998	116	14	130	7	89	96
P-9	Project Rodeo (Client Data)			3,956	644	519	1,163	312	238	550
P-10	Office Park (ITE 750)	1,550,000	Square Feet	17,160	1,986	246	2,232	116	1,543	1,659
P-11	Office Park (ITE 750)	375,000	Square Feet	4,152	481	59	540	28	373	401
P-12	Industrial Park (ITE 130)	405,000	Square Feet	1,366	131	31	162	34	128	162
P-13	Gas Station w/ Convenience Market (ITE 945)	12	Fueling Positions	2,464	76	74	150	86	82	168
P-14	Project Jungle (Client Data)			2,410	222	168	390	171	62	233
P-15	Fast Food Restaurant w/ Drive Thru (ITE 934)	5,000	Square Feet	2,356	103	98	201	85	78	163
P-16	Industrial Park (ITE 130)	770,000	Square Feet	2,596	249	59	308	65	243	308
P-17	Office Park (ITE 750)	190,000	Square Feet	2,104	244	30	274	14	189	203
P-18	Industrial Park (ITE 130)	630,000	Square Feet	2,124	204	48	252	53	199	252
Total Site Generated Trips				97,058	6,311	2,254	8,565	1,961	4,827	6,788



Project Peak Innovation Park: P-1
 Subject Trip Generation for Business Park
 Designed by JRP Date November 06, 2019 Job No. 096161008
 Checked by _____ Date _____ Sheet No. 1 of 1

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Average Rates

Land Use Code - Business Park (770)

Independent Variable - 1000 Square Feet Gross Floor Feet (X)

Gross Floor Area = **180,000**

X = 180.0

T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (700 Series Page 281)

(T) = 0.40 (X)		Directional Distribution:	61% ent.	39% exit.
(T) = 0.40 *	(180.0)	T = 72	Average Vehicle Trip Ends	
		44 entering	28	exiting
		44 + 28 =	72	

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (700 Series Page 282)

(T) = 0.42 (X)		Directional Distribution:	46% ent.	54% exit.
(T) = 0.42 *	(180.0)	T = 76	Average Vehicle Trip Ends	
		35 entering	41	exiting
		35 + 41 =	76	

(*) TRIP END WAS CHANGED BY 1 TO SATISFY THE TOTAL

Weekday (700 Series Page 280)

Average Weekday		Directional Distribution:	50% ent.	50% exit.
(T) = 12.44 (X)		T = 2240	Average Vehicle Trip Ends	
(T) = 12.44 *	(180.0)	1120 entering	1120	exiting
		1120 + 1120 =	2240	



Project Peak Innovation Park: P-2
 Subject Trip Generation for Business Park
 Designed by JRP Date November 06, 2019 Job No. 096161008
 Checked by _____ Date _____ Sheet No. 1 of 1

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Average Rates

Land Use Code - Business Park (770)

Independent Variable - 1000 Square Feet Gross Floor Feet (X)

Gross Floor Area = **1,130,000**

X = 1130.0

T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (700 Series Page 281)

(T) = 0.40 (X)		Directional Distribution:	61% ent.	39% exit.
(T) = 0.40 *	(1130.0)	T =	452	Average Vehicle Trip Ends
			276 entering	176 exiting
			276 +	176 = 452

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (700 Series Page 282)

(T) = 0.42 (X)		Directional Distribution:	46% ent.	54% exit.
(T) = 0.42 *	(1130.0)	T =	475	Average Vehicle Trip Ends
			217 entering	257 exiting
			217 +	258 = 475

Weekday (700 Series Page 280)

Average Weekday		Directional Distribution:	50% ent.	50% exit.
(T) = 12.44 (X)		T =	14058	Average Vehicle Trip Ends
(T) = 12.44 *	(1130.0)		7029 entering	7029 exiting
			7029 +	7029 = 14058



Project Peak Innovation Park: P-3
 Subject Trip Generation for Business Park
 Designed by JRP Date November 06, 2019 Job No. 096161008
 Checked by _____ Date _____ Sheet No. 1 of 1

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Average Rates

Land Use Code - Business Park (770)

Independent Variable - 1000 Square Feet Gross Floor Feet (X)

Gross Floor Area = **1,170,000**

X = 1170.0

T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (700 Series Page 281)

(T) = 0.40 (X)		Directional Distribution:	61% ent.	39% exit.
(T) = 0.40 *	(1170.0)	T =	468	Average Vehicle Trip Ends
			285 entering	183 exiting
			285 +	183 = 468

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (700 Series Page 282)

(T) = 0.42 (X)		Directional Distribution:	46% ent.	54% exit.
(T) = 0.42 *	(1170.0)	T =	491	Average Vehicle Trip Ends
			226 entering	265 exiting
			226 +	265 = 491

(*) TRIP END WAS CHANGED BY 1 TO SATISFY THE TOTAL

Weekday (700 Series Page 280)

Average Weekday		Directional Distribution:	50% ent.	50% exit.
(T) = 12.44 (X)		T =	14556	Average Vehicle Trip Ends
(T) = 12.44 *	(1170.0)		7278 entering	7278 exiting
			7278 +	7278 = 14556



Project Peak Innovation Park: P-4
 Subject Trip Generation for Business Park
 Designed by JRP Date November 06, 2019 Job No. 096161008
 Checked by _____ Date _____ Sheet No. 1 of 1

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Average Rates

Land Use Code - Business Park (770)

Independant Variable - 1000 Square Feet Gross Floor Feet (X)

Gross Floor Area = **40,000**

X = 40.0

T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (700 Series Page 281)

(T) = 0.40 (X)		Directional Distribution:	61% ent.	39% exit.
(T) = 0.40 *	(40.0)	T = 16	Average Vehicle Trip Ends	
		10 entering	6	exiting
		10 + 6	= 16	

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (700 Series Page 282)

(T) = 0.42 (X)		Directional Distribution:	46% ent.	54% exit.
(T) = 0.42 *	(40.0)	T = 17	Average Vehicle Trip Ends	
		8 entering	9	exiting
		8 + 9	= 17	

Weekday (700 Series Page 280)

Average Weekday		Directional Distribution:	50% ent.	50% exit.
(T) = 12.44 (X)		T = 498	Average Vehicle Trip Ends	
(T) = 12.44 *	(40.0)	249 entering	249	exiting
		249 + 249	= 498	

Project Peak Innovation Park: P-4
 Subject Trip Generation for Fast-Food Restaurant with Drive-Through Window
 Designed by ACK Date November 14, 2019 Job No. 096161008
 Checked by _____ Date _____ Sheet No. 1 of 1

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Average Rate Equations

Land Use Code - Fast Food Restaurant With Drive-Through Window (934)

Independent Variable - 1000 Square Feet Gross Floor Area (X)

Gross Floor Area = **10,000** Square Feet

X = 10.000

T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (900 Series page 158)

Average Weekday		Directional Distribution:	51% ent.	49% exit.
T = 40.19 (X)		T = 402	Average Vehicle Trip Ends	
T = 40.19 *	10.000	205 entering	197	exiting
		205 + 197 =	402	

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (900 Series page 159)

Average Weekday		Directional Distribution:	52% ent.	48% exit.
T = 32.67 (X)		T = 327	Average Vehicle Trip Ends	
T = 32.67 *	10.000	170 entering	157	exiting
		170 + 157 =	327	

Weekday (900 Series page 157)

Average Weekday		Directional Distribution:	50% entering, 50% exiting	
T = 470.95 (X)		T = 4710	Average Vehicle Trip Ends	
T = 470.95 *	10.000	2355 entering	2355	exiting
		2355 + 2355 =	4710	

Saturday Peak Hour of Generator (900 Series page 163)

		Directional Distribution:	51% ent.	49% exit.
T = 54.86 (X)		T = 549	Average Vehicle Trip Ends	
T = 54.86 *	10.000	280 entering	269	exiting
		280 + 269 =	549	

Non Pass-By Trip Volumes (Per ITE Trip Generation Handbook, 3rd Edition September 2017)

AM Peak Hour =	51%	Non-Pass By	PM Peak Hour =	50%	Non-Pass By
	IN	Out	Total		
AM Peak	105	100	205		
PM Peak	85	79	164		
Daily	1178	1178	2356		PM Peak Hour Rate Applied to Daily

Pass-By Trip Volumes (Per ITE Trip Generation Handbook, 3rd Edition September 2017)

AM Peak Hour =	49%	Pass By	PM Peak Hour =	50%	Pass By
	IN	Out	Total		
AM Peak	100	97	197		
PM Peak	85	79	164		
Daily	1177	1177	2354		PM Peak Hour Rate Applied to Daily

Project Peal Peak Innovation Park: P-4
 Subject Trip Generation for Gasoline/Service Station with Convenience Market
 Designed by ACK Date November 14, 2019 Job No. 096161008
 Checked by _____ Date _____ Sheet No. 1 of 1

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Average Rate Equations

Land Use Code - Gasoline/Service Station with Convenience Market (945)

Independant Variable - Vehicle Fueling Positions (X)

Vehicle Fueling Positions= **12** Positions
 X = 12
 T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (900 Series page 369)

Average Weekday Directional Distribution: 51% ent. 49% exit.
 T = 12.47 (X) T = 150 Average Vehicle Trip Ends
 T = 12.47 * 12 76 entering 74 exiting
 76 + 74 = 150

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (900 Series page 370)

Average Weekday Directional Distribution: 51% ent. 49% exit.
 T = 13.99 (X) T = 168 Average Vehicle Trip Ends
 T = 13.99 * 12.000 86 entering 82 exiting
 86 + 82 = 168

Weekday (900 Series page 368)

Average Weekday Directional Distribution: 50% entering, 50% exiting
 T = 205.36 (X) T = 2464 Average Vehicle Trip Ends
 T = 205.36 * 12.000 1232 entering 1232 exiting
 1232 + 1232 = 2464

Non Pass-By Trip Volumes (Per ITE Trip Generation Handbook, 3rd Edition September 2017)

PM Peak Hour = 44% Non-Pass By	AM Peak Hour = 38% Non-Pass By
IN Out Total	
AM Peak 29 28 57	
PM Peak 38 36 74	
Daily 542 542 1084	PM Peak Hour Rate Applied to Daily

Pass-By Trip Volumes (Per ITE Trip Generation Handbook, 3rd Edition September 2017)

PM Peak Hour = 56% Pass By	AM Peak Hour = 62% Pass By
IN Out Total	
AM Peak 47 46 93	
PM Peak 48 46 94	
Daily 690 690 1380	PM Peak Hour Rate Applied to Daily

Project Peak Innovation Park: P-5
 Subject Trip Generation for Hotel
 Designed by JRP Date January 20, 2020 Job No. 096161008
 Checked by _____ Sheet No. 1 of 1

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Average Rate Equations

Land Use Code -Hotel (310)

Independent Variable - Rooms (X)

$$X = 240$$

T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (Series 300 Page 3)

(T) = 0.47 (X)		Directional Distribution:	59% ent.	41% exit.
(T) = 0.47 *	(240.0)	T =	113	Average Vehicle Trip Ends
		67	entering	46 exiting
		67	+	46 = 113

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (Series 300 Page 4)

T = 0.60 X		Directional Distribution:	51% ent.	49% exit.
T = 0.60 *	240	T =	144	Average Vehicle Trip Ends
		73	entering	71 exiting
		73	+	71 = 144

Weekday (Series 300 Page 2)

Average Weekday		Directional Distribution:	50% entering,	50% exiting
(T) = 8.36 (X)		T =	2006	Average Vehicle Trip Ends
(T) = 8.36 *	(240.0)	1003	entering	1003 exiting
		1003	+	1003 = 2006

Saturday (300 Series Page 7)

T = 8.19 X		Directional Distribution:	50% ent.	50% exit.
T = 8.19 *	240	T =	1966	Average Vehicle Trip Ends
		983	entering	983 exiting
		983	+	983 = 1966

Saturday Peak Hour of Generator (300 Series Page 8)

Average Weekday		Directional Distribution:	56% entering,	44% exiting
(T) = 0.72 (X)		T =	172	Average Vehicle Trip Ends
(T) = 0.72 *	(240.0)	86	entering	86 exiting
		86	+	86 = 172



Project Peak Innovation Park: P-5
 Subject Trip Generation for Business Park
 Designed by JRP Date November 06, 2019 Job No. 096161008
 Checked by _____ Date _____ Sheet No. 1 of 1

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Average Rates

Land Use Code - Business Park (770)

Independent Variable - 1000 Square Feet Gross Floor Feet (X)

Gross Floor Area = **690,000**

X = 690.0

T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (700 Series Page 281)

(T) = 0.40 (X)		Directional Distribution:	61% ent.	39% exit.
(T) = 0.40 *	(690.0)	T =	276	Average Vehicle Trip Ends
			168 entering	108 exiting
			168 +	108 = 276

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (700 Series Page 282)

(T) = 0.42 (X)		Directional Distribution:	46% ent.	54% exit.
(T) = 0.42 *	(690.0)	T =	290	Average Vehicle Trip Ends
			133 entering	157 exiting
			133 +	157 = 290

Weekday (700 Series Page 280)

Average Weekday		Directional Distribution:	50% ent.	50% exit.
(T) = 12.44 (X)		T =	8584	Average Vehicle Trip Ends
(T) = 12.44 *	(690.0)		4292 entering	4292 exiting
			4292 +	4292 = 8584



Project Peak Innovation Park: P-6
 Subject Trip Generation for Office Park
 Designed by JRP Date November 06, 2019 Job No. 096161008
 Checked by _____ Date _____ Sheet No. 1 of 1

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Average Rates

Land Use Code - Office Park (750)

Independant Variable - 1000 Square Feet Gross Floor Feet (X)

Gross Floor Area = **265,000**

X = 265.0

T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (700 Series Page 234)

(T) = 1.44 (X)		Directional Distribution:	89% ent.	11% exit.
(T) = 1.44 *	(265.0)	T =	382	Average Vehicle Trip Ends
			340 entering	42 exiting
			340 +	42 = 382

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (700 Series Page 235)

(T) = 1.07 (X)		Directional Distribution:	7% ent.	93% exit.
(T) = 1.07 *	(265.0)	T =	284	Average Vehicle Trip Ends
			20 entering	264 exiting
			20 +	264 = 284

(*) TRIP END WAS CHANGED BY 1 TO SATISFY THE TOTAL

Weekday (700 Series Page 233)

Average Weekday		Directional Distribution:	50% ent.	50% exit.
(T) = 11.07 (X)		T =	2934	Average Vehicle Trip Ends
(T) = 11.07 *	(265.0)		1467 entering	1467 exiting
			1467 +	1467 = 2934

1 Fill in all cells which are red.



Project Peak Innovation Park: P-7
 Subject Trip Generation for Office Park
 Designed by JRP Date November 06, 2019 Job No. 096161008
 Checked by _____ Date _____ Sheet No. 1 of 1

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Average Rates

Land Use Code - Office Park (750)

Independant Variable - 1000 Square Feet Gross Floor Feet (X)

Gross Floor Area = 300,000

X = 300.0

T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (700 Series Page 234)

(T) = 1.44 (X)		Directional Distribution:	89% ent.	11% exit.
(T) = 1.44 *	(300.0)	T =	432	Average Vehicle Trip Ends
			384 entering	48 exiting
			384 +	48 = 432

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (700 Series Page 235)

(T) = 1.07 (X)		Directional Distribution:	7% ent.	93% exit.
(T) = 1.07 *	(300.0)	T =	321	Average Vehicle Trip Ends
			22 entering	299 exiting
			22 +	299 = 321

Weekday (700 Series Page 233)

Average Weekday		Directional Distribution:	50% ent.	50% exit.
(T) = 11.07 (X)		T =	3322	Average Vehicle Trip Ends
(T) = 11.07 *	(300.0)		1661 entering	1661 exiting
			1661 +	1661 = 3322

1 Fill in all cells which are red.



Project Peak Innovation Park: P-8
 Subject Trip Generation for Office Park
 Designed by JRP Date November 06, 2019 Job No. 096161008
 Checked by _____ Date _____ Sheet No. 1 of 1

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Average Rates

Land Use Code - Office Park (750)

Independant Variable - 1000 Square Feet Gross Floor Feet (X)

Gross Floor Area = **90,000**

X = 90.0

T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (700 Series Page 234)

(T) = 1.44 (X)		Directional Distribution:	89% ent.	11% exit.
(T) = 1.44 *	(90.0)	T = 130	Average Vehicle Trip Ends	
		116 entering	14	exiting
		116 + 14 = 130		

(*) TRIP END WAS CHANGED BY 1 TO SATISFY THE TOTAL

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (700 Series Page 235)

(T) = 1.07 (X)		Directional Distribution:	7% ent.	93% exit.
(T) = 1.07 *	(90.0)	T = 96	Average Vehicle Trip Ends	
		7 entering	89	exiting
		7 + 89 = 96		

Weekday (700 Series Page 233)

Average Weekday		Directional Distribution:	50% ent.	50% exit.
(T) = 11.07 (X)		T = 998	Average Vehicle Trip Ends	
(T) = 11.07 *	(90.0)	499 entering	499	exiting
		499 + 499 = 998		

1 Fill in all cells which are red.

AR Sortable 640K FC

TRAFFIC DATA FOR ENTITLEMENT USE

Headcount

	Total	IB/OB Split
Headcount - Day Shift	1120	560
Headcount Night Shift	1022	511

Shift Structure

	Start	End
Day Shift Inbound	7:00:00 AM	5:30:00 PM
Day Shift Outbound	7:30:00 AM	6:00:00 PM
Night Shift Inbound	6:00:00 PM	6:30:00 AM
Night Shift Outbound	6:30:00 PM	7:00:00 AM

Adjustment below accounts for mass transit and carpool users.
Adjust as needed for jurisdiction
Net Cars Factor 81%

Traffic Schedule

Cars				Trucks				Total Vehicles			
Average Weekday - Non-Peak				Average Weekday - Non-Peak				Cars + Trucks Average Weekday			
Time	In	Out	Total	Time	In	Out	Total	In	Out	Total	
00:00	4	7	11	00:00	9	9	18	00:00	12	15	27
01:00	2	4	6	01:00	15	15	30	01:00	17	18	35
02:00	6	15	21	02:00	6	6	12	02:00	11	18	29
03:00	9	15	24	03:00	12	12	24	03:00	19	24	43
04:00	20	32	52	04:00	6	6	12	04:00	22	32	54
05:00	42	54	96	05:00	9	9	18	05:00	43	53	96
06:00	32	14	46	06:00	2	2	4	06:00	28	13	41
06:15	84	13	97	06:15	2	2	4	06:15	70	13	83
06:30	145	67	212	06:30	2	2	4	06:30	119	56	176
06:45	195	111	306	06:45	2	2	4	06:45	160	92	252
07:00	192	185	377	07:00	3	3	6	07:00	159	153	311
07:15	250	265	515	07:15	3	3	6	07:15	206	218	423
07:30	37	76	113	07:30	3	3	6	07:30	33	65	98
07:45	8	17	25	07:45	3	3	6	07:45	9	17	26
08:00	29	20	49	08:00	12	12	24	08:00	35	28	64
09:00	19	11	30	09:00	21	21	42	09:00	36	30	66
10:00	23	19	42	10:00	12	12	24	10:00	31	27	58
11:00	44	46	90	11:00	13	13	26	11:00	49	50	99
12:00	12	20	32	12:00	13	13	26	12:00	23	29	52
13:00	15	16	31	13:00	8	8	16	13:00	20	21	41
14:00	13	29	42	14:00	8	8	16	14:00	19	31	50
15:00	34	43	77	15:00	8	8	16	15:00	36	43	78
16:00	51	37	88	16:00	9	9	18	16:00	50	39	89
17:00	30	37	67	17:00	2	2	4	17:00	26	32	58
17:15	57	17	74	17:15	2	2	4	17:15	48	16	64
17:30	126	146	272	17:30	2	2	4	17:30	104	120	224
17:45	163	84	247	17:45	2	2	4	17:45	134	70	204
18:00	204	281	485	18:00	2	2	4	18:00	167	230	397
18:15	197	190	387	18:15	2	2	4	18:15	162	156	317
18:30	26	127	153	18:30	2	2	4	18:30	23	105	128
18:45	6	47	53	18:45	2	2	4	18:45	7	40	47
19:00	21	40	61	19:00	7	7	14	19:00	24	39	63
20:00	9	9	18	20:00	11	11	22	20:00	18	18	37
21:00	17	17	34	21:00	8	8	16	21:00	22	22	44
22:00	20	24	44	22:00	11	11	22	22:00	27	30	58
23:00	3	6	9	23:00	8	8	16	23:00	10	13	23
	2,142	2,142	4,286		242	242	484		1,979	1,976	3,956

Peak Innovation Park:
P9 Project Rodeo Trip Generation Summary

Morning Peak Hour of Generator/Adjacent Street			
	Enter	Exit	Total
06:30-07:30	644	519	1,163
06:30	119	56	175
06:45	160	92	252
07:00	159	153	312
07:15	206	218	424

Afternoon Peak Hour of Adjacent Street			
	Enter	Exit	Total
17:00-18:00	312	238	550
17:00	26	32	58
17:15	48	16	64
17:30	104	120	224
17:45	134	70	204

Evening Peak Hour of Generator			
	Enter	Exit	Total
17:30-18:30	567	576	1,143
17:30	104	120	224
17:45	134	70	204
18:00	167	230	397
18:15	162	156	318



Project Peak Innovation Park: P-10
 Subject Trip Generation for Office Park
 Designed by JRP Date November 06, 2019 Job No. 096161008
 Checked by _____ Date _____ Sheet No. 1 of 1

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Average Rates

Land Use Code - Office Park (750)

Independant Variable - 1000 Square Feet Gross Floor Feet (X)

Gross Floor Area = **1,550,000**

X = 1550.0

T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (700 Series Page 234)

(T) = 1.44 (X)		Directional Distribution:	89% ent.	11% exit.
(T) = 1.44 *	(1550.0)	T =	2232	Average Vehicle Trip Ends
			1986 entering	246 exiting
			1986 +	246 = 2232

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (700 Series Page 235)

(T) = 1.07 (X)		Directional Distribution:	7% ent.	93% exit.
(T) = 1.07 *	(1550.0)	T =	1659	Average Vehicle Trip Ends
			116 entering	1543 exiting
			116 +	1543 = 1659

(*) TRIP END WAS CHANGED BY 1 TO SATISFY THE TOTAL

Weekday (700 Series Page 233)

Average Weekday		Directional Distribution:	50% ent.	50% exit.
(T) = 11.07 (X)		T =	17160	Average Vehicle Trip Ends
(T) = 11.07 *	(1550.0)		8580 entering	8580 exiting
			8580 +	8580 = 17160

1 Fill in all cells which are red.



Project Peak Innovation Park: P-11
 Subject Trip Generation for Office Park
 Designed by JRP Date November 06, 2019 Job No. 096161008
 Checked by _____ Date _____ Sheet No. 1 of 1

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Average Rates

Land Use Code - Office Park (750)

Independent Variable - 1000 Square Feet Gross Floor Feet (X)

Gross Floor Area = **375,000**

X = 375.0

T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (700 Series Page 234)

(T) = 1.44 (X)

(T) = 1.44 * (375.0)

Directional Distribution: 89% ent. 11% exit.

T = 540 Average Vehicle Trip Ends

481 entering 59 exiting

481 + 59 = 540

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (700 Series Page 235)

(T) = 1.07 (X)

(T) = 1.07 * (375.0)

Directional Distribution: 7% ent. 93% exit.

T = 401 Average Vehicle Trip Ends

28 entering 373 exiting

28 + 373 = 401

Weekday (700 Series Page 233)

Average Weekday

(T) = 11.07 (X)

(T) = 11.07 * (375.0)

Directional Distribution: 50% ent. 50% exit.

T = 4152 Average Vehicle Trip Ends

2076 entering 2076 exiting

2076 + 2076 = 4152

1 Fill in all cells which are red.

Project Peak Innovation Park: P-12
 Subject Trip Generation for Industrial Park
 Designed by JRP Date November 05, 2019 Job No. 096161008
 Checked by _____ Date _____ Sheet No. 1 of 1

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Average Rate Equations

Land Use Code - Industrial Park (130)

Independent Variable - 1000 Square Feet Gross Floor Feet (X)

Gross Floor Area = **405,000**

X = 405.0

T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (100 Series Page 22)

		Directional Distribution:	81% ent.	19% exit.
T = 0.40 (X)		T =	162	Average Vehicle Trip Ends
T = 0.40 *	405	131 entering	31 exiting	
		131 + 31 =	162	

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (100 Series Page 23)

		Directional Distribution:	21% ent.	79% exit.
T = 0.40 (X)		T =	162	Average Vehicle Trip Ends
T = 0.40 *	405	34 entering	128 exiting	
		34 + 128 =	162	

Weekday (100 Series Page 21)

		Directional Distribution:	50% entering,	50% exiting
T = 3.37 (X)		T =	1366	Average Vehicle Trip Ends
T = 3.37 *	405	683 entering	683 exiting	
		683 + 683 =	1366	

Project Peak Innovation Park: P-13
 Subject Trip Generation for Gasoline/Service Station with Convenience Market
 Designed by ACK Date November 14, 2019 Job No. 096161008
 Checked by _____ Date _____ Sheet No. 1 of 1

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Average Rate Equations

Land Use Code - Gasoline/Service Station with Convenience Market (945)

Independant Variable - Vehicle Fueling Positions (X)

Vehicle Fueling Positions= **12** Positions
 X = 12
 T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (900 Series page 369)

Average Weekday	Directional Distribution:	51% ent.	49% exit.
T = 12.47 (X)	T = 150	Average Vehicle Trip Ends	
T = 12.47 * 12	76 entering	74	exiting
	76 + 74 = 150		

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (900 Series page 370)

Average Weekday	Directional Distribution:	51% ent.	49% exit.
T = 13.99 (X)	T = 168	Average Vehicle Trip Ends	
T = 13.99 * 12.000	86 entering	82	exiting
	86 + 82 = 168		

Weekday (900 Series page 368)

Average Weekday	Directional Distribution:	50% entering, 50% exiting	
T = 205.36 (X)	T = 2464	Average Vehicle Trip Ends	
T = 205.36 * 12.000	1232 entering	1232	exiting
	1232 + 1232 = 2464		

Non Pass-By Trip Volumes (Per ITE Trip Generation Handbook, 3rd Edition September 2017)

PM Peak Hour = 44% Non-Pass By	AM Peak Hour = 38% Non-Pass By
IN Out Total	
AM Peak 29 28 57	
PM Peak 38 36 74	
Daily 542 542 1084	PM Peak Hour Rate Applied to Daily

Pass-By Trip Volumes (Per ITE Trip Generation Handbook, 3rd Edition September 2017)

PM Peak Hour = 56% Pass By	AM Peak Hour = 62% Pass By
IN Out Total	
AM Peak 47 46 93	
PM Peak 48 46 94	
Daily 690 690 1380	PM Peak Hour Rate Applied to Daily

Project Peak Innovation Park: P-15
 Subject Trip Generation for Fast-Food Restaurant with Drive-Through Window
 Designed by ACK Date November 14, 2019 Job No. 096161008
 Checked by _____ Date _____ Sheet No. 1 of 1

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Average Rate Equations

Land Use Code - Fast Food Restaurant With Drive-Through Window (934)

Independant Variable - 1000 Square Feet Gross Floor Area (X)

Gross Floor Area = **5,000** Square Feet

X = 5.000

T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (900 Series page 158)

Average Weekday		Directional Distribution:	51% ent.	49% exit.
T = 40.19 (X)		T =	201	Average Vehicle Trip Ends
T = 40.19 *	5.000	103	entering	98 exiting
		103	+	98 (*) = 201

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (900 Series page 159)

Average Weekday		Directional Distribution:	52% ent.	48% exit.
T = 32.67 (X)		T =	163	Average Vehicle Trip Ends
T = 32.67 *	5.000	85	entering	78 exiting
		85	+	78 = 163

Weekday (900 Series page 157)

Average Weekday		Directional Distribution:	50% entering,	50% exiting
T = 470.95 (X)		T =	2356	Average Vehicle Trip Ends
T = 470.95 *	5.000	1178	entering	1178 exiting
		1178	+	1178 = 2356

Saturday Peak Hour of Generator (900 Series page 163)

		Directional Distribution:	51% ent.	49% exit.
T = 54.86 (X)		T =	274	Average Vehicle Trip Ends
T = 54.86 *	5.000	140	entering	134 exiting
		140	+	134 = 274

Non Pass-By Trip Volumes (Per ITE Trip Generation Handbook, 3rd Edition September 2017)

AM Peak Hour =	51%	Non-Pass By	PM Peak Hour =	50%	Non-Pass By
	IN	Out	Total		
AM Peak	53	50	103		
PM Peak	43	39	82		
Daily	589	589	1178	PM Peak Hour Rate Applied to Daily	

Pass-By Trip Volumes (Per ITE Trip Generation Handbook, 3rd Edition September 2017)

AM Peak Hour =	49%	Pass By	PM Peak Hour =	50%	Pass By
	IN	Out	Total		
AM Peak	50	48	98		
PM Peak	43	39	82		
Daily	589	589	1178	PM Peak Hour Rate Applied to Daily	

Project Peak Innovation Park: P-16
 Subject Trip Generation for Industrial Park
 Designed by JRP Date November 05, 2019 Job No. 096161008
 Checked by _____ Date _____ Sheet No. 1 of 1

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Average Rate Equations

Land Use Code - Industrial Park (130)

Independent Variable - 1000 Square Feet Gross Floor Feet (X)

Gross Floor Area = **770,000**

X = 770.0

T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (100 Series Page 22)

		Directional Distribution:	81% ent.	19% exit.
T = 0.40 (X)		T = 308	Average Vehicle Trip Ends	
T = 0.40 *	770	249 entering	59	exiting
		249 + 59 =	308	

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (100 Series Page 23)

		Directional Distribution:	21% ent.	79% exit.
T = 0.40 (X)		T = 308	Average Vehicle Trip Ends	
T = 0.40 *	770	65 entering	243	exiting
		65 + 243 =	308	

Weekday (100 Series Page 21)

		Directional Distribution:	50% entering,	50% exiting
T = 3.37 (X)		T = 2596	Average Vehicle Trip Ends	
T = 3.37 *	770	1298 entering	1298	exiting
		1298 + 1298 =	2596	



Project Peak Innovation Park: P-17
 Subject Trip Generation for Office Park
 Designed by JRP Date November 06, 2019 Job No. 096161008
 Checked by _____ Date _____ Sheet No. 1 of 1

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Average Rates

Land Use Code - Office Park (750)

Independent Variable - 1000 Square Feet Gross Floor Feet (X)

Gross Floor Area = **190,000**

X = 190.0

T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (700 Series Page 234)

(T) = 1.44 (X)

(T) = 1.44 * (190.0)

Directional Distribution: 89% ent. 11% exit.

T = 274 Average Vehicle Trip Ends

244 entering 30 exiting

244 + 30 = 274

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (700 Series Page 235)

(T) = 1.07 (X)

(T) = 1.07 * (190.0)

Directional Distribution: 7% ent. 93% exit.

T = 203 Average Vehicle Trip Ends

14 entering 189 exiting

14 + 189 = 203

Weekday (700 Series Page 233)

Average Weekday

(T) = 11.07 (X)

(T) = 11.07 * (190.0)

Directional Distribution: 50% ent. 50% exit.

T = 2104 Average Vehicle Trip Ends

1052 entering 1052 exiting

1052 + 1052 = 2104

1 Fill in all cells which are red.

Project Peak Innovation Park: P-18
 Subject Trip Generation for Industrial Park
 Designed by JRP Date November 05, 2019 Job No. 096161008
 Checked by _____ Date _____ Sheet No. 1 of 1

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Average Rate Equations

Land Use Code - Industrial Park (130)

Independent Variable - 1000 Square Feet Gross Floor Feet (X)

Gross Floor Area = **630,000**

X = 630.0

T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (100 Series Page 22)

		Directional Distribution:	81% ent.	19% exit.
T = 0.40 (X)		T = 252	Average Vehicle Trip Ends	
T = 0.40 *	630	204 entering	48	exiting
		204 + 48 =	252	

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (100 Series Page 23)

		Directional Distribution:	21% ent.	79% exit.
T = 0.40 (X)		T = 252	Average Vehicle Trip Ends	
T = 0.40 *	630	53 entering	199	exiting
		53 + 199 =	252	

Weekday (100 Series Page 21)

		Directional Distribution:	50% entering,	50% exiting
T = 3.37 (X)		T = 2124	Average Vehicle Trip Ends	
T = 3.37 *	630	1062 entering	1062	exiting
		1062 + 1062 =	2124	

Truck Percentage Calculations - Peak Innovation Park

Trip Gen Totals:	SF/Rooms	SF/1000	Daily	AM Peak			PM Peak		
				In	Out	Total	In	Out	Total
Business Park	3,210,000	3,210	39,936	783	501	1,284	619	730	1,349
Office Park	2,770,000	2,770	30,670	3,551	439	3,990	207	2,757	2,964
Industrial Park	1,805,000	1,805	6,086	584	138	722	152	570	722
Fast Food	15,000	15	7,066	308	295	603	255	235	490
Gas Station	6,000	6	4,928	152	148	300	172	164	336
Hotel	240	240	2,006	67	46	113	73	71	144
Amazon	-	-	6,366	866	687	1,553	483	300	783
Total			97,058	6,311	2,254	8,565	1,961	4,827	6,788

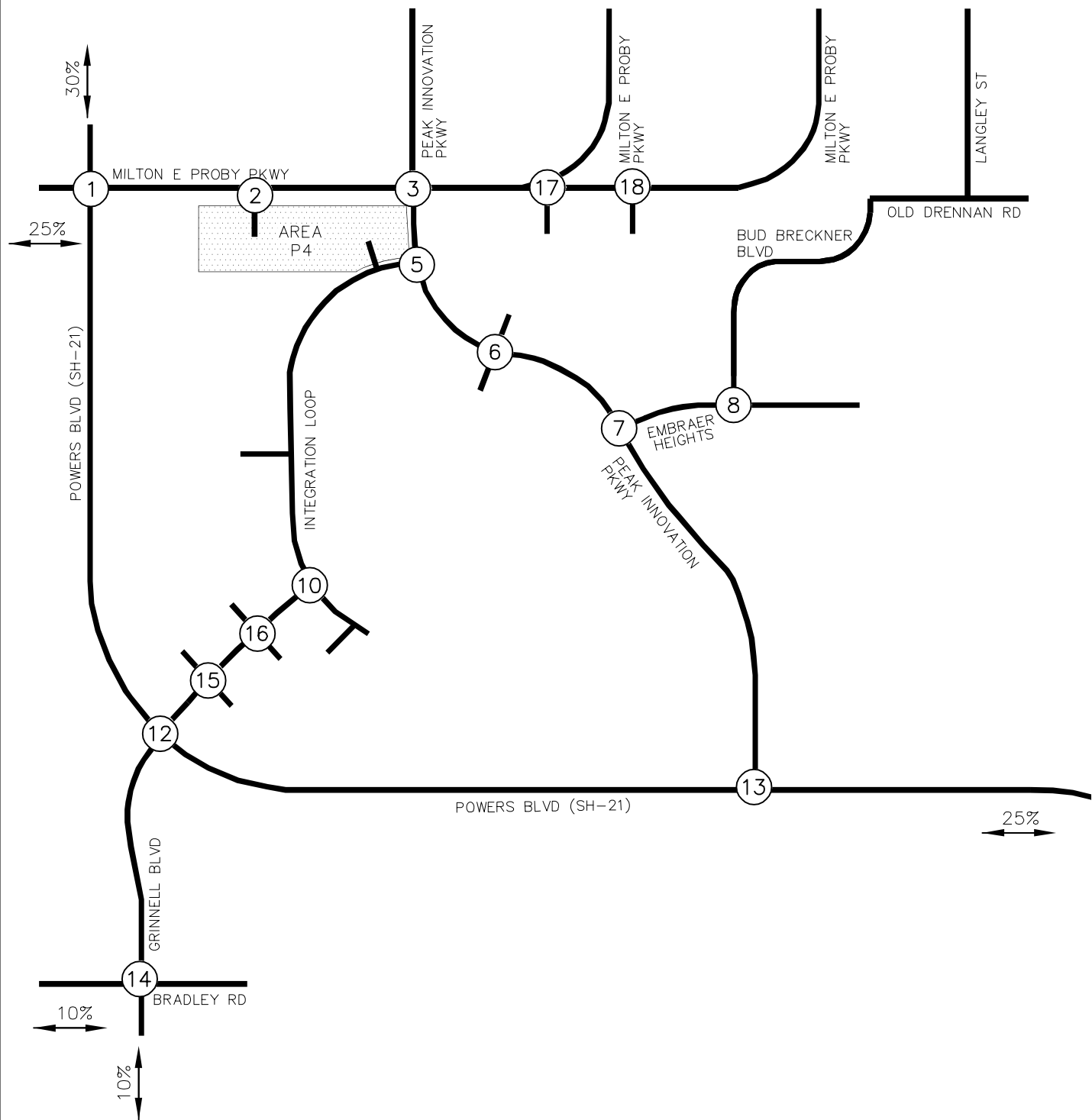
Truck Rates:	Daily			AM Total			PM Total
Business Park	0.12			0.01			0.01
Office Park	0.12			0.01			0.01
Industrial Park	0.57			0.04			0.04
Fast Food	1.89			0.29			0.06
Gas Station	4.38			0.84			0.13
Hotel	0.15			0.01			0.01
Amazon	-			-			-

Truck Trip Gen	Daily			AM Total			PM Total
Business Park	386			33			33
Office Park	333			28			28
Industrial Park	1029			73			73
Fast Food	29			5			1
Gas Station	27			6			1
Hotel	36			3			3
Amazon	484			20			16
Total Trucks	1840			148			139
Total Truck %'s	1.90%			1.73%			2.05%

Individual Truck %'s	Daily			AM Total			PM Total
Business Park	0.97%			2.57%			2.45%
Office Park	1.09%			0.70%			0.94%
Industrial Park	16.91%			10.11%			10.11%
Fast Food	0.41%			0.83%			0.20%
Gas Station	0.55%			2.00%			0.30%
Hotel	1.79%			2.65%			2.08%
Amazon	7.60%			1.29%			2.04%

APPENDIX D

Trip Distribution Figures



MILTON E PROBY PKWY / POWERS BLVD (SH-21) 1		MILTON E PROBY PKWY / RIRO ACCESS 2		MILTON E PROBY PKWY / PEAK INNOVATION PKWY 3		PEAK INNOVATION PKWY / INTEGRATION LOOP 5	
30(0) →	20(0) →	80(0) →	0(5) →	0(5) →	0(55) →	0(15) →	10(0) →
← 30(0)	← 0(30)	← 0(60)					
← 0(30)							
PEAK INNOVATION PKWY / ACCESS 6		PEAK INNOVATION PKWY / EMBRAER HEIGHTS 7		EMBRAER HEIGHTS / BUD BRECKNER BLVD 8		GRINNELL BLVD / INTEGRATION LOOP 10	
0(20) →			10(0) →			10(0) →	
← 10(0)			← 0(20)			← 0(20)	
POWERS BLVD (SH-21) / GRINNELL BLVD 12		PEAK INNOVATION PKWY / POWERS BLVD (SH-21) 13		BRADLEY RD / GRINNELL BLVD 14		GRINNELL BLVD / SOUTH ACCESS 15	
10(0) →	10(0) →			10(0) →	10(0) →	10(0) →	
← 10(0)	← 10(0)	← 0(20)	← 10(0)	← 0(10)	← 0(10)		← 0(20)
← 0(20)							
GRINNELL BLVD / NORTH ACCESS 16		MILTON E PROBY WEST RIRO ACCESS 17		MILTON E PROBY EAST RIRO ACCESS 18			
10(0) →							
← 0(20)							

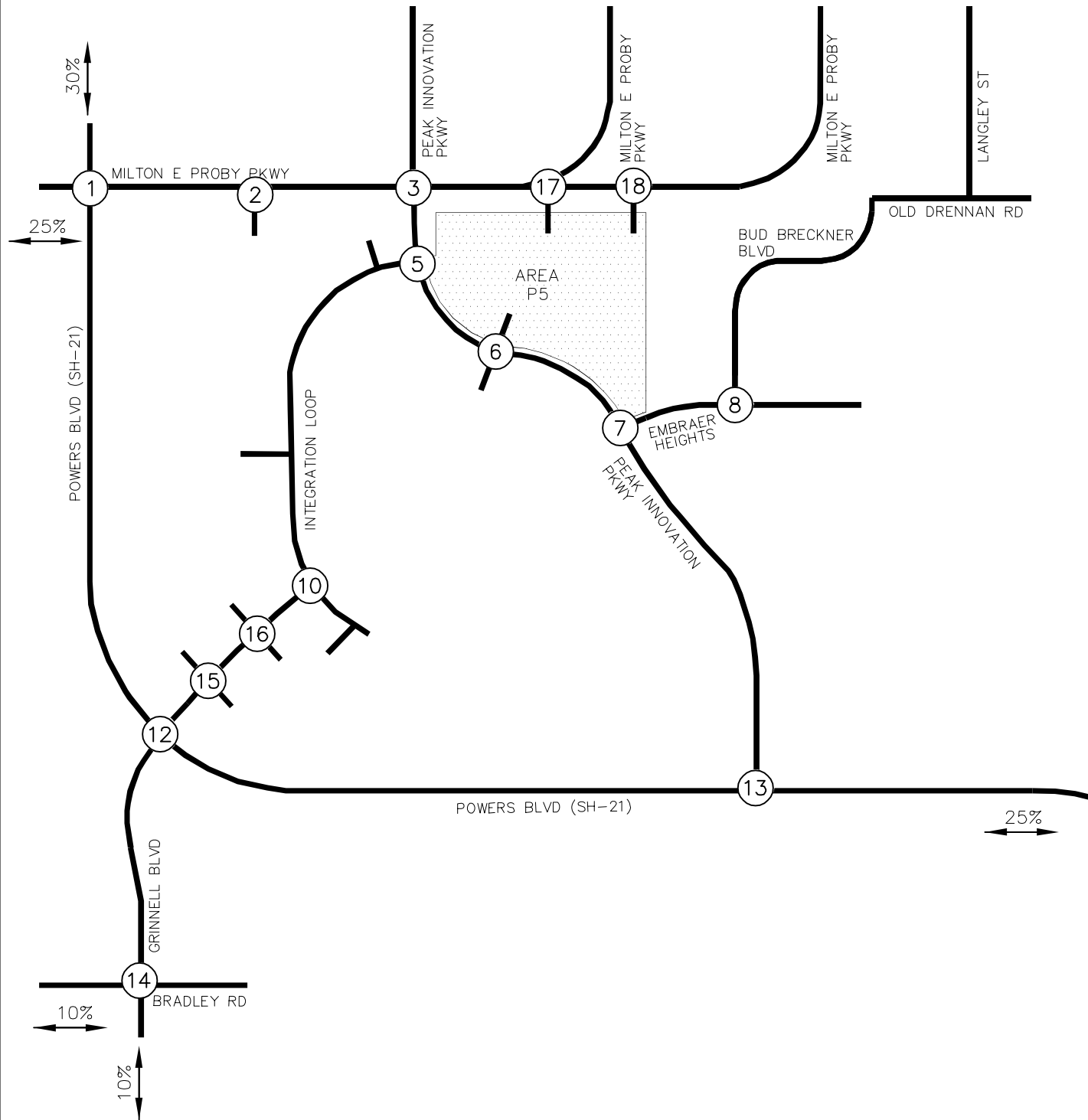
LEGEND

(X) Study Area Key Intersection

XX%(XX%) Entering(Exiting) Project Trip Distribution Percentage

PEAK INNOVATION PARK
 2022 PROJECT TRIP DISTRIBUTION (AREA P4)

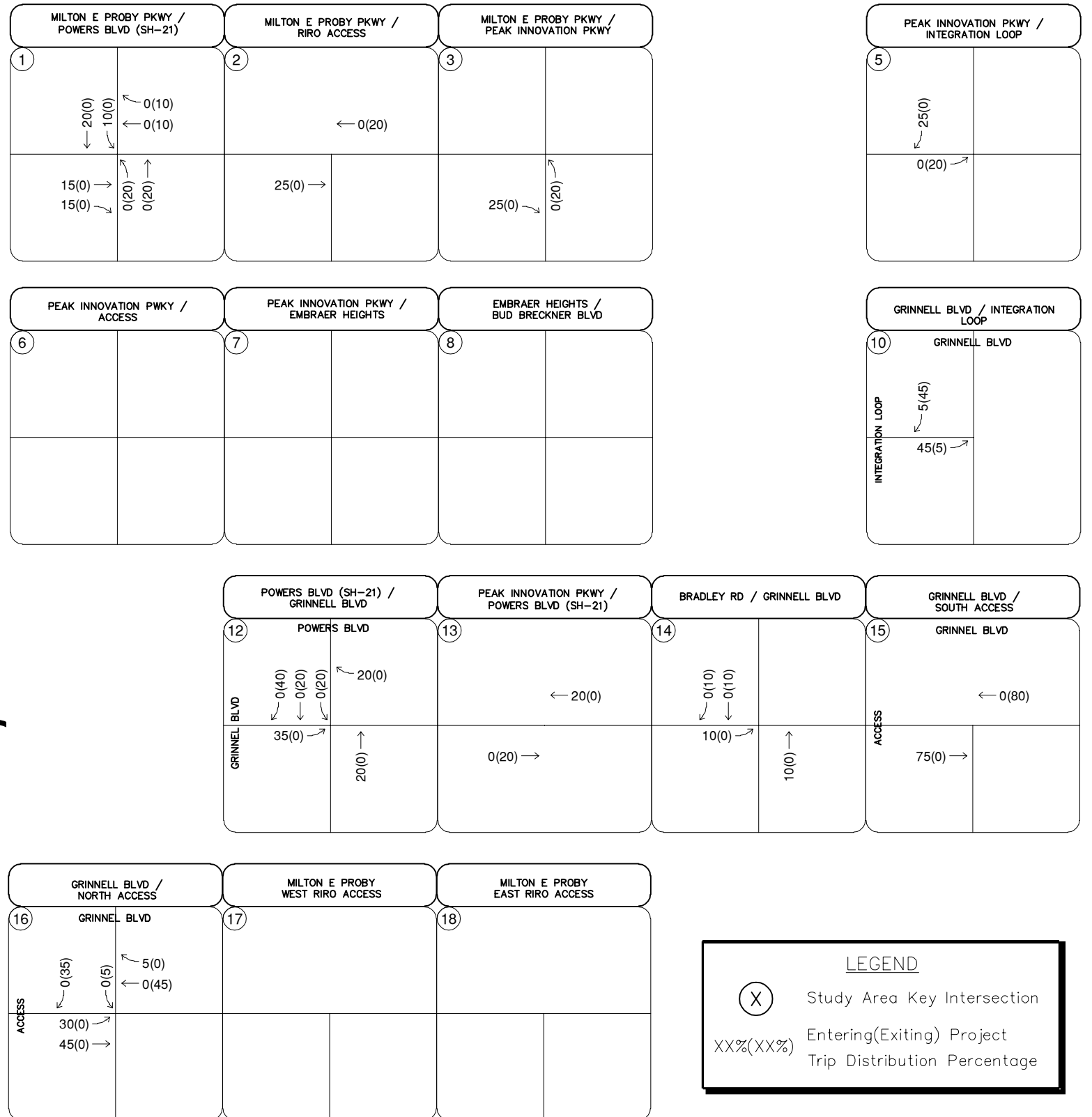
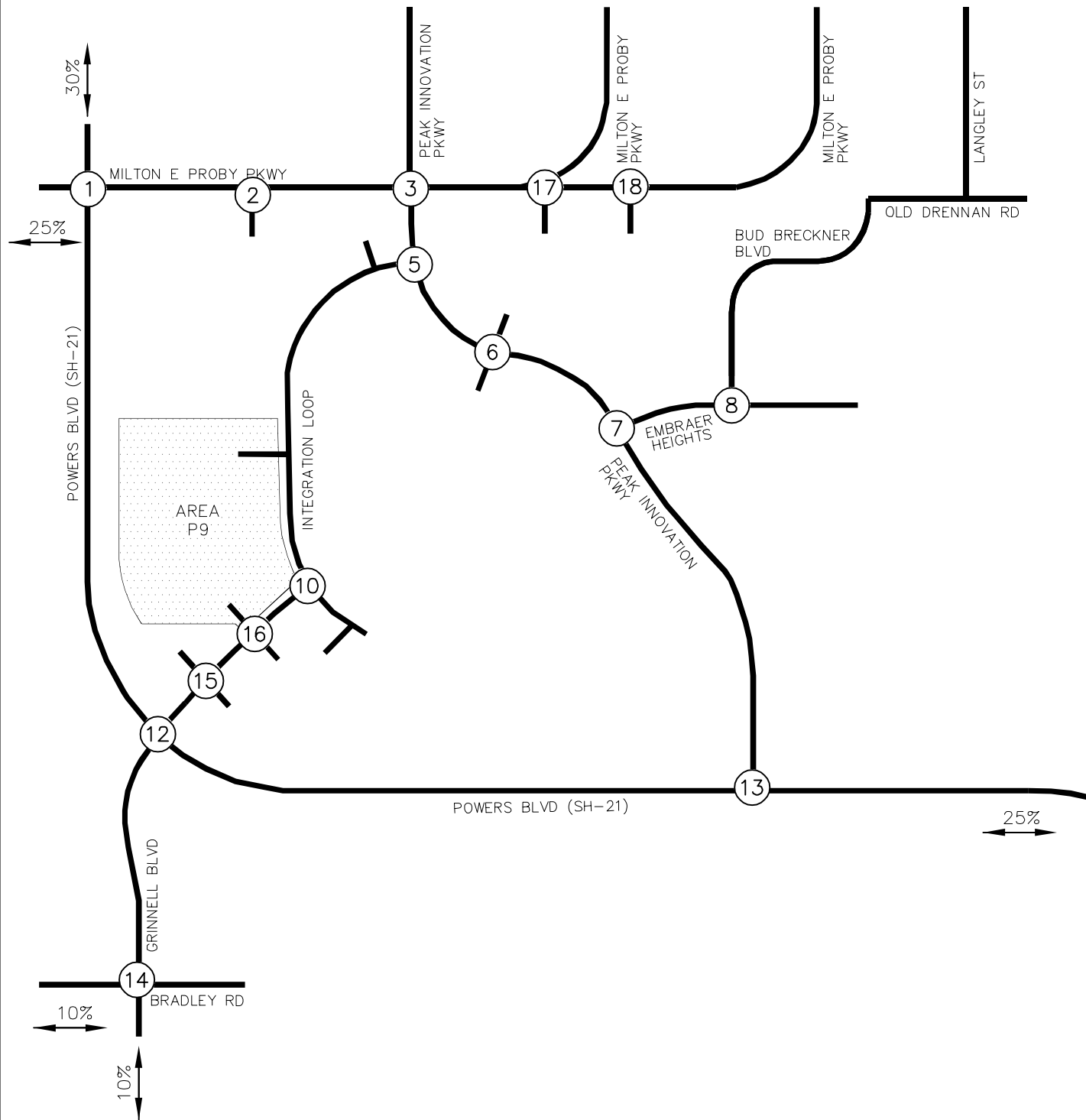
FIGURE A1



MILTON E PROBY PKWY / POWERS BLVD (SH-21) ① ← 30(0) ← 0(30) ← 0(30) 30(0) →		MILTON E PROBY PKWY / RIRO ACCESS ② ← 0(60) 60(0) →		MILTON E. PROBY PKWY / PEAK INNOVATION PKWY ③ ← 0(30) 35(0) → 25(0) ↓ 0(30) ↘		PEAK INNOVATION PKWY / INTEGRATION LOOP ⑤ ← 10(0) ← 15(0) ← 0(20) ← 0(15) ← 0(5) 15(0) → 0(10) ↑ 5(0) ↘	
PEAK INNOVATION PKWY / ACCESS ⑥ ← 0(10) ← 0(20) ← 20(0) ← 5(0) 10(0) ↗ 0(5) →		PEAK INNOVATION PKWY / EMBRAER HEIGHTS ⑦ ← 0(25) 25(0) →		EMBRAER HEIGHTS / BUD BRECKNER BLVD ⑧ 15(0) → 0(5) →		GRINNELL BLVD / INTEGRATION LOOP ⑩ GRINNELL BLVD INTEGRATION LOOP ← 0(15) 15(0) ↗	
POWERS BLVD (SH-21) / GRINNELL BLVD ⑫ POWERS BLVD GRINNELL BLVD ↓ 0(15) ← 0(5) 15(0) ↑ 5(0) ↘		PEAK INNOVATION PKWY / POWERS BLVD (SH-21) ⑬ ↓ 0(5) ↓ 0(20) ← 20(0) 5(0) →		BRADLEY RD / GRINNELL BLVD ⑭ ↓ 0(10) ↓ 0(10) 10(0) ↗ 10(0) ↑		GRINNELL BLVD / SOUTH ACCESS ⑮ GRINNELL BLVD ACCESS ← 0(15) 15(0) →	
GRINNELL BLVD / NORTH ACCESS ⑯ GRINNELL BLVD ACCESS ← 0(15) 15(0) →		MILTON E PROBY WEST RIRO ACCESS ⑰ 10(0) → 25(0) ↘ 0(15) ↗		MILTON E PROBY EAST RIRO ACCESS ⑱ 0(15) → 10(0) ↘ 0(15) ↗		LEGEND (X) Study Area Key Intersection XX%(XX%) Entering(Exiting) Project Trip Distribution Percentage	

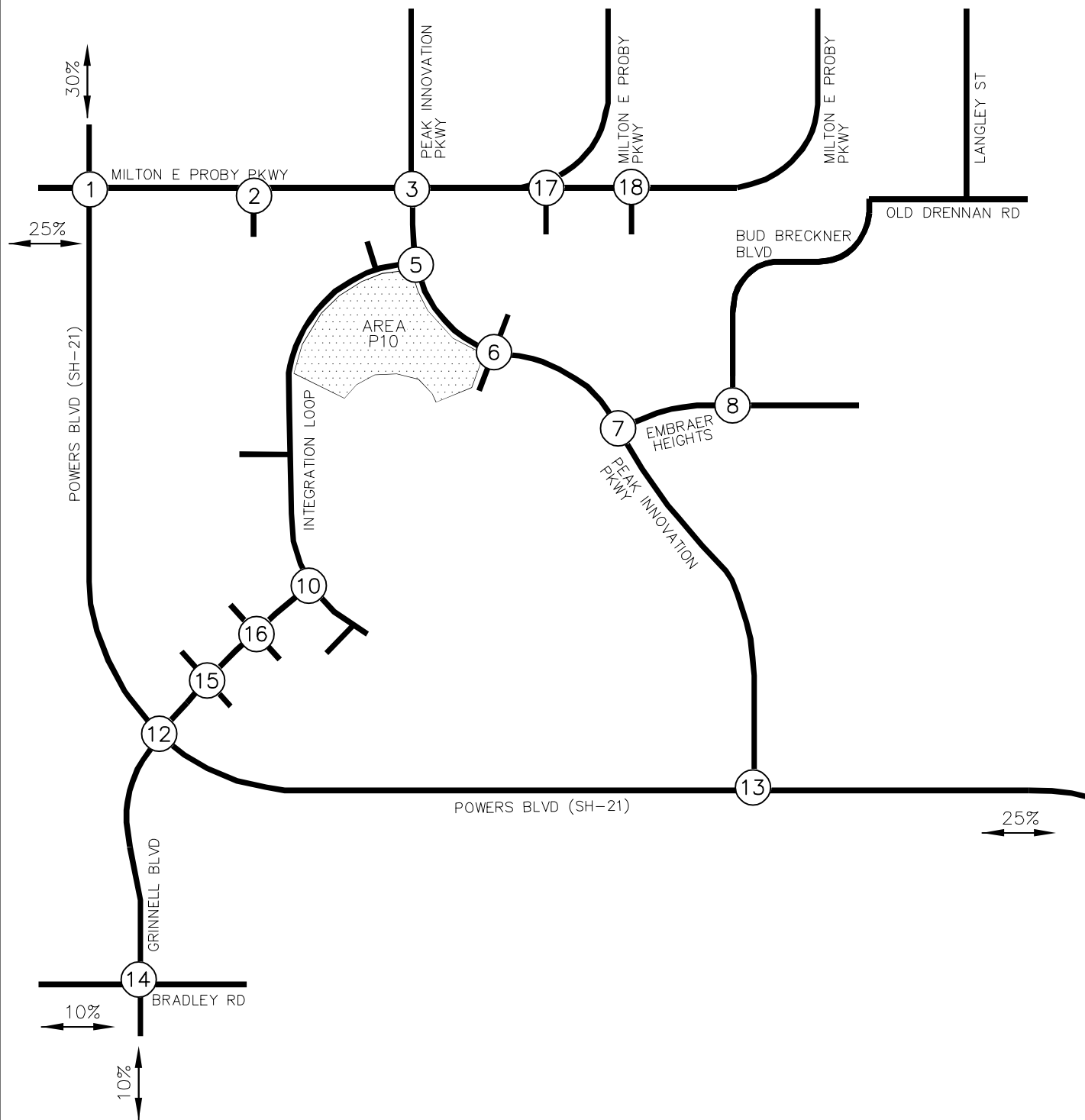
PEAK INNOVATION PARK
 2022 PROJECT TRIP DISTRIBUTION (AREA P5)

FIGURE A2



PEAK INNOVATION PARK
 2022 PROJECT TRIP DISTRIBUTION (AREA P9)

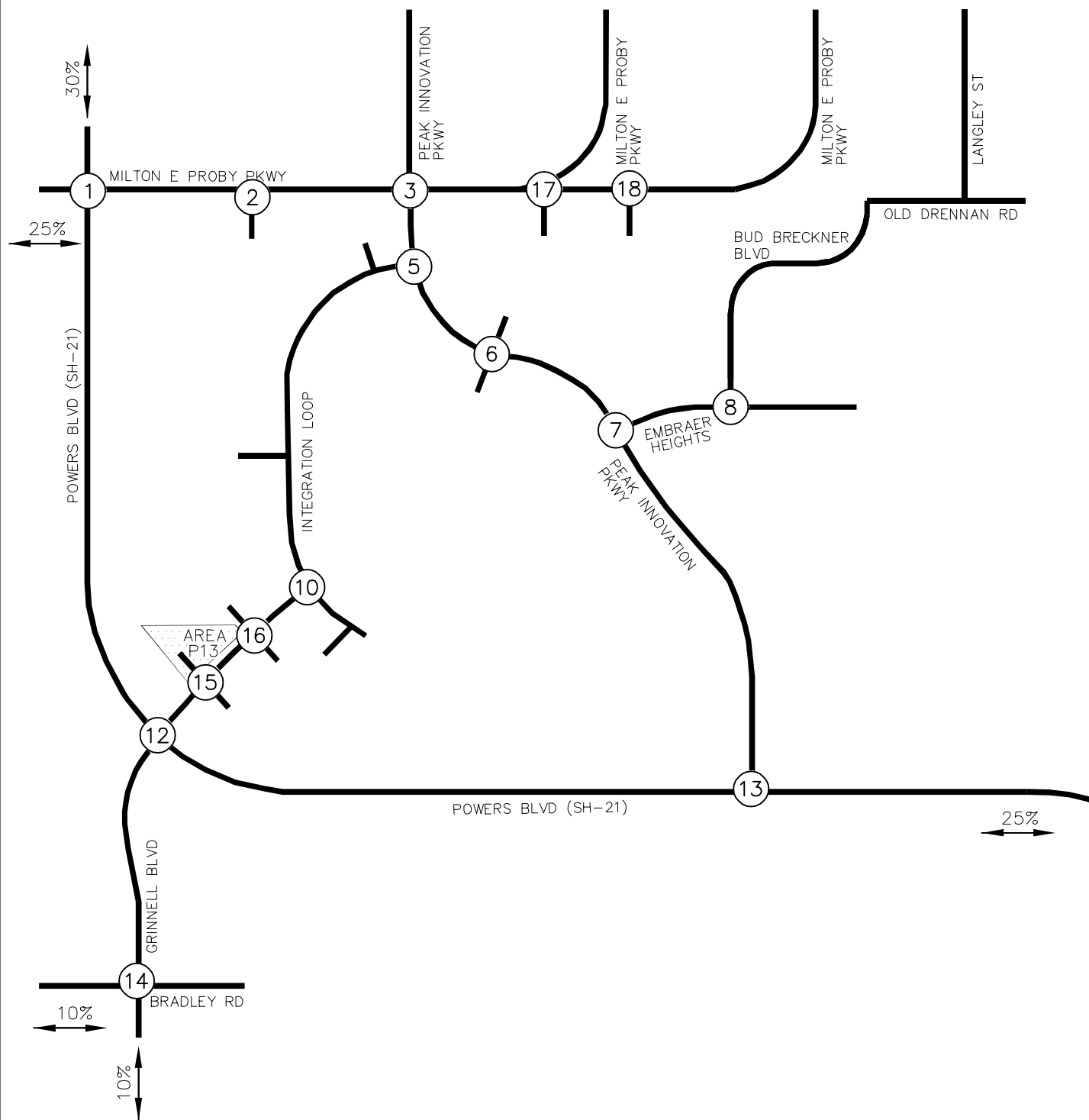
FIGURE A3



MILTON E PROBY PKWY / POWERS BLVD (SH-21) 1 30(0) ← 0(30) → 0(30) →		MILTON E PROBY PKWY / RIRO ACCESS 2 ← 0(60)		MILTON E. PROBY PKWY / PEAK INNOVATION PKWY 3 60(0) ↓ 0(60) →		PEAK INNOVATION PKWY / INTEGRATION LOOP 5 ↓ 60(0) 15(0) ↓ 0(15) → 0(60) →	
PEAK INNOVATION PKWY / ACCESS 6 75(0) ↓ 0(75) → 0(25) →		PEAK INNOVATION PKWY / EMBRAER HEIGHTS 7 ← 0(25) 25(0) →		EMBRAER HEIGHTS / BUD BRECKNER BLVD 8 25(0) →		GRINNELL BLVD / INTEGRATION LOOP 10 INTEGRATION LOOP 15(0) → 0(15) →	
POWERS BLVD (SH-21) / GRINNELL BLVD 12 POWERS BLVD GRINNELL BLVD ↓ 0(15) 15(0) ↑ 5(0) → 0(5) →		PEAK INNOVATION PKWY / POWERS BLVD (SH-21) 13 5(0) → 0(5) ↓ 0(20) ↓ 20(0) →		BRADLEY RD / GRINNELL BLVD 14 10(0) ↓ 0(10) ↓ 10(0) → 10(0) ↑		GRINNELL BLVD / SOUTH ACCESS 15 GRINNELL BLVD ACCESS 15(0) → ← 0(15)	
GRINNELL BLVD / NORTH ACCESS 16 GRINNELL BLVD ACCESS 15(0) → ← 0(15)		MILTON E PROBY WEST RIRO ACCESS 17 18		MILTON E PROBY EAST RIRO ACCESS 18		LEGEND (X) Study Area Key Intersection XX%(XX%) Entering(Exiting) Project Trip Distribution Percentage	

PEAK INNOVATION PARK
 2022 PROJECT TRIP DISTRIBUTION (AREA P10)

FIGURE A4



MILTON E PROBY PKWY / POWERS BLVD (SH-21) 1 20(0) ↓, 10(0) ↓, 0(10) ↖, 0(10) ↗ 10(0) →, 20(0) ↘, 0(20) ↖, 0(20) ↗		MILTON E PROBY PKWY / RIRO ACCESS 2 ← 0(20)		MILTON E PROBY PKWY / PEAK INNOVATION PKWY 3 20(0) ↘, 0(20) ↗		PEAK INNOVATION PKWY / INTEGRATION LOOP 5 20(0) ↓, 0(20) ↗	
PEAK INNOVATION PKWY / ACCESS 6 		PEAK INNOVATION PKWY / EMBRAER HEIGHTS 7 		EMBRAER HEIGHTS / BUD BRECKNER BLVD 8 		GRINNELL BLVD / INTEGRATION LOOP 10 20(0) ↓, 0(20) ↗	
POWERS BLVD (SH-21) / GRINNELL BLVD 12 POWERS BLVD 0(40) ↓, 0(20) ↓, 0(20) ↓, 20(0) ↖, 40(0) ↗, 20(0) ↖		PEAK INNOVATION PKWY / POWERS BLVD (SH-21) 13 ← 20(0) 0(20) →		BRADLEY RD / GRINNELL BLVD 14 0(10) ↓, 0(10) ↓, 10(0) ↗, 10(0) ↑		GRINNELL BLVD / SOUTH ACCESS 15 GRINNELL BLVD 0(80) ↓, 0(20) ↓, 20(0) ↖, 80(0) ↗	
GRINNELL BLVD / NORTH ACCESS 16 GRINNELL BLVD ← 20(0) ACCESS 0(20) →		MILTON E PROBY WEST RIRO ACCESS 17 		MILTON E PROBY EAST RIRO ACCESS 18 			

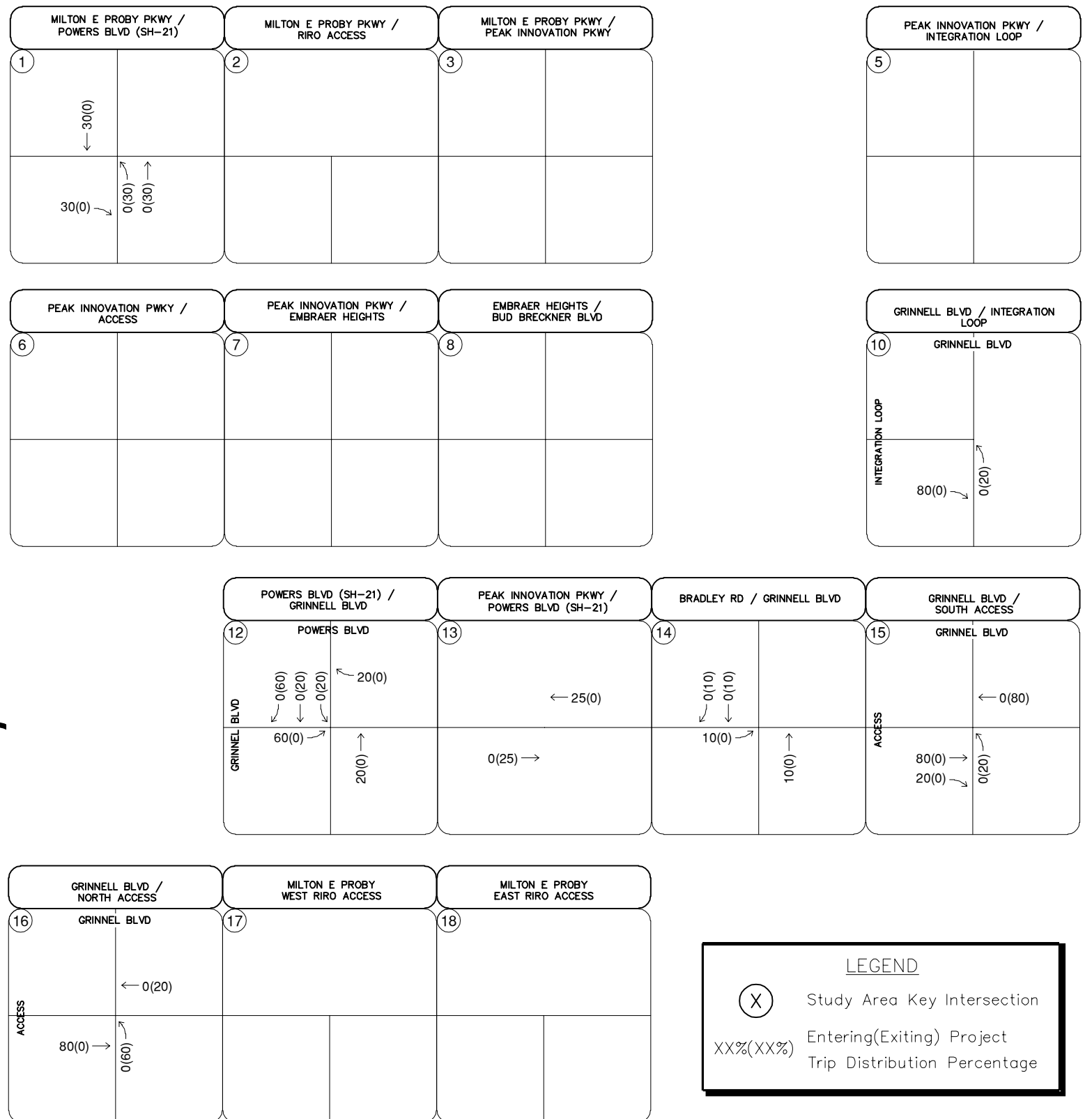
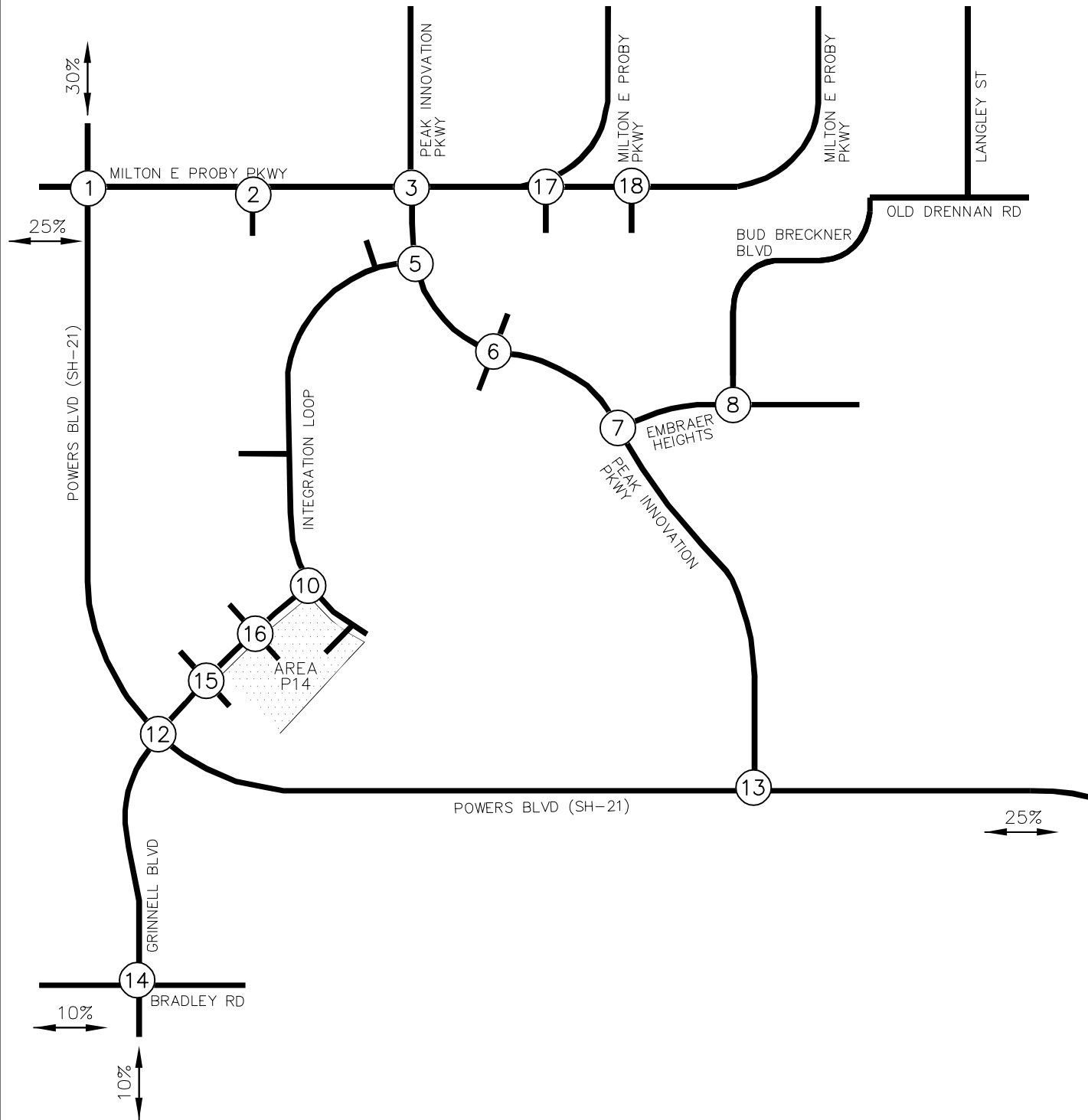
LEGEND

(X) Study Area Key Intersection

XX%(XX%) Entering(Exiting) Project Trip Distribution Percentage

PEAK INNOVATION PARK
 2022 PROJECT TRIP DISTRIBUTION (AREA P13)

FIGURE A5



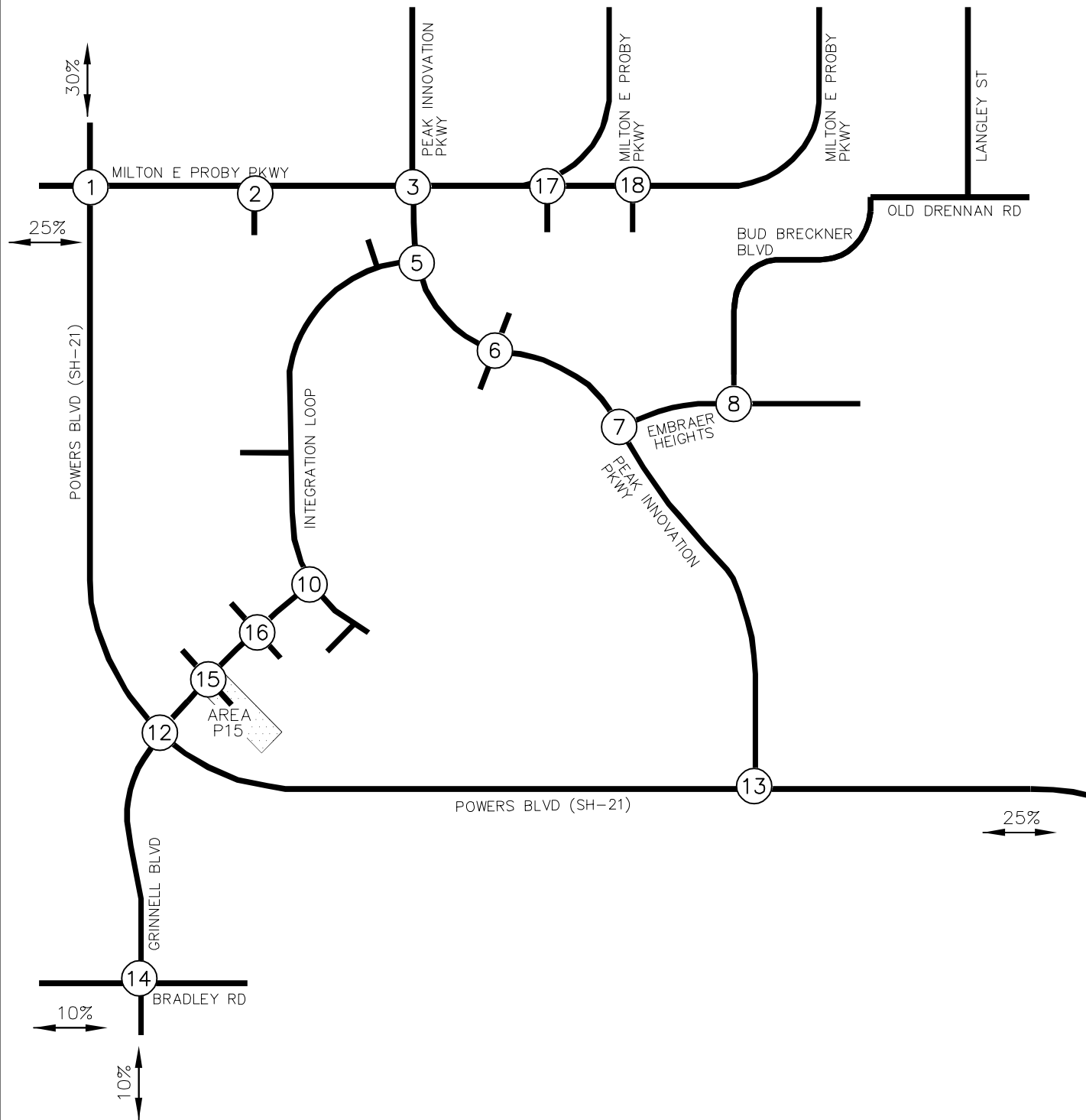
LEGEND

(X) Study Area Key Intersection

XX%(XX%) Entering(Exiting) Project Trip Distribution Percentage

PEAK INNOVATION PARK
 2022 PROJECT TRIP DISTRIBUTION (AREA P14)

FIGURE A6



MILTON E PROBY PKWY / POWERS BLVD (SH-21)		MILTON E PROBY PKWY / RIRO ACCESS		MILTON E PROBY PKWY / PEAK INNOVATION PKWY	
1	30(0) ↓	2		3	
	30(0) ↘		0(30) ↗		0(30) ↗

PEAK INNOVATION PKWY / ACCESS		PEAK INNOVATION PKWY / EMBRAER HEIGHTS		EMBRAER HEIGHTS / BUD BRECKNER BLVD	
6		7		8	

PEAK INNOVATION PKWY / INTEGRATION LOOP	
5	

GRINNELL BLVD / INTEGRATION LOOP	
10	GRINNELL BLVD
INTEGRATION LOOP	5(0) ↘
	0(5) ↗

POWERS BLVD (SH-21) / GRINNELL BLVD		PEAK INNOVATION PKWY / POWERS BLVD (SH-21)		BRADLEY RD / GRINNELL BLVD		GRINNELL BLVD / SOUTH ACCESS	
12	POWERS BLVD	13		14		15	GRINNELL BLVD
GRINNELL BLVD	0(60) ↘ 0(20) ↓ 0(20) ↓		← 20(0)		0(10) ↘ 0(10) ↓	ACCESS	GRINNELL BLVD
	60(0) ↗		0(20) →		10(0) ↗		100(0) ↘
	20(0) ↗				10(0) ↑		0(100) ↗

GRINNELL BLVD / NORTH ACCESS		MILTON E PROBY WEST RIRO ACCESS		MILTON E PROBY EAST RIRO ACCESS	
16	GRINNELL BLVD	17		18	
ACCESS					

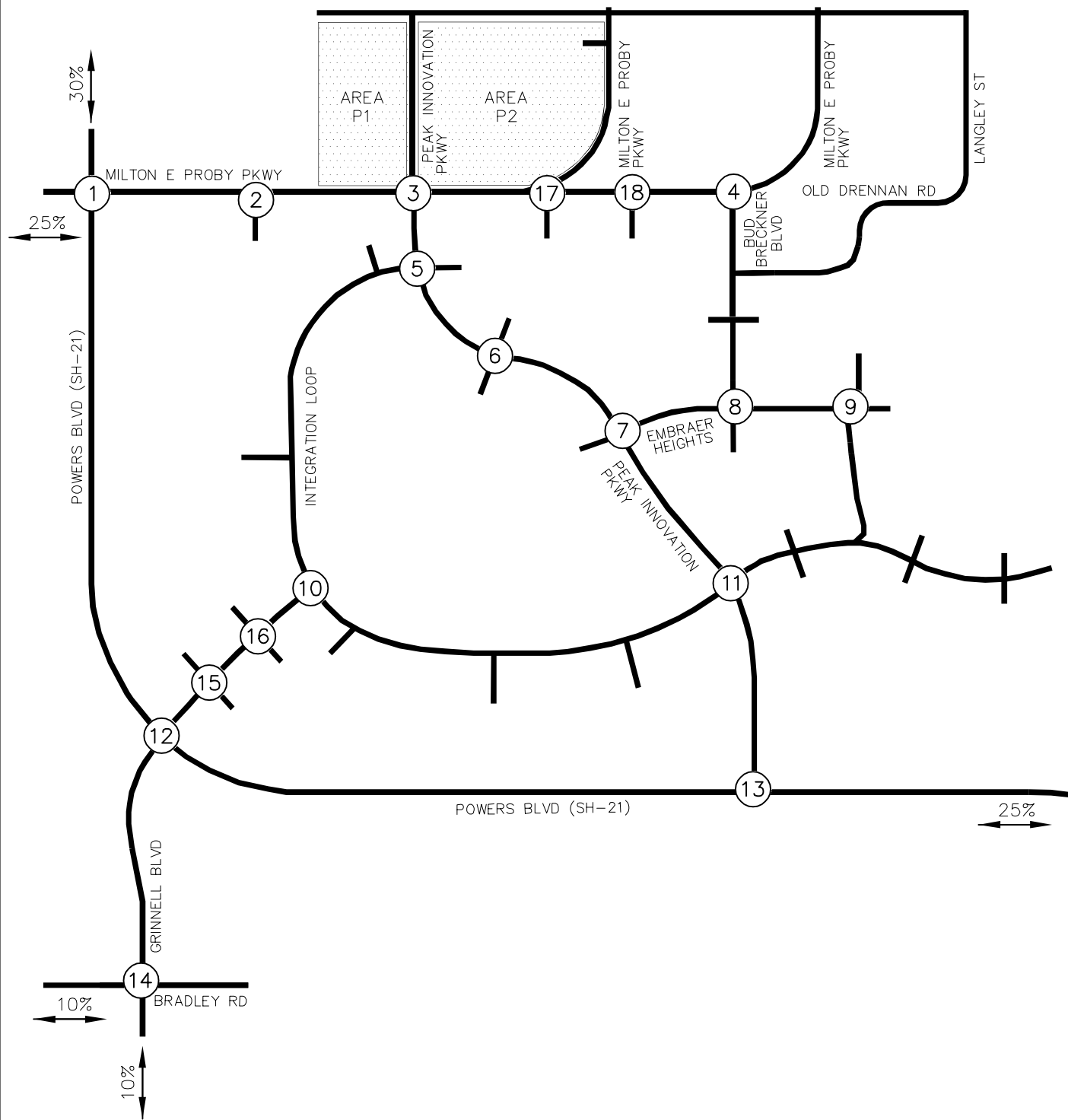
LEGEND

(X) Study Area Key Intersection

XX%(XX%) Entering(Exiting) Project Trip Distribution Percentage

PEAK INNOVATION PARK
 2022 PROJECT TRIP DISTRIBUTION (AREA P15)

FIGURE A7



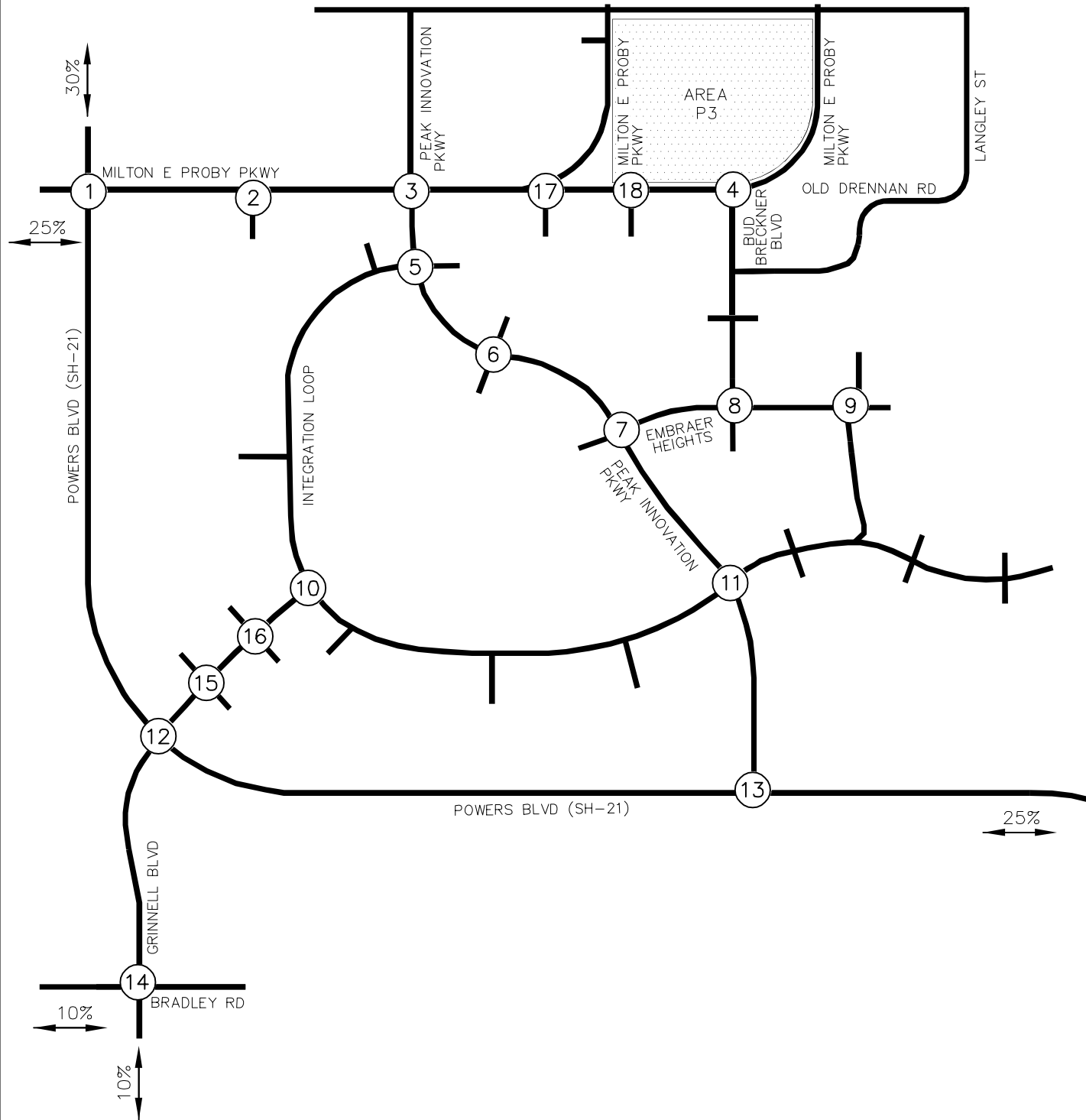
MILTON E PROBY PKWY / POWERS BLVD (SH-21) 1 30(0) → ← 30(0) ← 0(30) ← 0(30) ← 0(20) 20(0) →	MILTON E PROBY PKWY / RIRO ACCESS 2 ← 0(80)	MILTON E PROBY PKWY / PEAK INNOVATION PKWY 3 ← 0(80) ↓ 0(15) 80(0) → 10(0) →	MILTON E PROBY PKWY / BUD BRECKNER BLVD 4	PEAK INNOVATION PKWY / INTEGRATION LOOP 5 ← 0(15) 10(0) →
PEAK INNOVATION PKWY / ACCESS 6 0(15) → ← 0(5) ↑ 10(0) ↓ 10(0)	PEAK INNOVATION PKWY / EMBRAER HEIGHTS 7 ← 0(20)	EMBRAER HEIGHTS / BUD BRECKNER BLVD 8 20(0) →	EMBRAER HEIGHTS / ACCESS 9	GRINNELL BLVD / INTEGRATION LOOP 10 INTEGRATION LOOP
PEAK INNOVATION PKWY / INTEGRATION LOOP 11 ↓ 0(20)	POWERS BLVD (SH-21) / GRINNELL BLVD 12 GRINNELL BLVD 0(20) → 20(0) →	PEAK INNOVATION PKWY / POWERS BLVD (SH-21) 13 ↓ 0(20) 20(0) →	BRADLEY RD / GRINNELL BLVD 14 ↓ 0(10) ↓ 0(10) 10(0) → 10(0) →	GRINNELL BLVD / SOUTH ACCESS 15 GRINNELL BLVD ACCESS
GRINNELL BLVD / NORTH ACCESS 16 ACCESS	MILTON E PROBY WEST RIRO ACCESS 17	MILTON E PROBY EAST RIRO ACCESS 18		

LEGEND

(X) Study Area Key Intersection

XX%(XX%) Entering(Exiting) Project Trip Distribution Percentage

PEAK INNOVATION PARK
 2030 & 2045 PROJECT TRIP DISTRIBUTION (AREA P1 & P2)



MILTON E PROBY PKWY / POWERS BLVD (SH-21)		MILTON E PROBY PKWY / RIRO ACCESS		MILTON E PROBY PKWY / PEAK INNOVATION PKWY		MILTON E PROBY PKWY / BUD BRECKNER BLVD		PEAK INNOVATION PKWY / INTEGRATION LOOP	
1	30(0) → 20(0) ↗ 0(30) ↖ 0(30) ↖ 0(20) ↖	2	80(0) →	3	80(0) → 20(0) ↗ 0(80) ↖ 0(20) ↖	4	100(0) →	5	0(20) ↖ 20(0) ↗
PEAK INNOVATION PKWY / ACCESS		PEAK INNOVATION PKWY / EMBRAER HEIGHTS		EMBRAER HEIGHTS / BUD BRECKNER BLVD		EMBRAER HEIGHTS / ACCESS		GRINNELL BLVD / INTEGRATION LOOP	
6	0(20) → 20(0) ↖	7	25(0) → 0(25) ↖	8		9		10	INTEGRATION LOOP GRINNELL BLVD
PEAK INNOVATION PKWY / INTEGRATION LOOP		POWERS BLVD (SH-21) / GRINNELL BLVD		PEAK INNOVATION PKWY / POWERS BLVD (SH-21)		BRADLEY RD / GRINNELL BLVD		GRINNELL BLVD / SOUTH ACCESS	
11	0(20) ↖ 20(0) ↗	12	GRINNELL BLVD 0(20) ↖ 20(0) ↗	13	0(20) ↖ 20(0) ↗	14	0(10) ↖ 0(10) ↖ 10(0) ↗ 10(0) ↗	15	ACCESS GRINNELL BLVD
GRINNELL BLVD / NORTH ACCESS		MILTON E PROBY WEST RIRO ACCESS		MILTON E PROBY EAST RIRO ACCESS					
16	ACCESS GRINNELL BLVD	17	100(0) →	18	100(0) →				

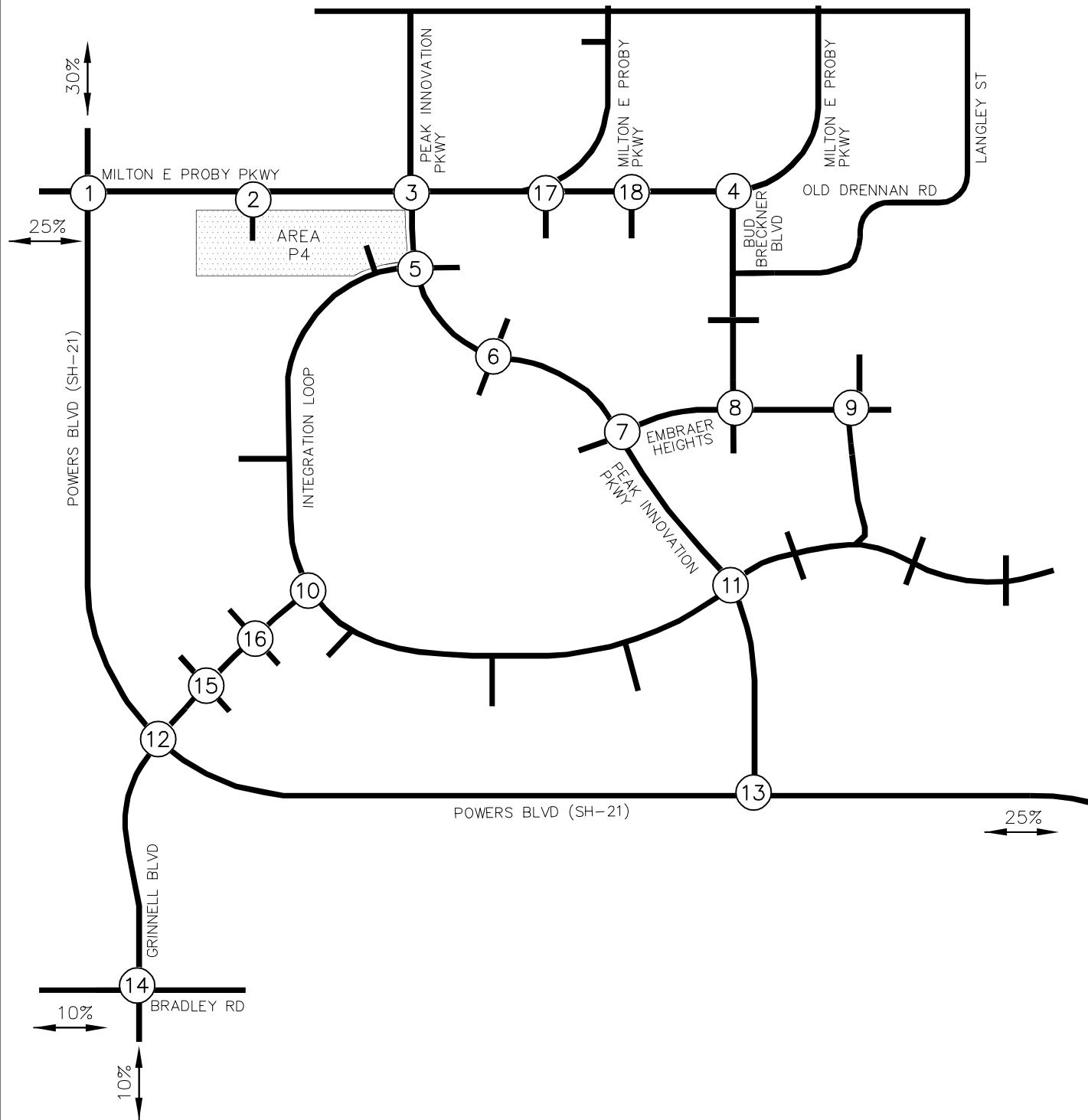
LEGEND

(X) Study Area Key Intersection

XX%(XX%) Entering(Exiting) Project Trip Distribution Percentage

PEAK INNOVATION PARK
 2030 & 2045 PROJECT TRIP DISTRIBUTION (AREA P3)

FIGURE A9



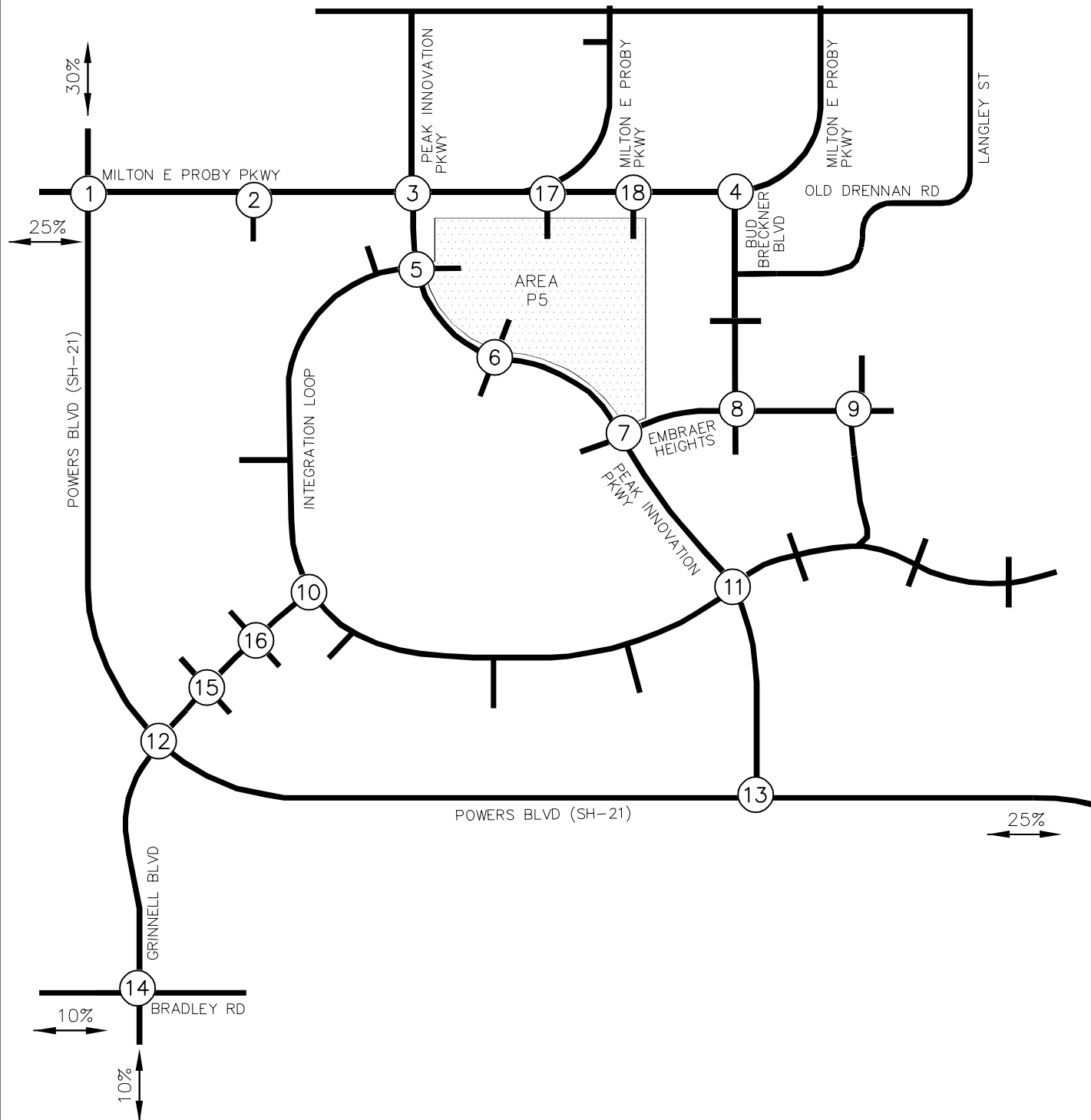
MILTON E PROBY PKWY / POWERS BLVD (SH-21)		MILTON E PROBY PKWY / RIRO ACCESS		MILTON E PROBY PKWY / PEAK INNOVATION PKWY		MILTON E PROBY PKWY / BUD BRECKNER BLVD		PEAK INNOVATION PKWY / INTEGRATION LOOP	
1	30(0) → ← 0(30) ← 0(30)	2	← 0(60)	3		4		5	0(60) ↓ 0(10) ↓ 15(0) ↘
PEAK INNOVATION PKWY / ACCESS		PEAK INNOVATION PKWY / EMBRAER HEIGHTS		EMBRAER HEIGHTS / BUD BRECKNER BLVD		EMBRAER HEIGHTS / ACCESS		GRINNELL BLVD / INTEGRATION LOOP	
6	← 15(0)	7	← 0(10)	8		9		10	INTEGRATION LOOP 0(20) ↓ 0(10) ↓ 10(0) ↗
PEAK INNOVATION PKWY / INTEGRATION LOOP		POWERS BLVD (SH-21) / GRINNELL BLVD		PEAK INNOVATION PKWY / POWERS BLVD (SH-21)		BRADLEY RD / GRINNELL BLVD		GRINNELL BLVD / SOUTH ACCESS	
11	0(10) ↓ 15(0) ↑	12	GRINNELL BLVD 0(20) ↓ ← 5(0)	13	0(20) ↓ 15(0) ↗ ← 5(0)	14	0(10) ↓ 0(10) ↓ 10(0) ↗ 10(0) ↑	15	ACCESS 10(0) → ← 0(20)
GRINNELL BLVD / NORTH ACCESS		MILTON E PROBY WEST RIRO ACCESS		MILTON E PROBY EAST RIRO ACCESS					
16	ACCESS 10(0) → ← 0(20)	17		18					

LEGEND

- (X) Study Area Key Intersection
- XX%(XX%) Entering(Exiting) Project Trip Distribution Percentage

PEAK INNOVATION PARK
 2030 & 2040 PROJECT TRIP DISTRIBUTION (AREA P4)

FIGURE A10



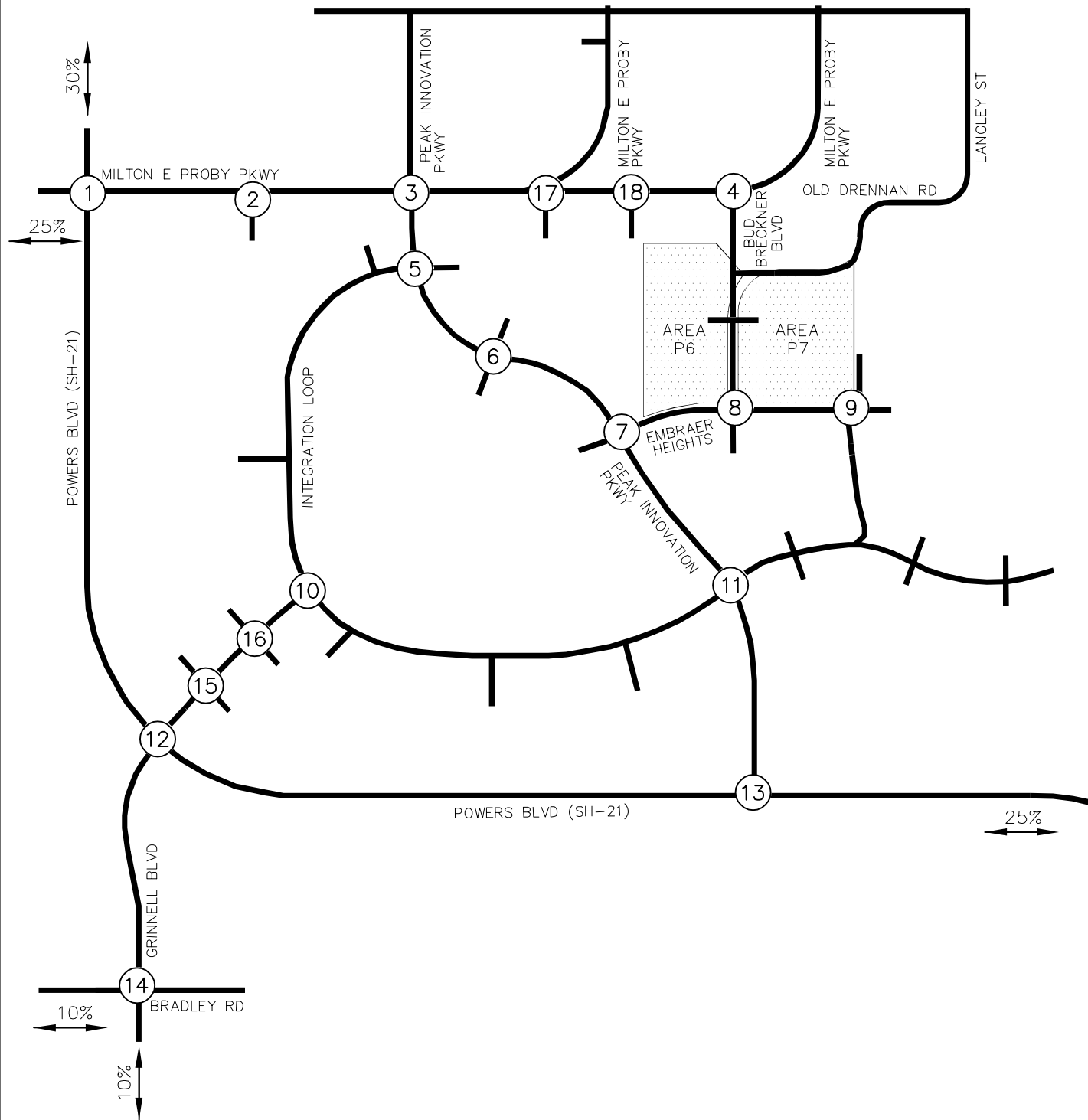
MILTON E PROBY PKWY / POWERS BLVD (SH-21)		MILTON E PROBY PKWY / RIRO ACCESS		MILTON E PROBY PKWY / PEAK INNOVATION PKWY		MILTON E PROBY PKWY / BUD BRECKNER BLVD		PEAK INNOVATION PKWY / INTEGRATION LOOP	
1	30(0) → ← 0(30) ← 0(30)	2	60(0) → ← 0(60)	3	35(0) → 25(0) ↓ ← 0(30)	4	0(30) →	5	15(0) → ← 10(0) ← 15(0) ← 0(20) ← 0(15) ← 0(5) 0(10) ↑ 5(0) ↗
PEAK INNOVATION PKWY / ACCESS		PEAK INNOVATION PKWY / EMBRAER HEIGHTS		EMBRAER HEIGHTS / BUD BRECKNER BLVD		EMBRAER HEIGHTS / ACCESS		GRINNELL BLVD / INTEGRATION LOOP	
6	10(0) ↗ 0(5) → ← 0(10) ← 0(20) ← 20(0) ← 5(0)	7	25(0) → ← 0(25)	8		9		10	15(0) ↗ ← 0(15)
PEAK INNOVATION PKWY / INTEGRATION LOOP		POWERS BLVD (SH-21) / GRINNELL BLVD		PEAK INNOVATION PKWY / POWERS BLVD (SH-21)		BRADLEY RD / GRINNELL BLVD		GRINNELL BLVD / SOUTH ACCESS	
11	25(0) → ← 0(25)	12	15(0) → 5(0) ↗ ← 0(15) ← 0(5)	13	5(0) → ← 0(5) ← 0(20) ← 20(0)	14	10(0) ↗ 10(0) ↓ ← 0(10) ← 0(10)	15	15(0) → ← 0(15)
GRINNELL BLVD / NORTH ACCESS		MILTON E PROBY WEST RIRO ACCESS		MILTON E PROBY EAST RIRO ACCESS					
16	15(0) → ← 0(15)	17	10(0) → 25(0) ↗ 0(15) ↗	18	0(15) → 10(0) ↗ 0(15) ↗				

LEGEND

- (X) Study Area Key Intersection
- XX%(XX%) Entering(Exiting) Project Trip Distribution Percentage

PEAK INNOVATION PARK
2030 & 2045 PROJECT TRIP DISTRIBUTION (AREA P5)

FIGURE A11



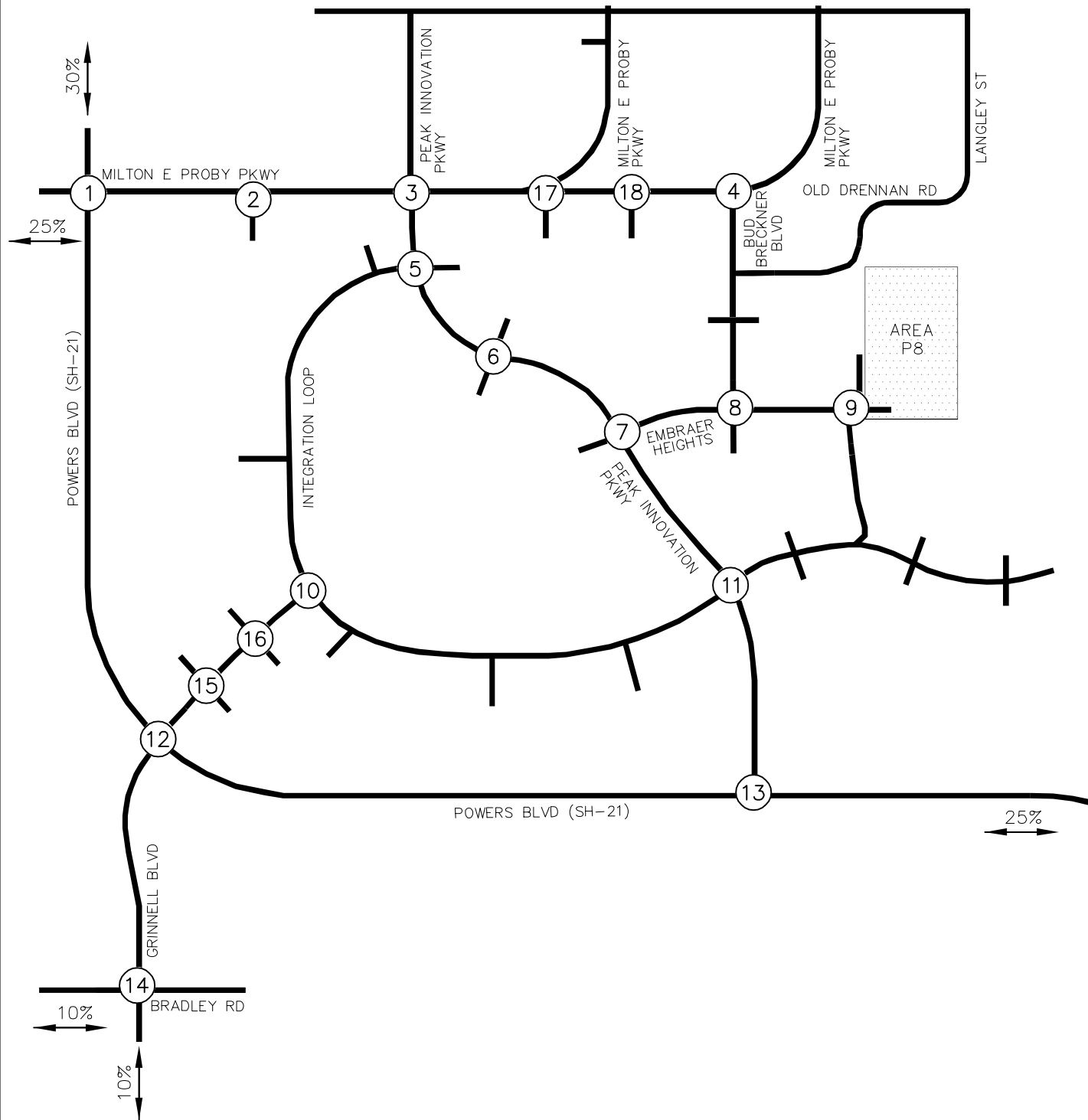
MILTON E PROBY PKWY / POWERS BLVD (SH-21)		MILTON E PROBY PKWY / RIRO ACCESS		MILTON E PROBY PKWY / PEAK INNOVATION PKWY		MILTON E PROBY PKWY / BUD BRECKNER BLVD		PEAK INNOVATION PKWY / INTEGRATION LOOP	
1	30(0) → 10(0) ↗	0(30) ↖ 0(30) ← 0(10) ↘	70(0) →	0(70) ←	60(0) → 10(0) ↘	0(60) ← 0(10) ↗	60(0) ↘	0(45) ↗	10(0) ↖ 0(10) ↗
PEAK INNOVATION PKWY / ACCESS		PEAK INNOVATION PKWY / EMBRAER HEIGHTS		EMBRAER HEIGHTS / BUD BRECKNER BLVD		EMBRAER HEIGHTS / ACCESS		GRINNELL BLVD / INTEGRATION LOOP	
6	10(0) →	0(10) ←	10(0) ↖ 0(10) ↗ 30(0) ↘	0(30) ↖ 0(10) ↗	40(0) ↗	0(40) ↖			INTEGRATION LOOP
PEAK INNOVATION PKWY / INTEGRATION LOOP		POWERS BLVD (SH-21) / GRINNELL BLVD		PEAK INNOVATION PKWY / POWERS BLVD (SH-21)		BRADLEY RD / GRINNELL BLVD		GRINNELL BLVD / SOUTH ACCESS	
11	0(35) ↖	35(0) →	0(10) ↖ 10(0) ↗ 10(0) ↘	0(10) ↖ 0(20) ↗ 20(0) ↘	10(0) →	0(10) ↖ 0(10) ↗	10(0) ↗	10(0) ↖	ACCESS
GRINNELL BLVD / NORTH ACCESS		MILTON E PROBY WEST RIRO ACCESS		MILTON E PROBY EAST RIRO ACCESS					
16	ACCESS	60(0) →		60(0) →					

LEGEND

(X) Study Area Key Intersection

XX%(XX%) Entering(Exiting) Project Trip Distribution Percentage

PEAK INNOVATION PARK
 2030 & 2045 PROJECT TRIP DISTRIBUTION (AREA P6 & P7)



MILTON E PROBY PKWY / POWERS BLVD (SH-21)		MILTON E PROBY PKWY / RIRO ACCESS		MILTON E PROBY PKWY / PEAK INNOVATION PKWY		MILTON E PROBY PKWY / BUD BRECKNER BLVD		PEAK INNOVATION PKWY / INTEGRATION LOOP	
1	30(0) → ← 30(0) 0(30) ← 0(30) ←	2	60(0) → ← 0(60)	3	50(0) → 10(0) ↓ 0(10) → ← 0(50)	4	50(0) ↓ 0(50) ↻	5	10(0) ↓ 0(10) ↑
PEAK INNOVATION PKWY / ACCESS		PEAK INNOVATION PKWY / EMBRAER HEIGHTS		EMBRAER HEIGHTS / BUD BRECKNER BLVD		EMBRAER HEIGHTS / ACCESS		GRINNELL BLVD / INTEGRATION LOOP	
6	10(0) → ← 0(10)	7	25(0) ↻ 10(0) ↻ 0(10) ↻ 0(25) ↻	8	35(0) → 50(0) ↻ 0(50) ↻ 0(30) ↻	9	85(0) → 15(0) ↻ 0(85) ↻ 0(15) ↻	10	5(0) ↓ 0(5) ↻
PEAK INNOVATION PKWY / INTEGRATION LOOP		POWERS BLVD (SH-21) / GRINNELL BLVD		PEAK INNOVATION PKWY / POWERS BLVD (SH-21)		BRADLEY RD / GRINNELL BLVD		GRINNELL BLVD / SOUTH ACCESS	
11	5(0) → 0(25) ↓ 0(5) ← 0(10) ↻ 25(0) ↑ 10(0) ↻	12	5(0) ↑ 15(0) ↻ 0(15) ↻ 0(5) ↓	13	15(0) → 0(15) ↓ 0(20) ↻ 20(0) ↻	14	10(0) ↻ 0(10) ↓ 0(10) ↓ 10(0) ↻	15	5(0) → ← 0(5)
GRINNELL BLVD / NORTH ACCESS		MILTON E PROBY WEST RIRO ACCESS		MILTON E PROBY EAST RIRO ACCESS					
16	5(0) → ← 0(5)	17	55(0) →	18	55(0) →				

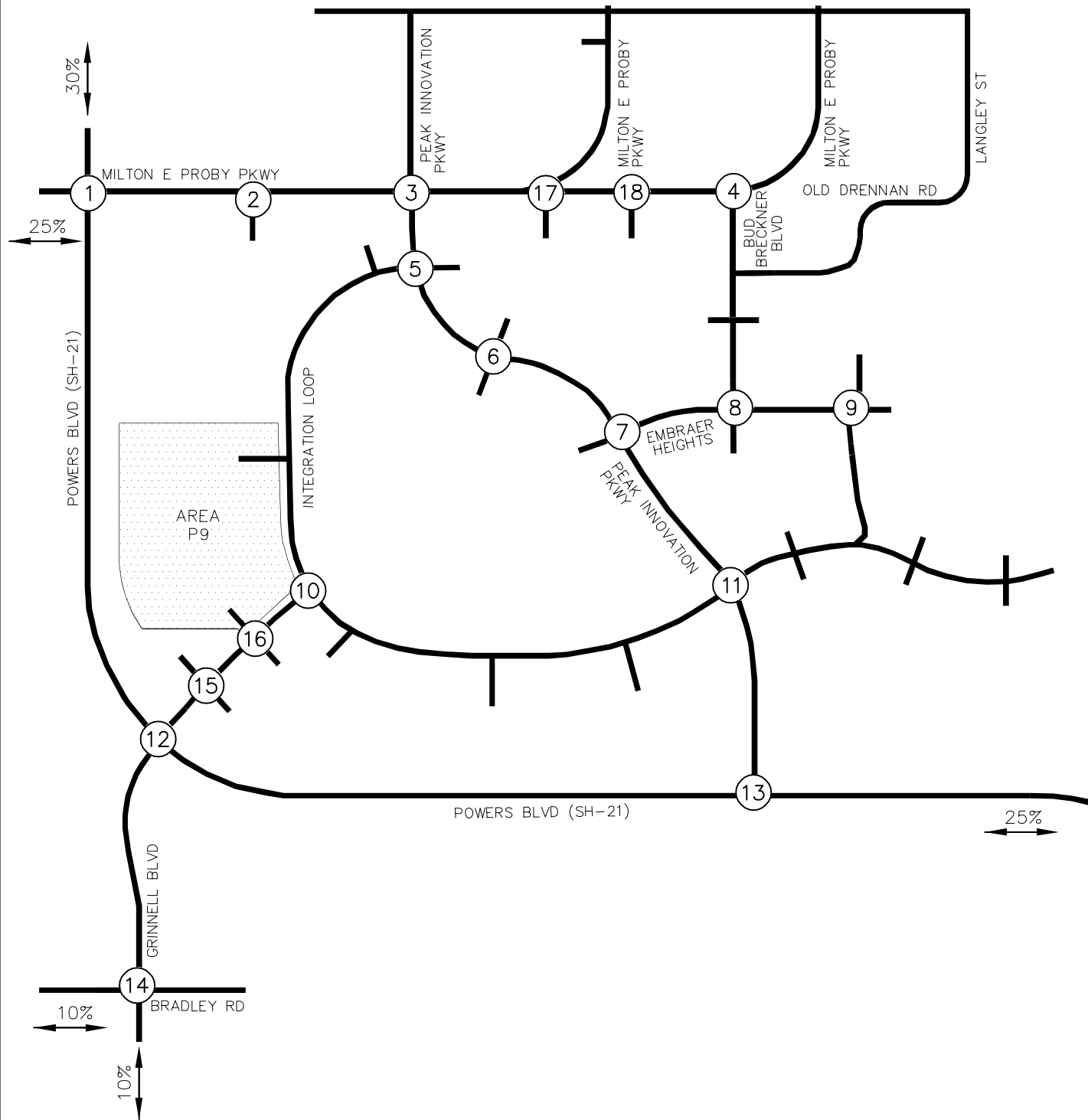
LEGEND

(X) Study Area Key Intersection

XX%(XX%) Entering(Exiting) Project Trip Distribution Percentage

PEAK INNOVATION PARK
 2030 & 2045 PROJECT TRIP DISTRIBUTION (AREA P8)

FIGURE A13



MILTON E PROBY PKWY / POWERS BLVD (SH-21) 1 20(0) ↓ 10(0) ↓ 0(10) ← 0(10) ← 15(0) → 15(0) → 0(20) → 0(20) →	MILTON E PROBY PKWY / RIRO ACCESS 2 ← 0(20)	MILTON E PROBY PKWY / PEAK INNOVATION PKWY 3 25(0) ↓ 0(20) →	MILTON E PROBY PKWY / BUD BRECKNER BLVD 4	PEAK INNOVATION PKWY / INTEGRATION LOOP 5 25(0) ↓ 0(20) →
PEAK INNOVATION PKWY / ACCESS 6	PEAK INNOVATION PKWY / EMBRAER HEIGHTS 7	EMBRAER HEIGHTS / BUD BRECKNER BLVD 8	EMBRAER HEIGHTS / ACCESS 9	GRINNELL BLVD / INTEGRATION LOOP 10 GRINNELL BLVD 5(40) ↓ 40(5) → 0(5) ↓ 5(0) →
PEAK INNOVATION PKWY / INTEGRATION LOOP 11	POWERS BLVD (SH-21) / GRINNELL BLVD 12 POWERS BLVD 0(40) ↓ 0(20) ↓ 0(15) ↓ 15(0) → 35(0) → 20(0) →	PEAK INNOVATION PKWY / POWERS BLVD (SH-21) 13 0(5) ↓ 5(0) ← 15(0) ←	BRADLEY RD / GRINNELL BLVD 14 0(10) ↓ 0(10) ↓ 10(0) → 10(0) →	GRINNELL BLVD / SOUTH ACCESS 15 GRINNELL BLVD ← 0(75) 70(0) →
GRINNELL BLVD / NORTH ACCESS 16 GRINNELL BLVD 0(35) ↓ 0(10) ↓ 10(0) → 0(40) ← 30(0) → 40(0) →	MILTON E PROBY WEST RIRO ACCESS 17	MILTON E PROBY EAST RIRO ACCESS 18		

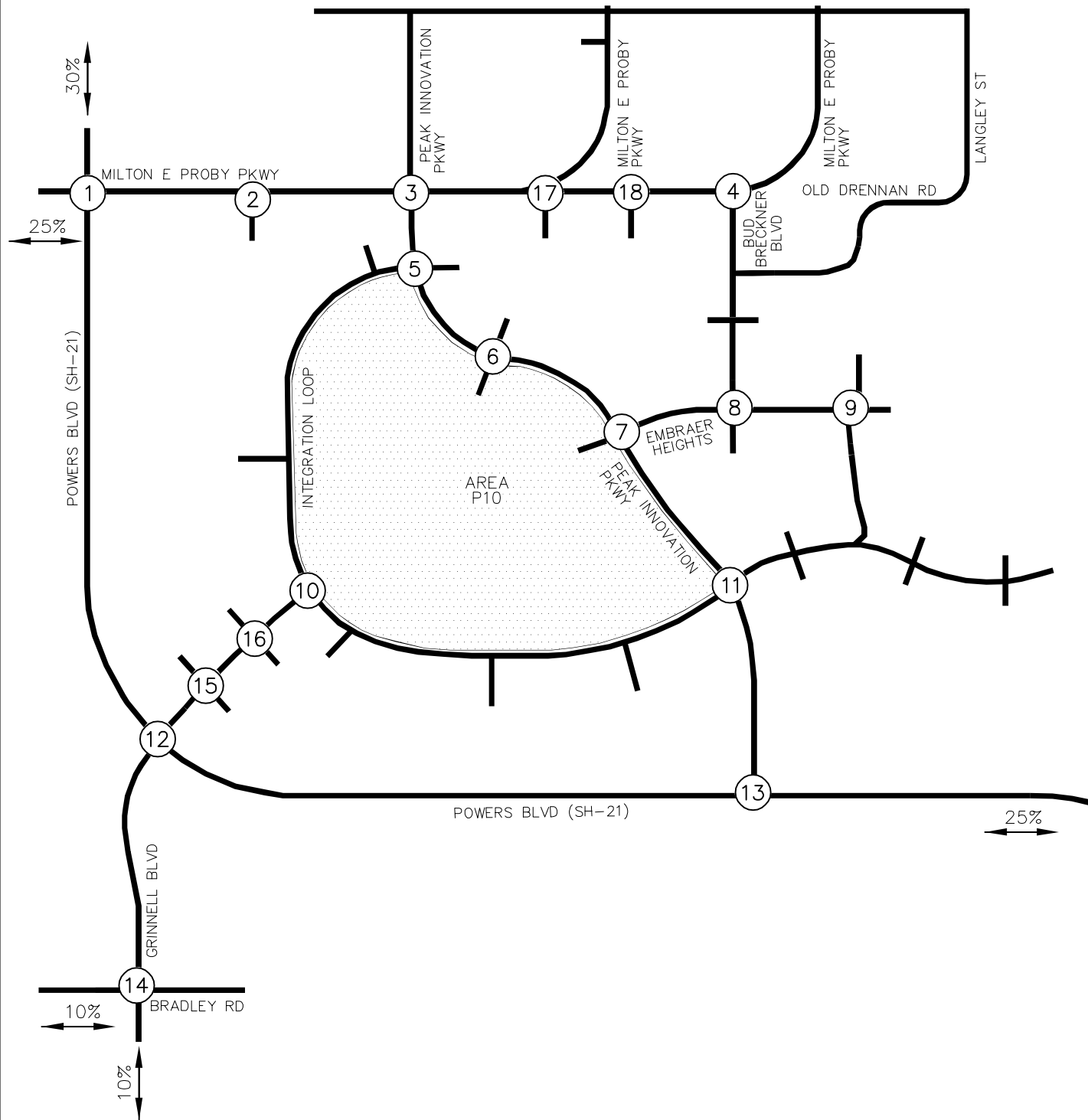
LEGEND

(X) Study Area Key Intersection

XX%(XX%) Entering(Exiting) Project Trip Distribution Percentage

PEAK INNOVATION PARK
 2030 & 2040 PROJECT TRIP DISTRIBUTION (AREA P9)

FIGURE A14



MILTON E PROBY PKWY / POWERS BLVD (SH-21)		MILTON E PROBY PKWY / RIRO ACCESS		MILTON E PROBY PKWY / PEAK INNOVATION PKWY		MILTON E PROBY PKWY / BUD BRECKNER BLVD		PEAK INNOVATION PKWY / INTEGRATION LOOP	
1	30(0) → ← 0(30) ← 0(30)	2	← 0(60)	3	60(0) ↓ 0(60) →	4		5	← 60(0) 15(0) ↓ 0(15) → 0(60) →
PEAK INNOVATION PKWY / ACCESS		PEAK INNOVATION PKWY / EMBRAER HEIGHTS		EMBRAER HEIGHTS / BUD BRECKNER BLVD		EMBRAER HEIGHTS / ACCESS		GRINNELL BLVD / INTEGRATION LOOP	
6	← 0(25) 10(0) ↓ 25(0) → 50(0) ↓ 0(50) → 0(10) →	7	← 25(0) 0(10) ↓ 0(25) → 0(15) ↓ 15(0) → 10(0) →	8		9		10	← 0(15) 15(0) →
PEAK INNOVATION PKWY / INTEGRATION LOOP		POWERS BLVD (SH-21) / GRINNELL BLVD		PEAK INNOVATION PKWY / POWERS BLVD (SH-21)		BRADLEY RD / GRINNELL BLVD		GRINNELL BLVD / SOUTH ACCESS	
11	← 0(25) 25(0) →	12	← 0(15) 0(5) ↓ 15(0) → 5(0) →	13	← 0(5) 0(20) ↓ 5(0) → 20(0) →	14	← 0(10) 0(10) ↓ 10(0) → 10(0) →	15	← 0(15) 15(0) →
GRINNELL BLVD / NORTH ACCESS		MILTON E PROBY WEST RIRO ACCESS		MILTON E PROBY EAST RIRO ACCESS					
16	← 0(15) 15(0) →	17		18					

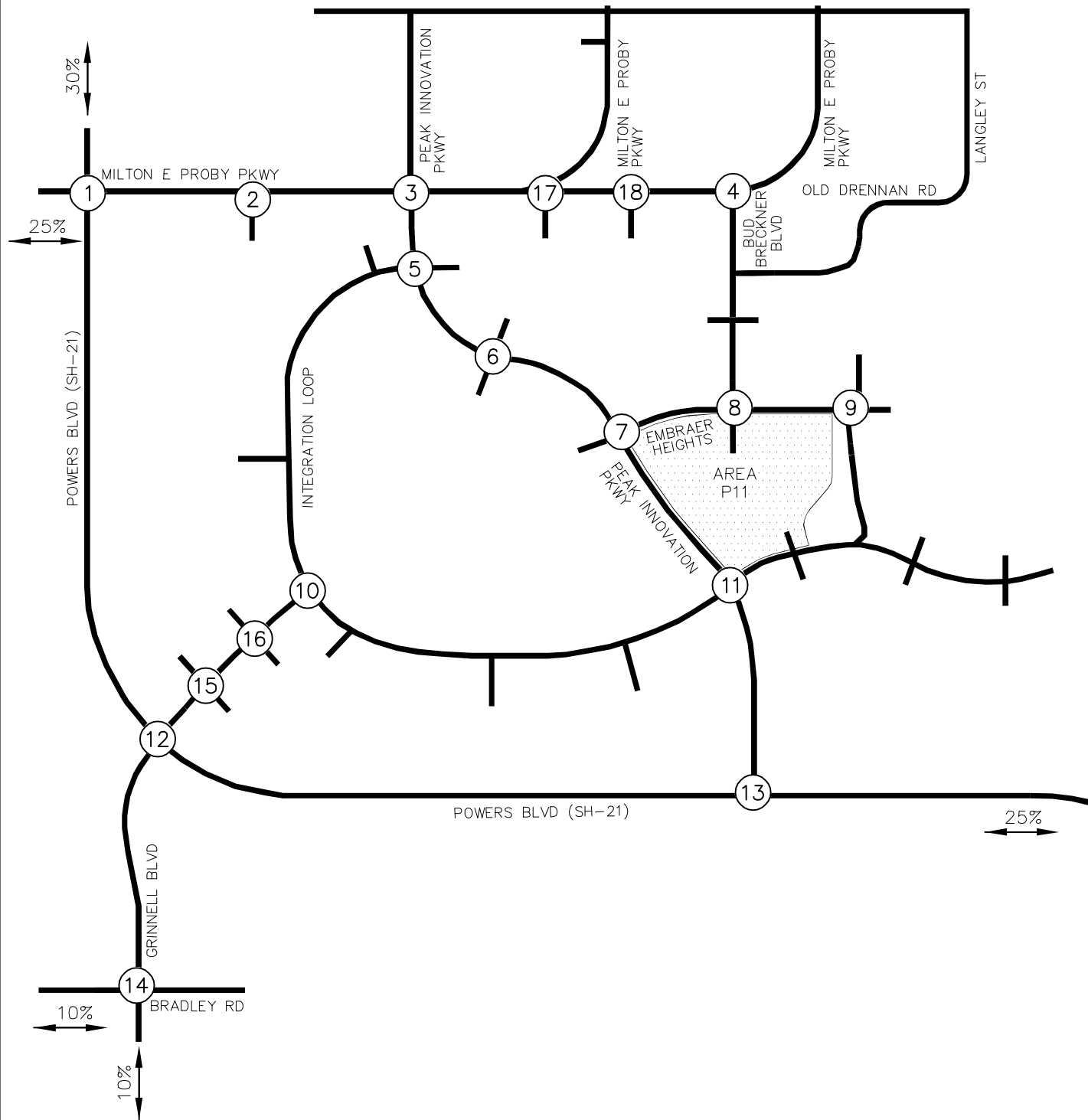
LEGEND

(X) Study Area Key Intersection

XX%(XX%) Entering(Exiting) Project Trip Distribution Percentage

PEAK INNOVATION PARK
 2030 & 2045 PROJECT TRIP DISTRIBUTION (AREA P10)

FIGURE A15



MILTON E PROBY PKWY / POWERS BLVD (SH-21)		MILTON E PROBY PKWY / RIRO ACCESS		MILTON E PROBY PKWY / PEAK INNOVATION PKWY		MILTON E PROBY PKWY / BUD BRECKNER BLVD		PEAK INNOVATION PKWY / INTEGRATION LOOP	
1	30(0) → ← 30(0) 0(30) ← 0(30)	2	60(0) → ← 0(60)	3	20(0) → 40(0) ↓ ← 0(20) 0(40)	4	20(0) ↓ 0(20) ↗	5	← 40(0) 0(40) ↑
PEAK INNOVATION PKWY / ACCESS		PEAK INNOVATION PKWY / EMBRAER HEIGHTS		EMBRAER HEIGHTS / BUD BRECKNER BLVD		EMBRAER HEIGHTS / ACCESS		GRINNELL BLVD / INTEGRATION LOOP	
6	← 0(40) 40(0) →	7	10(0) ↓ 30(0) ↘ 0(30) 0(10) 0(10) ↑ 10(0) ↗	8	← 20(0) 40(0) ↓ 0(40) ↗ 0(20) ↑	9		10	INTEGRATION LOOP 5(0) ↓ 0(5) ↗
PEAK INNOVATION PKWY / INTEGRATION LOOP		POWERS BLVD (SH-21) / GRINNELL BLVD		PEAK INNOVATION PKWY / POWERS BLVD (SH-21)		BRADLEY RD / GRINNELL BLVD		GRINNELL BLVD / SOUTH ACCESS	
11	0(10) ↓ 10(0) ↘ 0(10) 0(5) 0(25) 5(0) → 10(0) ↑ 25(0) ↗	12	GRINNELL BLVD ← 0(5) 0(15) 5(0) ↑ 15(0) ↗	13	0(15) ↓ 0(20) ↘ 20(0) 15(0) →	14	0(10) ↓ 0(10) ↓ 10(0) ↗ 10(0) ↑	15	ACCESS ← 0(5) 5(0) →
GRINNELL BLVD / NORTH ACCESS		MILTON E PROBY WEST RIRO ACCESS		MILTON E PROBY EAST RIRO ACCESS					
16	ACCESS ← 0(5) 5(0) →	17	20(0) →	18	20(0) →				

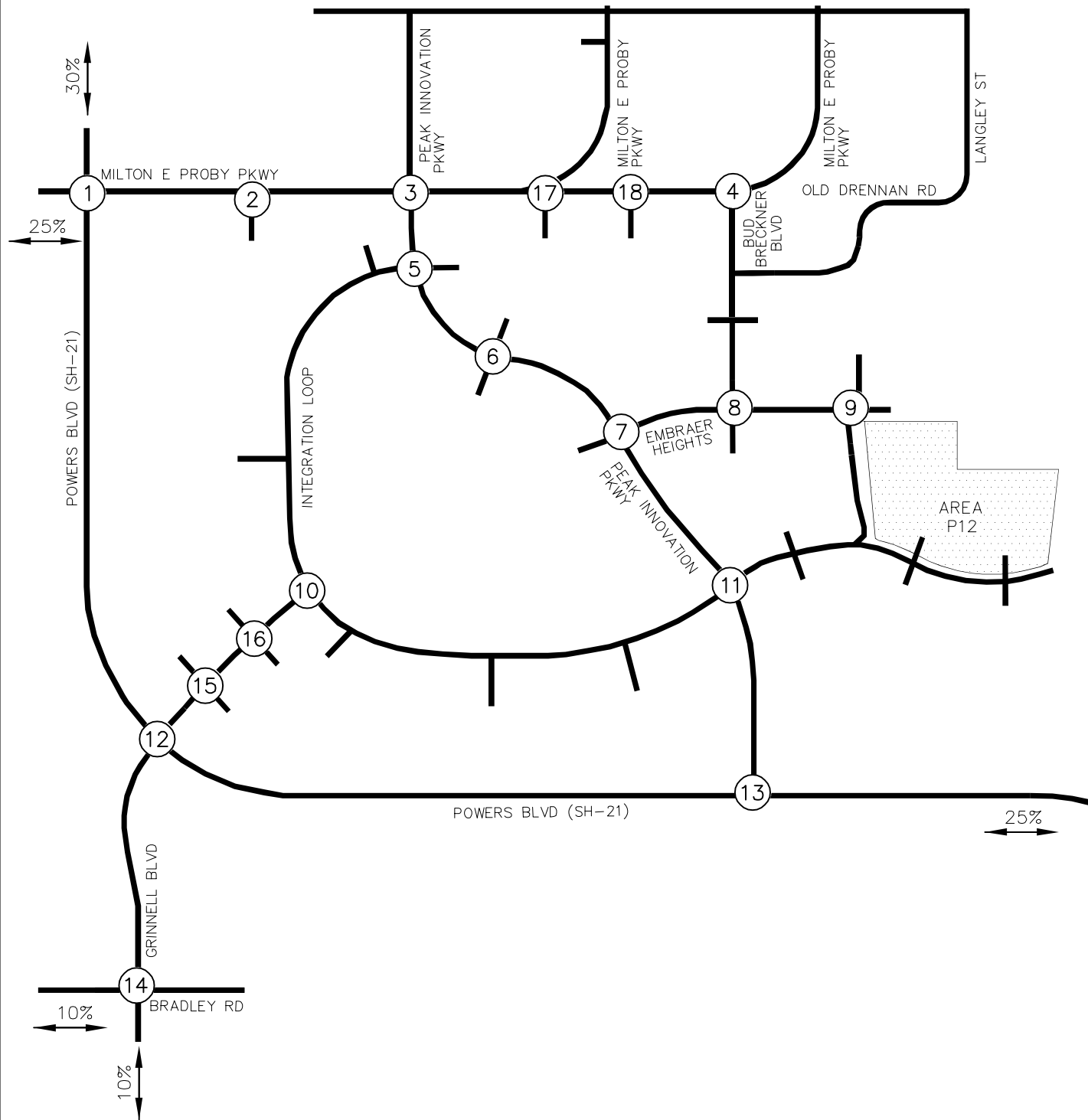
LEGEND

(X) Study Area Key Intersection

XX%(XX%) Entering(Exiting) Project Trip Distribution Percentage

PEAK INNOVATION PARK
 2030 & 2045 PROJECT TRIP DISTRIBUTION (AREA P11)

FIGURE A16



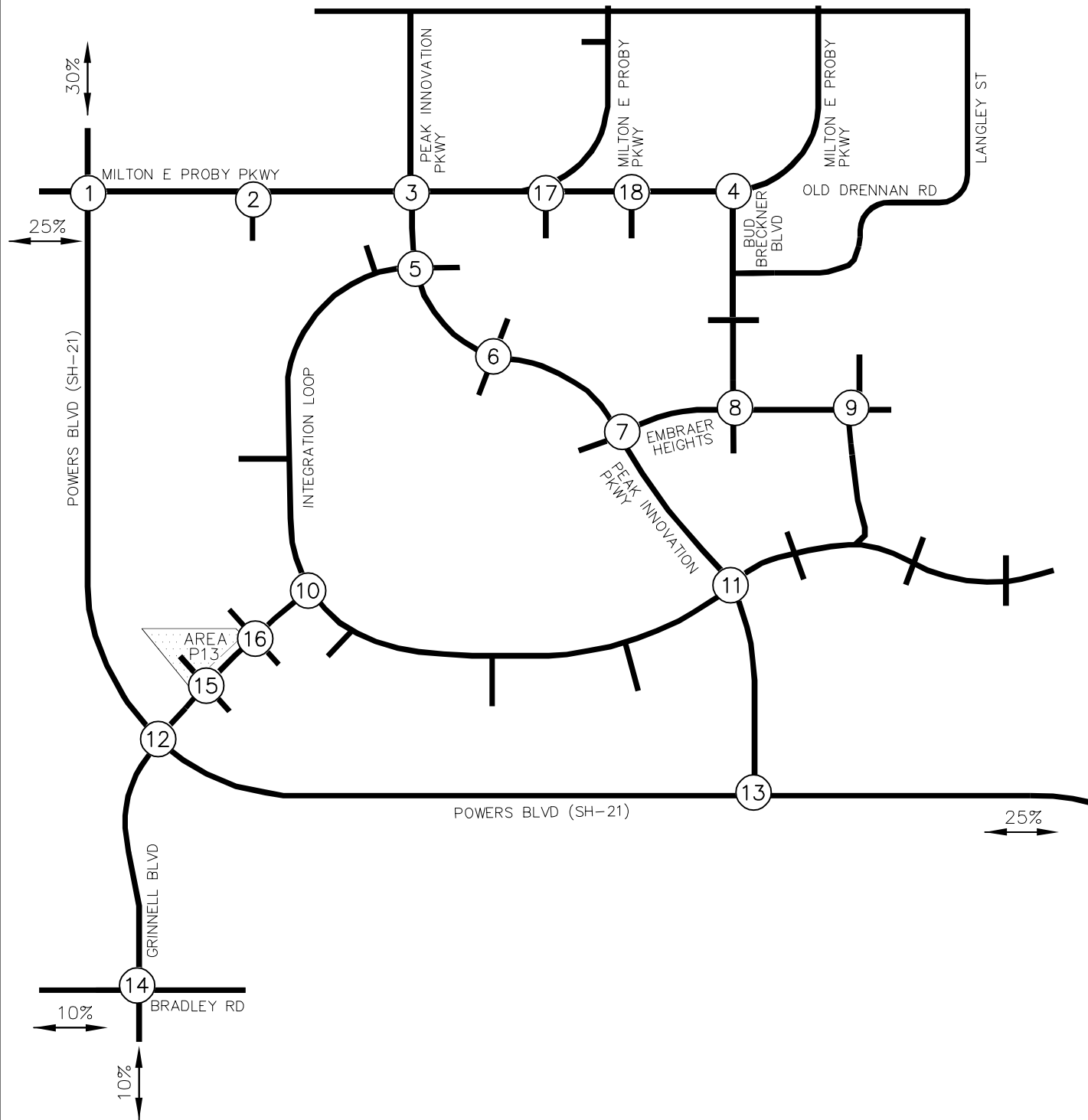
MILTON E PROBY PKWY / POWERS BLVD (SH-21)		MILTON E PROBY PKWY / RIRO ACCESS		MILTON E PROBY PKWY / PEAK INNOVATION PKWY		MILTON E PROBY PKWY / BUD BRECKNER BLVD		PEAK INNOVATION PKWY / INTEGRATION LOOP	
1	← 30(0) ← 0(30) 30(0) →	2	← 0(60) 60(0) →	3	← 0(25) 25(0) → 35(0) ↓ 0(35) ↗	4	25(0) ↓ 0(25) ↗	5	← 35(0) 0(35) →
PEAK INNOVATION PKWY / ACCESS		PEAK INNOVATION PKWY / EMBRAER HEIGHTS		EMBRAER HEIGHTS / BUD BRECKNER BLVD		EMBRAER HEIGHTS / ACCESS		GRINNELL BLVD / INTEGRATION LOOP	
6	← 0(35) 35(0) →	7	← 10(0) ← 25(0) 0(25) ↗ 0(10) →	8	← 25(0) 0(25) ↗ 0(25) ↘	9	← 10(0) 0(10) ↗ 0(45) ↘	10	INTEGRATION LOOP 5(0) ↓ 0(5) ↗
PEAK INNOVATION PKWY / INTEGRATION LOOP		POWERS BLVD (SH-21) / GRINNELL BLVD		PEAK INNOVATION PKWY / POWERS BLVD (SH-21)		BRADLEY RD / GRINNELL BLVD		GRINNELL BLVD / SOUTH ACCESS	
11	← 10(0) 0(10) ↗ 0(5) ↘ 0(35) ↘ 5(0) → 35(0) ↗	12	GRINNELL BLVD ← 0(5) 0(15) ↗ 5(0) ↗ 15(0) ↗	13	0(15) ↘ 0(20) ↘ 25(0) ↘ 15(0) →	14	0(10) ↘ 0(10) ↘ 10(0) → 10(0) ↑	15	ACCESS ← 0(5) 5(0) →
GRINNELL BLVD / NORTH ACCESS		MILTON E PROBY WEST RIRO ACCESS		MILTON E PROBY EAST RIRO ACCESS					
16	ACCESS ← 0(5) 5(0) →	17	25(0) →	18	25(0) →				

LEGEND

- (X) Study Area Key Intersection
- XX%(XX%) Entering(Exiting) Project Trip Distribution Percentage

PEAK INNOVATION PARK
 2030 & 2045 PROJECT TRIP DISTRIBUTION (AREA P12)

FIGURE A17



MILTON E PROBY PKWY / POWERS BLVD (SH-21) 1 20(0) ↓ 10(0) → 20(0) ↓ 10(0) ← 0(10) ↑ 0(10) ←	MILTON E PROBY PKWY / RIRO ACCESS 2 ← 0(20)	MILTON E PROBY PKWY / PEAK INNOVATION PKWY 3 20(0) ↓ 0(20) →	MILTON E PROBY PKWY / BUD BRECKNER BLVD 4	PEAK INNOVATION PKWY / INTEGRATION LOOP 5 20(0) ↓ 0(20) →
PEAK INNOVATION PKWY / ACCESS 6	PEAK INNOVATION PKWY / EMBRAER HEIGHTS 7	EMBRAER HEIGHTS / BUD BRECKNER BLVD 8	EMBRAER HEIGHTS / ACCESS 9	GRINNELL BLVD / INTEGRATION LOOP 10 20(0) ↓ 0(20) → 0(5) ↓ 5(0) →
PEAK INNOVATION PKWY / INTEGRATION LOOP 11 0(5) ↓ 5(0) →	POWERS BLVD (SH-21) / GRINNELL BLVD 12 0(40) ↓ 40(0) → 0(20) ↓ 0(15) ↓ 15(0) ↑ 20(0) →	PEAK INNOVATION PKWY / POWERS BLVD (SH-21) 13 0(5) ↓ 5(0) ↑ 5(0) ↑ 15(0) ←	BRADLEY RD / GRINNELL BLVD 14 0(10) ↓ 10(0) → 0(10) ↓ 10(0) ↑	GRINNELL BLVD / SOUTH ACCESS 15 0(75) ↓ 75(0) → 0(25) ↓ 25(0) ↑
GRINNELL BLVD / NORTH ACCESS 16 ← 25(0)	MILTON E PROBY WEST RIRO ACCESS 17	MILTON E PROBY EAST RIRO ACCESS 18		

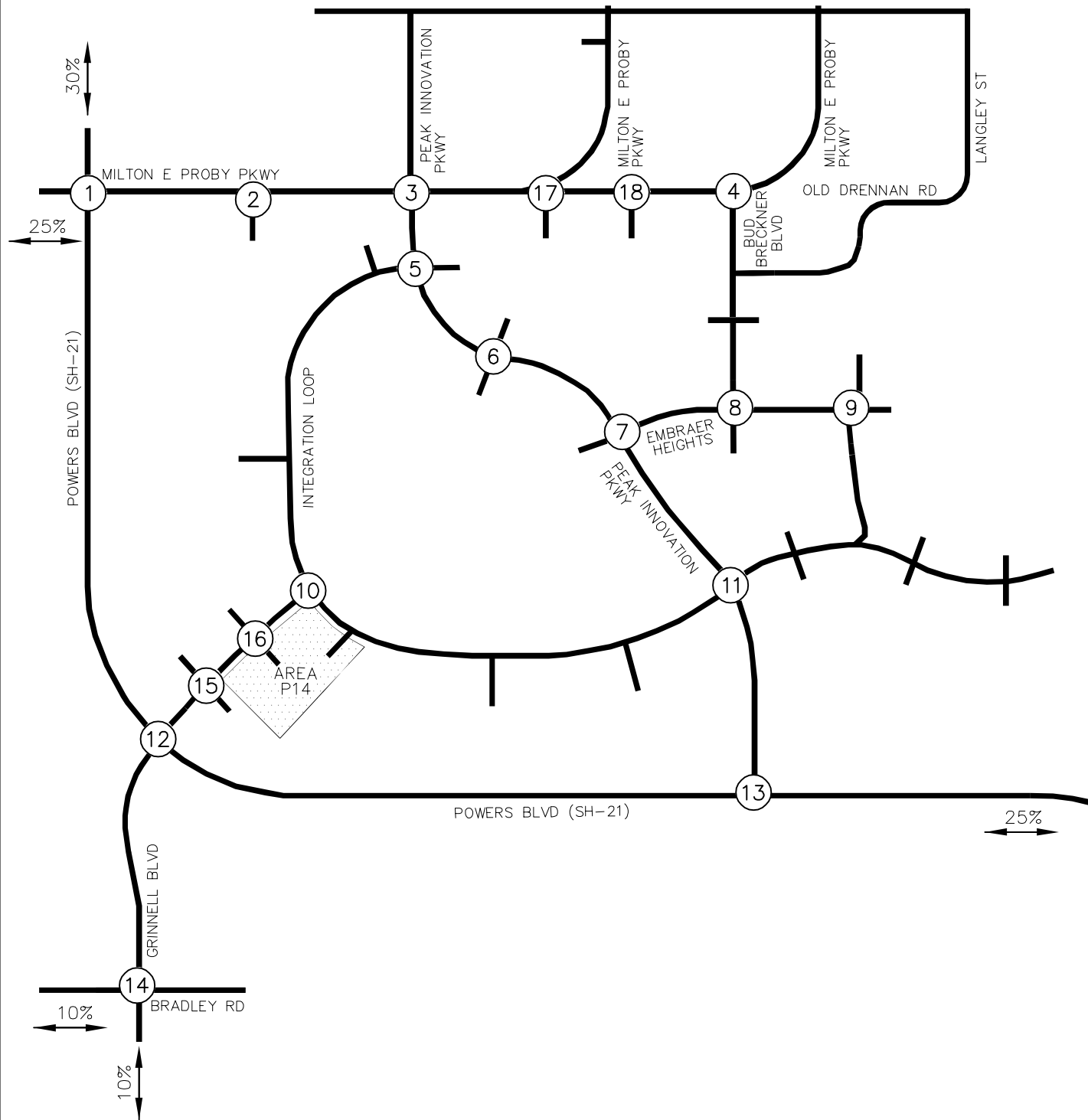
LEGEND

(X) Study Area Key Intersection

XX%(XX%) Entering(Exiting) Project Trip Distribution Percentage

PEAK INNOVATION PARK
 2030 & 2045 PROJECT TRIP DISTRIBUTION (AREA P13)

FIGURE A18



MILTON E PROBY PKWY / POWERS BLVD (SH-21)		MILTON E PROBY PKWY / RIRO ACCESS		MILTON E PROBY PKWY / PEAK INNOVATION PKWY		MILTON E PROBY PKWY / BUD BRECKNER BLVD		PEAK INNOVATION PKWY / INTEGRATION LOOP	
1	← 30(0) 30(0) →								
PEAK INNOVATION PKWY / ACCESS		PEAK INNOVATION PKWY / EMBRAER HEIGHTS		EMBRAER HEIGHTS / BUD BRECKNER BLVD		EMBRAER HEIGHTS / ACCESS		GRINNELL BLVD / INTEGRATION LOOP	
6		7		8		9		10	INTEGRATION LOOP 70(10) → 10(20) →
PEAK INNOVATION PKWY / INTEGRATION LOOP		POWERS BLVD (SH-21) / GRINNELL BLVD		PEAK INNOVATION PKWY / POWERS BLVD (SH-21)		BRADLEY RD / GRINNELL BLVD		GRINNELL BLVD / SOUTH ACCESS	
11	0(10) → 10(0) →	12	POWERS BLVD GRINNELL BLVD 0(60) → 0(20) → 0(10) → 10(0) →	13	0(10) → 10(0) → 10(0) →	14	0(10) → 0(10) → 10(0) → 10(0) →	15	ACCESS ← 0(70) 70(0) → 20(0) → 0(20) → 0(5) →
GRINNELL BLVD / NORTH ACCESS		MILTON E PROBY WEST RIRO ACCESS		MILTON E PROBY EAST RIRO ACCESS					
16	ACCESS ← 0(20) 70(5) → 0(5) → 0(5) →	17		18					

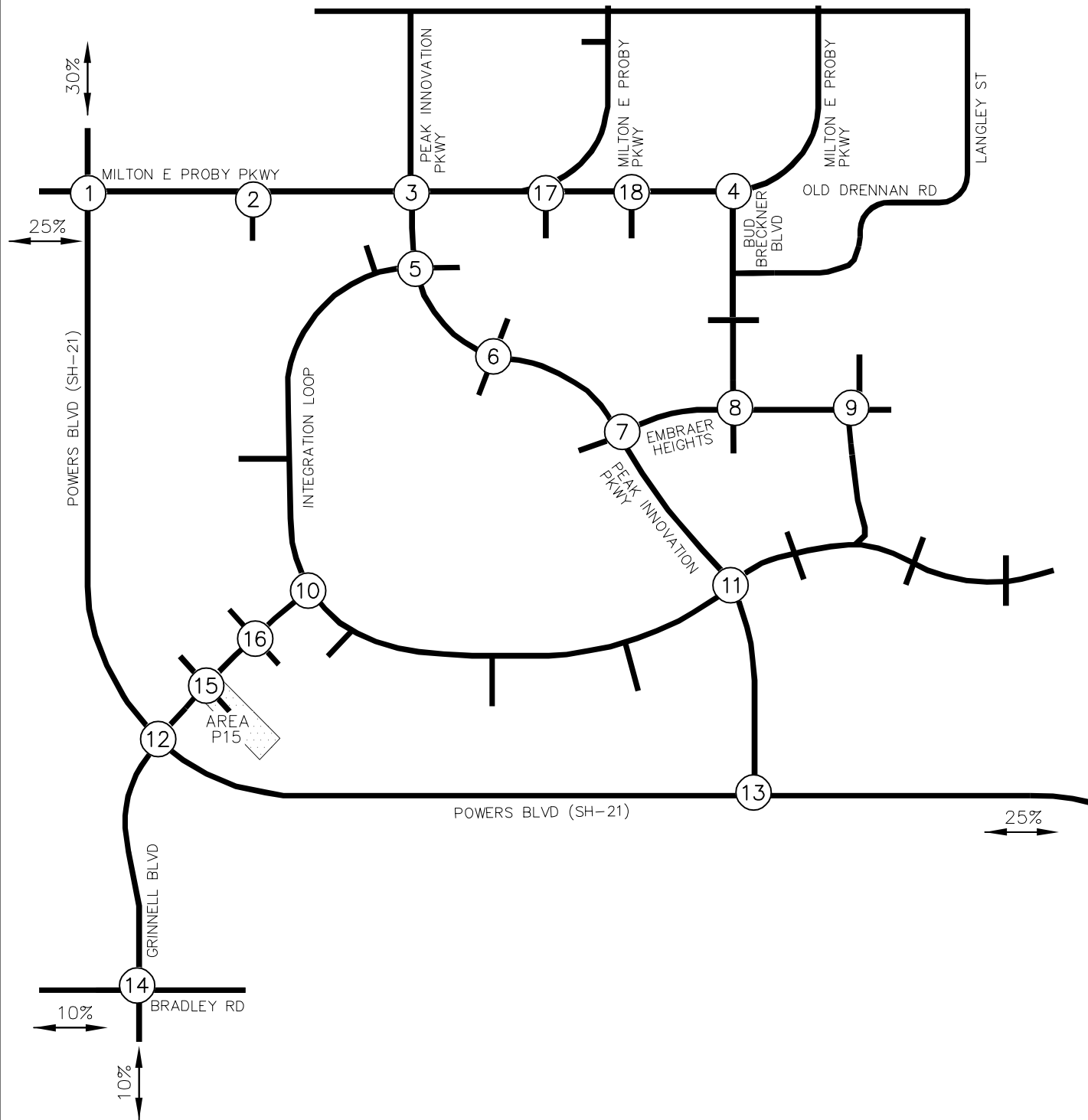
LEGEND

(X) Study Area Key Intersection

XX%(XX%) Entering(Exiting) Project Trip Distribution Percentage

PEAK INNOVATION PARK
 2030 & 2045 PROJECT TRIP DISTRIBUTION (AREA P14)

FIGURE A19



MILTON E PROBY PKWY / POWERS BLVD (SH-21)		MILTON E PROBY PKWY / RIRO ACCESS		MILTON E PROBY PKWY / PEAK INNOVATION PKWY		MILTON E PROBY PKWY / BUD BRECKNER BLVD		PEAK INNOVATION PKWY / INTEGRATION LOOP	
1	← 30(0) 30(0) →								
PEAK INNOVATION PKWY / ACCESS		PEAK INNOVATION PKWY / EMBRAER HEIGHTS		EMBRAER HEIGHTS / BUD BRECKNER BLVD		EMBRAER HEIGHTS / ACCESS		GRINNELL BLVD / INTEGRATION LOOP	
6								5(0) →	0(5) →
PEAK INNOVATION PKWY / INTEGRATION LOOP		POWERS BLVD (SH-21) / GRINNELL BLVD		PEAK INNOVATION PKWY / POWERS BLVD (SH-21)		BRADLEY RD / GRINNELL BLVD		GRINNELL BLVD / SOUTH ACCESS	
11	0(5) →	5(0) →	60(0) →	15(0) →	20(0) →	0(15) →	5(0) →	15(0) →	10(0) →
GRINNELL BLVD / NORTH ACCESS		MILTON E PROBY WEST RIRO ACCESS		MILTON E PROBY EAST RIRO ACCESS					
16	← 5(0)								
ACCESS		ACCESS		ACCESS		ACCESS		ACCESS	
	0(5) →								

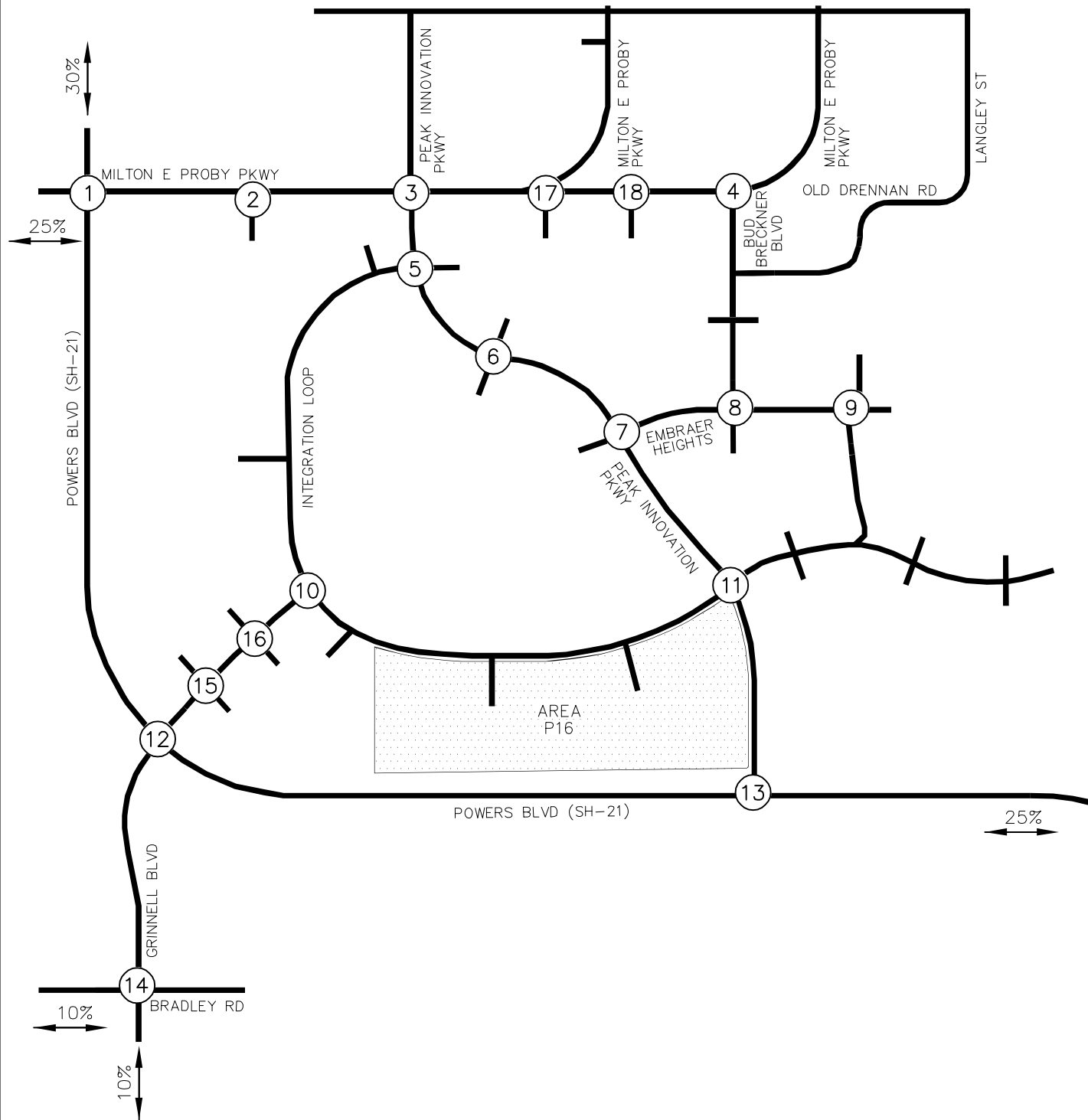
LEGEND

(X) Study Area Key Intersection

XX%(XX%) Entering(Exiting) Project Trip Distribution Percentage

PEAK INNOVATION PARK
 2030 & 2045 PROJECT TRIP DISTRIBUTION (AREA P15)

FIGURE A20



<p>MILTON E PROBY PKWY / POWERS BLVD (SH-21)</p> <p>1</p> <p>20(0) 10(0)</p> <p>5(0) → 25(0) ↓</p> <p>0(30) → 0(30) ←</p>	<p>MILTON E PROBY PKWY / RIRO ACCESS</p> <p>2</p> <p>← 0(15)</p> <p>15(0) →</p>	<p>MILTON E PROBY PKWY / PEAK INNOVATION PKWY</p> <p>3</p> <p>15(0) ↓</p> <p>0(15) →</p>	<p>MILTON E PROBY PKWY / BUD BRECKNER BLVD</p> <p>4</p>	<p>PEAK INNOVATION PKWY / INTEGRATION LOOP</p> <p>5</p> <p>← 15(0)</p> <p>0(15) →</p>
<p>PEAK INNOVATION PKWY / ACCESS</p> <p>6</p> <p>← 0(15)</p> <p>15(0) →</p>	<p>PEAK INNOVATION PKWY / EMBRAER HEIGHTS</p> <p>7</p> <p>← 15(0)</p> <p>0(15) →</p>	<p>EMBRAER HEIGHTS / BUD BRECKNER BLVD</p> <p>8</p>	<p>EMBRAER HEIGHTS / ACCESS</p> <p>9</p>	<p>GRINNELL BLVD / INTEGRATION LOOP</p> <p>10</p> <p>GRINNELL BLVD</p> <p>INTEGRATION LOOP</p> <p>50(0) ↓</p> <p>0(50) →</p>
<p>PEAK INNOVATION PKWY / INTEGRATION LOOP</p> <p>11</p> <p>← 15(0)</p> <p>0(15) →</p> <p>0(35) ↓</p> <p>35(0) →</p>	<p>POWERS BLVD (SH-21) / GRINNELL BLVD</p> <p>12</p> <p>POWERS BLVD</p> <p>GRINNELL BLVD</p> <p>0(35) ↓ 0(15) ↓</p> <p>35(0) → 10(0) →</p> <p>← 0(10) ← 0(5)</p> <p>15(0) → 5(0) →</p>	<p>PEAK INNOVATION PKWY / POWERS BLVD (SH-21)</p> <p>13</p> <p>0(15) ↓</p> <p>0(20) ↓</p> <p>20(0) →</p> <p>15(0) →</p>	<p>BRADLEY RD / GRINNELL BLVD</p> <p>14</p> <p>0(10) ↓ 0(10) ↓</p> <p>10(0) →</p> <p>10(0) ↑</p>	<p>GRINNELL BLVD / SOUTH ACCESS</p> <p>15</p> <p>GRINNELL BLVD</p> <p>ACCESS</p> <p>← 0(50)</p> <p>50(0) →</p>
<p>GRINNELL BLVD / NORTH ACCESS</p> <p>16</p> <p>GRINNELL BLVD</p> <p>ACCESS</p> <p>← 0(50)</p> <p>50(0) →</p>	<p>MILTON E PROBY WEST RIRO ACCESS</p> <p>17</p>	<p>MILTON E PROBY EAST RIRO ACCESS</p> <p>18</p>		

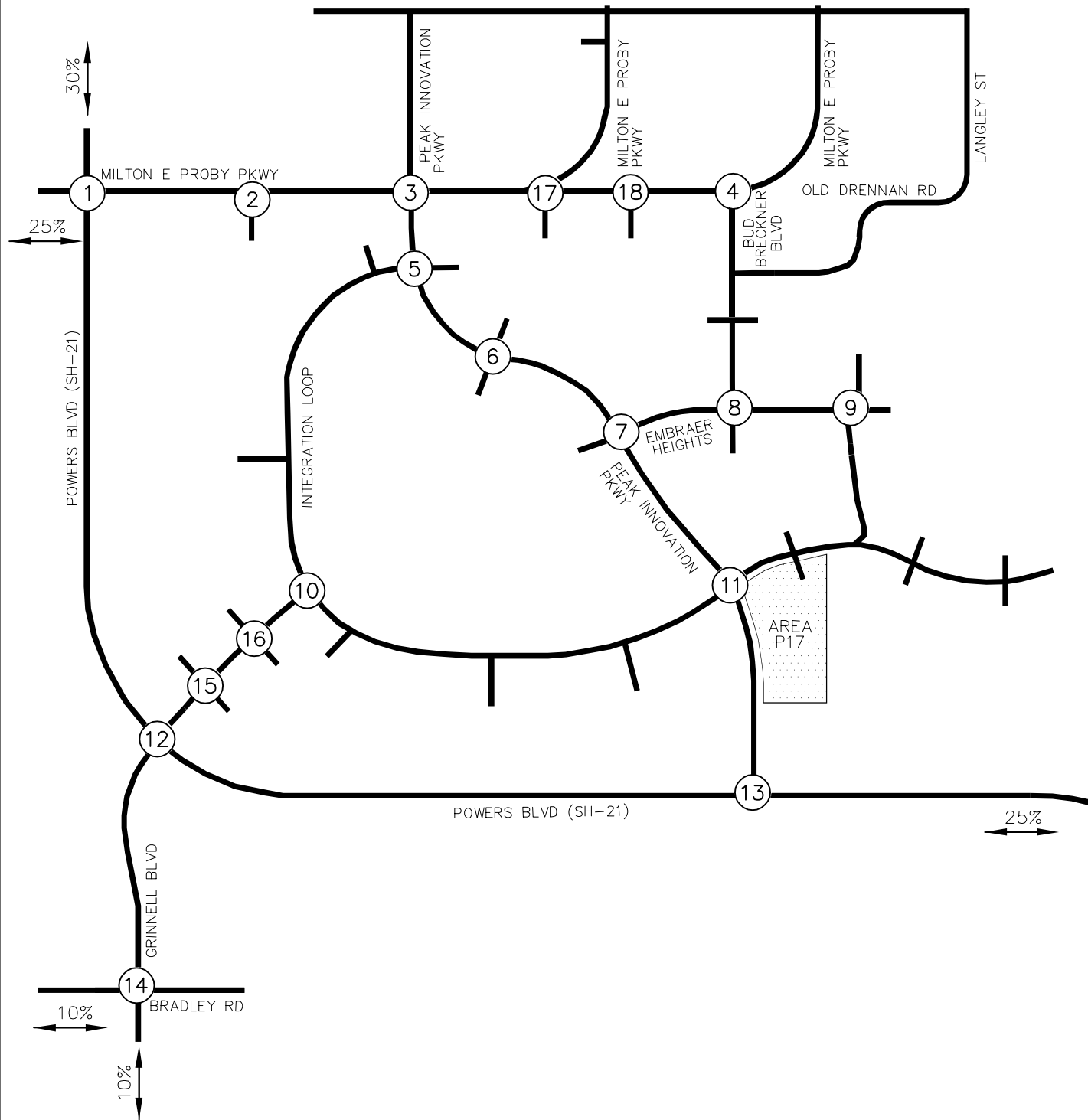
LEGEND

(X) Study Area Key Intersection

XX%(XX%) Entering(Exiting) Project Trip Distribution Percentage

PEAK INNOVATION PARK
 2030 & 2045 PROJECT TRIP DISTRIBUTION (AREA P16)

FIGURE A21



MILTON E PROBY PKWY / POWERS BLVD (SH-21) 1 15(0) ↓, 15(0) ↓, 0(15) ↗, 0(15) ↖ 15(0) →, 15(0) ↘, 0(15) ↗, 0(15) ↘	MILTON E PROBY PKWY / RIRO ACCESS 2 ← 0(30)	MILTON E PROBY PKWY / PEAK INNOVATION PKWY 3 30(0) ↘, 0(30) ↗	MILTON E PROBY PKWY / BUD BRECKNER BLVD 4	PEAK INNOVATION PKWY / INTEGRATION LOOP 5 ← 30(0) 0(30) ↗
PEAK INNOVATION PKWY / ACCESS 6 ← 0(30) 30(0) →	PEAK INNOVATION PKWY / EMBRAER HEIGHTS 7 ← 30(0) 0(30) ↗	EMBRAER HEIGHTS / BUD BRECKNER BLVD 8	EMBRAER HEIGHTS / ACCESS 9	GRINNELL BLVD / INTEGRATION LOOP 10 GRINNELL BLVD INTEGRATION LOOP 10(0) ↘, 0(10) ↗
PEAK INNOVATION PKWY / INTEGRATION LOOP 11 30(0) ↘, 0(30) ↗, 0(10) ↖, 0(60) ↘ 10(0) →, 60(0) ↗	POWERS BLVD (SH-21) / GRINNELL BLVD 12 GRINNELL BLVD POWERS BLVD 30(0) →, 0(10) ↓, 0(30) ↖, 0(10) ↘, 10(0) ↗, 10(0) ↘	PEAK INNOVATION PKWY / POWERS BLVD (SH-21) 13 0(40) ↘, 0(20) ↘, 20(0) ↗ 40(0) ↗	BRADLEY RD / GRINNELL BLVD 14 0(10) ↘, 0(10) ↘, 10(0) ↗, 10(0) ↑	GRINNELL BLVD / SOUTH ACCESS 15 GRINNELL BLVD SOUTH ACCESS ← 0(10) 10(0) →
GRINNELL BLVD / NORTH ACCESS 16 GRINNELL BLVD NORTH ACCESS ← 0(10) 10(0) →	MILTON E PROBY WEST RIRO ACCESS 17	MILTON E PROBY EAST RIRO ACCESS 18		

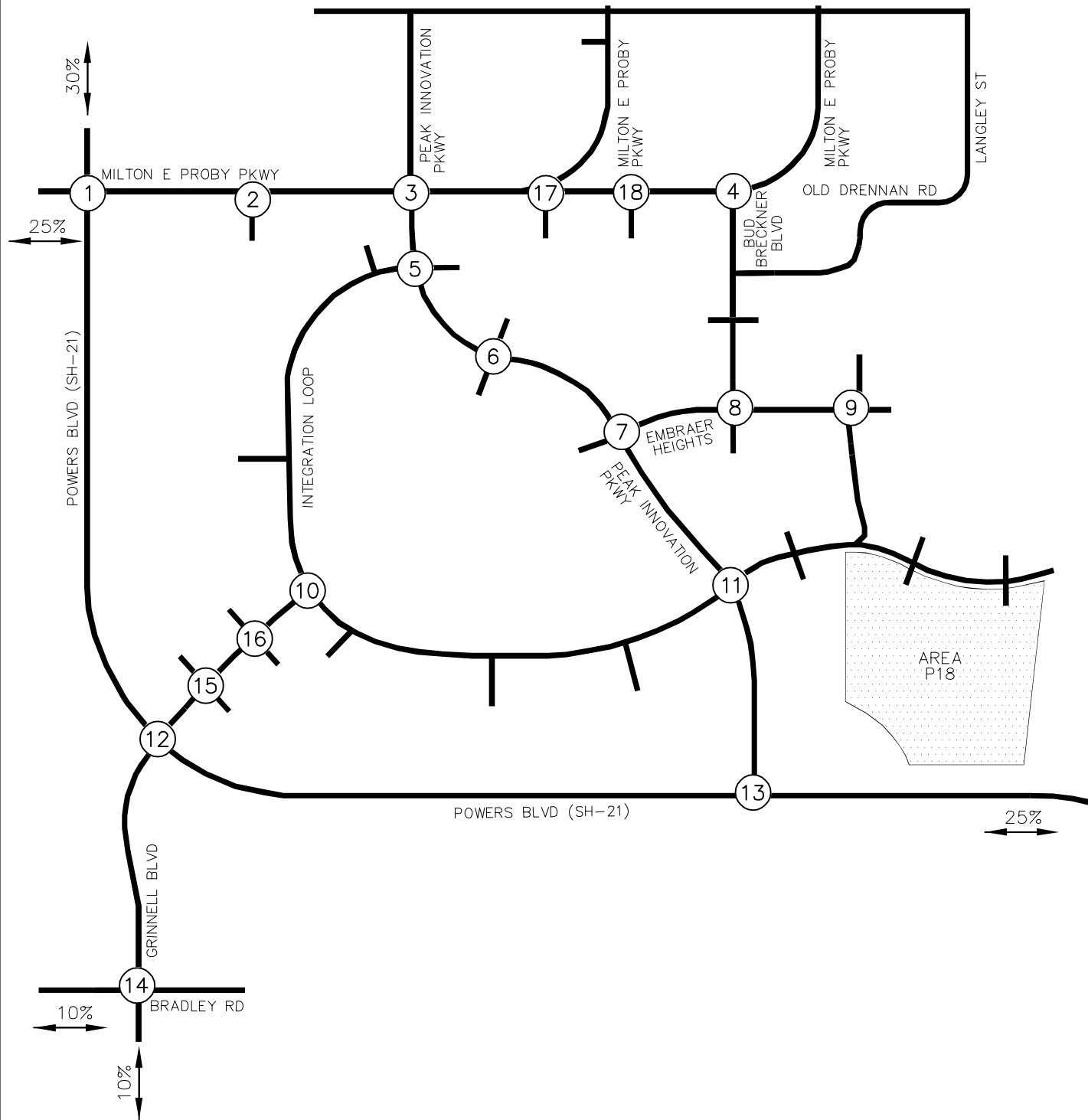
LEGEND

(X) Study Area Key Intersection

XX%(XX%) Entering(Exiting) Project Trip Distribution Percentage

PEAK INNOVATION PARK
 2030 & 2045 PROJECT TRIP DISTRIBUTION (AREA P17)

FIGURE A22



MILTON E PROBY PKWY / POWERS BLVD (SH-21)		MILTON E PROBY PKWY / RIRO ACCESS		MILTON E PROBY PKWY / PEAK INNOVATION PKWY		MILTON E PROBY PKWY / BUD BRECKNER BLVD		PEAK INNOVATION PKWY / INTEGRATION LOOP	
1	15(0) ↓ 15(0) ↓ 0(15) ← 0(15) ←	2	← 0(30)	3	30(0) ↓ 0(30) ↓	4		5	← 30(0) 0(30) ↑
PEAK INNOVATION PKWY / ACCESS		PEAK INNOVATION PKWY / EMBRAER HEIGHTS		EMBRAER HEIGHTS / BUD BRECKNER BLVD		EMBRAER HEIGHTS / ACCESS		GRINNEL BLVD / INTEGRATION LOOP	
6	← 0(30)	7	← 30(0) 0(30) ↑	8		9		10	INTEGRATION LOOP 10(0) ↓ 0(10) ↓
PEAK INNOVATION PKWY / INTEGRATION LOOP		POWERS BLVD (SH-21) / GRINNEL BLVD		PEAK INNOVATION PKWY / POWERS BLVD (SH-21)		BRADLEY RD / GRINNEL BLVD		GRINNEL BLVD / SOUTH ACCESS	
11	30(0) ↓ 0(30) ↓ 0(10) ↓ 0(60) ↓ 10(0) → 60(0) ↑	12	GRINNEL BLVD 30(0) → 0(10) ↓ ← 0(30) ← 0(10)	13	0(40) ↓ 0(20) ↓ 20(0) ↓ 40(0) →	14	0(10) ↓ 0(10) ↓ 10(0) → 10(0) ↑	15	ACCESS 10(0) → ← 0(10)
GRINNEL BLVD / NORTH ACCESS		MILTON E PROBY WEST RIRO ACCESS		MILTON E PROBY EAST RIRO ACCESS					
16	ACCESS 10(0) → ← 0(10)	17		18					

LEGEND

(X) Study Area Key Intersection

XX%(XX%) Entering(Exiting) Project Trip Distribution Percentage

PEAK INNOVATION PARK
 2030 & 2045 PROJECT TRIP DISTRIBUTION (AREA P18)

FIGURE A23

APPENDIX E

Intersection Analysis Worksheets

Timings
1: Powers Blvd (SH-21) & Milton E Proby Parkway

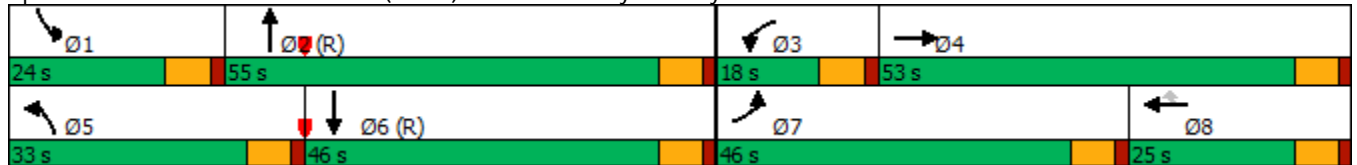
2019 Existing AM.syn
04/16/2020

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	603	203	218	4	69	89	338	1028	13	288	541	693
Future Volume (vph)	603	203	218	4	69	89	338	1028	13	288	541	693
Turn Type	Prot	NA	Free	Prot	NA	Perm	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			8			Free			Free
Detector Phase	7	4		3	8	8	5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	11.5	24.5		11.5	24.5	24.5	11.5	24.5		11.5	24.5	
Total Split (s)	46.0	53.0		18.0	25.0	25.0	33.0	55.0		24.0	46.0	
Total Split (%)	30.7%	35.3%		12.0%	16.7%	16.7%	22.0%	36.7%		16.0%	30.7%	
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
All-Red Time (s)	1.5	1.5		1.5	1.5	1.5	1.5	1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.5	6.5		6.5	6.5	6.5	6.5	6.5		6.5	6.5	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None	None	None	C-Max		None	C-Max	
Act Effect Green (s)	37.2	50.8	150.0	6.3	9.9	9.9	22.1	54.8	150.0	22.0	54.8	150.0
Actuated g/C Ratio	0.25	0.34	1.00	0.04	0.07	0.07	0.15	0.37	1.00	0.15	0.37	1.00
v/c Ratio	0.90	0.23	0.16	0.11	0.46	0.37	0.77	1.08	0.02	0.74	0.48	0.49
Control Delay	69.3	36.2	0.2	71.8	73.6	3.4	71.9	94.3	0.0	70.7	39.8	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.3	36.2	0.2	71.8	73.6	3.4	71.9	94.3	0.0	70.7	39.8	1.1
LOS	E	D	A	E	E	A	E	F	A	E	D	A
Approach Delay		49.0			38.7			88.0			29.2	
Approach LOS		D			D			F			C	

Intersection Summary

Cycle Length: 150
 Actuated Cycle Length: 150
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 150
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.08
 Intersection Signal Delay: 55.3
 Intersection LOS: E
 Intersection Capacity Utilization 76.8%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 1: Powers Blvd (SH-21) & Milton E Proby Parkway



HCM 6th Signalized Intersection Summary
 1: Powers Blvd (SH-21) & Milton E Proby Parkway

2019 Existing AM.syn
 04/16/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗↘	↑↑	↗	↘	↑↑	↗	↗↘	↑↑	↗	↗↘	↑↑	↗
Traffic Volume (veh/h)	603	203	218	4	69	89	338	1028	13	288	541	693
Future Volume (veh/h)	603	203	218	4	69	89	338	1028	13	288	541	693
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1841	1781	1841	1841	1781	1841
Adj Flow Rate, veh/h	754	267	0	8	105	0	380	1318	0	365	582	0
Peak Hour Factor	0.80	0.76	0.89	0.50	0.66	0.80	0.89	0.78	0.54	0.79	0.93	0.91
Percent Heavy Veh, %	4	4	4	4	4	4	4	8	4	4	8	4
Cap, veh/h	815	964		17	159		438	1438		397	1397	
Arrive On Green	0.24	0.28	0.00	0.01	0.05	0.00	0.13	0.42	0.00	0.12	0.41	0.00
Sat Flow, veh/h	3401	3497	1560	1753	3497	1560	3401	3385	1560	3401	3385	1560
Grp Volume(v), veh/h	754	267	0	8	105	0	380	1318	0	365	582	0
Grp Sat Flow(s),veh/h/ln	1700	1749	1560	1753	1749	1560	1700	1692	1560	1700	1692	1560
Q Serve(g_s), s	32.5	9.0	0.0	0.7	4.4	0.0	16.4	55.0	0.0	15.9	18.3	0.0
Cycle Q Clear(g_c), s	32.5	9.0	0.0	0.7	4.4	0.0	16.4	55.0	0.0	15.9	18.3	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	815	964		17	159		438	1438		397	1397	
V/C Ratio(X)	0.92	0.28		0.48	0.66		0.87	0.92		0.92	0.42	
Avail Cap(c_a), veh/h	896	1084		134	431		601	1438		397	1397	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	55.7	42.6	0.0	73.9	70.5	0.0	64.1	40.6	0.0	65.6	31.2	0.0
Incr Delay (d2), s/veh	14.3	0.2	0.0	20.2	4.7	0.0	9.8	10.7	0.0	26.3	0.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	15.6	4.0	0.0	0.4	2.1	0.0	7.7	24.9	0.0	8.4	7.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	70.1	42.8	0.0	94.1	75.1	0.0	73.9	51.3	0.0	91.9	32.2	0.0
LnGrp LOS	E	D		F	E		E	D		F	C	
Approach Vol, veh/h		1021	A		113	A		1698	A		947	A
Approach Delay, s/veh		62.9			76.5			56.4			55.2	
Approach LOS		E			E			E			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	24.0	70.2	7.9	47.8	25.8	68.4	42.5	13.3				
Change Period (Y+Rc), s	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5				
Max Green Setting (Gmax), s	17.5	48.5	11.5	46.5	26.5	39.5	39.5	18.5				
Max Q Clear Time (g_c+l1), s	17.9	57.0	2.7	11.0	18.4	20.3	34.5	6.4				
Green Ext Time (p_c), s	0.0	0.0	0.0	1.9	0.9	3.9	1.5	0.4				

Intersection Summary

HCM 6th Ctrl Delay	58.4
HCM 6th LOS	E

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Timings
1: Powers Blvd (SH-21) & Milton E Proby Parkway

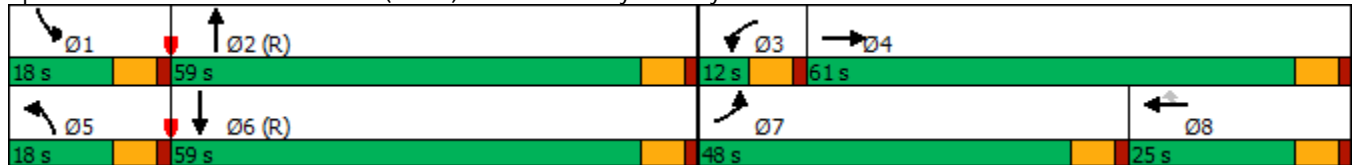
2019 Existing PM.syn
04/16/2020

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	670	84	320	9	159	248	154	581	6	124	938	519
Future Volume (vph)	670	84	320	9	159	248	154	581	6	124	938	519
Turn Type	Prot	NA	Free	Prot	NA	Perm	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			8			Free			Free
Detector Phase	7	4		3	8	8	5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	11.5	24.5		11.5	24.5	24.5	11.5	24.5		11.5	24.5	
Total Split (s)	48.0	61.0		12.0	25.0	25.0	18.0	59.0		18.0	59.0	
Total Split (%)	32.0%	40.7%		8.0%	16.7%	16.7%	12.0%	39.3%		12.0%	39.3%	
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
All-Red Time (s)	1.5	1.5		1.5	1.5	1.5	1.5	1.5		1.5	1.5	
Lost Time Adjust (s)	-0.5	-0.5		-0.5	-0.5	-0.5	-0.5	-0.5		-0.5	-0.5	
Total Lost Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None	None	None	C-Max		None	C-Max	
Act Effect Green (s)	37.7	52.9	150.0	6.0	16.4	16.4	12.7	60.4	150.0	11.4	59.2	150.0
Actuated g/C Ratio	0.25	0.35	1.00	0.04	0.11	0.11	0.08	0.40	1.00	0.08	0.39	1.00
v/c Ratio	0.86	0.09	0.23	0.29	0.65	0.76	0.70	0.45	0.01	0.58	0.78	0.37
Control Delay	64.6	32.4	0.3	80.4	71.9	32.1	80.1	35.4	0.0	76.3	45.6	0.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.6	32.4	0.3	80.4	71.9	32.1	80.1	35.4	0.0	76.3	45.6	0.7
LOS	E	C	A	F	E	C	F	D	A	E	D	A
Approach Delay		42.3			52.6			45.6			33.6	
Approach LOS		D			D			D			C	

Intersection Summary

Cycle Length: 150
 Actuated Cycle Length: 150
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 100
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.86
 Intersection Signal Delay: 40.6
 Intersection LOS: D
 Intersection Capacity Utilization 73.8%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 1: Powers Blvd (SH-21) & Milton E Proby Parkway



HCM 6th Signalized Intersection Summary
 1: Powers Blvd (SH-21) & Milton E Proby Parkway

2019 Existing PM.syn
 04/16/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↗	↑↑	↖	↖	↑↑	↖	↖↗	↑↑	↖	↖↗	↑↑	↖
Traffic Volume (veh/h)	670	84	320	9	159	248	154	581	6	124	938	519
Future Volume (veh/h)	670	84	320	9	159	248	154	581	6	124	938	519
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1811	1856	1856	1811	1856
Adj Flow Rate, veh/h	736	117	0	20	248	0	200	618	0	151	1042	0
Peak Hour Factor	0.91	0.72	0.88	0.45	0.64	0.95	0.77	0.94	0.50	0.82	0.90	0.90
Percent Heavy Veh, %	3	3	3	3	3	3	3	6	3	3	6	3
Cap, veh/h	816	1080		39	319		255	1552		208	1504	
Arrive On Green	0.24	0.31	0.00	0.02	0.09	0.00	0.07	0.45	0.00	0.06	0.44	0.00
Sat Flow, veh/h	3428	3526	1572	1767	3526	1572	3428	3441	1572	3428	3441	1572
Grp Volume(v), veh/h	736	117	0	20	248	0	200	618	0	151	1042	0
Grp Sat Flow(s),veh/h/ln	1714	1763	1572	1767	1763	1572	1714	1721	1572	1714	1721	1572
Q Serve(g_s), s	31.2	3.6	0.0	1.7	10.3	0.0	8.6	18.0	0.0	6.5	36.7	0.0
Cycle Q Clear(g_c), s	31.2	3.6	0.0	1.7	10.3	0.0	8.6	18.0	0.0	6.5	36.7	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	816	1080		39	319		255	1552		208	1504	
V/C Ratio(X)	0.90	0.11		0.51	0.78		0.78	0.40		0.73	0.69	
Avail Cap(c_a), veh/h	960	1293		71	447		274	1552		274	1504	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	55.4	37.3	0.0	72.5	66.8	0.0	68.2	27.6	0.0	69.2	34.1	0.0
Incr Delay (d2), s/veh	10.4	0.0	0.0	9.9	5.7	0.0	13.0	0.8	0.0	6.5	2.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.7	1.6	0.0	0.9	4.9	0.0	4.2	7.7	0.0	3.1	15.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	65.8	37.4	0.0	82.4	72.5	0.0	81.3	28.3	0.0	75.7	36.7	0.0
LnGrp LOS	E	D		F	E		F	C		E	D	
Approach Vol, veh/h		853	A		268	A		818	A		1193	A
Approach Delay, s/veh		61.9			73.2			41.3			41.7	
Approach LOS		E			E			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	15.1	73.6	9.3	51.9	17.2	71.6	41.7	19.6				
Change Period (Y+Rc), s	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5				
Max Green Setting (Gmax), s	11.5	52.5	5.5	54.5	11.5	52.5	41.5	18.5				
Max Q Clear Time (g_c+I1), s	8.5	20.0	3.7	5.6	10.6	38.7	33.2	12.3				
Green Ext Time (p_c), s	0.1	4.8	0.0	0.8	0.1	6.3	2.0	0.7				

Intersection Summary

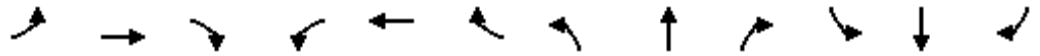
HCM 6th Ctrl Delay	49.8
HCM 6th LOS	D

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Timings

1: Powers Blvd (SH-21) & Milton E Proby Parkway



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↑↑	↗	↖	↑↑	↗	↔↔	↑↑↑	↗	↔↔	↑↑	↗
Traffic Volume (vph)	621	565	435	4	259	280	546	1257	71	620	799	714
Future Volume (vph)	621	565	435	4	259	280	546	1257	71	620	799	714
Turn Type	Prot	NA	Free	pm+pt	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free	8		Free			Free			Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	11.5	24.5		11.5	24.5		11.5	24.5		11.5	24.5	
Total Split (s)	38.0	51.0		11.5	24.5		36.5	50.3		37.2	51.0	
Total Split (%)	25.3%	34.0%		7.7%	16.3%		24.3%	33.5%		24.8%	34.0%	
Yellow Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	
Act Effct Green (s)	31.4	52.0	150.0	21.4	16.4	150.0	28.9	44.9	150.0	31.4	47.4	150.0
Actuated g/C Ratio	0.21	0.35	1.00	0.14	0.11	1.00	0.19	0.30	1.00	0.21	0.32	1.00
v/c Ratio	0.96	0.51	0.30	0.03	0.74	0.20	0.90	0.93	0.05	0.95	0.81	0.49
Control Delay	83.5	41.1	0.5	33.8	77.2	0.3	76.4	63.3	0.1	81.3	55.1	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	83.5	41.1	0.5	33.8	77.2	0.3	76.4	63.3	0.1	81.3	55.1	1.1
LOS	F	D	A	C	E	A	E	E	A	F	E	A
Approach Delay		46.4			37.3			64.7			44.7	
Approach LOS		D			D			E			D	

Intersection Summary

Cycle Length: 150
 Actuated Cycle Length: 150
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 140
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.96
 Intersection Signal Delay: 50.5
 Intersection LOS: D
 Intersection Capacity Utilization 88.5%
 ICU Level of Service E
 Analysis Period (min) 15

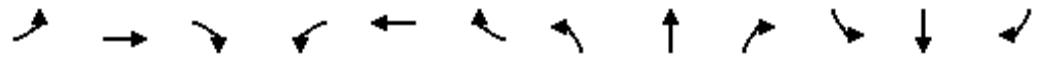
Splits and Phases: 1: Powers Blvd (SH-21) & Milton E Proby Parkway



HCM 6th Signalized Intersection Summary
 1: Powers Blvd (SH-21) & Milton E Proby Parkway

2022 Total AM Imp_3-13-14.syn

04/16/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↗	↕	↖	↗	↕	↖	↖↗	↕	↖	↖↗	↕	↖
Traffic Volume (veh/h)	621	565	435	4	259	280	546	1257	71	620	799	714
Future Volume (veh/h)	621	565	435	4	259	280	546	1257	71	620	799	714
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1841	1781	1841	1841	1781	1841
Adj Flow Rate, veh/h	675	614	0	4	282	0	581	1337	0	667	859	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.94	0.94	0.92	0.93	0.93	0.93
Percent Heavy Veh, %	4	4	4	4	4	4	4	8	4	4	8	4
Cap, veh/h	712	1053		134	338		632	1536		696	1133	
Arrive On Green	0.21	0.30	0.00	0.01	0.10	0.00	0.19	0.32	0.00	0.20	0.33	0.00
Sat Flow, veh/h	3401	3497	1560	1753	3497	1560	3401	4863	1560	3401	3385	1560
Grp Volume(v), veh/h	675	614	0	4	282	0	581	1337	0	667	859	0
Grp Sat Flow(s),veh/h/ln	1700	1749	1560	1753	1749	1560	1700	1621	1560	1700	1692	1560
Q Serve(g_s), s	29.4	22.3	0.0	0.3	11.9	0.0	25.2	38.9	0.0	29.1	33.9	0.0
Cycle Q Clear(g_c), s	29.4	22.3	0.0	0.3	11.9	0.0	25.2	38.9	0.0	29.1	33.9	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	712	1053		134	338		632	1536		696	1133	
V/C Ratio(X)	0.95	0.58		0.03	0.83		0.92	0.87		0.96	0.76	
Avail Cap(c_a), veh/h	714	1053		183	420		680	1536		696	1133	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	58.5	44.4	0.0	60.6	66.6	0.0	60.0	48.4	0.0	59.0	44.5	0.0
Incr Delay (d2), s/veh	21.8	0.8	0.0	0.1	11.3	0.0	17.1	7.0	0.0	24.2	4.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.8	9.9	0.0	0.1	5.9	0.0	12.4	16.7	0.0	14.9	15.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	80.2	45.3	0.0	60.7	77.8	0.0	77.0	55.4	0.0	83.2	49.2	0.0
LnGrp LOS	F	D		E	E		E	E		F	D	
Approach Vol, veh/h		1289	A		286	A		1918	A		1526	A
Approach Delay, s/veh		63.6			77.6			62.0			64.1	
Approach LOS		E			E			E			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	37.2	53.9	7.3	51.6	34.4	56.7	37.9	21.0				
Change Period (Y+Rc), s	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5				
Max Green Setting (Gmax), s	30.7	43.8	5.0	44.5	30.0	44.5	31.5	18.0				
Max Q Clear Time (g_c+l1), s	31.1	40.9	2.3	24.3	27.2	35.9	31.4	13.9				
Green Ext Time (p_c), s	0.0	2.2	0.0	4.2	0.7	3.8	0.0	0.6				

Intersection Summary

HCM 6th Ctrl Delay	63.9
HCM 6th LOS	E

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Timings

1: Powers Blvd (SH-21) & Milton E Proby Parkway

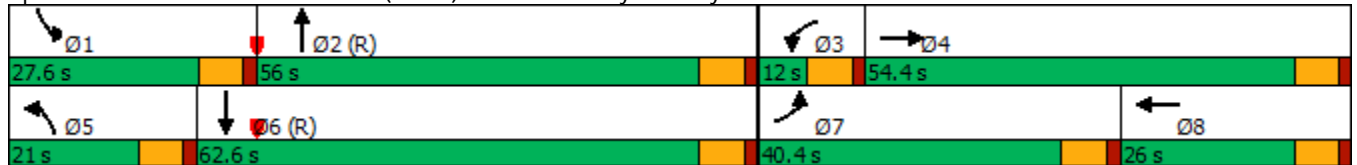
04/16/2020

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	690	273	471	9	408	500	265	705	59	298	1122	535
Future Volume (vph)	690	273	471	9	408	500	265	705	59	298	1122	535
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free			Free			Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	11.5	24.5		11.5	24.5		11.5	24.5		11.5	24.5	
Total Split (s)	40.4	54.4		12.0	26.0		21.0	56.0		27.6	62.6	
Total Split (%)	26.9%	36.3%		8.0%	17.3%		14.0%	37.3%		18.4%	41.7%	
Yellow Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)	-0.5	-0.5		-0.5	-0.5		-0.5	-0.5		-0.5	-0.5	
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	
Act Effct Green (s)	34.4	53.2	150.0	6.0	20.0	150.0	15.0	52.3	150.0	19.3	56.6	150.0
Actuated g/C Ratio	0.23	0.35	1.00	0.04	0.13	1.00	0.10	0.35	1.00	0.13	0.38	1.00
v/c Ratio	0.97	0.24	0.34	0.29	0.95	0.34	0.92	0.44	0.04	0.74	0.95	0.38
Control Delay	83.1	35.8	0.6	80.4	94.4	0.6	98.0	38.9	0.1	73.7	60.9	0.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	83.1	35.8	0.6	80.4	94.4	0.6	98.0	38.9	0.1	73.7	60.9	0.7
LOS	F	D	A	F	F	A	F	D	A	E	E	A
Approach Delay		46.5			44.2			53.1			46.1	
Approach LOS		D			D			D			D	

Intersection Summary

Cycle Length: 150
 Actuated Cycle Length: 150
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 130
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.97
 Intersection Signal Delay: 47.2
 Intersection LOS: D
 Intersection Capacity Utilization 89.5%
 ICU Level of Service E
 Analysis Period (min) 15

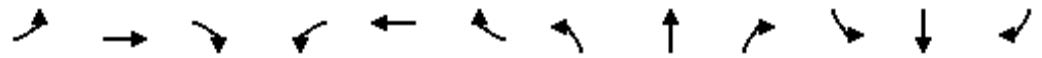
Splits and Phases: 1: Powers Blvd (SH-21) & Milton E Proby Parkway



HCM 6th Signalized Intersection Summary
 1: Powers Blvd (SH-21) & Milton E Proby Parkway

2022 Total PM Imp_3-13-14.syn

04/16/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↗	↑↑	↖	↖	↑↑	↖	↖↗	↑↑↑	↖	↖↗	↑↑	↖
Traffic Volume (veh/h)	690	273	471	9	408	500	265	705	59	298	1122	535
Future Volume (veh/h)	690	273	471	9	408	500	265	705	59	298	1122	535
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1811	1856	1856	1811	1856
Adj Flow Rate, veh/h	758	297	0	20	443	0	312	750	0	324	1220	0
Peak Hour Factor	0.91	0.92	0.88	0.45	0.92	0.95	0.85	0.94	0.92	0.92	0.92	0.90
Percent Heavy Veh, %	3	3	3	3	3	3	3	6	3	3	6	3
Cap, veh/h	786	1200		39	470		343	1802		387	1298	
Arrive On Green	0.23	0.34	0.00	0.02	0.13	0.00	0.10	0.36	0.00	0.11	0.38	0.00
Sat Flow, veh/h	3428	3526	1572	1767	3526	1572	3428	4944	1572	3428	3441	1572
Grp Volume(v), veh/h	758	297	0	20	443	0	312	750	0	324	1220	0
Grp Sat Flow(s),veh/h/ln	1714	1763	1572	1767	1763	1572	1714	1648	1572	1714	1721	1572
Q Serve(g_s), s	32.8	9.1	0.0	1.7	18.7	0.0	13.5	17.0	0.0	13.9	51.3	0.0
Cycle Q Clear(g_c), s	32.8	9.1	0.0	1.7	18.7	0.0	13.5	17.0	0.0	13.9	51.3	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	786	1200		39	470		343	1802		387	1298	
V/C Ratio(X)	0.96	0.25		0.51	0.94		0.91	0.42		0.84	0.94	
Avail Cap(c_a), veh/h	786	1200		71	470		343	1802		494	1298	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	57.2	35.6	0.0	72.5	64.4	0.0	66.8	35.7	0.0	65.2	45.1	0.0
Incr Delay (d2), s/veh	23.6	0.1	0.0	9.9	27.6	0.0	27.3	0.7	0.0	9.7	14.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	16.8	4.0	0.0	0.9	10.2	0.0	7.2	7.1	0.0	6.6	24.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	80.8	35.7	0.0	82.4	92.0	0.0	94.1	36.4	0.0	74.9	59.2	0.0
LnGrp LOS	F	D		F	F		F	D		E	E	
Approach Vol, veh/h		1055	A		463	A		1062	A		1544	A
Approach Delay, s/veh		68.1			91.6			53.4			62.5	
Approach LOS		E			F			D			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	22.9	60.7	9.3	57.1	21.0	62.6	40.4	26.0				
Change Period (Y+Rc), s	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5				
Max Green Setting (Gmax), s	21.1	49.5	5.5	47.9	14.5	56.1	33.9	19.5				
Max Q Clear Time (g_c+l1), s	15.9	19.0	3.7	11.1	15.5	53.3	34.8	20.7				
Green Ext Time (p_c), s	0.5	5.9	0.0	2.1	0.0	2.0	0.0	0.0				

Intersection Summary

HCM 6th Ctrl Delay	64.9
HCM 6th LOS	E

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Timings
1: Powers Blvd (SH-21) & Milton E Proby Parkway

2030 Total AM.syn

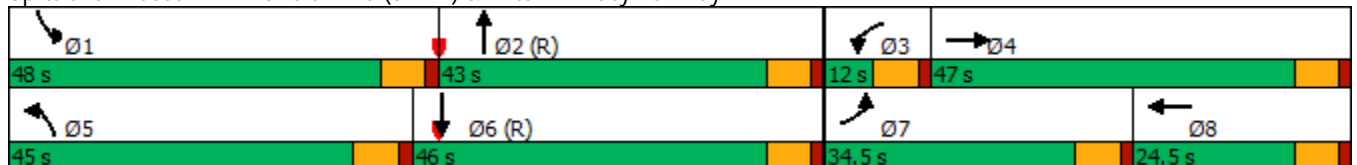
04/16/2020

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	673	971	505	38	365	387	587	1357	125	1038	894	773
Future Volume (vph)	673	971	505	38	365	387	587	1357	125	1038	894	773
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free			Free			Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	11.5	24.5		11.5	24.5		11.5	24.5		11.5	24.5	
Total Split (s)	34.5	47.0		12.0	24.5		45.0	43.0		48.0	46.0	
Total Split (%)	23.0%	31.3%		8.0%	16.3%		30.0%	28.7%		32.0%	30.7%	
Yellow Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	
Act Effct Green (s)	28.0	41.5	150.0	5.5	16.6	150.0	32.7	36.5	150.0	42.9	46.6	150.0
Actuated g/C Ratio	0.19	0.28	1.00	0.04	0.11	1.00	0.22	0.24	1.00	0.29	0.31	1.00
v/c Ratio	1.17	0.76	0.35	0.65	0.72	0.27	0.85	1.24	0.09	1.14	0.64	0.53
Control Delay	143.0	54.4	0.6	112.7	72.1	0.4	67.8	160.2	0.1	121.9	47.8	1.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	143.0	54.4	0.6	112.7	72.1	0.4	67.8	160.2	0.1	121.9	47.8	1.3
LOS	F	D	A	F	E	A	E	F	A	F	D	A
Approach Delay		69.5			38.9			124.2			62.7	
Approach LOS		E			D			F			E	

Intersection Summary

Cycle Length: 150
 Actuated Cycle Length: 150
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 150
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.24
 Intersection Signal Delay: 78.6
 Intersection LOS: E
 Intersection Capacity Utilization 103.7%
 ICU Level of Service G
 Analysis Period (min) 15

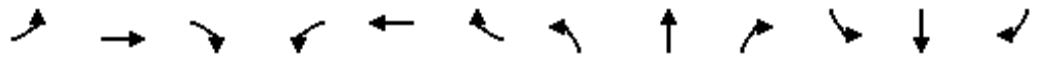
Splits and Phases: 1: Powers Blvd (SH-21) & Milton E Proby Parkway



HCM 6th Signalized Intersection Summary
 1: Powers Blvd (SH-21) & Milton E Proby Parkway

2030 Total AM.syn

04/16/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↑↑↑	↗	↖	↑↑↑	↗	↔↔	↑↑↑	↗	↔↔	↑↑↑	↗
Traffic Volume (veh/h)	673	971	505	38	365	387	587	1357	125	1038	894	773
Future Volume (veh/h)	673	971	505	38	365	387	587	1357	125	1038	894	773
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1841	1781	1841	1841	1781	1841
Adj Flow Rate, veh/h	732	1055	0	41	397	0	624	1444	0	1093	951	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.94	0.94	0.92	0.95	0.94	0.94
Percent Heavy Veh, %	4	4	4	4	4	4	4	8	4	4	8	4
Cap, veh/h	635	1278		52	490		694	1293		941	1646	
Arrive On Green	0.19	0.25	0.00	0.03	0.10	0.00	0.20	0.27	0.00	0.28	0.34	0.00
Sat Flow, veh/h	3401	5025	1560	1753	5025	1560	3401	4863	1560	3401	4863	1560
Grp Volume(v), veh/h	732	1055	0	41	397	0	624	1444	0	1093	951	0
Grp Sat Flow(s),veh/h/ln	1700	1675	1560	1753	1675	1560	1700	1621	1560	1700	1621	1560
Q Serve(g_s), s	28.0	29.7	0.0	3.5	11.6	0.0	26.8	39.9	0.0	41.5	24.1	0.0
Cycle Q Clear(g_c), s	28.0	29.7	0.0	3.5	11.6	0.0	26.8	39.9	0.0	41.5	24.1	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	635	1278		52	490		694	1293		941	1646	
V/C Ratio(X)	1.15	0.83		0.78	0.81		0.90	1.12		1.16	0.58	
Avail Cap(c_a), veh/h	635	1357		64	603		873	1293		941	1646	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	61.0	52.8	0.0	72.3	66.3	0.0	58.2	55.1	0.0	54.2	40.8	0.0
Incr Delay (d2), s/veh	86.0	4.1	0.0	38.1	6.7	0.0	10.4	63.6	0.0	84.6	1.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	19.7	13.0	0.0	2.1	5.3	0.0	12.6	23.9	0.0	28.8	10.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	147.0	56.9	0.0	110.4	73.1	0.0	68.6	118.7	0.0	138.8	42.3	0.0
LnGrp LOS	F	E		F	E		E	F		F	D	
Approach Vol, veh/h		1787	A		438	A		2068	A		2044	A
Approach Delay, s/veh		93.8			76.6			103.6			93.9	
Approach LOS		F			E			F			F	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	48.0	46.4	11.0	44.6	37.1	57.3	34.5	21.1				
Change Period (Y+Rc), s	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5				
Max Green Setting (Gmax), s	41.5	36.5	5.5	40.5	38.5	39.5	28.0	18.0				
Max Q Clear Time (g_c+l1), s	43.5	41.9	5.5	31.7	28.8	26.1	30.0	13.6				
Green Ext Time (p_c), s	0.0	0.0	0.0	4.6	1.8	5.6	0.0	1.0				

Intersection Summary

HCM 6th Ctrl Delay	95.8
HCM 6th LOS	F

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Timings
1: Powers Blvd (SH-21) & Milton E Proby Parkway

2030 Total PM.syn

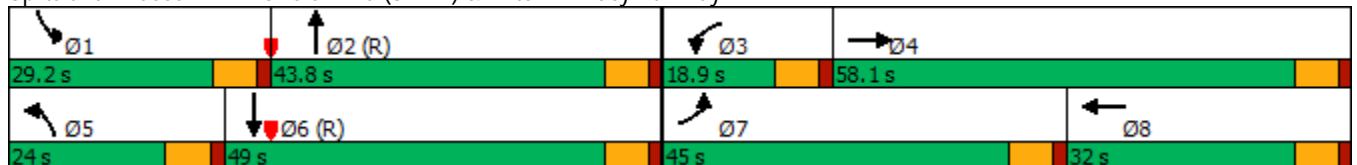
04/16/2020

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	747	379	509	69	739	839	331	807	87	409	1212	579
Future Volume (vph)	747	379	509	69	739	839	331	807	87	409	1212	579
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free			Free			Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	11.5	24.5		11.5	24.5		11.5	24.5		11.5	24.5	
Total Split (s)	45.0	58.1		18.9	32.0		24.0	43.8		29.2	49.0	
Total Split (%)	30.0%	38.7%		12.6%	21.3%		16.0%	29.2%		19.5%	32.7%	
Yellow Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)	-0.5	-0.5		-0.5	-0.5		-0.5	-0.5		-0.5	-0.5	
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	
Act Effct Green (s)	38.2	53.0	150.0	11.2	26.0	150.0	17.9	39.2	150.0	22.6	43.9	150.0
Actuated g/C Ratio	0.25	0.35	1.00	0.07	0.17	1.00	0.12	0.26	1.00	0.15	0.29	1.00
v/c Ratio	0.94	0.23	0.35	0.58	0.92	0.56	0.89	0.67	0.06	0.87	0.91	0.40
Control Delay	73.2	34.7	0.6	84.1	77.0	1.5	88.7	53.1	0.1	80.2	61.7	0.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	73.2	34.7	0.6	84.1	77.0	1.5	88.7	53.1	0.1	80.2	61.7	0.8
LOS	E	C	A	F	E	A	F	D	A	F	E	A
Approach Delay		41.7			39.4			59.0			49.0	
Approach LOS		D			D			E			D	

Intersection Summary

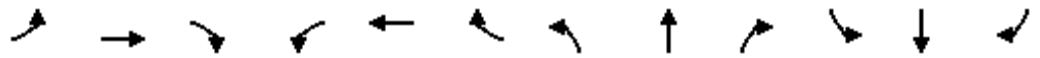
Cycle Length: 150
 Actuated Cycle Length: 150
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 120
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.94
 Intersection Signal Delay: 46.7
 Intersection LOS: D
 Intersection Capacity Utilization 88.4%
 ICU Level of Service E
 Analysis Period (min) 15

Splits and Phases: 1: Powers Blvd (SH-21) & Milton E Proby Parkway



HCM 6th Signalized Intersection Summary
 1: Powers Blvd (SH-21) & Milton E Proby Parkway

2030 Total PM.syn
 04/16/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↑↑↑	↗	↖	↑↑↑	↗	↔↔	↑↑↑	↗	↔↔	↑↑↑	↗
Traffic Volume (veh/h)	747	379	509	69	739	839	331	807	87	409	1212	579
Future Volume (veh/h)	747	379	509	69	739	839	331	807	87	409	1212	579
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1811	1856	1856	1811	1856
Adj Flow Rate, veh/h	812	412	0	75	803	0	360	859	0	445	1303	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.95	0.92	0.94	0.92	0.92	0.93	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	6	3	3	6	3
Cap, veh/h	867	1872		100	876		411	1325		501	1454	
Arrive On Green	0.25	0.37	0.00	0.06	0.17	0.00	0.12	0.27	0.00	0.15	0.29	0.00
Sat Flow, veh/h	3428	5066	1572	1767	5066	1572	3428	4944	1572	3428	4944	1572
Grp Volume(v), veh/h	812	412	0	75	803	0	360	859	0	445	1303	0
Grp Sat Flow(s),veh/h/ln	1714	1689	1572	1767	1689	1572	1714	1648	1572	1714	1648	1572
Q Serve(g_s), s	34.8	8.4	0.0	6.3	23.4	0.0	15.5	23.1	0.0	19.1	37.9	0.0
Cycle Q Clear(g_c), s	34.8	8.4	0.0	6.3	23.4	0.0	15.5	23.1	0.0	19.1	37.9	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	867	1872		100	876		411	1325		501	1454	
V/C Ratio(X)	0.94	0.22		0.75	0.92		0.88	0.65		0.89	0.90	
Avail Cap(c_a), veh/h	891	1872		152	878		411	1325		530	1454	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	54.8	32.4	0.0	69.7	61.0	0.0	64.9	48.6	0.0	62.8	50.7	0.0
Incr Delay (d2), s/veh	16.6	0.1	0.0	10.8	14.2	0.0	18.6	2.5	0.0	16.2	8.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	17.0	3.5	0.0	3.2	11.2	0.0	7.9	9.9	0.0	9.5	16.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	71.5	32.5	0.0	80.6	75.1	0.0	83.5	51.1	0.0	79.0	59.7	0.0
LnGrp LOS	E	C		F	E		F	D		E	E	
Approach Vol, veh/h		1224	A		878	A		1219	A		1748	A
Approach Delay, s/veh		58.4			75.6			60.7			64.6	
Approach LOS		E			E			E			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	27.9	46.2	14.5	61.4	24.0	50.1	43.9	31.9				
Change Period (Y+Rc), s	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5				
Max Green Setting (Gmax), s	22.7	37.3	12.4	51.6	17.5	42.5	38.5	25.5				
Max Q Clear Time (g_c+I1), s	21.1	25.1	8.3	10.4	17.5	39.9	36.8	25.4				
Green Ext Time (p_c), s	0.3	4.7	0.0	3.1	0.0	1.9	0.7	0.1				

Intersection Summary

HCM 6th Ctrl Delay	64.1
HCM 6th LOS	E

Notes

User approved pedestrian interval to be less than phase max green.
 Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Timings
1: Powers Blvd (SH-21) & Milton E Proby Parkway

2045 Total AM.syn

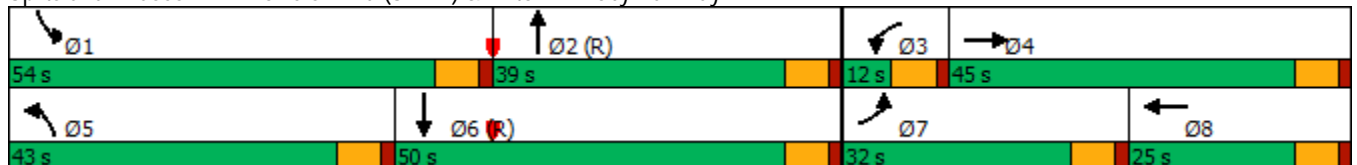
04/16/2020

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	781	1730	622	88	526	552	666	1560	225	1820	1061	898
Future Volume (vph)	781	1730	622	88	526	552	666	1560	225	1820	1061	898
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free			Free			Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	11.5	24.5		11.5	24.5		11.5	24.5		11.5	24.5	
Total Split (s)	32.0	45.0		12.0	25.0		43.0	39.0		54.0	50.0	
Total Split (%)	21.3%	30.0%		8.0%	16.7%		28.7%	26.0%		36.0%	33.3%	
Yellow Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	
Act Effct Green (s)	25.5	38.5	150.0	5.5	18.5	150.0	35.1	32.5	150.0	47.5	44.9	150.0
Actuated g/C Ratio	0.17	0.26	1.00	0.04	0.12	1.00	0.23	0.22	1.00	0.32	0.30	1.00
v/c Ratio	1.48	1.47	0.44	1.52	0.93	0.39	0.92	1.63	0.16	1.86	0.79	0.63
Control Delay	268.6	254.1	0.9	344.9	87.3	0.7	80.6	316.9	0.1	418.4	53.4	1.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	268.6	254.1	0.9	344.9	87.3	0.7	80.6	316.9	0.1	418.4	53.4	1.9
LOS	F	F	A	F	F	A	F	F	A	F	D	A
Approach Delay		207.5			65.8			223.6			217.4	
Approach LOS		F			E			F			F	

Intersection Summary

Cycle Length: 150
 Actuated Cycle Length: 150
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 150
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.86
 Intersection Signal Delay: 199.1
 Intersection LOS: F
 Intersection Capacity Utilization 142.0%
 ICU Level of Service H
 Analysis Period (min) 15

Splits and Phases: 1: Powers Blvd (SH-21) & Milton E Proby Parkway



HCM 6th Signalized Intersection Summary
 1: Powers Blvd (SH-21) & Milton E Proby Parkway

2045 Total AM.syn

04/16/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↗	↑↑↑	↖	↖	↑↑↑	↖	↖↗	↑↑↑	↖	↖↗	↑↑↑	↖
Traffic Volume (veh/h)	781	1730	622	88	526	552	666	1560	225	1820	1061	898
Future Volume (veh/h)	781	1730	622	88	526	552	666	1560	225	1820	1061	898
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1841	1781	1841	1841	1781	1841
Adj Flow Rate, veh/h	849	1880	0	96	572	0	724	1696	0	1978	1141	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.93	0.92
Percent Heavy Veh, %	4	4	4	4	4	4	4	8	4	4	8	4
Cap, veh/h	578	1290		64	620		778	1054		1077	1482	
Arrive On Green	0.17	0.26	0.00	0.04	0.12	0.00	0.23	0.22	0.00	0.32	0.30	0.00
Sat Flow, veh/h	3401	5025	1560	1753	5025	1560	3401	4863	1560	3401	4863	1560
Grp Volume(v), veh/h	849	1880	0	96	572	0	724	1696	0	1978	1141	0
Grp Sat Flow(s),veh/h/ln	1700	1675	1560	1753	1675	1560	1700	1621	1560	1700	1621	1560
Q Serve(g_s), s	25.5	38.5	0.0	5.5	16.9	0.0	31.3	32.5	0.0	47.5	32.0	0.0
Cycle Q Clear(g_c), s	25.5	38.5	0.0	5.5	16.9	0.0	31.3	32.5	0.0	47.5	32.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	578	1290		64	620		778	1054		1077	1482	
V/C Ratio(X)	1.47	1.46		1.49	0.92		0.93	1.61		1.84	0.77	
Avail Cap(c_a), veh/h	578	1290		64	620		828	1054		1077	1482	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	62.3	55.8	0.0	72.3	65.0	0.0	56.7	58.8	0.0	51.3	47.4	0.0
Incr Delay (d2), s/veh	220.1	210.3	0.0	287.5	19.6	0.0	16.4	278.7	0.0	380.1	3.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	28.7	41.4	0.0	7.6	8.4	0.0	15.2	40.5	0.0	77.0	13.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	282.4	266.0	0.0	359.8	84.6	0.0	73.1	337.5	0.0	431.4	51.3	0.0
LnGrp LOS	F	F		F	F		E	F		F	D	
Approach Vol, veh/h		2729	A		668	A		2420	A		3119	A
Approach Delay, s/veh		271.1			124.1			258.4			292.3	
Approach LOS		F			F			F			F	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	54.0	39.0	12.0	45.0	40.8	52.2	32.0	25.0				
Change Period (Y+Rc), s	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5				
Max Green Setting (Gmax), s	47.5	32.5	5.5	38.5	36.5	43.5	25.5	18.5				
Max Q Clear Time (g_c+I1), s	49.5	34.5	7.5	40.5	33.3	34.0	27.5	18.9				
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	1.0	5.3	0.0	0.0				

Intersection Summary

HCM 6th Ctrl Delay	264.1
HCM 6th LOS	F

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Timings
1: Powers Blvd (SH-21) & Milton E Proby Parkway

2045 Total PM.syn

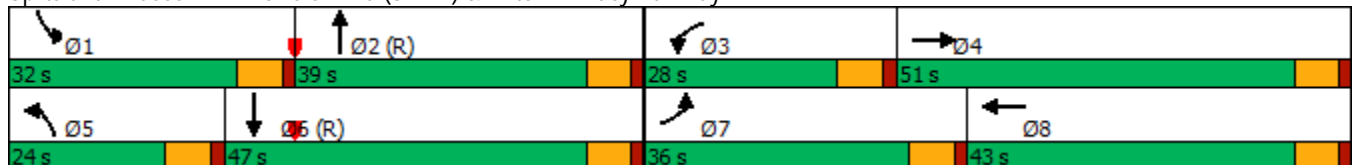
04/16/2020

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	868	526	581	158	1348	1463	436	990	146	566	1394	672
Future Volume (vph)	868	526	581	158	1348	1463	436	990	146	566	1394	672
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free			Free			Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	11.5	24.5		11.5	24.5		11.5	24.5		11.5	24.5	
Total Split (s)	36.0	51.0		28.0	43.0		24.0	39.0		32.0	47.0	
Total Split (%)	24.0%	34.0%		18.7%	28.7%		16.0%	26.0%		21.3%	31.3%	
Yellow Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	
Act Effct Green (s)	29.5	47.4	150.0	18.6	36.5	150.0	17.5	32.5	150.0	25.5	40.5	150.0
Actuated g/C Ratio	0.20	0.32	1.00	0.12	0.24	1.00	0.12	0.22	1.00	0.17	0.27	1.00
v/c Ratio	1.41	0.36	0.40	0.79	1.20	0.98	1.20	0.99	0.10	1.06	1.15	0.47
Control Delay	236.7	40.9	0.8	84.7	144.8	27.2	164.9	84.1	0.1	113.4	123.6	1.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	236.7	40.9	0.8	84.7	144.8	27.2	164.9	84.1	0.1	113.4	123.6	1.0
LOS	F	D	A	F	F	C	F	F	A	F	F	A
Approach Delay		115.1			84.5			98.9			90.1	
Approach LOS		F			F			F			F	

Intersection Summary

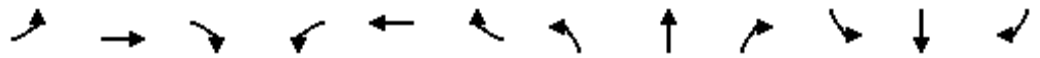
Cycle Length: 150
 Actuated Cycle Length: 150
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 150
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.41
 Intersection Signal Delay: 95.3
 Intersection LOS: F
 Intersection Capacity Utilization 111.8%
 ICU Level of Service H
 Analysis Period (min) 15

Splits and Phases: 1: Powers Blvd (SH-21) & Milton E Proby Parkway



HCM 6th Signalized Intersection Summary
 1: Powers Blvd (SH-21) & Milton E Proby Parkway

2045 Total PM.syn
 04/16/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↖	↑↑↑	↗	↖	↑↑↑	↗	↖↖	↑↑↑	↗	↖↖	↑↑↑	↗
Traffic Volume (veh/h)	868	526	581	158	1348	1463	436	990	146	566	1394	672
Future Volume (veh/h)	868	526	581	158	1348	1463	436	990	146	566	1394	672
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1811	1856	1856	1811	1856
Adj Flow Rate, veh/h	943	572	0	172	1465	0	474	1053	0	615	1515	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.95	0.92	0.94	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	6	3	3	6	3
Cap, veh/h	674	1669		195	1233		400	1071		583	1335	
Arrive On Green	0.20	0.33	0.00	0.11	0.24	0.00	0.12	0.22	0.00	0.17	0.27	0.00
Sat Flow, veh/h	3428	5066	1572	1767	5066	1572	3428	4944	1572	3428	4944	1572
Grp Volume(v), veh/h	943	572	0	172	1465	0	474	1053	0	615	1515	0
Grp Sat Flow(s),veh/h/ln	1714	1689	1572	1767	1689	1572	1714	1648	1572	1714	1648	1572
Q Serve(g_s), s	29.5	12.8	0.0	14.4	36.5	0.0	17.5	31.8	0.0	25.5	40.5	0.0
Cycle Q Clear(g_c), s	29.5	12.8	0.0	14.4	36.5	0.0	17.5	31.8	0.0	25.5	40.5	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	674	1669		195	1233		400	1071		583	1335	
V/C Ratio(X)	1.40	0.34		0.88	1.19		1.19	0.98		1.06	1.13	
Avail Cap(c_a), veh/h	674	1669		253	1233		400	1071		583	1335	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	60.3	38.0	0.0	65.7	56.8	0.0	66.3	58.5	0.0	62.3	54.8	0.0
Incr Delay (d2), s/veh	188.3	0.1	0.0	23.6	93.2	0.0	105.9	23.7	0.0	52.7	70.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	30.5	5.4	0.0	7.8	26.2	0.0	13.6	15.6	0.0	15.4	25.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	248.5	38.1	0.0	89.3	150.0	0.0	172.2	82.2	0.0	114.9	125.2	0.0
LnGrp LOS	F	D		F	F		F	F		F	F	
Approach Vol, veh/h		1515	A		1637	A		1527	A		2130	A
Approach Delay, s/veh		169.1			143.6			110.1			122.2	
Approach LOS		F			F			F			F	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	32.0	39.0	23.1	55.9	24.0	47.0	36.0	43.0				
Change Period (Y+Rc), s	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5				
Max Green Setting (Gmax), s	25.5	32.5	21.5	44.5	17.5	40.5	29.5	36.5				
Max Q Clear Time (g_c+I1), s	27.5	33.8	16.4	14.8	19.5	42.5	31.5	38.5				
Green Ext Time (p_c), s	0.0	0.0	0.2	4.3	0.0	0.0	0.0	0.0				

Intersection Summary

HCM 6th Ctrl Delay	135.1
HCM 6th LOS	F

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection						
Int Delay, s/veh	0.1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑		↑↑		↑
Traffic Vol, veh/h	1100	233	0	603	0	14
Future Vol, veh/h	1100	233	0	603	0	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	300	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	4	2	2	4	2	2
Mvmt Flow	1196	253	0	655	0	15

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	-	-	598
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-
Critical Hdwy	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	3.32
Pot Cap-1 Maneuver	-	-	0	-	445
Stage 1	-	-	0	-	-
Stage 2	-	-	0	-	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	445
Mov Cap-2 Maneuver	-	-	-	-	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	13.4
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	445	-	-	-
HCM Lane V/C Ratio	0.034	-	-	-
HCM Control Delay (s)	13.4	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	0.1	-	-	-

Intersection						
Int Delay, s/veh	0.1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑		↑↑		↑
Traffic Vol, veh/h	425	211	0	976	0	12
Future Vol, veh/h	425	211	0	976	0	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	300	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	2	2	3	2	2
Mvmt Flow	462	229	0	1061	0	13

Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	-	-	-	231
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	-	-	0	-	0	771
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	-	771
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	9.8
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	771	-	-	-
HCM Lane V/C Ratio	0.017	-	-	-
HCM Control Delay (s)	9.8	-	-	-
HCM Lane LOS	A	-	-	-
HCM 95th %tile Q(veh)	0.1	-	-	-

Intersection						
Int Delay, s/veh	0.1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑	↑		↑↑		↑
Traffic Vol, veh/h	1997	218	0	856	0	14
Future Vol, veh/h	1997	218	0	856	0	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	300	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	4	2	2	4	2	2
Mvmt Flow	2171	237	0	930	0	15

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	- - - 1086
Stage 1	-	-	- - -
Stage 2	-	-	- - -
Critical Hdwy	-	-	- - - 7.14
Critical Hdwy Stg 1	-	-	- - -
Critical Hdwy Stg 2	-	-	- - -
Follow-up Hdwy	-	-	- - - 3.92
Pot Cap-1 Maneuver	-	- 0	- 0 182
Stage 1	-	- 0	- 0 -
Stage 2	-	- 0	- 0 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	- - - 182
Mov Cap-2 Maneuver	-	-	- - -
Stage 1	-	-	- - -
Stage 2	-	-	- - -

Approach	EB	WB	NB
HCM Control Delay, s	0	0	26.6
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	182	-	-	-
HCM Lane V/C Ratio	0.084	-	-	-
HCM Control Delay (s)	26.6	-	-	-
HCM Lane LOS	D	-	-	-
HCM 95th %tile Q(veh)	0.3	-	-	-

Intersection						
Int Delay, s/veh	0.1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑	↑		↑↑		↑
Traffic Vol, veh/h	683	198	0	1726	0	12
Future Vol, veh/h	683	198	0	1726	0	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	300	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	2	2	3	2	2
Mvmt Flow	742	215	0	1876	0	13

Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	-	-	-	371
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.92
Pot Cap-1 Maneuver	-	-	0	-	0	535
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	-	535
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	11.9
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	535	-	-	-
HCM Lane V/C Ratio	0.024	-	-	-
HCM Control Delay (s)	11.9	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	0.1	-	-	-

Intersection						
Int Delay, s/veh	0					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑	↑		↑↑↑		↑
Traffic Vol, veh/h	3651	218	0	1247	0	14
Future Vol, veh/h	3651	218	0	1247	0	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Free
Storage Length	-	300	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	92	92	95	92	92
Heavy Vehicles, %	4	2	2	4	2	2
Mvmt Flow	3843	237	0	1313	0	15

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3	Minor4
Conflicting Flow All	0	0	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-
Pot Cap-1 Maneuver	-	-	0	-	0	0
Stage 1	-	-	0	-	0	0
Stage 2	-	-	0	-	0	0
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-
HCM Control Delay (s)	0	-	-	-
HCM Lane LOS	A	-	-	-
HCM 95th %tile Q(veh)	-	-	-	-

Intersection						
Int Delay, s/veh	0					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑	↑		↑↑↑		↑
Traffic Vol, veh/h	1047	198	0	3080	0	12
Future Vol, veh/h	1047	198	0	3080	0	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Free
Storage Length	-	300	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	2	2	3	2	2
Mvmt Flow	1138	215	0	3348	0	13

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3	Minor4
Conflicting Flow All	0	0	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-
Pot Cap-1 Maneuver	-	-	0	-	0	0
Stage 1	-	-	0	-	0	0
Stage 2	-	-	0	-	0	0
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-
HCM Control Delay (s)	0	-	-	-
HCM Lane LOS	A	-	-	-
HCM 95th %tile Q(veh)	-	-	-	-

Intersection												
Int Delay, s/veh	1.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑	↗↗	↘	↑↑	↗	↘	↑	↗		↘	↗
Traffic Vol, veh/h	46	261	272	9	184	1	28	3	19	0	0	6
Future Vol, veh/h	46	261	272	9	184	1	28	3	19	0	0	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Free	-	-	None	-	-	Free	-	-	Free
Storage Length	500	-	300	300	-	275	0	-	0	-	-	300
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	77	86	88	56	57	25	70	38	59	92	92	75
Heavy Vehicles, %	2	4	2	2	4	2	2	2	2	2	2	2
Mvmt Flow	60	303	309	16	323	4	40	8	32	0	0	8

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	327	0	-	303	0	0	617	782	-	631	778	-
Stage 1	-	-	-	-	-	-	423	423	-	355	355	-
Stage 2	-	-	-	-	-	-	194	359	-	276	423	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	-	7.54	6.54	-
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	-	3.52	4.02	-
Pot Cap-1 Maneuver	1229	-	0	1255	-	-	374	324	0	366	326	0
Stage 1	-	-	0	-	-	-	579	586	0	635	628	0
Stage 2	-	-	0	-	-	-	789	626	0	707	586	0
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1229	-	-	1255	-	-	356	304	-	342	306	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	356	304	-	342	306	-
Stage 1	-	-	-	-	-	-	551	557	-	604	620	-
Stage 2	-	-	-	-	-	-	779	618	-	663	557	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	1.3			0.4			16.5			0		
HCM LOS							C			A		

Minor Lane/Major Mvmt	NBLn1	NBLn2	NBLn3	EBL	EBT	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	356	304	-	1229	-	1255	-	-	-	-
HCM Lane V/C Ratio	0.112	0.026	-	0.049	-	0.013	-	-	-	-
HCM Control Delay (s)	16.4	17.2	0	8.1	-	7.9	-	-	0	0
HCM Lane LOS	C	C	A	A	-	A	-	-	A	A
HCM 95th %tile Q(veh)	0.4	0.1	-	0.2	-	0	-	-	-	-

Intersection												
Int Delay, s/veh	7.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑	↗↗	↘	↑↑	↗	↘	↑	↗		↘	↗
Traffic Vol, veh/h	4	166	51	13	267	0	190	0	3	0	2	17
Future Vol, veh/h	4	166	51	13	267	0	190	0	3	0	2	17
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Free	-	-	None	-	-	Free	-	-	Free
Storage Length	500	-	300	300	-	275	0	-	0	-	-	300
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	50	88	55	81	63	92	67	92	38	92	50	47
Heavy Vehicles, %	2	3	2	2	3	2	2	2	2	2	2	2
Mvmt Flow	8	189	93	16	424	0	284	0	8	0	4	36

Major/Minor	Major1		Major2		Minor1		Minor2					
Conflicting Flow All	424	0	-	189	0	0	451	661	-	567	661	-
Stage 1	-	-	-	-	-	-	205	205	-	456	456	-
Stage 2	-	-	-	-	-	-	246	456	-	111	205	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	-	7.54	6.54	-
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	-	3.52	4.02	-
Pot Cap-1 Maneuver	1132	-	0	1382	-	-	492	381	0	406	381	0
Stage 1	-	-	0	-	-	-	778	731	0	554	567	0
Stage 2	-	-	0	-	-	-	736	567	0	882	731	0
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1132	-	-	1382	-	-	481	374	-	400	374	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	481	374	-	400	374	-
Stage 1	-	-	-	-	-	-	773	726	-	550	560	-
Stage 2	-	-	-	-	-	-	722	560	-	876	726	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	0.3		0.3		22.7		14.7	
HCM LOS					C		B	

Minor Lane/Major Mvmt	NBLn1	NBLn2	NBLn3	EBL	EBT	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	481	-	-	1132	-	1382	-	-	374	-
HCM Lane V/C Ratio	0.59	-	-	0.007	-	0.012	-	-	0.011	-
HCM Control Delay (s)	22.7	0	0	8.2	-	7.6	-	-	14.7	0
HCM Lane LOS	C	A	A	A	-	A	-	-	B	A
HCM 95th %tile Q(veh)	3.7	-	-	0	-	0	-	-	0	-

Intersection												
Int Delay, s/veh	64.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↗	↗	↘	↗	↘	↘	↗	↘		↗	↘
Traffic Vol, veh/h	47	326	741	9	222	1	361	3	20	0	0	6
Future Vol, veh/h	47	326	741	9	222	1	361	3	20	0	0	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Free	-	-	None	-	-	Free	-	-	Free
Storage Length	500	-	300	300	-	275	0	-	0	-	-	300
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	77	86	92	56	57	25	92	38	59	92	92	75
Heavy Vehicles, %	2	4	2	2	4	2	2	2	2	2	2	2
Mvmt Flow	61	379	805	16	389	4	392	8	34	0	0	8

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	393	0	379	0
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.14	-	4.14	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.22	-	2.22	-
Pot Cap-1 Maneuver	1162	0	1176	-
Stage 1	-	0	-	-
Stage 2	-	0	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	1162	-	1176	-
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.1	0.3	201.1	0
HCM LOS			F	A

Minor Lane/Major Mvmt	NBLn1	NBLn2	NBLn3	EBL	EBT	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	295	250	-	1162	-	1176	-	-	-	-
HCM Lane V/C Ratio	1.33	0.032	-	0.053	-	0.014	-	-	-	-
HCM Control Delay (s)	204.7	19.9	0	8.3	-	8.1	-	-	0	0
HCM Lane LOS	F	C	A	A	-	A	-	-	A	A
HCM 95th %tile Q(veh)	19.7	0.1	-	0.2	-	0	-	-	-	-

Notes
 -: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection												
Int Delay, s/veh	158.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑	↗↗	↘	↑↑	↗	↘	↑	↗		↘	↗
Traffic Vol, veh/h	4	223	210	13	323	0	623	0	3	0	2	18
Future Vol, veh/h	4	223	210	13	323	0	623	0	3	0	2	18
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Free	-	-	None	-	-	Free	-	-	Free
Storage Length	500	-	300	300	-	275	0	-	0	-	-	300
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	50	88	92	81	63	92	92	92	38	92	50	47
Heavy Vehicles, %	2	3	2	2	3	2	2	2	2	2	2	2
Mvmt Flow	8	253	228	16	513	0	677	0	8	0	4	38

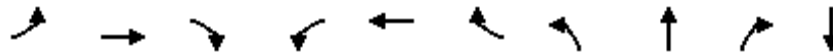
Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	513	0	253	0
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.14	-	4.14	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.22	-	2.22	-
Pot Cap-1 Maneuver	1049	0	1309	-
Stage 1	-	0	-	-
Stage 2	-	0	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	1049	-	1309	-
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	0.2	\$ 344.5	17
HCM LOS			F	C

Minor Lane/Major Mvmt	NBLn1	NBLn2	NBLn3	EBL	EBT	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	401	-	-	1049	-	1309	-	-	305	-
HCM Lane V/C Ratio	1.689	-	-	0.008	-	0.012	-	-	0.013	-
HCM Control Delay (s)	\$ 344.5	0	0	8.5	-	7.8	-	-	17	0
HCM Lane LOS	F	A	A	A	-	A	-	-	C	A
HCM 95th %tile Q(veh)	40.8	-	-	0	-	0	-	-	0	-

Notes
 -: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

3: Peak Innovation Parkway & Milton E Proby Parkway

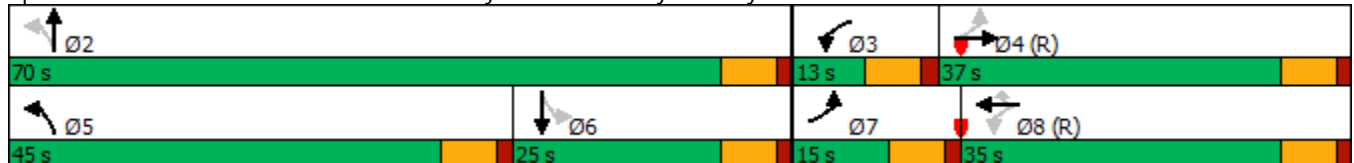


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT
Lane Configurations	↖	↗	↘	↖	↗	↘	↖	↗	↘	↘
Traffic Volume (vph)	47	326	741	9	222	1	361	3	20	0
Future Volume (vph)	47	326	741	9	222	1	361	3	20	0
Turn Type	pm+pt	NA	Free	pm+pt	NA	Perm	pm+pt	NA	Free	NA
Protected Phases	7	4		3	8		5	2		6
Permitted Phases	4		Free	8		8	2		Free	
Detector Phase	7	4		3	8	8	5	2		6
Switch Phase										
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0
Minimum Split (s)	11.5	24.5		11.5	24.5	24.5	11.5	24.5		24.5
Total Split (s)	15.0	37.0		13.0	35.0	35.0	45.0	70.0		25.0
Total Split (%)	12.5%	30.8%		10.8%	29.2%	29.2%	37.5%	58.3%		20.8%
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0
All-Red Time (s)	1.5	1.5		1.5	1.5	1.5	1.5	1.5		1.5
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0
Total Lost Time (s)	6.5	6.5		6.5	6.5	6.5	6.5	6.5		6.5
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead			Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes			Yes
Recall Mode	None	C-Max		None	C-Max	C-Max	None	Max		Max
Act Effect Green (s)	41.7	38.3	120.0	36.8	31.8	31.8	63.5	63.5	120.0	35.1
Actuated g/C Ratio	0.35	0.32	1.00	0.31	0.26	0.26	0.53	0.53	1.00	0.29
v/c Ratio	0.19	0.34	0.51	0.05	0.42	0.01	0.54	0.01	0.02	0.01
Control Delay	27.0	33.7	1.2	25.4	39.3	0.0	20.2	13.3	0.0	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.0	33.7	1.2	25.4	39.3	0.0	20.2	13.3	0.0	0.0
LOS	C	C	A	C	D	A	C	B	A	A
Approach Delay		12.3			38.4			18.5		
Approach LOS		B			D			B		

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.54
 Intersection Signal Delay: 18.7
 Intersection LOS: B
 Intersection Capacity Utilization 56.1%
 ICU Level of Service B
 Analysis Period (min) 15

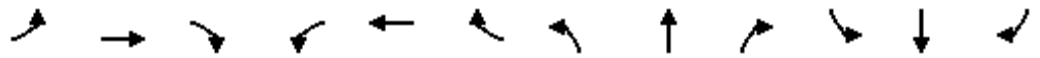
Splits and Phases: 3: Peak Innovation Parkway & Milton E Proby Parkway



HCM 6th Signalized Intersection Summary
 3: Peak Innovation Parkway & Milton E Proby Parkway

2022 Total AM Imp_3-13-14.syn

04/16/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗	↘	↖	↗	↘	↖	↗	↘
Traffic Volume (veh/h)	47	326	741	9	222	1	361	3	20	0	0	6
Future Volume (veh/h)	47	326	741	9	222	1	361	3	20	0	0	6
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1841	1870	1870	1841	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	61	379	0	16	389	4	392	8	0	0	0	8
Peak Hour Factor	0.77	0.86	0.92	0.56	0.57	0.25	0.92	0.38	0.59	0.92	0.92	0.75
Percent Heavy Veh, %	2	4	2	2	4	2	2	2	2	2	2	2
Cap, veh/h	304	1018		296	952	431	787	990		60	0	484
Arrive On Green	0.04	0.29	0.00	0.02	0.27	0.27	0.17	0.53	0.00	0.00	0.00	0.31
Sat Flow, veh/h	1781	3497	1585	1781	3497	1585	1781	1870	1585	1407	0	1585
Grp Volume(v), veh/h	61	379	0	16	389	4	392	8	0	0	0	8
Grp Sat Flow(s),veh/h/ln	1781	1749	1585	1781	1749	1585	1781	1870	1585	1407	0	1585
Q Serve(g_s), s	2.9	10.3	0.0	0.8	10.9	0.2	17.2	0.2	0.0	0.0	0.0	0.4
Cycle Q Clear(g_c), s	2.9	10.3	0.0	0.8	10.9	0.2	17.2	0.2	0.0	0.0	0.0	0.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	304	1018		296	952	431	787	990		60	0	484
V/C Ratio(X)	0.20	0.37		0.05	0.41	0.01	0.50	0.01		0.00	0.00	0.02
Avail Cap(c_a), veh/h	366	1018		362	952	431	1056	990		60	0	484
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	30.3	33.8	0.0	30.9	35.8	31.9	19.9	13.4	0.0	0.0	0.0	29.1
Incr Delay (d2), s/veh	0.3	1.0	0.0	0.1	1.3	0.0	0.5	0.0	0.0	0.0	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	4.6	0.0	0.3	4.9	0.1	7.2	0.1	0.0	0.0	0.0	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.6	34.9	0.0	30.9	37.1	31.9	20.4	13.4	0.0	0.0	0.0	29.2
LnGrp LOS	C	C		C	D	C	C	B		A	A	C
Approach Vol, veh/h		440	A		409			400	A			8
Approach Delay, s/veh		34.3			36.8			20.3				29.2
Approach LOS		C			D			C				C
Timer - Assigned Phs		2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s		70.0	8.6	41.4	26.9	43.1	10.8	39.2				
Change Period (Y+Rc), s		6.5	6.5	6.5	6.5	6.5	6.5	6.5				
Max Green Setting (Gmax), s		63.5	6.5	30.5	38.5	18.5	8.5	28.5				
Max Q Clear Time (g_c+I1), s		2.2	2.8	12.3	19.2	2.4	4.9	12.9				
Green Ext Time (p_c), s		0.0	0.0	2.3	1.2	0.0	0.0	2.2				

Intersection Summary

HCM 6th Ctrl Delay	30.6
HCM 6th LOS	C

Notes

Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

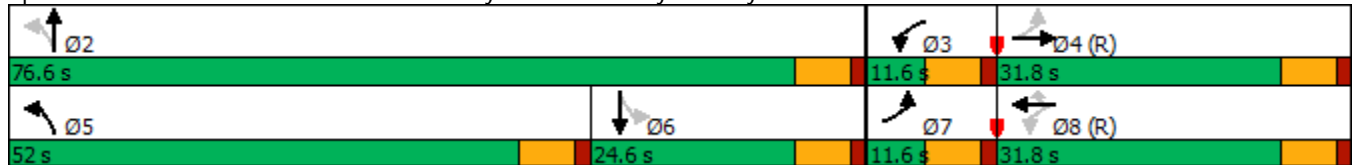


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBR	SBT	Ø2
Lane Configurations	↖	↗	↘	↖	↗	↖	↗	↘	
Traffic Volume (vph)	4	223	210	13	323	623	3	2	
Future Volume (vph)	4	223	210	13	323	623	3	2	
Turn Type	pm+pt	NA	Free	pm+pt	NA	pm+pt	Free	NA	
Protected Phases	7	4		3	8	5		6	2
Permitted Phases	4		Free	8		2	Free		
Detector Phase	7	4		3	8	5		6	
Switch Phase									
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0		5.0	5.0
Minimum Split (s)	11.5	24.5		11.5	24.5	11.5		24.5	24.5
Total Split (s)	11.6	31.8		11.6	31.8	52.0		24.6	76.6
Total Split (%)	9.7%	26.5%		9.7%	26.5%	43.3%		20.5%	64%
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0		5.0	5.0
All-Red Time (s)	1.5	1.5		1.5	1.5	1.5		1.5	1.5
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0	
Total Lost Time (s)	6.5	6.5		6.5	6.5	6.5		6.5	
Lead/Lag	Lead	Lag		Lead	Lag	Lead		Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes		Yes	
Recall Mode	None	C-Max		None	C-Max	None		Max	Max
Act Effect Green (s)	34.3	32.3	120.0	35.6	34.6	70.1	120.0	27.4	
Actuated g/C Ratio	0.29	0.27	1.00	0.30	0.29	0.58	1.00	0.23	
v/c Ratio	0.04	0.27	0.14	0.05	0.51	0.80	0.01	0.11	
Control Delay	29.5	36.9	0.2	29.6	38.6	25.4	0.0	16.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	29.5	36.9	0.2	29.6	38.6	25.4	0.0	16.1	
LOS	C	D	A	C	D	C	A	B	
Approach Delay		19.7			38.3			16.1	
Approach LOS		B			D			B	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.80
 Intersection Signal Delay: 27.4
 Intersection LOS: C
 Intersection Capacity Utilization 62.8%
 ICU Level of Service B
 Analysis Period (min) 15

Splits and Phases: 3: Peak Innovation Parkway & Milton E Proby Parkway



HCM 6th Signalized Intersection Summary
 3: Peak Innovation Parkway & Milton E Proby Parkway

2022 Total PM Imp_3-13-14.syn

04/16/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗	↘	↖	↗	↘	↖	↗	↘
Traffic Volume (veh/h)	4	223	210	13	323	0	623	0	3	0	2	18
Future Volume (veh/h)	4	223	210	13	323	0	623	0	3	0	2	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1856	1870	1870	1856	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	8	253	0	16	513	0	677	0	0	0	4	38
Peak Hour Factor	0.50	0.88	0.92	0.81	0.63	0.92	0.92	0.92	0.38	0.92	0.50	0.47
Percent Heavy Veh, %	2	3	2	2	3	2	2	2	2	2	2	2
Cap, veh/h	179	832		290	859	386	884	1093		60	34	320
Arrive On Green	0.01	0.24	0.00	0.02	0.24	0.00	0.31	0.00	0.00	0.00	0.22	0.22
Sat Flow, veh/h	1781	3526	1585	1781	3526	1585	1781	1870	1585	1418	153	1455
Grp Volume(v), veh/h	8	253	0	16	513	0	677	0	0	0	0	42
Grp Sat Flow(s),veh/h/ln	1781	1763	1585	1781	1763	1585	1781	1870	1585	1418	0	1608
Q Serve(g_s), s	0.4	7.1	0.0	0.8	15.5	0.0	33.4	0.0	0.0	0.0	0.0	2.5
Cycle Q Clear(g_c), s	0.4	7.1	0.0	0.8	15.5	0.0	33.4	0.0	0.0	0.0	0.0	2.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.90
Lane Grp Cap(c), veh/h	179	832		290	859	386	884	1093		60	0	353
V/C Ratio(X)	0.04	0.30		0.06	0.60	0.00	0.77	0.00		0.00	0.00	0.12
Avail Cap(c_a), veh/h	238	832		335	859	386	1007	1093		60	0	353
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	35.2	37.7	0.0	34.0	40.2	0.0	20.1	0.0	0.0	0.0	0.0	37.5
Incr Delay (d2), s/veh	0.1	0.9	0.0	0.1	3.1	0.0	3.1	0.0	0.0	0.0	0.0	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	3.2	0.0	0.4	7.1	0.0	14.1	0.0	0.0	0.0	0.0	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.3	38.7	0.0	34.0	43.2	0.0	23.2	0.0	0.0	0.0	0.0	38.2
LnGrp LOS	D	D		C	D	A	C	A		A	A	D
Approach Vol, veh/h		261	A		529			677	A			42
Approach Delay, s/veh		38.6			43.0			23.2				38.2
Approach LOS		D			D			C				D
Timer - Assigned Phs		2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s		76.6	8.6	34.8	43.7	32.9	7.7	35.7				
Change Period (Y+Rc), s		6.5	6.5	6.5	6.5	6.5	6.5	6.5				
Max Green Setting (Gmax), s		70.1	5.1	25.3	45.5	18.1	5.1	25.3				
Max Q Clear Time (g_c+I1), s		0.0	2.8	9.1	35.4	4.5	2.4	17.5				
Green Ext Time (p_c), s		0.0	0.0	1.4	1.9	0.1	0.0	2.1				

Intersection Summary

HCM 6th Ctrl Delay	33.2
HCM 6th LOS	C

Notes

Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

Timings
 3: Peak Innovation Parkway & Milton E Proby Parkway

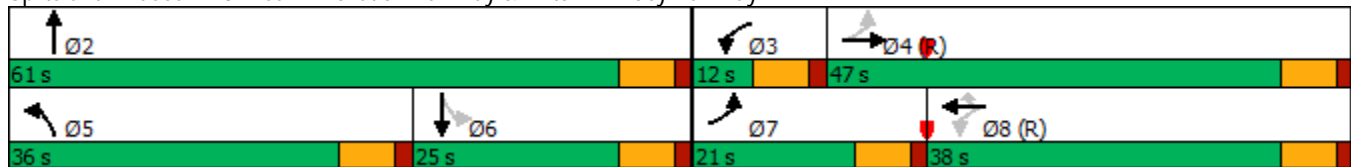
2030 Total AM.syn
 04/16/2020

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	154	642	1215	25	333	6	451	16	44	10	13	73
Future Volume (vph)	154	642	1215	25	333	6	451	16	44	10	13	73
Turn Type	pm+pt	NA	Free	pm+pt	NA	Perm	Prot	NA	Free	Perm	NA	Free
Protected Phases	7	4		3	8		5	2			6	
Permitted Phases	4		Free	8		8			Free	6		Free
Detector Phase	7	4		3	8	8	5	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	11.5	24.5		11.5	24.5	24.5	11.5	24.5		24.5	24.5	
Total Split (s)	21.0	47.0		12.0	38.0	38.0	36.0	61.0		25.0	25.0	
Total Split (%)	17.5%	39.2%		10.0%	31.7%	31.7%	30.0%	50.8%		20.8%	20.8%	
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
All-Red Time (s)	1.5	1.5		1.5	1.5	1.5	1.5	1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.5	6.5		6.5	6.5	6.5	6.5	6.5		6.5	6.5	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes			Yes	Yes	
Recall Mode	None	C-Max		None	C-Max	C-Max	None	Max		Max	Max	
Act Effct Green (s)	52.5	45.3	120.0	39.4	33.9	33.9	22.3	54.5	120.0	25.7	25.7	120.0
Actuated g/C Ratio	0.44	0.38	1.00	0.33	0.28	0.28	0.19	0.45	1.00	0.21	0.21	1.00
v/c Ratio	0.39	0.53	0.83	0.11	0.37	0.01	0.77	0.02	0.03	0.04	0.04	0.05
Control Delay	23.9	32.0	5.3	21.3	36.3	0.0	70.6	15.6	0.0	40.7	40.4	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.9	32.0	5.3	21.3	36.3	0.0	70.6	15.6	0.0	40.7	40.4	0.1
LOS	C	C	A	C	D	A	E	B	A	D	D	A
Approach Delay		15.3			34.7			62.8			9.8	
Approach LOS		B			C			E			A	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.83
 Intersection Signal Delay: 25.6
 Intersection LOS: C
 Intersection Capacity Utilization 57.7%
 ICU Level of Service B
 Analysis Period (min) 15

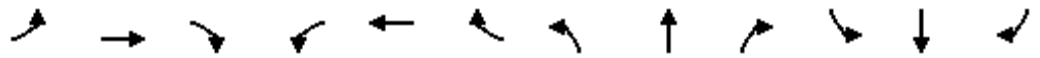
Splits and Phases: 3: Peak Innovation Parkway & Milton E Proby Parkway



HCM 6th Signalized Intersection Summary
 3: Peak Innovation Parkway & Milton E Proby Parkway

2030 Total AM.syn

04/16/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↗	↘	↘	↗	↘	↘	↗	↘	↘	↗	↘
Traffic Volume (veh/h)	154	642	1215	25	333	6	451	16	44	10	13	73
Future Volume (veh/h)	154	642	1215	25	333	6	451	16	44	10	13	73
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1841	1870	1870	1841	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	167	698	0	27	362	7	490	17	0	11	14	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	4	2	2	4	2	2	2	2	2	2	2
Cap, veh/h	428	1254		253	1061	481	574	849		386	437	
Arrive On Green	0.08	0.36	0.00	0.02	0.30	0.30	0.17	0.45	0.00	0.23	0.23	0.00
Sat Flow, veh/h	1781	3497	1585	1781	3497	1585	3456	1870	1585	1396	1870	1585
Grp Volume(v), veh/h	167	698	0	27	362	7	490	17	0	11	14	0
Grp Sat Flow(s),veh/h/ln	1781	1749	1585	1781	1749	1585	1728	1870	1585	1396	1870	1585
Q Serve(g_s), s	7.4	19.2	0.0	1.2	9.7	0.4	16.5	0.6	0.0	0.7	0.7	0.0
Cycle Q Clear(g_c), s	7.4	19.2	0.0	1.2	9.7	0.4	16.5	0.6	0.0	0.7	0.7	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	428	1254		253	1061	481	574	849		386	437	
V/C Ratio(X)	0.39	0.56		0.11	0.34	0.01	0.85	0.02		0.03	0.03	
Avail Cap(c_a), veh/h	501	1254		290	1061	481	850	849		386	437	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	0.00	1.00	1.00	1.00	0.85	0.85	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	24.5	30.8	0.0	28.2	32.5	29.2	48.6	18.0	0.0	35.5	35.5	0.0
Incr Delay (d2), s/veh	0.6	1.8	0.0	0.2	0.9	0.1	4.8	0.0	0.0	0.1	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	8.4	0.0	0.5	4.2	0.2	7.5	0.3	0.0	0.3	0.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.1	32.6	0.0	28.4	33.4	29.3	53.5	18.1	0.0	35.6	35.6	0.0
LnGrp LOS	C	C		C	C	C	D	B		D	D	
Approach Vol, veh/h		865	A		396			507	A		25	A
Approach Delay, s/veh		31.2			32.9			52.3			35.6	
Approach LOS		C			C			D			D	
Timer - Assigned Phs		2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s		61.0	9.5	49.5	26.4	34.6	16.1	42.9				
Change Period (Y+Rc), s		6.5	6.5	6.5	6.5	6.5	6.5	6.5				
Max Green Setting (Gmax), s		54.5	5.5	40.5	29.5	18.5	14.5	31.5				
Max Q Clear Time (g_c+I1), s		2.6	3.2	21.2	18.5	2.7	9.4	11.7				
Green Ext Time (p_c), s		0.1	0.0	4.7	1.4	0.0	0.2	2.3				

Intersection Summary

HCM 6th Ctrl Delay	37.6
HCM 6th LOS	D

Notes

Unsignalized Delay for [NBR, EBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Timings
3: Peak Innovation Parkway & Milton E Proby Parkway

2030 Total PM.syn

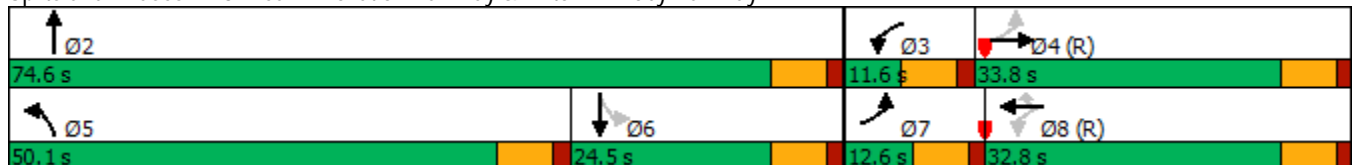
04/16/2020

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	85	343	267	37	592	5	1019	10	21	15	20	115
Future Volume (vph)	85	343	267	37	592	5	1019	10	21	15	20	115
Turn Type	pm+pt	NA	Free	pm+pt	NA	Perm	Prot	NA	Free	Perm	NA	Free
Protected Phases	7	4		3	8		5	2				6
Permitted Phases	4		Free	8		8			Free	6		Free
Detector Phase	7	4		3	8	8	5	2		6		6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0		5.0
Minimum Split (s)	11.5	24.5		11.5	24.5	24.5	11.5	24.5		24.5		24.5
Total Split (s)	12.6	33.8		11.6	32.8	32.8	50.1	74.6		24.5		24.5
Total Split (%)	10.5%	28.2%		9.7%	27.3%	27.3%	41.8%	62.2%		20.4%		20.4%
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0		5.0
All-Red Time (s)	1.5	1.5		1.5	1.5	1.5	1.5	1.5		1.5		1.5
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	6.5	6.5		6.5	6.5	6.5	6.5	6.5		6.5		6.5
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead			Lag		Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes			Yes		Yes
Recall Mode	None	C-Max		None	C-Max	C-Max	None	Max		Max		Max
Act Effect Green (s)	34.5	29.6	120.0	31.4	26.3	26.3	42.2	68.1	120.0	19.4	19.4	120.0
Actuated g/C Ratio	0.29	0.25	1.00	0.26	0.22	0.22	0.35	0.57	1.00	0.16	0.16	1.00
v/c Ratio	0.57	0.43	0.18	0.15	0.84	0.01	0.92	0.01	0.01	0.07	0.07	0.08
Control Delay	45.0	40.8	0.3	29.8	55.7	0.0	50.7	16.9	0.0	44.9	44.7	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.0	40.8	0.3	29.8	55.7	0.0	50.7	16.9	0.0	44.9	44.7	0.1
LOS	D	D	A	C	E	A	D	B	A	D	D	A
Approach Delay		25.7			53.8			49.4				10.5
Approach LOS		C			D			D				B

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 100
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.92
 Intersection Signal Delay: 41.7
 Intersection LOS: D
 Intersection Capacity Utilization 73.1%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 3: Peak Innovation Parkway & Milton E Proby Parkway



HCM 6th Signalized Intersection Summary
 3: Peak Innovation Parkway & Milton E Proby Parkway

2030 Total PM.syn
 04/16/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗	↘	↖	↗	↘	↖	↗	↘
Traffic Volume (veh/h)	85	343	267	37	592	5	1019	10	21	15	20	115
Future Volume (veh/h)	85	343	267	37	592	5	1019	10	21	15	20	115
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1856	1870	1870	1856	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	92	373	0	40	643	5	1108	11	0	16	22	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	3	2	2	3	2	2	2	2	2	2	2
Cap, veh/h	186	844		265	773	347	1187	1061		299	318	
Arrive On Green	0.05	0.24	0.00	0.03	0.22	0.22	0.34	0.57	0.00	0.17	0.17	0.00
Sat Flow, veh/h	1781	3526	1585	1781	3526	1585	3456	1870	1585	1404	1870	1585
Grp Volume(v), veh/h	92	373	0	40	643	5	1108	11	0	16	22	0
Grp Sat Flow(s),veh/h/ln	1781	1763	1585	1781	1763	1585	1728	1870	1585	1404	1870	1585
Q Serve(g_s), s	4.8	10.8	0.0	2.1	20.9	0.3	37.2	0.3	0.0	1.1	1.2	0.0
Cycle Q Clear(g_c), s	4.8	10.8	0.0	2.1	20.9	0.3	37.2	0.3	0.0	1.1	1.2	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	186	844		265	773	347	1187	1061		299	318	
V/C Ratio(X)	0.50	0.44		0.15	0.83	0.01	0.93	0.01		0.05	0.07	
Avail Cap(c_a), veh/h	186	844		286	773	347	1256	1061		299	318	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	0.00	1.00	1.00	1.00	0.93	0.93	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	35.8	38.8	0.0	34.8	44.7	36.7	38.1	11.3	0.0	41.8	41.8	0.0
Incr Delay (d2), s/veh	2.0	1.7	0.0	0.3	10.2	0.1	11.7	0.0	0.0	0.3	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	4.9	0.0	0.9	10.2	0.1	17.4	0.1	0.0	0.4	0.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.8	40.5	0.0	35.1	54.9	36.8	49.8	11.3	0.0	42.2	42.2	0.0
LnGrp LOS	D	D		D	D	D	D	B		D	D	
Approach Vol, veh/h		465	A		688			1119	A		38	A
Approach Delay, s/veh		40.0			53.6			49.4			42.2	
Approach LOS		D			D			D			D	
Timer - Assigned Phs		2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s		74.6	10.2	35.2	47.7	26.9	12.6	32.8				
Change Period (Y+Rc), s		6.5	6.5	6.5	6.5	6.5	6.5	6.5				
Max Green Setting (Gmax), s		68.1	5.1	27.3	43.6	18.0	6.1	26.3				
Max Q Clear Time (g_c+I1), s		2.3	4.1	12.8	39.2	3.2	6.8	22.9				
Green Ext Time (p_c), s		0.0	0.0	2.1	2.0	0.1	0.0	1.4				

Intersection Summary

HCM 6th Ctrl Delay	48.6
HCM 6th LOS	D

Notes

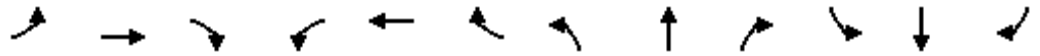
Unsignalized Delay for [NBR, EBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Timings

2045 Total AM.syn

3: Peak Innovation Parkway & Milton E Proby Parkway

04/16/2020

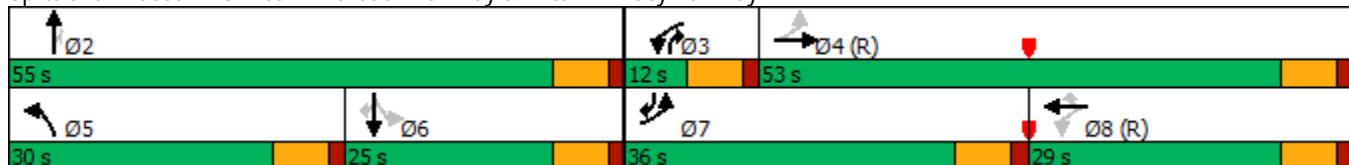


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑↑	↗	↘	↑↑↑	↗	↘↘↘	↑	↗	↘	↑	↗
Traffic Volume (vph)	316	1091	2257	49	489	11	588	36	82	10	31	171
Future Volume (vph)	316	1091	2257	49	489	11	588	36	82	10	31	171
Turn Type	pm+pt	NA	Free	pm+pt	NA	Perm	Prot	NA	pm+ov	Perm	NA	pm+ov
Protected Phases	7	4		3	8		5	2	3		6	7
Permitted Phases	4		Free	8		8			2	6		6
Detector Phase	7	4		3	8	8	5	2	3	6	6	7
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.5	24.5		11.5	24.5	24.5	11.5	24.5	11.5	24.5	24.5	11.5
Total Split (s)	36.0	53.0		12.0	29.0	29.0	30.0	55.0	12.0	25.0	25.0	36.0
Total Split (%)	30.0%	44.2%		10.0%	24.2%	24.2%	25.0%	45.8%	10.0%	20.8%	20.8%	30.0%
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	1.5	1.5		1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5		6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead		Lead	Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes
Recall Mode	None	C-Max		None	C-Max	C-Max	None	Max	None	Max	Max	None
Act Effct Green (s)	58.5	46.5	120.0	36.8	31.3	31.3	20.4	48.5	60.5	21.6	21.6	48.8
Actuated g/C Ratio	0.49	0.39	1.00	0.31	0.26	0.26	0.17	0.40	0.50	0.18	0.18	0.41
v/c Ratio	0.70	0.61	1.55	0.29	0.41	0.02	0.75	0.05	0.11	0.04	0.10	0.27
Control Delay	27.9	31.2	264.2	23.8	39.0	0.1	59.5	29.9	4.8	43.5	43.8	12.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.9	31.2	264.2	23.8	39.0	0.1	59.5	29.9	4.8	43.5	43.8	12.3
LOS	C	C	F	C	D	A	E	C	A	D	D	B
Approach Delay		174.5			36.9			51.6			18.4	
Approach LOS		F			D			D			B	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.55
 Intersection Signal Delay: 136.4
 Intersection LOS: F
 Intersection Capacity Utilization 61.1%
 ICU Level of Service B
 Analysis Period (min) 15

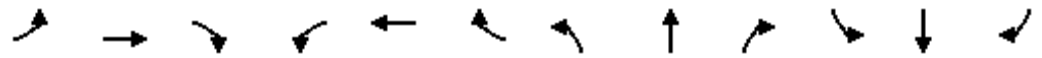
Splits and Phases: 3: Peak Innovation Parkway & Milton E Proby Parkway



HCM 6th Signalized Intersection Summary
 3: Peak Innovation Parkway & Milton E Proby Parkway

2045 Total AM.syn

04/16/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑↑	↗	↘	↑↑↑	↗	↘↗↘	↑	↗	↘	↑	↗
Traffic Volume (veh/h)	316	1091	2257	49	489	11	588	36	82	10	31	171
Future Volume (veh/h)	316	1091	2257	49	489	11	588	36	82	10	31	171
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1841	1870	1870	1841	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	343	1186	0	53	532	12	639	39	89	11	34	186
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	4	2	2	4	2	2	2	2	2	2	2
Cap, veh/h	502	2004		222	1400	442	767	756	695	309	369	558
Arrive On Green	0.15	0.40	0.00	0.03	0.28	0.28	0.15	0.40	0.40	0.20	0.20	0.20
Sat Flow, veh/h	1781	5025	1585	1781	5025	1585	5023	1870	1585	1262	1870	1585
Grp Volume(v), veh/h	343	1186	0	53	532	12	639	39	89	11	34	186
Grp Sat Flow(s),veh/h/ln	1781	1675	1585	1781	1675	1585	1674	1870	1585	1262	1870	1585
Q Serve(g_s), s	15.7	22.3	0.0	2.5	10.3	0.7	14.8	1.5	4.0	0.8	1.8	10.3
Cycle Q Clear(g_c), s	15.7	22.3	0.0	2.5	10.3	0.7	14.8	1.5	4.0	0.8	1.8	10.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	502	2004		222	1400	442	767	756	695	309	369	558
V/C Ratio(X)	0.68	0.59		0.24	0.38	0.03	0.83	0.05	0.13	0.04	0.09	0.33
Avail Cap(c_a), veh/h	664	2004		242	1400	442	984	756	695	309	369	558
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	0.00	1.00	1.00	1.00	0.88	0.88	0.88	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.5	28.4	0.0	29.5	34.9	31.5	49.4	21.8	20.0	39.0	39.4	28.5
Incr Delay (d2), s/veh	1.8	1.3	0.0	0.5	0.8	0.1	4.4	0.1	0.3	0.2	0.5	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.8	9.1	0.0	1.1	4.3	0.3	6.5	0.7	1.6	0.3	0.9	4.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.4	29.7	0.0	30.0	35.7	31.6	53.7	21.9	20.4	39.2	39.9	30.1
LnGrp LOS	C	C		C	D	C	D	C	C	D	D	C
Approach Vol, veh/h		1529	A		597			767			231	
Approach Delay, s/veh		28.7			35.1			48.2			32.0	
Approach LOS		C			D			D			C	
Timer - Assigned Phs		2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s		55.0	10.6	54.4	24.8	30.2	25.1	39.9				
Change Period (Y+Rc), s		6.5	6.5	6.5	6.5	6.5	6.5	6.5				
Max Green Setting (Gmax), s		48.5	5.5	46.5	23.5	18.5	29.5	22.5				
Max Q Clear Time (g_c+I1), s		6.0	4.5	24.3	16.8	12.3	17.7	12.3				
Green Ext Time (p_c), s		0.5	0.0	9.2	1.5	0.4	0.8	2.6				

Intersection Summary

HCM 6th Ctrl Delay	35.0
HCM 6th LOS	C

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Timings

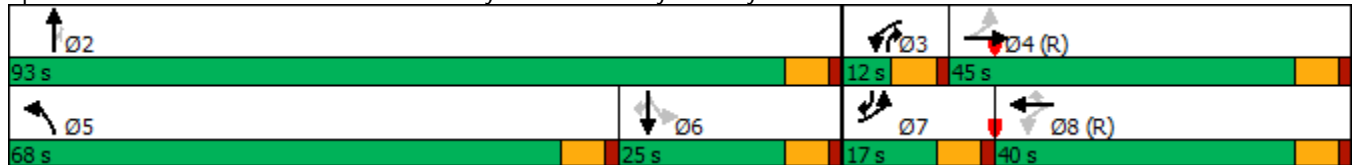
3: Peak Innovation Parkway & Milton E Proby Parkway

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	207	502	352	70	977	15	1842	25	49	15	48	261
Future Volume (vph)	207	502	352	70	977	15	1842	25	49	15	48	261
Turn Type	pm+pt	NA	Free	pm+pt	NA	Perm	Prot	NA	pm+ov	Perm	NA	pm+ov
Protected Phases	7	4		3	8		5	2	3		6	7
Permitted Phases	4		Free	8		8			2	6		6
Detector Phase	7	4		3	8	8	5	2	3	6	6	7
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.5	24.5		11.5	24.5	24.5	11.5	24.5	11.5	24.5	24.5	11.5
Total Split (s)	17.0	45.0		12.0	40.0	40.0	68.0	93.0	12.0	25.0	25.0	17.0
Total Split (%)	11.3%	30.0%		8.0%	26.7%	26.7%	45.3%	62.0%	8.0%	16.7%	16.7%	11.3%
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	1.5	1.5		1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5		6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead		Lead	Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes
Recall Mode	None	C-Max		None	C-Max	C-Max	None	Max	None	Max	Max	None
Act Effct Green (s)	49.0	38.5	150.0	39.0	33.5	33.5	61.5	86.5	98.5	18.5	18.5	35.5
Actuated g/C Ratio	0.33	0.26	1.00	0.26	0.22	0.22	0.41	0.58	0.66	0.12	0.12	0.24
v/c Ratio	1.30	0.42	0.24	0.33	0.94	0.04	0.98	0.03	0.05	0.09	0.23	0.66
Control Delay	204.2	59.5	0.3	40.3	73.6	0.1	58.9	13.8	2.3	60.0	62.2	46.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	6.2	0.0	0.0	0.0	0.0	0.0
Total Delay	204.2	59.5	0.3	40.3	73.6	0.1	65.1	13.8	2.3	60.0	62.2	46.3
LOS	F	E	A	D	E	A	E	B	A	E	E	D
Approach Delay		68.1			70.4			62.8				49.3
Approach LOS		E			E			E				D

Intersection Summary

Cycle Length: 150
 Actuated Cycle Length: 150
 Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 150
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.30
 Intersection Signal Delay: 64.9
 Intersection Capacity Utilization 88.3%
 Analysis Period (min) 15
 Intersection LOS: E
 ICU Level of Service E

Splits and Phases: 3: Peak Innovation Parkway & Milton E Proby Parkway



HCM 6th Signalized Intersection Summary
 3: Peak Innovation Parkway & Milton E Proby Parkway

2045 Total PM.syn
 04/16/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	207	502	352	70	977	15	1842	25	49	15	48	261
Future Volume (veh/h)	207	502	352	70	977	15	1842	25	49	15	48	261
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1856	1870	1870	1856	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	225	546	0	76	1062	16	2002	27	53	16	52	186
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	3	2	2	3	2	2	2	2	2	2	2
Cap, veh/h	182	1300		257	1131	354	2055	1079	972	212	232	308
Arrive On Green	0.07	0.26	0.00	0.04	0.22	0.22	0.41	0.58	0.58	0.12	0.12	0.12
Sat Flow, veh/h	1781	5066	1585	1781	5066	1585	5023	1870	1585	1319	1870	1585
Grp Volume(v), veh/h	225	546	0	76	1062	16	2002	27	53	16	52	186
Grp Sat Flow(s),veh/h/ln	1781	1689	1585	1781	1689	1585	1674	1870	1585	1319	1870	1585
Q Serve(g_s), s	10.5	13.5	0.0	4.9	30.9	1.2	58.7	0.9	2.0	1.6	3.8	16.1
Cycle Q Clear(g_c), s	10.5	13.5	0.0	4.9	30.9	1.2	58.7	0.9	2.0	1.6	3.8	16.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	182	1300		257	1131	354	2055	1079	972	212	232	308
V/C Ratio(X)	1.24	0.42		0.30	0.94	0.05	0.97	0.03	0.05	0.08	0.22	0.60
Avail Cap(c_a), veh/h	182	1300		257	1131	354	2060	1079	972	212	232	308
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	0.00	1.00	1.00	1.00	0.73	0.73	0.73	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.0	46.4	0.0	43.2	57.2	45.7	43.5	13.6	11.6	58.2	59.2	55.2
Incr Delay (d2), s/veh	145.1	1.0	0.0	0.6	15.6	0.2	11.6	0.0	0.1	0.7	2.2	8.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.2	5.8	0.0	2.3	14.8	0.5	26.3	0.4	0.7	0.6	1.9	7.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	193.1	47.4	0.0	43.8	72.8	45.9	55.1	13.7	11.7	58.9	61.4	63.7
LnGrp LOS	F	D		D	E	D	E	B	B	E	E	E
Approach Vol, veh/h		771	A		1154			2082			254	
Approach Delay, s/veh		90.0			70.5			53.5			62.9	
Approach LOS		F			E			D			E	
Timer - Assigned Phs		2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s		93.0	12.0	45.0	67.9	25.1	17.0	40.0				
Change Period (Y+Rc), s		6.5	6.5	6.5	6.5	6.5	6.5	6.5				
Max Green Setting (Gmax), s		86.5	5.5	38.5	61.5	18.5	10.5	33.5				
Max Q Clear Time (g_c+I1), s		4.0	6.9	15.5	60.7	18.1	12.5	32.9				
Green Ext Time (p_c), s		0.3	0.0	3.8	0.6	0.0	0.0	0.4				

Intersection Summary

HCM 6th Ctrl Delay	65.2
HCM 6th LOS	E

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Intersection						
Int Delay, s/veh	0.3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑				↑
Traffic Vol, veh/h	472	178	0	0	0	21
Future Vol, veh/h	472	178	0	0	0	21
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	300	-	-	-	0
Veh in Median Storage, #	0	-	-	16983	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	4	2	2	4	2	2
Mvmt Flow	513	193	0	0	0	23

Major/Minor	Major1		Minor1	
Conflicting Flow All	0	0	-	257
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	-	-	3.32
Pot Cap-1 Maneuver	-	-	0	742
Stage 1	-	-	0	-
Stage 2	-	-	0	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	742
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	NB
HCM Control Delay, s	0	10
HCM LOS		B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR
Capacity (veh/h)	742	-	-
HCM Lane V/C Ratio	0.031	-	-
HCM Control Delay (s)	10	-	-
HCM Lane LOS	B	-	-
HCM 95th %tile Q(veh)	0.1	-	-

Intersection						
Int Delay, s/veh	2.6					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑				↑
Traffic Vol, veh/h	348	14	0	0	0	121
Future Vol, veh/h	348	14	0	0	0	121
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	300	-	-	-	0
Veh in Median Storage, #	0	-	-	16983	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	2	2	3	2	2
Mvmt Flow	378	15	0	0	0	132

Major/Minor	Major1		Minor1	
Conflicting Flow All	0	0	-	189
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	-	-	3.32
Pot Cap-1 Maneuver	-	-	0	821
Stage 1	-	-	0	-
Stage 2	-	-	0	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	821
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	NB
HCM Control Delay, s	0	10.2
HCM LOS		B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR
Capacity (veh/h)	821	-	-
HCM Lane V/C Ratio	0.16	-	-
HCM Control Delay (s)	10.2	-	-
HCM Lane LOS	B	-	-
HCM 95th %tile Q(veh)	0.6	-	-

Intersection						
Int Delay, s/veh	0.8					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑				↑
Traffic Vol, veh/h	694	443	0	0	0	51
Future Vol, veh/h	694	443	0	0	0	51
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	Free	-	None	-	None
Storage Length	-	0	-	-	-	0
Veh in Median Storage, #	0	-	-	16983	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	4	2	2	4	2	2
Mvmt Flow	754	482	0	0	0	55

Major/Minor	Major1		Minor1	
Conflicting Flow All	0	-	-	377
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	-	-	3.32
Pot Cap-1 Maneuver	-	0	0	621
Stage 1	-	0	0	-
Stage 2	-	0	0	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	621
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	NB
HCM Control Delay, s	0	11.4
HCM LOS		B

Minor Lane/Major Mvmt	NBLn1	EBT
Capacity (veh/h)	621	-
HCM Lane V/C Ratio	0.089	-
HCM Control Delay (s)	11.4	-
HCM Lane LOS	B	-
HCM 95th %tile Q(veh)	0.3	-

Intersection						
Int Delay, s/veh	5.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑				↑
Traffic Vol, veh/h	513	34	0	0	0	301
Future Vol, veh/h	513	34	0	0	0	301
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	Free	-	None	-	None
Storage Length	-	0	-	-	-	0
Veh in Median Storage, #	0	-	-	16983	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	2	2	3	2	2
Mvmt Flow	558	37	0	0	0	327

Major/Minor	Major1		Minor1	
Conflicting Flow All	0	-	-	279
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	-	-	3.32
Pot Cap-1 Maneuver	-	0	0	718
Stage 1	-	0	0	-
Stage 2	-	0	0	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	718
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	NB
HCM Control Delay, s	0	14.1
HCM LOS		B

Minor Lane/Major Mvmt	NBLn1	EBT
Capacity (veh/h)	718	-
HCM Lane V/C Ratio	0.456	-
HCM Control Delay (s)	14.1	-
HCM Lane LOS	B	-
HCM 95th %tile Q(veh)	2.4	-

Intersection												
Int Delay, s/veh	5.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↵	↵		↵	↵		↵	↑↑↑	↵	↵	↑↑↑	↵
Traffic Vol, veh/h	271	24	100	5	16	21	36	92	8	24	550	176
Future Vol, veh/h	271	24	100	5	16	21	36	92	8	24	550	176
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	150	-	-	300	-	300	225	-	475
Veh in Median Storage, #	-	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	295	26	109	5	17	23	39	100	9	26	598	191

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	777	837	299	482	1019	50	789	0	0	109	0	0
Stage 1	650	650	-	178	178	-	-	-	-	-	-	-
Stage 2	127	187	-	304	841	-	-	-	-	-	-	-
Critical Hdwy	6.44	6.54	7.14	6.44	6.54	7.14	5.34	-	-	5.34	-	-
Critical Hdwy Stg 1	7.34	5.54	-	7.34	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.74	5.54	-	6.74	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.82	4.02	3.92	3.82	4.02	3.92	3.12	-	-	3.12	-	-
Pot Cap-1 Maneuver	611	532	*800	*821	405	855	775	-	-	1029	-	-
Stage 1	719	717	-	*719	751	-	-	-	-	-	-	-
Stage 2	794	744	-	*821	575	-	-	-	-	-	-	-
Platoon blocked, %	1	1	1	1	1	1	1	-	-	-	-	-
Mov Cap-1 Maneuver	544	492	*800	*645	375	855	775	-	-	1029	-	-
Mov Cap-2 Maneuver	562	539	-	*558	436	-	-	-	-	-	-	-
Stage 1	683	699	-	*683	713	-	-	-	-	-	-	-
Stage 2	716	707	-	*666	561	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	15.9	11.4	2.6	0.3
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	775	-	-	562	731	558	604	1029	-	-
HCM Lane V/C Ratio	0.05	-	-	0.524	0.184	0.01	0.067	0.025	-	-
HCM Control Delay (s)	9.9	-	-	18.2	11	11.5	11.4	8.6	-	-
HCM Lane LOS	A	-	-	C	B	B	B	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	3	0.7	0	0.2	0.1	-	-

Notes
 -: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection												
Int Delay, s/veh	6.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↵	↵		↵	↵		↵	↑↑↑	↵	↵	↑↑↑	↵
Traffic Vol, veh/h	200	22	40	8	24	32	71	394	7	22	108	95
Future Vol, veh/h	200	22	40	8	24	32	71	394	7	22	108	95
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	150	-	-	300	-	300	225	-	475
Veh in Median Storage, #	-	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	217	24	43	9	26	35	77	428	8	24	117	103

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	503	755	59	689	850	214	220	0	0	436	0	0
Stage 1	165	165	-	582	582	-	-	-	-	-	-	-
Stage 2	338	590	-	107	268	-	-	-	-	-	-	-
Critical Hdwy	6.44	6.54	7.14	6.44	6.54	7.14	5.34	-	-	5.34	-	-
Critical Hdwy Stg 1	7.34	5.54	-	7.34	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.74	5.54	-	6.74	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.82	4.02	3.92	3.82	4.02	3.92	3.12	-	-	3.12	-	-
Pot Cap-1 Maneuver	509	346	876	398	304	673	937	-	-	726	-	-
Stage 1	763	779	-	386	497	-	-	-	-	-	-	-
Stage 2	596	493	-	844	702	-	-	-	-	-	-	-
Platoon blocked, %	1	1	1	1	1	1	-	-	-	-	-	-
Mov Cap-1 Maneuver	417	307	876	329	270	673	937	-	-	726	-	-
Mov Cap-2 Maneuver	418	368	-	322	355	-	-	-	-	-	-	-
Stage 1	700	753	-	354	456	-	-	-	-	-	-	-
Stage 2	489	453	-	751	679	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	20.1		13.9		1.4		1	
HCM LOS	C		B					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	937	-	-	418	588	322	486	726	-	-
HCM Lane V/C Ratio	0.082	-	-	0.52	0.115	0.027	0.125	0.033	-	-
HCM Control Delay (s)	9.2	-	-	22.6	11.9	16.5	13.5	10.1	-	-
HCM Lane LOS	A	-	-	C	B	C	B	B	-	-
HCM 95th %tile Q(veh)	0.3	-	-	2.9	0.4	0.1	0.4	0.1	-	-

MOVEMENT SUMMARY

 Site: 101 [5 2022 Total AM - Peak Innovation Pkwy / Integration Loop]

New Site
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back Vehicles veh	of Queue Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: RoadName												
3	L2	39	3.0	0.082	5.1	LOS A	0.2	5.6	0.33	0.26	0.33	33.7
8	T1	100	3.0	0.082	5.0	LOS A	0.2	5.6	0.31	0.25	0.31	34.8
18	R2	9	3.0	0.010	4.4	LOS A	0.0	0.7	0.31	0.20	0.31	34.1
Approach		148	3.0	0.082	5.0	LOS A	0.2	5.6	0.32	0.25	0.32	34.4
East: RoadName												
1	L2	5	3.0	0.029	4.9	LOS A	0.1	1.9	0.35	0.27	0.35	34.7
6	T1	17	3.0	0.029	4.9	LOS A	0.1	1.9	0.35	0.27	0.35	34.6
16	R2	23	3.0	0.028	4.8	LOS A	0.1	1.8	0.33	0.26	0.33	34.1
Approach		46	3.0	0.029	4.8	LOS A	0.1	1.9	0.34	0.27	0.34	34.4
North: RoadName												
7	L2	26	3.0	0.298	6.4	LOS A	1.0	25.9	0.16	0.08	0.16	34.4
4	T1	598	3.0	0.298	6.4	LOS A	1.0	25.9	0.16	0.07	0.16	34.4
14	R2	191	3.0	0.183	5.1	LOS A	0.5	13.9	0.14	0.06	0.14	33.8
Approach		815	3.0	0.298	6.1	LOS A	1.0	25.9	0.15	0.07	0.15	34.3
West: RoadName												
5	L2	295	3.0	0.460	11.8	LOS B	2.1	53.7	0.55	0.65	0.86	30.0
2	T1	26	3.0	0.460	11.8	LOS B	2.1	53.7	0.55	0.65	0.86	29.9
12	R2	109	3.0	0.161	7.2	LOS A	0.4	11.4	0.46	0.46	0.46	32.9
Approach		429	3.0	0.460	10.6	LOS B	2.1	53.7	0.53	0.60	0.76	30.6
All Vehicles		1438	3.0	0.460	7.3	LOS A	2.1	53.7	0.29	0.25	0.36	33.1

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

 Site: 101 [5 2022 Total PM - Peak Innovation Pkwy / Integration Loop]

New Site
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back Vehicles veh	of Queue Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: RoadName												
3	L2	77	3.0	0.279	6.9	LOS A	0.9	22.9	0.34	0.27	0.34	33.5
8	T1	428	3.0	0.279	6.9	LOS A	0.9	22.9	0.33	0.27	0.33	33.9
18	R2	8	3.0	0.008	4.1	LOS A	0.0	0.5	0.26	0.15	0.26	34.3
Approach		513	3.0	0.279	6.9	LOS A	0.9	22.9	0.33	0.27	0.33	33.9
East: RoadName												
1	L2	9	3.0	0.055	6.3	LOS A	0.1	3.6	0.45	0.44	0.45	34.0
6	T1	26	3.0	0.055	6.3	LOS A	0.1	3.6	0.45	0.44	0.45	33.9
16	R2	35	3.0	0.053	6.1	LOS A	0.1	3.3	0.43	0.42	0.43	33.5
Approach		70	3.0	0.055	6.2	LOS A	0.1	3.6	0.44	0.43	0.44	33.7
North: RoadName												
7	L2	24	3.0	0.070	4.2	LOS A	0.2	4.7	0.18	0.09	0.18	34.8
4	T1	117	3.0	0.070	4.2	LOS A	0.2	4.7	0.18	0.09	0.18	35.3
14	R2	103	3.0	0.102	4.5	LOS A	0.3	6.6	0.17	0.09	0.17	34.1
Approach		245	3.0	0.102	4.3	LOS A	0.3	6.6	0.17	0.09	0.17	34.7
West: RoadName												
5	L2	211	3.0	0.238	6.0	LOS A	0.7	17.8	0.23	0.15	0.23	32.4
2	T1	24	3.0	0.238	6.0	LOS A	0.7	17.8	0.23	0.15	0.23	32.4
12	R2	43	3.0	0.044	4.1	LOS A	0.1	2.9	0.20	0.11	0.20	34.5
Approach		278	3.0	0.238	5.7	LOS A	0.7	17.8	0.23	0.14	0.23	32.7
All Vehicles		1105	3.0	0.279	6.0	LOS A	0.9	22.9	0.27	0.21	0.27	33.7

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

 Site: 101 [5 2030 Total AM - Peak Innovation Pkwy / Integration Loop]

New Site
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back Vehicles veh	of Queue Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: RoadName												
3	L2	64	3.0	0.168	6.1	LOS A	0.5	12.2	0.37	0.33	0.37	33.5
8	T1	212	3.0	0.168	6.1	LOS A	0.5	12.2	0.36	0.32	0.36	34.2
18	R2	13	3.0	0.016	4.6	LOS A	0.0	1.0	0.33	0.23	0.33	34.0
Approach		289	3.0	0.168	6.0	LOS A	0.5	12.2	0.36	0.32	0.36	34.1
East: RoadName												
1	L2	9	3.0	0.048	5.7	LOS A	0.1	3.2	0.41	0.37	0.41	34.3
6	T1	25	3.0	0.048	5.7	LOS A	0.1	3.2	0.41	0.37	0.41	34.2
16	R2	34	3.0	0.047	5.5	LOS A	0.1	2.9	0.39	0.35	0.39	33.8
Approach		67	3.0	0.048	5.6	LOS A	0.1	3.2	0.40	0.36	0.40	34.0
North: RoadName												
7	L2	38	3.0	0.574	11.1	LOS B	2.9	75.1	0.31	0.19	0.31	32.2
4	T1	1133	3.0	0.574	11.0	LOS B	2.9	75.1	0.30	0.19	0.30	32.2
14	R2	191	3.0	0.188	5.3	LOS A	0.6	14.3	0.18	0.10	0.18	33.7
Approach		1362	3.0	0.574	10.2	LOS B	2.9	75.1	0.29	0.17	0.29	32.4
West: RoadName												
5	L2	310	3.0	0.742	30.4	LOS D	4.5	115.2	0.83	1.12	1.92	24.3
2	T1	38	3.0	0.742	30.4	LOS D	4.5	115.2	0.83	1.12	1.92	24.2
12	R2	161	3.0	0.365	14.6	LOS B	1.2	31.2	0.70	0.77	0.96	29.7
Approach		509	3.0	0.742	25.4	LOS D	4.5	115.2	0.79	1.01	1.62	25.7
All Vehicles		2227	3.0	0.742	13.0	LOS B	4.5	115.2	0.41	0.39	0.60	30.8

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

 Site: 101 [5 2030 Total PM - Peak Innovation Pkwy / Integration Loop]

New Site
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back Vehicles veh	of Queue Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: RoadName												
3	L2	145	3.0	0.573	12.4	LOS B	4.4	111.8	0.51	0.60	0.82	31.1
8	T1	861	3.0	0.573	12.3	LOS B	4.4	111.8	0.50	0.58	0.80	31.4
18	R2	11	3.0	0.012	4.2	LOS A	0.0	0.8	0.29	0.18	0.29	34.2
Approach		1016	3.0	0.573	12.2	LOS B	4.4	111.8	0.50	0.58	0.80	31.4
East: RoadName												
1	L2	12	3.0	0.116	10.2	LOS B	0.3	7.7	0.64	0.64	0.64	32.1
6	T1	37	3.0	0.116	10.2	LOS B	0.3	7.7	0.64	0.64	0.64	32.0
16	R2	50	3.0	0.111	9.6	LOS A	0.3	7.1	0.62	0.62	0.62	31.8
Approach		99	3.0	0.116	9.9	LOS A	0.3	7.7	0.63	0.63	0.63	31.9
North: RoadName												
7	L2	34	3.0	0.131	5.0	LOS A	0.4	9.3	0.25	0.17	0.25	34.6
4	T1	214	3.0	0.131	5.0	LOS A	0.4	9.3	0.24	0.16	0.24	34.9
14	R2	103	3.0	0.109	4.8	LOS A	0.3	7.6	0.25	0.16	0.25	33.9
Approach		351	3.0	0.131	5.0	LOS A	0.4	9.3	0.24	0.17	0.24	34.6
West: RoadName												
5	L2	232	3.0	0.292	7.0	LOS A	0.9	22.8	0.32	0.26	0.32	32.0
2	T1	34	3.0	0.292	7.0	LOS A	0.9	22.8	0.32	0.26	0.32	32.0
12	R2	35	3.0	0.039	4.4	LOS A	0.1	2.5	0.27	0.18	0.27	34.3
Approach		300	3.0	0.292	6.7	LOS A	0.9	22.8	0.32	0.26	0.32	32.3
All Vehicles		1766	3.0	0.573	9.7	LOS A	4.4	111.8	0.42	0.45	0.60	32.2

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

 Site: 101 [5 2045 Total AM - Peak Innovation Pkwy / Integration Loop]

New Site
 Site Category: (None)
 Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back Vehicles veh	of Queue Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: RoadName												
3	L2	88	3.0	0.189	5.7	LOS A	0.6	14.1	0.28	0.21	0.28	33.6
8	T1	424	3.0	0.189	5.7	LOS A	0.6	14.1	0.28	0.20	0.28	34.6
18	R2	13	3.0	0.189	5.7	LOS A	0.5	13.3	0.26	0.19	0.26	33.7
Approach		525	3.0	0.189	5.7	LOS A	0.6	14.1	0.28	0.20	0.28	34.4
East: RoadName												
1	L2	9	3.0	0.052	6.1	LOS A	0.1	3.4	0.44	0.42	0.44	34.1
6	T1	25	3.0	0.052	6.1	LOS A	0.1	3.4	0.44	0.42	0.44	34.0
16	R2	34	3.0	0.050	5.9	LOS A	0.1	3.1	0.42	0.39	0.42	33.6
Approach		67	3.0	0.052	6.0	LOS A	0.1	3.4	0.43	0.40	0.43	33.8
North: RoadName												
7	L2	38	3.0	0.846	23.9	LOS C	23.7	605.6	0.68	0.79	1.23	27.3
4	T1	2311	3.0	0.846	23.9	LOS C	23.7	605.6	0.67	0.79	1.22	27.3
14	R2	191	3.0	0.846	23.8	LOS C	23.3	597.1	0.65	0.77	1.20	26.5
Approach		2540	3.0	0.846	23.9	LOS C	23.7	605.6	0.67	0.78	1.22	27.2
West: RoadName												
5	L2	310	3.0	1.959	495.0	LOS F	59.5	1522.1	1.00	3.65	12.97	4.2
2	T1	38	3.0	1.959	495.0	LOS F	59.5	1522.1	1.00	3.65	12.97	4.2
12	R2	354	3.0	1.768	405.8	LOS F	54.0	1381.2	1.00	3.68	13.07	4.8
Approach		702	3.0	1.959	450.0	LOS F	59.5	1522.1	1.00	3.67	13.02	4.4
All Vehicles		3835	3.0	1.959	99.1	LOS F	59.5	1522.1	0.67	1.23	3.24	14.3

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
 Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

 Site: 101 [5 2045 Total PM - Peak Innovation Pkwy / Integration Loop]

New Site
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back Vehicles veh	of Queue Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: RoadName												
3	L2	295	3.0	1.195	117.2	LOS F	87.4	2236.3	1.00	3.36	6.68	12.9
8	T1	1802	3.0	1.195	117.0	LOS F	88.3	2261.5	1.00	3.38	6.72	12.9
18	R2	11	3.0	0.012	4.2	LOS A	0.0	0.8	0.29	0.18	0.29	34.2
Approach		2108	3.0	1.195	116.5	LOS F	88.3	2261.5	1.00	3.36	6.69	12.9
East: RoadName												
1	L2	12	3.0	0.208	20.3	LOS C	0.5	13.5	0.82	0.83	0.88	28.2
6	T1	37	3.0	0.208	20.3	LOS C	0.5	13.5	0.82	0.83	0.88	28.1
16	R2	50	3.0	0.192	18.0	LOS C	0.5	11.9	0.80	0.80	0.81	28.4
Approach		99	3.0	0.208	19.1	LOS C	0.5	13.5	0.81	0.82	0.85	28.3
North: RoadName												
7	L2	34	3.0	0.231	6.5	LOS A	0.7	17.9	0.34	0.29	0.34	34.1
4	T1	373	3.0	0.231	6.5	LOS A	0.7	17.9	0.33	0.28	0.33	34.3
14	R2	103	3.0	0.118	5.3	LOS A	0.3	8.3	0.31	0.24	0.31	33.7
Approach		510	3.0	0.231	6.2	LOS A	0.7	17.9	0.33	0.27	0.33	34.2
West: RoadName												
5	L2	232	3.0	0.327	8.2	LOS A	1.0	25.7	0.42	0.41	0.42	31.5
2	T1	34	3.0	0.327	8.2	LOS A	1.0	25.7	0.42	0.41	0.42	31.4
12	R2	46	3.0	0.057	5.1	LOS A	0.1	3.8	0.35	0.29	0.35	34.0
Approach		311	3.0	0.327	7.8	LOS A	1.0	25.7	0.41	0.39	0.41	31.8
All Vehicles		3027	3.0	1.195	83.6	LOS F	88.3	2261.5	0.82	2.45	4.78	15.8

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Intersection												
Int Delay, s/veh	2.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↙	↑↑	↗	↙	↑↑	↗	↙	↗		↙	↗	
Traffic Vol, veh/h	16	352	288	96	84	32	36	0	12	21	0	11
Future Vol, veh/h	16	352	288	96	84	32	36	0	12	21	0	11
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	450	-	0	300	-	400	150	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	17	383	313	104	91	35	39	0	13	23	0	12

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	126	0	0	696	0	0	671	751	192	525	1029	46
Stage 1	-	-	-	-	-	-	417	417	-	299	299	-
Stage 2	-	-	-	-	-	-	254	334	-	226	730	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	1458	-	-	896	-	-	342	338	817	435	232	1014
Stage 1	-	-	-	-	-	-	584	590	-	685	665	-
Stage 2	-	-	-	-	-	-	728	642	-	756	426	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1458	-	-	896	-	-	305	295	817	387	203	1014
Mov Cap-2 Maneuver	-	-	-	-	-	-	305	295	-	474	266	-
Stage 1	-	-	-	-	-	-	577	583	-	677	588	-
Stage 2	-	-	-	-	-	-	636	568	-	735	421	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.2			4.3			16.3			11.5		
HCM LOS							C			B		

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	305	817	1458	-	-	896	-	-	474	1014
HCM Lane V/C Ratio	0.128	0.016	0.012	-	-	0.116	-	-	0.048	0.012
HCM Control Delay (s)	18.5	9.5	7.5	-	-	9.5	-	-	13	8.6
HCM Lane LOS	C	A	A	-	-	A	-	-	B	A
HCM 95th %tile Q(veh)	0.4	0	0	-	-	0.4	-	-	0.2	0

Intersection

Int Delay, s/veh 6.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑	↗	↘	↑↑	↗	↘	↗		↘	↗	
Traffic Vol, veh/h	15	138	17	6	244	30	224	0	75	32	0	16
Future Vol, veh/h	15	138	17	6	244	30	224	0	75	32	0	16
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	450	-	0	300	-	300	150	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	16	150	18	7	265	33	243	0	82	35	0	17

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	298	0	0	168
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.14	-	-	4.14
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.22	-	-	2.22
Pot Cap-1 Maneuver	1260	-	-	1407
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	1260	-	-	1407
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.7	0.2	13.9	10.9
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	580	971	1260	-	-	1407	-	-	561	892
HCM Lane V/C Ratio	0.42	0.084	0.013	-	-	0.005	-	-	0.062	0.019
HCM Control Delay (s)	15.6	9	7.9	-	-	7.6	-	-	11.8	9.1
HCM Lane LOS	C	A	A	-	-	A	-	-	B	A
HCM 95th %tile Q(veh)	2.1	0.3	0	-	-	0	-	-	0.2	0.1

Intersection												
Int Delay, s/veh	2.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗	↘	↖	↗	↘	↖	↗	↘
Traffic Vol, veh/h	24	764	398	80	197	60	50	5	10	35	5	15
Future Vol, veh/h	24	764	398	80	197	60	50	5	10	35	5	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	450	-	0	300	-	400	300	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	26	830	433	87	214	65	54	5	11	38	5	16

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	279	0	0	1263	0	0	1166	1335	415	858	1703	107
Stage 1	-	-	-	-	-	-	882	882	-	388	388	-
Stage 2	-	-	-	-	-	-	284	453	-	470	1315	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	1281	-	-	546	-	-	149	152	586	251	91	926
Stage 1	-	-	-	-	-	-	307	362	-	607	607	-
Stage 2	-	-	-	-	-	-	699	568	-	543	226	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1281	-	-	546	-	-	122	125	586	209	75	926
Mov Cap-2 Maneuver	-	-	-	-	-	-	226	237	-	318	116	-
Stage 1	-	-	-	-	-	-	301	355	-	595	510	-
Stage 2	-	-	-	-	-	-	571	478	-	514	221	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.2			3			23.3			17.4		
HCM LOS							C			C		

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	226	393	1281	-	-	546	-	-	318	337
HCM Lane V/C Ratio	0.24	0.041	0.02	-	-	0.159	-	-	0.12	0.065
HCM Control Delay (s)	25.9	14.6	7.9	-	-	12.8	-	-	17.9	16.4
HCM Lane LOS	D	B	A	-	-	B	-	-	C	C
HCM 95th %tile Q(veh)	0.9	0.1	0.1	-	-	0.6	-	-	0.4	0.2

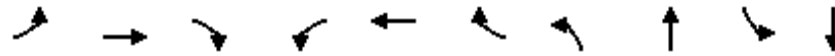
Intersection												
Int Delay, s/veh	9.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑↑	↗	↖	↑↑	↗	↖	↗		↖	↗	
Traffic Vol, veh/h	21	197	24	5	617	51	309	10	62	52	10	23
Future Vol, veh/h	21	197	24	5	617	51	309	10	62	52	10	23
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	450	-	0	300	-	400	300	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	23	214	26	5	671	55	336	11	67	57	11	25

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	726	0	0	240	0	0	611	996	107	840	967	336
Stage 1	-	-	-	-	-	-	260	260	-	681	681	-
Stage 2	-	-	-	-	-	-	351	736	-	159	286	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	873	-	-	1324	-	-	378	243	926	258	253	660
Stage 1	-	-	-	-	-	-	722	692	-	407	448	-
Stage 2	-	-	-	-	-	-	639	423	-	827	674	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	873	-	-	1324	-	-	347	236	926	228	245	660
Mov Cap-2 Maneuver	-	-	-	-	-	-	444	323	-	323	346	-
Stage 1	-	-	-	-	-	-	703	674	-	396	446	-
Stage 2	-	-	-	-	-	-	598	421	-	735	656	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.8			0.1			29.7			16.2		
HCM LOS							D			C		

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	444	735	873	-	-	1324	-	-	323	518
HCM Lane V/C Ratio	0.756	0.106	0.026	-	-	0.004	-	-	0.175	0.069
HCM Control Delay (s)	34.2	10.5	9.2	-	-	7.7	-	-	18.5	12.5
HCM Lane LOS	D	B	A	-	-	A	-	-	C	B
HCM 95th %tile Q(veh)	6.3	0.4	0.1	-	-	0	-	-	0.6	0.2

Timings
6: Middle Access & Peak Innovation Parkway

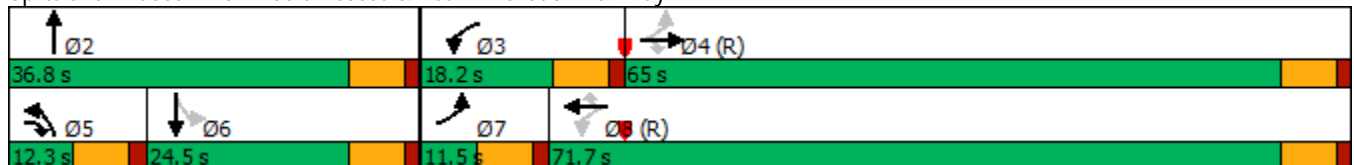


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations	↖	↗	↘	↖	↗	↘	↖	↗	↘	↘
Traffic Volume (vph)	24	1432	993	199	340	79	123	10	41	10
Future Volume (vph)	24	1432	993	199	340	79	123	10	41	10
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	Perm	Prot	NA	Perm	NA
Protected Phases	7	4	5	3	8		5	2		6
Permitted Phases	4		4	8		8			6	
Detector Phase	7	4	5	3	8	8	5	2	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.5	24.5	11.5	11.5	24.5	24.5	11.5	24.5	24.5	24.5
Total Split (s)	11.5	65.0	12.3	18.2	71.7	71.7	12.3	36.8	24.5	24.5
Total Split (%)	9.6%	54.2%	10.3%	15.2%	59.8%	59.8%	10.3%	30.7%	20.4%	20.4%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead		Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes
Recall Mode	None	C-Max	None	None	C-Max	C-Max	None	Max	Max	Max
Act Effect Green (s)	63.5	58.5	70.8	76.7	69.8	69.8	5.8	30.3	18.0	18.0
Actuated g/C Ratio	0.53	0.49	0.59	0.64	0.58	0.58	0.05	0.25	0.15	0.15
v/c Ratio	0.05	0.90	0.86	0.92	0.18	0.09	0.81	0.09	0.22	0.10
Control Delay	10.7	24.1	17.5	95.0	7.2	0.6	90.6	17.0	48.1	26.6
Queue Delay	0.0	0.0	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.7	24.1	18.9	95.0	7.2	0.6	90.6	17.0	48.1	26.6
LOS	B	C	B	F	A	A	F	B	D	C
Approach Delay		21.9			34.6			74.3		40.0
Approach LOS		C			C			E		D

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 150
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.92
 Intersection Signal Delay: 27.1
 Intersection LOS: C
 Intersection Capacity Utilization 92.9%
 ICU Level of Service F
 Analysis Period (min) 15

Splits and Phases: 6: Middle Access & Peak Innovation Parkway



HCM 6th Signalized Intersection Summary
 6: Middle Access & Peak Innovation Parkway

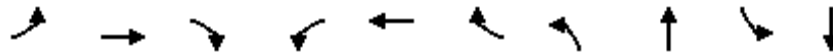
2045 Total AM.syn
 04/02/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗	↑↑	↘	↖	↑↑	↗	↖↗	↖		↘	↗	
Traffic Volume (veh/h)	24	1432	993	199	340	79	123	10	25	41	10	15
Future Volume (veh/h)	24	1432	993	199	340	79	123	10	25	41	10	15
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	26	1557	862	216	370	86	134	11	27	45	11	16
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	561	1742	853	242	1993	889	167	121	298	265	103	150
Arrive On Green	0.02	0.49	0.49	0.09	0.56	0.56	0.05	0.25	0.25	0.15	0.15	0.15
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	3456	480	1178	1370	689	1002
Grp Volume(v), veh/h	26	1557	862	216	370	86	134	0	38	45	0	27
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1728	0	1658	1370	0	1690
Q Serve(g_s), s	0.9	47.7	58.8	9.4	6.1	3.0	4.6	0.0	2.1	3.5	0.0	1.7
Cycle Q Clear(g_c), s	0.9	47.7	58.8	9.4	6.1	3.0	4.6	0.0	2.1	3.5	0.0	1.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.71	1.00		0.59
Lane Grp Cap(c), veh/h	561	1742	853	242	1993	889	167	0	419	265	0	254
V/C Ratio(X)	0.05	0.89	1.01	0.89	0.19	0.10	0.80	0.00	0.09	0.17	0.00	0.11
Avail Cap(c_a), veh/h	593	1742	853	247	1993	889	167	0	419	265	0	254
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	14.4	27.8	27.7	35.3	12.9	12.2	56.5	0.0	34.3	44.8	0.0	44.1
Incr Delay (d2), s/veh	0.0	7.5	33.3	30.3	0.2	0.2	23.8	0.0	0.4	1.4	0.0	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	21.4	31.0	8.4	2.5	1.1	2.6	0.0	0.9	1.3	0.0	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.4	35.3	61.0	65.6	13.1	12.5	80.3	0.0	34.7	46.2	0.0	44.9
LnGrp LOS	B	D	F	E	B	B	F	A	C	D	A	D
Approach Vol, veh/h		2445			672			172				72
Approach Delay, s/veh		44.1			29.9			70.3				45.7
Approach LOS		D			C			E				D
Timer - Assigned Phs		2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s		36.8	17.9	65.3	12.3	24.5	9.4	73.8				
Change Period (Y+Rc), s		6.5	6.5	6.5	6.5	6.5	6.5	6.5				
Max Green Setting (Gmax), s		30.3	11.7	58.5	5.8	18.0	5.0	65.2				
Max Q Clear Time (g_c+l1), s		4.1	11.4	60.8	6.6	5.5	2.9	8.1				
Green Ext Time (p_c), s		0.1	0.0	0.0	0.0	0.1	0.0	3.0				
Intersection Summary												
HCM 6th Ctrl Delay			42.7									
HCM 6th LOS			D									

Timings
6: Middle Access & Peak Innovation Parkway

2045 Total PM.syn
04/02/2020

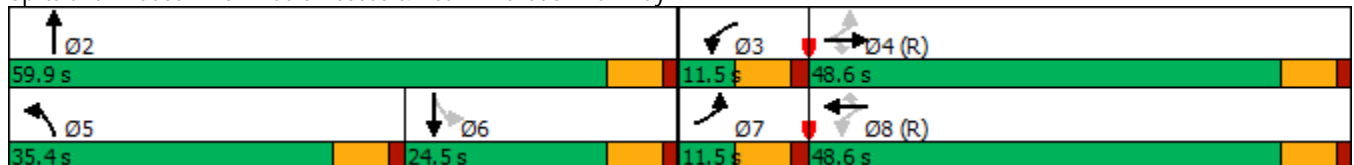


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations	↖	↗	↘	↖	↗	↘	↖	↗	↘	↘
Traffic Volume (vph)	21	321	58	12	1161	66	772	15	61	15
Future Volume (vph)	21	321	58	12	1161	66	772	15	61	15
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm	NA
Protected Phases	7	4		3	8		5	2		6
Permitted Phases	4		4	8		8			6	
Detector Phase	7	4	4	3	8	8	5	2	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.5	24.5	24.5	11.5	24.5	24.5	11.5	24.5	24.5	24.5
Total Split (s)	11.5	48.6	48.6	11.5	48.6	48.6	35.4	59.9	24.5	24.5
Total Split (%)	9.6%	40.5%	40.5%	9.6%	40.5%	40.5%	29.5%	49.9%	20.4%	20.4%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead		Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	Max	Max	Max
Act Effct Green (s)	51.0	49.0	49.0	49.7	46.7	46.7	28.9	53.4	18.0	18.0
Actuated g/C Ratio	0.42	0.41	0.41	0.41	0.39	0.39	0.24	0.44	0.15	0.15
v/c Ratio	0.17	0.24	0.09	0.03	0.92	0.10	1.02	0.23	0.37	0.15
Control Delay	27.2	17.0	0.2	23.7	50.9	3.1	80.5	4.6	52.6	24.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.2	17.0	0.2	23.7	50.9	3.1	80.5	4.6	52.6	24.8
LOS	C	B	A	C	D	A	F	A	D	C
Approach Delay		15.1			48.1			66.9		42.0
Approach LOS		B			D			E		D

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 120
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.02
 Intersection Signal Delay: 49.5
 Intersection LOS: D
 Intersection Capacity Utilization 74.5%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 6: Middle Access & Peak Innovation Parkway



HCM 6th Signalized Intersection Summary
6: Middle Access & Peak Innovation Parkway

2045 Total PM.syn

04/02/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	21	321	58	12	1161	66	772	15	154	61	15	23
Future Volume (veh/h)	21	321	58	12	1161	66	772	15	154	61	15	23
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	23	349	63	13	1262	72	839	16	167	66	16	25
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	109	1343	599	388	1316	587	832	63	652	240	99	154
Arrive On Green	0.02	0.38	0.38	0.01	0.37	0.37	0.24	0.45	0.45	0.15	0.15	0.15
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	3456	140	1466	1201	658	1028
Grp Volume(v), veh/h	23	349	63	13	1262	72	839	0	183	66	0	41
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1728	0	1606	1201	0	1685
Q Serve(g_s), s	1.0	8.1	3.1	0.5	41.6	3.6	28.9	0.0	8.6	5.9	0.0	2.5
Cycle Q Clear(g_c), s	1.0	8.1	3.1	0.5	41.6	3.6	28.9	0.0	8.6	5.9	0.0	2.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.91	1.00		0.61
Lane Grp Cap(c), veh/h	109	1343	599	388	1316	587	832	0	715	240	0	253
V/C Ratio(X)	0.21	0.26	0.11	0.03	0.96	0.12	1.01	0.00	0.26	0.27	0.00	0.16
Avail Cap(c_a), veh/h	144	1343	599	436	1316	587	832	0	715	240	0	253
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	30.1	25.8	24.2	23.1	36.9	24.9	45.5	0.0	20.9	45.9	0.0	44.4
Incr Delay (d2), s/veh	0.9	0.5	0.4	0.0	16.8	0.4	33.2	0.0	0.9	2.8	0.0	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	3.5	1.2	0.2	20.8	1.4	16.1	0.0	3.4	2.0	0.0	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.0	26.2	24.5	23.1	53.7	25.4	78.8	0.0	21.7	48.7	0.0	45.8
LnGrp LOS	C	C	C	C	D	C	F	A	C	D	A	D
Approach Vol, veh/h		435			1347			1022				107
Approach Delay, s/veh		26.2			51.9			68.5				47.6
Approach LOS		C			D			E				D
Timer - Assigned Phs		2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s		59.9	8.3	51.8	35.4	24.5	9.2	50.9				
Change Period (Y+Rc), s		6.5	6.5	6.5	6.5	6.5	6.5	6.5				
Max Green Setting (Gmax), s		53.4	5.0	42.1	28.9	18.0	5.0	42.1				
Max Q Clear Time (g_c+I1), s		10.6	2.5	10.1	30.9	7.9	3.0	43.6				
Green Ext Time (p_c), s		1.3	0.0	2.7	0.0	0.2	0.0	0.0				
Intersection Summary												
HCM 6th Ctrl Delay					53.8							
HCM 6th LOS					D							

Intersection												
Int Delay, s/veh	5.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑	↗	↘	↑	↗	↘	↑↑↑	↗	↘	↑↑↑	↗
Traffic Vol, veh/h	11	0	4	0	0	13	14	22	58	211	6	66
Future Vol, veh/h	11	0	4	0	0	13	14	22	58	211	6	66
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Yield	-	-	Yield	-	-	Yield	-	-	Yield
Storage Length	300	-	300	400	-	475	400	-	425	500	-	500
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	69	92	50	92	92	65	70	61	76	84	50	79
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	16	0	8	0	0	20	20	36	76	251	12	84

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	568	590	6	583	590	18	12	0	0	36	0	0
Stage 1	514	514	-	76	76	-	-	-	-	-	-	-
Stage 2	54	76	-	507	514	-	-	-	-	-	-	-
Critical Hdwy	6.44	6.54	7.14	6.44	6.54	7.14	5.34	-	-	5.34	-	-
Critical Hdwy Stg 1	7.34	5.54	-	7.34	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.74	5.54	-	6.74	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.82	4.02	3.92	3.82	4.02	3.92	3.12	-	-	3.12	-	-
Pot Cap-1 Maneuver	454	419	910	445	419	895	1139	-	-	1111	-	-
Stage 1	429	534	-	840	831	-	-	-	-	-	-	-
Stage 2	876	831	-	472	534	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	362	318	910	360	318	895	1139	-	-	1111	-	-
Mov Cap-2 Maneuver	362	318	-	360	318	-	-	-	-	-	-	-
Stage 1	421	413	-	825	816	-	-	-	-	-	-	-
Stage 2	841	816	-	362	413	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.3	9.1	1.2	6.7
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	1139	-	-	362	-	910	-	-	895	1111	-	-
HCM Lane V/C Ratio	0.018	-	-	0.044	-	0.009	-	-	0.022	0.226	-	-
HCM Control Delay (s)	8.2	-	-	15.4	0	9	0	0	9.1	9.2	-	-
HCM Lane LOS	A	-	-	C	A	A	A	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.1	-	0	-	-	0.1	0.9	-	-

Intersection												
Int Delay, s/veh	7.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑	↗	↖	↑	↗	↖	↑↑↑	↗	↖	↑↑↑	↗
Traffic Vol, veh/h	52	0	6	35	0	141	4	12	1	6	14	58
Future Vol, veh/h	52	0	6	35	0	141	4	12	1	6	14	58
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Yield	-	-	Yield	-	-	Yield	-	-	Yield
Storage Length	300	-	300	400	-	475	400	-	425	500	-	500
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	72	92	50	67	92	82	33	60	25	38	70	91
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	72	0	12	52	0	172	12	20	4	16	20	64

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	84	96	10	84	96	10	20	0	0	20	0	0
Stage 1	52	52	-	44	44	-	-	-	-	-	-	-
Stage 2	32	44	-	40	52	-	-	-	-	-	-	-
Critical Hdwy	6.44	6.54	7.14	6.44	6.54	7.14	5.34	-	-	5.34	-	-
Critical Hdwy Stg 1	7.34	5.54	-	7.34	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.74	5.54	-	6.74	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.82	4.02	3.92	3.82	4.02	3.92	3.12	-	-	3.12	-	-
Pot Cap-1 Maneuver	848	793	905	848	793	905	1130	-	-	1130	-	-
Stage 1	871	851	-	882	858	-	-	-	-	-	-	-
Stage 2	903	858	-	893	851	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	674	773	905	821	773	905	1130	-	-	1130	-	-
Mov Cap-2 Maneuver	674	773	-	821	773	-	-	-	-	-	-	-
Stage 1	861	839	-	872	849	-	-	-	-	-	-	-
Stage 2	724	849	-	869	839	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	10.7		9.9		2.8		1.3	
HCM LOS	B		A					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	1130	-	-	674	-	905	821	-	905	1130	-	-
HCM Lane V/C Ratio	0.011	-	-	0.107	-	0.013	0.064	-	0.19	0.014	-	-
HCM Control Delay (s)	8.2	-	-	11	0	9	9.7	0	9.9	8.2	-	-
HCM Lane LOS	A	-	-	B	A	A	A	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.4	-	0	0.2	-	0.7	0	-	-

Intersection												
Int Delay, s/veh	3.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑	↗	↘	↑	↗	↘	↑↑	↗	↘	↑↑	↗
Traffic Vol, veh/h	11	0	4	0	0	13	14	189	60	217	100	68
Future Vol, veh/h	11	0	4	0	0	13	14	189	60	217	100	68
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Yield	-	-	Yield	-	-	Yield	-	-	Yield
Storage Length	300	-	300	400	-	475	400	-	425	500	-	500
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	69	92	50	92	92	65	70	92	76	84	92	79
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	16	0	8	0	0	20	20	205	79	258	109	86

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	768	870	55	816	870	103	109	0	0	205	0	0
Stage 1	625	625	-	245	245	-	-	-	-	-	-	-
Stage 2	143	245	-	571	625	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	291	288	1000	269	288	932	1479	-	-	1364	-	-
Stage 1	439	475	-	737	702	-	-	-	-	-	-	-
Stage 2	845	702	-	473	475	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	241	230	1000	226	230	932	1479	-	-	1364	-	-
Mov Cap-2 Maneuver	241	230	-	226	230	-	-	-	-	-	-	-
Stage 1	433	385	-	727	692	-	-	-	-	-	-	-
Stage 2	816	692	-	380	385	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	16.9		8.9		0.5		4.7	
HCM LOS	C		A					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	1479	-	-	241	-	1000	-	-	932	1364	-	-
HCM Lane V/C Ratio	0.014	-	-	0.066	-	0.008	-	-	0.021	0.189	-	-
HCM Control Delay (s)	7.5	-	-	21	0	8.6	0	0	8.9	8.3	-	-
HCM Lane LOS	A	-	-	C	A	A	A	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.2	-	0	-	-	0.1	0.7	-	-

Intersection												
Int Delay, s/veh	5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑	↗	↘	↑	↗	↘	↑↑	↗	↘	↑↑	↗
Traffic Vol, veh/h	54	0	6	36	0	145	4	81	1	6	179	60
Future Vol, veh/h	54	0	6	36	0	145	4	81	1	6	179	60
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	Yield	-	-	Yield
Storage Length	300	-	300	400	-	475	400	-	425	500	-	500
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	72	92	50	67	92	82	33	92	25	38	92	91
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	75	0	12	54	0	177	12	88	4	16	195	66

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	295	339	98	242	339	44	195	0	0	88	0	0
Stage 1	227	227	-	112	112	-	-	-	-	-	-	-
Stage 2	68	112	-	130	227	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	635	581	939	692	581	1017	1375	-	-	1506	-	-
Stage 1	755	715	-	881	802	-	-	-	-	-	-	-
Stage 2	934	802	-	860	715	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	517	569	939	673	569	1017	1375	-	-	1506	-	-
Mov Cap-2 Maneuver	517	569	-	673	569	-	-	-	-	-	-	-
Stage 1	748	707	-	873	795	-	-	-	-	-	-	-
Stage 2	765	795	-	840	707	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB			
HCM Control Delay, s	12.5		9.6		0.9		0.4			
HCM LOS	B		A							

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	1375	-	-	517	-	939	673	-	1017	1506	-	-
HCM Lane V/C Ratio	0.009	-	-	0.145	-	0.013	0.08	-	0.174	0.01	-	-
HCM Control Delay (s)	7.6	-	-	13.1	0	8.9	10.8	0	9.3	7.4	-	-
HCM Lane LOS	A	-	-	B	A	A	B	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.5	-	0	0.3	-	0.6	0	-	-

Timings
7: Peak Innovation Parkway & Embraer Heights

2030 Total AM.syn

04/02/2020

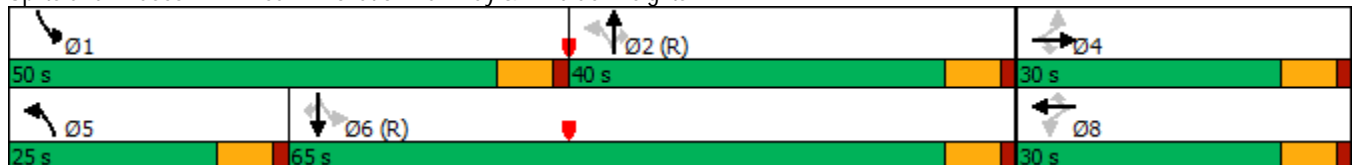
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	37	5	19	11	5	28	136	278	147	328	212	273
Future Volume (vph)	37	5	19	11	5	28	136	278	147	328	212	273
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	4	4	4	8	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.5	24.5	24.5	24.5	24.5	24.5	11.5	24.5	24.5	11.5	24.5	24.5
Total Split (s)	30.0	30.0	30.0	30.0	30.0	30.0	25.0	40.0	40.0	50.0	65.0	65.0
Total Split (%)	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	20.8%	33.3%	33.3%	41.7%	54.2%	54.2%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	8.9	8.9	8.9	8.9	8.9	8.9	90.5	83.1	83.1	97.5	86.6	86.6
Actuated g/C Ratio	0.07	0.07	0.07	0.07	0.07	0.07	0.75	0.69	0.69	0.81	0.72	0.72
v/c Ratio	0.38	0.04	0.08	0.12	0.04	0.12	0.17	0.12	0.14	0.40	0.09	0.24
Control Delay	62.7	50.0	0.6	52.6	50.0	0.9	3.7	8.9	3.2	6.5	9.4	8.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.7	50.0	0.6	52.6	50.0	0.9	3.7	8.9	3.2	6.5	9.4	8.5
LOS	E	D	A	D	D	A	A	A	A	A	A	A
Approach Delay		42.0			19.4			6.1			8.0	
Approach LOS		D			B			A			A	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.40
 Intersection Signal Delay: 9.0
 Intersection Capacity Utilization 50.8%
 Analysis Period (min) 15

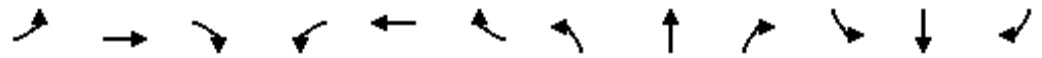
Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 7: Peak Innovation Parkway & Embraer Heights



HCM 6th Signalized Intersection Summary
 7: Peak Innovation Parkway & Embraer Heights

2030 Total AM.syn
 04/02/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗	↘	↖	↕	↗	↘	↕	↘
Traffic Volume (veh/h)	37	5	19	11	5	28	136	278	147	328	212	273
Future Volume (veh/h)	37	5	19	11	5	28	136	278	147	328	212	273
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	40	5	0	12	5	0	148	302	0	357	230	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	115	78		115	78		960	2553		943	2681	
Arrive On Green	0.04	0.04	0.00	0.04	0.04	0.00	0.04	0.72	0.00	0.08	0.75	0.00
Sat Flow, veh/h	1411	1870	1585	1411	1870	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	40	5	0	12	5	0	148	302	0	357	230	0
Grp Sat Flow(s),veh/h/ln	1411	1870	1585	1411	1870	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	3.4	0.3	0.0	1.0	0.3	0.0	2.6	3.1	0.0	6.1	2.0	0.0
Cycle Q Clear(g_c), s	3.7	0.3	0.0	1.3	0.3	0.0	2.6	3.1	0.0	6.1	2.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	115	78		115	78		960	2553		943	2681	
V/C Ratio(X)	0.35	0.06		0.10	0.06		0.15	0.12		0.38	0.09	
Avail Cap(c_a), veh/h	333	366		333	366		1161	2553		1451	2681	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	57.0	55.2	0.0	55.9	55.2	0.0	3.8	5.2	0.0	3.2	3.9	0.0
Incr Delay (d2), s/veh	1.8	0.3	0.0	0.4	0.3	0.0	0.1	0.1	0.0	0.3	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.2	0.0	0.4	0.2	0.0	0.8	1.1	0.0	1.8	0.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	58.8	55.6	0.0	56.3	55.6	0.0	3.8	5.3	0.0	3.4	3.9	0.0
LnGrp LOS	E	E		E	E		A	A		A	A	
Approach Vol, veh/h		45	A		17	A		450	A		587	A
Approach Delay, s/veh		58.4			56.1			4.8			3.6	
Approach LOS		E			E			A			A	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	15.8	92.7		11.5	11.5	97.0		11.5				
Change Period (Y+Rc), s	6.5	6.5		6.5	6.5	6.5		6.5				
Max Green Setting (Gmax), s	43.5	33.5		23.5	18.5	58.5		23.5				
Max Q Clear Time (g_c+I1), s	8.1	5.1		5.7	4.6	4.0		3.3				
Green Ext Time (p_c), s	1.1	2.0		0.1	0.3	1.6		0.0				

Intersection Summary

HCM 6th Ctrl Delay	7.2
HCM 6th LOS	A

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Timings
7: Peak Innovation Parkway & Embraer Heights

2030 Total PM.syn

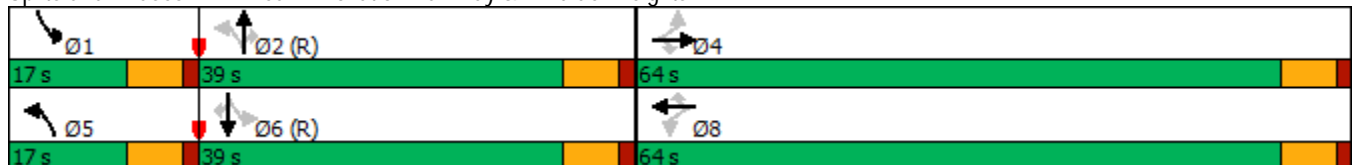
04/02/2020

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	213	10	100	103	10	232	11	234	7	16	225	77
Future Volume (vph)	213	10	100	103	10	232	11	234	7	16	225	77
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	4	4	4	8	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.5	24.5	24.5	24.5	24.5	24.5	11.5	24.5	24.5	11.5	24.5	24.5
Total Split (s)	64.0	64.0	64.0	64.0	64.0	64.0	17.0	39.0	39.0	17.0	39.0	39.0
Total Split (%)	53.3%	53.3%	53.3%	53.3%	53.3%	53.3%	14.2%	32.5%	32.5%	14.2%	32.5%	32.5%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	26.4	26.4	26.4	26.4	26.4	26.4	77.9	75.4	75.4	78.1	75.5	75.5
Actuated g/C Ratio	0.22	0.22	0.22	0.22	0.22	0.22	0.65	0.63	0.63	0.65	0.63	0.63
v/c Ratio	0.76	0.03	0.25	0.36	0.03	0.46	0.02	0.11	0.01	0.02	0.11	0.08
Control Delay	58.5	32.2	7.3	41.1	32.2	6.8	7.4	9.8	0.0	15.2	17.5	10.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.5	32.2	7.3	41.1	32.2	6.8	7.4	9.8	0.0	15.2	17.5	10.3
LOS	E	C	A	D	C	A	A	A	A	B	B	B
Approach Delay		41.8			17.8			9.4			15.7	
Approach LOS		D			B			A			B	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.76
 Intersection Signal Delay: 21.8
 Intersection LOS: C
 Intersection Capacity Utilization 48.9%
 ICU Level of Service A
 Analysis Period (min) 15

Splits and Phases: 7: Peak Innovation Parkway & Embraer Heights



HCM 6th Signalized Intersection Summary
 7: Peak Innovation Parkway & Embraer Heights

2030 Total PM.syn
 04/02/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗	↘	↖	↗	↘	↖	↗	↘
Traffic Volume (veh/h)	213	10	100	103	10	232	11	234	7	16	225	77
Future Volume (veh/h)	213	10	100	103	10	232	11	234	7	16	225	77
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	232	11	0	112	11	0	12	254	0	17	245	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	319	354		319	354		774	2240		770	2255	
Arrive On Green	0.19	0.19	0.00	0.19	0.19	0.00	0.01	0.63	0.00	0.02	0.63	0.00
Sat Flow, veh/h	1404	1870	1585	1404	1870	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	232	11	0	112	11	0	12	254	0	17	245	0
Grp Sat Flow(s),veh/h/ln	1404	1870	1585	1404	1870	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	19.4	0.6	0.0	8.5	0.6	0.0	0.3	3.4	0.0	0.4	3.2	0.0
Cycle Q Clear(g_c), s	20.0	0.6	0.0	9.1	0.6	0.0	0.3	3.4	0.0	0.4	3.2	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	319	354		319	354		774	2240		770	2255	
V/C Ratio(X)	0.73	0.03		0.35	0.03		0.02	0.11		0.02	0.11	
Avail Cap(c_a), veh/h	726	896		726	896		905	2240		893	2255	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	47.8	39.7	0.0	43.4	39.7	0.0	7.7	8.8	0.0	7.5	8.6	0.0
Incr Delay (d2), s/veh	3.2	0.0	0.0	0.7	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.0	0.3	0.0	3.0	0.3	0.0	0.1	1.3	0.0	0.2	1.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	51.0	39.7	0.0	44.0	39.7	0.0	7.7	8.9	0.0	7.6	8.7	0.0
LnGrp LOS	D	D		D	D		A	A		A	A	
Approach Vol, veh/h		243	A		123	A		266	A		262	A
Approach Delay, s/veh		50.5			43.7			8.9			8.6	
Approach LOS		D			D			A			A	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.7	82.1		29.2	8.1	82.7		29.2				
Change Period (Y+Rc), s	6.5	6.5		6.5	6.5	6.5		6.5				
Max Green Setting (Gmax), s	10.5	32.5		57.5	10.5	32.5		57.5				
Max Q Clear Time (g_c+I1), s	2.4	5.4		22.0	2.3	5.2		11.1				
Green Ext Time (p_c), s	0.0	1.7		0.7	0.0	1.6		0.4				

Intersection Summary

HCM 6th Ctrl Delay	24.9
HCM 6th LOS	C

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Timings
7: Peak Innovation Parkway & Embraer Heights

2045 Total AM.syn

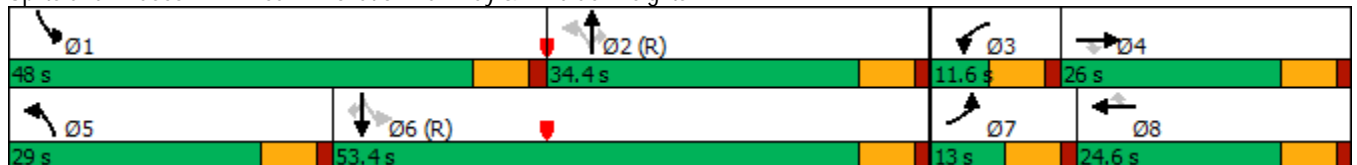
04/02/2020

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	76	10	42	26	10	49	316	506	280	505	419	582
Future Volume (vph)	76	10	42	26	10	49	316	506	280	505	419	582
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8	2		2	6		6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.5	24.5	24.5	11.5	24.5	24.5	11.5	24.5	24.5	11.5	24.5	24.5
Total Split (s)	13.0	26.0	26.0	11.6	24.6	24.6	29.0	34.4	34.4	48.0	53.4	53.4
Total Split (%)	10.8%	21.7%	21.7%	9.7%	20.5%	20.5%	24.2%	28.7%	28.7%	40.0%	44.5%	44.5%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	6.4	9.7	9.7	5.1	6.3	6.3	66.3	53.5	53.5	92.7	73.5	73.5
Actuated g/C Ratio	0.05	0.08	0.08	0.04	0.05	0.05	0.55	0.45	0.45	0.77	0.61	0.61
v/c Ratio	0.45	0.07	0.14	0.19	0.11	0.19	0.58	0.35	0.35	0.69	0.21	0.52
Control Delay	63.3	53.3	1.0	58.7	56.2	1.5	25.9	43.6	22.3	19.0	25.1	18.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.3	53.3	1.0	58.7	56.2	1.5	25.9	43.6	22.3	19.0	25.1	18.1
LOS	E	D	A	E	E	A	C	D	C	B	C	B
Approach Delay		42.0			25.4			33.1			20.4	
Approach LOS		D			C			C			C	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.69
 Intersection Signal Delay: 26.5
 Intersection LOS: C
 Intersection Capacity Utilization 74.0%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 7: Peak Innovation Parkway & Embraer Heights



HCM 6th Signalized Intersection Summary
 7: Peak Innovation Parkway & Embraer Heights

2045 Total AM.syn
 04/02/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↗	↑	↖	↖↗	↑	↖	↖	↑↑	↖	↖	↑↑	↖
Traffic Volume (veh/h)	76	10	42	26	10	49	316	506	280	505	419	582
Future Volume (veh/h)	76	10	42	26	10	49	316	506	280	505	419	582
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	83	11	0	28	11	0	343	550	0	549	455	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	135	89		87	63		759	1973		743	2154	
Arrive On Green	0.04	0.05	0.00	0.03	0.03	0.00	0.10	0.56	0.00	0.16	0.61	0.00
Sat Flow, veh/h	3456	1870	1585	3456	1870	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	83	11	0	28	11	0	343	550	0	549	455	0
Grp Sat Flow(s),veh/h/ln	1728	1870	1585	1728	1870	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	2.8	0.7	0.0	1.0	0.7	0.0	9.7	9.8	0.0	14.8	6.9	0.0
Cycle Q Clear(g_c), s	2.8	0.7	0.0	1.0	0.7	0.0	9.7	9.8	0.0	14.8	6.9	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	135	89		87	63		759	1973		743	2154	
V/C Ratio(X)	0.62	0.12		0.32	0.17		0.45	0.28		0.74	0.21	
Avail Cap(c_a), veh/h	187	304		147	282		907	1973		1082	2154	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	56.8	54.8	0.0	57.5	56.3	0.0	8.6	14.0	0.0	8.1	10.7	0.0
Incr Delay (d2), s/veh	4.5	0.6	0.0	2.1	1.3	0.0	0.4	0.4	0.0	1.5	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.3	0.0	0.4	0.3	0.0	3.7	4.0	0.0	5.3	2.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	61.3	55.4	0.0	59.6	57.6	0.0	9.0	14.4	0.0	9.7	10.9	0.0
LnGrp LOS	E	E		E	E		A	B		A	B	
Approach Vol, veh/h		94	A		39	A		893	A		1004	A
Approach Delay, s/veh		60.6			59.0			12.3			10.2	
Approach LOS		E			E			B			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	25.1	73.1	9.5	12.2	19.0	79.2	11.2	10.6				
Change Period (Y+Rc), s	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5				
Max Green Setting (Gmax), s	41.5	27.9	5.1	19.5	22.5	46.9	6.5	18.1				
Max Q Clear Time (g_c+I1), s	16.8	11.8	3.0	2.7	11.7	8.9	4.8	2.7				
Green Ext Time (p_c), s	1.9	3.4	0.0	0.0	0.8	3.4	0.0	0.0				

Intersection Summary

HCM 6th Ctrl Delay	14.4
HCM 6th LOS	B

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Timings
7: Peak Innovation Parkway & Embraer Heights

2045 Total PM.syn

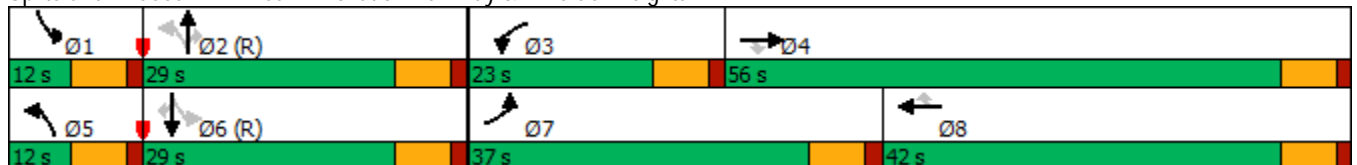
04/02/2020

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	453	15	239	204	15	369	22	430	14	29	416	104
Future Volume (vph)	453	15	239	204	15	369	22	430	14	29	416	104
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8	2		2	6		6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.5	24.5	24.5	11.5	24.5	24.5	11.5	24.5	24.5	11.5	24.5	24.5
Total Split (s)	37.0	56.0	56.0	23.0	42.0	42.0	12.0	29.0	29.0	12.0	29.0	29.0
Total Split (%)	30.8%	46.7%	46.7%	19.2%	35.0%	35.0%	10.0%	24.2%	24.2%	10.0%	24.2%	24.2%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	22.4	31.8	31.8	13.0	22.4	22.4	51.5	47.2	47.2	52.1	47.5	47.5
Actuated g/C Ratio	0.19	0.26	0.26	0.11	0.19	0.19	0.43	0.39	0.39	0.43	0.40	0.40
v/c Ratio	0.77	0.03	0.46	0.60	0.05	0.86	0.06	0.34	0.02	0.08	0.32	0.15
Control Delay	54.5	27.3	10.1	57.5	34.9	39.8	29.4	37.2	0.1	33.4	40.3	7.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.5	27.3	10.1	57.5	34.9	39.8	29.4	37.2	0.1	33.4	40.3	7.5
LOS	D	C	B	E	C	D	C	D	A	C	D	A
Approach Delay		38.9			45.8			35.7			33.8	
Approach LOS		D			D			D			C	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.86
 Intersection Signal Delay: 38.8
 Intersection LOS: D
 Intersection Capacity Utilization 63.9%
 ICU Level of Service B
 Analysis Period (min) 15

Splits and Phases: 7: Peak Innovation Parkway & Embraer Heights



HCM 6th Signalized Intersection Summary
7: Peak Innovation Parkway & Embraer Heights

2045 Total PM.syn
04/02/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗↖	↑	↗	↗↖	↑	↗	↖	↑↑	↗	↖	↑↑	↗
Traffic Volume (veh/h)	453	15	239	204	15	369	22	430	14	29	416	104
Future Volume (veh/h)	453	15	239	204	15	369	22	430	14	29	416	104
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	492	16	0	222	16	0	24	467	0	32	452	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	578	236		287	78		557	1944		552	1960	
Arrive On Green	0.17	0.13	0.00	0.08	0.04	0.00	0.02	0.55	0.00	0.03	0.55	0.00
Sat Flow, veh/h	3456	1870	1585	3456	1870	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	492	16	0	222	16	0	24	467	0	32	452	0
Grp Sat Flow(s),veh/h/ln	1728	1870	1585	1728	1870	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	16.6	0.9	0.0	7.6	1.0	0.0	0.7	8.2	0.0	0.9	7.8	0.0
Cycle Q Clear(g_c), s	16.6	0.9	0.0	7.6	1.0	0.0	0.7	8.2	0.0	0.9	7.8	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	578	236		287	78		557	1944		552	1960	
V/C Ratio(X)	0.85	0.07		0.77	0.21		0.04	0.24		0.06	0.23	
Avail Cap(c_a), veh/h	878	772		475	553		598	1944		585	1960	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	48.5	46.2	0.0	53.9	55.6	0.0	11.5	14.2	0.0	11.4	13.8	0.0
Incr Delay (d2), s/veh	5.1	0.1	0.0	4.5	1.3	0.0	0.0	0.3	0.0	0.0	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.5	0.4	0.0	3.5	0.5	0.0	0.3	3.4	0.0	0.4	3.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	53.7	46.4	0.0	58.4	56.9	0.0	11.5	14.5	0.0	11.4	14.1	0.0
LnGrp LOS	D	D		E	E		B	B		B	B	
Approach Vol, veh/h		508	A		238	A		491	A		484	A
Approach Delay, s/veh		53.4			58.3			14.3			13.9	
Approach LOS		D			E			B			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.8	72.2	16.5	21.6	9.3	72.7	26.6	11.5				
Change Period (Y+Rc), s	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5				
Max Green Setting (Gmax), s	5.5	22.5	16.5	49.5	5.5	22.5	30.5	35.5				
Max Q Clear Time (g_c+I1), s	2.9	10.2	9.6	2.9	2.7	9.8	18.6	3.0				
Green Ext Time (p_c), s	0.0	2.4	0.4	0.1	0.0	2.4	1.5	0.0				

Intersection Summary

HCM 6th Ctrl Delay	31.8
HCM 6th LOS	C

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection						
Int Delay, s/veh	6.9					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↵	↑↑	↑↑		↵	↵
Traffic Vol, veh/h	280	7	5	0	1	8
Future Vol, veh/h	280	7	5	0	1	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Yield
Storage Length	400	-	-	-	150	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	97	29	31	92	25	50
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	289	24	16	0	4	16

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	16	0	-	0	606
Stage 1	-	-	-	-	16
Stage 2	-	-	-	-	590
Critical Hdwy	4.14	-	-	-	6.84
Critical Hdwy Stg 1	-	-	-	-	5.84
Critical Hdwy Stg 2	-	-	-	-	5.84
Follow-up Hdwy	2.22	-	-	-	3.52
Pot Cap-1 Maneuver	1600	-	-	-	429
Stage 1	-	-	-	-	1004
Stage 2	-	-	-	-	517
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1600	-	-	-	351
Mov Cap-2 Maneuver	-	-	-	-	351
Stage 1	-	-	-	-	822
Stage 2	-	-	-	-	517

Approach	EB	WB	SB
HCM Control Delay, s	7.1	0	9.8
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1600	-	-	-	351	1072
HCM Lane V/C Ratio	0.18	-	-	-	0.011	0.015
HCM Control Delay (s)	7.7	-	-	-	15.4	8.4
HCM Lane LOS	A	-	-	-	C	A
HCM 95th %tile Q(veh)	0.7	-	-	-	0	0

Intersection						
Int Delay, s/veh	9.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↗	↖		↖	↖
Traffic Vol, veh/h	10	1	1	0	0	200
Future Vol, veh/h	10	1	1	0	0	200
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Yield
Storage Length	400	-	-	-	150	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	83	25	25	92	25	73
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	12	4	4	0	0	274

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	4	0	-	0	30
Stage 1	-	-	-	-	4
Stage 2	-	-	-	-	26
Critical Hdwy	4.14	-	-	-	6.84
Critical Hdwy Stg 1	-	-	-	-	5.84
Critical Hdwy Stg 2	-	-	-	-	5.84
Follow-up Hdwy	2.22	-	-	-	3.52
Pot Cap-1 Maneuver	1616	-	-	-	980
Stage 1	-	-	-	-	1018
Stage 2	-	-	-	-	993
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1616	-	-	-	973
Mov Cap-2 Maneuver	-	-	-	-	973
Stage 1	-	-	-	-	1011
Stage 2	-	-	-	-	993

Approach	EB	WB	SB
HCM Control Delay, s	5.4	0	9.5
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1616	-	-	-	-	1081
HCM Lane V/C Ratio	0.007	-	-	-	-	0.253
HCM Control Delay (s)	7.2	-	-	-	0	9.5
HCM Lane LOS	A	-	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	-	-	1

Intersection						
Int Delay, s/veh	7					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↵	↑↑	↑↑		↵	↵
Traffic Vol, veh/h	288	7	5	0	1	8
Future Vol, veh/h	288	7	5	0	1	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Yield
Storage Length	400	-	-	-	150	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	97	29	31	92	25	50
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	297	24	16	0	4	16

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	16	0	-	0	622
Stage 1	-	-	-	-	16
Stage 2	-	-	-	-	606
Critical Hdwy	4.14	-	-	-	6.84
Critical Hdwy Stg 1	-	-	-	-	5.84
Critical Hdwy Stg 2	-	-	-	-	5.84
Follow-up Hdwy	2.22	-	-	-	3.52
Pot Cap-1 Maneuver	1600	-	-	-	419
Stage 1	-	-	-	-	1004
Stage 2	-	-	-	-	507
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1600	-	-	-	341
Mov Cap-2 Maneuver	-	-	-	-	341
Stage 1	-	-	-	-	817
Stage 2	-	-	-	-	507

Approach	EB	WB	SB
HCM Control Delay, s	7.2	0	9.9
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1600	-	-	-	341	1072
HCM Lane V/C Ratio	0.186	-	-	-	0.012	0.015
HCM Control Delay (s)	7.8	-	-	-	15.7	8.4
HCM Lane LOS	A	-	-	-	C	A
HCM 95th %tile Q(veh)	0.7	-	-	-	0	0

Intersection						
Int Delay, s/veh	9.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↗	↖		↖	↗
Traffic Vol, veh/h	10	1	1	0	0	206
Future Vol, veh/h	10	1	1	0	0	206
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Yield
Storage Length	400	-	-	-	150	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	83	25	25	92	25	73
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	12	4	4	0	0	282

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	4	0	-	0	30
Stage 1	-	-	-	-	4
Stage 2	-	-	-	-	26
Critical Hdwy	4.14	-	-	-	6.84
Critical Hdwy Stg 1	-	-	-	-	5.84
Critical Hdwy Stg 2	-	-	-	-	5.84
Follow-up Hdwy	2.22	-	-	-	3.52
Pot Cap-1 Maneuver	1616	-	-	-	980
Stage 1	-	-	-	-	1018
Stage 2	-	-	-	-	993
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1616	-	-	-	973
Mov Cap-2 Maneuver	-	-	-	-	973
Stage 1	-	-	-	-	1011
Stage 2	-	-	-	-	993

Approach	EB	WB	SB
HCM Control Delay, s	5.4	0	9.5
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1616	-	-	-	-	1081
HCM Lane V/C Ratio	0.007	-	-	-	-	0.261
HCM Control Delay (s)	7.2	-	-	-	0	9.5
HCM Lane LOS	A	-	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	-	-	1

Intersection												
Int Delay, s/veh	8.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↕		↖	↕		↖	↕		↖	↕	↗
Traffic Vol, veh/h	381	38	77	5	11	6	10	5	5	38	39	18
Future Vol, veh/h	381	38	77	5	11	6	10	5	5	38	39	18
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	Yield
Storage Length	400	-	-	100	-	-	100	-	-	150	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	393	41	84	5	12	7	11	5	5	41	42	20

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	19	0	0	125	0	0	906	898	63	835	937	10
Stage 1	-	-	-	-	-	-	869	869	-	26	26	-
Stage 2	-	-	-	-	-	-	37	29	-	809	911	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	1596	-	-	1474	-	-	235	281	1012	265	266	1069
Stage 1	-	-	-	-	-	-	318	370	-	988	873	-
Stage 2	-	-	-	-	-	-	974	870	-	346	355	-
Platoon blocked, %	-	-	-	1	-	-	1	1	1	1	1	-
Mov Cap-1 Maneuver	1596	-	-	1474	-	-	162	211	1012	210	200	1069
Mov Cap-2 Maneuver	-	-	-	-	-	-	206	242	-	225	234	-
Stage 1	-	-	-	-	-	-	240	279	-	745	870	-
Stage 2	-	-	-	-	-	-	906	867	-	254	267	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	6.1			1.7			18.9			21.2		
HCM LOS							C			C		

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2	SBLn3
Capacity (veh/h)	206	391	1596	-	-	1474	-	-	225	234	1069
HCM Lane V/C Ratio	0.053	0.028	0.246	-	-	0.004	-	-	0.184	0.181	0.018
HCM Control Delay (s)	23.4	14.5	8	-	-	7.5	-	-	24.6	23.8	8.4
HCM Lane LOS	C	B	A	-	-	A	-	-	C	C	A
HCM 95th %tile Q(veh)	0.2	0.1	1	-	-	0	-	-	0.7	0.6	0.1

Intersection												
Int Delay, s/veh	8.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↶	↶↷		↶	↶↷		↶	↷		↶	↶	↷
Traffic Vol, veh/h	15	6	5	5	25	31	60	30	5	6	3	277
Future Vol, veh/h	15	6	5	5	25	31	60	30	5	6	3	277
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	Yield
Storage Length	400	-	-	100	-	-	100	-	-	150	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	16	7	5	5	27	34	65	33	5	7	3	301

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	61	0	0	12	0	0	67	113	6	106	98	31
Stage 1	-	-	-	-	-	-	42	42	-	54	54	-
Stage 2	-	-	-	-	-	-	25	71	-	52	44	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	1540	-	-	1605	-	-	918	776	1075	862	791	1036
Stage 1	-	-	-	-	-	-	967	859	-	952	849	-
Stage 2	-	-	-	-	-	-	989	835	-	954	858	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1540	-	-	1605	-	-	643	766	1075	821	781	1036
Mov Cap-2 Maneuver	-	-	-	-	-	-	643	766	-	821	781	-
Stage 1	-	-	-	-	-	-	957	850	-	942	846	-
Stage 2	-	-	-	-	-	-	697	832	-	903	849	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	4.2			0.6			10.6			9.9		
HCM LOS							B			A		

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2	SBLn3
Capacity (veh/h)	643	799	1540	-	-	1605	-	-	821	781	1036
HCM Lane V/C Ratio	0.101	0.048	0.011	-	-	0.003	-	-	0.008	0.004	0.291
HCM Control Delay (s)	11.2	9.7	7.4	-	-	7.3	-	-	9.4	9.6	9.9
HCM Lane LOS	B	A	A	-	-	A	-	-	A	A	A
HCM 95th %tile Q(veh)	0.3	0.1	0	-	-	0	-	-	0	0	1.2

MOVEMENT SUMMARY

 Site: 101 [2045 Total AM]

Embraer Heights & Bud Breckner Boulevard
 Site Category: (None)
 Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: Bud Breckner Boulevard												
3	L2	26	3.0	0.075	6.9	LOS A	0.3	7.1	0.62	0.59	0.62	32.7
8	T1	13	3.0	0.075	6.9	LOS A	0.3	7.1	0.62	0.59	0.62	32.6
18	R2	5	3.0	0.075	6.9	LOS A	0.3	7.1	0.62	0.59	0.62	31.7
Approach		45	3.0	0.075	6.9	LOS A	0.3	7.1	0.62	0.59	0.62	32.5
East: Embraer Heights												
1	L2	5	3.0	0.059	5.8	LOS A	0.2	5.8	0.57	0.50	0.57	34.5
6	T1	20	3.0	0.059	5.8	LOS A	0.2	5.8	0.57	0.50	0.57	34.4
16	R2	16	3.0	0.059	5.8	LOS A	0.2	5.8	0.57	0.50	0.57	33.4
Approach		41	3.0	0.059	5.8	LOS A	0.2	5.8	0.57	0.50	0.57	34.0
North: Bud Breckner Boulevard												
7	L2	100	3.0	0.155	4.0	LOS A	0.7	17.3	0.16	0.06	0.16	34.4
4	T1	104	3.0	0.155	4.0	LOS A	0.7	17.3	0.16	0.06	0.16	34.3
14	R2	34	3.0	0.026	2.9	LOS A	0.1	2.5	0.14	0.04	0.14	35.0
Approach		238	3.0	0.155	3.9	LOS A	0.7	17.3	0.16	0.06	0.16	34.4
West: Embraer Heights												
5	L2	580	3.0	0.513	9.0	LOS A	3.2	81.1	0.51	0.38	0.51	30.8
2	T1	90	3.0	0.264	5.6	LOS A	1.2	31.3	0.39	0.27	0.39	34.7
12	R2	209	3.0	0.264	5.6	LOS A	1.2	31.3	0.39	0.27	0.39	33.6
Approach		879	3.0	0.513	7.9	LOS A	3.2	81.1	0.47	0.34	0.47	31.8
All Vehicles		1203	3.0	0.513	7.0	LOS A	3.2	81.1	0.42	0.30	0.42	32.4

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

 Site: 101 [2045 Total PM]

Embraer Heights & Bud Breckner Boulevard
 Site Category: (None)
 Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: Bud Breckner Boulevard												
3	L2	162	3.0	0.196	4.5	LOS A	1.0	24.8	0.19	0.07	0.19	33.7
8	T1	82	3.0	0.196	4.5	LOS A	1.0	24.8	0.19	0.07	0.19	33.6
18	R2	5	3.0	0.196	4.5	LOS A	1.0	24.8	0.19	0.07	0.19	32.7
Approach		249	3.0	0.196	4.5	LOS A	1.0	24.8	0.19	0.07	0.19	33.6
East: Embraer Heights												
1	L2	5	3.0	0.153	5.0	LOS A	0.7	17.2	0.43	0.31	0.43	35.2
6	T1	65	3.0	0.153	5.0	LOS A	0.7	17.2	0.43	0.31	0.43	35.1
16	R2	84	3.0	0.153	5.0	LOS A	0.7	17.2	0.43	0.31	0.43	34.1
Approach		154	3.0	0.153	5.0	LOS A	0.7	17.2	0.43	0.31	0.43	34.5
North: Bud Breckner Boulevard												
7	L2	14	3.0	0.019	3.4	LOS A	0.1	1.8	0.33	0.18	0.33	34.1
4	T1	7	3.0	0.019	3.4	LOS A	0.1	1.8	0.33	0.18	0.33	34.1
14	R2	426	3.0	0.384	7.2	LOS A	2.0	51.2	0.46	0.34	0.46	32.8
Approach		447	3.0	0.384	7.0	LOS A	2.0	51.2	0.45	0.33	0.45	32.9
West: Embraer Heights												
5	L2	25	3.0	0.019	2.8	LOS A	0.1	1.8	0.09	0.02	0.09	33.5
2	T1	13	3.0	0.019	2.8	LOS A	0.1	1.8	0.09	0.02	0.09	36.4
12	R2	12	3.0	0.019	2.8	LOS A	0.1	1.8	0.09	0.02	0.09	35.2
Approach		50	3.0	0.019	2.8	LOS A	0.1	1.8	0.09	0.02	0.09	34.6
All Vehicles		900	3.0	0.384	5.7	LOS A	2.0	51.2	0.36	0.24	0.36	33.4

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Intersection												
Int Delay, s/veh	2.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	2	64	5	1	11	2	2	5	7	6	5	5
Future Vol, veh/h	2	64	5	1	11	2	2	5	7	6	5	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	70	5	1	12	2	2	5	8	7	5	5

Major/Minor	Major1		Major2		Minor1			Minor2				
Conflicting Flow All	14	0	0	75	0	0	97	93	73	98	94	13
Stage 1	-	-	-	-	-	-	77	77	-	15	15	-
Stage 2	-	-	-	-	-	-	20	16	-	83	79	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1604	-	-	1524	-	-	885	797	989	884	796	1067
Stage 1	-	-	-	-	-	-	932	831	-	1005	883	-
Stage 2	-	-	-	-	-	-	999	882	-	925	829	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1604	-	-	1524	-	-	874	795	989	872	794	1067
Mov Cap-2 Maneuver	-	-	-	-	-	-	874	795	-	872	794	-
Stage 1	-	-	-	-	-	-	931	830	-	1004	882	-
Stage 2	-	-	-	-	-	-	987	881	-	911	828	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	0.2		0.5		9.1		9.1	
HCM LOS					A		A	

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	894	1604	-	-	1524	-	-	896
HCM Lane V/C Ratio	0.017	0.001	-	-	0.001	-	-	0.019
HCM Control Delay (s)	9.1	7.2	0	-	7.4	0	-	9.1
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.1

Intersection												
Int Delay, s/veh	3.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	2	9	5	6	54	6	2	10	1	2	10	5
Future Vol, veh/h	2	9	5	6	54	6	2	10	1	2	10	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	10	5	7	59	7	2	11	1	2	11	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	66	0	0	15	0	0	102	97	13	100	96	63
Stage 1	-	-	-	-	-	-	17	17	-	77	77	-
Stage 2	-	-	-	-	-	-	85	80	-	23	19	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1536	-	-	1603	-	-	879	793	1067	881	794	1002
Stage 1	-	-	-	-	-	-	1002	881	-	932	831	-
Stage 2	-	-	-	-	-	-	923	828	-	995	880	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1536	-	-	1603	-	-	861	788	1067	867	789	1002
Mov Cap-2 Maneuver	-	-	-	-	-	-	861	788	-	867	789	-
Stage 1	-	-	-	-	-	-	1001	880	-	931	827	-
Stage 2	-	-	-	-	-	-	901	824	-	981	879	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.9			0.7			9.5			9.3		
HCM LOS							A			A		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	815	1536	-	-	1603	-	-	851
HCM Lane V/C Ratio	0.017	0.001	-	-	0.004	-	-	0.022
HCM Control Delay (s)	9.5	7.3	0	-	7.3	0	-	9.3
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.1

Intersection												
Int Delay, s/veh	2.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	2	158	5	2	26	3	2	10	17	13	10	5
Future Vol, veh/h	2	158	5	2	26	3	2	10	17	13	10	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	172	5	2	28	3	2	11	18	14	11	5

Major/Minor	Major1		Major2		Minor1			Minor2				
Conflicting Flow All	31	0	0	177	0	0	221	214	175	227	215	30
Stage 1	-	-	-	-	-	-	179	179	-	34	34	-
Stage 2	-	-	-	-	-	-	42	35	-	193	181	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1582	-	-	1399	-	-	735	684	868	728	683	1044
Stage 1	-	-	-	-	-	-	823	751	-	982	867	-
Stage 2	-	-	-	-	-	-	972	866	-	809	750	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1582	-	-	1399	-	-	721	683	868	703	682	1044
Mov Cap-2 Maneuver	-	-	-	-	-	-	721	683	-	703	682	-
Stage 1	-	-	-	-	-	-	822	750	-	981	866	-
Stage 2	-	-	-	-	-	-	954	865	-	780	749	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	0.1		0.5		9.8		10.1	
HCM LOS					A		B	

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	784	1582	-	-	1399	-	-	738
HCM Lane V/C Ratio	0.04	0.001	-	-	0.002	-	-	0.041
HCM Control Delay (s)	9.8	7.3	0	-	7.6	0	-	10.1
HCM Lane LOS	A	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.1

Intersection												
Int Delay, s/veh	2.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	2	21	5	13	134	13	2	15	1	3	15	5
Future Vol, veh/h	2	21	5	13	134	13	2	15	1	3	15	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	23	5	14	146	14	2	16	1	3	16	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	160	0	0	28	0	0	222	218	26	219	213	153
Stage 1	-	-	-	-	-	-	30	30	-	181	181	-
Stage 2	-	-	-	-	-	-	192	188	-	38	32	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1419	-	-	1585	-	-	734	680	1050	737	684	893
Stage 1	-	-	-	-	-	-	987	870	-	821	750	-
Stage 2	-	-	-	-	-	-	810	745	-	977	868	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1419	-	-	1585	-	-	710	673	1050	716	676	893
Mov Cap-2 Maneuver	-	-	-	-	-	-	710	673	-	716	676	-
Stage 1	-	-	-	-	-	-	986	869	-	820	743	-
Stage 2	-	-	-	-	-	-	780	738	-	957	867	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.5			0.6			10.4			10.2		
HCM LOS							B			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	691	1419	-	-	1585	-	-	719
HCM Lane V/C Ratio	0.028	0.002	-	-	0.009	-	-	0.035
HCM Control Delay (s)	10.4	7.5	0	-	7.3	0	-	10.2
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.1

Timings

10: Integration Loop & Grinnel Blvd



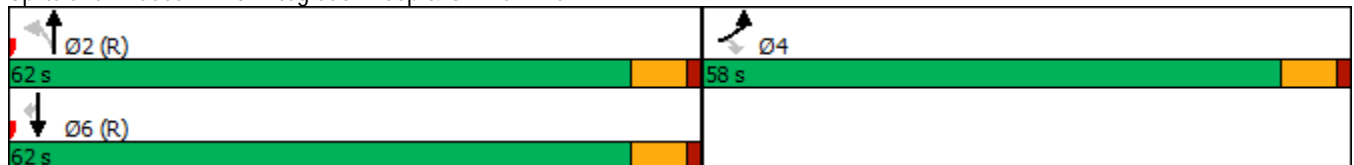
Lane Group	EBL	EBR	NBL	NBT	SBR
Lane Configurations	↖ ↗	↖	↖	↑	↖
Traffic Volume (vph)	442	183	39	10	359
Future Volume (vph)	442	183	39	10	359
Turn Type	Prot	Perm	Perm	NA	Perm
Protected Phases	4			2	
Permitted Phases		4	2		6
Detector Phase	4	4	2	2	6
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.5	24.5	24.5	24.5	24.5
Total Split (s)	58.0	58.0	62.0	62.0	62.0
Total Split (%)	48.3%	48.3%	51.7%	51.7%	51.7%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	6.5	6.5	6.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	C-Max	C-Max	C-Max
Act Effect Green (s)	22.9	22.9	84.1	84.1	84.1
Actuated g/C Ratio	0.19	0.19	0.70	0.70	0.70
v/c Ratio	0.73	0.43	0.04	0.01	0.27
Control Delay	33.3	8.0	6.7	6.7	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	33.3	8.0	6.7	6.7	0.5
LOS	C	A	A	A	A
Approach Delay	25.8			6.7	
Approach LOS	C			A	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
 Natural Cycle: 50
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.73
 Intersection Signal Delay: 16.1
 Intersection Capacity Utilization 37.2%
 Analysis Period (min) 15

Intersection LOS: B
 ICU Level of Service A

Splits and Phases: 10: Integration Loop & Grinnel Blvd



HCM 6th Signalized Intersection Summary
 10: Integration Loop & Grinnel Blvd

2022 Total AM Imp_3-13-14.syn

04/02/2020



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	442	183	39	10	0	359
Future Volume (veh/h)	442	183	39	10	0	359
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	480	199	42	11	0	390
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	593	272	776	1347	1347	1141
Arrive On Green	0.17	0.17	0.72	0.72	0.00	0.72
Sat Flow, veh/h	3456	1585	994	1870	1870	1585
Grp Volume(v), veh/h	480	199	42	11	0	390
Grp Sat Flow(s),veh/h/ln	1728	1585	994	1870	1870	1585
Q Serve(g_s), s	16.0	14.3	1.5	0.2	0.0	11.0
Cycle Q Clear(g_c), s	16.0	14.3	1.5	0.2	0.0	11.0
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	593	272	776	1347	1347	1141
V/C Ratio(X)	0.81	0.73	0.05	0.01	0.00	0.34
Avail Cap(c_a), veh/h	1483	680	776	1347	1347	1141
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	0.95	0.95	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	47.8	47.1	4.9	4.7	0.0	6.2
Incr Delay (d2), s/veh	2.6	3.6	0.1	0.0	0.0	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.1	5.9	0.3	0.1	0.0	3.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	50.4	50.7	5.0	4.7	0.0	7.1
LnGrp LOS	D	D	A	A	A	A
Approach Vol, veh/h	679			53	390	
Approach Delay, s/veh	50.5			5.0	7.1	
Approach LOS	D			A	A	
Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		92.9		27.1		92.9
Change Period (Y+Rc), s		6.5		6.5		6.5
Max Green Setting (Gmax), s		55.5		51.5		55.5
Max Q Clear Time (g_c+I1), s		3.5		18.0		13.0
Green Ext Time (p_c), s		0.2		2.6		1.5
Intersection Summary						
HCM 6th Ctrl Delay			33.2			
HCM 6th LOS			C			

Timings
10: Integration Loop & Grinnel Blvd



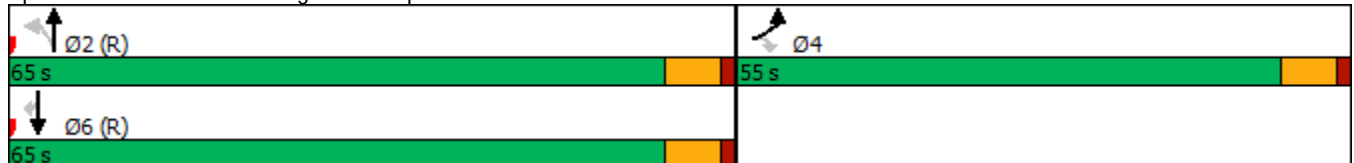
Lane Group	EBL	EBR	NBL	NBT	SBR
Lane Configurations	↖ ↗	↖	↖	↑	↖
Traffic Volume (vph)	219	141	16	15	259
Future Volume (vph)	219	141	16	15	259
Turn Type	Prot	Perm	Perm	NA	Perm
Protected Phases	4			2	
Permitted Phases		4	2		6
Detector Phase	4	4	2	2	6
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.5	24.5	24.5	24.5	24.5
Total Split (s)	55.0	55.0	65.0	65.0	65.0
Total Split (%)	45.8%	45.8%	54.2%	54.2%	54.2%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	6.5	6.5	6.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	C-Max	C-Max	C-Max
Act Effect Green (s)	13.8	13.8	93.2	93.2	93.2
Actuated g/C Ratio	0.12	0.12	0.78	0.78	0.78
v/c Ratio	0.61	0.48	0.02	0.01	0.19
Control Delay	65.1	33.4	3.6	3.6	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	65.1	33.4	3.6	3.6	0.3
LOS	E	C	A	A	A
Approach Delay	52.7			3.6	
Approach LOS	D			A	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
 Natural Cycle: 50
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.61
 Intersection Signal Delay: 29.5
 Intersection Capacity Utilization 31.0%
 Analysis Period (min) 15

Intersection LOS: C
 ICU Level of Service A

Splits and Phases: 10: Integration Loop & Grinnel Blvd



HCM 6th Signalized Intersection Summary
 10: Integration Loop & Grinnel Blvd

2022 Total PM Imp_3-13-14.syn

04/02/2020



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	219	141	16	15	0	259
Future Volume (veh/h)	219	141	16	15	0	259
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	238	153	17	16	0	282
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	422	193	904	1439	1439	1220
Arrive On Green	0.12	0.12	0.77	0.77	0.00	0.77
Sat Flow, veh/h	3456	1585	1097	1870	1870	1585
Grp Volume(v), veh/h	238	153	17	16	0	282
Grp Sat Flow(s),veh/h/ln	1728	1585	1097	1870	1870	1585
Q Serve(g_s), s	7.8	11.3	0.4	0.2	0.0	6.0
Cycle Q Clear(g_c), s	7.8	11.3	0.4	0.2	0.0	6.0
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	422	193	904	1439	1439	1220
V/C Ratio(X)	0.56	0.79	0.02	0.01	0.00	0.23
Avail Cap(c_a), veh/h	1397	641	904	1439	1439	1220
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	0.99	0.99	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	49.7	51.2	3.2	3.2	0.0	3.9
Incr Delay (d2), s/veh	1.2	7.0	0.0	0.0	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	4.8	0.1	0.1	0.0	1.8
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	50.8	58.2	3.3	3.2	0.0	4.3
LnGrp LOS	D	E	A	A	A	A
Approach Vol, veh/h	391			33	282	
Approach Delay, s/veh	53.7			3.3	4.3	
Approach LOS	D			A	A	
Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		98.9		21.1		98.9
Change Period (Y+Rc), s		6.5		6.5		6.5
Max Green Setting (Gmax), s		58.5		48.5		58.5
Max Q Clear Time (g_c+l1), s		2.4		13.3		8.0
Green Ext Time (p_c), s		0.1		1.4		1.0
Intersection Summary						
HCM 6th Ctrl Delay			31.6			
HCM 6th LOS			C			

Timings
10: Integration Loop & Grinnel Blvd

2030 Total AM.syn
04/02/2020

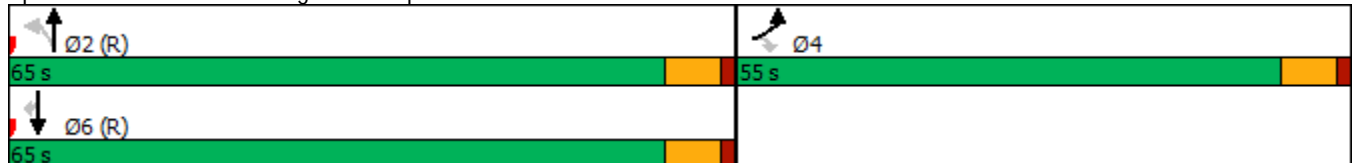


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↖↗	↖	↖	↑	↑	↖
Traffic Volume (vph)	483	290	115	5	28	348
Future Volume (vph)	483	290	115	5	28	348
Turn Type	Prot	Perm	Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Detector Phase	4	4	2	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.5	24.5	24.5	24.5	24.5	24.5
Total Split (s)	55.0	55.0	65.0	65.0	65.0	65.0
Total Split (%)	45.8%	45.8%	54.2%	54.2%	54.2%	54.2%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	6.5	6.5	6.5	6.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max
Act Effect Green (s)	25.0	25.0	82.0	82.0	82.0	82.0
Actuated g/C Ratio	0.21	0.21	0.68	0.68	0.68	0.68
v/c Ratio	0.74	0.54	0.13	0.00	0.02	0.31
Control Delay	59.2	24.8	8.0	9.2	8.8	2.8
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0
Total Delay	59.2	24.9	8.0	9.2	8.8	2.8
LOS	E	C	A	A	A	A
Approach Delay	46.3			8.0	3.3	
Approach LOS	D			A	A	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
 Natural Cycle: 50
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.74
 Intersection Signal Delay: 30.0
 Intersection LOS: C
 Intersection Capacity Utilization 38.8%
 ICU Level of Service A
 Analysis Period (min) 15

Splits and Phases: 10: Integration Loop & Grinnel Blvd



HCM 6th Signalized Intersection Summary
 10: Integration Loop & Grinnel Blvd

2030 Total AM.syn
 04/02/2020



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	483	290	115	5	28	348
Future Volume (veh/h)	483	290	115	5	28	348
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	525	315	125	5	30	378
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	806	370	698	1231	1231	1044
Arrive On Green	0.23	0.23	0.66	0.66	0.66	0.66
Sat Flow, veh/h	3456	1585	978	1870	1870	1585
Grp Volume(v), veh/h	525	315	125	5	30	378
Grp Sat Flow(s),veh/h/ln	1728	1585	978	1870	1870	1585
Q Serve(g_s), s	16.5	22.8	6.1	0.1	0.7	12.8
Cycle Q Clear(g_c), s	16.5	22.8	6.8	0.1	0.7	12.8
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	806	370	698	1231	1231	1044
V/C Ratio(X)	0.65	0.85	0.18	0.00	0.02	0.36
Avail Cap(c_a), veh/h	1397	641	698	1231	1231	1044
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	0.86	0.86	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.6	44.0	8.3	7.0	7.1	9.2
Incr Delay (d2), s/veh	0.8	4.9	0.6	0.0	0.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.1	9.4	1.4	0.0	0.3	4.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	42.4	48.9	8.9	7.0	7.2	10.2
LnGrp LOS	D	D	A	A	A	B
Approach Vol, veh/h	840			130	408	
Approach Delay, s/veh	44.8			8.8	9.9	
Approach LOS	D			A	A	
Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		85.5		34.5		85.5
Change Period (Y+Rc), s		6.5		6.5		6.5
Max Green Setting (Gmax), s		58.5		48.5		58.5
Max Q Clear Time (g_c+I1), s		8.8		24.8		14.8
Green Ext Time (p_c), s		0.7		3.2		1.6
Intersection Summary						
HCM 6th Ctrl Delay			31.1			
HCM 6th LOS			C			

Timings
10: Integration Loop & Grinnel Blvd

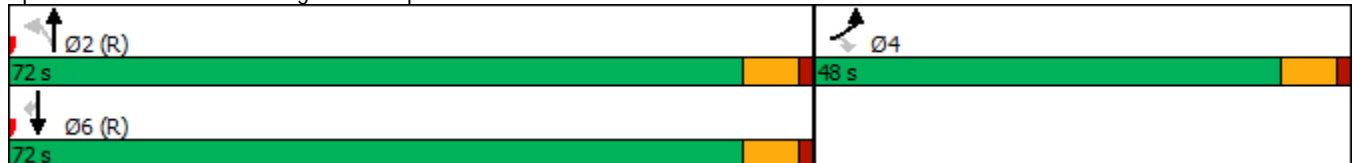


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↖↗	↗	↖	↑	↑	↗
Traffic Volume (vph)	217	163	129	10	25	305
Future Volume (vph)	217	163	129	10	25	305
Turn Type	Prot	Perm	Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Detector Phase	4	4	2	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.5	24.5	24.5	24.5	24.5	24.5
Total Split (s)	48.0	48.0	72.0	72.0	72.0	72.0
Total Split (%)	40.0%	40.0%	60.0%	60.0%	60.0%	60.0%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	6.5	6.5	6.5	6.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max
Act Effect Green (s)	13.7	13.7	93.3	93.3	93.3	93.3
Actuated g/C Ratio	0.11	0.11	0.78	0.78	0.78	0.78
v/c Ratio	0.60	0.53	0.13	0.01	0.02	0.25
Control Delay	65.5	33.6	3.6	3.2	4.6	1.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.5	33.6	3.6	3.2	4.6	1.7
LOS	E	C	A	A	A	A
Approach Delay	51.9			3.6	1.9	
Approach LOS	D			A	A	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 50
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.60
 Intersection Signal Delay: 24.5
 Intersection Capacity Utilization 36.9%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service A

Splits and Phases: 10: Integration Loop & Grinnel Blvd



HCM 6th Signalized Intersection Summary
 10: Integration Loop & Grinnel Blvd

2030 Total PM.syn
 04/02/2020



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	217	163	129	10	25	305
Future Volume (veh/h)	217	163	129	10	25	305
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	236	177	140	11	27	332
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	474	217	828	1411	1411	1196
Arrive On Green	0.14	0.14	0.75	0.75	0.75	0.75
Sat Flow, veh/h	3456	1585	1022	1870	1870	1585
Grp Volume(v), veh/h	236	177	140	11	27	332
Grp Sat Flow(s),veh/h/ln	1728	1585	1022	1870	1870	1585
Q Serve(g_s), s	7.6	13.0	4.7	0.2	0.4	7.8
Cycle Q Clear(g_c), s	7.6	13.0	5.2	0.2	0.4	7.8
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	474	217	828	1411	1411	1196
V/C Ratio(X)	0.50	0.81	0.17	0.01	0.02	0.28
Avail Cap(c_a), veh/h	1195	548	828	1411	1411	1196
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	0.99	0.99	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.9	50.3	4.3	3.6	3.7	4.6
Incr Delay (d2), s/veh	0.8	7.2	0.4	0.0	0.0	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.3	5.6	1.0	0.1	0.2	2.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	48.8	57.4	4.8	3.6	3.7	5.1
LnGrp LOS	D	E	A	A	A	A
Approach Vol, veh/h	413			151	359	
Approach Delay, s/veh	52.5			4.7	5.0	
Approach LOS	D			A	A	
Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		97.0		23.0		97.0
Change Period (Y+Rc), s		6.5		6.5		6.5
Max Green Setting (Gmax), s		65.5		41.5		65.5
Max Q Clear Time (g_c+I1), s		7.2		15.0		9.8
Green Ext Time (p_c), s		0.7		1.4		1.4
Intersection Summary						
HCM 6th Ctrl Delay			26.2			
HCM 6th LOS			C			

Timings
10: Integration Loop & Grinnel Blvd

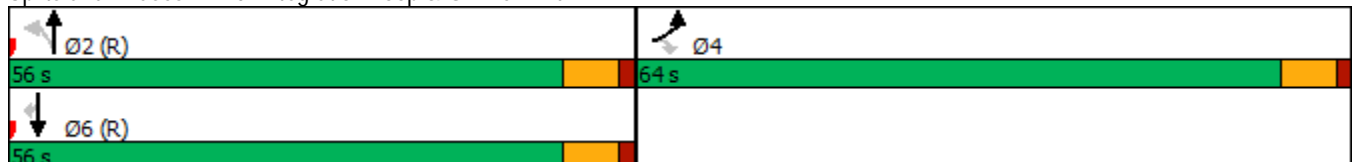


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↖↗	↖	↖	↑	↑	↖
Traffic Volume (vph)	661	413	141	15	28	370
Future Volume (vph)	661	413	141	15	28	370
Turn Type	Prot	Perm	Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Detector Phase	4	4	2	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.5	24.5	24.5	24.5	24.5	24.5
Total Split (s)	64.0	64.0	56.0	56.0	56.0	56.0
Total Split (%)	53.3%	53.3%	46.7%	46.7%	46.7%	46.7%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	6.5	6.5	6.5	6.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max
Act Effect Green (s)	33.5	33.5	73.5	73.5	73.5	73.5
Actuated g/C Ratio	0.28	0.28	0.61	0.61	0.61	0.61
v/c Ratio	0.75	0.59	0.18	0.01	0.03	0.36
Control Delay	53.4	21.4	8.1	7.1	14.8	5.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.4	21.4	8.1	7.1	14.8	5.9
LOS	D	C	A	A	B	A
Approach Delay	41.1			8.0	6.5	
Approach LOS	D			A	A	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 50
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.75
 Intersection Signal Delay: 29.5
 Intersection Capacity Utilization 44.2%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service A

Splits and Phases: 10: Integration Loop & Grinnel Blvd



HCM 6th Signalized Intersection Summary
 10: Integration Loop & Grinnel Blvd

2045 Total AM.syn
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Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	661	413	141	15	28	370
Future Volume (veh/h)	661	413	141	15	28	370
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	718	449	153	16	30	402
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	1118	513	596	1063	1063	900
Arrive On Green	0.32	0.32	0.57	0.57	0.57	0.57
Sat Flow, veh/h	3456	1585	956	1870	1870	1585
Grp Volume(v), veh/h	718	449	153	16	30	402
Grp Sat Flow(s),veh/h/ln	1728	1585	956	1870	1870	1585
Q Serve(g_s), s	21.3	32.1	10.0	0.4	0.8	17.6
Cycle Q Clear(g_c), s	21.3	32.1	10.9	0.4	0.8	17.6
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	1118	513	596	1063	1063	900
V/C Ratio(X)	0.64	0.88	0.26	0.02	0.03	0.45
Avail Cap(c_a), veh/h	1656	760	596	1063	1063	900
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	0.86	0.86	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.7	38.3	13.8	11.3	11.4	15.0
Incr Delay (d2), s/veh	0.5	6.8	1.0	0.0	0.0	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.0	13.3	2.3	0.2	0.4	6.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	35.2	45.1	14.8	11.3	11.4	16.6
LnGrp LOS	D	D	B	B	B	B
Approach Vol, veh/h	1167			169	432	
Approach Delay, s/veh	39.0			14.5	16.2	
Approach LOS	D			B	B	
Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		74.7		45.3		74.7
Change Period (Y+Rc), s		6.5		6.5		6.5
Max Green Setting (Gmax), s		49.5		57.5		49.5
Max Q Clear Time (g_c+I1), s		12.9		34.1		19.6
Green Ext Time (p_c), s		0.9		4.7		1.7
Intersection Summary						
HCM 6th Ctrl Delay			31.1			
HCM 6th LOS			C			

Timings
10: Integration Loop & Grinnel Blvd

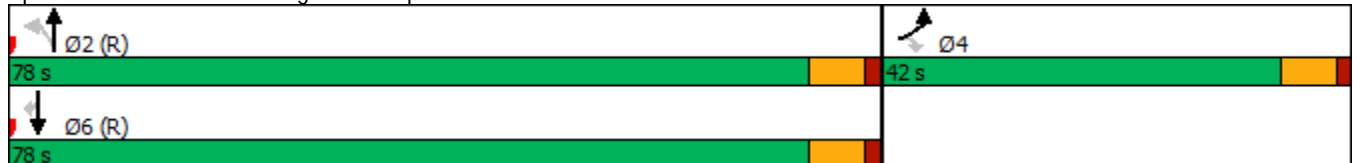


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↖ ↗	↗	↖	↑	↑	↗
Traffic Volume (vph)	227	188	243	20	25	443
Future Volume (vph)	227	188	243	20	25	443
Turn Type	Prot	Perm	Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Detector Phase	4	4	2	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.5	24.5	24.5	24.5	24.5	24.5
Total Split (s)	42.0	42.0	78.0	78.0	78.0	78.0
Total Split (%)	35.0%	35.0%	65.0%	65.0%	65.0%	65.0%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	6.5	6.5	6.5	6.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max
Act Effect Green (s)	14.0	14.0	93.0	93.0	93.0	93.0
Actuated g/C Ratio	0.12	0.12	0.78	0.78	0.78	0.78
v/c Ratio	0.62	0.56	0.25	0.02	0.02	0.36
Control Delay	54.7	18.0	5.8	4.5	1.9	1.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.7	18.0	5.8	4.5	1.9	1.6
LOS	D	B	A	A	A	A
Approach Delay	38.1			5.7	1.6	
Approach LOS	D			A	A	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 50
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.62
 Intersection Signal Delay: 15.7
 Intersection LOS: B
 Intersection Capacity Utilization 51.7%
 ICU Level of Service A
 Analysis Period (min) 15

Splits and Phases: 10: Integration Loop & Grinnel Blvd



HCM 6th Signalized Intersection Summary
 10: Integration Loop & Grinnel Blvd

2045 Total PM.syn
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Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	227	188	243	20	25	443
Future Volume (veh/h)	227	188	243	20	25	443
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	247	204	264	22	27	482
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	532	244	714	1380	1380	1169
Arrive On Green	0.15	0.15	0.74	0.74	0.74	0.74
Sat Flow, veh/h	3456	1585	891	1870	1870	1585
Grp Volume(v), veh/h	247	204	264	22	27	482
Grp Sat Flow(s),veh/h/ln	1728	1585	891	1870	1870	1585
Q Serve(g_s), s	7.8	15.0	13.5	0.4	0.5	13.8
Cycle Q Clear(g_c), s	7.8	15.0	13.9	0.4	0.5	13.8
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	532	244	714	1380	1380	1169
V/C Ratio(X)	0.46	0.84	0.37	0.02	0.02	0.41
Avail Cap(c_a), veh/h	1022	469	714	1380	1380	1169
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	0.99	0.99	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	46.2	49.3	6.0	4.2	4.2	5.9
Incr Delay (d2), s/veh	0.6	7.3	1.5	0.0	0.0	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	6.4	2.5	0.1	0.2	4.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	46.9	56.6	7.5	4.2	4.2	7.0
LnGrp LOS	D	E	A	A	A	A
Approach Vol, veh/h	451			286	509	
Approach Delay, s/veh	51.3			7.3	6.9	
Approach LOS	D			A	A	
Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		95.0		25.0		95.0
Change Period (Y+Rc), s		6.5		6.5		6.5
Max Green Setting (Gmax), s		71.5		35.5		71.5
Max Q Clear Time (g_c+l1), s		15.9		17.0		15.8
Green Ext Time (p_c), s		1.9		1.5		2.1
Intersection Summary						
HCM 6th Ctrl Delay			23.0			
HCM 6th LOS			C			

Timings
 11: Peak Innovation Parkway & S Integration Loop

2030 Total AM.syn
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Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↖	↗	↖	↑↑	↗	↖	↑↑	↗
Traffic Volume (vph)	4	33	30	6	98	545	179	78	151	15
Future Volume (vph)	4	33	30	6	98	545	179	78	151	15
Turn Type	Perm	NA	Perm	NA	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4		8	5	2		1	6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	4	4	8	8	5	2	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.5	24.5	24.5	24.5	11.5	24.5	24.5	11.5	24.5	24.5
Total Split (s)	38.0	38.0	38.0	38.0	21.0	60.0	60.0	22.0	61.0	61.0
Total Split (%)	31.7%	31.7%	31.7%	31.7%	17.5%	50.0%	50.0%	18.3%	50.8%	50.8%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Lead/Lag					Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effect Green (s)	9.2	9.2	9.2	9.2	92.9	87.0	87.0	91.0	84.3	84.3
Actuated g/C Ratio	0.08	0.08	0.08	0.08	0.77	0.72	0.72	0.76	0.70	0.70
v/c Ratio	0.04	0.61	0.46	0.15	0.11	0.23	0.16	0.13	0.07	0.01
Control Delay	40.5	25.5	72.2	30.1	2.2	4.6	0.4	2.2	1.9	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.5	25.5	72.2	30.1	2.2	4.6	0.4	2.2	1.9	0.0
LOS	D	C	E	C	A	A	A	A	A	A
Approach Delay		26.0		55.8		3.4			1.9	
Approach LOS		C		E		A			A	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.61
 Intersection Signal Delay: 7.5
 Intersection Capacity Utilization 52.4%
 Analysis Period (min) 15

Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 11: Peak Innovation Parkway & S Integration Loop



HCM 6th Signalized Intersection Summary
 11: Peak Innovation Parkway & S Integration Loop

2030 Total AM.syn

04/02/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↑↑	↗	↖	↑↑	↗
Traffic Volume (veh/h)	4	33	89	30	6	13	98	545	179	78	151	15
Future Volume (veh/h)	4	33	89	30	6	13	98	545	179	78	151	15
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	4	36	97	33	7	14	107	592	195	85	164	16
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	212	54	145	114	67	134	928	2409	1075	552	2405	1073
Arrive On Green	0.12	0.12	0.12	0.12	0.12	0.12	0.04	0.68	0.68	0.04	0.68	0.68
Sat Flow, veh/h	1391	448	1206	1257	557	1113	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	4	0	133	33	0	21	107	592	195	85	164	16
Grp Sat Flow(s),veh/h/ln	1391	0	1653	1257	0	1670	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	0.3	0.0	9.2	3.1	0.0	1.3	2.2	7.7	5.4	1.7	1.9	0.4
Cycle Q Clear(g_c), s	1.7	0.0	9.2	12.3	0.0	1.3	2.2	7.7	5.4	1.7	1.9	0.4
Prop In Lane	1.00		0.73	1.00		0.67	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	212	0	199	114	0	201	928	2409	1075	552	2405	1073
V/C Ratio(X)	0.02	0.00	0.67	0.29	0.00	0.10	0.12	0.25	0.18	0.15	0.07	0.01
Avail Cap(c_a), veh/h	410	0	434	293	0	438	1071	2409	1075	712	2405	1073
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.8	0.0	50.5	56.4	0.0	47.0	5.1	7.5	7.1	5.4	6.6	6.3
Incr Delay (d2), s/veh	0.0	0.0	3.9	1.4	0.0	0.2	0.1	0.2	0.4	0.1	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	4.0	1.0	0.0	0.6	0.8	2.9	1.9	0.6	0.7	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.8	0.0	54.3	57.8	0.0	47.3	5.2	7.7	7.5	5.5	6.6	6.4
LnGrp LOS	D	A	D	E	A	D	A	A	A	A	A	A
Approach Vol, veh/h		137			54			894			265	
Approach Delay, s/veh		54.2			53.7			7.4			6.2	
Approach LOS		D			D			A			A	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	11.2	87.9		20.9	11.4	87.7		20.9				
Change Period (Y+Rc), s	6.5	6.5		6.5	6.5	6.5		6.5				
Max Green Setting (Gmax), s	15.5	53.5		31.5	14.5	54.5		31.5				
Max Q Clear Time (g_c+I1), s	3.7	9.7		11.2	4.2	3.9		14.3				
Green Ext Time (p_c), s	0.1	5.4		0.7	0.2	1.2		0.1				
Intersection Summary												
HCM 6th Ctrl Delay				13.7								
HCM 6th LOS				B								

Timings
11: Peak Innovation Parkway & S Integration Loop

2030 Total PM.syn
04/02/2020

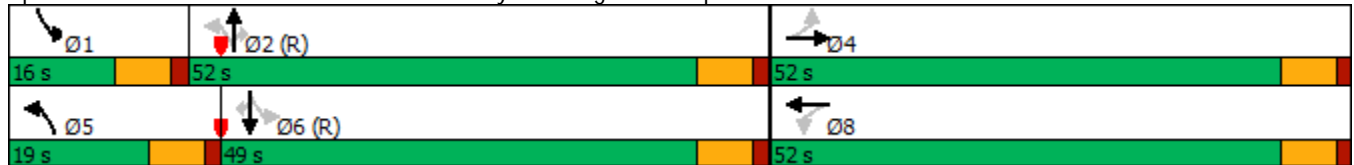


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↖	↗	↖	↑↑	↗	↖	↑↑	↗
Traffic Volume (vph)	15	4	152	28	51	164	24	11	416	4
Future Volume (vph)	15	4	152	28	51	164	24	11	416	4
Turn Type	Perm	NA	Perm	NA	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4		8	5	2		1	6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	4	4	8	8	5	2	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.5	24.5	24.5	24.5	11.5	24.5	24.5	11.5	24.5	24.5
Total Split (s)	52.0	52.0	52.0	52.0	19.0	52.0	52.0	16.0	49.0	49.0
Total Split (%)	43.3%	43.3%	43.3%	43.3%	15.8%	43.3%	43.3%	13.3%	40.8%	40.8%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Lead/Lag					Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effect Green (s)	20.9	20.9	20.9	20.9	84.1	81.0	81.0	80.0	75.3	75.3
Actuated g/C Ratio	0.17	0.17	0.17	0.17	0.70	0.68	0.68	0.67	0.63	0.63
v/c Ratio	0.07	0.27	0.73	0.29	0.08	0.07	0.02	0.01	0.20	0.00
Control Delay	24.3	4.0	64.7	16.3	5.6	7.5	0.0	3.4	7.9	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.3	4.0	64.7	16.3	5.6	7.5	0.0	3.4	7.9	0.0
LOS	C	A	E	B	A	A	A	A	A	A
Approach Delay		6.9		46.1		6.3			7.7	
Approach LOS		A		D		A			A	

Intersection Summary

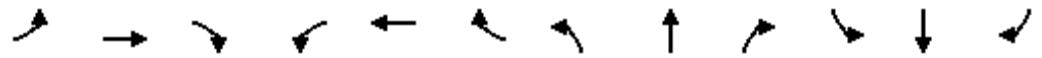
Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.73
 Intersection Signal Delay: 16.6
 Intersection LOS: B
 Intersection Capacity Utilization 47.0%
 ICU Level of Service A
 Analysis Period (min) 15

Splits and Phases: 11: Peak Innovation Parkway & S Integration Loop



HCM 6th Signalized Intersection Summary
 11: Peak Innovation Parkway & S Integration Loop

2030 Total PM.syn
 04/02/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	4	85	152	28	67	51	164	24	11	416	4
Future Volume (veh/h)	15	4	85	152	28	67	51	164	24	11	416	4
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	16	4	92	165	30	73	55	178	26	12	452	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	251	13	307	254	97	236	631	2214	988	794	2139	954
Arrive On Green	0.20	0.20	0.20	0.20	0.20	0.20	0.04	0.62	0.62	0.01	0.60	0.60
Sat Flow, veh/h	1291	66	1529	1300	483	1176	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	16	0	96	165	0	103	55	178	26	12	452	4
Grp Sat Flow(s),veh/h/ln	1291	0	1595	1300	0	1659	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	1.3	0.0	6.1	14.8	0.0	6.4	1.4	2.4	0.8	0.3	7.0	0.1
Cycle Q Clear(g_c), s	7.6	0.0	6.1	21.0	0.0	6.4	1.4	2.4	0.8	0.3	7.0	0.1
Prop In Lane	1.00		0.96	1.00		0.71	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	251	0	320	254	0	333	631	2214	988	794	2139	954
V/C Ratio(X)	0.06	0.00	0.30	0.65	0.00	0.31	0.09	0.08	0.03	0.02	0.21	0.00
Avail Cap(c_a), veh/h	481	0	605	486	0	629	754	2214	988	910	2139	954
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.1	0.0	40.8	49.7	0.0	40.9	8.4	9.0	8.7	8.9	10.9	9.5
Incr Delay (d2), s/veh	0.1	0.0	0.5	2.8	0.0	0.5	0.1	0.1	0.0	0.0	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	2.5	5.0	0.0	2.7	0.5	0.9	0.3	0.1	2.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.2	0.0	41.3	52.5	0.0	41.4	8.4	9.0	8.7	8.9	11.1	9.5
LnGrp LOS	D	A	D	D	A	D	A	A	A	A	B	A
Approach Vol, veh/h		112			268			259			468	
Approach Delay, s/veh		41.7			48.2			8.9			11.1	
Approach LOS		D			D			A			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.1	81.3		30.6	10.7	78.7		30.6				
Change Period (Y+Rc), s	6.5	6.5		6.5	6.5	6.5		6.5				
Max Green Setting (Gmax), s	9.5	45.5		45.5	12.5	42.5		45.5				
Max Q Clear Time (g_c+I1), s	2.3	4.4		9.6	3.4	9.0		23.0				
Green Ext Time (p_c), s	0.0	1.3		0.6	0.1	3.3		1.1				
Intersection Summary												
HCM 6th Ctrl Delay				22.6								
HCM 6th LOS				C								

Timings
11: Peak Innovation Parkway & S Integration Loop

2045 Total AM.syn

04/02/2020

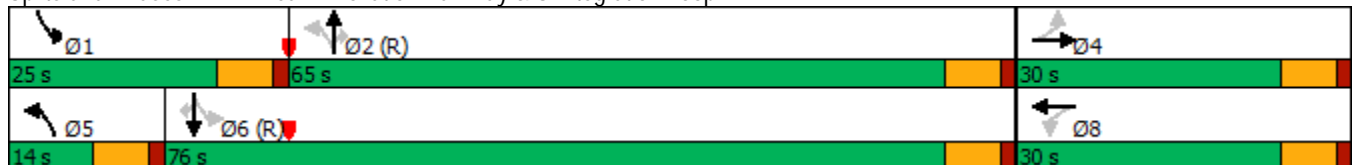


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↖	↗	↖	↑↑	↗	↖	↑↑	↗
Traffic Volume (vph)	9	81	74	14	150	1067	446	195	254	37
Future Volume (vph)	9	81	74	14	150	1067	446	195	254	37
Turn Type	Perm	NA	Perm	NA	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4		8	5	2		1	6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	4	4	8	8	5	2	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.5	24.5	24.5	24.5	11.5	24.5	24.5	11.5	24.5	24.5
Total Split (s)	30.0	30.0	30.0	30.0	14.0	65.0	65.0	25.0	76.0	76.0
Total Split (%)	25.0%	25.0%	25.0%	25.0%	11.7%	54.2%	54.2%	20.8%	63.3%	63.3%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Lead/Lag					Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effect Green (s)	16.3	16.3	16.3	16.3	81.0	73.1	73.1	86.9	76.4	76.4
Actuated g/C Ratio	0.14	0.14	0.14	0.14	0.68	0.61	0.61	0.72	0.64	0.64
v/c Ratio	0.05	0.73	0.82	0.20	0.21	0.54	0.42	0.57	0.12	0.04
Control Delay	42.7	53.8	101.4	21.0	3.9	10.1	0.5	37.9	2.6	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.7	53.8	101.4	21.0	3.9	10.1	0.5	37.9	2.6	0.1
LOS	D	D	F	C	A	B	A	D	A	A
Approach Delay		53.3		70.5		7.0			16.6	
Approach LOS		D		E		A			B	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.82
 Intersection Signal Delay: 15.6
 Intersection LOS: B
 Intersection Capacity Utilization 76.6%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 11: Peak Innovation Parkway & S Integration Loop



HCM 6th Signalized Intersection Summary
 11: Peak Innovation Parkway & S Integration Loop

2045 Total AM.syn
 04/02/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↑↑	↗	↖	↑↑	↗
Traffic Volume (veh/h)	9	81	101	74	14	32	150	1067	446	195	254	37
Future Volume (veh/h)	9	81	101	74	14	32	150	1067	446	195	254	37
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	10	88	110	80	15	35	163	1160	485	212	276	40
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	283	144	180	159	95	221	751	2060	919	295	2110	941
Arrive On Green	0.19	0.19	0.19	0.19	0.19	0.19	0.05	0.58	0.58	0.07	0.59	0.59
Sat Flow, veh/h	1355	756	945	1185	498	1163	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	10	0	198	80	0	50	163	1160	485	212	276	40
Grp Sat Flow(s),veh/h/ln	1355	0	1700	1185	0	1661	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	0.7	0.0	12.8	8.0	0.0	3.0	4.4	24.4	22.2	5.7	4.1	1.3
Cycle Q Clear(g_c), s	3.8	0.0	12.8	20.8	0.0	3.0	4.4	24.4	22.2	5.7	4.1	1.3
Prop In Lane	1.00		0.56	1.00		0.70	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	283	0	323	159	0	316	751	2060	919	295	2110	941
V/C Ratio(X)	0.04	0.00	0.61	0.50	0.00	0.16	0.22	0.56	0.53	0.72	0.13	0.04
Avail Cap(c_a), veh/h	291	0	333	166	0	325	766	2060	919	449	2110	941
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.2	0.0	44.5	54.1	0.0	40.6	8.9	15.7	15.3	16.5	10.7	10.2
Incr Delay (d2), s/veh	0.1	0.0	3.2	2.5	0.0	0.2	0.1	1.1	2.2	3.3	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	5.7	2.5	0.0	1.3	1.7	9.9	8.3	3.0	1.6	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.2	0.0	47.7	56.5	0.0	40.8	9.1	16.9	17.4	19.7	10.9	10.2
LnGrp LOS	D	A	D	E	A	D	A	B	B	B	B	B
Approach Vol, veh/h		208			130			1808			528	
Approach Delay, s/veh		47.4			50.5			16.3			14.4	
Approach LOS		D			D			B			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	14.6	76.1		29.3	12.9	77.7		29.3				
Change Period (Y+Rc), s	6.5	6.5		6.5	6.5	6.5		6.5				
Max Green Setting (Gmax), s	18.5	58.5		23.5	7.5	69.5		23.5				
Max Q Clear Time (g_c+I1), s	7.7	26.4		14.8	6.4	6.1		22.8				
Green Ext Time (p_c), s	0.4	13.5		0.7	0.0	2.1		0.0				
Intersection Summary												
HCM 6th Ctrl Delay				20.0								
HCM 6th LOS				C								

Timings
 11: Peak Innovation Parkway & S Integration Loop

2045 Total PM.syn
 04/02/2020

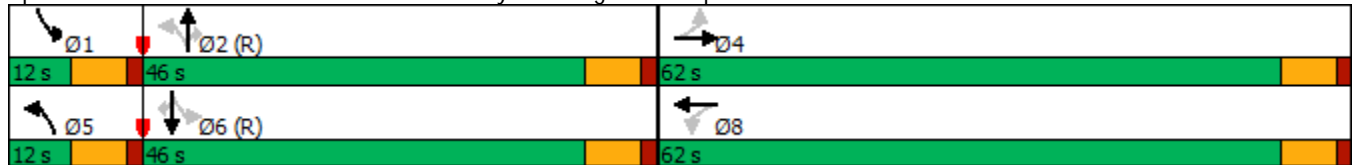


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↖	↗	↖	↑↑	↗	↖	↑↑	↗
Traffic Volume (vph)	36	9	379	68	64	248	60	26	830	10
Future Volume (vph)	36	9	379	68	64	248	60	26	830	10
Turn Type	Perm	NA	Perm	NA	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4		8	5	2		1	6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	4	4	8	8	5	2	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.5	24.5	24.5	24.5	11.5	24.5	24.5	11.5	24.5	24.5
Total Split (s)	62.0	62.0	62.0	62.0	12.0	46.0	46.0	12.0	46.0	46.0
Total Split (%)	51.7%	51.7%	51.7%	51.7%	10.0%	38.3%	38.3%	10.0%	38.3%	38.3%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Lead/Lag					Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effect Green (s)	46.6	46.6	46.6	46.6	57.0	52.7	52.7	54.5	49.6	49.6
Actuated g/C Ratio	0.39	0.39	0.39	0.39	0.48	0.44	0.44	0.45	0.41	0.41
v/c Ratio	0.10	0.22	0.88	0.35	0.29	0.17	0.09	0.05	0.62	0.02
Control Delay	15.2	1.5	53.7	11.5	18.9	19.3	0.9	29.9	39.2	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.2	1.5	53.7	11.5	18.9	19.3	0.9	29.9	39.2	0.3
LOS	B	A	D	B	B	B	A	C	D	A
Approach Delay		4.2		37.5		16.2			38.5	
Approach LOS		A		D		B			D	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.88
 Intersection Signal Delay: 31.1
 Intersection LOS: C
 Intersection Capacity Utilization 78.7%
 ICU Level of Service D
 Analysis Period (min) 15

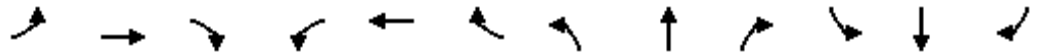
Splits and Phases: 11: Peak Innovation Parkway & S Integration Loop



HCM 6th Signalized Intersection Summary
 11: Peak Innovation Parkway & S Integration Loop

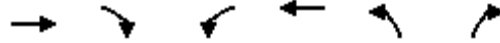
2045 Total PM.syn

04/02/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	36	9	136	379	68	167	64	248	60	26	830	10
Future Volume (veh/h)	36	9	136	379	68	167	64	248	60	26	830	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	39	10	148	412	74	182	70	270	65	28	902	11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	414	43	631	499	202	496	230	1392	621	462	1348	601
Arrive On Green	0.42	0.42	0.42	0.42	0.42	0.42	0.04	0.39	0.39	0.03	0.38	0.38
Sat Flow, veh/h	1124	101	1499	1228	479	1179	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	39	0	158	412	0	256	70	270	65	28	902	11
Grp Sat Flow(s),veh/h/ln	1124	0	1601	1228	0	1658	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	3.0	0.0	7.6	38.9	0.0	12.7	2.9	6.0	3.1	1.1	25.3	0.5
Cycle Q Clear(g_c), s	15.7	0.0	7.6	46.5	0.0	12.7	2.9	6.0	3.1	1.1	25.3	0.5
Prop In Lane	1.00		0.94	1.00		0.71	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	414	0	673	499	0	697	230	1392	621	462	1348	601
V/C Ratio(X)	0.09	0.00	0.23	0.83	0.00	0.37	0.30	0.19	0.10	0.06	0.67	0.02
Avail Cap(c_a), veh/h	461	0	740	550	0	767	244	1392	621	499	1348	601
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.2	0.0	22.3	37.3	0.0	23.8	24.3	24.0	23.2	21.7	31.0	23.3
Incr Delay (d2), s/veh	0.1	0.0	0.2	9.3	0.0	0.3	0.7	0.3	0.3	0.1	2.7	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	2.9	12.8	0.0	5.0	1.2	2.6	1.2	0.5	11.3	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.3	0.0	22.5	46.6	0.0	24.1	25.0	24.3	23.5	21.8	33.6	23.3
LnGrp LOS	C	A	C	D	A	C	C	C	C	C	C	C
Approach Vol, veh/h		197			668			405			941	
Approach Delay, s/veh		23.9			38.0			24.3			33.2	
Approach LOS		C			D			C			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.5	53.5		57.0	11.0	52.0		57.0				
Change Period (Y+Rc), s	6.5	6.5		6.5	6.5	6.5		6.5				
Max Green Setting (Gmax), s	5.5	39.5		55.5	5.5	39.5		55.5				
Max Q Clear Time (g_c+I1), s	3.1	8.0		17.7	4.9	27.3		48.5				
Green Ext Time (p_c), s	0.0	2.0		1.2	0.0	5.0		1.9				
Intersection Summary												
HCM 6th Ctrl Delay				32.2								
HCM 6th LOS				C								

Timings
12: Grinnel Blvd & Powers Blvd (SH-21)

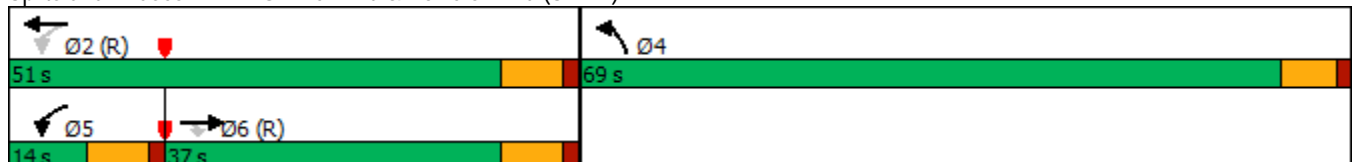


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↵	↑↑	↵	↵
Traffic Volume (vph)	495	268	109	823	562	115
Future Volume (vph)	495	268	109	823	562	115
Turn Type	NA	Perm	pm+pt	NA	Prot	Free
Protected Phases	6		5	2	4	
Permitted Phases		6	2			Free
Detector Phase	6	6	5	2	4	
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	25.0	25.0	12.0	25.0	24.5	
Total Split (s)	37.0	37.0	14.0	51.0	69.0	
Total Split (%)	30.8%	30.8%	11.7%	42.5%	57.5%	
Yellow Time (s)	5.5	5.5	5.5	5.5	5.0	
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	7.0	7.0	7.0	7.0	6.5	
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Max	C-Max	None	C-Max	None	
Act Effect Green (s)	35.1	35.1	51.0	51.0	55.5	120.0
Actuated g/C Ratio	0.29	0.29	0.42	0.42	0.46	1.00
v/c Ratio	0.58	0.44	0.48	0.78	0.88	0.11
Control Delay	40.5	6.4	30.3	36.0	41.6	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.5	6.4	30.3	36.0	41.6	0.1
LOS	D	A	C	D	D	A
Approach Delay	29.2			35.3	33.4	
Approach LOS	C			D	C	

Intersection Summary

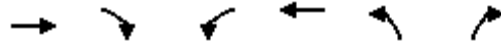
Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBT, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.88
 Intersection Signal Delay: 33.0
 Intersection Capacity Utilization 67.9%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service C

Splits and Phases: 12: Grinnel Blvd & Powers Blvd (SH-21)



HCM 6th Signalized Intersection Summary
 12: Grinnel Blvd & Powers Blvd (SH-21)

2019 Existing AM.syn
 04/16/2020



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↗	↖	↑↑	↖	↗
Traffic Volume (veh/h)	495	268	109	823	562	115
Future Volume (veh/h)	495	268	109	823	562	115
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1781	1841	1841	1781	1841	1841
Adj Flow Rate, veh/h	569	0	143	1112	702	0
Peak Hour Factor	0.87	0.94	0.76	0.74	0.80	0.67
Percent Heavy Veh, %	8	4	4	8	4	4
Cap, veh/h	1181		343	1576	740	
Arrive On Green	0.35	0.00	0.06	0.47	0.42	0.00
Sat Flow, veh/h	3474	1560	1753	3474	1753	1560
Grp Volume(v), veh/h	569	0	143	1112	702	0
Grp Sat Flow(s),veh/h/ln	1692	1560	1753	1692	1753	1560
Q Serve(g_s), s	15.8	0.0	6.1	31.4	46.3	0.0
Cycle Q Clear(g_c), s	15.8	0.0	6.1	31.4	46.3	0.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1181		343	1576	740	
V/C Ratio(X)	0.48		0.42	0.71	0.95	
Avail Cap(c_a), veh/h	1181		343	1576	913	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	30.6	0.0	23.3	25.5	33.4	0.0
Incr Delay (d2), s/veh	1.4	0.0	0.8	2.7	16.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.7	0.0	2.6	13.0	22.6	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	32.0	0.0	24.1	28.2	50.2	0.0
LnGrp LOS	C		C	C	D	
Approach Vol, veh/h	569	A		1255	702	A
Approach Delay, s/veh	32.0			27.7	50.2	
Approach LOS	C			C	D	
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		62.9		57.1	14.0	48.9
Change Period (Y+Rc), s		7.0		6.5	7.0	7.0
Max Green Setting (Gmax), s		44.0		62.5	7.0	30.0
Max Q Clear Time (g_c+l1), s		33.4		48.3	8.1	17.8
Green Ext Time (p_c), s		5.7		2.3	0.0	3.1

Intersection Summary

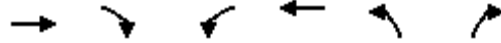
HCM 6th Ctrl Delay	34.9
HCM 6th LOS	C

Notes

Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

Timings
12: Grinnel Blvd & Powers Blvd (SH-21)

2019 Existing PM.syn
04/16/2020

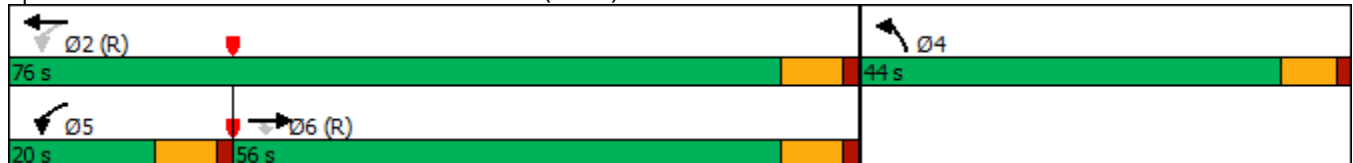


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↑	↑↑	↑	↑
Traffic Volume (vph)	725	500	147	483	268	72
Future Volume (vph)	725	500	147	483	268	72
Turn Type	NA	Perm	pm+pt	NA	Prot	Free
Protected Phases	6		5	2	4	
Permitted Phases		6	2			Free
Detector Phase	6	6	5	2	4	
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	25.0	25.0	12.0	25.0	24.5	
Total Split (s)	56.0	56.0	20.0	76.0	44.0	
Total Split (%)	46.7%	46.7%	16.7%	63.3%	36.7%	
Yellow Time (s)	5.5	5.5	5.5	5.5	5.0	
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	
Lost Time Adjust (s)	-0.5	-0.5	-0.5	-0.5	-0.5	
Total Lost Time (s)	6.5	6.5	6.5	6.5	6.0	
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Max	C-Max	None	C-Max	None	
Act Effect Green (s)	65.3	65.3	81.9	81.9	25.6	120.0
Actuated g/C Ratio	0.54	0.54	0.68	0.68	0.21	1.00
v/c Ratio	0.43	0.50	0.36	0.24	0.77	0.06
Control Delay	18.5	3.3	10.0	8.2	57.9	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.5	3.3	10.0	8.2	57.9	0.1
LOS	B	A	A	A	E	A
Approach Delay	12.3			8.6	43.4	
Approach LOS	B			A	D	

Intersection Summary

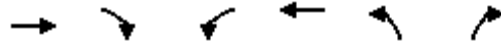
Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBT, Start of Green
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.77
 Intersection Signal Delay: 16.1
 Intersection LOS: B
 Intersection Capacity Utilization 58.9%
 ICU Level of Service B
 Analysis Period (min) 15

Splits and Phases: 12: Grinnel Blvd & Powers Blvd (SH-21)



HCM 6th Signalized Intersection Summary
 12: Grinnel Blvd & Powers Blvd (SH-21)

2019 Existing PM.syn
 04/16/2020



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↑	↑↑	↑	↑
Traffic Volume (veh/h)	725	500	147	483	268	72
Future Volume (veh/h)	725	500	147	483	268	72
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1811	1856	1856	1811	1856	1856
Adj Flow Rate, veh/h	797	0	160	562	288	0
Peak Hour Factor	0.91	0.90	0.92	0.86	0.93	0.75
Percent Heavy Veh, %	6	3	3	6	3	3
Cap, veh/h	2068		482	2443	328	
Arrive On Green	0.60	0.00	0.06	0.71	0.19	0.00
Sat Flow, veh/h	3532	1572	1767	3532	1767	1572
Grp Volume(v), veh/h	797	0	160	562	288	0
Grp Sat Flow(s),veh/h/ln	1721	1572	1767	1721	1767	1572
Q Serve(g_s), s	14.4	0.0	3.9	6.8	19.0	0.0
Cycle Q Clear(g_c), s	14.4	0.0	3.9	6.8	19.0	0.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	2068		482	2443	328	
V/C Ratio(X)	0.39		0.33	0.23	0.88	
Avail Cap(c_a), veh/h	2068		584	2443	560	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	12.4	0.0	8.5	6.0	47.5	0.0
Incr Delay (d2), s/veh	0.5	0.0	0.4	0.2	8.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.6	0.0	1.5	2.3	9.1	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	13.0	0.0	8.9	6.2	55.7	0.0
LnGrp LOS	B		A	A	E	
Approach Vol, veh/h	797	A		722	288	A
Approach Delay, s/veh	13.0			6.8	55.7	
Approach LOS	B			A	E	
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		91.7		28.3	13.1	78.6
Change Period (Y+Rc), s		7.0		6.5	7.0	7.0
Max Green Setting (Gmax), s		69.0		37.5	13.0	49.0
Max Q Clear Time (g_c+I1), s		8.8		21.0	5.9	16.4
Green Ext Time (p_c), s		4.5		0.8	0.2	6.5

Intersection Summary

HCM 6th Ctrl Delay	17.3
HCM 6th LOS	B

Notes

Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

Timings

12: Grinnel Blvd & Powers Blvd (SH-21)

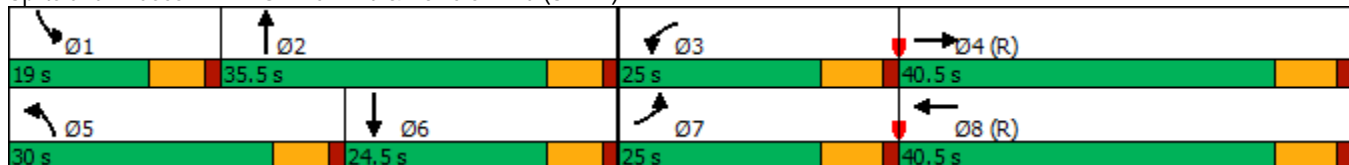


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↑↑	↗	↖	↑↑	↗	↔↔	↑↑	↗	↔↔	↑↑	↗
Traffic Volume (vph)	450	510	276	119	877	209	608	320	145	173	251	398
Future Volume (vph)	450	510	276	119	877	209	608	320	145	173	251	398
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free			Free			Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	12.0	25.0		12.0	25.0		24.5	24.5		11.5	24.5	
Total Split (s)	25.0	40.5		25.0	40.5		30.0	35.5		19.0	24.5	
Total Split (%)	20.8%	33.8%		20.8%	33.8%		25.0%	29.6%		15.8%	20.4%	
Yellow Time (s)	5.5	5.5		5.5	5.5		5.0	5.0		5.0	5.0	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	7.0	7.0		7.0	7.0		6.5	6.5		6.5	6.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max		None	C-Max		None	Max		None	Max	
Act Effct Green (s)	18.0	37.6	120.0	13.9	33.5	120.0	23.5	30.3	120.0	11.2	18.0	120.0
Actuated g/C Ratio	0.15	0.31	1.00	0.12	0.28	1.00	0.20	0.25	1.00	0.09	0.15	1.00
v/c Ratio	0.94	0.53	0.19	0.65	1.01	0.14	0.98	0.39	0.13	0.59	0.52	0.27
Control Delay	78.3	36.8	0.3	74.2	69.1	0.1	77.6	36.8	0.1	55.8	65.7	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	78.3	36.8	0.3	74.2	69.1	0.1	77.6	36.8	0.1	55.8	65.7	0.6
LOS	E	D	A	E	E	A	E	D	A	E	E	A
Approach Delay		43.8			57.6			52.9			32.1	
Approach LOS		D			E			D			C	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Green
 Natural Cycle: 120
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.01
 Intersection Signal Delay: 47.7
 Intersection LOS: D
 Intersection Capacity Utilization 83.9%
 ICU Level of Service E
 Analysis Period (min) 15

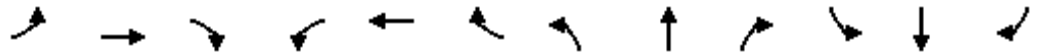
Splits and Phases: 12: Grinnel Blvd & Powers Blvd (SH-21)



HCM 6th Signalized Intersection Summary
 12: Grinnel Blvd & Powers Blvd (SH-21)

2022 Total AM Imp_3-13-14.syn

04/16/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↗	↑↑	↖	↗	↑↑	↖	↖↗	↑↑	↖	↖↗	↑↑	↖
Traffic Volume (veh/h)	450	510	276	119	877	209	608	320	145	173	251	398
Future Volume (veh/h)	450	510	276	119	877	209	608	320	145	173	251	398
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1781	1841	1841	1781	1870	1841	1870	1841	1870	1870	1870
Adj Flow Rate, veh/h	484	554	0	129	943	0	647	348	0	188	273	0
Peak Hour Factor	0.93	0.92	0.94	0.92	0.93	0.92	0.94	0.92	0.74	0.92	0.92	0.92
Percent Heavy Veh, %	2	8	4	4	8	2	4	2	4	2	2	2
Cap, veh/h	518	1151		156	945		666	974		248	533	
Arrive On Green	0.15	0.34	0.00	0.09	0.28	0.00	0.20	0.27	0.00	0.07	0.15	0.00
Sat Flow, veh/h	3456	3385	1560	1753	3385	1585	3401	3554	1560	3456	3554	1585
Grp Volume(v), veh/h	484	554	0	129	943	0	647	348	0	188	273	0
Grp Sat Flow(s),veh/h/ln	1728	1692	1560	1753	1692	1585	1700	1777	1560	1728	1777	1585
Q Serve(g_s), s	16.6	15.5	0.0	8.7	33.4	0.0	22.7	9.5	0.0	6.4	8.5	0.0
Cycle Q Clear(g_c), s	16.6	15.5	0.0	8.7	33.4	0.0	22.7	9.5	0.0	6.4	8.5	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	518	1151		156	945		666	974		248	533	
V/C Ratio(X)	0.93	0.48		0.83	1.00		0.97	0.36		0.76	0.51	
Avail Cap(c_a), veh/h	518	1151		263	945		666	974		360	533	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	50.4	31.3	0.0	53.7	43.2	0.0	47.9	35.0	0.0	54.7	47.0	0.0
Incr Delay (d2), s/veh	24.2	1.4	0.0	10.4	28.8	0.0	27.8	1.0	0.0	5.5	3.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.9	6.6	0.0	4.3	17.6	0.0	12.1	4.3	0.0	3.0	4.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	74.6	32.7	0.0	64.1	72.0	0.0	75.7	36.1	0.0	60.1	50.4	0.0
LnGrp LOS	E	C		E	E		E	D		E	D	
Approach Vol, veh/h		1038	A		1072	A		995	A		461	A
Approach Delay, s/veh		52.2			71.1			61.8			54.4	
Approach LOS		D			E			E			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	15.1	39.4	17.7	47.8	30.0	24.5	25.0	40.5				
Change Period (Y+Rc), s	6.5	6.5	7.0	7.0	6.5	6.5	7.0	7.0				
Max Green Setting (Gmax), s	12.5	29.0	18.0	33.5	23.5	18.0	18.0	33.5				
Max Q Clear Time (g_c+I1), s	8.4	11.5	10.7	17.5	24.7	10.5	18.6	35.4				
Green Ext Time (p_c), s	0.2	2.1	0.2	3.4	0.0	0.9	0.0	0.0				

Intersection Summary

HCM 6th Ctrl Delay	60.9
HCM 6th LOS	E

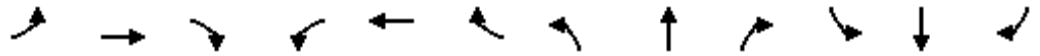
Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Timings

12: Grinnel Blvd & Powers Blvd (SH-21)

04/16/2020

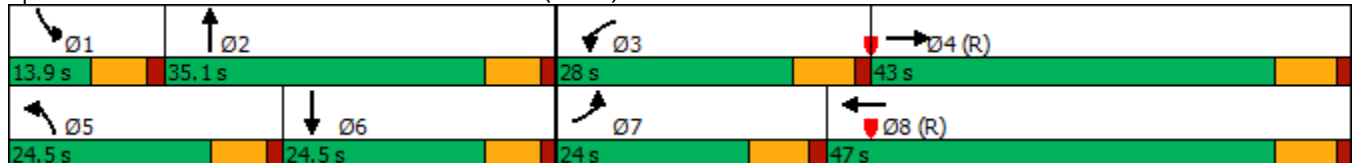


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↑↑	↔	↔	↑↑	↔	↔↔	↑↑	↔	↔↔	↑↑	↔
Traffic Volume (vph)	297	747	515	174	524	130	302	181	82	92	211	212
Future Volume (vph)	297	747	515	174	524	130	302	181	82	92	211	212
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free			Free			Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	12.0	25.0		12.0	25.0		24.5	24.5		11.5	24.5	
Total Split (s)	24.0	43.0		28.0	47.0		24.5	35.1		13.9	24.5	
Total Split (%)	20.0%	35.8%		23.3%	39.2%		20.4%	29.3%		11.6%	20.4%	
Yellow Time (s)	5.5	5.5		5.5	5.5		5.0	5.0		5.0	5.0	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	-0.5		-0.5	-0.5		-0.5	0.0		0.0	0.0	
Total Lost Time (s)	7.0	6.5		6.5	6.5		6.0	6.5		6.5	6.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max		None	C-Max		None	Max		None	Max	
Act Effct Green (s)	15.5	40.1	120.0	17.9	42.0	120.0	16.5	28.8	120.0	7.2	20.0	120.0
Actuated g/C Ratio	0.13	0.33	1.00	0.15	0.35	1.00	0.14	0.24	1.00	0.06	0.17	1.00
v/c Ratio	0.73	0.71	0.36	0.72	0.48	0.09	0.70	0.23	0.07	0.49	0.39	0.15
Control Delay	60.3	39.9	0.6	87.0	20.7	0.1	60.0	34.6	0.1	53.6	37.6	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.3	39.9	0.6	87.0	20.7	0.1	60.0	34.6	0.1	53.6	37.6	0.2
LOS	E	D	A	F	C	A	E	C	A	D	D	A
Approach Delay		30.8			31.4			41.7			25.1	
Approach LOS		C			C			D			C	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.73
 Intersection Signal Delay: 31.9
 Intersection LOS: C
 Intersection Capacity Utilization 66.0%
 ICU Level of Service C
 Analysis Period (min) 15

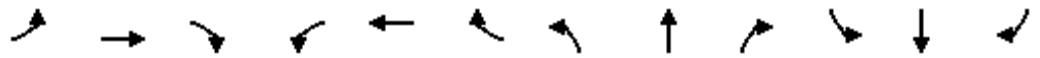
Splits and Phases: 12: Grinnel Blvd & Powers Blvd (SH-21)



HCM 6th Signalized Intersection Summary
 12: Grinnel Blvd & Powers Blvd (SH-21)

2022 Total PM Imp_3-13-14.syn

04/16/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↗	↕	↖	↗	↕	↖	↖↗	↕	↖	↖↗	↕	↖
Traffic Volume (veh/h)	297	747	515	174	524	130	302	181	82	92	211	212
Future Volume (veh/h)	297	747	515	174	524	130	302	181	82	92	211	212
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1811	1856	1856	1811	1870	1856	1870	1856	1870	1870	1870
Adj Flow Rate, veh/h	323	812	0	189	570	0	325	197	0	100	229	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.93	0.92	0.75	0.92	0.92	0.92
Percent Heavy Veh, %	2	6	3	3	6	2	3	2	3	2	2	2
Cap, veh/h	387	1286		225	1325		403	847		152	600	
Arrive On Green	0.11	0.37	0.00	0.13	0.39	0.00	0.12	0.24	0.00	0.04	0.17	0.00
Sat Flow, veh/h	3456	3441	1572	1767	3441	1585	3428	3554	1572	3456	3554	1585
Grp Volume(v), veh/h	323	812	0	189	570	0	325	197	0	100	229	0
Grp Sat Flow(s),veh/h/ln	1728	1721	1572	1767	1721	1585	1714	1777	1572	1728	1777	1585
Q Serve(g_s), s	11.0	23.2	0.0	12.5	14.7	0.0	11.1	5.4	0.0	3.4	6.9	0.0
Cycle Q Clear(g_c), s	11.0	23.2	0.0	12.5	14.7	0.0	11.1	5.4	0.0	3.4	6.9	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	387	1286		225	1325		403	847		152	600	
V/C Ratio(X)	0.84	0.63		0.84	0.43		0.81	0.23		0.66	0.38	
Avail Cap(c_a), veh/h	490	1286		317	1325		529	847		213	600	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	52.2	30.8	0.0	51.2	27.2	0.0	51.6	36.9	0.0	56.5	44.3	0.0
Incr Delay (d2), s/veh	9.7	2.4	0.0	13.1	1.0	0.0	6.8	0.6	0.0	4.8	1.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.3	10.0	0.0	6.4	6.2	0.0	5.1	2.4	0.0	1.6	3.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	61.9	33.2	0.0	64.2	28.2	0.0	58.4	37.5	0.0	61.3	46.1	0.0
LnGrp LOS	E	C		E	C		E	D		E	D	
Approach Vol, veh/h		1135	A		759	A		522	A		329	A
Approach Delay, s/veh		41.3			37.2			50.5			50.8	
Approach LOS		D			D			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	11.8	35.1	21.8	51.4	20.1	26.8	20.4	52.7				
Change Period (Y+Rc), s	6.5	6.5	7.0	7.0	6.5	6.5	7.0	7.0				
Max Green Setting (Gmax), s	7.4	28.6	21.0	36.0	18.0	18.0	17.0	40.0				
Max Q Clear Time (g_c+I1), s	5.4	7.4	14.5	25.2	13.1	8.9	13.0	16.7				
Green Ext Time (p_c), s	0.0	1.1	0.3	4.2	0.5	0.9	0.4	4.0				

Intersection Summary

HCM 6th Ctrl Delay	43.1
HCM 6th LOS	D

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Timings
12: Grinnel Blvd & Powers Blvd (SH-21)

2030 Total AM.syn
05/01/2020

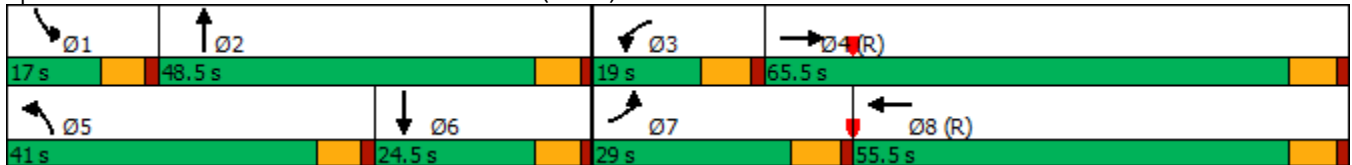
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↖	↑↑	↗	↖↖	↑↑	↗	↖↖	↑↑	↗	↖↖	↑↑	↗
Traffic Volume (vph)	485	616	333	148	945	145	722	440	263	121	275	407
Future Volume (vph)	485	616	333	148	945	145	722	440	263	121	275	407
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free			Free			Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	12.0	25.0		12.0	25.0		11.5	24.5		11.5	24.5	
Total Split (s)	29.0	65.5		19.0	55.5		41.0	48.5		17.0	24.5	
Total Split (%)	19.3%	43.7%		12.7%	37.0%		27.3%	32.3%		11.3%	16.3%	
Yellow Time (s)	5.5	5.5		5.5	5.5		5.0	5.0		5.0	5.0	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	7.0	7.0		7.0	7.0		6.5	6.5		6.5	6.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max		None	C-Max		None	Max		None	Max	
Act Effct Green (s)	22.0	59.3	150.0	11.2	48.5	150.0	34.5	42.6	150.0	9.9	18.0	150.0
Actuated g/C Ratio	0.15	0.40	1.00	0.07	0.32	1.00	0.23	0.28	1.00	0.07	0.12	1.00
v/c Ratio	1.05	0.51	0.23	0.64	0.95	0.10	0.99	0.48	0.18	0.59	0.71	0.28
Control Delay	116.6	17.7	0.3	79.4	67.3	0.1	87.5	46.5	0.3	78.8	73.3	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	116.6	17.7	0.3	79.4	67.3	0.1	87.5	46.5	0.3	78.8	73.3	0.4
LOS	F	B	A	E	E	A	F	D	A	E	E	A
Approach Delay		47.3			60.9			58.4			37.2	
Approach LOS		D			E			E			D	

Intersection Summary

Cycle Length: 150
 Actuated Cycle Length: 150
 Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Green
 Natural Cycle: 150
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.05
 Intersection Signal Delay: 52.3
 Intersection Capacity Utilization 90.7%
 Analysis Period (min) 15

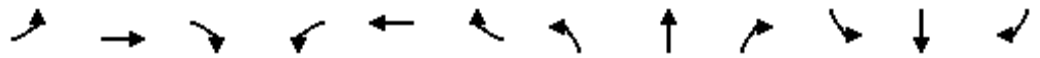
Intersection LOS: D
 ICU Level of Service E

Splits and Phases: 12: Grinnel Blvd & Powers Blvd (SH-21)



HCM 6th Signalized Intersection Summary
 12: Grinnel Blvd & Powers Blvd (SH-21)

2030 Total AM.syn
 05/01/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↗	↑↑	↖	↖↗	↑↑	↖	↖↗	↑↑	↖	↖↗	↑↑	↖
Traffic Volume (veh/h)	485	616	333	148	945	145	722	440	263	121	275	407
Future Volume (veh/h)	485	616	333	148	945	145	722	440	263	121	275	407
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1781	1841	1841	1781	1870	1841	1870	1841	1870	1870	1870
Adj Flow Rate, veh/h	527	670	0	161	1027	0	768	478	0	132	299	0
Peak Hour Factor	0.92	0.92	0.94	0.92	0.92	0.92	0.94	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	8	4	4	8	2	4	2	4	2	2	2
Cap, veh/h	507	1385		207	1094		782	1061		178	426	
Arrive On Green	0.15	0.41	0.00	0.06	0.32	0.00	0.23	0.30	0.00	0.05	0.12	0.00
Sat Flow, veh/h	3456	3385	1560	3401	3385	1585	3401	3554	1560	3456	3554	1585
Grp Volume(v), veh/h	527	670	0	161	1027	0	768	478	0	132	299	0
Grp Sat Flow(s),veh/h/ln	1728	1692	1560	1700	1692	1585	1700	1777	1560	1728	1777	1585
Q Serve(g_s), s	22.0	21.9	0.0	7.0	44.2	0.0	33.7	16.4	0.0	5.7	12.1	0.0
Cycle Q Clear(g_c), s	22.0	21.9	0.0	7.0	44.2	0.0	33.7	16.4	0.0	5.7	12.1	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	507	1385		207	1094		782	1061		178	426	
V/C Ratio(X)	1.04	0.48		0.78	0.94		0.98	0.45		0.74	0.70	
Avail Cap(c_a), veh/h	507	1385		272	1094		782	1061		242	426	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	64.0	32.6	0.0	69.4	49.3	0.0	57.4	42.6	0.0	70.2	63.4	0.0
Incr Delay (d2), s/veh	50.7	1.2	0.0	10.0	15.9	0.0	27.6	1.4	0.0	7.9	9.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	13.3	9.3	0.0	3.3	21.1	0.0	17.5	7.5	0.0	2.7	6.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	114.7	33.9	0.0	79.5	65.2	0.0	85.0	44.0	0.0	78.1	72.7	0.0
LnGrp LOS	F	C		E	E		F	D		E	E	
Approach Vol, veh/h		1197	A		1188	A		1246	A		431	A
Approach Delay, s/veh		69.4			67.1			69.3			74.3	
Approach LOS		E			E			E			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	14.2	51.3	16.1	68.4	41.0	24.5	29.0	55.5				
Change Period (Y+Rc), s	6.5	6.5	7.0	7.0	6.5	6.5	7.0	7.0				
Max Green Setting (Gmax), s	10.5	42.0	12.0	58.5	34.5	18.0	22.0	48.5				
Max Q Clear Time (g_c+I1), s	7.7	18.4	9.0	23.9	35.7	14.1	24.0	46.2				
Green Ext Time (p_c), s	0.1	3.3	0.1	5.3	0.0	0.6	0.0	1.5				

Intersection Summary

HCM 6th Ctrl Delay	69.2
HCM 6th LOS	E

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Timings
12: Grinnel Blvd & Powers Blvd (SH-21)

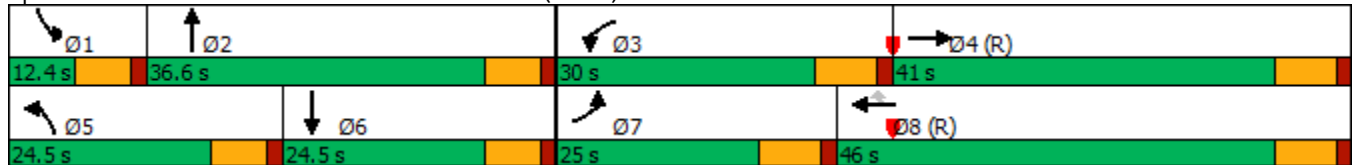
2030 Total PM.syn
04/16/2020

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↖	↑↑	↗	↖↖	↑↑	↗	↖↖	↑↑	↗	↖↖	↑↑	↗
Traffic Volume (vph)	307	820	617	275	609	90	365	202	102	66	310	246
Future Volume (vph)	307	820	617	275	609	90	365	202	102	66	310	246
Turn Type	Prot	NA	Free	Prot	NA	Perm	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			8			Free			Free
Detector Phase	7	4		3	8	8	5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	12.0	25.0		12.0	25.0	25.0	24.5	24.5		11.5	24.5	
Total Split (s)	25.0	41.0		30.0	46.0	46.0	24.5	36.6		12.4	24.5	
Total Split (%)	20.8%	34.2%		25.0%	38.3%	38.3%	20.4%	30.5%		10.3%	20.4%	
Yellow Time (s)	5.5	5.5		5.5	5.5	5.5	5.0	5.0		5.0	5.0	
All-Red Time (s)	1.5	1.5		1.5	1.5	1.5	1.5	1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	-0.5		-0.5	-0.5	0.0	-0.5	0.0		0.0	0.0	
Total Lost Time (s)	7.0	6.5		6.5	6.5	7.0	6.0	6.5		6.5	6.5	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max		None	C-Max	C-Max	None	Max		None	Max	
Act Effct Green (s)	16.1	41.7	120.0	16.3	41.4	40.9	17.6	32.6	120.0	5.9	18.9	120.0
Actuated g/C Ratio	0.13	0.35	1.00	0.14	0.34	0.34	0.15	0.27	1.00	0.05	0.16	1.00
v/c Ratio	0.73	0.75	0.43	0.65	0.56	0.14	0.79	0.23	0.07	0.43	0.60	0.17
Control Delay	59.3	40.1	0.9	73.8	23.8	1.2	61.1	35.4	0.1	63.2	44.8	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.3	40.1	0.9	73.8	23.8	1.2	61.1	35.4	0.1	63.2	44.8	0.2
LOS	E	D	A	E	C	A	E	D	A	E	D	A
Approach Delay		29.6			35.8			43.9			29.2	
Approach LOS		C			D			D			C	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.79
 Intersection Signal Delay: 33.4
 Intersection LOS: C
 Intersection Capacity Utilization 70.7%
 ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 12: Grinnel Blvd & Powers Blvd (SH-21)



HCM 6th Signalized Intersection Summary
 12: Grinnel Blvd & Powers Blvd (SH-21)

2030 Total PM.syn
 04/16/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↗	↑↑	↖	↖↗	↑↑	↖	↖↗	↑↑	↖	↖↗	↑↑	↖
Traffic Volume (veh/h)	307	820	617	275	609	90	365	202	102	66	310	246
Future Volume (veh/h)	307	820	617	275	609	90	365	202	102	66	310	246
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1811	1856	1856	1811	1870	1856	1870	1856	1870	1870	1870
Adj Flow Rate, veh/h	334	891	0	299	662	0	392	220	0	72	337	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.93	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	6	3	3	6	2	3	2	3	2	2	2
Cap, veh/h	399	1316		384	1290		465	891		131	558	
Arrive On Green	0.12	0.38	0.00	0.11	0.37	0.00	0.14	0.25	0.00	0.04	0.16	0.00
Sat Flow, veh/h	3456	3441	1572	3428	3441	1585	3428	3554	1572	3456	3554	1585
Grp Volume(v), veh/h	334	891	0	299	662	0	392	220	0	72	337	0
Grp Sat Flow(s),veh/h/ln	1728	1721	1572	1714	1721	1585	1714	1777	1572	1728	1777	1585
Q Serve(g_s), s	11.4	25.9	0.0	10.2	17.9	0.0	13.4	5.9	0.0	2.5	10.6	0.0
Cycle Q Clear(g_c), s	11.4	25.9	0.0	10.2	17.9	0.0	13.4	5.9	0.0	2.5	10.6	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	399	1316		384	1290		465	891		131	558	
V/C Ratio(X)	0.84	0.68		0.78	0.51		0.84	0.25		0.55	0.60	
Avail Cap(c_a), veh/h	518	1316		671	1290		529	891		170	558	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	52.0	30.9	0.0	51.8	29.0	0.0	50.6	35.9	0.0	56.7	47.1	0.0
Incr Delay (d2), s/veh	9.1	2.8	0.0	3.4	1.5	0.0	10.7	0.7	0.0	3.6	4.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.4	11.2	0.0	4.6	7.6	0.0	6.4	2.7	0.0	1.1	5.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	61.0	33.7	0.0	55.2	30.5	0.0	61.3	36.6	0.0	60.3	51.9	0.0
LnGrp LOS	E	C		E	C		E	D		E	D	
Approach Vol, veh/h		1225	A		961	A		612	A		409	A
Approach Delay, s/veh		41.1			38.2			52.4			53.4	
Approach LOS		D			D			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	11.0	36.6	20.0	52.4	22.3	25.4	20.9	51.5				
Change Period (Y+Rc), s	6.5	6.5	7.0	7.0	6.5	6.5	7.0	7.0				
Max Green Setting (Gmax), s	5.9	30.1	23.0	34.0	18.0	18.0	18.0	39.0				
Max Q Clear Time (g_c+I1), s	4.5	7.9	12.2	27.9	15.4	12.6	13.4	19.9				
Green Ext Time (p_c), s	0.0	1.3	0.8	3.1	0.4	1.0	0.5	4.5				

Intersection Summary

HCM 6th Ctrl Delay	44.0
HCM 6th LOS	D

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Timings
12: Grinnel Blvd & Powers Blvd (SH-21)

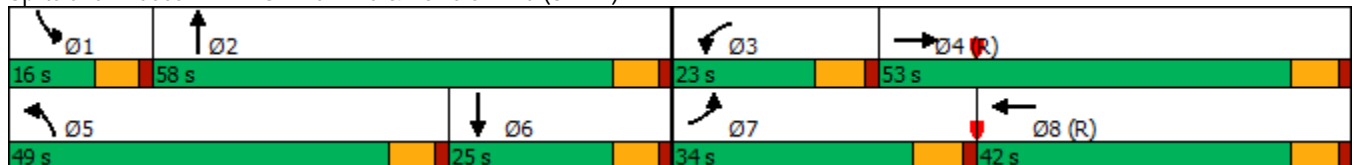
2045 Total AM.syn

04/16/2020

	←		→		←		→		←		→	
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↑↑↑	↔	↔↔	↑↑↑	↔	↔↔	↑↑	↔	↔↔	↑↑	↔
Traffic Volume (vph)	537	800	430	193	1110	145	921	689	468	121	311	419
Future Volume (vph)	537	800	430	193	1110	145	921	689	468	121	311	419
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free			Free			Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	12.0	25.0		12.0	25.0		24.5	24.5		11.5	24.5	
Total Split (s)	34.0	53.0		23.0	42.0		49.0	58.0		16.0	25.0	
Total Split (%)	22.7%	35.3%		15.3%	28.0%		32.7%	38.7%		10.7%	16.7%	
Yellow Time (s)	5.5	5.5		5.5	5.5		5.0	5.0		5.0	5.0	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	7.0	7.0		7.0	7.0		6.5	6.5		6.5	6.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max		None	C-Max		None	Max		None	Max	
Act Effect Green (s)	26.8	47.9	150.0	14.1	35.2	150.0	42.5	51.8	150.0	9.2	18.5	150.0
Actuated g/C Ratio	0.18	0.32	1.00	0.09	0.23	1.00	0.28	0.35	1.00	0.06	0.12	1.00
v/c Ratio	0.94	0.55	0.29	0.67	1.04	0.10	1.02	0.61	0.33	0.63	0.78	0.28
Control Delay	57.2	31.2	0.3	76.2	91.4	0.1	85.8	43.5	0.6	82.3	76.6	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.2	31.2	0.3	76.2	91.4	0.1	85.8	43.5	0.6	82.3	76.6	0.5
LOS	E	C	A	E	F	A	F	D	A	F	E	A
Approach Delay		31.7			80.0			52.1			40.1	
Approach LOS		C			E			D			D	

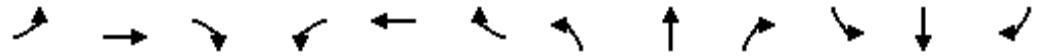
Intersection Summary
 Cycle Length: 150
 Actuated Cycle Length: 150
 Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Green
 Natural Cycle: 150
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.04
 Intersection Signal Delay: 51.1
 Intersection LOS: D
 Intersection Capacity Utilization 94.1%
 ICU Level of Service F
 Analysis Period (min) 15

Splits and Phases: 12: Grinnel Blvd & Powers Blvd (SH-21)



HCM 6th Signalized Intersection Summary
 12: Grinnel Blvd & Powers Blvd (SH-21)

2045 Total AM.syn
 04/16/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↗	↑↑↑	↖	↖↗	↑↑↑	↖	↖↗	↑↑	↖	↖↗	↑↑	↖
Traffic Volume (veh/h)	537	800	430	193	1110	145	921	689	468	121	311	419
Future Volume (veh/h)	537	800	430	193	1110	145	921	689	468	121	311	419
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1781	1841	1841	1781	1870	1841	1870	1841	1870	1870	1870
Adj Flow Rate, veh/h	577	851	0	210	1168	0	969	749	0	132	338	0
Peak Hour Factor	0.93	0.94	0.94	0.92	0.95	0.92	0.95	0.92	0.92	0.92	0.92	0.93
Percent Heavy Veh, %	2	8	4	4	8	2	4	2	4	2	2	2
Cap, veh/h	617	1640		259	1142		964	1263		177	438	
Arrive On Green	0.18	0.34	0.00	0.08	0.23	0.00	0.28	0.36	0.00	0.05	0.12	0.00
Sat Flow, veh/h	3456	4863	1560	3401	4863	1585	3401	3554	1560	3456	3554	1585
Grp Volume(v), veh/h	577	851	0	210	1168	0	969	749	0	132	338	0
Grp Sat Flow(s),veh/h/ln	1728	1621	1560	1700	1621	1585	1700	1777	1560	1728	1777	1585
Q Serve(g_s), s	24.7	21.1	0.0	9.1	35.2	0.0	42.5	25.8	0.0	5.7	13.8	0.0
Cycle Q Clear(g_c), s	24.7	21.1	0.0	9.1	35.2	0.0	42.5	25.8	0.0	5.7	13.8	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	617	1640		259	1142		964	1263		177	438	
V/C Ratio(X)	0.94	0.52		0.81	1.02		1.01	0.59		0.75	0.77	
Avail Cap(c_a), veh/h	622	1640		363	1142		964	1263		219	438	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	60.8	39.9	0.0	68.2	57.4	0.0	53.8	39.5	0.0	70.2	63.7	0.0
Incr Delay (d2), s/veh	21.5	1.2	0.0	9.2	32.6	0.0	30.4	2.1	0.0	10.3	12.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.7	8.7	0.0	4.3	17.9	0.0	22.2	11.7	0.0	2.8	7.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	82.2	41.1	0.0	77.4	90.0	0.0	84.1	41.5	0.0	80.5	76.1	0.0
LnGrp LOS	F	D		E	F		F	D		F	E	
Approach Vol, veh/h		1428	A		1378	A		1718	A		470	A
Approach Delay, s/veh		57.7			88.1			65.5			77.3	
Approach LOS		E			F			E			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	14.2	59.8	18.4	57.6	49.0	25.0	33.8	42.2				
Change Period (Y+Rc), s	6.5	6.5	7.0	7.0	6.5	6.5	7.0	7.0				
Max Green Setting (Gmax), s	9.5	51.5	16.0	46.0	42.5	18.5	27.0	35.0				
Max Q Clear Time (g_c+I1), s	7.7	27.8	11.1	23.1	44.5	15.8	26.7	37.2				
Green Ext Time (p_c), s	0.1	5.5	0.3	6.4	0.0	0.5	0.1	0.0				

Intersection Summary

HCM 6th Ctrl Delay	70.6
HCM 6th LOS	E

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Timings
12: Grinnel Blvd & Powers Blvd (SH-21)

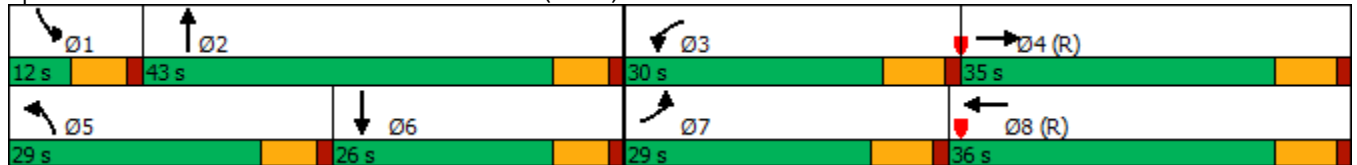
2045 Total PM.syn
04/16/2020

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	320	966	794	450	780	90	471	223	131	66	511	297
Future Volume (vph)	320	966	794	450	780	90	471	223	131	66	511	297
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free			Free			Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	12.0	25.0		12.0	25.0		24.5	24.5		11.5	24.5	
Total Split (s)	29.0	35.0		30.0	36.0		29.0	43.0		12.0	26.0	
Total Split (%)	24.2%	29.2%		25.0%	30.0%		24.2%	35.8%		10.0%	21.7%	
Yellow Time (s)	5.5	5.5		5.5	5.5		5.0	5.0		5.0	5.0	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	7.0	7.0		7.0	7.0		6.5	6.5		6.5	6.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max		None	C-Max		None	Max		None	Max	
Act Effect Green (s)	17.4	29.9	120.0	21.1	33.6	120.0	21.2	38.9	120.0	5.5	20.8	120.0
Actuated g/C Ratio	0.14	0.25	1.00	0.18	0.28	1.00	0.18	0.32	1.00	0.05	0.17	1.00
v/c Ratio	0.70	0.86	0.55	0.82	0.62	0.06	0.84	0.21	0.09	0.46	0.91	0.20
Control Delay	56.5	51.8	1.4	73.9	39.7	0.1	58.0	29.7	0.1	61.8	85.2	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.5	51.8	1.4	73.9	39.7	0.1	58.0	29.7	0.1	61.8	85.2	0.3
LOS	E	D	A	E	D	A	E	C	A	E	F	A
Approach Delay		33.3			48.6			41.1			54.6	
Approach LOS		C			D			D			D	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.91
 Intersection Signal Delay: 42.2
 Intersection LOS: D
 Intersection Capacity Utilization 81.6%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 12: Grinnel Blvd & Powers Blvd (SH-21)



HCM 6th Signalized Intersection Summary
 12: Grinnel Blvd & Powers Blvd (SH-21)

2045 Total PM.syn
 04/16/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↗	↑↑↑	↖	↖↗	↑↑↑	↖	↖↗	↑↑	↖	↖↗	↑↑	↖
Traffic Volume (veh/h)	320	966	794	450	780	90	471	223	131	66	511	297
Future Volume (veh/h)	320	966	794	450	780	90	471	223	131	66	511	297
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1811	1856	1856	1811	1870	1856	1870	1856	1870	1870	1870
Adj Flow Rate, veh/h	348	1050	0	489	848	0	506	242	0	72	555	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.93	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	6	3	3	6	2	3	2	3	2	2	2
Cap, veh/h	421	1337		557	1539		571	1081		131	624	
Arrive On Green	0.12	0.27	0.00	0.16	0.31	0.00	0.17	0.30	0.00	0.04	0.18	0.00
Sat Flow, veh/h	3456	4944	1572	3428	4944	1585	3428	3554	1572	3456	3554	1585
Grp Volume(v), veh/h	348	1050	0	489	848	0	506	242	0	72	555	0
Grp Sat Flow(s),veh/h/ln	1728	1648	1572	1714	1648	1585	1714	1777	1572	1728	1777	1585
Q Serve(g_s), s	11.8	23.6	0.0	16.7	17.1	0.0	17.3	6.1	0.0	2.5	18.3	0.0
Cycle Q Clear(g_c), s	11.8	23.6	0.0	16.7	17.1	0.0	17.3	6.1	0.0	2.5	18.3	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	421	1337		557	1539		571	1081		131	624	
V/C Ratio(X)	0.83	0.79		0.88	0.55		0.89	0.22		0.55	0.89	
Avail Cap(c_a), veh/h	634	1337		657	1539		643	1081		158	624	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	51.5	40.6	0.0	49.1	34.4	0.0	48.9	31.2	0.0	56.7	48.3	0.0
Incr Delay (d2), s/veh	5.6	4.7	0.0	11.5	1.4	0.0	13.1	0.5	0.0	3.6	17.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.4	10.1	0.0	8.0	7.1	0.0	8.4	2.7	0.0	1.1	9.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	57.1	45.3	0.0	60.5	35.8	0.0	62.0	31.7	0.0	60.3	65.5	0.0
LnGrp LOS	E	D		E	D		E	C		E	E	
Approach Vol, veh/h		1398	A		1337	A		748	A		627	A
Approach Delay, s/veh		48.2			44.8			52.2			64.9	
Approach LOS		D			D			D			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	11.0	43.0	26.5	39.4	26.5	27.6	21.6	44.4				
Change Period (Y+Rc), s	6.5	6.5	7.0	7.0	6.5	6.5	7.0	7.0				
Max Green Setting (Gmax), s	5.5	36.5	23.0	28.0	22.5	19.5	22.0	29.0				
Max Q Clear Time (g_c+l1), s	4.5	8.1	18.7	25.6	19.3	20.3	13.8	19.1				
Green Ext Time (p_c), s	0.0	1.6	0.8	1.5	0.7	0.0	0.8	4.1				

Intersection Summary

HCM 6th Ctrl Delay	50.4
HCM 6th LOS	D

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection

Int Delay, s/veh 0.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↘	↕↕	↕↕	↗	↘	↗
Traffic Vol, veh/h	11	618	945	82	13	1
Future Vol, veh/h	11	618	945	82	13	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Free	-	Free
Storage Length	1000	-	-	650	0	0
Veh in Median Storage, #	-	0	0	-	1	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	93	81	73	65	25
Heavy Vehicles, %	2	8	8	2	2	2
Mvmt Flow	12	665	1167	112	20	4

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	1167	0	0 1524
Stage 1	-	-	- 1167
Stage 2	-	-	- 357
Critical Hdwy	4.14	-	- 6.84
Critical Hdwy Stg 1	-	-	- 5.84
Critical Hdwy Stg 2	-	-	- 5.84
Follow-up Hdwy	2.22	-	- 3.52
Pot Cap-1 Maneuver	594	-	0 109 0
Stage 1	-	-	0 258 0
Stage 2	-	-	0 679 0
Platoon blocked, %	-	-	
Mov Cap-1 Maneuver	594	-	- 107
Mov Cap-2 Maneuver	-	-	- 204
Stage 1	-	-	- 253
Stage 2	-	-	- 679

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	24.6
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	SBLn1	SBLn2
Capacity (veh/h)	594	-	-	204	-
HCM Lane V/C Ratio	0.02	-	-	0.098	-
HCM Control Delay (s)	11.2	-	-	24.6	0
HCM Lane LOS	B	-	-	C	A
HCM 95th %tile Q(veh)	0.1	-	-	0.3	-

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↘	↗↗	↗↗	↘	↘	↘
Traffic Vol, veh/h	3	778	642	11	49	8
Future Vol, veh/h	3	778	642	11	49	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Free	-	Free
Storage Length	1000	-	-	650	0	0
Veh in Median Storage, #	-	0	0	-	1	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	75	88	91	46	88	92
Heavy Vehicles, %	2	6	6	2	2	2
Mvmt Flow	4	884	705	24	56	9

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	705	0	-	0	1155
Stage 1	-	-	-	-	705
Stage 2	-	-	-	-	450
Critical Hdwy	4.14	-	-	-	6.84
Critical Hdwy Stg 1	-	-	-	-	5.84
Critical Hdwy Stg 2	-	-	-	-	5.84
Follow-up Hdwy	2.22	-	-	-	3.52
Pot Cap-1 Maneuver	889	-	-	0	190
Stage 1	-	-	-	0	451
Stage 2	-	-	-	0	609
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	889	-	-	-	189
Mov Cap-2 Maneuver	-	-	-	-	319
Stage 1	-	-	-	-	449
Stage 2	-	-	-	-	609

Approach	EB	WB	SB
HCM Control Delay, s	0	0	18.7
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	SBLn1	SBLn2
Capacity (veh/h)	889	-	-	319	-
HCM Lane V/C Ratio	0.004	-	-	0.175	-
HCM Control Delay (s)	9.1	-	-	18.7	0
HCM Lane LOS	A	-	-	C	A
HCM 95th %tile Q(veh)	0	-	-	0.6	-

Intersection						
Int Delay, s/veh	3.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↘	↗↗	↗↗	↗	↘	↗
Traffic Vol, veh/h	38	818	1224	222	99	8
Future Vol, veh/h	38	818	1224	222	99	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Free	-	Free
Storage Length	1000	-	-	800	0	0
Veh in Median Storage, #	-	0	0	-	1	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	93	92	73	92	92
Heavy Vehicles, %	2	8	8	2	2	2
Mvmt Flow	41	880	1330	304	108	9

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	1330	0	0 1852
Stage 1	-	-	- 1330
Stage 2	-	-	- 522
Critical Hdwy	4.14	-	- 6.84
Critical Hdwy Stg 1	-	-	- 5.84
Critical Hdwy Stg 2	-	-	- 5.84
Follow-up Hdwy	2.22	-	- 3.52
Pot Cap-1 Maneuver	515	-	0 ~ 66 0
Stage 1	-	-	0 211 0
Stage 2	-	-	0 560 0
Platoon blocked, %	-	-	
Mov Cap-1 Maneuver	515	-	- ~ 61 -
Mov Cap-2 Maneuver	-	-	- 152 -
Stage 1	-	-	- 194 -
Stage 2	-	-	- 560 -

Approach	EB	WB	SB
HCM Control Delay, s	0.6	0	71.9
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	SBLn1	SBLn2
Capacity (veh/h)	515	-	-	152	-
HCM Lane V/C Ratio	0.08	-	-	0.708	-
HCM Control Delay (s)	12.6	-	-	71.9	0
HCM Lane LOS	B	-	-	F	A
HCM 95th %tile Q(veh)	0.3	-	-	4.2	-

Notes
 -: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection						
Int Delay, s/veh	6.7					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↘	↑↑	↑↑	↗	↘	↗
Traffic Vol, veh/h	11	898	826	71	192	31
Future Vol, veh/h	11	898	826	71	192	31
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Free	-	Free
Storage Length	1000	-	-	800	0	0
Veh in Median Storage, #	-	0	0	-	1	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	75	88	91	92	92	92
Heavy Vehicles, %	2	6	6	2	2	2
Mvmt Flow	15	1020	908	77	209	34

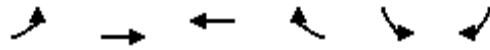
Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	908	0	0 1448
Stage 1	-	-	- 908
Stage 2	-	-	- 540
Critical Hdwy	4.14	-	- 6.84
Critical Hdwy Stg 1	-	-	- 5.84
Critical Hdwy Stg 2	-	-	- 5.84
Follow-up Hdwy	2.22	-	- 3.52
Pot Cap-1 Maneuver	745	-	0 ~ 122 0
Stage 1	-	-	0 354 0
Stage 2	-	-	0 548 0
Platoon blocked, %	-	-	
Mov Cap-1 Maneuver	745	-	- ~ 120 -
Mov Cap-2 Maneuver	-	-	- 245 -
Stage 1	-	-	- 347 -
Stage 2	-	-	- 548 -

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	68.5
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	SBLn1	SBLn2
Capacity (veh/h)	745	-	-	245	-
HCM Lane V/C Ratio	0.02	-	-	0.852	-
HCM Control Delay (s)	9.9	-	-	68.5	0
HCM Lane LOS	A	-	-	F	A
HCM 95th %tile Q(veh)	0.1	-	-	6.9	-

Notes
 -: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Timings
 13: Powers Blvd (SH-21) & Peak Innovation Parkway

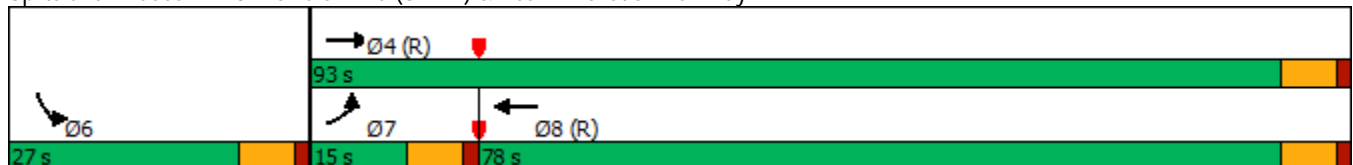


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↗↗	↖↖	↗	↘	↘
Traffic Volume (vph)	38	818	1224	222	99	8
Future Volume (vph)	38	818	1224	222	99	8
Turn Type	Prot	NA	NA	Free	Prot	Free
Protected Phases	7	4	8		6	
Permitted Phases				Free		Free
Detector Phase	7	4	8		6	
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0		5.0	
Minimum Split (s)	11.5	24.5	24.5		24.5	
Total Split (s)	15.0	93.0	78.0		27.0	
Total Split (%)	12.5%	77.5%	65.0%		22.5%	
Yellow Time (s)	5.0	5.0	5.0		5.0	
All-Red Time (s)	1.5	1.5	1.5		1.5	
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	
Total Lost Time (s)	6.5	6.5	6.5		6.5	
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	None	C-Max	C-Max		Max	
Act Effect Green (s)	7.5	86.5	74.9	120.0	20.5	120.0
Actuated g/C Ratio	0.06	0.72	0.62	1.00	0.17	1.00
v/c Ratio	0.37	0.37	0.64	0.19	0.36	0.01
Control Delay	81.1	2.0	16.7	0.3	47.9	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	81.1	2.0	16.7	0.3	47.9	0.0
LOS	F	A	B	A	D	A
Approach Delay		5.5	13.6		44.2	
Approach LOS		A	B		D	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.64
 Intersection Signal Delay: 12.2
 Intersection LOS: B
 Intersection Capacity Utilization 50.2%
 ICU Level of Service A
 Analysis Period (min) 15

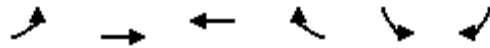
Splits and Phases: 13: Powers Blvd (SH-21) & Peak Innovation Parkway



HCM 6th Signalized Intersection Summary
 13: Powers Blvd (SH-21) & Peak Innovation Parkway

2022 Total AM Imp_3-13-14.syn

04/16/2020



Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations	↶	↷	↷	↷	↶	↷	
Traffic Volume (veh/h)	38	818	1224	222	99	8	
Future Volume (veh/h)	38	818	1224	222	99	8	
Initial Q (Qb), veh	0	0	0	0	0	0	
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	
Work Zone On Approach		No	No		No		
Adj Sat Flow, veh/h/ln	1870	1781	1781	1870	1870	1870	
Adj Flow Rate, veh/h	41	880	1330	0	108	0	
Peak Hour Factor	0.92	0.93	0.92	0.73	0.92	0.92	
Percent Heavy Veh, %	2	8	8	2	2	2	
Cap, veh/h	55	2440	2151		304		
Arrive On Green	0.03	0.72	0.64	0.00	0.17	0.00	
Sat Flow, veh/h	1781	3474	3474	1585	1781	1585	
Grp Volume(v), veh/h	41	880	1330	0	108	0	
Grp Sat Flow(s),veh/h/ln	1781	1692	1692	1585	1781	1585	
Q Serve(g_s), s	2.7	11.8	28.3	0.0	6.4	0.0	
Cycle Q Clear(g_c), s	2.7	11.8	28.3	0.0	6.4	0.0	
Prop In Lane	1.00			1.00	1.00	1.00	
Lane Grp Cap(c), veh/h	55	2440	2151		304		
V/C Ratio(X)	0.74	0.36	0.62		0.35		
Avail Cap(c_a), veh/h	126	2440	2151		304		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	0.00	
Uniform Delay (d), s/veh	57.7	6.3	13.1	0.0	43.9	0.0	
Incr Delay (d2), s/veh	17.5	0.4	1.3	0.0	3.2	0.0	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln	1.5	4.0	10.6	0.0	3.1	0.0	
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh	75.2	6.7	14.5	0.0	47.1	0.0	
LnGrp LOS	E	A	B		D		
Approach Vol, veh/h		921	1330	A	108	A	
Approach Delay, s/veh		9.8	14.5		47.1		
Approach LOS		A	B		D		
Timer - Assigned Phs				4	6	7	8
Phs Duration (G+Y+Rc), s				93.0	27.0	10.2	82.8
Change Period (Y+Rc), s				6.5	6.5	6.5	6.5
Max Green Setting (Gmax), s				86.5	20.5	8.5	71.5
Max Q Clear Time (g_c+I1), s				13.8	8.4	4.7	30.3
Green Ext Time (p_c), s				8.0	0.2	0.0	14.1

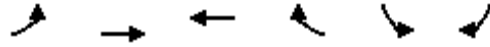
Intersection Summary

HCM 6th Ctrl Delay	14.1
HCM 6th LOS	B

Notes

Unsignalized Delay for [WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Timings
 13: Powers Blvd (SH-21) & Peak Innovation Parkway

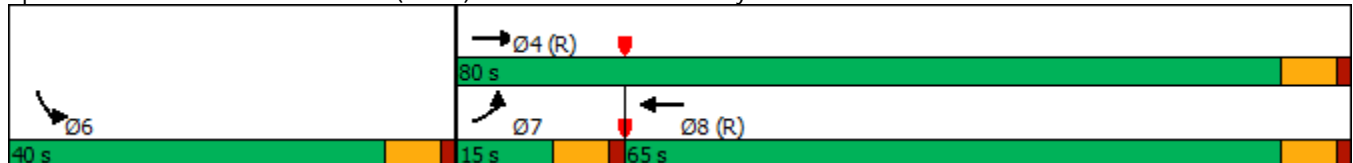


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↕↕	↕↕	↗	↖	↗
Traffic Volume (vph)	11	898	826	71	192	31
Future Volume (vph)	11	898	826	71	192	31
Turn Type	Prot	NA	NA	Free	Prot	Free
Protected Phases	7	4	8		6	
Permitted Phases				Free		Free
Detector Phase	7	4	8		6	
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0		5.0	
Minimum Split (s)	11.5	24.5	24.5		24.5	
Total Split (s)	15.0	80.0	65.0		40.0	
Total Split (%)	12.5%	66.7%	54.2%		33.3%	
Yellow Time (s)	5.0	5.0	5.0		5.0	
All-Red Time (s)	1.5	1.5	1.5		1.5	
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	
Total Lost Time (s)	6.5	6.5	6.5		6.5	
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	None	C-Max	C-Max		Max	
Act Effect Green (s)	6.6	73.5	67.8	120.0	33.5	120.0
Actuated g/C Ratio	0.06	0.61	0.56	1.00	0.28	1.00
v/c Ratio	0.15	0.49	0.47	0.05	0.42	0.02
Control Delay	79.0	2.4	17.6	0.1	38.6	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	79.0	2.4	17.6	0.1	38.6	0.0
LOS	E	A	B	A	D	A
Approach Delay		3.6	16.2		33.2	
Approach LOS		A	B		C	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Green
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.49
 Intersection Signal Delay: 12.2
 Intersection LOS: B
 Intersection Capacity Utilization 46.3%
 ICU Level of Service A
 Analysis Period (min) 15

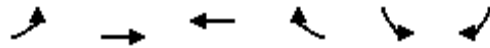
Splits and Phases: 13: Powers Blvd (SH-21) & Peak Innovation Parkway



HCM 6th Signalized Intersection Summary
 13: Powers Blvd (SH-21) & Peak Innovation Parkway

2022 Total PM Imp_3-13-14.syn

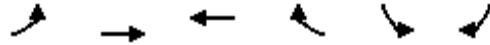
04/16/2020



Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations	↶	↷	↷	↷	↶	↷	
Traffic Volume (veh/h)	11	898	826	71	192	31	
Future Volume (veh/h)	11	898	826	71	192	31	
Initial Q (Qb), veh	0	0	0	0	0	0	
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	
Work Zone On Approach		No	No		No		
Adj Sat Flow, veh/h/ln	1870	1811	1811	1870	1870	1870	
Adj Flow Rate, veh/h	15	1020	908	0	209	0	
Peak Hour Factor	0.75	0.88	0.91	0.92	0.92	0.92	
Percent Heavy Veh, %	2	6	6	2	2	2	
Cap, veh/h	29	2108	1865		497		
Arrive On Green	0.02	0.61	0.54	0.00	0.28	0.00	
Sat Flow, veh/h	1781	3532	3532	1585	1781	1585	
Grp Volume(v), veh/h	15	1020	908	0	209	0	
Grp Sat Flow(s),veh/h/ln	1781	1721	1721	1585	1781	1585	
Q Serve(g_s), s	1.0	19.6	19.7	0.0	11.5	0.0	
Cycle Q Clear(g_c), s	1.0	19.6	19.7	0.0	11.5	0.0	
Prop In Lane	1.00			1.00	1.00	1.00	
Lane Grp Cap(c), veh/h	29	2108	1865		497		
V/C Ratio(X)	0.51	0.48	0.49		0.42		
Avail Cap(c_a), veh/h	126	2108	1865		497		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	0.00	
Uniform Delay (d), s/veh	58.5	12.8	17.1	0.0	35.3	0.0	
Incr Delay (d2), s/veh	13.3	0.8	0.9	0.0	2.6	0.0	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln	0.6	7.5	7.9	0.0	5.4	0.0	
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh	71.8	13.6	18.0	0.0	37.9	0.0	
LnGrp LOS	E	B	B		D		
Approach Vol, veh/h		1035	908	A	209	A	
Approach Delay, s/veh		14.4	18.0		37.9		
Approach LOS		B	B		D		
Timer - Assigned Phs				4	6	7	8
Phs Duration (G+Y+Rc), s				80.0	40.0	8.5	71.5
Change Period (Y+Rc), s				6.5	6.5	6.5	6.5
Max Green Setting (Gmax), s				73.5	33.5	8.5	58.5
Max Q Clear Time (g_c+I1), s				21.6	13.5	3.0	21.7
Green Ext Time (p_c), s				9.8	0.6	0.0	7.9
Intersection Summary							
HCM 6th Ctrl Delay			18.2				
HCM 6th LOS			B				
Notes							
Unsignalized Delay for [WBR, SBR] is excluded from calculations of the approach delay and intersection delay.							

Timings
 13: Powers Blvd (SH-21) & Peak Innovation Parkway

2030 Total AM.syn
 04/16/2020

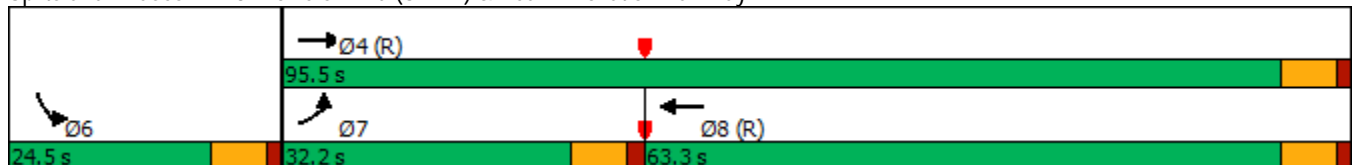


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↘	↑↑	↑↑	↗	↗↘	↗
Traffic Volume (vph)	212	810	1214	603	228	39
Future Volume (vph)	212	810	1214	603	228	39
Turn Type	Prot	NA	NA	Free	Prot	Free
Protected Phases	7	4	8		6	
Permitted Phases				Free		Free
Detector Phase	7	4	8		6	
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0		5.0	
Minimum Split (s)	11.5	24.5	24.5		24.5	
Total Split (s)	32.2	95.5	63.3		24.5	
Total Split (%)	26.8%	79.6%	52.8%		20.4%	
Yellow Time (s)	5.0	5.0	5.0		5.0	
All-Red Time (s)	1.5	1.5	1.5		1.5	
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	
Total Lost Time (s)	6.5	6.5	6.5		6.5	
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	None	C-Max	C-Max		Max	
Act Effect Green (s)	20.3	89.0	62.2	120.0	18.0	120.0
Actuated g/C Ratio	0.17	0.74	0.52	1.00	0.15	1.00
v/c Ratio	0.77	0.35	0.76	0.41	0.48	0.03
Control Delay	82.9	2.1	27.6	0.8	46.5	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	82.9	2.1	27.6	0.8	46.5	0.0
LOS	F	A	C	A	D	A
Approach Delay		19.0	18.7		39.7	
Approach LOS		B	B		D	

Intersection Summary

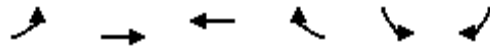
Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.77
 Intersection Signal Delay: 20.6
 Intersection LOS: C
 Intersection Capacity Utilization 68.1%
 ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 13: Powers Blvd (SH-21) & Peak Innovation Parkway



HCM 6th Signalized Intersection Summary
 13: Powers Blvd (SH-21) & Peak Innovation Parkway

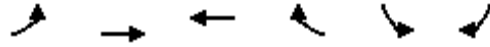
2030 Total AM.syn
 04/16/2020



Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations							
Traffic Volume (veh/h)	212	810	1214	603	228	39	
Future Volume (veh/h)	212	810	1214	603	228	39	
Initial Q (Qb), veh	0	0	0	0	0	0	
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	
Work Zone On Approach		No	No		No		
Adj Sat Flow, veh/h/ln	1870	1781	1781	1870	1870	1870	
Adj Flow Rate, veh/h	230	871	1320	0	248	0	
Peak Hour Factor	0.92	0.93	0.92	0.92	0.92	0.92	
Percent Heavy Veh, %	2	8	8	2	2	2	
Cap, veh/h	261	2510	1831		518		
Arrive On Green	0.15	0.74	0.54	0.00	0.15	0.00	
Sat Flow, veh/h	1781	3474	3474	1585	3456	1585	
Grp Volume(v), veh/h	230	871	1320	0	248	0	
Grp Sat Flow(s),veh/h/ln	1781	1692	1692	1585	1728	1585	
Q Serve(g_s), s	15.2	10.7	35.2	0.0	7.9	0.0	
Cycle Q Clear(g_c), s	15.2	10.7	35.2	0.0	7.9	0.0	
Prop In Lane	1.00			1.00	1.00	1.00	
Lane Grp Cap(c), veh/h	261	2510	1831		518		
V/C Ratio(X)	0.88	0.35	0.72		0.48		
Avail Cap(c_a), veh/h	381	2510	1831		518		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(l)	1.00	1.00	1.00	0.00	1.00	0.00	
Uniform Delay (d), s/veh	50.2	5.4	20.7	0.0	46.7	0.0	
Incr Delay (d2), s/veh	15.0	0.4	2.5	0.0	3.1	0.0	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln	7.8	3.5	14.1	0.0	3.6	0.0	
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh	65.2	5.8	23.2	0.0	49.8	0.0	
LnGrp LOS	E	A	C		D		
Approach Vol, veh/h		1101	1320	A	248	A	
Approach Delay, s/veh		18.2	23.2		49.8		
Approach LOS		B	C		D		
Timer - Assigned Phs				4	6	7	8
Phs Duration (G+Y+Rc), s				95.5	24.5	24.1	71.4
Change Period (Y+Rc), s				6.5	6.5	6.5	6.5
Max Green Setting (Gmax), s				89.0	18.0	25.7	56.8
Max Q Clear Time (g_c+l1), s				12.7	9.9	17.2	37.2
Green Ext Time (p_c), s				7.9	0.5	0.4	10.1
Intersection Summary							
HCM 6th Ctrl Delay			23.6				
HCM 6th LOS			C				
Notes							
Unsignalized Delay for [WBR, SBR] is excluded from calculations of the approach delay and intersection delay.							

Timings
 13: Powers Blvd (SH-21) & Peak Innovation Parkway

2030 Total PM.syn
 04/16/2020

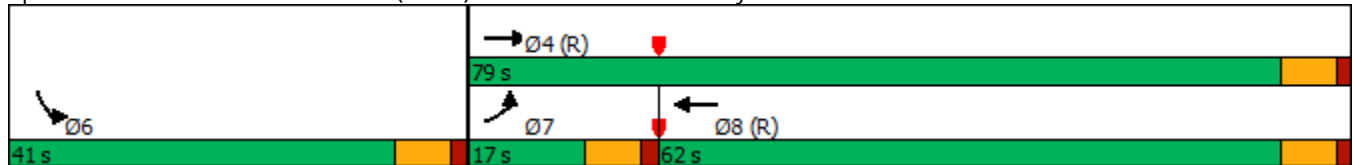


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↑↑	↑↑	↗	↗↗	↗
Traffic Volume (vph)	36	934	819	201	471	176
Future Volume (vph)	36	934	819	201	471	176
Turn Type	Prot	NA	NA	Free	Prot	Free
Protected Phases	7	4	8		6	
Permitted Phases				Free		Free
Detector Phase	7	4	8		6	
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0		5.0	
Minimum Split (s)	11.5	24.5	24.5		24.5	
Total Split (s)	17.0	79.0	62.0		41.0	
Total Split (%)	14.2%	65.8%	51.7%		34.2%	
Yellow Time (s)	5.0	5.0	5.0		5.0	
All-Red Time (s)	1.5	1.5	1.5		1.5	
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	
Total Lost Time (s)	6.5	6.5	6.5		6.5	
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	None	C-Max	C-Max		Max	
Act Effct Green (s)	8.0	72.5	63.1	120.0	34.5	120.0
Actuated g/C Ratio	0.07	0.60	0.53	1.00	0.29	1.00
v/c Ratio	0.33	0.49	0.50	0.14	0.52	0.12
Control Delay	84.8	2.2	20.8	0.2	47.4	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	84.8	2.2	20.8	0.2	47.4	0.2
LOS	F	A	C	A	D	A
Approach Delay		5.2	16.7		34.6	
Approach LOS		A	B		C	

Intersection Summary

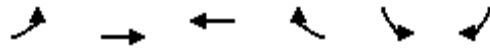
Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Green
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.52
 Intersection Signal Delay: 16.9
 Intersection LOS: B
 Intersection Capacity Utilization 54.2%
 ICU Level of Service A
 Analysis Period (min) 15

Splits and Phases: 13: Powers Blvd (SH-21) & Peak Innovation Parkway



HCM 6th Signalized Intersection Summary
 13: Powers Blvd (SH-21) & Peak Innovation Parkway

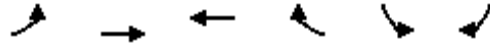
2030 Total PM.syn
 04/16/2020



Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations	↶	↷	↷	↷	↶	↷	
Traffic Volume (veh/h)	36	934	819	201	471	176	
Future Volume (veh/h)	36	934	819	201	471	176	
Initial Q (Qb), veh	0	0	0	0	0	0	
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	
Work Zone On Approach		No	No		No		
Adj Sat Flow, veh/h/ln	1870	1811	1811	1870	1870	1870	
Adj Flow Rate, veh/h	39	1015	890	0	512	0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Percent Heavy Veh, %	2	6	6	2	2	2	
Cap, veh/h	54	2079	1788		994		
Arrive On Green	0.03	0.60	0.52	0.00	0.29	0.00	
Sat Flow, veh/h	1781	3532	3532	1585	3456	1585	
Grp Volume(v), veh/h	39	1015	890	0	512	0	
Grp Sat Flow(s),veh/h/ln	1781	1721	1721	1585	1728	1585	
Q Serve(g_s), s	2.6	19.9	20.1	0.0	14.9	0.0	
Cycle Q Clear(g_c), s	2.6	19.9	20.1	0.0	14.9	0.0	
Prop In Lane	1.00			1.00	1.00	1.00	
Lane Grp Cap(c), veh/h	54	2079	1788		994		
V/C Ratio(X)	0.72	0.49	0.50		0.52		
Avail Cap(c_a), veh/h	156	2079	1788		994		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	0.00	
Uniform Delay (d), s/veh	57.7	13.3	18.7	0.0	35.8	0.0	
Incr Delay (d2), s/veh	16.5	0.8	1.0	0.0	1.9	0.0	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln	1.4	7.7	8.1	0.0	6.5	0.0	
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh	74.2	14.2	19.7	0.0	37.7	0.0	
LnGrp LOS	E	B	B		D		
Approach Vol, veh/h		1054	890	A	512	A	
Approach Delay, s/veh		16.4	19.7		37.7		
Approach LOS		B	B		D		
Timer - Assigned Phs				4	6	7	8
Phs Duration (G+Y+Rc), s				79.0	41.0	10.1	68.9
Change Period (Y+Rc), s				6.5	6.5	6.5	6.5
Max Green Setting (Gmax), s				72.5	34.5	10.5	55.5
Max Q Clear Time (g_c+I1), s				21.9	16.9	4.6	22.1
Green Ext Time (p_c), s				9.7	1.8	0.0	7.5
Intersection Summary							
HCM 6th Ctrl Delay			22.0				
HCM 6th LOS			C				
Notes							
Unsignalized Delay for [WBR, SBR] is excluded from calculations of the approach delay and intersection delay.							

Timings
 13: Powers Blvd (SH-21) & Peak Innovation Parkway

2045 Total AM.syn
 04/16/2020

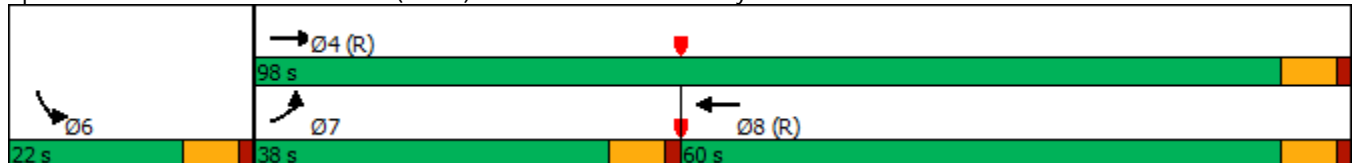


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↶	↶↶	↶↶	↶	↶↶	↶
Traffic Volume (vph)	494	921	1384	1155	342	82
Future Volume (vph)	494	921	1384	1155	342	82
Turn Type	Prot	NA	NA	Free	Prot	Free
Protected Phases	7	4	8		6	
Permitted Phases				Free		Free
Detector Phase	7	4	8		6	
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0		5.0	
Minimum Split (s)	11.5	24.5	24.5		24.5	
Total Split (s)	38.0	98.0	60.0		22.0	
Total Split (%)	31.7%	81.7%	50.0%		18.3%	
Yellow Time (s)	5.0	5.0	5.0		5.0	
All-Red Time (s)	1.5	1.5	1.5		1.5	
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	
Total Lost Time (s)	6.5	6.5	6.5		6.5	
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	None	C-Max	C-Max		Max	
Act Effect Green (s)	31.5	91.5	53.5	120.0	15.5	120.0
Actuated g/C Ratio	0.26	0.76	0.45	1.00	0.13	1.00
v/c Ratio	1.16	0.39	1.01	0.79	0.84	0.06
Control Delay	132.8	5.3	59.1	4.2	55.0	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	132.8	5.3	59.1	4.2	55.0	0.1
LOS	F	A	E	A	D	A
Approach Delay		50.1	34.1		44.4	
Approach LOS		D	C		D	

Intersection Summary

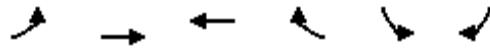
Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Green
 Natural Cycle: 150
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.16
 Intersection Signal Delay: 40.3
 Intersection LOS: D
 Intersection Capacity Utilization 91.6%
 ICU Level of Service F
 Analysis Period (min) 15

Splits and Phases: 13: Powers Blvd (SH-21) & Peak Innovation Parkway



HCM 6th Signalized Intersection Summary
 13: Powers Blvd (SH-21) & Peak Innovation Parkway

2045 Total AM.syn
 04/16/2020



Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations	↖	↑↑	↗	↑	↗	↑	
Traffic Volume (veh/h)	494	921	1384	1155	342	82	
Future Volume (veh/h)	494	921	1384	1155	342	82	
Initial Q (Qb), veh	0	0	0	0	0	0	
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	
Work Zone On Approach		No	No		No		
Adj Sat Flow, veh/h/ln	1870	1781	1781	1870	1870	1870	
Adj Flow Rate, veh/h	537	990	1504	0	372	0	
Peak Hour Factor	0.92	0.93	0.92	0.92	0.92	0.92	
Percent Heavy Veh, %	2	8	8	2	2	2	
Cap, veh/h	468	2581	1509		446		
Arrive On Green	0.26	0.76	0.45	0.00	0.13	0.00	
Sat Flow, veh/h	1781	3474	3474	1585	3456	1585	
Grp Volume(v), veh/h	537	990	1504	0	372	0	
Grp Sat Flow(s),veh/h/ln	1781	1692	1692	1585	1728	1585	
Q Serve(g_s), s	31.5	11.8	53.2	0.0	12.6	0.0	
Cycle Q Clear(g_c), s	31.5	11.8	53.2	0.0	12.6	0.0	
Prop In Lane	1.00			1.00	1.00	1.00	
Lane Grp Cap(c), veh/h	468	2581	1509		446		
V/C Ratio(X)	1.15	0.38	1.00		0.83		
Avail Cap(c_a), veh/h	468	2581	1509		446		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(l)	1.00	1.00	1.00	0.00	1.00	0.00	
Uniform Delay (d), s/veh	44.3	4.8	33.2	0.0	51.0	0.0	
Incr Delay (d2), s/veh	89.1	0.4	22.4	0.0	16.5	0.0	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln	25.3	3.7	25.8	0.0	6.5	0.0	
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh	133.4	5.2	55.6	0.0	67.5	0.0	
LnGrp LOS	F	A	E		E		
Approach Vol, veh/h		1527	1504	A	372	A	
Approach Delay, s/veh		50.3	55.6		67.5		
Approach LOS		D	E		E		
Timer - Assigned Phs				4	6	7	8
Phs Duration (G+Y+Rc), s				98.0	22.0	38.0	60.0
Change Period (Y+Rc), s				6.5	6.5	6.5	6.5
Max Green Setting (Gmax), s				91.5	15.5	31.5	53.5
Max Q Clear Time (g_c+I1), s				13.8	14.6	33.5	55.2
Green Ext Time (p_c), s				9.6	0.1	0.0	0.0

Intersection Summary

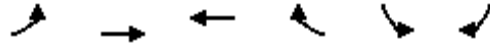
HCM 6th Ctrl Delay	54.5
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.
 Unsignalized Delay for [WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Timings
 13: Powers Blvd (SH-21) & Peak Innovation Parkway

2045 Total PM.syn
 04/16/2020

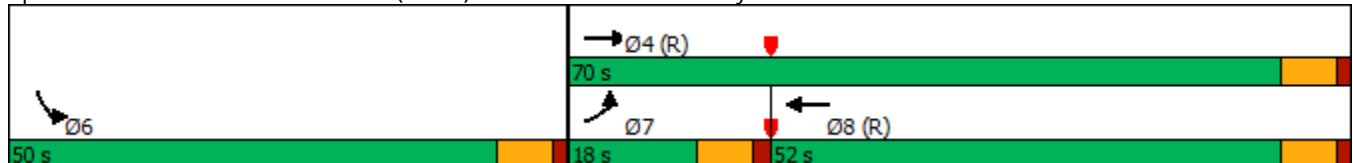


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↶	↷	↶	↷	↶	↷
Traffic Volume (vph)	70	1074	935	302	919	411
Future Volume (vph)	70	1074	935	302	919	411
Turn Type	Prot	NA	NA	Free	Prot	Free
Protected Phases	7	4	8		6	
Permitted Phases				Free		Free
Detector Phase	7	4	8		6	
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0		5.0	
Minimum Split (s)	11.5	24.5	24.5		24.5	
Total Split (s)	18.0	70.0	52.0		50.0	
Total Split (%)	15.0%	58.3%	43.3%		41.7%	
Yellow Time (s)	5.0	5.0	5.0		5.0	
All-Red Time (s)	1.5	1.5	1.5		1.5	
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	
Total Lost Time (s)	6.5	6.5	6.5		6.5	
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	None	C-Max	C-Max		Max	
Act Effct Green (s)	9.7	63.5	49.8	120.0	43.5	120.0
Actuated g/C Ratio	0.08	0.53	0.42	1.00	0.36	1.00
v/c Ratio	0.53	0.65	0.72	0.21	0.80	0.28
Control Delay	87.7	14.3	34.0	0.3	36.6	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	87.7	14.3	34.0	0.3	36.6	0.4
LOS	F	B	C	A	D	A
Approach Delay		18.8	25.8		25.4	
Approach LOS		B	C		C	

Intersection Summary

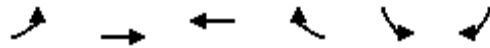
Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.80
 Intersection Signal Delay: 23.5
 Intersection LOS: C
 Intersection Capacity Utilization 72.5%
 ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 13: Powers Blvd (SH-21) & Peak Innovation Parkway



HCM 6th Signalized Intersection Summary
 13: Powers Blvd (SH-21) & Peak Innovation Parkway

2045 Total PM.syn
 04/16/2020



Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations							
Traffic Volume (veh/h)	70	1074	935	302	919	411	
Future Volume (veh/h)	70	1074	935	302	919	411	
Initial Q (Qb), veh	0	0	0	0	0	0	
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	
Work Zone On Approach		No	No		No		
Adj Sat Flow, veh/h/ln	1870	1811	1811	1870	1870	1870	
Adj Flow Rate, veh/h	76	1167	1016	0	999	0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Percent Heavy Veh, %	2	6	6	2	2	2	
Cap, veh/h	97	1821	1447		1253		
Arrive On Green	0.05	0.53	0.42	0.00	0.36	0.00	
Sat Flow, veh/h	1781	3532	3532	1585	3456	1585	
Grp Volume(v), veh/h	76	1167	1016	0	999	0	
Grp Sat Flow(s),veh/h/ln	1781	1721	1721	1585	1728	1585	
Q Serve(g_s), s	5.1	29.0	29.1	0.0	31.1	0.0	
Cycle Q Clear(g_c), s	5.1	29.0	29.1	0.0	31.1	0.0	
Prop In Lane	1.00			1.00	1.00	1.00	
Lane Grp Cap(c), veh/h	97	1821	1447		1253		
V/C Ratio(X)	0.78	0.64	0.70		0.80		
Avail Cap(c_a), veh/h	171	1821	1447		1253		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	0.00	
Uniform Delay (d), s/veh	56.0	20.1	28.6	0.0	34.3	0.0	
Incr Delay (d2), s/veh	12.8	1.7	2.9	0.0	5.3	0.0	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln	2.6	11.7	12.4	0.0	13.8	0.0	
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh	68.8	21.9	31.5	0.0	39.6	0.0	
LnGrp LOS	E	C	C		D		
Approach Vol, veh/h		1243	1016	A	999	A	
Approach Delay, s/veh		24.7	31.5		39.6		
Approach LOS		C	C		D		
Timer - Assigned Phs				4	6	7	8
Phs Duration (G+Y+Rc), s				70.0	50.0	13.0	57.0
Change Period (Y+Rc), s				6.5	6.5	6.5	6.5
Max Green Setting (Gmax), s				63.5	43.5	11.5	45.5
Max Q Clear Time (g_c+I1), s				31.0	33.1	7.1	31.1
Green Ext Time (p_c), s				10.8	3.2	0.0	6.3
Intersection Summary							
HCM 6th Ctrl Delay			31.4				
HCM 6th LOS			C				
Notes							
Unsignalized Delay for [WBR, SBR] is excluded from calculations of the approach delay and intersection delay.							

Intersection	
Intersection Delay, s/veh	115
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔	↔	↔		↔	↔	↔		↔↔	↔
Traffic Vol, veh/h	149	49	106	23	179	10	179	340	15	5	234	172
Future Vol, veh/h	149	49	106	23	179	10	179	340	15	5	234	172
Peak Hour Factor	0.69	0.77	0.83	0.52	0.84	0.50	0.73	0.58	0.54	0.42	0.93	0.73
Heavy Vehicles, %	4	4	4	4	4	4	4	4	4	4	4	4
Mvmt Flow	216	64	128	44	213	20	245	586	28	12	252	236
Number of Lanes	0	1	1	1	1	0	1	1	1	0	2	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	2	2
HCM Control Delay	41.4	33.7	228.2	25.3
HCM LOS	E	D	F	D

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	75%	0%	100%	0%	6%	0%	0%
Vol Thru, %	0%	100%	0%	25%	0%	0%	95%	94%	100%	0%
Vol Right, %	0%	0%	100%	0%	100%	0%	5%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	179	340	15	198	106	23	189	83	156	172
LT Vol	179	0	0	149	0	23	0	5	0	0
Through Vol	0	340	0	49	0	0	179	78	156	0
RT Vol	0	0	15	0	106	0	10	0	0	172
Lane Flow Rate	245	586	28	280	128	44	233	96	168	236
Geometry Grp	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.716	1.627	0.071	0.828	0.341	0.138	0.693	0.274	0.479	0.627
Departure Headway (Hd)	10.513	9.989	9.256	11.585	10.477	12.196	11.641	11.266	11.234	10.495
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	343	369	387	316	346	296	312	321	324	346
Service Time	8.278	7.753	7.019	9.285	8.177	9.896	9.341	8.966	8.934	8.195
HCM Lane V/C Ratio	0.714	1.588	0.072	0.886	0.37	0.149	0.747	0.299	0.519	0.682
HCM Control Delay	35.9	318.9	12.7	51.8	18.5	16.8	36.9	18.2	23.8	29.3
HCM Lane LOS	E	F	B	F	C	C	E	C	C	D
HCM 95th-tile Q	5.3	34.4	0.2	7	1.5	0.5	4.8	1.1	2.5	4

Intersection	
Intersection Delay, s/veh	26.8
Intersection LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗	↖	↗		↖	↗	↗		↖↗	↖
Traffic Vol, veh/h	140	138	205	20	57	5	127	223	25	7	384	162
Future Vol, veh/h	140	138	205	20	57	5	127	223	25	7	384	162
Peak Hour Factor	0.81	0.89	0.93	0.62	0.79	0.42	0.91	0.86	0.62	0.44	0.91	0.84
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	173	155	220	32	72	12	140	259	40	16	422	193
Number of Lanes	0	1	1	1	1	0	1	1	1	0	2	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	2	2
HCM Control Delay	34.8	16.1	24.8	23.2
HCM LOS	D	C	C	C

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	50%	0%	100%	0%	5%	0%	0%
Vol Thru, %	0%	100%	0%	50%	0%	0%	92%	95%	100%	0%
Vol Right, %	0%	0%	100%	0%	100%	0%	8%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	127	223	25	278	205	20	62	135	256	162
LT Vol	127	0	0	140	0	20	0	7	0	0
Through Vol	0	223	0	138	0	0	57	128	256	0
RT Vol	0	0	25	0	205	0	5	0	0	162
Lane Flow Rate	140	259	40	328	220	32	84	157	281	193
Geometry Grp	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.384	0.677	0.097	0.84	0.506	0.098	0.243	0.392	0.702	0.442
Departure Headway (Hd)	9.918	9.398	8.672	9.225	8.26	10.983	10.411	9.006	8.979	8.254
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	363	384	412	393	436	326	345	399	402	436
Service Time	7.686	7.166	6.439	6.986	6.021	8.766	8.195	6.767	6.74	6.014
HCM Lane V/C Ratio	0.386	0.674	0.097	0.835	0.505	0.098	0.243	0.393	0.699	0.443
HCM Control Delay	18.8	29.9	12.4	45.3	19.2	15	16.5	17.5	30.4	17.4
HCM Lane LOS	C	D	B	E	C	B	C	C	D	C
HCM 95th-tile Q	1.8	4.8	0.3	7.8	2.8	0.3	0.9	1.8	5.2	2.2

Intersection	
Intersection Delay, s/veh	208.7
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔	↔	↔		↔	↑	↔		↔↔	↔
Traffic Vol, veh/h	341	50	109	24	184	10	184	537	15	5	371	307
Future Vol, veh/h	341	50	109	24	184	10	184	537	15	5	371	307
Peak Hour Factor	0.92	0.77	0.83	0.52	0.84	0.50	0.73	0.80	0.54	0.42	0.93	0.92
Heavy Vehicles, %	4	4	4	4	4	4	4	4	4	4	4	4
Mvmt Flow	371	65	131	46	219	20	252	671	28	12	399	334
Number of Lanes	0	1	1	1	1	0	1	1	1	0	2	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	2	2
HCM Control Delay	201.8	49.6	378.8	57.5
HCM LOS	F	E	F	F

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	87%	0%	100%	0%	4%	0%	0%
Vol Thru, %	0%	100%	0%	13%	0%	0%	95%	96%	100%	0%
Vol Right, %	0%	0%	100%	0%	100%	0%	5%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	184	537	15	391	109	24	194	129	247	307
LT Vol	184	0	0	341	0	24	0	5	0	0
Through Vol	0	537	0	50	0	0	184	124	247	0
RT Vol	0	0	15	0	109	0	10	0	0	307
Lane Flow Rate	252	671	28	436	131	46	239	145	266	334
Geometry Grp	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.809	2.063	0.08	1.451	0.397	0.161	0.797	0.437	0.8	0.939
Departure Headway (Hd)	12.816	12.283	11.536	13.468	12.291	14.565	14.003	13.148	13.128	12.377
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	285	302	312	274	295	248	261	275	279	297
Service Time	10.516	9.983	9.236	11.168	9.991	12.265	11.703	10.848	10.828	10.077
HCM Lane V/C Ratio	0.884	2.222	0.09	1.591	0.444	0.185	0.916	0.527	0.953	1.125
HCM Control Delay	53.2	516.1	15.2	255.8	22.9	20	55.3	25.7	53	75
HCM Lane LOS	F	F	C	F	C	C	F	D	F	F
HCM 95th-tile Q	6.5	44.1	0.3	21.8	1.8	0.6	6.1	2.1	6.3	9.1























Intersection	
Intersection Delay, s/veh	83.7
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗	↖	↗		↖	↗	↗		↖↗	↖
Traffic Vol, veh/h	253	142	211	21	59	5	131	339	26	7	513	284
Future Vol, veh/h	253	142	211	21	59	5	131	339	26	7	513	284
Peak Hour Factor	0.92	0.89	0.93	0.62	0.79	0.42	0.91	0.92	0.62	0.44	0.92	0.92
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	275	160	227	34	75	12	144	368	42	16	558	309
Number of Lanes	0	1	1	1	1	0	1	1	1	0	2	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	2	2
HCM Control Delay	135.1	19.9	83	54.4
HCM LOS	F	C	F	F

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	64%	0%	100%	0%	4%	0%	0%
Vol Thru, %	0%	100%	0%	36%	0%	0%	92%	96%	100%	0%
Vol Right, %	0%	0%	100%	0%	100%	0%	8%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	131	339	26	395	211	21	64	178	342	284
LT Vol	131	0	0	253	0	21	0	7	0	0
Through Vol	0	339	0	142	0	0	59	171	342	0
RT Vol	0	0	26	0	211	0	5	0	0	284
Lane Flow Rate	144	368	42	435	227	34	87	202	372	309
Geometry Grp	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.448	1.095	0.116	1.312	0.622	0.12	0.292	0.545	1.003	0.773
Departure Headway (Hd)	11.999	11.475	10.741	11.094	10.052	13.356	12.779	10.585	10.565	9.83
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	302	321	336	330	361	270	283	343	346	370
Service Time	9.699	9.175	8.441	8.794	7.752	11.056	10.479	8.285	8.265	7.53
HCM Lane V/C Ratio	0.477	1.146	0.125	1.318	0.629	0.126	0.307	0.589	1.075	0.835
HCM Control Delay	24.1	113.7	14.8	191.1	27.9	17.9	20.7	25.3	83	39.1
HCM Lane LOS	C	F	B	F	D	C	C	D	F	E
HCM 95th-tile Q	2.2	13.4	0.4	20.5	4	0.4	1.2	3.1	11.4	6.3

Timings
14: Grinnel Blvd & Bradley Road

											
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	341	50	109	24	184	184	537	15	5	371	307
Future Volume (vph)	341	50	109	24	184	184	537	15	5	371	307
Turn Type	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8	5	2		1	6	
Permitted Phases	4		4	8		2		2	6		6
Detector Phase	7	4	4	3	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.5	24.5	24.5	11.5	24.5	11.5	24.5	24.5	11.5	24.5	24.5
Total Split (s)	28.4	41.3	41.3	11.6	24.5	23.2	55.6	55.6	11.5	43.9	43.9
Total Split (%)	23.7%	34.4%	34.4%	9.7%	20.4%	19.3%	46.3%	46.3%	9.6%	36.6%	36.6%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	45.9	36.6	36.6	22.6	17.5	61.1	56.5	56.5	45.1	40.0	40.0
Actuated g/C Ratio	0.38	0.30	0.30	0.19	0.15	0.51	0.47	0.47	0.38	0.33	0.33
v/c Ratio	0.92	0.12	0.21	0.17	0.90	0.52	0.78	0.03	0.07	0.34	0.45
Control Delay	59.8	32.0	0.9	27.3	84.5	21.2	35.8	0.1	16.4	27.1	5.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.8	32.0	0.9	27.3	84.5	21.2	35.8	0.1	16.4	27.1	5.5
LOS	E	C	A	C	F	C	D	A	B	C	A
Approach Delay		43.0			75.3		30.9			17.2	
Approach LOS		D			E		C			B	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 100
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.92
 Intersection Signal Delay: 34.6
 Intersection LOS: C
 Intersection Capacity Utilization 83.3%
 ICU Level of Service E
 Analysis Period (min) 15

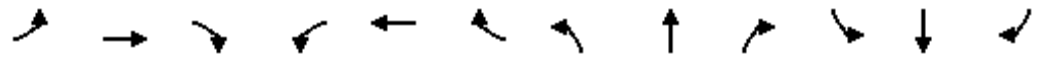
Splits and Phases: 14: Grinnel Blvd & Bradley Road



HCM 6th Signalized Intersection Summary
 14: Grinnel Blvd & Bradley Road

2022 Total AM Imp_3-13-14.syn

04/16/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	341	50	109	24	184	10	184	537	15	5	371	307
Future Volume (veh/h)	341	50	109	24	184	10	184	537	15	5	371	307
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	371	65	131	46	219	20	252	671	28	12	399	334
Peak Hour Factor	0.92	0.77	0.83	0.52	0.84	0.50	0.73	0.80	0.54	0.42	0.93	0.92
Percent Heavy Veh, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	399	546	463	289	244	22	436	811	687	172	1211	540
Arrive On Green	0.18	0.30	0.30	0.03	0.15	0.15	0.11	0.44	0.44	0.01	0.35	0.35
Sat Flow, veh/h	1753	1841	1560	1753	1662	152	1753	1841	1560	1753	3497	1560
Grp Volume(v), veh/h	371	65	131	46	0	239	252	671	28	12	399	334
Grp Sat Flow(s),veh/h/ln	1753	1841	1560	1753	0	1813	1753	1841	1560	1753	1749	1560
Q Serve(g_s), s	21.1	3.1	7.7	2.7	0.0	15.5	10.7	38.5	1.2	0.5	10.1	21.4
Cycle Q Clear(g_c), s	21.1	3.1	7.7	2.7	0.0	15.5	10.7	38.5	1.2	0.5	10.1	21.4
Prop In Lane	1.00		1.00	1.00		0.08	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	399	546	463	289	0	266	436	811	687	172	1211	540
V/C Ratio(X)	0.93	0.12	0.28	0.16	0.00	0.90	0.58	0.83	0.04	0.07	0.33	0.62
Avail Cap(c_a), veh/h	399	546	463	306	0	272	491	811	687	221	1211	540
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.1	30.8	32.4	41.5	0.0	50.3	20.6	29.6	19.1	27.9	28.9	32.6
Incr Delay (d2), s/veh	28.0	0.1	0.3	0.3	0.0	29.5	1.3	9.5	0.1	0.2	0.7	5.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.0	1.4	3.0	1.2	0.0	9.2	4.5	18.8	0.5	0.2	4.4	8.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	62.1	30.9	32.7	41.7	0.0	79.8	21.9	39.1	19.2	28.1	29.7	37.9
LnGrp LOS	E	C	C	D	A	E	C	D	B	C	C	D
Approach Vol, veh/h		567			285			951			745	
Approach Delay, s/veh		51.8			73.6			33.9			33.3	
Approach LOS		D			E			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.1	59.3	10.4	42.1	19.4	48.1	28.4	24.1				
Change Period (Y+Rc), s	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5				
Max Green Setting (Gmax), s	5.0	49.1	5.1	34.8	16.7	37.4	21.9	18.0				
Max Q Clear Time (g_c+I1), s	2.5	40.5	4.7	9.7	12.7	23.4	23.1	17.5				
Green Ext Time (p_c), s	0.0	3.0	0.0	0.7	0.3	3.3	0.0	0.1				
Intersection Summary												
HCM 6th Ctrl Delay			42.2									
HCM 6th LOS			D									

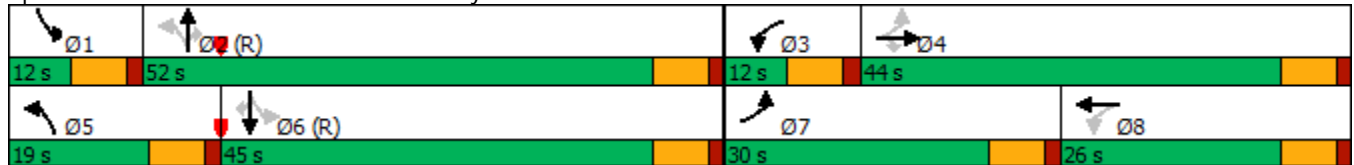
Timings
14: Grinnel Blvd & Bradley Road

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations												
Traffic Volume (vph)	253	142	211	21	59	131	339	26	7	513	284	
Future Volume (vph)	253	142	211	21	59	131	339	26	7	513	284	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA	Perm	
Protected Phases	7	4		3	8	5	2		1	6		
Permitted Phases	4		4	8		2		2	6		6	
Detector Phase	7	4	4	3	8	5	2	2	1	6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	11.5	24.5	24.5	11.5	24.5	11.5	24.5	24.5	11.5	24.5	24.5	
Total Split (s)	30.0	44.0	44.0	12.0	26.0	19.0	52.0	52.0	12.0	45.0	45.0	
Total Split (%)	25.0%	36.7%	36.7%	10.0%	21.7%	15.8%	43.3%	43.3%	10.0%	37.5%	37.5%	
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max	
Act Effct Green (s)	38.7	31.5	31.5	16.2	10.7	68.0	63.0	63.0	57.4	51.4	51.4	
Actuated g/C Ratio	0.32	0.26	0.26	0.14	0.09	0.57	0.52	0.52	0.48	0.43	0.43	
v/c Ratio	0.63	0.33	0.39	0.18	0.52	0.32	0.38	0.05	0.03	0.37	0.36	
Control Delay	38.6	38.0	6.5	30.5	58.9	15.4	21.0	0.1	17.0	27.1	6.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	38.6	38.0	6.5	30.5	58.9	15.4	21.0	0.1	17.0	27.1	6.6	
LOS	D	D	A	C	E	B	C	A	B	C	A	
Approach Delay		27.4			50.9		18.0			19.7		
Approach LOS		C			D		B			B		

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.63
 Intersection Signal Delay: 23.3
 Intersection Capacity Utilization 58.9%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service B

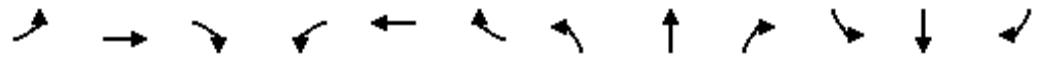
Splits and Phases: 14: Grinnel Blvd & Bradley Road



HCM 6th Signalized Intersection Summary
 14: Grinnel Blvd & Bradley Road

2022 Total PM Imp_3-13-14.syn

04/16/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	253	142	211	21	59	5	131	339	26	7	513	284
Future Volume (veh/h)	253	142	211	21	59	5	131	339	26	7	513	284
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	275	160	227	34	75	12	144	368	42	16	558	309
Peak Hour Factor	0.92	0.89	0.93	0.62	0.79	0.42	0.91	0.92	0.62	0.44	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	366	366	310	175	103	16	418	1004	850	504	1768	789
Arrive On Green	0.16	0.20	0.20	0.03	0.07	0.07	0.06	0.54	0.54	0.02	0.50	0.50
Sat Flow, veh/h	1767	1856	1572	1767	1561	250	1767	1856	1572	1767	3526	1572
Grp Volume(v), veh/h	275	160	227	34	0	87	144	368	42	16	558	309
Grp Sat Flow(s),veh/h/ln	1767	1856	1572	1767	0	1811	1767	1856	1572	1767	1763	1572
Q Serve(g_s), s	16.8	9.1	16.3	2.1	0.0	5.7	4.7	13.6	1.5	0.5	11.2	14.6
Cycle Q Clear(g_c), s	16.8	9.1	16.3	2.1	0.0	5.7	4.7	13.6	1.5	0.5	11.2	14.6
Prop In Lane	1.00		1.00	1.00		0.14	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	366	366	310	175	0	119	418	1004	850	504	1768	789
V/C Ratio(X)	0.75	0.44	0.73	0.19	0.00	0.73	0.34	0.37	0.05	0.03	0.32	0.39
Avail Cap(c_a), veh/h	431	580	491	206	0	294	502	1004	850	555	1768	789
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.1	42.3	45.2	50.2	0.0	55.0	13.4	15.8	13.0	14.4	17.7	18.6
Incr Delay (d2), s/veh	6.1	0.8	3.3	0.5	0.0	8.2	0.5	1.0	0.1	0.0	0.5	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.9	4.3	6.6	1.0	0.0	2.9	1.9	6.0	0.6	0.2	4.7	5.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.3	43.2	48.6	50.7	0.0	63.2	13.8	16.8	13.1	14.4	18.2	20.0
LnGrp LOS	D	D	D	D	A	E	B	B	B	B	B	C
Approach Vol, veh/h		662			121			554			883	
Approach Delay, s/veh		46.7			59.7			15.8			18.8	
Approach LOS		D			E			B			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.6	71.4	9.9	30.1	13.3	66.7	25.6	14.4				
Change Period (Y+Rc), s	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5				
Max Green Setting (Gmax), s	5.5	45.5	5.5	37.5	12.5	38.5	23.5	19.5				
Max Q Clear Time (g_c+I1), s	2.5	15.6	4.1	18.3	6.7	16.6	18.8	7.7				
Green Ext Time (p_c), s	0.0	2.5	0.0	1.6	0.2	5.0	0.4	0.3				
Intersection Summary												
HCM 6th Ctrl Delay			28.6									
HCM 6th LOS			C									

MOVEMENT SUMMARY

 Site: 101 [2022 Total AM]

Bradley Road and Grinnell Boulevard
 Site Category: (None)
 Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: Grinnell Boulevard												
3	L2	200	4.0	0.446	9.7	LOS A	2.5	65.0	0.61	0.63	0.74	31.7
8	T1	584	4.0	0.446	9.3	LOS A	2.5	65.0	0.59	0.61	0.71	32.6
18	R2	16	4.0	0.446	9.2	LOS A	2.5	63.6	0.59	0.60	0.70	32.1
Approach		800	4.0	0.446	9.4	LOS A	2.5	65.0	0.60	0.61	0.72	32.4
East: Bradley Road												
1	L2	26	4.0	0.257	12.5	LOS B	0.9	22.9	0.73	0.74	0.77	31.1
6	T1	200	4.0	0.257	11.7	LOS B	0.9	22.9	0.71	0.72	0.74	31.7
16	R2	11	4.0	0.257	11.1	LOS B	0.9	22.8	0.70	0.71	0.73	31.3
Approach		237	4.0	0.257	11.8	LOS B	0.9	22.9	0.71	0.72	0.75	31.6
North: Grinnell Boulevard												
7	L2	5	4.0	0.412	9.1	LOS A	2.1	53.4	0.59	0.58	0.65	33.2
4	T1	403	4.0	0.412	9.1	LOS A	2.1	53.4	0.59	0.58	0.64	33.1
14	R2	334	4.0	0.412	8.6	LOS A	2.0	51.6	0.57	0.54	0.60	32.2
Approach		742	4.0	0.412	8.8	LOS A	2.1	53.4	0.58	0.56	0.62	32.7
West: Bradley Road												
5	L2	371	4.0	0.399	8.4	LOS A	1.8	47.6	0.56	0.53	0.58	31.1
2	T1	54	4.0	0.202	6.3	LOS A	0.8	20.3	0.50	0.45	0.50	34.5
12	R2	118	4.0	0.202	6.3	LOS A	0.8	20.3	0.50	0.45	0.50	33.4
Approach		543	4.0	0.399	7.7	LOS A	1.8	47.6	0.54	0.51	0.56	31.9
All Vehicles		2323	4.0	0.446	9.1	LOS A	2.5	65.0	0.59	0.58	0.65	32.3

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

 Site: 101 [2022 Total PM]

Bradley Road and Grinnell Boulevard
 Site Category: (None)
 Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: Grinnell Boulevard												
3	L2	142	3.0	0.298	7.4	LOS A	1.3	32.5	0.54	0.50	0.54	32.7
8	T1	368	3.0	0.298	7.1	LOS A	1.3	32.5	0.53	0.48	0.53	33.7
18	R2	28	3.0	0.298	6.9	LOS A	1.3	32.0	0.52	0.47	0.52	33.2
Approach		539	3.0	0.298	7.2	LOS A	1.3	32.5	0.53	0.48	0.53	33.4
East: Bradley Road												
1	L2	23	3.0	0.070	6.6	LOS A	0.2	6.1	0.58	0.56	0.58	33.1
6	T1	64	3.0	0.070	6.1	LOS A	0.2	6.1	0.56	0.54	0.56	34.2
16	R2	5	3.0	0.070	5.9	LOS A	0.2	6.0	0.56	0.53	0.56	33.7
Approach		92	3.0	0.070	6.2	LOS A	0.2	6.1	0.57	0.54	0.57	33.9
North: Grinnell Boulevard												
7	L2	8	3.0	0.400	7.7	LOS A	2.0	52.4	0.46	0.35	0.46	33.9
4	T1	558	3.0	0.400	7.6	LOS A	2.0	52.4	0.46	0.34	0.46	33.9
14	R2	309	3.0	0.400	7.3	LOS A	2.0	51.6	0.44	0.33	0.44	32.9
Approach		874	3.0	0.400	7.5	LOS A	2.0	52.4	0.45	0.34	0.45	33.5
West: Bradley Road												
5	L2	275	3.0	0.418	10.3	LOS B	2.2	56.0	0.65	0.71	0.82	30.7
2	T1	154	3.0	0.418	9.7	LOS A	2.2	56.0	0.63	0.69	0.80	32.2
12	R2	229	3.0	0.418	9.6	LOS A	2.2	55.6	0.63	0.69	0.79	31.8
Approach		659	3.0	0.418	9.9	LOS A	2.2	56.0	0.64	0.70	0.81	31.4
All Vehicles		2164	3.0	0.418	8.1	LOS A	2.2	56.0	0.53	0.49	0.58	32.8

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: C:\Users\jeff.planck\OneDrive - KH\z_Peak Innovation Park\Engineering\Analysis\roundabouts\Int #14 - Bradley & Grinnell.sip8

Timings
14: Grinnel Blvd & Bradley Road

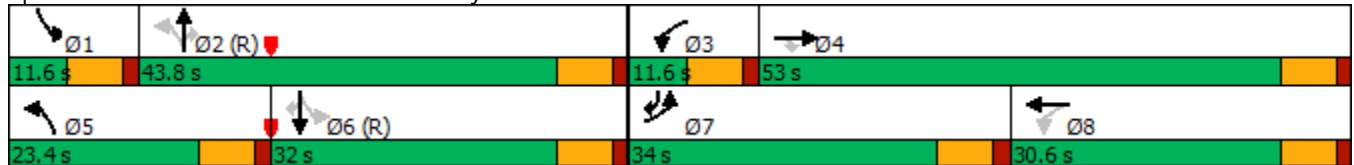
2030 Total AM.syn
04/16/2020

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations												
Traffic Volume (vph)	501	55	118	26	200	200	714	17	6	427	358	
Future Volume (vph)	501	55	118	26	200	200	714	17	6	427	358	
Turn Type	Prot	NA	Perm	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA	pm+ov	
Protected Phases	7	4		3	8	5	2		1	6	7	
Permitted Phases			4	8		2		2	6		6	
Detector Phase	7	4	4	3	8	5	2	2	1	6	7	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	11.5	24.5	24.5	11.5	24.5	11.5	24.5	24.5	11.5	24.5	11.5	
Total Split (s)	34.0	53.0	53.0	11.6	30.6	23.4	43.8	43.8	11.6	32.0	34.0	
Total Split (%)	28.3%	44.2%	44.2%	9.7%	25.5%	19.5%	36.5%	36.5%	9.7%	26.7%	28.3%	
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	None	
Act Effct Green (s)	24.4	43.6	43.6	24.7	19.6	56.5	54.2	54.2	41.4	35.9	66.8	
Actuated g/C Ratio	0.20	0.36	0.36	0.21	0.16	0.47	0.45	0.45	0.34	0.30	0.56	
v/c Ratio	0.80	0.09	0.18	0.10	0.77	0.53	0.50	0.02	0.03	0.44	0.39	
Control Delay	54.5	24.9	0.6	21.8	64.6	26.1	26.9	0.1	37.2	53.5	1.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	54.5	24.9	0.6	21.8	64.6	26.1	26.9	0.1	37.2	53.5	1.5	
LOS	D	C	A	C	E	C	C	A	D	D	A	
Approach Delay		42.7			59.9		26.2			29.7		
Approach LOS		D			E		C			C		

Intersection Summary

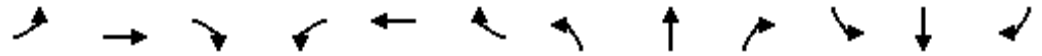
Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.80
 Intersection Signal Delay: 34.5
 Intersection LOS: C
 Intersection Capacity Utilization 71.1%
 ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 14: Grinnel Blvd & Bradley Road



HCM 6th Signalized Intersection Summary
 14: Grinnel Blvd & Bradley Road

2030 Total AM.syn
 04/16/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↗	↑	↖	↖	↗		↖	↑↑	↖	↖	↑↑	↖
Traffic Volume (veh/h)	501	55	118	26	200	11	200	714	17	6	427	358
Future Volume (veh/h)	501	55	118	26	200	11	200	714	17	6	427	358
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	545	60	128	28	217	12	217	776	18	7	459	389
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.93	0.92
Percent Heavy Veh, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	622	557	472	275	251	14	394	1562	697	269	1264	849
Arrive On Green	0.18	0.30	0.30	0.03	0.15	0.15	0.09	0.45	0.45	0.01	0.36	0.36
Sat Flow, veh/h	3401	1841	1560	1753	1728	96	1753	3497	1560	1753	3497	1560
Grp Volume(v), veh/h	545	60	128	28	0	229	217	776	18	7	459	389
Grp Sat Flow(s),veh/h/ln	1700	1841	1560	1753	0	1824	1753	1749	1560	1753	1749	1560
Q Serve(g_s), s	18.7	2.8	7.5	1.6	0.0	14.7	9.0	18.9	0.8	0.3	11.6	18.2
Cycle Q Clear(g_c), s	18.7	2.8	7.5	1.6	0.0	14.7	9.0	18.9	0.8	0.3	11.6	18.2
Prop In Lane	1.00		1.00	1.00		0.05	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	622	557	472	275	0	265	394	1562	697	269	1264	849
V/C Ratio(X)	0.88	0.11	0.27	0.10	0.00	0.86	0.55	0.50	0.03	0.03	0.36	0.46
Avail Cap(c_a), veh/h	779	713	604	305	0	366	476	1562	697	329	1264	849
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.7	30.1	31.8	42.0	0.0	50.1	20.3	23.6	18.6	24.2	28.2	16.6
Incr Delay (d2), s/veh	9.3	0.1	0.3	0.2	0.0	14.5	1.2	1.1	0.1	0.0	0.8	1.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.7	1.3	2.9	0.7	0.0	7.8	3.8	8.0	0.3	0.1	5.0	6.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	57.0	30.2	32.1	42.1	0.0	64.6	21.5	24.8	18.7	24.3	29.0	18.4
LnGrp LOS	E	C	C	D	A	E	C	C	B	C	C	B
Approach Vol, veh/h		733			257			1011			855	
Approach Delay, s/veh		50.4			62.2			23.9			24.1	
Approach LOS		D			E			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.5	60.1	9.5	42.8	17.7	49.9	28.4	23.9				
Change Period (Y+Rc), s	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5				
Max Green Setting (Gmax), s	5.1	37.3	5.1	46.5	16.9	25.5	27.5	24.1				
Max Q Clear Time (g_c+I1), s	2.3	20.9	3.6	9.5	11.0	20.2	20.7	16.7				
Green Ext Time (p_c), s	0.0	5.0	0.0	0.8	0.3	2.2	1.2	0.7				
Intersection Summary												
HCM 6th Ctrl Delay			34.2									
HCM 6th LOS			C									

Timings
14: Grinnel Blvd & Bradley Road

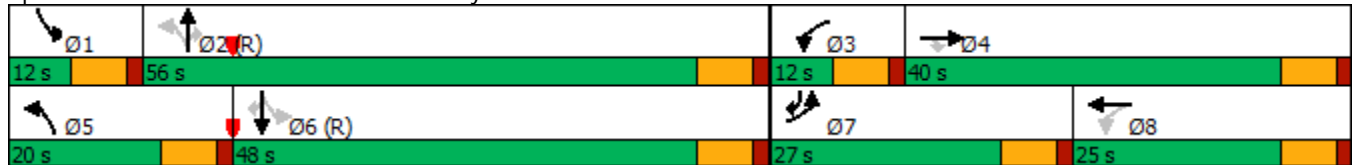
2030 Total PM.syn
04/16/2020

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	303	154	229	22	64	142	396	28	8	669	422
Future Volume (vph)	303	154	229	22	64	142	396	28	8	669	422
Turn Type	Prot	NA	Perm	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA	pm+ov
Protected Phases	7	4		3	8	5	2		1	6	7
Permitted Phases			4	8		2		2	6		6
Detector Phase	7	4	4	3	8	5	2	2	1	6	7
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.5	24.5	24.5	11.5	24.5	11.5	24.5	24.5	11.5	24.5	11.5
Total Split (s)	27.0	40.0	40.0	12.0	25.0	20.0	56.0	56.0	12.0	48.0	27.0
Total Split (%)	22.5%	33.3%	33.3%	10.0%	20.8%	16.7%	46.7%	46.7%	10.0%	40.0%	22.5%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	None
Act Effct Green (s)	17.0	24.0	24.0	14.5	10.2	75.8	73.2	73.2	65.0	59.2	82.7
Actuated g/C Ratio	0.14	0.20	0.20	0.12	0.08	0.63	0.61	0.61	0.54	0.49	0.69
v/c Ratio	0.68	0.45	0.48	0.14	0.49	0.36	0.20	0.03	0.02	0.42	0.38
Control Delay	56.2	45.4	8.0	32.2	59.3	13.4	13.1	0.0	17.0	25.8	0.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.2	45.4	8.0	32.2	59.3	13.4	13.1	0.0	17.0	25.8	0.8
LOS	E	D	A	C	E	B	B	A	B	C	A
Approach Delay		37.8			52.8		12.5			16.1	
Approach LOS		D			D		B			B	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.68
 Intersection Signal Delay: 22.7
 Intersection LOS: C
 Intersection Capacity Utilization 60.8%
 ICU Level of Service B
 Analysis Period (min) 15

Splits and Phases: 14: Grinnel Blvd & Bradley Road



HCM 6th Signalized Intersection Summary
 14: Grinnel Blvd & Bradley Road

2030 Total PM.syn
 04/16/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↗	↑	↖	↖	↗		↖	↑↑	↖	↖	↑↑	↖
Traffic Volume (veh/h)	303	154	229	22	64	6	142	396	28	8	669	422
Future Volume (veh/h)	303	154	229	22	64	6	142	396	28	8	669	422
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	329	167	246	24	70	7	154	430	30	9	727	459
Peak Hour Factor	0.92	0.92	0.93	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	399	336	285	185	146	15	348	2005	894	549	1840	1004
Arrive On Green	0.12	0.18	0.18	0.02	0.09	0.09	0.06	0.57	0.57	0.01	0.52	0.52
Sat Flow, veh/h	3428	1856	1572	1767	1660	166	1767	3526	1572	1767	3526	1572
Grp Volume(v), veh/h	329	167	246	24	0	77	154	430	30	9	727	459
Grp Sat Flow(s),veh/h/ln	1714	1856	1572	1767	0	1826	1767	1763	1572	1767	1763	1572
Q Serve(g_s), s	11.3	9.7	18.2	1.5	0.0	4.8	4.7	7.2	1.0	0.3	14.9	17.9
Cycle Q Clear(g_c), s	11.3	9.7	18.2	1.5	0.0	4.8	4.7	7.2	1.0	0.3	14.9	17.9
Prop In Lane	1.00		1.00	1.00		0.09	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	399	336	285	185	0	160	348	2005	894	549	1840	1004
V/C Ratio(X)	0.83	0.50	0.86	0.13	0.00	0.48	0.44	0.21	0.03	0.02	0.40	0.46
Avail Cap(c_a), veh/h	586	518	439	226	0	281	445	2005	894	611	1840	1004
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.8	44.2	47.7	48.1	0.0	52.1	12.7	12.7	11.4	13.2	17.3	11.1
Incr Delay (d2), s/veh	6.2	1.1	10.7	0.3	0.0	2.2	0.9	0.2	0.1	0.0	0.6	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.2	4.6	8.0	0.7	0.0	2.3	1.9	2.9	0.4	0.1	6.1	6.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	58.0	45.4	58.4	48.4	0.0	54.4	13.6	13.0	11.5	13.2	17.9	12.6
LnGrp LOS	E	D	E	D	A	D	B	B	B	B	B	B
Approach Vol, veh/h		742			101			614			1195	
Approach Delay, s/veh		55.3			53.0			13.1			15.8	
Approach LOS		E			D			B			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.8	74.7	9.3	28.2	13.4	69.1	20.5	17.0				
Change Period (Y+Rc), s	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5				
Max Green Setting (Gmax), s	5.5	49.5	5.5	33.5	13.5	41.5	20.5	18.5				
Max Q Clear Time (g_c+I1), s	2.3	9.2	3.5	20.2	6.7	19.9	13.3	6.8				
Green Ext Time (p_c), s	0.0	3.3	0.0	1.5	0.2	7.2	0.7	0.2				
Intersection Summary												
HCM 6th Ctrl Delay				27.6								
HCM 6th LOS				C								

MOVEMENT SUMMARY

 Site: 101 [2030 Total AM]

Bradley Road and Grinnell Boulevard
 Site Category: (None)
 Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: Grinnell Boulevard												
3	L2	217	4.0	0.666	17.7	LOS C	6.0	154.6	0.79	1.04	1.51	28.7
8	T1	776	4.0	0.666	16.8	LOS C	6.2	158.9	0.78	1.03	1.49	29.5
18	R2	18	4.0	0.666	16.4	LOS C	6.2	158.9	0.78	1.02	1.48	29.2
Approach		1012	4.0	0.666	17.0	LOS C	6.2	158.9	0.78	1.03	1.49	29.3
East: Bradley Road												
1	L2	28	4.0	0.397	21.8	LOS C	1.5	37.8	0.84	0.93	1.17	27.6
6	T1	217	4.0	0.397	20.1	LOS C	1.5	38.3	0.83	0.92	1.16	28.4
16	R2	12	4.0	0.397	18.9	LOS C	1.5	38.3	0.82	0.91	1.15	28.3
Approach		258	4.0	0.397	20.2	LOS C	1.5	38.3	0.83	0.92	1.16	28.3
North: Grinnell Boulevard												
7	L2	7	4.0	0.494	10.9	LOS B	3.2	83.1	0.65	0.74	0.90	32.3
4	T1	464	4.0	0.494	10.8	LOS B	3.2	83.1	0.65	0.73	0.89	32.3
14	R2	389	4.0	0.494	10.3	LOS B	3.2	82.7	0.63	0.70	0.86	31.5
Approach		860	4.0	0.494	10.6	LOS B	3.2	83.1	0.64	0.72	0.88	31.9
West: Bradley Road												
5	L2	545	4.0	0.620	13.6	LOS B	5.6	145.5	0.72	0.92	1.25	29.1
2	T1	60	4.0	0.233	7.0	LOS A	0.9	23.6	0.54	0.51	0.54	34.1
12	R2	128	4.0	0.233	7.0	LOS A	0.9	23.6	0.54	0.51	0.54	33.0
Approach		733	4.0	0.620	11.9	LOS B	5.6	145.5	0.68	0.81	1.07	30.1
All Vehicles		2862	4.0	0.666	14.1	LOS B	6.2	158.9	0.72	0.87	1.17	30.1

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

 Site: 101 [2030 Total PM]

Bradley Road and Grinnell Boulevard
 Site Category: (None)
 Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: Grinnell Boulevard												
3	L2	154	3.0	0.362	8.7	LOS A	1.6	41.3	0.60	0.60	0.61	32.1
8	T1	430	3.0	0.362	8.4	LOS A	1.6	41.3	0.58	0.57	0.59	33.1
18	R2	30	3.0	0.362	8.2	LOS A	1.6	40.1	0.58	0.56	0.58	32.6
Approach		615	3.0	0.362	8.4	LOS A	1.6	41.3	0.59	0.58	0.59	32.8
East: Bradley Road												
1	L2	24	3.0	0.085	7.6	LOS A	0.3	7.4	0.61	0.61	0.61	32.7
6	T1	70	3.0	0.085	7.0	LOS A	0.3	7.4	0.60	0.60	0.60	33.7
16	R2	7	3.0	0.085	6.8	LOS A	0.3	7.3	0.59	0.59	0.59	33.2
Approach		100	3.0	0.085	7.2	LOS A	0.3	7.4	0.60	0.60	0.60	33.4
North: Grinnell Boulevard												
7	L2	9	3.0	0.557	10.5	LOS B	4.2	106.5	0.58	0.50	0.66	32.6
4	T1	727	3.0	0.557	10.4	LOS B	4.2	106.5	0.57	0.50	0.65	32.5
14	R2	459	3.0	0.557	10.0	LOS B	3.9	99.6	0.55	0.46	0.61	31.6
Approach		1195	3.0	0.557	10.3	LOS B	4.2	106.5	0.56	0.48	0.64	32.2
West: Bradley Road												
5	L2	329	3.0	0.554	15.2	LOS C	3.5	90.0	0.75	0.90	1.23	28.7
2	T1	167	3.0	0.554	14.1	LOS B	3.6	91.7	0.73	0.89	1.21	30.5
12	R2	249	3.0	0.554	14.0	LOS B	3.6	91.7	0.73	0.89	1.21	30.0
Approach		746	3.0	0.554	14.5	LOS B	3.6	91.7	0.74	0.89	1.22	29.5
All Vehicles		2655	3.0	0.557	10.9	LOS B	4.2	106.5	0.62	0.62	0.79	31.6

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Timings
14: Grinnel Blvd & Bradley Road

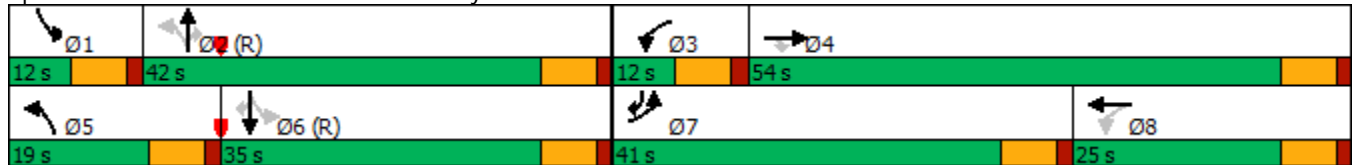
2045 Total AM.syn
04/16/2020

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations												
Traffic Volume (vph)	795	63	137	30	232	232	1042	19	6	524	444	
Future Volume (vph)	795	63	137	30	232	232	1042	19	6	524	444	
Turn Type	Prot	NA	Perm	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA	pm+ov	
Protected Phases	7	4		3	8	5	2		1	6	7	
Permitted Phases			4	8		2		2	6		6	
Detector Phase	7	4	4	3	8	5	2	2	1	6	7	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	11.5	24.5	24.5	11.5	24.5	11.5	24.5	24.5	11.5	24.5	11.5	
Total Split (s)	41.0	54.0	54.0	12.0	25.0	19.0	42.0	42.0	12.0	35.0	41.0	
Total Split (%)	34.2%	45.0%	45.0%	10.0%	20.8%	15.8%	35.0%	35.0%	10.0%	29.2%	34.2%	
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	None	
Act Effct Green (s)	33.8	51.7	51.7	24.1	18.6	48.1	45.7	45.7	34.4	28.9	69.2	
Actuated g/C Ratio	0.28	0.43	0.43	0.20	0.16	0.40	0.38	0.38	0.29	0.24	0.58	
v/c Ratio	0.91	0.09	0.19	0.12	0.94	0.88	0.86	0.03	0.05	0.67	0.50	
Control Delay	56.1	22.2	1.3	22.0	90.9	57.9	42.5	0.1	23.5	46.1	11.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	56.1	22.2	1.3	22.0	90.9	57.9	42.5	0.1	23.5	46.1	11.9	
LOS	E	C	A	C	F	E	D	A	C	D	B	
Approach Delay		46.4			83.3		44.7			30.3		
Approach LOS		D			F		D			C		

Intersection Summary

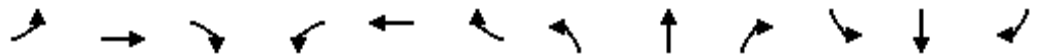
Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 120
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.94
 Intersection Signal Delay: 44.2
 Intersection LOS: D
 Intersection Capacity Utilization 90.3%
 ICU Level of Service E
 Analysis Period (min) 15

Splits and Phases: 14: Grinnel Blvd & Bradley Road



HCM 6th Signalized Intersection Summary
 14: Grinnel Blvd & Bradley Road

2045 Total AM.syn
 04/16/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↗	↑	↖	↖	↗		↖	↑↑	↖	↖	↑↑	↖
Traffic Volume (veh/h)	795	63	137	30	232	13	232	1042	19	6	524	444
Future Volume (veh/h)	795	63	137	30	232	13	232	1042	19	6	524	444
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	864	68	149	33	252	14	252	1133	21	7	563	483
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.93	0.92
Percent Heavy Veh, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	929	736	623	285	266	15	300	1215	542	92	881	819
Arrive On Green	0.27	0.40	0.40	0.03	0.15	0.15	0.10	0.35	0.35	0.01	0.25	0.25
Sat Flow, veh/h	3401	1841	1560	1753	1727	96	1753	3497	1560	1753	3497	1560
Grp Volume(v), veh/h	864	68	149	33	0	266	252	1133	21	7	563	483
Grp Sat Flow(s),veh/h/ln	1700	1841	1560	1753	0	1823	1753	1749	1560	1753	1749	1560
Q Serve(g_s), s	29.7	2.8	7.6	1.9	0.0	17.3	12.5	37.5	1.1	0.4	17.2	25.6
Cycle Q Clear(g_c), s	29.7	2.8	7.6	1.9	0.0	17.3	12.5	37.5	1.1	0.4	17.2	25.6
Prop In Lane	1.00		1.00	1.00		0.05	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	929	736	623	285	0	281	300	1215	542	92	881	819
V/C Ratio(X)	0.93	0.09	0.24	0.12	0.00	0.95	0.84	0.93	0.04	0.08	0.64	0.59
Avail Cap(c_a), veh/h	978	736	623	317	0	281	300	1215	542	157	881	819
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.5	22.5	23.9	40.9	0.0	50.3	30.6	37.8	25.9	35.8	40.0	19.6
Incr Delay (d2), s/veh	14.4	0.1	0.2	0.2	0.0	39.3	18.7	14.0	0.1	0.3	3.5	3.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.2	1.2	2.9	0.8	0.0	10.9	6.8	18.2	0.4	0.2	7.8	9.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	56.9	22.5	24.1	41.1	0.0	89.6	49.3	51.9	26.0	36.2	43.6	22.7
LnGrp LOS	E	C	C	D	A	F	D	D	C	D	D	C
Approach Vol, veh/h		1081			299			1406			1053	
Approach Delay, s/veh		50.2			84.2			51.0			34.0	
Approach LOS		D			F			D			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.5	48.2	9.8	54.4	19.0	36.7	39.3	25.0				
Change Period (Y+Rc), s	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5				
Max Green Setting (Gmax), s	5.5	35.5	5.5	47.5	12.5	28.5	34.5	18.5				
Max Q Clear Time (g_c+I1), s	2.4	39.5	3.9	9.6	14.5	27.6	31.7	19.3				
Green Ext Time (p_c), s	0.0	0.0	0.0	0.9	0.0	0.6	1.1	0.0				

Intersection Summary												
HCM 6th Ctrl Delay				48.7								
HCM 6th LOS				D								

Timings
14: Grinnel Blvd & Bradley Road

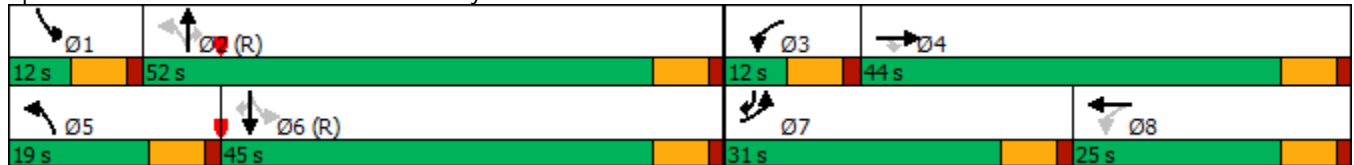
2045 Total PM.syn
04/16/2020

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations												
Traffic Volume (vph)	377	179	266	26	74	164	485	32	9	957	670	
Future Volume (vph)	377	179	266	26	74	164	485	32	9	957	670	
Turn Type	Prot	NA	Perm	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA	pm+ov	
Protected Phases	7	4		3	8	5	2		1	6	7	
Permitted Phases			4	8		2		2	6		6	
Detector Phase	7	4	4	3	8	5	2	2	1	6	7	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	11.5	24.5	24.5	11.5	24.5	11.5	24.5	24.5	11.5	24.5	11.5	
Total Split (s)	31.0	44.0	44.0	12.0	25.0	19.0	52.0	52.0	12.0	45.0	31.0	
Total Split (%)	25.8%	36.7%	36.7%	10.0%	20.8%	15.8%	43.3%	43.3%	10.0%	37.5%	25.8%	
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	None	
Act Effct Green (s)	21.0	31.2	31.2	16.4	10.9	68.6	66.0	66.0	55.5	49.7	77.2	
Actuated g/C Ratio	0.18	0.26	0.26	0.14	0.09	0.57	0.55	0.55	0.46	0.41	0.64	
v/c Ratio	0.69	0.41	0.49	0.15	0.52	0.64	0.27	0.04	0.02	0.72	0.62	
Control Delay	52.4	39.5	11.0	29.7	60.5	27.5	16.7	0.1	18.7	34.5	2.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	52.4	39.5	11.0	29.7	60.5	27.5	16.7	0.1	18.7	34.5	2.5	
LOS	D	D	B	C	E	C	B	A	B	C	A	
Approach Delay		36.3			53.0		18.5			21.3		
Approach LOS		D			D		B			C		

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.72
 Intersection Signal Delay: 25.5
 Intersection LOS: C
 Intersection Capacity Utilization 72.2%
 ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 14: Grinnel Blvd & Bradley Road



HCM 6th Signalized Intersection Summary
 14: Grinnel Blvd & Bradley Road

2045 Total PM.syn
 04/16/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↗	↑	↖	↖	↖		↖	↑↑	↖	↖	↑↑	↖
Traffic Volume (veh/h)	377	179	266	26	74	6	164	485	32	9	957	670
Future Volume (veh/h)	377	179	266	26	74	6	164	485	32	9	957	670
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	410	195	286	28	80	7	178	527	35	10	1040	728
Peak Hour Factor	0.92	0.92	0.93	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	486	386	327	188	154	14	249	1897	846	465	1704	983
Arrive On Green	0.14	0.21	0.21	0.03	0.09	0.09	0.07	0.54	0.54	0.01	0.48	0.48
Sat Flow, veh/h	3428	1856	1572	1767	1682	147	1767	3526	1572	1767	3526	1572
Grp Volume(v), veh/h	410	195	286	28	0	87	178	527	35	10	1040	728
Grp Sat Flow(s),veh/h/ln	1714	1856	1572	1767	0	1829	1767	1763	1572	1767	1763	1572
Q Serve(g_s), s	14.0	11.2	21.1	1.7	0.0	5.4	5.8	9.7	1.3	0.3	25.9	38.8
Cycle Q Clear(g_c), s	14.0	11.2	21.1	1.7	0.0	5.4	5.8	9.7	1.3	0.3	25.9	38.8
Prop In Lane	1.00		1.00	1.00		0.08	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	486	386	327	188	0	168	249	1897	846	465	1704	983
V/C Ratio(X)	0.84	0.50	0.87	0.15	0.00	0.52	0.71	0.28	0.04	0.02	0.61	0.74
Avail Cap(c_a), veh/h	700	580	491	224	0	282	316	1897	846	525	1704	983
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	50.2	42.0	46.0	47.5	0.0	52.0	21.1	15.0	13.1	15.4	22.7	15.7
Incr Delay (d2), s/veh	6.5	1.0	11.0	0.4	0.0	2.5	5.5	0.4	0.1	0.0	1.6	5.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.4	5.2	9.2	0.8	0.0	2.6	2.8	4.0	0.5	0.1	11.0	14.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	56.7	43.1	57.0	47.9	0.0	54.4	26.6	15.4	13.2	15.4	24.4	20.7
LnGrp LOS	E	D	E	D	A	D	C	B	B	B	C	C
Approach Vol, veh/h		891			115			740			1778	
Approach Delay, s/veh		53.8			52.8			18.0			22.8	
Approach LOS		D			D			B			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.9	71.1	9.5	31.5	14.5	64.5	23.5	17.5				
Change Period (Y+Rc), s	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5				
Max Green Setting (Gmax), s	5.5	45.5	5.5	37.5	12.5	38.5	24.5	18.5				
Max Q Clear Time (g_c+I1), s	2.3	11.7	3.7	23.1	7.8	40.8	16.0	7.4				
Green Ext Time (p_c), s	0.0	4.1	0.0	1.8	0.2	0.0	1.0	0.2				
Intersection Summary												
HCM 6th Ctrl Delay				30.6								
HCM 6th LOS				C								

MOVEMENT SUMMARY

 Site: 101 [2045 Total AM]

Bradley Road and Grinnell Boulevard
 Site Category: (None)
 Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: Grinnell Boulevard												
3	L2	252	4.0	1.180	123.1	LOS F	46.0	1187.6	1.00	3.19	8.18	12.4
8	T1	1133	4.0	1.180	121.0	LOS F	50.8	1309.4	1.00	3.30	8.47	12.6
18	R2	21	4.0	1.180	119.8	LOS F	50.8	1309.4	1.00	3.37	8.64	12.6
Approach		1405	4.0	1.180	121.3	LOS F	50.8	1309.4	1.00	3.28	8.42	12.6
East: Bradley Road												
1	L2	33	4.0	0.686	54.0	LOS F	2.9	73.8	0.94	1.15	1.82	19.9
6	T1	252	4.0	0.686	49.2	LOS E	3.0	76.7	0.94	1.15	1.82	20.9
16	R2	14	4.0	0.686	45.9	LOS E	3.0	76.7	0.93	1.15	1.82	21.2
Approach		299	4.0	0.686	49.5	LOS E	3.0	76.7	0.94	1.15	1.82	20.8
North: Grinnell Boulevard												
7	L2	7	4.0	0.628	14.8	LOS B	5.7	148.2	0.74	0.95	1.30	30.7
4	T1	570	4.0	0.628	14.7	LOS B	5.9	150.9	0.74	0.95	1.30	30.6
14	R2	483	4.0	0.628	13.9	LOS B	5.9	150.9	0.73	0.93	1.27	29.9
Approach		1059	4.0	0.628	14.3	LOS B	5.9	150.9	0.74	0.94	1.29	30.3
West: Bradley Road												
5	L2	864	4.0	1.084	79.0	LOS F	46.0	1186.9	1.00	2.82	6.19	16.1
2	T1	68	4.0	0.300	8.6	LOS A	1.2	30.7	0.60	0.60	0.60	33.3
12	R2	149	4.0	0.300	8.6	LOS A	1.2	30.7	0.60	0.60	0.60	32.3
Approach		1082	4.0	1.084	64.8	LOS F	46.0	1186.9	0.92	2.37	5.07	17.8
All Vehicles		3845	4.0	1.180	70.4	LOS F	50.8	1309.4	0.90	2.22	5.00	17.3

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

 Site: 101 [2045 Total PM]

Bradley Road and Grinnell Boulevard
 Site Category: (None)
 Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: Grinnell Boulevard												
3	L2	178	3.0	0.481	11.8	LOS B	2.9	73.8	0.69	0.79	0.99	30.9
8	T1	527	3.0	0.481	11.2	LOS B	2.9	74.1	0.67	0.78	0.97	31.8
18	R2	35	3.0	0.481	11.0	LOS B	2.9	74.1	0.67	0.77	0.96	31.3
Approach		740	3.0	0.481	11.4	LOS B	2.9	74.1	0.68	0.78	0.97	31.5
East: Bradley Road												
1	L2	28	3.0	0.118	9.5	LOS A	0.4	10.0	0.68	0.68	0.68	31.8
6	T1	80	3.0	0.118	8.8	LOS A	0.4	10.0	0.66	0.66	0.66	32.9
16	R2	7	3.0	0.118	8.5	LOS A	0.4	9.9	0.65	0.65	0.65	32.5
Approach		115	3.0	0.118	9.0	LOS A	0.4	10.0	0.66	0.66	0.66	32.6
North: Grinnell Boulevard												
7	L2	10	3.0	0.859	25.1	LOS D	24.2	618.6	0.97	1.44	2.24	27.0
4	T1	1040	3.0	0.859	24.9	LOS C	25.0	639.8	0.97	1.43	2.24	26.9
14	R2	728	3.0	0.859	23.9	LOS C	25.0	639.8	0.96	1.41	2.21	26.4
Approach		1778	3.0	0.859	24.5	LOS C	25.0	639.8	0.97	1.42	2.22	26.7
West: Bradley Road												
5	L2	410	3.0	0.886	47.3	LOS E	9.6	246.9	0.93	1.49	2.90	20.6
2	T1	195	3.0	0.886	43.4	LOS E	10.2	262.2	0.92	1.50	2.92	21.9
12	R2	289	3.0	0.886	43.3	LOS E	10.2	262.2	0.92	1.50	2.93	21.6
Approach		893	3.0	0.886	45.1	LOS E	10.2	262.2	0.92	1.49	2.91	21.2
All Vehicles		3527	3.0	0.886	26.5	LOS D	25.0	639.8	0.89	1.28	2.08	26.0

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Intersection												
Int Delay, s/veh	3.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑	↗	↘	↑↑		↘	↗		↘	↗	
Traffic Vol, veh/h	61	772	147	0	627	15	132	0	0	15	0	59
Future Vol, veh/h	61	772	147	0	627	15	132	0	0	15	0	59
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	0	100	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	95	92	92	95	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	66	813	160	0	660	16	143	0	0	16	0	64

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	676	0	0	973	0	0	1275	1621	407	1207	1773	338
Stage 1	-	-	-	-	-	-	945	945	-	668	668	-
Stage 2	-	-	-	-	-	-	330	676	-	539	1105	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	1252	-	-	704	-	-	*222	138	593	*257	*105	*841
Stage 1	-	-	-	-	-	-	*282	339	-	*793	*695	-
Stage 2	-	-	-	-	-	-	*793	690	-	*494	*285	-
Platoon blocked, %	1	-	-	-	-	-	1	1	-	1	1	1
Mov Cap-1 Maneuver	1252	-	-	704	-	-	*197	131	593	*247	*99	*841
Mov Cap-2 Maneuver	-	-	-	-	-	-	*235	245	-	*366	*212	-
Stage 1	-	-	-	-	-	-	*267	321	-	*751	*695	-
Stage 2	-	-	-	-	-	-	*732	690	-	*468	*270	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	0	41.7	10.8
HCM LOS			E	B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	235	-	1252	-	-	704	-	-	366	841
HCM Lane V/C Ratio	0.611	-	0.053	-	-	-	-	-	0.045	0.076
HCM Control Delay (s)	41.7	0	8	-	-	0	-	-	15.3	9.6
HCM Lane LOS	E	A	A	-	-	A	-	-	C	A
HCM 95th %tile Q(veh)	3.6	-	0.2	-	-	0	-	-	0.1	0.2

Notes
 -: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection												
Int Delay, s/veh	2.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑↑	↗	↖	↑↑		↖	↗		↖	↗	
Traffic Vol, veh/h	69	422	119	0	359	17	90	0	0	16	0	66
Future Vol, veh/h	69	422	119	0	359	17	90	0	0	16	0	66
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	0	100	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	95	92	92	95	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	75	444	129	0	378	18	98	0	0	17	0	72

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	396	0	0	573	0	0	783	990	222	759	1110	198
Stage 1	-	-	-	-	-	-	594	594	-	387	387	-
Stage 2	-	-	-	-	-	-	189	396	-	372	723	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	1396	-	-	996	-	-	*423	317	782	442	264	*945
Stage 1	-	-	-	-	-	-	*458	491	-	885	777	-
Stage 2	-	-	-	-	-	-	*891	769	-	621	429	-
Platoon blocked, %	1	-	-	-	-	-	1	1	-	1	1	1
Mov Cap-1 Maneuver	1396	-	-	996	-	-	*375	300	782	424	249	*945
Mov Cap-2 Maneuver	-	-	-	-	-	-	*388	380	-	494	338	-
Stage 1	-	-	-	-	-	-	*433	464	-	837	777	-
Stage 2	-	-	-	-	-	-	*823	769	-	588	406	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.9	0	17.4	9.8
HCM LOS			C	A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	388	-	1396	-	-	996	-	-	494	945
HCM Lane V/C Ratio	0.252	-	0.054	-	-	-	-	-	0.035	0.076
HCM Control Delay (s)	17.4	0	7.7	-	-	0	-	-	12.6	9.1
HCM Lane LOS	C	A	A	-	-	A	-	-	B	A
HCM 95th %tile Q(veh)	1	-	0.2	-	-	0	-	-	0.1	0.2

Notes
 -: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection												
Int Delay, s/veh	4.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↵	↑↑	↵	↵	↑↑		↵	↵		↵	↵	
Traffic Vol, veh/h	57	872	142	5	618	19	127	0	13	19	0	56
Future Vol, veh/h	57	872	142	5	618	19	127	0	13	19	0	56
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	0	100	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	62	948	154	5	672	21	138	0	14	21	0	61

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	693	0	0	1102	0	0	1418	1775	474	1291	1919	347
Stage 1	-	-	-	-	-	-	1072	1072	-	693	693	-
Stage 2	-	-	-	-	-	-	346	703	-	598	1226	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	1229	-	-	629	-	-	*163	105	537	214	81	*841
Stage 1	-	-	-	-	-	-	*235	295	-	764	676	-
Stage 2	-	-	-	-	-	-	*793	667	-	456	249	-
Platoon blocked, %	1	-	-	-	-	-	1	1	-	1	1	1
Mov Cap-1 Maneuver	1229	-	-	629	-	-	*145	99	537	200	76	*841
Mov Cap-2 Maneuver	-	-	-	-	-	-	*194	212	-	323	182	-
Stage 1	-	-	-	-	-	-	*223	280	-	726	670	-
Stage 2	-	-	-	-	-	-	*730	662	-	422	237	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.4			0.1			55			11.4		
HCM LOS							F			B		

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	194	537	1229	-	-	629	-	-	323	841
HCM Lane V/C Ratio	0.712	0.026	0.05	-	-	0.009	-	-	0.064	0.072
HCM Control Delay (s)	59.4	11.9	8.1	-	-	10.8	-	-	16.9	9.6
HCM Lane LOS	F	B	A	-	-	B	-	-	C	A
HCM 95th %tile Q(veh)	4.5	0.1	0.2	-	-	0	-	-	0.2	0.2

Notes
 -: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection												
Int Delay, s/veh	2.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑↑	↗	↖	↑↑		↖	↗		↖	↗	
Traffic Vol, veh/h	65	419	115	4	475	22	86	0	7	21	0	62
Future Vol, veh/h	65	419	115	4	475	22	86	0	7	21	0	62
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	0	100	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	71	455	125	4	516	24	93	0	8	23	0	67

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	540	0	0	580	0	0	863	1145	228	906	1258	270
Stage 1	-	-	-	-	-	-	597	597	-	536	536	-
Stage 2	-	-	-	-	-	-	266	548	-	370	722	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	1319	-	-	990	-	-	*435	279	775	399	232	*893
Stage 1	-	-	-	-	-	-	*456	490	-	830	730	-
Stage 2	-	-	-	-	-	-	*842	719	-	622	429	-
Platoon blocked, %	1	-	-	-	-	-	1	1	-	1	1	1
Mov Cap-1 Maneuver	1319	-	-	990	-	-	*384	263	775	378	218	*893
Mov Cap-2 Maneuver	-	-	-	-	-	-	*388	360	-	468	322	-
Stage 1	-	-	-	-	-	-	*431	464	-	785	727	-
Stage 2	-	-	-	-	-	-	*775	716	-	583	406	-

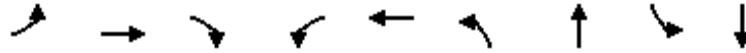
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.9			0.1			16.6			10.3		
HCM LOS							C			B		

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	388	775	1319	-	-	990	-	-	468	893
HCM Lane V/C Ratio	0.241	0.01	0.054	-	-	0.004	-	-	0.049	0.075
HCM Control Delay (s)	17.2	9.7	7.9	-	-	8.7	-	-	13.1	9.4
HCM Lane LOS	C	A	A	-	-	A	-	-	B	A
HCM 95th %tile Q(veh)	0.9	0	0.2	-	-	0	-	-	0.2	0.2

Notes
 -: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Timings
15: Grinnel Blvd & South Access

2030 Total AM.syn
04/02/2020

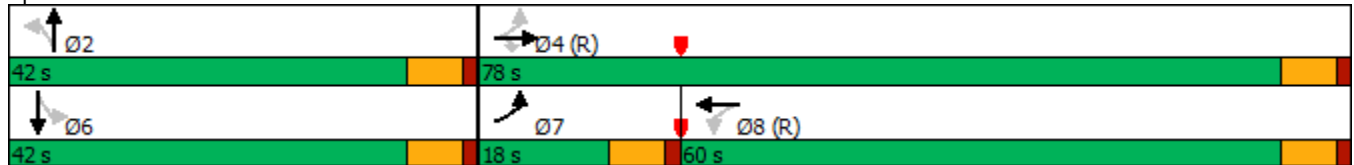


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	↗	↘	↖	↗	↖	↗	↖	↗
Traffic Volume (vph)	57	872	142	5	618	127	0	19	0
Future Volume (vph)	57	872	142	5	618	127	0	19	0
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	NA	Perm	NA
Protected Phases	7	4			8		2		6
Permitted Phases	4		4	8		2		6	
Detector Phase	7	4	4	8	8	2	2	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5
Total Split (s)	18.0	78.0	78.0	60.0	60.0	42.0	42.0	42.0	42.0
Total Split (%)	15.0%	65.0%	65.0%	50.0%	50.0%	35.0%	35.0%	35.0%	35.0%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Lead/Lag	Lead			Lag	Lag				
Lead-Lag Optimize?	Yes			Yes	Yes				
Recall Mode	None	C-Max	C-Max	C-Max	C-Max	Max	Max	Max	Max
Act Effect Green (s)	71.5	71.5	71.5	60.2	60.2	35.5	35.5	35.5	35.5
Actuated g/C Ratio	0.60	0.60	0.60	0.50	0.50	0.30	0.30	0.30	0.30
v/c Ratio	0.15	0.45	0.15	0.02	0.39	0.35	0.02	0.05	0.09
Control Delay	7.8	10.8	3.4	12.8	13.3	36.3	0.1	30.8	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.8	10.8	3.4	12.8	13.3	36.3	0.1	30.8	0.2
LOS	A	B	A	B	B	D	A	C	A
Approach Delay		9.7			13.3		33.0		8.1
Approach LOS		A			B		C		A

Intersection Summary

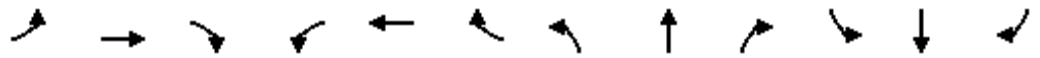
Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.45
 Intersection Signal Delay: 12.5
 Intersection LOS: B
 Intersection Capacity Utilization 58.2%
 ICU Level of Service B
 Analysis Period (min) 15

Splits and Phases: 15: Grinnel Blvd & South Access



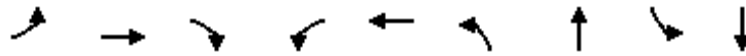
HCM 6th Signalized Intersection Summary
 15: Grinnel Blvd & South Access

2030 Total AM.syn
 04/02/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	57	872	142	5	618	19	127	0	13	19	0	56
Future Volume (veh/h)	57	872	142	5	618	19	127	0	13	19	0	56
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	62	948	154	5	672	21	138	0	14	21	0	61
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	377	2117	944	290	1777	56	419	0	469	465	0	469
Arrive On Green	0.04	0.60	0.60	0.17	0.17	0.17	0.30	0.00	0.30	0.30	0.00	0.30
Sat Flow, veh/h	1781	3554	1585	512	3518	110	1341	0	1585	1400	0	1585
Grp Volume(v), veh/h	62	948	154	5	339	354	138	0	14	21	0	61
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	512	1777	1851	1341	0	1585	1400	0	1585
Q Serve(g_s), s	1.9	17.6	5.2	1.0	20.4	20.4	10.1	0.0	0.8	1.3	0.0	3.4
Cycle Q Clear(g_c), s	1.9	17.6	5.2	7.8	20.4	20.4	13.5	0.0	0.8	2.1	0.0	3.4
Prop In Lane	1.00		1.00	1.00		0.06	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	377	2117	944	290	898	935	419	0	469	465	0	469
V/C Ratio(X)	0.16	0.45	0.16	0.02	0.38	0.38	0.33	0.00	0.03	0.05	0.00	0.13
Avail Cap(c_a), veh/h	483	2117	944	290	898	935	419	0	469	465	0	469
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	0.95	0.95	0.95	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	14.4	13.4	10.9	30.9	33.2	33.2	35.9	0.0	30.0	30.7	0.0	30.9
Incr Delay (d2), s/veh	0.2	0.7	0.4	0.1	1.2	1.1	2.1	0.0	0.1	0.2	0.0	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	7.0	1.9	0.1	10.0	10.4	3.6	0.0	0.3	0.5	0.0	1.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.6	14.1	11.2	31.0	34.4	34.3	38.0	0.0	30.1	30.9	0.0	31.5
LnGrp LOS	B	B	B	C	C	C	D	A	C	C	A	C
Approach Vol, veh/h		1164			698			152				82
Approach Delay, s/veh		13.7			34.3			37.2				31.4
Approach LOS		B			C			D				C
Timer - Assigned Phs		2		4		6	7	8				
Phs Duration (G+Y+Rc), s		42.0		78.0		42.0	10.9	67.1				
Change Period (Y+Rc), s		6.5		6.5		6.5	6.5	6.5				
Max Green Setting (Gmax), s		35.5		71.5		35.5	11.5	53.5				
Max Q Clear Time (g_c+l1), s		15.5		19.6		5.4	3.9	22.4				
Green Ext Time (p_c), s		0.4		9.5		0.4	0.1	4.8				
Intersection Summary												
HCM 6th Ctrl Delay				23.0								
HCM 6th LOS				C								

Timings
15: South Access & Grinnel Blvd

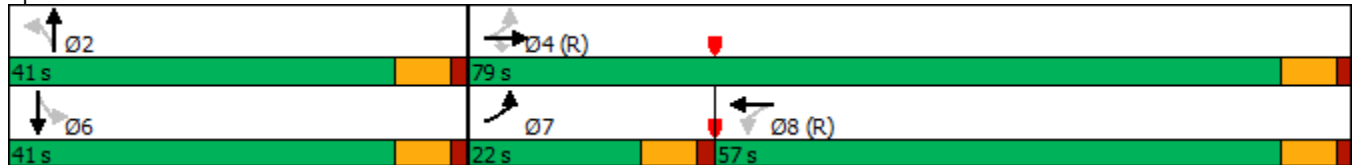


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	↗↗	↖	↖	↗↗	↖	↗	↖	↗
Traffic Volume (vph)	65	419	115	4	475	86	0	21	0
Future Volume (vph)	65	419	115	4	475	86	0	21	0
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	NA	Perm	NA
Protected Phases	7	4			8		2		6
Permitted Phases	4		4	8		2		6	
Detector Phase	7	4	4	8	8	2	2	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5
Total Split (s)	22.0	79.0	79.0	57.0	57.0	41.0	41.0	41.0	41.0
Total Split (%)	18.3%	65.8%	65.8%	47.5%	47.5%	34.2%	34.2%	34.2%	34.2%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Lead/Lag	Lead			Lag	Lag				
Lead-Lag Optimize?	Yes			Yes	Yes				
Recall Mode	None	C-Max	C-Max	C-Max	C-Max	Max	Max	Max	Max
Act Effct Green (s)	72.5	72.5	72.5	61.0	61.0	34.5	34.5	34.5	34.5
Actuated g/C Ratio	0.60	0.60	0.60	0.51	0.51	0.29	0.29	0.29	0.29
v/c Ratio	0.15	0.21	0.12	0.01	0.30	0.24	0.01	0.06	0.09
Control Delay	7.5	8.1	3.5	10.2	10.4	34.9	0.0	31.7	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.5	8.1	3.5	10.2	10.4	34.9	0.0	31.7	0.2
LOS	A	A	A	B	B	C	A	C	A
Approach Delay		7.2			10.4		32.2		8.3
Approach LOS		A			B		C		A

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.30
 Intersection Signal Delay: 10.4
 Intersection Capacity Utilization 45.7%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service A

Splits and Phases: 15: South Access & Grinnel Blvd



HCM 6th Signalized Intersection Summary
 15: South Access & Grinnel Blvd

2030 Total PM.syn
 04/02/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	65	419	115	4	475	22	86	0	7	21	0	62
Future Volume (veh/h)	65	419	115	4	475	22	86	0	7	21	0	62
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	71	455	125	4	516	24	93	0	8	23	0	67
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	458	2147	958	487	1771	82	402	0	456	460	0	456
Arrive On Green	0.04	0.60	0.60	0.17	0.17	0.17	0.29	0.00	0.29	0.29	0.00	0.29
Sat Flow, veh/h	1781	3554	1585	834	3458	161	1334	0	1585	1407	0	1585
Grp Volume(v), veh/h	71	455	125	4	265	275	93	0	8	23	0	67
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	834	1777	1841	1334	0	1585	1407	0	1585
Q Serve(g_s), s	2.2	7.0	4.1	0.5	15.6	15.7	6.7	0.0	0.4	1.4	0.0	3.8
Cycle Q Clear(g_c), s	2.2	7.0	4.1	0.5	15.6	15.7	10.5	0.0	0.4	1.9	0.0	3.8
Prop In Lane	1.00		1.00	1.00		0.09	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	458	2147	958	487	910	943	402	0	456	460	0	456
V/C Ratio(X)	0.16	0.21	0.13	0.01	0.29	0.29	0.23	0.00	0.02	0.05	0.00	0.15
Avail Cap(c_a), veh/h	620	2147	958	487	910	943	402	0	456	460	0	456
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	0.92	0.92	0.92	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	13.2	10.8	10.2	24.5	30.8	30.8	35.7	0.0	30.6	31.3	0.0	31.8
Incr Delay (d2), s/veh	0.2	0.2	0.3	0.0	0.7	0.7	1.3	0.0	0.1	0.2	0.0	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	2.8	1.5	0.1	7.6	7.9	2.3	0.0	0.2	0.5	0.0	1.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.3	11.0	10.5	24.5	31.6	31.6	37.0	0.0	30.7	31.5	0.0	32.5
LnGrp LOS	B	B	B	C	C	C	D	A	C	C	A	C
Approach Vol, veh/h		651			544			101				90
Approach Delay, s/veh		11.2			31.5			36.5				32.2
Approach LOS		B			C			D				C
Timer - Assigned Phs		2		4		6	7	8				
Phs Duration (G+Y+Rc), s		41.0		79.0		41.0	11.0	68.0				
Change Period (Y+Rc), s		6.5		6.5		6.5	6.5	6.5				
Max Green Setting (Gmax), s		34.5		72.5		34.5	15.5	50.5				
Max Q Clear Time (g_c+I1), s		12.5		9.0		5.8	4.2	17.7				
Green Ext Time (p_c), s		0.3		3.9		0.4	0.1	3.6				
Intersection Summary												
HCM 6th Ctrl Delay				22.4								
HCM 6th LOS				C								

Intersection												
Int Delay, s/veh	11.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↵	↑↑	↵	↵	↑↑		↵	↵		↵	↵	
Traffic Vol, veh/h	57	1174	142	5	666	19	127	0	13	19	0	56
Future Vol, veh/h	57	1174	142	5	666	19	127	0	13	19	0	56
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	0	100	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	62	1276	154	5	724	21	138	0	14	21	0	61

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	745	0	0	1430	0	0	1772	2155	638	1507	2299	373
Stage 1	-	-	-	-	-	-	1400	1400	-	745	745	-
Stage 2	-	-	-	-	-	-	372	755	-	762	1554	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	1217	-	-	471	-	-	*~ 80	53	419	144	41	*815
Stage 1	-	-	-	-	-	-	*148	205	-	766	672	-
Stage 2	-	-	-	-	-	-	*768	663	-	363	173	-
Platoon blocked, %	1	-	-	-	-	-	1	1	-	1	1	1
Mov Cap-1 Maneuver	1217	-	-	471	-	-	*~ 70	50	419	133	38	*815
Mov Cap-2 Maneuver	-	-	-	-	-	-	*~ 121	150	-	255	127	-
Stage 1	-	-	-	-	-	-	*140	195	-	727	665	-
Stage 2	-	-	-	-	-	-	*703	656	-	333	164	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.3			0.1			177.3			12.5		
HCM LOS							F			B		

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	121	419	1217	-	-	471	-	-	255	815
HCM Lane V/C Ratio	1.141	0.034	0.051	-	-	0.012	-	-	0.081	0.075
HCM Control Delay (s)	194	13.9	8.1	-	-	12.7	-	-	20.4	9.8
HCM Lane LOS	F	B	A	-	-	B	-	-	C	A
HCM 95th %tile Q(veh)	8.3	0.1	0.2	-	-	0	-	-	0.3	0.2

Notes
 -: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection												
Int Delay, s/veh	1.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑↑	↗	↖	↑↑		↖	↗		↖	↗	
Traffic Vol, veh/h	65	454	115	4	727	22	86	0	7	21	0	62
Future Vol, veh/h	65	454	115	4	727	22	86	0	7	21	0	62
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	0	100	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	71	493	125	4	790	24	93	0	8	23	0	67

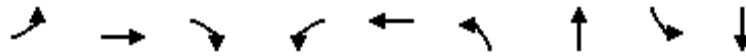
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	814	0	0	618	0	0	1038	1457	247	1199	1570	407
Stage 1	-	-	-	-	-	-	635	635	-	810	810	-
Stage 2	-	-	-	-	-	-	403	822	-	389	760	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	*1180	-	-	958	-	-	*454	207	753	*316	*168	*789
Stage 1	-	-	-	-	-	-	*433	471	-	*744	*652	-
Stage 2	-	-	-	-	-	-	*744	646	-	*606	*413	-
Platoon blocked, %	1	-	-	-	-	-	1	1	-	1	1	1
Mov Cap-1 Maneuver	*1180	-	-	958	-	-	*395	194	753	*297	*157	*789
Mov Cap-2 Maneuver	-	-	-	-	-	-	*371	314	-	*416	*285	-
Stage 1	-	-	-	-	-	-	*407	443	-	*699	*649	-
Stage 2	-	-	-	-	-	-	*677	644	-	*564	*388	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.8	0	17.3	11.1
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	371	753	* 1180	-	-	958	-	-	416	789
HCM Lane V/C Ratio	0.252	0.01	0.06	-	-	0.005	-	-	0.055	0.085
HCM Control Delay (s)	17.9	9.8	8.2	-	-	8.8	-	-	14.2	10
HCM Lane LOS	C	A	A	-	-	A	-	-	B	B
HCM 95th %tile Q(veh)	1	0	0.2	-	-	0	-	-	0.2	0.3

Notes
 -: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Timings
15: South Access & Grinnel Blvd

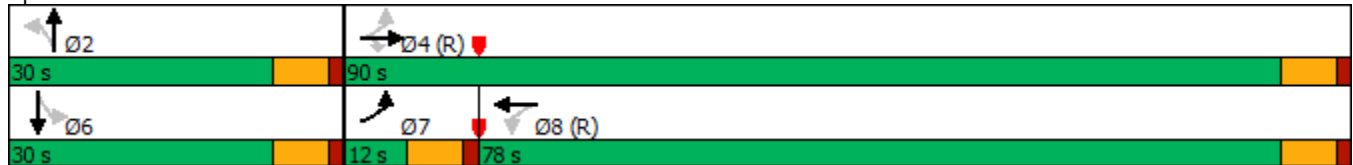


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	
Lane Configurations	↖	↕	↗	↖	↕	↖	↗	↖	↗	
Traffic Volume (vph)	57	1174	142	5	666	127	0	19	0	
Future Volume (vph)	57	1174	142	5	666	127	0	19	0	
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	NA	Perm	NA	
Protected Phases	7	4			8		2		6	
Permitted Phases	4		4	8		2		6		
Detector Phase	7	4	4	8	8	2	2	6	6	
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	11.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	
Total Split (s)	12.0	90.0	90.0	78.0	78.0	30.0	30.0	30.0	30.0	
Total Split (%)	10.0%	75.0%	75.0%	65.0%	65.0%	25.0%	25.0%	25.0%	25.0%	
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	
Lead/Lag	Lead			Lag			Lag			
Lead-Lag Optimize?	Yes			Yes			Yes			
Recall Mode	None	C-Max	C-Max	C-Max	C-Max	Max	Max	Max	Max	
Act Effct Green (s)	83.5	83.5	83.5	73.9	73.9	23.5	23.5	23.5	23.5	
Actuated g/C Ratio	0.70	0.70	0.70	0.62	0.62	0.20	0.20	0.20	0.20	
v/c Ratio	0.14	0.52	0.13	0.02	0.34	0.53	0.04	0.08	0.11	
Control Delay	6.5	9.6	1.2	3.4	3.5	51.7	0.2	40.5	0.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	6.5	9.6	1.2	3.4	3.5	51.7	0.2	40.5	0.4	
LOS	A	A	A	A	A	D	A	D	A	
Approach Delay		8.6			3.5			46.9		10.7
Approach LOS		A			A			D		B

Intersection Summary

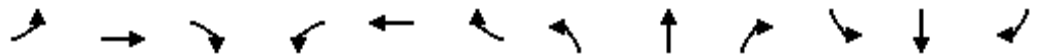
Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.53
 Intersection Signal Delay: 9.5
 Intersection LOS: A
 Intersection Capacity Utilization 66.6%
 ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 15: South Access & Grinnel Blvd



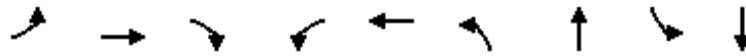
HCM 6th Signalized Intersection Summary
 15: South Access & Grinnel Blvd

2045 Total AM.syn
 04/02/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗		↖	↗		↖	↗	
Traffic Volume (veh/h)	57	1174	142	5	666	19	127	0	13	19	0	56
Future Volume (veh/h)	57	1174	142	5	666	19	127	0	13	19	0	56
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	62	1276	154	5	724	21	138	0	14	21	0	61
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	432	2473	1103	257	2135	62	280	0	310	324	0	310
Arrive On Green	0.04	0.70	0.70	0.20	0.20	0.20	0.20	0.00	0.20	0.20	0.00	0.20
Sat Flow, veh/h	1781	3554	1585	374	3527	102	1341	0	1585	1400	0	1585
Grp Volume(v), veh/h	62	1276	154	5	365	380	138	0	14	21	0	61
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	374	1777	1852	1341	0	1585	1400	0	1585
Q Serve(g_s), s	1.5	20.4	3.9	1.3	21.1	21.2	11.5	0.0	0.9	1.5	0.0	3.9
Cycle Q Clear(g_c), s	1.5	20.4	3.9	10.9	21.1	21.2	15.4	0.0	0.9	2.3	0.0	3.9
Prop In Lane	1.00		1.00	1.00		0.06	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	432	2473	1103	257	1075	1121	280	0	310	324	0	310
V/C Ratio(X)	0.14	0.52	0.14	0.02	0.34	0.34	0.49	0.00	0.05	0.06	0.00	0.20
Avail Cap(c_a), veh/h	449	2473	1103	257	1075	1121	280	0	310	324	0	310
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	0.95	0.95	0.95	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	9.7	8.7	6.1	27.3	27.4	27.4	46.8	0.0	39.1	40.1	0.0	40.4
Incr Delay (d2), s/veh	0.2	0.8	0.3	0.1	0.8	0.8	6.1	0.0	0.3	0.4	0.0	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	7.5	1.3	0.1	10.3	10.7	4.3	0.0	0.4	0.5	0.0	1.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	9.9	9.4	6.4	27.4	28.2	28.2	52.9	0.0	39.4	40.5	0.0	41.8
LnGrp LOS	A	A	A	C	C	C	D	A	D	D	A	D
Approach Vol, veh/h		1492			750			152				82
Approach Delay, s/veh		9.1			28.2			51.7				41.4
Approach LOS		A			C			D				D
Timer - Assigned Phs		2		4		6	7	8				
Phs Duration (G+Y+Rc), s		30.0		90.0		30.0	10.9	79.1				
Change Period (Y+Rc), s		6.5		6.5		6.5	6.5	6.5				
Max Green Setting (Gmax), s		23.5		83.5		23.5	5.5	71.5				
Max Q Clear Time (g_c+I1), s		17.4		22.4		5.9	3.5	23.2				
Green Ext Time (p_c), s		0.2		15.3		0.3	0.0	5.6				
Intersection Summary												
HCM 6th Ctrl Delay				18.6								
HCM 6th LOS				B								

Timings
15: South Access & Grinnel Blvd

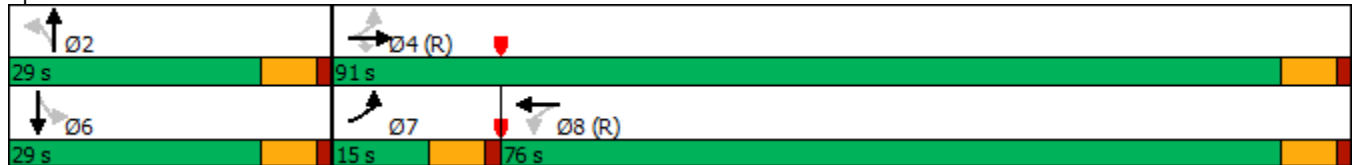


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	↗	↘	↙	↖	↗	↘	↙	↖
Traffic Volume (vph)	65	454	115	4	727	86	0	21	0
Future Volume (vph)	65	454	115	4	727	86	0	21	0
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	NA	Perm	NA
Protected Phases	7	4			8		2		6
Permitted Phases	4		4	8		2		6	
Detector Phase	7	4	4	8	8	2	2	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5
Total Split (s)	15.0	91.0	91.0	76.0	76.0	29.0	29.0	29.0	29.0
Total Split (%)	12.5%	75.8%	75.8%	63.3%	63.3%	24.2%	24.2%	24.2%	24.2%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Lead/Lag	Lead			Lag	Lag				
Lead-Lag Optimize?	Yes			Yes	Yes				
Recall Mode	None	C-Max	C-Max	C-Max	C-Max	Max	Max	Max	Max
Act Effect Green (s)	84.5	84.5	84.5	73.5	73.5	22.5	22.5	22.5	22.5
Actuated g/C Ratio	0.70	0.70	0.70	0.61	0.61	0.19	0.19	0.19	0.19
v/c Ratio	0.16	0.20	0.11	0.01	0.38	0.37	0.01	0.09	0.13
Control Delay	10.5	9.7	5.0	3.5	4.2	47.7	0.0	41.5	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.5	9.7	5.0	3.5	4.2	47.7	0.0	41.5	0.5
LOS	B	A	A	A	A	D	A	D	A
Approach Delay		8.9			4.2		43.9		11.0
Approach LOS		A			A		D		B

Intersection Summary

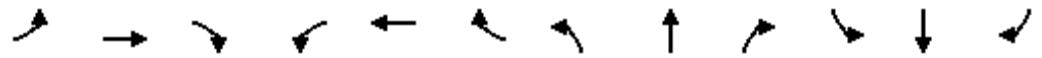
Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 53 (44%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.38
 Intersection Signal Delay: 8.8
 Intersection Capacity Utilization 52.6%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 15: South Access & Grinnel Blvd



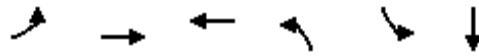
HCM 6th Signalized Intersection Summary
 15: South Access & Grinnel Blvd

2045 Total PM.syn
 04/02/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗		↖	↗		↖	↗	
Traffic Volume (veh/h)	65	454	115	4	727	22	86	0	7	21	0	62
Future Volume (veh/h)	65	454	115	4	727	22	86	0	7	21	0	62
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	71	493	125	4	790	24	93	0	8	23	0	67
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	538	2502	1116	553	2156	65	262	0	297	318	0	297
Arrive On Green	0.04	0.70	0.70	1.00	1.00	1.00	0.19	0.00	0.19	0.19	0.00	0.19
Sat Flow, veh/h	1781	3554	1585	805	3521	107	1334	0	1585	1407	0	1585
Grp Volume(v), veh/h	71	493	125	4	399	415	93	0	8	23	0	67
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	805	1777	1851	1334	0	1585	1407	0	1585
Q Serve(g_s), s	1.7	5.7	3.0	0.0	0.0	0.0	7.6	0.0	0.5	1.6	0.0	4.3
Cycle Q Clear(g_c), s	1.7	5.7	3.0	0.0	0.0	0.0	11.9	0.0	0.5	2.1	0.0	4.3
Prop In Lane	1.00		1.00	1.00		0.06	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	538	2502	1116	553	1088	1133	262	0	297	318	0	297
V/C Ratio(X)	0.13	0.20	0.11	0.01	0.37	0.37	0.35	0.00	0.03	0.07	0.00	0.23
Avail Cap(c_a), veh/h	597	2502	1116	553	1088	1133	262	0	297	318	0	297
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	0.93	0.93	0.93	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	7.0	6.1	5.7	0.0	0.0	0.0	46.4	0.0	39.8	40.7	0.0	41.4
Incr Delay (d2), s/veh	0.1	0.2	0.2	0.0	0.9	0.9	3.7	0.0	0.2	0.4	0.0	1.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	2.1	1.0	0.0	0.3	0.3	2.8	0.0	0.2	0.6	0.0	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	7.1	6.3	5.9	0.0	0.9	0.9	50.1	0.0	40.0	41.1	0.0	43.1
LnGrp LOS	A	A	A	A	A	A	D	A	D	D	A	D
Approach Vol, veh/h		689			818			101				90
Approach Delay, s/veh		6.3			0.9			49.3				42.6
Approach LOS		A			A			D				D
Timer - Assigned Phs		2		4		6	7	8				
Phs Duration (G+Y+Rc), s		29.0		91.0		29.0	11.0	80.0				
Change Period (Y+Rc), s		6.5		6.5		6.5	6.5	6.5				
Max Green Setting (Gmax), s		22.5		84.5		22.5	8.5	69.5				
Max Q Clear Time (g_c+I1), s		13.9		7.7		6.3	3.7	2.0				
Green Ext Time (p_c), s		0.1		4.2		0.3	0.0	6.2				
Intersection Summary												
HCM 6th Ctrl Delay				8.2								
HCM 6th LOS				A								

Timings
16: North Access & Grinnel Blvd

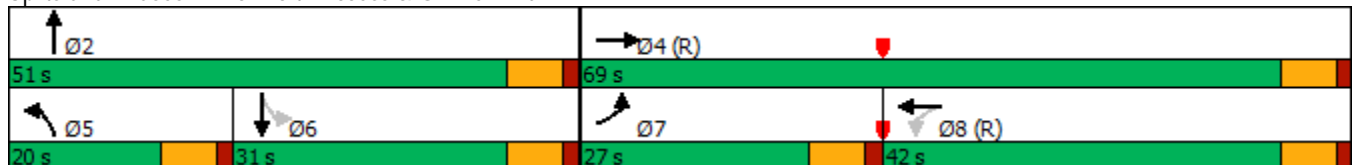


Lane Group	EBL	EBT	WBT	NBL	SBL	SBT	Ø2
Lane Configurations	↖↖	↗↗	↖↖	↗↗	↘	↘	
Traffic Volume (vph)	193	579	346	101	26	0	
Future Volume (vph)	193	579	346	101	26	0	
Turn Type	Prot	NA	NA	Prot	Perm	NA	
Protected Phases	7	4	8	5		6	2
Permitted Phases					6		
Detector Phase	7	4	8	5	6	6	
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.5	24.5	24.5	11.5	24.5	24.5	24.5
Total Split (s)	27.0	69.0	42.0	20.0	31.0	31.0	51.0
Total Split (%)	22.5%	57.5%	35.0%	16.7%	25.8%	25.8%	43%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Lead/Lag	Lead		Lag	Lead	Lag	Lag	
Lead-Lag Optimize?	Yes		Yes	Yes	Yes	Yes	
Recall Mode	None	C-Max	C-Max	None	Max	Max	Max
Act Effect Green (s)	12.6	62.5	43.4	9.2	28.8	28.8	
Actuated g/C Ratio	0.10	0.52	0.36	0.08	0.24	0.24	
v/c Ratio	0.58	0.34	0.32	0.42	0.08	0.26	
Control Delay	50.4	25.1	30.1	57.3	37.4	0.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	50.4	25.1	30.1	57.3	37.4	0.9	
LOS	D	C	C	E	D	A	
Approach Delay		31.4	30.1			5.4	
Approach LOS		C	C			A	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 67 (56%), Referenced to phase 4:EBT and 8:WBTL, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.58
 Intersection Signal Delay: 29.1
 Intersection Capacity Utilization 57.3%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service B

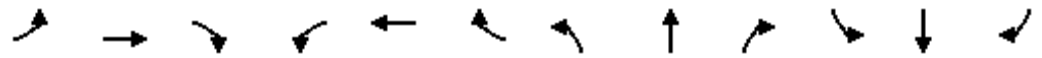
Splits and Phases: 16: North Access & Grinnel Blvd



HCM 6th Signalized Intersection Summary
 16: North Access & Grinnel Blvd

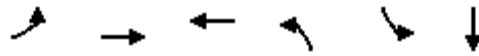
2022 Total AM Imp_3-13-14.syn

04/02/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↑↔		↔	↑↔		↔↔	↔		↔	↔	
Traffic Volume (veh/h)	193	579	0	0	346	32	101	0	0	26	0	182
Future Volume (veh/h)	193	579	0	0	346	32	101	0	0	26	0	182
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	210	629	0	0	376	35	110	0	0	28	0	198
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	278	1851	0	60	1270	118	166	694	0	441	0	426
Arrive On Green	0.08	0.52	0.00	0.00	0.39	0.39	0.05	0.00	0.00	0.27	0.00	0.27
Sat Flow, veh/h	3456	3647	0	797	3288	304	3456	1870	0	1418	0	1585
Grp Volume(v), veh/h	210	629	0	0	202	209	110	0	0	28	0	198
Grp Sat Flow(s),veh/h/ln	1728	1777	0	797	1777	1816	1728	1870	0	1418	0	1585
Q Serve(g_s), s	7.1	12.4	0.0	0.0	9.5	9.6	3.8	0.0	0.0	1.8	0.0	12.5
Cycle Q Clear(g_c), s	7.1	12.4	0.0	0.0	9.5	9.6	3.8	0.0	0.0	1.8	0.0	12.5
Prop In Lane	1.00		0.00	1.00		0.17	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	278	1851	0	60	686	701	166	694	0	441	0	426
V/C Ratio(X)	0.76	0.34	0.00	0.00	0.29	0.30	0.66	0.00	0.00	0.06	0.00	0.47
Avail Cap(c_a), veh/h	590	1851	0	60	686	701	389	694	0	441	0	426
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	0.00	0.00	0.98	0.98	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	54.0	16.7	0.0	0.0	25.5	25.5	56.2	0.0	0.0	32.7	0.0	36.7
Incr Delay (d2), s/veh	4.2	0.5	0.0	0.0	1.1	1.1	4.5	0.0	0.0	0.3	0.0	3.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.3	5.1	0.0	0.0	4.2	4.4	1.7	0.0	0.0	0.6	0.0	5.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	58.2	17.2	0.0	0.0	26.6	26.6	60.6	0.0	0.0	33.0	0.0	40.3
LnGrp LOS	E	B	A	A	C	C	E	A	A	C	A	D
Approach Vol, veh/h		839			411			110				226
Approach Delay, s/veh		27.5			26.6			60.6				39.4
Approach LOS		C			C			E				D
Timer - Assigned Phs		2		4	5	6	7	8				
Phs Duration (G+Y+Rc), s		51.0		69.0	12.3	38.7	16.1	52.9				
Change Period (Y+Rc), s		6.5		6.5	6.5	6.5	6.5	6.5				
Max Green Setting (Gmax), s		44.5		62.5	13.5	24.5	20.5	35.5				
Max Q Clear Time (g_c+I1), s		0.0		14.4	5.8	14.5	9.1	11.6				
Green Ext Time (p_c), s		0.0		5.0	0.2	0.9	0.5	2.5				
Intersection Summary												
HCM 6th Ctrl Delay				31.3								
HCM 6th LOS				C								

Timings
16: North Access & Grinnel Blvd

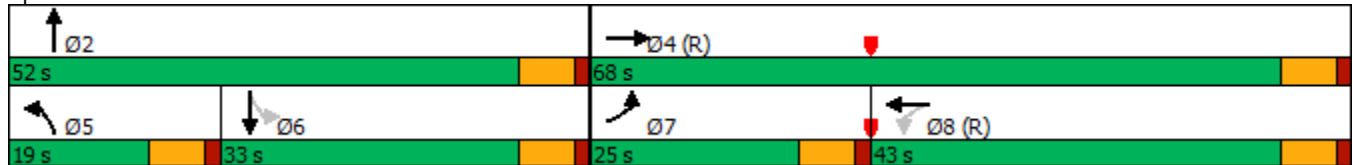


Lane Group	EBL	EBT	WBT	NBL	SBL	SBT	Ø2
Lane Configurations	↖↖	↗↗	↖↗	↖↖	↖	↗	
Traffic Volume (vph)	94	328	238	37	12	0	
Future Volume (vph)	94	328	238	37	12	0	
Turn Type	Prot	NA	NA	Prot	Perm	NA	
Protected Phases	7	4	8	5		6	2
Permitted Phases					6		
Detector Phase	7	4	8	5	6	6	
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.5	24.5	24.5	11.5	24.5	24.5	24.5
Total Split (s)	25.0	68.0	43.0	19.0	33.0	33.0	52.0
Total Split (%)	20.8%	56.7%	35.8%	15.8%	27.5%	27.5%	43%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Lead/Lag	Lead		Lag	Lead	Lag	Lag	
Lead-Lag Optimize?	Yes		Yes	Yes	Yes	Yes	
Recall Mode	None	C-Max	C-Max	None	Max	Max	Max
Act Effect Green (s)	8.9	61.5	46.1	6.8	34.6	34.6	
Actuated g/C Ratio	0.07	0.51	0.38	0.06	0.29	0.29	
v/c Ratio	0.40	0.20	0.20	0.21	0.03	0.10	
Control Delay	57.6	6.8	24.7	56.0	33.6	0.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	57.6	6.8	24.7	56.0	33.6	0.2	
LOS	E	A	C	E	C	A	
Approach Delay		18.1	24.7			4.4	
Approach LOS		B	C			A	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBTL, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.40
 Intersection Signal Delay: 20.3
 Intersection Capacity Utilization 37.2%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service A

Splits and Phases: 16: North Access & Grinnel Blvd



HCM 6th Signalized Intersection Summary
 16: North Access & Grinnel Blvd

2022 Total PM Imp_3-13-14.syn

04/02/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↗	↕		↖	↕		↖↗	↕		↖	↕	
Traffic Volume (veh/h)	94	328	0	0	238	16	37	0	0	12	0	83
Future Volume (veh/h)	94	328	0	0	238	16	37	0	0	12	0	83
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	102	357	0	0	259	17	40	0	0	13	0	90
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	158	1821	0	60	1397	91	106	709	0	477	0	467
Arrive On Green	0.05	0.51	0.00	0.00	0.41	0.41	0.03	0.00	0.00	0.29	0.00	0.29
Sat Flow, veh/h	3456	3647	0	1024	3386	221	3456	1870	0	1418	0	1585
Grp Volume(v), veh/h	102	357	0	0	135	141	40	0	0	13	0	90
Grp Sat Flow(s),veh/h/ln	1728	1777	0	1024	1777	1831	1728	1870	0	1418	0	1585
Q Serve(g_s), s	3.5	6.5	0.0	0.0	5.8	5.9	1.4	0.0	0.0	0.8	0.0	5.1
Cycle Q Clear(g_c), s	3.5	6.5	0.0	0.0	5.8	5.9	1.4	0.0	0.0	0.8	0.0	5.1
Prop In Lane	1.00		0.00	1.00		0.12	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	158	1821	0	60	733	755	106	709	0	477	0	467
V/C Ratio(X)	0.64	0.20	0.00	0.00	0.18	0.19	0.38	0.00	0.00	0.03	0.00	0.19
Avail Cap(c_a), veh/h	533	1821	0	60	733	755	360	709	0	477	0	467
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	0.00	0.00	0.99	0.99	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	56.3	15.9	0.0	0.0	22.4	22.4	57.0	0.0	0.0	30.2	0.0	31.7
Incr Delay (d2), s/veh	4.3	0.2	0.0	0.0	0.5	0.5	2.2	0.0	0.0	0.1	0.0	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	2.7	0.0	0.0	2.6	2.7	0.6	0.0	0.0	0.3	0.0	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	60.6	16.1	0.0	0.0	23.0	23.0	59.2	0.0	0.0	30.3	0.0	32.6
LnGrp LOS	E	B	A	A	C	C	E	A	A	C	A	C
Approach Vol, veh/h		459			276			40				103
Approach Delay, s/veh		26.0			23.0			59.2				32.3
Approach LOS		C			C			E				C
Timer - Assigned Phs		2		4	5	6	7	8				
Phs Duration (G+Y+Rc), s		52.0		68.0	10.2	41.8	12.0	56.0				
Change Period (Y+Rc), s		6.5		6.5	6.5	6.5	6.5	6.5				
Max Green Setting (Gmax), s		45.5		61.5	12.5	26.5	18.5	36.5				
Max Q Clear Time (g_c+I1), s		0.0		8.5	3.4	7.1	5.5	7.9				
Green Ext Time (p_c), s		0.0		2.6	0.0	0.5	0.2	1.6				
Intersection Summary												
HCM 6th Ctrl Delay					27.3							
HCM 6th LOS					C							

Timings
16: North Access & Grinnel Blvd

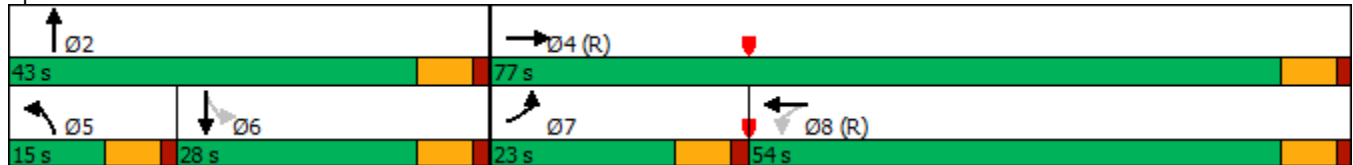


Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖↗	↕	↕	↖↗	↕	↖	↕
Traffic Volume (vph)	193	989	401	84	0	52	0
Future Volume (vph)	193	989	401	84	0	52	0
Turn Type	Prot	NA	NA	Prot	NA	Perm	NA
Protected Phases	7	4	8	5	2		6
Permitted Phases						6	
Detector Phase	7	4	8	5	2	6	6
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.5	24.5	24.5	11.5	24.5	24.5	24.5
Total Split (s)	23.0	77.0	54.0	15.0	43.0	28.0	28.0
Total Split (%)	19.2%	64.2%	45.0%	12.5%	35.8%	23.3%	23.3%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Lead/Lag	Lead		Lag	Lead		Lag	Lag
Lead-Lag Optimize?	Yes		Yes	Yes		Yes	Yes
Recall Mode	None	C-Max	C-Max	None	Max	Max	Max
Act Effect Green (s)	12.6	70.5	51.4	7.9	36.5	22.1	22.1
Actuated g/C Ratio	0.10	0.59	0.43	0.07	0.30	0.18	0.18
v/c Ratio	0.58	0.52	0.34	0.40	0.02	0.22	0.30
Control Delay	83.2	5.7	20.4	59.1	0.0	44.7	1.2
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Total Delay	83.2	5.7	20.4	59.1	0.0	44.7	1.2
LOS	F	A	C	E	A	D	A
Approach Delay		18.4	20.4		53.8		10.9
Approach LOS		B	C		D		B

Intersection Summary

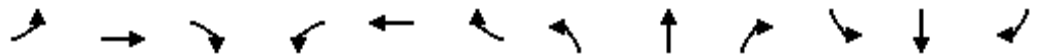
Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBTL, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.58
 Intersection Signal Delay: 19.6
 Intersection LOS: B
 Intersection Capacity Utilization 68.6%
 ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 16: North Access & Grinnel Blvd



HCM 6th Signalized Intersection Summary
 16: North Access & Grinnel Blvd

2030 Total AM.syn
 04/02/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↕↔		↔	↕↔		↔↔	↔		↔	↕↔	
Traffic Volume (veh/h)	193	989	0	0	401	64	84	0	8	52	0	182
Future Volume (veh/h)	193	989	0	0	401	64	84	0	8	52	0	182
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	210	1075	0	0	436	70	91	0	9	57	0	198
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	273	2088	0	60	1394	222	142	0	482	354	0	331
Arrive On Green	0.11	0.78	0.00	0.00	0.45	0.45	0.04	0.00	0.30	0.21	0.00	0.21
Sat Flow, veh/h	3456	3647	0	525	3069	490	3456	0	1585	1406	0	1585
Grp Volume(v), veh/h	210	1075	0	0	251	255	91	0	9	57	0	198
Grp Sat Flow(s),veh/h/ln	1728	1777	0	525	1777	1782	1728	0	1585	1406	0	1585
Q Serve(g_s), s	7.1	13.3	0.0	0.0	10.8	10.9	3.1	0.0	0.5	4.0	0.0	13.6
Cycle Q Clear(g_c), s	7.1	13.3	0.0	0.0	10.8	10.9	3.1	0.0	0.5	4.0	0.0	13.6
Prop In Lane	1.00		0.00	1.00		0.27	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	273	2088	0	60	807	810	142	0	482	354	0	331
V/C Ratio(X)	0.77	0.51	0.00	0.00	0.31	0.31	0.64	0.00	0.02	0.16	0.00	0.60
Avail Cap(c_a), veh/h	475	2088	0	60	807	810	245	0	482	354	0	331
HCM Platoon Ratio	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.90	0.90	0.00	0.00	0.97	0.97	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	52.6	6.9	0.0	0.0	20.8	20.8	56.7	0.0	29.2	39.1	0.0	42.9
Incr Delay (d2), s/veh	4.1	0.8	0.0	0.0	1.0	1.0	4.8	0.0	0.1	1.0	0.0	7.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	3.9	0.0	0.0	4.7	4.8	1.5	0.0	0.2	1.5	0.0	6.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	56.7	7.7	0.0	0.0	21.8	21.8	61.4	0.0	29.3	40.1	0.0	50.6
LnGrp LOS	E	A	A	A	C	C	E	A	C	D	A	D
Approach Vol, veh/h		1285			506			100				255
Approach Delay, s/veh		15.7			21.8			58.5				48.3
Approach LOS		B			C			E				D
Timer - Assigned Phs		2		4	5	6	7	8				
Phs Duration (G+Y+Rc), s		43.0		77.0	11.4	31.6	16.0	61.0				
Change Period (Y+Rc), s		6.5		6.5	6.5	6.5	6.5	6.5				
Max Green Setting (Gmax), s		36.5		70.5	8.5	21.5	16.5	47.5				
Max Q Clear Time (g_c+I1), s		2.5		15.3	5.1	15.6	9.1	12.9				
Green Ext Time (p_c), s		0.0		10.6	0.1	0.7	0.4	3.4				
Intersection Summary												
HCM 6th Ctrl Delay				23.0								
HCM 6th LOS				C								

Timings
16: North Access & Grinnel Blvd

2030 Total PM.syn
04/02/2020



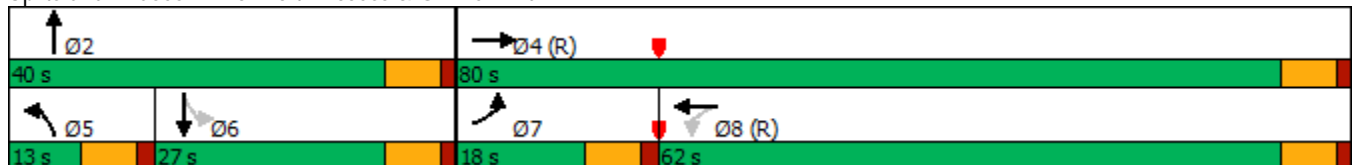
Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖↗	↕	↕	↖↗	↕	↖	↕
Traffic Volume (vph)	94	364	612	31	0	24	0
Future Volume (vph)	94	364	612	31	0	24	0
Turn Type	Prot	NA	NA	Prot	NA	Perm	NA
Protected Phases	7	4	8	5	2		6
Permitted Phases						6	
Detector Phase	7	4	8	5	2	6	6
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.5	24.5	24.5	11.5	24.5	24.5	24.5
Total Split (s)	18.0	80.0	62.0	13.0	40.0	27.0	27.0
Total Split (%)	15.0%	66.7%	51.7%	10.8%	33.3%	22.5%	22.5%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Lead/Lag	Lead		Lag	Lead		Lag	Lag
Lead-Lag Optimize?	Yes		Yes	Yes		Yes	Yes
Recall Mode	None	C-Max	C-Max	None	Max	Max	Max
Act Effect Green (s)	8.9	73.5	58.1	6.2	33.5	25.7	25.7
Actuated g/C Ratio	0.07	0.61	0.48	0.05	0.28	0.21	0.21
v/c Ratio	0.40	0.18	0.41	0.19	0.00	0.09	0.15
Control Delay	87.6	2.6	22.5	57.0	0.0	42.4	0.5
Queue Delay	0.0	0.0	0.4	0.0	0.0	0.0	0.0
Total Delay	87.6	2.6	22.8	57.0	0.0	42.4	0.5
LOS	F	A	C	E	A	D	A
Approach Delay		20.0	22.8		52.4		9.9
Approach LOS		C	C		D		A

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBTL, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.41
 Intersection Signal Delay: 21.5
 Intersection Capacity Utilization 46.3%
 Analysis Period (min) 15

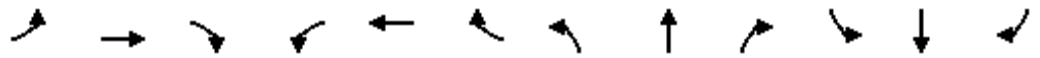
Intersection LOS: C
 ICU Level of Service A

Splits and Phases: 16: North Access & Grinnel Blvd



HCM 6th Signalized Intersection Summary
 16: North Access & Grinnel Blvd

2030 Total PM.syn
 04/02/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↑↔		↔	↑↔		↔↔	↔		↔	↔	
Traffic Volume (veh/h)	94	364	0	0	612	31	31	0	3	24	0	83
Future Volume (veh/h)	94	364	0	0	612	31	31	0	3	24	0	83
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	102	396	0	0	665	34	34	0	3	26	0	90
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	154	2177	0	60	1767	90	98	0	442	338	0	312
Arrive On Green	0.09	1.00	0.00	0.00	0.51	0.51	0.03	0.00	0.28	0.20	0.00	0.20
Sat Flow, veh/h	3456	3647	0	988	3440	176	3456	0	1585	1414	0	1585
Grp Volume(v), veh/h	102	396	0	0	343	356	34	0	3	26	0	90
Grp Sat Flow(s),veh/h/ln	1728	1777	0	988	1777	1839	1728	0	1585	1414	0	1585
Q Serve(g_s), s	3.4	0.0	0.0	0.0	14.0	14.0	1.2	0.0	0.2	1.8	0.0	5.8
Cycle Q Clear(g_c), s	3.4	0.0	0.0	0.0	14.0	14.0	1.2	0.0	0.2	1.8	0.0	5.8
Prop In Lane	1.00		0.00	1.00		0.10	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	154	2177	0	60	913	944	98	0	442	338	0	312
V/C Ratio(X)	0.66	0.18	0.00	0.00	0.38	0.38	0.35	0.00	0.01	0.08	0.00	0.29
Avail Cap(c_a), veh/h	331	2177	0	60	913	944	187	0	442	338	0	312
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.99	0.99	0.00	0.00	0.98	0.98	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	53.8	0.0	0.0	0.0	17.6	17.6	57.2	0.0	31.2	39.4	0.0	41.0
Incr Delay (d2), s/veh	4.7	0.2	0.0	0.0	1.2	1.1	2.1	0.0	0.0	0.4	0.0	2.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.1	0.0	0.0	6.0	6.2	0.5	0.0	0.1	0.7	0.0	2.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	58.5	0.2	0.0	0.0	18.8	18.7	59.3	0.0	31.3	39.9	0.0	43.4
LnGrp LOS	E	A	A	A	B	B	E	A	C	D	A	D
Approach Vol, veh/h		498			699			37				116
Approach Delay, s/veh		12.1			18.7			57.1				42.6
Approach LOS		B			B			E				D
Timer - Assigned Phs		2		4	5	6	7	8				
Phs Duration (G+Y+Rc), s		40.0		80.0	9.9	30.1	11.9	68.1				
Change Period (Y+Rc), s		6.5		6.5	6.5	6.5	6.5	6.5				
Max Green Setting (Gmax), s		33.5		73.5	6.5	20.5	11.5	55.5				
Max Q Clear Time (g_c+I1), s		2.2		2.0	3.2	7.8	5.4	16.0				
Green Ext Time (p_c), s		0.0		3.0	0.0	0.4	0.1	5.0				
Intersection Summary												
HCM 6th Ctrl Delay				19.4								
HCM 6th LOS				B								

Timings
16: North Access & Grinnel Blvd



Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖↖	↕↗	↕↗	↖↖	↗	↖	↗
Traffic Volume (vph)	193	989	401	84	0	52	0
Future Volume (vph)	193	989	401	84	0	52	0
Turn Type	Prot	NA	NA	Prot	NA	Perm	NA
Protected Phases	7	4	8	5	2		6
Permitted Phases						6	
Detector Phase	7	4	8	5	2	6	6
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.5	24.5	24.5	11.5	24.5	24.5	24.5
Total Split (s)	29.0	78.0	49.0	14.0	42.0	28.0	28.0
Total Split (%)	24.2%	65.0%	40.8%	11.7%	35.0%	23.3%	23.3%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Lead/Lag	Lead		Lag	Lead		Lag	Lag
Lead-Lag Optimize?	Yes		Yes	Yes		Yes	Yes
Recall Mode	None	C-Max	C-Max	None	Max	Max	Max
Act Effect Green (s)	12.6	71.5	52.4	7.3	35.5	21.7	21.7
Actuated g/C Ratio	0.10	0.60	0.44	0.06	0.30	0.18	0.18
v/c Ratio	0.58	0.51	0.33	0.44	0.02	0.22	0.29
Control Delay	65.5	12.8	15.5	61.2	0.0	44.9	1.1
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Total Delay	65.5	12.9	15.5	61.2	0.0	44.9	1.1
LOS	E	B	B	E	A	D	A
Approach Delay		21.5	15.5		55.7		10.9
Approach LOS		C	B		E		B

Intersection Summary

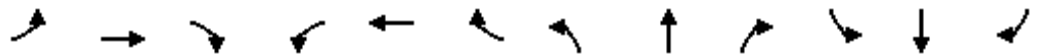
Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBTL, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.58
 Intersection Signal Delay: 20.4
 Intersection Capacity Utilization 68.6%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service C

Splits and Phases: 16: North Access & Grinnel Blvd



HCM 6th Signalized Intersection Summary
 16: North Access & Grinnel Blvd

2045 Total AM.syn
 04/02/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↕↔		↔	↕↔		↔↔	↔		↔	↕↔	
Traffic Volume (veh/h)	193	989	0	0	401	64	84	0	8	52	0	182
Future Volume (veh/h)	193	989	0	0	401	64	84	0	8	52	0	182
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	210	1075	0	0	436	70	91	0	9	57	0	198
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	279	2117	0	60	1415	226	141	0	469	342	0	318
Arrive On Green	0.08	0.60	0.00	0.00	0.46	0.46	0.04	0.00	0.30	0.20	0.00	0.20
Sat Flow, veh/h	3456	3647	0	525	3069	490	3456	0	1585	1406	0	1585
Grp Volume(v), veh/h	210	1075	0	0	251	255	91	0	9	57	0	198
Grp Sat Flow(s),veh/h/ln	1728	1777	0	525	1777	1782	1728	0	1585	1406	0	1585
Q Serve(g_s), s	7.1	21.0	0.0	0.0	10.7	10.8	3.1	0.0	0.5	4.1	0.0	13.7
Cycle Q Clear(g_c), s	7.1	21.0	0.0	0.0	10.7	10.8	3.1	0.0	0.5	4.1	0.0	13.7
Prop In Lane	1.00		0.00	1.00		0.27	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	279	2117	0	60	819	822	141	0	469	342	0	318
V/C Ratio(X)	0.75	0.51	0.00	0.00	0.31	0.31	0.64	0.00	0.02	0.17	0.00	0.62
Avail Cap(c_a), veh/h	648	2117	0	60	819	822	216	0	469	342	0	318
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.85	0.85	0.00	0.00	0.96	0.96	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	54.0	14.1	0.0	0.0	20.3	20.3	56.7	0.0	29.9	39.9	0.0	43.8
Incr Delay (d2), s/veh	3.5	0.7	0.0	0.0	0.9	0.9	4.8	0.0	0.1	1.0	0.0	8.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	8.4	0.0	0.0	4.6	4.7	1.5	0.0	0.2	1.5	0.0	6.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	57.5	14.8	0.0	0.0	21.2	21.3	61.5	0.0	30.0	41.0	0.0	52.7
LnGrp LOS	E	B	A	A	C	C	E	A	C	D	A	D
Approach Vol, veh/h		1285			506			100				255
Approach Delay, s/veh		21.8			21.3			58.7				50.0
Approach LOS		C			C			E				D
Timer - Assigned Phs		2		4	5	6	7	8				
Phs Duration (G+Y+Rc), s		42.0		78.0	11.4	30.6	16.2	61.8				
Change Period (Y+Rc), s		6.5		6.5	6.5	6.5	6.5	6.5				
Max Green Setting (Gmax), s		35.5		71.5	7.5	21.5	22.5	42.5				
Max Q Clear Time (g_c+I1), s		2.5		23.0	5.1	15.7	9.1	12.8				
Green Ext Time (p_c), s		0.0		10.4	0.0	0.6	0.6	3.3				
Intersection Summary												
HCM 6th Ctrl Delay				26.7								
HCM 6th LOS				C								

Timings
16: North Access & Grinnel Blvd

2045 Total PM.syn
04/02/2020

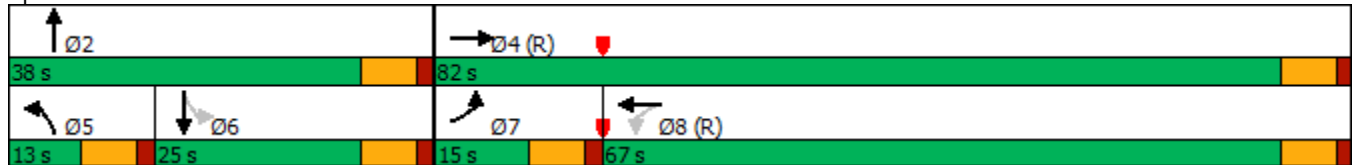


Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↔↔	↑↔	↑↔	↔↔	↔	↔	↔
Traffic Volume (vph)	94	364	612	31	0	24	0
Future Volume (vph)	94	364	612	31	0	24	0
Turn Type	Prot	NA	NA	Prot	NA	Perm	NA
Protected Phases	7	4	8	5	2		6
Permitted Phases						6	
Detector Phase	7	4	8	5	2	6	6
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.5	24.5	24.5	11.5	24.5	24.5	24.5
Total Split (s)	15.0	82.0	67.0	13.0	38.0	25.0	25.0
Total Split (%)	12.5%	68.3%	55.8%	10.8%	31.7%	20.8%	20.8%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Lead/Lag	Lead		Lag	Lead		Lag	Lag
Lead-Lag Optimize?	Yes		Yes	Yes		Yes	Yes
Recall Mode	None	C-Max	C-Max	None	Max	Max	Max
Act Effect Green (s)	8.0	75.5	61.0	6.2	31.5	23.7	23.7
Actuated g/C Ratio	0.07	0.63	0.51	0.05	0.26	0.20	0.20
v/c Ratio	0.45	0.18	0.39	0.19	0.00	0.09	0.16
Control Delay	70.7	8.2	22.4	57.0	0.0	44.2	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.7	8.2	22.4	57.0	0.0	44.2	0.6
LOS	E	A	C	E	A	D	A
Approach Delay		21.0	22.4		52.4		10.4
Approach LOS		C	C		D		B

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 50 (42%), Referenced to phase 4:EBT and 8:WBTL, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.45
 Intersection Signal Delay: 21.7
 Intersection LOS: C
 Intersection Capacity Utilization 46.3%
 ICU Level of Service A
 Analysis Period (min) 15

Splits and Phases: 16: North Access & Grinnel Blvd



HCM 6th Signalized Intersection Summary
 16: North Access & Grinnel Blvd

2045 Total PM.syn
 04/02/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↑↔		↔	↑↔		↔↔	↔		↔	↔	
Traffic Volume (veh/h)	94	364	0	0	612	31	31	0	3	24	0	83
Future Volume (veh/h)	94	364	0	0	612	31	31	0	3	24	0	83
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	102	396	0	0	665	34	34	0	3	26	0	90
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	153	2236	0	60	1826	93	98	0	416	315	0	285
Arrive On Green	0.09	1.00	0.00	0.00	0.53	0.53	0.03	0.00	0.26	0.18	0.00	0.18
Sat Flow, veh/h	3456	3647	0	988	3440	176	3456	0	1585	1414	0	1585
Grp Volume(v), veh/h	102	396	0	0	343	356	34	0	3	26	0	90
Grp Sat Flow(s),veh/h/ln	1728	1777	0	988	1777	1839	1728	0	1585	1414	0	1585
Q Serve(g_s), s	3.4	0.0	0.0	0.0	13.5	13.5	1.2	0.0	0.2	1.8	0.0	5.9
Cycle Q Clear(g_c), s	3.4	0.0	0.0	0.0	13.5	13.5	1.2	0.0	0.2	1.8	0.0	5.9
Prop In Lane	1.00		0.00	1.00		0.10	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	153	2236	0	60	943	976	98	0	416	315	0	285
V/C Ratio(X)	0.67	0.18	0.00	0.00	0.36	0.36	0.35	0.00	0.01	0.08	0.00	0.32
Avail Cap(c_a), veh/h	245	2236	0	60	943	976	187	0	416	315	0	285
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.99	0.99	0.00	0.00	0.96	0.96	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	53.8	0.0	0.0	0.0	16.4	16.4	57.2	0.0	32.7	41.1	0.0	42.8
Incr Delay (d2), s/veh	4.9	0.2	0.0	0.0	1.0	1.0	2.1	0.0	0.0	0.5	0.0	2.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	0.1	0.0	0.0	5.7	5.9	0.5	0.0	0.1	0.7	0.0	2.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	58.7	0.2	0.0	0.0	17.4	17.4	59.3	0.0	32.7	41.6	0.0	45.6
LnGrp LOS	E	A	A	A	B	B	E	A	C	D	A	D
Approach Vol, veh/h		498			699			37				116
Approach Delay, s/veh		12.2			17.4			57.2				44.7
Approach LOS		B			B			E				D
Timer - Assigned Phs		2		4	5	6	7	8				
Phs Duration (G+Y+Rc), s		38.0		82.0	9.9	28.1	11.8	70.2				
Change Period (Y+Rc), s		6.5		6.5	6.5	6.5	6.5	6.5				
Max Green Setting (Gmax), s		31.5		75.5	6.5	18.5	8.5	60.5				
Max Q Clear Time (g_c+I1), s		2.2		2.0	3.2	7.9	5.4	15.5				
Green Ext Time (p_c), s		0.0		3.0	0.0	0.3	0.1	5.0				
Intersection Summary												
HCM 6th Ctrl Delay				18.9								
HCM 6th LOS				B								

Intersection						
Int Delay, s/veh	0.4					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑				↑
Traffic Vol, veh/h	304	41	0	0	0	16
Future Vol, veh/h	304	41	0	0	0	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	300	-	-	-	0
Veh in Median Storage, #	0	-	-	16983	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	4	2	2	4	2	2
Mvmt Flow	330	45	0	0	0	17

Major/Minor	Major1		Minor1	
Conflicting Flow All	0	0	-	165
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	-	-	3.32
Pot Cap-1 Maneuver	-	-	0	850
Stage 1	-	-	0	-
Stage 2	-	-	0	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	850
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	NB
HCM Control Delay, s	0	9.3
HCM LOS		A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR
Capacity (veh/h)	850	-	-
HCM Lane V/C Ratio	0.02	-	-
HCM Control Delay (s)	9.3	-	-
HCM Lane LOS	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-

Intersection						
Int Delay, s/veh	0.9					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑				↑
Traffic Vol, veh/h	189	37	0	0	0	24
Future Vol, veh/h	189	37	0	0	0	24
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	300	-	-	-	0
Veh in Median Storage, #	0	-	-	16983	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	2	2	3	2	2
Mvmt Flow	205	40	0	0	0	26

Major/Minor	Major1		Minor1	
Conflicting Flow All	0	0	-	103
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	-	-	3.32
Pot Cap-1 Maneuver	-	-	0	932
Stage 1	-	-	0	-
Stage 2	-	-	0	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	932
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	NB
HCM Control Delay, s	0	9
HCM LOS		A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR
Capacity (veh/h)	932	-	-
HCM Lane V/C Ratio	0.028	-	-
HCM Control Delay (s)	9	-	-
HCM Lane LOS	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-

Intersection						
Int Delay, s/veh	0.3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑				↑
Traffic Vol, veh/h	1070	59	0	0	0	23
Future Vol, veh/h	1070	59	0	0	0	23
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	300	-	-	-	0
Veh in Median Storage, #	0	-	-	16983	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	4	2	2	4	2	2
Mvmt Flow	1163	64	0	0	0	25

Major/Minor	Major1		Minor1	
Conflicting Flow All	0	0	-	582
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	-	-	3.32
Pot Cap-1 Maneuver	-	-	0	456
Stage 1	-	-	0	-
Stage 2	-	-	0	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	456
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	NB
HCM Control Delay, s	0	13.4
HCM LOS		B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR
Capacity (veh/h)	456	-	-
HCM Lane V/C Ratio	0.055	-	-
HCM Control Delay (s)	13.4	-	-
HCM Lane LOS	B	-	-
HCM 95th %tile Q(veh)	0.2	-	-

Intersection						
Int Delay, s/veh	0.6					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑				↑
Traffic Vol, veh/h	470	52	0	0	0	34
Future Vol, veh/h	470	52	0	0	0	34
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	300	-	-	-	0
Veh in Median Storage, #	0	-	-	16983	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	2	2	3	2	2
Mvmt Flow	511	57	0	0	0	37

Major/Minor	Major1		Minor1	
Conflicting Flow All	0	0	-	256
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	-	-	3.32
Pot Cap-1 Maneuver	-	-	0	743
Stage 1	-	-	0	-
Stage 2	-	-	0	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	743
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	NB
HCM Control Delay, s	0	10.1
HCM LOS		B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR
Capacity (veh/h)	743	-	-
HCM Lane V/C Ratio	0.05	-	-
HCM Control Delay (s)	10.1	-	-
HCM Lane LOS	B	-	-
HCM 95th %tile Q(veh)	0.2	-	-

Intersection						
Int Delay, s/veh	0.3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑	↑				↑
Traffic Vol, veh/h	1121	59	0	0	0	23
Future Vol, veh/h	1121	59	0	0	0	23
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	0
Veh in Median Storage, #	0	-	-	16983	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	4	2	2	4	2	2
Mvmt Flow	1218	64	0	0	0	25

Major/Minor	Major1		Minor1	
Conflicting Flow All	0	0	-	609
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	-	-	3.92
Pot Cap-1 Maneuver	-	-	0	375
Stage 1	-	-	0	-
Stage 2	-	-	0	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	375
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	NB
HCM Control Delay, s	0	15.3
HCM LOS		C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR
Capacity (veh/h)	375	-	-
HCM Lane V/C Ratio	0.067	-	-
HCM Control Delay (s)	15.3	-	-
HCM Lane LOS	C	-	-
HCM 95th %tile Q(veh)	0.2	-	-

Intersection						
Int Delay, s/veh	0.6					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑	↑				↑
Traffic Vol, veh/h	500	52	0	0	0	34
Future Vol, veh/h	500	52	0	0	0	34
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	0
Veh in Median Storage, #	0	-	-	16983	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	2	2	3	2	2
Mvmt Flow	543	57	0	0	0	37

Major/Minor	Major1		Minor1	
Conflicting Flow All	0	0	-	272
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	-	-	3.92
Pot Cap-1 Maneuver	-	-	0	619
Stage 1	-	-	0	-
Stage 2	-	-	0	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	619
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	NB
HCM Control Delay, s	0	11.2
HCM LOS		B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR
Capacity (veh/h)	619	-	-
HCM Lane V/C Ratio	0.06	-	-
HCM Control Delay (s)	11.2	-	-
HCM Lane LOS	B	-	-
HCM 95th %tile Q(veh)	0.2	-	-

Intersection						
Int Delay, s/veh	0.4					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑				↑
Traffic Vol, veh/h	304	16	0	0	0	16
Future Vol, veh/h	304	16	0	0	0	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	300	-	-	-	0
Veh in Median Storage, #	0	-	-	16983	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	4	2	2	4	2	2
Mvmt Flow	330	17	0	0	0	17

Major/Minor	Major1		Minor1	
Conflicting Flow All	0	0	-	165
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	-	-	3.32
Pot Cap-1 Maneuver	-	-	0	850
Stage 1	-	-	0	-
Stage 2	-	-	0	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	850
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	NB
HCM Control Delay, s	0	9.3
HCM LOS		A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR
Capacity (veh/h)	850	-	-
HCM Lane V/C Ratio	0.02	-	-
HCM Control Delay (s)	9.3	-	-
HCM Lane LOS	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-

Intersection						
Int Delay, s/veh	0.9					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑				↑
Traffic Vol, veh/h	198	15	0	0	0	24
Future Vol, veh/h	198	15	0	0	0	24
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	300	-	-	-	0
Veh in Median Storage, #	0	-	-	16983	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	2	2	3	2	2
Mvmt Flow	215	16	0	0	0	26

Major/Minor	Major1		Minor1	
Conflicting Flow All	0	0	-	108
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	-	-	3.32
Pot Cap-1 Maneuver	-	-	0	925
Stage 1	-	-	0	-
Stage 2	-	-	0	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	925
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	NB
HCM Control Delay, s	0	9
HCM LOS		A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR
Capacity (veh/h)	925	-	-
HCM Lane V/C Ratio	0.028	-	-
HCM Control Delay (s)	9	-	-
HCM Lane LOS	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-

Intersection						
Int Delay, s/veh	0.3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑				↑
Traffic Vol, veh/h	1069	24	0	0	0	23
Future Vol, veh/h	1069	24	0	0	0	23
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	300	-	-	-	0
Veh in Median Storage, #	0	-	-	16983	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	4	2	2	4	2	2
Mvmt Flow	1162	26	0	0	0	25

Major/Minor	Major1		Minor1	
Conflicting Flow All	0	0	-	581
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	-	-	3.32
Pot Cap-1 Maneuver	-	-	0	457
Stage 1	-	-	0	-
Stage 2	-	-	0	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	457
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	NB
HCM Control Delay, s	0	13.3
HCM LOS		B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR
Capacity (veh/h)	457	-	-
HCM Lane V/C Ratio	0.055	-	-
HCM Control Delay (s)	13.3	-	-
HCM Lane LOS	B	-	-
HCM 95th %tile Q(veh)	0.2	-	-

Intersection						
Int Delay, s/veh	0.6					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑				↑
Traffic Vol, veh/h	483	21	0	0	0	34
Future Vol, veh/h	483	21	0	0	0	34
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	300	-	-	-	0
Veh in Median Storage, #	0	-	-	16983	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	2	2	3	2	2
Mvmt Flow	525	23	0	0	0	37

Major/Minor	Major1		Minor1	
Conflicting Flow All	0	0	-	263
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	-	-	3.32
Pot Cap-1 Maneuver	-	-	0	735
Stage 1	-	-	0	-
Stage 2	-	-	0	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	735
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	NB
HCM Control Delay, s	0	10.2
HCM LOS		B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR
Capacity (veh/h)	735	-	-
HCM Lane V/C Ratio	0.05	-	-
HCM Control Delay (s)	10.2	-	-
HCM Lane LOS	B	-	-
HCM 95th %tile Q(veh)	0.2	-	-

Intersection						
Int Delay, s/veh	0.3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑	↑				↑
Traffic Vol, veh/h	1120	24	0	0	0	23
Future Vol, veh/h	1120	24	0	0	0	23
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	0
Veh in Median Storage, #	0	-	-	16983	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	4	2	2	4	2	2
Mvmt Flow	1217	26	0	0	0	25

Major/Minor	Major1		Minor1	
Conflicting Flow All	0	0	-	609
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	-	-	3.92
Pot Cap-1 Maneuver	-	-	0	375
Stage 1	-	-	0	-
Stage 2	-	-	0	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	375
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	NB
HCM Control Delay, s	0	15.3
HCM LOS		C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR
Capacity (veh/h)	375	-	-
HCM Lane V/C Ratio	0.067	-	-
HCM Control Delay (s)	15.3	-	-
HCM Lane LOS	C	-	-
HCM 95th %tile Q(veh)	0.2	-	-

Intersection						
Int Delay, s/veh	0.7					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑	↑				↑
Traffic Vol, veh/h	513	21	0	0	0	34
Future Vol, veh/h	513	21	0	0	0	34
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	0
Veh in Median Storage, #	0	-	-	16983	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	2	2	3	2	2
Mvmt Flow	558	23	0	0	0	37

Major/Minor	Major1		Minor1	
Conflicting Flow All	0	0	-	279
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	-	-	3.92
Pot Cap-1 Maneuver	-	-	0	612
Stage 1	-	-	0	-
Stage 2	-	-	0	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	612
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	NB
HCM Control Delay, s	0	11.3
HCM LOS		B

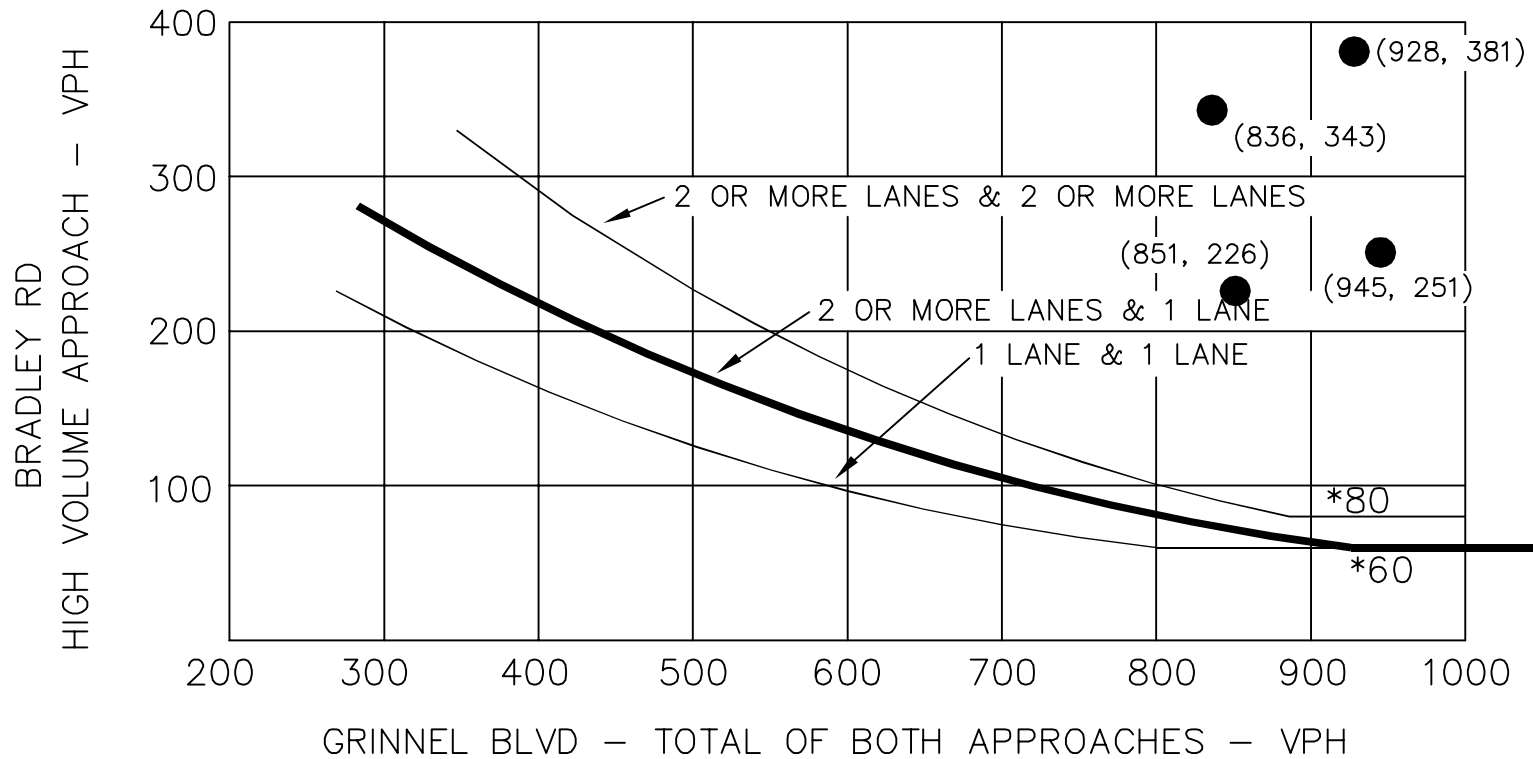
Minor Lane/Major Mvmt	NBLn1	EBT	EBR
Capacity (veh/h)	612	-	-
HCM Lane V/C Ratio	0.06	-	-
HCM Control Delay (s)	11.3	-	-
HCM Lane LOS	B	-	-
HCM 95th %tile Q(veh)	0.2	-	-

APPENDIX F

Signal Warrant Analysis Four-Hour Warrant Graph

WARRANT 2 - FOUR HOUR VEHICULAR VOLUME (70% FACTOR)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 70 km/h (40 mph) ON MAJOR STREET)



* NOTE: 80 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 60 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

GRINNELL BLVD & BRADLEY RD
 SIGNAL WARRANT ANALYSIS
 FOUR HOUR VOLUME WARRANT

● 2020 EXISTING TRAFFIC DATA POINT

FIGURE A1

Source: Manual of Uniform Traffic Control Devices 2009



APPENDIX G

Queuing Analysis Worksheets

Queues

1: Powers Blvd (SH-21) & Milton E Proby Parkway



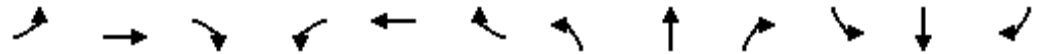
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	675	614	473	4	282	304	581	1337	77	667	859	768
v/c Ratio	0.96	0.51	0.30	0.03	0.74	0.20	0.90	0.93	0.05	0.95	0.81	0.49
Control Delay	83.5	41.1	0.5	33.8	77.2	0.3	76.4	63.3	0.1	81.3	55.1	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	83.5	41.1	0.5	33.8	77.2	0.3	76.4	63.3	0.1	81.3	55.1	1.1
Queue Length 50th (ft)	340	241	0	2	142	0	285	472	0	335	420	0
Queue Length 95th (ft)	#462	337	0	11	193	0	#377	#570	0	#463	508	0
Internal Link Dist (ft)		2600			1655			3275			3484	
Turn Bay Length (ft)	800		400	525		400	550		600	875		650
Base Capacity (vph)	707	1202	1553	141	416	1553	676	1436	1553	704	1055	1553
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.95	0.51	0.30	0.03	0.68	0.20	0.86	0.93	0.05	0.95	0.81	0.49

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Queues

1: Powers Blvd (SH-21) & Milton E Proby Parkway



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	758	297	535	20	443	526	312	750	64	324	1220	594
v/c Ratio	0.97	0.24	0.34	0.29	0.95	0.34	0.92	0.44	0.04	0.74	0.95	0.38
Control Delay	83.1	35.8	0.6	80.4	94.4	0.6	98.0	38.9	0.1	73.7	60.9	0.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	83.1	35.8	0.6	80.4	94.4	0.6	98.0	38.9	0.1	73.7	60.9	0.7
Queue Length 50th (ft)	382	113	0	19	230	0	158	208	0	158	607	0
Queue Length 95th (ft)	#514	154	0	24	#340	0	#225	254	0	211	#756	0
Internal Link Dist (ft)		2566			1655			3129			3499	
Turn Bay Length (ft)	800		400	525		400	550		600	875		650
Base Capacity (vph)	779	1242	1568	70	467	1568	340	1707	1568	489	1285	1568
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.97	0.24	0.34	0.29	0.95	0.34	0.92	0.44	0.04	0.66	0.95	0.38

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Intersection: 1: Powers Blvd (SH-21) & Milton E Proby Parkway

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	
Directions Served	L	L	T	T	T	R	L	T	T	T	T	R	L
Maximum Queue (ft)	1012	1025	2704	2704	2604	424	148	173	157	184	55	350	
Average Queue (ft)	873	886	1374	1318	714	14	47	96	99	96	2	202	
95th Queue (ft)	1223	1235	2873	2831	1751	140	108	150	149	152	18	302	
Link Distance (ft)			2689	2689	2689			1643	1643	1643			
Upstream Blk Time (%)			3	0									
Queuing Penalty (veh)			0	0									
Storage Bay Dist (ft)	1000	1000				400	525				400	1000	
Storage Blk Time (%)	7	33	22		0	0							
Queuing Penalty (veh)	23	107	146		2	0							

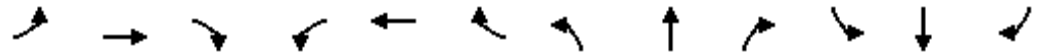
Intersection: 1: Powers Blvd (SH-21) & Milton E Proby Parkway

Movement	NB	NB	NB	NB	NB	B55	B55	SB	SB	SB	SB	SB
Directions Served	L	T	T	T	R	T	T	L	L	T	T	T
Maximum Queue (ft)	1025	2494	2469	2437	625	1363	1367	1012	1025	3121	3094	2777
Average Queue (ft)	709	1388	1386	1406	469	45	46	917	936	1383	1150	534
95th Queue (ft)	1346	2576	2551	2568	895	449	451	1105	1113	3012	2886	1560
Link Distance (ft)		3182	3182	3182		1384	1384			3619	3619	3619
Upstream Blk Time (%)							0					
Queuing Penalty (veh)							0					
Storage Bay Dist (ft)	1000				600			1000	1000			
Storage Blk Time (%)	0	30		64	0			10	26	17		
Queuing Penalty (veh)	0	177		81	1			30	78	181		

Queues
1: Powers Blvd (SH-21) & Milton E Proby Parkway

2030 Total PM.syn

04/28/2020



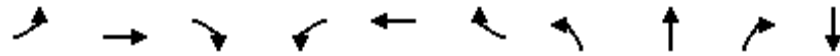
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	812	412	553	75	803	883	360	859	95	445	1303	629
v/c Ratio	0.94	0.23	0.35	0.58	0.92	0.56	0.89	0.67	0.06	0.87	0.91	0.40
Control Delay	73.2	34.7	0.6	84.1	77.0	1.5	88.7	53.1	0.1	80.2	61.7	0.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	73.2	34.7	0.6	84.1	77.0	1.5	88.7	53.1	0.1	80.2	61.7	0.8
Queue Length 50th (ft)	401	104	0	72	286	0	181	281	0	221	456	0
Queue Length 95th (ft)	#518	135	0	129	#365	0	#269	333	0	#304	#545	0
Internal Link Dist (ft)		2714			1655			3431			3650	
Turn Bay Length (ft)	800		400	525		400	550		600	1000		650
Base Capacity (vph)	884	1780	1568	150	873	1568	408	1277	1568	525	1430	1568
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.92	0.23	0.35	0.50	0.92	0.56	0.88	0.67	0.06	0.85	0.91	0.40

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

3: Peak Innovation Parkway & Milton E Proby Parkway

04/16/2020



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	61	379	805	16	389	4	392	8	34	8
v/c Ratio	0.19	0.34	0.51	0.05	0.42	0.01	0.54	0.01	0.02	0.01
Control Delay	27.0	33.7	1.2	25.4	39.3	0.0	20.2	13.3	0.0	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.0	33.7	1.2	25.4	39.3	0.0	20.2	13.3	0.0	0.0
Queue Length 50th (ft)	31	109	0	8	136	0	180	3	0	0
Queue Length 95th (ft)	52	168	0	14	111	0	256	4	0	0
Internal Link Dist (ft)		514			1226			686		1021
Turn Bay Length (ft)	500		300	300		275				
Base Capacity (vph)	324	1108	1583	343	920	529	814	985	1583	700
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.34	0.51	0.05	0.42	0.01	0.48	0.01	0.02	0.01

Intersection Summary

3: Peak Innovation Parkway & Milton E Proby Parkway

04/16/2020



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBR	SBT
Lane Group Flow (vph)	8	253	228	16	513	677	8	42
v/c Ratio	0.04	0.27	0.14	0.05	0.51	0.80	0.01	0.11
Control Delay	29.5	36.9	0.2	29.6	38.6	25.4	0.0	16.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.5	36.9	0.2	29.6	38.6	25.4	0.0	16.1
Queue Length 50th (ft)	4	76	0	9	169	338	0	2
Queue Length 95th (ft)	9	125	0	23	168	471	0	8
Internal Link Dist (ft)		574			1306			1021
Turn Bay Length (ft)	500		300	300				
Base Capacity (vph)	222	941	1583	339	1009	896	1583	396
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.27	0.14	0.05	0.51	0.76	0.01	0.11

Intersection Summary

3: Peak Innovation Parkway & Milton E Proby Parkway

04/16/2020



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	167	698	1321	27	362	7	490	17	48	11	14	79
v/c Ratio	0.39	0.53	0.83	0.11	0.37	0.01	0.77	0.02	0.03	0.04	0.04	0.05
Control Delay	23.9	32.0	5.3	21.3	36.3	0.0	70.6	15.6	0.0	40.7	40.4	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.9	32.0	5.3	21.3	36.3	0.0	70.6	15.6	0.0	40.7	40.4	0.1
Queue Length 50th (ft)	79	234	0	12	118	0	207	6	0	7	9	0
Queue Length 95th (ft)	127	298	0	30	167	0	263	m14	m0	25	29	0
Internal Link Dist (ft)		514			1306			686			1021	
Turn Bay Length (ft)	500			300		275			400	300		300
Base Capacity (vph)	450	1310	1583	257	980	597	843	846	1583	297	398	1583
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.53	0.83	0.11	0.37	0.01	0.58	0.02	0.03	0.04	0.04	0.05

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

3: Peak Innovation Parkway & Milton E Proby Parkway

04/16/2020



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	92	373	290	40	643	5	1108	11	23	16	22	125
v/c Ratio	0.57	0.43	0.18	0.15	0.84	0.01	0.92	0.01	0.01	0.07	0.07	0.08
Control Delay	45.0	40.8	0.3	29.8	55.7	0.0	50.7	16.9	0.0	44.9	44.7	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.0	40.8	0.3	29.8	55.7	0.0	50.7	16.9	0.0	44.9	44.7	0.1
Queue Length 50th (ft)	51	132	0	21	252	0	398	5	0	11	15	0
Queue Length 95th (ft)	#94	181	0	48	#339	0	#537	m18	m0	32	40	0
Internal Link Dist (ft)		574			1411			686			1021	
Turn Bay Length (ft)	500			300		275			400	300		300
Base Capacity (vph)	160	865	1583	269	768	464	1247	1057	1583	226	301	1583
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.57	0.43	0.18	0.15	0.84	0.01	0.89	0.01	0.01	0.07	0.07	0.08

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Intersection: 3: Peak Innovation Parkway & Milton E Proby Parkway

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB
Directions Served	L	T	T	T	R	L	T	T	T	R	L	L
Maximum Queue (ft)	237	202	1060	1181	1122	66	255	198	189	14	166	176
Average Queue (ft)	114	101	210	1024	1051	23	115	96	75	2	78	111
95th Queue (ft)	184	175	654	1465	1211	53	199	179	143	10	142	174
Link Distance (ft)		1122	1122	1122	1122							656
Upstream Blk Time (%)				9	0							
Queuing Penalty (veh)				83	4							
Storage Bay Dist (ft)	500					300				275	575	
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 3: Peak Innovation Parkway & Milton E Proby Parkway

Movement	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	T	R
Maximum Queue (ft)	215	49	76	46	85	104
Average Queue (ft)	135	15	29	5	21	45
95th Queue (ft)	201	46	61	26	63	87
Link Distance (ft)	656	656	656		1031	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)				300	300	
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 3: Peak Innovation Parkway & Milton E Proby Parkway

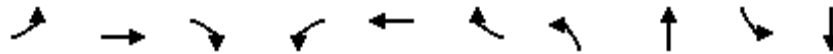
Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	T	L	T	T	T	R	L	L	L
Maximum Queue (ft)	286	179	196	236	325	690	678	722	296	600	726	711
Average Queue (ft)	176	103	128	148	172	437	412	398	12	585	657	659
95th Queue (ft)	279	157	184	208	394	676	667	676	100	640	734	712
Link Distance (ft)		1122	1122	1122							657	657
Upstream Blk Time (%)											16	22
Queuing Penalty (veh)											75	108
Storage Bay Dist (ft)	500				300				275	575		
Storage Blk Time (%)					0	39		39	0	9	25	
Queuing Penalty (veh)					0	27		6	0	54	156	

Intersection: 3: Peak Innovation Parkway & Milton E Proby Parkway

Movement	NB	NB	SB	SB	SB
Directions Served	T	R	L	T	R
Maximum Queue (ft)	666	53	68	508	325
Average Queue (ft)	202	12	14	96	174
95th Queue (ft)	662	39	46	337	326
Link Distance (ft)	657	657		1031	
Upstream Blk Time (%)	1				
Queuing Penalty (veh)	4				
Storage Bay Dist (ft)			300		300
Storage Blk Time (%)				0	7
Queuing Penalty (veh)				0	5

6: Middle Access & Peak Innovation Parkway

04/27/2020



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	26	1557	1079	216	370	86	134	38	45	27
v/c Ratio	0.05	0.90	0.86	0.92	0.18	0.09	0.81	0.09	0.22	0.10
Control Delay	10.7	24.1	17.5	95.0	7.2	0.6	90.6	17.0	48.1	26.6
Queue Delay	0.0	0.0	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.7	24.1	18.9	95.0	7.2	0.6	90.6	17.0	48.1	26.6
Queue Length 50th (ft)	6	224	586	140	29	1	54	6	31	7
Queue Length 95th (ft)	m10	339	883	#274	33	0	#108	35	68	35
Internal Link Dist (ft)		797			825			320		320
Turn Bay Length (ft)	450			300		400	300		150	
Base Capacity (vph)	556	1725	1261	234	2058	983	165	440	204	268
Starvation Cap Reductn	0	0	64	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.90	0.90	0.92	0.18	0.09	0.81	0.09	0.22	0.10

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Intersection: 6: Middle Access & Peak Innovation Parkway

Movement	EB	EB	EB	EB	WB	WB	WB	WB	B22	B22	NB	NB
Directions Served	L	T	T	R	L	T	T	R	T	T	L	L
Maximum Queue (ft)	60	100	119	5	549	946	933	425	488	488	487	500
Average Queue (ft)	15	28	41	1	41	590	602	158	175	194	434	455
95th Queue (ft)	38	71	88	5	266	1084	1099	493	527	579	576	579
Link Distance (ft)		772	772	772		814	814		429	429		
Upstream Blk Time (%)						34	35		8	18		
Queuing Penalty (veh)						213	219		50	114		
Storage Bay Dist (ft)	450				525			400			475	475
Storage Blk Time (%)						37	44	0			8	45
Queuing Penalty (veh)						4	29	0			14	76

Intersection: 6: Middle Access & Peak Innovation Parkway

Movement	NB	SB	SB
Directions Served	TR	L	TR
Maximum Queue (ft)	676	111	74
Average Queue (ft)	492	53	34
95th Queue (ft)	942	99	72
Link Distance (ft)	637		339
Upstream Blk Time (%)	47		
Queuing Penalty (veh)	0		
Storage Bay Dist (ft)		150	
Storage Blk Time (%)	1		
Queuing Penalty (veh)	10		

7: Peak Innovation Parkway & Embraer Heights

04/27/2020

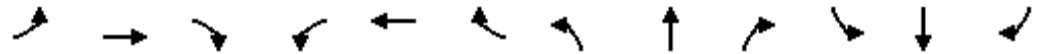


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	40	5	21	12	5	30	148	302	160	357	230	297
v/c Ratio	0.38	0.04	0.08	0.12	0.04	0.12	0.17	0.12	0.14	0.40	0.09	0.24
Control Delay	62.7	50.0	0.6	52.6	50.0	0.9	3.7	8.9	3.2	6.5	9.4	8.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.7	50.0	0.6	52.6	50.0	0.9	3.7	8.9	3.2	6.5	9.4	8.5
Queue Length 50th (ft)	30	4	0	9	4	0	15	64	21	173	62	106
Queue Length 95th (ft)	65	16	0	28	16	0	29	100	59	16	71	216
Internal Link Dist (ft)		374			1017			402			418	
Turn Bay Length (ft)	300		300	475		400	400		425	500		500
Base Capacity (vph)	275	364	430	275	364	430	1040	2449	1145	1123	2552	1224
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.01	0.05	0.04	0.01	0.07	0.14	0.12	0.14	0.32	0.09	0.24

Intersection Summary

7: Peak Innovation Parkway & Embraer Heights

04/27/2020



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	232	11	109	112	11	252	12	254	8	17	245	84
v/c Ratio	0.76	0.03	0.25	0.36	0.03	0.46	0.02	0.11	0.01	0.02	0.11	0.08
Control Delay	58.5	32.2	7.3	41.1	32.2	6.8	7.4	9.8	0.0	15.2	17.5	10.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.5	32.2	7.3	41.1	32.2	6.8	7.4	9.8	0.0	15.2	17.5	10.3
Queue Length 50th (ft)	170	7	0	74	7	0	2	25	0	5	35	1
Queue Length 95th (ft)	233	20	42	115	20	60	11	90	1	24	110	52
Internal Link Dist (ft)		374			1017			402			418	
Turn Bay Length (ft)	300		300	400		475	400		425	500		500
Base Capacity (vph)	669	892	815	669	892	889	799	2224	1028	792	2227	1029
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.35	0.01	0.13	0.17	0.01	0.28	0.02	0.11	0.01	0.02	0.11	0.08

Intersection Summary

7: Peak Innovation Parkway & Embraer Heights

04/27/2020



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	83	11	46	28	11	53	343	550	304	549	455	633
v/c Ratio	0.45	0.07	0.14	0.19	0.11	0.19	0.58	0.35	0.35	0.69	0.21	0.52
Control Delay	63.3	53.3	1.0	58.7	56.2	1.5	25.9	43.6	22.3	19.0	25.1	18.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.3	53.3	1.0	58.7	56.2	1.5	25.9	43.6	22.3	19.0	25.1	18.1
Queue Length 50th (ft)	32	8	0	10	8	0	178	224	97	429	183	299
Queue Length 95th (ft)	59	28	0	26	28	0	336	299	244	m487	m213	m333
Internal Link Dist (ft)		374			1017			402			418	
Turn Bay Length (ft)	300		300	475			400		425	500		500
Base Capacity (vph)	185	302	432	145	281	416	739	1578	874	883	2166	1214
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.45	0.04	0.11	0.19	0.04	0.13	0.46	0.35	0.35	0.62	0.21	0.52

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

7: Peak Innovation Parkway & Embraer Heights

04/27/2020



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	492	16	260	222	16	401	24	467	15	32	452	113
v/c Ratio	0.77	0.03	0.46	0.60	0.05	0.86	0.06	0.34	0.02	0.08	0.32	0.15
Control Delay	54.5	27.3	10.1	57.5	34.9	39.8	29.4	37.2	0.1	33.4	40.3	7.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.5	27.3	10.1	57.5	34.9	39.8	29.4	37.2	0.1	33.4	40.3	7.5
Queue Length 50th (ft)	188	9	33	85	10	152	13	181	0	17	136	0
Queue Length 95th (ft)	235	23	88	123	27	245	43	253	1	50	250	31
Internal Link Dist (ft)		374			1017			402			418	
Turn Bay Length (ft)	300		300	475		400	400		425	500		500
Base Capacity (vph)	872	768	772	472	551	615	403	1392	749	398	1401	752
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.02	0.34	0.47	0.03	0.65	0.06	0.34	0.02	0.08	0.32	0.15

Intersection Summary

Queues

10: Integration Loop & Grinnel Blvd



Lane Group	EBL	EBR	NBL	NBT	SBR
Lane Group Flow (vph)	480	199	42	11	390
v/c Ratio	0.73	0.43	0.04	0.01	0.27
Control Delay	33.7	7.9	6.7	6.7	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	33.7	7.9	6.7	6.7	0.5
Queue Length 50th (ft)	194	64	9	2	0
Queue Length 95th (ft)	246	113	24	9	0
Internal Link Dist (ft)	400			422	
Turn Bay Length (ft)	425		300		300
Base Capacity (vph)	1473	792	987	1305	1435
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.33	0.25	0.04	0.01	0.27

Intersection Summary

Queues

10: Integration Loop & Grinnel Blvd



Lane Group	EBL	EBR	NBL	NBT	SBR
Lane Group Flow (vph)	238	153	17	16	282
v/c Ratio	0.61	0.48	0.02	0.01	0.19
Control Delay	65.1	33.4	3.6	3.6	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	65.1	33.4	3.6	3.6	0.3
Queue Length 50th (ft)	101	63	2	2	0
Queue Length 95th (ft)	144	131	9	8	0
Internal Link Dist (ft)	374			422	
Turn Bay Length (ft)	425		300		300
Base Capacity (vph)	1387	730	1095	1447	1473
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.17	0.21	0.02	0.01	0.19

Intersection Summary

10: Integration Loop & Grinnel Blvd



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	525	315	125	5	30	378
v/c Ratio	0.74	0.54	0.13	0.00	0.02	0.31
Control Delay	59.2	24.7	8.0	9.2	8.8	2.8
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0
Total Delay	59.2	24.8	8.0	9.2	8.8	2.8
Queue Length 50th (ft)	215	121	28	1	6	0
Queue Length 95th (ft)	270	185	80	7	25	91
Internal Link Dist (ft)	398			422	355	
Turn Bay Length (ft)	425		300			300
Base Capacity (vph)	1387	827	939	1273	1273	1201
Starvation Cap Reductn	0	37	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.40	0.13	0.00	0.02	0.31

Intersection Summary

10: Integration Loop & Grinnel Blvd



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	236	177	140	11	27	332
v/c Ratio	0.60	0.53	0.13	0.01	0.02	0.25
Control Delay	65.5	33.7	3.6	3.2	4.6	1.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.5	33.7	3.6	3.2	4.6	1.7
Queue Length 50th (ft)	101	81	20	2	4	2
Queue Length 95th (ft)	138	149	40	5	16	48
Internal Link Dist (ft)	384			422	355	
Turn Bay Length (ft)	425		300			300
Base Capacity (vph)	1187	663	1071	1448	1448	1305
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.27	0.13	0.01	0.02	0.25

Intersection Summary

10: Integration Loop & Grinnel Blvd



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	718	449	153	16	30	402
v/c Ratio	0.75	0.59	0.18	0.01	0.03	0.36
Control Delay	53.4	21.4	8.1	7.1	14.8	5.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.4	21.4	8.1	7.1	14.8	5.9
Queue Length 50th (ft)	293	157	36	3	10	0
Queue Length 95th (ft)	354	232	66	11	m31	124
Internal Link Dist (ft)	551			422	355	
Turn Bay Length (ft)	425		300			300
Base Capacity (vph)	1644	992	841	1140	1140	1124
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.44	0.45	0.18	0.01	0.03	0.36

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

10: Integration Loop & Grinnel Blvd



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	247	204	264	22	27	482
v/c Ratio	0.62	0.56	0.25	0.02	0.02	0.36
Control Delay	54.7	18.1	5.8	4.5	1.9	1.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.7	18.1	5.8	4.5	1.9	1.6
Queue Length 50th (ft)	102	10	62	4	2	20
Queue Length 95th (ft)	145	114	105	13	m6	18
Internal Link Dist (ft)	494			422	355	
Turn Bay Length (ft)	425		300			300
Base Capacity (vph)	1015	611	1067	1443	1443	1335
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.33	0.25	0.02	0.02	0.36

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

11: Peak Innovation Parkway & S Integration Loop



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	4	133	33	21	107	592	195	85	164	16
v/c Ratio	0.04	0.61	0.46	0.15	0.11	0.23	0.16	0.13	0.07	0.01
Control Delay	40.5	25.5	72.2	30.1	2.2	4.6	0.4	2.2	1.9	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.5	25.5	72.2	30.1	2.2	4.6	0.4	2.2	1.9	0.0
Queue Length 50th (ft)	3	35	25	5	9	52	0	1	5	0
Queue Length 95th (ft)	m8	108	58	30	m21	83	5	14	8	0
Internal Link Dist (ft)		799		732		735			631	
Turn Bay Length (ft)	150		150		450		500	450		400
Base Capacity (vph)	363	507	244	450	1037	2566	1201	775	2486	1139
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.26	0.14	0.05	0.10	0.23	0.16	0.11	0.07	0.01

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

11: Peak Innovation Parkway & S Integration Loop

04/27/2020



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	16	96	165	103	55	178	26	12	452	4
v/c Ratio	0.07	0.27	0.73	0.29	0.08	0.07	0.02	0.01	0.20	0.00
Control Delay	24.3	4.0	64.7	16.3	5.6	7.5	0.0	3.4	7.9	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.3	4.0	64.7	16.3	5.6	7.5	0.0	3.4	7.9	0.0
Queue Length 50th (ft)	0	3	122	20	9	16	0	1	91	0
Queue Length 95th (ft)	18	13	185	64	25	44	0	3	106	0
Internal Link Dist (ft)		799		732		735			631	
Turn Bay Length (ft)	150		150		450		500	450		400
Base Capacity (vph)	487	661	491	676	717	2390	1098	869	2221	1027
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.15	0.34	0.15	0.08	0.07	0.02	0.01	0.20	0.00

Intersection Summary

11: Peak Innovation Parkway & S Integration Loop



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	10	198	80	50	163	1160	485	212	276	40
v/c Ratio	0.05	0.73	0.82	0.20	0.21	0.54	0.42	0.57	0.12	0.04
Control Delay	42.7	53.8	101.4	21.0	3.9	10.1	0.5	37.9	2.6	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.7	53.8	101.4	21.0	3.9	10.1	0.5	37.9	2.6	0.1
Queue Length 50th (ft)	8	127	61	10	20	155	0	115	10	0
Queue Length 95th (ft)	m17	196	#120	45	m30	m232	m0	179	14	0
Internal Link Dist (ft)		799		732		735			631	
Turn Bay Length (ft)	150		150		450		500	450		400
Base Capacity (vph)	264	372	141	354	779	2155	1153	471	2251	1040
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.53	0.57	0.14	0.21	0.54	0.42	0.45	0.12	0.04

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

11: Peak Innovation Parkway & S Integration Loop



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	39	158	412	256	70	270	65	28	902	11
v/c Ratio	0.10	0.22	0.88	0.35	0.29	0.17	0.09	0.05	0.62	0.02
Control Delay	15.2	1.5	53.7	11.5	18.9	19.3	0.9	29.9	39.2	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.2	1.5	53.7	11.5	18.9	19.3	0.9	29.9	39.2	0.3
Queue Length 50th (ft)	14	5	284	58	23	58	0	12	225	0
Queue Length 95th (ft)	27	10	391	109	54	91	5	m50	457	m0
Internal Link Dist (ft)		799		732		735			631	
Turn Bay Length (ft)	150		150		450		500	450		400
Base Capacity (vph)	455	819	559	842	243	1554	746	529	1461	707
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.19	0.74	0.30	0.29	0.17	0.09	0.05	0.62	0.02

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Intersection: 12: Grinnel Blvd & Powers Blvd (SH-21)

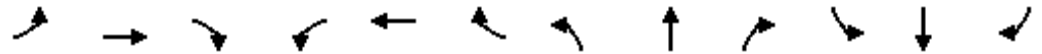
Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB
Directions Served	L	L	T	T	L	T	T	L	L	T	T	L
Maximum Queue (ft)	314	332	304	322	156	539	513	283	281	177	141	116
Average Queue (ft)	208	202	161	174	91	373	380	193	208	97	75	64
95th Queue (ft)	294	297	271	285	145	495	495	269	276	152	130	108
Link Distance (ft)			1316	1316		1061	1061			2037	2037	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	975	975			950			450	450			400
Storage Blk Time (%)												0
Queuing Penalty (veh)												0

Intersection: 12: Grinnel Blvd & Powers Blvd (SH-21)

Movement	SB	SB	SB
Directions Served	L	T	T
Maximum Queue (ft)	134	166	151
Average Queue (ft)	80	86	100
95th Queue (ft)	125	140	143
Link Distance (ft)		981	981
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	400		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Queues

12: Grinnel Blvd & Powers Blvd (SH-21)



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	323	812	560	189	570	141	325	197	109	100	229	230
v/c Ratio	0.73	0.71	0.36	0.72	0.48	0.09	0.70	0.23	0.07	0.49	0.39	0.15
Control Delay	60.3	39.9	0.6	87.1	20.7	0.1	60.0	34.6	0.1	53.6	37.6	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.3	39.9	0.6	87.1	20.7	0.1	60.0	34.6	0.1	53.6	37.6	0.2
Queue Length 50th (ft)	124	291	0	157	73	0	102	74	0	39	82	0
Queue Length 95th (ft)	173	380	0	234	104	0	186	73	0	68	123	0
Internal Link Dist (ft)		1282			1450			1841			983	
Turn Bay Length (ft)	975		400	950		700	450		150	400		250
Base Capacity (vph)	486	1138	1568	313	1192	1583	524	848	1568	211	590	1583
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.66	0.71	0.36	0.60	0.48	0.09	0.62	0.23	0.07	0.47	0.39	0.15

Intersection Summary

Intersection: 12: Grinnel Blvd & Powers Blvd (SH-21)

Movement	EB	EB	EB	EB	WB	WB	WB	WB	B59	B59	NB	NB
Directions Served	L	L	T	T	L	L	T	T	T	T	L	L
Maximum Queue (ft)	354	355	198	182	196	225	535	549	950	978	462	474
Average Queue (ft)	270	274	92	113	57	86	368	379	32	33	322	341
95th Queue (ft)	345	352	166	177	129	165	553	563	313	322	446	470
Link Distance (ft)			1384	1384			1472	1472	1164	1164		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	975	975			950	950					450	450
Storage Blk Time (%)											0	1
Queuing Penalty (veh)											0	1

Intersection: 12: Grinnel Blvd & Powers Blvd (SH-21)

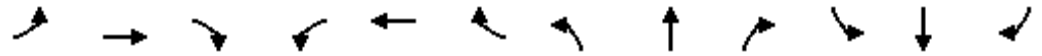
Movement	NB	NB	NB	SB	SB	SB	SB	B43
Directions Served	T	T	R	L	L	T	T	T
Maximum Queue (ft)	590	225	175	97	110	155	189	54
Average Queue (ft)	147	145	57	45	59	86	108	2
95th Queue (ft)	303	227	191	82	99	137	175	18
Link Distance (ft)	1844	1844				978	978	81
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			150	400	400			
Storage Blk Time (%)		7	0					
Queuing Penalty (veh)		17	0					

Queues

2030 Total PM.syn

12: Grinnel Blvd & Powers Blvd (SH-21)

04/28/2020



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	334	891	671	299	662	98	392	220	111	72	337	267
v/c Ratio	0.73	0.75	0.43	0.65	0.56	0.14	0.79	0.23	0.07	0.43	0.60	0.17
Control Delay	59.3	40.1	0.9	74.0	23.6	1.2	61.1	35.4	0.1	63.2	44.8	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.3	40.1	0.9	74.0	23.6	1.2	61.1	35.4	0.1	63.2	44.8	0.2
Queue Length 50th (ft)	128	318	0	127	90	0	159	83	0	22	141	0
Queue Length 95th (ft)	177	421	0	173	162	13	220	80	0	47	194	0
Internal Link Dist (ft)		1419			1827			1820			983	
Turn Bay Length (ft)	975			950		700	450		150	400		250
Base Capacity (vph)	514	1183	1568	665	1175	680	524	960	1568	168	558	1583
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.65	0.75	0.43	0.45	0.56	0.14	0.75	0.23	0.07	0.43	0.60	0.17

Intersection Summary

Intersection: 12: Grinnel Blvd & Powers Blvd (SH-21)

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB
Directions Served	L	L	T	T	T	L	L	T	T	T	L	L
Maximum Queue (ft)	265	272	146	205	190	155	167	358	389	396	677	631
Average Queue (ft)	123	130	45	69	88	64	88	252	282	306	348	366
95th Queue (ft)	206	209	101	136	156	134	148	323	373	385	505	509
Link Distance (ft)			1646	1646	1646			2011	2011	2011		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	975	975				950	950				850	850
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 12: Grinnel Blvd & Powers Blvd (SH-21)

Movement	NB	NB	SB	SB	SB	SB
Directions Served	T	T	L	L	T	T
Maximum Queue (ft)	350	329	97	110	245	225
Average Queue (ft)	204	199	34	68	153	156
95th Queue (ft)	313	308	78	102	231	222
Link Distance (ft)	1944	1944			770	770
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			400	400		
Storage Blk Time (%)						
Queuing Penalty (veh)						

Queues

2045 Total PM.syn

12: Grinnel Blvd & Powers Blvd (SH-21)

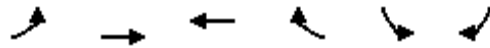
04/28/2020



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	348	1050	863	489	848	98	506	242	142	72	555	323
v/c Ratio	0.70	0.86	0.55	0.82	0.62	0.06	0.84	0.21	0.09	0.46	0.91	0.20
Control Delay	56.5	51.8	1.4	74.1	39.4	0.1	58.0	29.7	0.1	61.8	85.2	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.5	51.8	1.4	74.1	39.4	0.1	58.0	29.7	0.1	61.8	85.2	0.3
Queue Length 50th (ft)	134	290	0	205	149	0	148	78	0	28	218	0
Queue Length 95th (ft)	177	#376	0	262	207	m0	#275	84	0	54	#325	0
Internal Link Dist (ft)		1739			1823			2058			762	
Turn Bay Length (ft)	975			950		700	850		400	400		250
Base Capacity (vph)	629	1219	1568	651	1371	1583	637	1147	1568	157	613	1583
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.55	0.86	0.55	0.75	0.62	0.06	0.79	0.21	0.09	0.46	0.91	0.20

Intersection Summary

- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	41	880	1330	304	108	9
v/c Ratio	0.37	0.37	0.64	0.19	0.36	0.01
Control Delay	81.1	2.0	16.7	0.3	47.9	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	81.1	2.0	16.7	0.3	47.9	0.0
Queue Length 50th (ft)	34	27	341	0	74	0
Queue Length 95th (ft)	m66	35	419	0	132	m0
Internal Link Dist (ft)		1142	2843		1199	
Turn Bay Length (ft)	1000			800		
Base Capacity (vph)	125	2409	2085	1583	302	1583
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.37	0.64	0.19	0.36	0.01

Intersection Summary

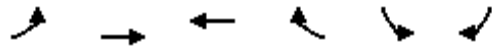
m Volume for 95th percentile queue is metered by upstream signal.

Queues

2022 Total PM Imp_3-13-14.syn

13: Powers Blvd (SH-21) & Peak Innovation Parkway

04/16/2020

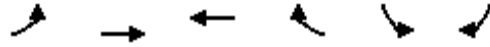


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	15	1020	908	77	209	34
v/c Ratio	0.15	0.49	0.47	0.05	0.42	0.02
Control Delay	79.0	2.4	17.6	0.1	38.6	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	79.0	2.4	17.6	0.1	38.6	0.0
Queue Length 50th (ft)	12	18	183	0	133	0
Queue Length 95th (ft)	m20	32	311	0	208	0
Internal Link Dist (ft)		1253	2843		1199	
Turn Bay Length (ft)	1000			800		
Base Capacity (vph)	125	2086	1925	1583	494	1583
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.49	0.47	0.05	0.42	0.02

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

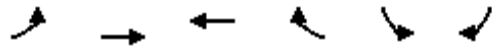
13: Powers Blvd (SH-21) & Peak Innovation Parkway



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	230	871	1320	655	248	42
v/c Ratio	0.77	0.35	0.76	0.41	0.48	0.03
Control Delay	82.9	2.1	27.6	0.8	46.5	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	82.9	2.1	27.6	0.8	46.5	0.0
Queue Length 50th (ft)	189	36	416	0	98	0
Queue Length 95th (ft)	274	34	557	0	144	0
Internal Link Dist (ft)		1142	2843		1199	
Turn Bay Length (ft)	1000			800	525	
Base Capacity (vph)	379	2479	1731	1583	514	1583
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.61	0.35	0.76	0.41	0.48	0.03

Intersection Summary

13: Powers Blvd (SH-21) & Peak Innovation Parkway



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	39	1015	890	218	512	191
v/c Ratio	0.33	0.49	0.50	0.14	0.52	0.12
Control Delay	84.8	2.2	20.8	0.2	47.4	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	84.8	2.2	20.8	0.2	47.4	0.2
Queue Length 50th (ft)	32	12	246	0	204	0
Queue Length 95th (ft)	m48	26	321	0	267	0
Internal Link Dist (ft)		1253	2843		1199	
Turn Bay Length (ft)	1000			800	525	
Base Capacity (vph)	154	2057	1789	1583	986	1583
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.49	0.50	0.14	0.52	0.12

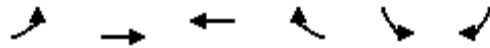
Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Intersection: 13: Powers Blvd (SH-21) & Peak Innovation Parkway

Movement	EB	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	T	T	L	L
Maximum Queue (ft)	803	157	142	649	734	178	168
Average Queue (ft)	518	55	65	421	452	94	111
95th Queue (ft)	776	118	126	591	625	148	155
Link Distance (ft)		1164	1164	2883	2883		1192
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	1000					525	
Storage Blk Time (%)							
Queuing Penalty (veh)							

13: Powers Blvd (SH-21) & Peak Innovation Parkway



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	76	1167	1016	328	999	447
v/c Ratio	0.53	0.65	0.72	0.21	0.80	0.28
Control Delay	87.7	14.3	34.0	0.3	36.6	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	87.7	14.3	34.0	0.3	36.6	0.4
Queue Length 50th (ft)	63	316	357	0	404	0
Queue Length 95th (ft)	m80	325	448	0	487	0
Internal Link Dist (ft)		1253	2843		1199	
Turn Bay Length (ft)	1000			800	525	
Base Capacity (vph)	169	1802	1414	1583	1244	1583
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.45	0.65	0.72	0.21	0.80	0.28

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Queues

2022 Total AM Imp_3-13-14.syn

14: Grinnel Blvd & Bradley Road

04/16/2020



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	371	65	131	46	239	252	671	28	12	399	334
v/c Ratio	0.92	0.12	0.21	0.17	0.90	0.52	0.78	0.03	0.07	0.34	0.45
Control Delay	59.8	32.0	0.9	27.3	84.5	21.2	35.8	0.1	16.4	27.1	5.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.8	32.0	0.9	27.3	84.5	21.2	35.8	0.1	16.4	27.1	5.5
Queue Length 50th (ft)	222	37	0	22	181	109	394	0	4	86	20
Queue Length 95th (ft)	#394	62	0	27	#292	128	539	0	6	115	46
Internal Link Dist (ft)		843			1133		432			2557	
Turn Bay Length (ft)	300		150	100		450		600	325		325
Base Capacity (vph)	402	557	619	264	273	507	859	841	183	1157	740
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.92	0.12	0.21	0.17	0.88	0.50	0.78	0.03	0.07	0.34	0.45

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues

2022 Total PM Imp_3-13-14.syn

14: Grinnel Blvd & Bradley Road

04/16/2020



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	275	160	227	34	87	144	368	42	16	558	309
v/c Ratio	0.63	0.33	0.39	0.18	0.52	0.32	0.38	0.05	0.03	0.37	0.36
Control Delay	38.6	38.0	6.5	30.5	58.9	15.4	21.0	0.1	17.0	27.1	6.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.6	38.0	6.5	30.5	58.9	15.4	21.0	0.1	17.0	27.1	6.6
Queue Length 50th (ft)	168	105	0	18	61	51	150	0	6	134	28
Queue Length 95th (ft)	234	158	60	27	96	94	301	0	8	185	56
Internal Link Dist (ft)		843			1133		432			2557	
Turn Bay Length (ft)	300		150	100		450		600	325		325
Base Capacity (vph)	453	576	646	188	298	469	968	922	498	1500	847
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.61	0.28	0.35	0.18	0.29	0.31	0.38	0.05	0.03	0.37	0.36

Intersection Summary

Queues

2030 Total AM.syn

14: Grinnel Blvd & Bradley Road

04/16/2020



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	545	60	128	28	229	217	776	18	7	459	389
v/c Ratio	0.80	0.09	0.18	0.10	0.77	0.53	0.50	0.02	0.03	0.44	0.39
Control Delay	54.5	24.9	0.6	21.8	64.6	26.1	26.9	0.1	37.2	53.5	1.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.5	24.9	0.6	21.8	64.6	26.1	26.9	0.1	37.2	53.5	1.5
Queue Length 50th (ft)	206	32	0	12	169	102	215	0	4	160	8
Queue Length 95th (ft)	263	59	0	28	249	174	353	0	m12	225	12
Internal Link Dist (ft)		843			1133		432			2557	
Turn Bay Length (ft)	300		150	100		450		600	325		325
Base Capacity (vph)	771	708	730	288	365	440	1566	815	264	1037	1022
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.08	0.18	0.10	0.63	0.49	0.50	0.02	0.03	0.44	0.38

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Queues

2030 Total PM.syn

14: Grinnel Blvd & Bradley Road

04/16/2020



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	329	167	246	24	77	154	430	30	9	727	459
v/c Ratio	0.68	0.45	0.48	0.14	0.49	0.36	0.20	0.03	0.02	0.42	0.38
Control Delay	56.2	45.4	8.0	32.2	59.3	13.4	13.1	0.0	17.0	25.8	0.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.2	45.4	8.0	32.2	59.3	13.4	13.1	0.0	17.0	25.8	0.8
Queue Length 50th (ft)	125	117	0	13	55	49	74	0	3	167	0
Queue Length 95th (ft)	170	174	64	32	102	93	147	0	m7	227	0
Internal Link Dist (ft)		843			1133		432			2557	
Turn Bay Length (ft)	300		150	100		450		600	325		325
Base Capacity (vph)	580	515	615	170	283	460	2139	1038	541	1728	1255
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.57	0.32	0.40	0.14	0.27	0.33	0.20	0.03	0.02	0.42	0.37

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Queues
14: Grinnel Blvd & Bradley Road

2045 Total AM.syn
04/16/2020



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	864	68	149	33	266	252	1133	21	7	563	483
v/c Ratio	0.91	0.09	0.19	0.12	0.94	0.88	0.86	0.03	0.05	0.67	0.50
Control Delay	56.1	22.2	1.3	22.0	90.9	57.9	42.5	0.1	23.5	46.1	11.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.1	22.2	1.3	22.0	90.9	57.9	42.5	0.1	23.5	46.1	11.9
Queue Length 50th (ft)	330	33	0	13	205	136	408	0	3	210	140
Queue Length 95th (ft)	#441	64	11	31	#374	#261	#660	0	13	273	226
Internal Link Dist (ft)		843			1133		432			2557	
Turn Bay Length (ft)	300		150	100		450		600	325		325
Base Capacity (vph)	968	787	788	281	282	287	1320	720	146	836	967
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.89	0.09	0.19	0.12	0.94	0.88	0.86	0.03	0.05	0.67	0.50

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
14: Grinnel Blvd & Bradley Road

2045 Total PM.syn
04/16/2020



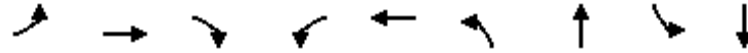
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	410	195	286	28	87	178	527	35	10	1040	728
v/c Ratio	0.69	0.41	0.49	0.15	0.52	0.64	0.27	0.04	0.02	0.72	0.62
Control Delay	52.4	39.5	11.0	29.7	60.5	27.5	16.7	0.1	18.7	34.5	2.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.4	39.5	11.0	29.7	60.5	27.5	16.7	0.1	18.7	34.5	2.5
Queue Length 50th (ft)	154	132	32	15	63	63	103	0	4	263	11
Queue Length 95th (ft)	202	190	105	33	113	139	196	0	m5	m#536	m42
Internal Link Dist (ft)		843			1133		432			2557	
Turn Bay Length (ft)	300		150	100		450		600	325		325
Base Capacity (vph)	694	576	651	186	283	295	1927	956	433	1451	1211
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.34	0.44	0.15	0.31	0.60	0.27	0.04	0.02	0.72	0.60

Intersection Summary

- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

Queues
15: Grinnel Blvd & South Access

2030 Total AM.syn
04/27/2020



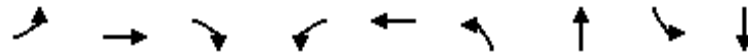
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	62	948	154	5	693	138	14	21	61
v/c Ratio	0.15	0.45	0.15	0.02	0.39	0.35	0.02	0.05	0.09
Control Delay	7.8	10.9	3.5	12.8	13.3	36.3	0.1	30.8	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.8	10.9	3.5	12.8	13.3	36.3	0.1	30.8	0.2
Queue Length 50th (ft)	23	197	25	1	91	84	0	12	0
Queue Length 95th (ft)	m29	m207	m34	m3	111	144	0	32	0
Internal Link Dist (ft)		78			428		293		253
Turn Bay Length (ft)	100			100		100		100	
Base Capacity (vph)	445	2108	1005	282	1768	395	562	412	690
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.45	0.15	0.02	0.39	0.35	0.02	0.05	0.09

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Queues
15: South Access & Grinnel Blvd

2030 Total PM.syn
04/27/2020

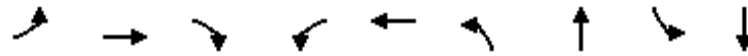


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	71	455	125	4	540	93	8	23	67
v/c Ratio	0.15	0.21	0.12	0.01	0.30	0.24	0.01	0.06	0.09
Control Delay	7.5	8.2	3.5	10.2	10.4	34.9	0.0	31.7	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.5	8.2	3.5	10.2	10.4	34.9	0.0	31.7	0.2
Queue Length 50th (ft)	23	78	4	1	57	55	0	13	0
Queue Length 95th (ft)	m36	104	m37	m2	58	102	0	34	0
Internal Link Dist (ft)		44			476		276		254
Turn Bay Length (ft)	100			100		100		100	
Base Capacity (vph)	559	2138	1005	464	1789	381	749	402	757
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.21	0.12	0.01	0.30	0.24	0.01	0.06	0.09

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

15: South Access & Grinnel Blvd

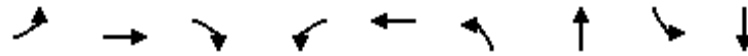


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	62	1276	154	5	745	138	14	21	61
v/c Ratio	0.14	0.52	0.13	0.02	0.34	0.53	0.04	0.08	0.11
Control Delay	6.5	9.6	1.2	3.4	3.5	51.7	0.2	40.5	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.5	9.6	1.2	3.4	3.5	51.7	0.2	40.5	0.4
Queue Length 50th (ft)	14	222	0	0	38	97	0	13	0
Queue Length 95th (ft)	27	270	19	m1	46	166	0	37	0
Internal Link Dist (ft)		207			546		309		229
Turn Bay Length (ft)	100			100		100		100	
Base Capacity (vph)	452	2462	1148	235	2172	261	387	272	539
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.52	0.13	0.02	0.34	0.53	0.04	0.08	0.11

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

15: South Access & Grinnel Blvd



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	71	493	125	4	814	93	8	23	67
v/c Ratio	0.16	0.20	0.11	0.01	0.38	0.37	0.01	0.09	0.13
Control Delay	10.5	9.7	4.9	3.5	4.2	47.7	0.0	41.5	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.5	9.7	4.9	3.5	4.2	47.7	0.0	41.5	0.5
Queue Length 50th (ft)	17	62	0	0	36	64	0	15	0
Queue Length 95th (ft)	m38	97	30	m1	45	117	0	39	0
Internal Link Dist (ft)		258			544		331		337
Turn Bay Length (ft)	100			100		100		100	
Base Capacity (vph)	454	2492	1151	538	2160	249	656	262	525
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.20	0.11	0.01	0.38	0.37	0.01	0.09	0.13

Intersection Summary

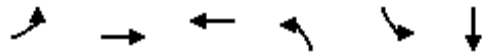
m Volume for 95th percentile queue is metered by upstream signal.

Queues

2022 Total AM Imp_3-13-14.syn

04/27/2020

16: North Access & Grinnel Blvd

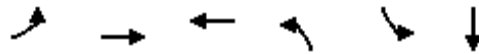


Lane Group	EBL	EBT	WBT	NBL	SBL	SBT
Lane Group Flow (vph)	210	629	411	110	28	198
v/c Ratio	0.58	0.34	0.32	0.42	0.08	0.26
Control Delay	50.4	25.1	30.1	57.3	37.4	0.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.4	25.1	30.1	57.3	37.4	0.9
Queue Length 50th (ft)	88	191	121	42	17	0
Queue Length 95th (ft)	m113	m239	175	71	44	0
Internal Link Dist (ft)		432	400			153
Turn Bay Length (ft)	175			100	100	
Base Capacity (vph)	586	1843	1267	386	338	750
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.34	0.32	0.28	0.08	0.26

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

16: North Access & Grinnel Blvd



Lane Group	EBL	EBT	WBT	NBL	SBL	SBT
Lane Group Flow (vph)	102	357	276	40	13	90
v/c Ratio	0.40	0.20	0.20	0.21	0.03	0.10
Control Delay	57.5	6.8	24.7	56.0	33.6	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.5	6.8	24.7	56.0	33.6	0.2
Queue Length 50th (ft)	31	28	73	15	8	0
Queue Length 95th (ft)	m55	39	109	34	24	0
Internal Link Dist (ft)		426	374			139
Turn Bay Length (ft)	175			100	100	
Base Capacity (vph)	529	1813	1350	357	406	895
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.20	0.20	0.11	0.03	0.10

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

16: North Access & Grinnel Blvd



Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	210	1075	506	91	9	57	198
v/c Ratio	0.58	0.52	0.34	0.40	0.02	0.22	0.30
Control Delay	83.3	5.6	20.4	59.1	0.0	44.7	1.2
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Total Delay	83.3	5.7	20.4	59.1	0.0	44.7	1.2
Queue Length 50th (ft)	87	72	133	35	0	38	0
Queue Length 95th (ft)	128	77	197	62	0	79	0
Internal Link Dist (ft)		428	398		335		231
Turn Bay Length (ft)	175			100		100	
Base Capacity (vph)	472	2079	1493	243	548	258	652
Starvation Cap Reductn	0	182	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.44	0.57	0.34	0.37	0.02	0.22	0.30

Intersection Summary

16: North Access & Grinnel Blvd



Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	102	396	699	34	3	26	90
v/c Ratio	0.40	0.18	0.41	0.19	0.00	0.09	0.15
Control Delay	87.7	2.6	22.5	57.0	0.0	42.4	0.5
Queue Delay	0.0	0.0	0.4	0.0	0.0	0.0	0.0
Total Delay	87.7	2.6	22.8	57.0	0.0	42.4	0.5
Queue Length 50th (ft)	42	15	181	13	0	17	0
Queue Length 95th (ft)	64	17	262	30	0	44	0
Internal Link Dist (ft)		476	384		304		191
Turn Bay Length (ft)	175			100		100	
Base Capacity (vph)	328	2167	1703	185	784	301	604
Starvation Cap Reductn	0	0	472	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.18	0.57	0.18	0.00	0.09	0.15

Intersection Summary

16: North Access & Grinnel Blvd



Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	210	1075	506	91	9	57	198
v/c Ratio	0.58	0.51	0.33	0.44	0.02	0.22	0.29
Control Delay	65.5	12.8	15.5	61.2	0.0	44.9	1.1
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Total Delay	65.5	12.9	15.5	61.2	0.0	44.9	1.1
Queue Length 50th (ft)	89	174	121	35	0	38	0
Queue Length 95th (ft)	131	200	92	63	0	79	0
Internal Link Dist (ft)		546	551		346		234
Turn Bay Length (ft)	175			100		100	
Base Capacity (vph)	643	2108	1521	214	538	254	682
Starvation Cap Reductn	0	148	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.55	0.33	0.43	0.02	0.22	0.29

Intersection Summary

16: North Access & Grinnel Blvd

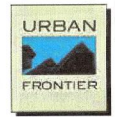


Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	102	396	699	34	3	26	90
v/c Ratio	0.45	0.18	0.39	0.19	0.00	0.09	0.16
Control Delay	70.8	8.2	22.4	57.0	0.0	44.2	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.8	8.2	22.4	57.0	0.0	44.2	0.6
Queue Length 50th (ft)	43	53	168	13	0	18	0
Queue Length 95th (ft)	75	70	213	30	0	45	0
Internal Link Dist (ft)		544	494		357		291
Turn Bay Length (ft)	175			100		100	
Base Capacity (vph)	243	2226	1789	185	773	278	569
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.18	0.39	0.18	0.00	0.09	0.16

Intersection Summary

APPENDIX H

Conceptual Site Plan



OPEN SPACE / RECREATION
Prepare by: VOLPE STUDIO LLC
Date: Jan. 20, 2020
0 100' 200' 400' 800' 1200'
Scale: 1" = 300'

