

Appendix B.

Alternatives Evaluation





Appendix B: Alternatives Evaluation

Alternatives Evaluation

The Vasquez Boulevard Planning and Environmental Linkages (PEL) Study (PEL Study) identified long-term packages of improvements to the Vasquez Boulevard corridor and the I-270/Vasquez Boulevard interchange (Project), as well as potential near-term improvement projects that could be implemented with available funding. The Project is focused on the near-term improvements along Vasquez Boulevard, specifically at the intersections within the study area. Alternatives evaluated as part of this Project include near-term alternatives recommended from the PEL Study ([Attachment A](#)), plus alternatives developed to optimize project goals and alternatives requested by stakeholders after the PEL Study. The alternatives were developed at a conceptual level with engineering analysis to refine and evaluate the alternatives to identify a proposed project to move forward into the National Environmental Policy Act (NEPA) process.

An alternatives evaluation was conducted to compare how well each alternative meets the Purpose and Need and identify potential impacts. Alternatives were refined and developed for the Vasquez Boulevard/60th Avenue intersection and for the Vasquez Boulevard/62nd Avenue intersection. The intersection alternatives were initially evaluated separately, then were combined to evaluate operations and optimize the roadway network traffic flow, safety and multimodal connections. In addition, due to the proposed improvements to Vasquez Boulevard, changes to local roads adjacent to the corridor were developed with several alternatives. Design options for the local roads were assessed based on several considerations, as discussed later in this document.

Evaluation Criteria

Alternatives were evaluated using criteria developed in partnership with the Federal Highway Administration (FHWA), the Colorado Department of Transportation (CDOT), the City of Commerce City (Commerce City) and Adams County staff ([Attachment B](#)). The criteria and associated performance measures from the Vasquez Boulevard PEL Study were reviewed for applicability and modified for the Project. [Table 1](#) lists the criteria categories, screening criteria and provides a description of the performance measure for each criterion.



Table 1: Evaluation Criteria and Performance Measures

Category	Criteria	Performance Measure
Safety	High-Crash Locations	High-crash locations and identify those locations that are improved
	Pedestrian and Bicyclist Safety	Number and type of pedestrian/bicyclist-vehicle conflict points at project intersection
Operations and Reliability	Travel Times on Vasquez	Peak hour travel time on Vasquez Boulevard
	Side Street Delay	Peak hour intersection delay at signalized intersections
	Queue Lengths	Queue lengths at project intersection
Multimodal Connectivity	Pedestrian and Bicycle Connections	Accommodation for pedestrians and considerations for bicycle movements along and across Vasquez Blvd within project area (Minor, Moderate, Major)
Access	Access Points	Access changes and perceived difficulty to access area businesses (Minor, Moderate, Major)
	Local Support	Input from local jurisdictions
Freight Travel	Freight Routes	Benefits/impacts to current high-volume freight movements (Minor, Moderate, Major)
Community and Environment	Local Plan Goals and Policies	Consistencies and inconsistencies with area plans, goals, policies and adjacent transportation improvements (including I-270)
	Right-of-Way (ROW)	- Number of properties potentially impacted - Type of property impact (Minor, Moderate, Major)
	Potential Environmental Impacts	Potential notable changes and/or impacts to resources (Minor, Moderate, Major)
Implementation	Constructability	Ease of construction, including traffic impacts during construction (Minor, Moderate, Major)



Alternatives Development

The No Action alternative is included in the evaluation as a baseline for comparison to the action alternatives. Under the No Action, only improvements that are already planned and funded by CDOT, Commerce City and/or Adams County, and routine maintenance would be completed. The following programmed transportation improvements located within a larger area surrounding the project study area that may affect regional travel within the study area. They are considered part of the No Action:

- I-270 improvements between I-25 and I-70 (south of study area)
- Highway 2 widening between 72nd Avenue and I-76 (north of study area)
- I-70 reconstruction (Central 70 Project) (south of study area)
- Regional Transportation District (RTD) North Metro Corridor commuter rail (future stations west and north of study area)

The most recent Mile High Greyhound Park (MHGP) site plans and traffic forecasts are also considered part of the No Action. The MGHP, located northeast of the Vasquez Boulevard/Highway 2/62nd Avenue intersection, has the first phases currently under construction with future phases already planned and funded. The MGHP will add vehicular traffic at existing and new accesses on Highway 2 and 62nd Avenue, along with additional multimodal demand and infrastructure in the study area.

In addition to the No Action, the alternatives listed in [Table 2](#) and [Table 3](#) and shown in [Figures 1 through 10](#) were evaluated for the Vasquez Boulevard/60th Avenue and Vasquez Boulevard/62nd Avenue intersections. The alternatives included the near-term recommendations from the PEL Study and new alternatives developed with the Project Management Team (PMT).



Table 2: Alternatives - Vasquez Boulevard/60th Avenue

Alternative	Description	Project Needs and Goals to be Addressed
No Action	<ul style="list-style-type: none"> - Only improvements that are already planned and funded by CDOT, Commerce City and/or Adams County would be completed 	<ul style="list-style-type: none"> - Included as baseline comparison of Project benefits and impacts
Alternative 1 Short Term Technology and Safety Improvements	<ul style="list-style-type: none"> - Recommended from the PEL study - Updated signal timing - In-pavement lighting - Near-side supplemental signal heads - Wayfinding signage improvements 	<ul style="list-style-type: none"> - Improves safety - Maintains property access - Minimizes environmental impacts
Alternative 2 Improved Frontage Road System	<ul style="list-style-type: none"> - Close frontage road connections at Vasquez Boulevard/60th Avenue intersection with options for frontage road connections from the PEL study, plus options developed by project team - Improved signal timing at Vasquez Boulevard/60th Avenue intersection provides more green time for Vasquez Boulevard and side streets - New frontage road connections to shift local circulation away from high-volume turning movements at Vasquez Boulevard/60th Avenue intersection 	<ul style="list-style-type: none"> - Improves safety - Improves transportation operations and reliability - Reduces pedestrian crossing width across Vasquez Boulevard - Balances property access - Improves freight movements
Alternative 3 Parkway Restricted Left out	<ul style="list-style-type: none"> - Modification from the PEL study recommendation to improve Parkway access - No left turn from Parkway to SB Vasquez Boulevard and EB and WB 60th (all inbound movements to Parkway remain open) - Vasquez Boulevard/62nd Avenue intersection improvements with new signal providing direct Vasquez access - Improved traffic signal phasing at Vasquez Boulevard/60th Avenue intersection - Potential Forest Dr traffic calming measures 	<ul style="list-style-type: none"> - Improves safety - Improves transportation operations and reliability - Reduces pedestrian crossing width across Vasquez Boulevard - Reduces pedestrian crossing conflict points - Balances property access - Improves freight movements



Alternative	Description	Project Needs and Goals to be Addressed
<p>Alternative 4 Parkway Closure with New Connection</p>	<ul style="list-style-type: none"> - Recommended from the PEL study - Parkway direct access to/from Vasquez Boulevard closed with cul-de-sac - New connection between Parkway and 60th Avenue to existing signal at Walmart - Improved traffic signal phasing at Vasquez Boulevard/60th Avenue intersection 	<ul style="list-style-type: none"> - Improves safety - Improves transportation operations and reliability - Reduces pedestrian crossing conflict points - Balances property access - Improves freight movements
<p>Alternative 5 Quadrant Road Intersection</p>	<ul style="list-style-type: none"> - Left turn movements and frontage road connections at Vasquez Boulevard/60th Avenue intersection removed, improving signal phasing - Left turn access to Parkway from Vasquez Boulevard or 60th Avenue made via quadrant road signal and right turns - Parkway access to/from Vasquez restricted to right-in/right-out 	<ul style="list-style-type: none"> - Improves safety - Improves transportation operations and reliability - Improves freight movements
<p>Alternative 6 Southbound Vasquez Slip Ramp</p>	<ul style="list-style-type: none"> - New slip ramp from SB Vasquez north of 60th Avenue removes some SB movements from Vasquez Boulevard/60th Avenue intersection - New frontage road connection to Clermont Street for route from SB slip ramp 	<ul style="list-style-type: none"> - Improves safety - Improves transportation operations and reliability - Maintains property access - Improves freight movements

Figure 1: Alternative 1 (60th): Short Term Technology and Safety Improvements





Figure 2: Alternative 2 (60th): Improved Frontage Road System

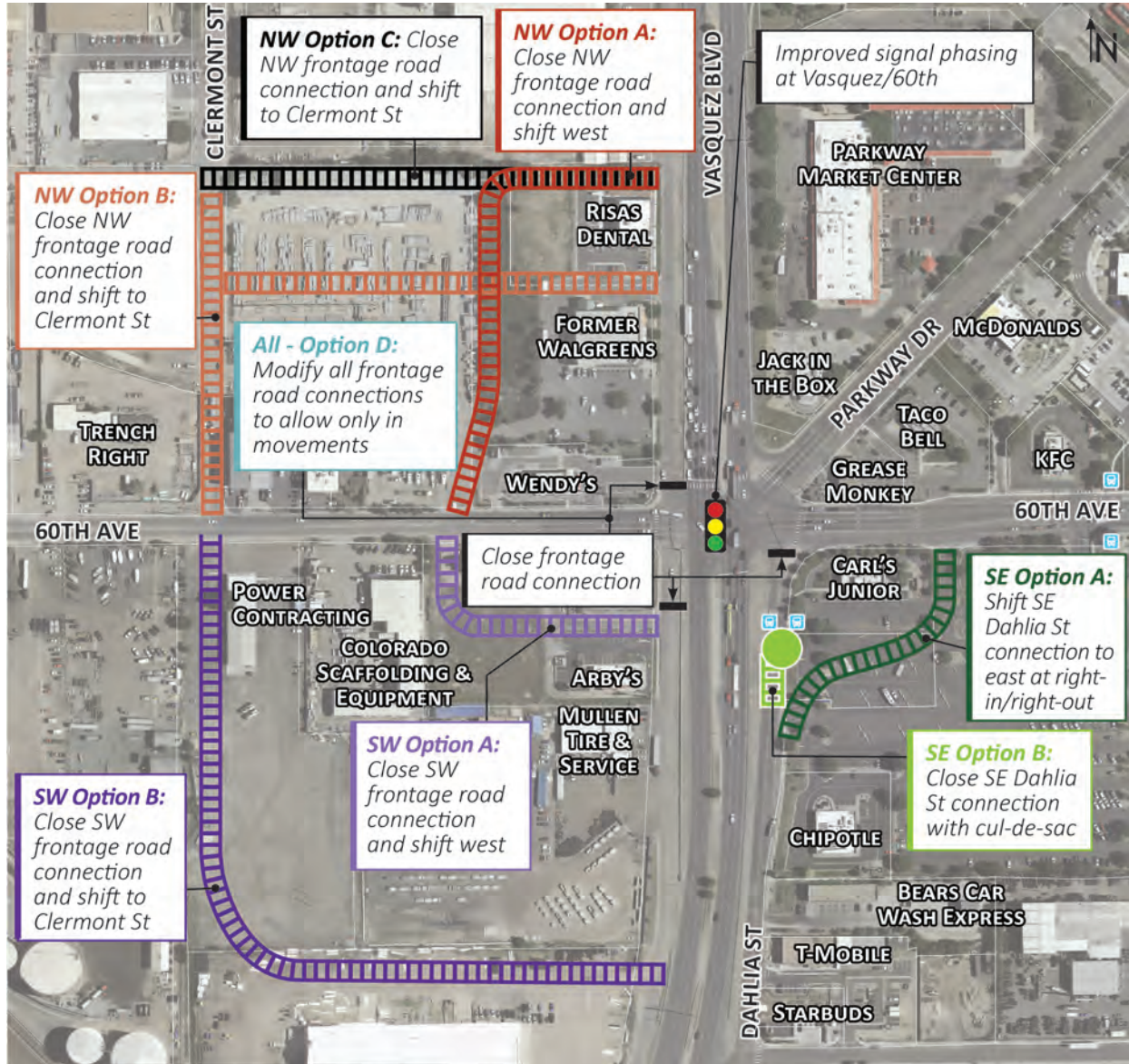




Figure 3: Alternative 3 (60th): Parkway Restricted Left Out

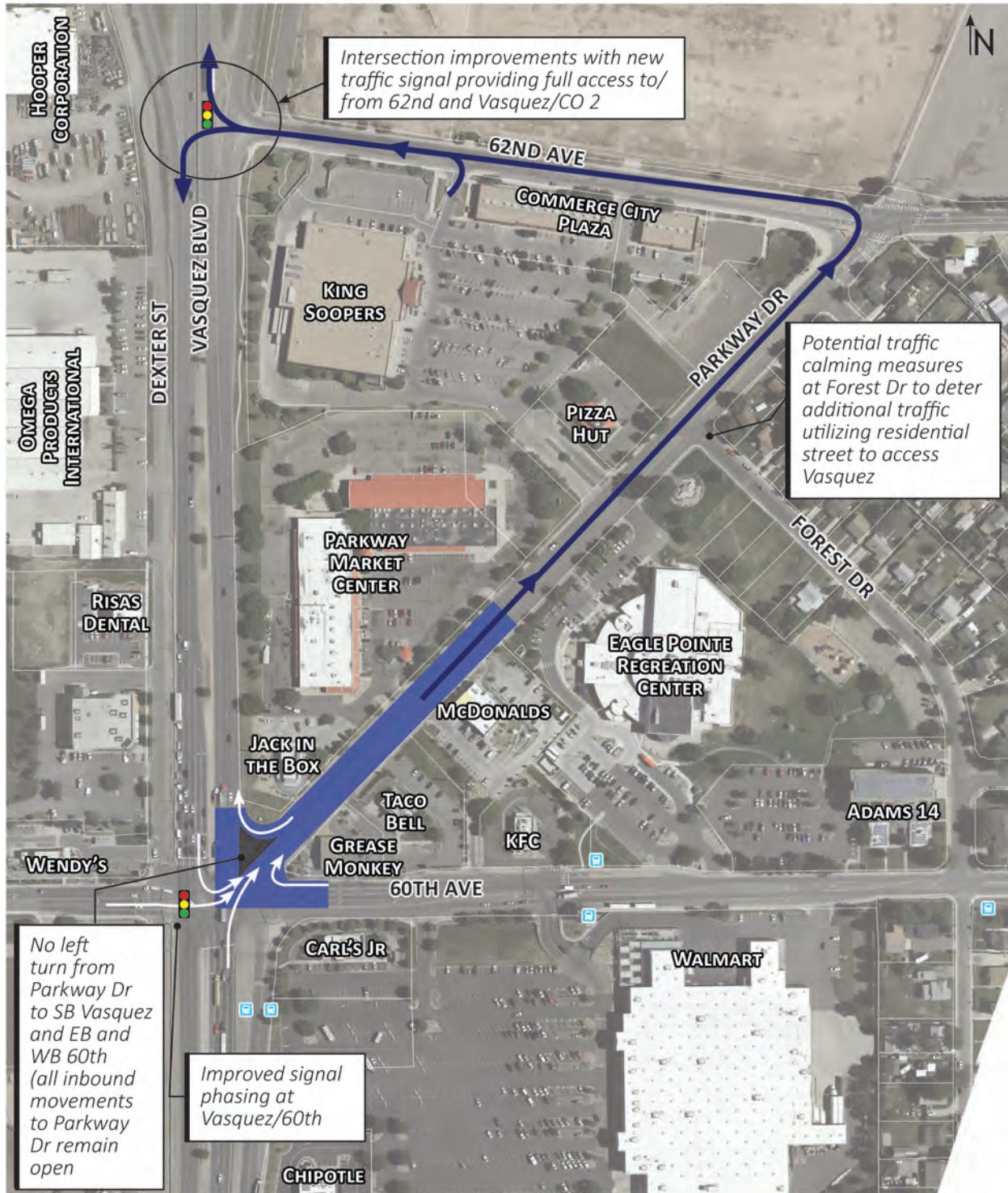




Figure 4: Alternative 4 (60th): Parkway Closure with New Connection





Figure 5: Alternative 5 (60th): Quadrant Road Intersection

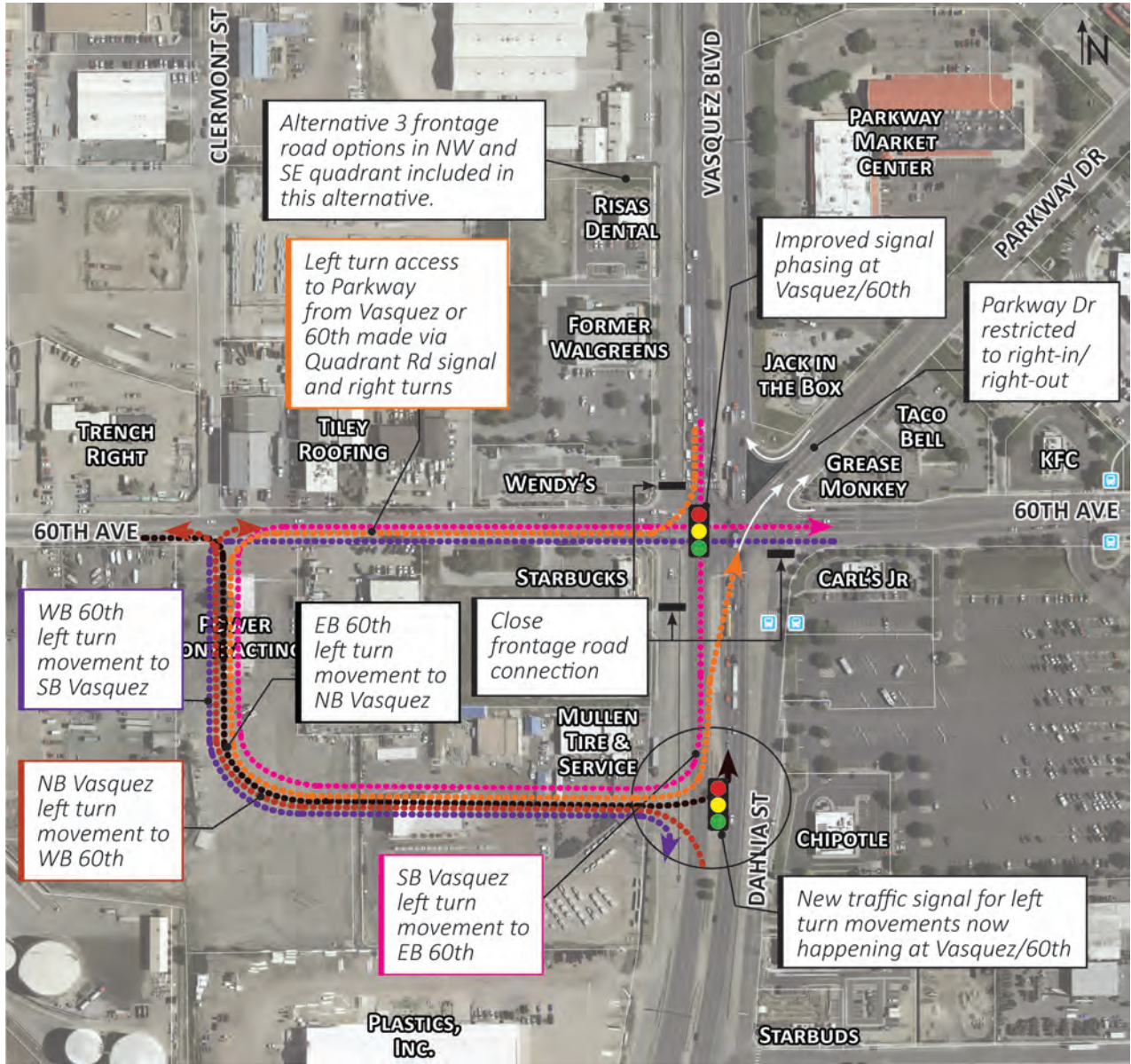




Figure 6: Alternative 6 (60th): Southbound Vasquez Boulevard Slip Ramp





Table 3: Vasquez Boulevard/62nd Avenue Alternatives

Alternative	Description	Project Needs and Goals to be Addressed
No Action	<ul style="list-style-type: none"> - Only improvements that are already planned and funded by CDOT, Commerce City and/or Adams County would be completed 	<ul style="list-style-type: none"> - Included as baseline comparison of Project benefits and impacts
Alternative 1 Full Signalized Intersection to North	<ul style="list-style-type: none"> - Recommended from the PEL study - Realign 62nd Avenue to north to line up with 63rd Avenue across Vasquez Boulevard - New traffic signal with full access to Vasquez Boulevard and Highway 2 	<ul style="list-style-type: none"> - Improves transportation operations and reliability - Balances property access - Improves freight movements
Alternative 2 Continuous-T Signalized Intersection	<ul style="list-style-type: none"> - New traffic signal with full access to Vasquez Boulevard and Highway 2 - SB Vasquez Boulevard traffic movement does not stop at signal 	<ul style="list-style-type: none"> - Improves transportation operations and reliability - Balances property access - Improves freight movements
Alternative 3 Full Signalized Intersection	<ul style="list-style-type: none"> - New traffic signal with full access to Vasquez Boulevard and Highway 2 - SB Highway 2 ramp traffic stops at signal, reducing weaving maneuvers along SB Vasquez Boulevard - Opportunity for new signalized pedestrian crossing across Vasquez Boulevard and Highway 2 	<ul style="list-style-type: none"> - Improves transportation operations and reliability - Balances property access - Connects modes and networks - Improves freight movements
Alternative 4 Full Signalized Intersection with Clermont Connection	<ul style="list-style-type: none"> - New traffic signal with full access to Vasquez Boulevard and Highway 2 - SB Highway 2 ramp realigned and modified to merge with Vasquez Boulevard north of new signal - New 62nd Avenue connection to Clermont west of Vasquez Boulevard as west leg of signal - Opportunity for new signalized pedestrian crossing across Vasquez Boulevard and Highway 2 	<ul style="list-style-type: none"> - Improves transportation operations and reliability - Balances property access - Connects modes and networks - Improves freight movements



Figure 7: Alternative 1 (62nd): Full Signalized Intersection to the North





Figure 8: Alternative 2 (62nd): Continuous-T Signalized Intersection





Figure 9: Alternative 3 (62nd): Full Signalized Intersection





Figure 10: Alternative 4 (62nd): Full Signalized Intersection with Clermont Connection





Screening Evaluation and Results

Below is a list of the intersection alternatives followed by the draft evaluation result for each. The full Initial Alternatives Evaluation Matrix can be found in [Attachment B](#).

Table 4: Alternatives Evaluation - Summary of Results

Alternative	Recommendation	Notes
Vasquez Boulevard /60th Avenue		
No Action	Remove from Further Consideration	To be evaluated in NEPA for comparison to the project
Alternative 1 Short Term Technology and Safety Improvements	Move Forward	Combine with other improvements for the project
Alternative 2 Improved Frontage Road System	Move Forward	Combine with other improvements for the project
Alternative 3 Parkway Restricted Left out	Move Forward	Combine with other improvements for the project
Alternative 4 Parkway Closure with New Connection	Remove from Further Consideration	Alternative has potential major business property impacts and major Section 6(f) and 4(f) impacts with new connection to 60 th Avenue
Alternative 5 Quadrant Road Intersection	Remove from Further Consideration	Alternative provides limited benefits with major property impacts and difficult construction
Alternative 6 Southbound Vasquez Slip Ramp	Remove from Further Consideration	Alternative provides minimal operational benefits with potential increase in rear end and sideswipe same direction crashes along SB Vasquez Boulevard with new conflict point at slip ramp and weave movements from Highway 2
Vasquez Boulevard/62nd Avenue		
No Action	Remove from Further Consideration	To be evaluated in NEPA for comparison to the project
Alternative 1 Full Signalized Intersection to North	Remove from Further Consideration	Alternative has property impacts with realignment of 62 nd Avenue that are not consistent with local development plans and goals
Alternative 2 Continuous-T Signalized Intersection	Move Forward	Combine with improvements at Vasquez Boulevard/60 th Avenue for the project



Alternative	Recommendation	Notes
Alternative 3-Full Signalized Intersection	Remove from Further Consideration	Alternative provides limited benefits and difficult construction
Alternative 4 Full Signalized Intersection with Clermont Connection	Remove from Further Consideration	Alternative provides limited benefits and difficult construction

Proposed Project

The Proposed Project includes improvements at the Vasquez Boulevard/60th Avenue and Vasquez Boulevard/62nd Avenue intersections, as well as the local street network and multimodal facilities, as shown in [Figure 11](#) and described on the following pages. The total estimated cost of the project is between \$20M - \$25M and includes the intersection modifications at Vasquez Boulevard/60th Avenue and the new traffic signal and intersection improvements at Vasquez Boulevard/62nd Avenue.

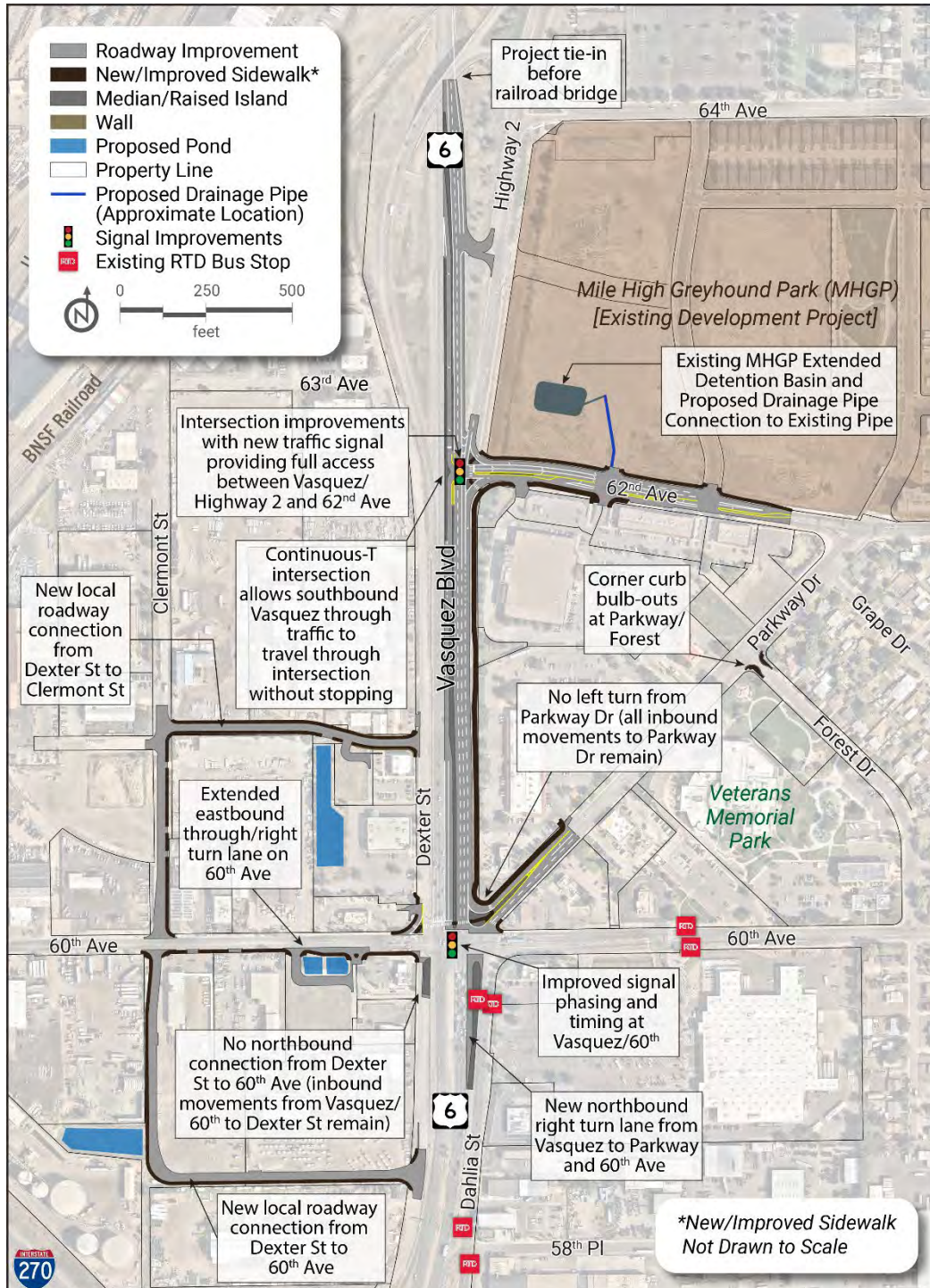
Vasquez Boulevard/60th Avenue

The Proposed Action includes the elements listed below for the Vasquez Boulevard/60th Avenue intersection:

- Only right turn movements to northbound Vasquez Boulevard from Parkway Drive. No access to other roads.
 - All inbound movements to Parkway Drive remain open as they exist now.
- All inbound movements from Vasquez Boulevard/60th to frontage roads remain as they exist now, but outbound movements are restricted.
 - Right turn only from southeast frontage road and all in movements allowed (all movements remain as they exist)
 - Right turn only from northwest frontage road and all in movements allowed (in movements remain as they exist)
 - No movement out from southwest frontage road and all in movements allowed (in movements remain as they exist)
- Two new local road connections to Clermont Street west of Vasquez Boulevard provide full access between frontage roads and 60th Avenue.
- Driveways on 60th Avenue, Parkway Drive and frontage roads remain as currently structures or have minor changes
- Restriping of existing crosswalks and new pedestrian refuges improve safety and accessibility of pedestrian infrastructure

- Corner curb bulb-outs would be added at the Parkway/Forest intersection as a deterrent to drivers who may think Forest Drive is an alternate route to 60th Avenue. The bulb-outs and crosswalk will provide visual indication of Forest Drive as a neighborhood street.

Figure 11: Proposed Project





Benefits

Traffic operations based on existing (2019) volumes, safety and multimodal connectivity were assessed for the Vasquez Boulevard/60th Avenue intersection with the Proposed Project:

- Removing the left turn out movement from Parkway Drive at Vasquez Boulevard/60th Avenue and limiting frontage road movements into the intersection provides more green time for traffic on Vasquez Boulevard and the side streets, reducing delay and queues at the intersection.
 - The overall intersection delays are reduced by over 50% in the AM and almost 40% in the PM peak hours.
 - Southbound queues on Vasquez Boulevard at 60th Avenue are reduced over 70% in the AM peak hour, from almost 50 cars in queue to 10 cars at the intersection.

Table 5: Vasquez Boulevard/60th Avenue Intersection Operations - 2019 AM/PM Peak Hour

Performance Measure	No Action	Proposed Project
Overall Intersection Level of Service (LOS)	F / E	D / D
Overall Intersection Average Delay (sec/veh)	109 / 77	51 / 47
95 th -percentile Queue Length (ft) - for worst approach	1,129 (SB) / 360 (WB Lt)	330 (SB) / 160 (WB Lt)

- Reducing the number of stops and delay at the intersection with the signal operation improvements reduces the frequency of rear-end crashes.
- Removal of the southwest frontage road approach on the west side of the intersection and the left turn from Parkway Drive reduces the number of conflict points through the intersection, resulting in a general reduction in crash potential.
- Adding connections to the local street network west of Vasquez Boulevard improves circulation with movements away from the high volumes at Vasquez Boulevard/60th.
- Reducing the width of the Parkway Drive approach to Vasquez Boulevard reduces the pedestrian/bicyclist crossing distance and conflict points.
- Improved signal operations reduces pedestrian/bicyclist crossing wait times.



Vasquez Boulevard/62nd Avenue

The Proposed Project includes the elements listed below for the Vasquez Boulevard/62nd Avenue intersection:

- New traffic signal with the Vasquez Boulevard/60th Avenue intersection improvements to provide movement from Parkway Drive to Vasquez Boulevard.
- Traffic signal provides full access to/from 62nd Avenue and Vasquez Boulevard/Northbound Highway 2.
- Southbound Highway 2 off ramp remains in existing configuration.
- Continuous green time for traffic on Vasquez Boulevard and the Highway 2 off ramp without stopping at the signal for 62nd Avenue traffic.

Benefits

Traffic operations based on 2019 volumes, safety and multimodal connectivity were assessed for the Vasquez Boulevard/62nd Avenue intersection with the Proposed Project:

- New signal at 62nd Avenue improves Vasquez Boulevard access to/from and around King Soopers and Commerce City Plaza.
- New signal at 62nd Avenue provides drivers to/from the north along Vasquez Boulevard more direct access to businesses and development along 62nd Avenue and Parkway Drive without needing to travel through the Vasquez Boulevard/60th Avenue intersection.
- New Vasquez Boulevard/62nd Avenue signal reduces turn volumes at Vasquez Boulevard/60th Avenue intersection.
- The continuous-T intersection configuration provides full access at Vasquez Boulevard/62nd Avenue with minor increases in delay for northbound Vasquez Boulevard and 62nd Avenue and relatively short queues on 62nd Avenue during peak hours.

Table 6: Vasquez Boulevard/62nd Avenue Intersection Operations – 2019 AM/PM Peak Hour

Performance Measure	No Action	Proposed Project
Overall Intersection Level of Service (LOS)	A / A	B / C
Overall Intersection Average Delay (sec/veh)	1 / 4	10 / 21
95 th -percentile Queue Length (ft) - for westbound 62 nd Ave approach	5 / 80	140 / 250



Local Road Connections

Due to the changes in the direct connections for the west side frontage road (Dexter Street) at the Vasquez Boulevard/60th Avenue intersection, new and improved local road connections are included in the Proposed Project to maintain and improve access for vehicular, truck and multimodal access to the properties located west of Vasquez Boulevard between approximately 58th Avenue and 63rd Avenue. To evaluate the most reasonable location for the new local road connections, the following factors were considered:

- Existing use of the west frontage roads, 60th Avenue, and Vasquez Boulevard by local businesses, particularly freight traffic
- Optimized vehicular circulation, access and operations along 60th Avenue, including consideration of the anticipated queue lengths along eastbound 60th Avenue with the operational improvements at the Vasquez Boulevard/60th Avenue signal under the Proposed Project conditions
- Preference of property owners regarding new roads and/or accesses
- Existing environmental conditions, specifically potential impacts to hazardous materials and historic resources

Options for the alignments and connection points for the new local road connections between the west side frontage road and 60th Avenue were developed and assessed utilizing the decision factors above. Multiple options were presented and discussed with Commerce City representatives and potentially impacted property owners.

The alignments for the new local road connections shown in [Figure 11](#) were found to best meet the project goals by optimizing local vehicular circulation and operations along 60th Avenue and provide new multimodal connection opportunities while minimizing property and environmental impacts. These new local road connections should be open for traffic prior to construction of the improvements at the Vasquez Boulevard/60th Avenue intersection in order to maintain continuous local access and provide alternate traffic routes.

Multimodal Facilities

As part of the Proposed Project, sidewalk improvements and expansions are planned along 60th Avenue, 62nd Avenue, Clermont Street and the new local street connections on the west side of Vasquez Boulevard. Corner curb bulb-outs added at the Parkway/Forest intersection would reduce the pedestrian crossing distance across Forest Drive. The bulb-outs and crosswalk will provide visual indication of Forest Drive as a neighborhood street. The sidewalk would be expanded along Vasquez Boulevard where there is a break between Parkway Drive and the start of the King Soopers property. There would be improved signal phasing and timing at the Vasquez Boulevard/60th Avenue intersection for safer and more comfortable pedestrian and bicyclist crossings.



Multimodal Enhancement Option Considered

During the alternatives evaluation process, a pedestrian/bicyclist grade separation was identified as an additional infrastructure element to enhance pedestrian/bicyclist comfort and safety in the Vasquez Boulevard/60th Avenue area. A pedestrian underpass for crossing Vasquez Boulevard in the vicinity of 60th Avenue was identified but was eliminated from further consideration due to the extensive utility relocations that would be required to tunnel under Vasquez Boulevard, which would greatly impact local and highway traffic during construction. In addition, the presence of potential subsurface hazardous materials from historic uses in the area could require extensive mitigation.

Attachment A.

Summary of PEL Study Reccomendations



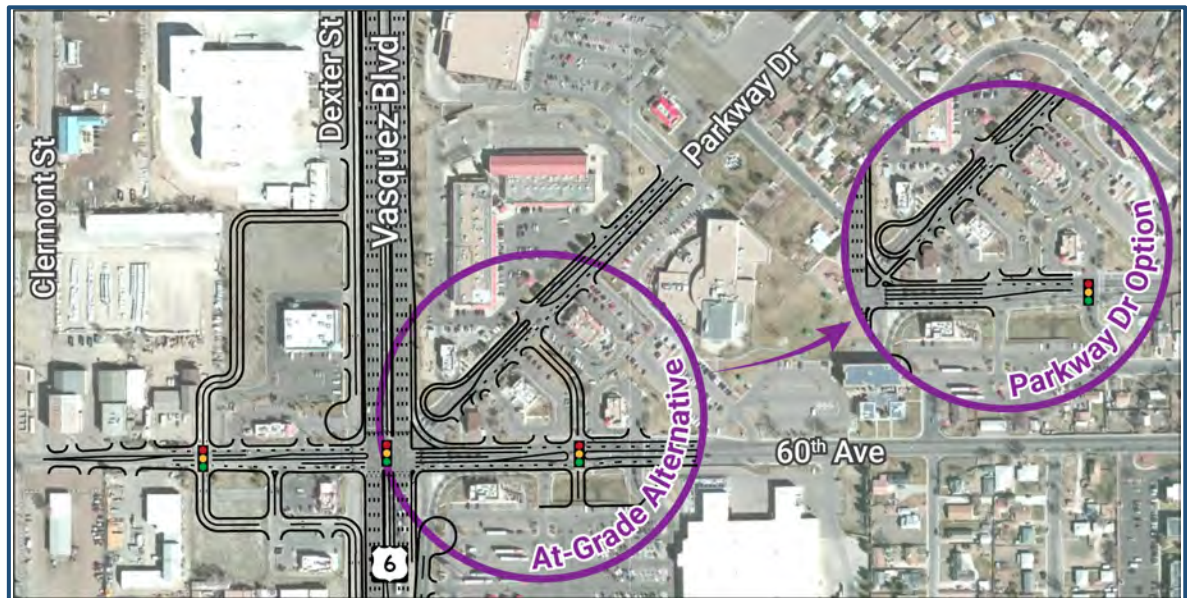


Summary of PEL Study Recommendations

A single Recommended Alternative was not identified as part of the Vasquez Boulevard Planning and Environmental Linkages (PEL) Study. Rather, the study recommended three packages as future options for long-term improvements along the Vasquez Boulevard corridor. The three recommended packages are listed below with overall descriptions from the PEL study and the options at the Vasquez Boulevard/60th Avenue and Vasquez Boulevard/62nd Avenue intersections. All snapshots included in this summary are directly from the PEL study.

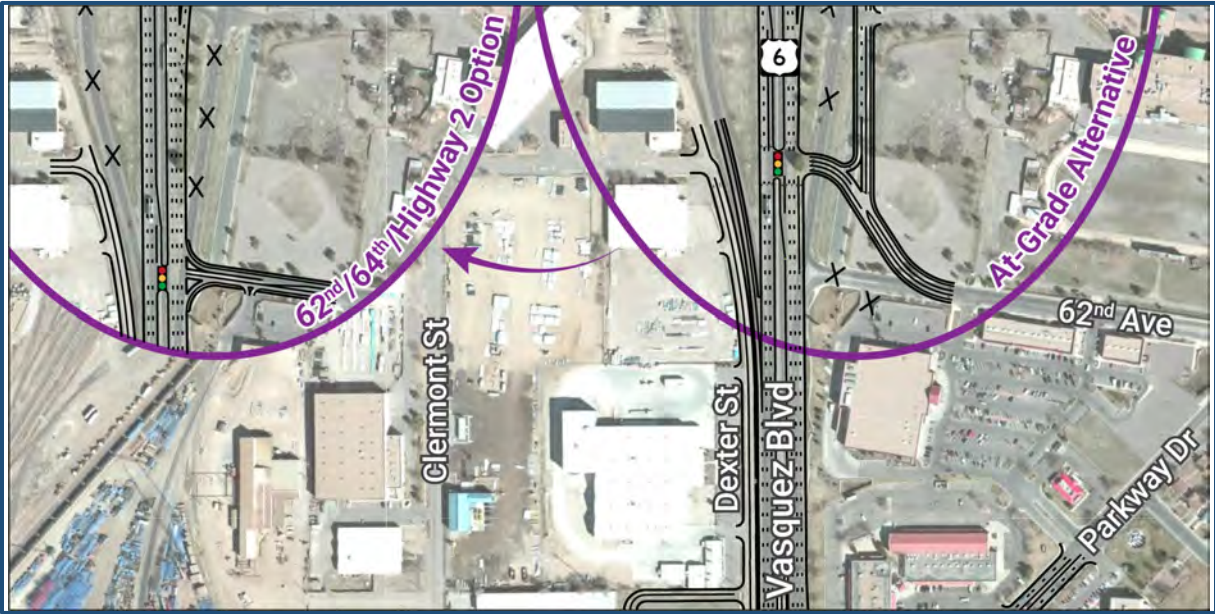
At Grade Package

- The intent of the At Grade Package is to maintain traffic at grade on Vasquez Boulevard and managed with traffic signals at the intersections. The existing frontage road system would be kept intact with new connections to 60th Avenue. Direct access to the existing businesses would remain from the side streets and frontage road system with changes to the location of frontage road intersections with 60th Avenue.
- At 60th Avenue:
 - Full-movement signalized intersection
 - Parkway Drive would be made into a cul-de-sac with an option to allow right-in traffic from 60th Avenue at the intersection of Vasquez Boulevard and 60th Avenue.





- At 62nd Avenue:
 - Full movement intersection





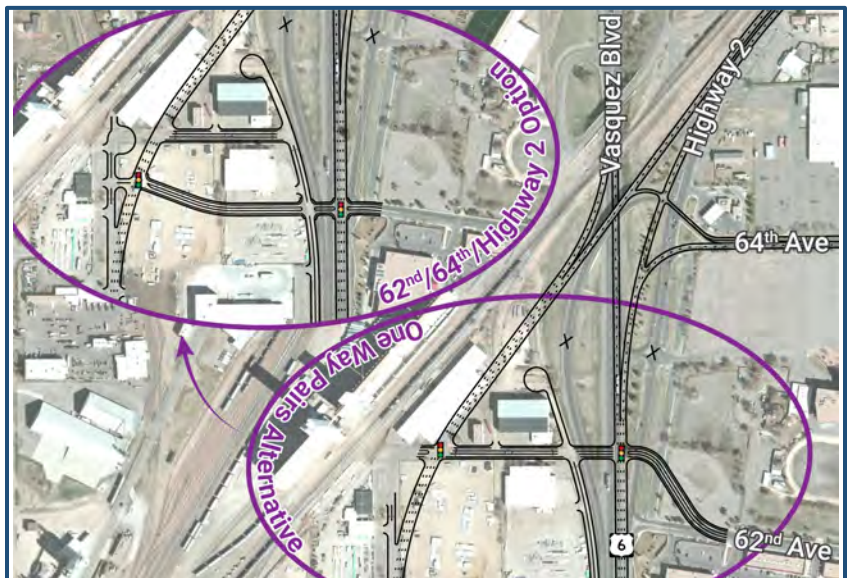
One Way Pairs Package

The intent of the One Way Pairs Package is to separate the northbound and southbound traffic, providing additional capacity for the Vasquez Boulevard traffic, while keeping the existing at grade travel. The existing frontage road system would be kept intact with new connections to 60th Avenue. Direct access to the existing businesses would remain from the side streets and frontage road system with changes to the location of frontage road intersections with 60th Avenue.

- At 60th Avenue:
 - Signalized intersection with two design options for Parkway Drive:
 - a right-in right-out configuration, or
 - full movements allowed for Parkway Drive traffic



- At 62nd Avenue:
 - Signalized intersection with two design options:
 - an extension of 62nd Avenue, or
 - an extension of 62nd Avenue that is shifted to the north to align with 63rd Avenue

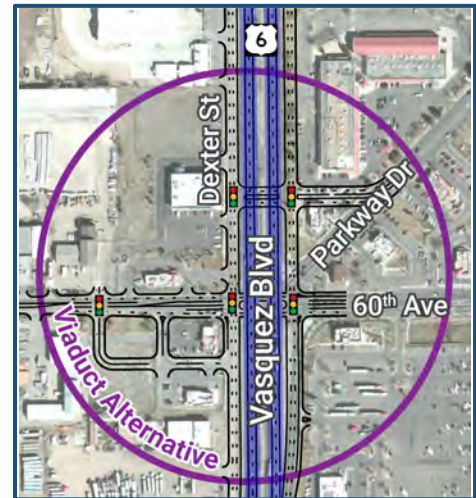




Viaduct Package

The intent of the Viaduct Package is to grade-separate through-traffic from the cross streets, providing an uninterrupted northbound and southbound trip between Colorado Boulevard (south of 56th Avenue) and SH 2. Access to local businesses and the frontage roads would not be available on the viaduct. This package provides excellent operations for through trips and it provides access to local businesses from frontage roads.

- At 60th Avenue:
 - Grade separation of Vasquez Boulevard with signalized intersections on 60th Avenue at frontage roads and Parkway Drive realigned to intersect frontage roads north of 60th Avenue; or



- Grade separation of Vasquez Boulevard with a single roundabout for 60th Avenue, frontage roads and Parkway Drive



- At 62nd Avenue:
 - Grade separation of Vasquez Boulevard with signalized intersections on 62nd Avenue at frontage roads



Attachment B.

Alternatives Evaluation Matrices

Alternatives Evaluation - 60th Avenue Intersection (1 of 3)

Evaluation Criteria	Performance Measure	Alternative						
		No Action	Alt. 1 Short Term Technology & Safety Improvements	Alt. 2 Improved Frontage Rd System	Alt. 3 Parkway Restricted Left Out	Alt. 4 Parkway Closure with New Connection	Alt. 5 Quadrant Road Intersection	Alt. 6 Southbound Vasquez Slip Ramp
High-Crash Locations	High-crash locations and identify those locations that are improved	Expected moderate increase in rear end crashes along NB and SB Vasquez at 60 th with increased congestion and no change in conflict points through the intersection	Potential minor reduction in sideswipe same direction crashes on Vasquez Boulevard with in-pavement lighting and in overall crashes with wayfinding and signal visibility improvements	Potential major reduction in rear end and all crash types with reduced conflict points, reduced congestion, and reduced size and complexity of intersection	Potential overall minor reduction in rear end and all crash types with reduced conflict point at Parkway and reduced congestion, but potential for increase in rear end crashes at new 62 nd signal	Potential overall moderate reduction in rear end and all crash types with reduced conflict points, reduced congestion and reduced size and complexity of intersection, but potential for increase in rear end crashes at new 62 nd signal	Potential overall minor reduction in crashes with reduced congestion, but potential for increase in rear end crashes south of 60 th with a new traffic signal	Potential minor increase in rear end and sideswipe same direction crashes along SB Vasquez Boulevard with new conflict point at slip ramp and weave movements between Hwy 2 and slip ramp
Pedestrian and Bicyclist Safety	Number and type of pedestrian/bicyclist-vehicle conflict points at intersection	45 pedestrian/bicyclist-vehicle conflict points	45 pedestrian/bicyclist-vehicle conflict points	34 pedestrian/bicyclist-vehicle conflict points	39 pedestrian/bicyclist-vehicle conflict points	34 pedestrian/bicyclist-vehicle conflict points	33 pedestrian/bicyclist-vehicle conflict points	45 pedestrian/bicyclist-vehicle conflict points
Travel Time on Vasquez Boulevard	Peak hour travel time on Vasquez Blvd.	Moderate increase in travel time with future increased congestion	No change in travel time with limited infrastructure changes	Up to 10% additional traffic signal green time available for Vasquez Boulevard would have a moderate reduction in travel time on Vasquez Boulevard	Up to 15% additional traffic signal green time available for Vasquez Boulevard would have a major reduction in travel time on Vasquez Boulevard	Up to 15% additional green time at 60 th Avenue, coordinated with the new connection, would have a major reduction in travel time on Vasquez Boulevard	Removing left-turns from the 60 th Ave intersection should result in a moderate reduction in travel time on Vasquez Boulevard (with well-coordinated signals)	Weaving between Hwy 2 on ramp and the SB slip-ramp may cause a minor increase in travel time on Vasquez
Side Street Delay	Peak hour intersection delay at signalized intersections	Moderate increase in intersection delay with future increased congestion	No change in intersection delay with limited infrastructure changes	Up to 5% additional traffic signal green time available for side street could have a minor reduction in delay	Up to 10% additional traffic signal green time available for side-street could have a moderate reduction in delay	Additional green time for Vasquez Boulevard and/or 60 th could result in a moderate reduction in delay	Additional green time for Vasquez Boulevard and/or 60 th could result in a moderate reduction in delay	No change in delay with benefits limited to southbound traffic destined for the NW quadrant
Queue Lengths	Queue lengths at Vasquez Boulevard/60 th intersection	Moderate increase in queue lengths with future increased congestion	No change in queue lengths with limited infrastructure changes	Additional traffic signal green time is expected to result in a moderate reduction in queue lengths	Additional traffic signal green time is expected to result in a moderate reduction in queue lengths	Reduced congestion would result in a moderate reduction in queue lengths	The signals would run with shorter cycle lengths, which should result in a minor reduction in queue lengths at 60 th , but potential issues with queues at new signal closer to I-270	No change expected with benefits limited to southbound traffic destined for the NW quadrant

<p>Pedestrian and Bicycle Connections</p>	<p>Accommodation for pedestrians and considerations for bicycle movements along and across Vasquez Boulevard within project area (Minor, Moderate, Major)</p>	<p>Major Impact Multiple congested crossings and relatively long crossing width at Vasquez Boulevard/60th creates difficulties for pedestrian and bicyclist connections across Vasquez Boulevard</p>	<p>Major Impact Multiple congested crossings and relatively long crossing width at Vasquez Boulevard/60th creates difficulties for pedestrian and bicyclist connections across Vasquez Boulevard</p>	<p>Major Benefit Reduced number and width of crossings improves pedestrian/bicyclist connection across Vasquez Boulevard and frontage road closures provide pedestrian refuge with new connections plus new connections along frontage roads</p>	<p>Minor Benefit Reduced crossing width of Parkway at Vasquez Boulevard/60th</p>	<p>Major Benefit Reduced number and width of crossings improves pedestrian and bicyclist connection across Vasquez Boulevard and Parkway closure provides pedestrian refuge</p>	<p>Major Benefit Provides new signalized E/W Vasquez Boulevard crossing and new connections along frontage roads</p>	<p>Major Impacts Multiple congested crossings and relatively long crossing width at Vasquez Boulevard/60th creates difficulties for pedestrian and bicyclist connections across Vasquez Boulevard</p>
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Alternatives Evaluation - 60th Avenue Intersection (2 of 3)

Evaluation Criteria	Performance Measure	Alternative						
		No Action	Alt. 1 Short Term Technology & Safety Improvements	Alt. 2 Improved Frontage Rd System	Alt. 3 Parkway Restricted Left Out	Alt. 4 Parkway Closure with New Connection	Alt. 5 Quadrant Road Intersection	Alt. 6 Southbound Vasquez Slip Ramp
Access Points	Access changes and perceived difficulty to access area businesses (Minor, Moderate, Major)	Minor Impact No changes to existing accesses, but increased congestion creates issues for accessing businesses due to congestion in peak travel hours	Minor Impact No changes to existing accesses, but continued congestion creates issues for accessing businesses due to congestion in peak travel hours	Moderate Benefit Reduced congestion and complications potentially improve access difficulties in peak travel hours and new local connections improve business access and overall area circulation	Moderate Benefit Reduced congestion potentially improves access difficulties in peak travel hours and new signal at Vasquez Boulevard/62 nd improves business access and overall area circulation	Minor Impact Shift of Parkway connection creates out-of-direction travel to/from businesses, but reduced congestion and complications potentially improve access difficulties in peak travel hours	Minor Impact No left turns at Vasquez Boulevard/60 th changes access and increases out-of-direction travel, but reduced congestion and complications potentially improve access difficulties in peak travel hours	Minor Impact SB slip ramp improves access only from SB Vasquez Boulevard to NW quadrant, but continued congestion creates issues for accessing businesses at Vasquez/60 th
Local Support	Gather and record input from local jurisdictions	Agency and business stakeholders concerned with continued congestion and safety issues	General support from agency stakeholders	General support from agency stakeholders, but concern with closing frontage road connections completely. Business stakeholders support new local connections.	Agency stakeholders concerned with limited access from Parkway. Business stakeholders support new full access at Vasquez Boulevard/62 nd for better overall access.	Agency stakeholders concerned with limited access to/from Parkway	Individual support from agency stakeholder	Individual support from agency stakeholder. Business stakeholders support access for trucks to avoid Vasquez Boulevard/60 th intersection.
Freight Routes	Note benefits/impacts to current high-volume freight movements (Minor, Moderate, Major)	Moderate impacts for freight movements with increased congestion	Minor benefits for freight movements within project area	Moderate benefits for freight movements along Vasquez, but some impacts to low-volume freight movements (<10 vehicles in peak hours) accessing frontage roads at Vasquez Boulevard/60 th intersection	Moderate benefits for freight movements along Vasquez Boulevard, but shift of low-volume freight movements (<15 vehicles in peak hours) turning left from Parkway to new signal at Vasquez/62 nd	Moderate benefits for freight movements along Vasquez Boulevard, but shift in direct access to/from Parkway to 60 th Ave	Minor benefits for freight movements along Vasquez Boulevard as changes to left turns at Vasquez Boulevard/60 th increases out-of-direction travel	Minor benefits for freight movements with SB slip ramp improvements only from SB Vasquez Boulevard to NW quadrant
Local Plan Goals and Policies	Note consistencies and inconsistencies with area plans, goals, policies, and adjacent transportation improvements (including I-270)	No changes at Vasquez Boulevard/60 th is not consistent with local and regional transportation plans and goals	Technology and safety improvements consistent with PEL Study	Frontage road modifications consistent with PEL Study	Parkway access restrictions consistent with PEL Study. Limited left turns from Parkway balanced with new full movement signal at Vasquez Boulevard/62 nd consistent with goals for improved local access.	Parkway access restrictions consistent with PEL Study. Parkway closure at Vasquez balanced with new connection to signal at 60 th consistent with goals for improved local access.	Frontage road modifications consistent with PEL Study and new quadrant road access consistent with goals for improved local access	Additional access from Vasquez Boulevard consistent with local development goals

<p>Right-of-Way (ROW)</p>	<p>Acres of new ROW needed - Number of properties potentially impacted - Potential partial acquisition - Potential full acquisition (Minor, Moderate, Major)</p>	<p>No property impacts expected and no new ROW needed</p>	<p>No property impacts expected and no new ROW needed</p>	<p><u>NW Option A</u>: 4 properties; Moderate impacts to business operations <u>NW Option B</u>: 6 properties; Potential major impacts to business with connection through property <u>NW Option C</u>: 6 properties; Potential moderate impacts with building impacts <u>SW Option A</u>: 1 property; Minor impacts <u>SW Option B</u>: 2 properties; Moderate impacts <u>SE Option A</u>: 3 properties; Moderate impacts to business parking area <u>SE Option B</u>: 1 property; Minor impacts</p>	<p>No property impacts expected and no new ROW needed</p>	<p><u>Option A</u>: 4 properties Potential major impacts with full business acquisition <u>Option B</u>: 4 properties Potential major impacts with full business acquisition</p>	<p><u>Quadrant Rd</u>: 2 properties; Potential major impacts with building impacts <u>NW Option A</u>: 4 properties; Moderate impacts to business operations <u>NW Option B</u>: 6 properties; Potential major impacts to business with connection through property <u>NW Option C</u>: 6 properties; Potential moderate impacts with building impacts</p>	<p><u>SB Slip Ramp</u>: No property impacts expected and no new ROW needed <u>NW Option C</u>: 6 properties Potential moderate impacts to business with building impacts</p>
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Alternatives Evaluation - 60th Avenue Intersection (3 of 3)

Evaluation Criteria	Performance Measure	Alternative						
		No Action	Alt. 1 Short Term Technology & Safety Improvements	Alt. 2 Improved Frontage Rd System	Alt. 3 Parkway Restricted Left Out	Alt. 4 Parkway Closure with New Connection	Alt. 5 Quadrant Road Intersection	Alt. 6 Southbound Vasquez Slip Ramp
Potential Environmental Impacts	Note potential changes and/or impacts to resources (Minor, Moderate, Major)	No notable environmental impacts expected	Potential minor environmental impacts with work within intersection	<u>NW Options</u> : Potential moderate environmental impacts with new roadway connections intersecting hazardous material concerns <u>SW Options</u> : Potential moderate environmental impacts with new roadway connections intersecting hazardous material concerns <u>SE Options</u> : Potential moderate environmental impacts with new roadway connections intersecting hazardous material concerns	Potential minor environmental impacts with work within intersection	<u>Option A</u> : Potential moderate noise impacts with alternative next to sensitive noise receptors <u>Option B</u> : Potential major Section 6(f) and 4(f) impacts to parcel; potential major noise impacts with alternative intersecting sensitive noise receptors	Potential major environmental impacts with new roadway connections intersecting hazardous material concerns	<u>SB Slip Ramp</u> : Potential minor environmental impacts with work within intersection <u>NW Option C</u> : Potential moderate environmental impacts with new roadway connection intersecting hazardous material concerns
Constructability	Note ease of construction, including traffic impacts during construction (Minor, Moderate, Major)	N/A	Minor Limited infrastructure changes and minor traffic impacts during construction	Minor New roadway construction occurring outside of existing travel lanes and minor traffic impacts at 60 th intersection	Moderate Construction at Parkway connection outside of Vasquez, but moderate traffic impacts with changes in travel movements during construction	Moderate Construction at Parkway connection outside of Vasquez and new roadway construction occurring outside of existing travel lanes, but moderate traffic impacts with changes in travel movements during construction	Major New roadway construction occurring outside of existing travel lanes, but difficult construction and major traffic impacts with new signalized intersection on Vasquez close to the I-270 interchange and movement changes at 60 th intersection	Minor Construction at new SB slip ramp and frontage road outside of existing travel lanes and minor traffic impacts on SB Vasquez
RESULTS		Remove from Further Consideration	Recommend for Concept Design (with other improvements)	Recommend for Concept Design (with other improvements)	Recommend for Concept Design (with other improvements)	Remove from Further Consideration	Remove from Further Consideration	Remove from Further Consideration
NOTES						Alternative has potential major business property impacts and major Section 6(f) and 4(f) impacts with new connection to 60 th Avenue	Alternative provides limited benefits with major property impacts plus difficult construction	Alternative provides minimal operational benefits with potential increase in rear end and sideswipe same direction crashes along SB Vasquez with new conflict point at slip ramp and weave movements between Hwy 2 and slip ramp

Alternatives Evaluation - 62nd Avenue Intersection (1 of 2)

Evaluation Criteria	Performance Measure	Alternative				
		No Action	Alt. 1 Full Signalized Intersection to North	Alt. 2 Continuous-T Signalized Intersection	Alt. 3 Full Signalized Intersection	Alt. 4 Full Signalized Intersection with Clermont Connection
High-Crash Locations	High-crash locations and highlight those locations that are improved	Expected increase in rear end crashes at 62 nd with increased congestion and no change in intersection configuration	Expected minor increase in rear end crashes along Hwy 2 and Vasquez Boulevard with a new traffic signal	Potential overall minor reduction in all crash types at intersection with a new traffic signal with acceleration/deceleration lanes and continuous flow for SB Vasquez Boulevard	Expected minor increase in rear end crashes along Hwy 2 and Vasquez Boulevard with a new traffic signal	Expected moderate increase in rear end crashes along Hwy 2 and Vasquez Boulevard with a new traffic signal, new intersection approach west of Vasquez Boulevard, and Hwy 2 ramp realignment with slower design speeds
Pedestrian and Bicyclist Safety	Number and type of vehicular/pedestrian/bicyclist conflict points at Vasquez Boulevard /62 nd	2 pedestrian/bicyclist-vehicle conflict points (across 62 nd only)	4 pedestrian/bicyclist-vehicle conflict points (across 62 nd only)	4 pedestrian/bicyclist-vehicle conflict points (across 62 nd only)	12 pedestrian/bicyclist-vehicle conflict points (across Vasquez Boulevard and 62 nd)	19 pedestrian/bicyclist-vehicle conflict points (across Vasquez Boulevard and 62 nd)
Travel Time on Vasquez	Peak hour travel time on Vasquez Blvd from south of 60 th Ave to north of 64 th Ave	Minor increase in travel time with future increased congestion	The addition of signalized intersection could result in a moderate increase in travel time on Vasquez Boulevard	By allowing free-flow southbound traffic, the additional signal would result in a minor increase in travel time on Vasquez Boulevard	The addition of signalized intersection, including Hwy 2 traffic, could result in a moderate increase in travel time on Vasquez Boulevard	The additional of a four-leg signalized intersection, including Hwy 2 traffic and the new connection, could result in a moderate to major increase in travel time on Vasquez Boulevard
Side Street Delay	Peak hour intersection delay at signalized intersections	Minor increase in intersection delay with future increased congestion	Minor reduction in delay with better overall network connectivity	Minor reduction in delay with better overall network connectivity	Minor reduction in delay with better overall network connectivity	Minor reduction in delay with better overall network connectivity
Queue Lengths	Queue lengths at Vasquez Boulevard/62 nd intersection	Minor increase in queue lengths with future increased congestion	There is the potential for a minor increase in queues with a new signal	There is the potential for a minor increase in queues with a new signal	There is the potential for a minor increase in queues with a new signal	There is the potential for a minor to moderate increase in queues with a new four-leg signalized intersection
Pedestrian and Bicycle Connections	Accommodation for pedestrians and considerations for bicycle movements along and across Vasquez Blvd within project area (Minor, Moderate, Major)	Moderate Impact No signalized E/W crossing	Moderate Impact No signalized E/W crossing because pedestrians/bicyclists cannot cross SB Hwy 2 ramp	Moderate Impact No signalized E/W crossing with continuous flow for SB Vasquez Boulevard and SB Hwy 2 ramp	Moderate Benefit Provides signalized E/W crossing	Major Benefit Provides signalized E/W crossing and pedestrian/bicyclist connection west of Vasquez
Access Points	Access changes and perceived difficulty to access area businesses (Minor, Moderate, Major)	Moderate Impact No changes to existing accesses, but no access to Vasquez at this intersection and increased congestion at Vasquez/60th creates issues for accessing businesses due to congestion in peak travel hours	Moderate Impact Provides additional access to/from development area east of Vasquez, but shifting intersection to north potentially creates perception of out-of-direction travel for accessing area businesses	Moderate Benefit Improves business access and overall area circulation east of Vasquez and allows continuous flow for SB Vasquez, reducing impacts of new signal	Minor Benefit Improves business access and overall area circulation east of Vasquez Boulevard	Moderate Benefit Improves business access and overall area circulation east and west of Vasquez Boulevard

Local Support	Gather and record input from local jurisdictions	Agency stakeholder support for not adding a new signal on Vasquez Boulevard at 62 nd	Agency stakeholders concern with adjacent property impacts to new development area. Business stakeholders support new full access at Vasquez Boulevard /62 nd for better overall access.	General support from agency stakeholders. Business stakeholders support new full access at Vasquez Boulevard /62 nd for better overall access.	Agency stakeholder support for signalized pedestrian crossing but concern with stopping SB Hwy 2 ramp with signal. Business stakeholders support new full access at Vasquez Boulevard /62 nd for better overall access.	Agency stakeholder support for signalized pedestrian crossing but concern with stopping SB Hwy 2 ramp with signal. Business stakeholders support new full access at Vasquez Boulevard/62 nd for better overall access.
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Alternatives Evaluation - 62nd Avenue Intersection (2 of 2)

Evaluation Criteria	Performance Measure	Alternative				
		No Action	Alt. 1 Full Signalized Intersection to North	Alt. 2 Continuous-T Signalized Intersection	Alt. 3 Full Signalized Intersection	Alt. 4 Full Signalized Intersection with Clermont Connection
Freight Routes	Note benefits/impacts to current high-volume freight movements (Minor, Moderate, Major)	Minor impacts for freight movements with increased congestion	Moderate impacts for freight movements along Vasquez Boulevard with new signal	Minor impacts for freight movements along Vasquez Boulevard with new signal, but continuous flow for SB Vasquez Boulevard and SB Hwy 2 ramp	Moderate impacts for freight movements along Vasquez Boulevard with new signal, including Hwy 2 ramp	Moderate impacts for freight movements along Vasquez Boulevard with new four-leg signalized intersection
Local Plan Goals and Policies	Note consistencies and inconsistencies with area plans, goals, policies and adjacent transportation improvements (including I-270)	No changes at Vasquez Boulevard /62 nd is not consistent with local and regional transportation plans and development goals	Property impacts with realignment of 62 nd not consistent with local development plans and goals	Additional access to/from development area east of Vasquez Boulevard consistent with local development goals	Additional access to/from development area east of Vasquez Boulevard consistent with local development goals	Additional access to/from development areas east and west of Vasquez Boulevard consistent with local development goals
Right-of-Way (ROW)	Acres of new ROW needed - Number of properties potentially impacted - Potential partial acquisition - Potential full acquisition	No new ROW needed and no property impacts	Moderate impacts 1 property potentially impacted	Minor impacts 3 properties potentially impacted	Minor impacts 3 properties potentially impacted	Moderate impacts with new connection west of Vasquez Boulevard 5 properties potentially impacted
Potential Environmental Impacts	Note potential changes and/or impacts to resources (Minor, Moderate, Major)	No notable environmental impacts expected	Potential minor noise impacts with alternative intersecting parcel considered a sensitive noise receptor	Potential minor noise impacts with alternative intersecting parcel considered a sensitive noise receptor	Potential minor noise impacts with alternative intersecting parcel considered a sensitive noise receptor	Potential minor environmental impacts with new roadway connection intersecting hazardous material concerns
Constructability	Note ease of construction, including traffic impacts during construction (Minor, Moderate, Major)	N/A	Moderate New roadway connection constructed outside of existing travel lanes with moderate traffic impacts with new signalized intersection on Vasquez Boulevard	Moderate Difficult construction and moderate traffic impacts with new signalized intersection on Vasquez Boulevard	Major Difficult construction and major traffic impacts with new signalized intersection on Vasquez Boulevard, including signalization of the Hwy 2 on ramp	Major Difficult construction and major traffic impacts with new signalized intersection on Vasquez Boulevard and realignment of Hwy 2 on ramp
RESULTS		Remove from Further Consideration	Remove from Further Consideration	Recommend for Concept Design	Remove from Further Consideration	Remove from Further Consideration
NOTES			Alternative has property impacts with realignment of 62 nd that are not consistent with local development plans and goals		Alternative provides limited benefits and difficult construction	Alternative provides limited benefits and difficult construction