

Fort Collins – CSU Transit Center DEIS Commuter Rail Station Evaluation

Page 1 of 17

August 20, 2007

Introduction

The North I-25 DEIS Package A alternative considers a single commuter rail route that will extend from the end of the planned RTD North Metro Commuter Rail Line and terminate in the city of Fort Collins. Proposed stations will be located in Erie, Longmont, Berthoud, Loveland, and Fort Collins.

The proposed commuter rail route follows the existing BNSF alignment which generally parallels the US 287 alignment from Fort Collins to Longmont. Between the Sugar Mill station in Longmont and the North Metro end-of-line station at SH-7, the alignment will parallel SH-119, WCR-7, and the UP Boulder branch. A map of the commuter rail route with station locations is provided in Figure 1.

The proposed CSU Transit Center commuter rail station would be located south of University Avenue near Old Main Drive on the west side of the BNSF tracks. Parking will not be provided for this rail station because of the location on the university campus.

This report documents potential traffic impacts the proposed commuter rail station may have on intersections along Mason Street and provides technical documentation of the traffic data analysis. Other commuter rail stations are addressed in separate reports.

Existing Conditions

Mason Street is a northbound, one-way, single lane, minor road that provides access to the east side of Colorado State University's Campus. Located along the west side of Mason Street is a designated bike lane and the east side consists of diagonal parking and the BNSF railroad. All of the intersections within the area of interest on Mason Street are unsignalized with stop sign control. The speed limit for Mason Street is 25 mph south of Edison Drive and 20 mph north of Edison Drive.

The station area includes the following intersections.

Pitkin Street/Mason Street Intersection

Pitkin Street is a two lane east/west road that intersects Mason Street and the BNSF railroad on the southeast corner of the Colorado State University's Campus. Pitkin Street has a striped

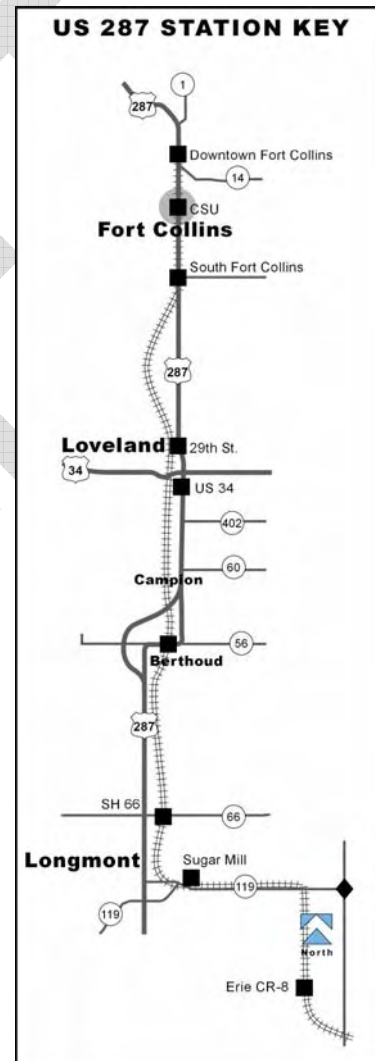


Figure 1. Vicinity Map

bike lane on both sides of the street and a designated left turn land on the eastbound approach. Pedestrians have a striped crosswalk across the eastbound and southbound approaches to the intersection. The only signalization at this intersection is for the BNSF railroad crossing. The posted speed limit for Pitkin Street in the area of interest is 25 mph.

Edison Drive/Mason Street Intersection

Edison Drive is a minor, two lane, east/west drive located one block north of Pitkin Street. The south side of Edison Drive has diagonal parking while the north side has parallel parking. Intersection control consists of a one-way stop for Edison Drive while Mason Street has a free one-way through movement. The speed limit for Edison Drive is 25 mph.

A Street/Mason Street Intersection

A Street is a minor, two lane, east/west road located one block north of Edison Street. Parallel parking is located on both sides of A Street along with a designated parking lot on the south side of the street. The intersection of A Street and Mason Street is three-legged with a one-way stop sign on A Street. The speed limit for A Street is 25 mph.

University Avenue/Mason Street Intersection

University Avenue is a minor, two lane, east/west road located one block north of A Street that runs from US 287 to the middle of Colorado State University's Campus. Bicyclists have a designated lane on both sides of University Avenue. This intersection is unique in that Mason Street shifts to the east side of the BNSF railroad tracks north of University Avenue. At this point, Mason Street turns into a two lane, north/south road with parallel parking on its east side. Directly south of Mason Street on the east side of the BNSF tracks is a parking lot access to the track and field facility east of Mason Street. Directly north of University Avenue on the west side of the BNSF tracks is a drive that accesses facilities on the University's campus. This drive also allows for parallel parking on its east side. Intersection control is conducted by stop signs on Mason Street, the drive access, and the parking lot access. When trains are present, University Avenue movements are stopped without an activated train crossing signal. The speed limit for University Avenue near this intersection is 20 mph.

Figure 2 summarizes the traffic counts collected in March of 2006 within the study area. At the Pitkin/Mason Street intersection, the westbound to northbound right-turning movement represents the highest turning volume (230 vehicles per hour) during the morning peak hour and the eastbound to northbound left-turning movement represents the highest turning volume (100 vehicles per hour) during the afternoon peak hour. At the University Avenue and Mason Street intersection, the northbound to westbound left-turning movement represents the highest turning volume (140 vehicles per hour, 120 vehicles per hour) during both morning and afternoon peak hours respectively.

Traffic Operations Evaluation

An operational analysis of the intersections was conducted based on methodology developed in the Highway Capacity Manual (Transportation Research Board, 2000). The result of such analysis is a level of service (LOS) rating. Level of service is a qualitative assessment of the

Fort Collins – CSU Transit Center DEIS Commuter Rail Station Evaluation

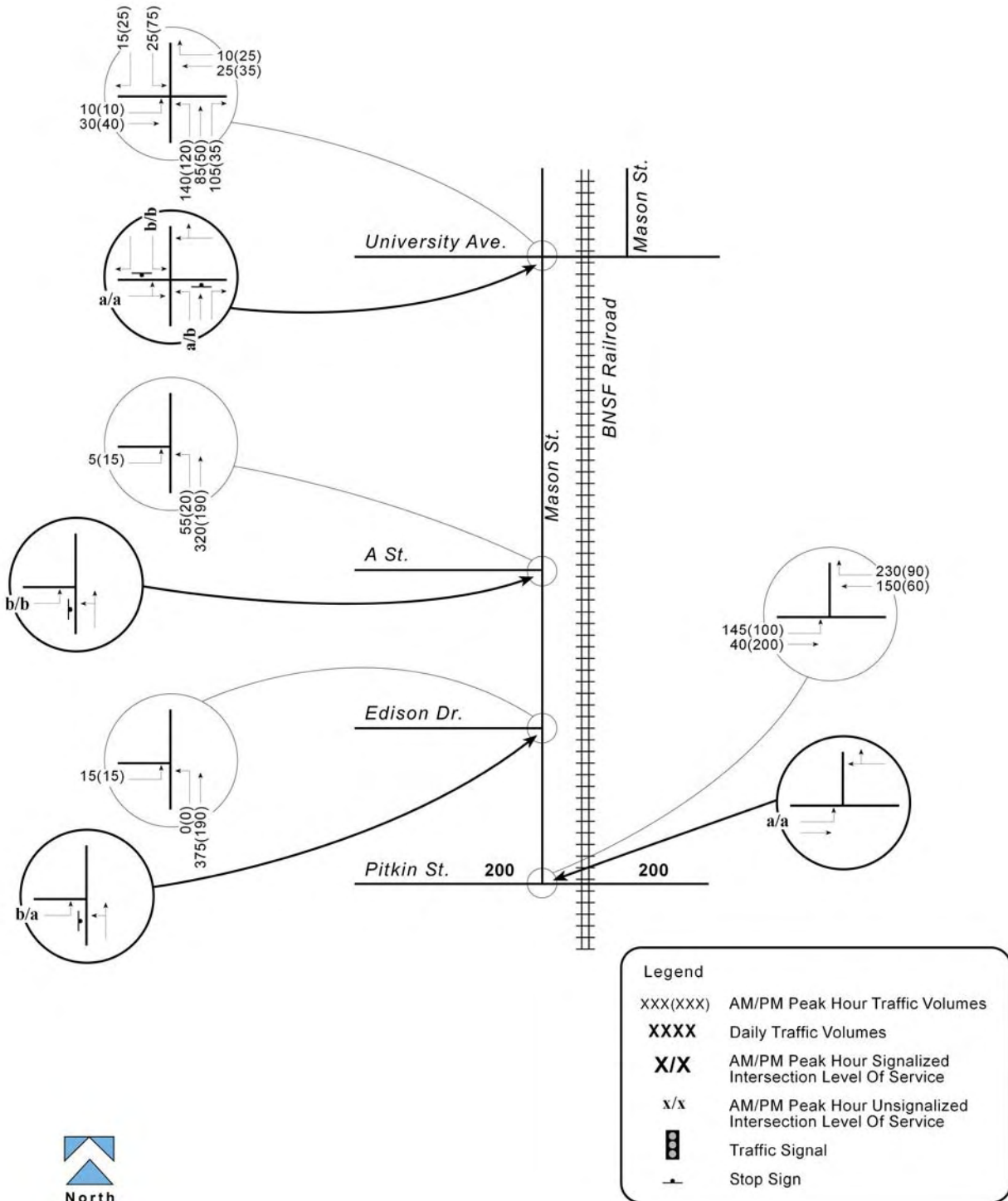


Figure 2. Existing Conditions



traffic flow based on the average stopped delay per vehicle at controlled intersections (i.e. traffic signal, stop-sign).

Levels of service are described by a letter designation ranging from “A” to “F”, with LOS A representing essentially uninterrupted flow, and LOS F representing a breakdown of traffic flow with excessive congestion and delay. Signalized intersection analyses result in a level of service rating for each movement and for the entire intersection but typically only the level of service for the entire intersection is reported. For unsignalized intersections a level of service rating is determined for each turn movement that must yield to another turn movement but an overall level of service rating is not determined for the entire intersection. The following table shows how average stopped delay at controlled intersections equates to levels of service.

Table 1. Equivalent Level of Service to Average Stopped Delay

Level of Service	Average Delay at Signalized Intersections (sec./veh.)	Average Delay at Stop-Controlled intersections (sec./veh.)
A	0 to <=10	0 to <=10.0
B	> 10 to <= 20	> 10 to <= 15
C	> 20 to <= 35	> 15 to <= 25
D	> 35 to <= 55	> 25 to <= 35
E	> 55 to <= 80	> 35 to <= 50
F	> 80	> 50

Peak hour traffic counts were conducted in March, 2006 at the intersections of interest. Other background parameters are documented in the *DEIS Traffic Evaluation – Methodology Summary*.

Figure 2 illustrates existing peak period levels of service at the unsignalized intersections within the study area. Currently all intersections and approaches within the study area operate at acceptable levels of service during both AM and PM peak hours.

Table 2 summarizes the existing LOS and average vehicle delay at the study area intersections.

Table 2. Existing Intersection LOS and Delay

Intersection / Movement	Level of Service		Delay (seconds)	
	AM	PM	AM	PM
University Ave. and Mason St. (unsignalized)				
Northbound Left Turn	A	B	10	10
Northbound Through/Right Turn	A	A	10	10
Southbound Approach	B	B	11	10
A St. and Mason St. (unsignalized)				
Eastbound Left Turn	B	B	12	10
Edison Dr. and Mason St. (unsignalized)				
Eastbound Left Turn	B	A	11	10
Pitkin St. and Mason St. (unsignalized)				
Eastbound Left Turn (Free)	A	A	9	8

2030 Conditions

2030 traffic projections were developed for the two alternatives being considered:

- 1) No Action Alternative
- 2) Package A: GPL + CR + CB 85

These packages are illustrated in Figures 3 and 4. Since there are no project elements in the CSU area in Package B, the No Action results are representative of Package B conditions. In developing peak hour turning movements at the study area intersections, the North I-25 Travel Demand Model – 2001 base year and 2030 No Action – results were utilized to calculate growth factors over a 29 year period. Since the actual traffic counts were conducted in year 2006, the growth factors were adjusted to reflect a 24 year growth rate. These results were checked for reasonableness and adjusted where necessary. The growth factors along with existing turning movement data were used in the NCHRP 255 balancing procedure to develop 2030 peak hour turning movement forecasts. These forecasts were checked for balancing between intersections and reasonableness.

2030 No Action Traffic Volumes

The 2030 No Action daily and peak hour projections for the study area intersections are shown in Figure 5. As shown, average daily volume projections on Pitkin Street at the Pitkin Street/Mason Street intersection have grown to approximately 430 vpd.

2030 Package A Traffic Volumes

The same methodology used to develop the 2030 No Action volumes was applied to estimate 2030 Package A traffic volumes. The 2030 Package A daily and peak hour projections for the study area intersections are shown in Figure 6. The volume patterns are generally the same patterns as existing conditions and No Action conditions. In general, daily traffic is projected to be less along US 287 in the Package A alternative, as more regional traffic is attracted to the improved I-25 corridor. However, at the intersections near this station, this impact is not evident. Daily and peak hour projections are nearly identical in both alternatives.

2030 No Action Traffic Operations

Figure 5 and Table 3 summarize the projected levels of service at the study area intersections under No Action conditions. As shown, all intersections and approaches within the study area will operate at acceptable levels of service during both AM and PM peak hours under the no-action scenario.

Table 3 depicts the 2030 No Action LOS and average vehicle delay at the study area intersections.



LEGEND

- ★ Major Structure Rehab by 2030
- Minor Structure Rehab by 2030
- Replace / Rehab Pavement by 2030
- Minor Safety Modifications by 2030
- FasTracks Rail Line

DRAFT



Figure 3. No Action Alternative



LEGEND

	1 New General Purpose Lane (GPL) in Each Direction
	1 New General Purpose Lane (GPL) + Auxiliary Lane in Each Direction
	Commuter Rail (CR)
	Commuter Bus (CB) Service in US 85 General Purpose Lanes and Que Jumps
	Feeder Bus Service
	Interchange Upgrades
	Number of Lanes
	Commuter Bus Station / Stop
	Commuter Rail Station
	FasTracks Rail Line
	FasTracks Transit Station
	Potential Commuter Rail Operational & Maintenance Facility
	Potential Commuter Bus Operational & Maintenance Facility

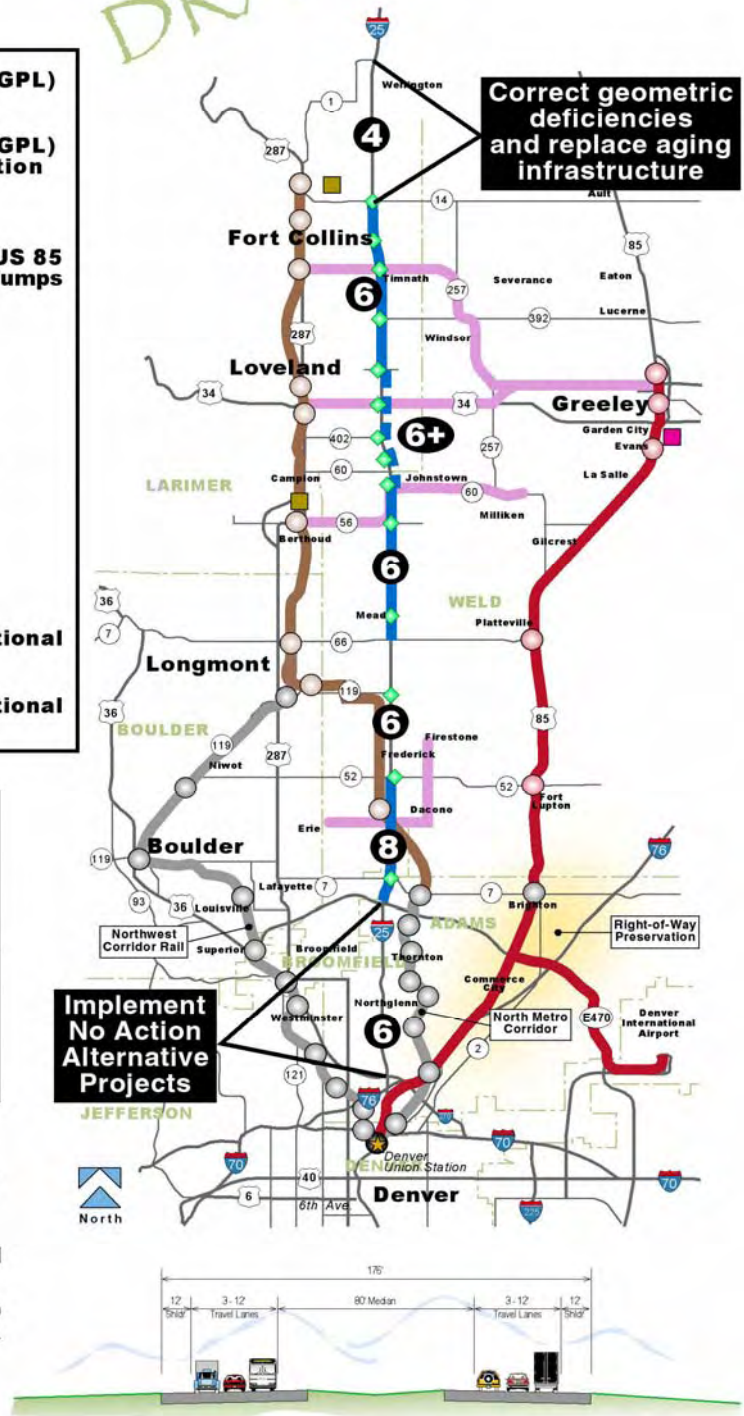
Congestion Management Measures include:

- Enhanced carpool lot parking capacity and amenities
- Courtesy patrol (incident management) from SH 14 to SH 7
- Variable messaging signs at all transit stations
- Automated Vehicle Locators on all transit vehicles - "next bus" technology
- Links to local bike and pedestrian systems at station areas
- Support for development of Transportation Management Organization (TMO)

NOTE:

- Select sections of I-25 would require auxiliary lanes and / or an additional through lane in addition to this 6-lane cross section.
- Where widening is needed between SH 66 and SH 7, the median would be used.
- Commuter Rail Service without a Longmont to North Metro connection will also be evaluated.

DRAFT



NOT TO SCALE

TYPICAL I-25 CROSS SECTION - 6 GENERAL PURPOSE LANES

Figure 4. Package A Alternative

Fort Collins – CSU Transit Center DEIS Commuter Rail Station Evaluation

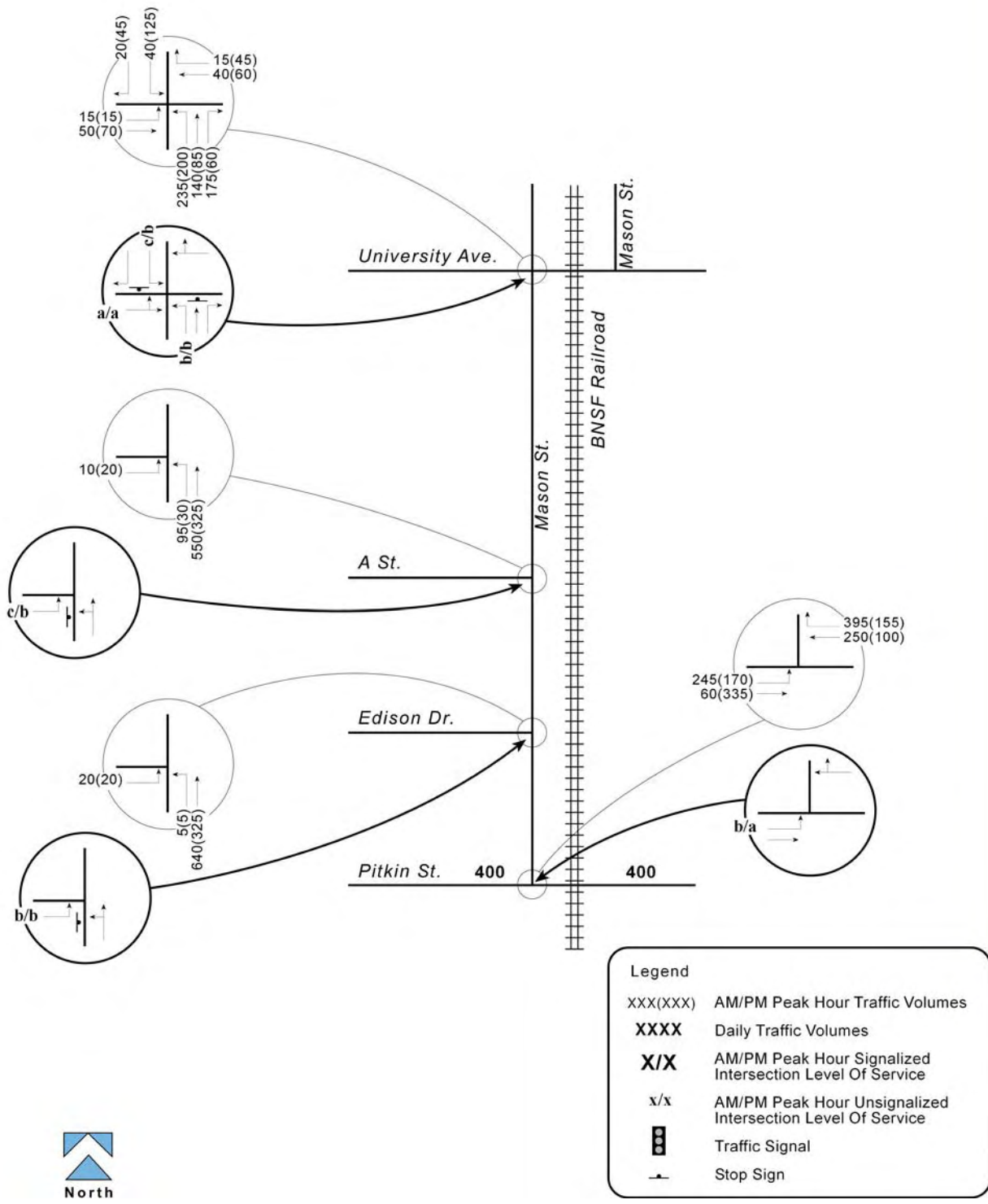


Figure 5. 2030 No Action Forecasts and Levels of Service

Fort Collins – CSU Transit Center DEIS Commuter Rail Station Evaluation

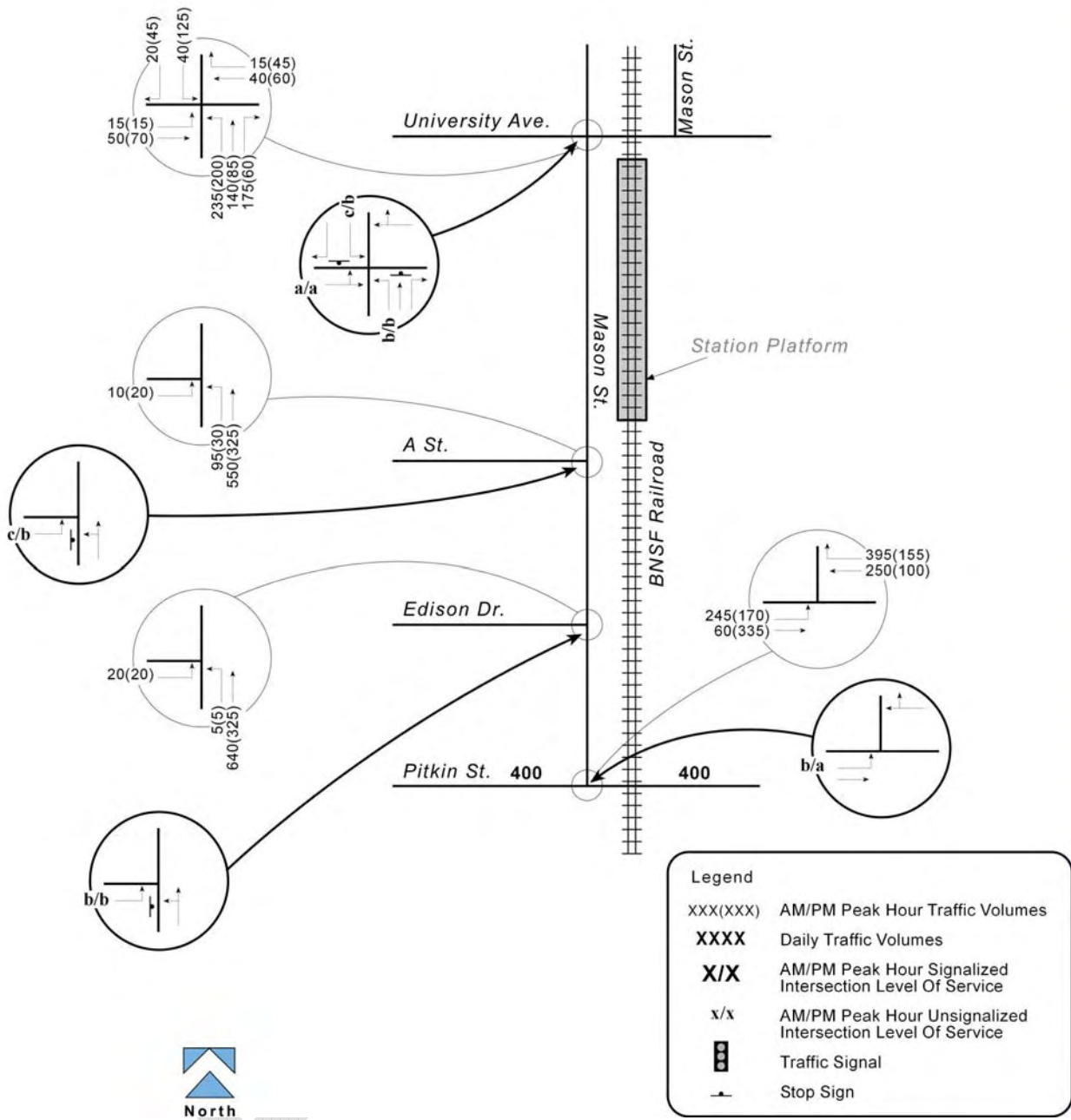


Figure 6. 2030 Package A Traffic Forecasts and Levels of Service

Table 3. 2030 No-Action Intersection LOS and Delay

Intersection / Movement	Level of Service		Delay (seconds)	
	AM	PM	AM	PM
University Ave. and Mason St. (unsignalized)				
Northbound Left Turn	B	B	12	13
Northbound Through/Right Turn	B	B	12	11
Southbound Approach	B	B	13	13
A St. and Mason St. (unsignalized)				
Eastbound Left Turn	C	B	16	12
Edison Dr. and Mason St. (unsignalized)				
Eastbound Left Turn	B	B	14	11
Pitkin St. and Mason St. (unsignalized)				
Eastbound Left Turn (Free)	B	A	11	8

2030 Package A Traffic Operations

Because volumes on the local streets near the proposed commuter rail station are nearly identical in both the No Action and Package A alternatives, traffic operations would be similar. Figure 6 and Table 4 summarize intersection LOS for the intersections analyzed in Package A.

Table 4. 2030 Package A Intersection LOS and Delay

Intersection / Movement	Level of Service		Delay (seconds)	
	AM	PM	AM	PM
University Ave. and Mason St. (unsignalized)				
Northbound Left Turn	B	B	12	13
Northbound Through/Right Turn	B	B	12	11
Southbound Approach	B	B	13	13
A St. and Mason St. (unsignalized)				
Eastbound Left Turn	C	B	16	12
Edison Dr. and Mason St. (unsignalized)				
Eastbound Left Turn	B	B	14	11
Pitkin St. and Mason St. (unsignalized)				
Eastbound Left Turn (Free)	B	A	11	8

Alternatives Evaluation Comparison

Traffic Operational Analysis

Table 5 compares the levels of service and delay at the study area intersections for the two packages. As the table indicates, the analyzed intersections would operate at acceptable levels of service in both the No Action and Package A alternatives.

Table 5. Intersection Level of Service and Delay for No Action, and Package A

Intersection	No Action		Package A	
	AM Peak	PM Peak	AM Peak	PM Peak
University Ave. & Mason St. (unsignalized)				
Northbound Left Turn	LOS B (12 sec.)	LOS B (13 sec.)	LOS B (12 sec.)	LOS B (13 sec.)
Northbound Through/Right Turn	LOS B (12 sec.)	LOS B (117 sec.)	LOS B (12 sec.)	LOS B (11 sec.)
Southbound Approach	LOS B (13 sec.)	LOS B (13 sec.)	LOS B (13 sec.)	LOS B (13 sec.)
A St. & Mason St. (unsignalized)				
Eastbound Left Turn	LOS C (16 sec.)	LOS B (12 sec.)	LOS C (16 sec.)	LOS B (12 sec.)
Edison Dr. & Mason St. (unsignalized)				
Eastbound Left Turn	LOS B (14 sec.)	LOS B (11 sec.)	LOS B (14 sec.)	LOS B (11 sec.)
Pitkin St. & Mason St. (unsignalized)				
Eastbound Left Turn (Free)	LOS B (11 sec.)	LOS A (8 sec.)	LOS B (11 sec.)	LOS A (8 sec.)

LOS X – Level of service
##.# - Average delay in seconds per vehicle