ALTERNATIVE CONCEPTS

Franklin Corridor Concepts

Contract #31900170

June 2022

Prepared for:

City of Bend
710 NW Wall St.
Bend, OR 97703

Prepared by:

DOWL DKS TOOLE DESIGN

TABLE OF CONTENTS

FIGURES

TABLES

APPENDICES

PURPOSE

Franklin Avenue is a key east-west connection between Downtown Bend and the emerging Bend Central District, a priority growth area for the City intended to accommodate denser urban mixed-use development. The corridor is anticipated to be redeveloped in the coming years with the implementation of the Core Area Tax Increment Finance Plan, capital improvement projects, and private development along the corridor. Franklin Avenue is a minor arterial, part of a planned Neighborhood Greenways route, and a route for Cascade East Transit (CET). This report, along with the recently completed similar study on NW Greenwood Avenue, will help inform the Midtown Crossings Feasibility Study.

In preparation for redevelopment of the corridor and capital improvement identified in the Bend Transportation Plan and funded through the voter approved Transportation General Obligation (GO) Bond, the Franklin Corridor Concepts project, summarized in this report, developed four complete street alternatives for the corridor between NW Harriman Street and NE 4th Street. Each alternative is discussed in detail and compared against the existing condition as well as the other alternatives on a variety of metrics. Full corridor alternatives are shown in Appendix A.

1.0 TRAFFIC ANALYSIS

In November 2021, traffic counts were collected along the corridor. These volumes were forecast to year 2024 (an assumed year of opening) and intersections along Franklin Avenue were evaluated to understand the potential impact of the alternatives on traffic operations. Appendix B includes the Traffic Analysis technical memorandum which reviews the methodology and assumptions, corridor operations, and safety of the corridor.

The Traffic Analysis technical memorandum evaluates a no-build and build scenario. The build scenario assumes one eastbound and one westbound travel lane with a center two-way-left-turn lane between NE 1st Street and NE 3rd Street. Based on the traffic analysis, the build lane configuration is included with each of the alternatives presented in this report.

Details of assumptions, methodologies, corridor operations, and safety for the four alternatives as a singular “build” condition are included in a standalone traffic analysis memorandum attached as Appendix B. As documented in Appendix B, the reconfiguration of travel lanes on Franklin Avenue is expected to result in minimal changes to motor vehicle operations, including the following:

- Westbound queues at NE 3rd Street are expected to increase by approximately 500 feet westbound compared to the no-build condition
- Westbound travel times are expected to increase by approximately 30 seconds (no significant change eastbound) with the increased congestion approaching NE 3rd Street
- No significant changes in side street delay or queueing are expected except at NE 4th Street, as westbound queues may block access to/from NE 4th Street

2.0 ALTERNATIVES FOR EVALUATION

Alternatives were created by the project team to represent a range of potential solutions that could improve multimodal travel and safety on Franklin Avenue. Alternatives 1 through 4, along with the existing street configuration, are depicted in a series of figures in Appendix A. Each alternative is compared against a no-build scenario to understand the impacts of not improving the corridor.

Because the corridor is naturally segmented by existing north-south constraints, each alternative is evaluated in three segments; Segment A covers NW Harriman Street to the Parkway, Segment B includes the Parkway to NE 2nd Street, and Segment C covers NE 2nd Street to NE 4th Street. These alternatives did not consider major changes to the existing undercrossing at Franklin Avenue, between Segment A and Segment B, since the City is initiating a separate effort, the Midtown Crossing Feasibility Study, to evaluate alternatives for the undercrossing itself.

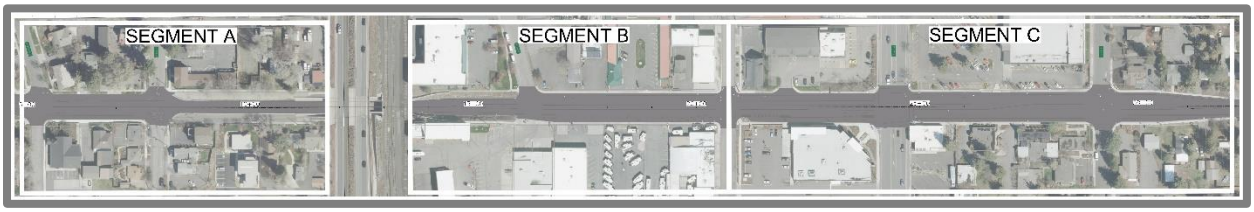


Figure 1: Segment Map

The first three alternatives were developed as a progression of bicycle and pedestrian safety and comfort with Alternative 1 providing the most separation from vehicles and Alternative 3 providing the least separation. Each component of the alternatives has different benefits and constraints which are viewed differently by the various user groups. By developing Alternative 4 after the first three alternatives were reviewed, scored, and discussed, Alternative 4 was developed with a balanced approach to account for the critical needs of each user group and to incorporate the preferred components of the first three alternatives.

2.1 General Proposed Modifications

The items covered in this section are consistent among the proposed alternatives.

2.1.1 Right-of-Way

Existing right-of-way (ROW) throughout the corridor is typically 80 feet wide and the center of roadway is generally offset from ROW center by the following distances:

- Segment A: existing road centerline is approximately 2.5 feet north of center of ROW
- Segment B: existing road centerline is approximately 0.5 feet south of center of ROW
- Segment C: existing road centerline is approximately 0.5 feet south of center of ROW

These offsets create some constraints as they require tapers to match proposed road sections into existing. Across the existing undercrossing at Franklin Avenue, the offset varies as the road centerline transitions approximately 3 feet between the offsets in Segments A and B. All four alternatives assume the same right-of-way (ROW) widths, maintaining the existing 80-foot width

in Segments A and C, and utilizing a 90-foot width through Segment B where a higher level of redevelopment is anticipated

In Segment A, the proposed improvements stay within the existing ROW width due to the constraints of matching the existing curb lines west of NW Harriman Street and the road width at the undercrossing – widening the typical section is not practical for a one-block section.

In Segment B, the alternatives use a proposed 90-foot ROW with the road centerline located at center of ROW softening the transition across the existing undercrossing by 0.5 feet. The proposed additional 10 feet of ROW is shown to be split evenly along the north and south ROW boundaries – 5 feet each side. The 90-foot ROW width is a result of retrofitting an existing corridor and attempting to limit the impacts. Proposed redevelopment of several sites within Segment B are expected and planning agreements between the City and the developer has resulted in anticipated 5-foot ROW dedications along their respective Franklin Avenue frontages. A short transition across the NE 1st Street intersection will be required to correct the centerline offset. The ROW boundary along the recently developed Walgreens site on the south side of Franklin Avenue between NE 2nd Street and NE 3rd Street is kept as existing.

In Segment C, the alternatives follow the existing ROW as there are no known planned redevelopments through this segment.

2.1.2 Lane Configuration

Based on the intersection operations, anticipated queuing, and sensitivity analysis included in the traffic analysis, impacts of reducing westbound through travel between NE 1st Street and NE 4th Street to one lane is minimal when compared against the safety benefits. As such, each alternative reduces westbound through traffic in Segment B to one lane. Removal of the second westbound lane provides additional space for bike lanes, parking, and landscape strips as shown in the alternatives. Removal of the second westbound lane in Segment B allows for a dedicated westbound right turn lane at NE 3rd Street.

2.1.3 Design Standards

Franklin Avenue is classified as a minor arterial. While the City of Bend has defined design standards for arterials, many of the components shown in the alternatives deviate from the design standards. There are several reasons for these deviations, but the primary reason is retrofitting an existing corridor creates more points where the proposed construction needs to match existing. A 90-foot ROW width is proposed for this corridor, rather than the typical 100-foot arterial ROW width due to the undercrossing constraint. The narrower ROW width limits the opportunity for additional lanes, parking, buffer space, and landscape strips for the corridor. Industry standards and best practices were used when the City of Bend design standards could not be met.

2.1.4 Segment A Plazas

Between NW Hill Street and the Parkway, the existing hard-surface open spaces that are grade-separated from the roadway are currently underutilized. They serve as the Franklin Avenue pedestrian routes leading to the undercrossing as well as provide access to the US97 bike/pedestrian ramps. These areas contain concrete pedestrian rails, approximately 18 feet of pavement, and 5.5 feet of curb and sidewalk. Proposed in each of the alternatives is removal of the curb and sidewalk and construction of single-elevation plazas approximately 23.5 feet wide. The additional width creates opportunities for community-friendly plaza areas, while also

maintaining fire and maintenance access. It also provides opportunities to consider stormwater management solutions such as permeable pavers. The intersection of NW Hill Street incorporates the western edge of the subdrainage basin for stormwater flowing towards the Franklin Avenue undercrossing which is a local low point. Measures to reduce impervious surface area and to detain and retain stormwater in the upper part of the basin would help reduce peak flows to the overstressed, undersized system in the base of the undercrossing.

Where the plaza meets NW Hill Street, the proposed mountable curb will discourage vehicles from entering the plazas while maintaining emergency and maintenance access.

Figure 2: Existing Plaza Areas

2.1.5 Parking

Each alternative includes various levels of parking however some parking constraints were applied consistently among the alternatives. In Segment A, all four existing on-street parking spaces between NW Harriman Street and NW Hill Street are proposed to be removed. In Segment C, the eight existing on-street parking spaces, which are rarely used, along the south side of Franklin Avenue between NE 3rd Street and NE 4th Street are proposed to be removed. In both cases, parking is proposed to be removed to meet intersection sight distance requirements.

2.1.6 Transit Stops

Transit stops are maintained in the same locations as existing. Enlarged concrete pads are proposed in each alternative providing additional space for enhanced transit amenities such as benches, trash cans, or shelters.

2.1.7 Stormwater Considerations

Per the City of Bend Standards and Specifications, areas with risk of extensive flooding, safety issues, or other concerns as defined by the City Engineer, shall be designed with a capacity to accommodate a 50-year storm event and provide safe passage for a 100-year storm event. Low

points within roadways, such as the Franklin Avenue undercrossing, shall be designed to a minimum 100-year storm event. Reducing stormwater in the upper portion of the subdrainage through low-impact development and green infrastructure will help relieve pressure on the undercrossing, which is noted in the Stormwater Master Plan as a priority area for reducing flooding.

2.1.8 Driveway Access

The existing driveway access to 181 NE Franklin Avenue is proposed to be closed with each alternative. The property is planned for redevelopment along with the adjacent properties allowing for access consolidation and potential relocation to NE 2nd Street.

2.1.9 Low Stress Network

The City of Bend's Transportation System Plan identifies a low stress bicycle network route, intended to provide low stress bicycle facilities in this area along NW Harriman Avenue between NW Delaware Avenue and NW Lafayette Avenue. However, the City of Bend staff recognized there could be benefits to a low stress alignment along NW Hill Street instead of NW Harriman Avenue and therefore various alternatives allow for the low stress alignment to utilize either NW Harriman Avenue or NW Hill Street depending on design treatment options at those intersections with Franklin Avenue.

2.2 Alternative 1: Maximize Active Transportation Separation

Alternative 1 features raised cycle tracks in both directions along the corridor, improving bicycle safety through separation. The cycle tracks are separated from both the travel lanes and the pedestrian sidewalks by landscape strips which could include street furnishings, landscaping, or stormwater management treatments.

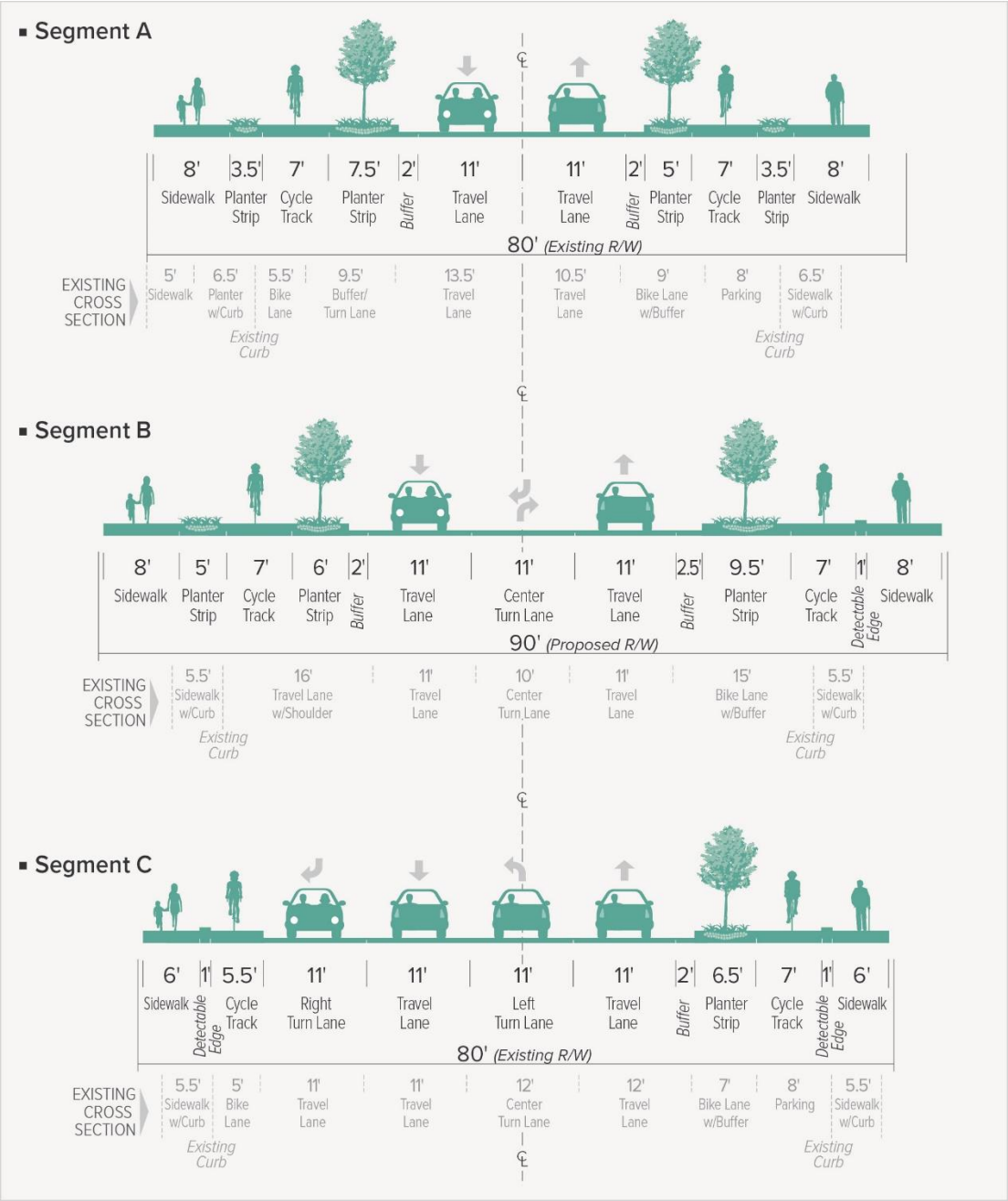


Figure 3: Alternative 1 Cross Sections

2.2.1 Segment A

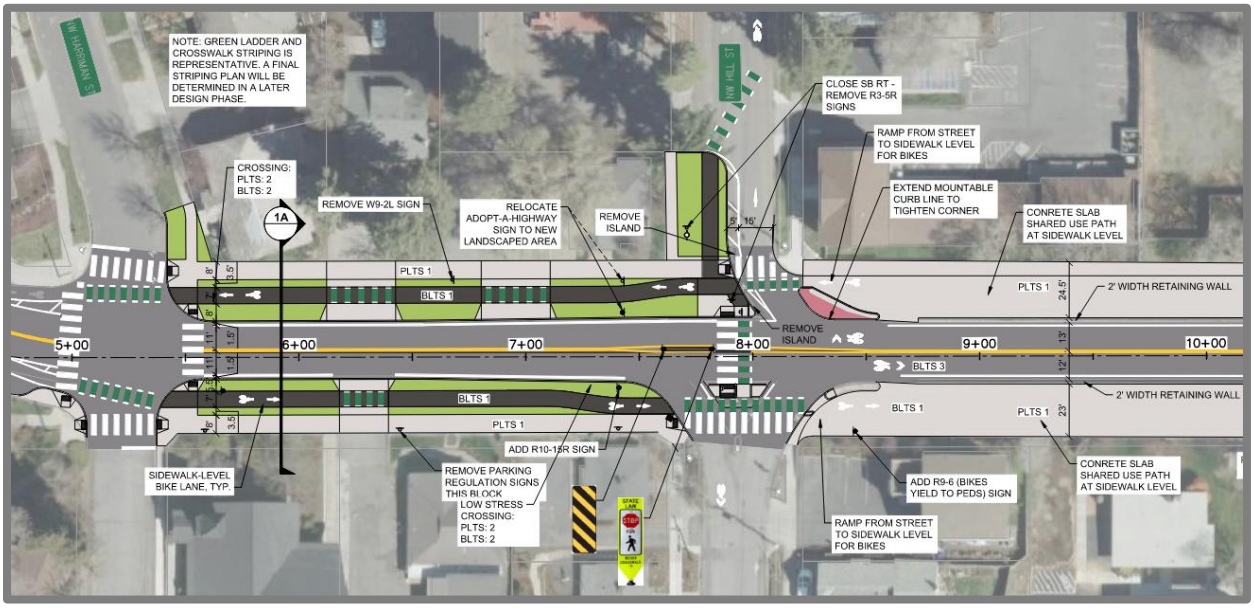


Figure 4: Alternative 1 – Segment A

At NW Harriman Street, pavement markings and shortened crossing distances improve this intersection for pedestrians and bicycle riders. Shortened crossings are created through proposed curb extensions and a cross section that moves the curb lines closer to centerline.

For Alternative 1, the proposed Neighborhood Greenway route is on NW Hill Street creating the need for an enhanced crossing. Site constraints prevent the ability to construct a 10-foot median, which is needed to meet pedestrian level of traffic stress (PLTS) 1, but other improvements can be made. A proposed narrow median with signage as well as added pavement markings improve visibility and delineate the crossing. Accessibility may require separation of the pedestrian and bicycle crossings at NW Hill Street.

For vehicular travel at NW Hill Street, the southbound right turn onto Franklin Avenue, which currently has sight distance issues, is proposed to be closed. Westbound traffic will still have the option to turn right onto northbound NW Hill Street. Southbound traffic on NW Hill Street is comprised mostly of southbound traffic exiting the Parkway at the Hawthorne Avenue off-ramp. Restricting the southbound right turn will displace traffic onto NW Harriman Avenue. Traffic could also be diverted to continue west on Hawthorne (via Oregon into Downtown); turning south onto Lava. Both the Bend Parkway Plan and Transportation Plan anticipate the Hawthorne right on-ramp will be closed and the off-ramp will remain. However, the Hawthorne overcrossing project may result in additional changes to the Hawthorne on/off ramps that will be considered in the Midtown Crossings Feasibility Study. There are currently 80 vehicles in the PM Peak Hour, therefore this turn restriction between Hill and Franklin could add a small amount of traffic volume to each alternative route, including additional traffic volume to the Neighborhood Greenway route. The existing sidewalk on Franklin Avenue between NW Harriman Street and NW Lava Road is already 8 feet wide allowing for a consistent width through this area.

On the south side of Franklin Avenue, the NW Hill Street intersection will remain right-in/right-out, consistent with the existing configuration.

2.2.2 Segment B

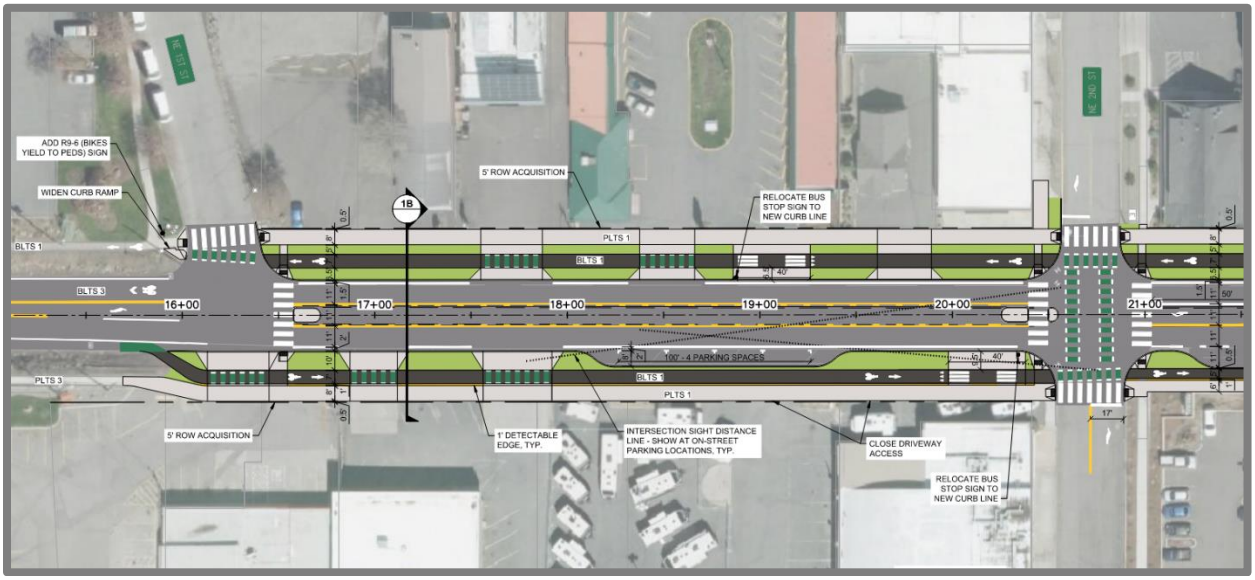


Figure 5: Alternative 1 – Segment B

Alternative 1 maintains all existing turning movements at the NE 1st Street intersection and adds a continental crosswalk on the east side of the intersection.

At the NE 2nd Street intersection, Alternative 1 restricts northbound through, southbound through, and eastbound left movements. The westbound left onto NE 2nd Street is still allowed in this configuration to enhance access to properties fronting Franklin Avenue with access from NE Emerson Avenue. The proposed islands at the intersection limit queuing storage for the NE 3rd Street eastbound left turn lane.

The planter strips in this alternative provide opportunity to incorporate stormwater detention or retention facilities throughout the corridor as well as room for utilities.

Four new on-street parking spaces are proposed with this alternative. The curb-tight parking spaces are separated from the bike lanes by striped buffers.

2.2.3 Segment C

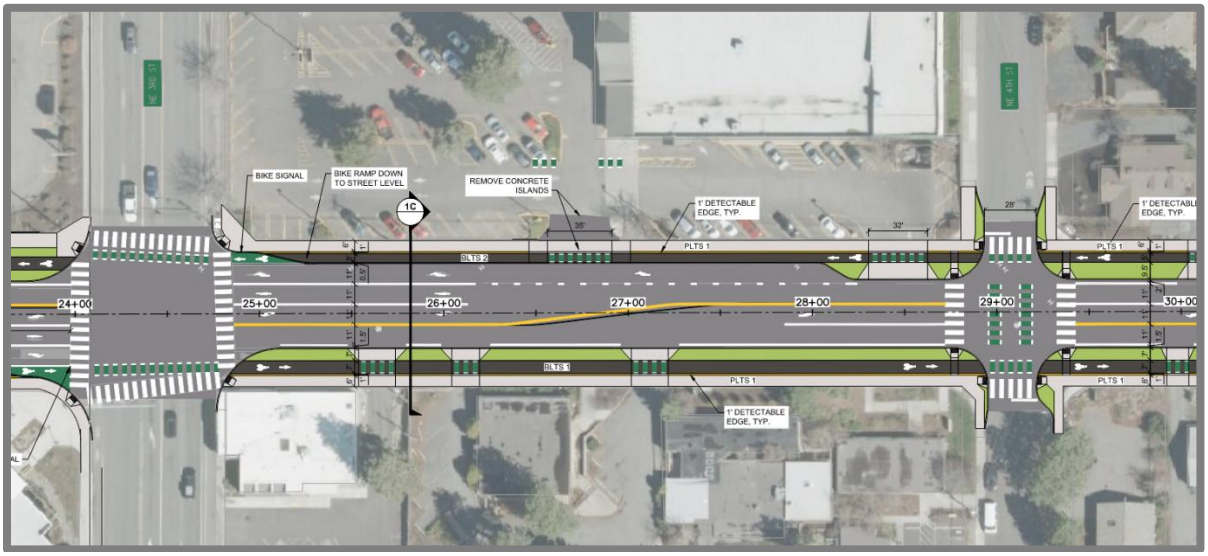


Figure 6: Alternative 1 – Segment C

Bike signals are proposed for eastbound and westbound bicycle travel at NE 3rd Street in Alternative 1. This keeps the bike lane alignment within the comfort and safety of the cycle track and separates bike and auto movements at the signal to eliminate risk of right turn hook crashes. The bike signal eliminates both right and left hook crashes[1].

At the NE 3rd Street intersection, the existing eastbound right turn lane is maintained. The westbound through movement will be reduced to one lane and a right turn lane will be introduced.

The NE 4th Street intersection is proposed with curb extensions, marked crossings, and continental bike lane extensions across the intersection. Just east of NE 4th Street, the proposed improvements transition to match the existing corridor. NE 4th Street is on the City's Low Stress Network and is a critical crossing between high density residential and commercial services.

[1] Right turn hook crashes represent 8% of bicycle crash types in the City of Bend, while left hook crashes represent 23% of bicycle crash types in Bend.

2.3 Alternative 2: Protected Bike Lane

Alternative 2 features parking protected bike lanes through most of the corridor. Where sufficient space is available, the bike lanes are protected by parking. Where less space is available, the bike lanes are protected by concrete islands (which could be designed to include planters or stormwater catchment areas).

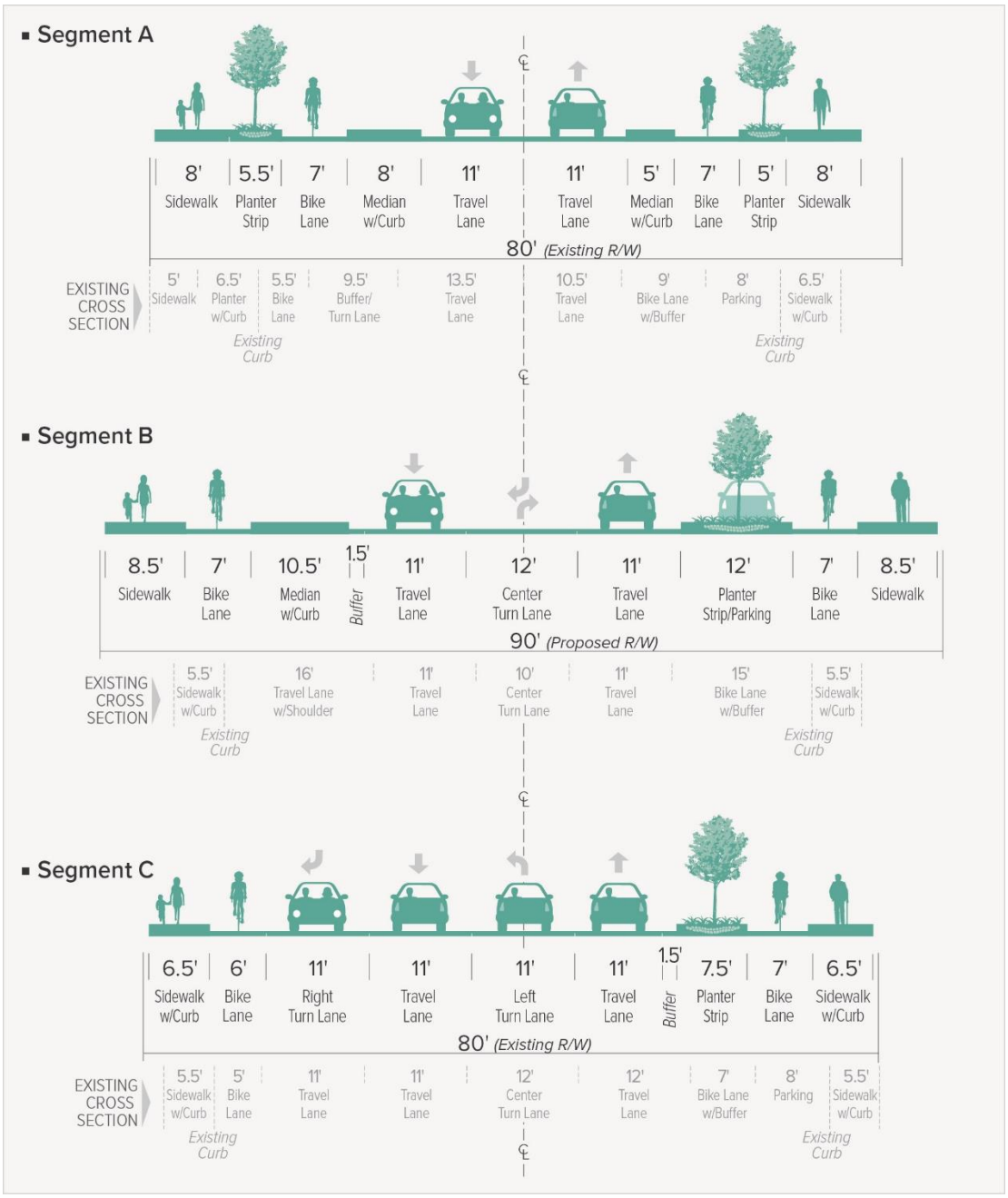


Figure 7: Alternative 2 Cross Sections

2.3.1 Segment A

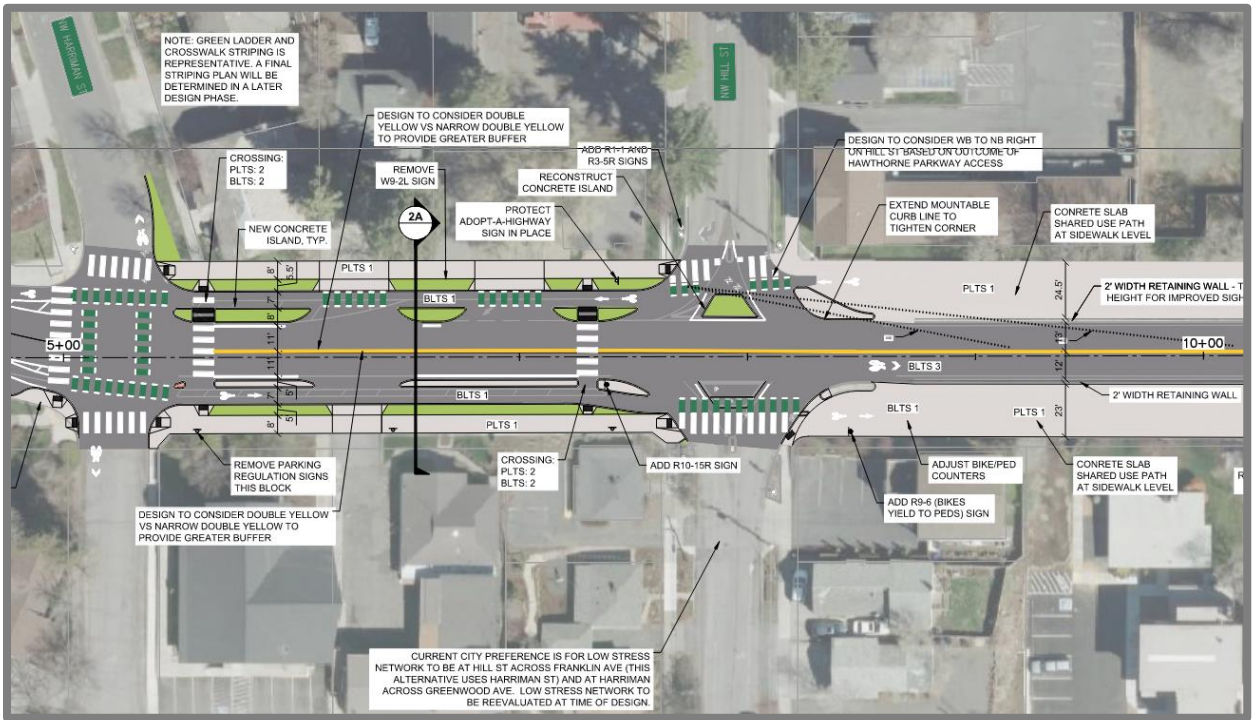


Figure 8: Alternative 2 – Segment A

NW Harriman Street in Alternative 2 is similar to Alternative 1 except concrete islands are proposed for the enhanced crossing rather than curb extensions. These islands allow the bike lane to follow curb line and do not restrict drainage as the flowline is unimpeded. Specialized snowplow and sweeper equipment, that the City of Bend does not currently own, would be required to maintain these narrow areas. Crossings for pedestrians and bicycle riders are marked through the intersection.

The NW Hill Street intersection allows the same movements as existing, right-in/right-out in both directions, but removes the southbound to westbound merge lane. The merge lane previously allowed vehicles to get turned in the westbound direction prior to merging with traffic due to the sight distance constraints of the undercrossing. The widened plaza area on the north side of Franklin Avenue will allow for reconstruction of the existing pedestrian rail, improving sight distance for the southbound to westbound movement.

2.3.2 Segment B

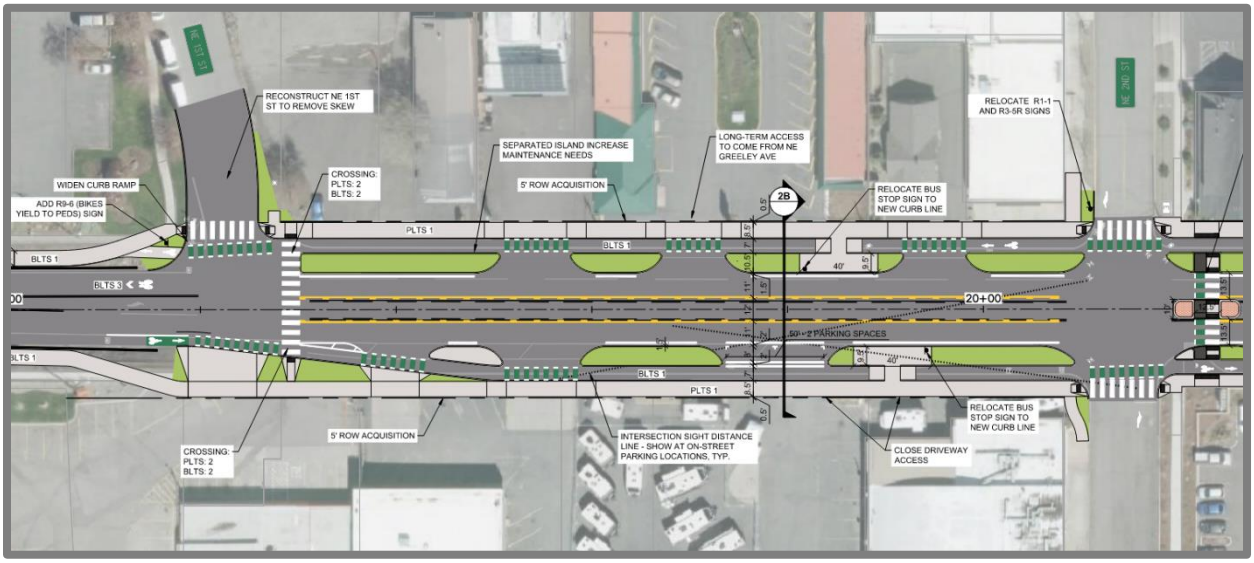


Figure 9: Alternative 2 – Segment B

New retaining walls and realignment of the sidewalks between the Burlington Northern Santa Fe (BNSF) railroad bridge and NE 1st Street are proposed to improve site lines through the pedestrian tunnels. These retaining walls and sidewalk realignments are independent of the rest of the proposed changes and could be applied to any of the alternatives. There is opportunity in the City's Midtown Crossing Feasibility study to consider additional design elements to enhance sidewalks and manage stormwater between BNSF undercrossing and NE 1st Street.

Alternative 2 maintains all existing turning movements at the NE 1st Street intersection and adds a continental crosswalk on the east side of the intersection. To improve visibility, NE 1st Street on the north side of Franklin Avenue is proposed to be realigned to create a perpendicular intersection.

At the NE 2nd Street intersection, Alternative 2 restricts northbound through, southbound through, and eastbound left movements. The proposed islands at the intersection limit queuing storage for the NE 3rd Street eastbound left turn lane.

Due to the nature of parking protected bike lanes and sight lines associated with the numerous access points along the corridor, only two new on-street parking spaces can be added along the south side of Franklin Avenue. The further parking is located from the curb, the greater the effect sight lines have on available space for parking.

2.3.3 Segment C

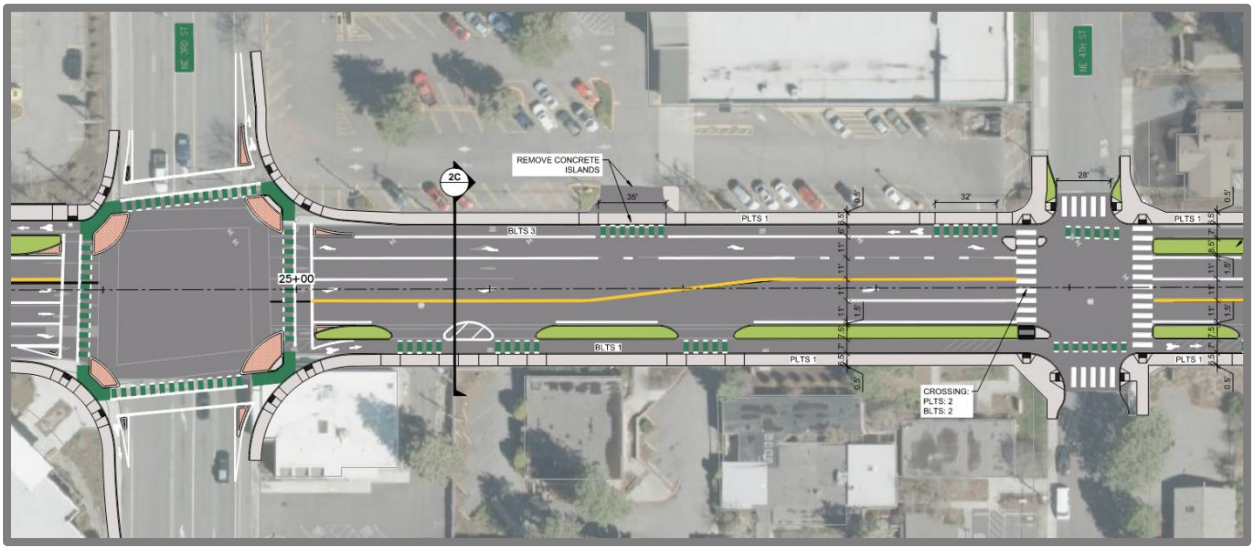


Figure 10: Alternative 2 – Segment C

At the NE 3rd Street intersection, a protected intersection is proposed. This alternative shows the layout for a full protected intersection which has significant ROW impacts in the southeast corner, likely requiring purchase of the property and demolition of the existing building. This layout is similar to the proposed protected intersection at NE 3rd Street and SE Wilson Avenue being constructed as part of the Wilson Corridor Improvements project. Alternative 4 proposes a modified protected intersection with reduced ROW impacts that would not require demolition of the existing building.

The NE 4th Street intersection is proposed with concrete islands and marked crossings. Just east of NE 4th Street, the proposed improvements transition to match the existing corridor.

2.4 Alternative 3: Maximum Parking with Buffered Bike Lane

Alternative 3 provides the most parking throughout the corridor but also the least bicycle protection - buffered bike lanes. Parking is shown curb-tight leaving only striped buffers as protection for the bike lanes. This alternative results in the widest curb-to-curb width and does not leave room for landscape strips. The proposed sidewalk varies between 6 feet and 8.5 feet in width along the corridor.

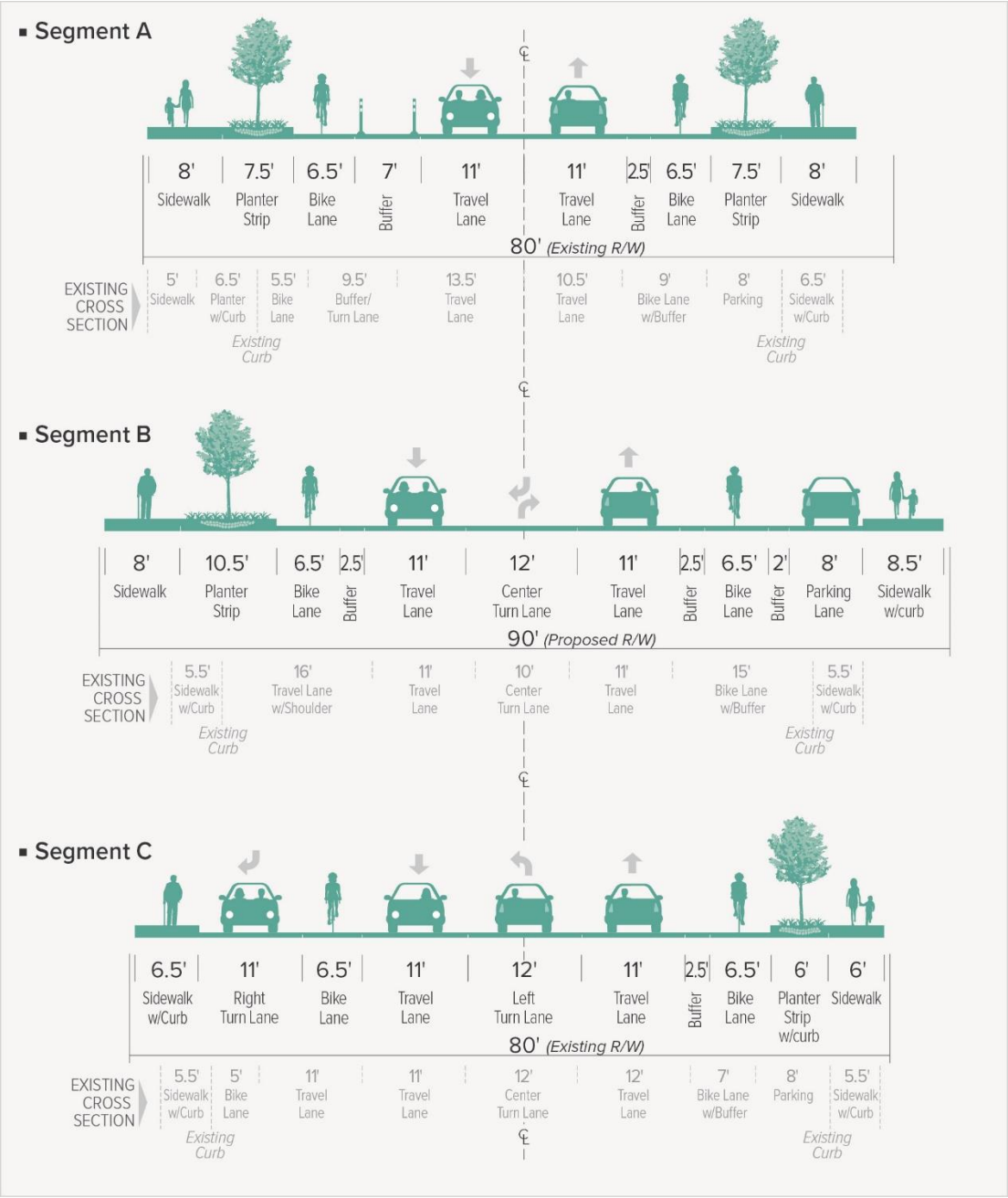


Figure 11: Alternative 3 Cross Sections

2.4.1 Segment A

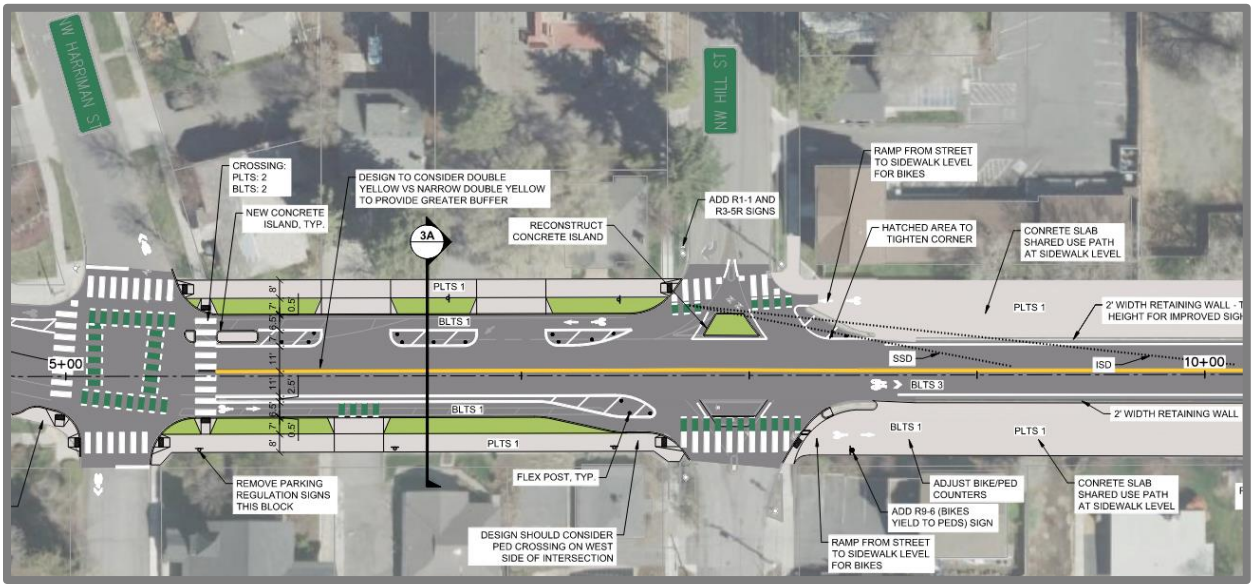


Figure 12: Alternative 3 – Segment A

NW Harriman Street in Alternative 3 includes curb extensions on the south side of the intersection and concrete islands on the northeast side. The island allows the bike lane to remain curb-tight on the north side of Franklin Avenue through this segment. Crossings for pedestrians and bicycle riders are marked through the intersection.

The NW Hill Street intersection in this alternative allows the same movements as existing, right-in/right-out in both directions, but removes the southbound to westbound merge lane. The merge lane previously allowed vehicles to get turned in the westbound direction prior to merging with traffic due to the sight distance constraints of the undercrossing. The widened plaza area on the north side of Franklin Avenue will allow for reconstruction of the existing pedestrian rail improving sight distance for the southbound to westbound movement.

The proposed planter strips on both sides of the road provide opportunities for landscaping and stormwater detention or retention facilities.

2.4.2 Segment B

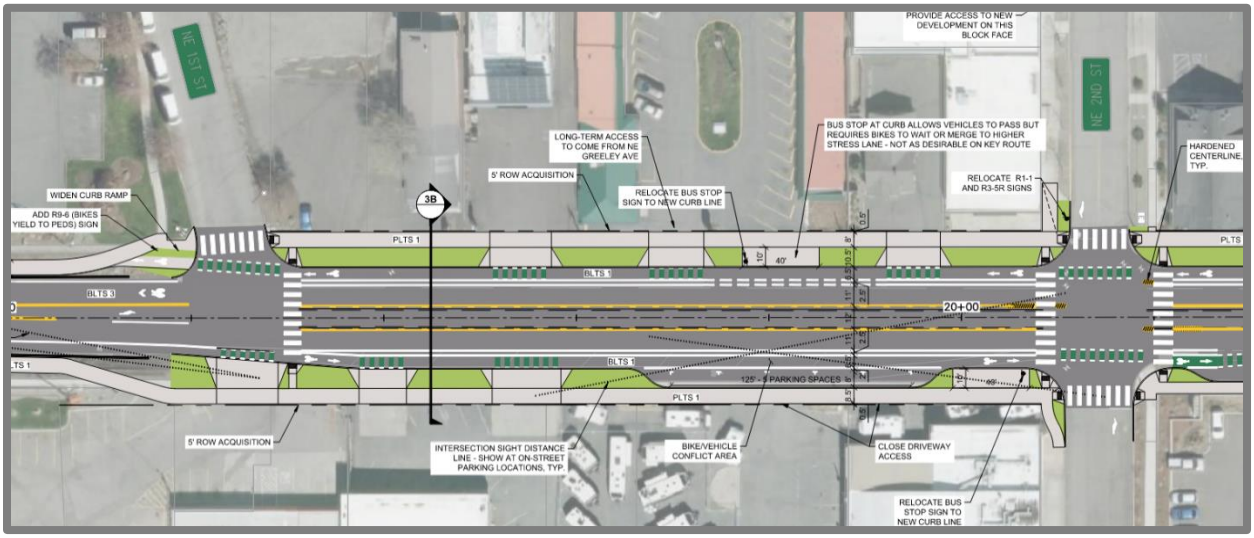


Figure 13: Alternative 3 – Segment B

Alternative 1 maintains all existing turning movements at the NE 1st Street intersection and adds a continental crosswalk on the east side of the intersection.

At the NE 2nd Street intersection, all existing movements are allowed. Hardened centerlines are proposed at key points in the intersection which force drivers to turn more slowly providing a safer pedestrian crossing. Hardened centerlines are a low-cost alternative compared with other delineators however, designs should consider snowplow operations.

Alternative 3 proposed nine new on-street parking spaces using both sides of Franklin Avenue between NE 1st Street and NE 3rd Street. The curb-tight parking spaces are separated from the bike lanes by striped buffers.

2.4.3 Segment C

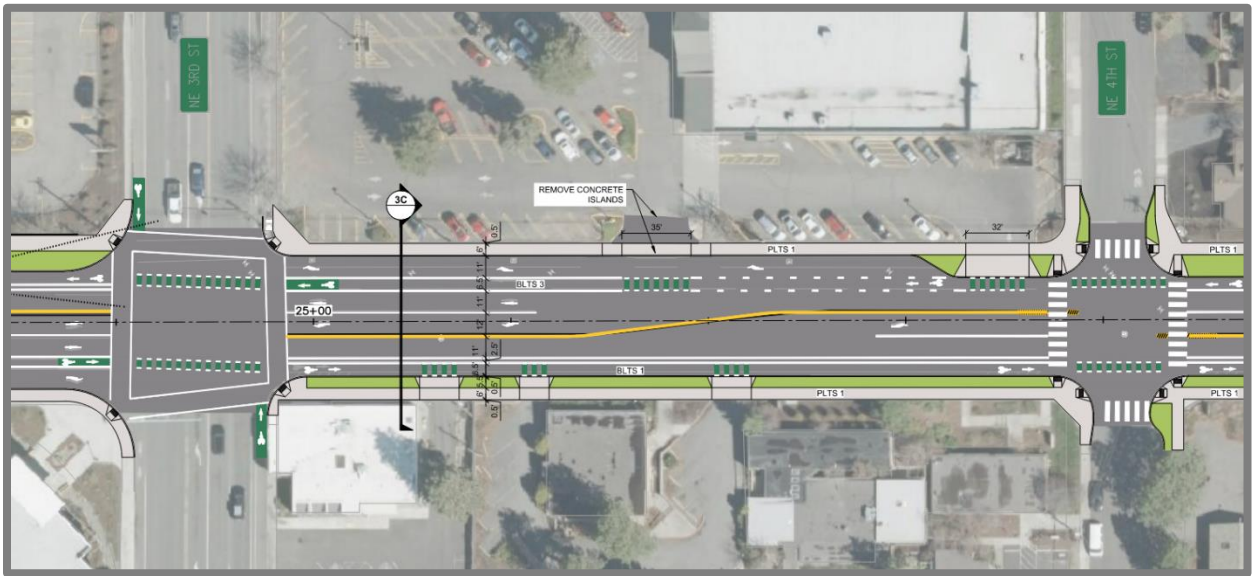


Figure 14: Alternative 3 – Segment C

At the NE 3rd Street intersection, the eastbound configuration matches existing with the right turn lane curb-tight and the bike lane between the right turn and through travel lanes. Like Alternatives 1 and 2, the westbound through movement will be changed to one lane and a right turn lane will be introduced.

The NE 4th Street intersection is proposed with marked crossings and curb extensions on NE 4th Street. Proposed planter strips change the curb line shortening the crossing distance across Franklin Avenue. Just east of NE 4th Street, the proposed improvements transition to match the existing corridor.

2.5 Alternative 4: Balanced

Alternative 4 features a number of preferred features from Alternatives 1 through 3 including raised cycle tracks in both directions along the corridor, enhanced crossings at NW Hill Street, NE 2nd Street, and NE 4th Street, and a modified protected intersection at NE 3rd Street. Alternative 4 also includes planter strips through most of the corridor providing opportunity for stormwater detention or retention facilities.

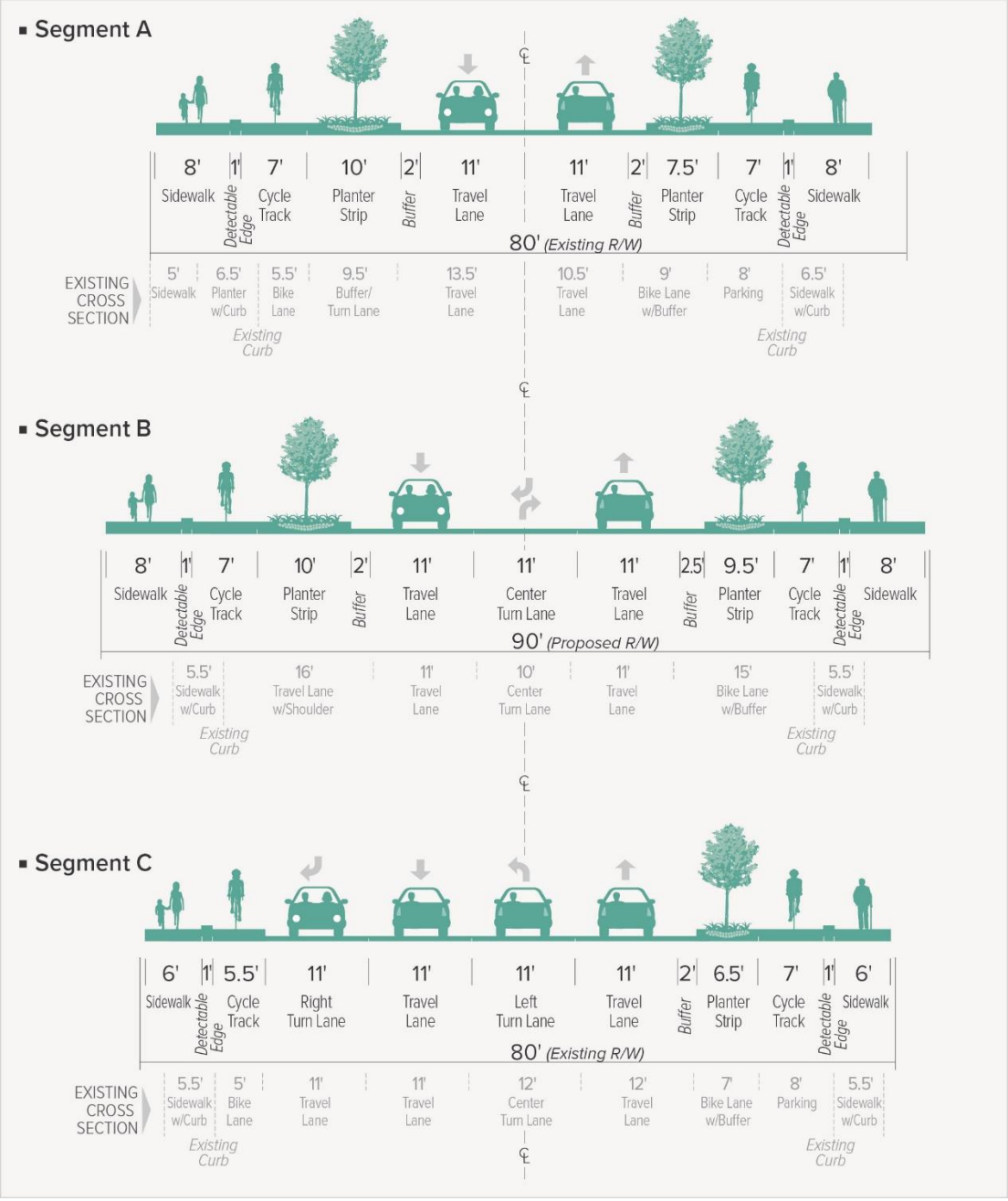


Figure 15: Alternative 4 Cross Sections

Both Alternative 1 and Alternative 4 feature cycle tracks throughout the corridor. One significant difference is that the planter strip in Alternative 4 is entirely between the curb and cycle track instead of separated. The single planter strip provides greater opportunity for landscaping, street trees, utilities, and stormwater facilities.

2.5.1 Segment A

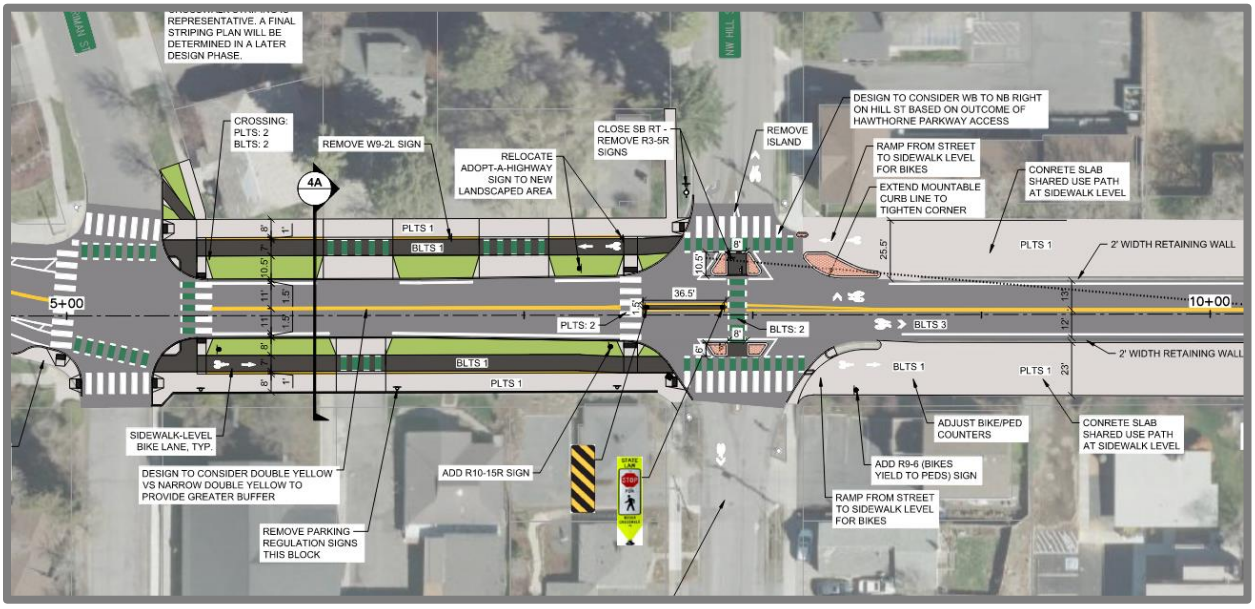


Figure 16: Alternative 4 – Segment A

The proposed improvements at NW Harriman Street in Alternative 4 are very similar to Alternative 1 but also include a bicycle crossing from the cycle track at the east crossing.

The proposed Neighborhood Greenway route for this alternative is also on NW Hill Street creating the need for an enhanced crossing. The pedestrian and bicycle crossings are separated to allow bicycle riders to cross Franklin Avenue without riding on the sidewalk. Like Alternative 1, a proposed narrow median with signage and pavement markings enhance the crossing.

For vehicular travel, the NW Hill Street intersection in this alternative allows the same movements as existing, right-in/right-out in both directions, but removes the southbound to westbound merge lane. The merge lane previously allowed vehicles to get turned in the westbound direction prior to merging with traffic due to the sight distance constraints of the undercrossing. The widened plaza area on the north side of Franklin Avenue will allow for reconstruction of the existing pedestrian rail improving sight distance for the southbound to westbound movement.

2.5.2 Segment B

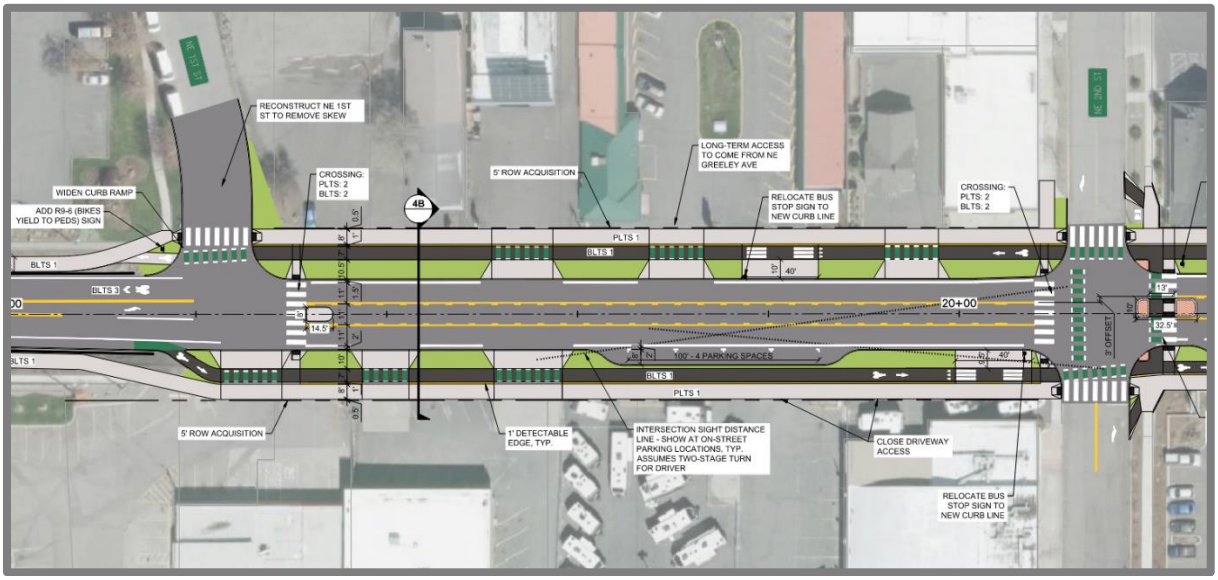


Figure 17: Alternative 4 – Segment B

Alternative 4 maintains all existing turning movements at the NE 1st Street intersection and adds a continental crosswalk on the east side of the intersection. To improve visibility, NE 1st Street on the north side of Franklin Avenue is proposed to be realigned to create a perpendicular intersection.

At the NE 2nd Street intersection, a proposed 10-foot wide median refuge is proposed at the east crossing. This refuge allows the crossing to meet PLTS 1 requirements but restricts westbound left-turn vehicular movement from Franklin Avenue to NE 2nd Street. The proposed median refuge also limits queuing storage for the NE 3rd Street eastbound left turn lane.

The planter strips in this alternative provide opportunity to incorporate stormwater detention or retention facilities throughout the corridor as well as room for utilities.

Four new on-street parking spaces are proposed with this alternative. The curb-tight parking spaces are separated from the bike lanes by striped buffers.

2.5.3 Segment C

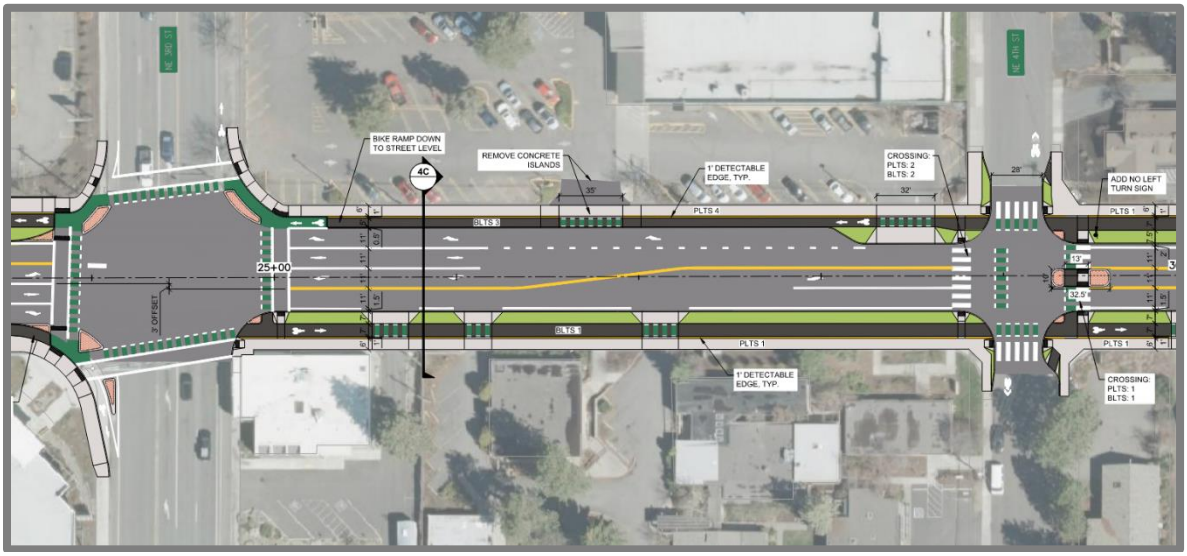


Figure 18: Alternative 4 – Segment C

At the NE 3rd Street intersection, a modified protected intersection is proposed. To limit ROW impacts, the curb line in the southeast corner is proposed to follow existing. This layout is similar to the proposed protected intersection at NE 3rd Street and SE Wilson Avenue being constructed as part of the Wilson Corridor Improvements project.

Without purchasing ROW between NE 3rd Street and NE 4th Street, separation between bicycle/pedestrian facilities and the roadway cannot be met without creating significant offset across the NE 3rd Street intersection. The proposed configuration shows a 3-foot offset.

At the NE 4th Street intersection, a proposed 10-foot wide median refuge is proposed at the east crossing. This refuge allows the crossing to meet PLTS 1 requirements but restricts westbound left-turn vehicular movement from Franklin Avenue to NE 4th Street. NE 4th Street is on the City's Low Stress Network and is a critical crossing between high density residential and commercial services.

3.0 EVALUATION & SCORING

3.1 General

This section summarizes the results of the scoring used to compare the existing condition and each of the four alternatives. Evaluation criteria was organized into five categories that, combined, create a weighted overall total score. The five categories are: General Corridor Impacts, Driving, Walking, Biking, and Transit. Within each category, additional criteria was defined and sub-weighted based on priority. A detailed breakdown of the score as well as discussion for each of the criteria is provided in Appendix E

Scoring is provided on numerical scale to provide easy comparison between build alternatives and the no-build condition. Table 1 defines the 1-5 scoring scale used in this report.

Table 1: Scoring Definition

Score	Performance
5	Excellent
4	Good
3	Fair
2	Poor
1	Very Poor

3.2 Construction Costs

At the concept level, construction cost estimates typically include contingencies up to 50 percent of the estimate to account for project soft costs and unknowns. As design develops, these items become better defined allowing contingency to be reduced at each progressive milestone. Table 2 summarizes the construction cost for each alternative and indicates how the cost compares to the least cost option. The costs were developed using unit prices from recent bids on City of Bend capital improvement projects and assume full reconstruction of the corridor. The full construction cost breakdowns are included in Appendix D.

Table 2: Construction Cost Comparison

Alternative	Construction Cost	w/ 50% Contingency	Delta from Least Cost Alternative
1	$ 1,890,000	$ 2,835,000	-
2	$ 2,374,000	$ 3,561,000	25.6%
3	$ 1,992,000	$ 2,988,000	5.4%
4	$ 1,896,000	$ 2,844,000	0.3%

3.3 Scoring

Table 2 presents an overall scoring summary with a weighting factor applied to each of the key areas discussed above. Weights for each section are noted in the table with General Corridor Impacts as the highest weighted area.

Table 3: Scoring Summary

			Alternative			
Area	**Weight**	**Existing**	**1**	**2**	**3**	**4**
General Corridor Impacts	25%	3.3	2.9	2.7	3.4	2.9
Driving	20%	3.3	2.9	2.7	3.4	2.9
Walking	20%	2.3	4.3	3.8	3.5	4.8
Biking	20%	2.3	4.8	4	3.3	5
Transit	15%	1.5	4.5	3	3.5	5
Subtotal	**100%**	**2.6**	**3.8**	**3.2**	**3.4**	**4**

Alternative 4 received the highest overall score due to significant improvements for walking, biking, and transit. Alternative 4 was developed last and incorporates many of the preferred features identified in Alternatives 1, 2, and 3. All the alternatives score higher than the existing conditions of the corridor, a no-build alternative.

Alternative 2 received the lowest overall score largely due to the floating islands proposed that create separation between bicycle riders and the travel lanes. These islands also pose significant maintenance challenges as the snowplow and street sweeper equipment the City of Bend currently owns cannot fit through the narrow bike lanes. Alternative 2 scored lowest in driving due the access restrictions created by median refuges (similar to Alternatives 1 and 4) and also provided the least amount of on-street parking spaces. The transit score was lowest due to the access and comfort of the bus stop being located in a floating island.

Key elements that helped differentiate scoring of each alternative include the following:

- **Traffic circulation -** Each of the alternatives contains changes to accessibility to/from Franklin Avenue, particularly east of the US 97 and the BNSF railroad bridge. Many of the local streets north and south of Franklin Avenue are unpaved and provide poor connectivity for accessing Franklin Avenue if turn restrictions are proposed at NE 2nd Street. As the Core Area is expected to redevelop, accessibility to these properties will need to be considered. Proposed changes to traffic circulation will need to be evaluated holistically through the Midtown Crossing Study to understand the potential impact of changes to circulation proposed on Greenwood Avenue, Franklin Avenue and Hawthorne Avenue.
- **Safety –** Alternatives with greater separation between facilities provide the safest corridors. The raised cycle track proposed in Alternatives 1 and 4 create the desired separation and accommodate walking, biking, and taking transit which is a desirable outcome. The NE 3rd Street protected intersection proposed in Alternative 2 and modified protected intersection proposed in Alternative 4 enhance safety at this crossing, which is a hotspot on this corridor.

- **Streetscaping –** The proposed planter strips in Alternatives 1, 2, and 4 led to higher general corridor impact scores. Planter strips allow room for landscaping, stormwater facilities, or utilities.

3.4 Summary

Franklin Avenue is a minor arterial that has been identified as a Neighborhood Greenway route. This corridor has a wide variety of users and does not meet current standards. The four alternatives proposed in this report present options for improving safety and overall corridor functions for all modes of travel. Based on the scoring criteria established for this project, Alternative 4, which features raised cycle tracks in each direction and a modified protect intersection at NE 3rd Street, is the preferred alternative.

4.0 APPENDIX

Appendix A1 – Franklin Avenue Alternative 1

Appendix A2 – Franklin Avenue Alternative 2

Appendix A3 – Franklin Avenue Alternative 3

Appendix A4 – Franklin Avenue Alternative 4

Appendix B – Traffic Analysis

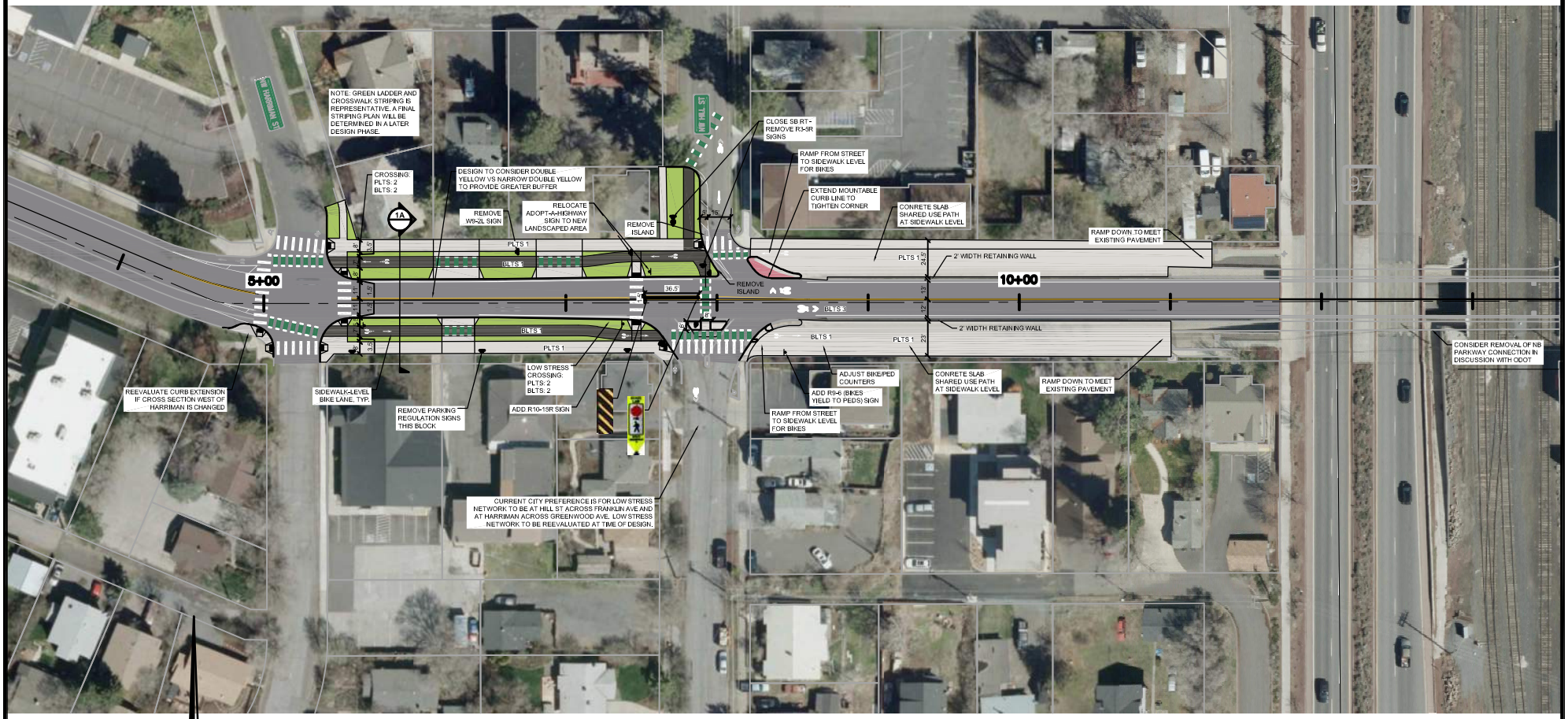
Appendix C – Opportunities & Constraints Memo

Appendix D – Construction Cost Breakdown

Appendix E – Scoring and Evaluation Detail

APPENDIX A1 – FRANKLIN AVENUE ALTERNATIVE 1

C:\dowl_pw\d0395232\Alternative_1.dwg PLOT DATE 2022-6-8 12:57 SAVED DATE 2022-06-08 09:09 USER: mphillis

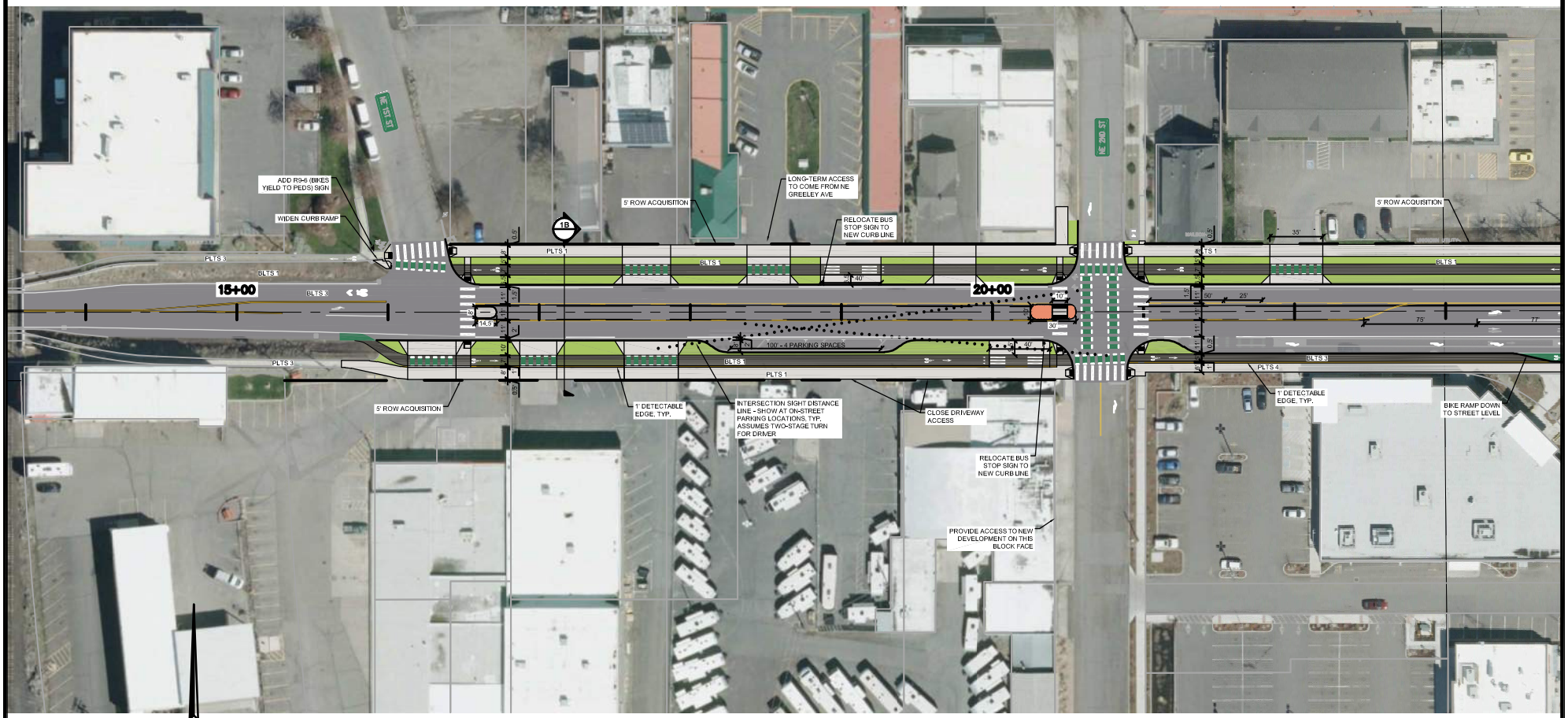


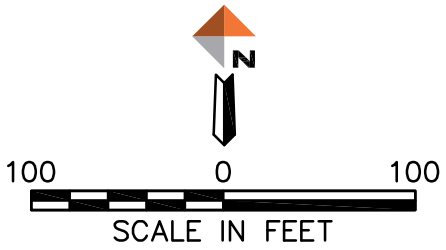
DOWL
WWW.DOWL.COM

FRANKLIN CORRIDOR CONCEPTS
ALTERNATIVE 1

PROJECT	14608-04
DATE	06/08/2022

FIGURE 1.0



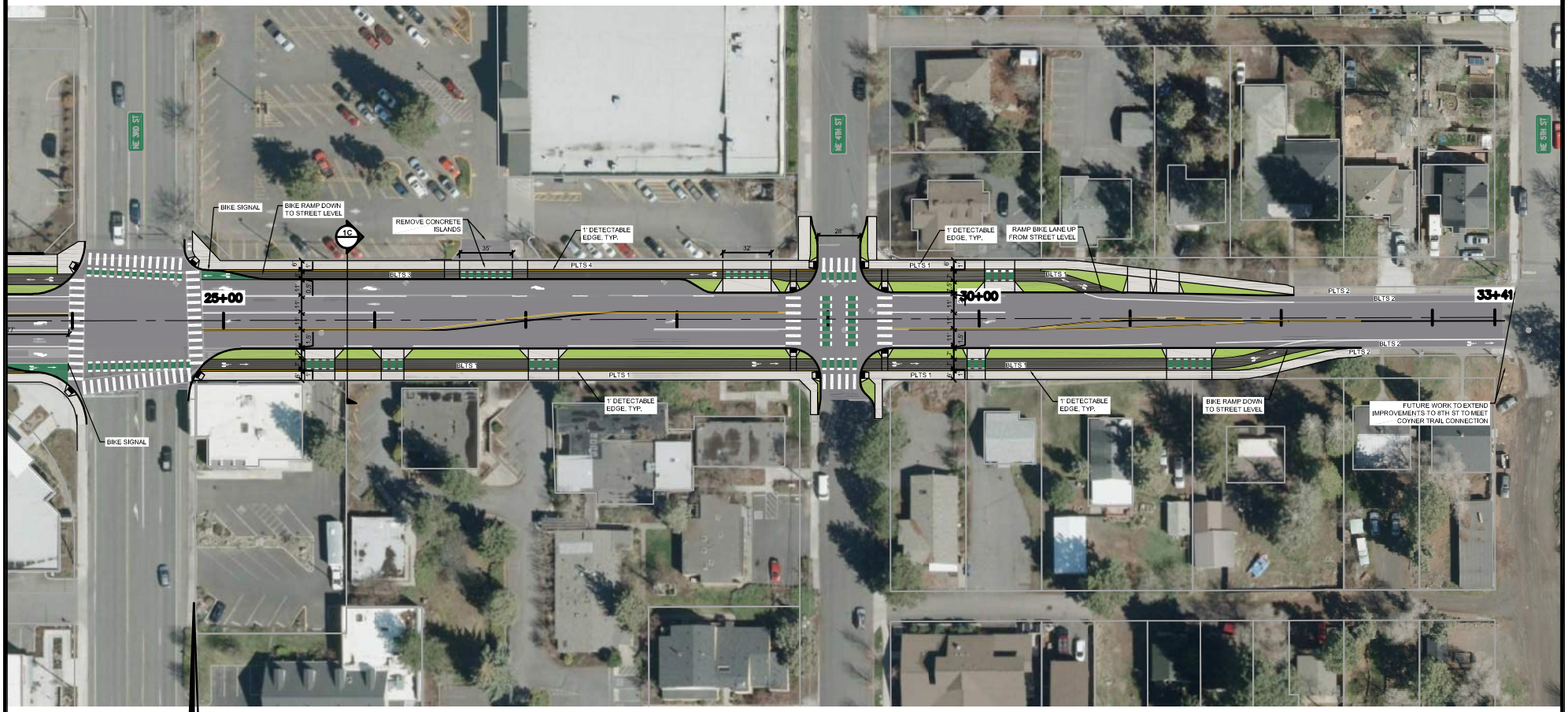


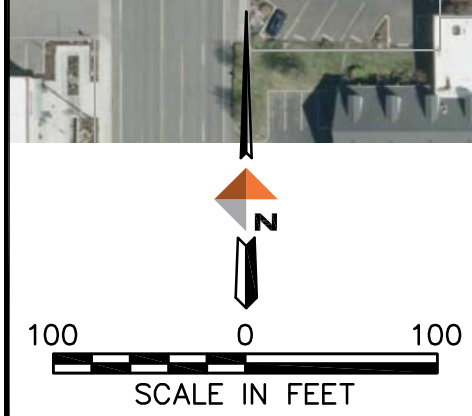
DOWL
WWW.DOWL.COM

FRANKLIN CORRIDOR CONCEPTS
ALTERNATIVE 1

PROJECT	14608-04
DATE	06/08/2022

FIGURE 1.1





DOWL
WWW.DOWL.COM

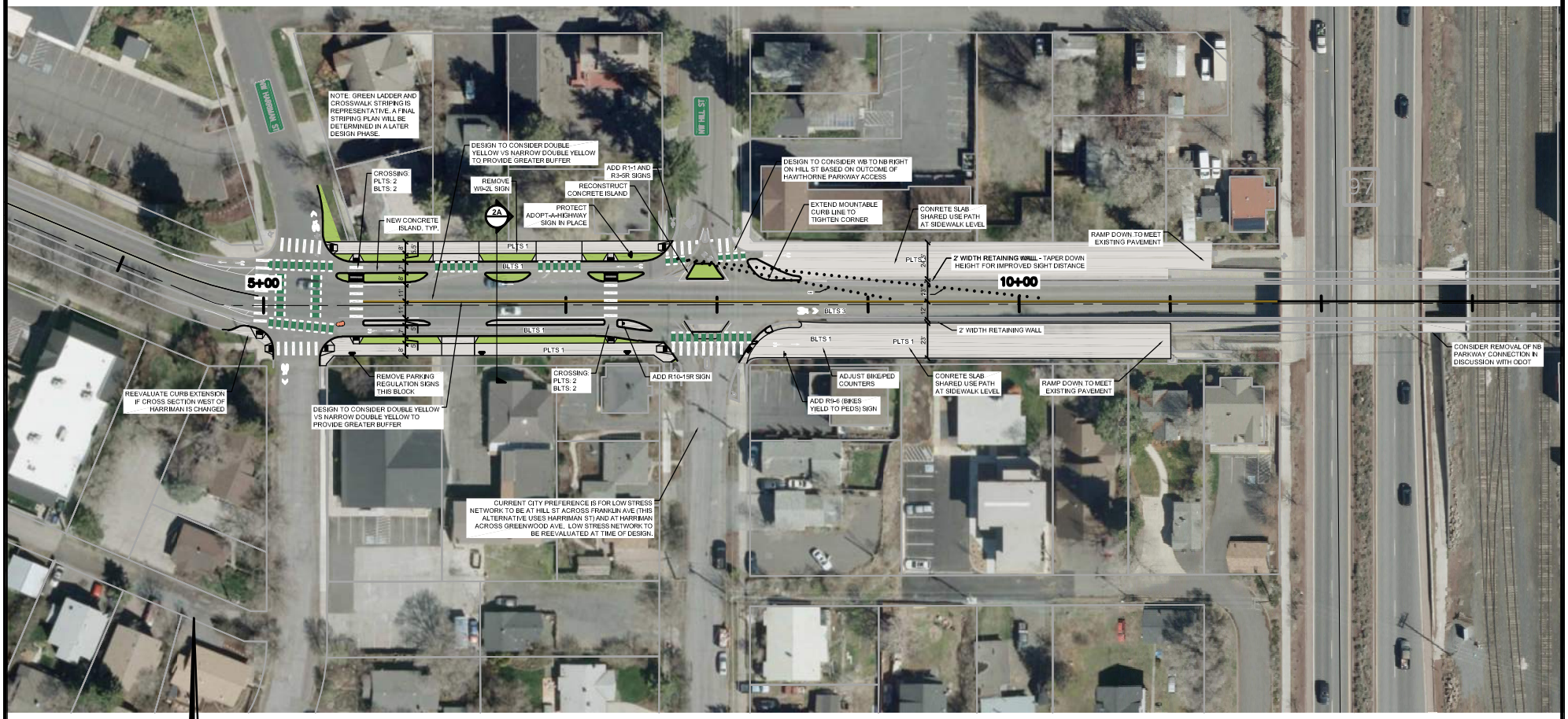
FRANKLIN CORRIDOR CONCEPTS
ALTERNATIVE 1

PROJECT	14608-04
DATE	06/08/2022

FIGURE 1.2

APPENDIX A2 – FRANKLIN AVENUE ALTERNATIVE 2

C:\dowl_pw\d0395232\Alternative_2.dwg PLOT DATE 2022-6-8 12:59 SAVED DATE 2022-06-08 11:48 USER: mphillis



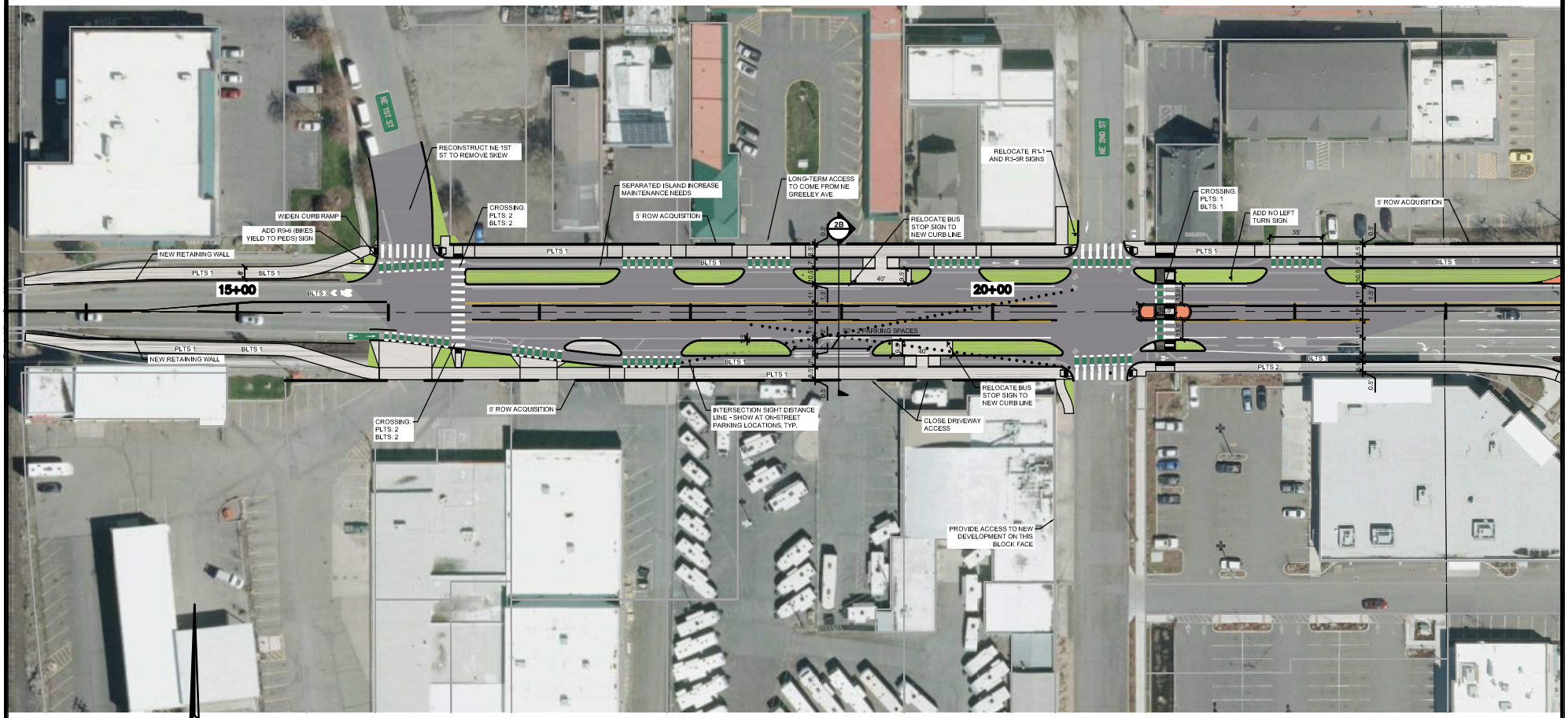
DOWL
WWW.DOWL.COM

FRANKLIN CORRIDOR CONCEPTS
ALTERNATIVE 2

PROJECT	14608-04
DATE	06/08/2022

FIGURE 2.0

C:\dowl_pw\d0395232\Alternative_2.dwg PLOT DATE 2022-6-8 12:59 SAVED DATE 2022-06-08 11:48 USER: mphillis



N

100 0 100

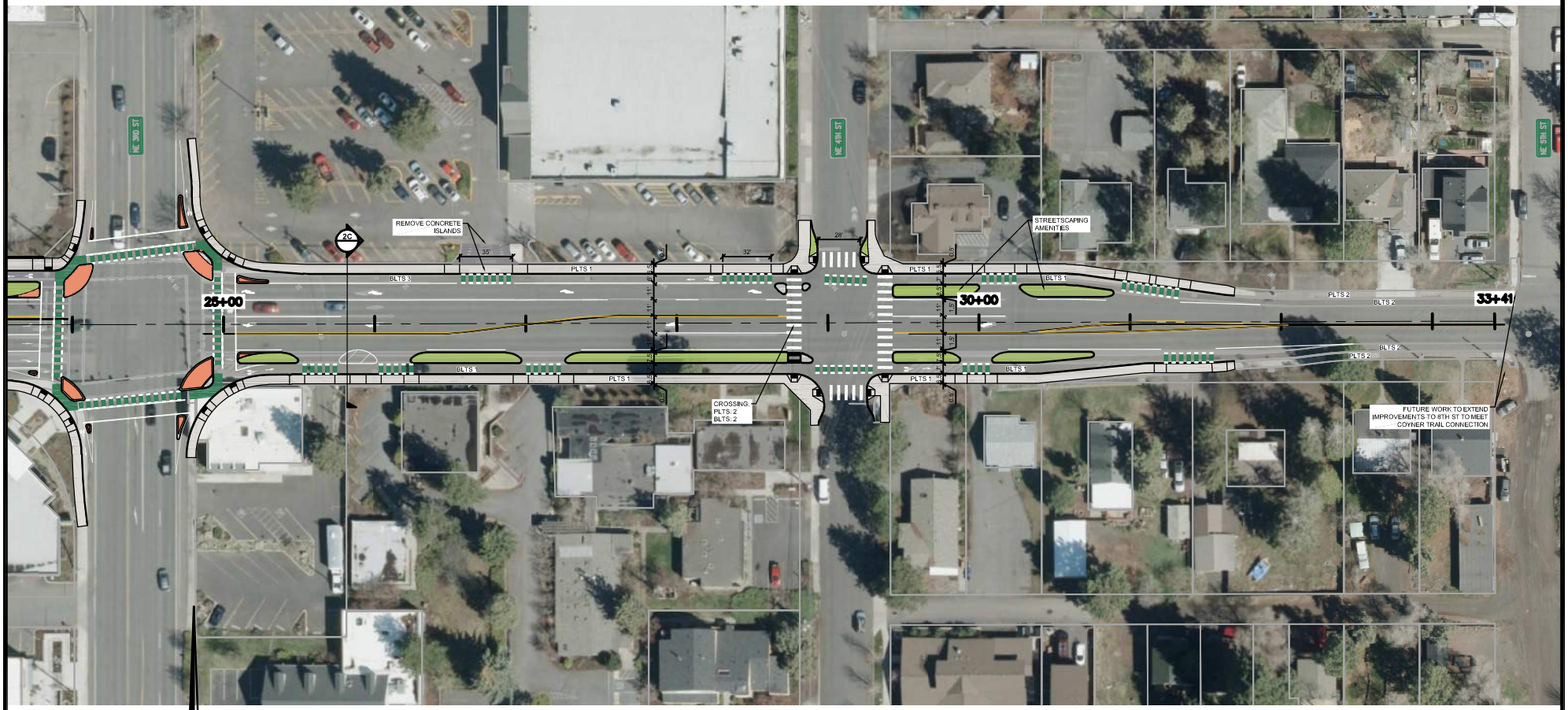
SCALE IN FEET

DOWL
WWW.DOWL.COM

FRANKLIN CORRIDOR CONCEPTS
ALTERNATIVE 2

PROJECT	14608-04
DATE	06/08/2022

FIGURE 2.1



N

100 0 100

SCALE IN FEET

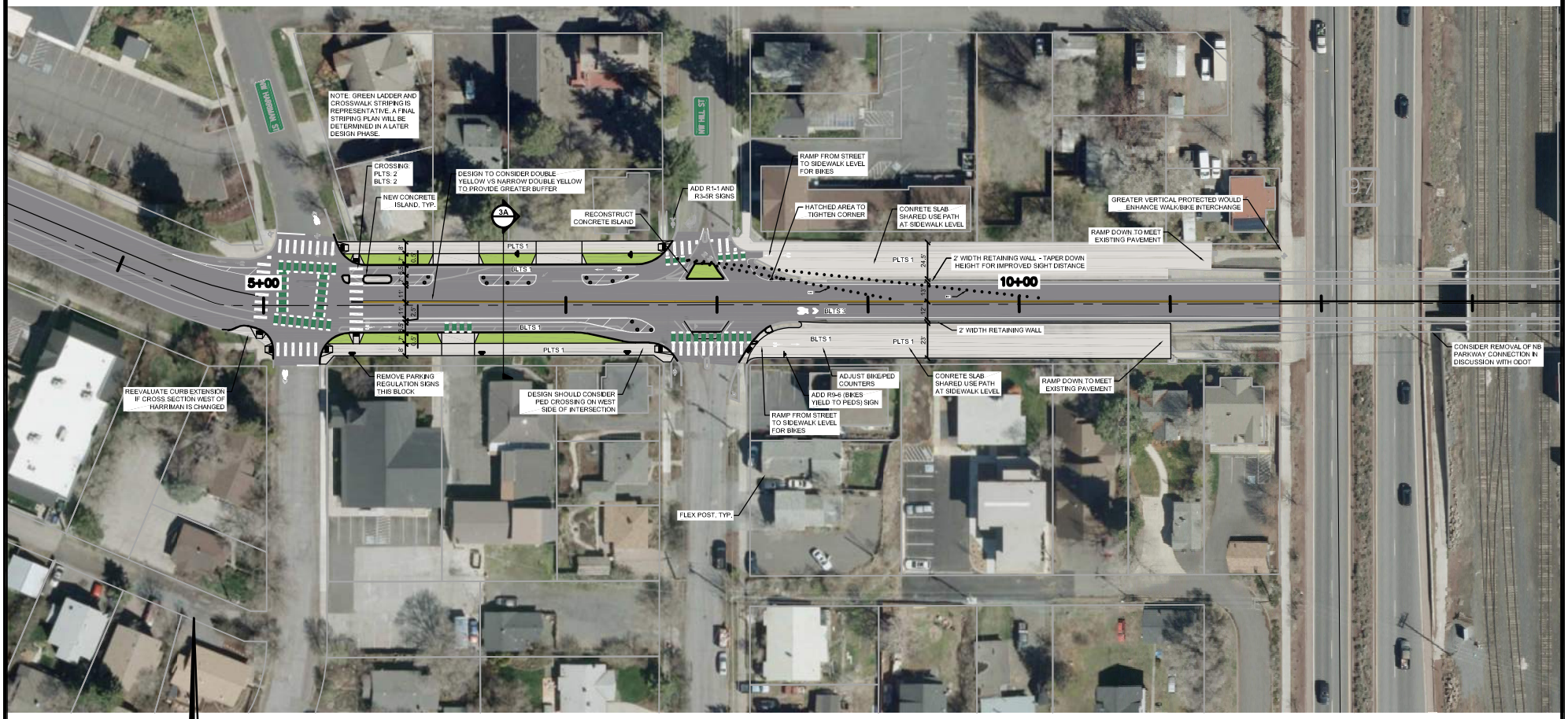
DOWL
WWW.DOWL.COM

FRANKLIN CORRIDOR CONCEPTS
ALTERNATIVE 2

PROJECT	14608-04
DATE	06/08/2022

FIGURE 2.2

APPENDIX A3 – FRANKLIN AVENUE ALTERNATIVE 3



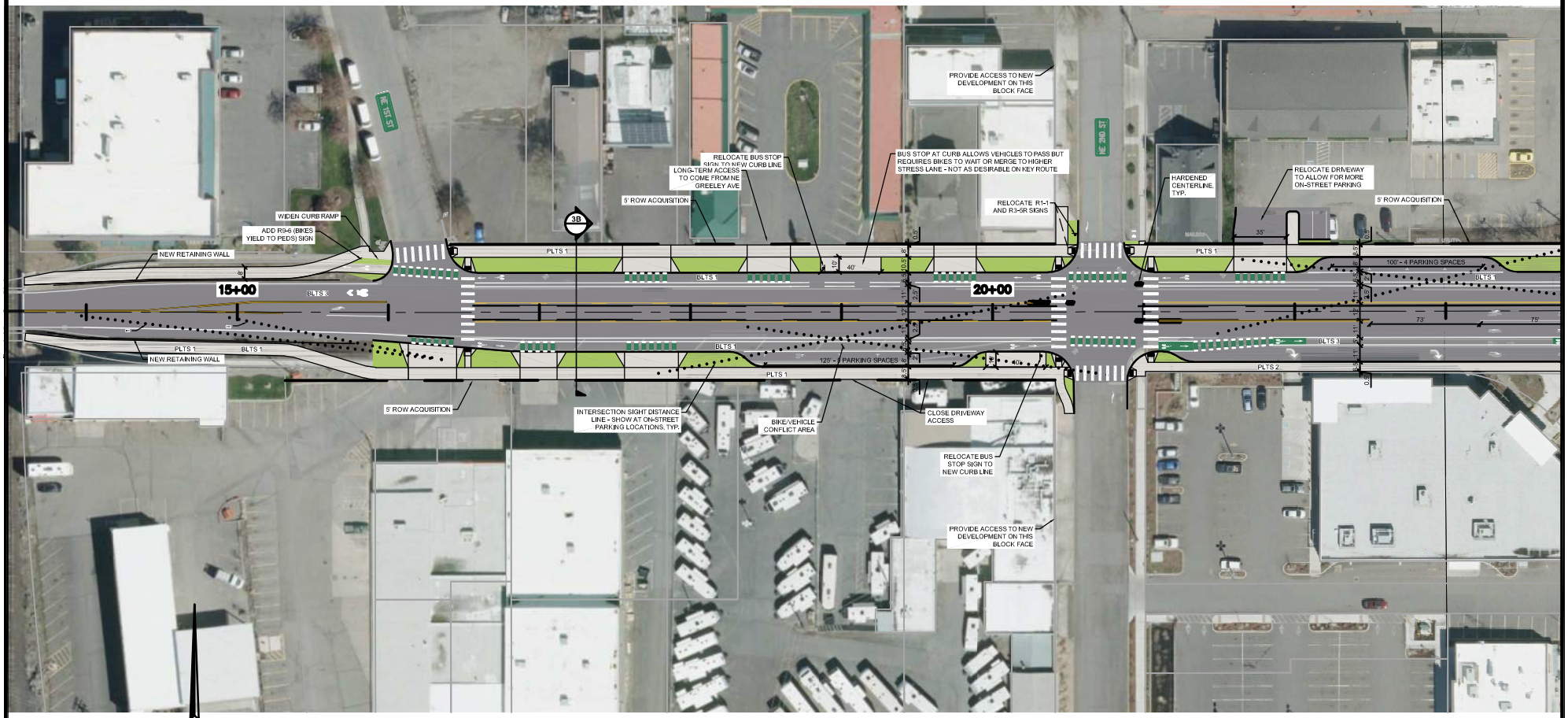
DOWL
WWW.DOWL.COM

FRANKLIN CORRIDOR CONCEPTS
ALTERNATIVE 3

PROJECT	14608-04
DATE	06/08/2022

FIGURE 3.0

C:\dowl_pw\d0395232\Alternative_3.dwg PLOT DATE 2022-6-8 13:06 SAVED DATE 2022-05-27 17:35 USER: mphillis



N

100 0 100

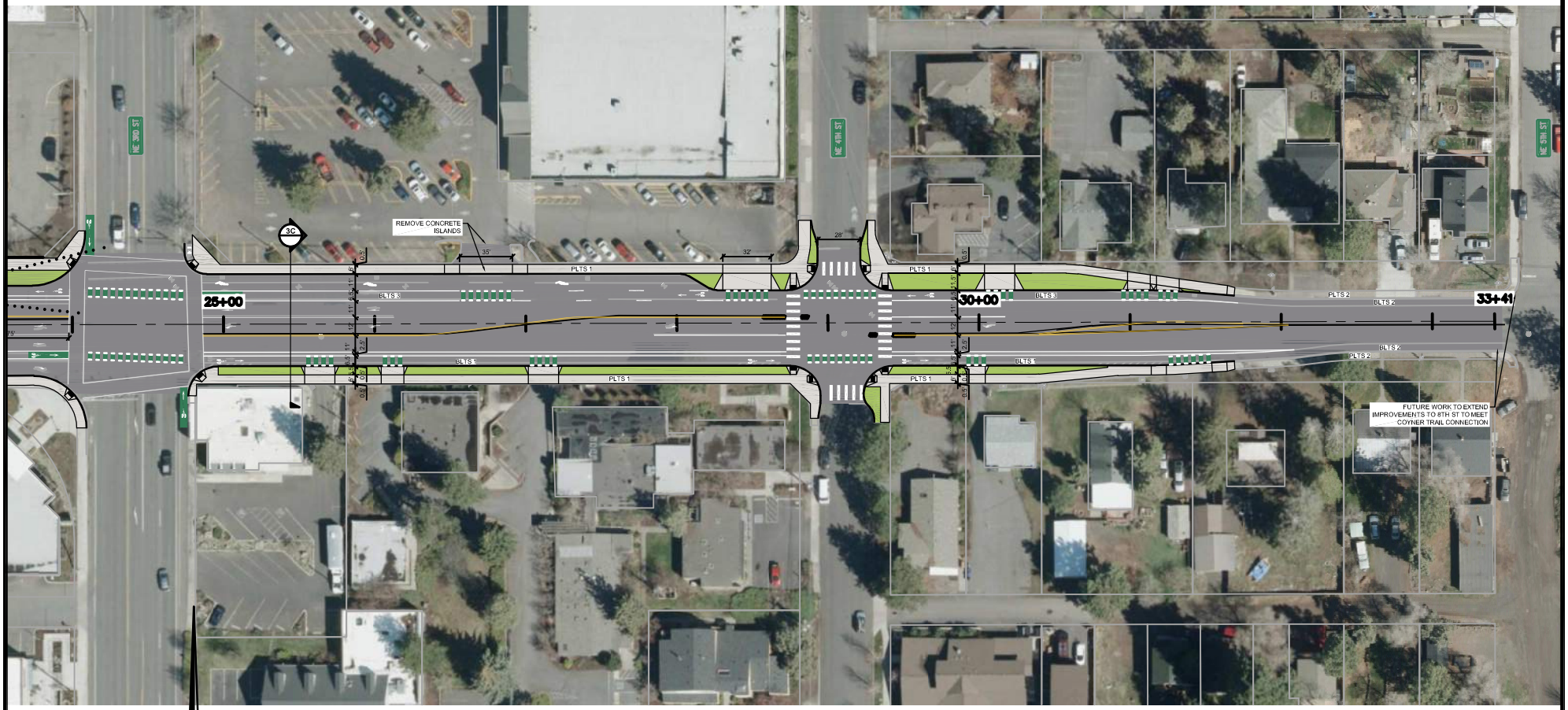
SCALE IN FEET

DOWL
WWW.DOWL.COM

FRANKLIN CORRIDOR CONCEPTS
ALTERNATIVE 3

PROJECT	14608-04
DATE	06/08/2022

FIGURE 3.1



N

100 0 100

SCALE IN FEET

DOWL
WWW.DOWL.COM

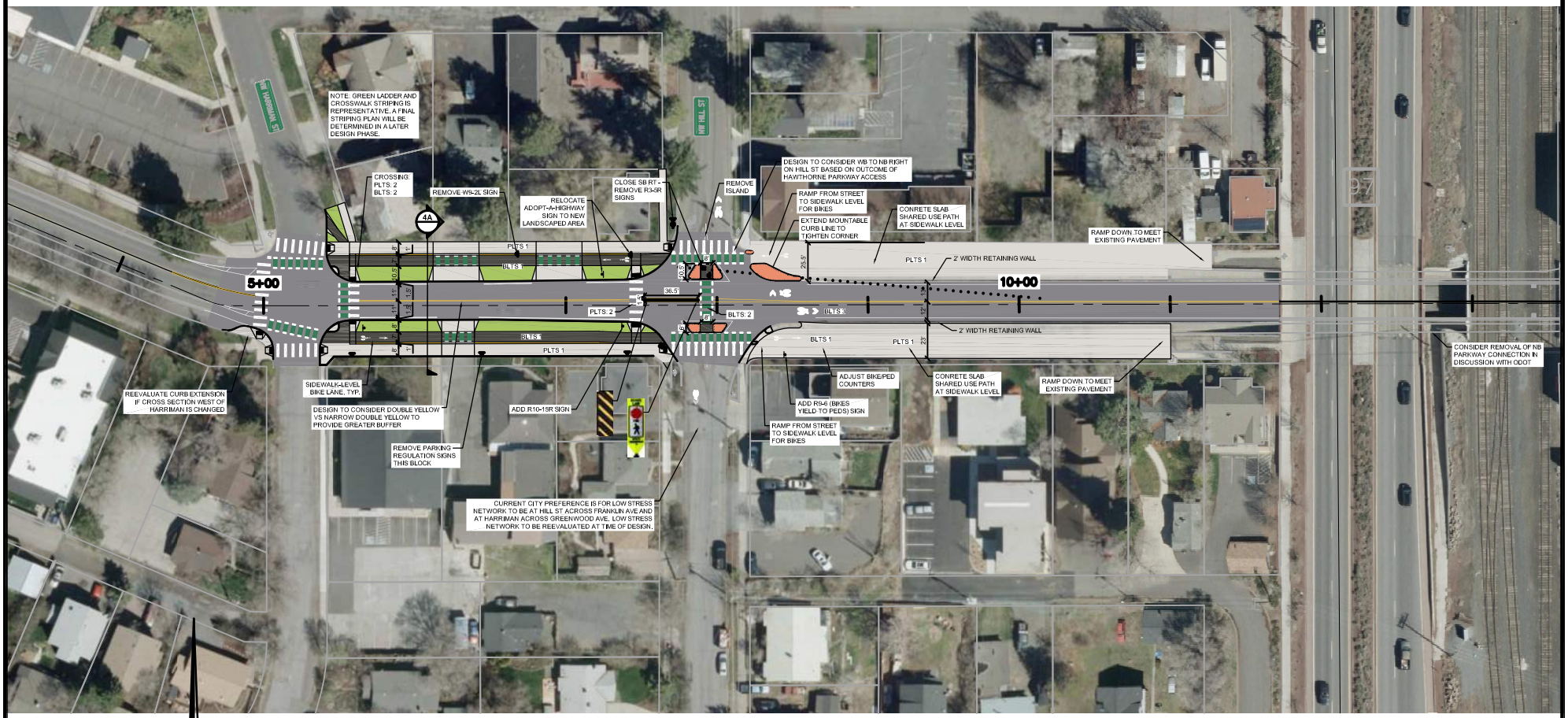
FRANKLIN CORRIDOR CONCEPTS
ALTERNATIVE 3

PROJECT	14608-04
DATE	06/08/2022

FIGURE 3.2

APPENDIX A4 – FRANKLIN AVENUE ALTERNATIVE 4

C:\dowl_pw\d0395232\Alternative_4.dwg PLOT DATE 2022-6-8 13:12 SAVED DATE 2022-05-27 17:22 USER: mphillis

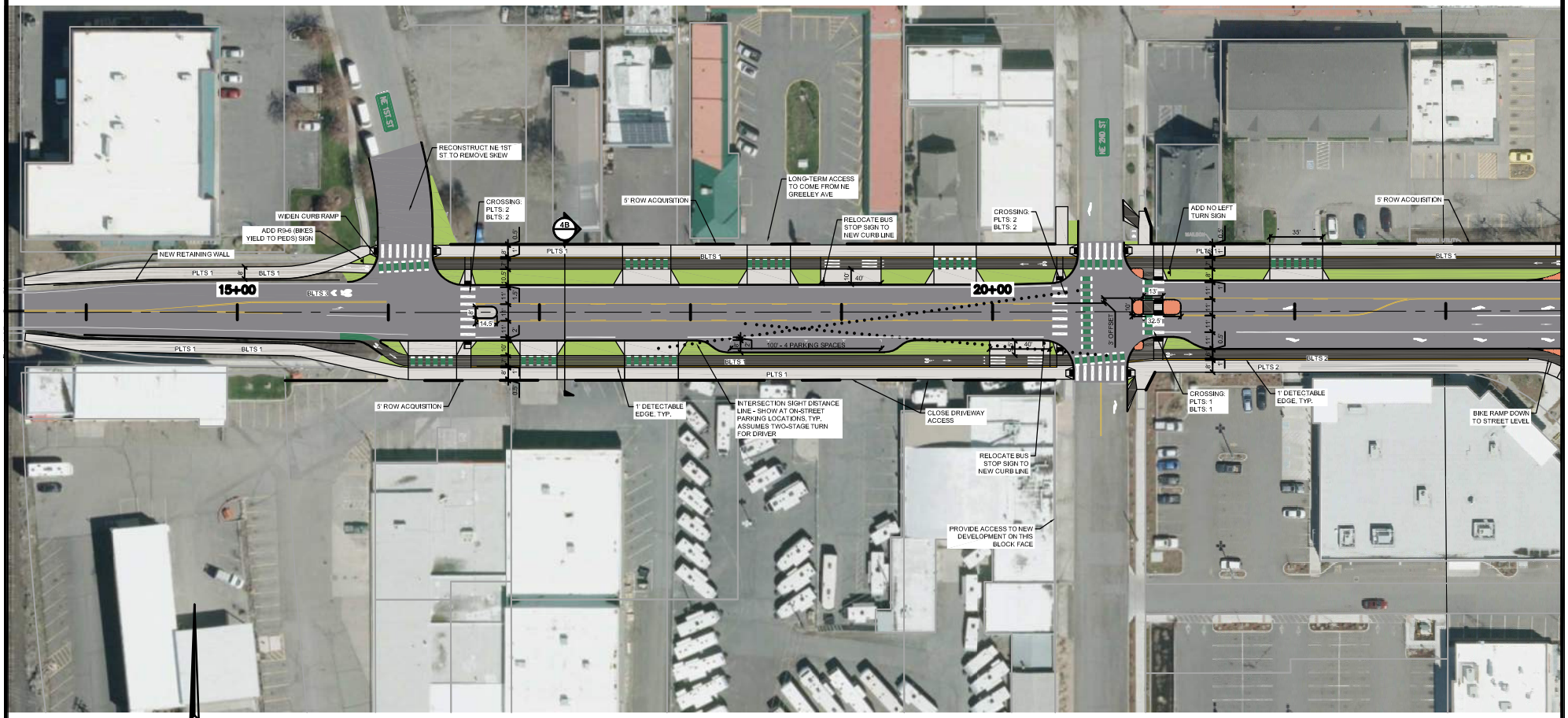


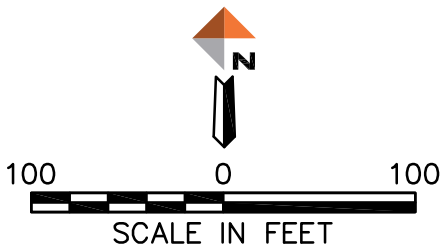
DOWL
WWW.DOWL.COM

FRANKLIN CORRIDOR CONCEPTS
ALTERNATIVE 4

PROJECT	14608-04
DATE	06/08/2022

FIGURE 4.0





DOWL
WWW.DOWL.COM

FRANKLIN CORRIDOR CONCEPTS
ALTERNATIVE 4

PROJECT	14608-04
DATE	06/08/2022

FIGURE 4.1

DOWL
WWW.DOWL.COM

FRANKLIN CORRIDOR CONCEPTS
ALTERNATIVE 4

PROJECT	14608-04
DATE	06/08/2022

FIGURE 4.2

APPENDIX B – TRAFFIC ANALYSIS

APPENDIX

CONTENTS

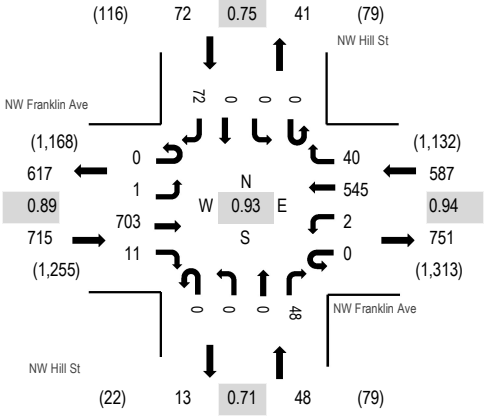
APPENDIX A: TRAFFIC COUNT DATA

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

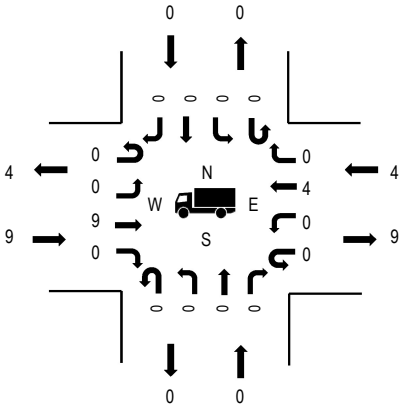
Location: 1 NW Hill St & NW Franklin Ave PM
Date: Wednesday, November 17, 2021
Peak Hour: 04:15 PM - 05:15 PM
Peak 15-Minutes: 05:00 PM - 05:15 PM

Peak Hour

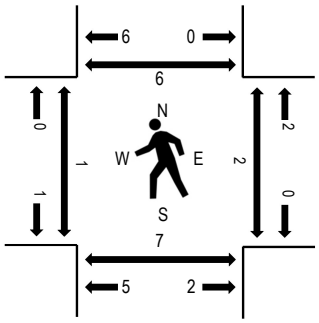
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	1.3%	0.89
WB	0.7%	0.94
NB	0.0%	0.71
SB	0.0%	0.75
All	0.9%	0.93

Traffic Counts - Motorized Vehicles

Interval Start Time	NW Franklin Ave Eastbound				NW Franklin Ave Westbound				NW Hill St Northbound				NW Hill St Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
4:00 PM	0	0	44	1	0	0	46	0	0	0	0	3	0	0	0	4	98	1,374
4:05 PM	0	0	58	2	0	0	52	3	0	0	0	3	0	0	0	6	124	1,405
4:10 PM	0	0	52	2	0	0	46	4	0	0	0	6	0	0	0	4	114	1,408
4:15 PM	0	0	62	1	0	0	48	7	0	0	0	3	0	0	0	7	128	1,422
4:20 PM	0	0	56	0	0	1	38	5	0	0	0	3	0	0	0	7	110	1,398
4:25 PM	0	0	48	1	0	0	55	1	0	0	0	5	0	0	0	9	119	1,400
4:30 PM	0	0	45	0	0	1	42	2	0	0	0	4	0	0	0	8	102	1,389
4:35 PM	0	0	61	2	0	0	35	1	0	0	0	1	0	0	0	6	106	1,388
4:40 PM	0	0	52	0	0	0	49	3	0	0	0	5	0	0	0	3	112	1,382
4:45 PM	0	0	63	1	0	0	34	4	0	0	0	3	0	0	0	4	109	1,350
4:50 PM	0	0	72	3	0	0	48	4	0	0	0	3	0	0	0	0	130	1,318
4:55 PM	0	0	61	1	0	0	49	0	0	0	0	3	0	0	0	8	122	1,266
5:00 PM	0	0	59	0	0	0	52	4	0	0	0	7	0	0	0	7	129	1,208
5:05 PM	0	0	59	0	0	0	51	3	0	0	0	7	0	0	0	7	127	
5:10 PM	0	1	65	2	0	0	44	6	0	0	0	4	0	0	0	6	128	
5:15 PM	0	0	35	1	0	0	54	3	0	0	0	6	0	0	0	5	104	
5:20 PM	0	0	62	0	0	1	43	4	0	0	0	1	0	0	0	1	112	
5:25 PM	0	0	46	1	0	0	52	3	0	0	0	3	0	0	0	3	108	
5:30 PM	0	0	44	1	0	0	39	6	0	0	0	3	0	0	0	8	101	
5:35 PM	0	0	49	0	0	0	43	4	0	0	0	1	0	0	0	3	100	
5:40 PM	0	0	43	0	0	0	32	2	0	0	0	1	0	0	0	2	80	
5:45 PM	0	0	44	0	0	0	29	2	0	0	0	1	0	0	0	1	77	
5:50 PM	0	1	25	0	0	0	43	3	0	0	0	2	0	0	0	4	78	
5:55 PM	0	0	29	0	0	0	28	3	0	0	0	1	0	0	0	3	64	
Count Total	0	2	1,234	19	0	3	1,052	77	0	0	0	79	0	0	0	116	2,582	
Peak Hour	0	1	703	11	0	2	545	40	0	0	0	48	0	0	0	72	1,422	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

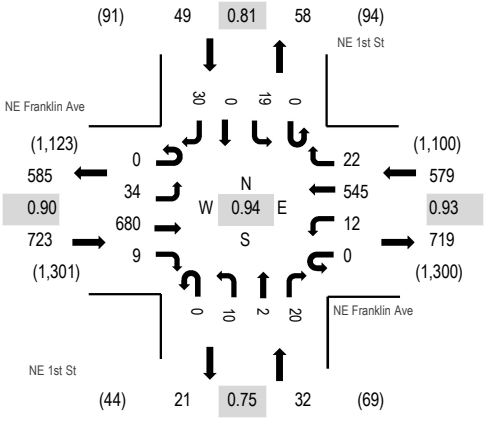
Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	1	0	0	0	1	4:00 PM	0	0	0	0	0	4:00 PM	0	1	0	1	2
4:05 PM	0	0	0	0	0	4:05 PM	2	0	0	0	2	4:05 PM	0	0	0	0	0
4:10 PM	1	0	0	0	1	4:10 PM	1	0	0	0	1	4:10 PM	0	0	1	2	3
4:15 PM	2	0	0	0	2	4:15 PM	0	0	0	0	0	4:15 PM	0	0	0	1	1
4:20 PM	0	0	0	0	0	4:20 PM	0	0	0	0	0	4:20 PM	0	1	0	1	2
4:25 PM	0	0	1	0	1	4:25 PM	0	0	0	0	0	4:25 PM	0	0	0	1	1
4:30 PM	1	0	0	0	1	4:30 PM	1	0	0	0	1	4:30 PM	0	0	0	1	1
4:35 PM	1	0	0	0	1	4:35 PM	1	0	0	0	1	4:35 PM	0	2	2	1	5
4:40 PM	2	0	0	0	2	4:40 PM	0	0	0	0	0	4:40 PM	1	1	0	0	2
4:45 PM	0	0	1	0	1	4:45 PM	0	0	0	0	0	4:45 PM	0	1	0	1	2
4:50 PM	0	0	1	0	1	4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	0	0
4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	1	1
5:00 PM	0	0	0	0	0	5:00 PM	0	0	0	0	0	5:00 PM	0	1	0	2	3
5:05 PM	1	0	1	0	2	5:05 PM	0	0	0	0	0	5:05 PM	0	1	0	0	1
5:10 PM	2	0	0	0	2	5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	0	0
5:15 PM	2	0	1	0	3	5:15 PM	0	0	0	0	0	5:15 PM	0	0	0	0	0
5:20 PM	1	0	0	0	1	5:20 PM	0	0	0	0	0	5:20 PM	0	0	0	1	1
5:25 PM	0	0	0	0	0	5:25 PM	0	0	0	0	0	5:25 PM	0	2	0	1	3
5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0
5:35 PM	0	0	0	0	0	5:35 PM	0	0	0	0	0	5:35 PM	0	1	0	0	1
5:40 PM	1	0	1	0	2	5:40 PM	0	0	0	0	0	5:40 PM	0	0	0	0	0
5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0	5:45 PM	0	0	1	0	1
5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	1	1
5:55 PM	0	0	0	0	0	5:55 PM	1	0	0	0	1	5:55 PM	0	0	0	4	4
Count Total	15	0	6	0	21	Count Total	6	0	0	0	6	Count Total	1	11	4	19	35
Peak Hour	9	0	4	0	13	Peak Hour	2	0	0	0	2	Peak Hour	1	7	2	9	19

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

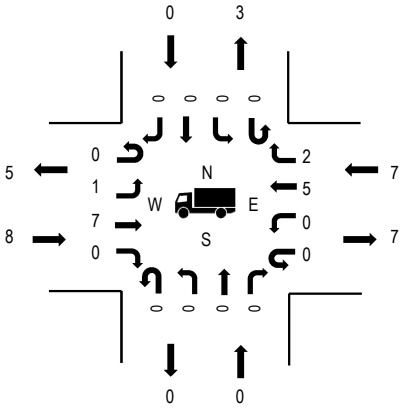
Location: 2 NE 1st St & NE Franklin Ave PM
Date: Wednesday, November 17, 2021
Peak Hour: 04:10 PM - 05:10 PM
Peak 15-Minutes: 04:45 PM - 05:00 PM

Peak Hour

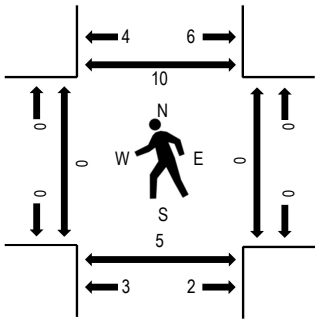
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	1.1%	0.90
WB	1.2%	0.93
NB	0.0%	0.75
SB	0.0%	0.81
All	1.1%	0.94

Traffic Counts - Motorized Vehicles

Interval Start Time	NE Franklin Ave Eastbound				NE Franklin Ave Westbound				NE 1st St Northbound				NE 1st St Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
4:00 PM	0	0	50	1	0	1	44	3	0	1	0	3	0	1	0	2	106	1,367
4:05 PM	0	3	51	1	0	1	47	2	0	1	1	1	0	3	0	3	114	1,376
4:10 PM	0	2	57	2	0	1	51	2	0	1	0	1	0	1	0	4	122	1,383
4:15 PM	0	5	56	1	0	2	45	3	0	2	0	1	0	3	0	2	120	1,379
4:20 PM	0	2	57	0	0	2	45	1	0	1	0	5	0	3	0	3	119	1,364
4:25 PM	0	3	44	0	0	0	42	2	0	1	0	2	0	0	0	4	98	1,380
4:30 PM	0	4	48	1	0	1	45	0	0	1	0	1	0	1	0	3	105	1,375
4:35 PM	0	3	56	0	0	0	41	6	0	0	0	0	0	3	0	1	110	1,369
4:40 PM	0	1	57	1	0	0	40	1	0	0	0	1	0	3	0	3	107	1,364
4:45 PM	0	1	60	2	0	2	47	0	0	1	0	1	0	3	0	1	118	1,337
4:50 PM	0	3	72	0	0	1	43	3	0	1	0	4	0	1	0	2	130	1,297
4:55 PM	0	3	60	0	0	1	46	1	0	1	2	2	0	1	0	1	118	1,254
5:00 PM	0	3	51	1	0	2	54	1	0	1	0	0	0	0	0	2	115	1,194
5:05 PM	0	4	62	1	0	0	46	2	0	0	0	2	0	0	0	4	121	
5:10 PM	0	0	54	2	0	0	53	0	0	0	0	3	0	0	0	6	118	
5:15 PM	0	4	50	0	0	0	47	1	0	2	0	0	0	0	0	1	105	
5:20 PM	0	6	64	3	0	2	53	1	0	0	0	1	0	2	1	2	135	
5:25 PM	0	1	39	1	0	1	46	2	0	0	0	2	0	1	0	0	93	
5:30 PM	0	0	48	0	0	1	40	3	0	0	0	2	0	1	0	4	99	
5:35 PM	0	1	51	3	0	0	38	0	0	3	0	2	0	1	0	6	105	
5:40 PM	0	1	42	1	0	0	32	2	0	0	0	1	0	0	0	1	80	
5:45 PM	0	1	47	0	0	1	25	0	0	0	0	2	0	0	1	1	78	
5:50 PM	0	0	27	0	0	1	52	0	0	1	0	3	0	0	0	3	87	
5:55 PM	0	2	23	1	0	0	21	1	0	1	1	6	0	0	0	2	58	
Count Total	0	53	1,226	22	0	20	1,043	37	0	19	4	46	0	28	2	61	2,561	
Peak Hour	0	34	680	9	0	12	545	22	0	10	2	20	0	19	0	30	1,383	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

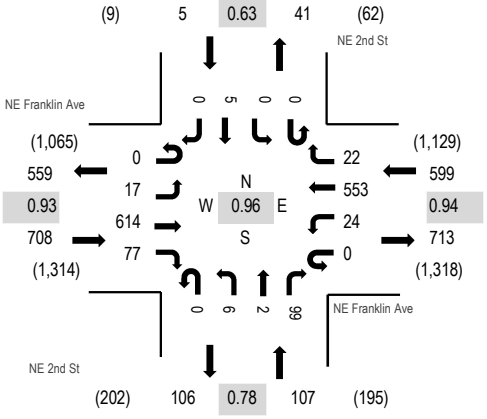
Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	1	0	0	0	1	4:00 PM	0	0	0	0	0	4:00 PM	0	1	0	4	5
4:05 PM	0	0	0	0	0	4:05 PM	1	0	0	0	1	4:05 PM	0	0	0	3	3
4:10 PM	3	0	0	0	3	4:10 PM	0	0	1	0	1	4:10 PM	0	2	0	3	5
4:15 PM	1	0	0	0	1	4:15 PM	0	0	0	0	0	4:15 PM	0	1	0	2	3
4:20 PM	0	0	1	0	1	4:20 PM	0	0	1	0	1	4:20 PM	0	1	0	2	3
4:25 PM	0	0	1	0	1	4:25 PM	0	0	0	0	0	4:25 PM	0	1	0	1	2
4:30 PM	1	0	0	0	1	4:30 PM	0	0	0	0	0	4:30 PM	0	1	0	0	1
4:35 PM	1	0	1	0	2	4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	0	0
4:40 PM	1	0	0	0	1	4:40 PM	0	0	0	0	0	4:40 PM	0	1	0	0	1
4:45 PM	0	0	2	0	2	4:45 PM	0	0	0	0	0	4:45 PM	0	0	0	1	1
4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	1	1
4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	1	1
5:00 PM	0	0	1	0	1	5:00 PM	0	0	0	0	0	5:00 PM	0	1	0	1	2
5:05 PM	1	0	1	0	2	5:05 PM	0	0	0	0	0	5:05 PM	0	1	0	1	2
5:10 PM	1	0	0	0	1	5:10 PM	0	0	0	0	0	5:10 PM	0	1	0	1	2
5:15 PM	2	0	0	0	2	5:15 PM	0	0	0	0	0	5:15 PM	0	2	0	2	4
5:20 PM	1	0	0	0	1	5:20 PM	0	0	0	0	0	5:20 PM	0	1	0	1	2
5:25 PM	0	0	0	0	0	5:25 PM	0	0	0	0	0	5:25 PM	0	0	0	0	0
5:30 PM	0	0	1	0	1	5:30 PM	0	0	0	1	1	5:30 PM	0	3	0	0	3
5:35 PM	0	0	1	0	1	5:35 PM	0	0	0	0	0	5:35 PM	0	2	0	0	2
5:40 PM	1	0	0	0	1	5:40 PM	0	0	0	0	0	5:40 PM	0	0	0	0	0
5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0	5:45 PM	0	2	0	0	2
5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	1	1
5:55 PM	1	0	0	0	1	5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	2	2
Count Total	15	0	9	0	24	Count Total	1	0	2	1	4	Count Total	0	21	0	27	48
Peak Hour	8	0	7	0	15	Peak Hour	0	0	2	0	2	Peak Hour	0	9	0	13	22

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

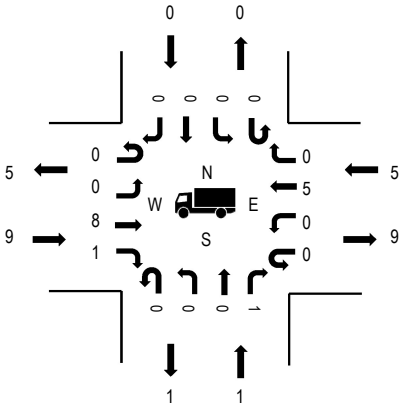
Location: 3 NE 2nd St & NE Franklin Ave PM
Date: Wednesday, November 17, 2021
Peak Hour: 04:10 PM - 05:10 PM
Peak 15-Minutes: 04:10 PM - 04:25 PM

Peak Hour

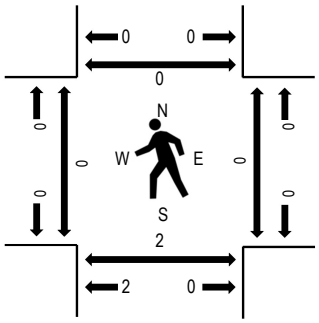
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	1.3%	0.93
WB	0.8%	0.94
NB	0.9%	0.78
SB	0.0%	0.63
All	1.1%	0.96

Traffic Counts - Motorized Vehicles

Interval Start Time	NE Franklin Ave Eastbound				NE Franklin Ave Westbound				NE 2nd St Northbound				NE 2nd St Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
4:00 PM	0	1	42	6	0	0	43	4	0	1	0	12	0	0	1	0	110	1,412
4:05 PM	0	1	60	6	0	0	54	1	0	0	0	7	0	0	0	0	129	1,410
4:10 PM	0	1	52	4	0	1	42	2	0	2	0	8	0	0	0	0	112	1,419
4:15 PM	0	0	57	8	0	3	59	4	0	0	0	5	0	0	1	0	137	1,409
4:20 PM	0	2	60	4	0	2	45	1	0	0	0	4	0	0	1	0	119	1,390
4:25 PM	0	1	43	8	0	0	41	1	0	1	0	8	0	0	0	0	103	1,398
4:30 PM	0	0	39	7	0	1	45	4	0	3	0	11	0	0	1	0	111	1,399
4:35 PM	0	4	49	8	0	3	40	1	0	0	0	10	0	0	0	0	115	1,411
4:40 PM	0	2	50	4	0	2	50	2	0	0	0	4	0	0	0	0	114	1,391
4:45 PM	0	0	52	9	0	3	47	2	0	0	0	9	0	0	0	0	122	1,363
4:50 PM	0	1	62	6	0	1	41	2	0	0	0	7	0	0	1	0	121	1,330
4:55 PM	0	3	52	5	0	1	51	0	0	0	0	7	0	0	0	0	119	1,295
5:00 PM	0	2	43	4	0	2	42	1	0	0	1	13	0	0	0	0	108	1,235
5:05 PM	0	1	55	10	0	5	50	2	0	0	1	13	0	0	1	0	138	
5:10 PM	0	2	37	11	0	4	41	0	0	0	0	7	0	0	0	0	102	
5:15 PM	0	0	51	3	0	2	55	0	0	0	0	7	0	0	0	0	118	
5:20 PM	0	2	56	11	0	1	49	0	0	0	1	6	0	0	1	0	127	
5:25 PM	0	2	40	5	0	4	50	0	0	0	0	3	0	0	0	0	104	
5:30 PM	0	1	55	8	0	2	47	1	0	0	0	9	0	0	0	0	123	
5:35 PM	0	1	45	7	0	3	31	2	0	3	0	3	0	0	0	0	95	
5:40 PM	0	0	34	6	0	2	34	0	0	0	0	9	0	1	0	0	86	
5:45 PM	0	1	45	4	0	3	27	0	0	1	0	8	0	0	0	0	89	
5:50 PM	0	1	29	1	0	0	46	0	0	2	0	7	0	0	0	0	86	
5:55 PM	0	0	30	2	0	2	22	0	0	0	0	2	0	0	1	0	59	
Count Total	0	29	1,138	147	0	47	1,052	30	0	13	3	179	0	1	8	0	2,647	
Peak Hour	0	17	614	77	0	24	553	22	0	6	2	99	0	0	5	0	1,419	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

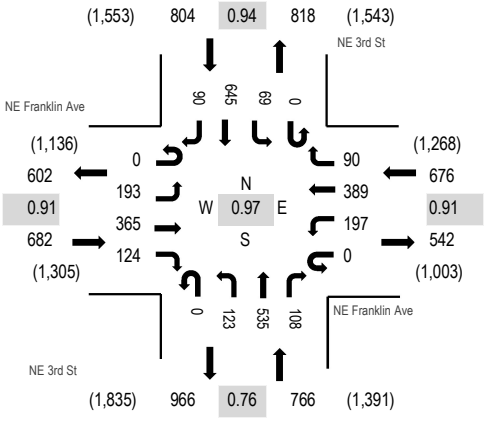
Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	2	0	0	0	2	4:00 PM	0	0	1	0	1	4:00 PM	0	1	1	0	2
4:05 PM	1	0	0	0	1	4:05 PM	0	0	0	0	0	4:05 PM	0	1	0	0	1
4:10 PM	2	0	0	0	2	4:10 PM	1	0	0	0	1	4:10 PM	0	0	0	0	0
4:15 PM	2	0	0	0	2	4:15 PM	1	0	0	0	1	4:15 PM	0	1	0	0	1
4:20 PM	0	0	1	0	1	4:20 PM	1	0	0	0	1	4:20 PM	0	0	0	0	0
4:25 PM	0	1	1	0	2	4:25 PM	0	0	0	0	0	4:25 PM	0	0	0	0	0
4:30 PM	0	0	0	0	0	4:30 PM	0	0	0	0	0	4:30 PM	0	0	0	0	0
4:35 PM	1	0	0	0	1	4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	0	0
4:40 PM	1	0	0	0	1	4:40 PM	0	0	0	0	0	4:40 PM	0	1	0	0	1
4:45 PM	0	0	2	0	2	4:45 PM	0	0	2	0	2	4:45 PM	0	0	0	0	0
4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	0	0
4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0
5:00 PM	0	0	0	0	0	5:00 PM	0	0	0	0	0	5:00 PM	0	0	0	0	0
5:05 PM	3	0	1	0	4	5:05 PM	0	0	0	0	0	5:05 PM	0	0	0	0	0
5:10 PM	1	0	0	0	1	5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	0	0
5:15 PM	2	0	0	0	2	5:15 PM	0	0	0	0	0	5:15 PM	0	0	0	0	0
5:20 PM	1	0	0	0	1	5:20 PM	0	0	0	0	0	5:20 PM	0	0	0	0	0
5:25 PM	0	0	0	0	0	5:25 PM	0	0	0	0	0	5:25 PM	0	0	0	0	0
5:30 PM	0	0	1	0	1	5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0
5:35 PM	0	0	0	0	0	5:35 PM	0	0	0	0	0	5:35 PM	0	2	0	0	2
5:40 PM	1	0	1	0	2	5:40 PM	0	0	0	0	0	5:40 PM	0	0	0	0	0
5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0
5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0
5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0
Count Total	17	1	7	0	25	Count Total	3	0	3	0	6	Count Total	0	6	1	0	7
Peak Hour	9	1	5	0	15	Peak Hour	3	0	2	0	5	Peak Hour	0	2	0	0	2

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

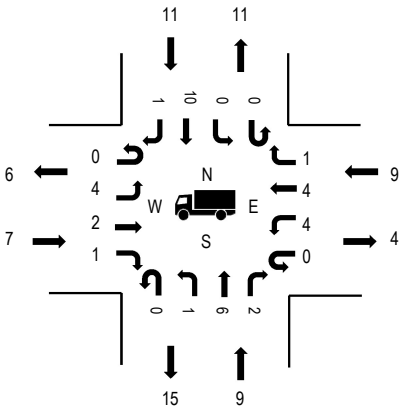
Location: 4 NE 3rd St & NE Franklin Ave PM
Date: Wednesday, November 17, 2021
Peak Hour: 04:40 PM - 05:40 PM
Peak 15-Minutes: 04:50 PM - 05:05 PM

Peak Hour

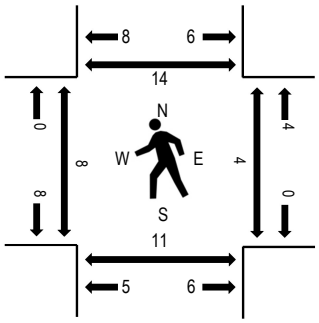
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	1.0%	0.91
WB	1.3%	0.91
NB	1.2%	0.76
SB	1.4%	0.94
All	1.2%	0.97

Traffic Counts - Motorized Vehicles

Interval Start Time	NE Franklin Ave Eastbound				NE Franklin Ave Westbound				NE 3rd St Northbound				NE 3rd St Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
4:00 PM	0	19	30	5	0	18	39	13	0	10	36	8	0	8	49	12	247	2,775
4:05 PM	0	22	31	14	0	18	27	6	0	5	46	8	0	2	56	8	243	2,815
4:10 PM	0	17	31	3	0	9	34	5	0	14	48	8	0	8	50	14	241	2,802
4:15 PM	0	21	34	17	0	25	36	6	0	9	26	8	0	6	43	12	243	2,793
4:20 PM	0	16	23	13	0	17	25	4	0	8	32	4	0	6	54	10	212	2,783
4:25 PM	0	18	28	7	0	11	37	7	0	7	34	12	0	8	50	2	221	2,847
4:30 PM	0	21	25	9	0	18	26	9	0	8	30	5	0	4	65	9	229	2,860
4:35 PM	0	17	28	5	0	15	28	7	0	9	34	9	0	7	54	5	218	2,865
4:40 PM	0	16	34	13	0	12	47	5	0	13	24	6	0	2	44	4	220	2,928
4:45 PM	0	21	21	18	0	19	18	6	0	10	35	7	0	3	66	13	237	2,893
4:50 PM	0	18	38	13	0	15	39	8	0	11	32	3	0	10	49	7	243	2,848
4:55 PM	0	25	31	13	0	21	24	9	0	8	21	5	0	3	53	8	221	2,805
5:00 PM	0	13	34	9	0	15	48	12	0	11	56	8	0	9	68	4	287	2,742
5:05 PM	0	16	29	11	0	24	34	3	0	4	36	10	0	10	44	9	230	
5:10 PM	0	13	31	5	0	15	36	4	0	6	41	8	0	7	57	9	232	
5:15 PM	0	12	37	3	0	19	35	11	0	7	41	5	0	4	53	6	233	
5:20 PM	0	17	22	8	0	15	28	5	0	14	72	10	0	8	66	11	276	
5:25 PM	0	11	33	12	0	20	36	13	0	18	42	10	0	4	32	3	234	
5:30 PM	0	18	23	5	0	5	15	7	0	11	52	22	0	6	58	12	234	
5:35 PM	0	13	32	14	0	17	29	7	0	10	83	14	0	3	55	4	281	
5:40 PM	0	17	23	6	0	26	20	2	0	9	30	5	0	9	30	8	185	
5:45 PM	0	17	28	9	0	14	26	5	0	4	31	6	0	2	46	4	192	
5:50 PM	0	15	20	5	0	8	23	4	0	13	44	8	0	2	49	9	200	
5:55 PM	0	11	10	8	0	5	10	9	0	8	46	3	0	4	38	6	158	
Count Total	0	404	676	225	0	381	720	167	0	227	972	192	0	135	1,229	189	5,517	
Peak Hour	0	193	365	124	0	197	389	90	0	123	535	108	0	69	645	90	2,928	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

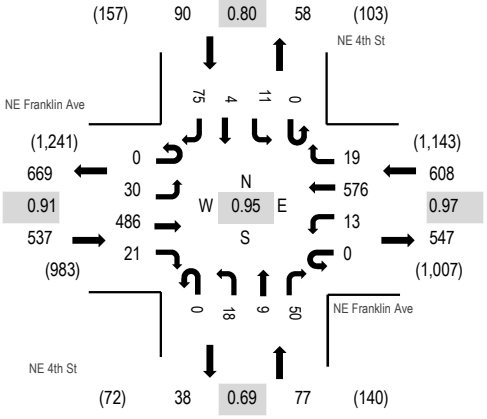
Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	3	1	1	0	5	4:00 PM	0	0	0	0	0	4:00 PM	2	1	0	2	5
4:05 PM	1	0	3	1	5	4:05 PM	0	0	0	0	0	4:05 PM	0	1	0	2	3
4:10 PM	2	1	0	4	7	4:10 PM	0	0	0	0	0	4:10 PM	0	0	0	2	2
4:15 PM	2	1	1	2	6	4:15 PM	1	0	0	0	1	4:15 PM	0	0	0	1	1
4:20 PM	0	0	0	2	2	4:20 PM	0	0	0	0	0	4:20 PM	0	0	0	0	0
4:25 PM	1	2	2	2	7	4:25 PM	1	0	0	0	1	4:25 PM	0	0	0	2	2
4:30 PM	0	0	0	3	3	4:30 PM	0	0	0	0	0	4:30 PM	0	0	0	1	1
4:35 PM	1	2	0	0	3	4:35 PM	1	0	0	0	1	4:35 PM	0	0	3	0	3
4:40 PM	1	2	0	0	3	4:40 PM	0	0	0	0	0	4:40 PM	2	2	2	2	8
4:45 PM	0	1	2	2	5	4:45 PM	0	0	0	0	0	4:45 PM	2	0	0	0	2
4:50 PM	0	2	0	1	3	4:50 PM	0	0	0	0	0	4:50 PM	2	2	1	2	7
4:55 PM	0	0	0	2	2	4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	3	3
5:00 PM	0	1	1	4	6	5:00 PM	0	0	0	0	0	5:00 PM	0	0	0	2	2
5:05 PM	1	1	0	0	2	5:05 PM	0	0	0	0	0	5:05 PM	0	0	0	1	1
5:10 PM	2	0	1	1	4	5:10 PM	0	0	0	0	0	5:10 PM	0	3	0	0	3
5:15 PM	2	0	1	0	3	5:15 PM	0	0	0	0	0	5:15 PM	0	0	1	0	1
5:20 PM	0	2	0	0	2	5:20 PM	0	0	0	0	0	5:20 PM	0	0	0	1	1
5:25 PM	1	0	2	1	4	5:25 PM	0	0	0	0	0	5:25 PM	2	0	0	2	4
5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0	5:30 PM	0	1	0	1	2
5:35 PM	0	0	2	0	2	5:35 PM	0	0	0	0	0	5:35 PM	0	3	0	0	3
5:40 PM	1	1	1	1	4	5:40 PM	0	0	0	0	0	5:40 PM	0	2	0	2	4
5:45 PM	0	0	1	0	1	5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	2	2
5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	2	2
5:55 PM	0	1	0	1	2	5:55 PM	0	0	0	0	0	5:55 PM	1	0	3	0	4
Count Total	18	18	18	27	81	Count Total	3	0	0	0	3	Count Total	11	15	10	30	66
Peak Hour	7	9	9	11	36	Peak Hour	0	0	0	0	0	Peak Hour	8	11	4	14	37

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

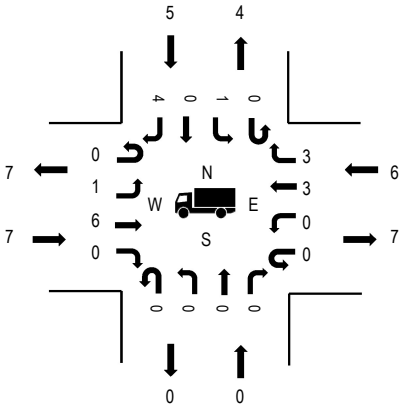
Location: 5 NE 4th St & NE Franklin Ave PM
Date: Wednesday, November 17, 2021
Peak Hour: 04:35 PM - 05:35 PM
Peak 15-Minutes: 05:25 PM - 05:40 PM

Peak Hour

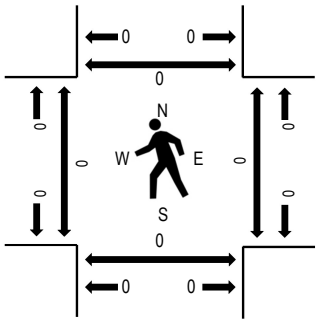
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	1.3%	0.91
WB	1.0%	0.97
NB	0.0%	0.69
SB	5.6%	0.80
All	1.4%	0.95

Traffic Counts - Motorized Vehicles

Interval Start Time	NE Franklin Ave Eastbound				NE Franklin Ave Westbound				NE 4th St Northbound				NE 4th St Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
4:00 PM	0	0	39	1	0	2	55	1	0	0	0	2	0	0	0	5	105	1,236
4:05 PM	0	4	30	1	0	2	46	0	0	1	0	5	0	2	0	6	97	1,244
4:10 PM	0	4	46	2	0	0	41	2	0	2	0	2	0	3	2	5	109	1,256
4:15 PM	0	3	34	4	0	4	52	3	0	1	1	4	0	1	1	6	114	1,264
4:20 PM	0	3	34	2	0	0	42	1	0	6	0	5	0	1	1	4	99	1,255
4:25 PM	0	1	39	0	0	0	48	1	0	2	0	1	0	0	0	3	95	1,264
4:30 PM	0	1	29	1	0	0	45	2	0	5	1	1	0	0	0	1	86	1,281
4:35 PM	0	1	49	1	0	1	49	1	0	2	0	5	0	1	2	7	119	1,312
4:40 PM	0	2	37	1	0	3	44	1	0	1	1	2	0	1	0	2	95	1,309
4:45 PM	0	2	28	2	0	1	52	3	0	3	1	2	0	1	0	6	101	1,290
4:50 PM	0	2	45	2	0	1	44	2	0	1	0	8	0	0	0	5	110	1,264
4:55 PM	0	3	35	2	0	3	50	1	0	0	0	2	0	0	0	10	106	1,241
5:00 PM	0	2	40	4	0	0	54	1	0	1	0	3	0	1	0	7	113	1,187
5:05 PM	0	5	38	3	0	0	45	1	0	1	1	4	0	2	0	9	109	
5:10 PM	0	3	46	1	0	0	55	2	0	1	1	3	0	1	1	3	117	
5:15 PM	0	4	37	1	0	2	41	2	0	6	1	4	0	0	0	7	105	
5:20 PM	0	2	38	2	0	0	49	3	0	1	2	5	0	2	0	4	108	
5:25 PM	0	1	44	2	0	1	53	1	0	0	0	0	0	1	0	9	112	
5:30 PM	0	3	49	0	0	1	40	1	0	1	2	12	0	1	1	6	117	
5:35 PM	0	5	44	0	0	0	43	1	0	1	3	11	0	2	0	6	116	
5:40 PM	0	2	34	0	0	1	29	1	0	1	0	0	0	2	1	5	76	
5:45 PM	0	0	27	0	0	1	38	1	0	0	0	1	0	2	3	2	75	
5:50 PM	0	1	37	0	0	1	43	1	0	0	0	3	0	0	0	1	87	
5:55 PM	0	1	17	0	0	2	25	1	0	2	0	2	0	0	2	0	52	
Count Total	0	55	896	32	0	26	1,083	34	0	39	14	87	0	24	14	119	2,423	
Peak Hour	0	30	486	21	0	13	576	19	0	18	9	50	0	11	4	75	1,312	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

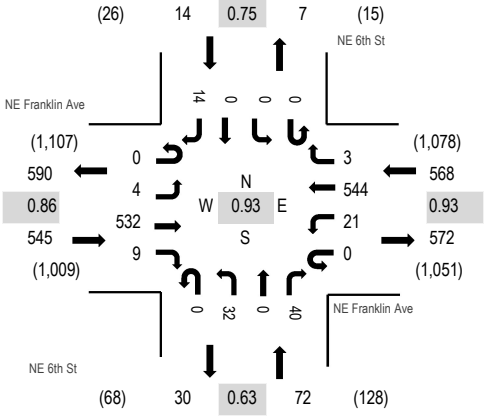
Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	1	0	1	1	3	4:00 PM	0	0	0	0	0	4:00 PM	0	0	0	0	0
4:05 PM	2	0	0	2	4	4:05 PM	0	0	0	0	0	4:05 PM	0	0	0	0	0
4:10 PM	4	0	0	0	4	4:10 PM	0	0	0	0	0	4:10 PM	0	0	0	0	0
4:15 PM	3	0	1	0	4	4:15 PM	0	0	0	0	0	4:15 PM	0	0	0	0	0
4:20 PM	1	0	0	0	1	4:20 PM	1	0	0	0	1	4:20 PM	0	0	0	0	0
4:25 PM	0	2	0	0	2	4:25 PM	1	0	0	0	1	4:25 PM	0	0	0	0	0
4:30 PM	0	0	0	0	0	4:30 PM	0	0	0	0	0	4:30 PM	0	0	0	0	0
4:35 PM	1	0	1	0	2	4:35 PM	1	0	0	0	1	4:35 PM	0	0	0	0	0
4:40 PM	1	0	0	0	1	4:40 PM	0	0	0	0	0	4:40 PM	0	0	0	0	0
4:45 PM	1	0	1	3	5	4:45 PM	0	0	0	0	0	4:45 PM	0	0	0	0	0
4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	0	0
4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0
5:00 PM	1	0	0	1	2	5:00 PM	0	0	0	0	0	5:00 PM	0	0	0	0	0
5:05 PM	1	0	0	0	1	5:05 PM	0	0	0	0	0	5:05 PM	0	0	0	0	0
5:10 PM	0	0	2	0	2	5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	0	0
5:15 PM	1	0	1	0	2	5:15 PM	0	0	0	0	0	5:15 PM	0	0	0	0	0
5:20 PM	1	0	1	1	3	5:20 PM	0	0	0	0	0	5:20 PM	0	0	0	0	0
5:25 PM	0	0	0	0	0	5:25 PM	0	0	0	0	0	5:25 PM	0	0	0	0	0
5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0
5:35 PM	0	0	2	1	3	5:35 PM	0	0	0	0	0	5:35 PM	0	0	0	0	0
5:40 PM	1	0	0	0	1	5:40 PM	0	0	0	0	0	5:40 PM	0	0	0	0	0
5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0
5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0
5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0
Count Total	19	2	10	9	40	Count Total	3	0	0	0	3	Count Total	0	0	0	0	0
Peak Hour	7	0	6	5	18	Peak Hour	1	0	0	0	1	Peak Hour	0	0	0	0	0

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

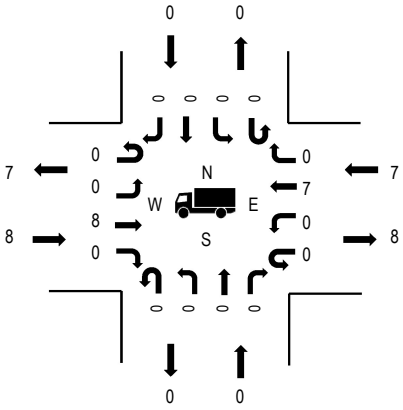
Location: 7 NE 6th St & NE Franklin Ave PM
Date: Wednesday, November 17, 2021
Peak Hour: 04:35 PM - 05:35 PM
Peak 15-Minutes: 05:20 PM - 05:35 PM

Peak Hour

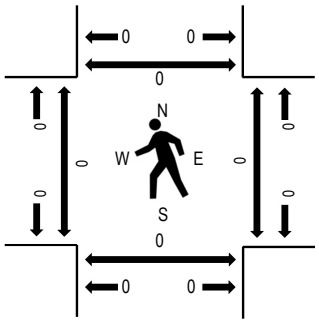
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	1.5%	0.86
WB	1.2%	0.93
NB	0.0%	0.63
SB	0.0%	0.75
All	1.3%	0.93

Traffic Counts - Motorized Vehicles

Interval Start Time	NE Franklin Ave Eastbound				NE Franklin Ave Westbound				NE 6th St Northbound				NE 6th St Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
4:00 PM	0	1	36	2	0	2	56	0	0	6	0	4	0	0	0	2	109	1,154
4:05 PM	0	2	38	1	0	2	43	0	0	3	0	5	0	0	0	1	95	1,146
4:10 PM	0	0	48	2	0	2	44	0	0	0	0	2	0	0	0	0	98	1,145
4:15 PM	0	1	37	0	0	0	49	0	0	1	0	5	0	0	0	0	93	1,151
4:20 PM	0	0	38	1	0	0	44	0	0	3	0	3	0	0	0	1	90	1,138
4:25 PM	0	1	36	1	0	2	36	0	0	2	0	3	0	0	0	0	81	1,162
4:30 PM	0	0	35	1	0	1	46	0	0	2	0	2	0	1	0	1	89	1,187
4:35 PM	0	1	55	1	0	0	44	1	0	4	0	4	0	0	0	1	111	1,199
4:40 PM	0	0	37	1	0	2	38	0	0	0	0	4	0	0	0	1	83	1,185
4:45 PM	0	0	32	0	0	1	52	0	0	1	0	1	0	0	0	1	88	1,174
4:50 PM	0	1	51	1	0	4	42	0	0	3	0	5	0	0	0	2	109	1,167
4:55 PM	0	0	37	2	0	3	50	1	0	6	0	7	0	0	0	2	108	1,142
5:00 PM	0	0	46	2	0	0	43	0	0	5	0	4	0	0	0	1	101	1,087
5:05 PM	0	2	43	1	0	1	41	0	0	4	0	1	0	0	0	1	94	
5:10 PM	0	0	46	1	0	2	51	0	0	2	0	1	0	0	0	1	104	
5:15 PM	0	0	31	0	0	2	42	1	0	1	0	2	0	0	0	1	80	
5:20 PM	0	0	50	0	0	1	55	0	0	2	0	6	0	0	0	0	114	
5:25 PM	0	0	45	0	0	4	50	0	0	3	0	2	0	0	0	2	106	
5:30 PM	0	0	59	0	0	1	36	0	0	1	0	3	0	0	0	1	101	
5:35 PM	0	0	54	1	0	2	37	0	0	1	0	1	0	0	0	1	97	
5:40 PM	0	2	33	1	0	2	27	0	0	1	0	4	0	0	0	2	72	
5:45 PM	0	1	26	3	0	3	44	0	0	0	0	4	0	0	0	0	81	
5:50 PM	0	0	37	1	0	3	37	0	0	1	0	2	0	2	0	1	84	
5:55 PM	0	0	22	2	0	3	25	0	0	0	0	1	0	0	0	0	53	
Count Total	0	12	972	25	0	43	1,032	3	0	52	0	76	0	3	0	23	2,241	
Peak Hour	0	4	532	9	0	21	544	3	0	32	0	40	0	0	0	14	1,199	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	0	0	1	0	1	4:00 PM	0	0	0	0	0	4:00 PM	0	0	0	0	0
4:05 PM	2	0	0	0	2	4:05 PM	0	0	0	0	0	4:05 PM	0	0	0	0	0
4:10 PM	2	0	0	0	2	4:10 PM	0	0	0	0	0	4:10 PM	0	0	0	0	0
4:15 PM	2	0	1	0	3	4:15 PM	0	0	0	0	0	4:15 PM	0	0	0	0	0
4:20 PM	0	0	0	0	0	4:20 PM	0	0	0	0	0	4:20 PM	0	0	0	0	0
4:25 PM	0	0	0	0	0	4:25 PM	0	0	0	0	0	4:25 PM	0	0	0	0	0
4:30 PM	0	0	1	0	1	4:30 PM	0	0	0	0	0	4:30 PM	0	0	0	0	0
4:35 PM	2	0	0	0	2	4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	0	0
4:40 PM	1	0	0	0	1	4:40 PM	0	0	0	0	0	4:40 PM	0	0	0	0	0
4:45 PM	2	0	2	0	4	4:45 PM	0	0	0	0	0	4:45 PM	0	0	0	0	0
4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	0	0
4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0
5:00 PM	1	0	1	0	2	5:00 PM	0	0	0	0	0	5:00 PM	0	0	0	0	0
5:05 PM	0	0	0	0	0	5:05 PM	0	0	0	0	0	5:05 PM	0	0	0	0	0
5:10 PM	0	0	3	0	3	5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	0	0
5:15 PM	0	0	0	0	0	5:15 PM	0	0	0	0	0	5:15 PM	0	0	0	0	0
5:20 PM	2	0	1	0	3	5:20 PM	0	0	0	0	0	5:20 PM	0	0	0	0	0
5:25 PM	0	0	0	0	0	5:25 PM	0	0	0	0	0	5:25 PM	0	0	0	0	0
5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0
5:35 PM	0	0	2	0	2	5:35 PM	0	0	0	0	0	5:35 PM	0	0	0	0	0
5:40 PM	0	0	1	0	1	5:40 PM	0	0	0	0	0	5:40 PM	0	0	0	0	0
5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0
5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0
5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0
Count Total	14	0	13	0	27	Count Total	0	0	0	0	0	Count Total	0	0	0	0	0
Peak Hour	8	0	7	0	15	Peak Hour	0	0	0	0	0	Peak Hour	0	0	0	0	0

APPENDIX B: SYNCHRO REPORTS

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	800	15	0	620	45	0	0	55	0	0	80
Future Vol, veh/h	0	800	15	0	620	45	0	0	55	0	0	80
Conflicting Peds, #/hr	6	0	7	7	0	6	1	0	2	2	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Yield	Yield	Yield
RT Channelized	-	-	None	-	-	None	-	-	Stop	-	-	Yield
Storage Length	-	-	-	-	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	16983	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	0	1	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	0	860	16	0	667	48	0	0	59	0	0	86

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	-	0	0	-	-	0	-	-	877
Stage 1	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-	-	-	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	-	-	3.3
Pot Cap-1 Maneuver	0	-	-	0	-	-	0	0	351
Stage 1	0	-	-	0	-	-	0	0	-
Stage 2	0	-	-	0	-	-	0	0	-
Platoon blocked, %		-	-		-	-			
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	0	348
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	0	-
Stage 1	-	-	-	-	-	-	-	0	-
Stage 2	-	-	-	-	-	-	-	0	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	17.5
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT	WBR
Capacity (veh/h)	348	-	-	-	-
HCM Lane V/C Ratio	0.17	-	-	-	-
HCM Control Delay (s)	17.5	-	-	-	-
HCM Lane LOS	C	-	-	-	-
HCM 95th %tile Q(veh)	0.6	-	-	-	-

Intersection	
Int Delay, s/veh	5.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	40	800	15	15	615	35	15	5	25	30	5	40
Future Vol, veh/h	40	800	15	15	615	35	15	5	25	30	5	40
Conflicting Peds, #/hr	10	0	5	5	0	10	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	70	-	-	100	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	3	1	0	0	1	9	0	0	0	0	0	0
Mvmt Flow	43	851	16	16	654	37	16	5	27	32	5	43

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	701	0	0	872	0	0	1679	1683	864	1657	1654	664
Stage 1	-	-	-	-	-	-	950	950	-	696	696	-
Stage 2	-	-	-	-	-	-	729	733	-	961	958	-
Critical Hdwy	4.13	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.227	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	891	-	-	782	-	-	76	95	357	79	99	464
Stage 1	-	-	-	-	-	-	315	341	-	435	446	-
Stage 2	-	-	-	-	-	-	417	429	-	311	338	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	883	-	-	778	-	-	62	87	355	65	91	460
Mov Cap-2 Maneuver	-	-	-	-	-	-	62	87	-	65	91	-
Stage 1	-	-	-	-	-	-	298	323	-	410	432	-
Stage 2	-	-	-	-	-	-	366	416	-	269	320	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0.2	52.4	75.6
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	122	883	-	-	778	-	-	124
HCM Lane V/C Ratio	0.392	0.048	-	-	0.021	-	-	0.643
HCM Control Delay (s)	52.4	9.3	-	-	9.7	-	-	75.6
HCM Lane LOS	F	A	-	-	A	-	-	F
HCM 95th %tile Q(veh)	1.6	0.2	-	-	0.1	-	-	3.4

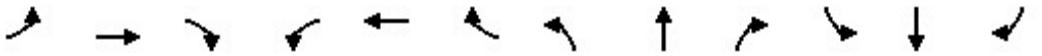
Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	20	735	100	30	655	35	0	0	110	0	0	10
Future Vol, veh/h	20	735	100	30	655	35	0	0	110	0	0	10
Conflicting Peds, #/hr	0	0	2	2	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	50	-	-	40	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	0	1	1	0	1	0	0	0	1	0	0	0
Mvmt Flow	21	766	104	31	682	36	0	0	115	0	0	10

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	718	0	0	872	0	0	-	-	820	-	-	359
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	4.1	-	-	4.1	-	-	-	-	6.215	-	-	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	-	-	3.3095	-	-	3.3
Pot Cap-1 Maneuver	892	-	-	782	-	-	0	0	376	0	0	643
Stage 1	-	-	-	-	-	-	0	0	-	0	0	-
Stage 2	-	-	-	-	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	892	-	-	781	-	-	-	-	375	-	-	643
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0.4	18.8	10.7
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	375	892	-	-	781	-	-	643
HCM Lane V/C Ratio	0.306	0.023	-	-	0.04	-	-	0.016
HCM Control Delay (s)	18.8	9.1	-	-	9.8	-	-	10.7
HCM Lane LOS	C	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	1.3	0.1	-	-	0.1	-	-	0



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	250	440	155	215	470	100	140	595	120	80	730	110
Future Volume (veh/h)	250	440	155	215	470	100	140	595	120	80	730	110
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.99	1.00		0.99
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	1885	1885	1870	1885	1885	1885	1885	1870	1900	1870	1885
Adj Flow Rate, veh/h	258	454	32	222	485	103	144	613	124	82	753	113
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	1	1	2	1	1	1	1	2	0	2	1
Cap, veh/h	292	538	449	257	655	139	177	1114	225	111	1048	157
Arrive On Green	0.16	0.29	0.29	0.14	0.27	0.26	0.10	0.38	0.37	0.06	0.34	0.33
Sat Flow, veh/h	1781	1885	1574	1781	2466	522	1795	2965	599	1810	3093	464
Grp Volume(v), veh/h	258	454	32	222	236	352	144	370	367	82	432	434
Grp Sat Flow(s),veh/h/ln	1781	1885	1574	1781	1207	1781	1795	1791	1773	1810	1777	1780
Q Serve(g_s), s	17.0	27.2	1.8	14.6	21.5	21.7	9.4	19.5	19.6	5.3	25.5	25.6
Cycle Q Clear(g_c), s	17.0	27.2	1.8	14.6	21.5	21.7	9.4	19.5	19.6	5.3	25.5	25.6
Prop In Lane	1.00		1.00	1.00		0.29	1.00		0.34	1.00		0.26
Lane Grp Cap(c), veh/h	292	538	449	257	320	473	177	673	666	111	602	603
V/C Ratio(X)	0.88	0.84	0.07	0.87	0.74	0.74	0.81	0.55	0.55	0.74	0.72	0.72
Avail Cap(c_a), veh/h	327	613	512	312	382	564	180	673	666	151	602	603
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	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	49.1	40.4	31.3	50.2	40.2	40.4	53.0	29.5	29.6	55.3	34.7	34.7
Incr Delay (d2), s/veh	21.6	9.1	0.0	17.9	5.4	3.9	23.1	3.2	3.3	9.7	7.2	7.2
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	9.4	14.0	0.7	7.8	6.9	10.1	5.4	8.8	8.8	2.7	12.0	12.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	70.7	49.5	31.3	68.1	45.7	44.3	76.1	32.7	32.8	65.1	41.9	42.0
LnGrp LOS	E	D	C	E	D	D	E	C	C	E	D	D
Approach Vol, veh/h		744			810			881			948	
Approach Delay, s/veh		56.1			51.2			39.8			43.9	
Approach LOS		E			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.8	44.6	21.3	38.2	11.4	49.1	23.6	35.9
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	11.5	31.5	20.5	38.5	9.5	33.5	21.5	37.5
Max Q Clear Time (g_c+I1), s	11.4	27.6	16.6	29.2	7.3	21.6	19.0	23.7
Green Ext Time (p_c), s	0.0	3.0	0.2	4.5	0.0	7.2	0.2	2.3

Intersection Summary	
HCM 6th Ctrl Delay	47.3
HCM 6th LOS	D

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	35	580	25	15	685	20	20	10	55	15	5	80
Future Vol, veh/h	35	580	25	15	685	20	20	10	55	15	5	80
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	125	-	-	75	-	125	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	3	1	0	0	1	16	0	0	0	9	0	5
Mvmt Flow	37	611	26	16	721	21	21	11	58	16	5	84

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	742	0	0	637	0	0	1093	1472	624	1497	1475	371
Stage 1	-	-	-	-	-	-	698	698	-	764	764	-
Stage 2	-	-	-	-	-	-	395	774	-	733	711	-
Critical Hdwy	4.145	-	-	4.1	-	-	7.3	6.5	6.2	7.435	6.5	6.975
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.635	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	6.235	5.5	-
Follow-up Hdwy	2.2285	-	-	2.2	-	-	3.5	4	3.3	3.5855	4	3.3475
Pot Cap-1 Maneuver	857	-	-	956	-	-	182	128	489	88	128	620
Stage 1	-	-	-	-	-	-	434	445	-	351	416	-
Stage 2	-	-	-	-	-	-	607	411	-	397	439	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	857	-	-	956	-	-	145	120	489	69	120	620
Mov Cap-2 Maneuver	-	-	-	-	-	-	145	120	-	69	120	-
Stage 1	-	-	-	-	-	-	415	426	-	336	409	-
Stage 2	-	-	-	-	-	-	509	404	-	327	420	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	0.2	26.6	28.2
HCM LOS			D	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	255	857	-	-	956	-	-	258
HCM Lane V/C Ratio	0.351	0.043	-	-	0.017	-	-	0.408
HCM Control Delay (s)	26.6	9.4	-	-	8.8	-	-	28.2
HCM Lane LOS	D	A	-	-	A	-	-	D
HCM 95th %tile Q(veh)	1.5	0.1	-	-	0.1	-	-	1.9

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	800	15	0	625	45	0	0	55	0	0	80
Future Vol, veh/h	0	800	15	0	625	45	0	0	55	0	0	80
Conflicting Peds, #/hr	6	0	7	7	0	6	1	0	2	2	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Yield	Yield	Yield
RT Channelized	-	-	None	-	-	None	-	-	Stop	-	-	Yield
Storage Length	-	-	-	-	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	16983	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	0	1	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	0	860	16	0	672	48	0	0	59	0	0	86

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	-	0	0	-	-	0	-	-	877
Stage 1	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-	-	-	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	-	-	3.3
Pot Cap-1 Maneuver	0	-	-	0	-	-	0	0	351
Stage 1	0	-	-	0	-	-	0	0	-
Stage 2	0	-	-	0	-	-	0	0	-
Platoon blocked, %		-	-		-	-			
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	0	348
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	0	-
Stage 1	-	-	-	-	-	-	-	0	-
Stage 2	-	-	-	-	-	-	-	0	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	17.5
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT	WBR
Capacity (veh/h)	348	-	-	-	-
HCM Lane V/C Ratio	0.17	-	-	-	-
HCM Control Delay (s)	17.5	-	-	-	-
HCM Lane LOS	C	-	-	-	-
HCM 95th %tile Q(veh)	0.6	-	-	-	-

Intersection	
Int Delay, s/veh	5.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	40	800	15	15	615	35	15	5	25	30	5	40
Future Vol, veh/h	40	800	15	15	615	35	15	5	25	30	5	40
Conflicting Peds, #/hr	10	0	5	5	0	10	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	70	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	3	1	0	0	1	9	0	0	0	0	0	0
Mvmt Flow	43	851	16	16	654	37	16	5	27	32	5	43

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	701	0	0	872	0	0	1679	1683	864	1676	1673	683
Stage 1	-	-	-	-	-	-	950	950	-	715	715	-
Stage 2	-	-	-	-	-	-	729	733	-	961	958	-
Critical Hdwy	4.13	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.227	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	891	-	-	782	-	-	76	95	357	76	97	453
Stage 1	-	-	-	-	-	-	315	341	-	425	438	-
Stage 2	-	-	-	-	-	-	417	429	-	311	338	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	883	-	-	778	-	-	62	87	355	63	89	449
Mov Cap-2 Maneuver	-	-	-	-	-	-	62	87	-	63	89	-
Stage 1	-	-	-	-	-	-	298	323	-	400	424	-
Stage 2	-	-	-	-	-	-	365	416	-	269	320	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0.2	52.4	79.4
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	122	883	-	-	778	-	-	121
HCM Lane V/C Ratio	0.392	0.048	-	-	0.021	-	-	0.659
HCM Control Delay (s)	52.4	9.3	-	-	9.7	-	-	79.4
HCM Lane LOS	F	A	-	-	A	-	-	F
HCM 95th %tile Q(veh)	1.6	0.2	-	-	0.1	-	-	3.5

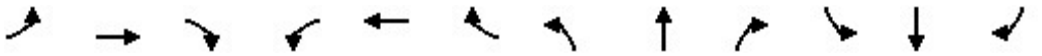
Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	20	735	100	30	655	35	0	0	110	0	0	10
Future Vol, veh/h	20	735	100	30	655	35	0	0	110	0	0	10
Conflicting Peds, #/hr	0	0	2	2	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	50	-	-	40	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	0	1	1	0	1	0	0	0	1	0	0	0
Mvmt Flow	21	766	104	31	682	36	0	0	115	0	0	10

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	718	0	0	872	0	0	-	-	820	-	-	700
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	4.1	-	-	4.1	-	-	-	-	6.21	-	-	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	-	-	3.309	-	-	3.3
Pot Cap-1 Maneuver	892	-	-	782	-	-	0	0	376	0	0	443
Stage 1	-	-	-	-	-	-	0	0	-	0	0	-
Stage 2	-	-	-	-	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	892	-	-	781	-	-	-	-	375	-	-	443
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0.4	18.8	13.3
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	375	892	-	-	781	-	-	443
HCM Lane V/C Ratio	0.306	0.023	-	-	0.04	-	-	0.024
HCM Control Delay (s)	18.8	9.1	-	-	9.8	-	-	13.3
HCM Lane LOS	C	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	1.3	0.1	-	-	0.1	-	-	0.1



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	250	440	155	215	470	100	140	595	120	80	730	110
Future Volume (veh/h)	250	440	155	215	470	100	140	595	120	80	730	110
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.99	1.00		0.99
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	1885	1885	1870	1885	1885	1885	1885	1870	1900	1870	1885
Adj Flow Rate, veh/h	258	454	101	222	485	44	144	613	124	82	753	113
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	1	1	2	1	1	1	1	2	0	2	1
Cap, veh/h	292	565	630	257	528	526	177	1070	216	111	1002	150
Arrive On Green	0.16	0.30	0.30	0.14	0.28	0.28	0.10	0.36	0.36	0.06	0.32	0.32
Sat Flow, veh/h	1781	1885	1575	1781	1885	1573	1795	2963	598	1810	3093	464
Grp Volume(v), veh/h	258	454	101	222	485	44	144	370	367	82	433	433
Grp Sat Flow(s),veh/h/ln	1781	1885	1575	1781	1885	1573	1795	1791	1770	1810	1777	1780
Q Serve(g_s), s	17.0	26.7	4.9	14.6	29.9	2.3	9.4	20.0	20.1	5.3	26.1	26.1
Cycle Q Clear(g_c), s	17.0	26.7	4.9	14.6	29.9	2.3	9.4	20.0	20.1	5.3	26.1	26.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.34	1.00		0.26
Lane Grp Cap(c), veh/h	292	565	630	257	528	526	177	647	639	111	576	577
V/C Ratio(X)	0.88	0.80	0.16	0.87	0.92	0.08	0.81	0.57	0.57	0.74	0.75	0.75
Avail Cap(c_a), veh/h	327	613	670	312	597	583	180	647	639	133	576	577
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	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	49.1	38.7	23.2	50.2	41.9	27.4	53.0	30.9	31.0	55.4	36.2	36.3
Incr Delay (d2), s/veh	21.6	6.8	0.1	17.9	17.7	0.1	23.1	3.6	3.7	14.5	8.7	8.7
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	9.4	13.4	1.9	7.8	16.5	0.9	5.4	9.1	9.1	2.9	12.5	12.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	70.7	45.6	23.3	68.1	59.6	27.5	76.1	34.5	34.7	69.8	45.0	45.0
LnGrp LOS	E	D	C	E	E	C	E	C	C	E	D	D
Approach Vol, veh/h		813			751			881			948	
Approach Delay, s/veh		50.8			60.2			41.4			47.2	
Approach LOS		D			E			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.8	42.9	21.3	40.0	11.4	47.4	23.6	37.6
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	11.5	31.5	20.5	38.5	8.3	34.7	21.5	37.5
Max Q Clear Time (g_c+I1), s	11.4	28.1	16.6	28.7	7.3	22.1	19.0	31.9
Green Ext Time (p_c), s	0.0	2.6	0.2	4.8	0.0	7.6	0.2	1.2

Intersection Summary	
HCM 6th Ctrl Delay	49.4
HCM 6th LOS	D

Intersection	
Int Delay, s/veh	4.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	35	580	25	15	685	20	20	10	55	15	5	80
Future Vol, veh/h	35	580	25	15	685	20	20	10	55	15	5	80
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	125	-	-	75	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	3	1	0	0	1	16	0	0	0	9	0	5
Mvmt Flow	37	611	26	16	721	21	21	11	58	16	5	84

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	742	0	0	637	0	0	1506	1472	624	1497	1475	732
Stage 1	-	-	-	-	-	-	698	698	-	764	764	-
Stage 2	-	-	-	-	-	-	808	774	-	733	711	-
Critical Hdwy	4.13	-	-	4.1	-	-	7.1	6.5	6.2	7.19	6.5	6.25
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.19	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.19	5.5	-
Follow-up Hdwy	2.227	-	-	2.2	-	-	3.5	4	3.3	3.581	4	3.345
Pot Cap-1 Maneuver	861	-	-	956	-	-	100	128	489	97	128	416
Stage 1	-	-	-	-	-	-	434	445	-	386	416	-
Stage 2	-	-	-	-	-	-	378	411	-	401	439	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	861	-	-	956	-	-	74	120	489	76	120	416
Mov Cap-2 Maneuver	-	-	-	-	-	-	74	120	-	76	120	-
Stage 1	-	-	-	-	-	-	415	426	-	369	409	-
Stage 2	-	-	-	-	-	-	293	404	-	330	420	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	0.2	42.5	32.8
HCM LOS			E	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	182	861	-	-	956	-	-	232
HCM Lane V/C Ratio	0.492	0.043	-	-	0.017	-	-	0.454
HCM Control Delay (s)	42.5	9.4	-	-	8.8	-	-	32.8
HCM Lane LOS	E	A	-	-	A	-	-	D
HCM 95th %tile Q(veh)	2.4	0.1	-	-	0.1	-	-	2.2

Summary of All Intervals

Run Number	1	10	2	3	4	5	6
Start Time	6:57	6:57	6:57	6:57	6:57	6:57	6:57
End Time	8:07	8:07	8:07	8:07	8:07	8:07	8:07
Total Time (min)	70	70	70	70	70	70	70
Time Recorded (min)	60	60	60	60	60	60	60
# of Intervals	3	3	3	3	3	3	3
# of Recorded Intervals	2	2	2	2	2	2	2
Vehs Entered	3837	3883	3850	3967	3775	3843	3776
Vehs Exited	3867	3905	3905	3948	3816	3840	3802
Starting Vehs	170	176	190	173	190	134	182
Ending Vehs	140	154	135	192	149	137	156
Travel Distance (mi)	2450	2469	2460	2511	2419	2414	2402
Travel Time (hr)	167.7	160.4	151.5	169.9	156.2	140.8	153.2
Total Delay (hr)	79.1	70.9	62.0	78.6	68.4	53.3	65.9
Total Stops	4639	4317	4122	4731	4246	3605	4139
Fuel Used (gal)	98.8	97.5	94.4	100.2	94.9	91.2	93.9

Summary of All Intervals

Run Number	7	8	9	Avg
Start Time	6:57	6:57	6:57	6:57
End Time	8:07	8:07	8:07	8:07
Total Time (min)	70	70	70	70
Time Recorded (min)	60	60	60	60
# of Intervals	3	3	3	3
# of Recorded Intervals	2	2	2	2
Vehs Entered	3825	3913	3999	3863
Vehs Exited	3880	3898	3912	3876
Starting Vehs	189	183	156	166
Ending Vehs	134	198	243	160
Travel Distance (mi)	2439	2485	2509	2456
Travel Time (hr)	157.0	214.0	200.4	167.1
Total Delay (hr)	68.1	124.1	108.9	77.9
Total Stops	4252	5838	5766	4567
Fuel Used (gal)	95.4	110.4	108.0	98.5

Interval #0 Information Seeding

Start Time	6:57
End Time	7:07
Total Time (min)	10

Volumes adjusted by PHF, Growth Factors.

No data recorded this interval.

Interval #1 Information Recording1

Start Time	7:07
End Time	7:22
Total Time (min)	15

Volumes adjusted by PHF, Growth Factors.

Run Number	1	10	2	3	4	5	6
Vehs Entered	1066	1033	995	1053	1017	1025	961
Vehs Exited	1026	1022	1030	1048	1029	1008	995
Starting Vehs	170	176	190	173	190	134	182
Ending Vehs	210	187	155	178	178	151	148
Travel Distance (mi)	652	652	642	659	650	642	627
Travel Time (hr)	47.1	44.5	41.3	40.9	45.1	37.5	41.8
Total Delay (hr)	23.6	20.7	17.9	16.9	21.5	14.3	19.1
Total Stops	1389	1211	1174	1142	1259	983	1152
Fuel Used (gal)	27.0	25.9	25.2	25.2	26.2	24.4	25.0

Interval #1 Information Recording1

Start Time	7:07
End Time	7:22
Total Time (min)	15

Volumes adjusted by PHF, Growth Factors.

Run Number	7	8	9	Avg
Vehs Entered	986	1031	1053	1019
Vehs Exited	1019	1012	1031	1021
Starting Vehs	189	183	156	166
Ending Vehs	156	202	178	171
Travel Distance (mi)	635	641	654	646
Travel Time (hr)	39.6	48.0	40.6	42.6
Total Delay (hr)	16.2	24.8	16.6	19.2
Total Stops	1084	1385	1096	1187
Fuel Used (gal)	24.5	26.7	25.5	25.6

Interval #2 Information Recording2

Start Time	7:22
End Time	8:07
Total Time (min)	45

Volumes adjusted by Growth Factors, Anti PHF.

Run Number	1	10	2	3	4	5	6
Vehs Entered	2771	2850	2855	2914	2758	2818	2815
Vehs Exited	2841	2883	2875	2900	2787	2832	2807
Starting Vehs	210	187	155	178	178	151	148
Ending Vehs	140	154	135	192	149	137	156
Travel Distance (mi)	1798	1817	1818	1851	1769	1773	1775
Travel Time (hr)	120.6	115.8	110.2	129.0	111.1	103.4	111.5
Total Delay (hr)	55.6	50.1	44.1	61.7	46.8	39.0	46.8
Total Stops	3250	3106	2948	3589	2987	2622	2987
Fuel Used (gal)	71.8	71.6	69.1	75.0	68.6	66.9	68.9

Interval #2 Information Recording2

Start Time	7:22
End Time	8:07
Total Time (min)	45

Volumes adjusted by Growth Factors, Anti PHF.

Run Number	7	8	9	Avg
Vehs Entered	2839	2882	2946	2845
Vehs Exited	2861	2886	2881	2853
Starting Vehs	156	202	178	171
Ending Vehs	134	198	243	160
Travel Distance (mi)	1803	1844	1854	1810
Travel Time (hr)	117.4	166.1	159.8	124.5
Total Delay (hr)	51.9	99.2	92.3	58.8
Total Stops	3168	4453	4670	3383
Fuel Used (gal)	70.9	83.7	82.5	72.9

Arterial Level of Service: EB NE Franklin Ave

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
NE Harriman S	55	3.0	26.3	0.2	23
	20	1.0	4.7	0.0	18
NE Hill St	1	1.5	6.5	0.0	18
1st Street	2	15.2	37.8	0.2	15
2nd Street	3	17.4	29.4	0.1	10
3rd Street	4	40.5	50.5	0.1	5
NE 4th St	5	2.3	15.6	0.1	21
Total		81.0	170.9	0.6	13

Arterial Level of Service: WB NE Franklin Ave

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
NE 4th St	5	2.6	41.0	0.3	24
3rd Street	4	34.2	46.5	0.1	7
2nd Street	3	3.6	14.6	0.1	18
1st Street	2	1.4	13.0	0.1	23
NE Hill St	1	2.6	25.2	0.2	23
	20	0.6	4.3	0.0	21
NE Harriman St	55	0.5	3.9	0.0	22
Total		45.5	148.4	0.7	17

Intersection: 1: NE Hill St & NE Franklin Ave

Movement	EB	B20	WB	NB
Directions Served	LTR	T	LTR	R
Maximum Queue (ft)	128	58	122	48
Average Queue (ft)	29	10	9	4
95th Queue (ft)	106	70	68	29
Link Distance (ft)	78	69	767	519
Upstream Blk Time (%)	3	2		
Queuing Penalty (veh)	24	18		
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 2: 1st Street & NE Franklin Ave

Movement	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	TR	L	T	R	LTR	LTR
Maximum Queue (ft)	79	624	36	36	4	125	200
Average Queue (ft)	22	186	10	2	0	47	68
95th Queue (ft)	61	627	33	23	3	119	166
Link Distance (ft)		767		362	362	448	524
Upstream Blk Time (%)		2					
Queuing Penalty (veh)		18					
Storage Bay Dist (ft)	70		100				
Storage Blk Time (%)	0	13		0			
Queuing Penalty (veh)	2	5		0			

Intersection: 3: 2nd Street & NE Franklin Ave

Movement	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	TR	L	T	TR	R	R
Maximum Queue (ft)	64	398	60	151	56	303	40
Average Queue (ft)	13	251	23	9	2	114	12
95th Queue (ft)	44	496	57	72	36	267	39
Link Distance (ft)		362		314	314	523	528
Upstream Blk Time (%)		11		0	0		
Queuing Penalty (veh)		94		0	0		
Storage Bay Dist (ft)	50		40				
Storage Blk Time (%)	0	24	14	0			
Queuing Penalty (veh)	3	5	45	0			

Intersection: 4: 3rd Street & NE Franklin Ave

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	T	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	275	370	275	274	426	380	224	422	420	225	802	788
Average Queue (ft)	239	327	137	197	244	200	155	248	242	138	529	509
95th Queue (ft)	329	395	314	306	377	330	256	387	372	270	937	910
Link Distance (ft)		314			396	396		1581	1581		1389	1389
Upstream Blk Time (%)		22			2	0					1	1
Queuing Penalty (veh)		186			6	0					0	0
Storage Bay Dist (ft)	250		250	250			200			200		
Storage Blk Time (%)	11	22	0	7	3		6	15		1	54	
Queuing Penalty (veh)	66	90	2	16	7		18	21		3	43	

Intersection: 5: NE 4th St & NE Franklin Ave

Movement	EB	WB	WB	WB	NB	SB
Directions Served	L	L	T	TR	LTR	LTR
Maximum Queue (ft)	59	43	56	36	120	147
Average Queue (ft)	20	6	4	2	49	54
95th Queue (ft)	52	28	40	28	91	106
Link Distance (ft)			1370		517	530
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	125	75		125		
Storage Blk Time (%)			1	0		
Queuing Penalty (veh)			2	0		

Intersection: 55: NE Harriman S/NE Harriman St & NE Franklin Ave

Movement	EB	B20	B20
Directions Served	LTR	T	
Maximum Queue (ft)	97	49	43
Average Queue (ft)	21	5	6
95th Queue (ft)	195	26	28
Link Distance (ft)	806	78	78
Upstream Blk Time (%)	0	0	
Queuing Penalty (veh)	0	0	
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 676

Summary of All Intervals

Run Number	1	10	2	3	4	5	6
Start Time	6:57	6:57	6:57	6:57	6:57	6:57	6:57
End Time	8:07	8:07	8:07	8:07	8:07	8:07	8:07
Total Time (min)	70	70	70	70	70	70	70
Time Recorded (min)	60	60	60	60	60	60	60
# of Intervals	3	3	3	3	3	3	3
# of Recorded Intervals	2	2	2	2	2	2	2
Vehs Entered	3981	3968	3854	3876	3844	3864	3890
Vehs Exited	3903	3893	3848	3905	3832	3912	3893
Starting Vehs	152	136	171	191	168	230	189
Ending Vehs	230	211	177	162	180	182	186
Travel Distance (mi)	2517	2512	2468	2474	2459	2502	2486
Travel Time (hr)	218.1	216.8	170.4	187.8	173.8	191.3	176.1
Total Delay (hr)	126.9	125.2	81.1	98.2	84.1	100.7	86.1
Total Stops	4434	5509	4493	5114	4925	5167	4675
Fuel Used (gal)	110.7	111.1	99.3	104.5	99.1	105.1	100.9

Summary of All Intervals

Run Number	7	8	9	Avg
Start Time	6:57	6:57	6:57	6:57
End Time	8:07	8:07	8:07	8:07
Total Time (min)	70	70	70	70
Time Recorded (min)	60	60	60	60
# of Intervals	3	3	3	3
# of Recorded Intervals	2	2	2	2
Vehs Entered	3934	3973	3899	3907
Vehs Exited	3944	3950	3913	3895
Starting Vehs	200	174	187	177
Ending Vehs	190	197	173	189
Travel Distance (mi)	2512	2531	2513	2497
Travel Time (hr)	193.7	209.5	199.3	193.7
Total Delay (hr)	102.6	117.5	107.8	103.0
Total Stops	5352	5029	5155	4985
Fuel Used (gal)	106.1	109.7	106.8	105.3

Interval #0 Information Seeding

Start Time	6:57
End Time	7:07
Total Time (min)	10

Volumes adjusted by PHF, Growth Factors.
No data recorded this interval.

Interval #1 Information Recording1

Start Time	7:07
End Time	7:22
Total Time (min)	15

Volumes adjusted by PHF, Growth Factors.

Run Number	1	10	2	3	4	5	6
Vehs Entered	1088	1062	1005	1013	1036	993	984
Vehs Exited	1023	956	1003	1037	1024	1001	984
Starting Vehs	152	136	171	191	168	230	189
Ending Vehs	217	242	173	167	180	222	189
Travel Distance (mi)	662	635	645	649	660	646	624
Travel Time (hr)	43.2	47.4	41.9	47.0	49.0	55.7	48.5
Total Delay (hr)	19.2	24.3	18.5	23.4	24.9	32.5	25.9
Total Stops	1186	1295	1190	1263	1425	1466	1260
Fuel Used (gal)	25.7	26.2	25.4	26.9	27.0	28.6	26.4

Interval #1 Information Recording1

Start Time	7:07
End Time	7:22
Total Time (min)	15

Volumes adjusted by PHF, Growth Factors.

Run Number	7	8	9	Avg
Vehs Entered	1015	1054	1021	1026
Vehs Exited	1022	1032	1027	1012
Starting Vehs	200	174	187	177
Ending Vehs	193	196	181	194
Travel Distance (mi)	643	663	650	648
Travel Time (hr)	46.7	49.2	44.7	47.3
Total Delay (hr)	23.4	25.3	21.0	23.8
Total Stops	1235	1426	1137	1291
Fuel Used (gal)	26.3	27.6	26.0	26.6

Interval #2 Information Recording2

Start Time	7:22
End Time	8:07
Total Time (min)	45

Volumes adjusted by Growth Factors, Anti PHF.

Run Number	1	10	2	3	4	5	6
Vehs Entered	2893	2906	2849	2863	2808	2871	2906
Vehs Exited	2880	2937	2845	2868	2808	2911	2909
Starting Vehs	217	242	173	167	180	222	189
Ending Vehs	230	211	177	162	180	182	186
Travel Distance (mi)	1855	1877	1823	1825	1799	1856	1862
Travel Time (hr)	174.9	169.5	128.5	140.8	124.8	135.6	127.6
Total Delay (hr)	107.7	101.0	62.5	74.8	59.2	68.3	60.2
Total Stops	3248	4214	3303	3851	3500	3701	3415
Fuel Used (gal)	85.0	84.8	73.9	77.6	72.1	76.5	74.5

Interval #2 Information Recording2

Start Time	7:22
End Time	8:07
Total Time (min)	45

Volumes adjusted by Growth Factors, Anti PHF.

Run Number	7	8	9	Avg
Vehs Entered	2919	2919	2878	2882
Vehs Exited	2922	2918	2886	2886
Starting Vehs	193	196	181	194
Ending Vehs	190	197	173	189
Travel Distance (mi)	1869	1868	1864	1850
Travel Time (hr)	147.1	160.3	154.6	146.4
Total Delay (hr)	79.2	92.2	86.7	79.2
Total Stops	4117	3603	4018	3697
Fuel Used (gal)	79.8	82.1	80.8	78.7

Arterial Level of Service: EB NE Franklin Ave

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
NE Harriman St	55	1.8	25.3	0.2	24
	20	0.7	4.4	0.0	20
NE Hill St	1	1.2	4.9	0.0	19
1st Street	2	14.7	37.2	0.2	15
2nd Street	3	17.4	29.4	0.1	10
3rd Street	4	40.3	50.4	0.1	5
NE 4th St	5	2.4	15.6	0.1	21
Total		78.4	167.1	0.6	13

Arterial Level of Service: WB NE Franklin Ave

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
NE 4th St	5	17.7	55.8	0.3	17
3rd Street	4	51.2	63.4	0.1	5
2nd Street	3	2.8	13.8	0.1	19
1st Street	2	1.6	13.3	0.1	22
NE Hill St	1	3.0	25.5	0.2	22
	20	0.6	4.3	0.0	21
NE Harriman St	55	0.5	4.0	0.0	22
Total		77.4	180.2	0.7	14

Intersection: 1: NE Hill St & NE Franklin Ave

Movement	EB	B20	WB	NB
Directions Served	LTR	T	LTR	R
Maximum Queue (ft)	145	90	205	65
Average Queue (ft)	22	8	12	5
95th Queue (ft)	99	58	89	38
Link Distance (ft)	78	69	767	519
Upstream Blk Time (%)	2	1		
Queuing Penalty (veh)	20	10		
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 2: 1st Street & NE Franklin Ave

Movement	EB	EB	WB	WB	NB	SB
Directions Served	L	TR	L	TR	LTR	LTR
Maximum Queue (ft)	78	631	39	38	120	150
Average Queue (ft)	20	182	8	1	39	57
95th Queue (ft)	58	624	30	21	89	117
Link Distance (ft)		767		362	448	530
Upstream Blk Time (%)		1				
Queuing Penalty (veh)		12				
Storage Bay Dist (ft)	70		100			
Storage Blk Time (%)	0	13		0		
Queuing Penalty (veh)	1	5		0		

Intersection: 3: 2nd Street & NE Franklin Ave

Movement	EB	EB	WB	WB	NB	SB
Directions Served	L	TR	L	TR	R	R
Maximum Queue (ft)	72	401	60	173	259	44
Average Queue (ft)	16	255	22	8	100	11
95th Queue (ft)	52	489	55	78	225	38
Link Distance (ft)		362		314	523	540
Upstream Blk Time (%)		11		0		
Queuing Penalty (veh)		90		1		
Storage Bay Dist (ft)	50		40			
Storage Blk Time (%)	0	25	13	0		
Queuing Penalty (veh)	3	5	90	0		

Intersection: 4: 3rd Street & NE Franklin Ave

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	T	R	L	T	TR	L	T	TR
Maximum Queue (ft)	275	378	275	275	449	225	225	457	454	225	802	775
Average Queue (ft)	243	325	142	234	410	111	172	269	262	145	526	507
95th Queue (ft)	327	404	326	333	491	271	268	423	411	274	839	813
Link Distance (ft)		314			397			1581	1581		1389	1389
Upstream Blk Time (%)		22			28							
Queuing Penalty (veh)		190			222							
Storage Bay Dist (ft)	250		250	250		200	200			200		
Storage Blk Time (%)	14	21	0	8	41	0	15	14		1	58	
Queuing Penalty (veh)	82	86	2	45	129	1	44	19		5	46	

Intersection: 5: NE 4th St & NE Franklin Ave

Movement	EB	EB	WB	WB	NB	SB
Directions Served	L	TR	L	TR	LTR	LTR
Maximum Queue (ft)	75	13	80	717	402	515
Average Queue (ft)	21	1	11	241	180	298
95th Queue (ft)	58	11	49	576	454	628
Link Distance (ft)		397		1370	517	542
Upstream Blk Time (%)					9	26
Queuing Penalty (veh)					0	0
Storage Bay Dist (ft)	125		75			
Storage Blk Time (%)	0		0	21		
Queuing Penalty (veh)	0		0	3		

Intersection: 55: NE Harriman St & NE Franklin Ave

Movement	EB	WB	B20	B20
Directions Served	LTR	LTR	T	
Maximum Queue (ft)	135	6	66	45
Average Queue (ft)	8	0	6	6
95th Queue (ft)	89	6	32	27
Link Distance (ft)	806	69	78	78
Upstream Blk Time (%)			0	
Queuing Penalty (veh)			0	
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 1111

APPENFIX C: SENSITIVITY TEST SYNCHRO REPORTS

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	800	15	5	620	45	0	0	55	0	0	80
Future Vol, veh/h	5	800	15	5	620	45	0	0	55	0	0	80
Conflicting Peds, #/hr	6	0	7	7	0	6	1	0	2	2	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Yield	Yield	Yield
RT Channelized	-	-	None	-	-	None	-	-	Stop	-	-	Yield
Storage Length	-	-	-	-	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	16983	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	0	1	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	5	860	16	5	667	48	0	0	59	0	0	86

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	721	0	0	883	0	0	-	-	877
Stage 1	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-
Critical Hdwy	4.1	-	-	4.1	-	-	-	-	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	-	-	3.3
Pot Cap-1 Maneuver	890	-	-	775	-	-	0	0	351
Stage 1	-	-	-	-	-	-	0	0	-
Stage 2	-	-	-	-	-	-	0	0	-
Platoon blocked, %		-	-		-	-			
Mov Cap-1 Maneuver	890	-	-	770	-	-	-	0	348
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	0	-
Stage 1	-	-	-	-	-	-	-	0	-
Stage 2	-	-	-	-	-	-	-	0	-

Approach	EB	WB	NB
HCM Control Delay, s	0.1	0.1	17.5
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR
Capacity (veh/h)	348	890	-	-	770	-	-
HCM Lane V/C Ratio	0.17	0.006	-	-	0.007	-	-
HCM Control Delay (s)	17.5	9.1	-	-	9.7	-	-
HCM Lane LOS	C	A	-	-	A	-	-
HCM 95th %tile Q(veh)	0.6	0	-	-	0	-	-

Intersection	
Int Delay, s/veh	5.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	40	800	15	15	615	35	15	5	25	30	5	40
Future Vol, veh/h	40	800	15	15	615	35	15	5	25	30	5	40
Conflicting Peds, #/hr	10	0	5	5	0	10	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	70	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	3	1	0	0	1	9	0	0	0	0	0	0
Mvmt Flow	43	851	16	16	654	37	16	5	27	32	5	43

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	701	0	0	872	0	0	1679	1683	864	1676	1673	683
Stage 1	-	-	-	-	-	-	950	950	-	715	715	-
Stage 2	-	-	-	-	-	-	729	733	-	961	958	-
Critical Hdwy	4.13	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.227	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	891	-	-	782	-	-	76	95	357	76	97	453
Stage 1	-	-	-	-	-	-	315	341	-	425	438	-
Stage 2	-	-	-	-	-	-	417	429	-	311	338	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	883	-	-	778	-	-	62	87	355	63	89	449
Mov Cap-2 Maneuver	-	-	-	-	-	-	62	87	-	63	89	-
Stage 1	-	-	-	-	-	-	298	323	-	400	424	-
Stage 2	-	-	-	-	-	-	365	416	-	269	320	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0.2	52.4	79.4
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	122	883	-	-	778	-	-	121
HCM Lane V/C Ratio	0.392	0.048	-	-	0.021	-	-	0.659
HCM Control Delay (s)	52.4	9.3	-	-	9.7	-	-	79.4
HCM Lane LOS	F	A	-	-	A	-	-	F
HCM 95th %tile Q(veh)	1.6	0.2	-	-	0.1	-	-	3.5

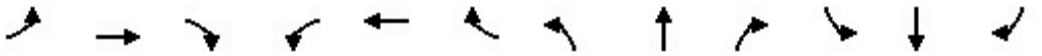
Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	20	735	100	30	655	35	0	0	110	0	0	10
Future Vol, veh/h	20	735	100	30	655	35	0	0	110	0	0	10
Conflicting Peds, #/hr	0	0	2	2	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	50	-	-	40	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	0	1	1	0	1	0	0	0	1	0	0	0
Mvmt Flow	21	766	104	31	682	36	0	0	115	0	0	10

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	718	0	0	872	0	0	-	-	820	-	-	700
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	4.1	-	-	4.1	-	-	-	-	6.21	-	-	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	-	-	3.309	-	-	3.3
Pot Cap-1 Maneuver	892	-	-	782	-	-	0	0	376	0	0	443
Stage 1	-	-	-	-	-	-	0	0	-	0	0	-
Stage 2	-	-	-	-	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	892	-	-	781	-	-	-	-	375	-	-	443
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0.4	18.8	13.3
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	375	892	-	-	781	-	-	443
HCM Lane V/C Ratio	0.306	0.023	-	-	0.04	-	-	0.024
HCM Control Delay (s)	18.8	9.1	-	-	9.8	-	-	13.3
HCM Lane LOS	C	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	1.3	0.1	-	-	0.1	-	-	0.1



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	250	440	155	215	470	100	140	595	120	80	730	110
Future Volume (veh/h)	250	440	155	215	470	100	140	595	120	80	730	110
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.99	1.00		0.99
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	1885	1885	1870	1885	1885	1885	1885	1870	1900	1870	1885
Adj Flow Rate, veh/h	258	454	160	222	485	103	144	613	124	82	753	113
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	1	1	2	1	1	1	1	2	0	2	1
Cap, veh/h	292	560	468	257	522	429	177	1079	218	111	1011	152
Arrive On Green	0.16	0.30	0.30	0.14	0.28	0.27	0.10	0.36	0.36	0.06	0.33	0.32
Sat Flow, veh/h	1781	1885	1575	1781	1885	1573	1795	2963	598	1810	3093	464
Grp Volume(v), veh/h	258	454	160	222	485	103	144	370	367	82	432	434
Grp Sat Flow(s),veh/h/ln	1781	1885	1575	1781	1885	1573	1795	1791	1770	1810	1777	1780
Q Serve(g_s), s	17.0	26.8	9.5	14.6	30.1	6.1	9.4	19.9	20.0	5.3	26.0	26.0
Cycle Q Clear(g_c), s	17.0	26.8	9.5	14.6	30.1	6.1	9.4	19.9	20.0	5.3	26.0	26.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.34	1.00		0.26
Lane Grp Cap(c), veh/h	292	560	468	257	522	429	177	652	644	111	581	582
V/C Ratio(X)	0.88	0.81	0.34	0.87	0.93	0.24	0.81	0.57	0.57	0.74	0.74	0.74
Avail Cap(c_a), veh/h	341	581	486	312	550	452	180	652	644	133	581	582
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	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	49.0	39.1	33.0	50.2	42.2	34.0	53.0	30.6	30.7	55.4	35.9	36.0
Incr Delay (d2), s/veh	19.9	8.0	0.3	17.9	21.6	0.2	23.1	3.6	3.6	14.5	8.4	8.4
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	9.2	13.7	3.7	7.8	17.1	2.4	5.4	9.1	9.0	2.9	12.4	12.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	68.9	47.0	33.3	68.1	63.8	34.2	76.1	34.1	34.3	69.8	44.3	44.4
LnGrp LOS	E	D	C	E	E	C	E	C	C	E	D	D
Approach Vol, veh/h		872			810			881			948	
Approach Delay, s/veh		51.0			61.2			41.1			46.6	
Approach LOS		D			E			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.8	43.2	21.3	39.6	11.4	47.7	23.7	37.2
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	11.5	33.5	20.5	36.5	8.3	36.7	22.5	34.5
Max Q Clear Time (g_c+I1), s	11.4	28.0	16.6	28.8	7.3	22.0	19.0	32.1
Green Ext Time (p_c), s	0.0	4.1	0.2	4.1	0.0	8.5	0.2	0.7

Intersection Summary	
HCM 6th Ctrl Delay	49.7
HCM 6th LOS	D

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	35	580	25	15	685	20	20	10	55	15	5	80
Future Vol, veh/h	35	580	25	15	685	20	20	10	55	15	5	80
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	125	-	-	75	-	125	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	3	1	0	0	1	16	0	0	0	9	0	5
Mvmt Flow	37	611	26	16	721	21	21	11	58	16	5	84

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	742	0	0	637	0	0	1506	1472	624	1486	1464	721
Stage 1	-	-	-	-	-	-	698	698	-	753	753	-
Stage 2	-	-	-	-	-	-	808	774	-	733	711	-
Critical Hdwy	4.13	-	-	4.1	-	-	7.1	6.5	6.2	7.19	6.5	6.25
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.19	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.19	5.5	-
Follow-up Hdwy	2.227	-	-	2.2	-	-	3.5	4	3.3	3.581	4	3.345
Pot Cap-1 Maneuver	861	-	-	956	-	-	100	128	489	99	130	422
Stage 1	-	-	-	-	-	-	434	445	-	391	420	-
Stage 2	-	-	-	-	-	-	378	411	-	401	439	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	861	-	-	956	-	-	74	120	489	78	122	422
Mov Cap-2 Maneuver	-	-	-	-	-	-	74	120	-	78	122	-
Stage 1	-	-	-	-	-	-	415	426	-	374	413	-
Stage 2	-	-	-	-	-	-	294	404	-	330	420	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	0.2	42.5	32
HCM LOS			E	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	182	861	-	-	956	-	-	236
HCM Lane V/C Ratio	0.492	0.043	-	-	0.017	-	-	0.446
HCM Control Delay (s)	42.5	9.4	-	-	8.8	-	-	32
HCM Lane LOS	E	A	-	-	A	-	-	D
HCM 95th %tile Q(veh)	2.4	0.1	-	-	0.1	-	-	2.1

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	805	15	5	637	45	0	0	55	0	0	80
Future Vol, veh/h	5	805	15	5	637	45	0	0	55	0	0	80
Conflicting Peds, #/hr	6	0	7	7	0	6	1	0	2	2	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Yield	Yield	Yield
RT Channelized	-	-	None	-	-	None	-	-	Stop	-	-	Yield
Storage Length	-	-	-	-	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	16983	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	0	1	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	5	866	16	5	685	48	0	0	59	0	0	86

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	739	0	0	889	0	0	-	-	883
Stage 1	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-
Critical Hdwy	4.1	-	-	4.1	-	-	-	-	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	-	-	3.3
Pot Cap-1 Maneuver	876	-	-	771	-	-	0	0	348
Stage 1	-	-	-	-	-	-	0	0	-
Stage 2	-	-	-	-	-	-	0	0	-
Platoon blocked, %		-	-		-	-			
Mov Cap-1 Maneuver	876	-	-	766	-	-	-	0	345
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	0	-
Stage 1	-	-	-	-	-	-	-	0	-
Stage 2	-	-	-	-	-	-	-	0	-

Approach	EB	WB	NB
HCM Control Delay, s	0.1	0.1	17.6
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR
Capacity (veh/h)	345	876	-	-	766	-	-
HCM Lane V/C Ratio	0.171	0.006	-	-	0.007	-	-
HCM Control Delay (s)	17.6	9.1	-	-	9.7	-	-
HCM Lane LOS	C	A	-	-	A	-	-
HCM 95th %tile Q(veh)	0.6	0	-	-	0	-	-

Intersection	
Int Delay, s/veh	11.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	42	803	15	15	624	38	15	5	25	47	5	48
Future Vol, veh/h	42	803	15	15	624	38	15	5	25	47	5	48
Conflicting Peds, #/hr	10	0	5	5	0	10	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	70	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	3	1	0	0	1	9	0	0	0	0	0	0
Mvmt Flow	45	854	16	16	664	40	16	5	27	50	5	51

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	714	0	0	875	0	0	1701	1703	867	1694	1691	694
Stage 1	-	-	-	-	-	-	957	957	-	726	726	-
Stage 2	-	-	-	-	-	-	744	746	-	968	965	-
Critical Hdwy	4.13	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.227	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	882	-	-	780	-	-	73	93	355	74	94	446
Stage 1	-	-	-	-	-	-	312	339	-	419	433	-
Stage 2	-	-	-	-	-	-	410	424	-	308	336	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	874	-	-	776	-	-	58	85	353	61	86	442
Mov Cap-2 Maneuver	-	-	-	-	-	-	58	85	-	61	86	-
Stage 1	-	-	-	-	-	-	295	320	-	393	420	-
Stage 2	-	-	-	-	-	-	351	411	-	266	317	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	0.2	56.3	160
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	116	874	-	-	776	-	-	107
HCM Lane V/C Ratio	0.413	0.051	-	-	0.021	-	-	0.994
HCM Control Delay (s)	56.3	9.3	-	-	9.7	-	-	160
HCM Lane LOS	F	A	-	-	A	-	-	F
HCM 95th %tile Q(veh)	1.7	0.2	-	-	0.1	-	-	6.3

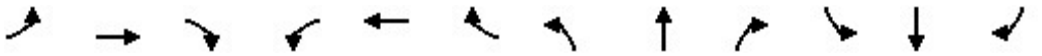
Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	23	752	100	30	658	38	0	0	110	0	0	19
Future Vol, veh/h	23	752	100	30	658	38	0	0	110	0	0	19
Conflicting Peds, #/hr	0	0	2	2	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	50	-	-	40	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	0	1	1	0	1	0	0	0	1	0	0	0
Mvmt Flow	24	783	104	31	685	40	0	0	115	0	0	20

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	725	0	0	889	0	0	-	-	837	-	-	705
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	4.1	-	-	4.1	-	-	-	-	6.21	-	-	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	-	-	3.309	-	-	3.3
Pot Cap-1 Maneuver	887	-	-	771	-	-	0	0	368	0	0	440
Stage 1	-	-	-	-	-	-	0	0	-	0	0	-
Stage 2	-	-	-	-	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	887	-	-	770	-	-	-	-	367	-	-	440
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0.4	19.2	13.6
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	367	887	-	-	770	-	-	440
HCM Lane V/C Ratio	0.312	0.027	-	-	0.041	-	-	0.045
HCM Control Delay (s)	19.2	9.2	-	-	9.9	-	-	13.6
HCM Lane LOS	C	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	1.3	0.1	-	-	0.1	-	-	0.1



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	250	457	155	215	476	103	140	598	120	88	738	110
Future Volume (veh/h)	250	457	155	215	476	103	140	598	120	88	738	110
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.99	1.00		0.99
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	1885	1885	1870	1885	1885	1885	1885	1870	1900	1870	1885
Adj Flow Rate, veh/h	258	471	101	222	491	47	144	616	124	91	761	113
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	1	1	2	1	1	1	1	2	0	2	1
Cap, veh/h	292	564	629	257	526	533	177	1057	212	121	1006	149
Arrive On Green	0.16	0.30	0.30	0.14	0.28	0.28	0.10	0.36	0.35	0.07	0.32	0.32
Sat Flow, veh/h	1781	1885	1575	1781	1885	1573	1795	2965	596	1810	3098	460
Grp Volume(v), veh/h	258	471	101	222	491	47	144	372	368	91	436	438
Grp Sat Flow(s),veh/h/ln	1781	1885	1575	1781	1885	1573	1795	1791	1770	1810	1777	1781
Q Serve(g_s), s	17.0	28.0	5.0	14.6	30.5	2.4	9.4	20.2	20.3	5.9	26.4	26.4
Cycle Q Clear(g_c), s	17.0	28.0	5.0	14.6	30.5	2.4	9.4	20.2	20.3	5.9	26.4	26.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.34	1.00		0.26
Lane Grp Cap(c), veh/h	292	564	629	257	526	533	177	638	631	121	577	578
V/C Ratio(X)	0.88	0.84	0.16	0.87	0.93	0.09	0.81	0.58	0.58	0.75	0.76	0.76
Avail Cap(c_a), veh/h	341	581	643	312	550	553	180	638	631	133	577	578
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	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	49.0	39.3	23.2	50.2	42.2	27.1	53.0	31.4	31.5	55.0	36.3	36.3
Incr Delay (d2), s/veh	19.9	9.7	0.1	17.9	22.4	0.1	23.1	3.9	3.9	18.1	9.0	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	9.2	14.5	1.9	7.8	17.4	0.9	5.4	9.3	9.2	3.3	12.7	12.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	68.9	49.0	23.3	68.1	64.5	27.2	76.1	35.2	35.4	73.1	45.2	45.3
LnGrp LOS	E	D	C	E	E	C	E	D	D	E	D	D
Approach Vol, veh/h		830			760			884			965	
Approach Delay, s/veh		52.1			63.3			42.0			47.9	
Approach LOS		D			E			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.8	43.0	21.3	39.9	12.1	46.8	23.7	37.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	11.5	33.5	20.5	36.5	8.3	36.7	22.5	34.5
Max Q Clear Time (g_c+I1), s	11.4	28.4	16.6	30.0	7.9	22.3	19.0	32.5
Green Ext Time (p_c), s	0.0	3.9	0.2	3.6	0.0	8.4	0.2	0.5

Intersection Summary	
HCM 6th Ctrl Delay	50.8
HCM 6th LOS	D

Intersection	
Int Delay, s/veh	4.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	35	605	25	15	694	20	20	10	55	15	5	80
Future Vol, veh/h	35	605	25	15	694	20	20	10	55	15	5	80
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	125	-	-	75	-	125	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	3	1	0	0	1	16	0	0	0	9	0	5
Mvmt Flow	37	637	26	16	731	21	21	11	58	16	5	84

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	752	0	0	663	0	0	1542	1508	650	1522	1500	731
Stage 1	-	-	-	-	-	-	724	724	-	763	763	-
Stage 2	-	-	-	-	-	-	818	784	-	759	737	-
Critical Hdwy	4.13	-	-	4.1	-	-	7.1	6.5	6.2	7.19	6.5	6.25
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.19	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.19	5.5	-
Follow-up Hdwy	2.227	-	-	2.2	-	-	3.5	4	3.3	3.581	4	3.345
Pot Cap-1 Maneuver	853	-	-	935	-	-	95	122	473	93	123	417
Stage 1	-	-	-	-	-	-	420	433	-	386	416	-
Stage 2	-	-	-	-	-	-	373	407	-	388	428	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	853	-	-	935	-	-	70	115	473	72	116	417
Mov Cap-2 Maneuver	-	-	-	-	-	-	70	115	-	72	116	-
Stage 1	-	-	-	-	-	-	402	414	-	369	409	-
Stage 2	-	-	-	-	-	-	289	400	-	317	410	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	0.2	45.8	34.1
HCM LOS			E	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	174	853	-	-	935	-	-	226
HCM Lane V/C Ratio	0.514	0.043	-	-	0.017	-	-	0.466
HCM Control Delay (s)	45.8	9.4	-	-	8.9	-	-	34.1
HCM Lane LOS	E	A	-	-	A	-	-	D
HCM 95th %tile Q(veh)	2.6	0.1	-	-	0.1	-	-	2.3

Summary of All Intervals

Run Number	1	10	2	3	4	5	6
Start Time	6:57	6:57	6:57	6:57	6:57	6:57	6:57
End Time	7:10	7:10	7:10	7:10	7:10	7:10	7:10
Total Time (min)	13	13	13	13	13	13	13
Time Recorded (min)	10	10	10	10	10	10	10
# of Intervals	2	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1	1
Vehs Entered	679	663	662	651	603	627	635
Vehs Exited	646	650	632	647	611	623	636
Starting Vehs	117	127	114	131	123	135	127
Ending Vehs	150	140	144	135	115	139	126
Travel Distance (mi)	426	422	413	417	389	403	408
Travel Time (hr)	24.5	24.3	24.2	24.3	23.6	23.4	23.7
Total Delay (hr)	8.9	8.8	9.1	9.1	9.4	8.6	8.7
Total Stops	619	594	632	617	591	577	584
Fuel Used (gal)	15.9	16.0	15.6	15.8	14.9	14.9	15.1

Summary of All Intervals

Run Number	7	8	9	Avg
Start Time	6:57	6:57	6:57	6:57
End Time	7:10	7:10	7:10	7:10
Total Time (min)	13	13	13	13
Time Recorded (min)	10	10	10	10
# of Intervals	2	2	2	2
# of Recorded Intervals	1	1	1	1
Vehs Entered	662	637	645	645
Vehs Exited	640	628	639	633
Starting Vehs	125	139	127	122
Ending Vehs	147	148	133	133
Travel Distance (mi)	418	402	415	411
Travel Time (hr)	25.6	24.0	25.0	24.3
Total Delay (hr)	10.2	9.3	10.0	9.2
Total Stops	658	602	661	609
Fuel Used (gal)	15.9	15.1	15.9	15.5

Interval #0 Information Seeding

Start Time	6:57
End Time	7:00
Total Time (min)	3

Volumes adjusted by Growth Factors.
No data recorded this interval.

Interval #1 Information Recording

Start Time	7:00
End Time	7:10
Total Time (min)	10

Volumes adjusted by Growth Factors.

Run Number	1	10	2	3	4	5	6
Vehs Entered	679	663	662	651	603	627	635
Vehs Exited	646	650	632	647	611	623	636
Starting Vehs	117	127	114	131	123	135	127
Ending Vehs	150	140	144	135	115	139	126
Travel Distance (mi)	426	422	413	417	389	403	408
Travel Time (hr)	24.5	24.3	24.2	24.3	23.6	23.4	23.7
Total Delay (hr)	8.9	8.8	9.1	9.1	9.4	8.6	8.7
Total Stops	619	594	632	617	591	577	584
Fuel Used (gal)	15.9	16.0	15.6	15.8	14.9	14.9	15.1

Interval #1 Information Recording

Start Time	7:00
End Time	7:10
Total Time (min)	10

Volumes adjusted by Growth Factors.

Run Number	7	8	9	Avg
Vehs Entered	662	637	645	645
Vehs Exited	640	628	639	633
Starting Vehs	125	139	127	122
Ending Vehs	147	148	133	133
Travel Distance (mi)	418	402	415	411
Travel Time (hr)	25.6	24.0	25.0	24.3
Total Delay (hr)	10.2	9.3	10.0	9.2
Total Stops	658	602	661	609
Fuel Used (gal)	15.9	15.1	15.9	15.5

Arterial Level of Service: EB NE Franklin Ave

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	5	2.5	15.6	0.1	21
Total		2.5	15.6	0.1	21

Arterial Level of Service: WB NE Franklin Ave

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
NE 4th St	5	6.3	41.2	0.3	24
3rd Street	4	41.5	52.4	0.1	6
Total		47.8	93.6	0.4	14

Intersection: 1: NE Franklin Ave & NE Hill St

Movement	EB	B20	WB	NB
Directions Served	LTR	T	LTR	R
Maximum Queue (ft)	72	30	48	11
Average Queue (ft)	23	9	11	2
95th Queue (ft)	95	68	74	20
Link Distance (ft)	78	69	767	519
Upstream Blk Time (%)	2	1		
Queuing Penalty (veh)	12	8		
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 2: NE Franklin Ave & 1st Street

Movement	EB	EB	WB	WB	NB	SB
Directions Served	L	TR	L	TR	LTR	LTR
Maximum Queue (ft)	37	38	24	2	41	111
Average Queue (ft)	16	8	9	0	22	71
95th Queue (ft)	48	68	31	5	49	138
Link Distance (ft)		767		362	448	530
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	70		100			
Storage Blk Time (%)		1				
Queuing Penalty (veh)		0				

Intersection: 3: 2nd Street

Movement	EB	EB	WB	NB	SB
Directions Served	L	TR	L	R	R
Maximum Queue (ft)	35	228	34	76	32
Average Queue (ft)	12	91	15	50	14
95th Queue (ft)	41	297	41	89	41
Link Distance (ft)		362		523	540
Upstream Blk Time (%)		1			
Queuing Penalty (veh)		6			
Storage Bay Dist (ft)	50		40		
Storage Blk Time (%)	0	7	1		
Queuing Penalty (veh)	3	2	10		

Intersection: 4: NE Franklin Ave & 3rd Street

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	T	R	L	T	TR	L	T	TR
Maximum Queue (ft)	274	345	273	274	428	209	189	248	237	183	294	296
Average Queue (ft)	195	289	124	207	376	98	141	185	174	125	234	227
95th Queue (ft)	321	380	310	324	488	251	236	279	258	241	319	319
Link Distance (ft)		314			397			1581	1581		1389	1389
Upstream Blk Time (%)		6			14							
Queuing Penalty (veh)		55			110							
Storage Bay Dist (ft)	250		250	250		200	200			200		
Storage Blk Time (%)	5	12	0	4	33	0	9	3			18	
Queuing Penalty (veh)	32	51	0	21	105	0	27	5			16	

Intersection: 5: NE Franklin Ave & NE 4th St

Movement	EB	WB	WB	WB	NB	SB
Directions Served	L	L	T	R	LTR	LTR
Maximum Queue (ft)	35	22	218	15	97	115
Average Queue (ft)	15	7	97	6	57	67
95th Queue (ft)	43	36	291	54	126	136
Link Distance (ft)			1370		517	530
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	125	75		125		
Storage Blk Time (%)			8			
Queuing Penalty (veh)			3			

Intersection: 55:

Movement	EB	B20	B20
Directions Served	LTR	T	
Maximum Queue (ft)	23	27	18
Average Queue (ft)	7	7	4
95th Queue (ft)	58	30	22
Link Distance (ft)	806	78	78
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 466

APPENDIX C – OPPORTUNITIES & CONSTRAINTS MEMO

OPPORTUNITIES & CONSTRAINTS MEMO

Franklin Avenue Corridor

Contract #31900170

January 2021

Prepared for:

City of Bend
710 NW Wall St.
Bend, OR 97703

Prepared by:

DOWL

963 SW Simpson Ave
Bend, OR 97702

TABLE OF CONTENTS

FIGURES

TABLES

PURPOSE

Franklin Avenue is a key east-west connection between Downtown Bend and the emerging Bend Central District, a priority growth area for the City intended to accommodate denser urban mixed-use development. The corridor is anticipated to be redeveloped in the coming years with the implementation of the Core Area Tax Increment Finance Plan, capital improvement projects, and private development along the corridor. Franklin Avenue is a minor arterial, part of a planned Neighborhood Greenways route, and a route for Cascade East Transit (CET). In preparation for redevelopment of the corridor and capital improvement identified in the Bend Transportation Plan and funded through the voter approved Transportation General Obligation (GO) Bond, the Franklin Corridor Concepts project will develop up to four complete street alternatives for the corridor between NW Harriman Street and NE 4th Street to provide direction to development and to help inform the Midtown Crossings Feasibility Study.

This memorandum summarizes the findings of the traffic data collected, identifies issues and constraints along the current corridor, and outlines potential opportunities for improvement within the project area. With this corridor having a wide variety of uses, and being a key east-west connector to and from Bend's Downtown area, finding the appropriate balance of multi-modal facilities is critical.

The constraints and opportunities discussed in the memorandum are based on the following:

- Background information provided by the City of Bend (City)
- Project Kickoff Meeting held on November 16, 2021
- Project site walk on November 18, 2021
- Traffic data collected in November 2021
- Collision data provided by the City
- Pedestrian, cyclist and automobile volumes from the City's automatic traffic recorder (ATR) station located on Franklin Avenue east of Hill Street
- Ridership data provided by CET
- Preliminary Alternatives Meeting held on December 15, 2021

Background Information

Franklin Avenue corridor has seen recent changes and investments over the last 10 years and has been a corridor of focus for the City for multi-modal east west connectivity. In 2014, one of two eastbound lanes at the 3rd Street/Franklin Avenue intersection was converted to a right turn lane with the construction of Walgreens. This same year, the Stormwater Master Plan listed the Franklin underpass project as a top five recommended stormwater CIP project given the quality of the drill holes and resultant flooding issues and spill risk in the underpass. In 2016, the City hired Kittelson & Associates, Inc. to conduct a Complete Street Analysis for the corridor in anticipation of proposed changes that were never realized. In 2018, the City purchased additional right of way at the Franklin and 3rd Street intersection as part of a safety and ADA project to reconstruct ADA ramps to comply with Public Rights of Way Accessibility Guidelines. The traffic signal at the Franklin Avenue and 3rd Street intersection is recommended for short-term reconstruction in the City's Signal Master Plan based on age (over 40 years old) and condition (rated 69% - fair). An upgraded signal controller and radar detection would improve the ability to

detect bicycles at the signal. The ADA project was built to accommodate the future signal reconstruction.

In 2020, the City updated its Bend Transportation System Plan which identified several project needs along the Franklin Corridor including:

- Pedestrian/Bicycle crossing improvements at the Franklin Avenue and 2nd Street and Franklin Avenue and 4th Street intersections
- Midtown Bicycle & Pedestrian Crossings
- Low Stress Bicycle Network (LSN) route on Franklin Avenue between NW Harriman and NE 8th Street
- Primary Transit Corridor between NW Wall Street and NE 3rd Street
- Franklin Avenue Corridor Study between NW Wall Street and NE 3rd Street

In November 2020, Bend voters passed a $190 million Transportation GO Bond to fund transportation investments. There is approximately $5.4 million intended for improvements along the Franklin Corridor between Bond Street and NE 6th Street from a variety of funding sources. $420,000 is allocated from the 'Key Intersection Improvements' portion of the GO Bond project summary. $340,000 is allocated from the 12 Citywide Key Routes portion of the GO Bond project summary. In addition, the City received $355,047 through an All Roads Transportation Safety (ARTS) grant for street lighting on the Franklin corridor between Downtown and the Parkway. Additional funds could be made available from an American Rescue Plan Act (ARPA) grant, Core Area Tax Increment revenue, and funds earmarked from the GO Bond for the Midtown Crossings Project. There is also $2.25 million of funding identified in the adopted 5-year CIP that is allocated to the Franklin Avenue and Greenwood Avenue Underpass stormwater system improvements between Fiscal Years (FY) 2024- FY 2026.

The City is currently conducting a similar study on Greenwood Avenue which identifies four alternatives for the corridor. The Greenwood Avenue alternatives locate the LSN at Harriman Street and offer various alternatives for restricted left turns at Harriman Street, Hill Street, 1st Street, and 2nd Street. The configuration selected there will impact access and circulation to the Franklin corridor. The Greenwood corridor alternatives will be reviewed and considered as Franklin corridor concepts are developed with the goal of producing two compatatable corridors around one cohesive district.

This effort is being funded through the City's Neighborhood Greenways Project Phase IV.

TRAFFIC DATA

Traffic Counts and Speed

In November 2021, 24-hour speed, vehicular class, and volume data was obtained along Franklin Avenue, as well as peak hour intersection count data at each intersection on Franklin Avenue between Hill Street and 4th Street. Franklin Avenue within the project area varies between a two-, four-, and five- lane section with a posted speed of 25 miles per hour (MPH). Table 1 summarizes the data collected.

Table 1: Franklin Avenue Daily Traffic Count Data Summary

MEASURE	RESULT
Average Daily Traffic (Between 2nd And 3rd Ave)	13,200 vehicles
85th Percentile Speed	29 MPH
Percent Of Vehicles > 30 MPH	12.1%
Heavy Vehicle Percentage	4.9%

Daily pedestrian, cyclist and automobile volumes were also obtained from the City's automatic traffic recorder station located on Franklin Avenue east of Hill Street. Automobile data obtained includes volume data from 2018 to 2021. Pedestrian and cyclist data obtained is for the year 2021 through November 28th. Table 2 below summarizes data obtained by the City of Bend's ATR station.

Table 2: City of Bend Franklin Avenue ATR Data Summary

MODE	MEASURE	VOLUME PER DAY
Motor Vehicle Daily Volume	Average, 2021	11,800
	Average, 2019*	12,700
Pedestrian Daily Volume	Average, 2021	280
	Maximum, 2021	560
Cyclist Daily Volume	Average, 2021	180
	Maximum, 2021	470

**2019 ADT provided as means for comparison to volumes reported prior to changes in travel patterns associated with the COVID-19 pandemic.*

Franklin Avenue within the project area does not experience steep peak activity, but rather has relatively steady automobile traffic between 8 AM and 6 PM. PM peak hour intersection data also aids in understanding modal shares and volume along Franklin Avenue. Peak hour intersection data collected in November 2021 is summarized below in Table 3. PM peak hour pedestrian and bicycle volumes were relatively low as the count was collected in winter when conditions were dark. Franklin Avenue and Harriman Street intersection traffic counts were not collected as part of this effort, however, alternatives will still include Harriman Street.

Table 3: PM Peak Hour Traffic Data

INTERSECTION	AUTOMOBILE VOLUME	PEDESTRIAN VOLUME	BICYCLE VOLUME
Franklin Ave/Hill St	1,420	19	2
Franklin Ave/1st St.	1,380	22	2
Franklin Ave/2nd St.	1,420	2	5
Franklin Ave/3rd St.	2,930	37	0
Franklin Ave/4th St.	1,310	0	1

Safety

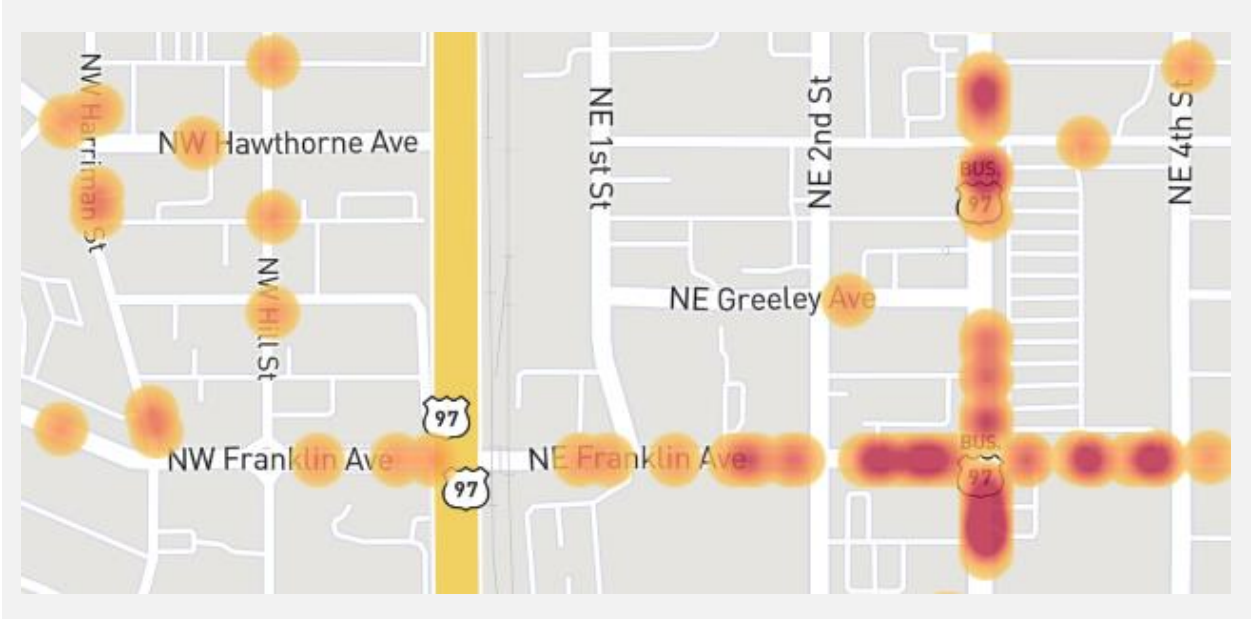
The most recent five years of collision data (2015 to 2019) was provided by the City of Bend using data sourced from Oregon Department of Transportation and was used to evaluate collision history. There were 72 total crashes recorded at the study intersections as shown in Table 4 and Figure 1.

Table 4: Crash Rates

INTERSECTION	2015	2016	2017	2018	2019	TOTAL	CRASH RATE*
Franklin Ave/Harriman St	1	0	1	0	1	3	0.193
Franklin Ave/Hill St	0	2	0	0	1	3	0.116
Franklin Ave/1st St.	1	1	1	1	2	6	0.238
Franklin Ave/2nd St.	1	1	8	0	1	11	0.708
Franklin Ave/3rd St.	7	9	4	8	8	36	**1.123**
Franklin Ave/4th St.	3	3	2	3	5	16	**1.114**

**Crash rate is measured in crashes per million entering vehicles (MEV). A collision rate of 1.0 MEV or greater generally indicates a higher than average collision rate and should be further investigated.*

Figure 1: Crash Heat Map



The 3rd Street and 4th Street intersections have reported higher than typical collision frequencies. The most common type of crash to occur along the Franklin Avenue corridor are rear end crashes, most of which occurred at the Franklin Avenue and 3rd Street intersection, most frequently on the south and west legs of the intersection. One crash in the 5-year sample involved a pedestrian, occurring at the Franklin Avenue and 3rd Street intersection and resulting in a non-fatal injury that was related to a pedestrian crossing maneuver at the intersection. Four crashes involved cyclists, all four of which occurred at the Franklin Avenue and 4th Street intersection, each occurred while traveling east/west on Franklin Avenue, and each resulting in non-fatal injuries. Of the four cyclist

related crashes, three involved one party not yielding right-of-way to the other party. Three of the four cyclist related crashes occurred at the nearby Safeway driveways just west of 4th Street. Coupling accident report information with spacial data indicate that eight of the 16 vehicular crashes attributed to the Franklin Avenue and 4th Street intersection occured at the Safeway accesses (four at each). Details about crash history can be analyzed to determine possible mitigation strategies.

Public Transit

CET operates fixed-route bus service in Bend, community connector fixed-schedule buses connecting several communities in Central Oregon, as well as dial-a-ride services within their jurisdiction. Franklin Avenue is currently served by routes 2, 5, 6 and 11, and contains two stops within the project study area. Both stops are simply post-mounted signs at curb-tight sidewalks located west of the Franklin Avenue and 2nd Street intersection serving eastbound and westbound routes 2 and 11. The nearest stops for routes 5 and 6 are at the Franklin Avenue and 6th Street intersection and the Franklin Avenue and 7th Street intersection, east of the project study area.

Schedule and annual boarding data were obtained from CET for the bus stops on Franklin Avenue/2nd Street for year 2019 to show ridership levels prior to the COVID-19 pandemic. Table 5 summarizes the data obtained related to CET bus routes 2, 101, and 11.

Table 5: CET Transit Ridership Data

STOP AND ROUTE		ANNUAL WEEKDAY BOARDINGS	ANNUAL SATURDAY BOARDINGS	TOTAL ANNUAL BOARDINGS	SERVICE FREQUENCY (MINS)**
Franklin/ 2nd (WB)	Route 2	326	55	381	45/60
	Route 10	236	0*	236	60/N/A*
	Route 11	226	29	255	60/60
	Total	**788**	**84**	**872**	**N/A**
Franklin/ 2nd (EB)	Route 2	33	10	43	45/60
	Route 10	54	0*	54	60/N/A*
	Route 11	45	7	52	60/60
	Total	**132**	**17**	**149**	**N/A**

**Route 10 did not operate on Saturdays.*

***Weekday Service Frequency/Saturday Service Frequency*

Approximately 1,000 riders annually were served by the two CET bus stops on Franklin Avenue within the project area in 2019. Weekday bus service spanned from 6:00 AM to 7:00 PM and weekend service, when available, spanned from 7:30 AM to 4:30 PM.

CET's 2040 Transit Master Plan identifies a portion of Franklin Corridor to be planned for future high-capacity transit service for a new route that combines Routes 7 and 10. Changes along this

[1] *Prior to the pandemic, Route 10 utilized the bus stops at Franklin Avenue/2nd Street and is included in CET's Transit Master Plan.*

corridor should, at a minimum, maintain the existing stops and consider CET's plans for future expansion.

PEDESTRIAN AND BICYCLE FACILITIES

Pedestrian Facilities

Within the project limits, existing pedestrian facilities include sidewalks along both the north and south sides of Franklin Avenue. The sidewalks are typically 5 feet wide and curb-tight and provide continuous connection along the corridor. Between NW Hill Street and NE 1st Street, the sidewalks go under the US97 Parkway bridge and through tunnels under the BNSF railroad bridge. The sidewalks are generally in fair condition but the aging concrete sidewalks adjacent to the BNSF bridge are cracking and spalling.

The only marked crossing of Franklin Avenue is at the traffic signal at NE 3rd Street – all other crossings are unmarked and uncontrolled.

Along the southbound lane of the Parkway, the existing sidewalk connects to both the north and south sides of Franklin Avenue via ramps accessible for pedestrians and bicycles.

Bicycle Facilities

Bicylce facilities along the corridor include bike lanes, typically 5 feet wide, adjacent to travel lanes. Approaching the undercrossing, bicyclists have the option to take the road or use the pedestrian facilities under the bridges. Sharrows at the transition points indicate that bicyclists have the option and warn drivers to share the lane.

In addition to the ramps along the southbound lane of the Parkway noted above, a northbound ramp allows bicycle connection to the sidewalks under the bridges on the south side of Franklin Avenue. This ramp has sight and manueverability constraints which will be discussed later in this memo.

ISSUES AND CONSTRAINTS

Right-of-Way

Within the project limits, the Franklin Avenue Corridor has a typical existing right-of-way (ROW) width of 80 feet. West of the undercrossing, there are no known plans for private redevelopment. East of the undercrossing, several properties plan to redevelop, see Figure 2. Franklin Avenue is identified as a Minor Arterial in the Bend Transportation Plan which requires a 100 feet of ROW dedication as the corridor redevelops. However, during the Core Area Project, the City identified that the ultimate corridor needs could be accommodated within a 90 foot ROW. Therefore, this effort will look at alternatives that fit within a 90 foot ROW.

Figure 2: Redevelopment Map

1. 105 NE Franklin Avenue – Property is currently occupied by Les Schwab Tire Centers but is in the process of being purchased with plans for redevelopment. Discussions with the buyer indicate they would like to maintain access on Franklin Avenue and vacate the 1st Street ROW, which would require public hearings with both Planning Commission and City Council as well as Council approval. City ROW bisects the property and the City also owns the lot labeled as 1A.
2. 181 NE Franklin Avenue – Property was recently purchased by Brooks Resources Corporation with plans to redevelop. The proposed redevelopment plan includes on-street parking on Franklin Avenue.
3. 154 NE Franklin Avenue – Property is currently occupied by the Rainbow Motel and is reportedly for sale. Plans for redevelopment are not known at the time of this memorandum.

Stormwater

A low area exists where Franklin Avenue passes under the Bend Parkway (Highway 97) and the Burlington Northern Santa Fe (BNSF) railroad tracks. The Franklin Avenue underpass is underwater during heavy rainfall events. At times, flooding causes the underpass to be closed to traffic requiring difficult and time-consuming detours for emergency vehicles as well as the general public. It receives drainage from a large area that is almost entirely impervious both within, and beyond, the ROW limits. An example of an impervious surface draining to ROW is shown in Figure 3.

Figure 3: Impervious Surface Draining to ROW

In a storm event, existing dry wells and drill holes are overwhelmed and unable to keep up with the rate and volume of stormwater runoff. Flooding of this underpass creates a barrier and safety hazard for vehicles traveling east and west on the corridor. The drill holes at the bottom of the underpass are located within the railroad crossing structure, making operation and maintenance access challenging. Given the lack of pretreatment and the location, one of the drill holes is no longer operational and the remaining drill hole at the low point now drains slowly despite appropriate maintenance.

A drywell that drains the 1st Street right-of-way and the Les Schwab site appears to have been covered and possibly removed without known authorization, it is located on a City-owned lot, labeled as “1A” identified in the ROW section above. Private development is required to address stormwater from their site and along their frontage, including the replacement of drill holes with drywells.

The City’s 2014 Stormwater Master Plan identifies the need for a new pump station, or a new regional stormwater management facility, to address flooding at both Franklin Avenue and Greenwood Avenue. Site redevelopment and corridor improvements should require capture, treatment, and infiltration of stormwater onsite as well as affected areas within ROW reducing the volume of stormwater collecting at the undercrossing.

Undercrossing

The existing Franklin Avenue Bridge carrying the BNSF railroad is a concrete and steel underpass with steel girders over the vehicular traffic. The concrete pedestrian tunnels were poured monolithic with the bridge abutments and are approximately 5 feet wide and 7 feet tall. The sidewalks leading to the pedestrian tunnels from the east curve horizontally and vertically, limiting the direct line of sight into the tunnels. A newer Bend Parkway bridge was built parallel to, and west of, the railroad bridge and comprises separate northbound and southbound structures. The northbound bridge was last inspected in December 2020 and received a sufficiency rating of 73.0.

The southbound bridge was last inspected in December 2020 and received a sufficiency rating of 81.8. The Parkway bridge spans the sidewalks allowing open view from Franklin Avenue.

Figure 4: Pedestrian Access Under BNSF and Parkway Bridges

Pedestrian tunnel under BNSF bridge

Pedestrian sidewalk under Parkway bridge

Between NW Hill Street and west side of the undercrossing, retaining walls with concrete rails separate the travel lanes from the bicycle and pedestrian routes which are vertically separated from the road. The retaining walls and concrete rails create challenging site lines for all users at the NW Hill Street intersection but allow pedestrians to follow a gentler profile than the centerline profile which has significant elevation changes for clearance purposes under the bridges. Both sides of the pedestrian routes include a drivable frontage-style road protected with surface mounted tubular markers, curb and sidewalk adjacent to ROW, and pedestrian/bicycle ramps connecting to the Parkway. The south side must maintain a minimum 20-foot width for emergency vehicle access. The north side includes a waterline which will require a minimum of 14 feet wide for maintenance access. The slopes of the east approach are steep and eroding including a section where the south sidewalk is in poor condition without many opportunities for low-cost maintenance and repair options.

Between the Parkway and BNSF railroad bridges, there is an existing northbound bicycle offramp from the Parkway which has poor visibility and tight corners which are difficult to maneuver on a bicycle. The City has expressed interest in closing this bicycle ramp due to its existing challenges pending future conversations with ODOT.

In 2019, murals were added to the north side underpass by the late artist Kaycee Anseth in an effort to make the undercrossing tunnel a more welcoming, and vibrant public space. In 2020, another mural was added to the south railroad undercrossing tunnel to express cultural values and a series of conversations held between Latinx stakeholders, high school students from COCC's ¡AVANZA! Program and selected artists, Carly Vargas Garzon and Melinda Martinez. Mecca Bend guided this innovative project to bridge the gap between efforts to revitalize the Bend

Central District and members of the Latinx community who live, work, and commute through the area[2].

The City has expressed interest in preserving both murals, pending future decisions made about tunnel improvements through the Midtown Crossing Feasibility Study, and turning the north side pedestrian approach, west of the Parkway, into a community-friendly plaza to honor the late artist and expand the welcoming feel of this public space in coordination with the Kaycee Anseth Legacy Foundation[3].

Parking

There are two locations with on-street parking along the Franklin corridor:

- NW Harriman Street to NW Hill Street – south side – 6 parking spaces
- NE 3rd Street to NE 4th Street – south side – 8 parking spaces

The total number of on-street parking spaces will be considered, evaluated, and measured as alternatives are developed along the corridor..

Utilities

Both overhead and underground utilities are present along the corridor. The most costly and challenging to relocate are likely to be the utility poles along both the north and south sides of Franklin Avenue. The poles are currently located adjacent to, or within, the existing sidewalk. Utility easements may need to be acquired if these facilities are to remain overhead. Relocation of curbs could result in more significant utility relocations that should be considered as part of the alternatives evaluation.

Figure 5: Utility Poles Along Franklin Avenue

[2] *https://www.bcdinitiative.org/whats-happening/2021/5/4/participate-in-proyectomural*
[3] *https://kayceeansethlegacyfoundation.org/*

The cost of relocating utilities will depend on the owner of the project creating the need for relocation. For private development projects, the cost will be borne by the developer. For a City capital improvement project, the cost will be borne by the franchise utility per the franchise agreement. If there is not room for the facility to relocate within ROW, the cost of an easement would be borne by either the developer or the City, not the franchise utility.

Street lighting is present at each intersection east of the undercrossing including several mid-block lights between NE 1st Street and NE 3rd Street. City of Bend standards require street lights at all street intersections with collectors and arterials – the corridor does not meet the current standads.

Access

Many of the homes and businesses along the corridor have driveway access on Franklin Avenue. Concepts will need to maintain access unless an alternative can be provided

OPPORTUNITIES

While the sections above outline a number of issues and constraints with the existing corridor, upcoming development allows opportunities for a purposeful and strategic approach to address existing issues and create a cohesive corridor that meets the multi-modal needs of the community. Potential opportunities for the corridor are outlined below and will be further explored during the alternatives development phase of the project.

- Develop and evaluate multiple cross sections for a 90-foot ROW considering the following cross sectional elements:
    - Low Stress Bike Facilities
    - On-street parking
    - Planter strips
    - Two-way left turne lanes
- Low Stress Bicycle Route to connect the City's existing Neighborhood Greenways to key destinations (Downtown, Bend Central District including Safeway, Bend High School, Juniper Park, and the Coyner Trail) on a Key Walking and Bicycling Route
- Curb extensions at NW Harriman Street to improve the crossing of the Greenways route
- Enhance safety at NW Hill Street caused by sight distance issues
- Enhancements to the north and south pedestrian/bicycle plaza areas between NW Hill Street and the Parkway
- Closure of the northbound bicycle off ramp from the Parkway
- Realigning east side pedestrian approaches to the BNSF bridge tunnels, similar to the Vallier Design Associates rending shown in Figure 6, to improve safety and comfort by straightening the sightlines through the tunnels

Figure 6: Vallier Design Associates Tunnel Approach Rendering

- Striped crosswalks at NE 1st Street
- Evaluation of impacts of closing the driveway access to 105 NE Franklin Avenue
- Enhanced crossing at NE 2nd Street – limit vehicular traffic to right-in, right-out, with striped bicycle crossings
- Evaluation of limiting westbound traffic to one through lane at NE 3rd Street by converting the outside lane to right only
- Curb extensions at NE 4th Street for improved pedestrian crossings
- Buffered bike lanes extending to NE 8th Street to connect to Coyner Trail
- Variety of potentially available funding sources (Private Development, Transportation GO Bond, ARPA Grant, ARTS Grant, Core Area Tax Increment, Stormwater Fund)
- Stormwater drainage improvements for public safety and access, potentially in conjunction with Greenwood improvements, and spill risk minimization
- Extraneous impervious surface removal (NW quadrant)/community plaza
- Opportunity to enhance overall circulation for all modes into and around the Bend Central District
- Coordinate improvements with other City efforts including the Greenwood Avenue Alternatives analysis and the upcoming Midtown Crossing Feasibility Study

IMPLEMENTATION

Due to the planned private development along the corridor, the City must consider the appearance of the overall corridor as these sites develop. Ideally a capital improvement project would upgrade the corridor in the near future to avoid, or minimize the duration of, newly redeveloped properties adjacent to older properties creating a "piecemeal" appearance. Through the permitting process, the City may elect to have the developer make contributions to a capital improvement project rather than constructing the offsite improvements with the development. If this option is selected, the developer should be required to dedicate ROW and plan for future grading needs.

Alternatively, constructing the improvements within ROW will result in multiple jogs within the curb and sidewalk and inconsistent City blocks.

APPENDIX D – CONSTRUCTION COST BREAKDOWN

Recent CIP Unit Prices

Item	Unit Price	Unit	Conversion
Conc Walk	$ 8.00	SF	= $ 8.00 SF
HMAC	$ 95.00	Ton	= $ 4.98 SF
Agg Base - 4"	$ 95.00	CY	= $ 1.17 SF
Agg Base - 10"	$ 90.00	CY	= $ 2.78 SF
Stormwater	$ 41,600.00	300 LF	= $ 3.47 SF
Earthwork - 8"	$ 45.00	CY	= $ 1.11 SF
Earthwork - 18"	$ 40.00	CY	= $ 2.22 SF
Curb	$ 20.00	LF	= $ 40.00 SF
Concrete Island	$ 18.00	SF	= $ 18.00 SF
Topsoil	$ 70.00	CY	= $ 1.30 SF
Landscape & Irrigation	$ 5.50	SF	= $ 5.50 SF

Planning Level Cost Estimates

Alternative 1

Segment	Station		Sidewalk $ 10.28		Planter Strip $ 7.91		Curb $ 43.40		Pavement $ 13.44		Raised Median $ 23.00		Total per Foot	Total Length	Total
			Width	Total	Width	Total	Width	Total	Width	Total	Width	Total			
A	5+00	8+50	30	$ 308.52	19.5	$ 154.19	1	$ 43.40	25	$ 336.12	0	$ -	$ 842.22	350	$ 294,779
B	16+00	20+75	31	$ 318.80	20.5	$ 162.10	1	$ 43.40	36.5	$ 490.73	0	$ -	$ 1,015.03	475	$ 482,139
C West	20+75	24+50	27	$ 277.67	11	$ 86.98	1	$ 43.40	45.5	$ 611.73	0	$ -	$ 1,019.78	375	$ 382,416
C East	24+50	32+00	26	$ 267.38	6.5	$ 51.40	1	$ 43.40	45.5	$ 611.73	0	$ -	$ 973.91	750	$ 730,431
													Cost		**$ 1,890,000**
													w/ 50% Contingency		**$ 2,835,000**

Lowest Cost

Alternative 2

Segment	Station		Sidewalk $ 10.28		Planter Strip $ 7.91		Curb $ 43.40		Pavement $ 13.44		Raised Median $ 23.00		Total per Foot	Total Length	Total
			Width	Total	Width	Total	Width	Total	Width	Total	Width	Total			
A	5+00	8+50	16	$ 164.54	9.5	$ 75.12	3	$ 130.19	39	$ 524.34	8	$ 184.00	$ 1,078.19	350	$ 377,367
B	16+00	20+75	16	$ 164.54	0	$ -	3	$ 130.19	51	$ 685.68	19	$ 437.00	$ 1,417.41	475	$ 673,268
C West	20+75	24+50	14	$ 143.98	0	$ -	2	$ 86.79	58.5	$ 786.51	9.5	$ 218.50	$ 1,235.78	375	$ 463,417
C East	24+50	32+00	12	$ 123.41	0	$ -	2	$ 86.79	58.5	$ 786.51	6.5	$ 149.50	$ 1,146.21	750	$ 859,658
													Cost		**$ 2,374,000**
													w/ 50% Contingency		**$ 3,561,000**

25.6%

Alternative 3

Segment	Station		Sidewalk $ 10.28		Planter Strip $ 7.91		Curb $ 43.40		Pavement $ 13.44		Raised Median $ 23.00		Total per Foot	Total Length	Total
			Width	Total	Width	Total	Width	Total	Width	Total	Width	Total			
A	5+00	8+50	16	$ 164.54	14	$ 110.70	1	$ 43.40	44.5	$ 598.29	0	$ -	$ 916.93	350	$ 320,925
B	16+00	20+75	16	$ 164.54	20	$ 158.15	1	$ 43.40	52	$ 699.12	0	$ -	$ 1,065.21	475	$ 505,974
C West	20+75	24+50	14	$ 143.98	10	$ 79.07	1	$ 43.40	59	$ 793.24	0	$ -	$ 1,059.68	375	$ 397,380
C East	24+50	32+00	12	$ 123.41	5.5	$ 43.49	1	$ 43.40	60.5	$ 813.40	0	$ -	$ 1,023.70	750	$ 767,772
													Cost		**$ 1,992,000**
													w/ 50% Contingency		**$ 2,988,000**

5.4%

Alternative 4

Segment	Station		Sidewalk $ 10.28		Planter Strip $ 7.91		Curb $ 43.40		Pavement $ 13.44		Raised Median $ 23.00		Total per Foot	Total Length	Total
			Width	Total	Width	Total	Width	Total	Width	Total	Width	Total			
A	5+00	8+50	32	$ 329.09	17.5	$ 138.38	1	$ 43.40	25	$ 336.12	0	$ -	$ 846.98	350	$ 296,442
B	16+00	20+75	32	$ 329.09	19.5	$ 154.19	1	$ 43.40	36.5	$ 490.73	0	$ -	$ 1,017.41	475	$ 483,268
C West	20+75	24+50	31	$ 318.80	7	$ 55.35	1	$ 43.40	45.5	$ 611.73	0	$ -	$ 1,029.28	375	$ 385,981
C East	24+50	32+00	26	$ 267.38	6.5	$ 51.40	1	$ 43.40	45.5	$ 611.73	0	$ -	$ 973.91	750	$ 730,431
													Cost		**$ 1,896,000**
													w/ 50% Contingency		**$ 2,844,000**

0.3%

The following items are included in the construction costs:

- Pavement and Concrete Surfacings
- Aggregate Base

- General Excavation
- Catch Basins, Sedimentation Manholes, and Drywells
- Landscaping & Irrigation including topsoil

The following items are not included in the construction costs but are considered within the 50% contingency addition to cost estimates:

- Engineering
- Construction Administration
- Street Lighting
- Utility Impacts
- ROW Acquisition
- Surveying
- Mobilization
- Traffic Control
- Erosion Control
- Demolition

APPENDIX E – SCORING AND EVALUATION DETAIL

General Corridor Impacts

Evaluation

RIGHT-OF-WAY

ROW evaluation is based on the severity of the ROW impacts with respect to the size of the ROW take, functionality of the property, and impacts to businesses. ROW impacts are generally consistent between the proposed alternatives, however, the protected intersection at NE 3rd Street proposed in Alternative 2 requires purchase of the property in the southeast corner of the intersection and demolition of the existing building.

Potential ROW issues to be evaluated during design include:

- Sherwin Williams (125 NE Franklin Avenue) - Grading challenges are created as most of the property sits several feet above the existing curb line. Concrete retaining walls are currently used to make up the grade difference and the driveways slope down to back of walk, which allows stormwater to flow from the site into the ROW. Acquiring ROW across this property will require reconstructing retaining walls as well as steepening or lengthening the driveways to meet grade requirements.

Sherwin Williams on the south side of NE Franklin Avenue

- Paulson's Floor Coverings (184 NE Franklin Avenue) – Adjusting the ROW line will encroach on the existing parking at the front of the store. Parking will either need to be eliminated, reconfigured, or replaced with parallel on-street parking.

Paulson's Floor Coverings on the north side of Franklin Avenue

STORMWATER

The selected alternative will need to capture all stormwater within ROW and, at a minimum, consider additional basin areas for impervious surfaces on private property that runoff to ROW. Higher scores are assigned to alternatives that provide adequate space for installation of stormwater facilities, typically located in planter strips. Longer-wider vegetated strips provide more stormwater benefit for reduced impervious surface area and increased green infrastructure treatment areas. These areas could be used to locate sedimentation manholes and underground injection controls (UIC), such as drywells. In some areas, the landscape strips are wide enough such that drainage swales and stormwater planters could be considered.

In Alternative 3, the lack of landscape strips limits stormwater options. Sedimentation utility access holes and drywells would be the only option and would result in utility access hole frames and covers located in the sidewalks which is undesirable.

UTILITY IMPACTS

Utility impacts will occur with any of the alternatives but some create larger challenges than others. Alternatives with planter strips score higher because they provide space for utilities to be installed.

Alternative 3 does not include landscape strips which would require utilities to place facilities within the sidewalks or acquire utility easements. The City requires new utilities to be installed underground, however, when relocating existing overhead facilities, the power companies are only responsible for the relocation costs associated with remaining overhead – additional costs required to underground would be the responsibility of the City. Undergrounding utilities as part of the implementation considerations for this corridor, which would support redevelopment goals since the zoning for the area allows for buildings up to 65 feet tall.

CONSTRUCTION COSTS

Construction costs are summarized in section 3.2 and detailed in Appendix D. The lowest cost option received the highest score with the most expensive option receiving the lowest score.

Alternative 1 is the least cost option but is similar to the construction cost for Alternative 4. The curb-to-curb pavement width has the largest impact on the construction cost. The cycle tracks proposed in Alternatives 1 and 4 move the bike facilities out of the road resulting in the lower construction costs.

MAINTENANCE

Maintenance techniques and equipment required along a road corridor depends on several factors. Below are several of the key elements affecting the qualitative maintenance score:

- Roadway – Roadway maintenance scores are better with narrower curb-to-curb widths reducing the area of surface with vehicle loadings.

- Pavement Markings – Pavement marking maintenance depends on the volume and type of pavement markings. Corridors with unique markings such as green bike lanes or hardened centerlines could require handwork rather than machined paint. Tubular markers also require more frequent replacement as they can be easily damaged by snowplows or general proximity to vehicular traffic.

- Landscaping – The width and volume of landscape strips will impact the amount of landscape maintenance required. Currently the City of Bend only has one landscape maintenance crewperson.

- Snowplow – Snowplow maintenance requires narrow, specialized equipment to maintain narrow sections such as median-protected bike lanes or separated cycle tracks. Corridors with limited space to store plowed snow add maintenance time and equipment to load, haul, and dump snow at off-site locations. Alternatives that don’t require specialized maintenance equipment or addition time score better in this category. Currently the City of Bend does not have the needed equipment to plow the narrow areas proposed in Alternatives 1 and 2.

Scoring

General Corridor Impacts Score

			Alternative			
Area	Sub Weight	Existing	1	2	3	4
Right-of-Way	15%	-	4	2	4	4
Stormwater	17%	2	4	3	2	4
Utility Impacts	17%	-	4	1	4	4
Construction Costs	17%	-	4	2	3	4
Maintenance	17%	2	3	1	4	4
Business Impacts	17%	2	3	2	4	3
Subtotal	**100%**	**2**	**3.7**	**1.8**	**3.5**	**3.8**

Driving

Evaluation

MOTOR VEHICLE OPERATIONS

Each of the alternatives reconfigure Franklin Avenue to three lanes (one travel lane in each direction with a center turn lane) with eastbound and westbound right turn lanes approaching NE 3rd Street. Therefore, each of the alternatives has similar performance on evaluation criteria such as intersection operations, vehicle queuing and side street delay compared to existing conditions.

While the overall corridor operations are expected to remain unchanged between the alternatives, some minor differences between alternatives will have an impact on motor vehicle operations.

One notable factor that differentiates the alternatives being evaluated are the presence of concrete islands at NE 2nd Street in Alternatives 1 and 2. These medians change the ability to turn onto, or off of Franklin Avenue at NE 2nd Street. In addition, the medians restrict the ability for vehicles making an eastbound left turn at NE 3rd Street to bypass a long eastbound through queue.

SAFETY

As documented in the *Franklin Avenue Opportunities and Constrains Memorandum,* Appendix C, NE 3rd Street and NE 4th Street reported higher than typical crash frequencies, with the most common crash to occur along the corridor being rear end crashes. Moreover, multiple cyclist-involved crashes occurred at NE 4th Street.

Each of the alternatives is expected to positively influence safety along Franklin Avenue. All of the alternatives include improvements to conditions for people walking and biking, such as enhanced bicycle facilities, curb extensions and marked crossings. Reducing a westbound lane at NE 4th Street, and the addition of curb extensions, reduces crossing distance and improves intersection visibility for all users.

Each of the alternatives also improves the existing westbound merge lane at NW Hill Street and realigns the crossing to enhance visibility for people walking and biking. In Alternatives 2, 3, and

4, any modification to the existing westbound merge lane would need to be accompanied by modifications to the bridge railing to ensure adequate sight distance for southbound right turning vehicles. Alternative 1 removes the southbound approach and any corresponding sight distance concerns.

Other elements included in the alternatives that could positively influence safety on Franklin Avenue (as measured by the ODOT All Roads Traffic Safety (ARTS) Crash Reduction Factors (CRF)) are summarized in the table below.

Crash Reduction Factor Summary by Alternative

CRF ID	Alternative(s) With Element	CRF Description	Reduction Factor	Crash Type Reduced
BP21	Alternative 1	Install Bike Signal	45%	Bicycle
BP23	Alternatives 1 & 4	Install Cycle Tracks	59%	Bicycle
BP25	Alternative 1	Prohibit Right-Turn-On-Red	41%	Bike/Ped
I29	Alternatives 1	Prohibit Right-Turn-On-Red	9%	All
BP24	Alternative 2 & 3	Install Buffered Bike Lanes	47%	Bicycle
BP16	All Alternatives	Install Curb Ramps and Extensions with a Marked Crosswalk and Pedestrian Warning Signs	37%	All
H4	All Alternatives	Right Turn Lane on Single Major Road Approaches: Signalized Intersection (3- or 4-leg)	4%	All

EMERGENCY VEHICLES AND TRUCK ACCESSIBILITY

In general, 20 feet between curb faces is desired to allow emergency vehicles to bypass a vehicle stalled on the roadway. Each alternative includes curb modifications that reduce the existing curb-to-curb width. Where 20 feet curb-to-curb cannot be met, mountable curbs with traversable medians are provided.

Emergency vehicle accessibility is also influenced by the ability to make full turning movements at intersections along Franklin Avenue. Alternative 3 restricts the fewest turning movements onto/off Franklin Avenue, creating more direct routes for emergency vehicle access.

In general, curb radii are proposed to be tightened, which may affect truck turning movements depending on design. Consideration during the design phase should be given to intersections where truck turning needs are more common to balance the conflicting needs of truck turning traffic with shortening pedestrian crossing distances by use of truck aprons and other treatments.

The ability of heavy vehicles to make deliveries on Franklin Avenue is also influenced by on-street truck loading potential. Alternative 3 provides the best on-street truck loading potential of all the alternatives. Trucks use the center turn lane today, so this does not limit or reduce truck access from no-build conditions.

DIVERSION AND TRAFFIC CIRCULATION

Significant traffic diversion is not expected for any of the alternatives compared to the existing lane configuration on Franklin Avenue. However, differences among the alternatives in proposed turning restrictions result in minor changes to traffic circulation.

The proposed Alternative 1 closes southbound trips at NW Hill Street. This would divert approximately 80 PM (2024) peak hour trips that would normally make a southbound right at NW Hill Street to other alternatives. Rerouted traffic routes include continuing west on NW Hawthorne Avenue to NW Oregon Avenue, turning south onto NW Lava Road, and turning south onto NW Harriman Street. NW Harriman Street is identified as a key route on the City of Bend's Low Stress Bike Network[2] and therefore added vehicle trips onto this corridor may not be consistent with the long-term outlook for NW Harriman Street. However, traffic circulation in this area will need to be further investigated as part of the Midtown Crossing Study, as changes to access to the Bend Parkway at NW Hawthorne Avenue could have a significant impact on circulation at NW Hill Street and NW Harriman Street.

PARKING

Creating more on-street parking spaces adds parking for nearby commercial businesses, however, the addition of parking typically limits the opportunity for roadway amenities such as landscape strips and enhanced bicycle and pedestrian facilities and reduces capacity of the arterial corridor. Capacity is reduced by maneuvers into and out of parking stalls. The table below provides a quantitative summary of existing and proposed on-street parking broken down by segment:

Parking

		Alternative			
Segment	**Existing**	**1**	**2**	**3**	**4**
A	6	0	0	0	0
B	0	4	2	5	4
C	8	0	0	4	0
Total	**14**	**4**	**2**	**9**	**4**

[2] *City of Bend Transportation System Plan, Adopted August 2020*

Scoring

Driving Score

Driving (20% Overall Weight)

			Alternative			
Area	Sub Weight	Existing	1	2	3	4
Motor Vehicle Operations (intersection level of service, side street delay queueing, travel time)	15%	4	3	3	3	3
Safety (potential crash reduction)	30%	2	3	3	3	3
Emergency Service Access & Response	20%	4	3	3	4	3
Truck Accessibility	20%	4	3	3	4	3
Parking	15%	3	2	1	3	2
Subtotal	**100%**	**3.3**	**2.9**	**2.7**	**3.4**	**2.9**

Walking

Evaluation

Today, Franklin Avenue has 6-foot sidewalks on each side of the roadway with no buffer from vehicle or bicycle traffic. There is only one marked crossing along Franklin Avenue within the project study area (at NE 3rd Street) where the crossing distance is approximately 80 feet, and turning movements across the intersection are permitted.

Each of the proposed alternatives enhances pedestrian facilities, including more frequent and enhanced pedestrian crossings, horizontal separation from motor vehicles, and wider sidewalks. Corridor conditions for people walking were evaluated using the following criteria for each alternative:

- Time exposed to vehicular traffic at crossings was assessed qualitatively by considering factors like the number of curb extensions or pedestrian median refuges which shorten the pedestrian crossing distance and reduce vehicle exposure. Vehicle exposure at traffic signals and unsignalized crossings was evaluated separately, although these considerations were combined into a single evaluation criterion.
- Visibility at crossings was assessed qualitatively by considering factors that could increase pedestrian visibility (e.g., curb extensions or median refuges) and factors that could decrease pedestrian visibility (e.g., landscaping or on-street parking). Each alternative was also evaluated for its ability to reduce the potential risk for “double threat” crashes where a stopped vehicle blocks a crossing pedestrian from view of the adjacent travel lane.
- Access to low-stress crossings was assessed qualitatively by considering the total number of low-stress, unsignalized pedestrian crossings and the distance between low-stress crossings. Providing evenly spaced crossings minimizes out-of-direction travel for pedestrians who desire to cross outside of the existing signal. PLTS was calculated for each of the crossings across Franklin Avenue.

- Ability to accommodate streetscape elements (e.g., landscaping, art, benches) was assessed qualitatively by considering the opportunity to add landscaping or other streetscape elements. Expanded landscaped buffers and curb extensions provide opportunities to include new streetscape elements.

PLTS for the no-build condition and each proposed alternative are summarized in the table below:

PLTS

Alternative	Segment	North	South	Crossing
Existing	A	2	2	3
	B	3	2	3
	C	3	2	3
1	A	1	1	2
	B	1	1	1
	C	1/2	1/2	2
2	A	1	1	2
	B	1	1	2
	C	1/2	1/2	2
3	A	1	1	2
	B	1	1	2
	C	1/2	1/2	2
4	A	1	1	2
	B	1	1	1
	C	1/2	1/2	1

Scoring

Walking Score

			Alternative			
Area	Sub Weight	Existing	1	2	3	4
Crossing Distance	25%	2	5	4	4	5
Visibility at Crossings	25%	3	5	4	4	5
Enhanced Pedestrian Crossings	25%	2	3	3	3	4
Streetscaping	25%	2	4	4	3	5
Subtotal	**100%**	**2.3**	**4.3**	**3.8**	**3.5**	**4.8**

Biking

Evaluation

The existing Franklin Avenue corridor includes bike lanes throughout the project area in a few configurations. Bike lanes widths vary between 5 feet and 7 feet and are travel lane adjacent bike lanes in some locations and buffered bike lanes in others creating an inconsistent feel. Through the undercrossing, riders have the option to take the road or follow the pedestrian path through BNSF bridge tunnel.

Each of the alternatives provides a more consistent approach to bicycle travel through the corridor yet there is a variety of separation from vehicle travel proposed. Due to the constraints posed by the undercrossing, bikers will still need to choose whether to take the road of follow the pedestrian path. Conditions for people biking through the corridor were evaluated using the following criteria:

- Separation from vehicular traffic enhances comfort and safety. The cycle tracks proposed in Alternatives 1 and 4 provide the most separation while the travel lane adjacent bike lanes in Alternative 3 provide the least separation and highest bicycle level of traffic stress (BLTS).
- Access to low-stress crossings – each alternative provide improvements to key low-stress crossings along the corridor
- Visibility at crossings was assessed qualitatively on factors such as curb extensions, bike signals, and pavement markings.

BLTS through the corridor is summarized in the table below:

BLTS

Alternative	Segment	North	South	Crossing
Existing	A	3	3	3
	B	3	2	3
	C	3	3	3
1	A	1	1	2
	B	1	1	2
	C	1/2	1/2	2
2	A	1	1	2
	B	1	1	1
	C	1/2	1/2	2
3	A	1	1	2
	B	1	1	2
	C	2/3	2	2
4	A	1	1	2
	B	1	1	1
	C	1/2	1/2	1

Scoring

Biking Score

			Alternative			
Area	Sub Weight	Existing	1	2	3	4
Comfort Level	25%	2	5	4	2	5
Greenways Connectivity	25%	2	4	4	4	5
Access to Enhanced/Controlled Crossings	25%	2	5	4	3	5
Visibility at Crossings	25%	3	5	4	4	5
Subtotal	**100%**	**2.3**	**4.8**	**4**	**3.3**	**5**

Transit

Evaluation

There are currently two transit stops on Franklin Avenue, located across the street from one another just west of NE 2nd Street. These stops are proposed to remain in their current locations. Amenities at the existing stops only include signage with a schedule attached. Today, buses pull off into the adjacent bike lanes to pick up, or drop off, riders at the curb, then merge back into traffic. This action can decrease on-time performance for the bus when traveling the corridor.

To enhance conditions for people riding buses on Franklin Avenue, enhanced crossings are proposed near transit stops in each alternative. Corridor conditions for people using transit were evaluated using the following evaluation criteria for each alternative:

- Bus on-time reliability was assessed quantitatively based on the ability of transit vehicles to stop in-lane rather than pulling into or out of traffic, where a bus might have to wait for vehicles to pass, decreasing their on-time performance.
- Bus stop accessibility was assessed qualitatively based on the distance between a transit stop and an adjacent enhanced crossing. Providing low-stress crossings immediately adjacent to each stop increases the accessibility of stops for transit riders. More frequent crossings can also minimize out-of-direction travel for pedestrians and improve the experience for riders.
- Ability to accommodate amenities at bus stops was assessed quantitatively based on the width for landscaping, which can be utilized for bus stop amenities.

Scoring

Transit Score

			Alternative			
Area	Sub Weight	Existing	1	2	3	4
Bus Stop Accessibility	50%	1	5	3	4	5
Ability to Accommodate Amenities at Bus Stops	50%	2	4	3	3	5
Subtotal	**100%**	**1.5**	**4.5**	**3**	**3.5**	**5**