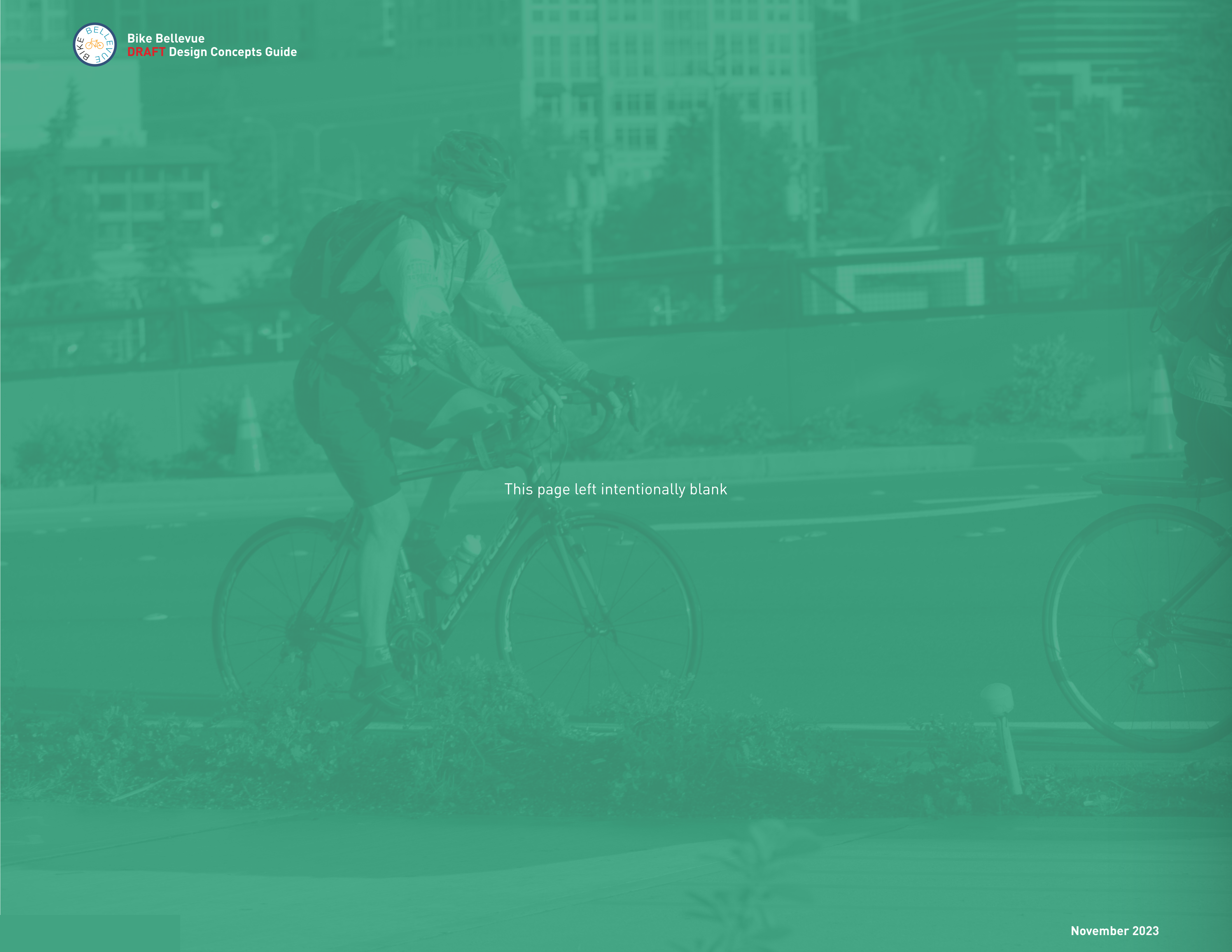
Bike Bellevue
DRAFT Design Concepts Guide

November 2023



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Bicyclists riding in buffered bike lane

Key Takeaways

Vehicle Lane and Parking Impacts Page 5 Appendix A	» Implementing the bicycle facilities identified in Bike Bellevue will result in the loss of 5.9 miles of vehicle lanes and approximately 30 on-street parking stalls.	» Bike Bellevue will implement 15.11 miles of new or upgraded bicycle facilities that are more attractive to users of all ages and abilities.
Safety Page 7-8 Appendix B	» People bicycling are more than nine times as likely to be killed or seriously injured in a collision compared to people in vehicles.	» Bike Bellevue improvements are forecast to eliminate 4-8 serious injury or fatality bicycle crashes over the next 20 years.
Bicycle Level of Traffic Stress Page 9-10	» Today, two-thirds of the Bike Bellevue corridors are rated LTS 4, where the speed limit and traffic volume on the street combined with minimal to no bicycle facilities accommodate only the strong and fearless bicycle rider.	» Bike Bellevue projects will eliminate LTS 4 conditions on all project corridors and will meet Bellevue's MIP performance target on 90% of the Bike Bellevue corridors.
Equity and Accessibility Page 11-12 Appendix C	» Bellevue residents living below the poverty line are 30% more likely to walk or bike than Bellevue residents living above the poverty line.	» Bike Bellevue expands low-income resident access to jobs by 24% and access to schools by 33%.
Access to Transit Page 12 Appendix C	» Only 9% of current bus stops are accessible by a low-stress bike route today.	» Bike Bellevue will provide low-stress bicycle access to all future Link light rail stations. » The number of bus stops accessible by a low stress bike route increases by 45%.
Sustainability Page 13-14 Appendix D	» Today, less than 1% of all trips are made by bicycle. » In a city survey, 62% of respondents indicated they would ride a bicycle more often if streets had safe and comfortable bike lanes.	» With denser land use and Bike Bellevue investments, the 2035 bicycle mode share is forecasted to be 2.6%-4.3% in the project area. » The corresponding reduction in driving is equivalent to eliminating the annual greenhouse gas emissions generated by 240-890 cars.
Vehicle Performance Page 15-16 Appendix E	» Bike Bellevue project concepts were developed in conjunction with a rigorous vehicle performance analysis.	» The average Bike Bellevue corridor speed is forecast to decrease by 0.2 miles per hour with implementation of Bike Bellevue projects.

Transportation Vision

Bike Bellevue is aimed at implementing bicycle network improvements in the urban core areas of Bellevue including Downtown, Wilburton and BelRed. The goal of Bike Bellevue is to enhance the multimodal transportation system in the city; align with the dense, vibrant land use vision in these urban core neighborhoods; and make getting around Bellevue safer, more equitable, sustainable, and accessible.

Background

Bellevue is known for many things. The city in a park, great schools, a growing and vibrant urban core, and quiet neighborhoods, just to name a few. While Bellevue has many strong assets, it is not known for its extensive bicycle network. There is an urgency to build out the infrastructure for Bellevue's least-developed mode—the bike network—particularly in the urban core.

Major capital projects, levy-supported projects, and private-sector developments are implementing various types of bicycle facilities in Bellevue's urban core neighborhoods. However, significant gaps in the planned bicycle network remain, limiting access to and the utility of these investments. In 2022, the Council approved funding to plan and implement rapid-build bicycle infrastructure in the urban core neighborhoods and subsequently directed staff to work with the Transportation Commission to prepare a Bike Bellevue recommendation plan for implementation.

Who Benefits?

Urban core neighborhoods in Bellevue are, by far, the fastest growing areas of the city and are preparing for 67,000 new jobs and 33,000 new residents by 2035 (Source: BKRCast). Anchoring this growth are five new East Link light rail stations, three planned frequent transit network routes, and the Eastrail regional trail. Completion of these transportation projects and realization of the land use vision will facilitate greater use of non-auto travel options in the Bike Bellevue project area.

The benefits of Bike Bellevue extend to the rest of the city as well. Residents of neighborhoods that surround the urban core will be able to easily access, jobs, shopping and recreation by bike. People anywhere in Bellevue and the region will be able to use transit to access the urban core and reach their destinations without the stress and financial barriers of parking and driving simply by bringing their bike on transit.

Document Outline

This document describes the major elements, benefits, and traffic implications of the Bike Bellevue project including the following:

- Relationship to Mobility Implementation Plan
- Project Principles
- Overview of Bike Bellevue Corridors
- Prioritizing Safety Improvements
- Reducing Level of Traffic Stress
- Enhancing Equitable Access
- Advancing Environmental Stewardship
- Implications for Traffic Congestion
- Detailed Corridor Profiles

Mobility Implementation Plan

A New Approach to Mobility

The Bellevue Mobility Implementation Plan (MIP) is a performance measurement and prioritization system that aligns transportation investments with the city's land use vision; providing the platform for Bellevue to meet the multimodal future envisioned in the Comprehensive Plan.

Layered Network

The MIP is based on a concept called the "layered network," shown in Figure 1. A layered network considers the land use context and each mode in the multimodal transportation system to be the "layers" that describe Bellevue's interconnected multimodal transportation system. The layered network acknowledges that existing and planned land use influences expectations for transportation network performance. For example, people expect to be able to ride their bicycle on arterials and residential streets in Bellevue, and they understand that the type of bicycle facility (e.g., bike lane, shared lane, off-street path) will vary based on adjacent land uses, the type of street, and the proximity and connections to other modes. The layered network acknowledges that there may be competing priorities between modes and constraints to provide an "ideal" facility for all modes on all streets.

Performance Metrics

To guide the implementation of the layered network, the MIP identifies performance metrics for each mode. The MIP also identifies performance targets for each mode that vary by land use context. Specific to Bike Bellevue corridors, the bicycle and vehicle performance metrics and targets are relevant.

- **Bicycle system performance** is measured using a concept known as level-of-traffic-stress (LTS), which describes the bicycle rider experience related to the speed limit and volume of traffic on the street, and the type of bicycle facility. LTS performance targets are defined by both the role of the bicycle facility as part of the city's overall network (e.g., priority bicycle corridor versus a general segment of the bicycle network) and the location of the segment with respect to the Performance Management Area (PMA) (described below).
- **Vehicle system performance** is measured using the PM peak period volume/capacity ratio at system intersections and vehicle travel speed along primary vehicle corridors. System intersections and primary vehicle corridors are defined in the MIP.

The bicycle network vision identified in the MIP is a robust network of bicycle facilities within PMA Type 1 as shown in Figure 2. This network will connect the diverse mix of uses within PMA 1, and it will also allow people from across Bellevue to better access the employment, transit, cultural, and recreational amenities within Downtown, BelRed, and Wilburton.

Consistent with the layered network approach, Bike Bellevue significantly expands low-stress bicycle access by strategically expanding bike infrastructure on a complete and connected network within PMA 1, with connections throughout the city and region.

Figure 1. Layered Network

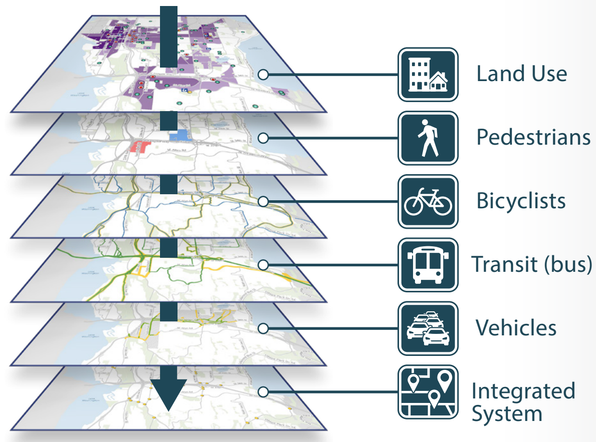


Figure 2. Bicycle Network LTS Vision

Bike Bellevue Principles

On March 27, 2023, the Bellevue City Council approved eight Bike Bellevue project principles and directed staff to work with the Transportation Commission to prepare and submit a recommendation for implementation to the Transportation Director. The icons below are used throughout the document to establish a connection to the eight Council principles. These principles are:

Safety

Reduce the frequency and severity of crashes and minimize conflicts between roadway users through bikeway design.

Connectivity

Implement a connected network of bicycle lanes that facilitate access to major destinations.

Comfort

Design bicycle lanes that maximize separation between motor vehicles and people bicycling on streets with higher speed limits and more vehicle traffic.

Evaluation

Use a data informed approach to evaluate impacts to all modes of travel and design the program to maximize the mobility of all modes.

Coordination

Coordinate transportation and land use efforts underway in Bellevue to ensure equity and sustainability outcomes are aligned.

Partnerships

Identify partnership opportunities to advance the implementation of bicycle projects.

Engagement

Engage community stakeholders in setting the priorities for Bike Bellevue investments.

Equity

Promote equity and inclusion in the development and delivery of bicycle projects. Consistent with the city's Diversity Advantage Plan, Bike Bellevue will center equity, access, inclusion, and opportunity in project delivery.

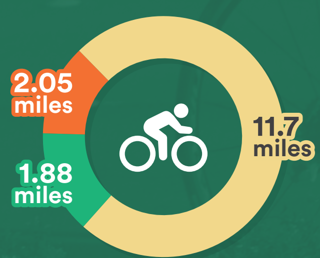
What is Bike Bellevue?

Bike Bellevue will implement 15.11 miles of bicycle network improvements in Downtown, BelRed, and Wilburton that will fill major gaps in the city's low stress bike network. Bike Bellevue will provide key linkages to East Link light rail stations, Eastrail, and many parks, schools, and other points of interest. The cost to implement Bike Bellevue is estimated at $18.6 million.

How Will We Add 15.11 Miles of Bike Lanes in Bellevue's Urban Core?

Implementing bicycle facilities in a built-out environment is challenging. Avoiding extensive property impacts requires trade-offs. The graphic below identifies the impacts to vehicle lanes from Bike Bellevue projects.

Of the 15.11 miles of bike lanes:

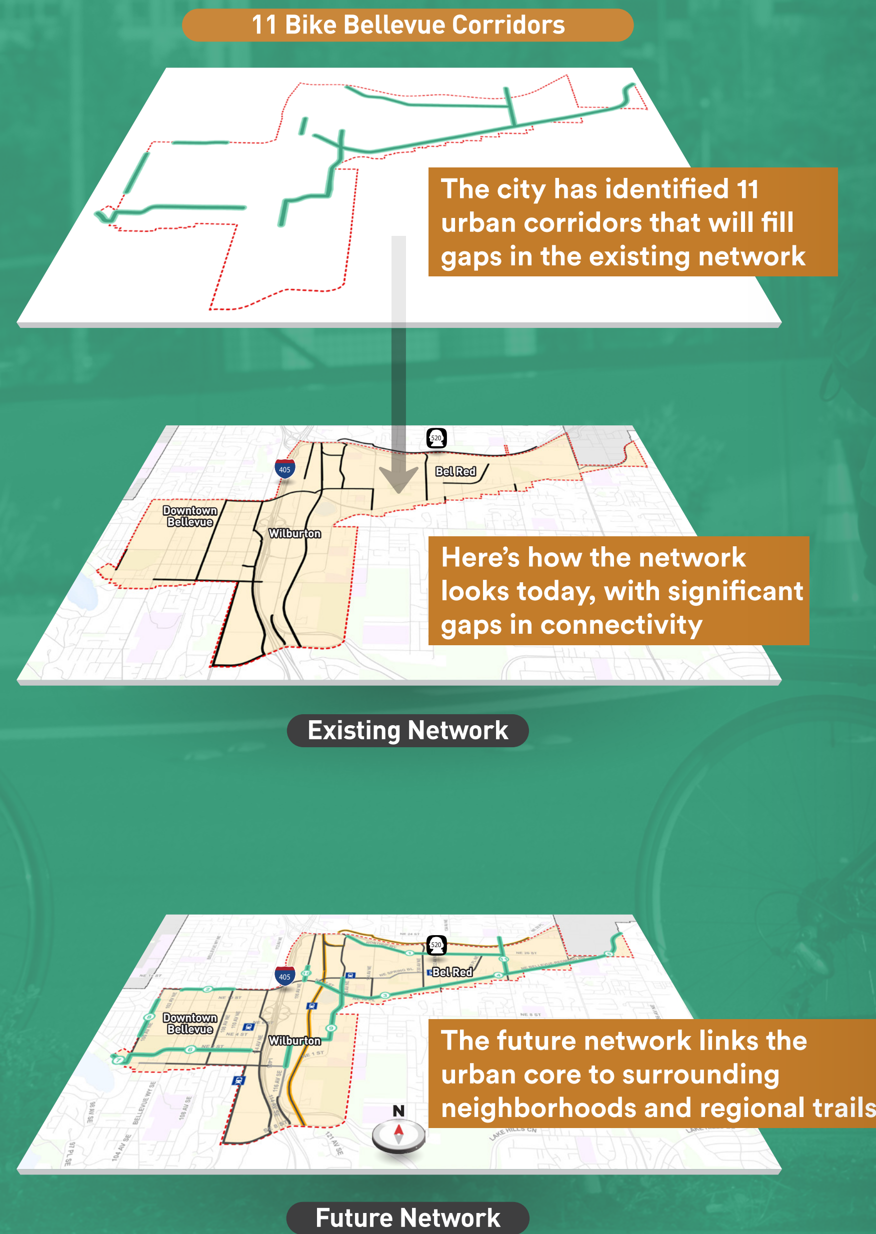


11.17 miles of new bike lanes are added by converting 5.90 miles of existing vehicle travel lanes

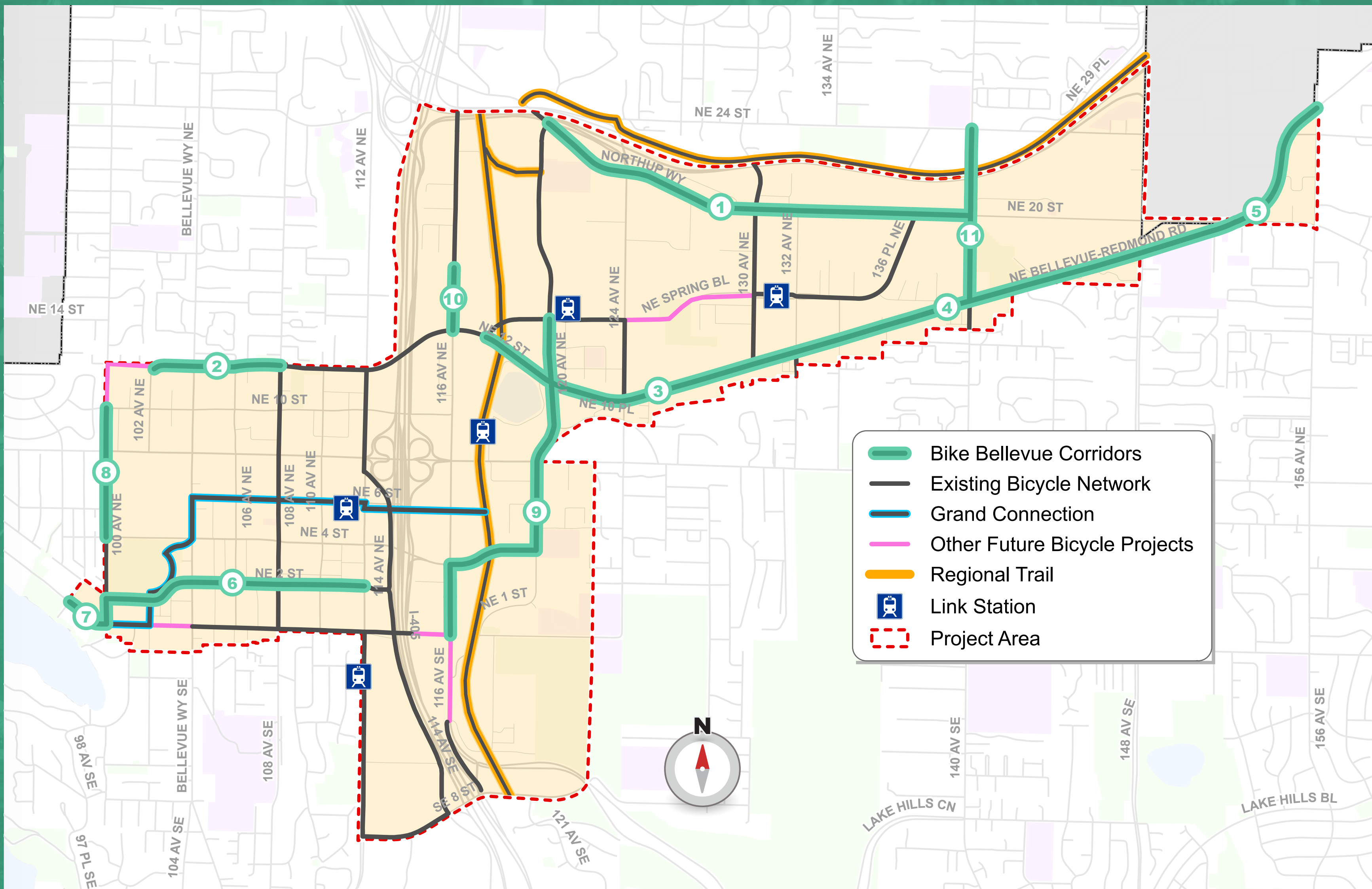
2.05 miles of new bike lanes are added with no modifications to vehicle travel lanes

1.88 miles of bike lanes are upgraded to reduce level of traffic stress with no modification to vehicle travel lanes

The project will also remove approximately 30 on-street parking spaces in Downtown Bellevue to provide adequate space for continuous bike lanes. The removed parking is located along Lake Washington Boulevard, 100th Ave NE, and NE 2nd Street. Due to a rigorous design and traffic evaluation, implementing these bicycle improvements will result in PM peak-hour travel speeds decreasing by about 0.2 miles per hour, on average, across the 11 Bike Bellevue Corridors. See the **Documenting Vehicle Performance** section and **Appendix A** for more details.



The future network will allow people to travel on a dedicated network of bicycle facilities throughout the urban core, greatly expanding access between homes, transit, jobs, and recreation.



Future Network

Prioritizing Safety

People bicycling are more than nine times as likely to be killed or seriously injured in a collision compared to people in vehicles.

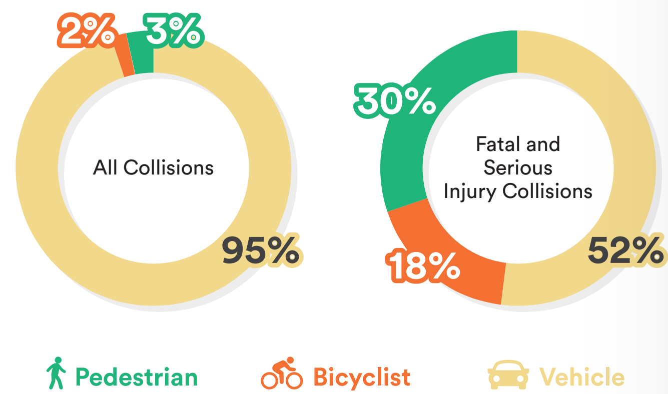
To achieve its goal of eliminating traffic deaths and serious injury collisions on city streets by 2030, the Bellevue City Council adopted the Safe System Approach. This outcome-based approach to road safety bundles strategies focused on safe people, safe streets, safe speeds, and safe vehicles—as well as the supporting elements of leadership, culture, partnerships, and data.

Bike Bellevue aligns with the City Council's commitment to a Safe System Approach to Vision Zero. In the Bike Bellevue project area, bicyclists are involved in 10% of all fatal and serious injury crashes even though they represent just 1% of all crashes on city streets in this geography. People bicycling are more than nine times as likely to be killed or seriously injured in a collision compared to people in vehicles (WSDOT Collision Data, 2013-2022).

Consistent with the collision data, Bike Bellevue streets account for only 9% of total street mileage, but 67% of Bike Bellevue corridors are on the High Injury Network. The High Injury Network represents the subset of city streets with the highest share of crashes with fatalities and/or serious injuries. It is a city priority to implement safety projects on the High Injury Network.

One of the strategies in Bellevue's Safe System Approach to Vision Zero is implementing Complete Streets improvements that make it safe, comfortable, and convenient to bike to work, school, shops, services, parks, transit, and anywhere else people want to go. To achieve this outcome, Bellevue is implementing proven countermeasure improvements that encourage safe behaviors by design (e.g., increasing the separation of bicycles and vehicles to allow for more time for travelers to react to unexpected situations) on sections of the city's High Injury Network (see Appendix B).

Collisions in Bellevue (2013 - 2022)



Source: WSDOT Collision Data (2013-2022)

Corridor safety improvements provide more space between vehicles, bicycles, and pedestrians, helping to reduce collisions.

Bike Bellevue could prevent 4-8 fatal and severe injury crashes over a 20 year period.

Prioritizing Safety

There was a 10% increase in vehicle speed on Bike Bellevue corridors from 2019 to 2023.

Speed is understood as one of the biggest threats to the safety of those outside of a vehicle, as higher speeds lead to worse outcomes when crashes occur. As shown in Figure 3 and 4, an analysis of 2023 citywide motor vehicle operating speed shows a 10% increase in speed on Bike Bellevue corridors from 2019 pre-Covid-19 levels. A 5 mph increase in speed (observed on multiple streets in the Bike Bellevue project area) correlates to a 10-15% increase in the risk of fatal and serious injury crashes.

Bike Bellevue's separated bikeways, narrower travel lanes, and road diets are proven safety countermeasures to reduce vehicle speeding and improve safety for all roadway users. These corridor safety improvements provide more space between vehicles, bicycles, and pedestrians, allowing more time for people to react to unexpected conditions. Cities that have emphasized and implemented multimodal mobility strategies for people who are walking, bicycling, and using public transportation have seen consistent reductions in collisions by as much as 50%.

Assuming a 20-50% reduction in fatal and severe injury bicycle and pedestrian crashes per year identified by the research, Bike Bellevue could prevent 4-8 fatal and severe injury crashes over a 20 year period (see Appendix B). Based on the FHWA's economic impact valuations related to fatal crashes, this reduction amounts to $16 to $32 million (Appendix B).

Figure 3. Bellevue Speed Map, 2020

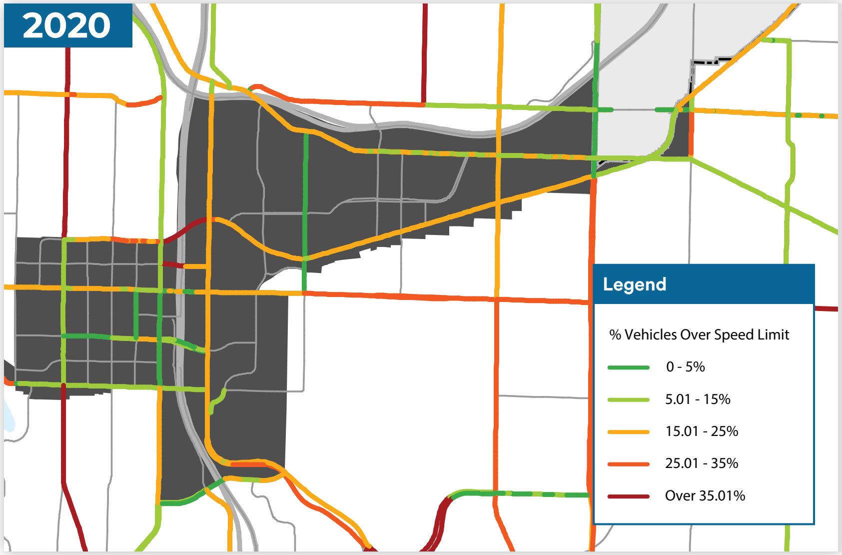
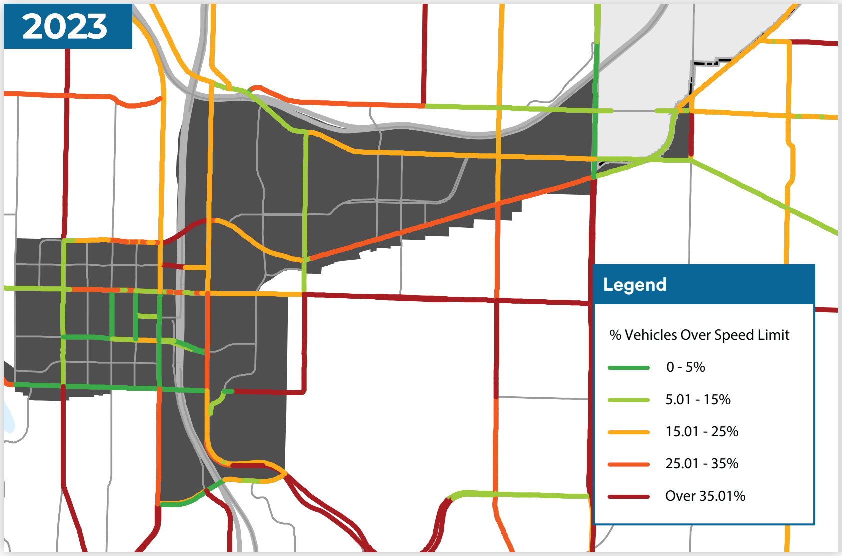


Figure 4. Bellevue Speed Map, 2023



Improving Bicycle LTS

Existing

Today, two-thirds of the Bike Bellevue corridors are rated LTS 4, where the speed limit and traffic volume on the street combined with minimal to no bicycle facilities accommodate only the strong and fearless bicycle rider.

Bellevue's bicycle network is comprised of connected corridors and intersections with facilities that range from multi-purpose paths separated from arterials, to protected bike lanes along arterials, to standard bike lanes or shared lanes on lower volume arterials. The bicycle network identified in the MIP was originally drawn from the city's 2009 Pedestrian and Bicycle Transportation Plan, with a 2021 update to address known constraints/conflicts, as well as to include new bicycle facility types.

The Performance Metric defined in the MIP for the bicycle network is Level of Traffic Stress (LTS). LTS considers that different types of bicycle riders are comfortable using different types of facilities depending on the characteristics of the roadway. The LTS and rider type range from LTS 1, which is a facility that can accommodate riders of all ages and abilities, to LTS 4, which will be comfortable for only the most experienced riders who are comfortable mixing with cars on congested corridors at high speeds. Upon completion, Bike Bellevue will eliminate the LTS 4 conditions on the 11 Bike Bellevue corridors.

Today, nearly two-thirds of Bike Bellevue corridors are rated as LTS 4, and none of the corridors are rated as LTS 1 or 2. See Figure 5 for a map of the existing LTS within the project area and Figure 6 for a breakdown of Bike Bellevue corridors by LTS. The lack of a complete and connected low-stress bike network is a substantial barrier to bicycling for people who are uncomfortable riding in mixed traffic.

LTS 1
All ages and abilities

LTS 2
Interested but concerned

LTS 3
Enthused and confident

LTS 4
Strong and fearless

Figure 5. Existing LTS Map, where two-thirds of the Bike Bellevue corridors are LTS 4

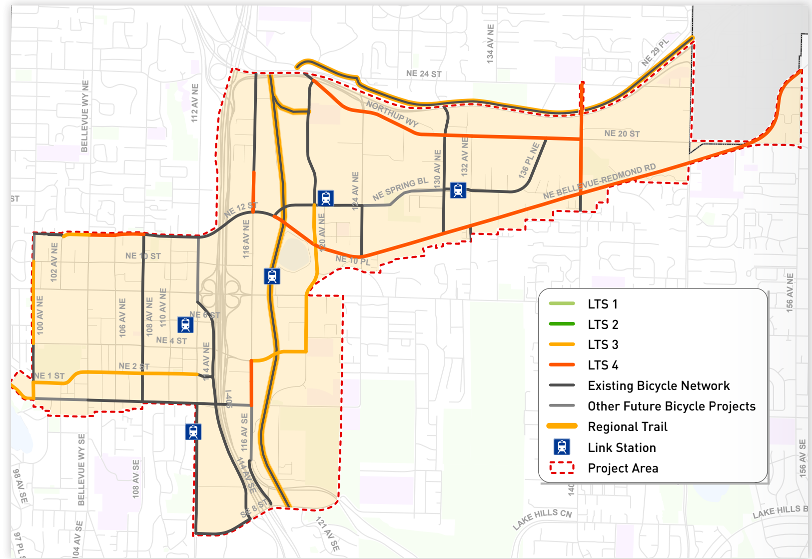
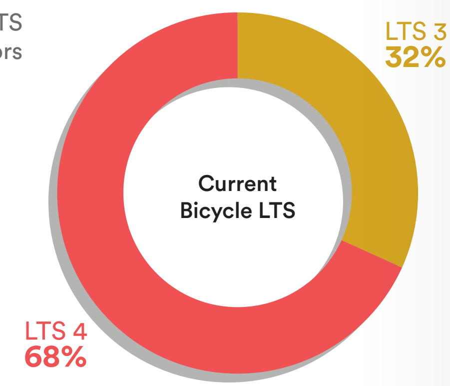


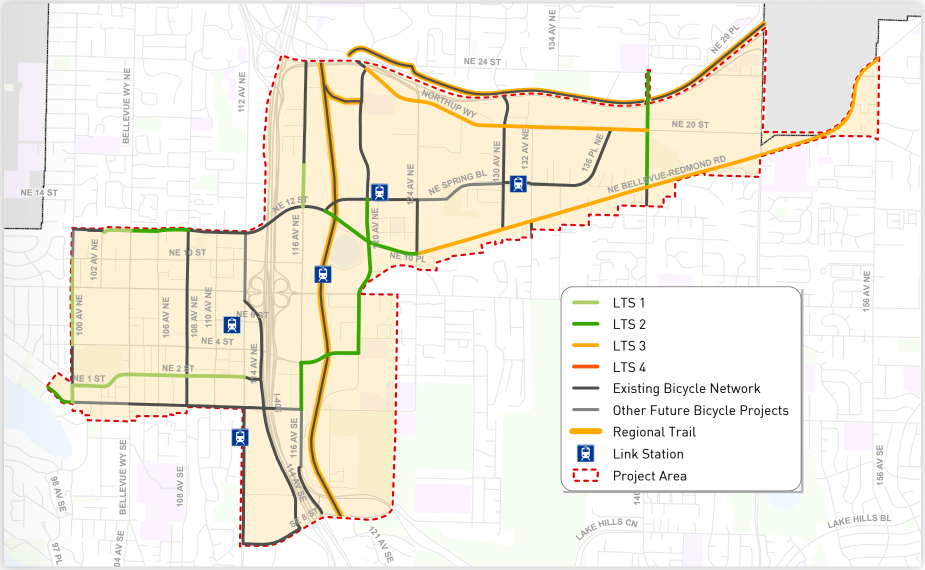
Figure 6. Current Bicycle LTS along Bike Bellevue corridors



Improving Bicycle LTS

Future

Figure 7. Bike Bellevue LTS Map, where 53% of Bike Bellevue segments will be LTS 1 and 2



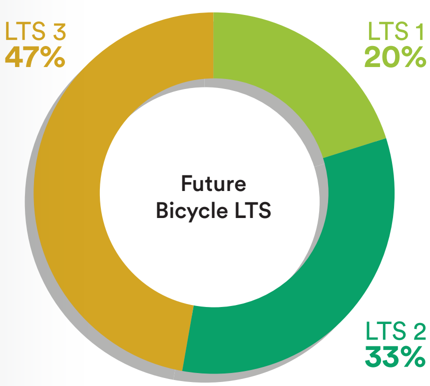


Figure 8. Future Bicycle LTS along Bike Bellevue corridors

Bike Bellevue projects will eliminate LTS 4 conditions on all project corridors and will meet Bellevue's MIP performance target on 90% of the Bike Bellevue corridors.

The Bike Bellevue project area is a subset of the citywide bicycle network and is intended to provide lower-stress routes to accommodate riders of various ability levels looking to access or travel through Downtown, Wilburton, and BelRed. The LTS ratings after Bike Bellevue is implemented are shown in Figure 7 and a breakdown of Bike Bellevue corridors by LTS is presented in Figure 8.

The implementation of separated bicycle facilities will eliminate the LTS 4 conditions on the Bike Bellevue corridors and will meet Bellevue's LTS target on 90% of the corridors. With these improvements, cyclists of all ages and abilities will have access to a network of separated bicycle facilities totaling 15.11 miles of roadway, up from 7.5 miles today—an increase of 100%.

Eight miles of Bike Bellevue corridors, approximately 55%, will be low-stress bicycle facilities comprised of LTS 1 and 2 segments; these corridors will accommodate riders of all ages and abilities. Low-stress bicycle facilities are shown to improve safety for all road users, not just those who are bicycling.

Enhancing Equitable Access

Bellevue residents living below the poverty line are 30% more likely to walk or bike and 80% more likely to ride transit than Bellevue residents living above the poverty line. Bike Bellevue expands resident access to jobs by 34%.

Transportation systems provide a vital link between people and opportunities. Travel to work, school, shopping, medical care, and social visits are necessary to live a healthy and fulfilling life. The connection between people and opportunities is captured by the term accessibility, defined as the ability to reach destinations distributed across an area. Put simply, accessibility—connections between people and opportunities—is the most important economic and social benefit created by a transportation system and it facilitates participation in activities that individuals need to lead a meaningful life.

One of the city's Diversity Advantage Initiative's guiding principles is equity, and "transportation equity seeks fairness in mobility and accessibility to meet the needs of all community members." Bike Bellevue aims to consider the circumstances that impact resident's mobility and accessibility needs. The goal is to expand active transportation access for all residents while focusing on underserved and disadvantaged communities.

There are many ways to evaluate equity and subject matter experts have correlated many social, economic, and demographic characteristics with underserved and disadvantaged communities. See Appendix C for how equity populations are distributed across Bellevue. When considering how equity intersects with transportation needs, the Transportation Commission has previously identified that Bellevue residents with low-incomes and people who work low-wage jobs are key groups to prioritize. For these low-income individuals, the cost-burden of owning, operating and maintaining a vehicle is proportionally higher compared to those with higher-incomes, and convenient accessibility by other modes is important to ensure people with lower-incomes can travel where they need and want to go.

To illustrate this point, City of Bellevue travel model data (Appendix D) demonstrates that residents who live below the poverty line are 30% more likely to walk or bike and 80% more likely to ride transit than Bellevue residents living above the poverty line. Low-income residents are mapped in Figure 9 and the city's retail and office areas have the highest concentrations of low-wage jobs.

The Bike Bellevue corridors would provide low-stress bicycle connections communities that could directly benefit from more active transportation options while also providing greater connectivity citywide. The expanded low-stress connections would provide the following benefits in the project area:

» **24% increase** in the number of jobs accessible to low-income residents by a low-stress bike route.

» **71% increase** in the number of low-income residents that have access to a bus stop via a low-stress bike route.

» **33% increase** in the number of low-income residents that would have a low-stress bicycle route to schools.

See Appendix C for more detailed access evaluations.

Bike Bellevue improvements greatly expand the number of employment opportunities, schools, transit stations and stops that people can comfortably get to by bike within the project area.

Enhancing Equitable Access

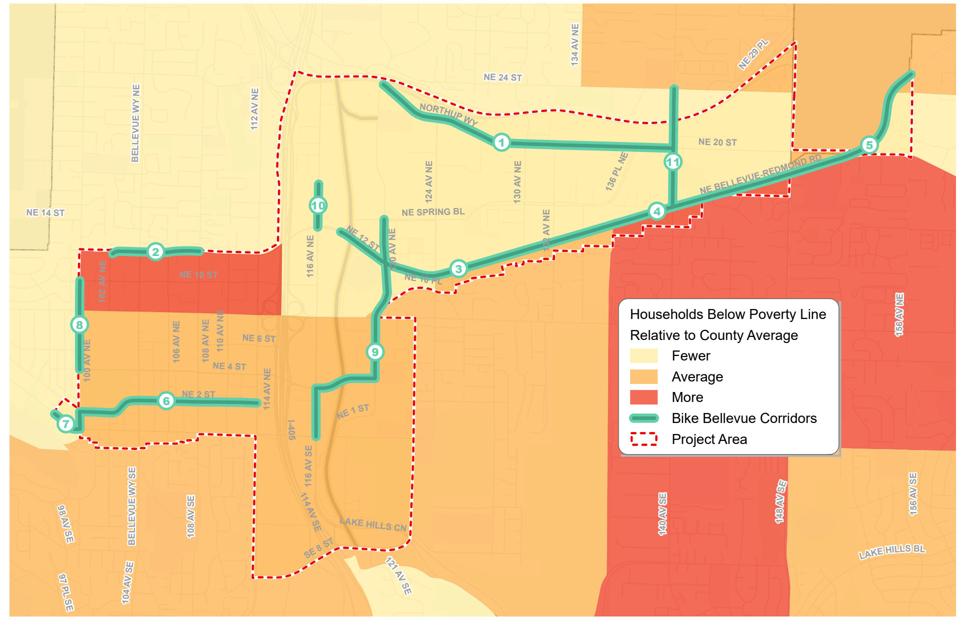
Access to Transit

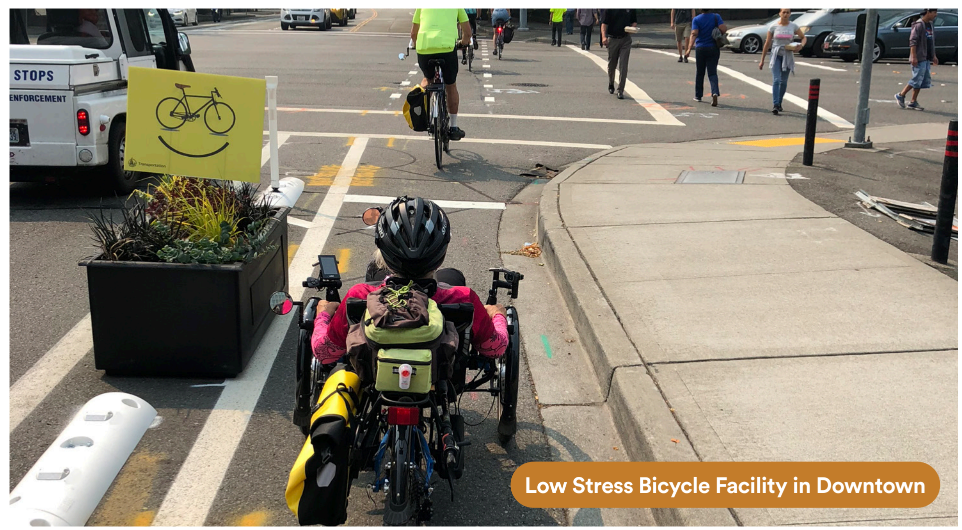
Bellevue recognizes the importance of transit access as it relates to mobility, economic development, and overall livability. The Bellevue Transit Master Plan identifies a set of policies and city investments to support "abundant access" through an enhanced transit system. Key elements of the Transit Master Plan that relate to Bike Bellevue include leveraging existing investments, making connections to transit easy and attractive, and encouraging walking and biking. Today, just 9% of bus stops in the project area have access via a low-stress bicycle route. Bike Bellevue helps advance the city's accessible transit vision by:

- **Building low-stress bicycle connections** that improve network connectivity near the East Link light rail stations
- **Reducing the level of traffic stress** adjacent to 19 bus stops on routes planned to be reconfigured as part of the East Link Connections project
- **Increasing the total number of residents that have low-stress access to a transit stop by 45%**
- **Improving the pedestrian environment to access transit** along Bike Bellevue corridors by creating additional separation between moving vehicles and the sidewalk

As noted in Appendix C, the City of Bellevue and King County Metro are working together to implement best practices on the design of bus stops along Bike Bellevue corridors. This collaborative effort will continue as the project concepts continue to be refined.

Figure 9. Low Income Population in the Bike Bellevue Project Area Based on US Census Bureau Data (2019-2023)





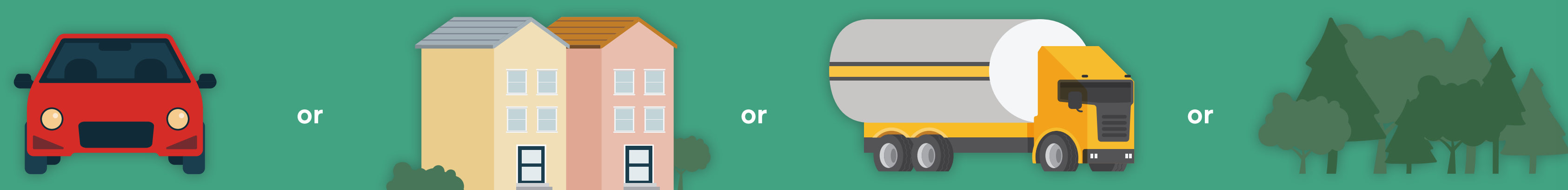
Low Stress Bicycle Facility in Downtown

Sustainability

Improving bike facilities encourages more people to ride. City modeling indicates that Bike Bellevue improvements and increased land use density will result in bicycle mode share increasing from 0.8% today to 2.6-4.3% by 2035 (Appendix E). These modeling results support a city survey, that found that 62% of respondents indicated they would ride a bicycle more often if streets had safe and comfortable bike lanes. **When built out in 2035, Bike Bellevue will:**

- Facilitate 825,000[a] to 4 million[b] bike trips a year
- Reduce GHG emissions by between 1,100[a] - 4,000[b] metric tons per year; equivalent of eliminating the annual GHG emissions of 240[a] - 890[b] cars
- Reduce VMT between 1.2 million[a] and 10.8 million[b] miles per year
- Support Bellevue's Environmental Stewardship goals of reducing total GHG emissions and per capita VMT by 50% over the next 10 years

Over the 20-year project lifetime, between 31,000[a] and 115,000[b] metric tons of GHG emissions are eliminated, equivalent to eliminating the annual emissions of:



6,900[a] and 25,700[b] cars

or

3,900[a] or 14,600[b] homes

or

Burning 3.5[a] million to 12.9[b] million gallons of gasoline

or

Planting between 37,000[a] and 137,500[b] acres of new forest

a. BKRCast Bike Bellevue 2035 Build Model (Appendix E)

b. ICLEI International Local Government GHG Emissions Analysis Protocol (IEAP) Level B (Appendix B)

Sustainability

Improved Health Outcomes

In addition to expanding the set of viable choices for how people travel and reducing pollution, bicycling produces tangible health benefits by increasing physical activity. Using a model from the World Health Organization that quantifies the benefits of active transportation on long-term health outcomes, Bike Bellevue is expected to reduce the number of premature deaths within the project area by 0.8 annually, by 2035.

Over 20 years, improved health outcomes attributable to more people bicycling will have a cumulative positive economic benefit of $208 million.

When combining the safety and health benefits of Bike Bellevue, the community should expect to see a benefit/cost ratio of 5.8-10.8 over a period of 20 years (Appendix B).

Cyclists on shared-use

Documenting Vehicle Performance (Existing)

The MIP defines a key performance metric for the vehicle network:

Volume-to-capacity ratio (V/C) at System Intersections Typical Urban Travel Speed on Vehicle Corridors during the two-hour PM peak period (4-6 PM)

We used BKRCast to analyze the combined impact of the Bike Bellevue corridors on vehicle performance and travel behavior. The vehicle network Performance Metrics from the MIP were used to evaluate System Intersections in and near the project area and along the 11 Bike Bellevue corridors. The vehicle Performance Metrics are evaluated during the PM peak period (4-6 PM) to capture the most congested part of the day. The Bike Bellevue project area is consistent with the Performance Management Area (PMA) Type 1 designation in the MIP which includes Downtown, Wilburton, and BelRed. The vehicle Performance Targets are based on the PMA in which the intersection or corridor are located.

The results for existing conditions, based on the 2019 Base Year model, are shown in Figure 11 for system intersections and Figure 12 for travel speed on the Bike Bellevue corridors. Within the analysis area, two system intersections do not meet the Performance Target (V/C < 1.00). However, these intersections have programmed improvements that will be implemented prior to 2035. The eleven Bike Bellevue corridors meet the Performance Target for Typical Urban Travel Speed (>= 0.5).

Type 1 PMA: High Density Mixed-Use	1.0 V/C ratio at System Intersections

Figure 11. Existing Conditions, 2019 Base Year Model, Intersection V/C for Analysis Area

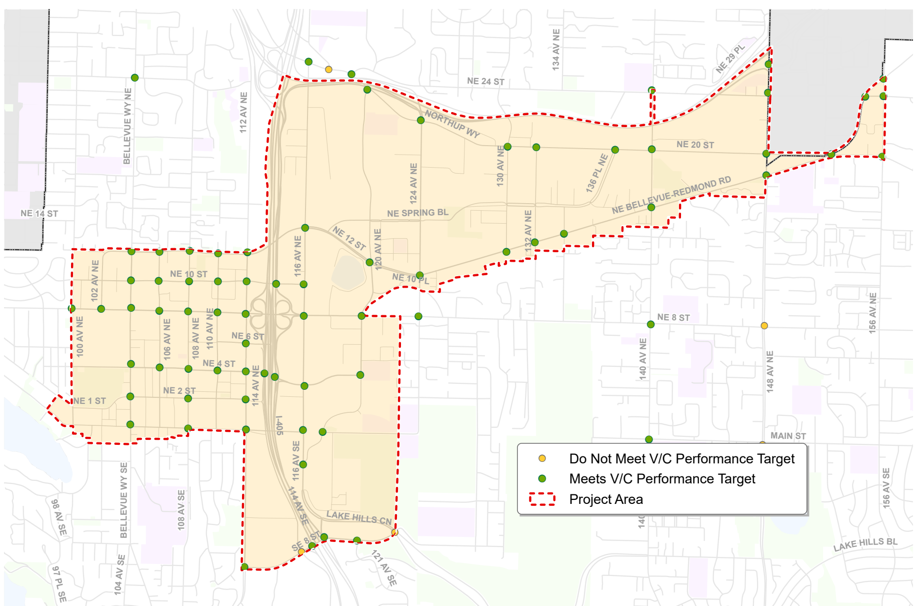
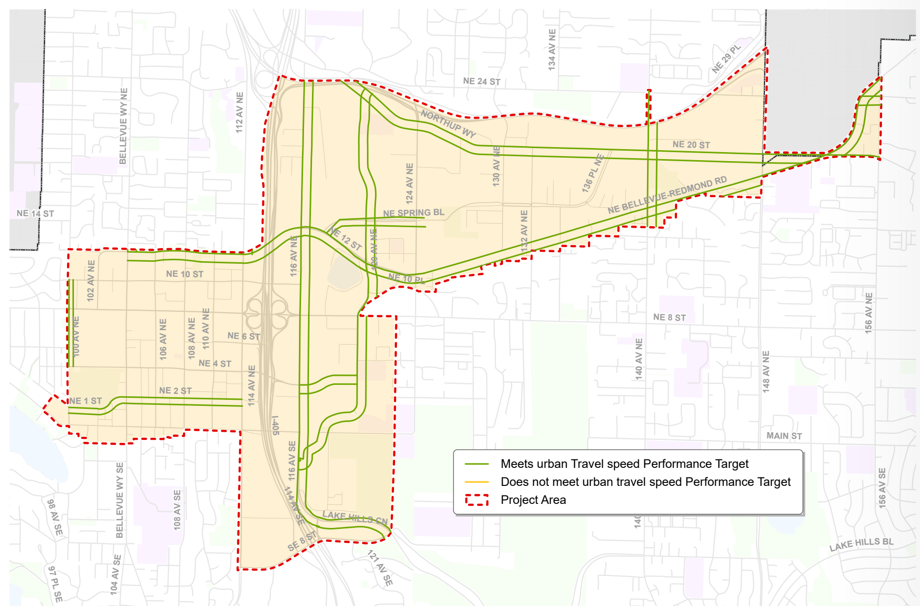


Figure 12. Existing Conditions, 2019 Base Year model, Urban Travel Speed on Bike Bellevue Corridors



Documenting Vehicle Performance (Future)

The average PM peak-hour vehicle speed on the 11 Bike Bellevue corridors decreased, on average, by 0.2 miles per hour with implementation of the projects.

In addition to modeling existing conditions using the 2019 Base Year model, two additional future year models were developed to evaluate the Build and No Build scenarios in 2035. The 2035 future year models are based on the BKRCast TFP Land Use Scenario (see Appendix E for a detailed description of the modeling assumptions and results). The projected land use in the project area includes the following:

- **Nearly 152,000 jobs**, an increase of almost 67,000 jobs from 2019.
- **Approximately 27,000 households**, an increase of nearly 16,000 households from 2019.
- **About 51,100 residents**, an increase of nearly 33,000 residents from 2019.

The only difference between the Build and No Build models are the 11 Bike Bellevue projects. Both future year models assume the completion of seven major transportation projects by 2035 (see Appendix E).

The results for future conditions, based on the 2035 Bike Bellevue Build model, are shown in Figure 13 for system intersections and Figure 14 for travel speed on the Bike Bellevue corridors. Within the analysis area, two system intersections within PMA 1 do not meet the Performance Target (Main St/112th Ave and Bel-Red Rd/124th Ave). Additionally, within the analysis area, one system intersection within PMA 3 does not meet the Performance Target (NE 24th St/14t0h Ave NE). See both results in Appendix E.

Of the three intersections in the analysis area that do not meet the Performance Target under future Build Conditions, two of the intersections also do not meet the Performance Target under future No Build Conditions. See the modeling approach Appendix E for additional information on the analysis. The eleven Bike Bellevue corridors meet the Performance Target for Typical Urban Travel Speed (>= 0.5).

Figure 13. Future Conditions, 2035 Bike Bellevue Build Model, Intersection V/C for Analysis Area

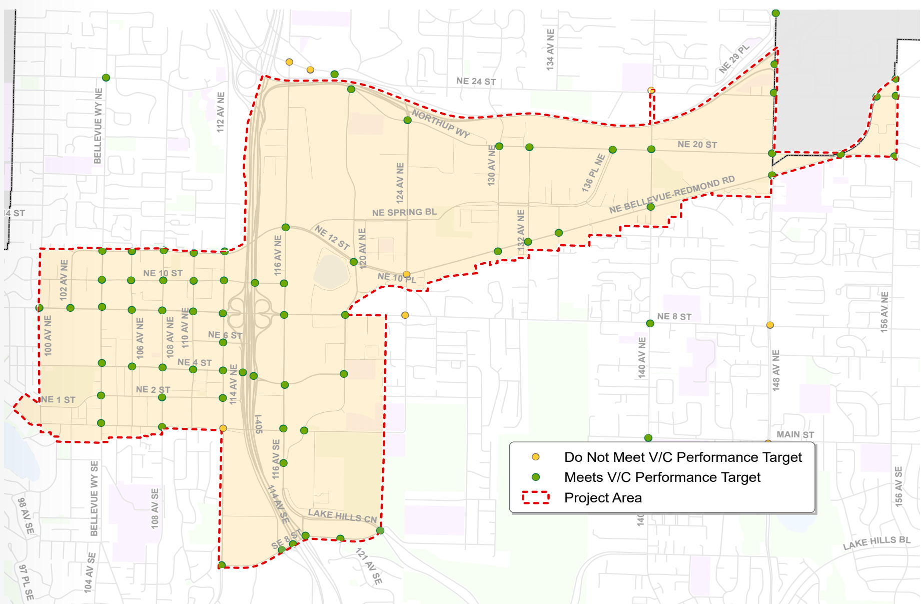
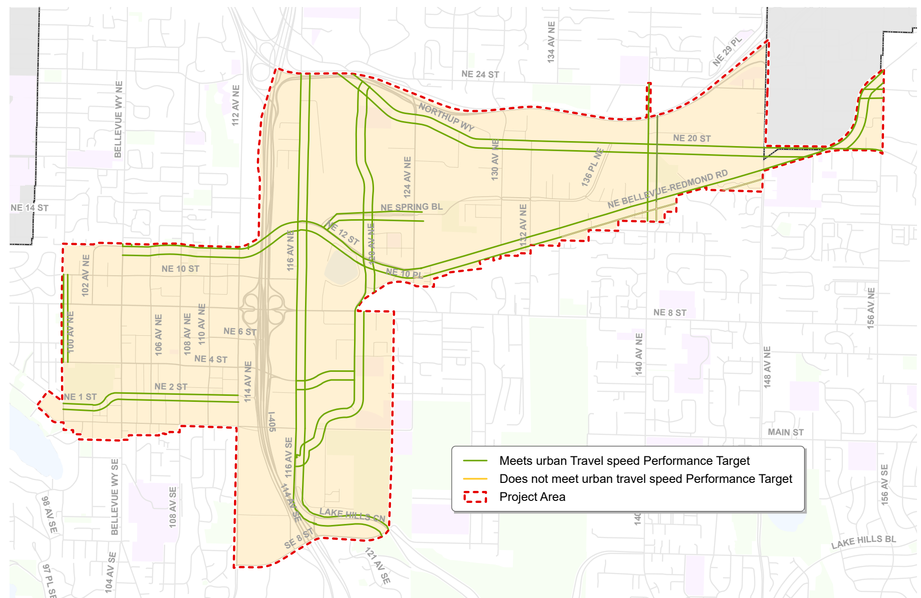


Figure 14. Future Conditions, 2035 Bike Bellevue Build Model, Urban Travel Speed on Bike Bellevue Corridors



Explore the 11 Bike Bellevue Corridors

Explore each of the corridor improvements on the following pages:

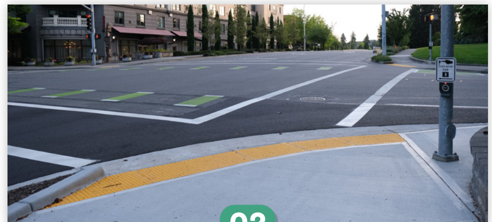
Page 19

01

120TH AVE NE TO 140TH AVE NE

Northup Way

Page 21



02

102ND AVE NE TO 108TH AVE NE

NE 12th Street

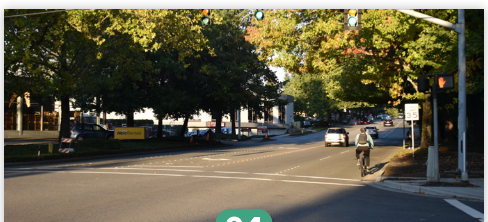
Page 23

03

NE SPRING BLVD TO 132ND AVE NE

NE 12th Street & Bel-Red Road

Page 25

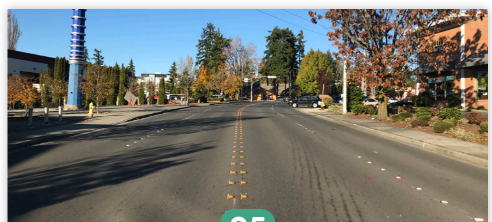


04

132ND AVE NE TO 148TH AVE NE

Bel-Red Road

Page 27

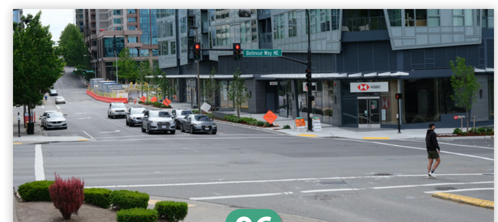


05

148TH AVE NE TO 156TH AVE NE

Bel-Red Road

Page 29



06

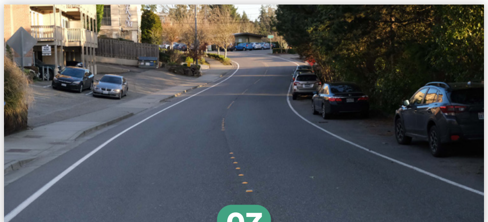
100TH AVE NE TO 112TH AVE NE

NE 1st & NE 2nd Street

Explore the 11 Bike Bellevue Corridors

Explore each of the corridor improvements on the following pages:

Page 31



07

100TH AVE NE TO 99TH AVE NE

Lake Washington Boulevard

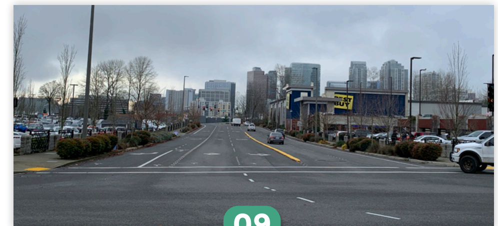
Page 33

08

MAIN ST TO NE 10TH ST

100th Ave NE

Page 35

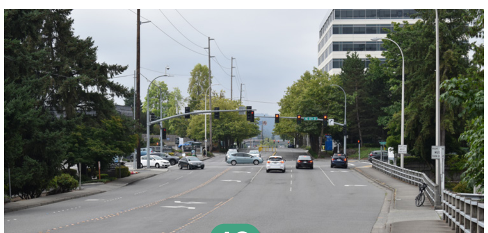


09

116TH AVE NE & NE 4TH STREET

Wilburton Route

Page 37

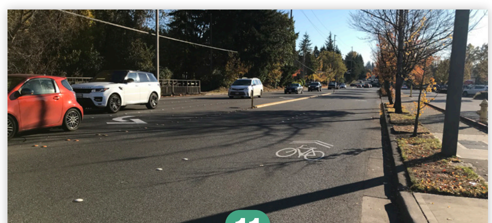


10

NE 12TH STREET TO NE 14TH STREET

116th Ave NE

Page 39



11

BEL-RED ROAD TO NE 24TH ST

140th Ave NE

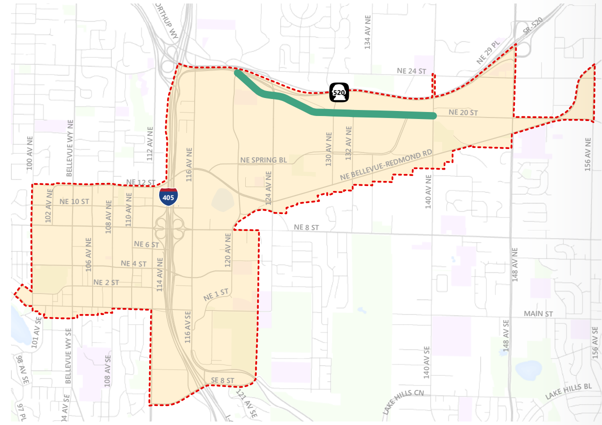
120TH AVE NE TO 140TH AVE NE

01 Northup Way

Project Description

Northup Way/NE 20th Street is an important east-west corridor serving the Bel-Red mixed-use area, which is rapidly densifying and changing from a light industrial to a mixed-use area.

The proposed concept reallocates one existing westbound lane to provide one-way separated buffered bike lanes on both sides of the corridor. The two-way left turn lane will be retained to provide vehicle access to the many businesses on both sides of the street.



Street Classification	Minor arterial
Traffic Volume (ADT)	20,000 - 30,000
Posted Speed Limit	35 mph
Existing Bicycle Facility	No facility
Existing Bike LTS	1 2 3 **4**
Target Bike LTS	1 2 **3** 4
Safety Data	• On the Vision Zero High Injury Network. • 3 severe or fatality crashes (2011 - 2022)
Major Nearby Destinations	Highland Park; access to SR 520 Trail and Eastrail
Population (600 Foot Buffer)	3,600 (2019) 16,850 (2050)
Employment (600 Foot Buffer)	18,300 (2019) 40,000 (2050)
Transit Route	King County Metro 249

Existing

Westbound Lanes | Eastbound Lanes

Proposed

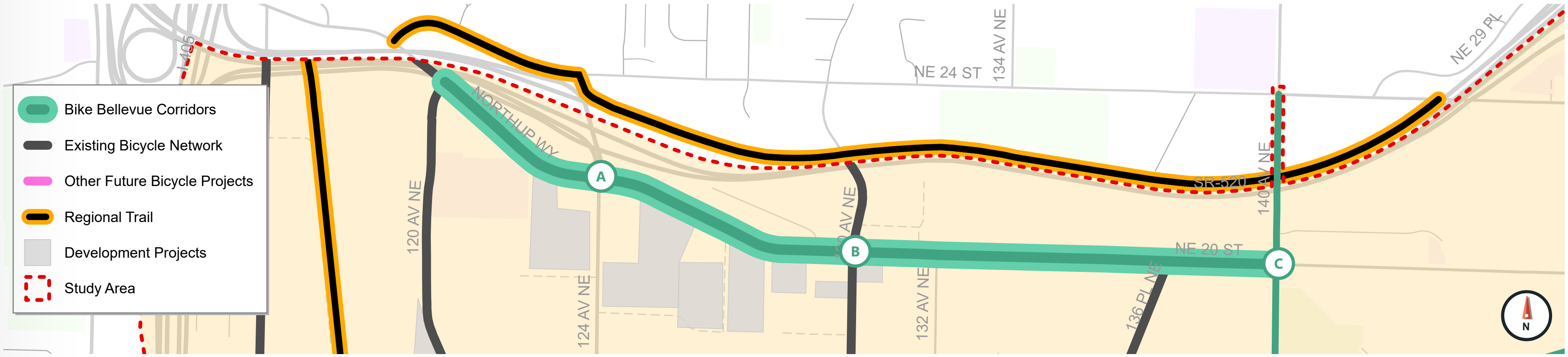
Westbound Lanes | Eastbound Lanes

Orientation of cross-section is eastbound (viewed as if looking east). This is an illustrative cross-section reflective of typical lane configurations. Because there are variations in lane markings along this corridor, please consult CAD drawings for details.

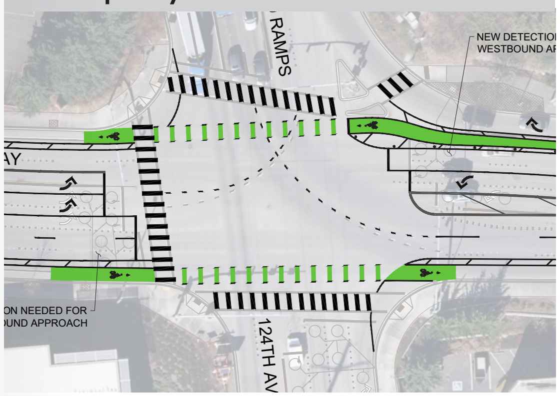
Visualization looking west along Northup Way/Northeast 20th Street, east of 132nd Avenue Northeast. Please consult CAD drawings for details.

120TH AVE NE TO 140TH AVE NE

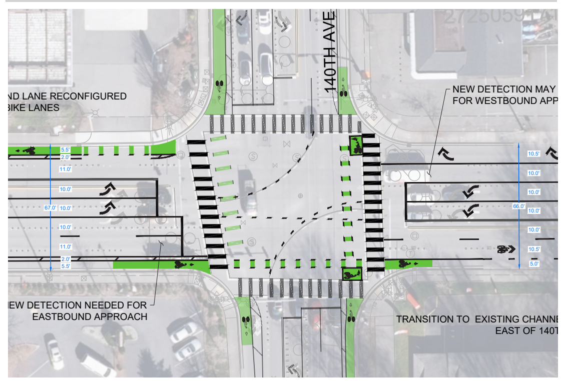
01 Northup Way



Northup Way at 124th Avenue NE



Northup Way and 140th Avenue NE



Changes

A Coordinate with WSDOT on 124th Avenue NE Interchange Project

B Convert 1 of 2 westbound lanes to separated buffered bike lanes

C Integrate with bike lanes on 140th Avenue NE

Level of traffic stress meets MIP target (LTS 3) between 120th Ave NE and 136th Place NE. Improves condition, but does not meet LTS 1 target east of 136th Place NE.

With changes, all intersections meet vehicle performance target of 1.0 V/C or lower.

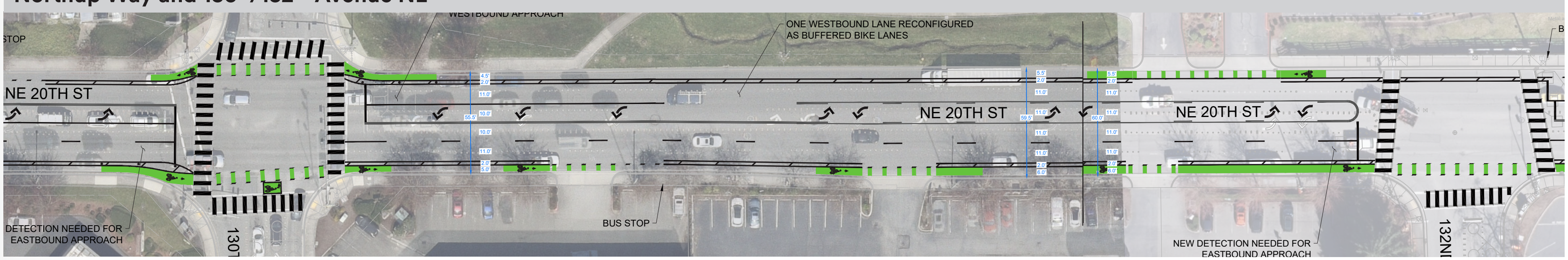
Benefits

One of two continuous east-west arterials in the BelRed neighborhood, connects to major commercial uses along corridor. Improves access to the East Link stations at 120th and 130th Avenues. Provides a less hilly alternative to the SR 520 trail.

Cost Estimate

$3.90M

Northup Way and 130th/132nd Avenue NE

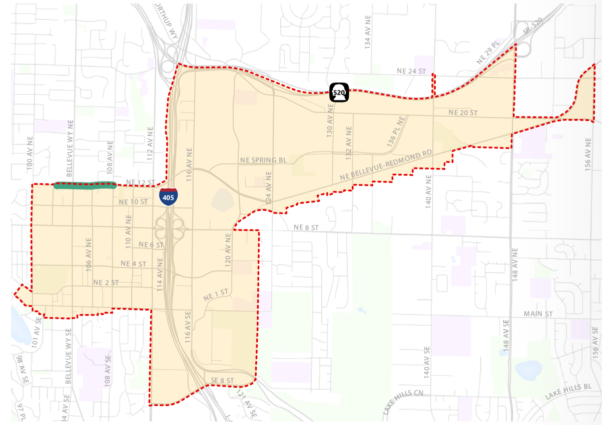


102ND AVE TO 108TH AVE NE

02 NE 12th Street

Project Description

The NE 12th Street project would extend the from the existing shared-use path that ends at 108th Avenue NE to a planned bicycle facility that extends west of 102nd Avenue NE. This would create a continuous low-stress bicycle route across all of north downtown. The proposed design reallocates one westbound lane to provide a two-way separated buffered bike lane on the north side of NE 12th Street.



Street Classification	Major/Minor arterial
Traffic Volume (ADT)	14,000 - 22,000
Posted Speed Limit	30 mph
Existing Bicycle Facility	No facility
Existing Bike LTS	1 2 3 **4**
Target Bike LTS	**1** 2 3 4
Safety Data	• 2 severe or fatality crashes (2011 - 2022)
Major Nearby Destinations	Bellevue Square, Bellevue Village Center
Population (600 Foot Buffer)	6,300 (2019) 27,200 (2050)
Employment (600 Foot Buffer)	17,100 (2019) 30,800 (2050)
Transit Route	N/A

Existing

Westbound Lanes | Eastbound Lanes

Proposed

Westbound Lanes | Eastbound Lanes

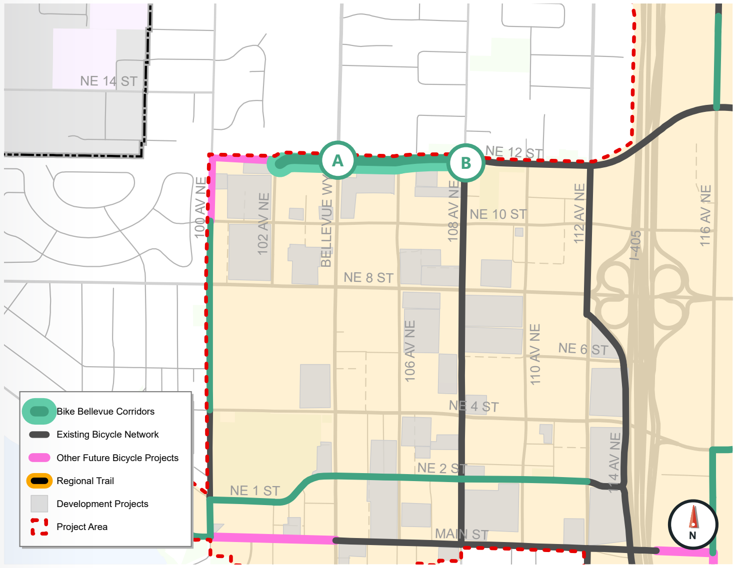
Orientation of cross-section is eastbound (viewed as if looking east). This is an illustrative cross-section reflective of typical lane configurations. Because there are variations in lane markings along this corridor, please consult CAD drawings for details.

Visualization looking west along Northeast 12th Street at 108th Avenue Northeast. Please consult CAD drawings for details.

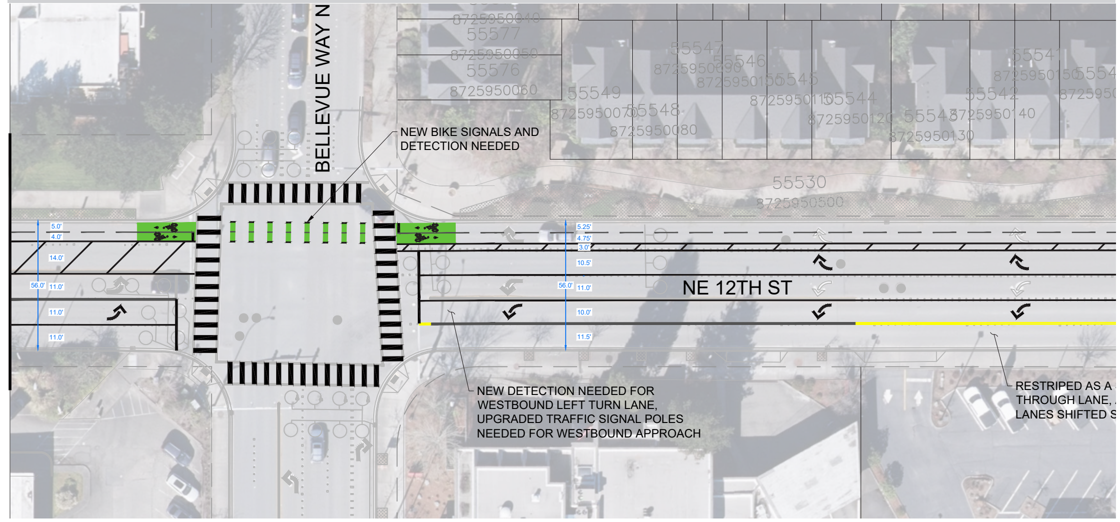
Visualization looking east along Northeast 12th Street, east of 102nd Avenue Northeast. Please consult CAD drawings for details.

102ND AVE TO 108TH AVE NE

02 NE 12th Street



NE 12th Street and Bellevue Way NE



Changes

Ⓐ 1 of 2 eastbound lanes removed east of Bellevue Way NE, 106th Avenue NE and 108th Avenue NE to improve westbound traffic operations.

Ⓑ New westbound right turn bay at 108th Avenue NE.

New level of traffic stress is between 2 and 3 (depending on vehicle volumes). Conditions are improved, but does not meet LTS 1 target along NE 12th Street.

With changes, all intersections meet vehicle performance target of 1.0 V/C or lower.

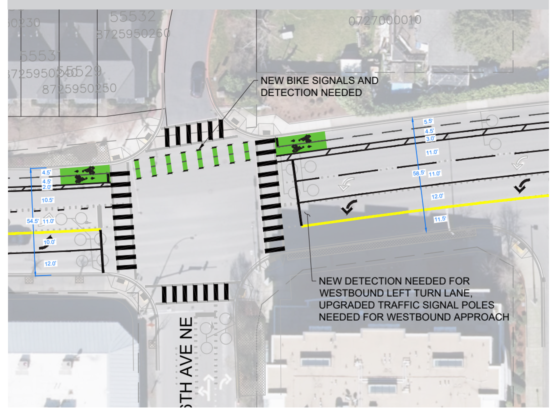
Benefits

Extends bicycle connection along NE 12th Street from the 108th Avenue corridor.

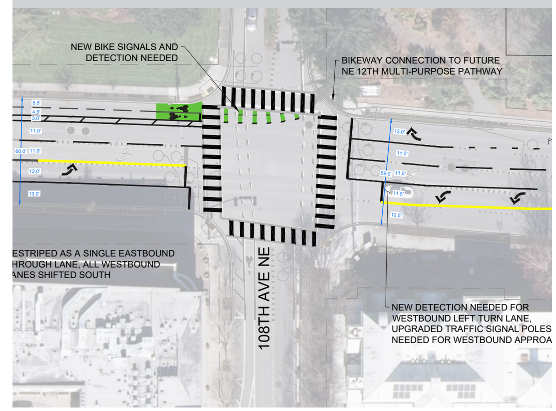
Cost Estimate

$0.99M

NE 12th Street and 106th Avenue NE



NE 12th Street and 108th Avenue NE



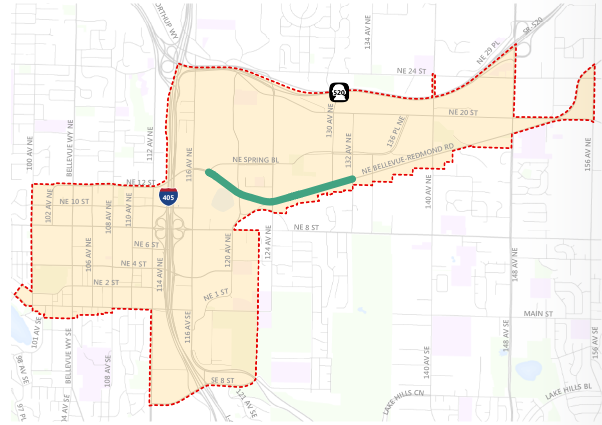
NE SPRING BLVD TO 132ND AVE NE

03 NE 12th Street/Bel-Red Road

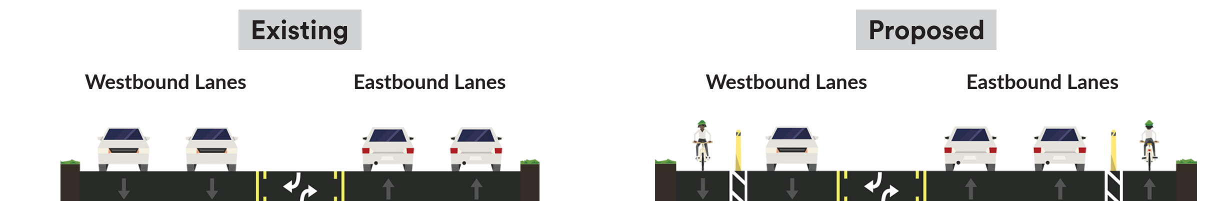
Project Description

The connection along NE 12th Street and Bel-Red Road is a key link between downtown Bellevue and the city's emerging BelRed neighborhood. This will be the only low-stress bike route between these areas until redevelopment occurs and NE Spring Boulevard is completed.

The proposed design reallocates 1 of 2 westbound lanes between NE Spring Blvd and 124th Avenue NE, and transitions to reallocating 1 of 2 eastbound lanes east of 124th Avenue NE to provide one-way separated buffered bike lanes in each direction. A new protected intersection will be installed at NE 12th Street and 120th Avenue NE to facilitate safe connections between the two bicycle routes.



Street Classification	Major arterial
Traffic Volume (ADT)	18,000 - 29,000
Posted Speed Limit	30/35 mph
Existing Bicycle Facility	No facility
Existing Bike LTS	1 2 3 **4**
Target Bike LTS	1 2 **3** 4
Safety Data	• On the Vision Zero High Injury Network. • 4 severe or fatality crashes (2011 - 2022)
Major Nearby Destinations	Overlake Medical Center, Spring District
Population (600 Foot Buffer)	4,700 (2019) 15,300 (2050)
Employment (600 Foot Buffer)	21,950 (2019) 40,550 (2050)
Transit Route	King County Metro 226



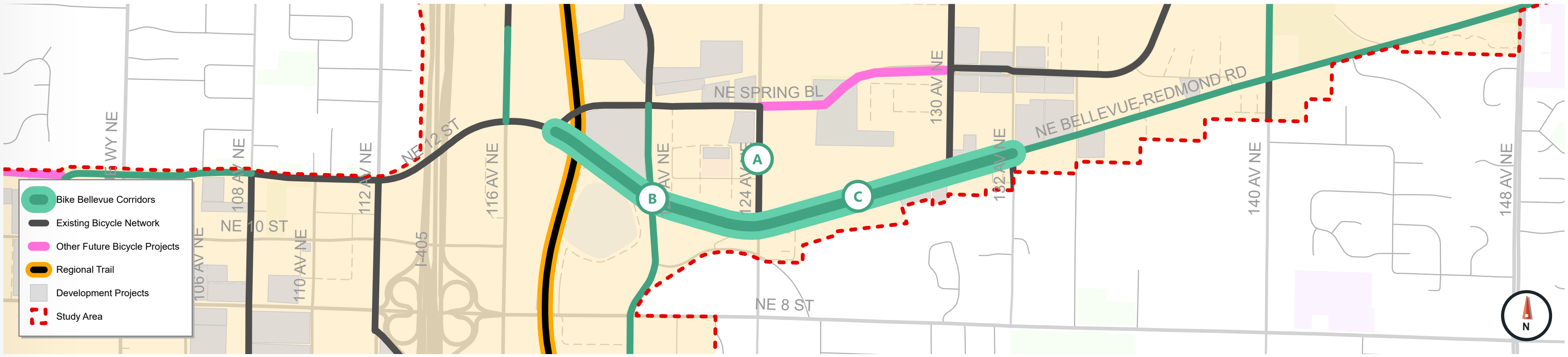
Orientation of cross-section is eastbound (viewed as if looking east). This is an illustrative cross-section reflective of typical lane configurations. Because there are variations in lane markings along this corridor, please consult CAD drawings for details.

Visualization looking east along Northeast 12th Street at 120th Avenue Northeast. Please consult CAD drawings for details.

Visualization looking west along Bel-Red Road, east of 124th Avenue Northeast. Please consult CAD drawings for details.

NE SPRING BLVD TO 132ND AVE NE

03 NE 12th Street/Bel-Red Road



Changes

Ⓐ Convert 1 of 2 westbound lanes to one-way buffered bike lanes between NE Spring Boulevard and 124th Avenue NE.

Ⓑ New protected intersection corners at NE 12th Street and 120th Avenue NE to facilitate safe bicycle movements between the two bike routes.

Ⓒ Maintain 2 westbound lanes and covert 1 of 2 eastbound lanes east of 124th Avenue NE to accommodate one-way separated buffered bike lanes on each side of the street.

Level of traffic stress meets MIP target (LTS 3).

With changes, one intersection does not meet the vehicle performance target of 1.0 V/C or lower, 124th Avenue NE & Bel-Red Road (V/C = 1.01).

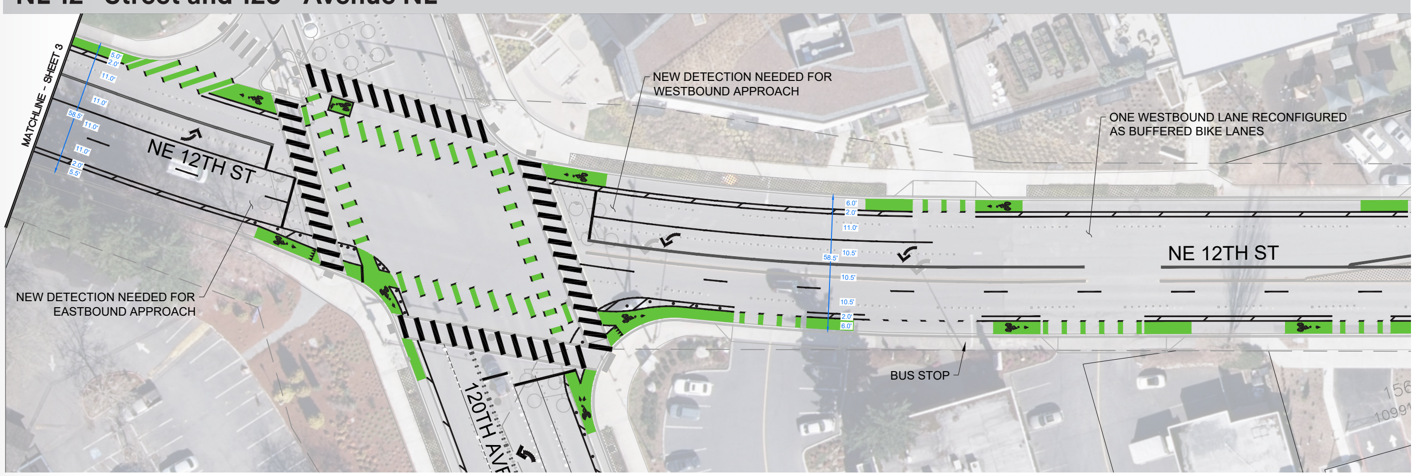
Benefits

One of two continuous east-west arterials in the BelRed neighborhood, connects to major commercial uses along corridor downtown, Wilburton, and other surrounding neighborhoods to the businesses and commercial uses in the BelRed neighborhood.

Cost Estimate

$3.38M

NE 12th Street and 120th Avenue NE



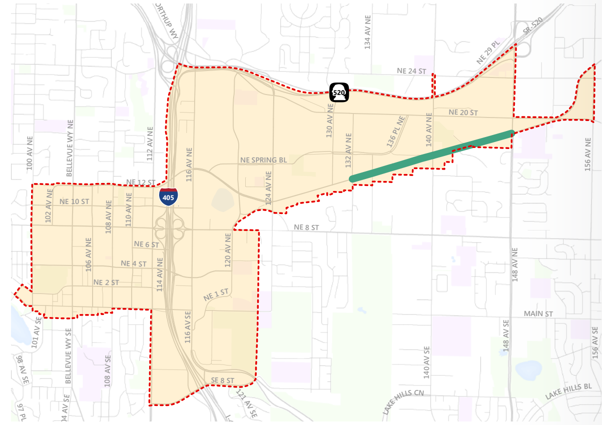
132ND AVE NE TO 148TH AVE NE

04 Bel-Red Road

Project Description

Bel-Red Road is a major continuous east-west corridor that serves the BelRed neighborhood and is one of the few continuous east-west streets through Bellevue. The area along Bel-Red Road is rapidly changing from light industrial to higher-density mixed-use consistent with the City's BelRed Plan.

The proposed design reallocates 1 of 2 eastbound lanes between 132nd Avenue NE and opens back up to 2 lanes on approach to the busy 148th Avenue NE intersection. This design provides one-way separated buffered bike lanes on both sides of the street. Between 143rd Avenue NE and 148th Avenue NE, 1 of 2 westbound lanes is modified to provide a two-way left turn lane, improving access to destinations on both sides of the corridor.



Street Classification	Major arterial
Traffic Volume (ADT)	19,000 - 25,000
Posted Speed Limit	35 mph
Existing Bicycle Facility	No facility
Existing Bike LTS	1 2 3 **4**
Target Bike LTS	1 2 **3** 4
Safety Data	• On the Vision Zero High Injury Network. • 5 severe or fatality crashes (2011 - 2022)
Major Nearby Destinations	Bel-Red mixed use neighborhood, Highland Park
Population (600 Foot Buffer)	6,150 (2019) 7,350 (2050)
Employment (600 Foot Buffer)	14,150 (2019) 30,250 (2050)
Transit Route	King County Metro 226

Existing

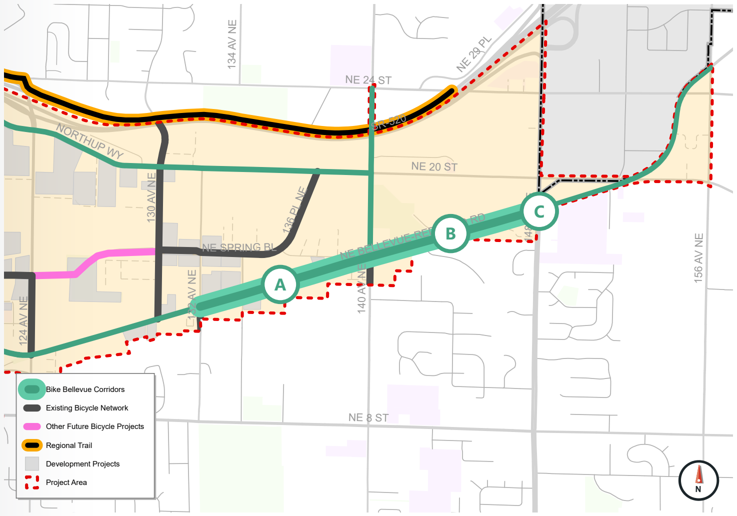
Proposed

Orientation of cross-section is eastbound (viewed as if looking east). This is an illustrative cross-section reflective of typical lane configurations. Because there are variations in lane markings along this corridor, please consult CAD drawings for details.

Visualization looking east along Bel-Red Road at 132nd Avenue Northeast. Please consult CAD drawings for details.

132ND AVE NE TO 148TH AVE NE

04 Bel-Red Road



Changes

Ⓐ Convert 1 of 2 eastbound lanes to one-way separated buffered bike lanes, retain 2 lanes westbound between 134th Avenue NE and 143rd Avenue NE.

Ⓑ Between NE 20th Pl and 148th Avenue NE, convert one of two westbound lanes to a one-way separated buffered bike lane; retain 2 lanes eastbound.

Ⓒ Convert 1 of 2 westbound lanes and retain 2 lanes eastbound at 148th Avenue NE.

Level of traffic stress meets MIP target (LTS 3).

With changes, all intersections meet vehicle performance target of 1.0 V/C or lower.

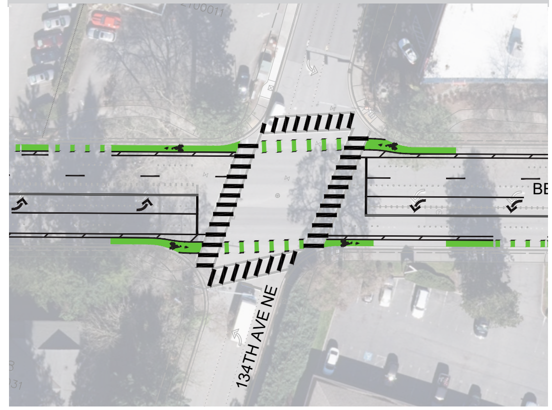
Benefits

One of the only continuous east-west bicycle routes in Bellevue between I-405 and the neighborhoods east of 156th Avenue NE.

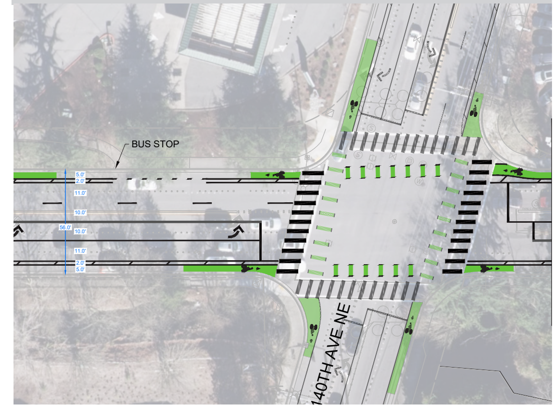
Cost Estimate

$2.81M

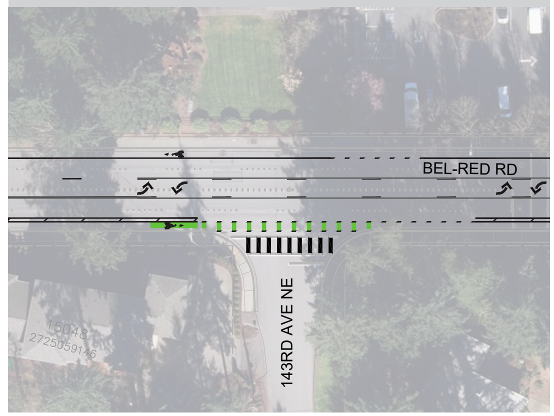
Bel-Red Road and 134th Avenue NE



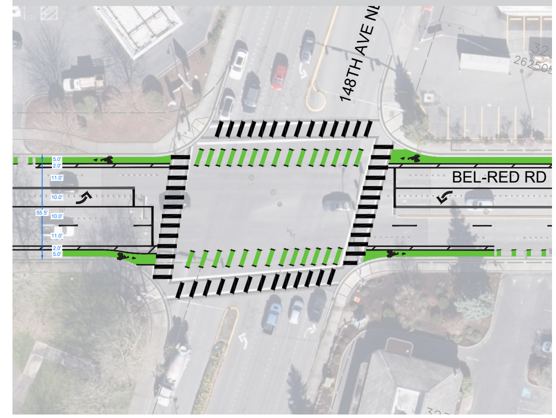
Bel-Red Road and 140th Avenue NE



Bel-Red Road and 143rd Avenue NE



Bel-Red Road and 148th Avenue NE



148TH AVE NE TO 156TH AVE NE

05 Bel-Red Road

Project Description

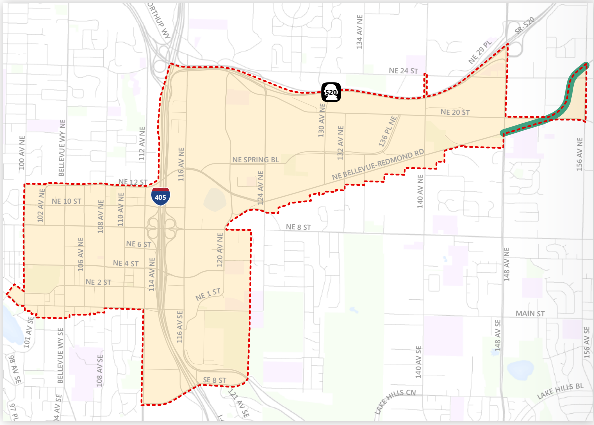
This segment of Bel-Red Road runs adjacent to the South Overlake neighborhood in Redmond, which is rapidly densifying with mixed-use development replacing low-density retail. This segment also is a key link between Bellevue's and Redmond's bicycle networks.

The proposed design:

» 2 lanes EB, 1 lane WB (143rd to NE 20th)

» 3 lanes (NE 20th to NE 24th)

» 2 lanes WB, 1 lane EB (NE 24th to 156th Avenue NE)

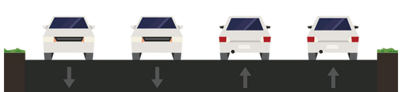


Street Classification	Major arterial
Traffic Volume (ADT)	12,000 - 19,000
Posted Speed Limit	35 mph
Existing Bicycle Facility	No facility
Existing Bike LTS	1 2 3 **4**
Target Bike LTS	1 2 **3** 4
Safety Data	• On the Vision Zero High Injury Network. • 6 severe or fatality crashes (2011 - 2022)
Major Nearby Destinations	Highland Middle School
Population (600 Foot Buffer)	9,850 (2019) 11,100 (2050)
Employment (600 Foot Buffer)	11,700 (2019) 20,650 (2050)
Transit Route	King County Metro 226

Existing

Southbound Lanes

Northbound Lanes



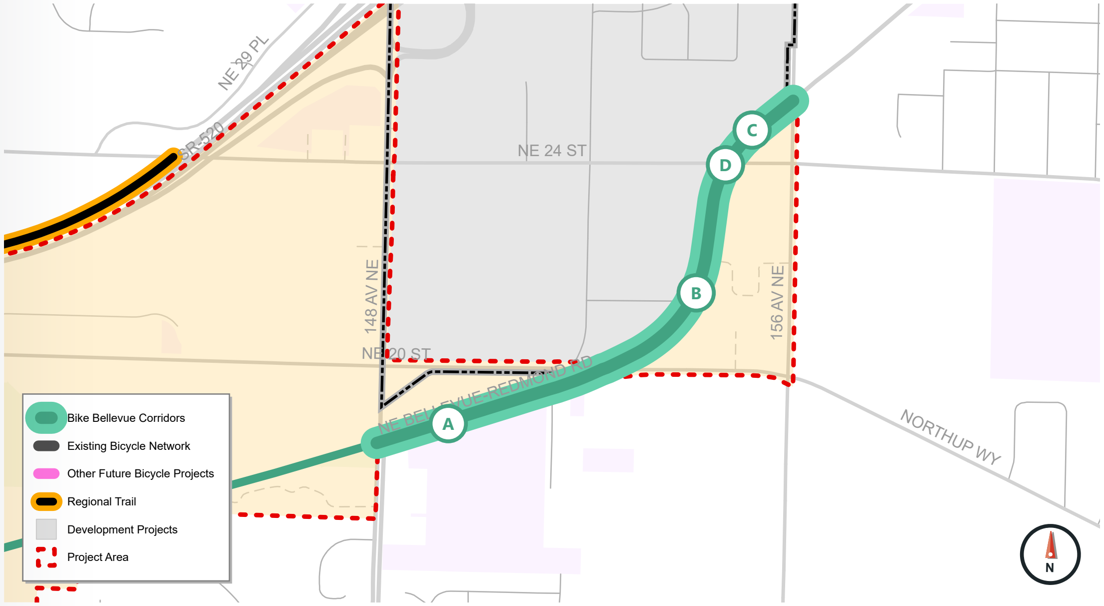
Proposed

Orientation of cross-section is northbound (viewed as if looking north). This is an illustrative cross-section reflective of typical lane configurations. Because there are variations in lane markings along this corridor, please consult CAD drawings for details.

View north along Bel-Red Road, north of Northeast 22nd Place. Please consult CAD drawings for details.

148TH AVE NE TO 156TH AVE NE

05 Bel-Red Road



Changes

Ⓐ Convert 1 of 2 eastbound lanes to one-way separated buffered bike lanes between 148th Avenue NE and NE 20th Street

Ⓑ Convert 1 eastbound lane and 1 westbound lane to a one-way separated buffered bike lanes and install a two-way left turn lane between NE 20th Street and NE 24th Street

Ⓒ Convert 1 of 2 eastbound lanes to one-way separated buffered bike lanes between NE 24th Street and 156th Avenue NE

Ⓓ Remove northbound peak hour left turn restriction

Level of traffic stress meets MIP target (LTS 3).

With changes, all intersections meet vehicle performance target of 1.0 V/C or lower.

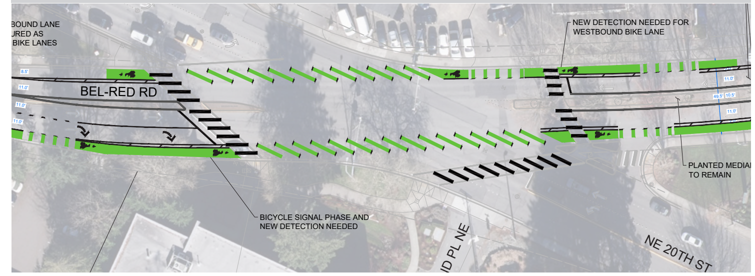
Benefits

One of two continuous east-west arterials in the BelRed neighborhood, connects to major commercial uses along corridor.

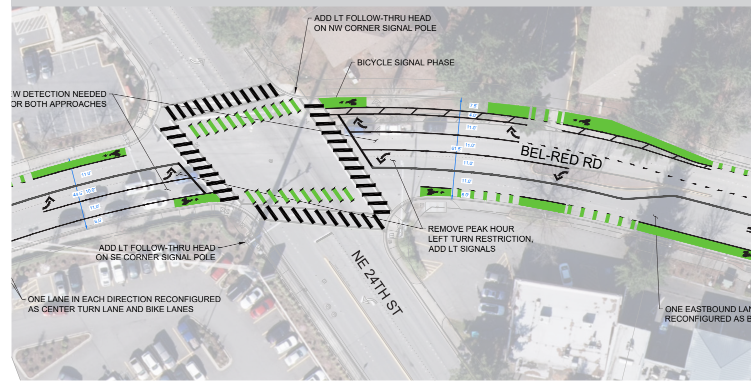
Cost Estimate

$1.61M

Bel-Red Road and NE 20th Street



Bel-Red Road and NE 24th Street



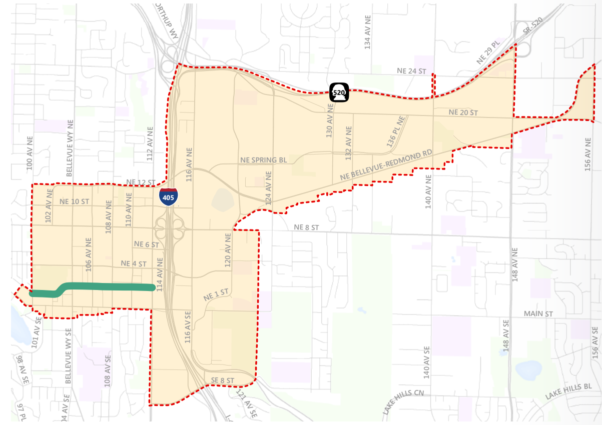
100TH AVE NE TO 112TH AVE NE

06 NE 1st/NE 2nd Street

Project Description

NE 1st Street and NE 2nd Street are minor arterials in the heart of downtown Bellevue that provide a direct connection to Bellevue Downtown Park, the 108th Avenue bicycle corridor, and other high density land uses.

The proposed design converts the westbound travel lane on NE 1st Street and NE 2nd Street to a two-way curb-separated bike lane on the north side of the street between 100th Avenue NE and Bellevue Way. The two-way curb-separated bike lane transitions to one-way bike lanes (mix of conventional, buffered, and separated buffered bike lanes) east of Bellevue Way NE, retaining 1 travel lane and the two-way left turn lane in each direction.



Existing

Westbound Lanes | Eastbound Lanes

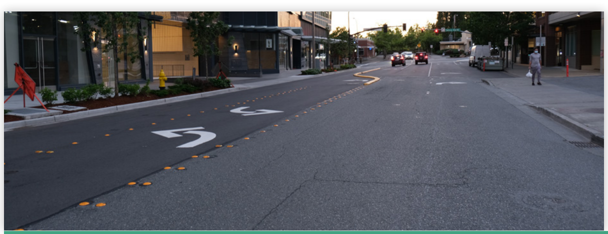
Proposed

Westbound Lanes | Eastbound Lanes

Orientation of cross-section is eastbound (viewed as if looking east). This is an illustrative cross-section reflective of typical lane configurations. Because there are variations in lane markings along this corridor, please consult CAD drawings for details.

Street Classification	Collector Arterial (NE 1st Street) Minor Arterial (NE 2nd Street)
Traffic Volume (ADT)	7,500-9,000
Posted Speed Limit	25 mph (NE 1st Street) 30 mph (NE 2nd Street)
Existing Bicycle Facility	Buffered bike lane at some locations
Existing Bike LTS	1 2 **3** 4
Target Bike LTS	1 2 **3** 4
Safety Data	• On the Vision Zero High Injury Network. • 3 severe or fatality crashes (2011 - 2022)
Major Nearby Destinations	Bellevue Downtown Park 108th Avenue bicycle corridor
Population (600 Foot Buffer)	8,100 (2019) 23,800 (2050)
Employment (600 Foot Buffer)	14,900 (2019) 31,400 (2050)
Transit Route	N/A

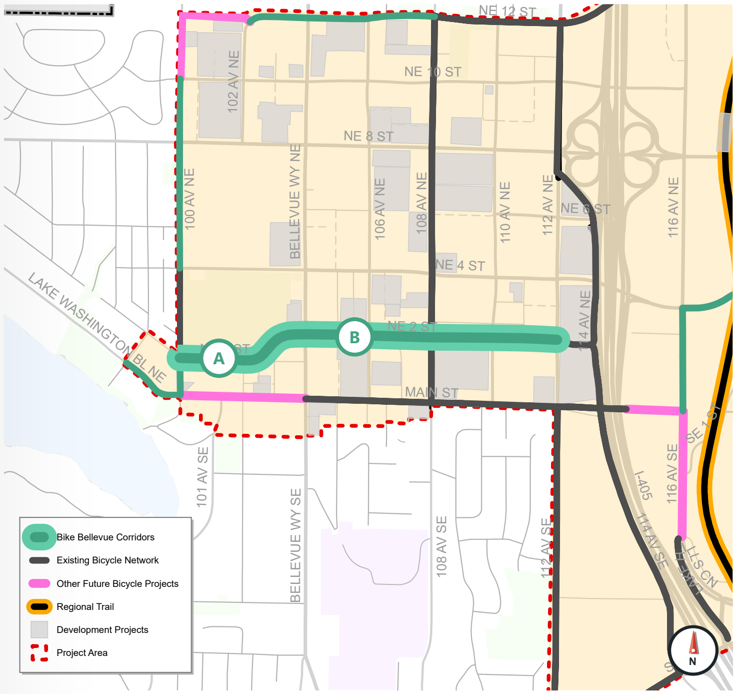
Visualization looking east along Northeast 2nd Street at Bellevue Way Northeast. Please consult CAD drawings for details.



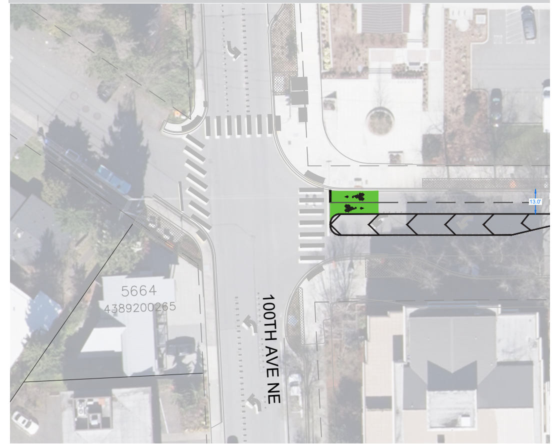
Visualization looking west along Northeast 2nd Street at 105th Avenue Northeast. Please consult CAD drawings for details.

100TH AVE NE TO 112TH AVE NE

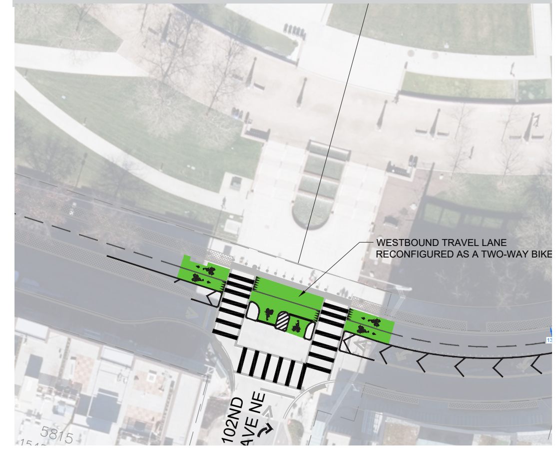
06 NE 1st/NE 2nd Street



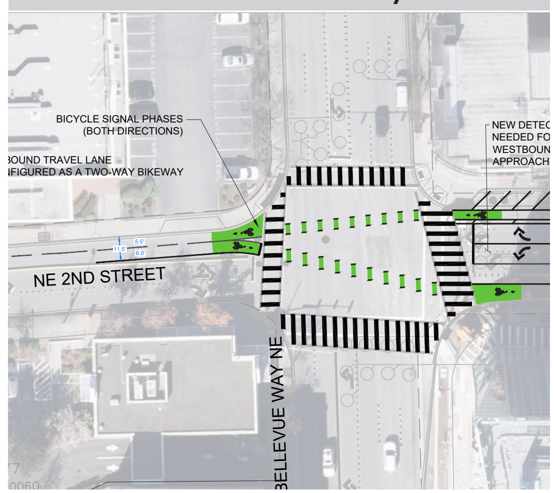
NE 1st Street and 100th Avenue NE



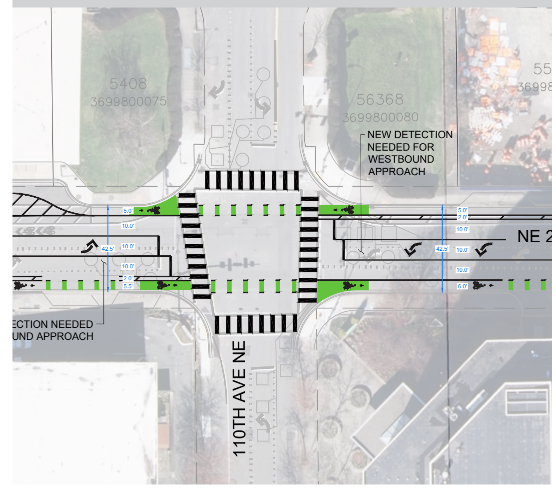
NE 1st Street and 102nd Avenue NE



NE 2nd Street and Bellevue Way NE



NE 2nd Street and 110th Avenue NE



Changes

Ⓐ Convert NE 1st Street and NE 2nd Street between 100th Avenue NE and Bellevue Way NE to one-way eastbound only for motor vehicles and provide a two-way curb-separated bike lane on the north side.

Ⓑ Between Bellevue Way NE and 112th Avenue NE, retain 1 lane in each direction to provide one-way bike lanes (a mix of conventional, buffered, and separated buffered).

Level of traffic stress is better than MIP target (LTS 3).

With changes, all intersections meet vehicle performance target of 1.0 V/C or lower.

Benefits

Provide a direct connection to Bellevue Downtown Park and access to Meydenbauer Bay Park. Connects to 108th Avenue corridor.

Cost Estimate

$1.25M

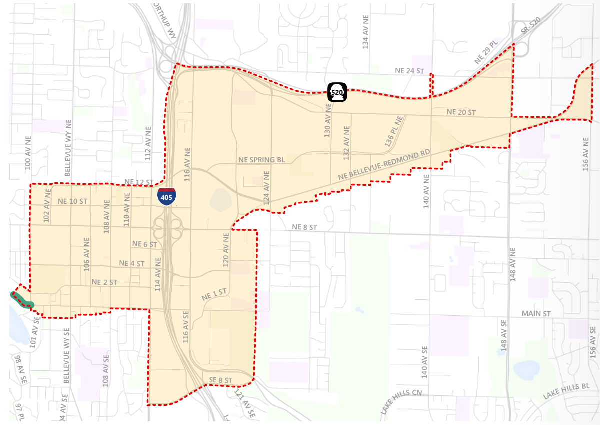
100TH AVE NE TO 99TH AVE NE

07 Lake Washington Boulevard

Project Description

Lake Washington Boulevard is an important corridor along Meydenbauer Bay, providing access to destinations including Meydenbauer Bay Park before turning into Main Street east of 100th Avenue NE.

The proposed design reallocates existing on-street parking on the south side and implements a set of one-way bicycle lanes (which vary from conventional to buffered bike lanes).



Existing

Proposed

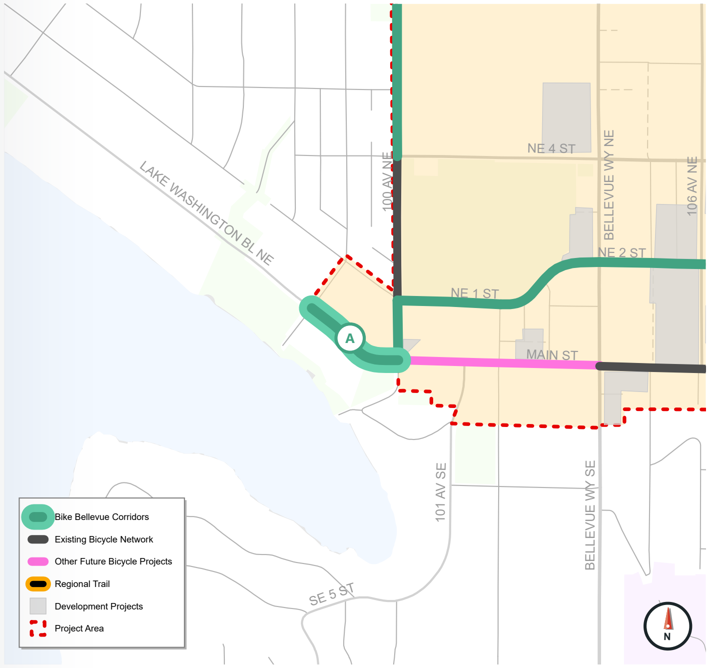
Orientation of cross-section is eastbound (viewed as if looking east). This is an illustrative cross-section reflective of typical lane configurations. Because there are variations in lane markings along this corridor, please consult CAD drawings for details.

Street Classification	Collector arterial
Traffic Volume (ADT)	6,500- 7,500
Posted Speed Limit	30 mph
Existing Bicycle Facility	No facility
Existing Bike LTS	1 2 3 **4**
Target Bike LTS	1 **2** 3 4
Safety Data	1 severe or fatality crash (2011 - 2022)
Major Nearby Destinations	Old Bellevue, Meydenbauer Bay Park
Population (600 Foot Buffer)	5,600 (2019) 14,400 (2050)
Employment (600 Foot Buffer)	2,000 (2019) 3,100 (2050)
Transit Route	N/A

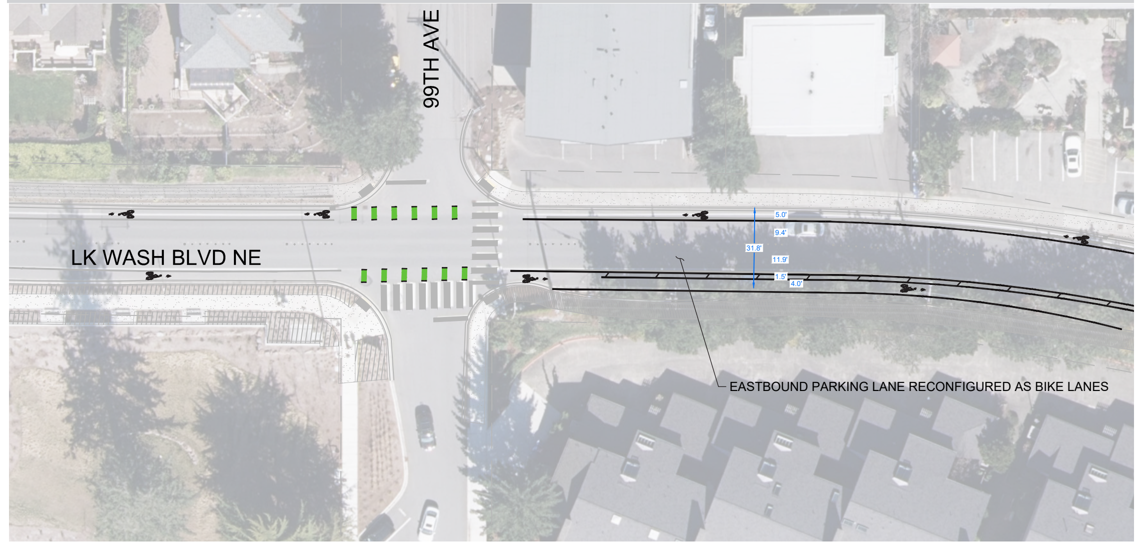
Visualization looking southeast along Lake Washington Boulevard Northeast at 99th Avenue Northeast. Please consult CAD drawings for details.

100TH AVE NE TO 99TH AVE NE

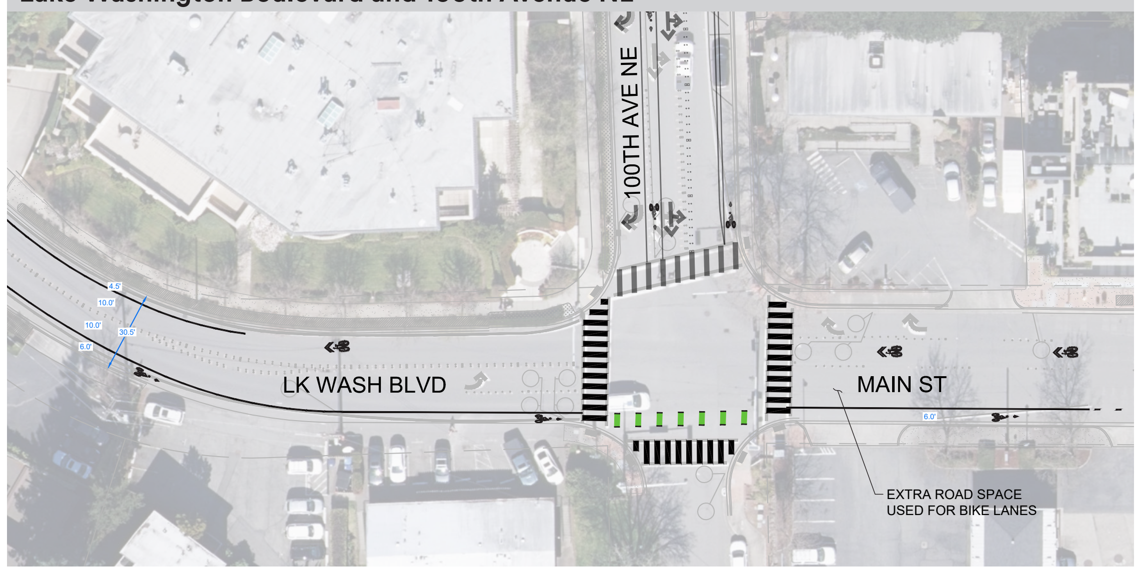
07 Lake Washington Boulevard



Lake Washington Boulevard and 99th Avenue SE



Lake Washington Boulevard and 100th Avenue NE



Changes

(A) Remove curbside parking on the south side to accommodate a pair of bicycle lanes.

Level of traffic stress meets MIP target (LTS 2).

No changes to vehicle operations.

Benefits

Improves bicycle and pedestrian access along Lake Washington Boulevard between Meydenbauer Bay Park and 100th Avenue NE.

Cost Estimate

$0.21M

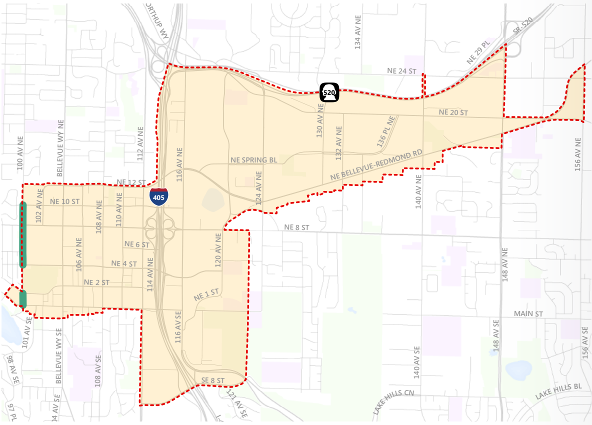
MAIN ST TO NE 10TH ST

08 100th Avenue NE

Project Description

100th Avenue NE is a continuous north-south corridor on the western edge of downtown Bellevue and provides a direct connection to Bellevue Square and Bellevue Downtown Park.

The proposed design provides one-way bike lanes (mix of conventional and buffered) between Main Street and NE 1st Street and transitions to the existing shared-use path on the east side between NE 1st Street and NE 4th Street. Between NE 4th and NE 8th Street, a two-way separated buffered bike lane is provided on the east side of the street and transitions to one-way bike lanes north of NE 8th Street.



Street Classification	Minor arterial
Traffic Volume (ADT)	9,000 - 12,000
Posted Speed Limit	30 mph
Existing Bicycle Facility	No facility
Existing Bike LTS	1 2 **3** 4
Target Bike LTS	**1** 2 3 4 (Main Street to NE 8th Street) 1 2 **3** 4 (NE 8th Street to NE 24th Street)
Safety Data	No severe or fatality crashes (2011 - 2022)
Major Nearby Destinations	Bellevue Square, Bellevue Downtown Park
Population (600 Foot Buffer)	7,600 (2019) 20,400 (2050)
Employment (600 Foot Buffer)	9,650 (2019) 17,600 (2050)
Transit Route	N/A

Existing

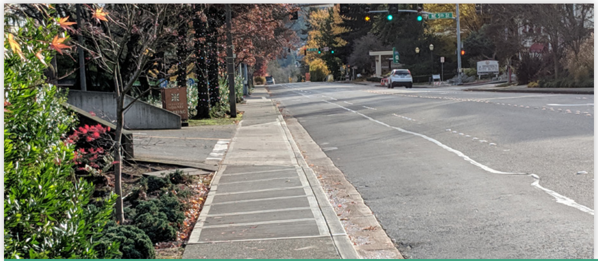
Southbound Lanes | Northbound Lanes

Proposed

Southbound Lanes | Northbound Lanes

Orientation of cross-section is northbound (viewed as if looking north). This is an illustrative cross-section reflective of typical lane configurations. Because there are variations in lane markings along this corridor, please consult CAD drawings for details.

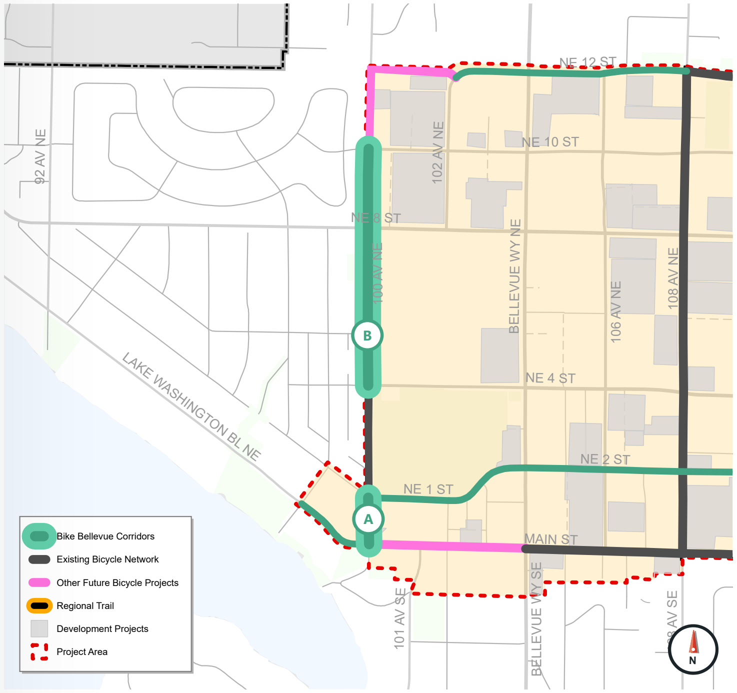
Visualization looking south along 100th Avenue Northeast, north of Northeast 8th Street. Please consult CAD drawings for details.



Visualization looking south along 100th Avenue Northeast, north of Northeast 5th Street. Please consult CAD drawings for details.

MAIN ST TO NE 10TH ST

08 100th Avenue NE



Changes

(A) Convert curbside parking to one-way bike lanes between Main Street and NE 1st Street.

(B) Between NE 4th Street and NE 8th Street, reallocate 1 of 2 northbound lanes to provide a separated buffered two-way bicycle facility on the east side.

Level of traffic stress meets MIP target (LTS 1) between NE 4th Street and NE 8th Street.

With changes, all intersections meet vehicle performance target of 1.0 V/C or lower.

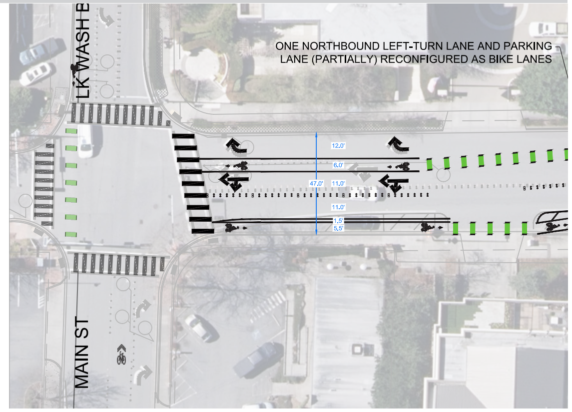
Benefits

Direct bicycle access to Bellevue Square and Bellevue Downtown Park for people of all ages and abilities. Improves low-stress access in a dense residential area.

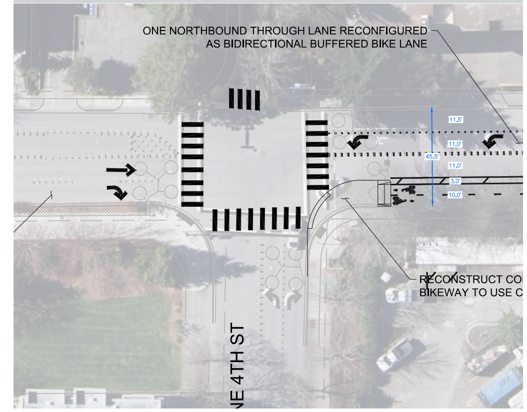
Cost Estimate

$0.61M

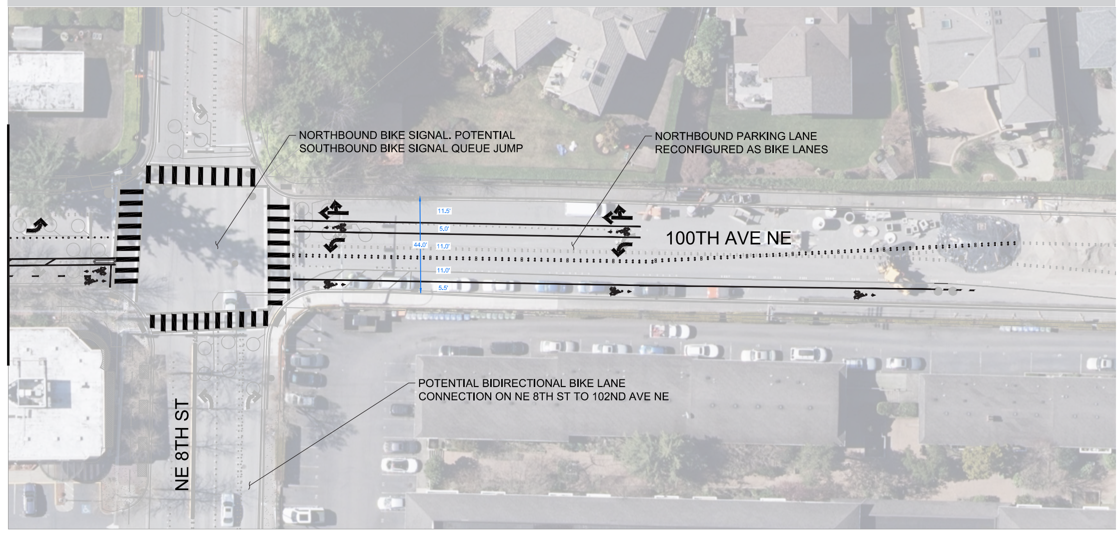
100th Avenue NE and Main Street



100th Avenue NE and NE 4th Street



100th Avenue NE and NE 8th Street



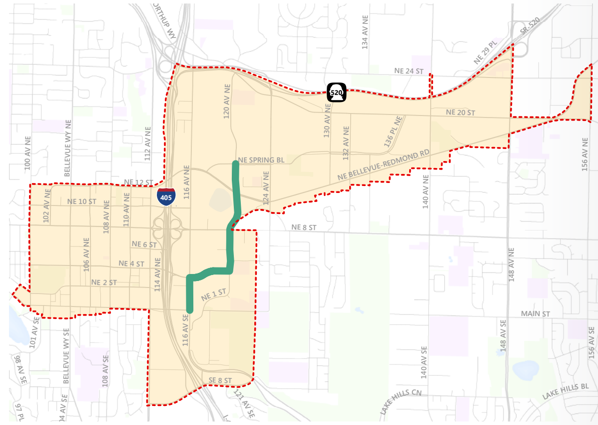
116TH AVE NE & NE 4TH STREET

09 Wilburton Route

Project Description

The Wilburton route along 116th Avenue NE, NE 4th Street, and 120th Avenue NE provides a main bicycle connection through the commercial portion of the Wilburton neighborhood and direct access to the Eastrail regional trail and Spring District/120th Link light rail station. This facility will close a key gap in the bicycle network between Main Street and Eastrail.

The proposed design retains two travel lanes in each direction and the two-way left turn lane on the entire route. The design installs one-way separated buffered bike lanes in each direction. A new protected bicycle corner will also be installed at the intersection of 116th Avenue NE and NE 4th Street to facilitate safe movements between the two bike routes.



Street Classification	Major arterial
Traffic Volume (ADT)	12,000 - 20,000
Posted Speed Limit	30 mph
Existing Bicycle Facility	• No facility on 116th Avenue NE • 1-way painted bike lane on 4th Avenue NE
Existing Bike LTS	1 2 **3** 4
Target Bike LTS	1 2 **3** 4
Safety Data	• On the Vision Zero High Injury Network. • 3 severe or fatality crashes (2011 - 2022)
Major Nearby Destinations	Eastrail, major retailers
Population (600 Foot Buffer)	1,288 (2019) 1,976 (2050)
Employment (600 Foot Buffer)	5,973 (2019) 11,425 (2050)
Transit Route	King County Metro 271

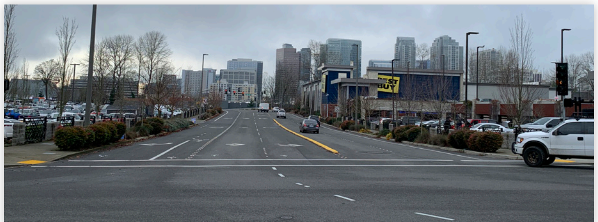
Existing

Southbound Lanes | Northbound Lanes

Proposed

Southbound Lanes | Northbound Lanes

Orientation of cross-section is northbound (viewed as if looking north). This is an illustrative cross-section reflective of typical lane configurations. Because there are variations in lane markings along this corridor, please consult CAD drawings for details.

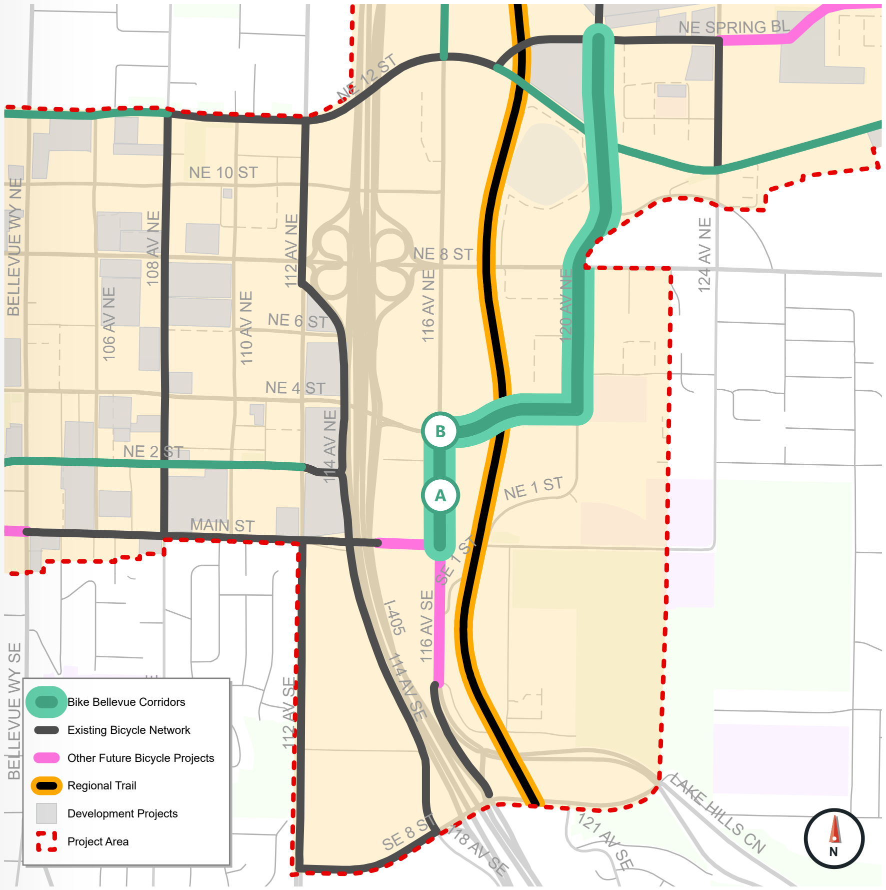


Visualization looking west along Northeast 4th Street at 120th Avenue Northeast. Please consult CAD drawings for details.

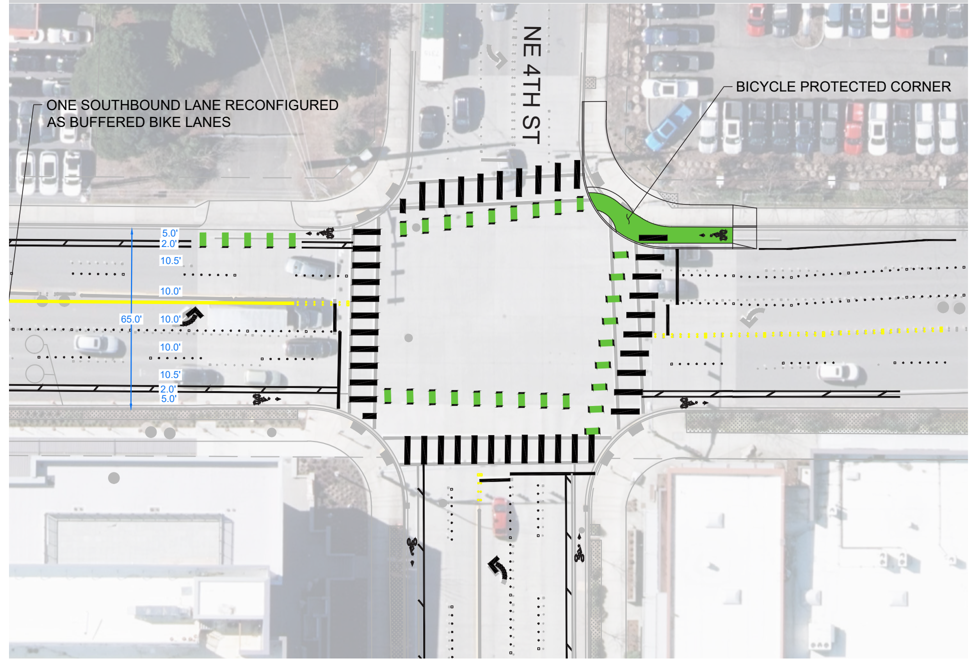
Visualization looking north along 116th Avenue Northeast at Northeast 2nd Place. Please consult CAD drawings for details.

116TH AVE NE & NE 4TH STREET

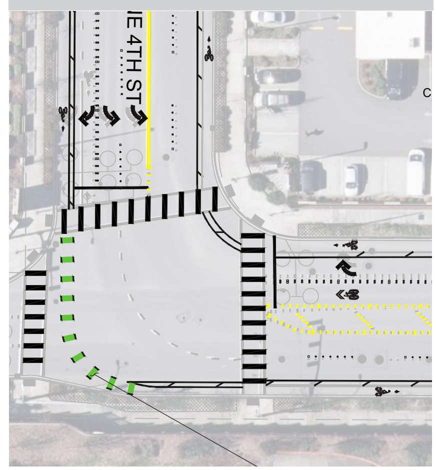
09 Wilburton Route



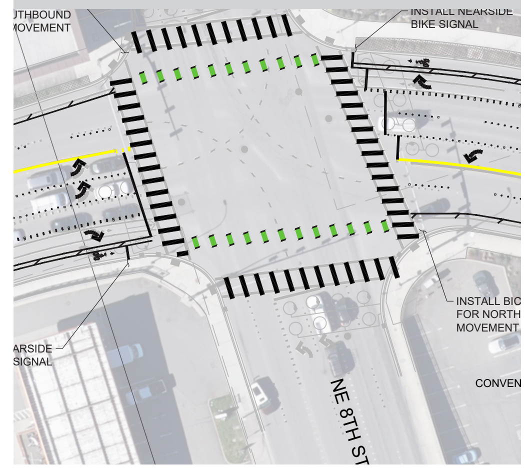
116th Avenue NE and NE 4th Street



120th Avenue NE and NE 4th



120th Avenue NE and NE 8th Street



Changes

(A) Restripe channelization to provide separated buffered bike lanes while maintaining existing 5-lane cross section.

(B) Protected bicycle corner at the intersection of 116th Avenue NE and NE 4th Street to improve westbound to southbound bicycle movement.

Level of traffic stress meets MIP target (LTS 3) while providing enhanced separation.

No change. Proposed design does not impact existing vehicle operations.

Benefits

Connects downtown Bellevue to Wilburton and Eastrail.

Cost Estimate

$1.87M

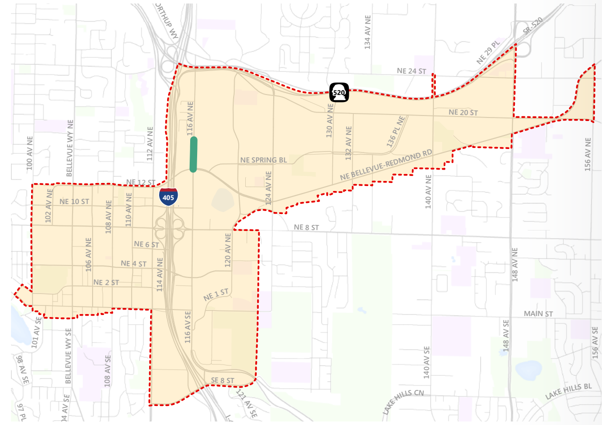
NE 12TH STREET TO NE 14TH STREET

10 116th Avenue NE

Project Description

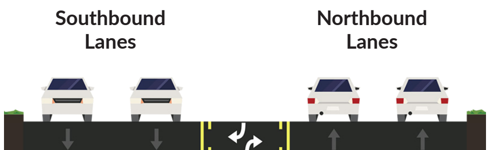
116th Avenue NE provides a connection between the Bridle Trails neighborhood, the SR 520 regional trail, downtown Bellevue, and the medical centers. This route would also provide direct access to the Spring District/120th Link station via the shared-use path along Spring Boulevard and NE 12th Street.

The proposed design closes the bicycle network gap along 116th Avenue NE between Northup Way and NE 12th Street by converting one of two northbound lanes (south of the NE 12th intersection) to a right turn lane and removing the merge lane north of the intersection to provide conventional bike lanes on both sides of the street.



Street Classification	Minor arterial
Traffic Volume (ADT)	10,500 - 12,000
Posted Speed Limit	30 mph
Existing Bicycle Facility	No existing facility
Existing Bike LTS	1 2 3 **4**
Target Bike LTS	1 2 **3** 4
Safety Data	1 severe or fatality crash (2011 - 2022)
Major Nearby Destinations	Overlake Hospital, Seattle Children's Hospital
Population (600 Foot Buffer)	400 (2019) 550 (2050)
Employment (600 Foot Buffer)	9,600 (2019) 13,800 (2050)
Transit Route	King County Metro 250

Existing



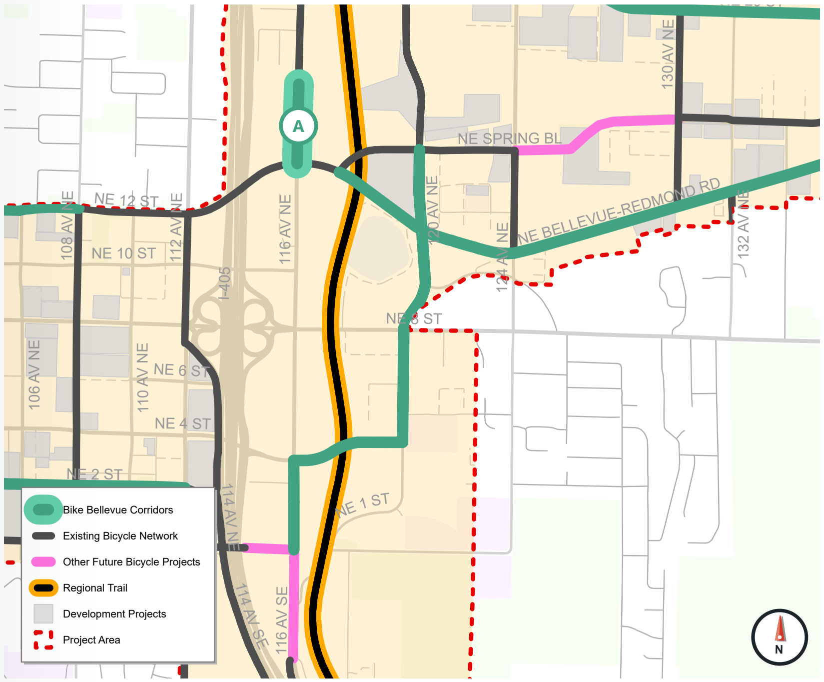
Proposed

Orientation of cross-section is northbound (viewed as if looking north). This is an illustrative cross-section reflective of typical lane configurations. Because there are variations in lane markings along this corridor, please consult CAD drawings for details.

Visualization looking south along 116th Avenue Northeast, north of Northeast 12th Street. Please consult CAD drawings for details.

NE 12TH STREET TO NE 14TH STREET

10 116th Avenue NE



Changes

Ⓐ Install new conventional bike lanes on both sides of the street by removing the northbound merge lane (north of NE 12th Street) and converting the curb lane to a right turn lane (south of NE 12th Street).

Level of traffic stress improves from LTS 4 to LTS 3 and meets the MIP LTS target.

No changes to the existing V/C at 116th Avenue NE and NE 12th Street.

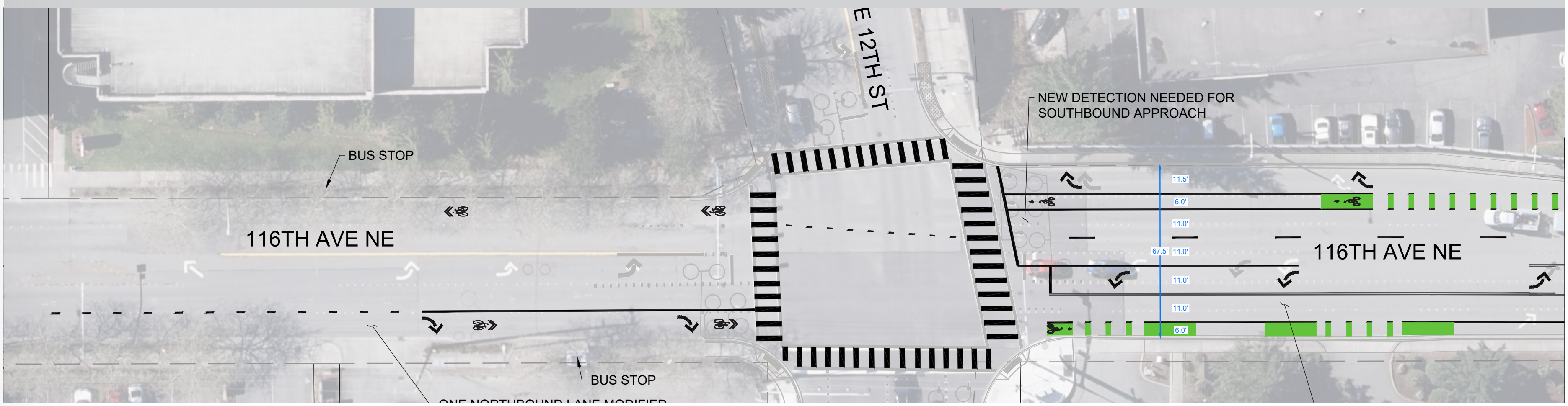
Benefits

Closes a major gap in the bicycling network by connecting the 116th Avenue NE corridor from Northup Way to NE 12th Street. NE 12th Street/ Spring Boulevard has a low-stress connection to downtown Bellevue and the Spring District.

Cost Estimate

$0.20M

116th Avenue NE and NE 12th Street



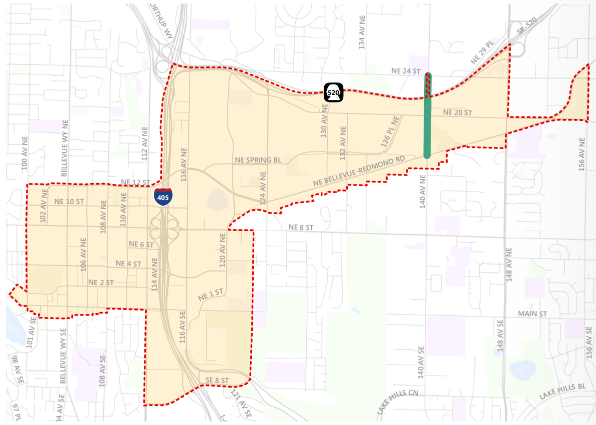
BEL-RED ROAD TO NE 24TH ST

11 140th Avenue NE

Project Description

140th Avenue NE, a priority bicycle corridor, provides a continuous north-south connection between the neighborhoods of Bridle Trails to the north and Crossroads and Lake Hills to the south.

The proposed design reallocates one southbound travel lane to provide separated buffered bike lanes in both directions. Right turn conflicts between vehicles and bicycles will be managed by providing separate right turn phases at Bel-Red Road (WB), NE 20th Street (WB), and NE 24th Street (EB). Green pavement markings will be installed at major intersections.



Existing

Southbound Lanes | Northbound Lanes

Proposed

Southbound Lanes | Northbound Lanes

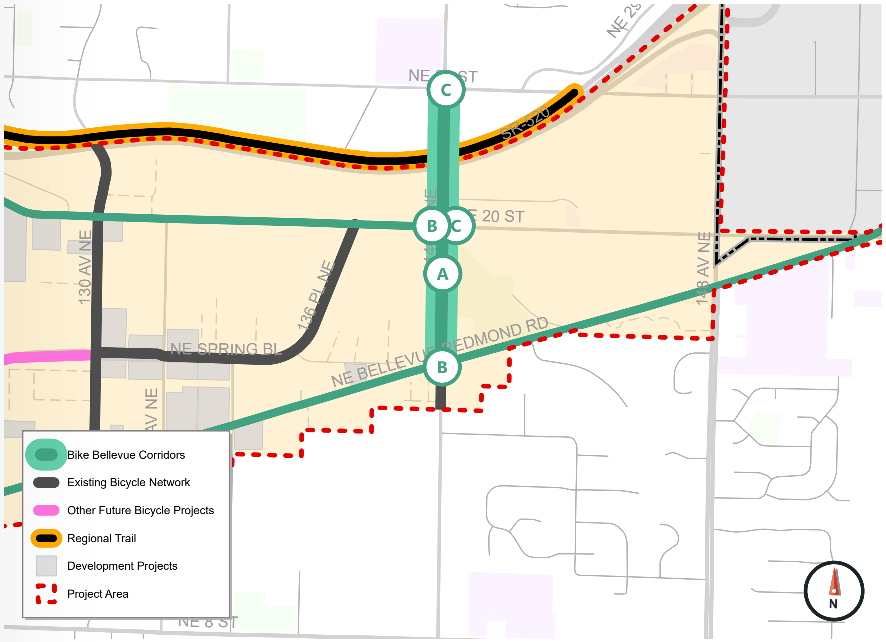
Orientation of cross-section is northbound (viewed as if looking north). This is an illustrative cross-section reflective of typical lane configurations. Because there are variations in lane markings along this corridor, please consult CAD drawings for details.

Visualization looking south along 140th Avenue Northeast, south of Northeast 18th Street. Please consult CAD drawings for details.

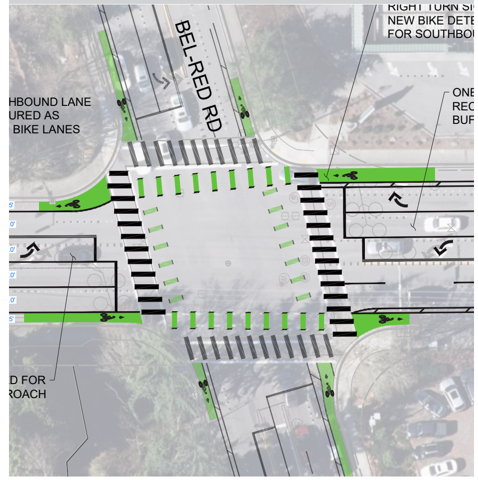
Street Classification	Minor arterial
Traffic Volume (ADT)	21,000 - 25,000
Posted Speed Limit	30 mph
Existing Bicycle Facility	• Conventional bike lane (Northbound) • Sharrow (Southbound)
Existing Bike LTS	1 2 **3** 4 (Northbound) 1 2 3 **4** (Southbound)
Target Bike LTS	**1** 2 3 4
Safety Data	• 2 severe or fatality crashes (2011-2022) • On the Vision Zero High Injury Network
Major Nearby Destinations	Highland Park, grocery stores and other retail
Population (600 Foot Buffer)	9,300 (2019) 9,600 (2050)
Employment (600 Foot Buffer)	15,900 (2019) 31,400 (2050) 249
Transit Route	King County Metro

BEL-RED ROAD TO NE 24TH ST

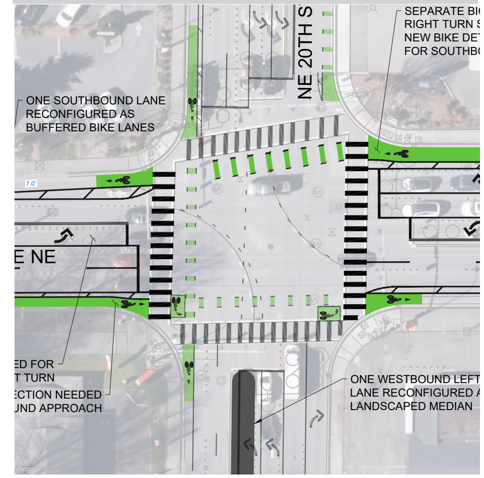
11 140th Avenue NE



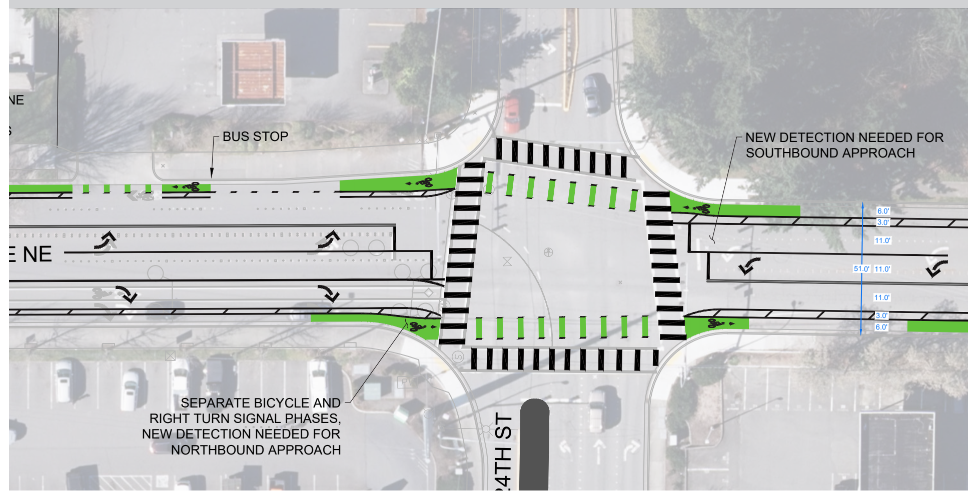
140th Avenue NE and Bel-Red Road



140th Avenue NE and NE 20th Street



140th Avenue NE and NE 24th Street



Changes

Ⓐ Convert 1 of 2 southbound lanes to separated buffered bike lanes.

Ⓑ Separate bicycle and right turn signal phases at Bel-Red Road (WB), NE 20th Street (WB), and NE 24th Street (EB) to manage turning conflicts and improve safety.

Ⓒ Existing dual westbound left turn lanes at NE 24th Street and NE 20th Street will be converted to single left turn lanes.

Level of traffic stress improves from LTS 4 to LTS 3 southbound, and remains LTS 3 northbound. Does not meet the MIP target of LTS 1.

With changes, the intersection of 140th Avenue NE and NE 24th Street (V/C = 0.97) does not meet the vehicle performance target for PMA 3 (V/C < 0.85).

Benefits

Significantly improves safety on one of the few continuous north-south corridors through Bellevue. Provides enhanced access to many of the businesses along 140th Avenue NE.

Cost Estimate

$1.76M

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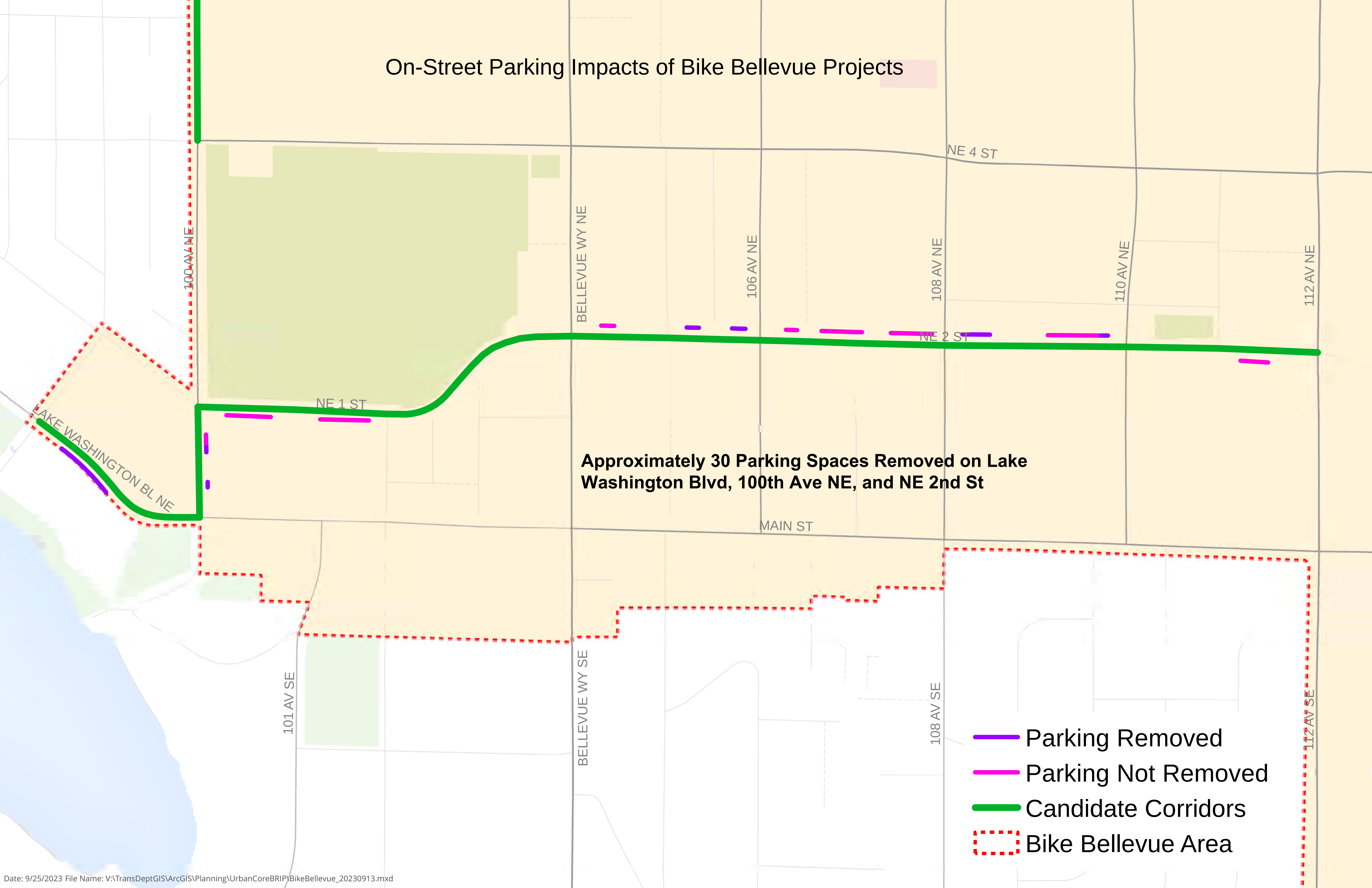
Appendix A: Vehicle Lane and Parking Impacts

Travel Lane Impacts of Bike Bellevue Projects

Corridor Number	Corridor Name	Segment Name	Project Description	Conversion Type	Length, ft
1	Northup Way 120th Ave NE to 140th Ave NE	Northup Way 120th Ave NE to 124th Ave NE	Convert 1 of 2 westbound lanes to one-way separated buffered bike lanes on both sides of the street.	**One Travel Lane Removed** Two Bike Lanes Added	1,453
1	Northup Way 120th Ave NE to 140th Ave NE	Northup Way 124th Ave NE to East of 124th Ave NE	Convert 1 of 2 westbound lanes to one-way separated buffered bike lanes on both sides of the street.	**One Travel Lane Removed** Two Bike Lanes Added	346
1	Northup Way 120th Ave NE to 140th Ave NE	Northup Way 132nd Ave NE to 136th Ave NE	Convert 1 of 2 westbound lanes to one-way separated buffered bike lanes on both sides of the street.	**One Travel Lane Removed** Two Bike Lanes Added	1,798
1	Northup Way 120th Ave NE to 140th Ave NE	Northup Way 136th Ave NE to 140th Ave NE	Convert 1 of 2 westbound lanes to one-way separated buffered bike lanes on both sides of the street.	**One Travel Lane Removed** Two Bike Lanes Added	835
1	Northup Way 120th Ave NE to 140th Ave NE	Northup Way East of 124th Ave NE to 132nd Ave NE	Convert 1 of 2 westbound lanes to one-way separated buffered bike lanes on both sides of the street.	**One Travel Lane Removed** Two Bike Lanes Added	2,396
2	NE 12th St 102nd Ave NE to 108th Ave NE	NE 12th St 102nd Ave NE to Bellevue Way NE	Convert 1 of 2 westbound lanes to a two-way separated buffered bike lane on the north side of the street.	**One Travel Lane Removed** Two Bike Lanes Added	621
2	NE 12th St 102nd Ave NE to 108th Ave NE	NE 12th St 106th Ave NE to 108th Ave NE	Convert 1 of 2 westbound lanes to a two-way separated buffered bike lane on the north side of the street.	**One Travel Lane Removed** Two Bike Lanes Added	693
2	NE 12th St 102nd Ave NE to 108th Ave NE	NE 12th St Bellevue Way NE to 106th Ave	Convert 1 of 2 westbound lanes to a two-way separated buffered bike lane on the north side of the street.	**One Travel Lane Removed** Two Bike Lanes Added	633
3	NE 12th St/Bel-Red Rd NE Spring Blvd to 132nd Ave NE	NE 12th St/Bel-Red Rd 120th Ave NE to 124th Ave NE	Convert 1 of 2 westbound lanes to one-way buffered bike lanes on both sides of the street.	**One Travel Lane Removed** Two Bike Lanes Added	1,157
3	NE 12th St/Bel-Red Rd NE Spring Blvd to 132nd Ave NE	NE 12th St/Bel-Red Rd 124th Ave NE to 132nd Ave NE	Convert 1 of 2 eastbound lanes to one-way separated buffered bike lanes on both sides of the street.	**One Travel Lane Removed** Two Bike Lanes Added	2,738
3	NE 12th St/Bel-Red Rd NE Spring Blvd to 132nd Ave NE	NE 12th St/Bel-Red Rd NE Spring Blvd to 120th Ave NE	Convert 1 of 2 westbound lanes to one-way buffered bike lanes on both sides of the street.	**One Travel Lane Removed** Two Bike Lanes Added	1,212
4	Bel-Red Rd 132nd Ave NE to 148th Ave NE	Bel-Red Rd 132nd Ave NE to 140th Ave NE	Convert 1 of 2 eastbound lanes to one-way separated buffered bike lanes on both sides of the street.	**One Travel Lane Removed** Two Bike Lanes Added	2,763
4	Bel-Red Rd 132nd Ave NE to 148th Ave NE	Bel-Red Rd 140th Ave NE to 143rd Ave NE	Convert 1 of 2 eastbound lanes to one-way separated buffered bike lanes on both sides of the street.	**One Travel Lane Removed** Two Bike Lanes Added	893
4	Bel-Red Rd 132nd Ave NE to 148th Ave NE	Bel-Red Rd 143rd Ave NE to 148th Ave NE	Convert 1 of 2 eastbound lanes to one-way separated buffered bike lanes on both sides of the street.	**One Travel Lane Removed** Two Bike Lanes Added	1,808
5	Bel-Red Rd 148th Ave NE to 156th Ave NE	Bel-Red Rd 148th Ave NE to NE 20th St	Convert 1 of 2 eastbound lanes to one-way separated buffered bike lanes on both sides of the street.	**One Travel Lane Removed** Two Bike Lanes Added	1,545
5	Bel-Red Rd 148th Ave NE to 156th Ave NE	Bel-Red Rd NE 24th St to 156th Ave NE	Convert 1 of 2 westbound lanes to one-way separated buffered bike lanes on both sides of the street.	**One Travel Lane Removed** Two Bike Lanes Added	593
5	Bel-Red Rd 148th Ave NE to 156th Ave NE	Bel-Red Rd NE 20th St to NE 24th St	Convert 1 eastbound lane and 1 westbound lane to one-way separated buffered bike lanes on both sides of the street.	**Two Travel Lanes Removed** Two Bike Lanes Added	1,678
6	NE 1st St/NE 2nd St 100th Ave NE to 112th Ave NE	NE 2nd St 108th Ave NE to 110th Ave NE	Install one-way bike lanes, retaining 1 travel lane and the two-way left turn lane in each direction.	No Travel Lanes Removed Two Bike Lanes Added	640
6	NE 1st St/NE 2nd St 100th Ave NE to 112th Ave NE	NE 2nd St 110th Ave NE to 112th Ave NE	Install one-way bike lanes, retaining 1 travel lane and the two-way left turn lane in each direction.	No Travel Lanes Removed Two Bike Lanes Added	675
6	NE 1st St/NE 2nd St 100th Ave NE to 112th Ave NE	NE 2nd St Bellevue Way NE to 108th Ave NE	Install one-way bike lanes, retaining 1 travel lane and the two-way left turn lane in each direction.	No Travel Lanes Removed Two Bike Lanes Added	1,315
6	NE 1st St/NE 2nd St 100th Ave NE to 112th Ave NE	NE 1st St 100th Ave NE to 102nd Ave NE	Convert the westbound travel lane to a two-way curb-separated bike lane on the north side of the street.	**One Travel Lane Removed** Two Bike Lanes Added	675
6	NE 1st St/NE 2nd St 100th Ave NE to 112th Ave NE	NE 1st St/NE 2nd St 102nd Ave NE to Bellevue Way NE	Convert the westbound travel lane to a two-way curb-separated bike lane on the north side of the street.	**One Travel Lane Removed** Two Bike Lanes Added	738
7	Lake Washington Blvd 100th Ave NE to 99th Ave NE	Lake Washington Blvd 100th Ave NE to 99th Ave NE	Convert the existing on street parking on the south side to one-way bicycle lanes on both sides of the street.	No Travel Lanes Removed Two Bike Lanes Added	690
8	100th Ave NE Main St to NE 10th St	100th Ave NE Main St to NE 1st St	Convert the existing curbside parking to one-way bike lanes on both sides of the street.	No Travel Lanes Removed Two Bike Lanes Added	389
8	100th Ave NE Main St to NE 10th St	100th Ave NE NE 8th St to NE 10th St	Install one-way bike lanes on both side of the street.	No Travel Lanes Removed Two Bike Lanes Added	661
8	100th Ave NE Main St to NE 10th St	100th Ave NE NE 4th St to NE 8th St	Convert 1 of 2 northbound lanes to a two-way separated buffered bike lane on the east side of the street.	**One Travel Lane Removed** Two Bike Lanes Added	1,317
9	Wilburton Route 116th Ave NE, NE 4th St, 120th Ave NE	116th Ave NE Main St to NE 2nd St	Install separated buffered bike lanes on both sides of the street while retaining two travel lanes in each direction.	No Travel Lanes Removed Two Bike Lanes Added	580
9	Wilburton Route 116th Ave NE, NE 4th St, 120th Ave NE	116th Ave NE NE 2nd St to NE 4th St	Install separated buffered bike lanes on both sides of the street while retaining two travel lanes in each direction.	No Travel Lanes Removed Two Bike Lanes Added	497
9	Wilburton Route 116th Ave NE, NE 4th St, 120th Ave NE	120th Ave NE 12th Ave NE to NE Spring Blvd	Upgrade the conventional bike lanes to one-way separated buffered bike lanes in each direction while retaining two travel lanes in each direction.	No Travel Lanes Removed Two Bike Lanes Upgraded	968
9	Wilburton Route 116th Ave NE, NE 4th St, 120th Ave NE	120th Ave NE NE 4th St to NE 8th St	Upgrade the conventional bike lanes to one-way separated buffered bike lanes in each direction while retaining two travel lanes in each direction.	No Travel Lanes Removed Two Bike Lanes Upgraded	1,356
9	Wilburton Route 116th Ave NE, NE 4th St, 120th Ave NE	120th Ave NE NE 8th St to NE 12th St	Upgrade the conventional bike lanes to one-way separated buffered bike lanes in each direction while retaining two travel lanes in each direction.	No Travel Lanes Removed Two Bike Lanes Upgraded	1,281
9	Wilburton Route 116th Ave NE, NE 4th St, 120th Ave NE	NE 4th St 116th Ave NE to 120th Ave NE	Upgrade the conventional bike lanes to one-way separated buffered bike lanes in each direction while retaining two travel lanes in each direction.	No Travel Lanes Removed Two Bike Lanes Upgraded	1,361
10	116th Ave NE NE 12th St to NE 14th St	116th Ave NE NE 12th St to NE 14th St	Convert the northbound merge lane to conventional bike lanes on both sides of the street.	**One Travel Lane Removed** Two Bike Lanes Added	957
11	140th Ave NE Bel-Red Rd to NE 24th St	140th Ave NE Bel-Red Rd to SR 520	Convert 1 of 2 southbound lanes to separated buffered bike lanes on both sides of the street.	**One Travel Lane Removed** Two Bike Lanes Added	1,923
11	140th Ave NE Bel-Red Rd to NE 24th St	140th Ave NE SR 520 to NE 24th St	Convert 1 of 2 southbound lanes to separated buffered bike lanes on both sides of the street.	**One Travel Lane Removed** Two Bike Lanes Added	706



On-Street Parking Impacts of Bike Bellevue Projects
Approximately 30 Parking Spaces Removed on Lake Washington Blvd, 100th Ave NE, and NE 2nd St
NE 4 ST
NE 2 ST
NE 1 ST
MAIN ST
100 AV NE
BELLEVUE WY NE
106 AV NE
108 AV NE
110 AV NE
112 AV NE
LAKE WASHINGTON BL NE
101 AV SE
BELLEVUE WY SE
108 AV SE
112 AV SE
Parking Removed
Parking Not Removed
Candidate Corridors
Bike Bellevue Area
Date: 9/25/2023 File Name: V:\TransDeptGIS\ArcGIS\Planning\UrbanCoreBRIP\BikeBellevue_20230913.mxd

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Bike Bellevue
DRAFT Design Concepts Guide

Appendix B: Safety

Prioritizing Safety: High Injury Network

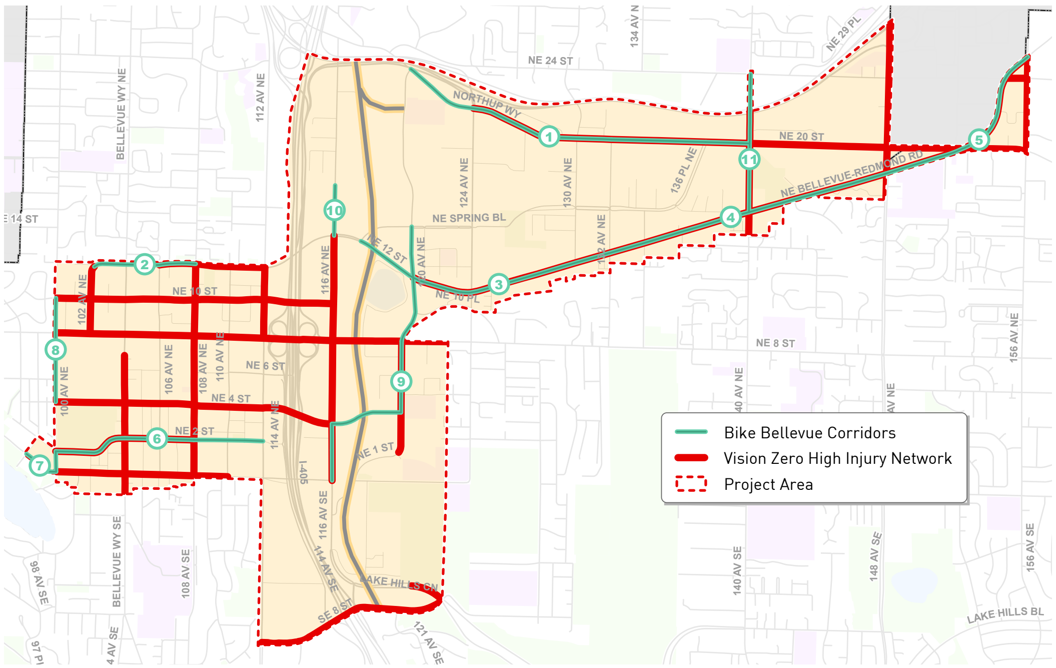


Figure 16. Bellevue High Injury Network and Bike Bellevue Corridors

Bike Bellevue Streets account for only 9% of total street mileage, but 67% of Bike Bellevue corridors are on the High Injury Network.

ClearGuide Content

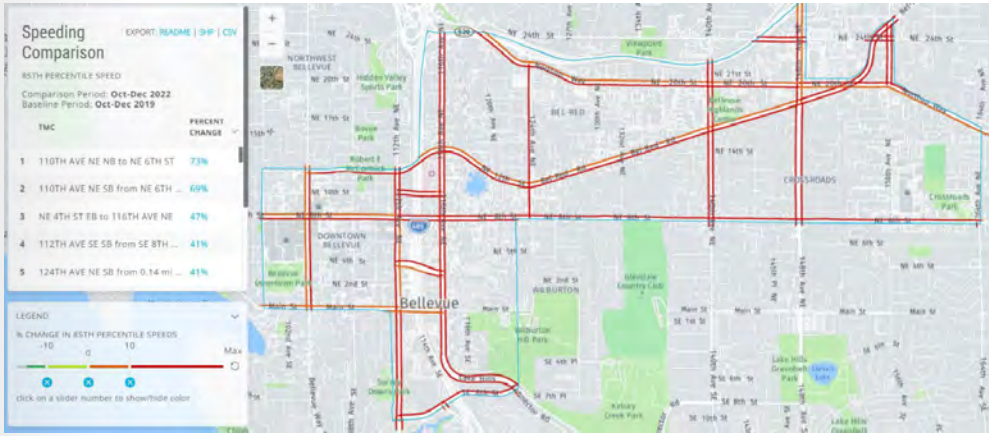


Figure 1 – Percent change in 85th Percentile Speed. Baseline period is Oct 1-Dec 31, 2019. Comparison period is Oct 1-Dec 31, 2022.

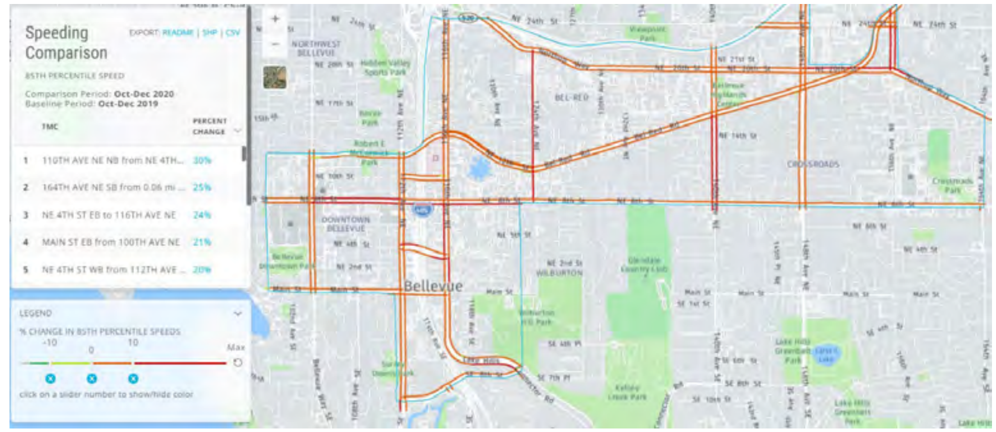


Figure 2 – Percent change in 85th Percentile Speed. Baseline period is Oct 1-Dec 31, 2019. Comparison period is Oct 1-Dec 31, 2020.

As seen in many cities nationally and locally, excessive speeding has increased in Bellevue from pre-Covid-19 pandemic levels. Figures 1 and 2 display the 85th percentile speeds along arterial roadway in the city using vehicle probe data from Iteris ClearGuide. These maps show Quarter 1 (January-March) data for 2020 and 2023, respectively. In 2020, there were no recorded corridors with 85th percentile speeds at or above 45 mph, while in the 2023 map we see that many arterial roadways – Bellevue Way SE, Coal Creek Parkway SE, Lake Hills Connector Road, SE Newport Way, and Lakemont Boulevard SE all exceed 45 mph. Speeds in excess of 40 mph (light red) and 45 mph (dark red) have increased citywide, and in particular near Stevenson Elementary, Highland Middle School, Lake Hill Elementary, International School, Bellevue Big Picture School, and Newport High School. This concerning trend further emphasizes the need to manage speed on Bellevue roads and implement road safety measures as identified by the Road Safety Assessments.

Bike Bellevue Economic Impact from Physical Activity and Crash Risk

FEHR & PEERS

Memorandum

Date: August, 25 2023

To: Franz Loewenherz, City of Bellevue

From: Jiamin Tan and Chris Breiland, Fehr & Peers

Subject: Bike Bellevue Economic Impact from Physical Activity and Crash Risk

SE23-0896

Introduction

This memorandum provides our assessment of the economic impacts from increased physical activity and reduced crash risk by the Bike Bellevue project. The health benefit of increasing physical activity was assessed using the Health Economic Assessment Tool (HEAT) developed by the World Health Organization (WHO). The economic impact of reducing crash risk was calculated using crash modification factors and the monetary value of preventing injuries from the Federal Highway Administration (FHWA). The assessments, input assumptions, and results are described in the following sections.

Health Benefits

The link between greater levels of physical activity and improved health outcomes is well documented[1, 2]. This assessment quantifies the benefits of the additional physical activity that stem from the Bike Bellevue projects[3]. The economic value of increased physical activity was determined using the HEAT software from the World Health Organization, specifically HEAT version 5.2.0. In a review of other health impact assessments performed across the country, HEAT was the most widely used tool to monetarize the reduction in mortality related to additional

[1] World Health Organization, *Physical Activity Fact Sheet.* https://www.who.int/news-room/fact-sheets/detail/physical-activity

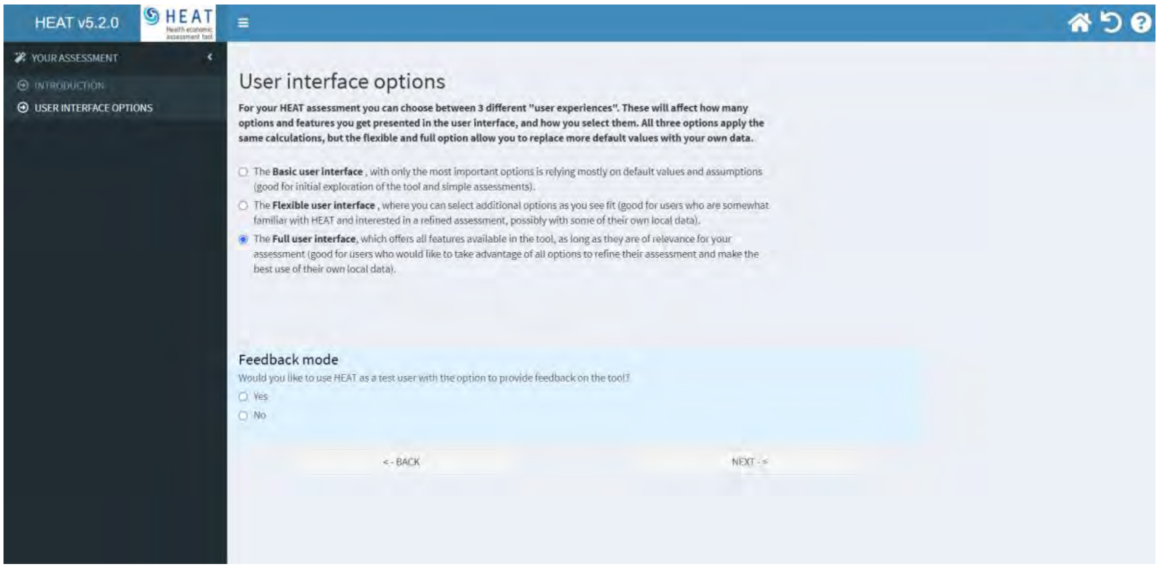
[2] Centers for Disease Control and Prevention, *Health Benefits of Physical Activity*

[3] See Appendix C for the methodology and results of the additional bicycle mode share that results from Bike Bellevue

bicycling activity[4]. The following sections document the input we used at each step in HEAT along with screenshots.

User Interface Options

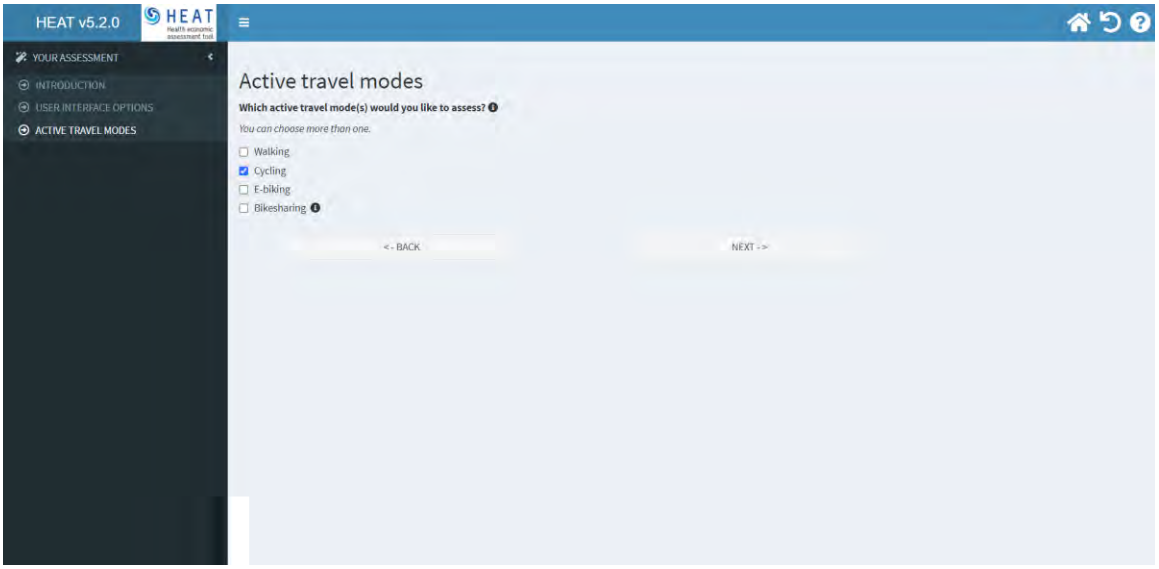
The full user interface was selected to perform the assessment.



[4] World Health Organization, *Welcome to the Health Economic Assessment Tool (HEAT) for walking and cycling by WHO*. https://www.heatwalkingcycling.org/#homepage

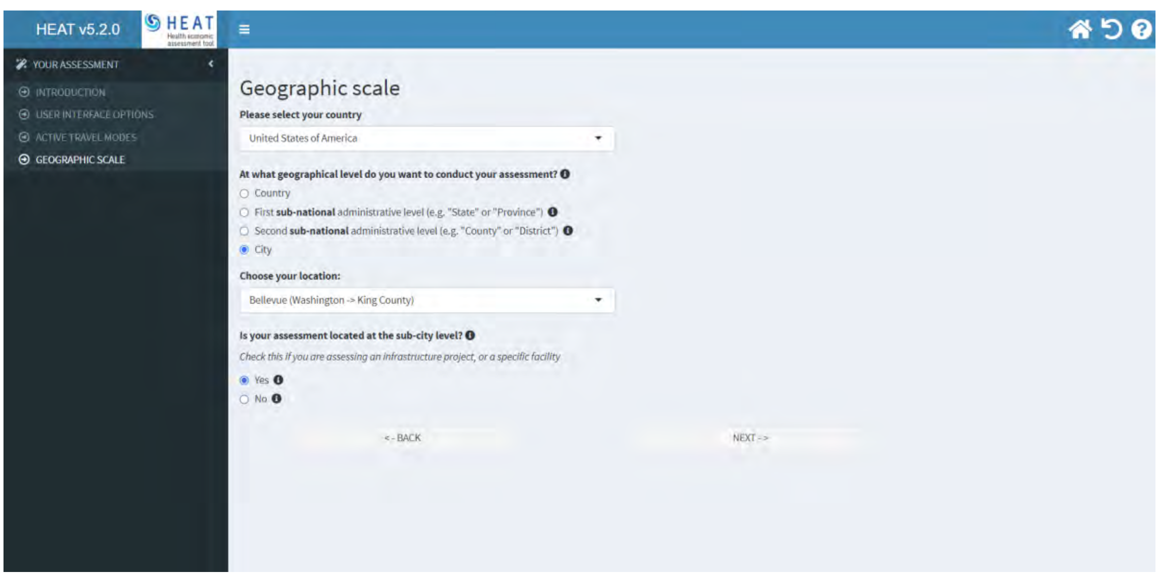
Active Travel Modes

Cycling was selected as the only active travel mode in this assessment.



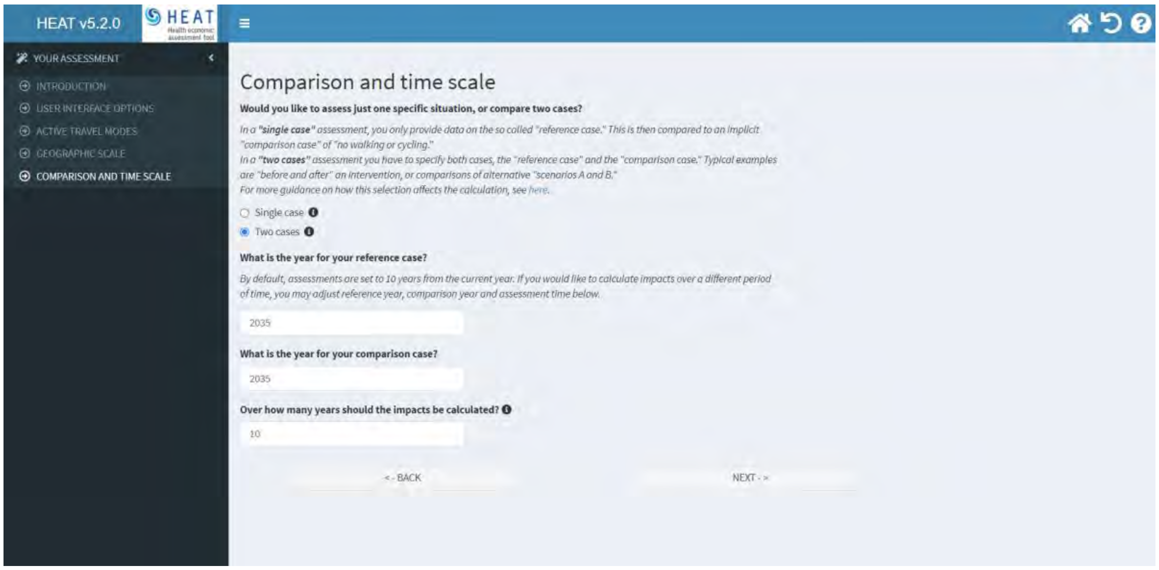
Geographic Scale

United States was selected as the country for analysis. A city level assessment was conducted. The City of Bellevue, WA was specified. The sub-city level assessment option was checked.



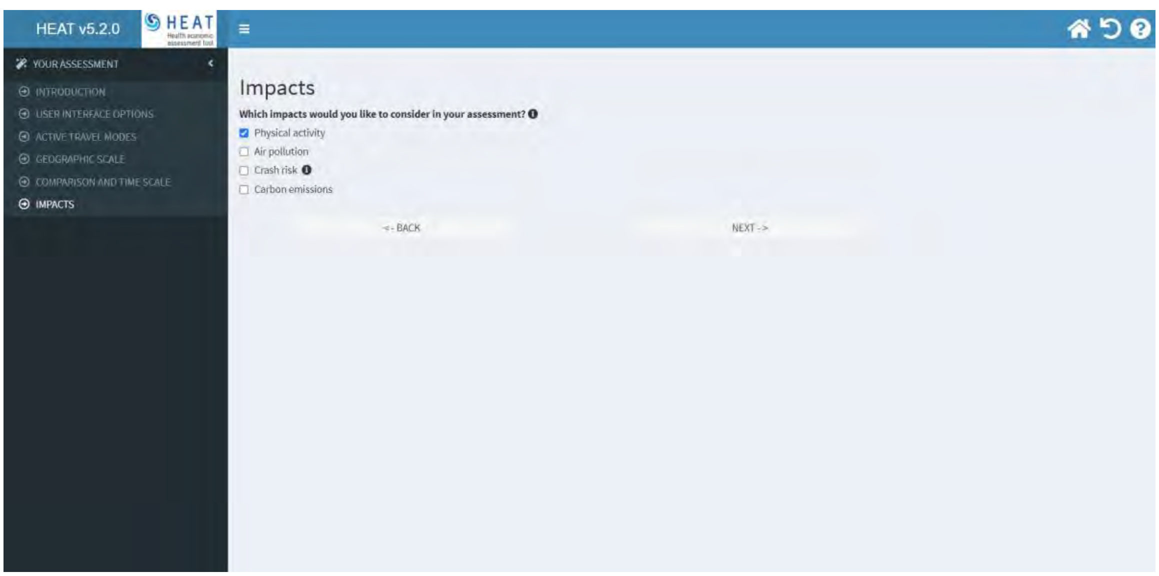
Comparison and Time Scale

A "two-case" situation was specified to understand the health benefits of Bike Bellevue in different scenarios. The year 2035 was used for both the reference case and the comparison case, assuming the project will be built by that time. Ten years was specified for the impact calculation.



Impacts

Physical activity is selected for the assessment. Crash risk was not selected since the HEAT model does not use FHWA countermeasures and crash modification factors that are typical for evaluations in the United States.



Active Modes Data

Data inputs in this step provide the amounts of cycling activity in reference and comparison cases. The reference case used data from the 2035 no build forecast from BKRCast model (see Appendix C). The 0.8% bike mode share and the total of 348,108 tours are used for the input, along with the 4.7-mile (or 7.56-kilometer) average bike trip length. **Table 1** below shows the number of tours, and **Table 2** below shows the average trip length of different modes derived from the BKRCast model.

Table 1: Tours from BKRCast Model

Mode	2019 Tours	2035 No Build Tours	2035 Build Tours
Walk	35,256	71,703	71,581
Bike	951	2,796	3,006
SOV	81,872	99,865	99,444
HOV 2 persons	52,841	64,527	64,005
HOV 3+ persons	37,102	41,329	41,652
Transit Walk Access	7,211	49,958	50,002
Transit Auto Access	7,778	11,558	11,617
School Bus	1,997	6,372	6,373
Total	225,008	348,108	34,7680

Source: BKRCast Model.

Table 2: Average Trip Lengths

Mode	2019 Average Trip Length	2035 No Build Average Trip Length	2035 Build Average Trip Length
Walk	1.7	1.5	1.5
Bike	4.9	4.7	4.7
SOV	5.8	6	6
HOV	4.5	4.9	4.9
Transit	8.5	8.2	8.2
School Bus	2.9	3	3

Source: BKRCast Model.

The comparison case used data from ClearPath[5], a tool from ICLEI that Bellevue uses to inform the Environmental Stewardship Plan[6]. Consistent with the greenhouse gas emissions evaluation performed for Bike Bellevue (see Appendix C), ICLEI identifies three levels of potential bicycle facility implementation:

- Level A bike lane/path implementation is focused on areas like central business districts that provide secure parking, repair, rentals, and proper changing facilities. There is a continuous network of on-street bicycle lanes for a combined network density of 2 miles of bicycle lanes per square mile.
- Level B is more extensive than Level A and provides a continuous network of routes for cyclists including bike lanes, boulevards, and shared-use paths. Boulevards include traffic calming to limit automobile use/speed. There are four miles of bicycle lanes per square mile.
- Level C is the most extensive with bike lanes/paths implemented business centers and transit hubs that connect to a dense network of bike lanes, boulevards, and shared use paths for a total of eight miles of bicycle lanes per square mile[7].

ICLEI identifies a change in bicycle mode share for each of the three levels of implementation. **Table 3** below shows the ideal bike mode share at different levels.

Table 3: Urban Area Bicycle Mode Share by Density Class

Area Population Density (persons/mi^2)	No Amenities	Level A	Level B	Level C
0-500	0.3%	1.5%	2.7%	5.0%
500-2k	0.3%	1.5%	2.7%	5.0%
2k-4k	0.3%	1.5%	2.7%	5.0%
4k-10k	0.4%	2.1%	3.7%	6.8%
>10k	0.8%	4.4%	7.6%	14.0%
All	0.4%	2.2%	3.9%	7.4%

Source: ICLEI, 2023; cited from: Cambridge Systematics, Inc. Moving Cooler An Analysis of Transportation Strategies for Reducing Greenhouse Gas Emissions – Technical Appendices. October, 2009.

[5] ICLEI, *ClearPath* https://icleiusa.org/clearpath/
[6] City of Bellevue, *2021-2025 Environmental Stewardship Plan*. https://bellevuewa.gov/city-government/departments/community-development/environmental-stewardship/esi-strategic-plan
[7] ICLEI, *New Reduction Strategy using Improved Bike Infrastructure*. https://clearpath.icleiusa.org/community_scale/reduction_strategies/new?calculator_id=141

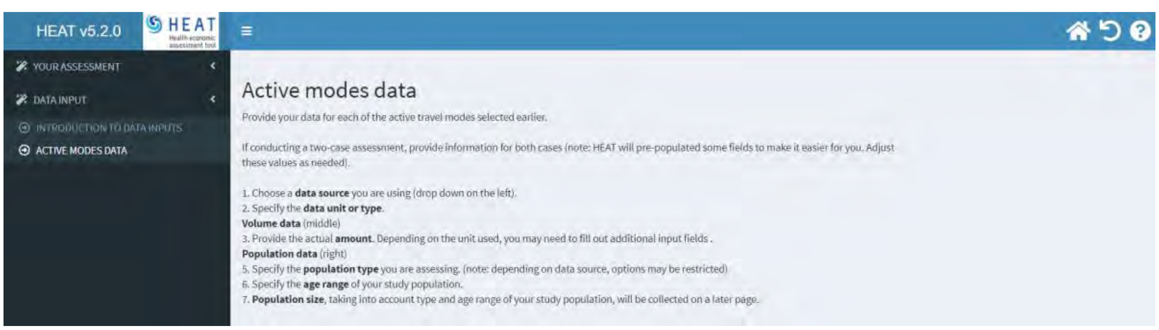
As a point of reference, under 2019 conditions, the Bike Bellevue project area had a population density of approximately 6,500 persons per square mile and approximately 8.7 miles of bicycle facilities (this equates to approximately 3 miles of bicycle lane per square mile in the project area). By 2035, the population density is expected to increase to about 17,800 persons per square mile and approximately 8 miles of bicycle facilities per square mile (assuming implementation of Bike Bellevue).

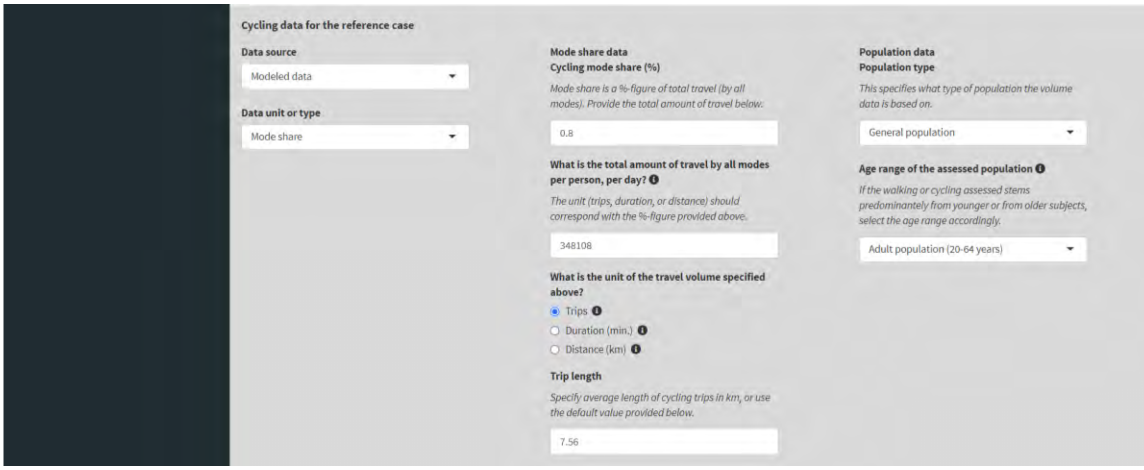
Given the degree of uncertainty around how people will specifically respond to increased densities and improved bicycle amenities in Bellevue, our initial calculations related to health benefits are based on the more conservative (lower) ICLEI Level A implementation assumptions. Specifically, we added the change in Level A mode share between "No Amenities" and "Level A" for the "All" population densities category to the existing observed Bellevue bicycle mode share of 0.8%.

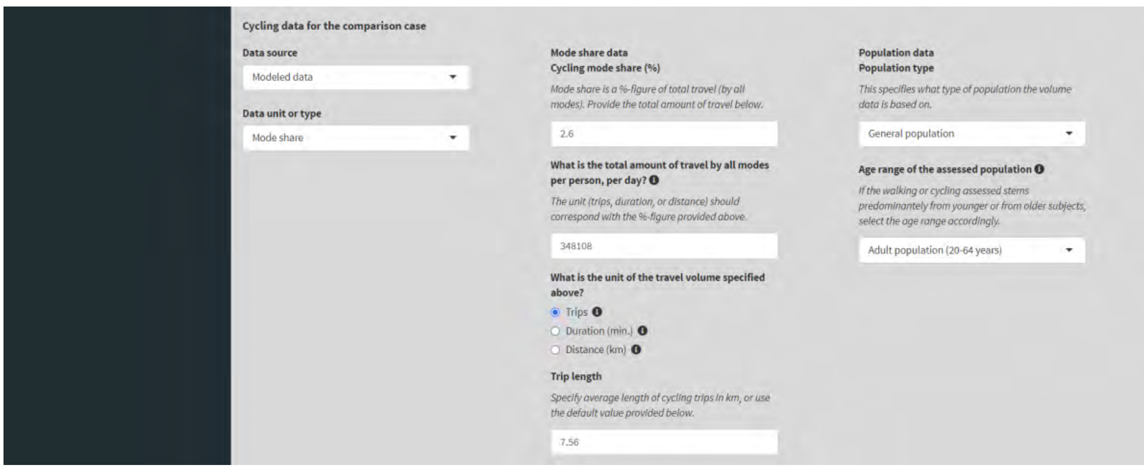
0.8% + (2.2%-0.4%) = 2.6% bicycle mode share

A 2.6% bike mode share is used for the HEAT "with project" comparison case, while the 7.56-km trip length and 348,108 total trips inputs were assumed the same as in the "no project" comparison case.

The "general population" was accounted for the total volume, and the "adult population of ages between 20 and 64" was assessed for cycling in both reference and comparison cases.







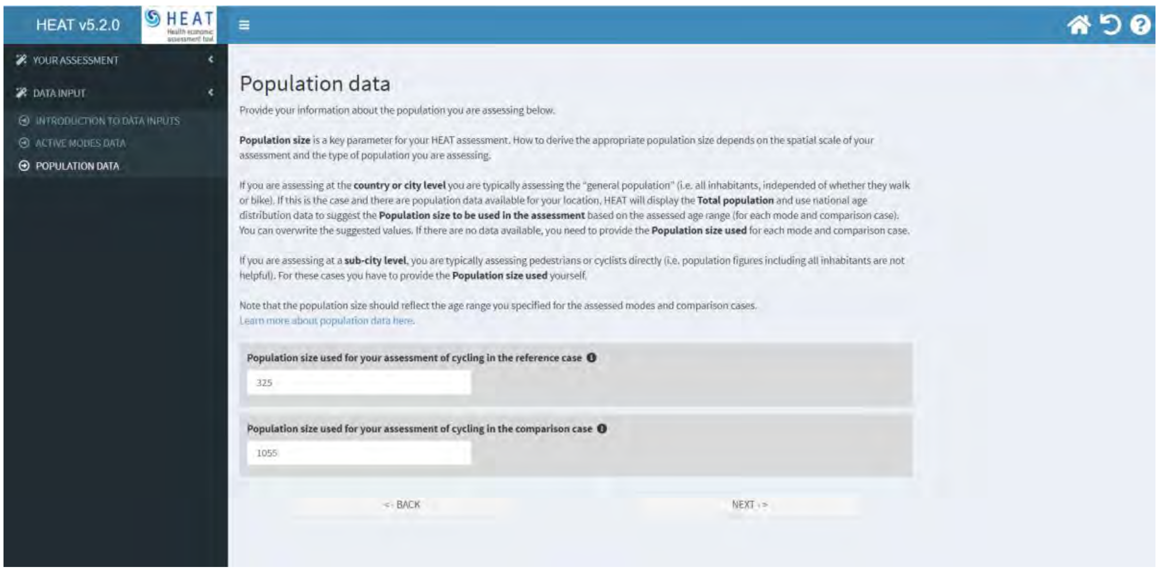
Population Data

Since we are assessing the health outcome cases at sub-city level, the population data inputs should be the “number of cyclists” per HEAT’s instruction on this page. To determine the number of cyclists, we had to first isolate the total population to the age group analyzed by HEAT (20-64 year olds). This age group represents a ratio of 78.9% of the total population based on the US Census Bureau America Community Survey (ACS) 2017-2021 5-Year Estimates. We requested the study area population data used for BKRCast from the City and multiplied the number of residents by the ratio above to get the residents who are between age 20 and 64. We then multiply the results by the bike mode share (0.8% for no build and 2.6% for build) in each case. This resulted in a cycling population of 325 cyclists for the no build reference case and 1,055 cyclists for the ICLEI Level A build comparison case. **Table 4** below shows the study area population data used in the BKRCast model.

Table 4: Study Area Population in BKRCast Model

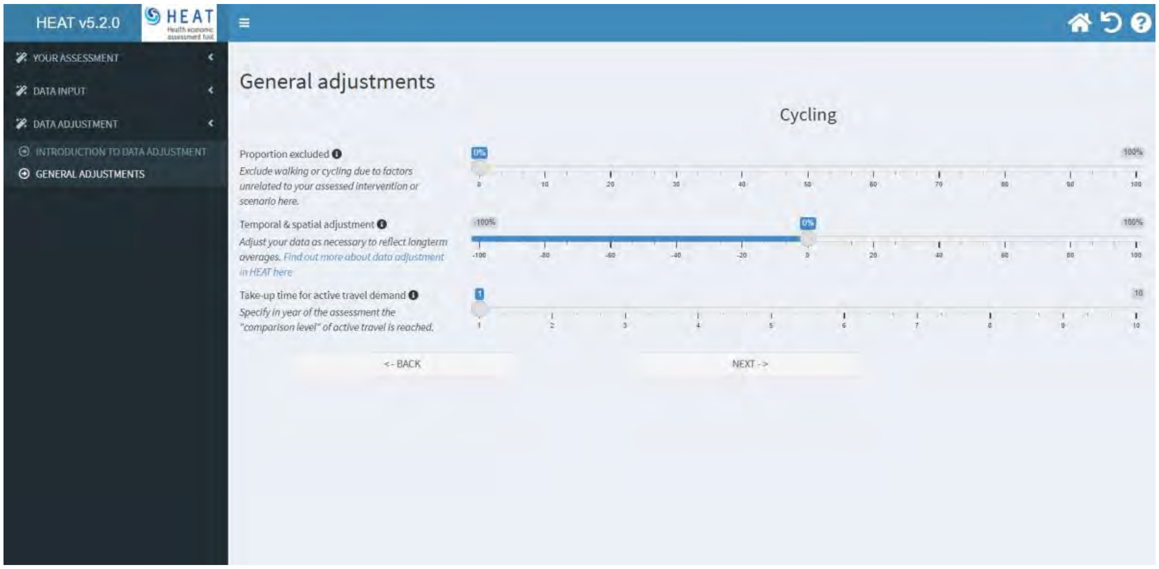
Year	Employment	Households	Residents
2019	83,880	11,110	18,595
2035	150,565	26,590	51,410

Source: BKRCast Model.



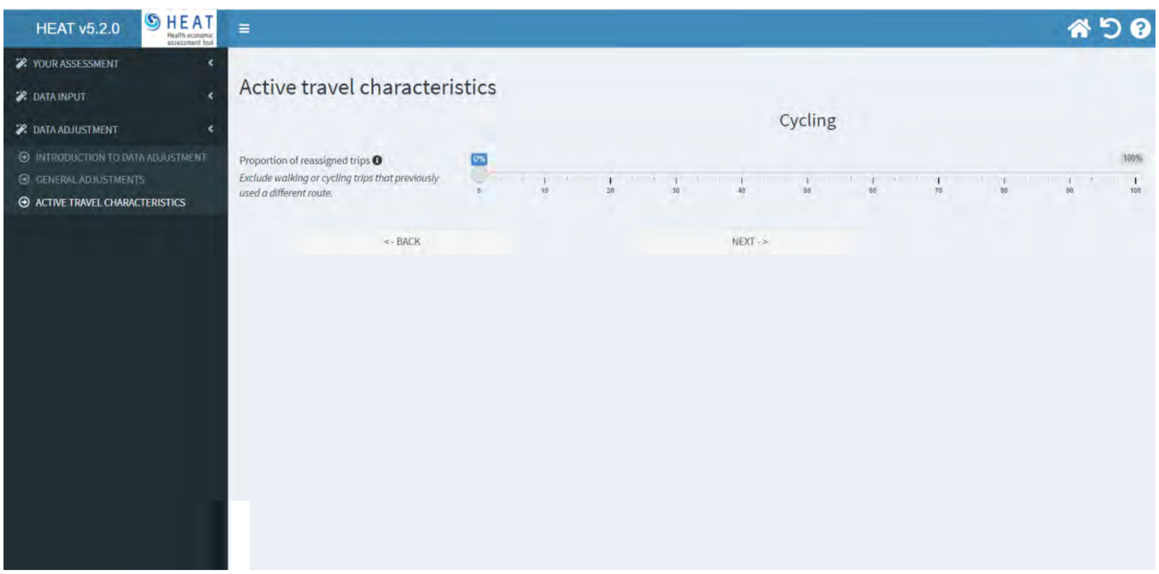
General Adjustments

Default values from HEAT were applied to the "proportion excluded", "temporal & spatial adjustment", and "take-up time for active travel demand" variables in this step. Specifically, the values of 0%, 0%, and 1 are used for each variable, respectively. Testing indicated that the model was not sensitive to changes in these variables.



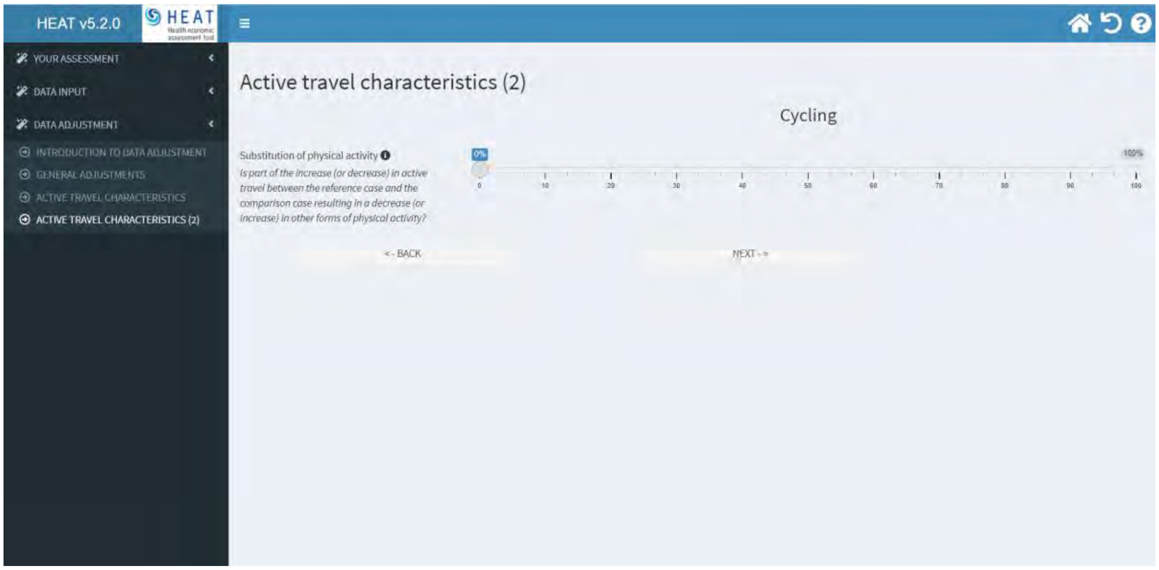
Active Travel Characteristics

The default of 0% reassigned trip was assumed since trip reassignment was already identified using the ICLEI and BKRCast data.



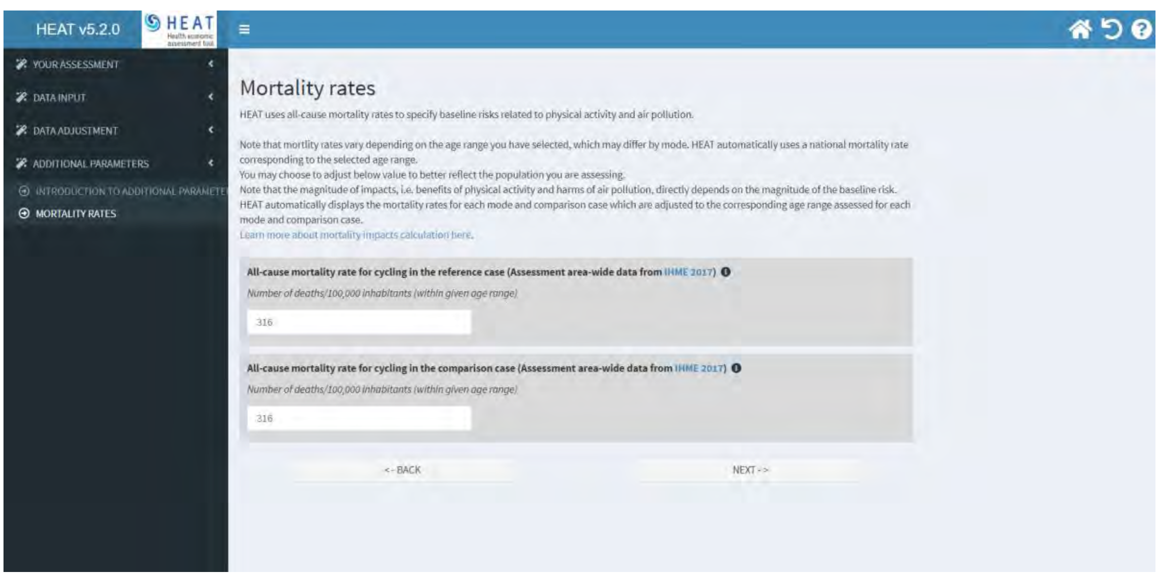
Active Travel Characteristics (2)

The default of 0% substitution of physical activity was assumed.



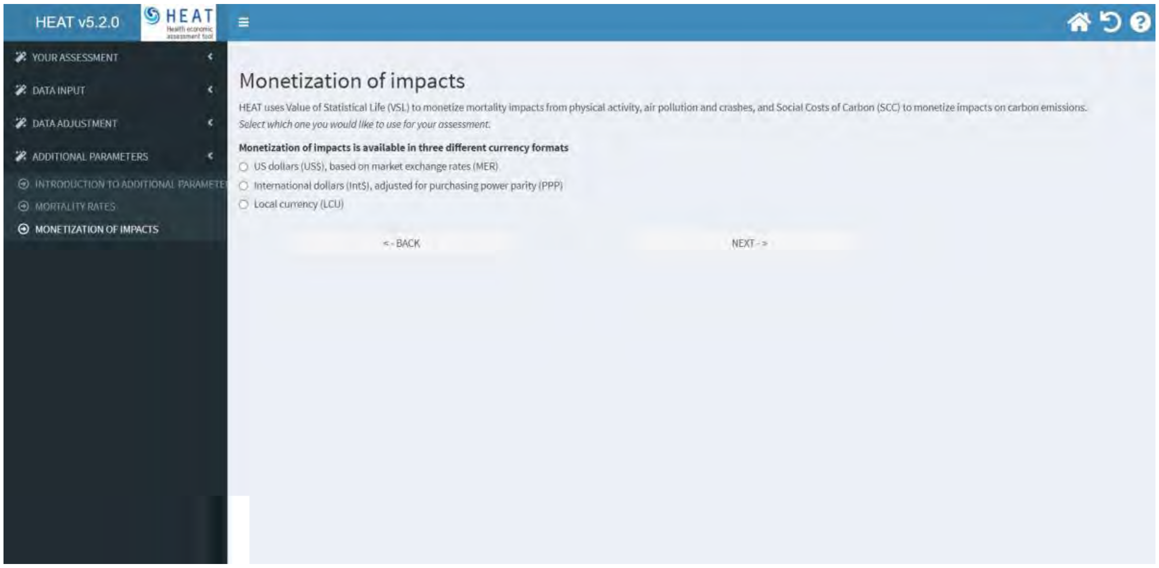
Mortality Rates

Default values from HEAT were used. Specifically, 316-death per 100,000 inhabitants between age 20 and 64 was used for this step. These data are part of the HEAT database for King County, Washington.



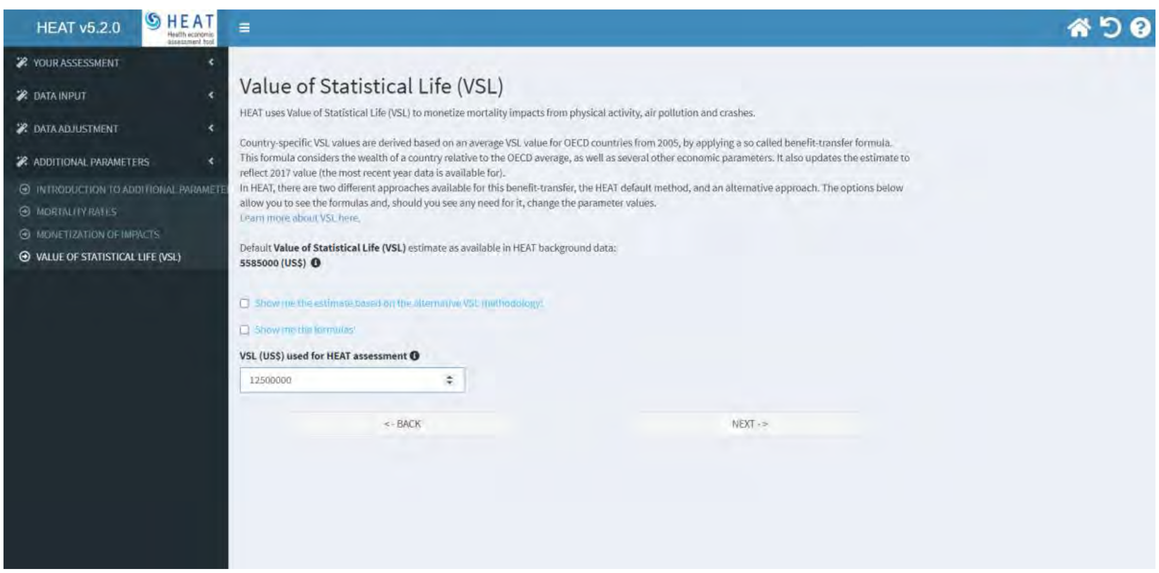
Monetization of Impacts

US dollars (US$) was selected for this assessment.



Value of Statistical Life (VSL)

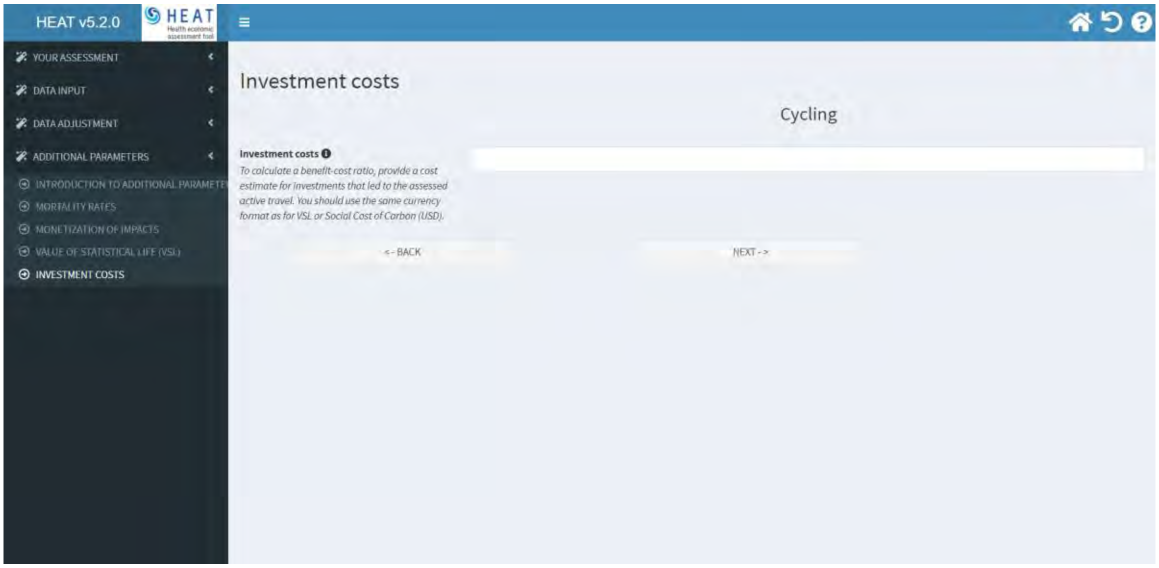
According to the U.S. Department of Transportation (USDOT), the estimate of the value of a statistical life $12.5 million with a base year of 2022[8].



Investment Cost

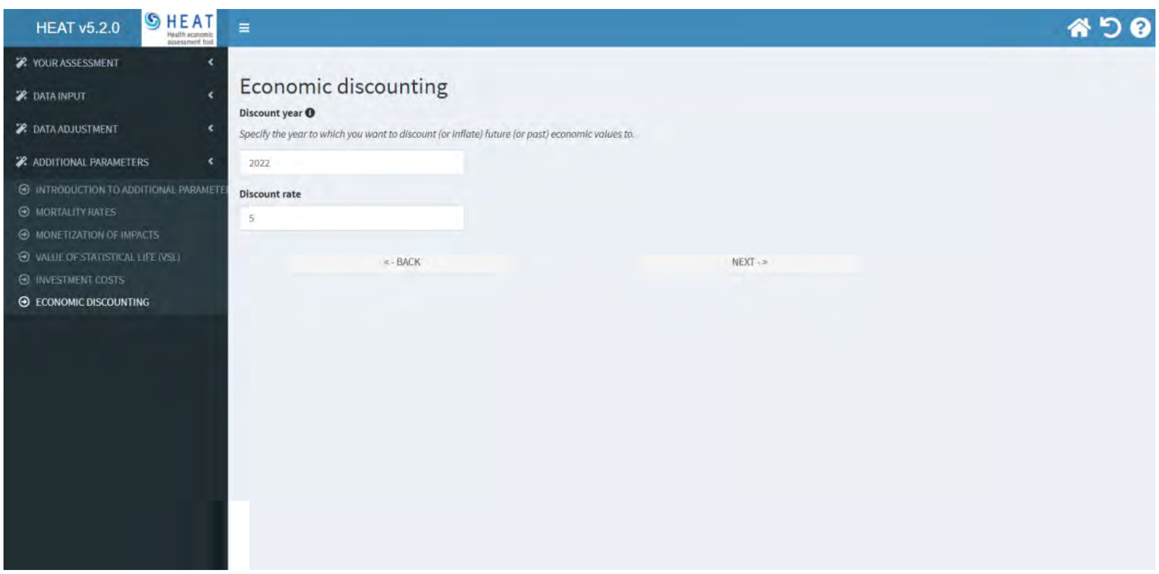
The total Bike Bellevue project cost of $17.6 million is used for this assessment.

[8] U.S. Department of Transportation, *Departmental Guidance on Valuation of a Statistical Life in Economic Analysis*, https://www.transportation.gov/office-policy/transportation-policy/revised-departmental-guidance-on-valuation-of-a-statistical-life-in-economic-analysis



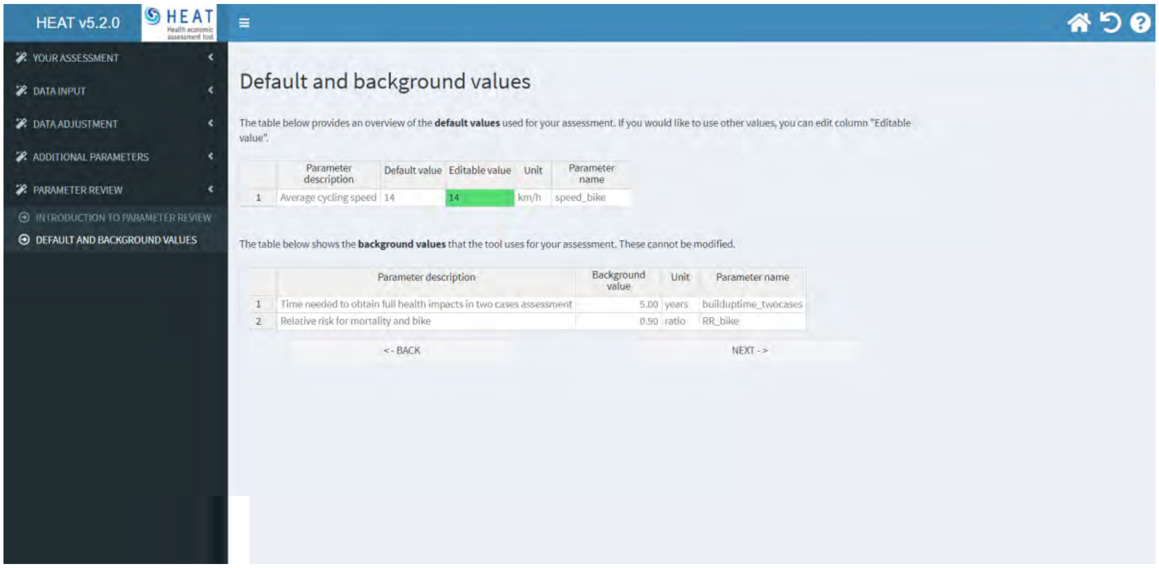
Economic Discounting

The discount year of 2022 and discount rate of 5 is used for this assessment.



Default and Background Values

A default value of 14 km/h of average cycling speed is used for this assessment.



Results

To get the final results, we went through all the steps documented above one more time using the ICLEI Level B implementation bike mode share. All the inputs were kept the same, except that we used 4.3% in the "Active modes data" page for the comparison case mode share and used 1,744 as the comparison case cyclist population in the "Population" data page.

Results are as follows:

- Assuming the Bike Bellevue project will achieve a mode share between 2.8% and 4.3% in 2035, 0.83-1.6 premature deaths will be prevented each year due to the increase in physical activities.
- The corresponding economic benefit of reduced mortality is between $10.4 to $20.2 million dollars per year, or a total economic impact between $81.4 and $158 million over 20 years, assuming a VSL of $12.5 million in constant 2022 US dollars.

Crash Risk

Although HEAT also provides an option to estimate the economic value of crash risk it does not consider the quality of the new bike infrastructures or incorporate the crash reduction factors of the improvements. Therefore, we decided to move away from HEAT's methodology and to use guidance from the USDOT instead. The USDOT VSL guidance updated in 2021 provides fractions of VSL for estimating the value of preventing injuries with different severity levels. **Table 5** below shows the fraction of VSL based on the injury severity level (MAIS). Given that the USDOT estimated the value of a statistical life is $12.5 million using a base year of 2022, the values of preventing a serious, a severe and a critical injury (MAIS Level 3, 4, and 5) will be $12.5 million ×

0.105 = $1.31 million, $12.5 million × 0.266 = $3.33 million, and $12.5 million × 0.593 = $7.41 million, respectively.

Table 5: Relative Disutility Factors by Injury Severity Level (MAIS)

MAIS	Level Severity	Fraction of VSL
MAIS 1	Minor	0.003
MAIS 2	Moderate	0.047
MAIS 3	Serious	0.105
MAIS 4	Severe	0.266
MAIS 5	Critical	0.593
MAIS 6	Unsurvivable	1.000

Source: U.S. Department of Transportation. *Treatment of the Value of Preventing Fatalities and Injuries in Preparing Economic Analyses*. March 2021.

We investigated the number of bike crashes resulting fatalities/serious injuries (KSI) in the Bike Bellevue project area. **Table 6** below shows the number of bicycle-involved KSI crashes in the project area from 2013 to 2022. In total, there were eight serious injuries and zero fatalities. Assuming the same 10-year amount of KSI collisions would happen in the future, 16 serious injuries will be observed in the next two decades[9]. In reviewing the USDOT Crash Modification Factors Clearinghouse[10], the major improvements of buffered separated bike lanes and cycletracks have a crash reduction factor ranging from 25% to 50%. Applying these crash reduction factors to the Bike Bellevue project area, we can expect a reduction of four to eight KSI collisions in the next twenty years. Since the KSI data from the City didn't further specify the severity of serious injuries, we assume future serious injuries will be evenly distributed across the three MAIS levels (serious, severe, and critical) mentioned above. The average value of preventing a serious injury is $12.5 million × (0.105+0.266+0.593)/3 = $4.02 million. Therefore, the economic value of preventing 4 to 8 biking KSI collisions will range from $16 million to $32 million assuming a VSL of $12.5 million in constant 2022 US dollars.

[9] This is a conservative assumption. Our analysis does not consider growth in overall bicycle trips when quantifying the benefits of the countermeasures. By not assuming growth in trips in prevented crashes, we remove an additional layer of uncertainty around the background growth in bike crashes that would occur with and without Bike Bellevue. Increased land use density (population and employment) will result in more bike usage in the future and, as noted, the improved facilities from Bike Bellevue will also increase bike usage. By applying the crash reduction benefits from Bike Bellevue to the existing level of bike crashes, we feel we are reducing uncertainty while providing a conservative estimate of the benefit of the Bike Bellevue improvements to safety.

[10] US Department of Transportation, *Crash Modification Factors Clearinghouse*. https://www.cmfclearinghouse.org/index.php

Table 6: Fatality/Serious Injuries in Study Area, 2013-2022

Year	Bicycle Serious Injuries	Bicycle Fatalities
2013	1	0
2014	0	0
2015	1	0
2016	0	0
2017	1	0
2018	0	0
2019	1	0
2020	1	0
2021	1	0
2022	2	0

Source: City of Bellevue, 2023

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Appendix C: Equity and Accessibility

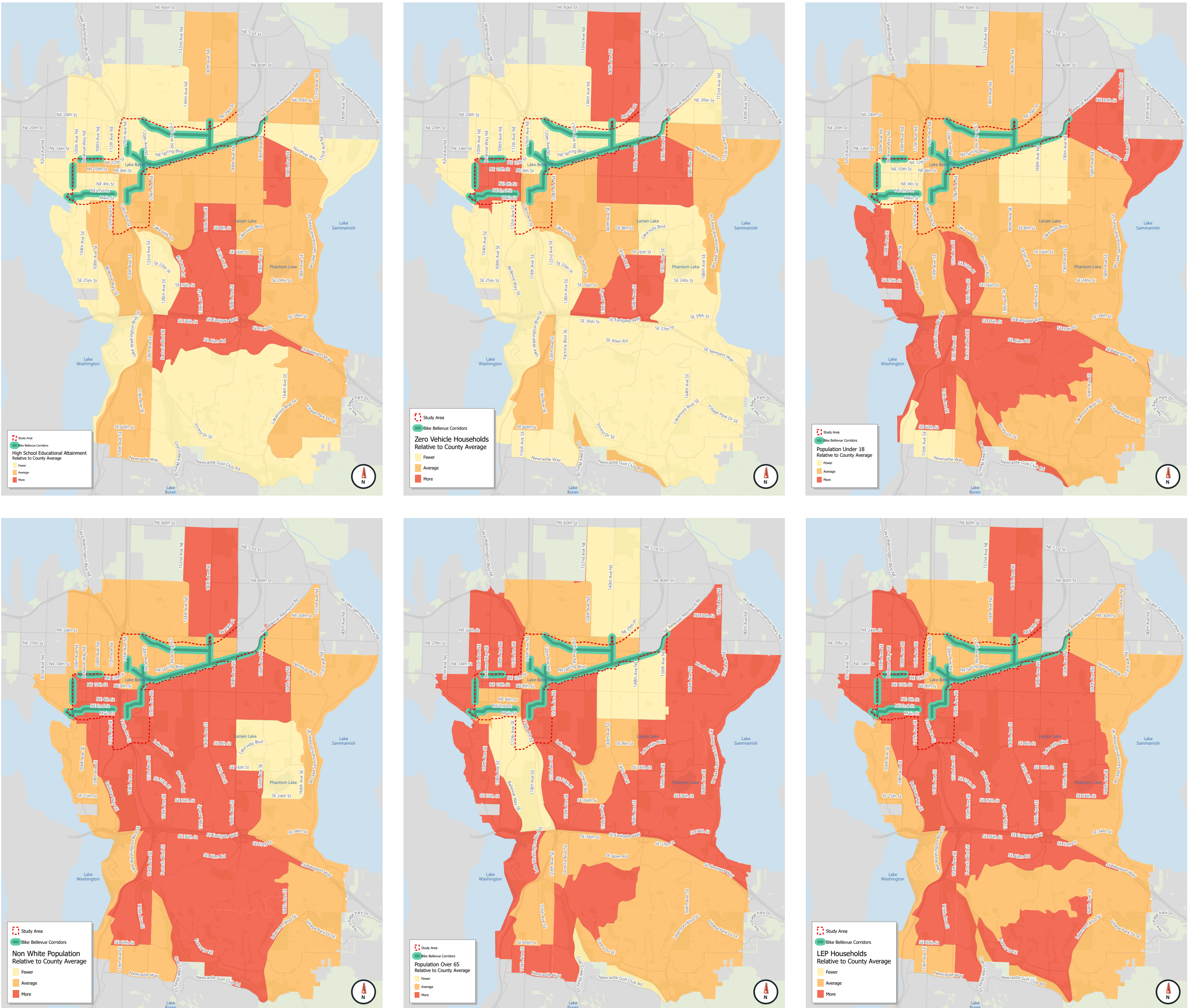
Enhancing Equitable Access

One of the city's Diversity Advantage Initiative's guiding principles is equity, and "transportation equity seeks fairness in mobility and accessibility to meet the needs of all community members." Bike Bellevue aims to consider the circumstances that impact resident's mobility and accessibility needs. The goal is to expand active transportation access for all residents while focusing on underserved and disadvantaged communities.

Figure 17 is an equity needs map for the Bike Bellevue project area. The equity needs were determined using indicators of residents who cannot or prefer not to drive for many of their daily trips. These indicators were selected from the Equity Evaluation Components from the MIP's Equity Goal and industry research. The data used to analyze the equity needs was retrieved from the 2018 U.S. Census American Community Survey (5-year estimates) for King County at the Census Tract level. The equity indicators used to develop the equity needs map include the following:

- High School Educational Attainment: Number of residents over the age of 25 that have completed a High School education or equivalent (Table B15003).
- Zero Vehicle Household: Number of zero vehicle households (Table B08201).
- Children and Seniors: Number of residents under the age of 18 and number of residents over the age of 64 (Table B01001).
- Non-White Population: Number of non-white residents (Table B02001).
- Limited English Proficiency: Number of households that identify as having limited English proficiency (Table C16002).

Enhancing Equitable Access



Equity Scores Relative to County Average. Clockwise from top-left: High school educational attainment; Zero vehicle households; Population under 18; Non-white population; Population over 65; and Limited English Proficiency (LEP) households.

Alta Accessibility Analysis

MEMORANDUM

To: City of Bellevue

From: David Wasserman, Grace Young, Lisa Bender

Date: 7/20/2023

Re: Bike Bellevue Concept Guide Accessibility Support

Bike Bellevue Concept Guide Supplementary Analysis

Alta, in collaboration with the City of Bellevue and Fehr & Peers, have prepared this memorandum to document key assumptions of three accessibility analyses evaluating the low-stress access gains achieved by different combinations of the Bike Bellevue Corridor improvements and the buildout of planned Eastrail facilities. In addition, this memorandum documents an evaluation of active and low-income active trips in and around the City of Bellevue using Replica Places[1] data. This analysis conducts key tabulations for three study areas using the results from this analysis to better stratify the benefits and potential for supporting active transportation investments in the region.

Study Areas

There are three study areas considered in this analysis: Bike Bellevue, the City of Bellevue, and Beyond Bellevue, which is a 5-mile buffer around Eastrail and the Bike Bellevue improvement projects. These project areas are shown in **Figure 1**.

Level of Traffic Stress Analysis

Alta conducted a review of the Level of Traffic Stress (LTS) analysis for an expanded bicycle network, which ranks streets from low stress (LTS 1, suitable for children) to high stress (LTS 4, suitable only for "strong and fearless" bicyclists). This network was derived from the LTS analysis that utilizes OpenStreetMap (OSM) data and aims to identify large facilities with high-speed traffic that could potentially serve as soft barriers to bicycle or pedestrian activity. Within Bellevue, LTS values were updated to match the results of a more robust LTS analysis that was previously completed as part of the project. The previously conducted LTS analysis includes information on the current LTS score of the road segment as well as a future LTS score following installation of new bicycle infrastructure. Outside of Bellevue, LTS values were derived from OSM assumptions, as described in **Appendix A**. The methodology for Bicycle LTS across the region is documented in **Appendix B**.

Why Accessibility is Important

Each person has places they need and want to go, like school, their friend's house, the grocery store, and the movie theater. Accessibility speaks to the ability to reach these desired services and activities, within a reasonable travel time, and is tied to the transportation system's contribution to our quality of life more concretely than traditional facility metrics like delay or pavement quality.

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[1] Replica Places is a data product provided by Sidewalk Labs spin-off Replica. Replica Places is an activity-based model developed off a combination of mobile, land use, census, and transaction data to generate census-block level OD estimates that can be used to estimate trip distances and understand common origins-destinations. Their data also provides estimates of mode split and trip purpose based on their synthetic populations that are created as part of their estimation process.

Accessibility Analysis

Network Settings

We conducted an access analysis for three scenarios using the Pandana Python library to compute access aggregations (network bikesheds) for every intersection node in the road network. **Table 1** describes the scenario conditions, including the facilities and LTS conditions used in the network settings. All networks excluded segments where bicycles are restricted (i.e., highways). Access aggregations used exponential discounting for destinations that were further way to more realistically model changes in access as identified by best practice guidance.[2]

Table 1. Accessibility Analysis Scenario Network Settings

Scenario	Network Notes	LTS Conditions
Baseline	OSM-based network, all existing Eastrail segments included	Current LTS values for all network segments
Bike Bellevue Only	OSM-based network, all existing Eastrail segments included	Future LTS values for all Bike Bellevue Projects, current LTS values everywhere else
Bike Bellevue + Eastrail	OSM-based network, existing and proposed Eastrail segments included	Future LTS values for all Bike Bellevue projects, current LTS values everywhere else

LTS Impedance Adjustment

Each segment in the network has an associate 'cost' that indicates the amount of time it takes to travel along the segment based on an assumed travel speed of 10 mph. This cost, also called impedance, is adjusted based on the level of traffic stress a user experiences while traveling on the segment. Higher stress segments increase the perceived amount of time it takes for a bicyclist to travel along the road which is represented in the network by increasing the impedance of that segment. **Table 2** describes the adjustments made to network impedances based on the bicycle LTS on the segment. For example, the impedance of a segment with a bicycle LTS of 2 is increased by 1.5 times. These impedance adjustments are informed by research related to observed bicyclist's behavior marginal substitution rates between network quality and distance.[3]

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[2] Levinson, D., King, D.(2020) Transport Access Manual: A Guide for Measuring Connection between People and Places by The Committee of the Transport Access Manual. https://ses.library.usyd.edu.au/bitstream/handle/2123/23733/COTAM_Nov2020_GoldMaster_r001.pdf?sequence=3&isAllowed=y

[3] Broach, J., Dill, J., & Gliebe, J. (2012). Where do cyclists ride? A route choice model developed with revealed preference GPS data. Transportation Research Part A: Policy and Practice, 46(10), 1730-1740.

Table 2. Impedance Adjustments Based on Bicycle LTS

LTS Category	Impedance Adjustment Multiplier
1	1
2	1.5
3	3
4	8

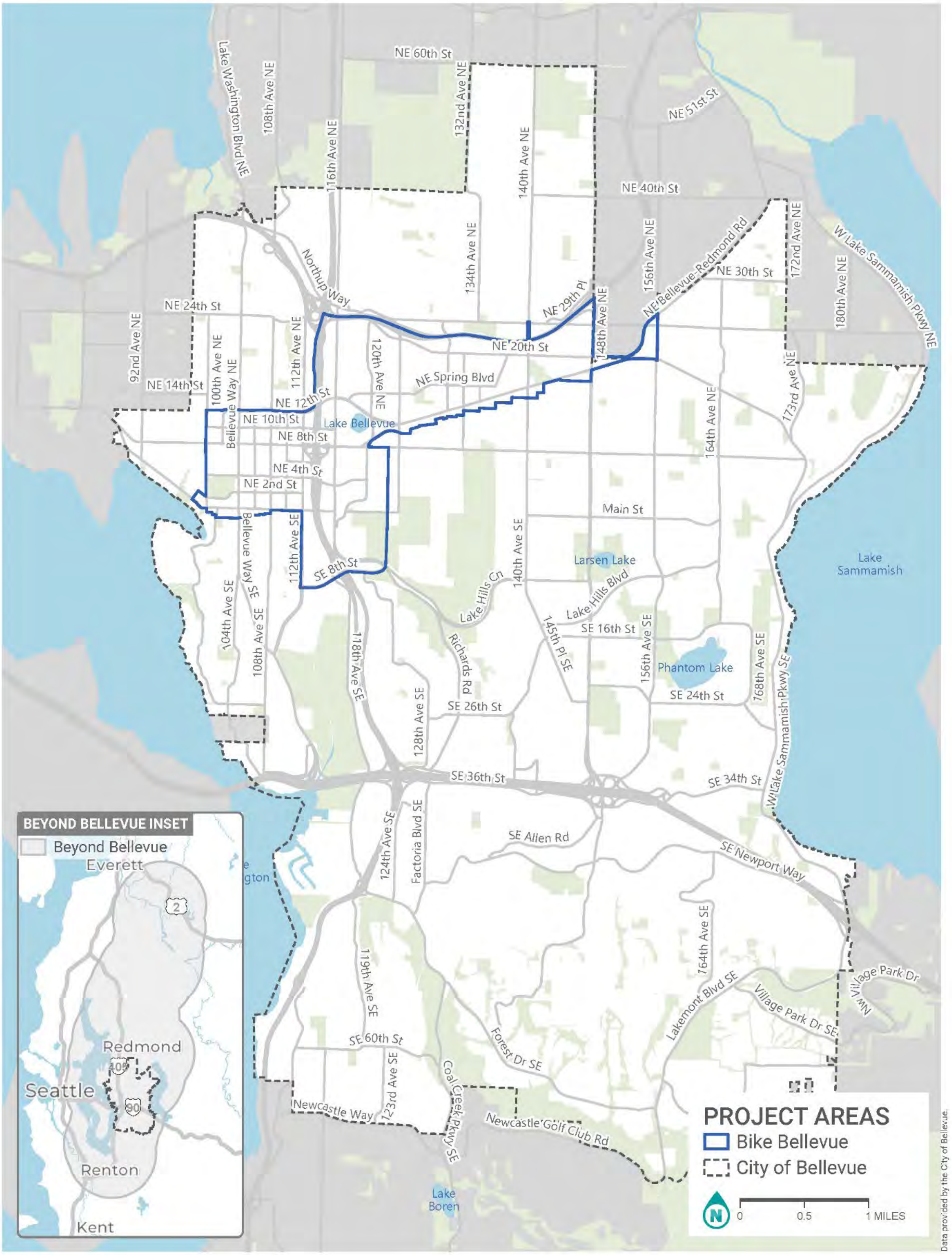
Results Aggregation

Results were aggregated in one of two ways. For jobs, access gains are presented in terms of the number of jobs the average resident would gain access to within a 25-minute impedance-adjusted ride if the bike facilities were built. This is calculated by first aggregating at the hex grid level by taking the average number of jobs accessible at each node within the hex for both the baseline and improved scenario. Next, to calculate the access gain to the average resident within the project areas. This typical gain in access is based on a population-weighted average of all the access gains across all the hexes within the project area. This means that hexagons with more people living in them contributed more to the aggregated access gain within the study area of interest.

The second aggregation method is used to calculate the access gains for schools and transit stops. In this case, it makes more sense to understand the number of people within the access shed of a school, rather than the number of schools an average resident can access. This method follows the same initial aggregation step of taking the average population accessible at each node within the hex for the baseline and improved scenarios. The average access gain for schools would then be an average of all the access gains in hexes with schools present, or likewise with transit stops. The bikeshed travel time for schools and transit are 20 minutes and 10 minutes, respectively.

Results were aggregated to four different project areas, as shown in **Figure 1**.

Figure 1. Project Areas for Analysis Aggregation



Baseline Accessibility Results

Jobs

Job access is defined as the average number of jobs accessible within a 25-minute bikeshed of the average network node within each hex. In general, western Bellevue currently has the highest access to jobs, driven by the commercial centers in and near downtown Bellevue like Bellevue Square and along 116th Ave NE between Main St and Bel-Red Rd. Additionally, access to jobs is high in northeast Bellevue around Bel-Red Rd and NE 20th St. Bel-Red Road is a major high-stress barrier connecting east-west between the two major jobs centers. Baseline scenario jobs access is shown in **Figure 2**.

Population

Population access is measured by the number of people within a 20-minute bikeshed of the average network node within each hex. It is the highest on the edges of the city of Bellevue, particularly in the east and to the west of I-405. Population access through the centrally located commercial areas near Bel-Red Rd and NE 20th St, and north along 134th and 140th Ave is among the lowest in the city. Baseline scenario population access is shown in **Figure 3**.

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Figure 2. Baseline Job Accessibility

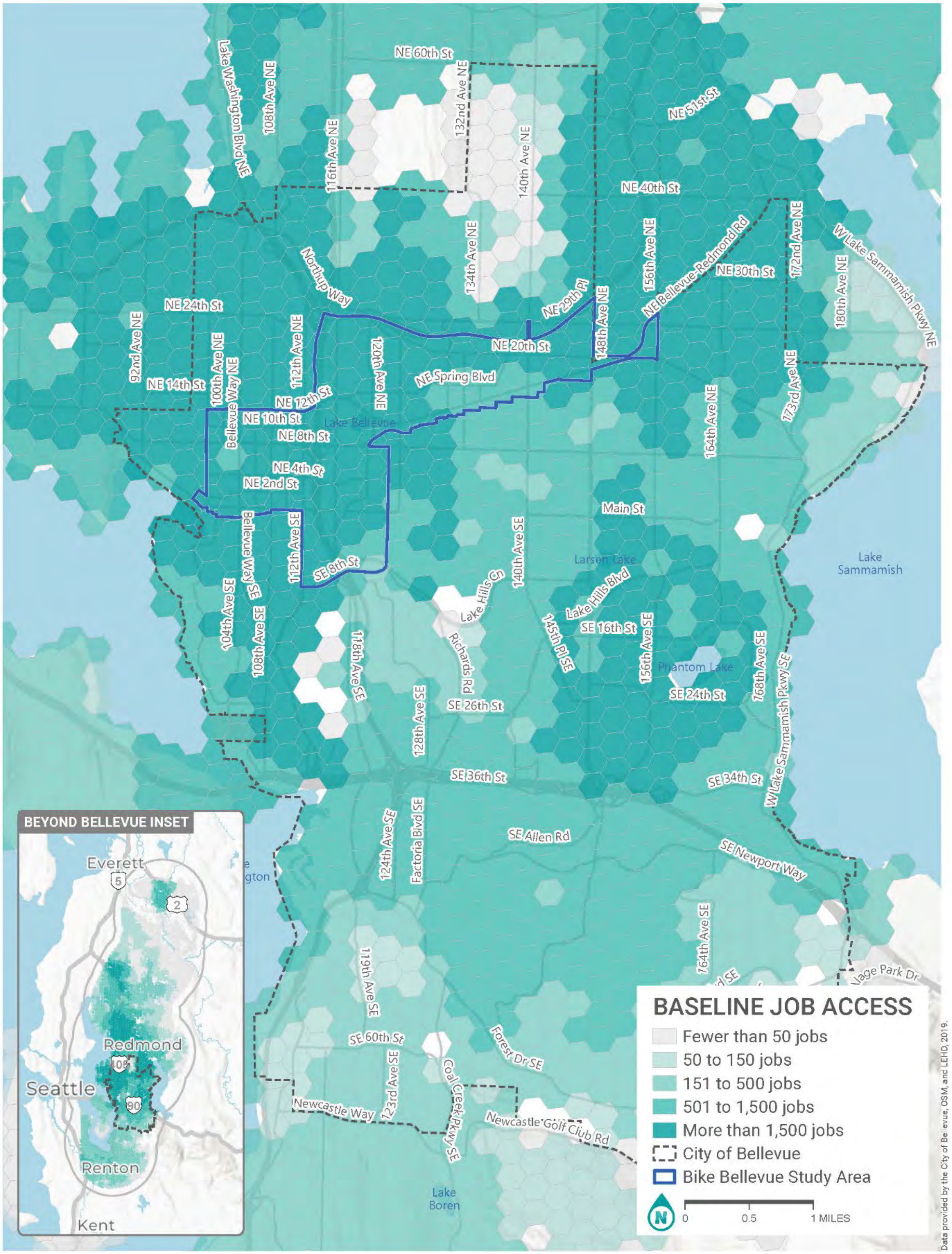
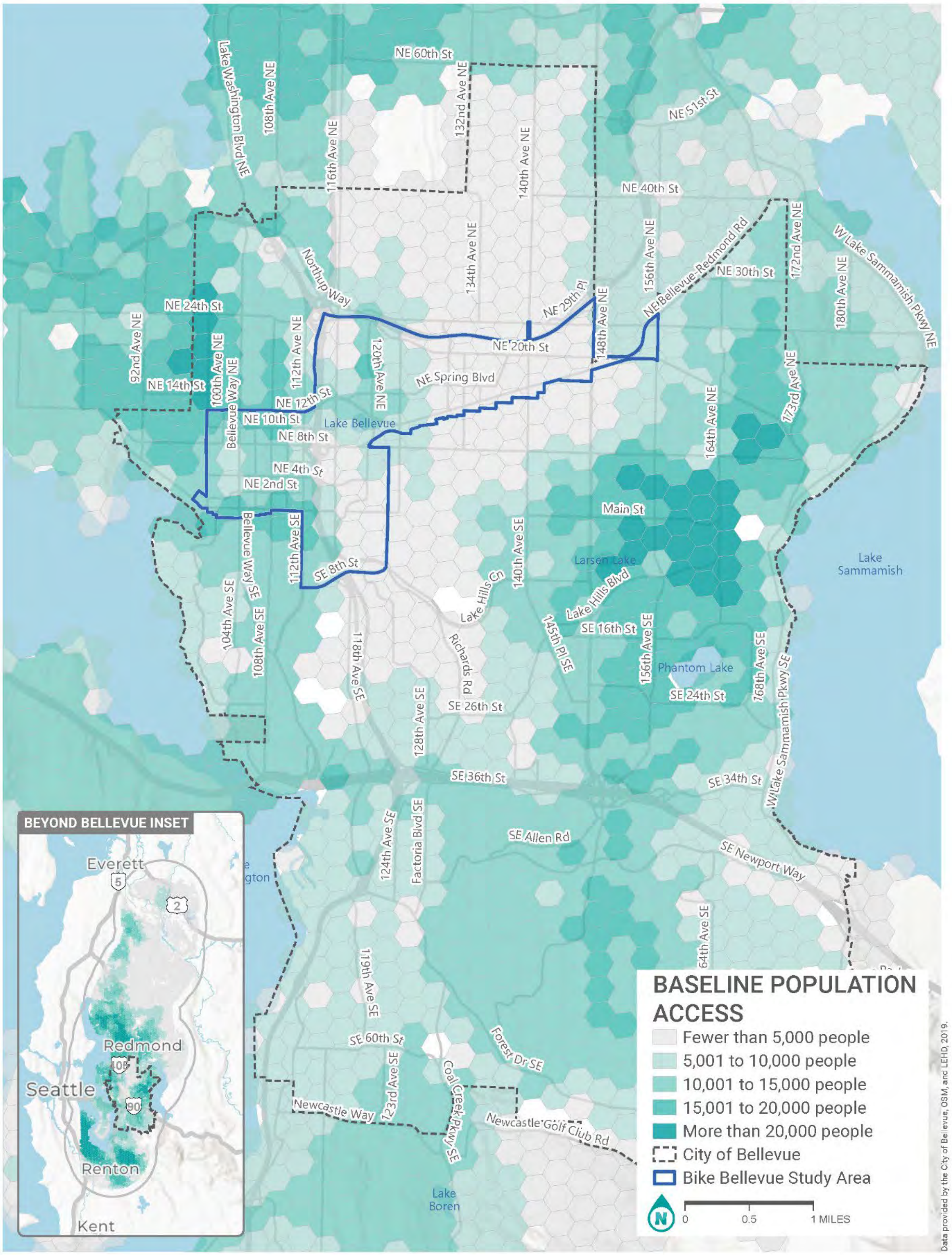


Figure 3. Baseline Population Accessibility



Bike Bellevue Only

Access to Jobs

The impact on job access from constructing the Bike Bellevue Corridor projects is shown in **Figure 4**. The majority of job access benefits are concentrated in the north of Bellevue, particularly east of I-405. There are minor gains in job access along Lake Washington in the southwest corner of the city.

Access to People

Figure 5 shows the impact on access to people from constructing the Bike Bellevue Corridor projects. Access gains are highest near the I-405 and SR-520 interchange and along 120th Ave NE and NE 4th St. The population benefits drop off sharply south of Bel-Red Rd outside of the Bike Bellevue study area.

Figure 4. Job Access Gains of Bike Bellevue Only

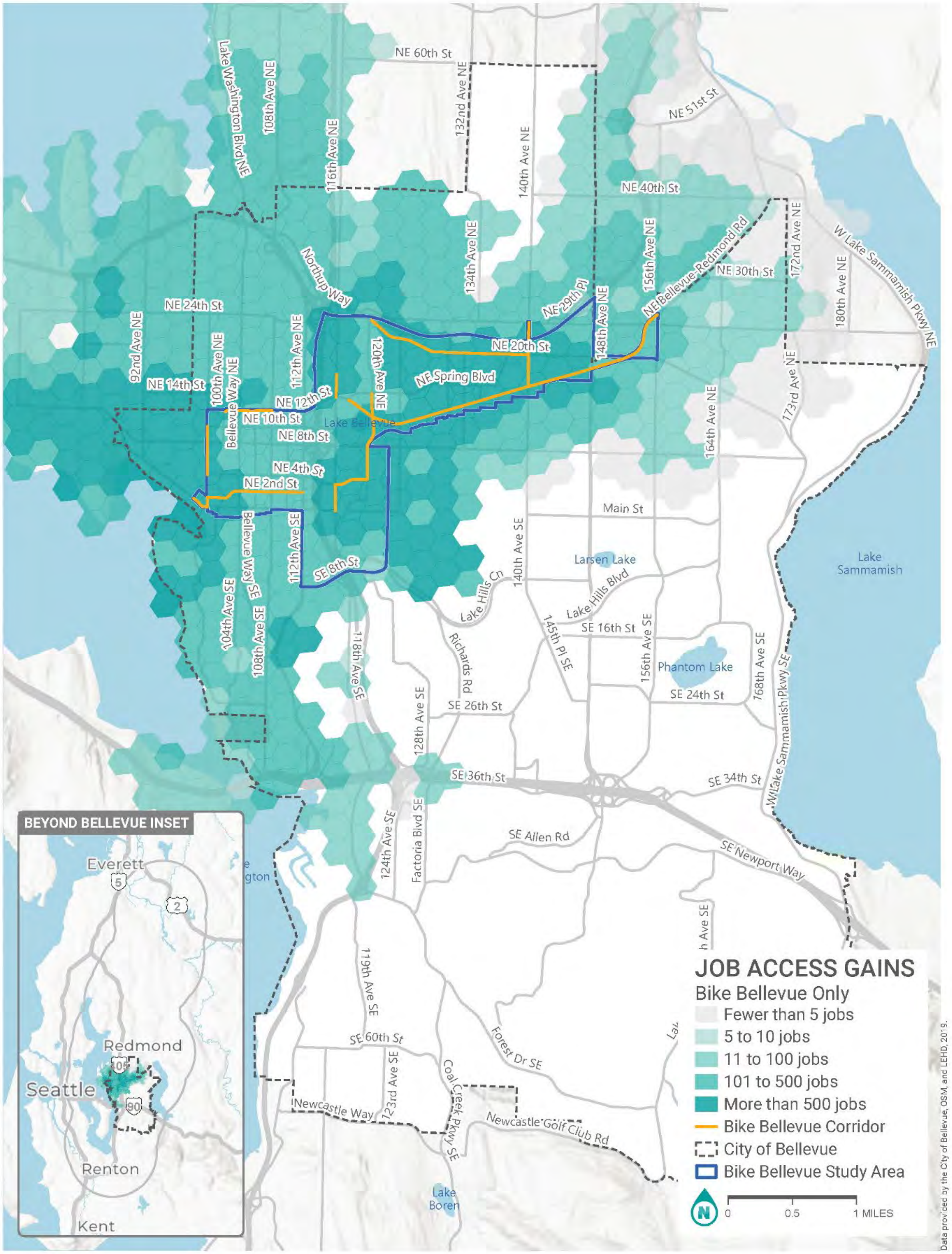


Figure 5. Population Access Gains of Bike Bellevue Only

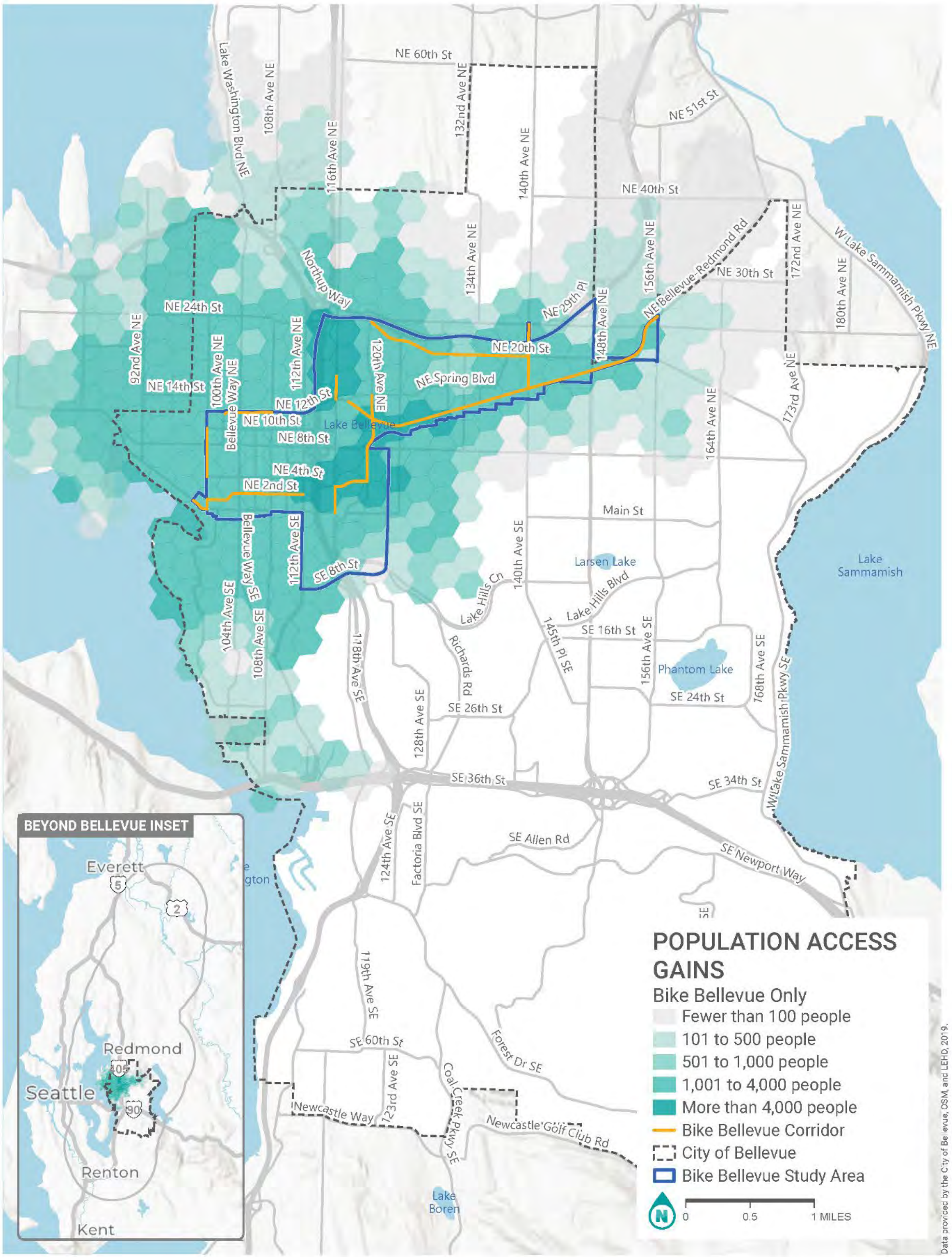


Table 3 and **Table 4** show the tabulation of results for the four project areas and indicate the number of jobs the average resident will gain access to, as well as the average population access gain for schools and transit stops in the project area. **Table 4** specifically tabulates results for low-income residents, defined as those with household incomes below 200% of the federal poverty line, adjusted for household size.

Table 3. Bike Bellevue Accessibility Results – General Population

Project Areas	Low-Stress Job Access Gain	Low-Stress School Access Gain	Low Stress Transit Stop Access Gain
	Average Increase Each Resident Sees in Number of Job Accessible	Average Increase Each School Sees in the Number of Residents with Access to the School	Average Increase Each Transit Stop Sees in the Number of Residents with Access to the Stop
Bike Bellevue	563 jobs (+18%)	2,202 people (+35%)	750 people (+45%)
City of Bellevue	163 jobs (+10%)	547 people (+5%)	175 people (+7%)
Beyond Bellevue	38 jobs (+4%)	259 people (+2%)	48 people (+1%)

Table 4. Bike Bellevue Accessibility Results – Low Income Population

Project Areas	Low-Stress Job Access Gain	Low-Stress Lower-Income Job Access Gain	Low-Stress School Access Gain	Low Stress Transit Stop Access Gain
	Average Increase Each Resident Sees in Number of Jobs Accessible	Average Increase Each Resident Sees in Number of Lower-Income Jobs Accessible	Average Increase Each School Sees in the Number of Low-Income Residents with Access to the School	Average Increase Each Transit Stop Sees in the Number of Low-Income Residents with Access to the Stop
Bike Bellevue	670 jobs (+24%)	106 jobs (+30%)	313 people (+33%)	72 people (+71%)
City of Bellevue	120 jobs (+8%)	19 jobs (+8%)	70 people (+3%)	16 people (+3%)
Beyond Bellevue	25 jobs (+3%)	4 jobs (+3%)	32 people (+1%)	4 people (+0.5%)

Bike Bellevue + Eastrail

Access to Jobs

The construction of the Bike Bellevue and Eastrail projects brings access to jobs to the area, particularly by providing connections along Bel-Red Rd and across I-405. Additionally, residents on the far western edge of Bellevue and north along Eastrail see large gains in the number of jobs accessible. Full results are shown in **Figure 6** with regional results shown in **Figure 7**.

Access to People

The Bike Bellevue projects provide large gains in low stress access to people along Eastrail in the commercial district just east of I-405. Additionally, job gains extend along the Bel-Red Rd and NE 20th St corridors, connecting east and west Bellevue and spanning two major barriers in I-405 and SR520. Full results are shown in **Figure 8** with regional results shown in **Figure 9**.

Access to Schools

Figure 10 shows the percentage gain in the number of people accessible within a 20-minute ride of each school in Bellevue following the implementation of the Bike Bellevue + Eastrail projects. Schools seeing the largest gains in access are generally located immediately to the east of I-405 and near the intersection of NE 20th St and Bel-Red Rd.

Access to Transit

Figure 11 shows the percentage gain in the number of people accessible within a 10-minute ride of each transit stop in Bellevue following the implementation of the Bike Bellevue + Eastrail projects. Gains in population access for transit stops is roughly evenly distributed across the Bike Bellevue study area, with improvements of over 30% at most stops.

Figure 6. Job Access Gains of Bike Bellevue + Eastrail

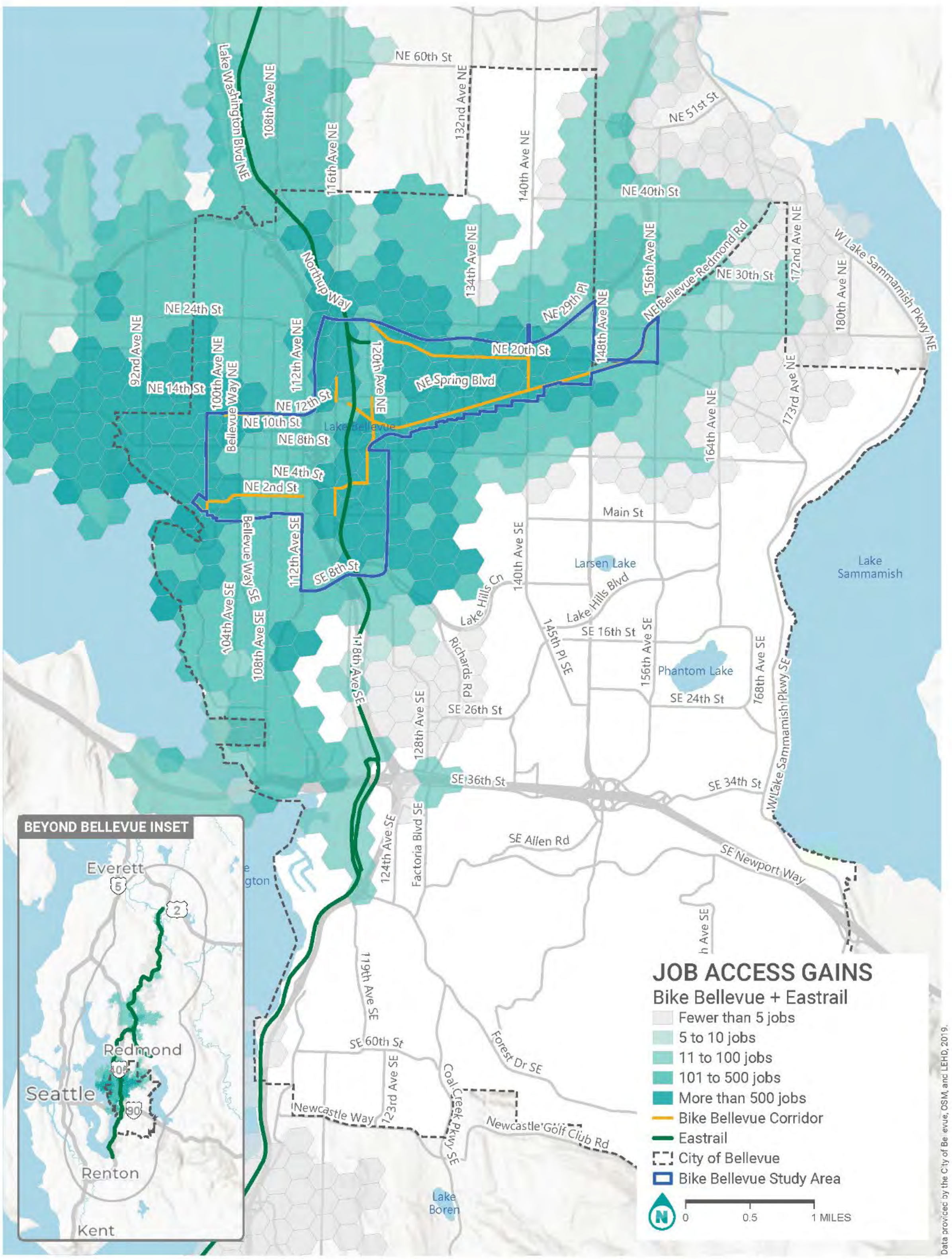


Figure 7. Regional Job Access Gains of Bike Bellevue + Eastrail

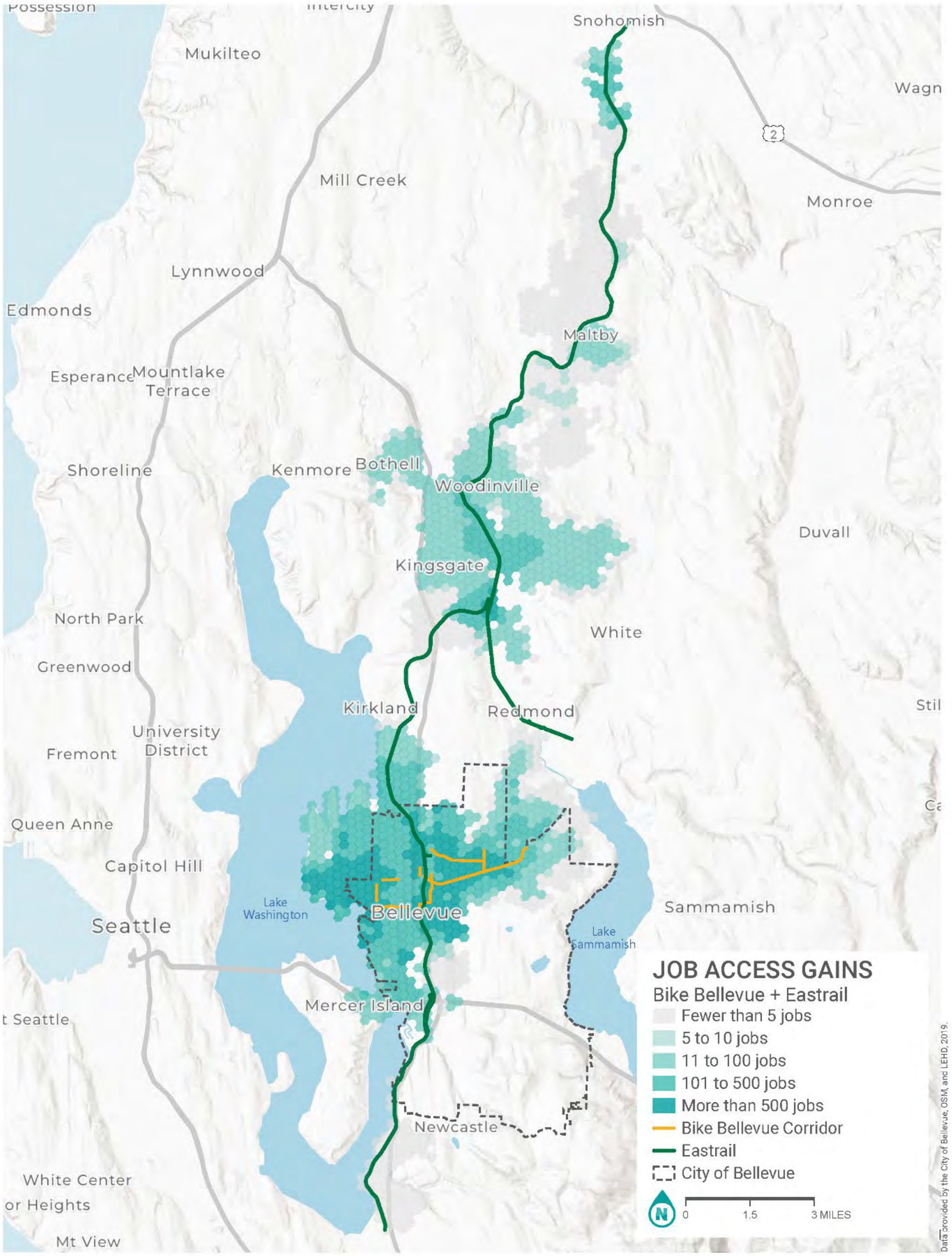


Figure 8. Population Access Gains of Bike Bellevue + Eastrail

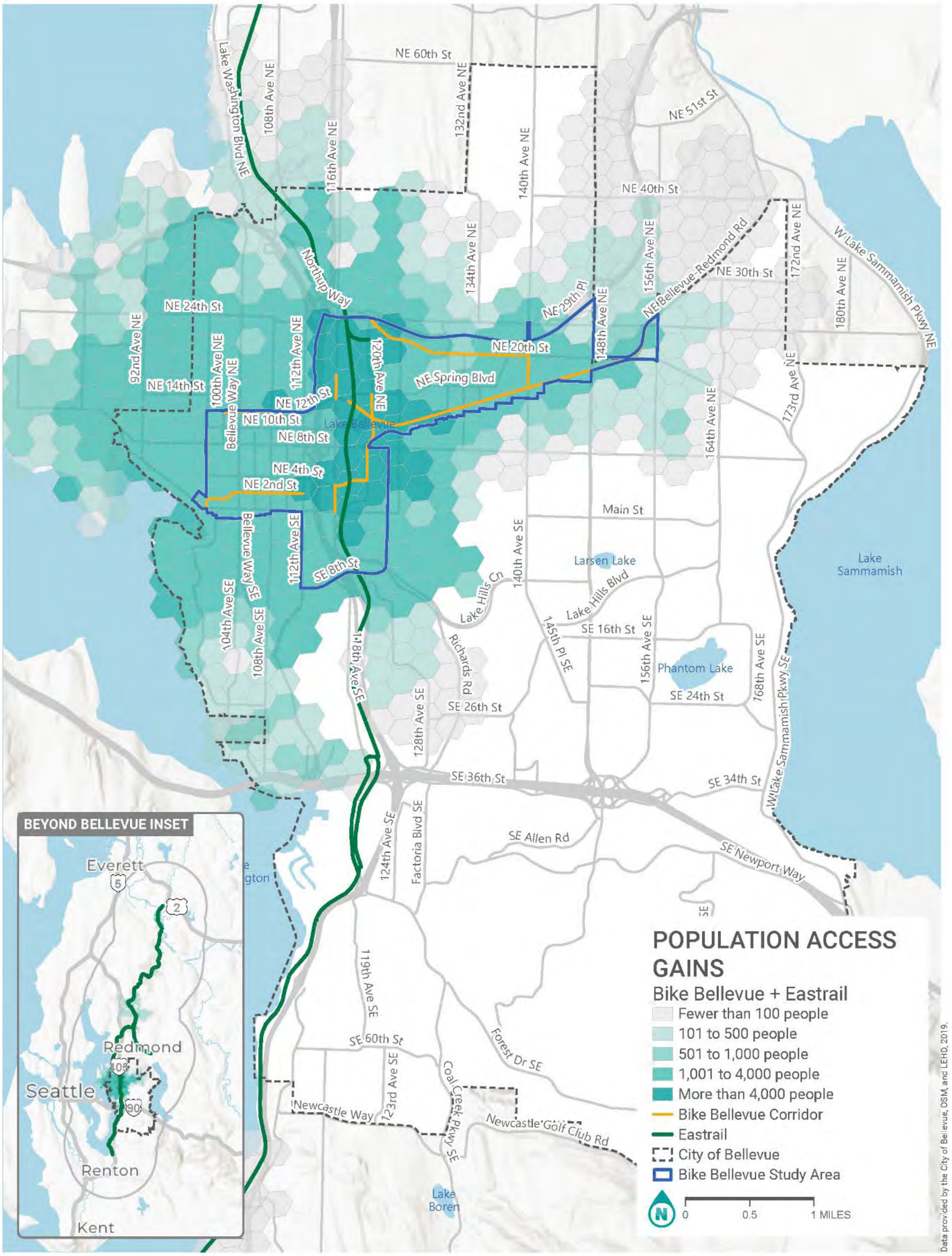


Figure 9. Regional Population Access Gains of Bike Bellevue + Eastrail

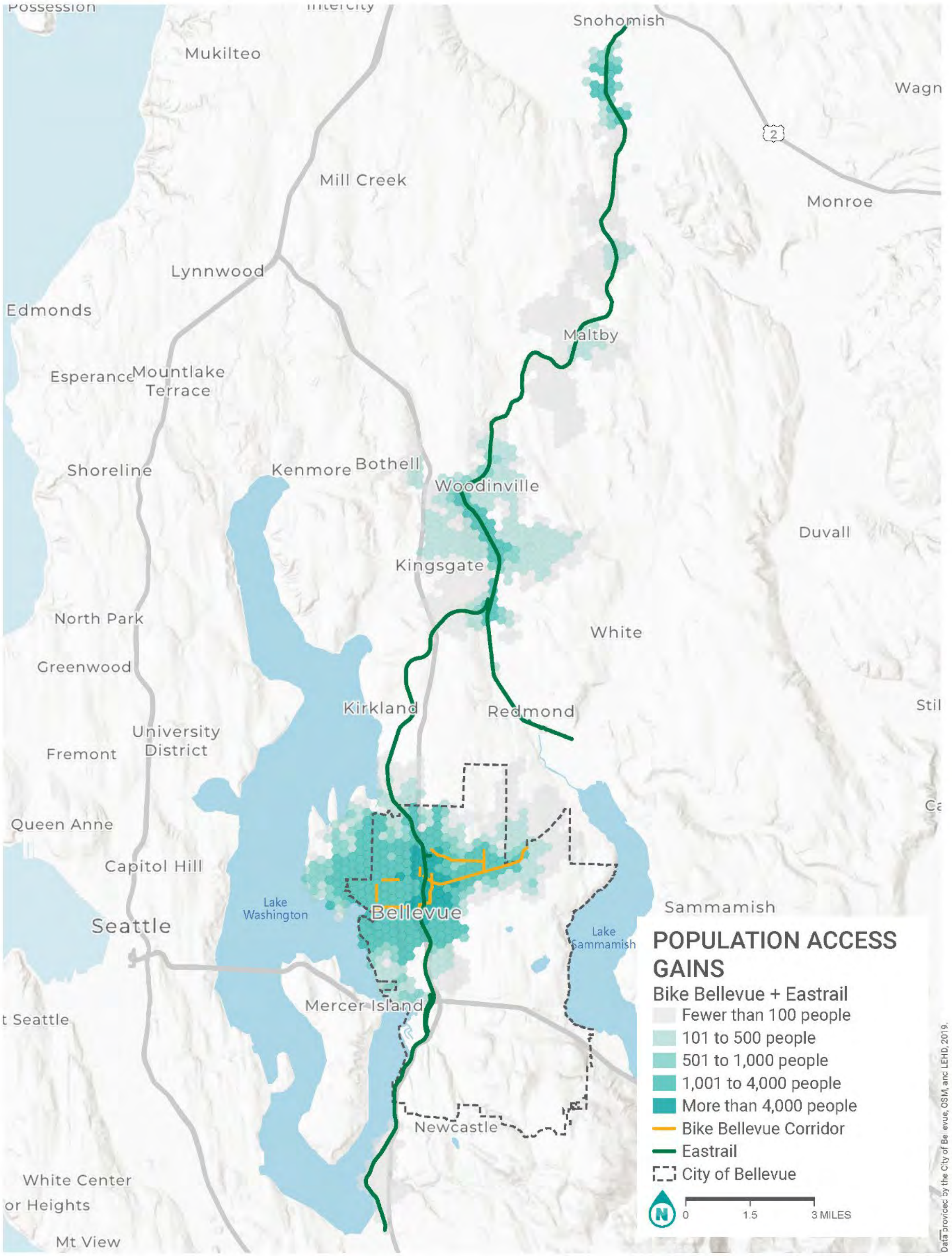


Figure 10. Percentage Gain in Access to Schools for Bike Bellevue + Eastrail

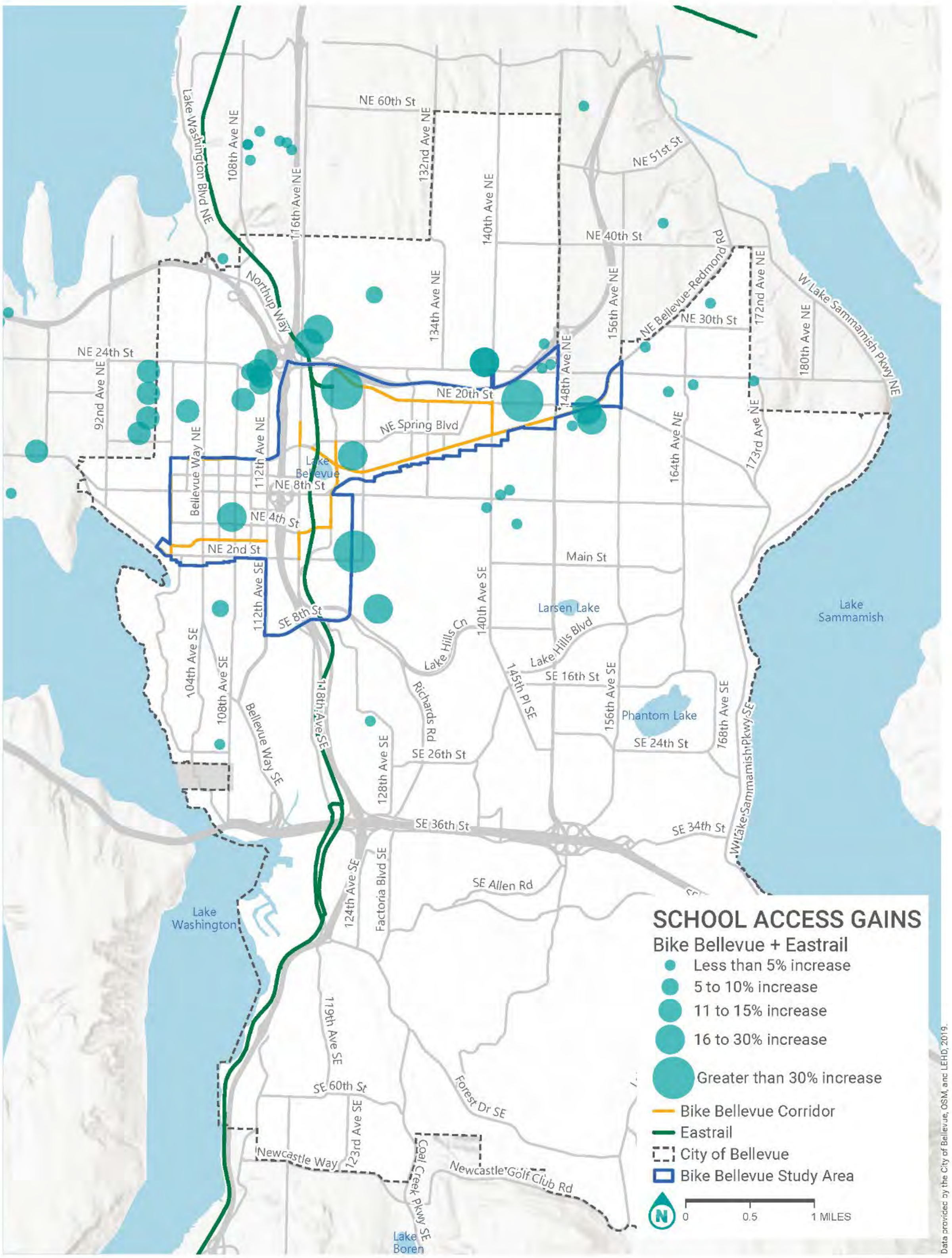


Figure 11. Percentage Gain in Access to Transit for Bike Bellevue + Eastrail

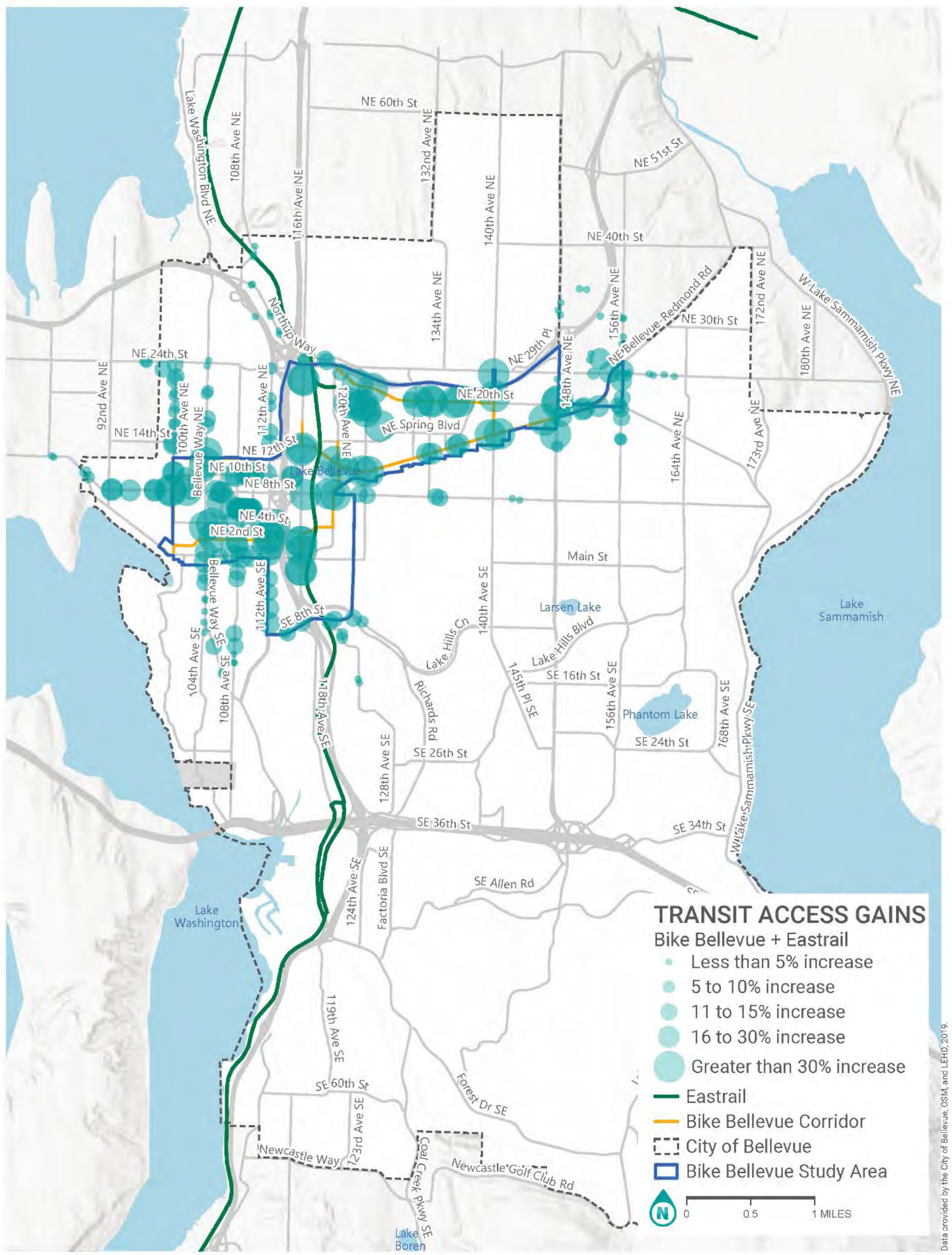


Table 5 and **Table 6** show the tabulation of results for the four project areas and indicate the number of jobs the average resident will gain access to, as well as the average population access gain for schools and transit stops in the project area. **Table 6** specifically tabulates results for low-income residents, defined as those with household incomes below 200% of the federal poverty line, adjusted for household size.

Table 5. Bike Bellevue + Eastrail Accessibility Results – General Population

Project Areas	Low-Stress Job Access Gain	Low-Stress School Access Gain	Low Stress Transit Stop Access Gain
	Average Increase Each Resident Sees in Number of Jobs Accessible	Average Increase Each School Sees in the Number of Residents with Access to the School	Average Increase Each Transit Stop Sees in the Number of Residents with Access to the Stop
Bike Bellevue	607 jobs (+19%) 3171 baseline jobs	2,673 people (+42%) 6298 baseline people	800 people (+48%) 1677 baseline people
City of Bellevue	178 jobs (+11%) 1684 baseline jobs	629 people (+6%) 10869 baseline people	185 people (+8%) 2357 baseline people
Beyond Bellevue	45 jobs (+5%) 878 baseline jobs	300 people (+3%) 11572 baseline people	52 people (+1%) 3471 baseline people

Table 6. Bike Bellevue + Eastrail Accessibility Results – Low Income Population

Project Areas	Low-Stress Job Access Gain	Low-Stress Lower-Income Job Access Gain	Low-Stress School Access Gain	Low Stress Transit Stop Access Gain
	Average Increase Each Low-Income Resident Sees in Number of Jobs Accessible	Average Increase Each Low-Income Resident Sees in Number of Lower-Income Jobs Accessible	Average Increase Each School Sees in the Number of Low-Income Residents with Access to the School	Average Increase Each Transit Stop Sees in the Number of Low-Income Residents with Access to the Stop
Bike Bellevue	723 jobs (+26%) 2829 baseline jobs	115 jobs (+33%) 352 baseline jobs	384 people (+41%) 946 baseline people	82 people (+47%) 176 baseline people
City of Bellevue	130 jobs (+9%) 1524 baseline jobs	21 jobs (+9%) 224 baseline jobs	84 people (+3%) 2434 baseline people	18 people (+3%) 530 baseline people
Beyond Bellevue	30 jobs (+4%) 849 baseline jobs	5 jobs (+3%) 150 baseline jobs	39 people (+2%) 2583 baseline people	6 people (+1%) 840 baseline people

Replica Places Active Trip Analysis

The active trip analysis uses modeled trip data from Replica Places to illustrate where active trips are currently made within the project areas. Modeled data from a typical weekday during Fall 2022 is aggregated at the census block group level based on the location of the trip destination. Low-income trips are those made by individuals living in a household that is at or below 200% of the federal poverty line, adjusted for household size. **Figure 12** and **Figure 13** show the density of active trips (those made by walking or biking modes) for low-income individuals and the general population, respectively.

Summaries by Study Area Geography

Active trip densities for both the general population and low-income residents are high near downtown Bellevue and the Bellevue Square shopping area, as well as in the more residential areas surrounding Highland Middle School south of Northup Way. Areas with the largest differences in active trip densities when comparing the behavior of low-income individuals to the general population are north of Bel-Red Rd between 120th Ave NE and 148th Ave NE, as well as on the east side of I-405 near Wilburton Hill Park. **Table 7** summarizes the number of walking and biking trips taken that end in the project areas. Additionally, it includes short vehicle trips (less than 3 miles) that are of suitable distance to potentially be converted to active trips.

Table 7. Replica Places Active Trip Analysis

Project Areas	Walking		Biking		Short Vehicle Trips (<3 Miles)	
	All	Low-Income	All	Low-Income	All	Low-Income
Bike Bellevue	25,044 trips	1,648 trips	1,627 trips	256 trips	27,991 trips	1,538 trips
City of Bellevue	91,095 trips	7,764 trips	5,285 trips	855 trips	202,124 trips	6,250 trips
Beyond Bellevue	581,952 trips	67,898 trips	37,502 trips	4,657 trips	720,803 trips	44,318 trips

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Figure 12. Low-Income Active Trip Density

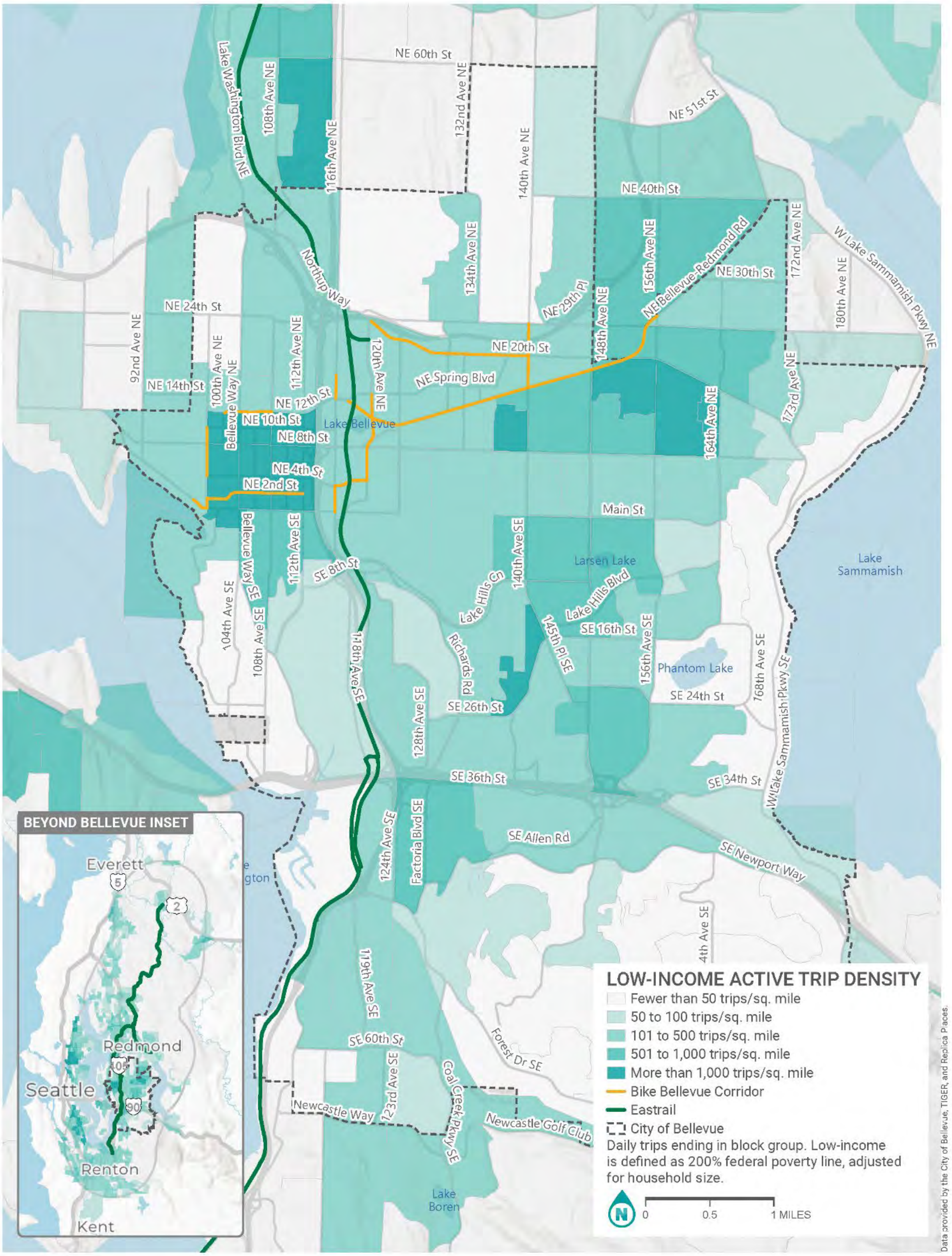
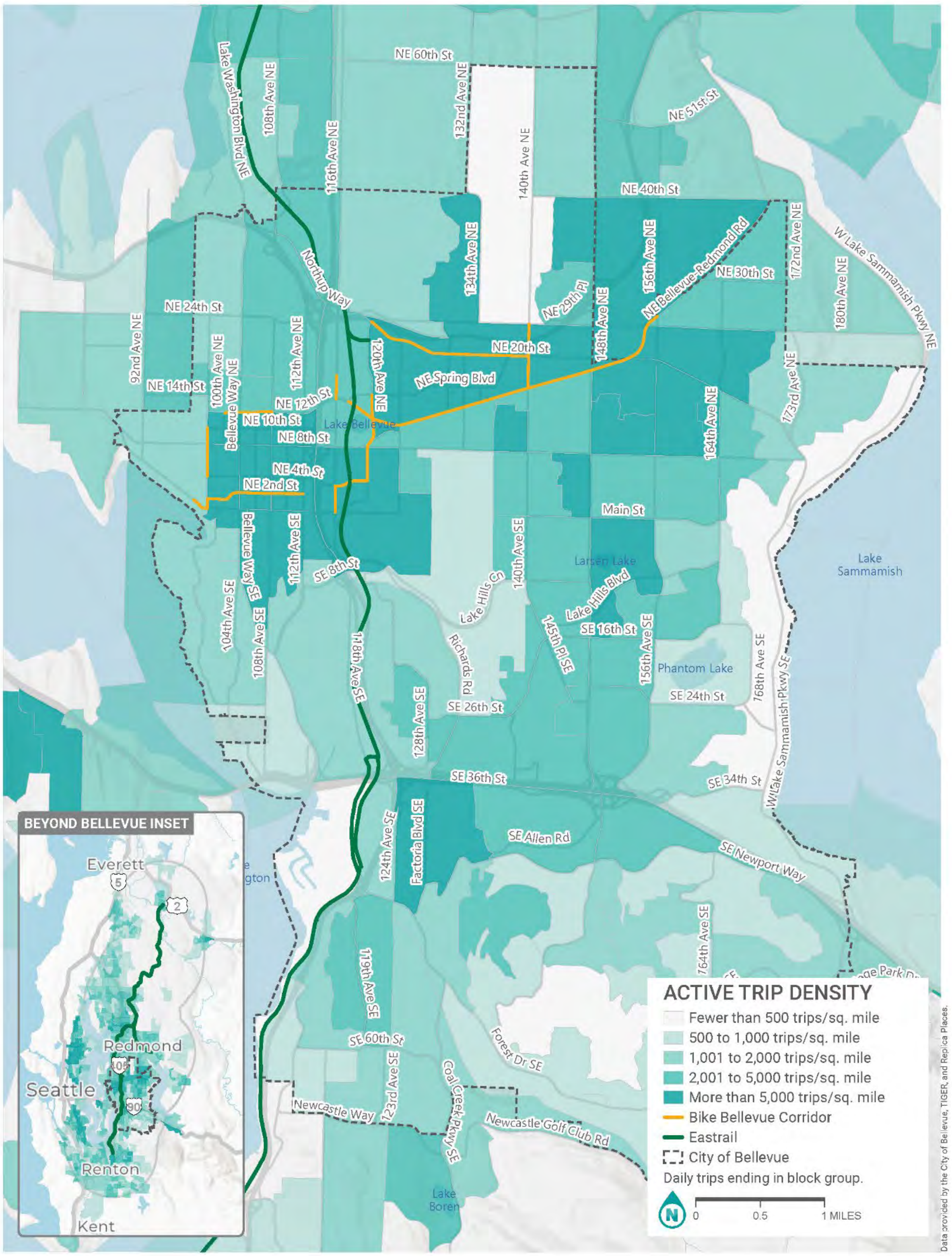


Figure 13. Active Trip Density



Narrative Summary

The City of Bellevue first developed as an automobile-oriented edge city but is now evolving as a multi-modal economic center that serves a diversity of people throughout the region. Past transportation decisions in Bellevue prioritized the efficient movement of commuters coming in and out of the city by car, creating safety challenges for people traveling on foot and bicycle. Now, Bellevue is addressing these safety challenges and building a safe, connected network for people walking, bicycling and taking transit.

Over the past 15 years, Bellevue has embarked on a data-driven approach to road safety focused on creating a low-stress network of pedestrian and bicycle routes that connect people to key destinations. Research from around the country shows that low-stress bicycle facilities boost bicycling rates and improve safety for all road users, not just those who are bicycling.[i] Bellevue's low-stress network is designed to connect users of all ages and abilities to important destinations to improve quality of life, mobility and access to economic opportunity. The full buildout of the planned Eastrail is an important complement to this safe transportation network and increases access to jobs, schools, and transit within Bellevue and beyond.

In an online questionnaire involving more than 1,200 people, 57% of respondents reported feeling unsafe riding a bicycle in Downtown, and 62% indicated they would ride a bike in Downtown more often if streets had safe and comfortable bike lanes. The City of Bellevue's Bicycle Level of Traffic Stress (LTS) analysis indicates that 66% of the Bike Bellevue arterial mileage provide bicyclists a Level 4 (highest-stress) experience – suitable for only those cyclists classified as "strong and fearless."

Bike Bellevue streets were selected with safety as the top priority; notably, 66% of streets associated with the project are on the HIN. FHWA Proven Safety Countermeasures (PSC) include separated bike lanes and road diets, resulting in improved safety on arterials accessing East Link light rail, the Eastrail shared use path, and the significant growth and development occurring in the Bike Bellevue geography.

Increased Access to Jobs

Construction of the Bike Bellevue Corridor projects will improve access to job opportunities for people living in Bellevue, with particular benefit for low-income residents.

- *By 2035, over 72,000 jobs will be directly accessible to a comfortable bicycle facility.*
- After the construction of the Bike Bellevue network, residents in the core of Bellevue will each be able to access 560 more jobs with a low-stress walk or bicycle ride, an 18% increase in the number of jobs accessible by a low-stress route.
- Job access benefits are even greater for low-income residents in Bellevue's core, who would each be able to access 670 new jobs (a 24% increase) with a low-stress walk or bicycle ride. Currently, 16% of all bicycle trips are made by low-income residents of Bellevue. The Bike Bellevue network will serve those who currently ride, as well as provide a low-cost, safe option for residents who don't currently feel comfortable riding a bicycle.
- When considered with the completed Eastrail, the economic impacts of constructing the Bike Bellevue network extend to the region as well, giving residents access to nearly 50 new jobs by a low-stress bicycle ride.

Increased Safe Routes to School

Implementing the Bike Bellevue network will allow significantly more people to walk or bicycle on a low-stress route to Bellevue schools, particularly increasing access for low-income residents to safe routes to school. The combination of

Eastrail construction with local improvements in the Bike Bellevue network provides an even larger increase in the number of people who can access schools on a safe, low-stress route.

- The construction of the Bike Bellevue network would provide safe access on a low-stress route for 550 more people to each Bellevue school citywide.
- Within the Bellevue core, over 2,200 more people would be able to get to school on a low-stress walking and biking route, which is a 35% increase.
- Construction of the Bike Bellevue improvements combined with the completion of Eastrail would allow nearly 2,700 more people to access schools on a low-stress walking or biking route, a 42% increase.
- Citywide, the average school would be accessible on a low-stress walking or biking route by 630 more people than today.
- For low-income residents within the Bellevue core, building the Bike Bellevue network along with completing Eastrail would allow 380 more people would be able to access a school on a low-stress walking or biking route.

Increased Safe Access to Transit

The Bike Bellevue Corridors will provide additional benefit by connecting into the regional transit network, amplifying the benefits to the Bellevue region in increased access to economic opportunities.

- The Bike Bellevue network would enable 750 more people on average to walk or bike on a low-stress connection to each transit stop within the Bellevue core, which is a 45% increase in the number of people with a safe route to transit.
- For low-income residents, the increase is even higher, with 71% more people able to access each transit stop through a low-stress walking or biking route, or 72 more low-income people able to safely walk or bike to transit each day.

Population Coverage of Benefit

The geographic impact of the Bike Bellevue investments combined with the full buildout of Eastrail reaches a large portion of the regional population. The number of people who would be able to access jobs along a low-stress pedestrian and bicycle route increases with the implementation of these projects:

- *By 2035, over 24,000 residents will be directly accessible to a comfortable bicycle facility.*
- 82,800 people in Bellevue would have increased job access via a low-stress pedestrian or bicycle route (55% of the population)
- 177,000 people in King County see an increase in job access via a low-stress pedestrian or bicycle route (8% of the population)

Marshall, [i] Wesley E. and Ferenchak, Nicholas N. “Why cities with high bicycling rates are safer for all road users,” Journal of Transport & Health, Volume 13, 2019, 100539, ISSN 2214-1405, https://doi.org/10.1016/j.jth.2019.03.004.

Draft Recommendations for Bus Stop Design Features on Bike Bellevue Corridors

FEHR PEERS

Memorandum

Date: September 6, 2023

To: Franz Loewenherz, City of Bellevue

From: Jiamin Tan and Chris Breiland, Fehr & Peers

Subject: Draft Recommendations for Bus Stop Design Features on Bike Bellevue Corridors

SE23-0896

Introduction

This memorandum summarizes our recommendations for bus stop accommodations on Bike Bellevue corridors. The recommendations are formed after examining published guidelines from local and national authorities and studying existing local practices. Based on considerations for ensuring predictable maneuvers for vehicles and bicycles, bus frequencies, and traffic volumes, we recommend one of the four treatments – a ramped curb extension, skip striping within the bike lane with Type C curb, skip striping within the bike lane without Type C curb, or bus stop consolidation – to each of the stops affected by the Bike Bellevue project along Bellevue-Redmond Road and 116th Avenue NE (the other Bike Bellevue Corridors will not have active bus stops following the East Link Connections bus service restructure in 2025). The following sections document the processes of forming the recommendations.

Guidance Reviewed

We reviewed local and national guidance of bike/bus interface and talked to transit and active mode design experts in Fehr & Peers to guide the specific recommendations. The first document we reviewed was the *King County Metro Transit Route Facilities Guidelines* (2020), but it does not provide any guidance on bus stop accommodations at bike/bus interfaces. We then reviewed the *Separated Bike Lane Planning and Design Guide* from the Federal Highway Administration (FHWA, 2015). The FHWA guide recommends fully separating bikes and buses only when there are more than four buses using the stop per hour[1]. There was no guidance relative to the volume of bicycle

[1] Federal Highway Administration, *Separated Bike Lane Planning and Design Guide,* pp.*59.*

riders in the lane. The guide also provides an example of implementing skip striping at a bus stop with frequencies of four buses per hour or less. In addition, we looked into the *Transit Street Design Guide* by the National Association of City Transportation Officials (NATCO, 2016). We found NACTO provides design guidelines on shared cycle track stops (bus stops with curb extension) while not mentioning when to implement such treatment from a bus frequency, ridership, or bike volume perspective[2].

In addition to the guidance listed above, we also reviewed some local practices. In Bellevue, a modular bus island was installed at 108th Ave NE & NE 2nd St in 2018 to separate buses from the bike lanes[3]. The stop had a maximum of 6 buses per hour during a weekday at the time the platform installed. **Figure 1** shows the stop before and after the treatment. Similarly, Seattle Department of Transportation implemented a concrete bus island along Gilman Ave W[4] (see **Figure 2**), although the passenger waiting area in this installation is small and does not meet Metro's eight foot minimum clearance. Therefore, in this example, the full length of the bus zone is raised for access.

At locations where there is not enough space for a full bus island, some jurisdictions have installed a curb extension with ramped bike lanes is adopted so that the buses can pull to the curb while staying in lane. **Figure 3** shows the bus stop with curb extension at NE 65th St & 8th Ave NE near Roosevelt light rail station. Bellevue recently installed a similar curb extension along Main St, west of 106th Ave NW (see **Figure 4**). Another strategy adopted when right-of-way is limited is to implement skip striping within the bike lane to denote where buses can be expected to encroach into the bike lane. **Figure 5** shows the bus stops with skip striping both in Seattle and Bellevue.

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[2] National Association of City Transportation Officials, "Transit Street Design Guide", *Transit Street Design Guide*. https://nacto.org/publication/transit-street-design-guide/stations-stops/stop-configurations/shared-cycle-track-stop/

[3] City of Bellevue. *Safer Bikes, Faster Buses with New Bus Platform*. https://bellevuewa.gov/city-news/safer-bikes-faster-buses-new-bus-platform

[4] Seattle Department of Transportation. *Gilman Ave W Transit and Bicycle Improvements*. Updated June 6, 2022. https://www.seattle.gov/transportation/projects-and-programs/programs/transit-program/gilman-ave-w-transit-and-bicycle-improvements

Figure 1: Bus Stop at 108th Ave NE & NE 2nd St Before (Left) and After (Right) Treatment.

Source: Google Maps.

Figure 2: Island Bus Stop with Ramped Bike Lane at Gilman Ave W & 27th Ave W, Seattle, WA

Source: Google Maps.

Figure 3: Bus Stop with Curb Extension at NE 65th St & 8th Ave NE, Seattle, WA

Source: Google Maps.

Figure 4: Bus Stop with Curb Extension at Main St, west of 106th Ave NE, Bellevue, WA

Source: Fehr & Peers.

Figure 5: Skip Striping at SE Avalon Way & SW Bradford St, Seattle (Left) and at Main St & 106th Ave, Bellevue (Right).

Source: Google Maps.

Design Expert Discussions

Given the lack of strong guidance from either local or national documents about the best treatments for low-volume bus stops like those on the Bike Bellevue corridors, we also talked with transit and active mode design experts within Fehr & Peers. The designers noted that the most recent experiences and discussions with transit agencies and city/county planners and engineers have indicated the following:

- If sufficient right-of-way is available, bus islands are the best choice because they provide visibility and space for bus patrons while separating bike riders from buses and people waiting for the bus.
- If there is not sufficient right-of-way for a bus island, transit agencies we have talked to have expressed a slight preference to the operations of the skip-striping bus treatment because it is easier for bus drivers to align with the curb in the event of an wheelchair ramp deployment (no risk of overlapping with the bike lane ramp) and it also avoids conflicts with bikes and people boarding/waiting for the bus. This treatment is less-preferred if there are very high bicycle volumes in the bike lanes. Examples cited have several hundred bicyclists per hour, which are higher than any of the volumes anticipated on the 116th Ave NE or Bel-Red Rd corridors.
- Traffic operations experts did identify a benefit of curb extensions of being more effective at dissuading drivers entering oncoming traffic or inappropriately using a two-way left-turn lane to pass buses since there is not a "partial travel lane" to attempt to sneak around the bus. However, a similar outcome can also be achieved with skip striping and a Type C mountable curb located in the centerline of the street. For this evaluation, we have identified Type C curb for bus stops located in areas with a single through lane and

opposing traffic immediately adjacent to the lane and curb extensions where there is a single lane adjacent to a two-way left-turn lane.

Draft Recommendations

Recommended bus stop treatments for this project are based on the guidance above and the future bus operations planned for the relevant Bike Bellevue corridors after King County Metro's East Link Connections project has been implemented. East Link Connections is planned to occur in conjunction with or after the initiation of full East Link (2 Line) service is established between Redmond and Lynnwood. **Table 1** summarizes the bus frequencies on the two relevant Bike Bellevue corridors – Bel-Red Road and 116th Avenue NE.

Table 2: Buses Routes on Bike Bellevue Corridors After East Link Opens

Route	Corridor	Weekday Peak Headway	Weekday Midday Headway
226	Bellevue-Redmond Rd	20 minutes	30 minutes
250	116th Ave NE	15 minutes	

Source: King County Metro, East Link Connections. https://kingcounty.gov/en/legacy/depts/transportation/metro/programs-projects/fares-routes-and-service/east-link-connections.aspx

Considering the planned bus frequencies and roadway design features (lane configurations, traffic volumes, proximity to intersections, availability of street crossings, etc.), we identified a preliminary draft recommended bus stop configuration for each relevant bus stop. The draft recommendations are shown in **Table 2**. **Figure 6** shows a map of recommendation at each bus stop. It is important to recognize that there is still work to be done to verify the bus stop treatments within the City of Bellevue and with King County Metro. The bus stop treatments have also not yet been included in the cost estimates as the specifics of curb work, striping, and other elements need to be finalized. Therefore, these draft recommendations are presented for information and discussion with the Transportation Commission and key stakeholders.

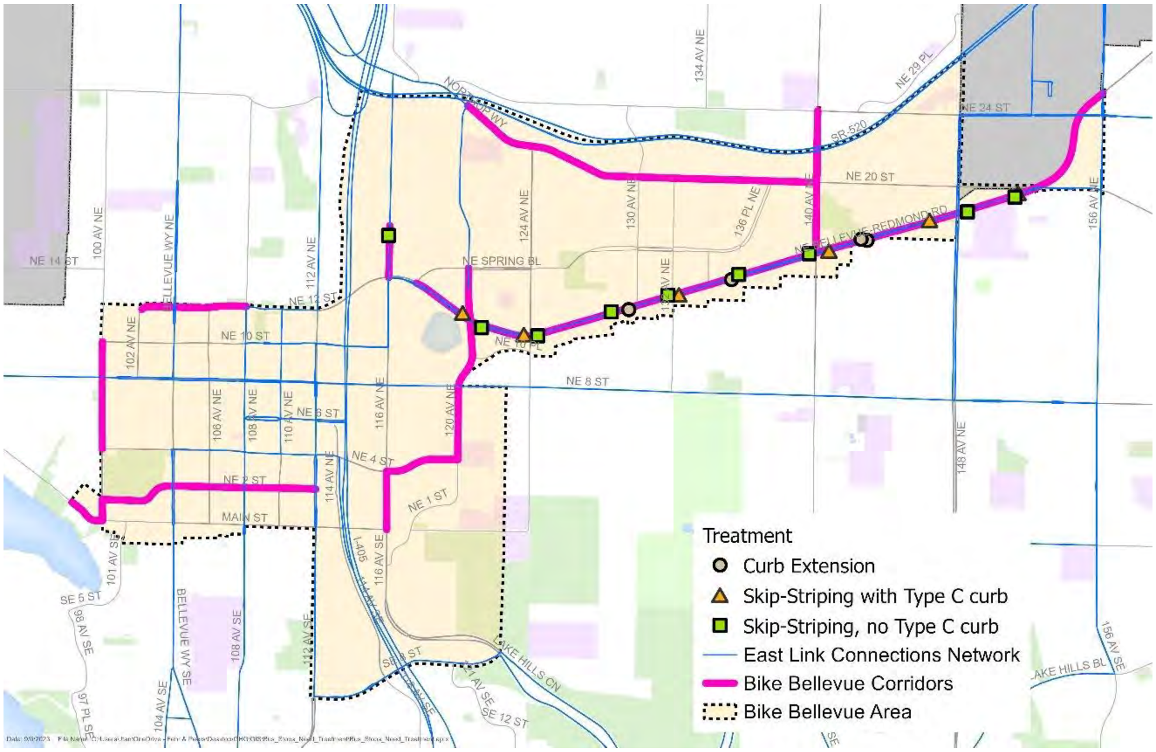
Table 2: DRAFT Recommended Bus Stop Treatment

Bus Stop	Draft Recommendation	Notes
116th Ave NE & NE 12 (SB) #73051	Skip-striping, no Type C curb	Midblock crossing island prevents vehicles entering two-way left-turn lane
NE 12th St & 120th Ave NE (WB) #84832	Skip-striping with Type C curb	One westbound vehicle lane. Type C curb prevents vehicles passing buses using the oncoming vehicle lane
NE 12th St & 120th Ave NE (EB) #68064	Skip-striping, no Type C curb	Two eastbound vehicle lanes allow vehicles to pass bus
NE 12th St & 124th Ave NE (WB) #84828	Skip-striping with Type C curb	One westbound vehicle lane. Type C curb prevents vehicles passing buses using the oncoming vehicle lane
NE 12th St & 124th Ave NE (EB) #68066	Skip-striping, no Type C curb	Two eastbound vehicle lanes allow vehicles to pass bus
Bel-Red Rd & 130th Ave NE (WB) #84827	Skip-striping, no Type C curb	Two westbound vehicle lanes allow vehicles to pass bus
Bel-Red Rd & 130th Ave NE (EB) #68065	Curb extension	One eastbound vehicle lane. Curb extension discourages vehicles passing buses using the two-way left turn lane
Bel-Red Rd & 132nd Ave NE (WB) #84826	Skip-striping, no Type C curb	Two westbound vehicle lanes allow vehicles to pass bus
Bel-Red Rd & 132nd Ave NE (EB) #68067	Skip-striping with Type C curb	One eastbound vehicle lane. Type C curb prevents vehicles passing buses using the oncoming vehicle lane
Bel-Red Rd & 136th Ave NE (WB) #84831	Skip-striping, no Type C curb	Two westbound vehicle lanes allow vehicles to pass bus
Bel-Red Rd & 136th Ave NE (EB) #68070	Curb extension	One eastbound vehicle lane. Curb extension discourages vehicles passing buses using the two-way left turn lane
Bel-Red Rd & 140th Ave NE (WB) #84824	Skip-striping, no Type C curb	Two westbound vehicle lanes allow vehicles to pass bus
Bel-Red Rd & 140th Ave NE (EB) #68068	Skip-striping with Type C curb	One eastbound vehicle lane. Type C curb prevents vehicles passing buses using the oncoming vehicle lane

Bel-Red Rd & 143rd Ave NE (WB) #84822	Curb extension	One westbound vehicle lane. Curb extension discourages vehicles passing buses using the two-way left turn lane
Bel-Red Rd & 143rd Ave NE (EB) #68069	Curb extension	One eastbound vehicle lane. Curb extension discourages vehicles passing buses using the two-way left turn lane
Bel-Red Rd & 148th Ave NE (WB) #84825	Skip-striping with Type C curb	One westbound vehicle lane. Type C curb prevents vehicles passing buses using the oncoming vehicle lane
Bel-Red Rd & 148th Ave NE (EB) #68063	Skip-striping, no Type C curb (potential to consolidate this bus stop with a single stop just east of the Highland Middle School traffic signal given close proximity to 152nd Ave NE).	Two eastbound lanes allow vehicles to pass bus
Bel-Red Rd & NE 20th St (WB) #84829	Skip-striping with Type C curb	One westbound vehicle lane. Type C curb prevents vehicles passing buses using the oncoming vehicle lane
Bel-Red Rd & 152nd Ave NE (EB) #84821	Skip-striping, no Type C curb (potential to consolidate this bus stop with a single stop just east of the Highland Middle School traffic signal given close proximity to 148th Ave NE).	Two eastbound lanes allow vehicles to pass bus

Source: Fehr & Peers, 2023.

Figure 6: DRAFT Recommended Treatment at Each Bus Stop Along Bike Bellevue Corridors



Source: Fehr & Peers, 2023.

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Appendix D: Sustainability

BKRCast Model Outputs

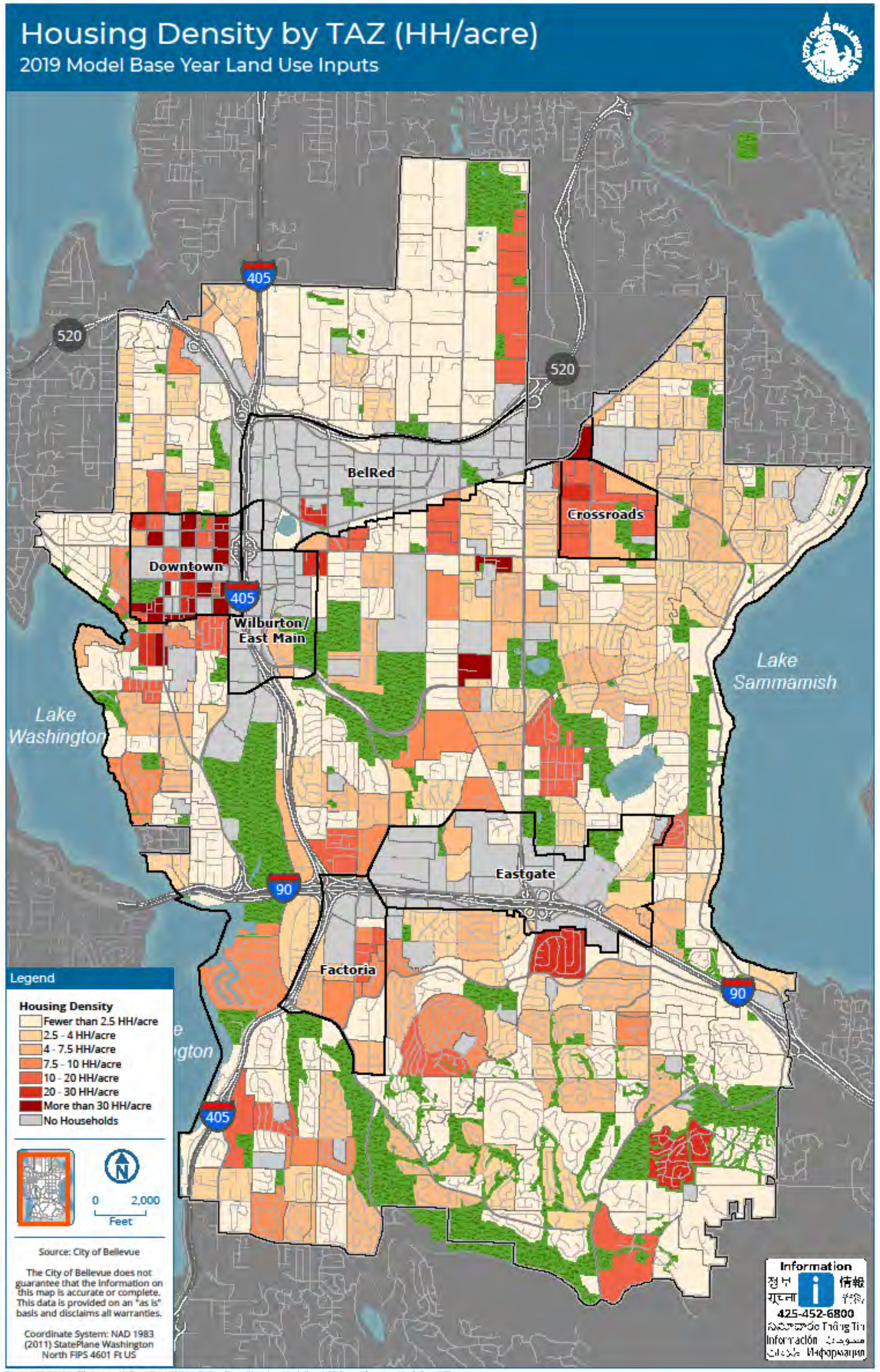
BKRCast Model Outputs

Modeling and Analysis Group

4/26/2023

Model Assumptions

- Land Use (No Build and Build):
  - TFP 2033 Land Use
- 30% Workers Working from Home (No Build and Build)
- Network (No Build)
  - TFP 2033 Network
  - Grand Connection
  - Spring Blvd between 124th and 130th
  - SR520 half interchange at 124th Ave NE
- Network (Build)
  - No Build + proposed 11 bike projects.



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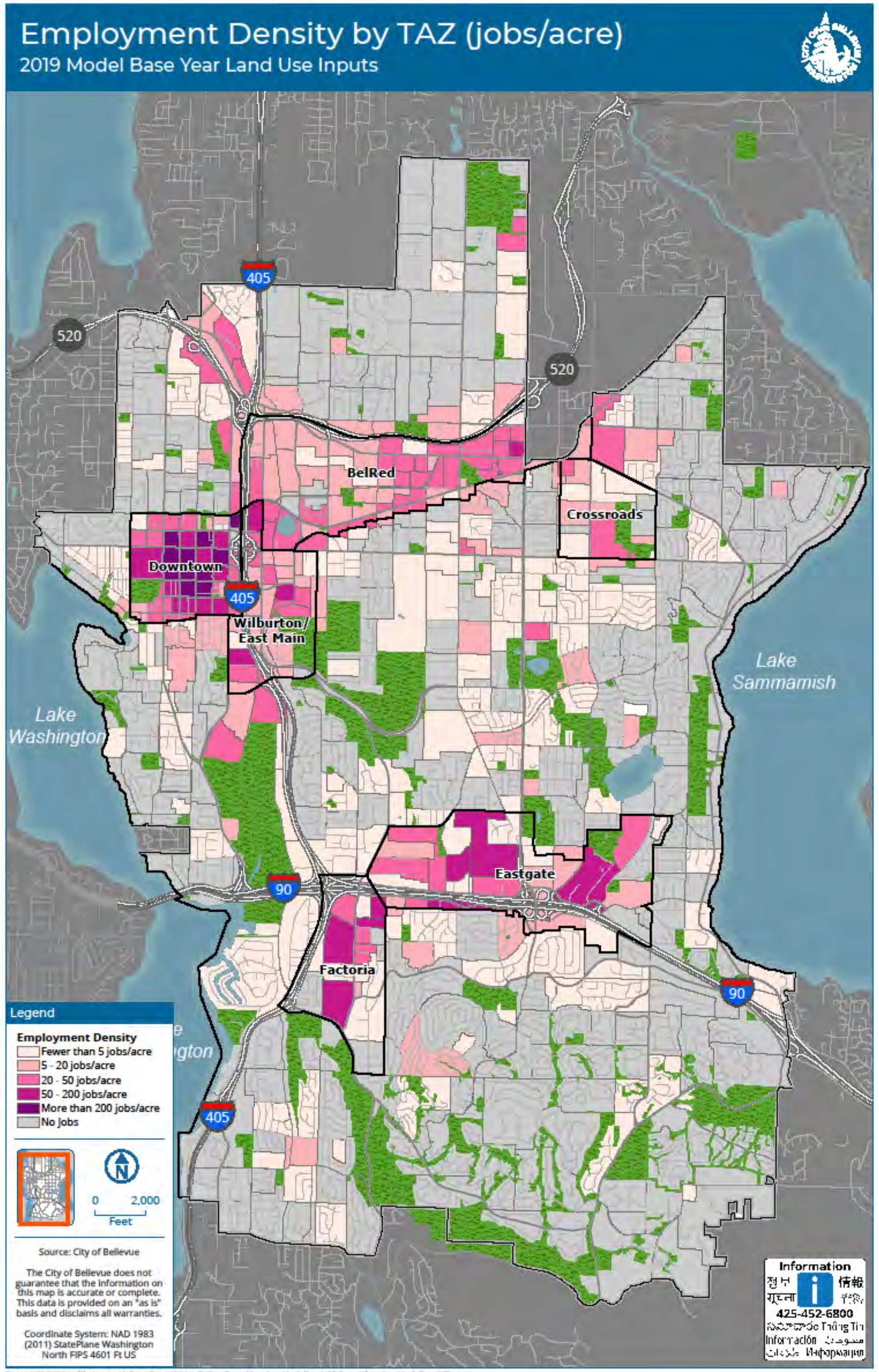

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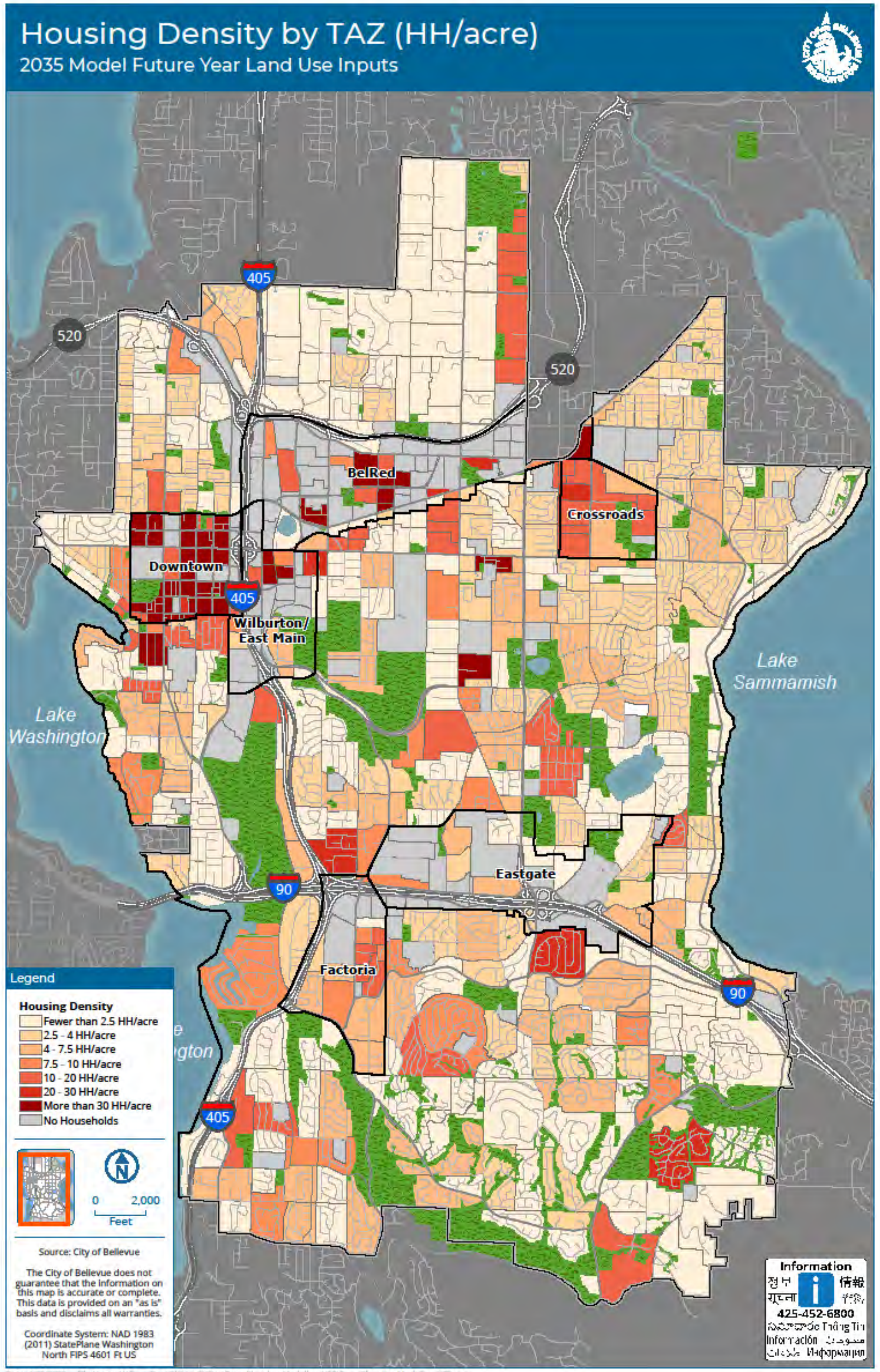

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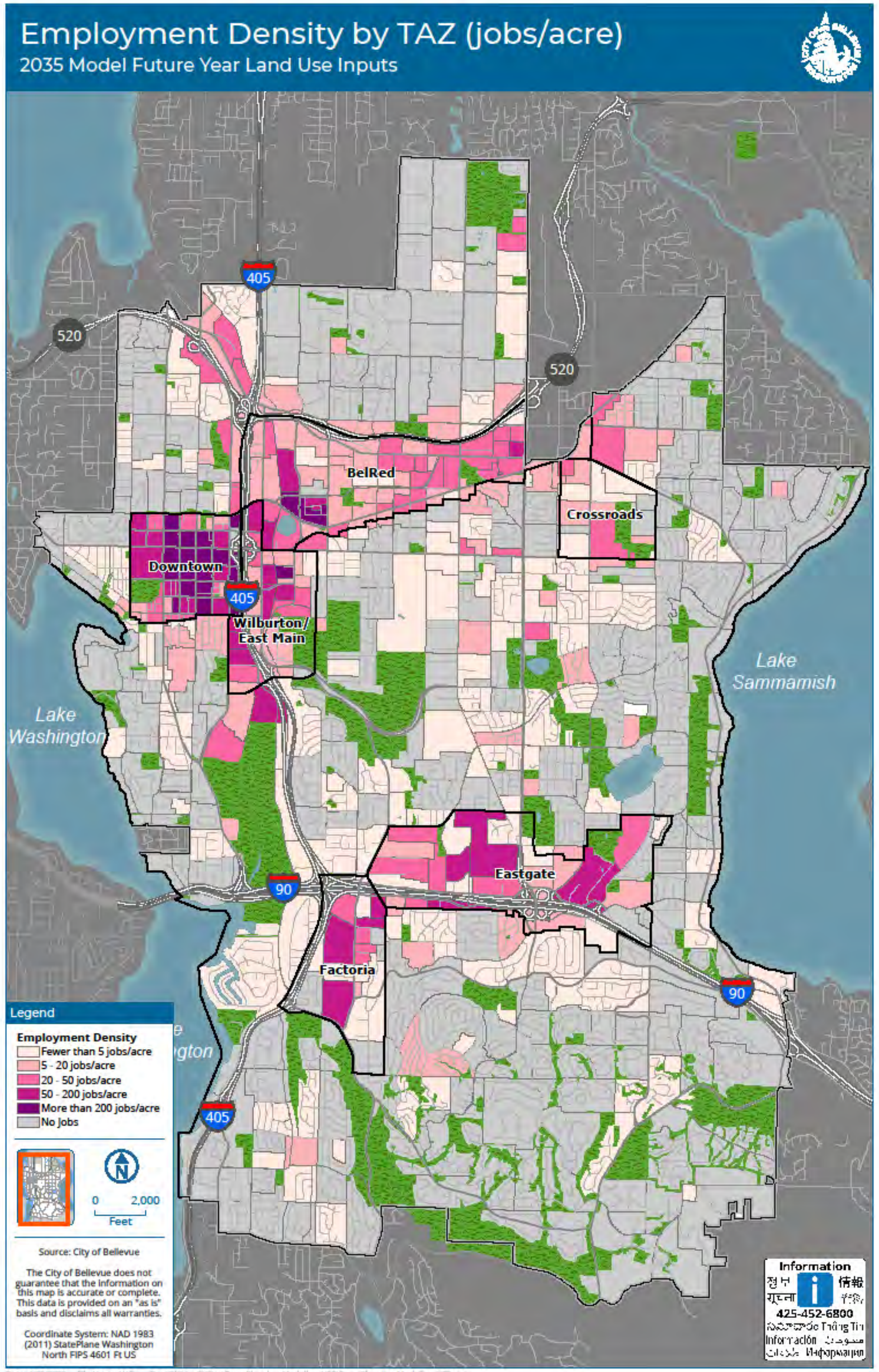

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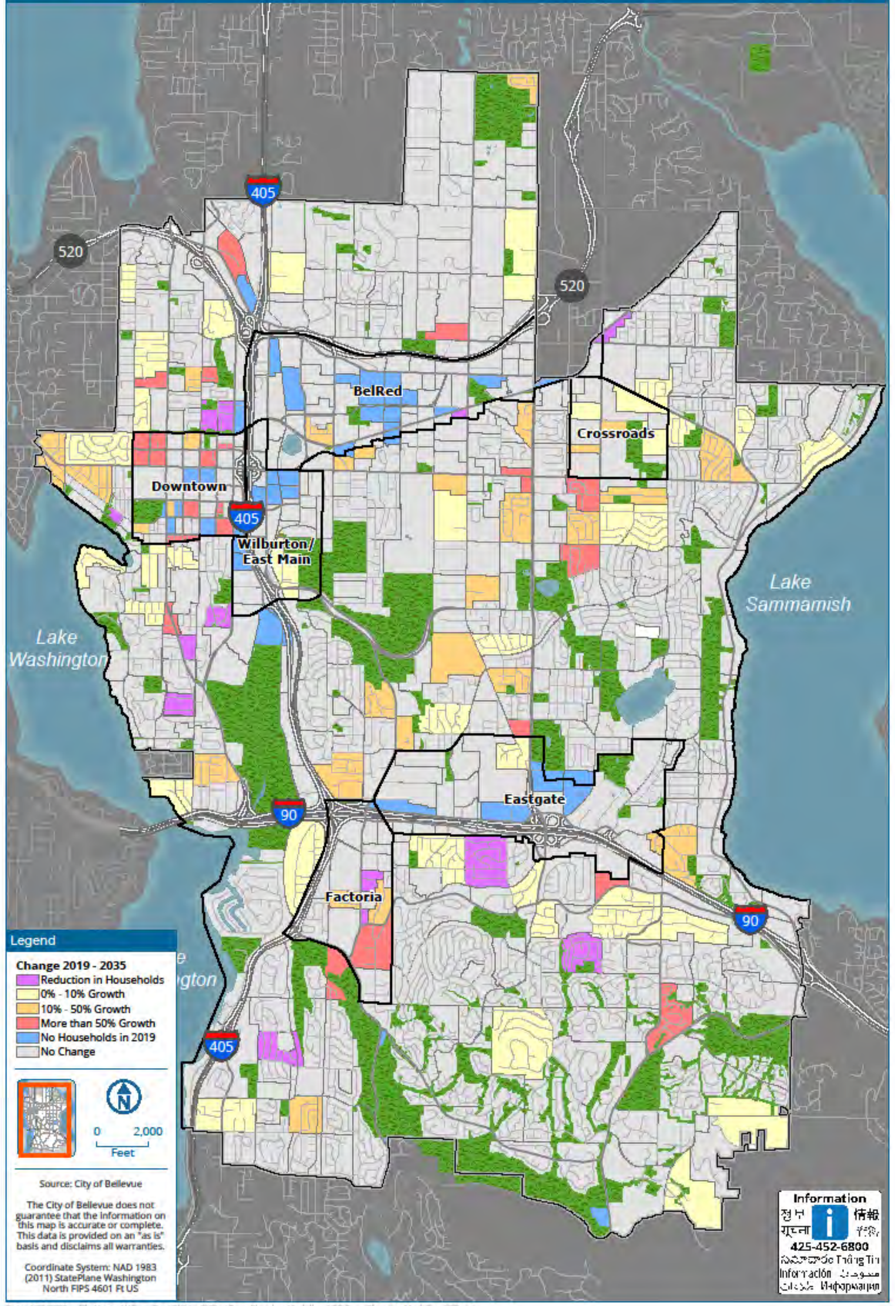
Change in Households by TAZ

2019 Model Base Year and 2035 Model Future Year Land Use Inputs



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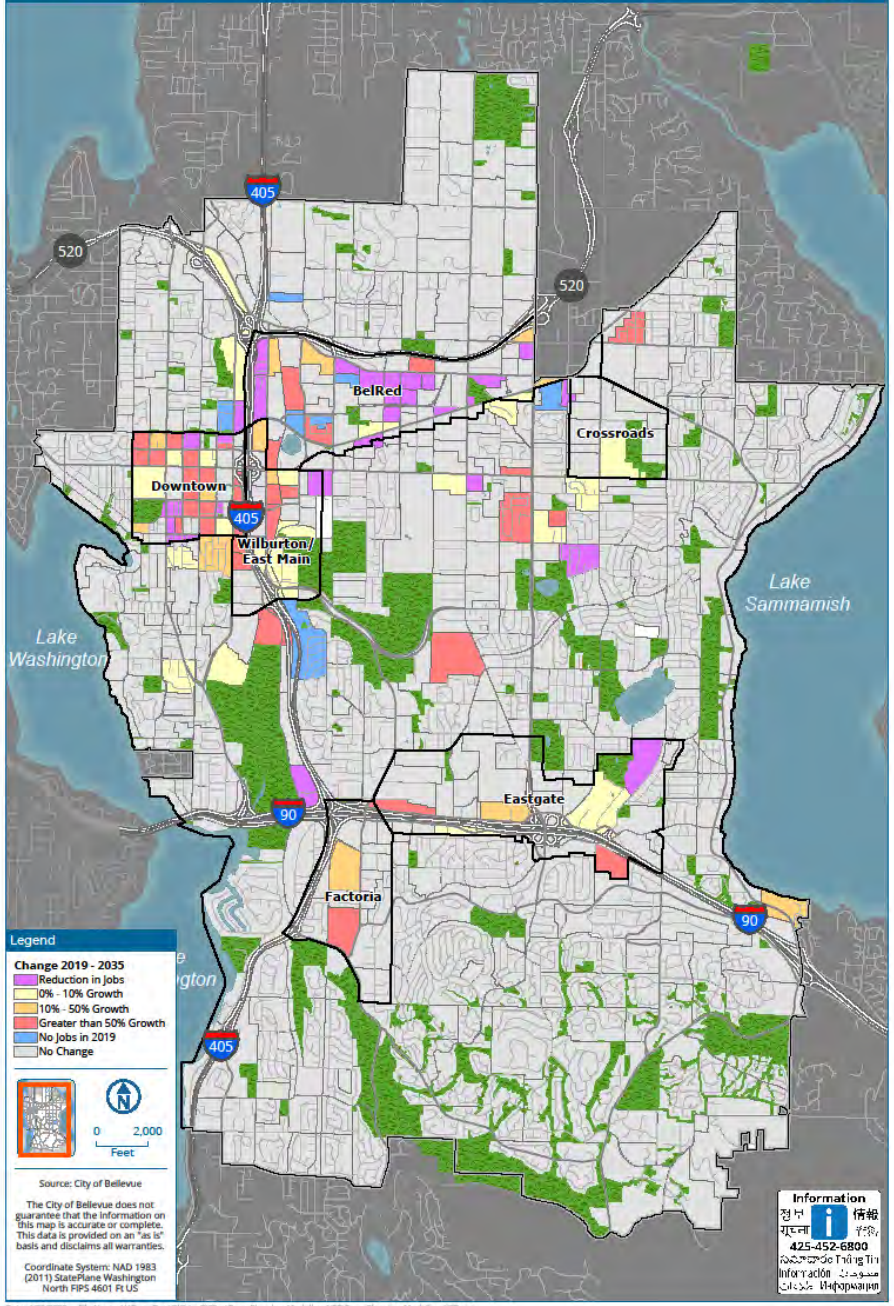
Change in Employment by TAZ

2019 Model Base Year and 2035 Model Future Year Land Use Inputs



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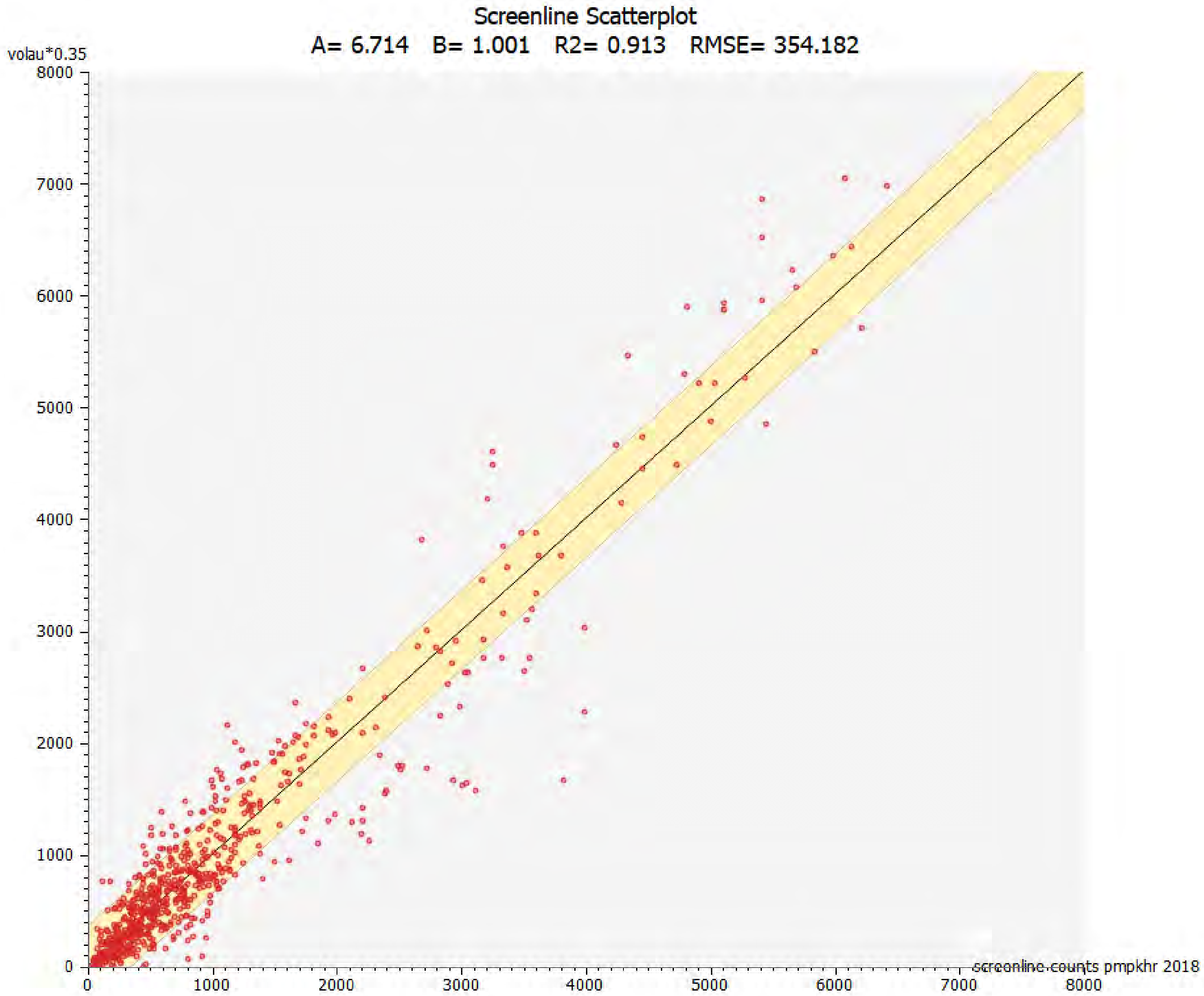
2019 PMPKHR Volume Comparison



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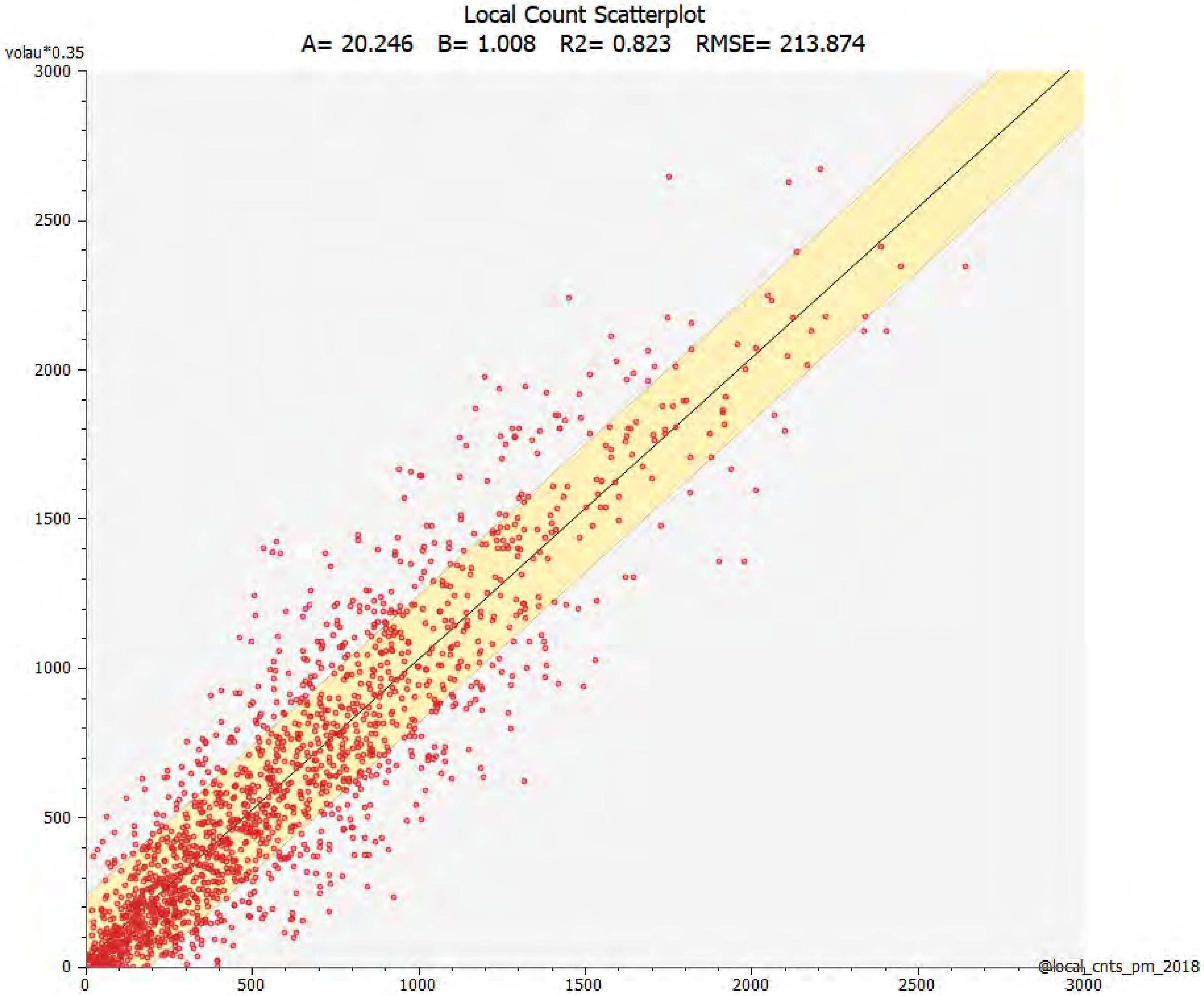

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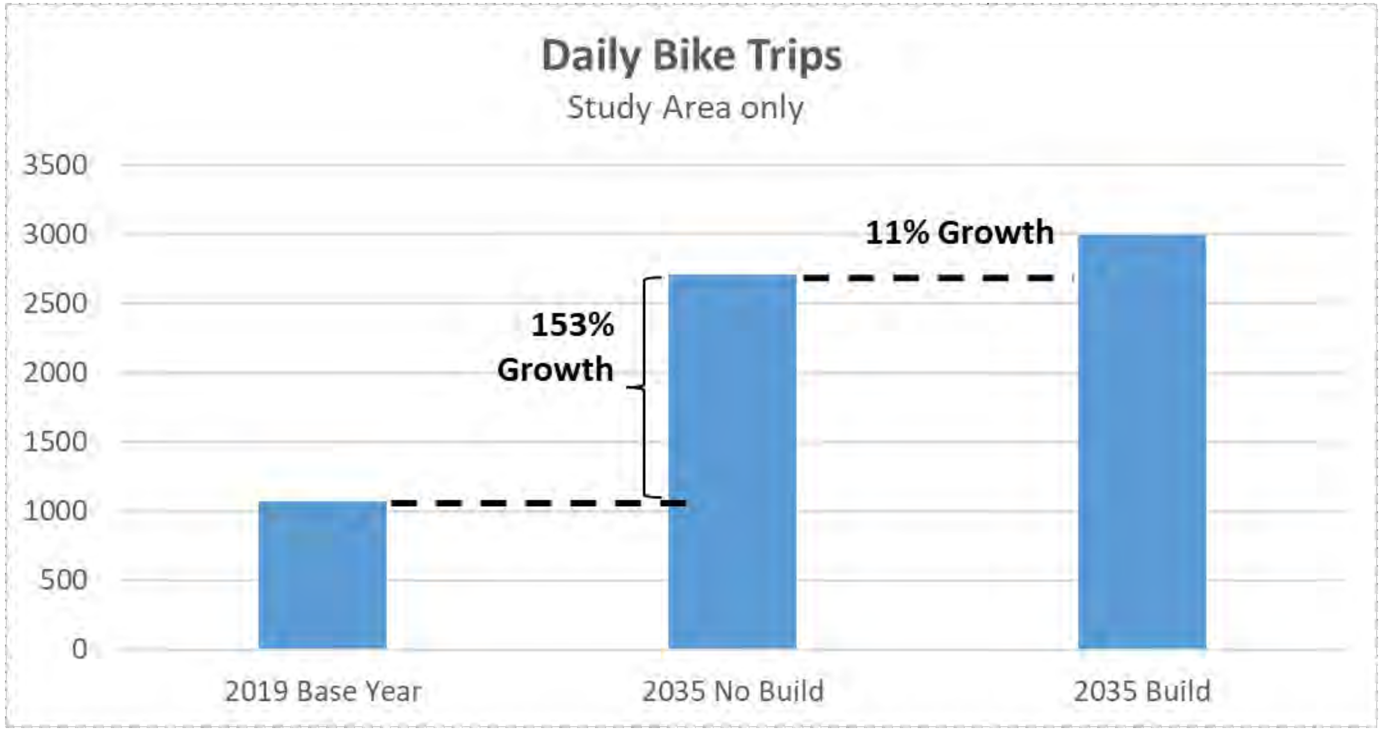
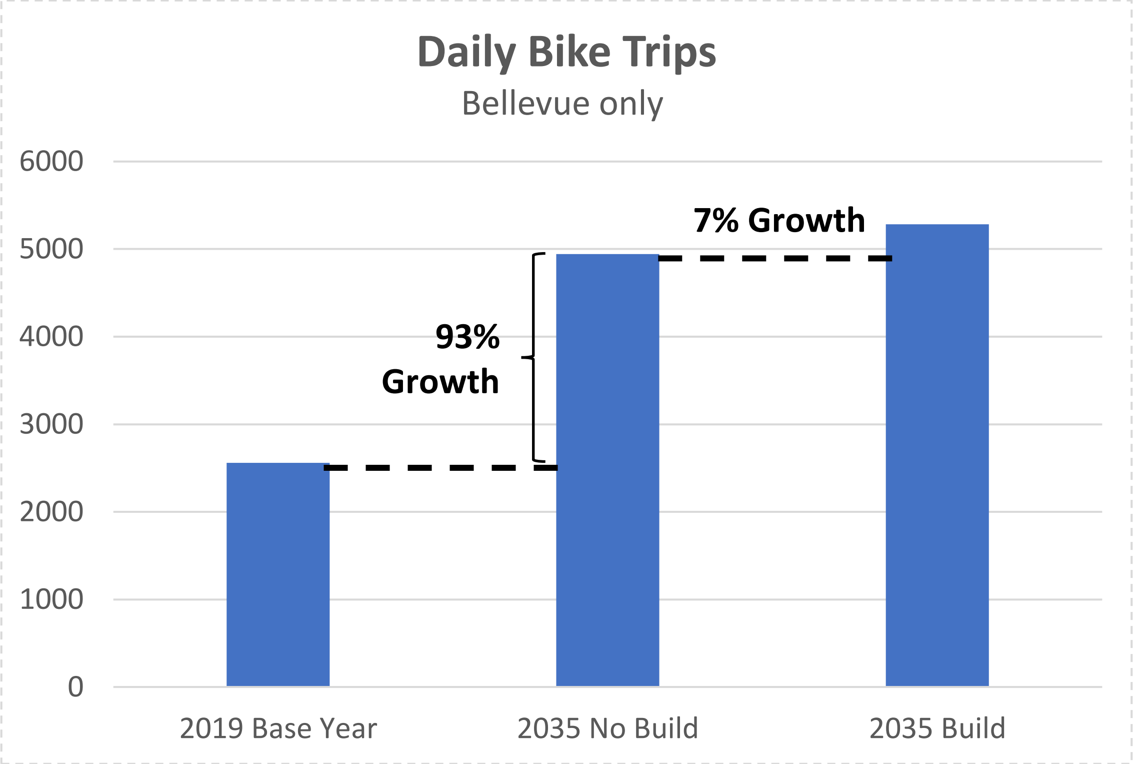
Daily Bike Trips

	Regional			Bellevue Trip Only			Study Area Only		
	Daily Bike Trips	Growth from 2019	% growth from 2019	Daily Bike Trips	Growth from 2019	% growth from 2019	Daily Bike Trips	Growth from 2019	% growth from 2019
2019 Base Year	41175			2561			1068		
2035 No Build	56970	15795	38%	4942	2381	93%	2706	1638	153%
2035 Build	57788	16613	40%	5284	2723	106%	2992	1924	180%





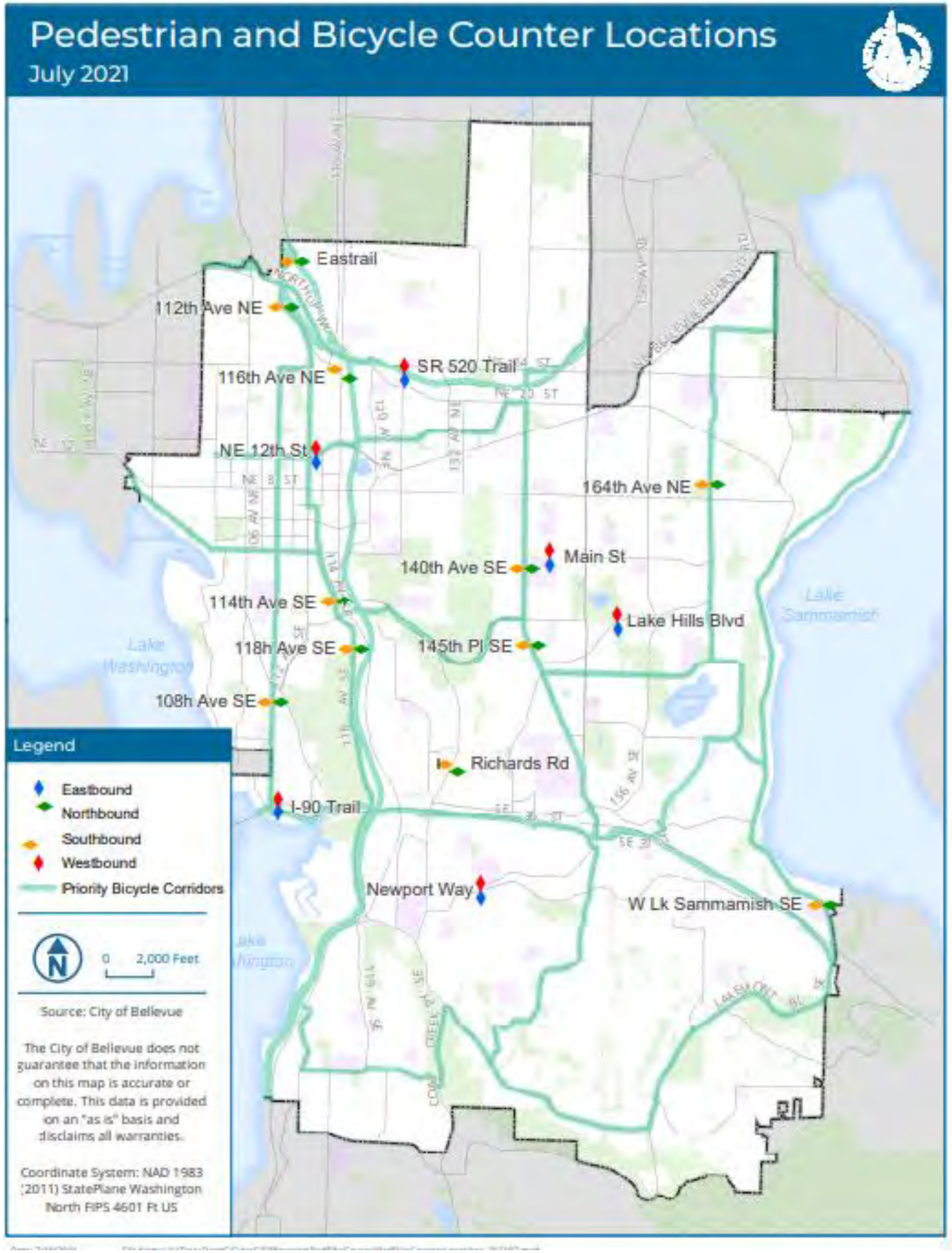
Bellevue bike trips (not trip ends):

trips originated from or destined for Bellevue.

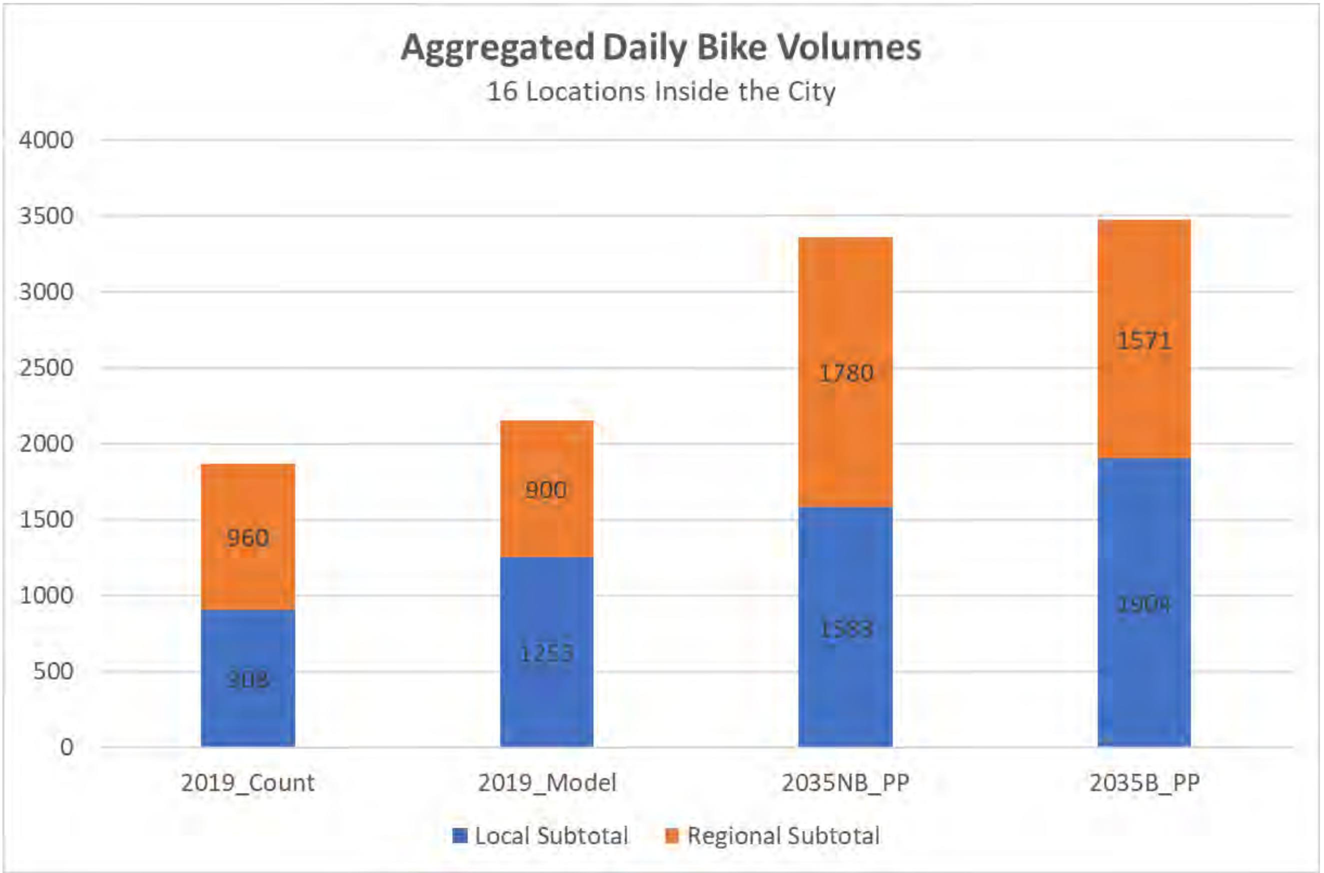
"D:\projects\Bike_Bellevue\bike_trips.xlsx"

Bike Counting Locations

- 13 locations on local streets
- 3 locations on regional trails
  - SR520 trail
  - I-90 trail
  - Eastrail



Bike Daily Volumes



	Daily			
	Count	2019_model	2035 No Build	2035 Build
112th Ave NE (south of SR 520)	78	59	126	172
116th Ave NE (south of SR 520)	214	137	220	399
NE 12th St (east of 112th)	44	235	237	297
114th Ave SE (n/o of SE 8th)	94	105	202	197
118th Ave SE (s/o SE 8th)	86	178	197	187
108th Ave SE (s/o Bellevue Way)	68	213	188	185
Newport Way (w/o of Allen Rd)	22	16	25	24
W Lk Smmsh SE (s/o SE 34th)	49	6	51	53
145th PL SE (s/o SE 8th St)	65	98	82	82
Lake Hill Blvd	20	20	27	31
140th Ave SE (s/o Main St)	65	137	101	135
Main St (e/o 140th Ave)	27	14	36	49
164th Ave NE (n/o NE 8th)	76	37	93	95
Local Subtotal	**908**	**1255**	**1583**	**1904**
Eastrail (close to SR 520)	108	128	366	340
I-90 Trail	476	416	732	735
SR520 trail	376	356	682	496
Regional Subtotal	**960**	**900**	**1780**	**1571**
Total	**1868**	**2155**	**3363**	**3475**

Bike counts: 2019 Averaged daily counts between April and October

"D:\projects\Bike_Bellevue\BKR3-19-6_v2\2019_bike_volums_comparison-BKR3-19-6.xlsx"

Daily VMT/VHT/VDT inside Bellevue

	daily_VMT			daily_VHT			daily_VDT		
	2019	2035 NB	2035 B	2019	2035 NB	2035 B	2019	2035 NB	2035 B
COB (w/ freeways)	4,652,110	5,138,210	5,124,446	128,486	138,808	138,251	21,700	23,032	22,875
COB (Local Streets Only)	1,804,028	1,842,693	1,830,395	61,687	63,144	62,821	5,420	5,589	5,632
Study Area (Local Streets Only)	427,738	473,423	462,058	13,953	15,704	15,482	372	548	662
Other COB Area (Local Streets Only)	1,376,289	1,369,271	1,368,336	47,735	47,441	47,339	5,049	5,041	4,970

Notes:
In general, we include freeways and ramps in VMT calculation. But when we zoom in to a much smaller area (like the Bike Bellevue study area), the VMT on local street system could be overshadowed by freeway system. Therefore, freeways and ramps are excluded from VMT calculation in the study area.

"D:\projects\Bike_Bellevue\bike_trips.xlsx"

Project Area (Tour includes a destination within the Type 1 PMAs)

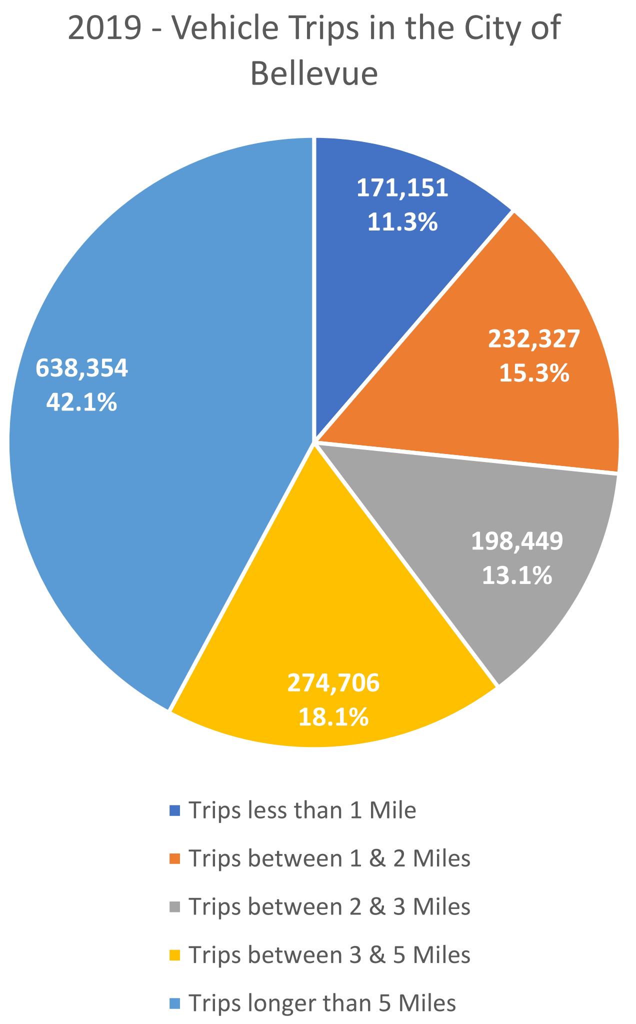
	2019				2035 - No Build				2035 - Build				Change (Build minus No Build)	
	All Purposes (includes sub-tours)		Work Purpose		All Purposes (includes sub-tours)		Work Purpose		All Purposes (includes sub-tours)		Work Purpose		All Purposes (includes sub-tours)	Work Purpose
Mode	Tours	Mode Share	Tours	Mode Share	Tours	Mode Share	Tours	Mode Share	Tours	Mode Share	Tours	Mode Share	Tours	Tours
Walk	35,256	15.7%	1,964	2.3%	71,703	20.6%	3,049	2.1%	71,581	20.6%	3,087	2.1%	-123	38
Bike	951	0.4%	126	0.1%	2,796	0.8%	309	0.2%	3,006	0.9%	309	0.2%	**210**	**0**
SOV	81,872	36.4%	50,681	58.5%	99,865	28.7%	64,288	43.8%	99,444	28.6%	64,183	43.8%	-421	-105
HOV 2 persons	52,841	23.5%	14,271	16.5%	64,527	18.5%	19,729	13.5%	64,005	18.4%	19,607	13.4%	-522	-122
HOV 3+ persons	37,102	16.5%	7,530	8.7%	41,329	11.9%	9,914	6.8%	41,652	12.0%	9,976	6.8%	323	62
Transit Walk Access	7,211	3.2%	4,302	5.0%	49,958	14.4%	37,712	25.7%	50,002	14.4%	37,734	25.7%	44	22
Transit Auto Access	7,778	3.5%	7,778	9.0%	11,558	3.3%	11,669	8.0%	11,617	3.3%	11,726	8.0%	59	57
School Bus	1,997	0.9%	0	0.0%	6,372	1.8%	0	0.0%	6,373	1.8%	0	0.0%	1	0
Total	**225,008**	**100%**	**86,652**	**100%**	**348,109**	**100%**	**146,670**	**100%**	**347,680**	**100%**	**146,622**	**100%**	**-429**	**-48**
Auto	**171,815**	**76.4%**	**72,482**	**83.6%**	**205,721**	**59.1%**	**93,931**	**64.0%**	**205,101**	**59.0%**	**93,766**	**64.0%**	**-620**	**-165**
Transit / School Bus	**16,986**	**7.5%**	**12,080**	**13.9%**	**67,888**	**19.5%**	**49,381**	**33.7%**	**67,992**	**19.6%**	**49,460**	**33.7%**	**104**	**79**
Non-Motorized	**36,207**	**16.1%**	**2,090**	**2.4%**	**74,499**	**21.4%**	**3,358**	**2.3%**	**74,587**	**21.5%**	**3,396**	**2.3%**	**88**	**38**

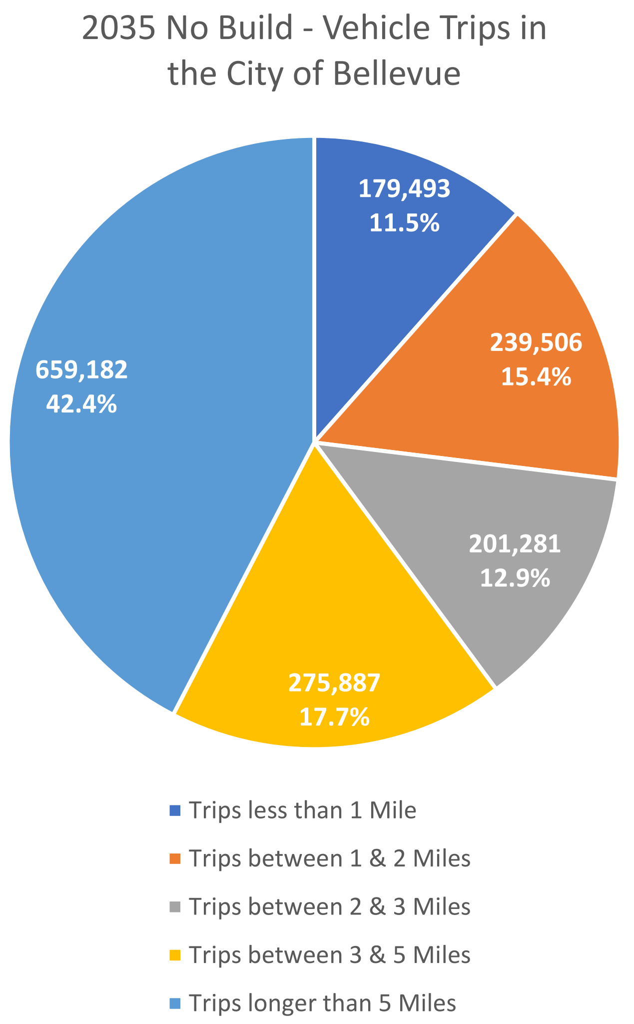
Citywide (Tour includes a destination within the City of Bellevue)

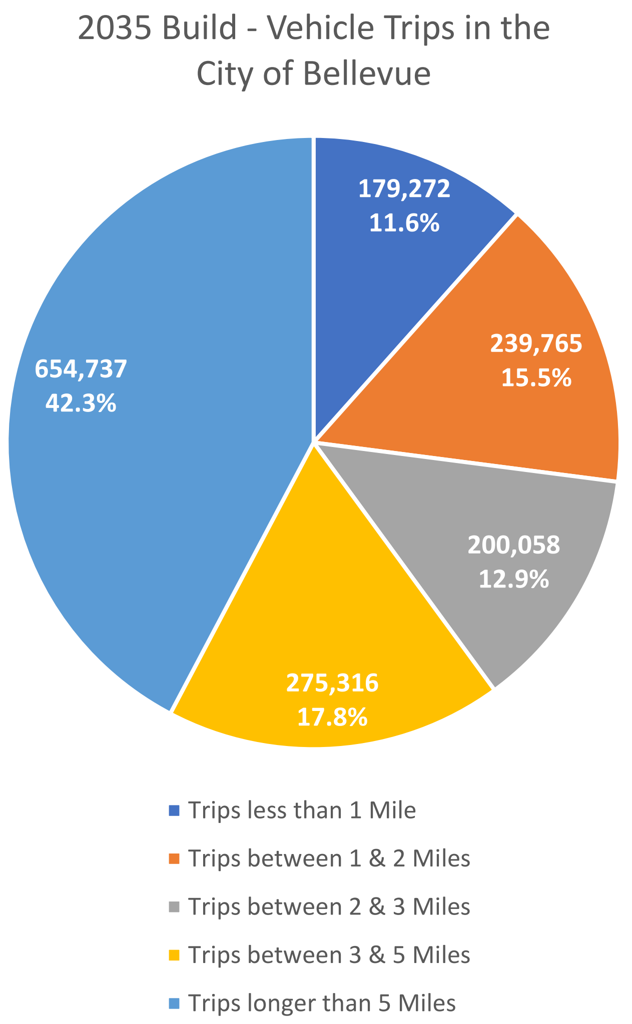
	2019				2035 - No Build				2035 - Build				Change (Build minus No Build)	
	All Purposes (includes sub-tours)		Work Purpose		All Purposes (includes sub-tours)		Work Purpose		All Purposes (includes sub-tours)		Work Purpose		All Purposes (includes sub-tours)	Work Purpose
Mode	Tours	Mode Split	Tours	Mode Split	Tours	Mode Split	Tours	Mode Split	Tours	Mode Split	Tours	Mode Split	Tours	Tours
Walk	74,896	12.0%	2,752	1.4%	118,126	15.3%	3,872	1.5%	118,410	15.3%	3,887	1.5%	284	15
Bike	2,544	0.4%	258	0.1%	5,417	0.7%	534	0.2%	5,793	0.8%	547	0.2%	**376**	**13**
SOV	215,805	34.7%	123,746	62.4%	237,492	30.8%	130,517	51.2%	236,440	30.7%	130,017	51.1%	-1,052	-500
HOV 2 persons	155,667	25.0%	33,569	16.9%	167,691	21.7%	37,483	14.7%	166,572	21.6%	37,538	14.7%	-1,118	55
HOV 3+ persons	128,078	20.6%	18,052	9.1%	123,316	16.0%	19,454	7.6%	123,910	16.1%	19,550	7.7%	594	96
Transit Walk Access	13,378	2.1%	6,718	3.4%	71,166	9.2%	46,156	18.1%	71,378	9.3%	46,198	18.1%	213	42
Transit Auto Access	13,129	2.1%	13,129	6.6%	16,495	2.1%	16,683	6.6%	16,686	2.2%	16,876	6.6%	191	193
School Bus	18,958	3.0%	0	0.0%	32,153	4.2%	0	0.0%	32,223	4.2%	0	0.0%	70	0
Total	**622,455**	**100%**	**198,224**	**100%**	**771,855**	**100%**	**254,699**	**100%**	**771,413**	**100%**	**254,613**	**100%**	**-442**	**-86**
Auto	**499,550**	**80.3%**	**175,367**	**88.5%**	**528,500**	**68.5%**	**187,454**	**73.6%**	**526,923**	**68.3%**	**187,105**	**73.5%**	**-1,577**	**-349**
Transit / School Bus	**45,465**	**7.3%**	**19,847**	**10.0%**	**119,813**	**15.5%**	**62,839**	**24.7%**	**120,287**	**15.6%**	**63,074**	**24.8%**	**474**	**235**
Non-Motorized	**77,440**	**12.4%**	**3,010**	**1.5%**	**123,542**	**16.0%**	**4,406**	**1.7%**	**124,203**	**16.1%**	**4,434**	**1.7%**	**661**	**28**

Citywide (Either end of the trip in the City of Bellevue)

Trip Purpose	2019			2035 - No Build			2035 - Build		
	Trips	Share	Average Distance	Trips	Share	Average Distance	Trips	Share	Average Distance
Home	585,824	31.4%	6.5	699,440	31.7%	6.1	698,913	31.7%	6.1
Work	291,887	15.7%	8.6	365,740	16.6%	8.7	364,789	16.5%	8.7
School	79,784	4.3%	4.8	132,252	6.0%	4.9	132,339	6.0%	4.9
Escort	135,841	7.3%	5.3	140,824	6.4%	5.4	140,456	6.4%	5.4
Personal Buisiness	204,255	11.0%	5.0	220,074	10.0%	4.8	220,089	10.0%	4.8
Shopping	234,119	12.6%	4.2	246,970	11.2%	4.1	246,121	11.2%	4.1
Meal	119,225	6.4%	4.4	152,993	6.9%	3.9	152,506	6.9%	3.8
Social	198,285	10.6%	4.6	233,049	10.6%	4.2	232,605	10.5%	4.2
Change	13,552	0.7%	5.2	17,138	0.8%	6.2	17,354	0.8%	6.1
Total	**1,862,772**	**100%**	**5.9**	**2,208,480**	**100%**	**5.7**	**2,205,172**	**100%**	**5.7**



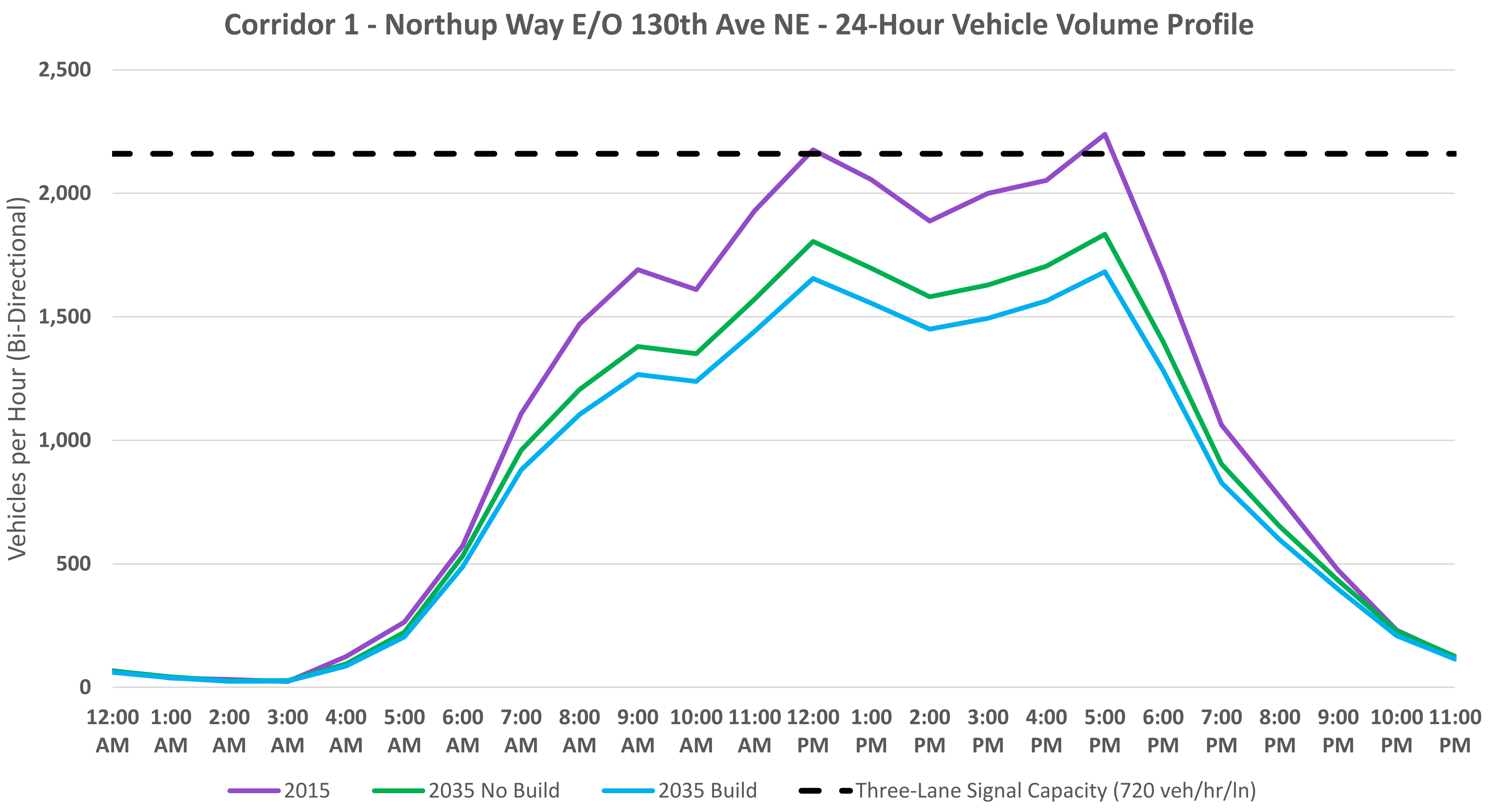




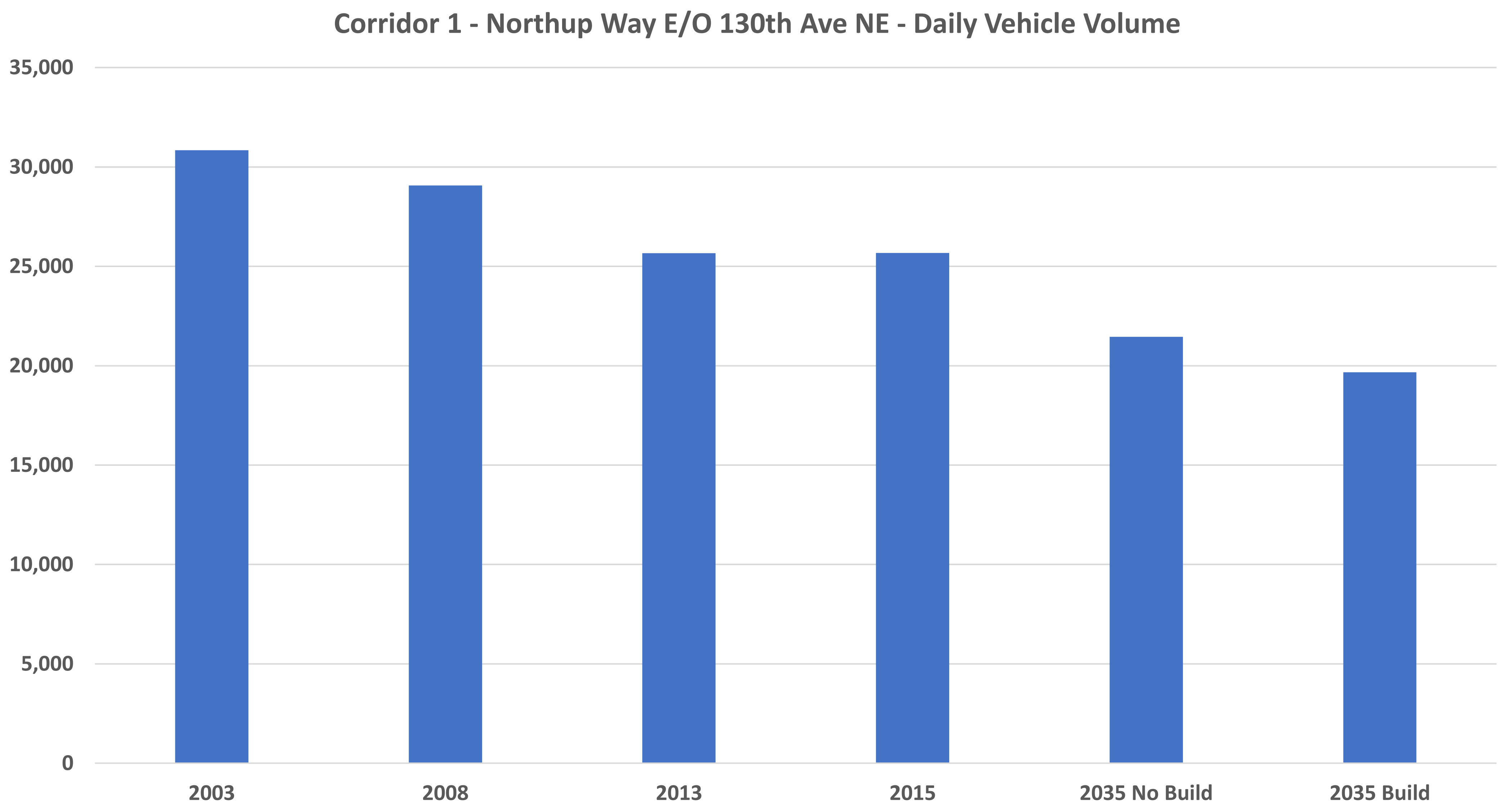
Data includes vehicle trips to, from, and within the City of Bellevue

Daily Vehicle Volumes and 24-Hour Profiles

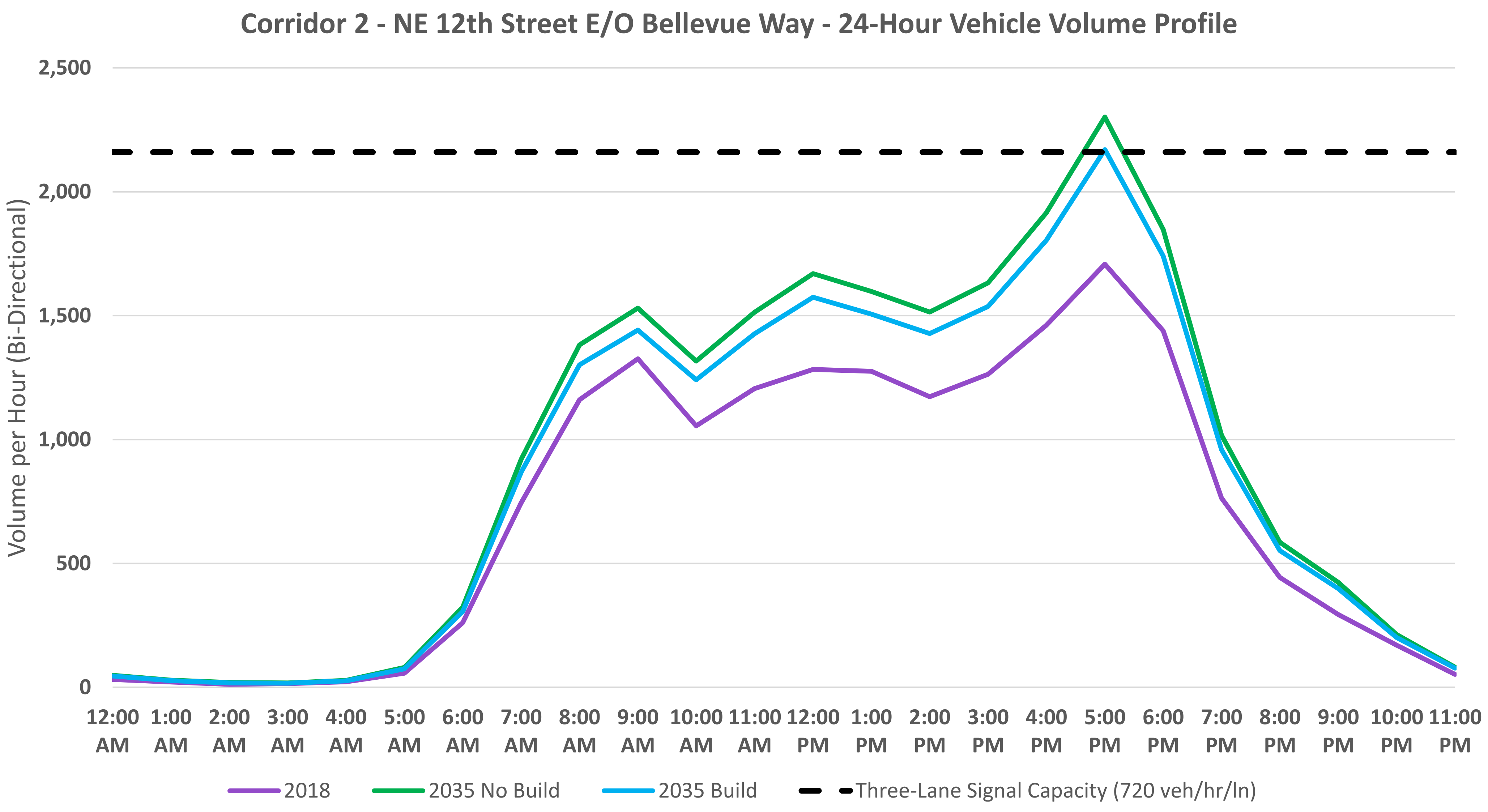
- Future 24-Hour vehicle volume profiles were developed using a weighted average derived from historic count data for each corridor
- No Build and Build volumes are based on the same profile for each corridor
- 2035 No Build and Build model volumes were post-processed to develop daily vehicle volume estimates
- Capacity threshold represents bi-directional Build conditions
- The capacity threshold of 720 vehicles/hour/lane is the default capacity from *NCHRP Report 1036: Roadway Cross-Section Reallocation: A Guide* for volume profile analysis
  - Original Source: Exhibit 47 of *NCHRP Report 825: Planning and Preliminary Engineering Applications Guide to the Highway Capacity Manual*

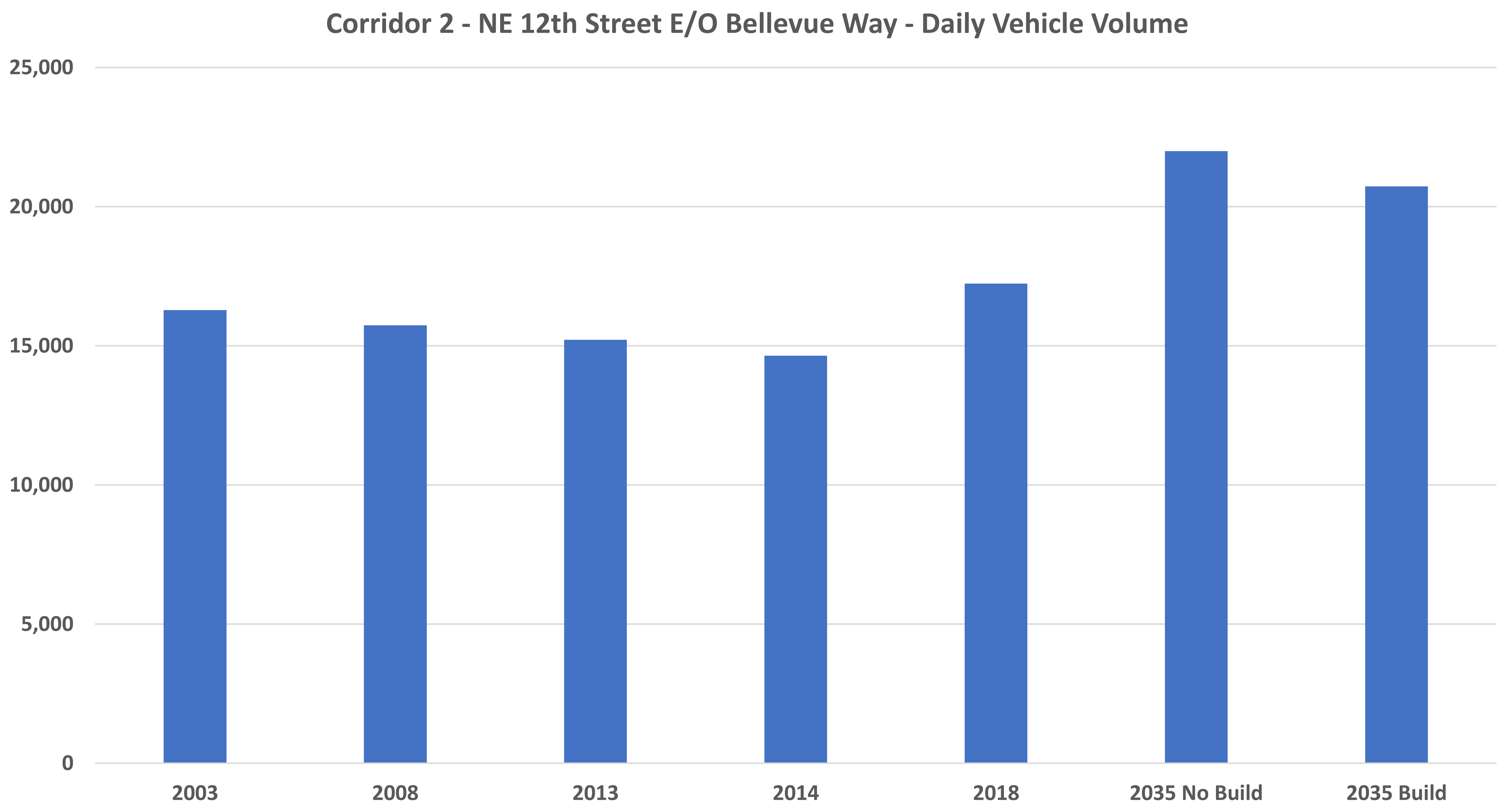


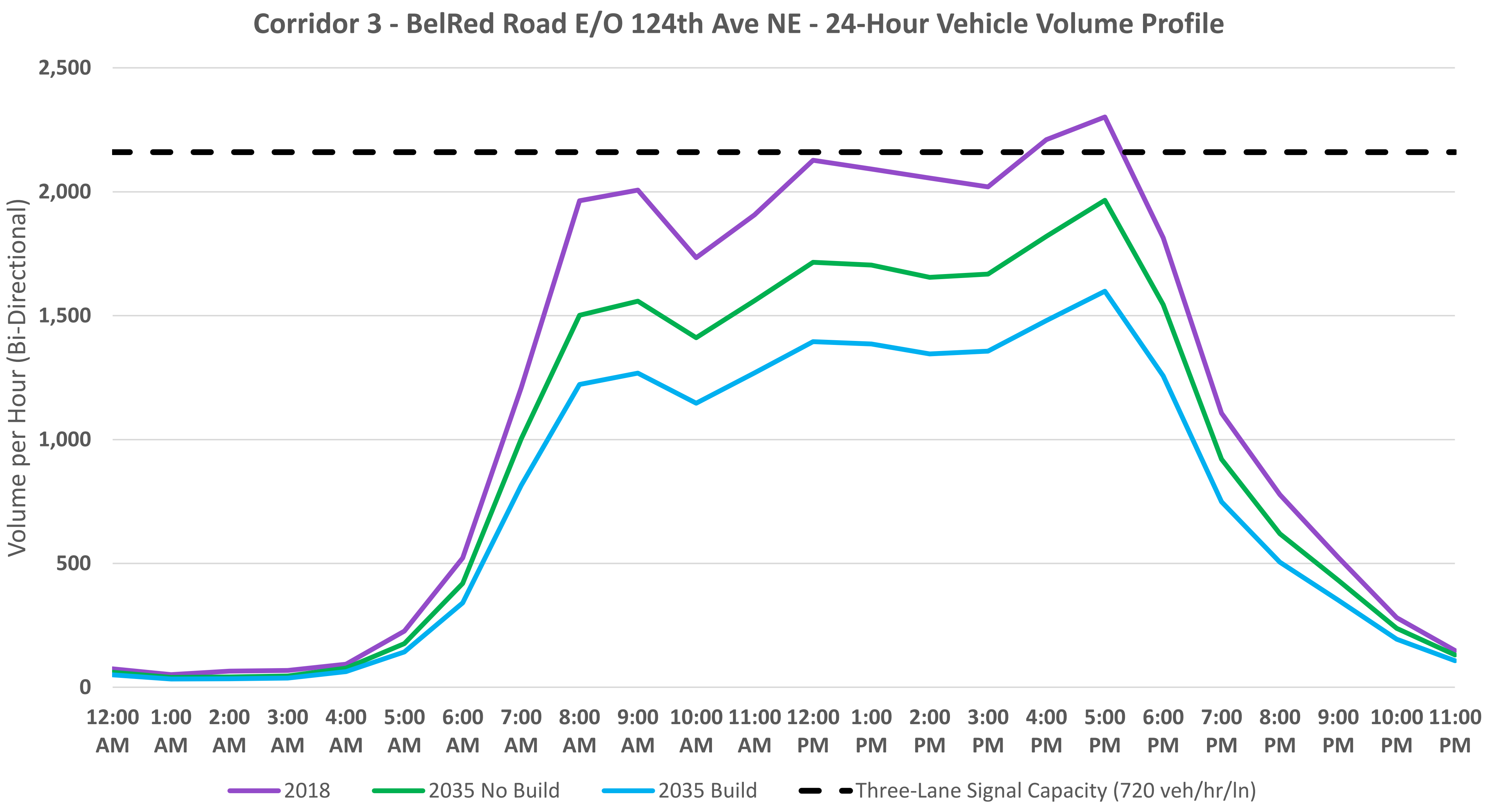
Corridor 1 - Northup Way E/O 130th Ave NE - 24-Hour Vehicle Volume Profile
Vehicles per Hour (Bi-Directional)
2,500
2,000
1,500
1,000
500
0
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
11:00 PM
2015
2035 No Build
2035 Build
Three-Lane Signal Capacity (720 veh/hr/ln)

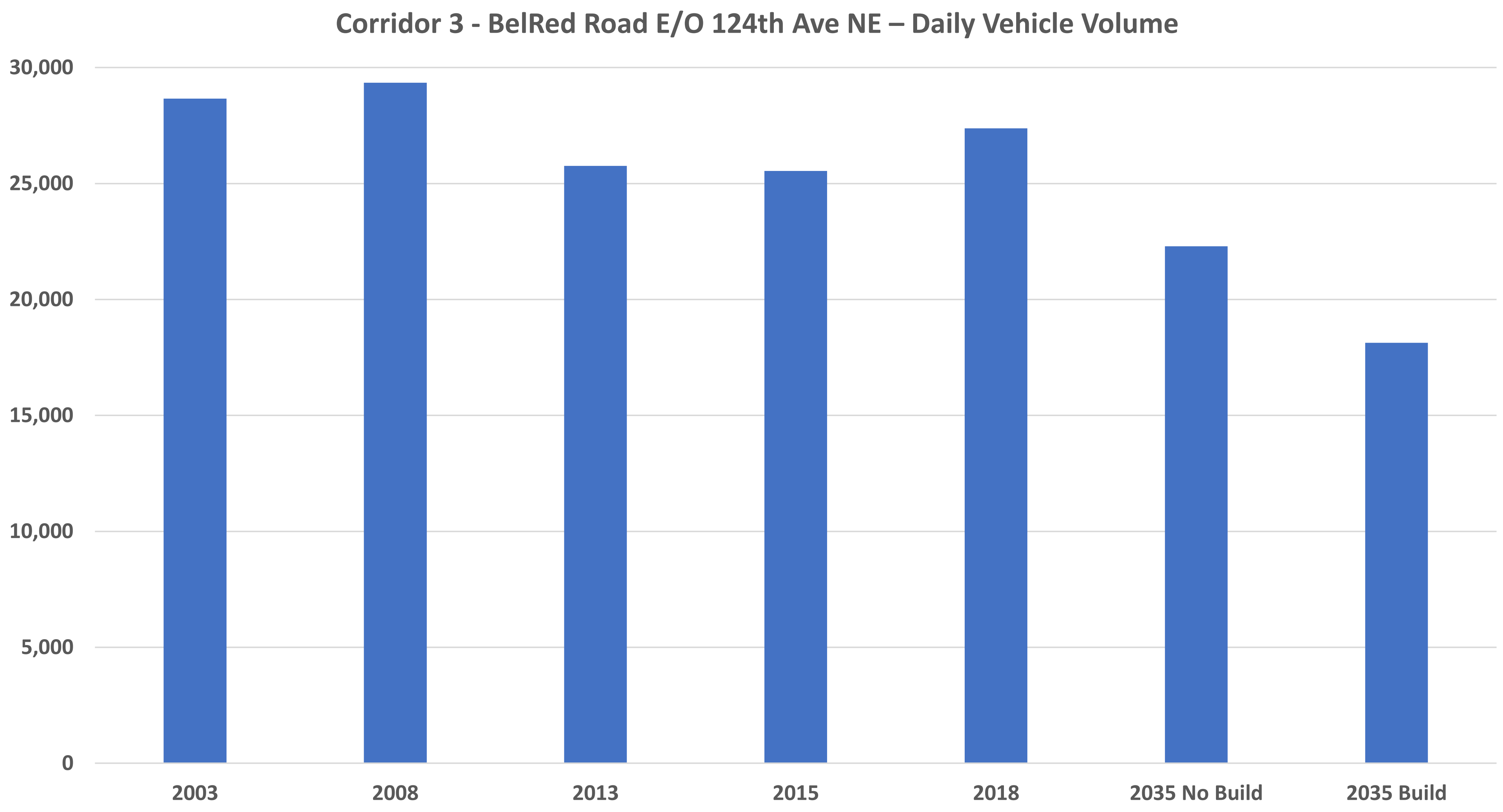


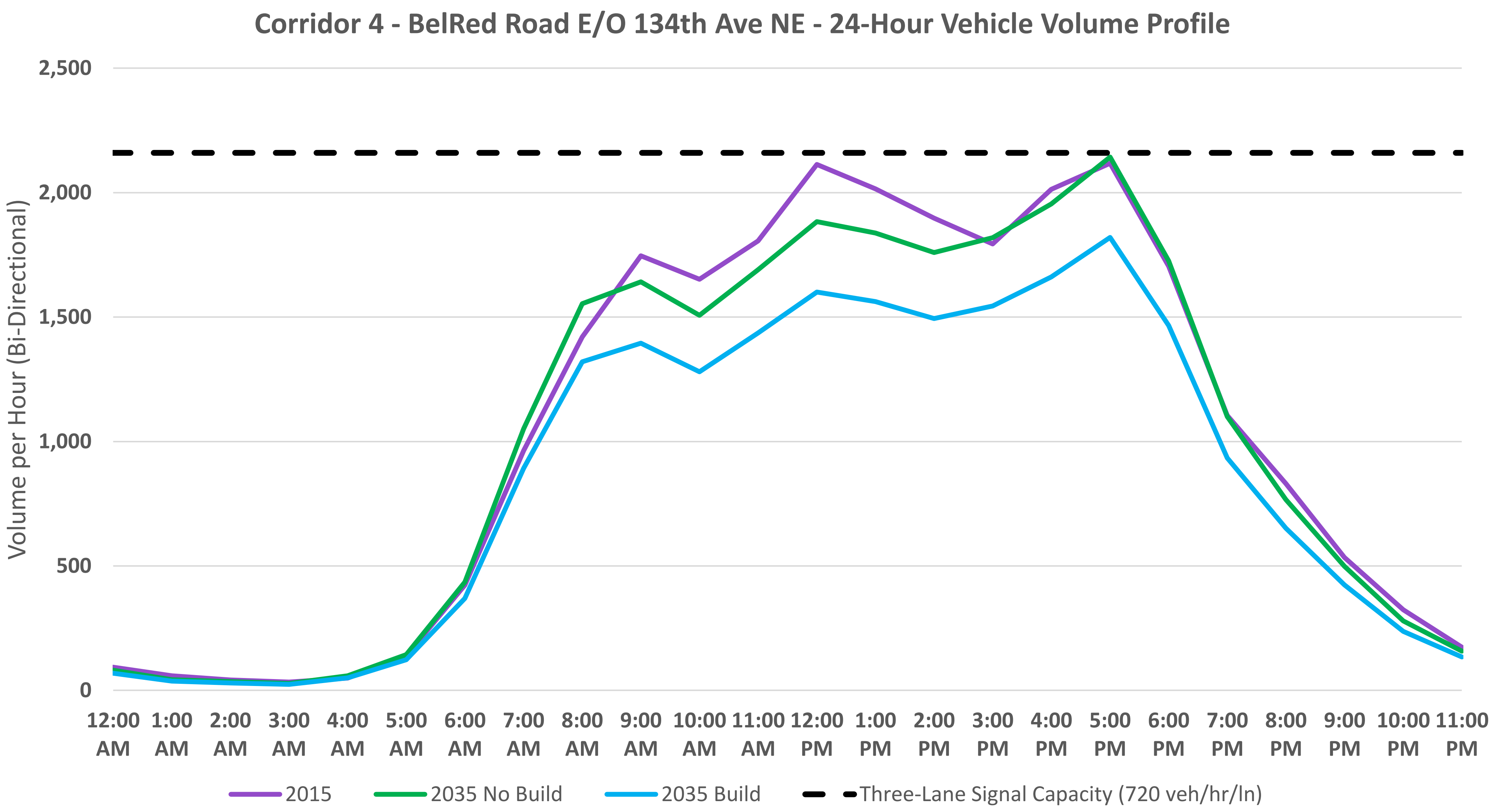
Corridor 1 - Northup Way E/O 130th Ave NE - Daily Vehicle Volume
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
2003
2008
2013
2015
2035 No Build
2035 Build


Corridor 2 - NE 12th Street E/O Bellevue Way - 24-Hour Vehicle Volume Profile
Volume per Hour (Bi-Directional)
2,500
2,000
1,500
1,000
500
0
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
11:00 PM
2018
2035 No Build
2035 Build
Three-Lane Signal Capacity (720 veh/hr/ln)

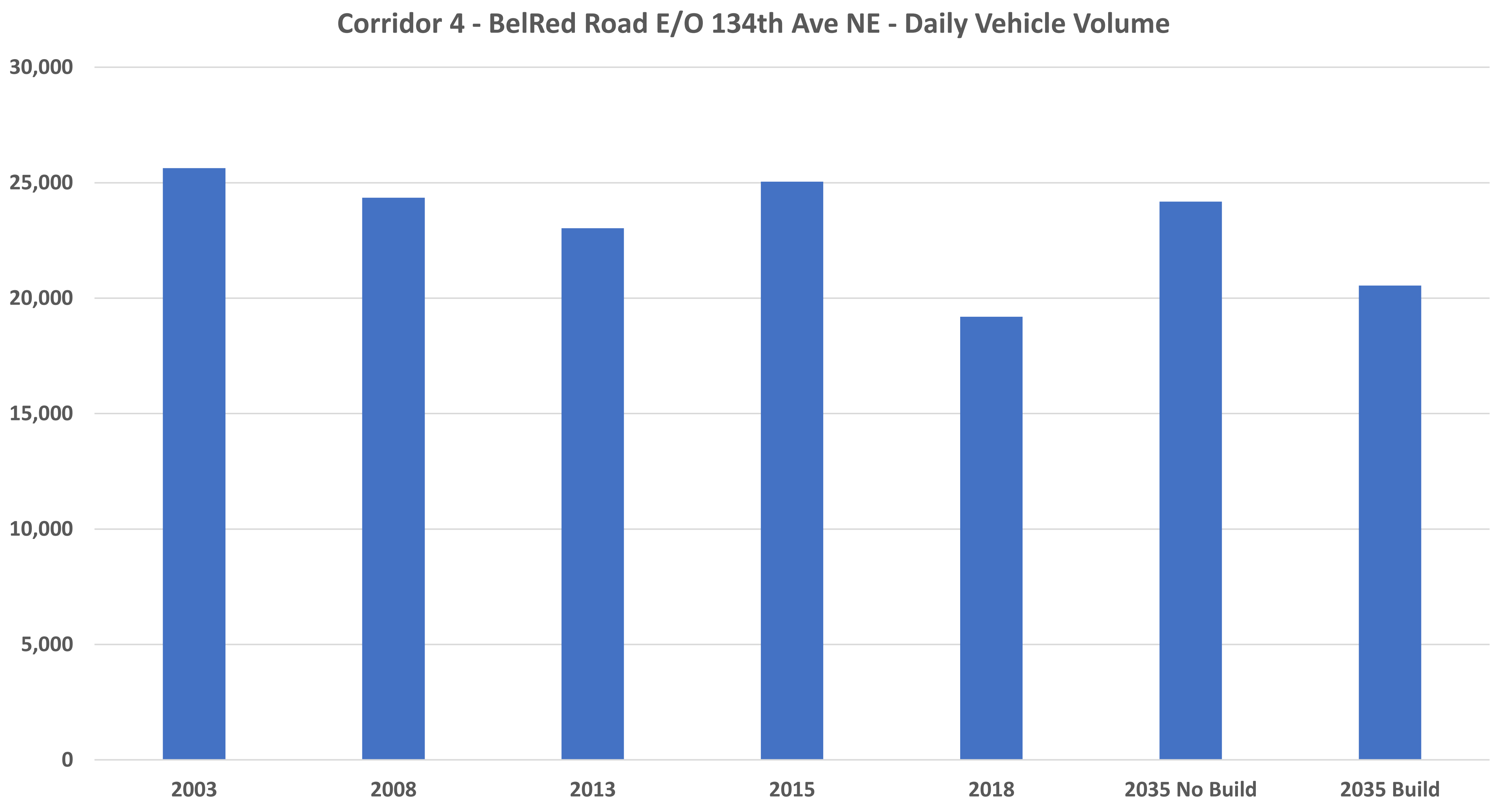

Corridor 2 - NE 12th Street E/O Bellevue Way - Daily Vehicle Volume
25,000
20,000
15,000
10,000
5,000
0
2003
2008
2013
2014
2018
2035 No Build
2035 Build


Corridor 3 - BelRed Road E/O 124th Ave NE - 24-Hour Vehicle Volume Profile
Volume per Hour (Bi-Directional)
2,500
2,000
1,500
1,000
500
0
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
11:00 PM
2018
2035 No Build
2035 Build
Three-Lane Signal Capacity (720 veh/hr/ln)

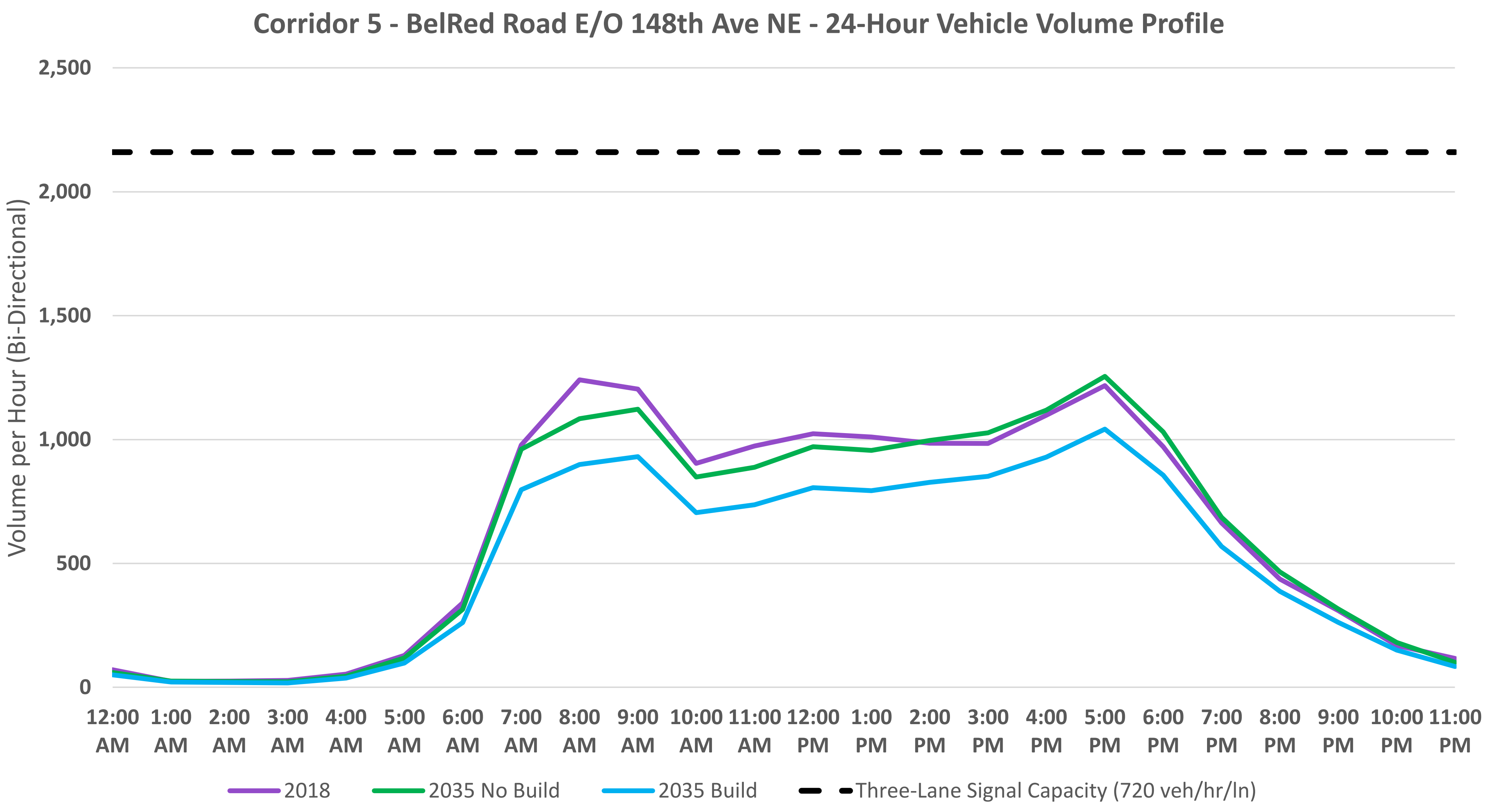

Corridor 3 - BelRed Road E/O 124th Ave NE – Daily Vehicle Volume
30,000
25,000
20,000
15,000
10,000
5,000
0
2003
2008
2013
2015
2018
2035 No Build
2035 Build

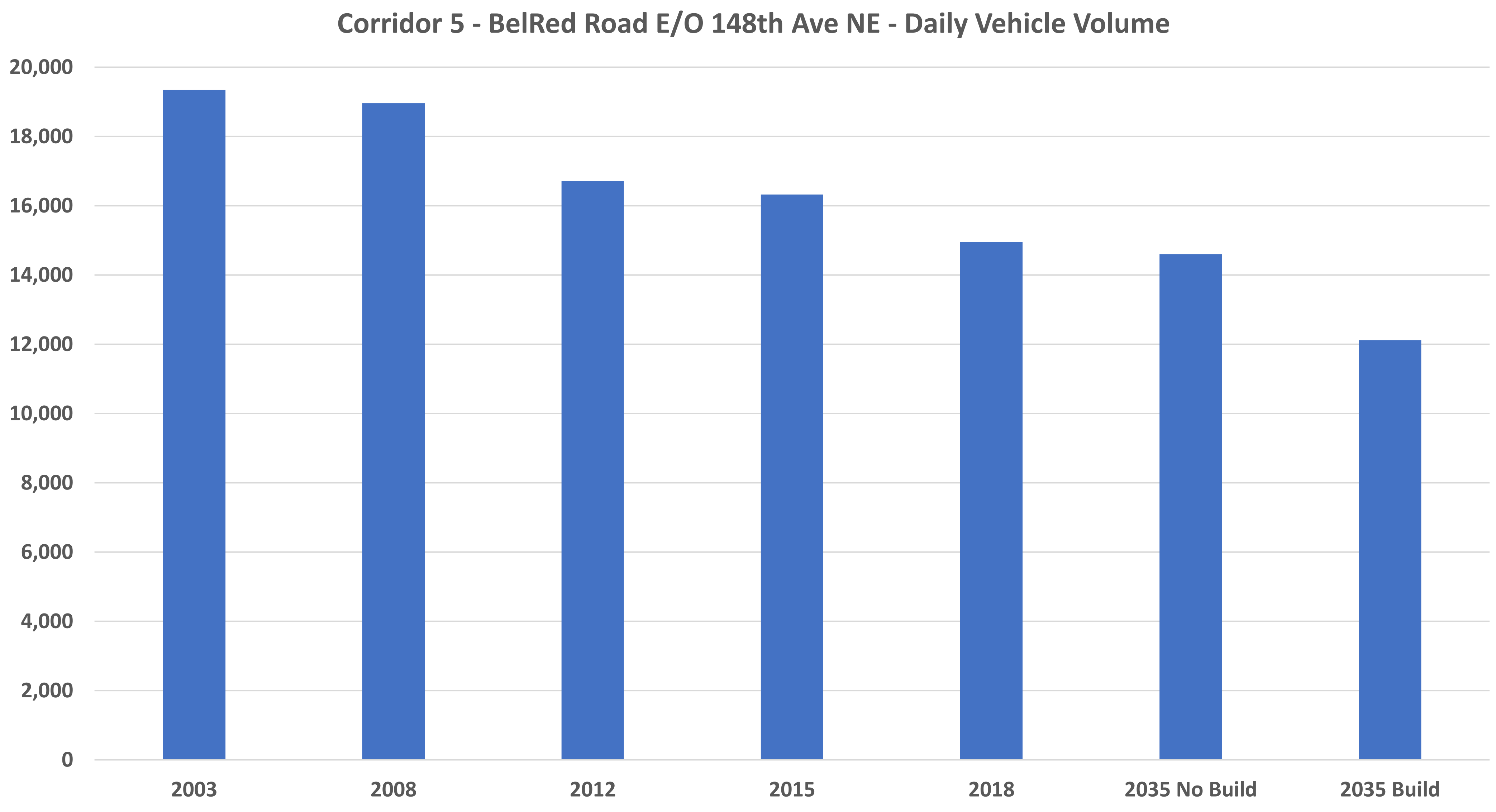


Corridor 4 - BelRed Road E/O 134th Ave NE - 24-Hour Vehicle Volume Profile
Volume per Hour (Bi-Directional)
2,500
2,000
1,500
1,000
500
0
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
11:00 PM
2015
2035 No Build
2035 Build
Three-Lane Signal Capacity (720 veh/hr/ln)

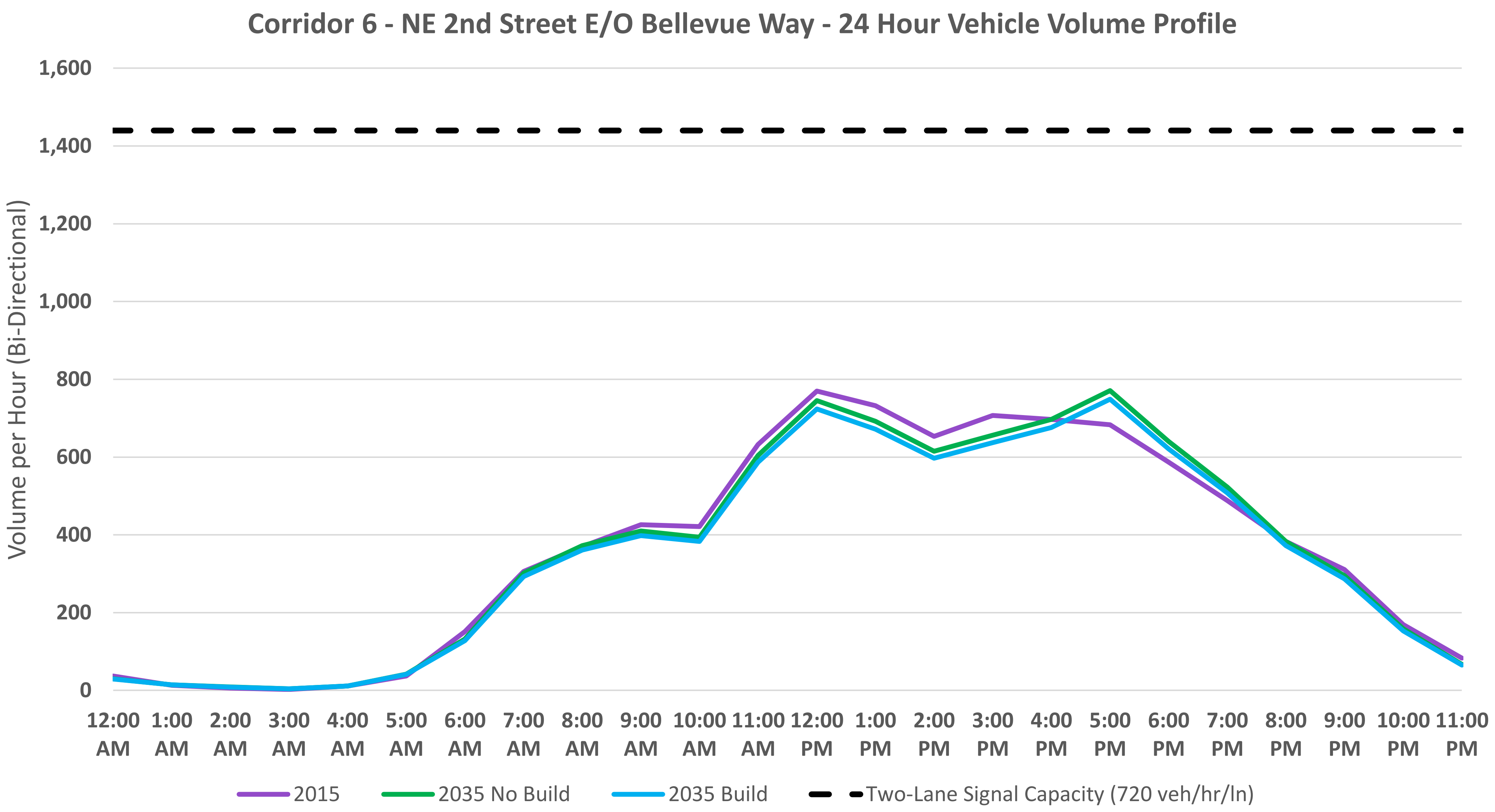


Corridor 4 - BelRed Road E/O 134th Ave NE - Daily Vehicle Volume
30,000
25,000
20,000
15,000
10,000
5,000
0
2003
2008
2013
2015
2018
2035 No Build
2035 Build

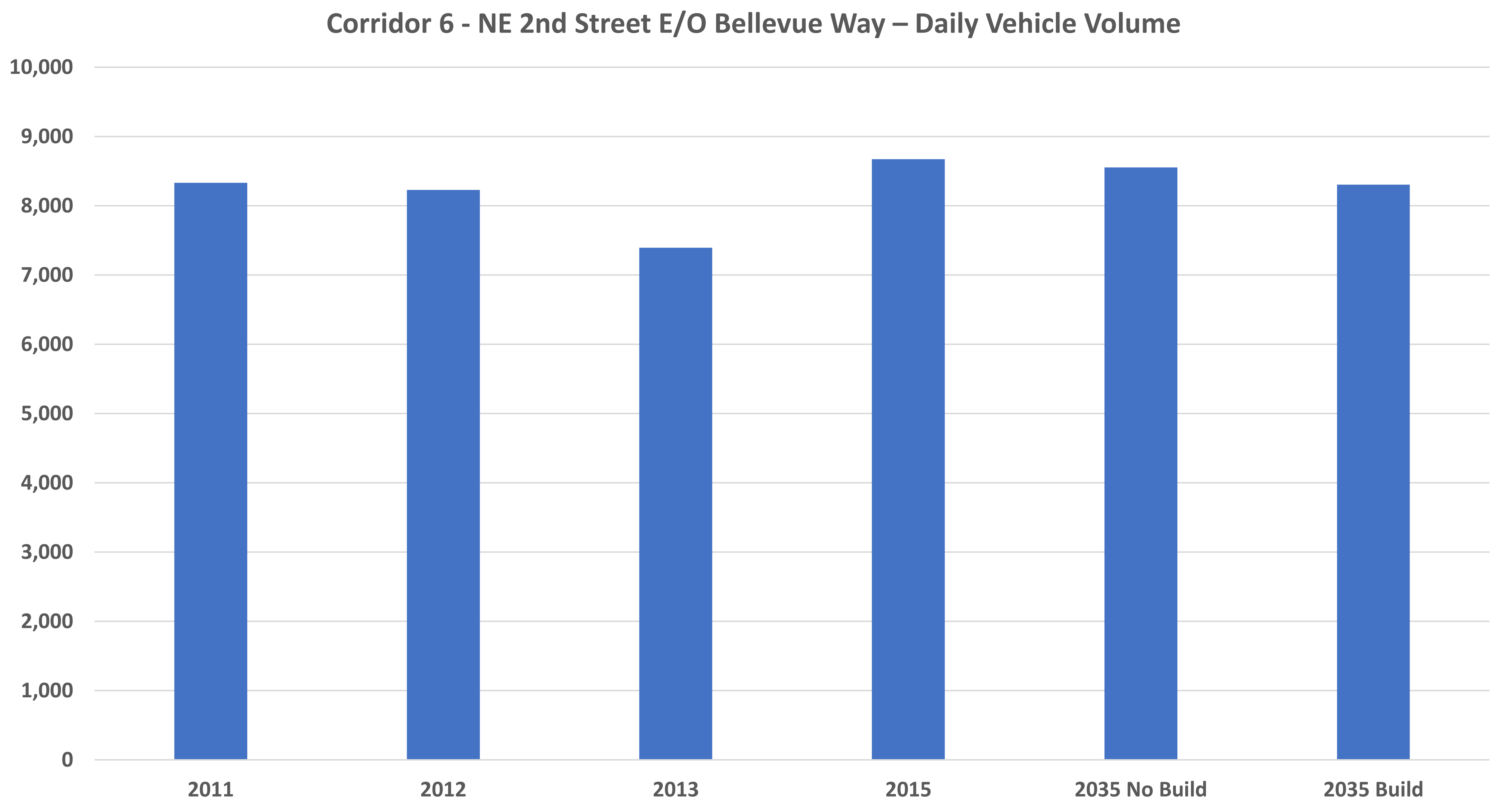

Corridor 5 - BelRed Road E/O 148th Ave NE - 24-Hour Vehicle Volume Profile
Volume per Hour (Bi-Directional)
2,500
2,000
1,500
1,000
500
0
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
11:00 PM
2018
2035 No Build
2035 Build
Three-Lane Signal Capacity (720 veh/hr/ln)



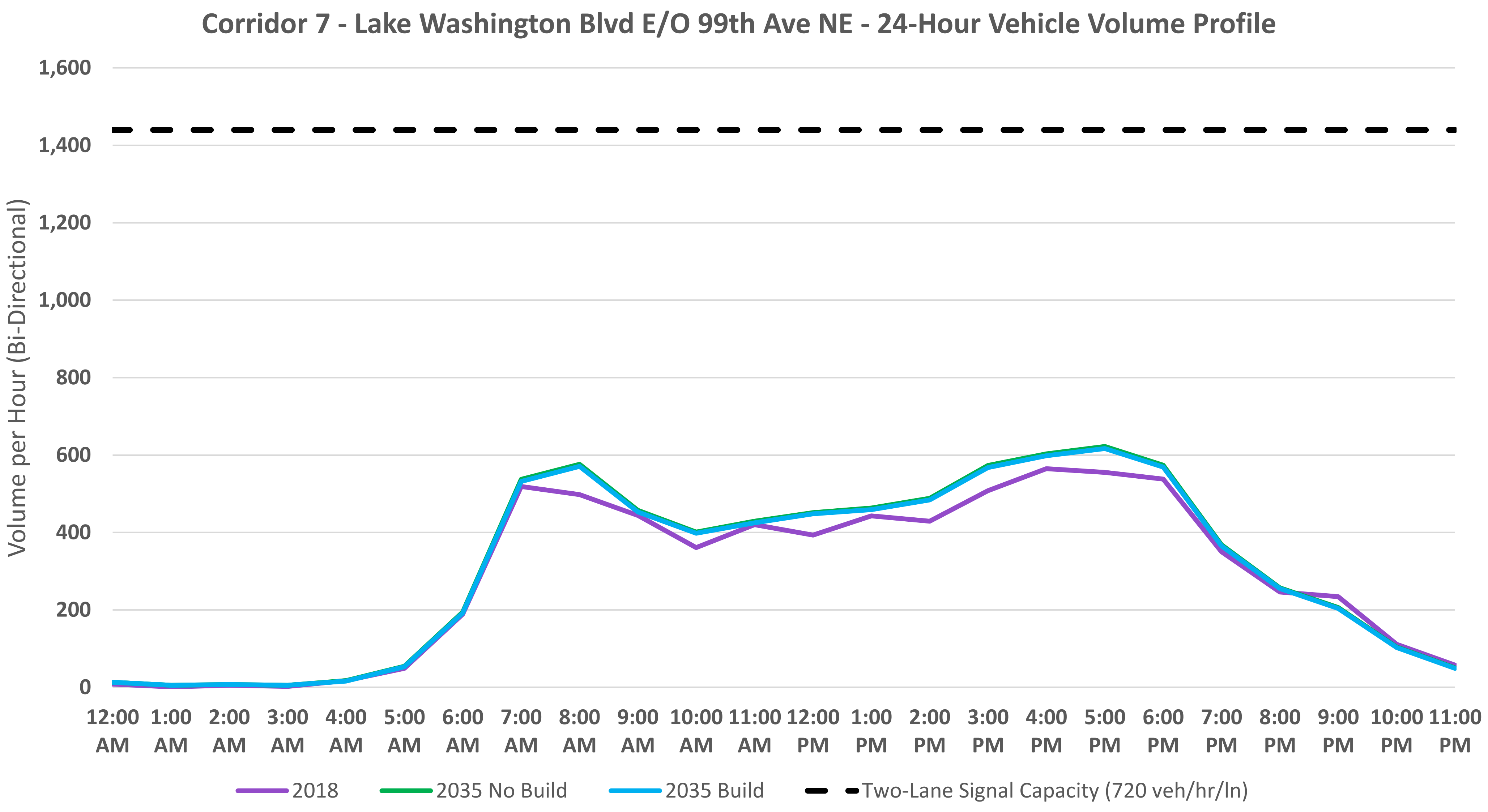
Corridor 5 - BelRed Road E/O 148th Ave NE - Daily Vehicle Volume
20,000
18,000
16,000
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
2003
2008
2012
2015
2018
2035 No Build
2035 Build



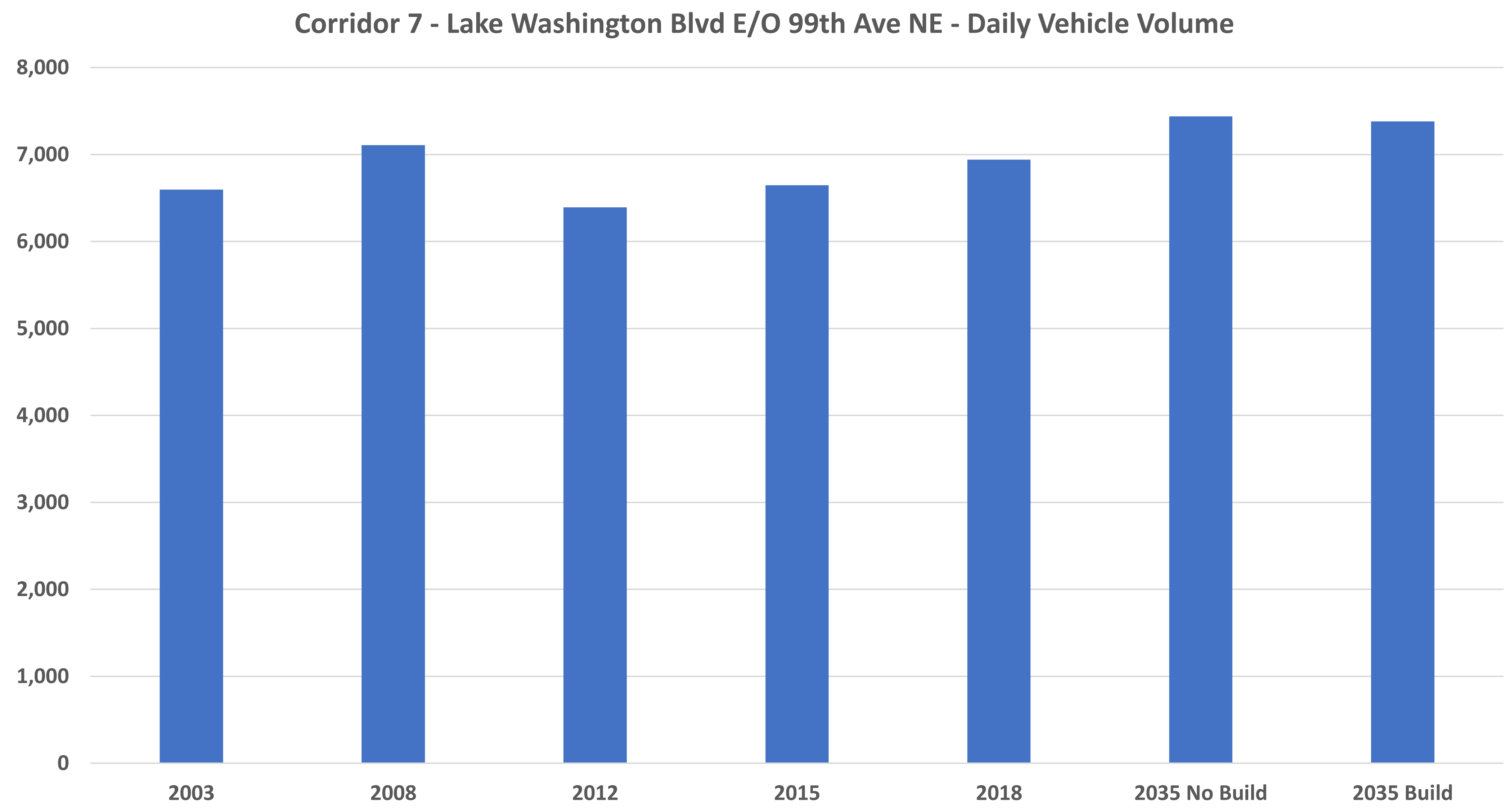
Corridor 6 - NE 2nd Street E/O Bellevue Way - 24 Hour Vehicle Volume Profile
Volume per Hour (Bi-Directional)
1,600
1,400
1,200
1,000
800
600
400
200
0
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
11:00 PM
2015
2035 No Build
2035 Build
Two-Lane Signal Capacity (720 veh/hr/ln)

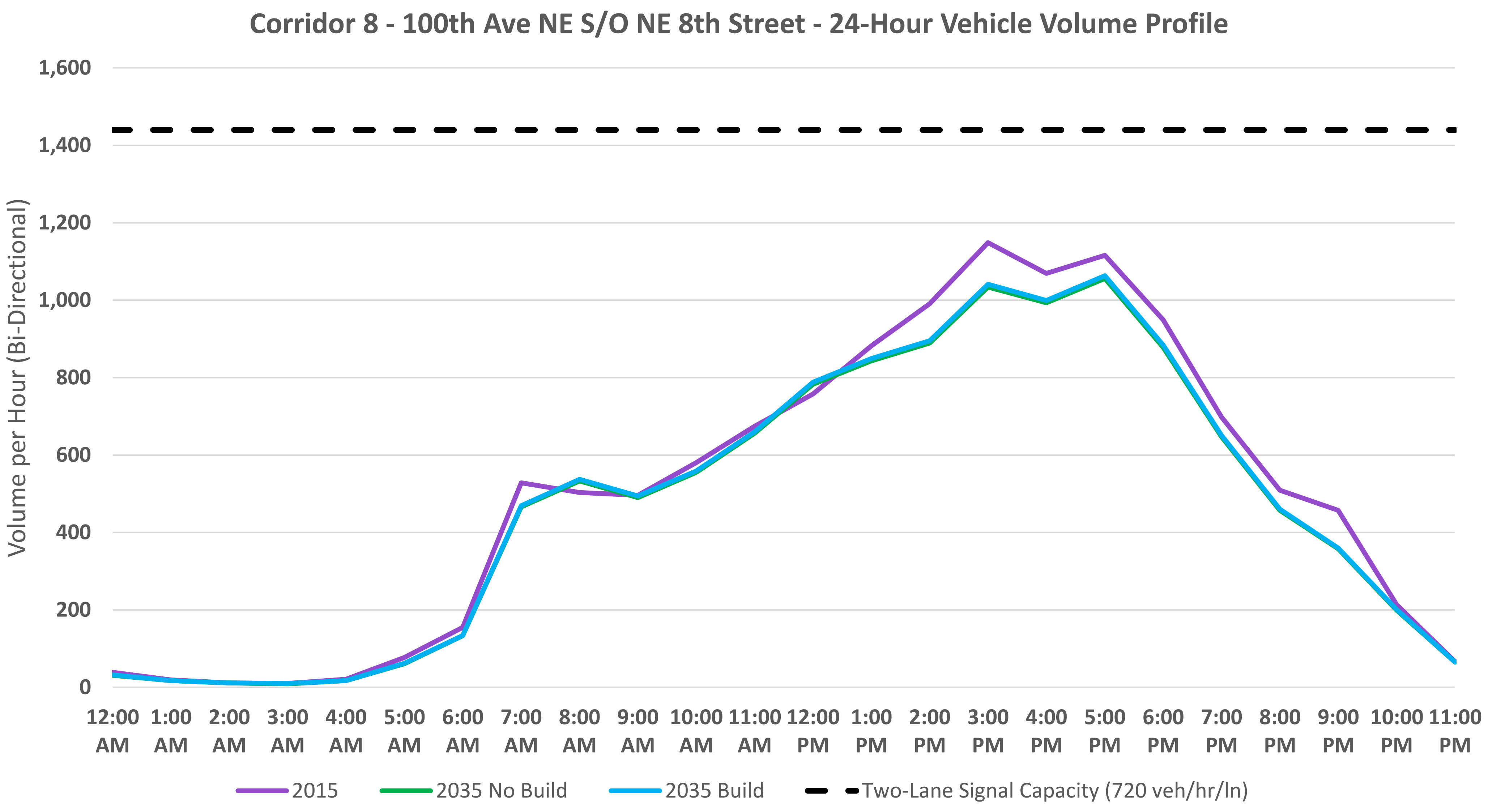


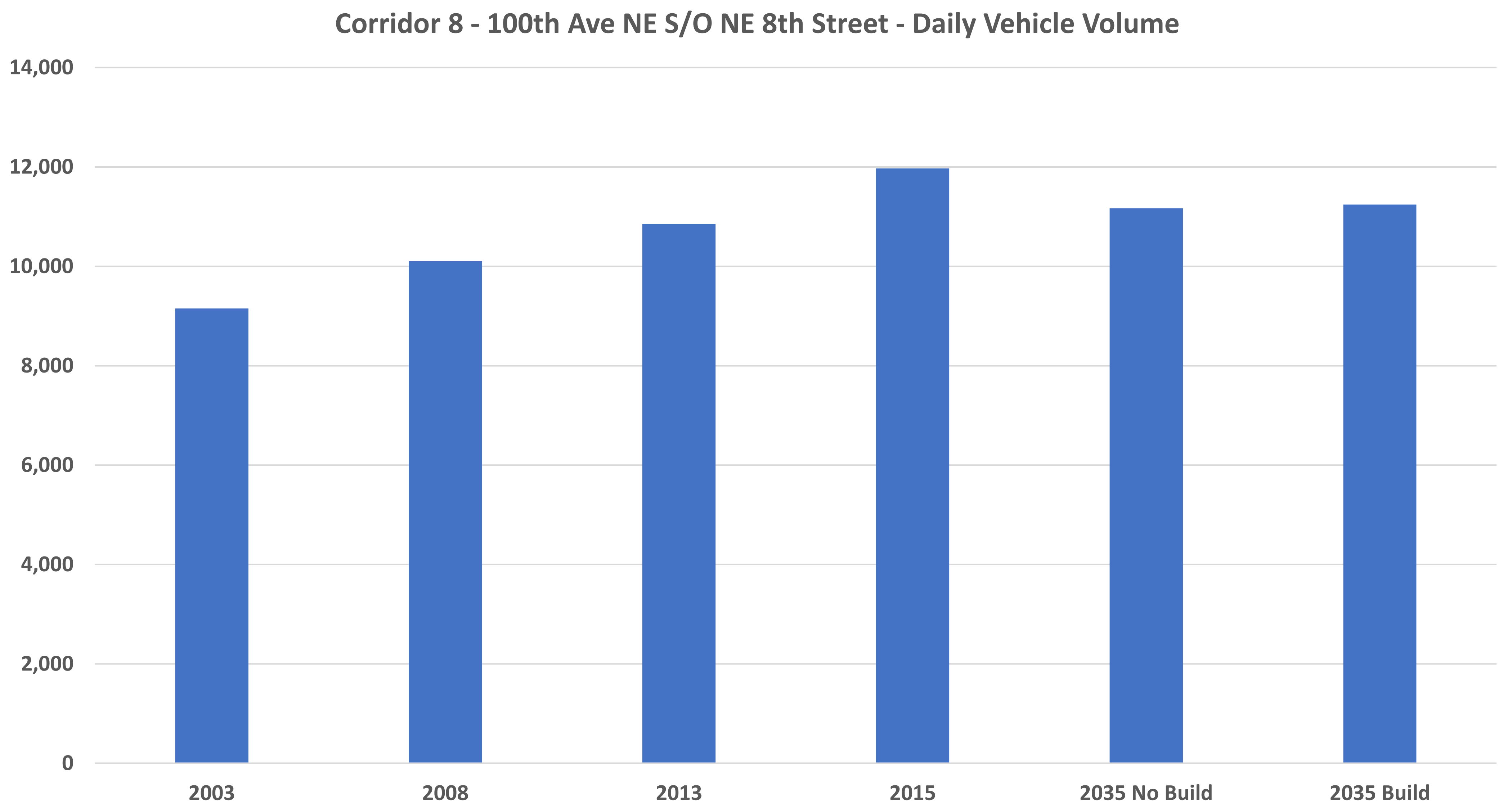
Corridor 6 - NE 2nd Street E/O Bellevue Way – Daily Vehicle Volume
10,000
9,000
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
2011
2012
2013
2015
2035 No Build
2035 Build



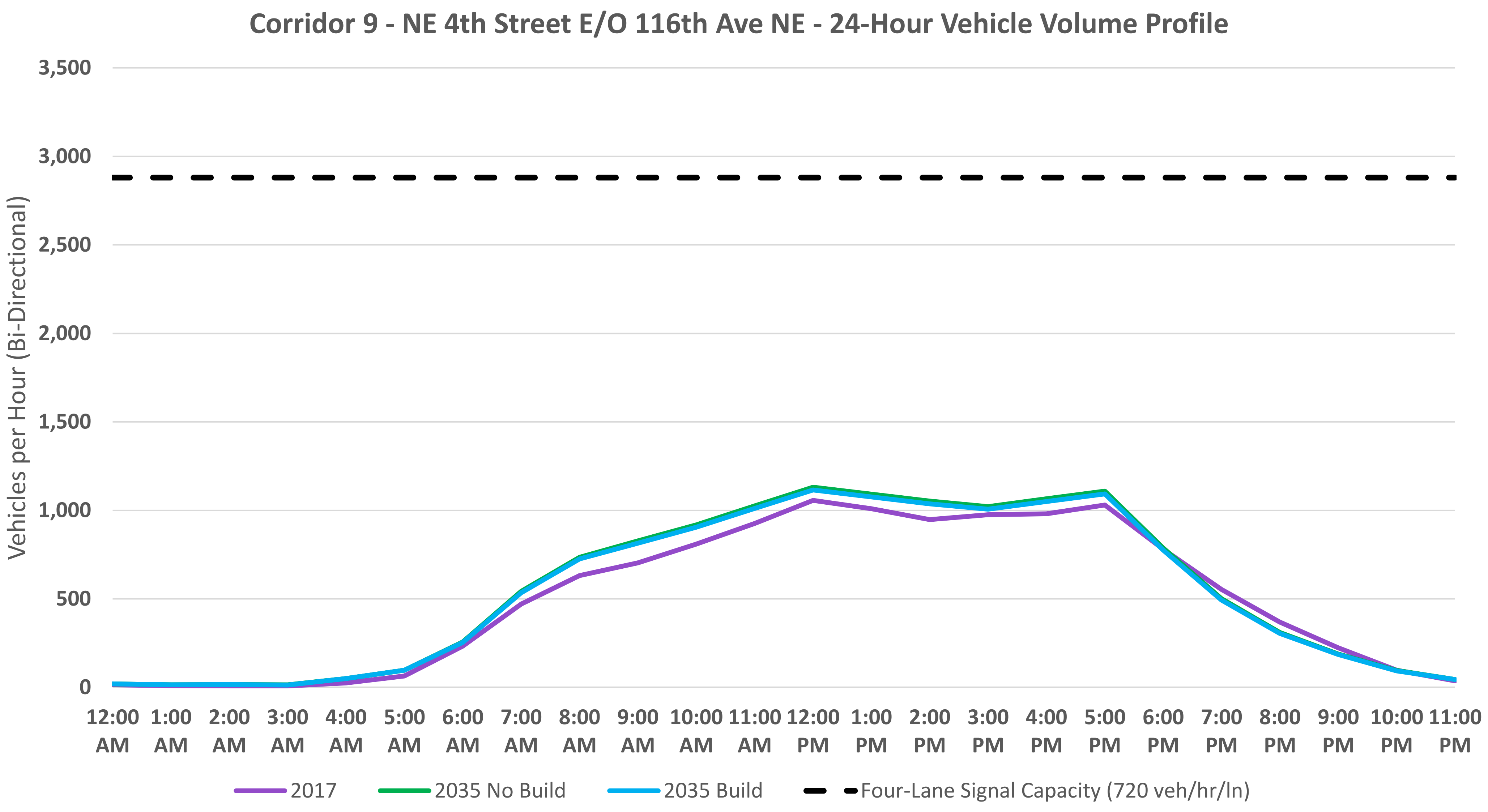
Corridor 7 - Lake Washington Blvd E/O 99th Ave NE - 24-Hour Vehicle Volume Profile
Volume per Hour (Bi-Directional)
1,600
1,400
1,200
1,000
800
600
400
200
0
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
11:00 PM
2018
2035 No Build
2035 Build
Two-Lane Signal Capacity (720 veh/hr/ln)

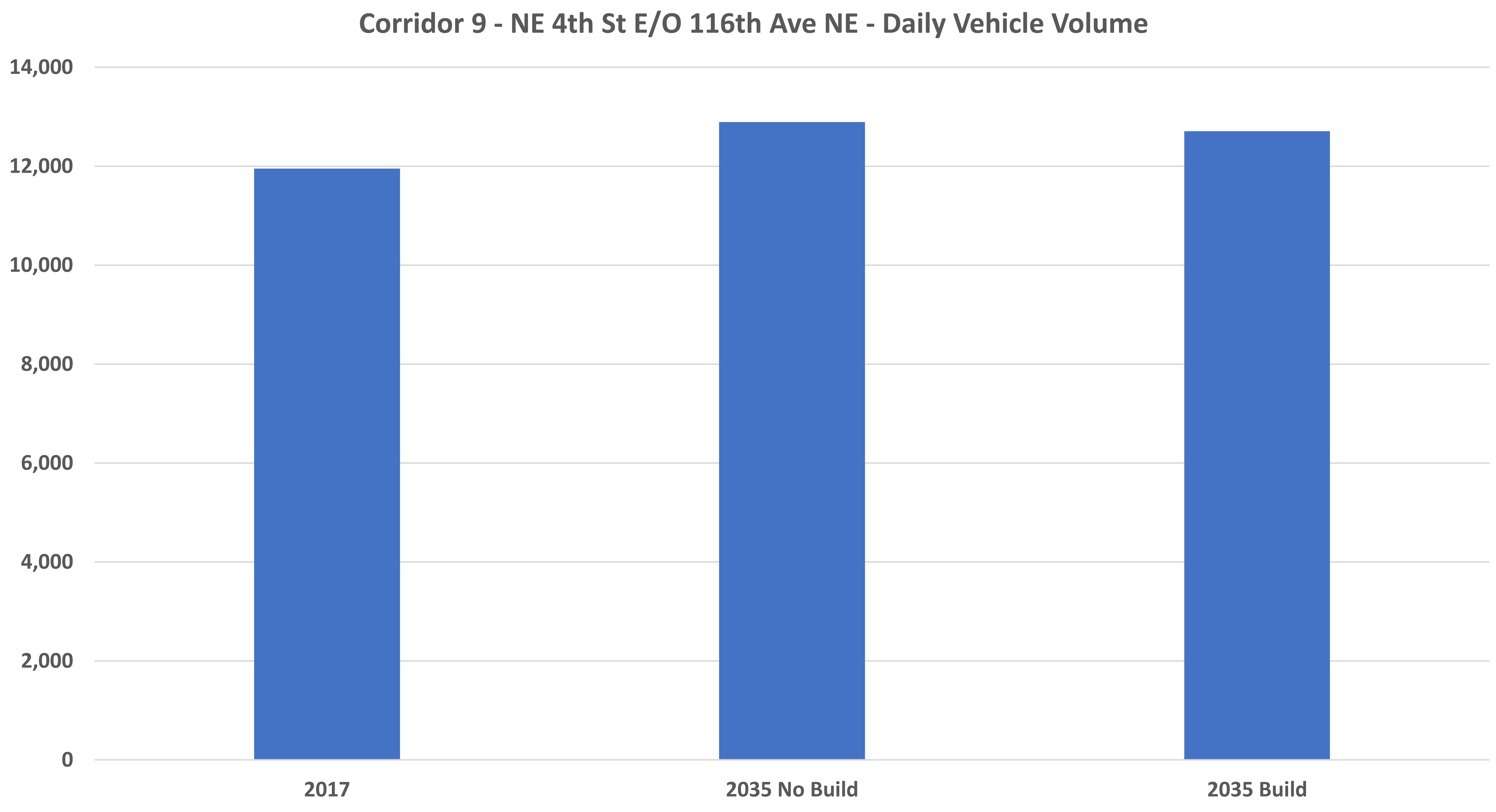

Corridor 7 - Lake Washington Blvd E/O 99th Ave NE - Daily Vehicle Volume
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
2003
2008
2012
2015
2018
2035 No Build
2035 Build


Corridor 8 - 100th Ave NE S/O NE 8th Street - 24-Hour Vehicle Volume Profile
Volume per Hour (Bi-Directional)
1,600
1,400
1,200
1,000
800
600
400
200
0
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
11:00 PM
2015
2035 No Build
2035 Build
Two-Lane Signal Capacity (720 veh/hr/ln)

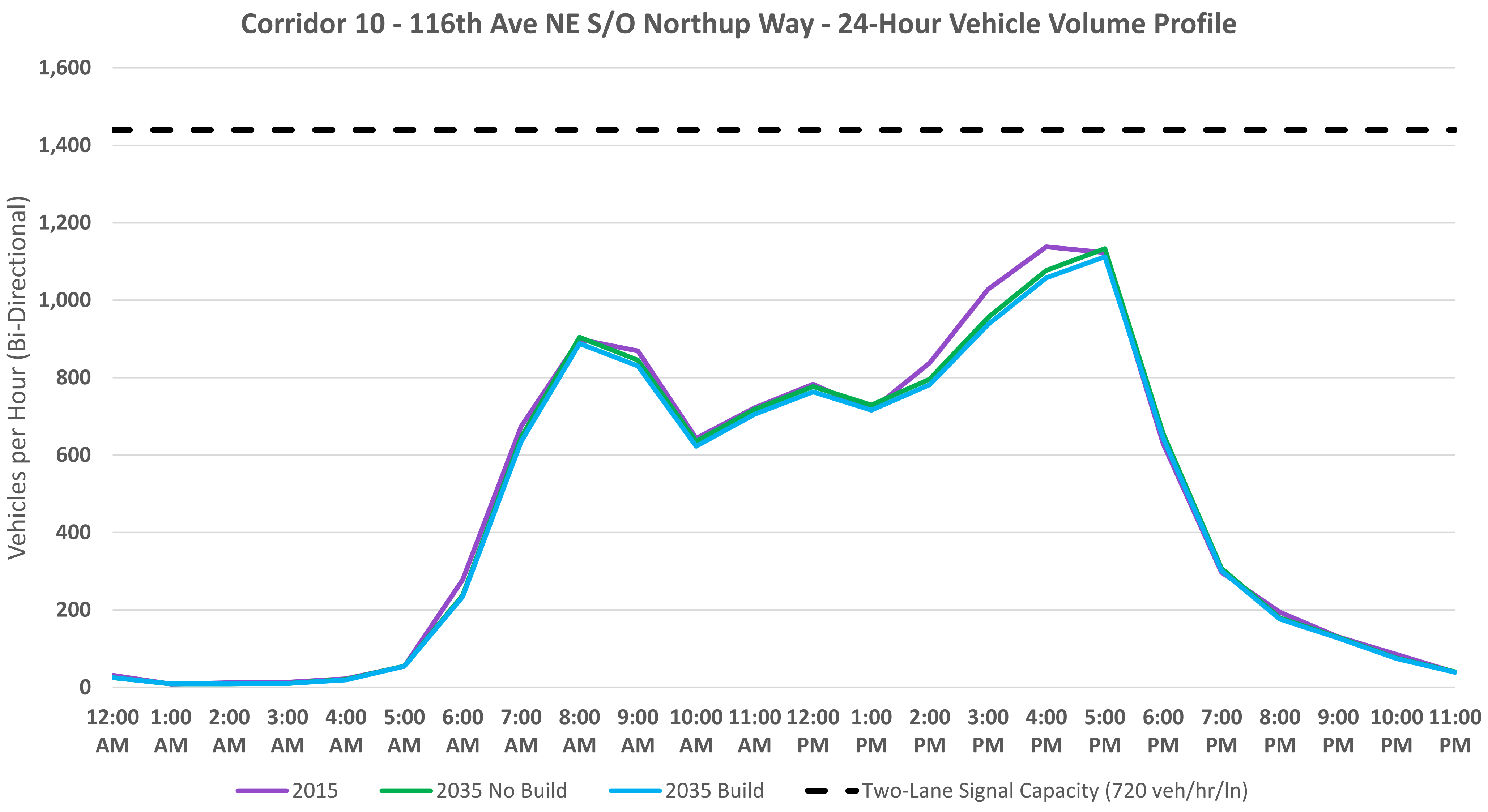


Corridor 8 - 100th Ave NE S/O NE 8th Street - Daily Vehicle Volume
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
2003
2008
2013
2015
2035 No Build
2035 Build

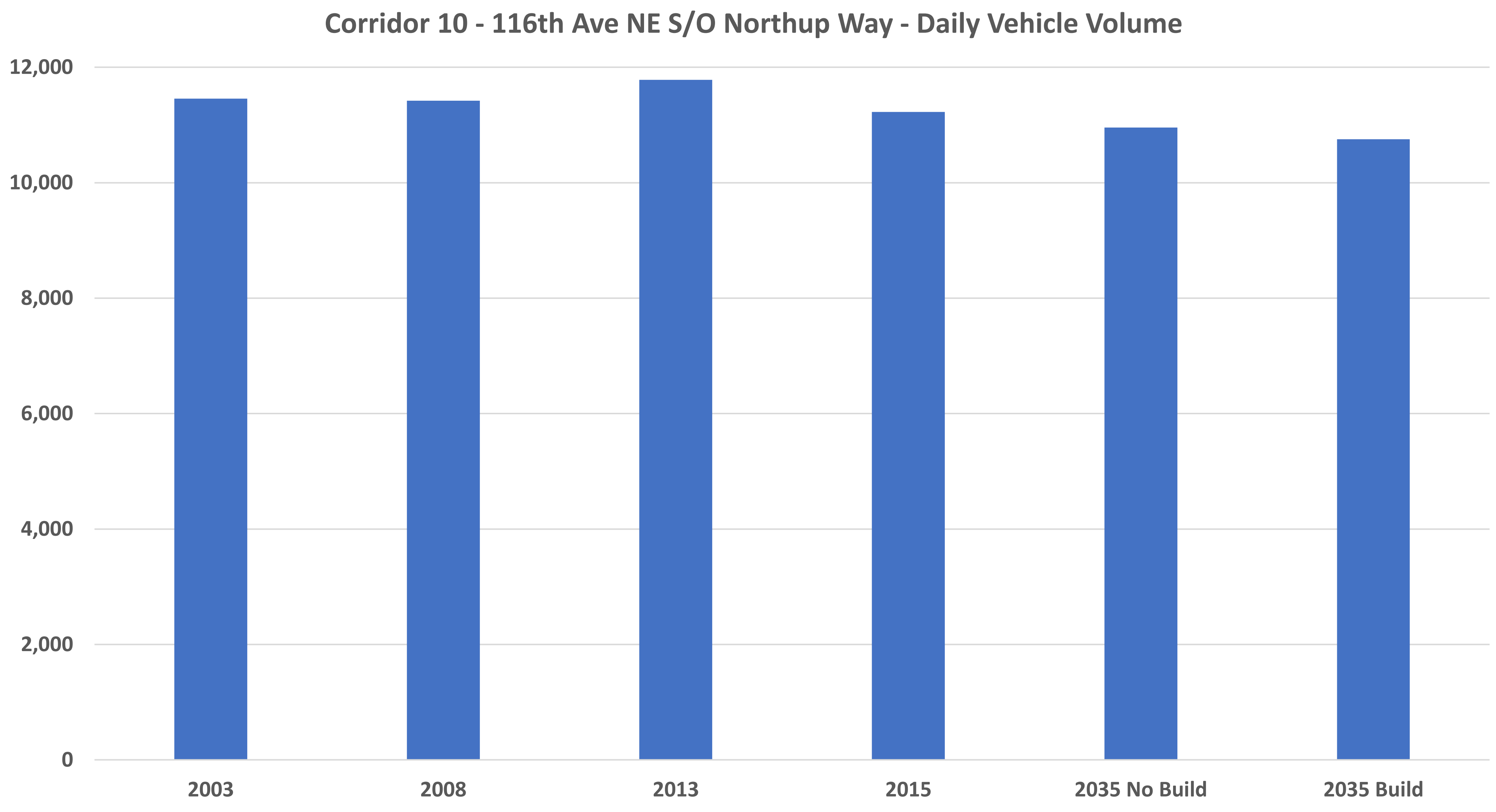

Corridor 9 - NE 4th Street E/O 116th Ave NE - 24-Hour Vehicle Volume Profile
Vehicles per Hour (Bi-Directional)
3,500
3,000
2,500
2,000
1,500
1,000
500
0
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
11:00 PM
2017
2035 No Build
2035 Build
Four-Lane Signal Capacity (720 veh/hr/ln)



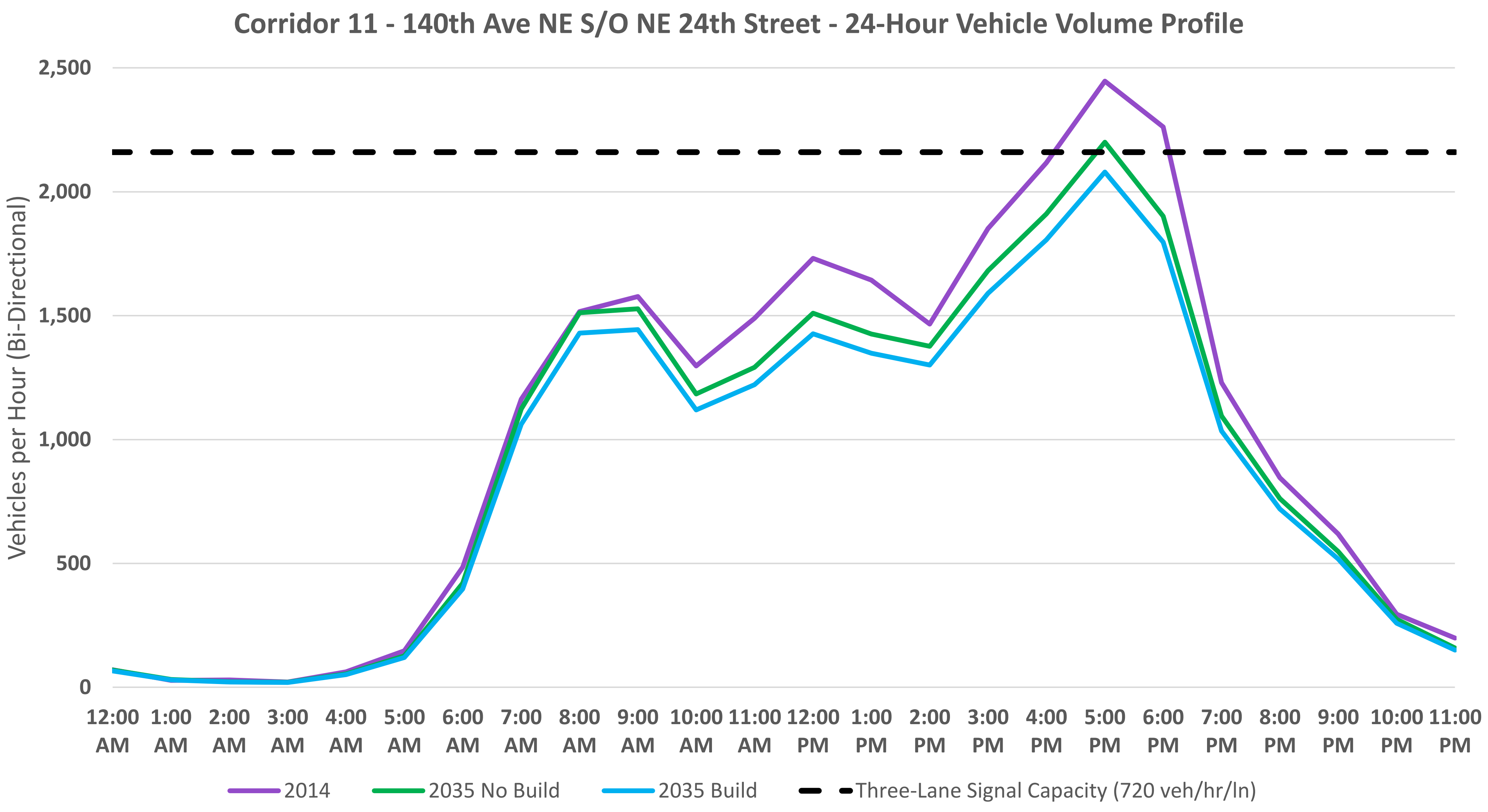
Corridor 9 - NE 4th St E/O 116th Ave NE - Daily Vehicle Volume
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
2017
2035 No Build
2035 Build

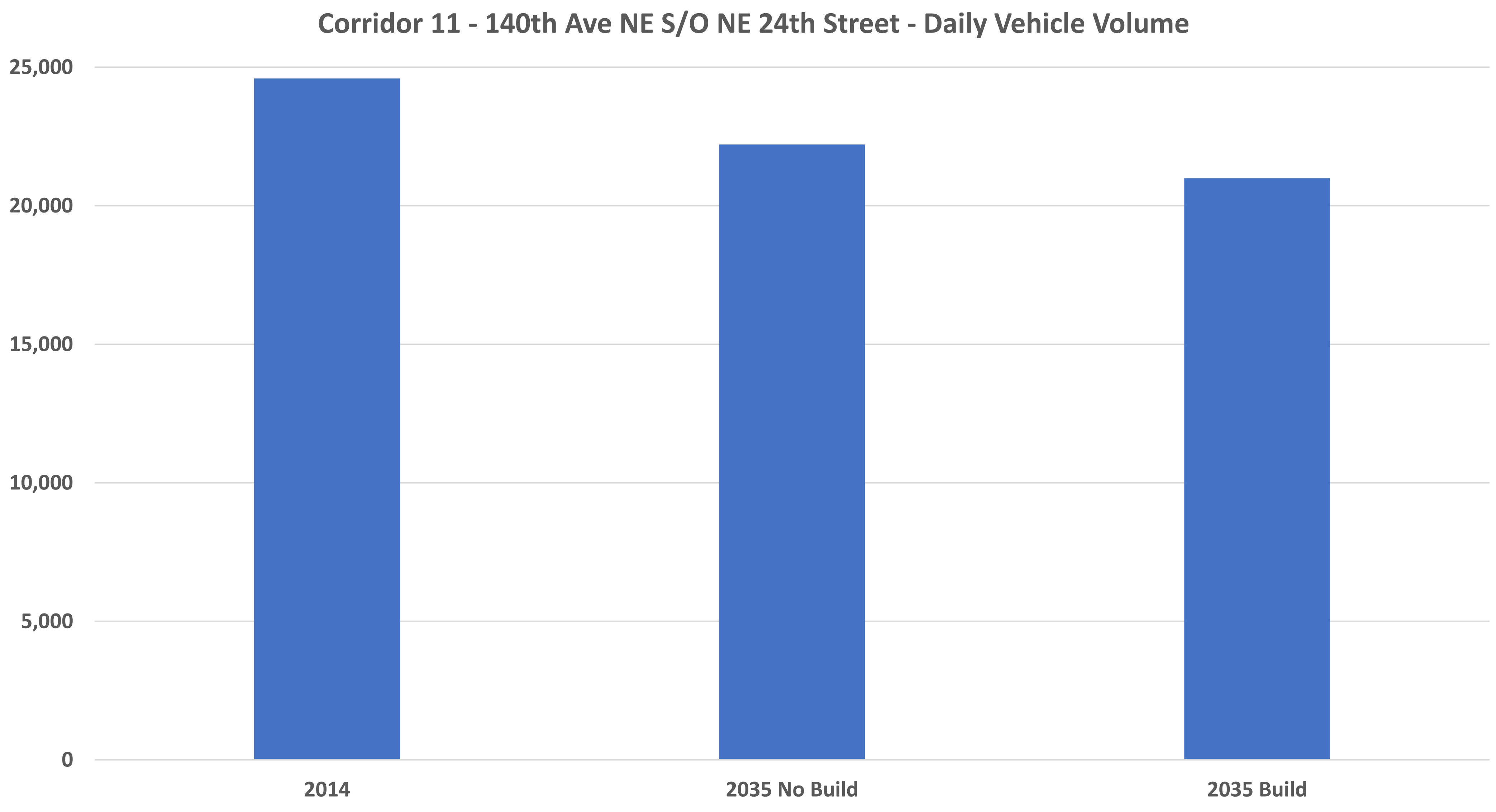


Corridor 10 - 116th Ave NE S/O Northup Way - 24-Hour Vehicle Volume Profile
Vehicles per Hour (Bi-Directional)
1,600
1,400
1,200
1,000
800
600
400
200
0
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
11:00 PM
2015
2035 No Build
2035 Build
Two-Lane Signal Capacity (720 veh/hr/ln)

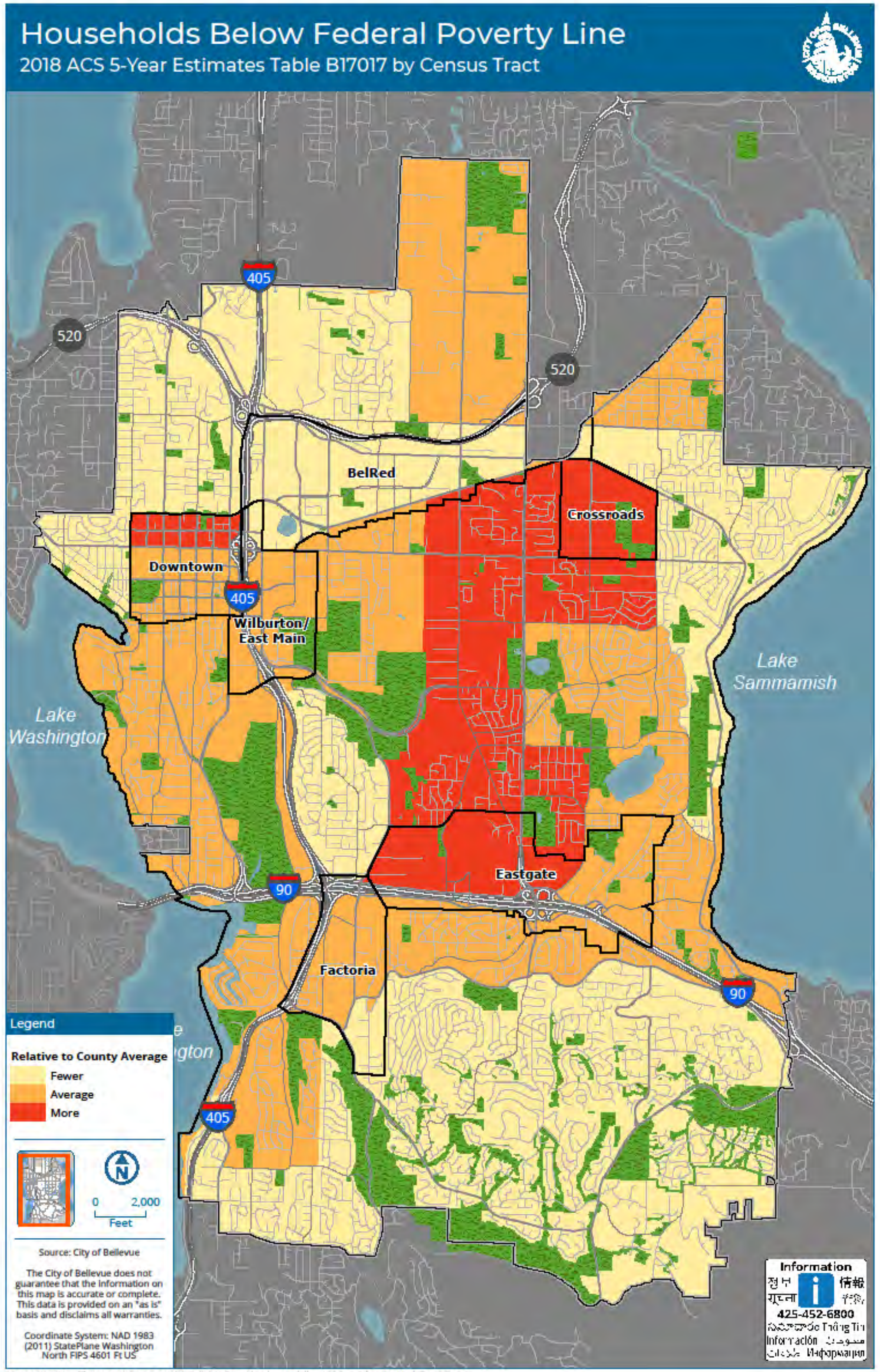


Corridor 10 - 116th Ave NE S/O Northup Way - Daily Vehicle Volume
12,000
10,000
8,000
6,000
4,000
2,000
0
2003
2008
2013
2015
2035 No Build
2035 Build


Corridor 11 - 140th Ave NE S/O NE 24th Street - 24-Hour Vehicle Volume Profile
Vehicles per Hour (Bi-Directional)
2,500
2,000
1,500
1,000
500
0
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
11:00 PM
2014
2035 No Build
2035 Build
Three-Lane Signal Capacity (720 veh/hr/ln)



Corridor 11 - 140th Ave NE S/O NE 24th Street - Daily Vehicle Volume
25,000
20,000
15,000
10,000
5,000
0
2014
2035 No Build
2035 Build



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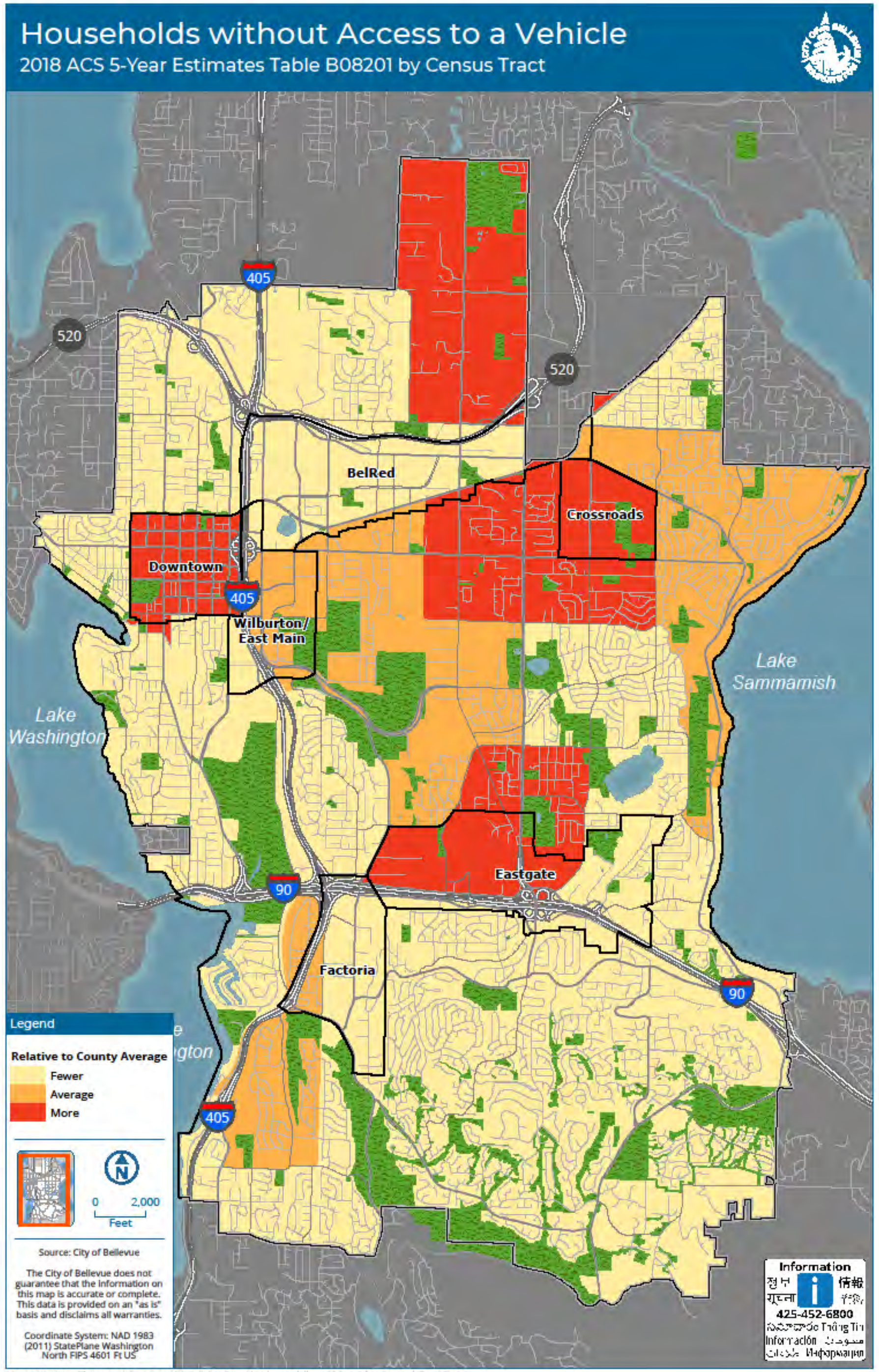
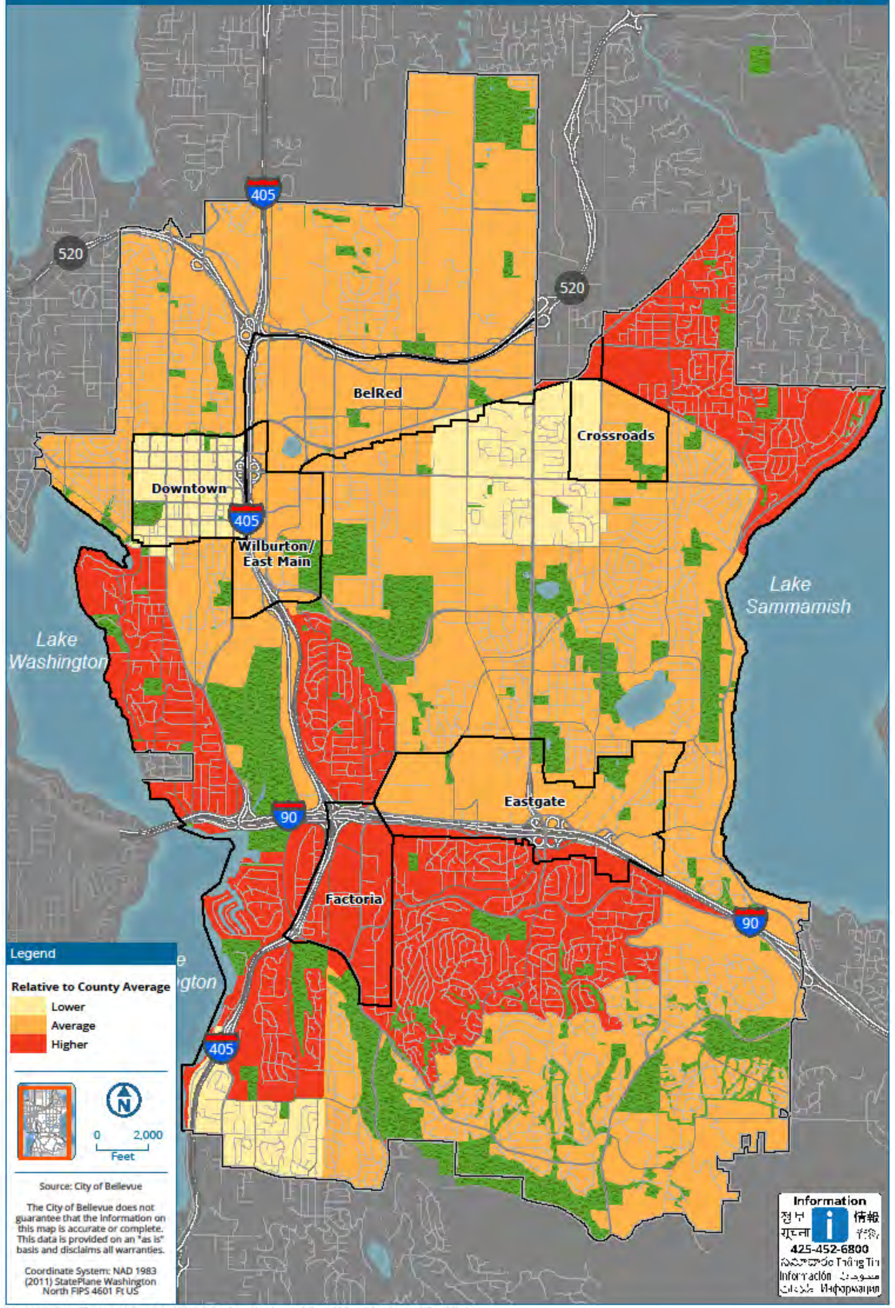


Date: 4/24/2023 File Name: V:\TransDeptGIS\ArcGISPro\TransPlanning_Modeling_NFB\TransPlanning_Modeling_NFB.aprx

Percent of Population Under 18

2018 ACS 5-Year Estimates Table B01001 by Census Tract



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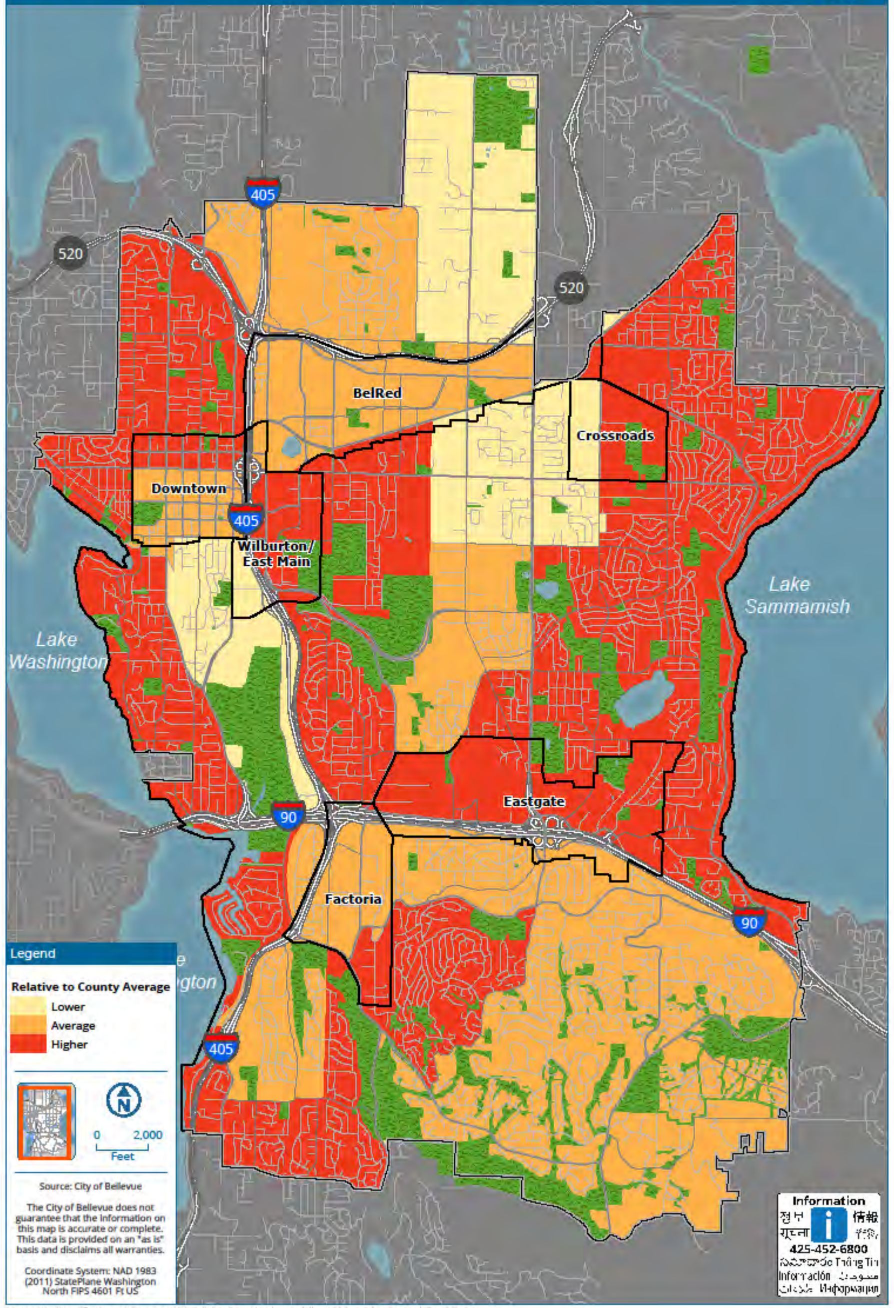
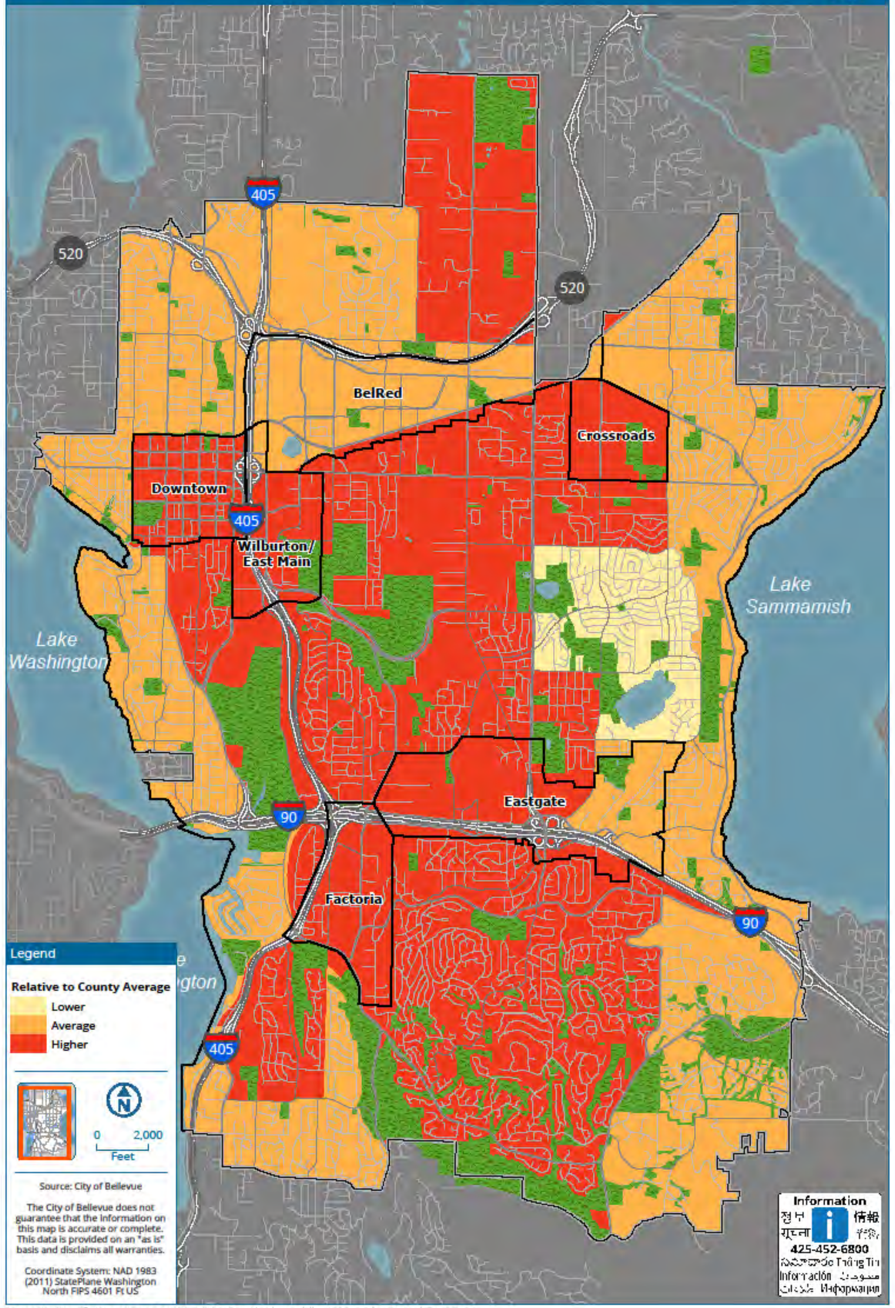
Percent of Population over 65

2018 ACS 5-Year Estimates Table B01001 by Census Tract



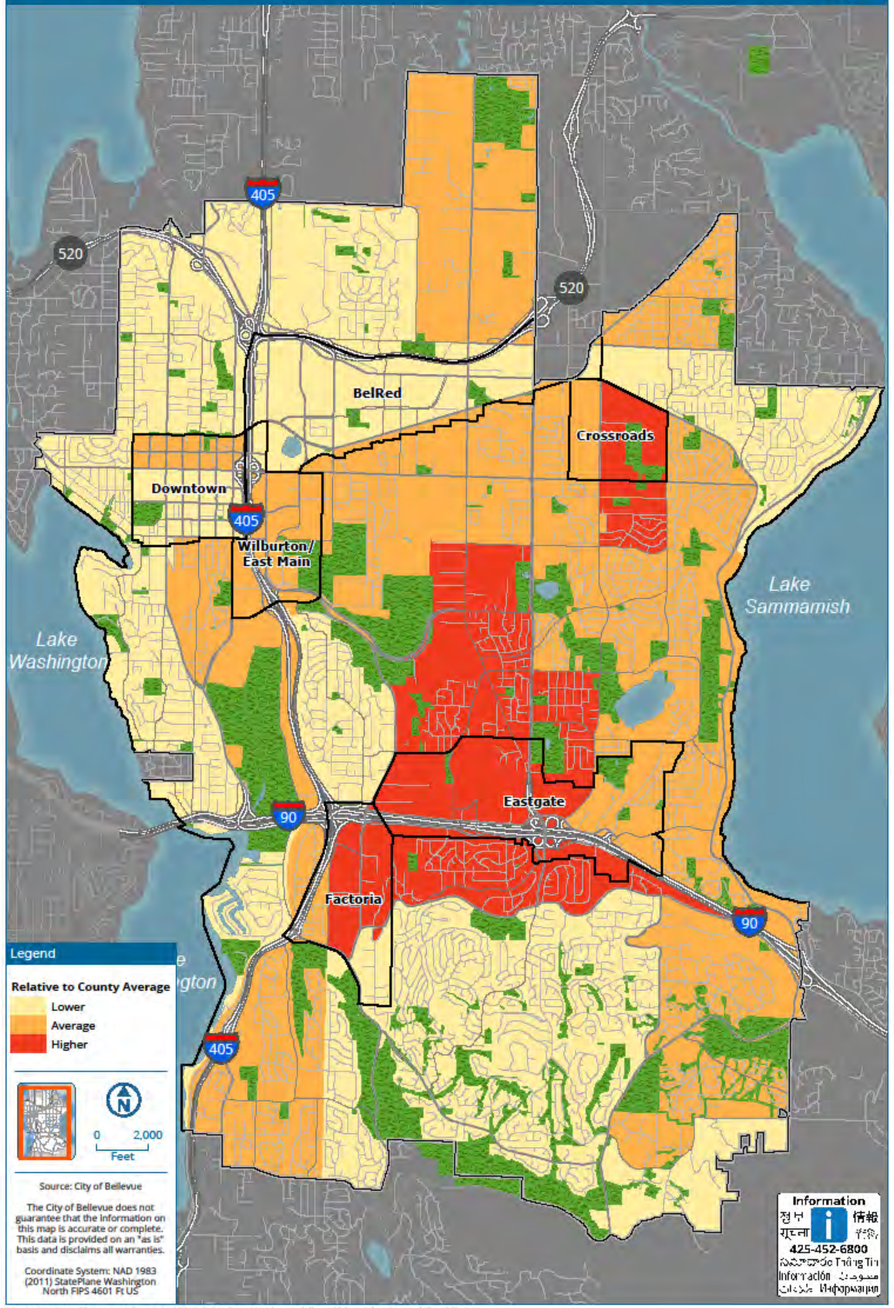
Date: 4/24/2023 File Name: V:\TransDeptGIS\ArcGISPro\TransPlanning_Modeling_NFB\TransPlanning_Modeling_NFB.aprx

Percent of Population Identifying as Non-White
2018 ACS 5-Year Estimates Table B02001 by Census Tract



Date: 4/24/2023 File Name: V:\TransDeptGIS\ArcGISPro\TransPlanning_Modeling_NFB\TransPlanning_Modeling_NFB.aprx

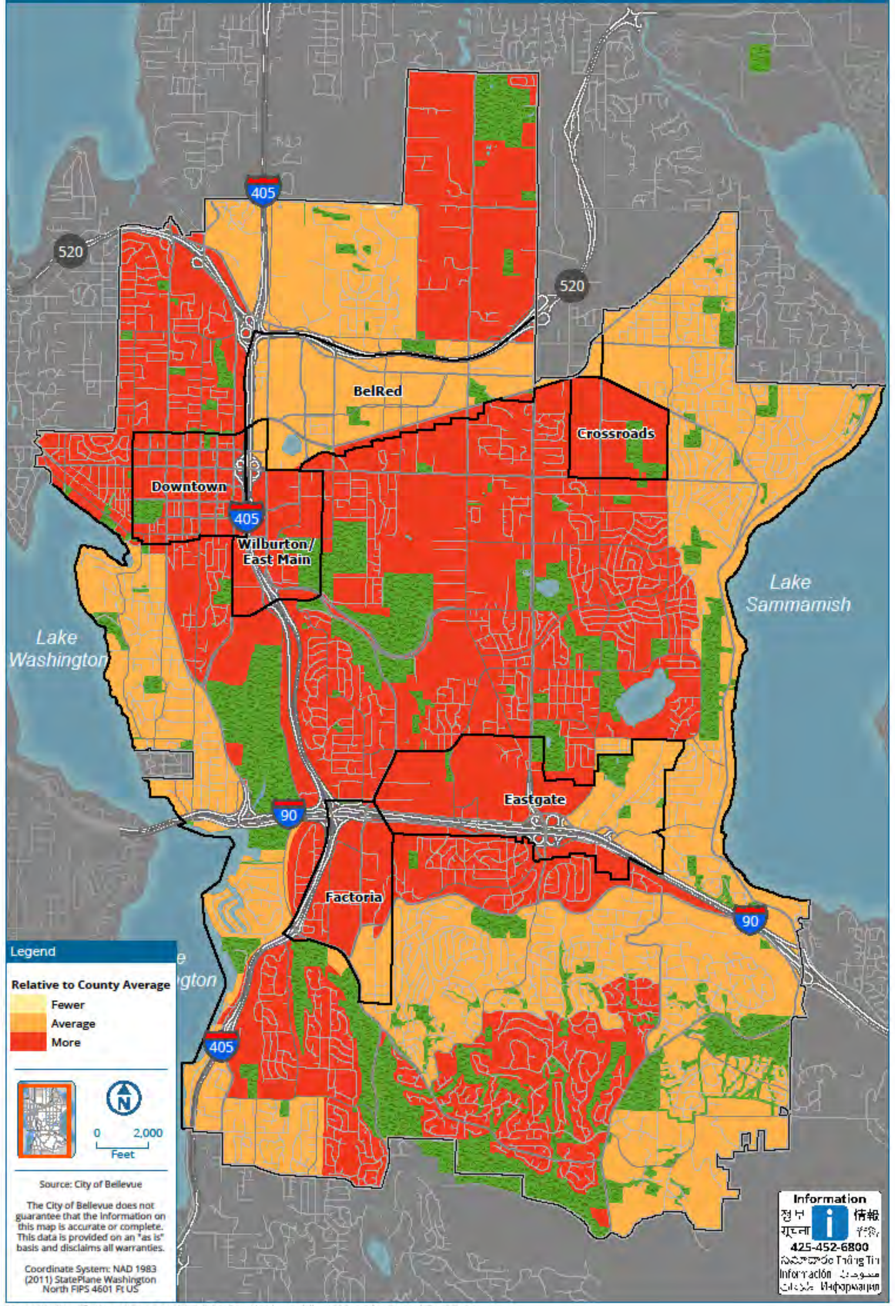
Percent of Population over 25 w/o High School Diploma
2018 ACS 5-Year Estimates Table B15003 by Census Tract



Date: 4/24/2023 File Name: V:\TransDeptGIS\ArcGISPro\TransPlanning_Modeling_NFB\TransPlanning_Modeling_NFB.aprx

Limited English Proficiency (LEP) Households

2018 ACS 5-Year Estimates Table C16002 by Census Tract



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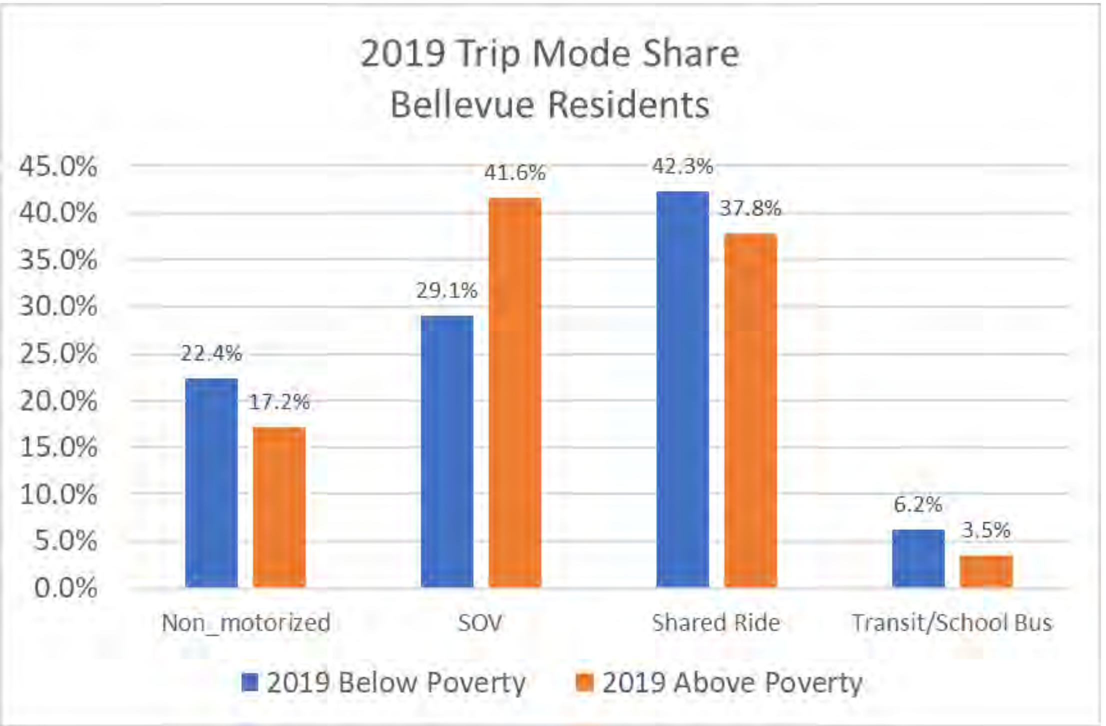
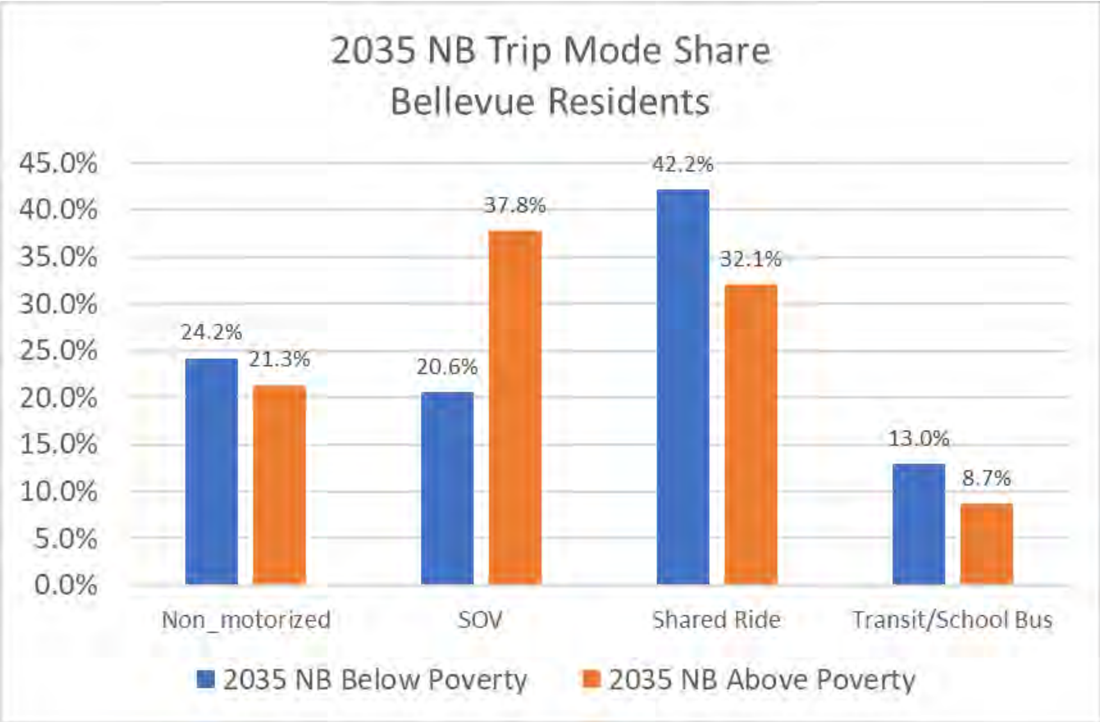
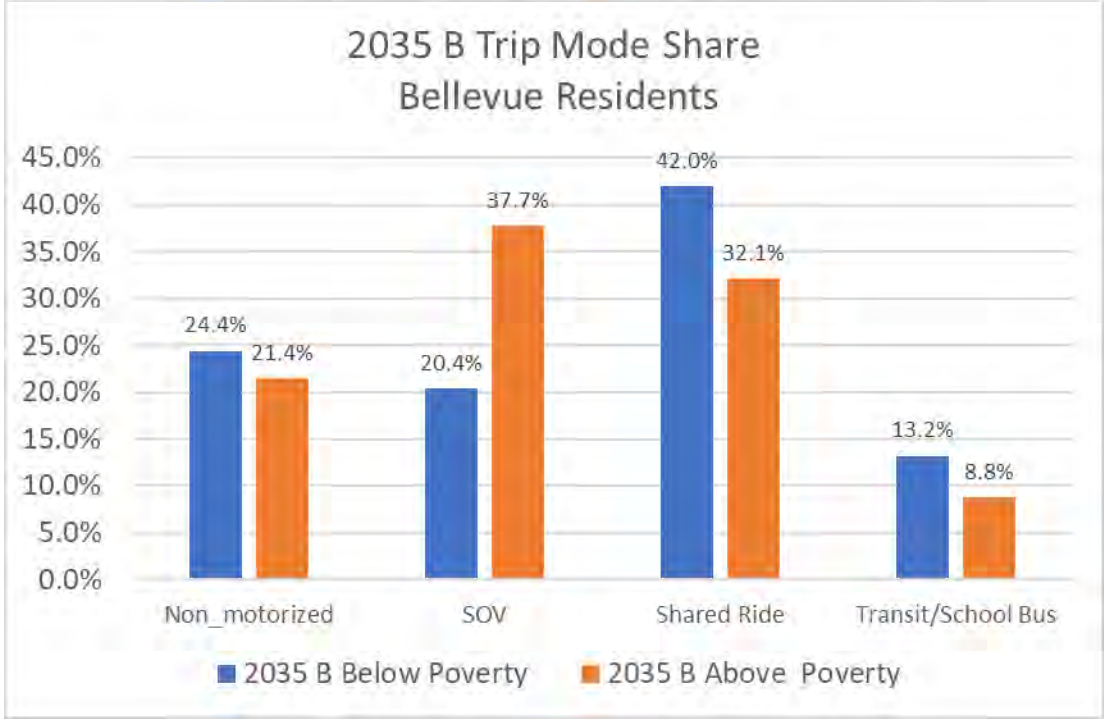
Mode Share by Poverty Line



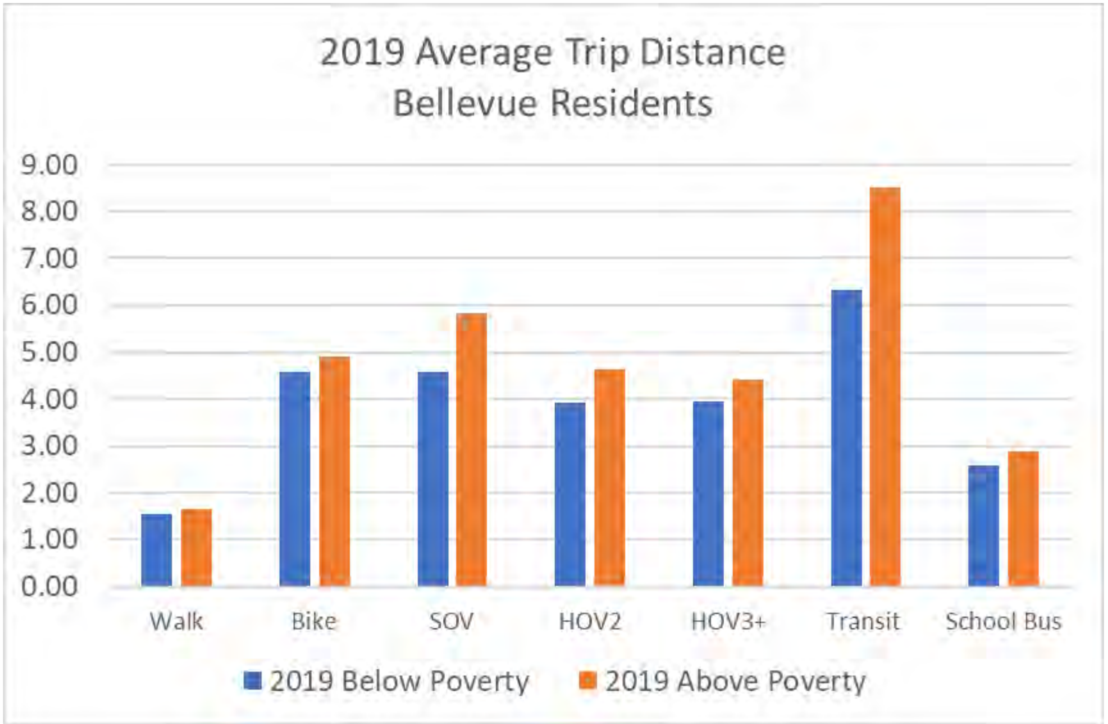
Trip Mode Share by Bellevue Residents				
	Non_motorized	SOV	Shared Ride	Transit/School Bus
2019 Below Poverty	22.4%	29.1%	42.3%	6.2%
2019 Above Poverty	17.2%	41.6%	37.8%	3.5%
2035 NB Below Poverty	24.2%	20.6%	42.2%	13.0%
2035 NB Above Poverty	21.3%	37.8%	32.1%	8.7%
2035 B Below Poverty	24.4%	20.4%	42.0%	13.2%
2035 B Above Poverty	21.4%	37.7%	32.1%	8.8%

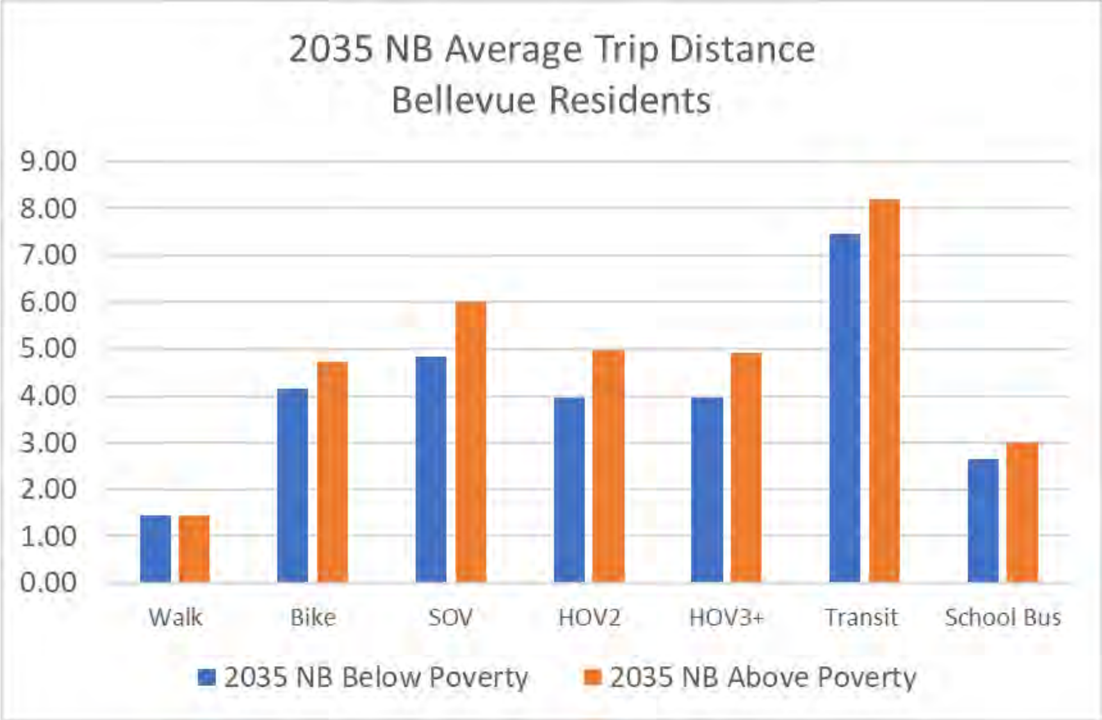
"D:\projects\Bike_Bellevue\equity.xlsx"

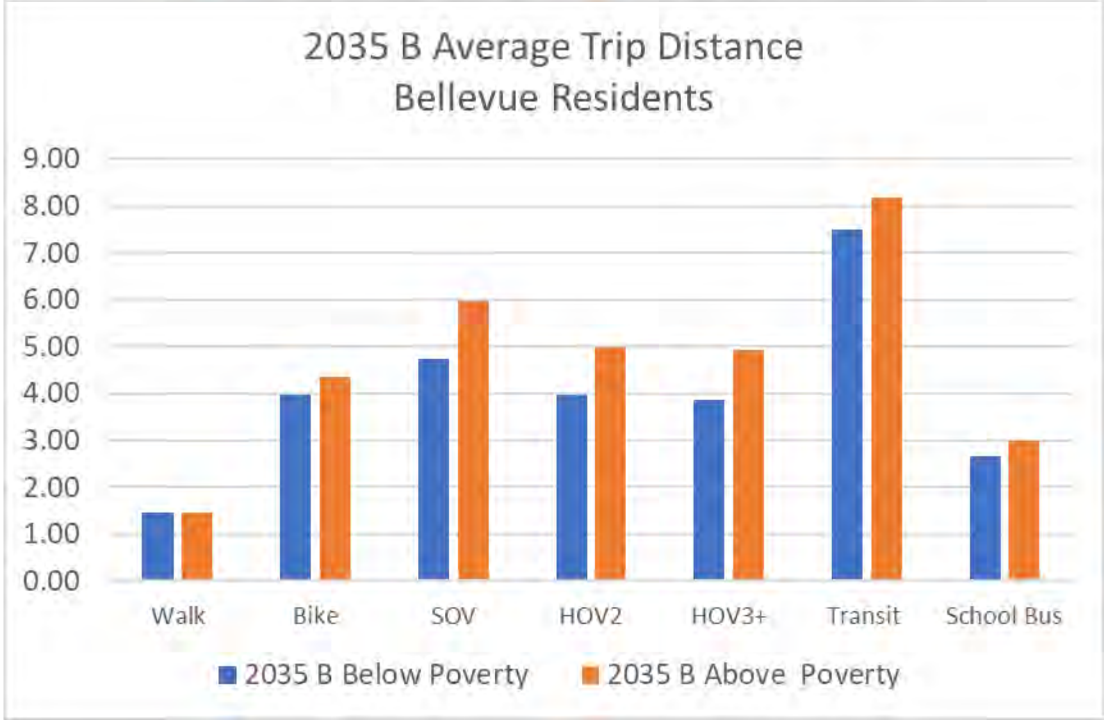




Trip Distance by Poverty Line







Average Bellevue Trip Distance by Mode and Poverty Level

		Walk	Bike	SOV	HOV2	HOV3+	Transit	School Bus
2019	2019 Below Poverty	1.54	4.57	4.57	3.93	3.94	6.33	2.57
	2019 Above Poverty	1.65	4.92	5.84	4.63	4.43	8.51	2.87
2035 NB	2035 NB Below Poverty	1.45	4.14	4.82	3.97	3.95	7.45	2.64
	2035 NB Above Poverty	1.46	4.71	6.02	4.96	4.91	8.21	3.00
2035 B	2035 B Below Poverty	1.45	3.96	4.74	3.99	3.86	7.51	2.65
	2035 B Above Poverty	1.46	4.36	5.96	4.99	4.92	8.18	3.00

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Bike Bellevue Greenhouse Gas Emission Reduction Calculation

Memorandum

Date: September 6, 2023

To: Franz Loewenherz, City of Bellevue

From: Jiamin Tan and Chris Breiland, Fehr & Peers

Subject: Bike Bellevue Greenhouse Gas Emission Reduction Calculation

SE23-0896

Introduction

This memorandum summarizes the transportation-related greenhouse gas (GHG) emissions analysis performed for the Bike Bellevue project. Two principal analysis methods were used for the analysis. The first method uses data from the city's BKRCast travel model to evaluate the change in driving and thus transportation-related GHG emissions. The second method uses a tool developed by ICLEI, a non-profit organization that Bellevue works with on the city's sustainability initiative. The analysis methods, input assumptions, and results are described in the following sections.

BKRCast Method

Transportation-related GHG emissions are calculated by multiplying the total amount of vehicle travel (vehicle-miles traveled, or VMT) by the GHG emissions generated per mile of travel, also called an emissions factor. VMT is further stratified by vehicle speed since slow-moving vehicles generate more GHG emissions per mile of travel.

For this analysis, the Bellevue transportation modeling team provided citywide VMT in 5 mph "speed bins" from the BKRCast model for the base year (2019) and 2035 with and without the Bike Bellevue project. VMT is shown in **Table 1**.

Table 1: Citywide VMT Stratified by 5-mph Speed Bins

Speed Bins (mph)	2019 Daily VMT	2035 Daily VMT (No Build)	2035 Daily VMT (Build)
(0.0, 2.5]	30	30	30
(2.5, 7.5]	3,300	5,190	5,490
(7.5, 12.5]	28,220	24,590	25,240
(12.5, 22.5]	238,080	253,710	245,120
(22.5, 27.5]	379,310	400,910	398,280
(27.5, 32.5]	880,110	852,660	872,920
(32.5, 37.5]	775,330	810,350	785,750
(37.5, 42.5]	394,320	525,700	537,240
(42.5, 47.5]	209,570	242,060	227,880
(47.5, 52.5]	208,600	308,490	296,700
(52.5, 57.5]	357,520	462,460	474,640
(57.5, 62.5]	1,177,730	1,252,070	1,255,170

Source: BKRCast Model.

For corresponding emission factors, the project team requested King County's GHG emission factors from PSRC. The emissions factors are derived from the US Environmental Protection Agency's MOVES model[1], which outputs "CO_2 equivalent" emissions in grams per mile. CO_2 equivalent emissions convert all GHG emissions produced by vehicles into the "equivalent" volume of carbon dioxide, which is the general standard for global warming potential. PSRC provided data for the years 2018, 2030, and 2040. In this case, we interpolated the 2019 and 2035 GHG emission factors using linear relationships between 2018 and 2030 and between 2030 and 2040, respectively. **Table 2** below shows the original GHG emission factors in 2018, 2030, and 2040 and the interpolated factors in 2019 and 2035 at different speeds.

Table 2: GHG Emission Factors in Grams CO2 Equivalent per Mile

Speed Bins	2018	2030	2040	2019 Interpolated	2035 Interpolated
(0.0, 2.5]	2089	1597	1442	2048	1520
(2.5, 7.5]	1160	885	799	1137	842
(7.5, 12.5]	698	531	479	684	505
(12.5, 17.5]	550	418	377	539	398
(17.5, 22.5]	456	348	314	447	331

[1] US Environmental Protection Agency, *MOVES and Mobile Source Emissions Research.* https://www.epa.gov/moves

(12.5, 22.5]	503	383	345	493	364
(22.5, 27.5]	406	310	280	398	295
(27.5, 32.5]	374	285	257	367	271
(32.5, 37.5]	361	275	248	354	262
(37.5, 42.5]	352	269	242	345	255
(42.5, 47.5]	344	263	238	338	250
(47.5, 52.5]	335	256	232	329	244
(52.5, 57.5]	327	250	226	321	238
(57.5, 62.5]	323	247	223	316	235

Source: PSRC MOVES Dataset and Fehr & Peers.

We then calculated the total weekday GHG emissions in 2019 and 2035 build and no build scenarios by multiplying the VMT and the corresponding emission factors in each speed bin and summing up the results. Note that since the BKRCast results only has VMT data in the speed range from 12.5 to 22.5 miles per hour instead of from 12.5 to 17.5 and from 17.5 to 22.5 miles per hour, an average factor of the latter two ranges were calculated from the original MOVES dataset. **Table 3** below shows the citywide average weekday GHG emissions in equivalent metric tons of CO_2 emissions.

Table 3: Average Citywide Weekday GHG Emissions

	2019 Baseline	2035 No Build	2035 Build
Average weekday GHG emissions (metric tons CO_2 equivalent)	1651	1346	1342

Source: Fehr & Peers.

To present data across longer timescales, we worked with the Bellevue transportation modeling team to identify an “annualization” factor that can scale average weekday conditions to an annual total. Based on a review of traffic count data, Bellevue transportation modelers identified an annualization factor of 274. **Table 4** below shows the annual GHG emissions for the three scenarios. Approximately 1,100 metric tons of equivalent CO2 emission will be reduced from the project in 2035.

Table 4: Annual Citywide Weekday GHG Emissions

	2019 Baseline	2035 No Build	2035 Build
Annual weekday GHG emissions (metric tons CO_2 equivalent)	452,370	368,800	367,700

Source: Fehr & Peers.

ICLEI Method

In reviewing the BKRCast data, the city's travel demand forecasting model shows some reduction in VMT as result of both increased bicycle travel mode share and a reduction in vehicle travel because there is slightly less roadway capacity available to vehicles as a result of the Bike Bellevue projects. To supplement the BKRCast output, the project team also reviewed the analysis tool used by the Community Development Department for the Environmental Stewardship Initiative[2]. This tool, developed by ICLEI includes mode share "elasticity" factors that equate increased bicycle mode share with increased bicycle infrastructure. Specifically, the ICLEI bicycle mode share elasticities are derived from *Moving Cooler: An Analysis of Transportation Strategies for Reducing Greenhouse Gas Emissions,* Cambridge Systematics, 2009.

While a different approach than what is used by the BKRCast model, elasticity factors are well-supported by research on travel behavior. A 2014 article by Anderson pointed out bike ridership doubled both in Washington D.C. and New York City after the two cities built large network with protected bike lanes between 2009 and 2013[3]. A 2021 study by Kraus and Koch collected data from 106 European cities and found an average of 11.5 km provisional bike lanes built per city during the COVID-19 pandemic increased cycling between 11% and 48%[4]. Another 2021 study by Yang et al found that the bike mode would increase by 2.5% if the bikeway length were increased 10% in US cities[5].

ICLEI identifies three levels of potential bike facility implementation:

- Level A bike lane/path implementation is focused on areas like central business districts that provide secure parking, repair, rentals, and proper changing facilities. There is a continuous network of on-street bicycle lanes for a combined network density of 2 miles of bicycle lanes per square mile.
- Level B is more extensive than Level A and provides a continuous network of routes for cyclists including bike lanes, boulevards, and shared-use paths. Boulevards include traffic calming to limit automobile use/speed. There are four miles of bicycle lanes per square mile.

[2] City of Bellevue, *Environmental Stewardship*. https://bellevuewa.gov/city-government/departments/community-development/environmental-stewardship

[3] Anderson, Michael (2014). New York City and D.C. Doubled Biking Rates in Just Four Years. Urbanland. https://urbanland.uli.org/news/new-york-city-d-c-doubled-biking-rates-just-four-years/?Site=ULI2015

[4] Kraus, S., & Koch, N. (2021). Provisional covid-19 infrastructure induces large, rapid increases in cycling. Proceedings of the National Academy of Sciences, 118(15). https://doi.org/10.1073/pnas.2024399118

[5] Yang, Q.; Cai, J.; Feng, T.; Liu, Z.; Timmermans, H (2021). Bikeway Provision and Bicycle Commuting: City-Level Empirical Findings from the US. Sustainability, 13, 3113. https://doi.org/10.3390/su13063113

- Level C is the most extensive with bike lanes/paths implemented business centers and transit hubs that connect to a dense network of bike lanes, boulevards, and shared use paths for a total of eight miles of bicycle lanes per square mile[6].

ICLEI identifies a change in bicycle mode share for each of the three levels of implementation. **Table 5** below shows the ideal bike mode share at different levels.

Table 5: Urban Area Bicycle Mode Share by Density Class

Area Population Density (persons/mi)	No Amenities	Level A	Level B	Level C
0-500	0.3%	1.5%	2.7%	5.0%
500-2k	0.3%	1.5%	2.7%	5.0%
2k-4k	0.3%	1.5%	2.7%	5.0%
4k-10k	0.4%	2.1%	3.7%	6.8%
>10k	0.8%	4.4%	7.6%	14.0%
All	0.4%	2.2%	3.9%	7.4%

Source: ICLEI, 2023; citing Cambridge Systematics, Inc. Moving Cooler An Analysis of Transportation Strategies for Reducing Greenhouse Gas Emissions – Technical Appendices. October, 2009.

As a point of reference, under 2019 conditions, the Bike Bellevue project area had a population density of approximately 6,500 persons per square mile and approximately 8.7 miles of bicycle facilities (this equates to approximately 3 miles of bicycle lane per square mile in the project area). By 2035, the population density is expected to increase to about 17,800 persons per square mile and approximately 8 miles of bicycle facilities per square mile (assuming implementation of Bike Bellevue).

To account for the Bike Bellevue implementation effects on travel modes, we increased 2035 no build bicycle mode share from the BKRCast model by the difference between "no amenity" and the ICLEI implementation level. In reviewing the ICLEI model documentation, we determined that Bike Bellevue implementations meet the Level A definition and potentially meet the Level B definition. Since Bellevue's population density is expected to change over time, we also elected to use a more conservative approach of selecting the mode share change from the "All" population density category as opposed to the ">10k" category, even though the Bike Bellevue project area 2035 population density is forecast to be substantially above 10,000 persons per mile by 2035.

When calculating the new bike trips for Level A implementation, we increased bike mode share by 1.8% (2.2% from level A minus the 0.4% from "no amenities"). We assumed the increase in bike

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[6] ICLEI, *New Reduction Strategy using Improved Bike Infrastructure.* https://clearpath.icleiusa.org/community_scale/reduction_strategies/new?calculator_id=141

trips will absorb trips from other modes, so we split the total increase in bike trips – 6,266 trips (total 2035 no build trip multiplies the new bike mode share then minus the original 2035 no build bike trips) – from all other modes proportional to their usage. **Table 6** below shows the total bike trips under different scenarios. The reduction of vehicle trips (specifically single occupancy vehicle—SOV and high occupancy vehicle—HOV) is then calculated using the reduced mode share. **Table 7** shows the SOV and HOV trips reductions from the mode share change by assuming Level A and Level B implementation respectively.

Table 6: Bike Trips in ICLEI Scenarios

2035 No Build Bike Tours	2035 No Build Total Tours	2035 No Build Bike Mode Share	Mode Share Increase Level A	Mode Share Increase Level B	Bike Tours under Level A	Bike Tours under Level B	2035 Level A bike tours difference	2035 Level B bike tours difference
2,796	348,108	0.8%	1.8%	3.5%	9,062	14,980	+6,266	+12,184

Source: Fehr & Peers, 2023.

Table 7: Vehicle Trips Reduction in ICLEI Scenarios

	2035 no build tours	2035 build mode share Level A implementation	2035 Level A tours difference	2035 Level A bike tours difference
SOV	99,865	98,053	-1,812	-3,524
HOV 2 persons	64,527	63,356	-1,171	-2,277
HOV 3+ persons	41,329	40,579	-750	-1,458
Other modes (except bike)	139,591	137,058	-2,533	-4,925

Source: Fehr & Peers, 2023.

The reduced SOV and HOV trips are then converted into VMT by multiplying the average trip length data derived from the BKRCast model. The average trip lengths in the build scenarios are assumed to be the same as in the no build scenario. **Table 8** shows the average trip length of different modes in each scenario.

Table 8: Average Trip Lengths

Mode	2019 Average Trip Length	2035 No Build Average Trip Length	2035 Build Average Trip Length
Walk	1.7	1.5	1.5
Bike	4.9	4.7	4.7
SOV	5.8	6	6

HOV	4.5	4.9	4.9
Transit	8.5	8.2	8.2
School Bus	2.9	3	3

Source: City of Bellevue BKRCast Model, 2023.

The reduced SOV and HOV VMT are then split into different speed ranges based on the citywide VMT and speed distribution from the BKRCast model. The same GHG emissions factors from **Table 2** are used to calculate the final weekday GHG emissions reductions when taking the ICLEI mode shift into account. **Table 9** below shows the reduced VMT binned by different speed range in different scenarios.

Table 9: Citywide VMT Stratified by 5-mph Speed Bins in ICLEI Scenarios

Speed Bins	2019 Weekday VMT	2035 No Build Weekday VMT	2035 Build Weekday VMT Level A	2035 Build Weekday VMT Level B
(0.0, 2.5]	30	30	30	30
(2.5, 7.5]	3,300	5,190	5,460	5,440
(7.5, 12.5]	28,220	24,590	25,140	25,050
(12.5, 22.5]	238,080	253,710	244,150	243,230
(22.5, 27.5]	379,310	400,910	396,700	395,210
(27.5, 32.5]	880,110	852,660	869,470	866,200
(32.5, 37.5]	775,330	810,350	782,640	779,700
(37.5, 42.5]	394,320	525,700	535,110	533,100
(42.5, 47.5]	209,570	242,060	226,980	226,120
(47.5, 52.5]	208,600	308,490	295,530	294,420
(52.5, 57.5]	357,520	462,460	472,760	470,980
(57.5, 62.5]	1,177,730	1,252,070	1,250,200	1,245,510

Source: Fehr & Peers, 2023.

The annualization factor of 274 is used to calculate total annual GHG emissions. **Table 10** below shows the annual GHG emissions for the 2019, 2035 no build, and 2035 build using ICLEI Level A and B implementation assumptions. The results show that approximately 2,600 metric tons of equivalent CO_2 emissions are estimated to be reduced under the Level A assumption, and approximately 4,000 metric tons of equivalent CO_2 emissions are estimated to be reduced under the Level B assumption.

Table 10: Annual Citywide Weekday GHG Emissions in ICLEI Scenarios

	2019 Baseline	2035 No Build	2035 Build Level A	2035 Build Level B
Annual weekday GHG emissions (metric tons CO_2 equivalent)	452,370	368,800	366,070	364,700

Source: Fehr & Peers, 2023.

20-Year Cumulative GHG Emissions Reduction

To calculate cumulative GHG emissions reductions over the project lifespan (assumed at 20 years), we first extrapolated the 2045 build and no build VMT at different speeds by assuming a linear relationship in VMT from 2035 to 2055. The rate of change of VMT between 2019 and 2035 build/no build was used for the extrapolation. Similarly, we extrapolated the emissions factors in 2045 by adopting the same linear rate of change as from 2030 to 2040. **Table 11** below shows the 2030, 2040, and extrapolated 2045 emission factors. **Table 12** below shows the extrapolated 2045 no build and 2045 build VMT in baseline and assuming ICLEI Level A and B implementation.

Table 11: 2045 GHG Emission Factors in Grams CO2 Equivalent per Mile

Speed Bins	2035 Interpolated	2040	2045 Extrapolated
(0.0, 2.5]	1,520	1,442	1,364
(2.5, 7.5]	842	799	755
(7.5, 12.5]	505	479	453
(12.5, 17.5]	398	377	357
(17.5, 22.5]	331	314	297
(12.5, 22.5]	364	345	327
(22.5, 27.5]	295	280	264
(27.5, 32.5]	271	257	244
(32.5, 37.5]	262	248	235
(37.5, 42.5]	255	242	229
(42.5, 47.5]	250	238	225
(47.5, 52.5]	244	232	219

(52.5, 57.5]	238	226	214
(57.5, 62.5]	235	223	211
(62.5, 67.5]	240	227	215
(67.5, 72.5]	250	237	224
(72.5, 75]	264	250	237

Source: PSRC MOVES Dataset and Fehr & Peers, 2023.

Table 12: 2045 Daily VMT in Different Scenarios

Speed Bins	2045 No Build	2045 Build BKRCast	2045 Build ICLEI Level A	2045 Build ICLEI Level B
(0.0, 2.5]	30	30	30	30
(2.5, 7.5]	6,370	6,850	6,820	6,780
(7.5, 12.5]	22,320	23,390	23,220	23,070
(12.5, 22.5]	263,480	249,520	247,940	246,450
(22.5, 27.5]	414,400	410,130	407,570	405,150
(27.5, 32.5]	835,500	868,430	862,810	857,510
(32.5, 37.5]	832,230	792,260	787,200	782,430
(37.5, 42.5]	607,800	626,560	623,100	619,840
(42.5, 47.5]	262,360	239,320	237,860	236,470
(47.5, 52.5]	370,920	351,770	349,860	348,060
(52.5, 57.5]	528,060	547,840	544,780	541,900
(57.5, 62.5]	1,298,540	1,303,560	1,295,490	1,287,860

Source: Fehr & Peers, 2023.

Total GHG emissions reductions in 2045 were then calculated by multiplying and summing the extrapolated VMT and emissions factors in each speed bin. The annualization factor of 274 is used in the calculation as well. The 20-year cumulative GHG emission reduction was then derived by multiplying 20 years to the 2045 annual GHG emissions reduction. **Table 13** below shows the 20-year cumulative GHG reduction in metric tons of CO_2 equivalent from each scenario. Note that all future year GHG emissions reductions calculation assumes an increasing share of electric vehicles, which are assumed to have lower CO_2 emissions per mile.

Table 13: 2045 Daily VMT in Different Scenarios

	BKRCast	ICLEI Level A	ICLEI LEVEL B

20-year cumulative reduction after Bike Bellevue implementation in 2035	32,920	75,380	115,460

Source: Fehr & Peers, 2023.

GHG Emissions in Other Contexts

While the total reduction of GHG emissions in metric tons is relevant to transportation planners, it is difficult for the layperson to relate to. Therefore, we also translated the equivalent CO_2 emissions reduction into more tangible objects, such as number of gasoline cars driven per year, gallons of gasoline consumed, and area of forests needed for sequestering the same amount of carbon, etc., based on a US EPA calculator. **Table 14** shows specific factors used by the US EPA calculator to convert a metric ton of CO_2 emissions to other units of measurement. **Table 15** below shows the range of GHG emissions reductions from Bike Bellevue for the year 2035 as well as the 20-year cumulative benefit (the range is based on the Level A and Level B ICLEI assumptions).

Table 14: Factors used in the US EPA Calculator to Convert from Metric Tons of CO_2

	Factor from US EPA
Gasoline-powered passenger vehicles driven for one year	4.49
Typical US homes' energy use for one year	7.93
Gallons of gasoline consumed	$8.887*10^{-3}$
Acres of US forests in one year	0.84

Source: US EPA, Greenhouse Gases Equivalencies Calculator – Calculations and References, https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator.

Table 15: Tangible GHG Emission Contexts

	2035 Annual GHG Reduction	2035-2055 Cumulative GHG Reduction
Total metric tons CO_2 reduction	2,600 – 4,000	75,400 – 11,5500
Equivalent to…		
Gasoline-powered passenger vehicles driven for one year	580 – 890	16,800 – 25,700
Typical US homes' energy use for one year	330 – 500	9,500 – 14,600
Gallons of gasoline consumed	292,600 – 450,000	8,482,100 – 12,992,000

Acres of US forests in one year	3,100 – 4,800	89,700 – 137,500

Source: Fehr & Peers, 2023.

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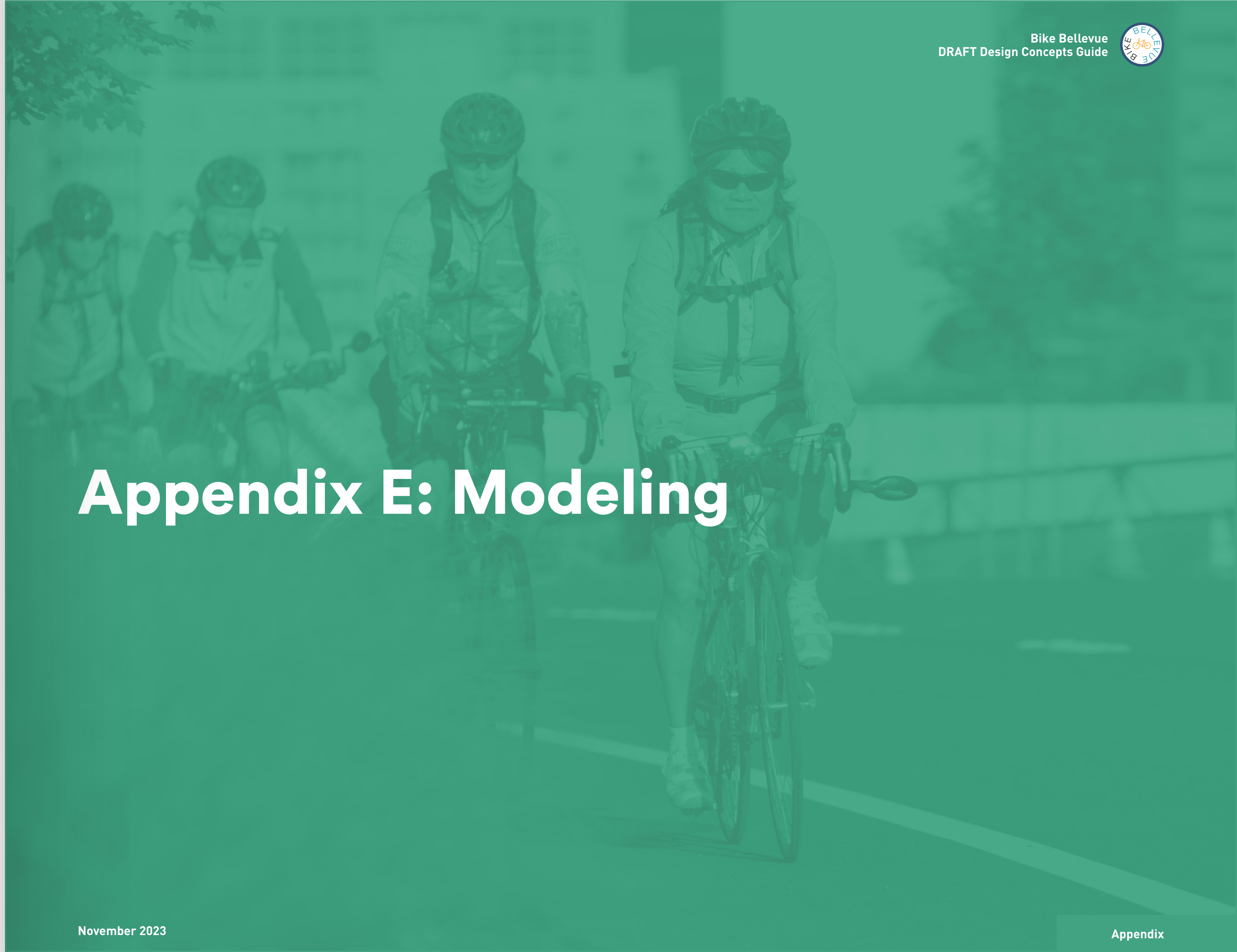


Appendix E: Modeling

Documenting Vehicle Performance (Existing)

The results for existing conditions, based on the 2019 Base Year model, are shown in Figure 12 for system intersections and Figure 13 for travel speed on the Bike Bellevue corridors. Within the analysis area, two system intersections do not meet the Performance Target (V/C < 1.00), 118th Avenue SE & SE 8th Street and Lake Hills Connector & SE 7th Place. However, these intersections have programmed improvements that will be implemented prior to 2035. The eleven Bike Bellevue corridors meet the Performance Target for Typical Urban Travel Speed (>= 0.5).

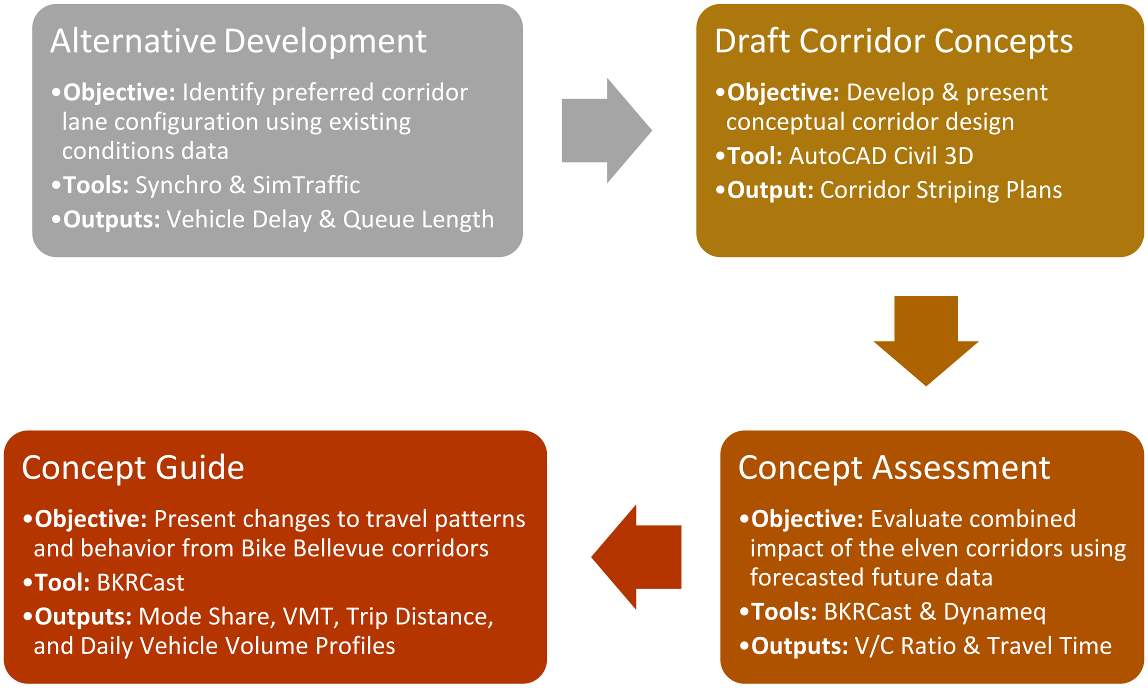
Documenting Vehicle Performance (Future)

The results for future conditions, based on the 2035 Bike Bellevue Build model, are shown in Figure 14 for system intersections and Figure 15 for travel speed on the Bike Bellevue corridors. Within the analysis area, two system intersections within PMA 1 do not meet the Performance Target (V/C < 1.00), 112th Avenue NE & Main Street and 124th Avenue NE & Bel-Red Road. Additionally, within the analysis area, five system intersections within PMA 3 do not meet the Performance Target (V/C < 0.85), 148th Avenue NE & NE 8th Street, 148th Avenue NE & Main Street, 115th Place NE & Northup Way, 124th Avenue NE & NE 8th Street, 140th Avenue NE & NE 24th Street, and 116th Avenue NE & Northup Way.

Both future year models assume the completion of the following major transportation projects by 2035:

- Spring Boulevard Phase III Extension – 124th Avenue NE to 130th Avenue NE.
- I-405 / Renton to Bellevue Widening and Express Toll Lanes.
- SR 520 and 124th Avenue NE Interchange Reconfiguration adding a SR 520 westbound off-ramp and eastbound on-ramp.
- South Downtown Access – I-405 Southbound on-ramp.
- Link Light Rail Service to Lynnwood, Federal Way, and Redmond.
- Stride Bus Rapid Transit between Lynnwood and Burien on I-405.
- Eastrail regional trail through Bellevue.

Modeling Analysis Summary



As part of the project, city staff implemented a multi-step transportation analysis to support the Bike Bellevue project goal of "substantially improving the network of safe and comfortable bike routes in the project area without substantially degrading traffic operations." The first step, alternative development, utilized Synchro and SimTraffic microsimulation modeling to select a preferred corridor configuration to carry forward into the design phase. The second step, concept assessment, leveraged the City's travel demand forecasting tool Bellevue-Kirkland-Redmond (BKR)Cast to predict how travel behavior could change with the implementation of the eleven Bike Bellevue corridors and any subsequent impacts to vehicle system performance, as defined in the Bellevue Mobility Implementation Plan (MIP).

Alternative Development

The alternative development analysis occurred prior to the preliminary corridor design work to identify the corridor configuration that best supported the project goal. A variety of configurations were evaluated for the corridors; repurposing a single lane travel lane in one direction along the whole corridor, repurposing a single travel lane in the opposite direction along the whole corridor, and hybrid configurations where the repurposed lane changed directions along the corridor based on traffic patterns. Delay and queuing performance measures were used to compare the configurations.

The analysis used Synchro 10 and SimTraffic 10 software and was completed in the early 2021 using 2018/2019 pre-pandemic volumes. Traffic volumes remain lower than pre-pandemic levels and the travel pattern is more spread throughout the day; therefore, the pre-pandemic volumes represent a more worst-case scenario. This analysis methodology was selected because it allows for the impact of queuing and delay from one intersection to the next to be compared and could highlight any potential network failures from queue spill back or bottlenecks. The preferred configuration from this analysis was carried forward to the preliminary design phase and incorporated into the Concept Guide. The methodology and results for the alternative development analysis are summarized in Appendix A.

Concept Assessment

The concept assessment analyzed the combined impact of the eleven Bike Bellevue corridors on vehicle system performance and travel behavior in the project area. For this analysis, BKRCast (Commit: 0054a75, EMME 4.6, Dynameq 4.4) was used to forecast the future intersection V/C ratio for each System Intersection in the project area and the travel speed for the eleven Bike Bellevue Corridors. Existing conditions intersection V/C ratio and corridor travel speed analyses were conducted using 2018/2019 pre-pandemic volumes, in line with the alternative development analysis and the selected BKRCast base year model.

BKRCast is an activity-based model developed from the Puget Sound Regional Council (PSRC) SoundCast model with additional detail in the BKR area. The city uses BKRCast to predict how travel behavior will change based on changes in land use patterns and improvements to the transportation network. An activity-based model simulates an individual person's travel patterns over the course of a day based on regional household travel survey data, demographic information, land use inputs, and travel options. BKRCast has been calibrated and validated for use in Bellevue. The model is best used to compare the relative differences between alternatives rather than an absolute prediction of future travel patterns.

For the Bike Bellevue concept assessment, one base year model and two future year models were developed. The base year model from 2019 was selected since the pre-pandemic base year model is representative of the most recent regional household travel survey and demographic information used to calibrate BKRCast. A new regional household travel survey is being conducted in 2023 by the PSRC to better understand changes in travel patterns as the pandemic recovery continues. This survey will be used to recalibrate and update BKRCast over the next couple of years. The future year models have a horizon year of 2035 and are based on the 2022-2033 Transportation Facilities Plan (TFP) land use scenario with a 30-percent work-from-home rate considered. The land use inputs are summarized in Table 1.

Table 1 BKRCast Model Land Use Inputs for Bike Bellevue Modeling

Model Inputs	Total Employment	Total Households
2019 - Citywide	140,890	70,980
2019 - Project Area	*83,755*	*11,110*
2035 TFP - Citywide	217,750	91,055
2035 TFP - Project Area	*152,665*	*26,765*

The No Build future year model network is based on the 2033 TFP network with the addition of a pedestrian Grand Connection between Eastrail and the Downtown Link Light Rail Station, the Spring Boulevard extension between 124th Ave NE and 130th Ave NE, and the SR 520 eastbound half-interchange at 124th Ave NE. The No Build model includes Sound Transit and King County Metro transit capacity projects programmed to be implemented prior to 2035. The Build future year model network is based on the No Build network with the addition of the eleven Bike Bellevue corridors.

Mode share is the percentage of travel events that are taken by each mode of transportation: walking, bicycling, single-occupancy vehicle, high-occupancy vehicle, and transit/school bus. For the Bike Bellevue concept assessment, the mode share is presented by tours that originate or have a destination in the project area or Bellevue for both all purposes and work purpose. The mode share is summarized in Table

2. In BKRCast, tours are travel events with a primary purpose that start at a person's home and eventually return home. Tours can be made up of two or more trips and can include sub-tours and intermediate stops. The table compares existing and future year mode share to identify how travel patterns could change over the next fifteen years. The mode share differences, at this scale, between the No Build and Build model are negligible given they are based on the same land use and include the same major network improvements. The differences in the two future year models are represented more in a person's route choice. Between existing and future conditions, the share of walk, bike, and transit tours are expected to increase while overall auto usage is expected to decrease. This trend aligns with the opening of light rail in Bellevue and the densification of housing and jobs in transit accessible areas.

Table 2 Project Area and Citywide Mode Share

Project Area

	All Purposes (includes sub-tours)			**Work Purpose**		
Mode Share	2019	2035 No Build	2035 Build	2019	2035 No Build	2035 Build
Walk	16%	21%	21%	2%	2%	2%
Bike	0%	1%	1%	0%	0%	0%
SOV	36%	29%	29%	58%	44%	44%
HOV	40%	30%	30%	25%	20%	20%
Transit/School Bus	8%	20%	20%	14%	34%	34%

Citywide

	All Purposes (includes sub-tours)			**Work Purpose**		
Mode Share	2019	2035 No Build	2035 Build	2019	2035 No Build	2035 Build
Walk	12%	15%	15%	1%	2%	2%
Bike	0%	1%	1%	0%	0%	0%
SOV	35%	31%	31%	62%	51%	51%
HOV	46%	38%	38%	26%	22%	22%
Transit/School Bus	7%	16%	16%	10%	25%	25%

The total vehicle miles travelled (VMT) and VMT per capita in Bellevue is summarized in Table 3. While the total daily VMT is expected to increase from existing conditions to 2035 No Build, the VMT per capita is expected to decrease over the next fifteen years. The increase in daily VMT can be attributed to employment and housing growth while the decrease in VMT per capita can be attributed to the shift towards non-auto travel modes. The shift to non-auto travel modes continues from 2035 No Build to Build, with a decrease in both daily VMT and VMT per capita. While the impact of the Bike Bellevue corridors was not reflected in Mode Share, it can be attributed to the decrease in VMT and VMT per capita between the two future year models.

Table 3 Citywide VMT and VMT per Capita

	2019	**2035 No Build**	**2035 Build**
Daily VMT	4,652,110	5,138,210	5,124,446
Daily VMT per Capita	32.2	27.5	27.4

The BKRCast travel demand model results in conjunction with City's dynamic traffic assignment (DTA) model were used to forecast volumes at selected system intersections for the project for the No Build and Build models. The Bike Bellevue analysis 57 system intersections were selected l, 45 of which are located in a Type 1 Performance Management Area (Area) within the project area, one intersection is in the Crossroads Type 2 PMA and the rest are in the residential Type 3 PMA. The city uses Dynameq for DTA analyses, a sister program to EMME which is used to run the BKRCast travel demand model. The Origin-Destination (O-D) result trip matrices from BKRCast are used as the input for Dynameq. BKRCast employes a static routing algorithm to predict the effects of congestion and the impact on route choice because of the congestion; however, the static algorithm simplifies the impacts of queuing, signalization, and flow interruptions on congestion. DTA models employ a time-dependent shortest-path and experience travel time algorithm, explicit representation of traffic control devices, and a finer level of temporal detail for traffic loading to produce more robust estimates of volumes and travel times. Dynameq is a lane-based simulation model including detailed network geometry like merge zones, turn pockets, lane drops, etc. It also includes intersection control parameters at the intersections in Bellevue and therefore, the delay due to the intersection controls is considered during the assignment. BKRCast breaks the day down into four time periods: AM Peak, midday, PM peak, and night. Each period in BKRCast represents one assignment time interval. Dynameq uses 15-minute assignment intervals to dynamically route traffic as congestion develops over the course of the larger time period. The Bike Bellevue system intersection analysis focuses on the PM peak hour, since this period has the highest number of people travelling. The project intersection analysis is summarized in Table 4. Under existing conditions, 52 of the 57 intersections (91%) meet the performance target. Of the five intersections that do not meet the performance target, two are located within a Type 1 PMA, Wilburton/East Main, and the other three are located within the Type 3 PMA, residential. The two intersections located within the Wilburton/East Main Type 1 PMA have programmed improvements that will be implemented prior to 2035. Under 2035 No Build conditions, 51 of the 57 intersections (89%) meet the performance target. One of the intersections is located within the Downton Type 1 PMA while the other five intersections are located within the Type 3 PMA. The implementation of the Bike Bellevue projects results in two additional intersections that don't meet the performance target. One intersection is located on a Bike Bellevue corridor in the BelRed Type 1 PMA while the other is located within the Type 3 PMA.

Table 4 Vehicle System Performance – Project Intersections

Analysis Area	**Performance Target**	**Percent of Intersections Meeting Target**		
		Existing – 2019	**2035 No Build**	**2035 Build**
Type 1 PMA (Project Area)	1.00	96%	98%	96%
Type 2 PMA	0.90	100%	100%	100%
Type 3 PMA	0.85	73%	55%	45%
Citywide (Project Intersections)		91%	89%	86%
Analysis Area (Performance Target)	**Intersection Not Meeting Target**	**V/C Ratio**		
		Existing – 2019	**2035 No Build**	**2035 Build**
Type 1 PMA (Performance Target = 1.00)	118th Ave SE & SE 8th St	**1.02**	0.88	0.89
	Lake Hills Connector & SE 7th Pl	**1.03**	1.00	1.00
	112th Ave NE & Main St	0.98	**1.15**	**1.19**
	124th Ave NE & Bel-Red Rd	0.82	0.89	**1.01**
	148th Ave NE & NE 8th St	**0.99**	0.84	**0.87**
	148th Ave NE & Main St	**0.95**	**1.05**	**1.02**

Type 3 PMA (Performance Target = 0.85)	115th Pl NE & Northup Way	**0.95**	**1.07**	**0.98**
	124th Ave NE & NE 8th St	0.53	**0.93**	**0.89**
	140th Ave NE & NE 24th St	0.84	**0.88**	**0.97**
	116th Ave NE & Northup Way	0.79	**0.95**	**0.96**

Similar to intersection performance, the corridor travel speed was forecasted using the O-D trip matrices resulted from BKRCast travel demand model and the Dynameq model for the eleven Bike Bellevue corridors. All eleven corridors meet the performance target, and the combined average speed of the corridors is summarized in Table 5.

Table 5 Vehicle System Performance – Bike Bellevue Corridors

Analysis Area	Corridors Not Meeting Performance Target	Speed (miles per hour)		
		Existing – 2019	2035 No Build	2035 Build
Project Area (Type 1 PMA)	0	15.0	14.2	14.0

In addition to the vehicle system performance metrics outlined in the MIP, additional travel pattern data from BKRCast was used to support the Bike Bellevue concept guide. This travel data included an auto trip length analysis for trips in the city, a review of mode share and trip length by Bellevue residents who live in a household below the federal poverty line, and the development of 24-hour vehicle volume profiles for the eleven corridors.

Providing a safe, comfortable, and connected bike network provides more opportunities for shorter distance trips to be made by bicycle and can reduce vehicle congestion and parking demands. To understand how people are making short distance trips, BKRCast trip data was grouped by trip length and filtered to identify auto trips made to, from, and within the city. Existing conditions, No Build and Build future conditions trip length metrics are presented in Figure 1, Figure 2, and Figure 3. The data from all three models shows that 40-percent of auto vehicle trips in the city are less than three miles in length. Most trips, 42-percent, in the city are longer than five miles and trips between three and five miles account for the remaining 18-percent of auto trips.

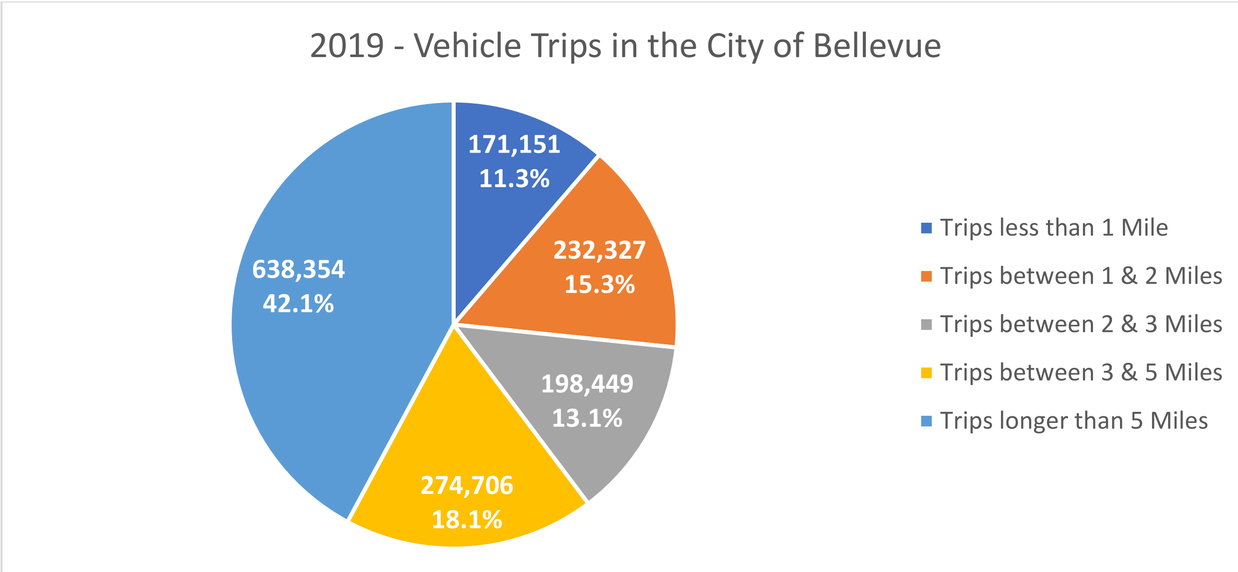


Figure 1 BKRCast 2019 Auto Vehicle Trip Length Distribution for the City of Bellevue

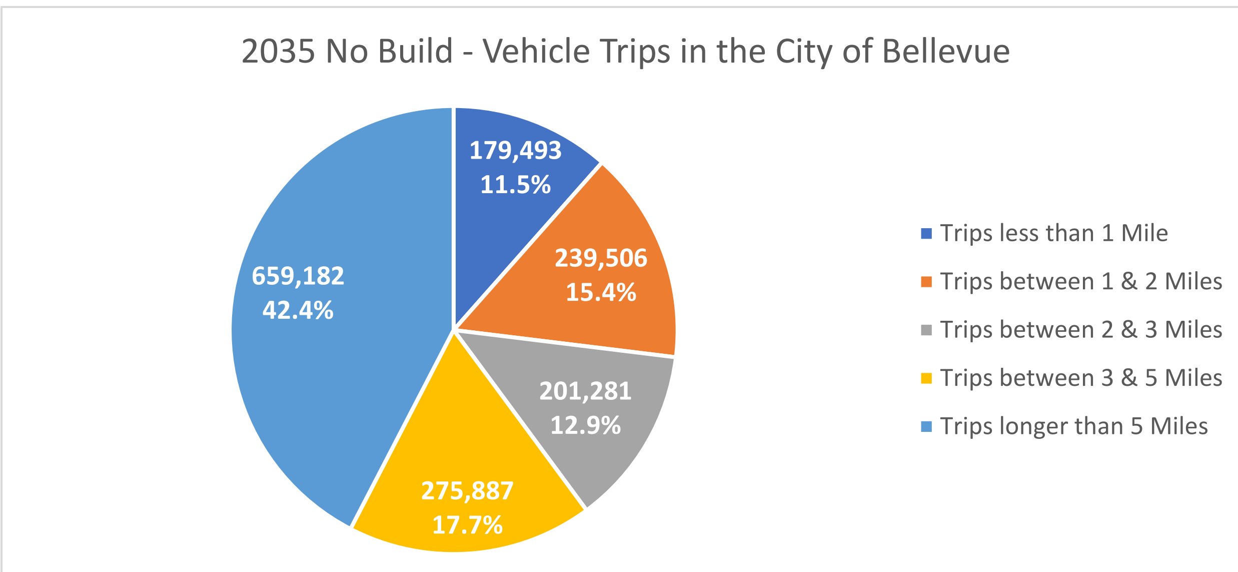


Figure 2 BKRCast 2035 No Build Auto Trip Length Distribution for the City of Bellevue

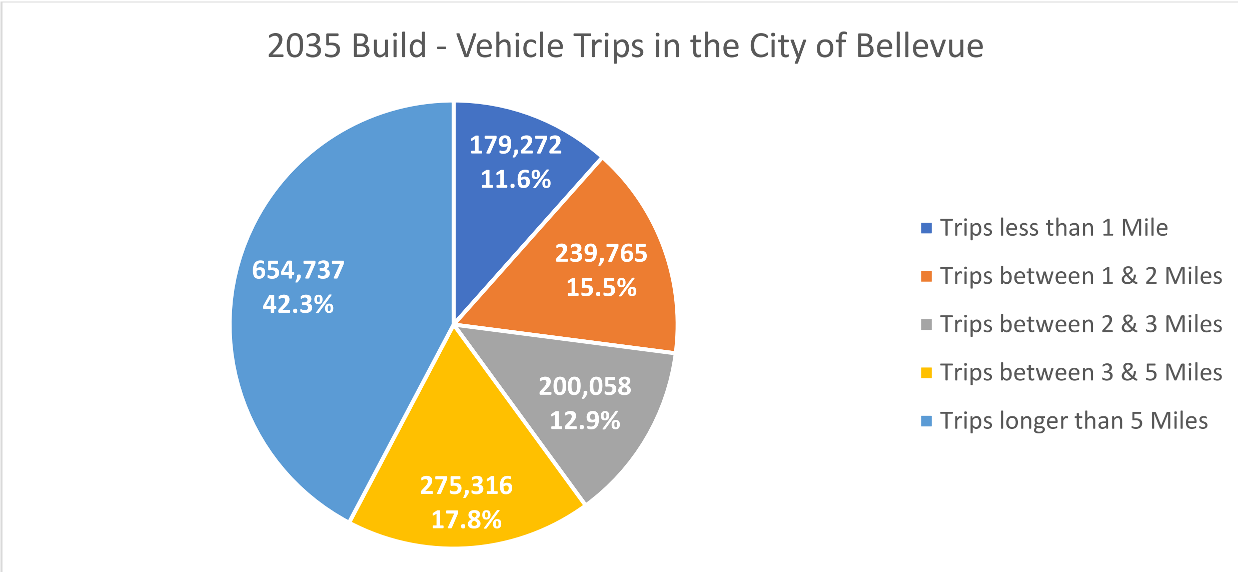


Figure 3 BKRCast 2035 Build Auto Trip Length Distribution for the City of Bellevue

To support the Bike Bellevue equity analysis, a cross-tabulation was completed using BKRCast input household demographic data and output trip data to determine the mode share and average trip length for Bellevue residents living in households below and above the 2016 federal poverty line. The federal poverty line used for this analysis was $11,770 for the first resident in a household and an additional $4,160 for each additional resident of the household. An example poverty line calculation for a household of three people is: $11,770 + $4,160 + $4,160 = $20,090. The travel characteristics of the two groups of Bellevue residents are summarized in Table 6. Overall, residents living below the poverty line are more likely to use non-motorized or shared modes of transportation, while residents living above the poverty line are more likely to travel by single-occupancy vehicle. Residents living above the poverty line have the means to travel further, on average, than those living below the poverty line.

Table 6 Travel Characteristics of Bellevue Residents by Household Income Level (Above/Below Federal Poverty Line)

Below Federal Poverty Line

	Mode Share			Trip Length (mi.)		
Mode	2019	2035 No Build	2035 Build	2019	2035 No Build	2035 Build
Walk	22%	24%	24%	1.5	1.4	1.4
Bike	1%	1%	1%	4.6	4.1	4.0
SOV	29%	21%	21%	4.6	4.8	4.7
HOV	42%	42%	42%	3.9	4.0	3.9
Transit	3%	7%	7%	6.3	7.5	7.5
School Bus	3%	5%	5%	2.6	2.6	2.7

Above Federal Poverty Line

	Mode Share			Trip Length (mi.)		
Mode	2019	2035 No Build	2035 Build	2019	2035 No Build	2035 Build
Walk	17%	21%	21%	1.7	1.5	1.5
Bike	>1%	>1%	>1%	4.9	4.7	4.4
SOV	42%	38%	38%	5.8	6.0	6.0
HOV	38%	32%	32%	4.5	4.9	5.0

Transit	1%	6%	6%	8.5	8.2	8.2
School Bus	2%	3%	3%	2.9	3.0	3.0

Using historic count data and BKRCast daily volume forecasts, 24-hour vehicle volume profiles were developed for the eleven Bike Bellevue corridors. These profiles provide insight into how the roadway capacity is utilized throughout the day as opposed to the single hour snapshot during the pm peak period provided by the V/C ratio and travel time analyses previously discussed. The change in modelled daily vehicle volume from existing to future conditions was used in conjunction with the existing field collected count data to develop the estimated future Build and No Build daily volumes on the eleven corridors. A weighted average profile of vehicle volume by hour was calculated for each of the eleven corridors using historic count data dating back to 2003. The most recent count data was assigned the highest weight. The weight was halved for the next most recent set of data until reaching the first year of data from 2003, which received the lowest weight. Between three and six sets of historic count data were used for each corridor to develop the weighted average profile. A weighted average profile was developed to highlight any changes in travel patterns over the last 20 years. The weighted average profile and the modelled daily volume estimates were used to plot the future 24-hour vehicle volume profiles. The No Build and Build profiles used the same weighted average profile for each corridor. A capacity threshold of 720 vehicles per hour per lane was selected based on information provided in *NCHRP Report 1036: Roadway Cross-Section Reallocation: A Guide*. This threshold represents the average traffic signal throughput capacity during heavily congested conditions.

Bike Bellevue Performance Measures Using Dynameq DTA Model

Bike Bellevue
Performance Measures
Using Dynameq DTA Model

May 10 2023

STA Vs DTA

- STA:

For each OD pair, all used routes have equal and lowest **TRAVEL TIME (generalized cost)**.

- DTA:

For each OD pair and **DEPARTURE TIME**, all used routes have equal and lowest **EXPERIENCED TRAVEL TIME (generalized cost)**.

Plus:

- Capacity constraints
- Take intersection controls into accounts

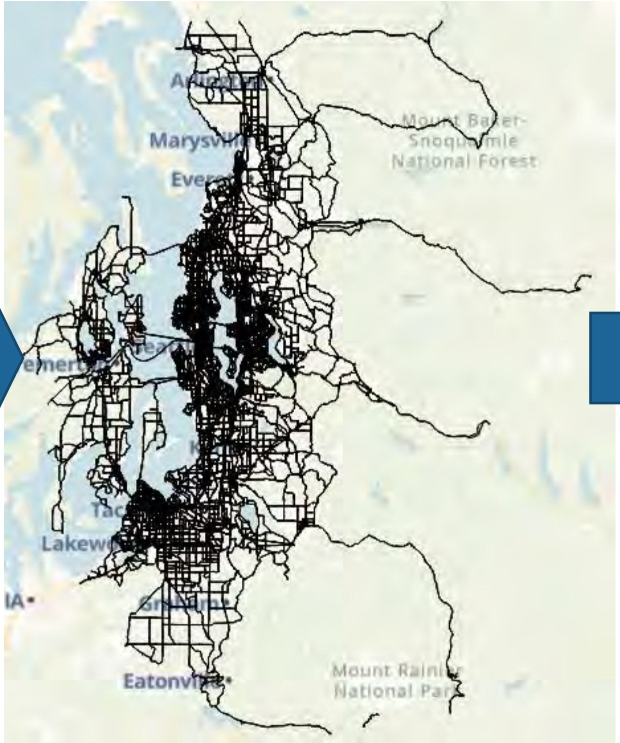
Network Development

Macro-scopic TDM

Meso-scopic DTA Model

BKRCast EMME Model

Dynameq Regionwide Model



Dynameq Citywide Model

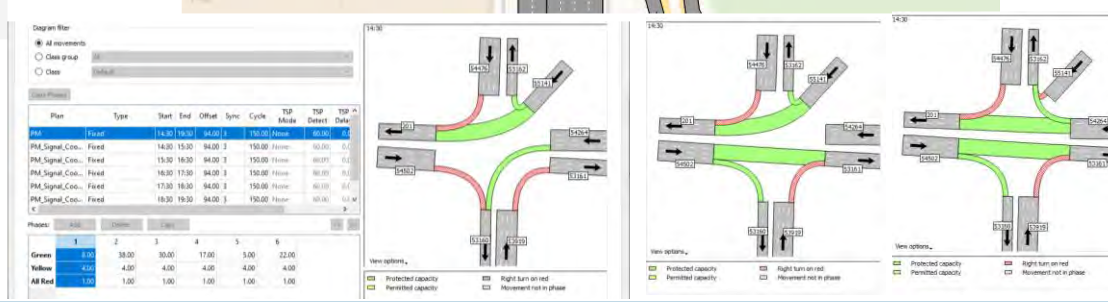
Network Development

Macro-scopic TDM

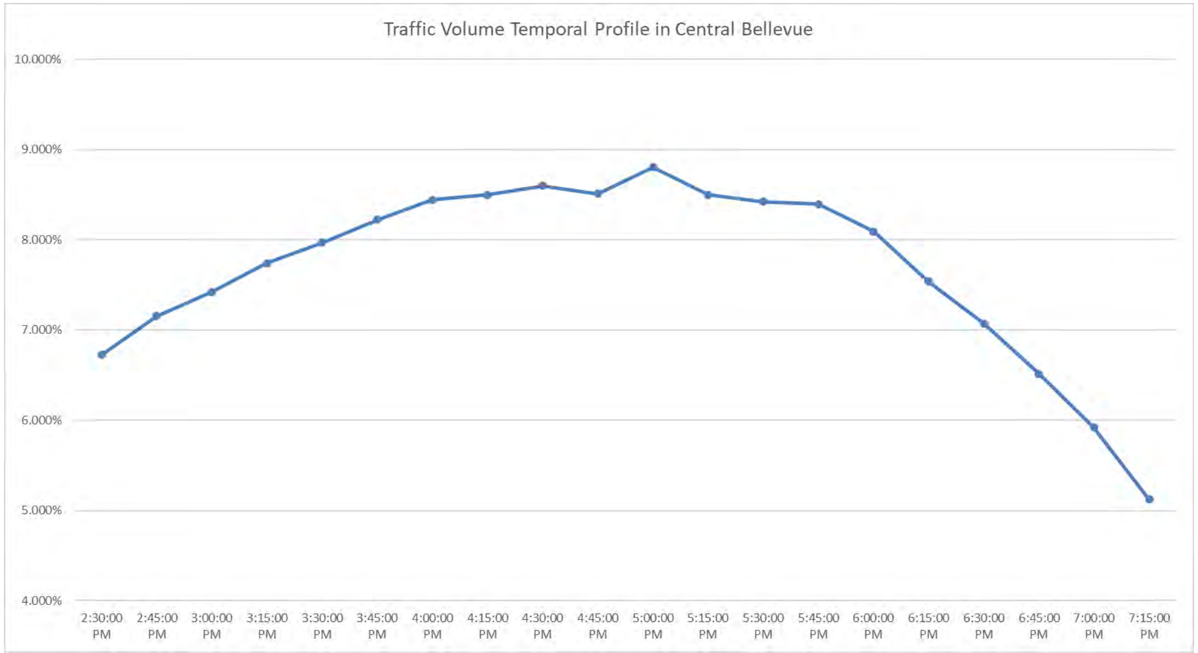
BKRCast EMME Model

Meso-scopic DTA Model

Dynameq Model



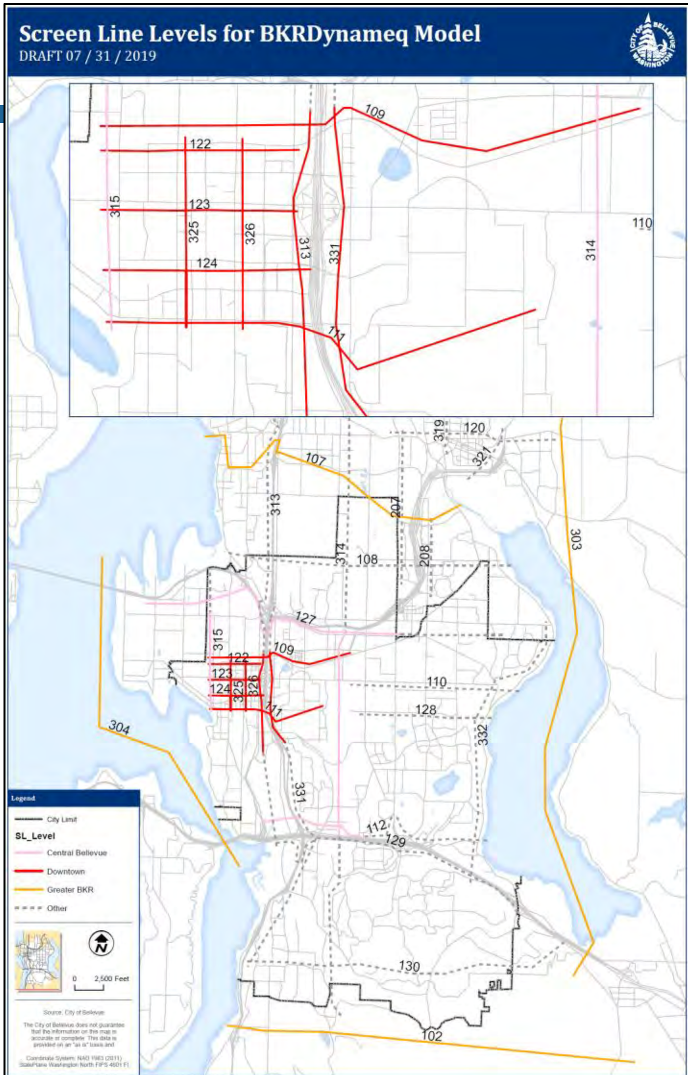
Traffic Volume Temporal Profile (2018 tube counts were used)



- 20 trip matrices from EMME model were inputted in the Dynameq model.
- PM 3-Hr trip matrices were expanded to 5 hours by following the profile.

Traffic Volume Validation at Screen Lines – 1

2018 Counts Vs 2018 Model (Hourly Average from 16:00 – 18:00)



SL_ID	Screenline Name	Screenline Description	Direction	2018 Counts	DTA Model Vol	% Diff
102	South Boundary	S/O SE 69th Way & Newcastle-Coal Creek Rd	SB	6802	7700	13.2%
			NB	6816	6445	-5.4%
107	EW-3	N/O NE 68th St, NE 72nd St, NE 70th St, & NE 51st St	SB	7984	7123	-10.8%
			NB	11929	11398	-4.5%
303	East boundary	E/O Avondale Rd, 196th Ave NE & W Lk Samm Pkwy	WB	4436	3442	-22.4%
			EB	7861	6021	-23.4%
304	West boundary	Lk WA bridge crossing - SR-520 & I-90	WB	9300	10238	10.1%
			EB	10500	11276	7.4%
Total				**65628**	**63643**	**-3.0%**

Summary of Bellevue (Pink Screenlines)

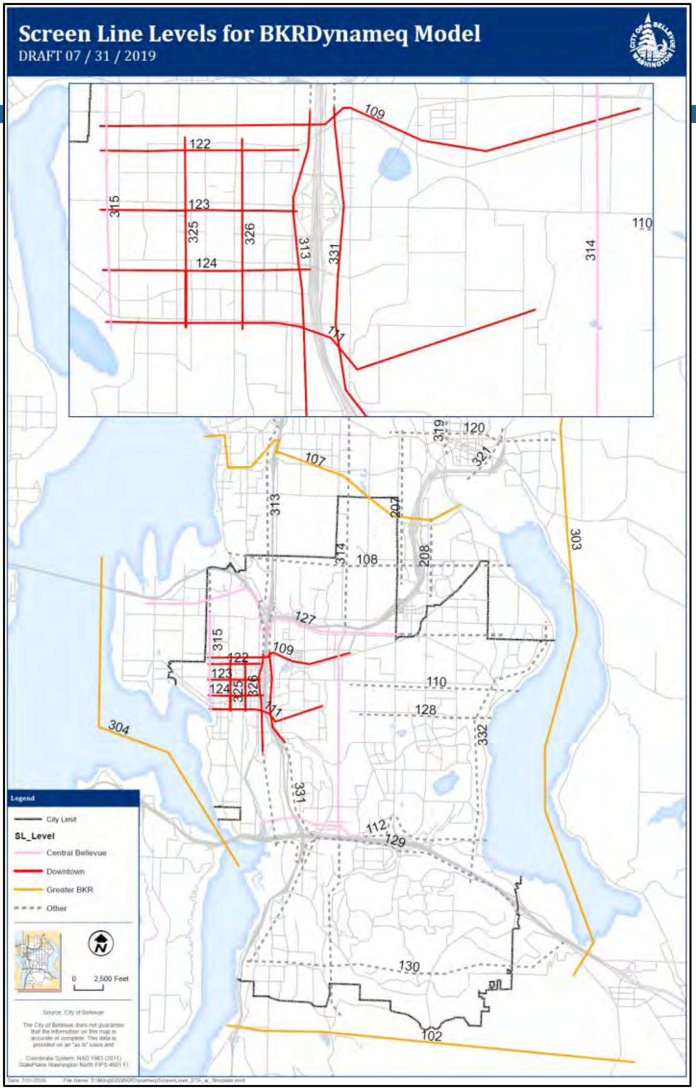
SL_ID	Screenline Name	Screenline Description	Direction	2018 Counts	DTA Model Vol	% Diff
112	EW-8-BEL	N/O I-90 & Eastgate Way	SB	12093	10543	-12.8%
			NB	9922	8980	-9.5%
127	EW-1-BEL	S/O SR-520 & N/O NE 20th St	SB	11226	11046	-1.6%
			NB	11601	11429	-1.5%
314	NS-2	E/O 132nd Ave NE, Richards Rd, 128th Ave SE & CC Pkwy	WB	4596	4680	1.8%
			EB	4914	4373	-11.0%
315	NS-3-BEL	W/O 100th Ave NE	WB	1343	1479	10.1%
			EB	872	695	-20.3%
Total				**56567**	**53225**	**-5.9%**

Summary of CBD (Red Screenlines)

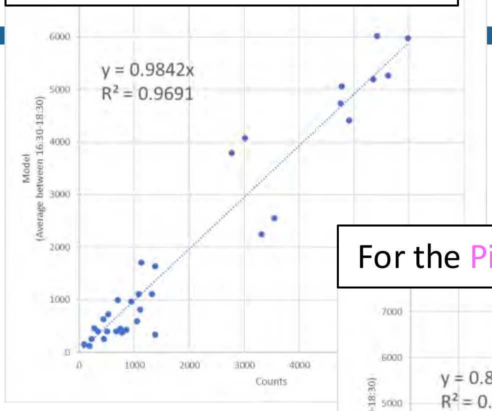
SL_ID	Screenline Name	Screenline Description	Direction	2018 Counts	DTA Model Vol	% Diff
109	EW-5-BEL	N/O NE 12th St & Bel-Red Rd	SB	10621	9868	-7.1%
			NB	13411	13474	0.5%
111	EW-7-BEL	S/O Main St	SB	12703	11397	-10.3%
			NB	10466	9350	-10.7%
122	EW-1-BEL:CBD	S/O NE 12th St	SB	2706	1901	-29.7%
			NB	2362	2979	26.1%
123	EW-2-BEL:CBD	S/O NE 8th St	SB	3902	3410	-12.6%
			NB	3462	4029	16.4%
124	EW-3-BEL:CBD	S/O NE 4th St	SB	3603	3544	-1.6%
			NB	2726	2495	-8.5%
313	NS-1	W/O I-405	WB	5063	4800	-5.2%
			EB	6887	7475	8.5%
325	NS-1-BEL:CBD	E/O Bellevue Way	WB	4402	3956	-10.1%
			EB	2801	2726	-2.7%
326	NS-2-BEL:CBD	E/O 108th Ave NE	WB	4691	4338	-7.5%
			EB	4815	5417	12.5%
331	NS-1-BEL	E/O I-405	WB	5210	5297	1.7%
			EB	4368	5048	15.6%
Total				**104199**	**101504**	**-2.6%**

Traffic Volume Validation at Screen Lines – 2

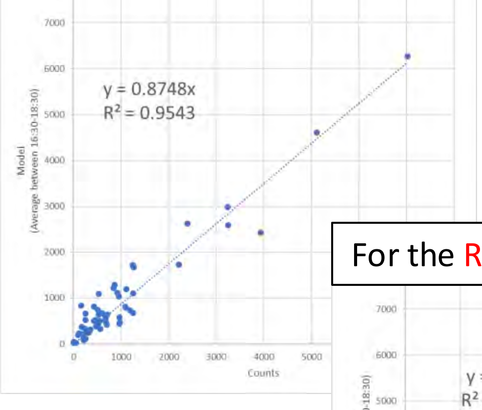
2018 Counts Vs 2018 Model (Hourly Average from 16:00 – 18:00)



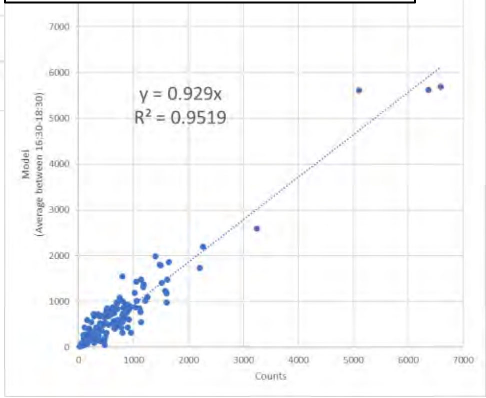
For the Orange Screen Lines



For the Pink Screen Lines

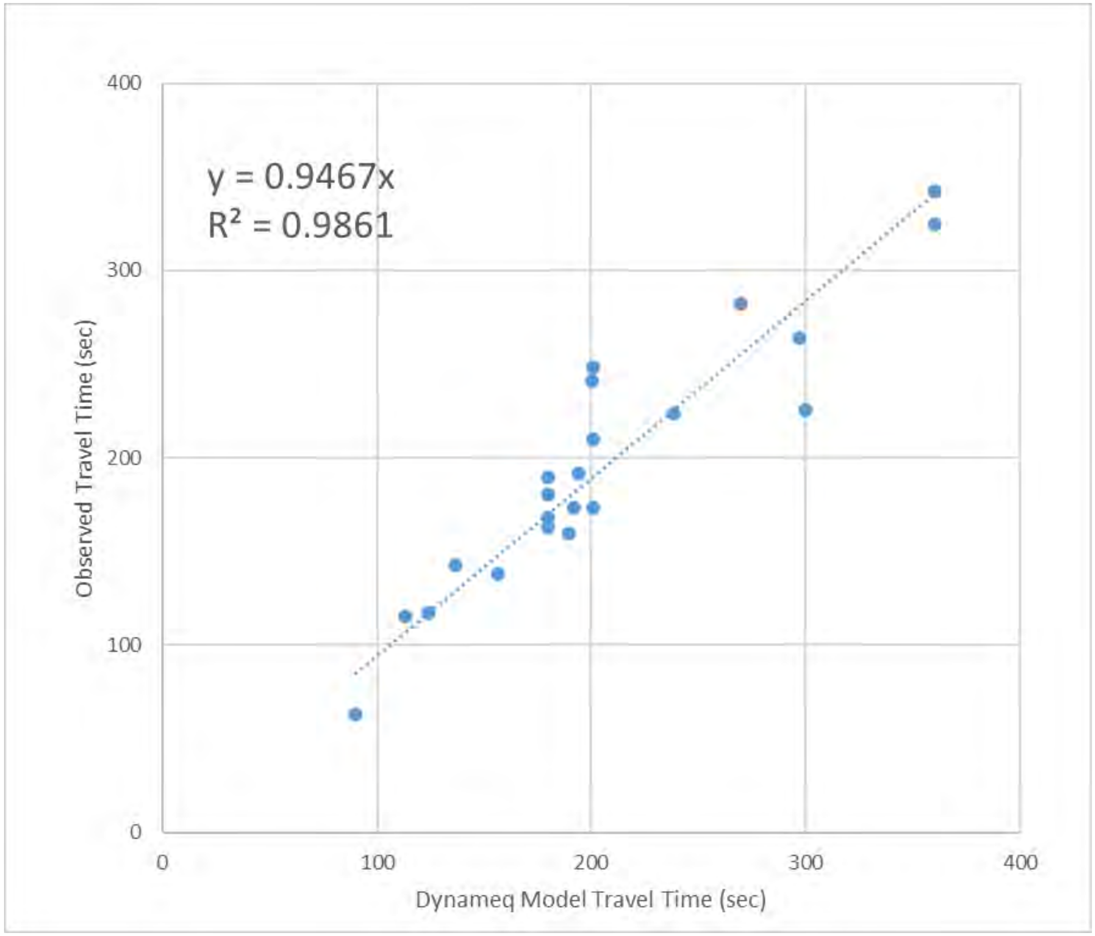


For the Red Screen Lines



Travel Time Validation at Urban Core Corridors

2019 PM Peak Travel Time

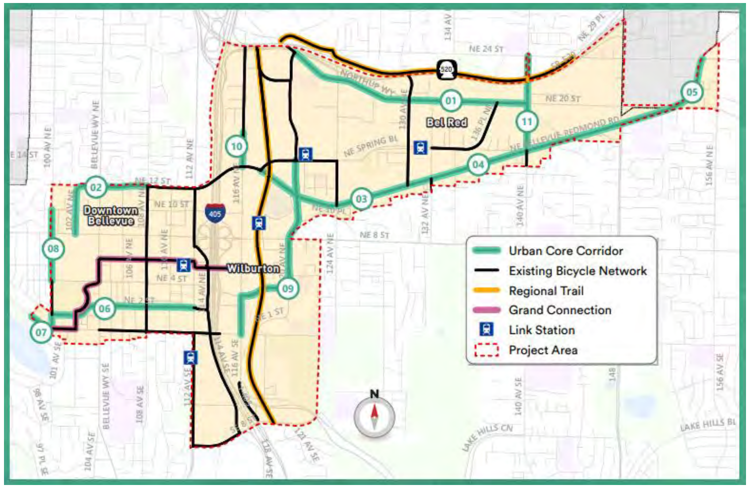


Performance Metrics

- **Intersection V/C Ratio**
  - 57 system intersections were analyzed.
    - PMA1 – 45 intersections
      - Performance Target – 1.0
    - PMA 2 – 1 intersection
      - Performance Target – 0.9
    - PMA 3 – 11 intersections
      - Performance Target – 0.85
  - City’s V/C calculation method/toll in MIP was used.
  - PM peak hour volumes were analyzed.
- **Corridor Travel Speed**
  - 11 Urban Core Corridors were analysed.
    - All are in PMA 1
      - Performance Target – 0.5 of Typical Urban Travel Speed

      (where the TUTS = 40% of posted speed limit)
  - The calculation method in MIP was used.
  - PM peak hour travel time/speed was analyzed.

Figure 3. Intersection V/C



Intersection V/C Ratio

			Existing Counts				Dynameq Model							
		METHOD	PMA				PMA				PMA			
		PLATFORM	BKR3-19				Dynameq				Dynameq			
		YEAR	NA				2035				2035			
		TOD	2hr Average PM Pk				2hr Average PM Pk				2hr Average PM Pk			
		PEDS	PEDS YES				PEDS YES				PEDS YES			
		TITLE	2019 Base Year				Bike Bellevue 2035 NA				Bike Bellevue 2035 Build			
PMA	Subarea	Performance Target	Crit Vol	Capacity	v/c	Number of Intersections Exceeding Performance Target	Crit Vol	Capacity	v/c	Number of Intersections Exceeding Performance Target	Crit Vol	Capacity	v/c	Number of Intersections Exceeding Performance Target
1a	Downtown	1.00	12386	17766	0.70	0	13718	17890	0.77	1	13724	17842	0.77	1
1b	BelRed	1.00	20517	31294	0.66	0	21524	31296	0.69	0	23779	31342	0.76	1
1c	Wilburton/East Main	1.00	11095	14196	0.78	2	10846	14210	0.76	0	10568	14205	0.74	0
2a	Crossroads	0.90	1041	1388	0.75	0	1052	1384	0.76	0	1082	1387	0.78	0
3	Residential	0.85	11794	15821	0.75	3	13478	15851	0.85	5	13285	15818	0.84	6
All System Intersections			56833	80465	0.71	5	60618	80631	0.75	6	62438	80594	0.77	8

Intersection V/C Ratio - PMA 1 Downtown

DRAFT: 05/10/2023			Existing Counts				Dynameq Model					
		METHOD	PMA				PMA			PMA		
		PLATFORM	BKR3-19				Dynameq			Dynameq		
		YEAR	NA				2035			2035		
		TOD	2hr Average PM Pk				2hr Average PM Pk			2hr Average PM Pk		
		PEDS	PEDS YES				PEDS YES			PEDS YES		
		TITLE	2019 Base Year				Bike Bellevue 2035 NA			Bike Bellevue 2035 Build		
Area 1a	Downtown											
Int	NS Street	EW Street	Crit Vol	Capacity	v/c	Base Yr. count	Crit Vol	Capacity	v/c	Crit Vol	Capacity	v/c
3	100th Ave NE	NE 8th St	1122	1403	0.80	2019	1218	1400	0.87	1190	1400	0.85
5	Bellevue Wy NE	NE 12th St	904	1391	0.65	2019	1309	1393	0.94	1261	1401	0.90
7	Bellevue Wy NE	NE 8th St	854	1294	0.66	2019	899	1303	0.69	878	1291	0.68
8	Bellevue Wy NE	NE 4th St	759	1286	0.59	2019	718	1305	0.55	710	1291	0.55
20	108th Ave NE	NE 12th St	742	1455	0.51	2018	885	1451	0.61	1130	1449	0.78
21	108th Ave NE	NE 8th St	869	1317	0.66	2018	998	1331	0.75	1021	1326	0.77
22	108th Ave NE	NE 4th St	1027	1300	0.79	2018	1047	1293	0.81	958	1295	0.74
24	108th Ave	Main St	529	1469	0.36	2018	674	1498	0.45	772	1485	0.52
25	112th Ave NE	NE 12th St	1053	1404	0.75	2019	1350	1392	0.97	1152	1388	0.83
26	112th Ave NE	NE 8th St	1260	1260	1.00	2018	1187	1263	0.94	1247	1260	0.99
31	Bellevue Way NE	NE 2nd St	969	1404	0.69	2017	811	1475	0.55	695	1479	0.47
36	112th Ave	Main St	1370	1398	0.98	2017	1611	1401	1.15	1660	1395	1.19
72	112th Ave NE	NE 4th St	928	1385	0.67	2017	1011	1385	0.73	1050	1382	0.76
Sum			12386	17766			13718	17890		13724	17842	
Areawide LOS Average					0.70				0.77			0.77
Int exceeding LOS standard					0				1			1
Areawide Standard					*1.00*				*1.00*			*1.00*

Intersection V/C Ratio - PMA 1 Bel-Red

DRAFT: 05/10/2023			Existing Counts				Dynameq Model					
		METHOD	PMA				PMA			PMA		
		PLATFORM	BKR3-19				Dynameq			Dynameq		
		YEAR	NA				2035			2035		
		TOD	2hr Average PM Pk				2hr Average PM Pk			2hr Average PM Pk		
		PEDS	PEDS YES				PEDS YES			PEDS YES		
		TITLE	2019 Base Year				Bike Bellevue 2035 NA			Bike Bellevue 2035 Build		
Area 1b	BelRed											
Int	**NS Street**	**EW Street**	**Crit Vol**	**Capacity**	**v/c**	**Base Yr. count**	**Crit Vol**	**Capacity**	**v/c**	**Crit Vol**	**Capacity**	**v/c**
29	116th Ave NE	NE 12th St	1111	1389	0.80	2018	1279	1390	0.92	1342	1398	0.96
32	120th Ave NE	NE 12th St	803	1409	0.57	2018	896	1400	0.64	945	1410	0.67
34	124th Ave NE	Bel-Red Rd	1145	1396	0.82	2018	1243	1397	0.89	1419	1405	1.01
37	130th Ave NE	Bel-Red Rd	829	1454	0.57	2017	915	1452	0.63	876	1460	0.60
39	140th Ave NE	NE 20th St	990	1394	0.71	2019	1027	1407	0.73	1212	1409	0.86
40	140th Ave NE	Bel-Red Rd	1105	1399	0.79	2019	1244	1398	0.89	1335	1391	0.96
47	148th Ave NE	NE 20th St	1294	1391	0.93	2019	1216	1398	0.87	1233	1401	0.88
48	148th Ave NE	Bel-Red Rd	1375	1403	0.98	2018	1310	1409	0.93	1352	1408	0.96
59	Bel-Red Rd	NE 24th St	934	1459	0.64	2019	881	1444	0.61	925	1445	0.64
60	156th Ave NE	Bel-Red Rd	1030	1392	0.74	2019	826	1400	0.59	1034	1397	0.74
61	156th Ave NE	NE 24th St	1153	1389	0.83	2018	1134	1383	0.82	1134	1383	0.82
68	130th Ave NE	Northup Wy	848	1413	0.60	2017	906	1394	0.65	1171	1411	0.83
81	148th Ave NE	NE 24th St	1291	1403	0.92	2019	1224	1391	0.88	1255	1394	0.90
88	124th Ave NE	Northup Wy	762	1411	0.54	2018	1213	1410	0.86	1258	1398	0.90
117	120th Ave NE	Northup Wy	448	1445	0.31	2017	644	1464	0.44	1044	1470	0.71
38	132nd Ave NE	Bel-Red Rd	836	1467	0.57	2017	991	1479	0.67	1281	1472	0.87
175	134th Ave NE	Bel-Red Rd	808	1469	0.55	2017	936	1463	0.64	1028	1469	0.70
252	132nd Ave NE	NE 20th St	785	1481	0.53	2017	663	1473	0.45	738	1476	0.50
168	120th Ave NE	Spring Blvd	285	1425	0.20	2022	621	1411	0.44	604	1405	0.43
185	136th Pl NE	Northup Way/NE 20th St	717	1463	0.49	2017	518	1480	0.35	697	1483	0.47
58	Bel-Red Rd	NE 20th St	780	1444	0.54	2018	808	1443	0.56	859	1456	0.59
62	156th Ave NE	Northup Wy	1188	1398	0.85	2018	1029	1410	0.73	1037	1401	0.74
Sum			**20517**	**31294**			**21524**	**31296**		**23779**	**31342**	
Areawide LOS Average					0.66				0.69			0.76
Int exceeding LOS standard					0				0			1
Areawide Standard					*1.00*				*1.00*			*1.00*

Intersection V/C Ratio
- PMA 1 Wilburton/East Main

DRAFT: 05/10/2023			Existing Counts				Dynameq Model					
		METHOD	PMA				PMA			PMA		
		PLATFORM	BKR3-19				Dynameq			Dynameq		
		YEAR	NA				2035			2035		
		TOD	2hr Average PM Pk				2hr Average PM Pk			2hr Average PM Pk		
		PEDS	PEDS YES				PEDS YES			PEDS YES		
		TITLE	**2019 Base Year**				**Bike Bellevue 2035 NA**			**Bike Bellevue 2035 Build**		
Area 1c	**Wilburton/East Main**											
Int	**NS Street**	**EW Street**	**Crit Vol**	**Capacity**	**v/c**	**Base Yr. count**	**Crit Vol**	**Capacity**	**v/c**	**Crit Vol**	**Capacity**	**v/c**
30	116th Ave NE	NE 8th St	1024	1403	0.73	2018	1036	1400	0.74	1112	1390	0.80
73	116th Ave	Main St	908	1397	0.65	2018	842	1403	0.60	902	1409	0.64
89	112th Ave SE	SE 8th St	936	1463	0.64	2017	773	1458	0.53	720	1469	0.49
102	118th Ave SE	SE 8th St	1436	1408	1.02	2018	1239	1408	0.88	1254	1409	0.89
131	116th Ave SE	SE 1st St	1186	1395	0.85	2018	1301	1399	0.93	1312	1396	0.94
139	116th Ave NE	NE 4th St	1287	1399	0.92	2018	1295	1392	0.93	1141	1391	0.82
219	I-405 NB Off and On Ram	SE 8th St	1046	1473	0.71	2018	870	1475	0.59	822	1468	0.56
226	I-405 SB Ramps	SE 8th St	960	1455	0.66	2018	835	1465	0.57	712	1453	0.49
33	120th Ave NE	NE 8th St	869	1402	0.62	2017	1255	1410	0.89	1191	1418	0.84
71	Lk Hills Connector	SE 7th Pl	1443	1401	1.03	2018	1400	1400	1.00	1402	1402	1.00
Sum			**11095**	**14196**			**10846**	**14210**		**10568**	**14205**	
Areawide LOS Average					0.78				0.76			0.74
Int exceeding LOS standard					2				0			0
Areawide Standard					*1.00*				*1.00*			*1.00*

Intersection V/C Ratio
- PMA 2 Crossroad & PMA 3 Residential

DRAFT: 05/10/2023			Existing Counts				Dynameq Model					
		METHOD	PMA				PMA			PMA		
		PLATFORM	BKR3-19				Dynameq			Dynameq		
		YEAR	NA				2035			2035		
		TOD	2hr Average PM Pk				2hr Average PM Pk			2hr Average PM Pk		
		PEDS	PEDS YES				PEDS YES			PEDS YES		
		TITLE	**2019 Base Year**				**Bike Bellevue 2035 NA**			**Bike Bellevue 2035 Build**		
Area 2a	**Crossroads**											
Int	**NS Street**	**EW Street**	**Crit Vol**	**Capacity**	**v/c**	**Base Yr. count**	**Crit Vol**	**Capacity**	**v/c**	**Crit Vol**	**Capacity**	**v/c**
63	156th Ave NE	NE 8th St	1041	1388	0.75	2018	1052	1384	0.76	1082	1387	0.78
Sum			**1041**	**1388**			**1052**	**1384**		**1082**	**1387**	
Areawide LOS Average					0.75				0.76			0.78
Int exceeding LOS standard					0				0			0
Areawide Standard					*0.90*				*0.90*			*0.90*
Area 3	**Residential**											
Int	**NS Street**	**EW Street**	**Crit Vol**	**Capacity**	**v/c**	**Base Yr. count**	**Crit Vol**	**Capacity**	**v/c**	**Crit Vol**	**Capacity**	**v/c**
35	124th Ave NE	NE 8th St	778	1468	0.53	2018	1364	1467	0.93	1306	1467	0.89
41	140th Ave NE	NE 8th St	1093	1384	0.79	2018	1109	1386	0.80	990	1375	0.72
42	140th Ave	Main St	881	1468	0.60	2018	958	1474	0.65	961	1456	0.66
49	148th Ave NE	NE 8th St	1387	1401	0.99	2018	1182	1407	0.84	1226	1409	0.87
50	148th Ave	Main St	1322	1392	0.95	2018	1470	1400	1.05	1426	1398	1.02
64	140th Ave NE	NE 24th St	1172	1395	0.84	2019	1232	1400	0.88	1361	1403	0.97
69	Bellevue Wy NE	NE 24th St	947	1413	0.67	2018	1170	1410	0.83	1126	1408	0.80
83	156th Ave	Main St	1040	1507	0.69	2018	909	1515	0.60	920	1508	0.61
114	116th Ave NE	Northup Wy	1068	1463	0.73	2018	1396	1469	0.95	1399	1457	0.96
116	115th Pl NE	Northup Wy	1384	1457	0.95	2019	1559	1457	1.07	1439	1468	0.98
118	Northup Wy	NE 24th St	722	1473	0.49	2019	1129	1466	0.77	1131	1469	0.77
Sum			**11794**	**15821**			**13478**	**15851**		**13285**	**15818**	
Areawide LOS Average					0.75				0.85			0.84
Int exceeding LOS standard					3				5			6
Areawide Standard					*0.85*				*0.85*			*0.85*

Corridor Travel Speed
(Peak hour travel speed)

DRAFT: 05/10/2023											Dynameq Model					Dynameq	
											NA		Build			NA	Build
ID	Dir	Corridor	From	To	PMA	Target ratio to TUTS	Speed Limit (mph)	Typical Urban Travel Speed (mph)	Weighted Average (Iteris Peak 15min) Speed (mph)	Existing peak 15min Ratio to the TUTS	2035 PP Speed (mph)	2035 Ratio to TUTC	2035 PP Speed (mph)	2035 Ratio to TUTC	Existing peak 15min Ratio to the TUTS	2035 Ratio to TUTS	2035 Ratio to TUTC
UCC1	NB/EB	Northup Way	120th Ave NE	140th Ave NE	1	>0.5	35.00	14.00	14.06	1.00	10.97	0.78	11.15	0.80	Meet the Target	Meet the Target	Meet the Target
UCC1	SB/WB	Northup Way	140th Ave NE	120th Ave NE	1	>0.5	35.00	14.00	15.47	1.11	19.44	1.39	17.89	1.28	Meet the Target	Meet the Target	Meet the Target
UCC2	NB/EB	102nd Ave NE & NE 12th St	NE 8th St	108th Avde NE	1	>0.5	30.00	12.00	12.60	1.05	11.56	0.96	11.30	0.94	Meet the Target	Meet the Target	Meet the Target
UCC2	SB/WB	102nd Ave NE & NE 12th St	108th Avde NE	NE 8th St	1	>0.5	30.00	12.00	12.60	1.05	11.51	0.96	12.04	1.00	Meet the Target	Meet the Target	Meet the Target
UCC3	NB/EB	NE 12th St & Bel-Red Road	116th Ave NE	132nd Ave NE	1	>0.5	35.00	14.00	18.99	1.36	17.24	1.23	14.41	1.03	Meet the Target	Meet the Target	Meet the Target
UCC3	SB/WB	NE 12th St & Bel-Red Road	132nd Ave NE	116th Ave NE	1	>0.5	35.00	14.00	19.69	1.41	17.19	1.23	15.37	1.10	Meet the Target	Meet the Target	Meet the Target
UCC4	NB/EB	Bel-Red Rd	132nd Ave NE	148th Ave NE	1	>0.5	35.00	14.00	15.57	1.11	14.63	1.05	8.70	0.62	Meet the Target	Meet the Target	Meet the Target
UCC4	SB/WB	Bel-Red Rd	148th Ave NE	132nd Ave NE	1	>0.5	35.00	14.00	19.56	1.40	16.55	1.18	19.40	1.39	Meet the Target	Meet the Target	Meet the Target
UCC5	NB/EB	Bel-Red Rd	148th Ave NE	156th Ave NE	1	>0.5	35.00	14.00	13.69	0.98	13.58	0.97	13.53	0.97	Meet the Target	Meet the Target	Meet the Target
UCC5	SB/WB	Bel-Red Rd	156th Ave NE	148th Ave NE	1	>0.5	35.00	14.00	13.07	0.93	12.28	0.88	9.89	0.71	Meet the Target	Meet the Target	Meet the Target
UCC6	NB/EB	NE 1st & NE 2nd St	100th Ave NE	112th Ave NE	1	>0.5	30.00	12.00	10.40	0.87	12.18	1.02	11.71	0.98	Meet the Target	Meet the Target	Meet the Target
UCC6	SB/WB	NE 1st & NE 2nd St	112th Ave NE	100th Ave NE/Bellevue Way	1	>0.5	30.00	12.00	9.36	0.78	9.60	0.80	11.79	0.98*	Meet the Target	Meet the Target	Meet the Target
UCC7	NB/EB	Lake Washington Boulevard	92nd Ave NE	100th Ave NE	1	>0.5	30.00	12.00	21.27	1.77	22.37	1.86	22.43	1.87	Meet the Target	Meet the Target	Meet the Target
UCC7	SB/WB	Lake Washington Boulevard	100th Ave NE	92nd Ave NE	1	>0.5	30.00	12.00	26.80	2.23	21.86	1.82	22.05	1.84	Meet the Target	Meet the Target	Meet the Target
UCC8	NB/EB	100th Ave NE	Main St	NE 10th St	1	>0.5	30.00	12.00	12.40	1.03	12.86	1.07	12.62	1.05	Meet the Target	Meet the Target	Meet the Target
UCC8	SB/WB	100th Ave NE	NE 10th St	Main St	1	>0.5	30.00	12.00	12.40	1.03	11.95	1.00	12.54	1.04	Meet the Target	Meet the Target	Meet the Target
UCC9	NB/EB	Wilburton Route - 116th Ave NE/NE 4th St/120th Ave NE	Main St	Spring Blvd	1	>0.5	30.00	12.00	11.80	0.98	11.23	0.94	11.67	0.97	Meet the Target	Meet the Target	Meet the Target
UCC9	SB/WB	Wilburton Route - 116th Ave NE/NE 4th St/120th Ave NE	Spring Blvd	Main St	1	>0.5	30.00	12.00	11.80	0.98	9.28	0.77	9.25	0.77	Meet the Target	Meet the Target	Meet the Target
UCC10	NB/EB	116th Ave NE	NE 12th St	Northup Way	1	>0.5	30.00	12.00	20.58	1.72	19.50	1.62	19.79	1.65	Meet the Target	Meet the Target	Meet the Target
UCC10	SB/WB	116th Ave NE	Northup Way	NE 12th St	1	>0.5	30.00	12.00	16.32	1.36	15.71	1.31	15.90	1.33	Meet the Target	Meet the Target	Meet the Target
UCC11	NB/EB	140th Ave NE	Bel-Red Rd	NE 24th St	1	>0.5	30.00	12.00	13.16	1.10	12.97	1.08	16.42	1.37	Meet the Target	Meet the Target	Meet the Target
UCC11	SB/WB	140th Ave NE	NE 24th St	Bel-Red Rd	1	>0.5	30.00	12.00	8.98	0.75	7.70	0.64	7.79	0.65	Meet the Target	Meet the Target	Meet the Target
									15.03		14.19		13.98				

Note: * - in 2035 Build scenario 2nd St west of Bellevue Way would become one way. The travel speed for 2nd St WB was measured from 112th Ave NE to Bellevue Way

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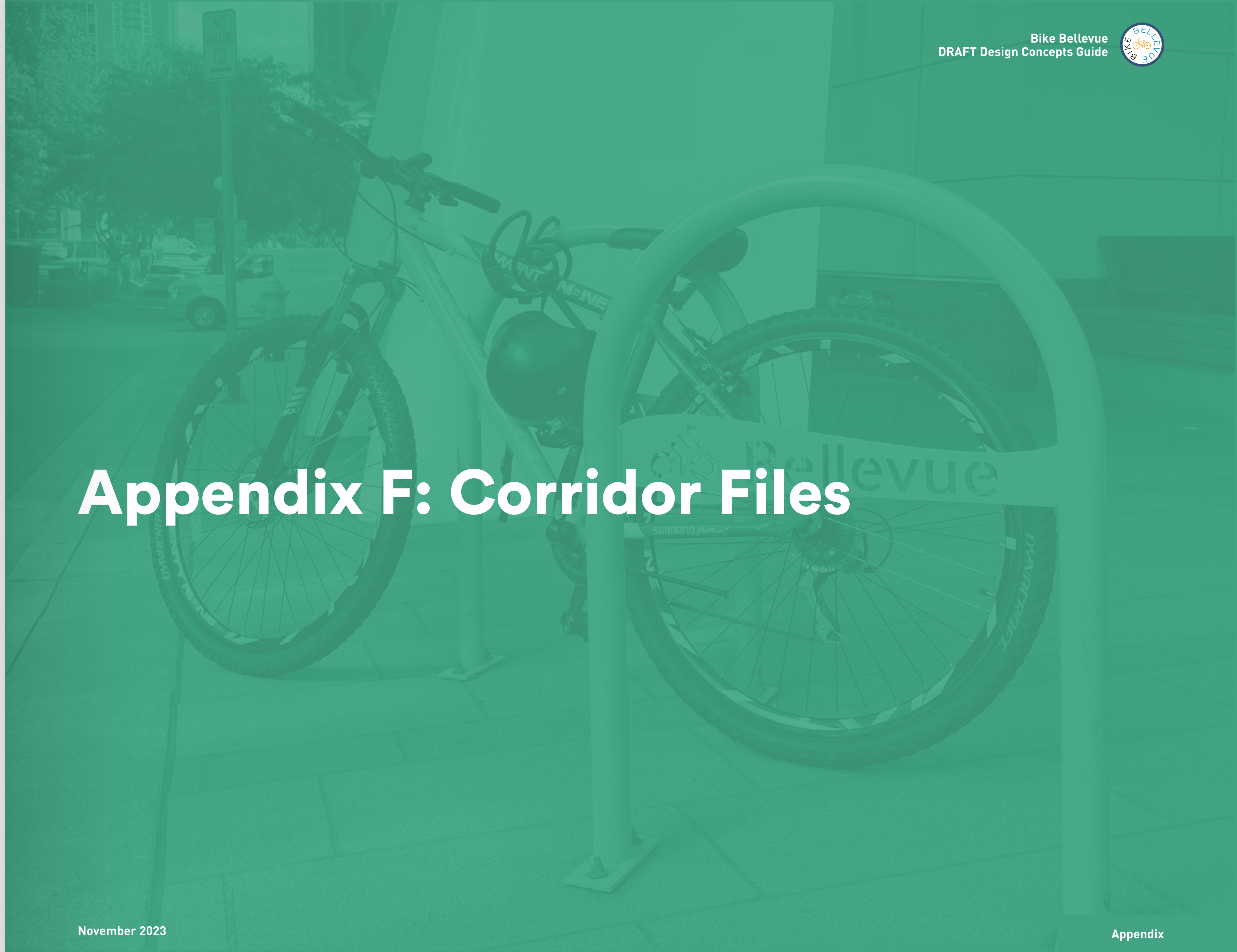


Appendix F: Corridor Files

Corridor 1

CITY OF BELLEVUE
TRANSPORTATION DEPARTMENT

BIKE BELLEVUE
NORTHUP WY / NE 20TH ST CORRIDOR

CITY MANAGER
BRAD MIYAKE

MAYOR
LYNNE ROBINSON

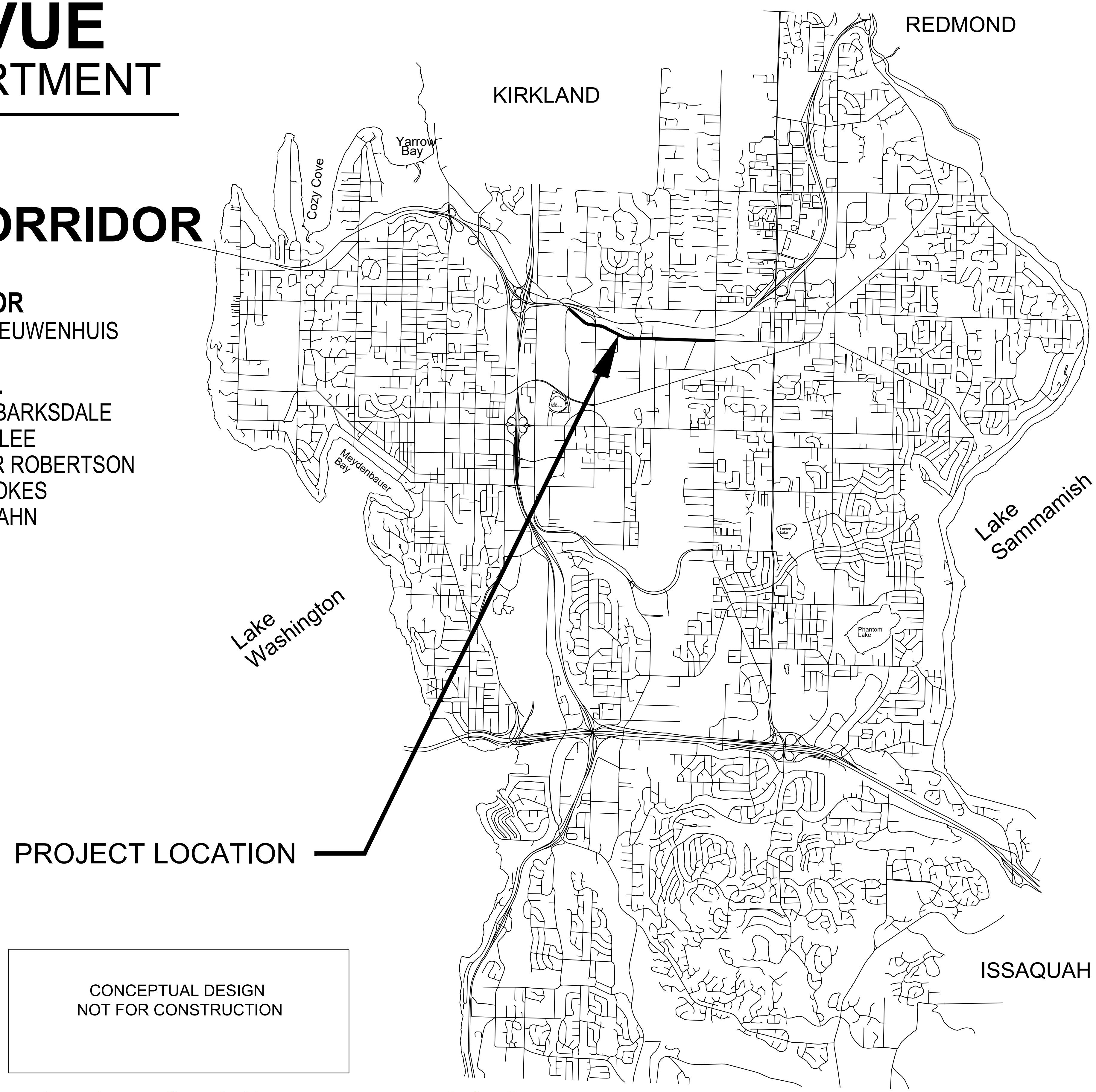
DIRECTOR OF TRANSPORTATION
ANDREW SINGELAKIS

DEPUTY MAYOR
JARED NIEUWENHUIS

CITY COUNCIL
JEREMY BARKSDALE
CONRAD LEE
JENNIFER ROBERTSON
JOHN STOKES
JANICE ZAHN

SCHEDULE OF DRAWINGS

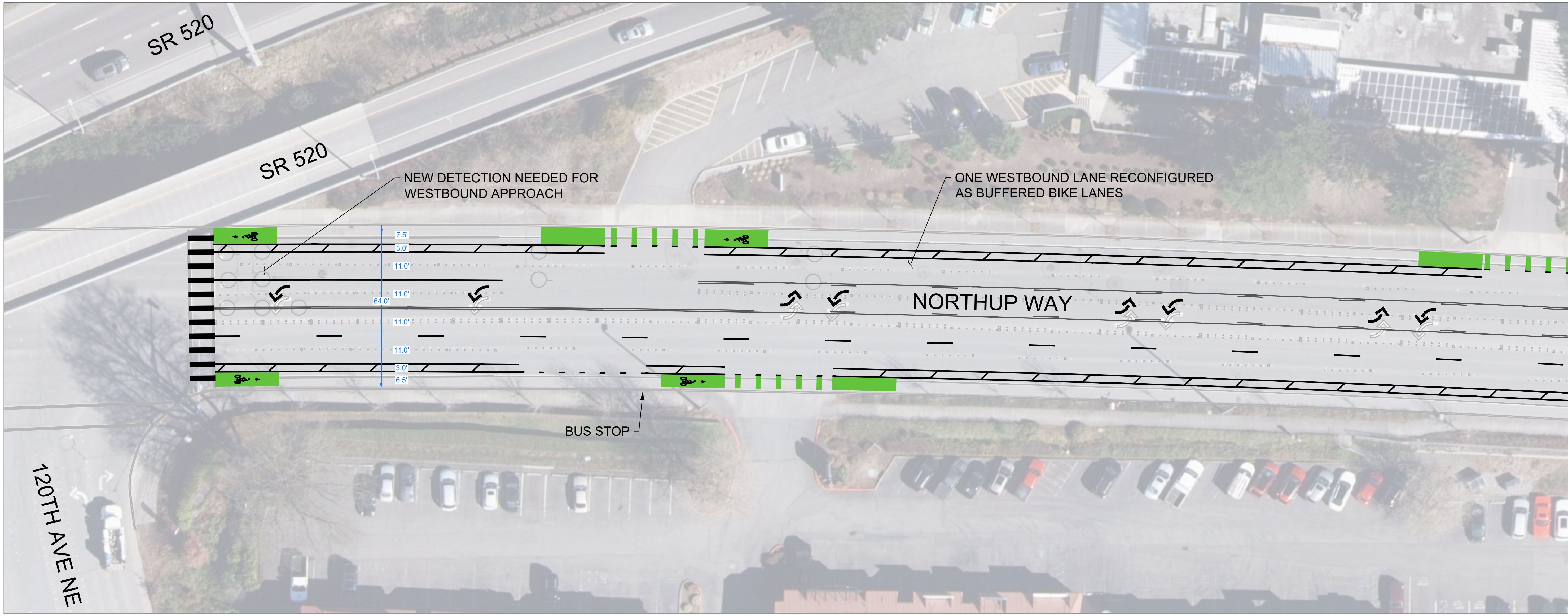
SHEET	DRAWINGS
1	COVER SHEET
2-13	ROADWAY PLANS



CONCEPTUAL DESIGN
NOT FOR CONSTRUCTION

C.I.P. NUMBER xxxxxx

Design to be coordinated with WSDOT SR520-124th planning



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KP 6/14/21
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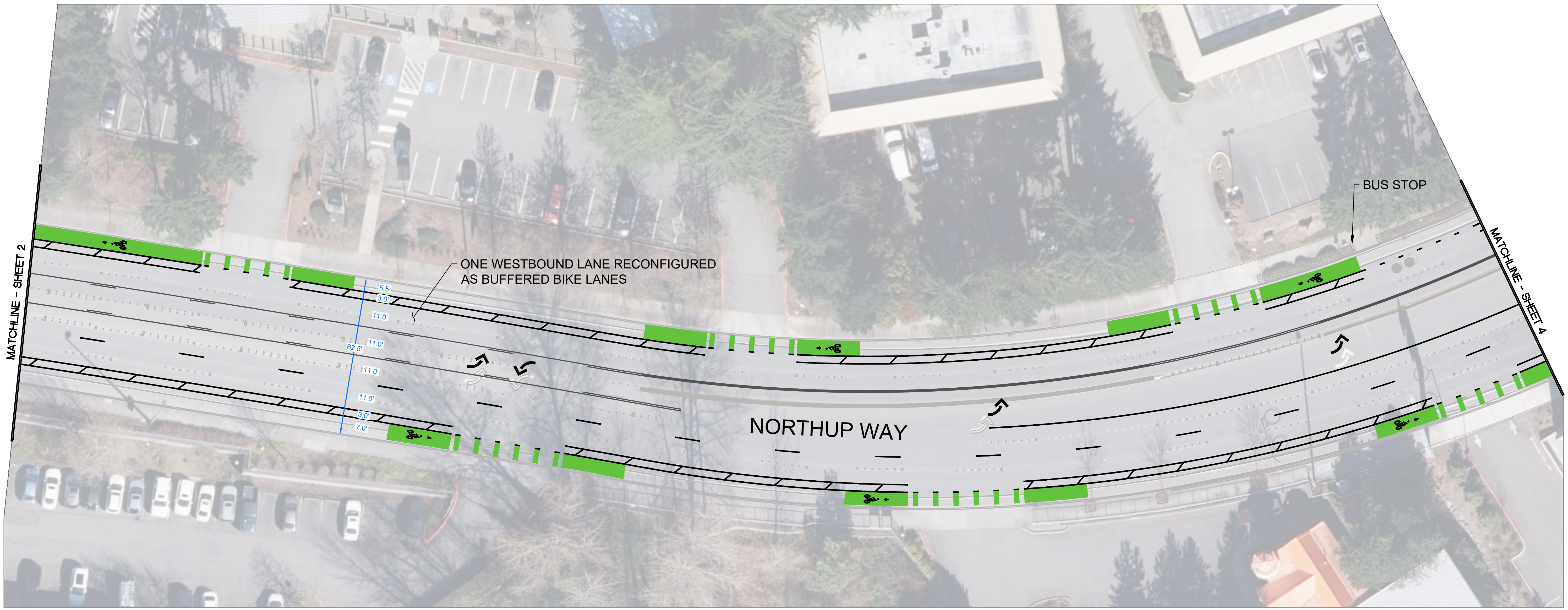
City of Bellevue
Transportation Department

PRELIMINARY DESIGN

BIKE BELLEVUE
NORTHUP WAY / NE 12TH STREET CORRIDOR

CONCEPTUAL PLAN

SHT 2 OF 13



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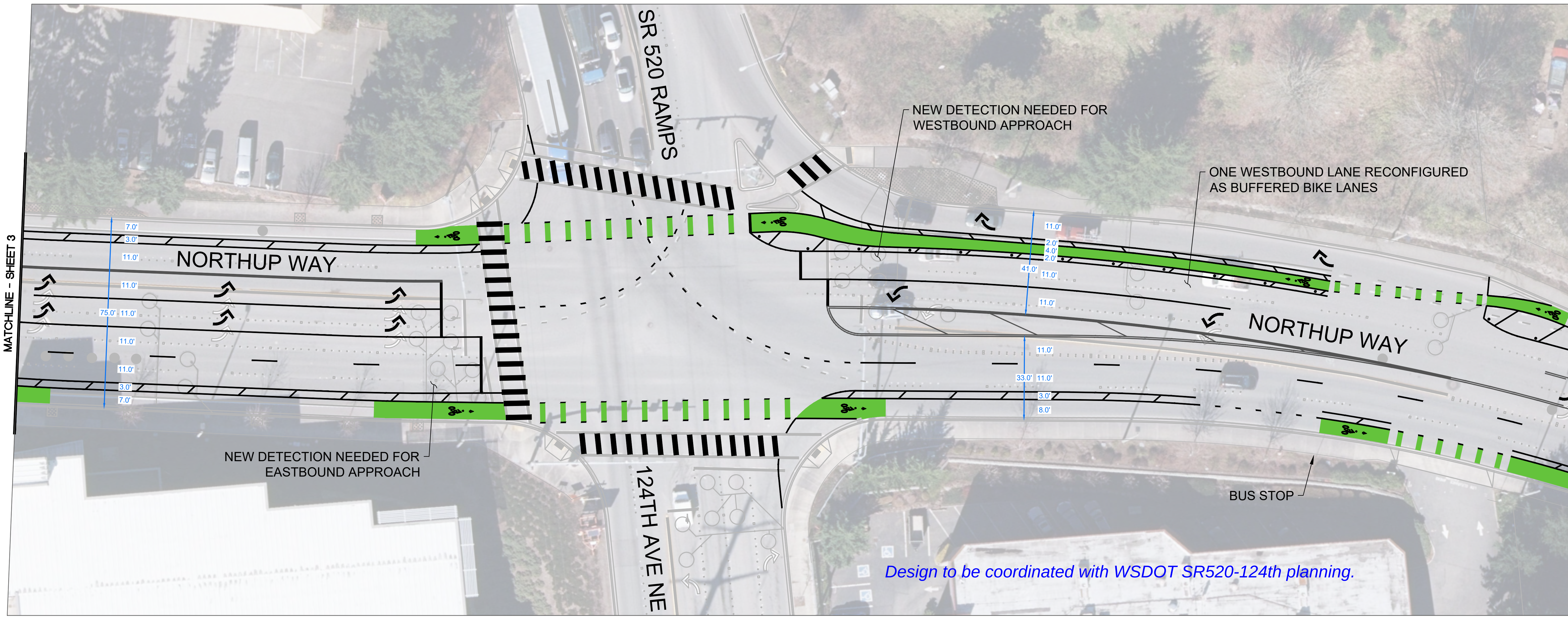
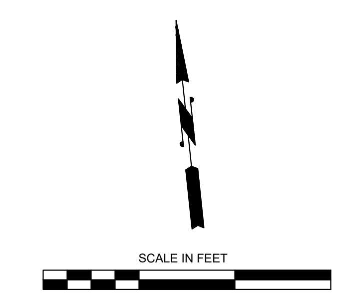
BIKE BELLEVUE
NORTHUP WAY / NE 12TH STREET CORRIDOR

CONCEPTUAL PLAN

SHT 3 OF 13





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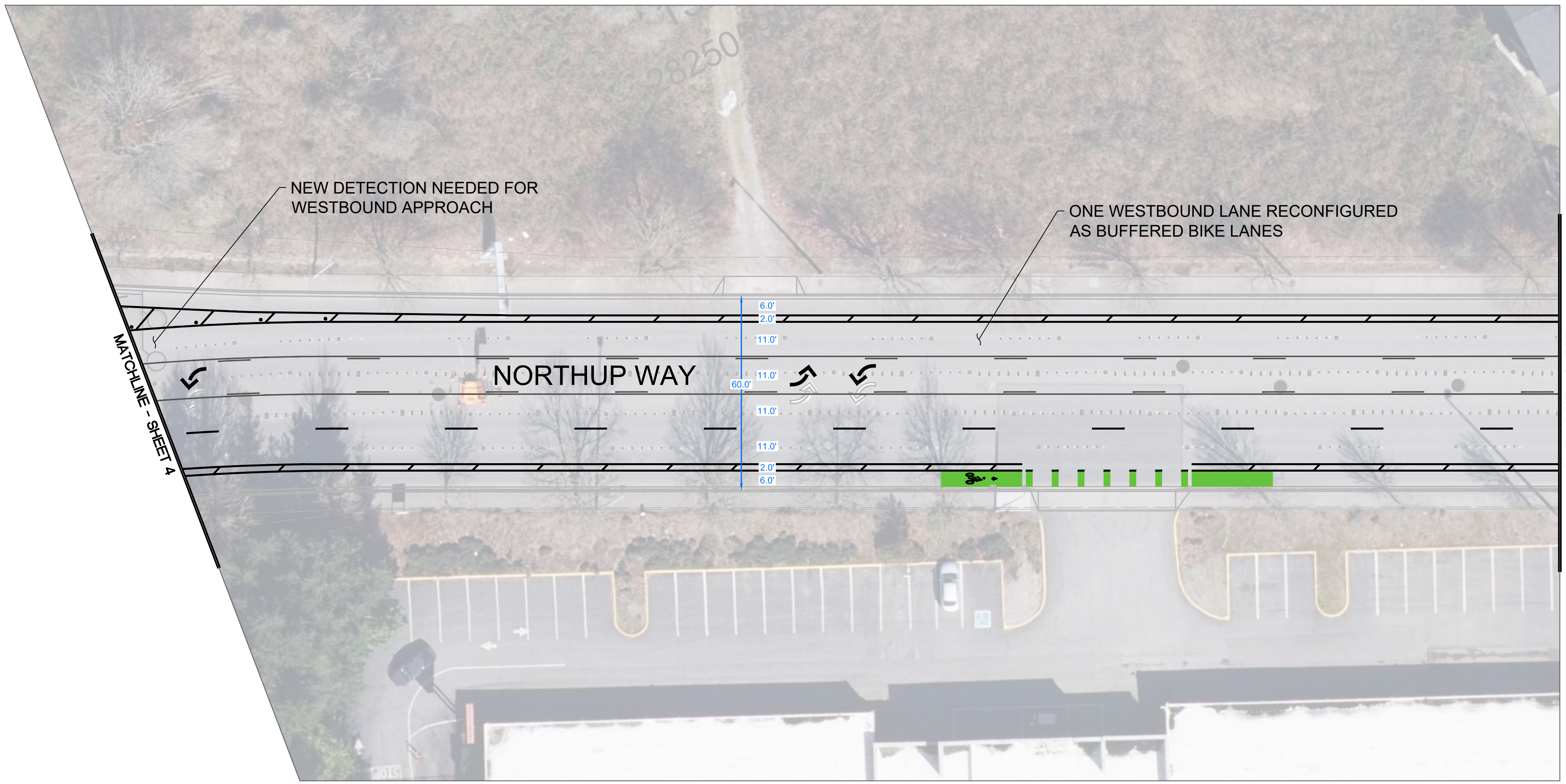
Transportation Department

PRELIMINARY DESIGN

BIKE BELLEVUE
NORTHUP WAY / NE 12TH STREET CORRIDOR

CONCEPTUAL PLAN

SHT 4 OF 13



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Transportation Department

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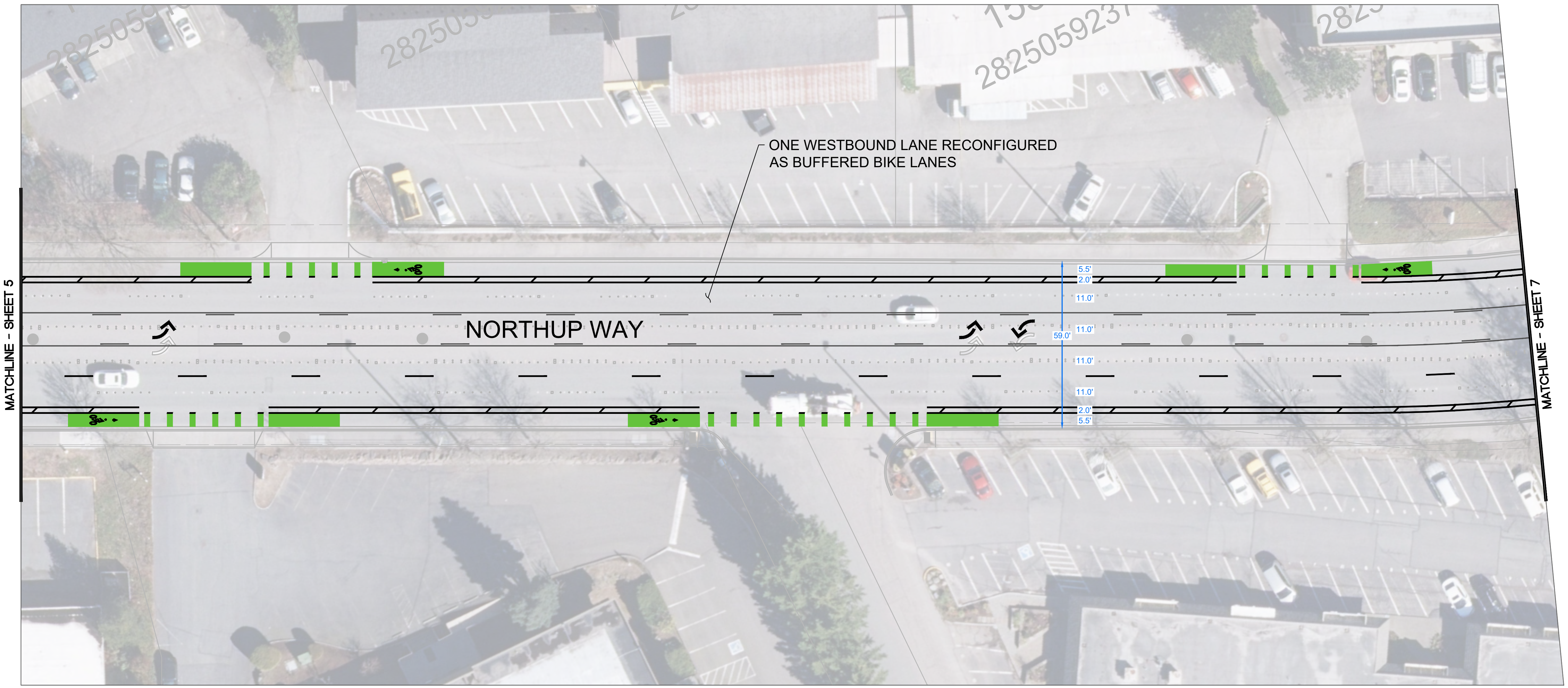
BIKE BELLEVUE
NORTHUP WAY / NE 12TH STREET CORRIDOR

CONCEPTUAL PLAN

SHT 5 OF 13



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BIKE BELLEVUE
NORTHUP WAY / NE 12TH STREET CORRIDOR

CONCEPTUAL PLAN

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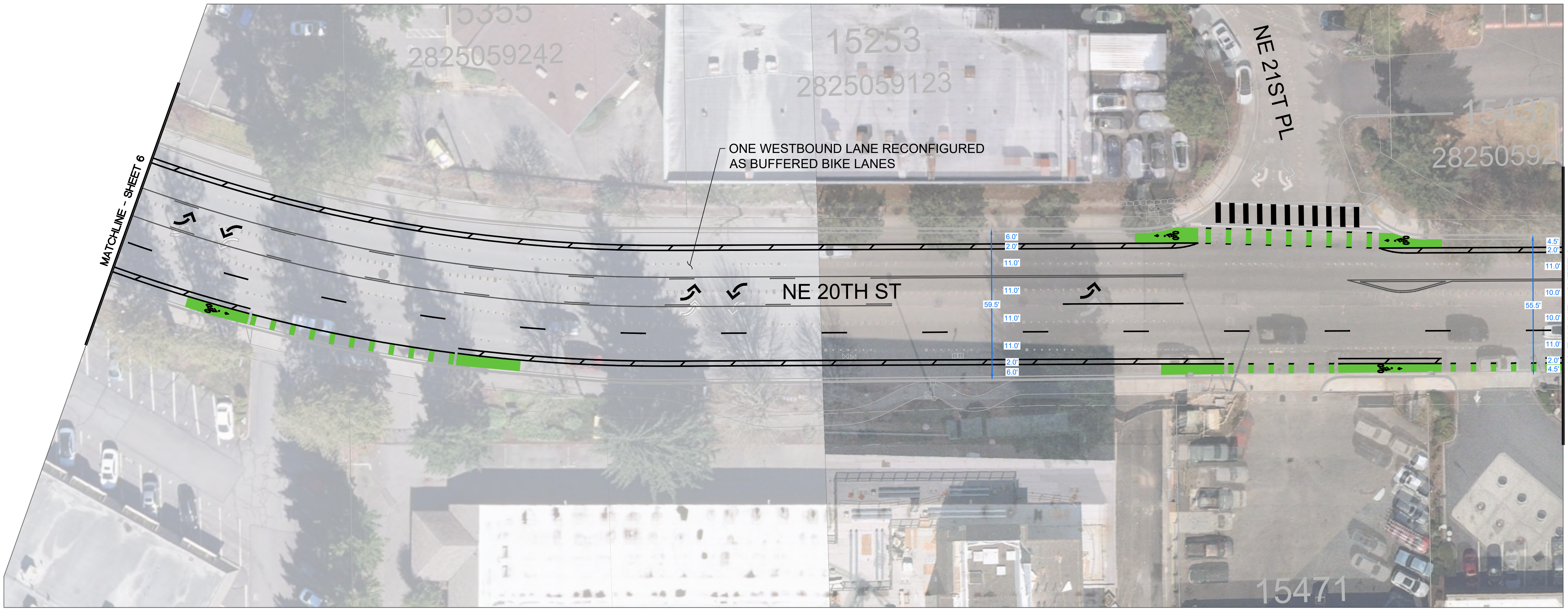

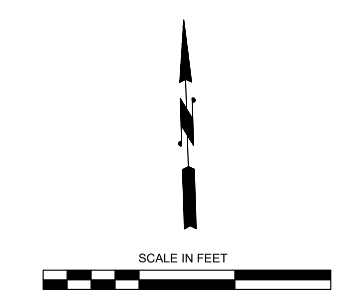

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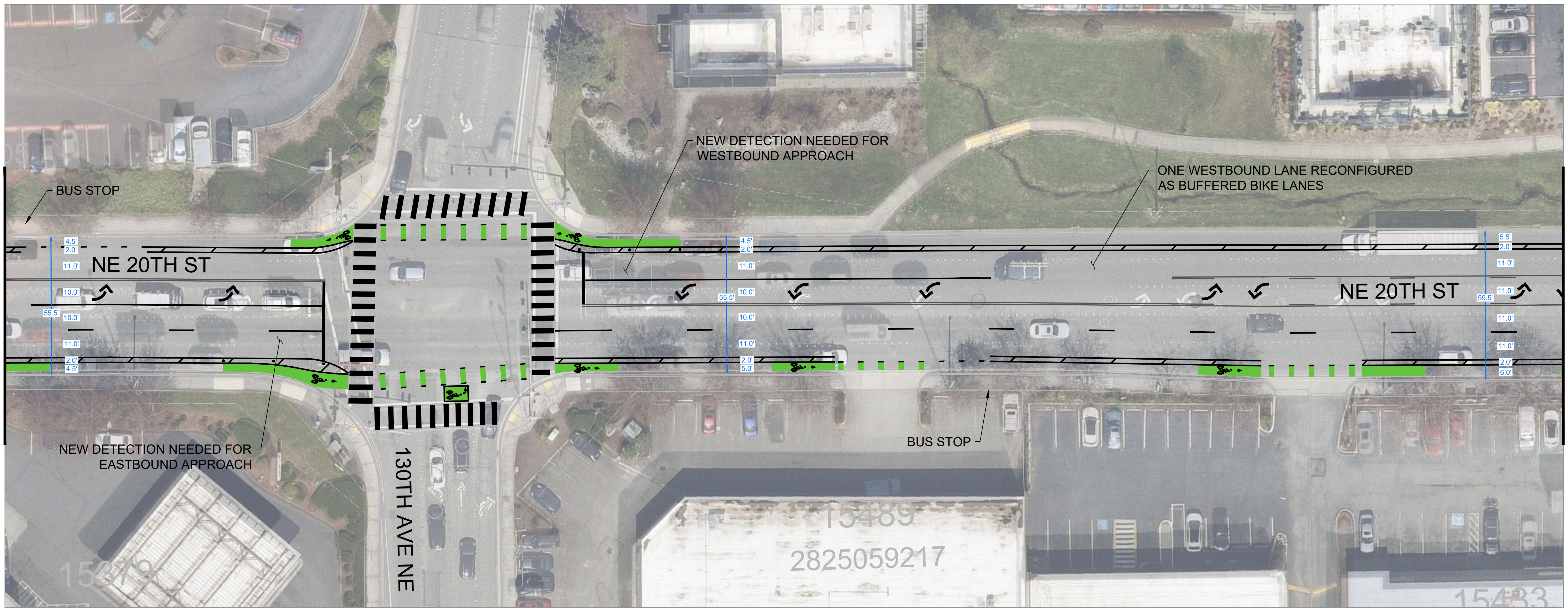
Transportation Department

PRELIMINARY DESIGN

BIKE BELLEVUE
NORTHUP WAY / NE 12TH STREET CORRIDOR

CONCEPTUAL PLAN

SHT 7 OF 13



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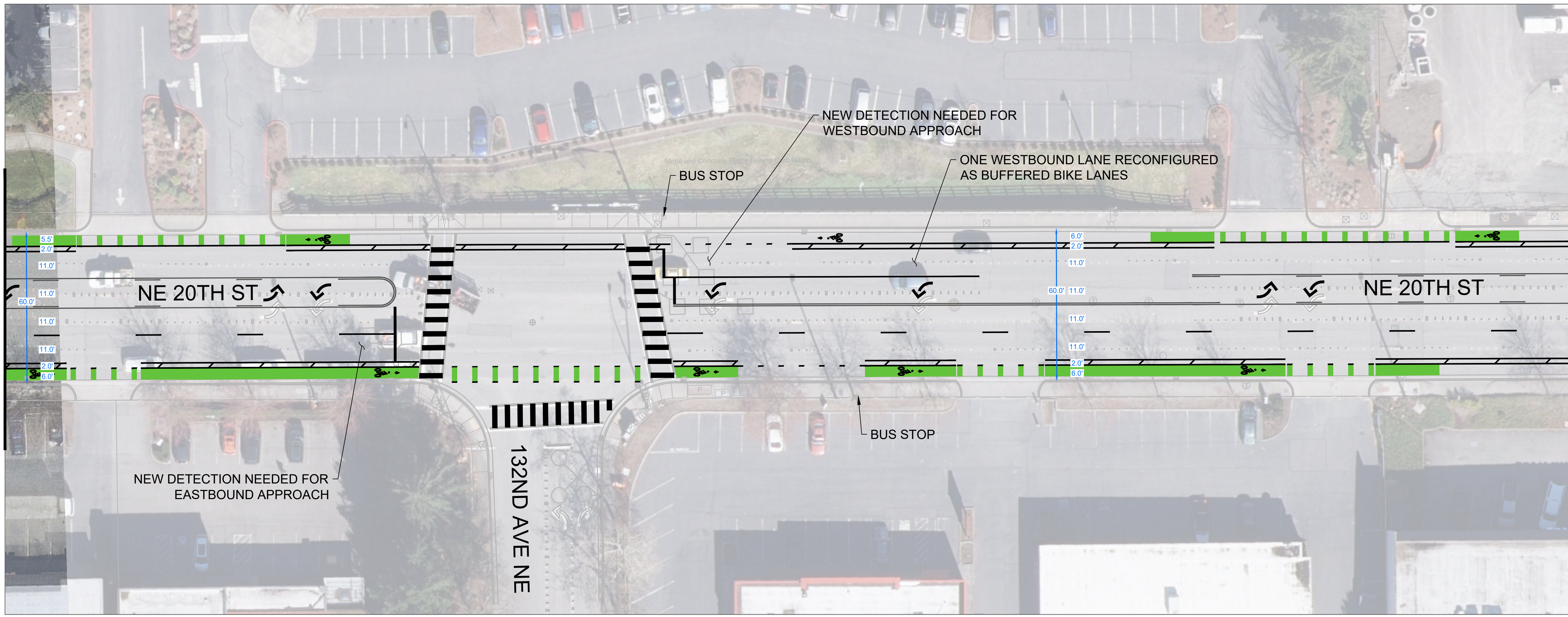
Transportation Department

PRELIMINARY DESIGN

BIKE BELLEVUE
NORTHUP WAY / NE 12TH STREET CORRIDOR

CONCEPTUAL PLAN

SHT 8 OF 13



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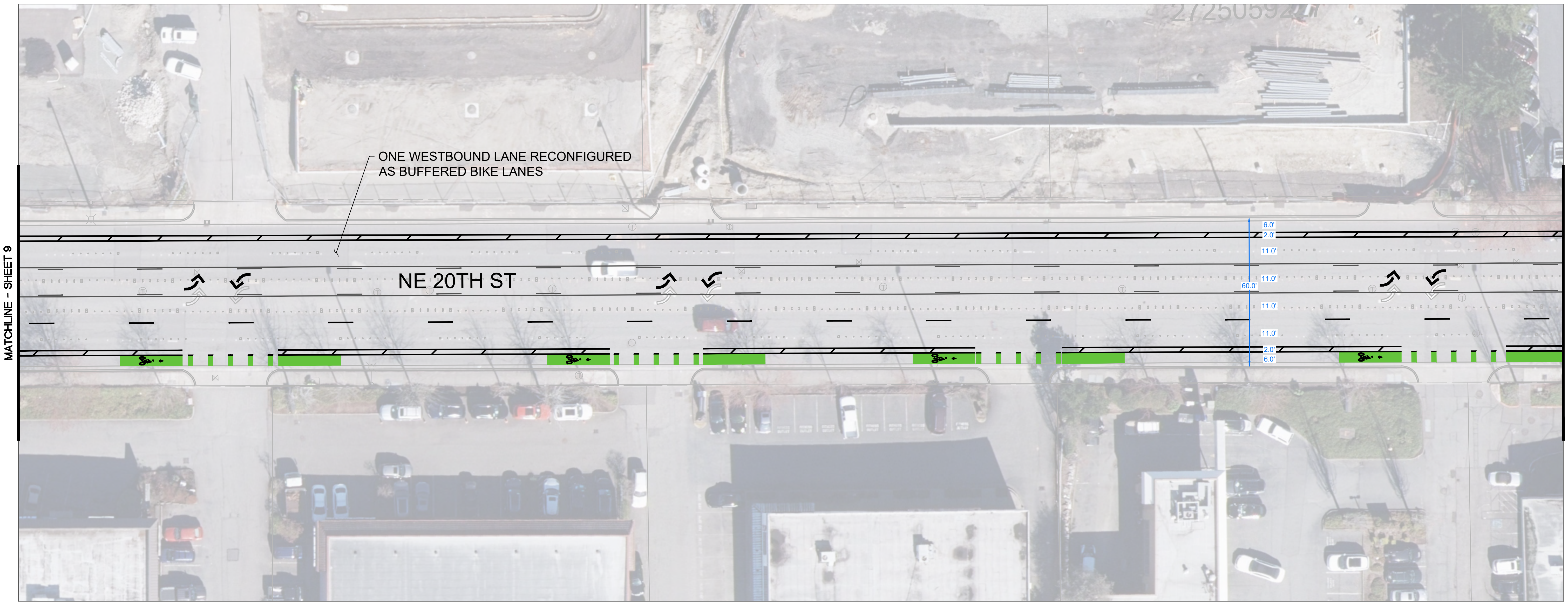
BIKE BELLEVUE
NORTHUP WAY / NE 12TH STREET CORRIDOR

CONCEPTUAL PLAN

SHT 9 OF 13



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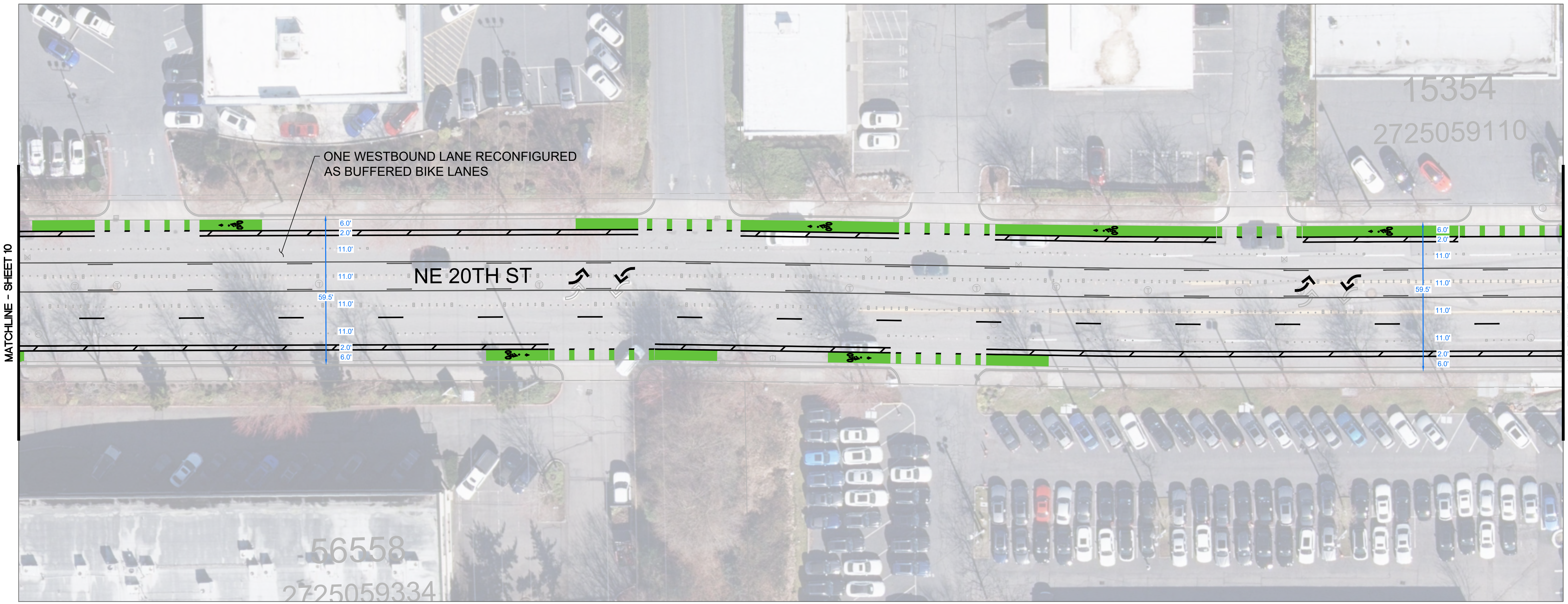
Transportation Department

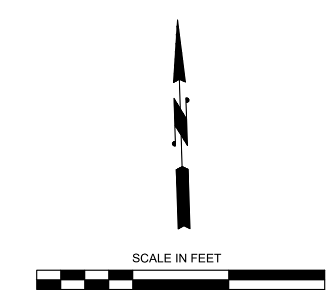
PRELIMINARY DESIGN

BIKE BELLEVUE
NORTHUP WAY / NE 12TH STREET CORRIDOR

CONCEPTUAL PLAN

SHT 10 OF 13





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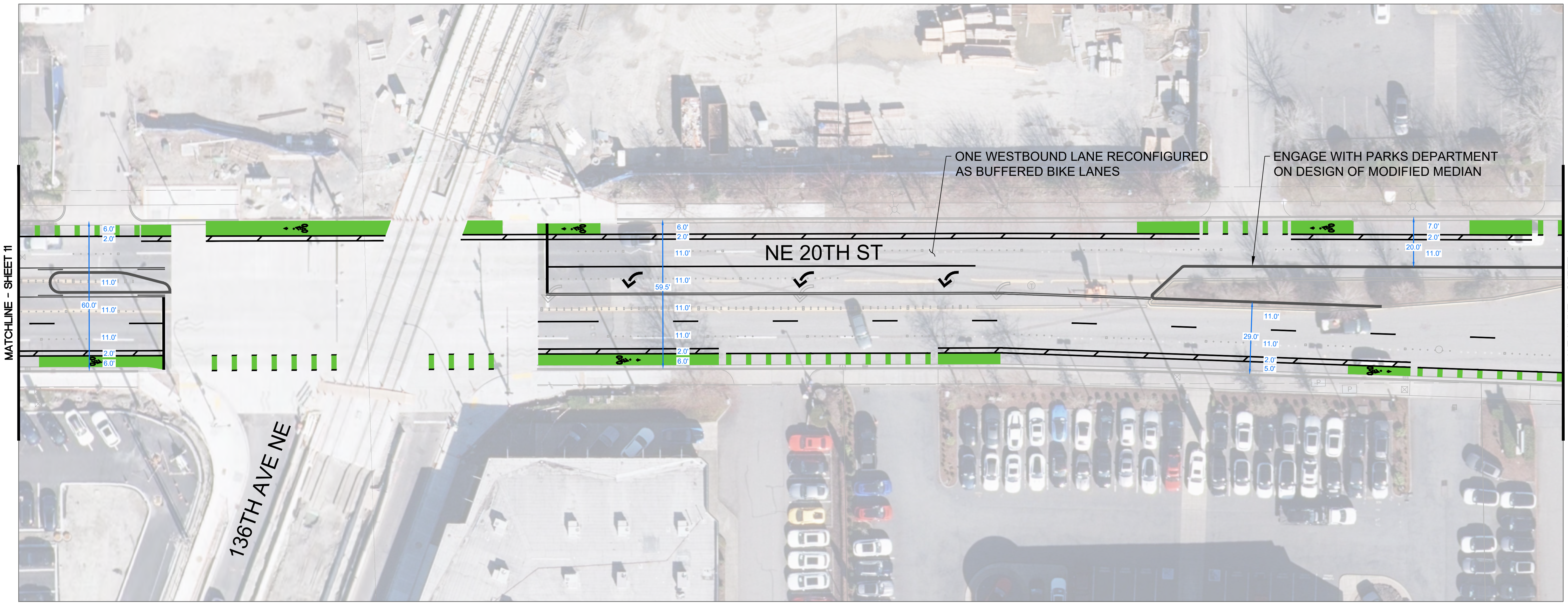
BIKE BELLEVUE
NORTHUP WAY / NE 12TH STREET CORRIDOR

CONCEPTUAL PLAN

SHT 11 OF 13



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Transportation Department

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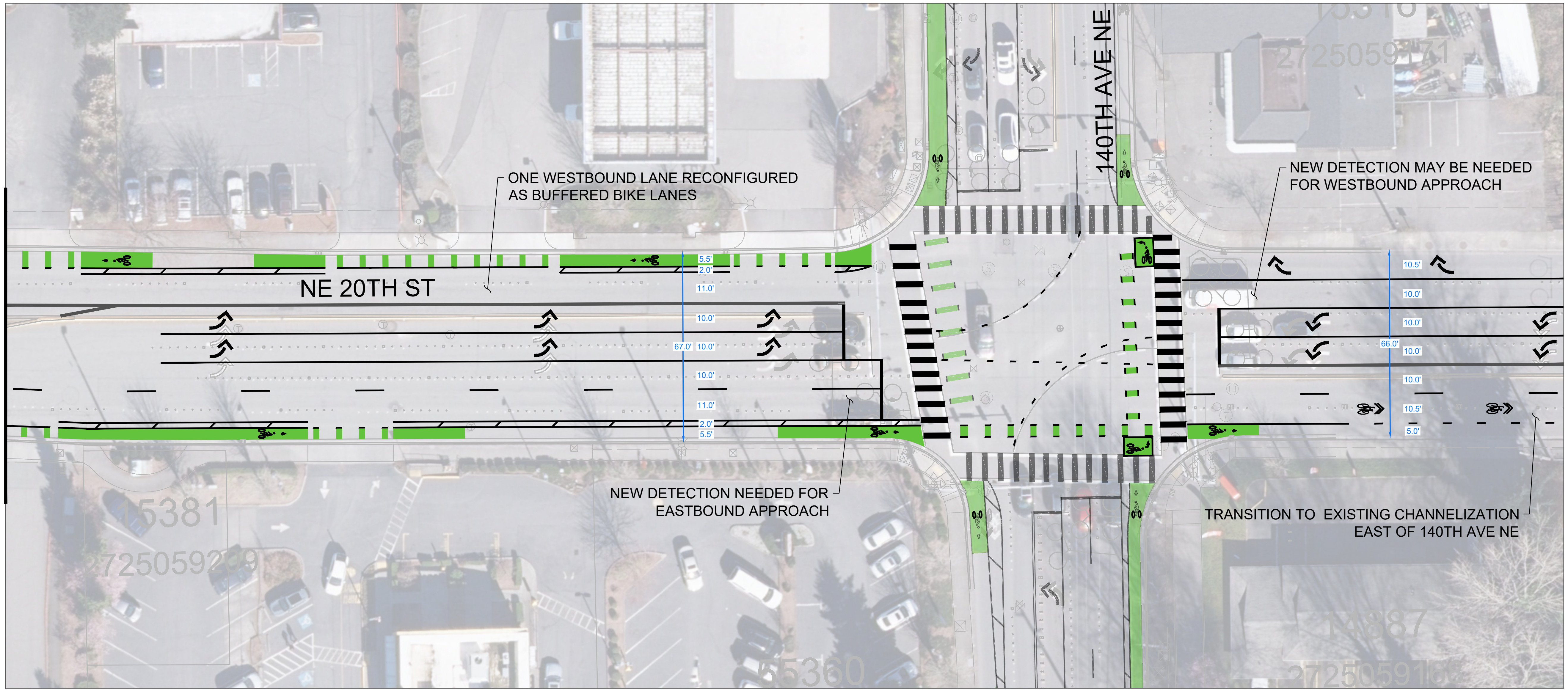
BIKE BELLEVUE
NORTHUP WAY / NE 12TH STREET CORRIDOR

CONCEPTUAL PLAN

SHT 12 OF 13

MATCHLINE - SHEET 12



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City of Bellevue
Transportation Department

PRELIMINARY DESIGN

BIKE BELLEVUE
NORTHUP WAY / NE 12TH STREET CORRIDOR

CONCEPTUAL PLAN

SHT 13 OF 13

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	313	607	199	194	446	217	125	521	182	196	678	333
Future Volume (vph)	313	607	199	194	446	217	125	521	182	196	678	333
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	12	11	11	11	11	12	12	11	11	12
Total Lost time (s)	3.0	3.0		3.0	3.0	4.0	3.0	3.0		3.0	3.0	3.0
Lane Util. Factor	0.97	0.95		0.97	1.00	1.00	1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.98	1.00	0.99		1.00	1.00	0.95
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3319	3275		3319	1801	1496	1711	3378		1711	3421	1507
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.16	1.00		0.12	1.00	1.00
Satd. Flow (perm)	3319	3275		3319	1801	1496	289	3378		211	3421	1507
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	329	639	209	204	469	228	132	548	192	206	714	351
RTOR Reduction (vph)	0	22	0	0	0	131	0	26	0	0	0	249
Lane Group Flow (vph)	329	826	0	204	469	97	132	714	0	206	714	102
Confl. Peds. (#/hr)			6			6			8			9
Turn Type	Prot	NA		Prot	NA	Perm	D.P+P	NA		D.P+P	NA	Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases						2	8			4		8
Actuated Green, G (s)	17.0	60.7		11.4	55.1	55.1	47.9	32.2		47.9	38.3	38.3
Effective Green, g (s)	19.0	62.7		13.4	57.1	56.1	51.9	34.2		51.9	40.3	40.3
Actuated g/C Ratio	0.14	0.45		0.10	0.41	0.40	0.37	0.24		0.37	0.29	0.29
Clearance Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	450	1466		317	734	599	224	825		267	984	433
v/s Ratio Prot	c0.10	0.25		0.06	c0.26		0.05	c0.21		c0.10	0.21	
v/s Ratio Perm						0.06	0.17			0.19		0.07
v/c Ratio	0.73	0.56		0.64	0.64	0.16	0.59	0.87		0.77	0.73	0.23
Uniform Delay, d1	58.0	28.5		61.0	33.2	26.9	32.4	50.7		34.7	44.9	38.1
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	5.2	1.6		3.3	4.2	0.6	2.5	9.1		11.8	2.3	0.1
Delay (s)	63.3	30.1		64.3	37.4	27.5	35.0	59.8		46.5	47.2	38.2
Level of Service	E	C		E	D	C	C	E		D	D	D
Approach Delay (s)		39.4			41.0			56.1			44.6	
Approach LOS		D			D			E			D	

Intersection Summary			
HCM 2000 Control Delay	44.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	77.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	240	517	165	260	482	133	158	948	49	175	1213	147
Future Volume (vph)	240	517	165	260	482	133	158	948	49	175	1213	147
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.91	
Frpb, ped/bikes	1.00	0.99		1.00	0.98		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.96		1.00	0.97		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3364		1770	3343		1770	3494		1770	4947	
Flt Permitted	0.17	1.00		0.12	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	320	3364		221	3343		1770	3494		1770	4947	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	253	544	174	274	507	140	172	1030	53	190	1318	160
RTOR Reduction (vph)	0	20	0	0	17	0	0	3	0	0	10	0
Lane Group Flow (vph)	253	698	0	274	630	0	172	1080	0	190	1468	0
Confl. Peds. (#/hr)			19			40			39			39
Turn Type	D.P+P	NA		D.P+P	NA		Prot	NA		Prot	NA	
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	55.4	33.7		55.4	37.0		16.8	56.1		18.5	57.8	
Effective Green, g (s)	55.4	33.7		55.4	37.0		16.8	56.1		18.5	57.8	
Actuated g/C Ratio	0.37	0.22		0.37	0.25		0.11	0.37		0.12	0.39	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	2.0	3.0		2.0	3.0		2.0	3.0		2.0	3.0	
Lane Grp Cap (vph)	296	755		305	824		198	1306		218	1906	
v/s Ratio Prot	0.10	c0.21		c0.13	0.19		0.10	c0.31		c0.11	0.30	
v/s Ratio Perm	c0.21			0.20								
v/c Ratio	0.85	0.92		0.90	0.77		0.87	0.83		0.87	0.77	
Uniform Delay, d1	37.1	56.9		43.3	52.5		65.5	42.6		64.6	40.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	20.0	16.9		26.5	4.3		29.9	6.1		28.7	2.0	
Delay (s)	57.1	73.9		69.7	56.7		95.4	48.7		93.3	42.3	
Level of Service	E	E		E	E		F	D		F	D	
Approach Delay (s)		69.5			60.6			55.1			48.1	
Approach LOS		E			E			E			D	

Intersection Summary			
HCM 2000 Control Delay	56.6	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	88.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	226	823	105	131	759	127	104	140	154	107	127	124
Future Volume (vph)	226	823	105	131	759	127	104	140	154	107	127	124
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Util. Factor	1.00	0.95		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.99	1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98		1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3470		1770	1817		1770	1863	1560	1770	1863	1524
Flt Permitted	0.08	1.00		0.24	1.00		0.44	1.00	1.00	0.40	1.00	1.00
Satd. Flow (perm)	143	3470		443	1817		828	1863	1560	749	1863	1524
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	238	866	111	138	799	134	109	147	162	113	134	131
RTOR Reduction (vph)	0	7	0	0	5	0	0	0	129	0	0	96
Lane Group Flow (vph)	238	970	0	138	928	0	109	147	33	113	134	35
Confl. Peds. (#/hr)			1			1			6			18
Turn Type	D.P+P	NA		D.P+P	NA		D.P+P	NA	pm+ov	D.P+P	NA	pm+ov
Protected Phases	1	6		5	2		7	4	5	3	8	1
Permitted Phases	2			6			8		4	4		8
Actuated Green, G (s)	81.1	74.4		81.1	66.7		18.9	13.9	20.6	18.9	13.9	28.3
Effective Green, g (s)	85.1	76.4		85.1	68.7		22.9	15.9	24.6	22.9	15.9	32.3
Actuated g/C Ratio	0.71	0.64		0.71	0.57		0.19	0.13	0.21	0.19	0.13	0.27
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	323	2209		410	1040		212	246	358	202	246	448
v/s Ratio Prot	c0.10	0.28		0.02	c0.51		0.03	c0.08	0.01	c0.03	0.07	0.01
v/s Ratio Perm	0.42			0.21			0.07		0.01	0.07		0.01
v/c Ratio	0.74	0.44		0.34	0.89		0.51	0.60	0.09	0.56	0.54	0.08
Uniform Delay, d1	32.3	11.0		6.7	22.4		42.0	49.0	38.7	42.1	48.7	32.7
Progression Factor	1.25	0.36		0.98	0.86		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.6	0.5		0.1	9.5		0.9	2.6	0.0	1.9	1.3	0.0
Delay (s)	45.9	4.5		6.7	28.8		42.9	51.6	38.7	44.0	50.0	32.8
Level of Service	D	A		A	C		D	D	D	D	D	C
Approach Delay (s)		12.6			25.9			44.3			42.2	
Approach LOS		B			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	25.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	90.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	57	411	45	103	664	422	108	129	110	757	189	250
Future Volume (vph)	57	411	45	103	664	422	108	129	110	757	189	250
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	15	12	11	10	12	11	10	10	11	11	11
Total Lost time (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	4.0	3.0	3.0	3.0
Lane Util. Factor	0.97	0.95		1.00	1.00	1.00	1.00	*0.90	1.00	0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3830		1711	1739	1583	1711	3129	1478	3319	1801	1496
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3830		1711	1739	1583	1711	3129	1478	3319	1801	1496
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	60	433	47	108	699	444	114	136	116	797	199	263
RTOR Reduction (vph)	0	6	0	0	0	62	0	0	94	0	0	120
Lane Group Flow (vph)	60	474	0	108	699	382	114	136	22	797	199	143
Confl. Peds. (#/hr)			2									1
Turn Type	Prot	NA		Prot	NA	pt+ov	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	1	6		5	2	2 3	7	4	5	3	8	
Permitted Phases									4			8
Actuated Green, G (s)	4.0	49.7		11.0	56.7	86.4	11.1	9.6	20.6	29.7	28.2	28.2
Effective Green, g (s)	6.0	51.7		13.0	58.7	90.4	13.1	11.6	22.6	31.7	30.2	30.2
Actuated g/C Ratio	0.05	0.43		0.11	0.49	0.75	0.11	0.10	0.19	0.26	0.25	0.25
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	171	1650		185	850	1192	186	302	327	876	453	376
v/s Ratio Prot	0.02	c0.12		0.06	c0.40	0.24	0.07	0.04	0.01	c0.24	c0.11	
v/s Ratio Perm									0.01			0.10
v/c Ratio	0.35	0.29		0.58	0.82	0.32	0.61	0.45	0.07	0.91	0.44	0.38
Uniform Delay, d1	55.1	22.2		50.9	26.2	4.8	51.0	51.2	40.0	42.8	37.8	37.2
Progression Factor	1.16	1.27		1.26	0.78	0.63	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	0.4		2.3	6.9	0.0	4.2	0.4	0.0	12.9	0.2	0.2
Delay (s)	64.3	28.6		66.4	27.3	3.1	55.2	51.6	40.1	55.7	38.0	37.4
Level of Service	E	C		E	C	A	E	D	D	E	D	D
Approach Delay (s)		32.6			22.0			49.1			49.1	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	36.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	79.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	377	150	289	707	202	146
Future Volume (vph)	377	150	289	707	202	146
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0		3.0	3.0	3.0	3.0
Lane Util. Factor	0.95		1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	0.96		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3375		1769	1863	1770	1567
Flt Permitted	1.00		0.40	1.00	0.95	1.00
Satd. Flow (perm)	3375		744	1863	1770	1567
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	397	158	304	744	213	154
RTOR Reduction (vph)	24	0	0	0	0	111
Lane Group Flow (vph)	531	0	304	744	213	43
Confl. Peds. (#/hr)		1	1			3
Turn Type	NA		pm+pt	NA	Prot	pm+ov
Protected Phases	6		5	2	7	5
Permitted Phases			2			7
Actuated Green, G (s)	75.8		91.3	91.3	18.7	29.2
Effective Green, g (s)	77.8		93.3	93.3	20.7	33.2
Actuated g/C Ratio	0.65		0.78	0.78	0.17	0.28
Clearance Time (s)	5.0		5.0	5.0	5.0	5.0
Vehicle Extension (s)	2.0		2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	2188		685	1448	305	472
v/s Ratio Prot	0.16		0.05	c0.40	c0.12	0.01
v/s Ratio Perm			0.30			0.02
v/c Ratio	0.24		0.44	0.51	0.70	0.09
Uniform Delay, d1	8.8		4.0	4.9	46.7	32.2
Progression Factor	0.94		0.57	0.58	1.00	1.00
Incremental Delay, d2	0.3		0.1	0.9	5.5	0.0
Delay (s)	8.6		2.4	3.8	52.3	32.2
Level of Service	A		A	A	D	C
Approach Delay (s)	8.6			3.4	43.8	
Approach LOS	A			A	D	

Intersection Summary			
HCM 2000 Control Delay	12.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	58.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	990	100	80	850	85	155
Future Volume (vph)	990	100	80	850	85	155
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11
Total Lost time (s)	3.0		3.0	3.0	2.5	3.0
Lane Util. Factor	0.95		1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	0.99		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3359		1709	1801	1711	1501
Flt Permitted	1.00		0.22	1.00	0.95	1.00
Satd. Flow (perm)	3359		387	1801	1711	1501
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1042	105	84	895	89	163
RTOR Reduction (vph)	4	0	0	0	0	101
Lane Group Flow (vph)	1143	0	84	895	89	62
Confl. Peds. (#/hr)		10	10			10
Turn Type	NA		D.P+P	NA	Perm	pm+ov
Protected Phases	6		5	2		5
Permitted Phases			6		4	4
Actuated Green, G (s)	88.6		94.2	99.2	11.3	16.9
Effective Green, g (s)	90.6		98.2	101.2	13.3	20.9
Actuated g/C Ratio	0.75		0.82	0.84	0.11	0.17
Clearance Time (s)	5.0		5.0	5.0	4.5	5.0
Vehicle Extension (s)	2.0		2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	2536		400	1518	189	261
v/s Ratio Prot	0.34		0.01	c0.50		0.02
v/s Ratio Perm			0.16		c0.05	0.03
v/c Ratio	0.45		0.21	0.59	0.47	0.24
Uniform Delay, d1	5.5		2.8	2.9	50.0	42.7
Progression Factor	1.43		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5		0.1	1.7	0.7	0.2
Delay (s)	8.4		2.9	4.6	50.7	42.9
Level of Service	A		A	A	D	D
Approach Delay (s)	8.4			4.5	45.6	
Approach LOS	A			A	D	

Intersection Summary			
HCM 2000 Control Delay	10.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.5
Intersection Capacity Utilization	59.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1030	50	87	930	86	121
Future Volume (vph)	1030	50	87	930	86	121
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0		3.0	3.0	2.5	3.0
Lane Util. Factor	0.95		1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00		1.00	1.00	0.99	1.00
Frt	0.99		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3507		1769	1863	1747	1576
Flt Permitted	1.00		0.21	1.00	0.95	1.00
Satd. Flow (perm)	3507		390	1863	1747	1576
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1084	53	92	979	91	127
RTOR Reduction (vph)	2	0	0	0	0	86
Lane Group Flow (vph)	1135	0	92	979	91	41
Confl. Peds. (#/hr)		7	7		4	4
Turn Type	NA		D.P+P	NA	custom	pt+ov
Protected Phases	6		5	2	7	5 3
Permitted Phases			6		8	4
Actuated Green, G (s)	83.9		88.9	93.9	12.1	17.1
Effective Green, g (s)	85.9		92.9	95.9	16.1	23.1
Actuated g/C Ratio	0.72		0.77	0.80	0.13	0.19
Clearance Time (s)	5.0		5.0	5.0	4.5	
Vehicle Extension (s)	2.0		2.0	2.0	2.0	
Lane Grp Cap (vph)	2510		382	1488	270	342
v/s Ratio Prot	0.32		0.01	c0.53	c0.03	0.02
v/s Ratio Perm			0.17		0.02	0.01
v/c Ratio	0.45		0.24	0.66	0.34	0.12
Uniform Delay, d1	7.2		8.8	5.1	47.4	40.1
Progression Factor	0.52		0.75	0.76	1.00	1.00
Incremental Delay, d2	0.5		0.1	2.0	0.3	0.1
Delay (s)	4.2		6.7	5.9	47.7	40.1
Level of Service	A		A	A	D	D
Approach Delay (s)	4.2			5.9	43.3	
Approach LOS	A			A	D	

Intersection Summary			
HCM 2000 Control Delay	8.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	60.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	820	75	120	670	30	75	10	50	60	5	25
Future Volume (vph)	50	820	75	120	670	30	75	10	50	60	5	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	12	12	11	12	12	12	12	12	12	12	12
Total Lost time (s)	3.0	3.0		3.0	3.0		2.5	2.5		2.5	2.5	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.88		1.00	0.87	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1711	3495		1711	3516		1770	1631		1770	1628	
Flt Permitted	0.35	1.00		0.27	1.00		0.74	1.00		0.64	1.00	
Satd. Flow (perm)	634	3495		487	3516		1373	1631		1194	1628	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	53	863	79	126	705	32	79	11	53	63	5	26
RTOR Reduction (vph)	0	4	0	0	2	0	0	47	0	0	23	0
Lane Group Flow (vph)	53	938	0	126	735	0	79	17	0	63	8	0
Turn Type	D.P+P	NA		D.P+P	NA		Perm	NA		Perm	NA	
Protected Phases	1	6		5	2			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	93.8	85.2		93.8	89.5		11.7	11.7		11.7	11.7	
Effective Green, g (s)	97.8	87.2		97.8	91.5		13.7	13.7		13.7	13.7	
Actuated g/C Ratio	0.81	0.73		0.81	0.76		0.11	0.11		0.11	0.11	
Clearance Time (s)	5.0	5.0		5.0	5.0		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	573	2539		505	2680		156	186		136	185	
v/s Ratio Prot	0.00	c0.27		c0.02	0.21			0.01			0.00	
v/s Ratio Perm	0.07			0.18			c0.06			0.05		
v/c Ratio	0.09	0.37		0.25	0.27		0.51	0.09		0.46	0.04	
Uniform Delay, d1	2.2	6.1		2.7	4.3		50.0	47.6		49.7	47.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	0.4		0.1	0.3		0.9	0.1		0.9	0.0	
Delay (s)	2.3	6.5		2.8	4.5		50.9	47.7		50.6	47.3	
Level of Service	A	A		A	A		D	D		D	D	
Approach Delay (s)		6.3			4.3			49.5			49.5	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	10.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	52.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Bike Bellevue - Corridor 1 (Northup Way/NE 20 St - 120 Ave NE to 140 Ave NE)

City of Bellevue Transportation Department

Estimate - 8/29/2023

Planning Level Estimate

Item No.	Sect. No.	Item	Quantity	Unit	Unit Cost	Total Cost
1	1-09	Mobilization	1	LS	$ 200,000.00	$ 200,000.00
2	1-10	Traffic Control Supervisor	1	LS	$ 35,300.00	$ 35,300.00
3	1-10	Pedestrian Traffic Control	1	LS	$ 6,600.00	$ 6,600.00
4	1-10	Sequential Arrow Sign	1040	HR	$ 5.50	$ 5,720.00
5	1-10	Flaggers and Other Traffic Control Labor	2080	HR	$ 70.50	$ 146,640.00
6	1-10	Other Temporary Traffic Control	1	LS	$ 28,200.00	$ 28,200.00
7	2-01	Tree Removal	7	EA	$ 750.00	$ 5,250.00
8	2-01	Roadside Cleanup	1	FA	$ 11,000.00	$ 11,000.00
9	2-02	Removing Traffic Island	1642	SF	$ 5.00	$ 8,210.00
10	2-02	Removing Asphalt Concrete Pavement	225	SY	$ 25.00	$ 5,625.00
11	2-02	Removing PreCast C-Curb	1226	LF	$ 10.00	$ 12,260.00
12	2-03	Roadway Excavation Incl. Haul	100	CY	$ 80.00	$ 8,000.00
13	4-04	Crushed Surfacing Base Course	50	TON	$ 80.00	$ 4,000.00
14	5-04	HMA Cl 1/2" PG 58H-22	1300	TON	$ 220.00	$ 286,000.00
15	5-04	Planing Bituminous Pavement	8900	SY	$ 20.00	$ 178,000.00
16	5-05	Patterned Concrete	40	SY	$ 250.00	$ 10,000.00
17	8-01	Erosion Control and Water Pollution Prevention	1	LS	$ 7,500.00	$ 7,500.00
18	8-01	Turbidity and pH Monitoring	65	EA	$ 110.00	$ 7,150.00
19	8-02	Topsoil Type A	85	CY	$ 80.00	$ 6,800.00
20	8-02	Trees	7	EA	$ 850.00	$ 5,950.00
21	8-02	Property Restoration	1	FA	$ 10,900.00	$ 10,900.00
22	8-04	Cement Conc. Curb	520	LF	$ 80.00	$ 41,600.00
23	8-07	Dual Faced Mountable Precast Curb	7312	LF	$ 35.00	$ 255,920.00
24	8-09	Raised Pavement Marker Type 1	5600	EA	$ 10.00	$ 56,000.00
25	8-09	Raised Pavement Marker Type 2	1500	EA	$ 15.00	$ 22,500.00
26	8-09	Removing Raised Pavement Marker	1	LS	$ 16,300.00	$ 16,300.00
27	8-10	Flexible Guide Posts	459	EA	$ 150.00	$ 68,850.00
28	8-20	Traffic Signal System Modfications Complete - Northup Way & 124 Ave NE	1	LS	$ 100,000.00	$ 100,000.00
29	8-20	Traffic Signal System Modfications Complete - NE 20 St & 130 Ave NE	1	LS	$ 20,000.00	$ 20,000.00
30	8-20	Traffic Signal System Modfications Complete - NE 20 St & 132 Ave NE	1	LS	$ 20,000.00	$ 20,000.00
31	8-20	Traffic Signal System Modfications Complete - NE 20 St & 136 Ave NE	1	LS	$ 5,000.00	$ 5,000.00
32	8-20	Traffic Signal System Modfications Complete - NE 20 St & 140 Ave NE	1	LS	$ 30,000.00	$ 30,000.00
33	8-20	Induction Loops	85	EA	$ 1,500.00	$ 127,500.00
34	8-20	Video Detection (TrafiSense Camera)	12	EA	$ 6,000.00	$ 72,000.00
35	8-22	Paint Line, 6 Inch	21100	LF	$ 2.00	$ 42,200.00
36	8-22	Plastic Line, 6 Inch	1300	LF	$ 7.50	$ 9,750.00
37	8-22	Plastic Crosswalk Line	3120	SF	$ 20.00	$ 62,400.00
38	8-22	Plastic Stop Line	281	LF	$ 15.00	$ 4,215.00
39	8-22	Plastic Traffic Arrow	75	EA	$ 350.00	$ 26,250.00
40	8-22	Plastic Bicycle Lane Symbol	63	EA	$ 385.00	$ 24,255.00
41	8-22	Plastic Induction Loop Symbol	94	EA	$ 350.00	$ 32,900.00
42	8-22	Green Bicycle Lane Treatment	19060	SF	$ 25.00	$ 476,500.00
43	8-22	Plastic Bicycle Box	125	SF	$ 30.00	$ 3,750.00
44	8-22	Removing Pavement Marking	1	LS	$ 19,600.00	$ 19,600.00
45	8-23	Temporary Pavement Marking	1	LS	$ 10,900.00	$ 10,900.00
					SubTotal	**$ 2,537,495.00**
					+ 10% Prelim. Design Contingency	**$ 253,749.50**
					+Police Officers	**$ 90,000.00**
					+10% Construction Management	**$ 253,749.50**
					+ 10% Contingency	**$ 253,749.50**
					Construction Total	**$ 3,388,743.50**
					Design & Permitting Total (15% of Construction)	**$ 508,311.53**
					Project Total (Design + Construction)	**$ 3,897,055.03**

Preliminary cost estimates to be finalized and determined by City, this range is an approximation completed in 2023.

Corridor 2

CITY OF BELLEVUE
TRANSPORTATION DEPARTMENT

BIKE BELLEVUE
NE 12TH ST CORRIDOR

CITY MANAGER
BRAD MIYAKE

MAYOR
LYNNE ROBINSON

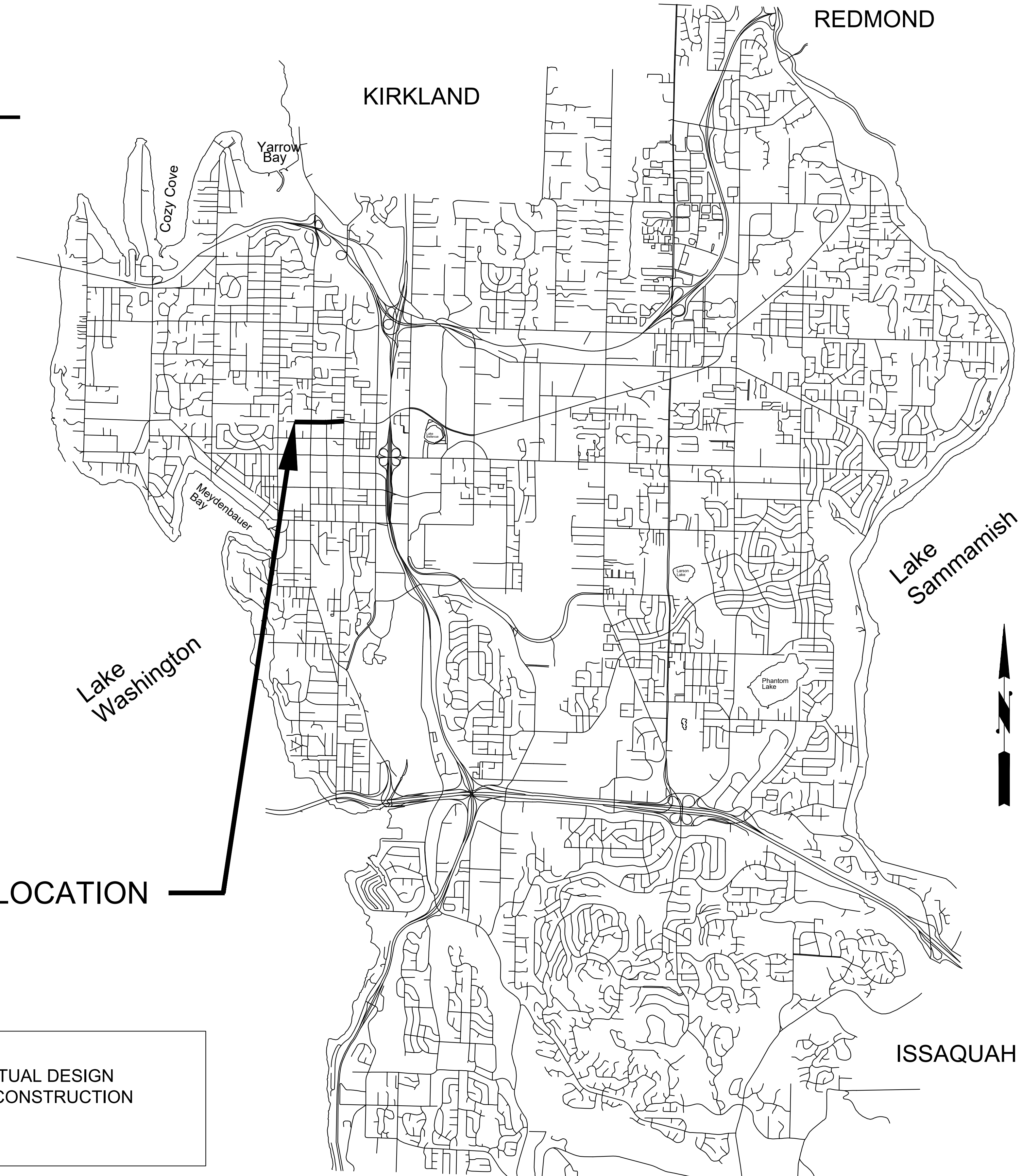
DIRECTOR OF TRANSPORTATION
ANDREW SINGELAKIS

DEPUTY MAYOR
JARED NIEUWENHUIS

CITY COUNCIL
JEREMY BARKSDALE
CONRAD LEE
JENNIFER ROBERTSON
JOHN STOKES
JANICE ZAHN

SCHEDULE OF DRAWINGS

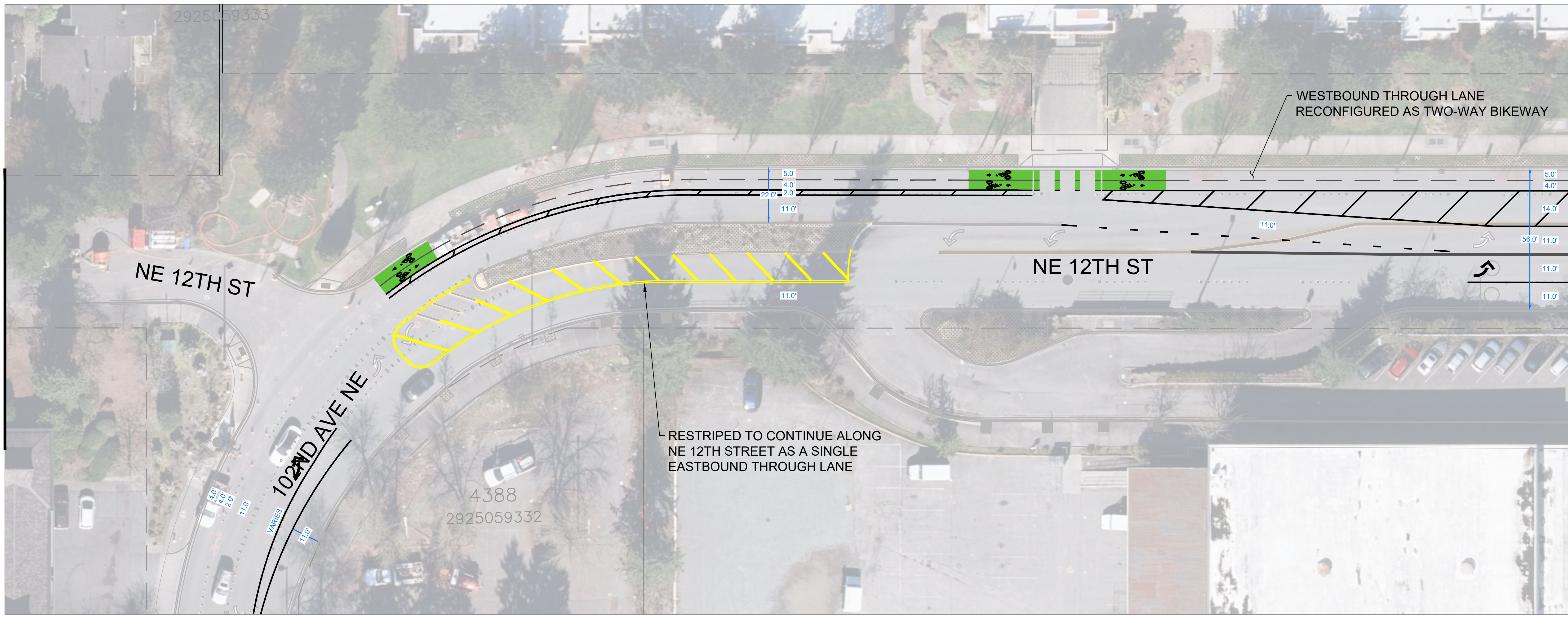
SHEET	DRAWINGS
1	COVER SHEET
4B-7B	ROADWAY PLANS



CONCEPTUAL DESIGN
NOT FOR CONSTRUCTION

Design to be coordinated with Sound Transit Layover

C.I.P. NUMBER xxxxxx



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NO.	DATE	BY	APPR.	REVISIONS

KP 6/14/21
DESIGNED BY DATE
KP 6/14/21
DRAWN BY DATE
CHECKED BY DATE

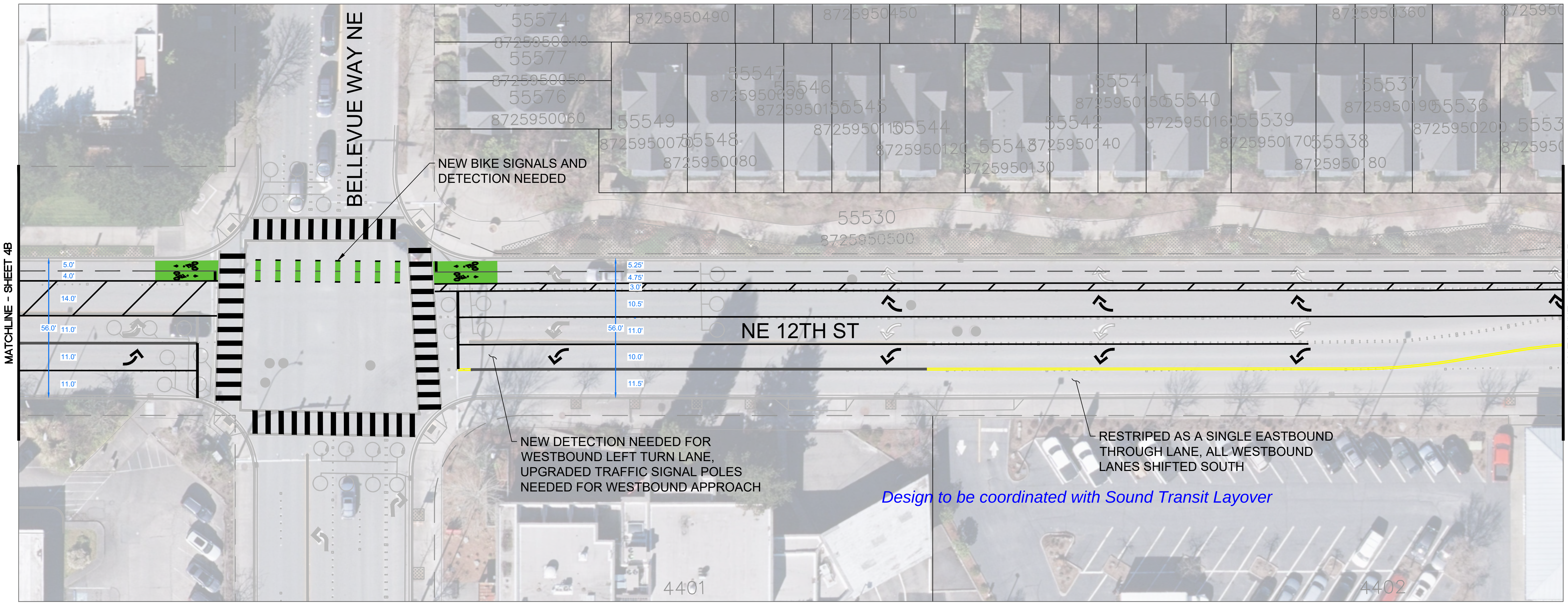
City of Bellevue
Transportation Department

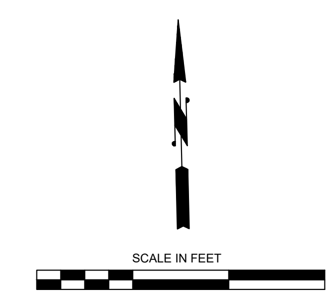
PRELIMINARY DESIGN

BIKE BELLEVUE
NE 12TH STREET CORRIDOR

CONCEPTUAL PLAN

SHT 4B OF 7B





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NO.	DATE	BY	APPR.	REVISIONS

KP 6/14/21
DESIGNED BY DATE
KP 6/14/21
DRAWN BY DATE
CHECKED BY DATE

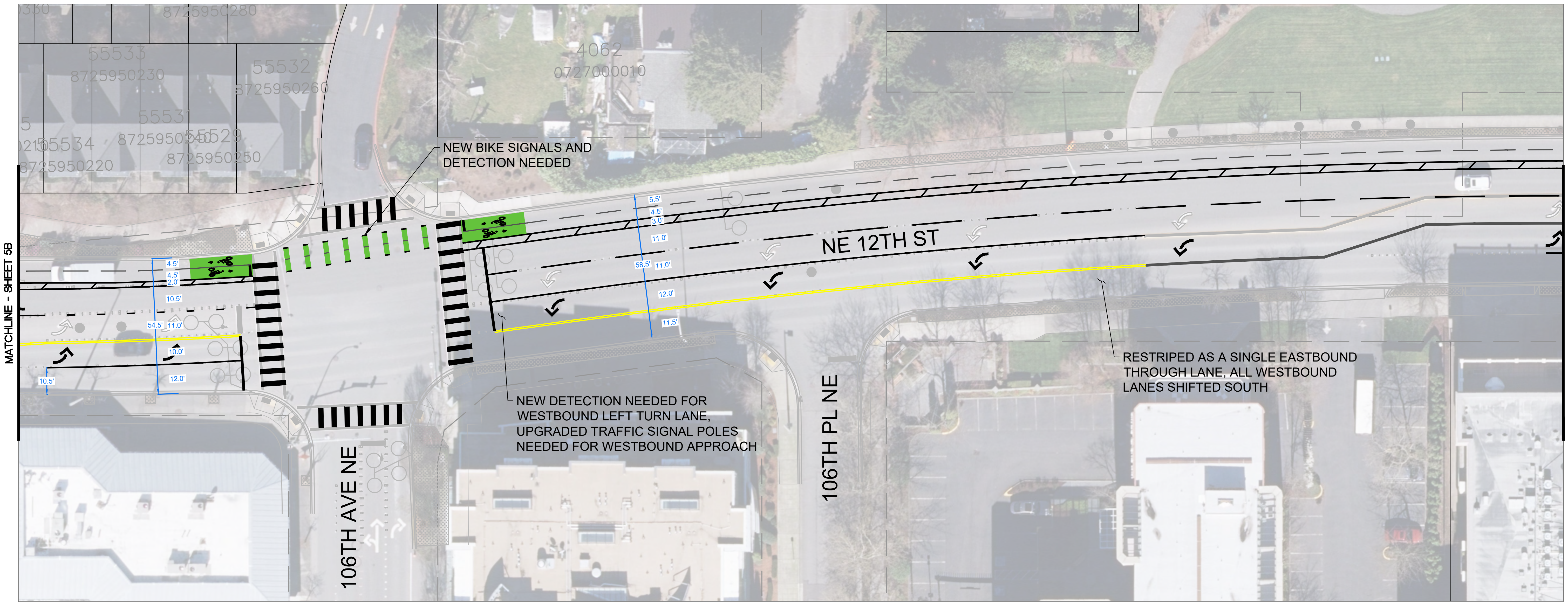
City of Bellevue
Transportation Department

PRELIMINARY DESIGN

BIKE BELLEVUE
NE 12TH STREET CORRIDOR

CONCEPTUAL PLAN

SHT 5B OF 7B



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SCALE IN FEET

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NO.	DATE	BY	APPR.	REVISIONS

KP	6/14/21
DESIGNED BY	DATE
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DRAWN BY	DATE
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CHECKED BY	DATE

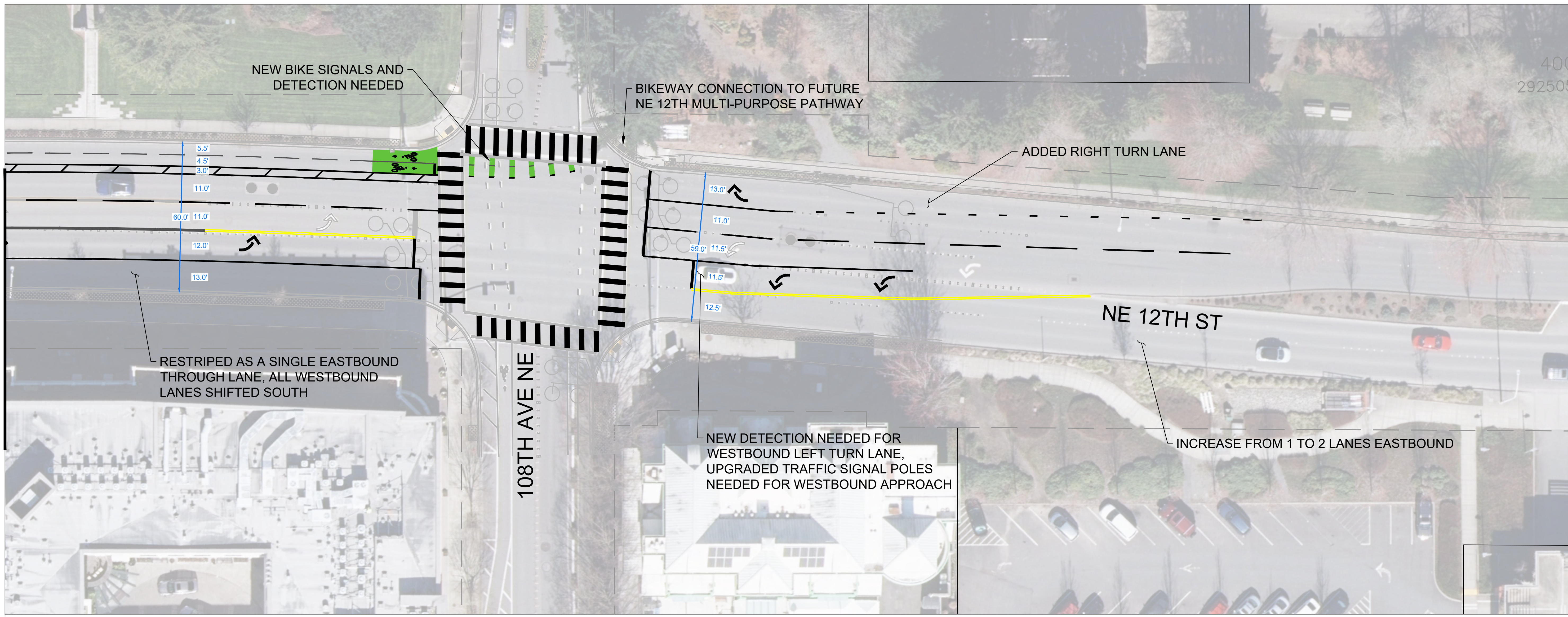
City of Bellevue
Transportation Department

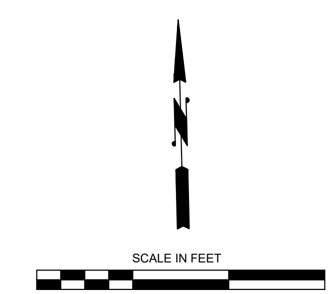
PRELIMINARY DESIGN

BIKE BELLEVUE
NE 12TH STREET CORRIDOR

CONCEPTUAL PLAN

SHT 6B OF 7B





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NO.	DATE	BY	APPR.	REVISIONS

KP 6/14/21
DESIGNED BY DATE
KP 6/14/21
DRAWN BY DATE
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City of Bellevue
Transportation Department

PRELIMINARY DESIGN

BIKE BELLEVUE
NE 12TH STREET CORRIDOR

CONCEPTUAL PLAN

SHT 7B OF 7B

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	80	500	550	100	90	130
Future Volume (vph)	80	500	550	100	90	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	10	11	11	11	11	11
Total Lost time (s)	3.0	3.0	3.0		3.0	3.0
Lane Util. Factor	1.00	0.95	*0.76		1.00	1.00
Frt	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1486	3079	2407		1540	1378
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1486	3079	2407		1540	1378
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	84	526	579	105	95	137
RTOR Reduction (vph)	0	0	8	0	0	95
Lane Group Flow (vph)	84	526	676	0	95	42
Turn Type	Prot	NA	NA		Prot	pm+ov
Protected Phases	1	6	2		8	1
Permitted Phases						8
Actuated Green, G (s)	14.0	70.1	51.1		9.9	23.9
Effective Green, g (s)	16.0	72.1	53.1		11.9	27.9
Actuated g/C Ratio	0.18	0.80	0.59		0.13	0.31
Clearance Time (s)	5.0	5.0	5.0		5.0	5.0
Vehicle Extension (s)	2.0	2.0	2.0		2.0	2.0
Lane Grp Cap (vph)	264	2466	1420		203	473
v/s Ratio Prot	c0.06	0.17	c0.28		c0.06	0.02
v/s Ratio Perm						0.01
v/c Ratio	0.32	0.21	0.48		0.47	0.09
Uniform Delay, d1	32.2	2.1	10.5		36.1	22.0
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.3	0.2	1.1		0.6	0.0
Delay (s)	32.5	2.3	11.7		36.7	22.1
Level of Service	C	A	B		D	C
Approach Delay (s)		6.5	11.7		28.1	
Approach LOS		A	B		C	

Intersection Summary			
HCM 2000 Control Delay	12.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	40.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	97	155	8	197	346	478	31	718	163	300	582	150
Future Volume (vph)	97	155	8	197	346	478	31	718	163	300	582	150
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	10	11	12	10	11	10	11	10	10
Total Lost time (s)	3.0	3.0		3.0	3.0	4.0	3.0	3.0	3.0	3.0	3.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.96	1.00	1.00	0.91	1.00	0.94	
Flpb, ped/bikes	1.00	1.00		0.99	1.00	1.00	0.98	1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1534	1605		1469	1621	1362	1462	3079	1214	1533	2717	
Flt Permitted	0.21	1.00		0.46	1.00	1.00	0.29	1.00	1.00	0.24	1.00	
Satd. Flow (perm)	344	1605		709	1621	1362	453	3079	1214	386	2717	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	100	160	8	203	357	493	32	740	168	309	600	155
RTOR Reduction (vph)	0	2	0	0	0	62	0	0	81	0	17	0
Lane Group Flow (vph)	100	166	0	203	357	431	32	740	87	309	738	0
Confl. Peds. (#/hr)	34		27	27		34	88		32	32		88
Turn Type	D.P+P	NA		D.P+P	NA	pm+ov	D.P+P	NA	pm+ov	D.P+P	NA	
Protected Phases	3	8		7	4	5	1	6	7	5	2	
Permitted Phases	4			8		4	2		6	6		
Actuated Green, G (s)	34.1	21.5		34.1	29.1	49.2	65.9	45.8	58.4	65.9	62.9	
Effective Green, g (s)	38.1	23.5		38.1	31.1	51.2	69.9	47.8	62.4	69.9	64.9	
Actuated g/C Ratio	0.32	0.20		0.32	0.26	0.43	0.58	0.40	0.52	0.58	0.54	
Clearance Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	178	314		317	420	626	305	1226	661	436	1469	
v/s Ratio Prot	0.03	0.10		c0.08	c0.22	c0.12	0.00	0.24	0.02	0.13	0.27	
v/s Ratio Perm	0.14			0.13		0.20	0.06		0.06	c0.28		
v/c Ratio	0.56	0.53		0.64	0.85	0.69	0.10	0.60	0.13	0.71	0.50	
Uniform Delay, d1	31.6	43.3		32.7	42.2	27.9	17.4	28.6	14.8	15.6	17.4	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.4	0.7		3.3	14.3	2.5	0.1	2.2	0.0	4.3	1.2	
Delay (s)	34.0	44.0		36.0	56.5	30.4	17.4	30.8	14.9	19.8	18.6	
Level of Service	C	D		D	E	C	B	C	B	B	B	
Approach Delay (s)		40.3			40.3			27.5			19.0	
Approach LOS		D			D			C			B	

Intersection Summary			
HCM 2000 Control Delay	29.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	81.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	500	120	170	860	6	150	5	130	5	5	5
Future Volume (vph)	5	500	120	170	860	6	150	5	130	5	5	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	11	10	12	12	9	12	10	12	12	12
Total Lost time (s)	5.0	3.0		3.0	3.0			5.0	3.0		5.0	
Lane Util. Factor	1.00	1.00		1.00	0.95			1.00	1.00		1.00	
Frt	1.00	0.97		1.00	1.00			1.00	0.85		0.95	
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00		0.98	
Satd. Flow (prot)	1593	1574		1486	3182			1599	1330		1575	
Flt Permitted	0.31	1.00		0.31	1.00			0.72	1.00		0.92	
Satd. Flow (perm)	525	1574		486	3182			1210	1330		1467	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	5	526	126	179	905	6	158	5	137	5	5	5
RTOR Reduction (vph)	0	5	0	0	0	0	0	0	100	0	4	0
Lane Group Flow (vph)	5	647	0	179	911	0	0	163	37	0	11	0
Turn Type	Perm	NA		D.P+P	NA		Perm	NA	pm+ov	Perm	NA	
Protected Phases		6		5	2			4	5		8	
Permitted Phases	6			6			4		4	8		
Actuated Green, G (s)	84.0	84.0		92.9	97.9			22.1	31.0		22.1	
Effective Green, g (s)	84.0	86.0		96.9	99.9			22.1	35.0		22.1	
Actuated g/C Ratio	0.65	0.66		0.75	0.77			0.17	0.27		0.17	
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	
Vehicle Extension (s)	2.0	2.0		2.0	3.0			2.0	2.0		2.0	
Lane Grp Cap (vph)	339	1041		446	2445			205	388		249	
v/s Ratio Prot		c0.41		c0.03	0.29				0.01			
v/s Ratio Perm	0.01			0.27				c0.13	0.02		0.01	
v/c Ratio	0.01	0.62		0.40	0.37			0.80	0.10		0.04	
Uniform Delay, d1	8.2	12.6		7.4	4.9			51.8	35.6		45.1	
Progression Factor	1.00	1.00		0.98	0.64			1.00	1.00		1.00	
Incremental Delay, d2	0.1	2.8		0.2	0.4			17.7	0.0		0.0	
Delay (s)	8.3	15.4		7.4	3.5			69.5	35.7		45.1	
Level of Service	A	B		A	A			E	D		D	
Approach Delay (s)		15.4			4.2			54.0			45.1	
Approach LOS		B			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	15.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	74.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	540	43	127	933	43	46	40	148	32	47	29
Future Volume (vph)	23	540	43	127	933	43	46	40	148	32	47	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	10	12	12	11	11	11	16	16	16
Total Lost time (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Util. Factor	1.00	1.00		1.00	0.95			1.00			1.00	
Frt	1.00	0.99		1.00	0.99			0.91			0.96	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.99	
Satd. Flow (prot)	1593	1603		1486	3164			1468			1803	
Flt Permitted	0.24	1.00		0.34	1.00			0.90			0.71	
Satd. Flow (perm)	399	1603		527	3164			1339			1307	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	24	568	45	134	982	45	48	42	156	34	49	31
RTOR Reduction (vph)	0	1	0	0	1	0	0	54	0	0	11	0
Lane Group Flow (vph)	24	612	0	134	1026	0	0	192	0	0	103	0
Turn Type	D.P+P	NA		D.P+P	NA		Perm	NA		Perm	NA	
Protected Phases	1	6		5	2			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	92.7	85.0		92.7	89.5			22.3			22.3	
Effective Green, g (s)	96.7	87.0		96.7	91.5			24.3			24.3	
Actuated g/C Ratio	0.74	0.67		0.74	0.70			0.19			0.19	
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0			2.0			2.0	
Lane Grp Cap (vph)	344	1072		463	2226			250			244	
v/s Ratio Prot	0.00	c0.38		c0.02	0.32							
v/s Ratio Perm	0.05			0.19				c0.14			0.08	
v/c Ratio	0.07	0.57		0.29	0.46			0.77			0.42	
Uniform Delay, d1	5.1	11.5		6.5	8.4			50.2			46.6	
Progression Factor	0.88	0.51		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.0	1.9		0.1	0.7			12.0			0.4	
Delay (s)	4.5	7.7		6.6	9.1			62.2			47.1	
Level of Service	A	A		A	A			E			D	
Approach Delay (s)		7.6			8.8			62.2			47.1	
Approach LOS		A			A			E			D	

Intersection Summary			
HCM 2000 Control Delay	16.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	70.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	130	160	75	80	160	15	30	120	40	100	220	180
Future Volume (vph)	130	160	75	80	160	15	30	120	40	100	220	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	13	11	10	11	11	10	10	10
Total Lost time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Util. Factor	1.00	0.95		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.95		1.00	0.99		1.00	0.96		1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1540	2931		1540	1710		1486	1560		1486	1459	
Flt Permitted	0.58	1.00		0.58	1.00		0.27	1.00		0.57	1.00	
Satd. Flow (perm)	932	2931		940	1710		424	1560		899	1459	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	137	168	79	84	168	16	32	126	42	105	232	189
RTOR Reduction (vph)	0	52	0	0	5	0	0	16	0	0	36	0
Lane Group Flow (vph)	137	195	0	84	179	0	32	152	0	105	385	0
Turn Type	D.P+P	NA		D.P+P	NA		D.P+P	NA		D.P+P	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	29.1	24.0		29.1	23.5		25.9	19.4		25.9	23.5	
Effective Green, g (s)	33.1	26.0		33.1	25.5		29.9	21.4		29.9	25.5	
Actuated g/C Ratio	0.44	0.35		0.44	0.34		0.40	0.29		0.40	0.34	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	472	1016		471	581		231	445		424	496	
v/s Ratio Prot	c0.03	0.07		0.02	c0.10		0.01	0.10		c0.03	c0.26	
v/s Ratio Perm	0.10			0.06			0.05			0.07		
v/c Ratio	0.29	0.19		0.18	0.31		0.14	0.34		0.25	0.78	
Uniform Delay, d1	12.9	17.2		12.4	18.3		14.9	21.2		14.6	22.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.4		0.1	1.4		0.1	0.2		0.1	6.8	
Delay (s)	13.0	17.6		12.5	19.6		15.0	21.4		14.7	29.0	
Level of Service	B	B		B	B		B	C		B	C	
Approach Delay (s)		15.9			17.4			20.4			26.2	
Approach LOS		B			B			C			C	

Intersection Summary				
HCM 2000 Control Delay	20.8	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.49			
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	61.0%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Bike Bellevue - Corridor 2 (102 Ave NE & NE 12 St)

City of Bellevue Transportation Department

Estimate 08/29/2023

Planning Level Estimate

Item No.	Sect. No.	Item	Quantity	Unit	Unit Cost	Total Cost
1	1-09	Mobilization	1	LS	$ 65,000.00	$ 65,000.00
2	1-10	Traffic Control Supervisor	1	LS	$ 11,000.00	$ 11,000.00
3	1-10	Sequential Arrow Sign	640	HR	$ 5.50	$ 3,520.00
4	1-10	Flaggers and Other Traffic Control Labor	640	HR	$ 71.50	$ 45,760.00
5	1-10	Other Temporary Traffic Control	1	LS	$ 7,500.00	$ 7,500.00
6	2-01	Roadside Cleanup	1	FA	$ 5,500.00	$ 5,500.00
7	8-01	Erosion Control and Water Pollution Prevention	1	LS	$ 2,000.00	$ 2,000.00
8	8-02	Property Restoration	1	FA	$ 5,500.00	$ 5,500.00
9	8-07	Precast Dual Faced Sloped Mountable Curb	675	LF	$ 35.00	$ 23,625.00
10	8-09	Raised Pavement Marking Type 1	1795	EA	$ 10.00	$ 17,945.48
11	8-09	Raised Pavement Marking Type 2	502	EA	$ 15.00	$ 7,523.93
12	8-09	Removing Raised Pavement Marker	1	LS	$ 5,500.00	$ 5,500.00
13	8-10	Flexible Guide Post	110	EA	$ 150.00	$ 16,500.00
14	8-20	Traffic Signal System Modfications Complete - NE 12 St & Bellevue Way NE	1	LS	$ 75,000.00	$ 75,000.00
15	8-20	Traffic Signal System Modfications Complete - NE 12 St & 106 Ave NE	1	LS	$ 70,000.00	$ 70,000.00
16	8-20	Traffic Signal System Modfications Complete - NE 12 St & 108 Ave NE	1	LS	$ 70,000.00	$ 70,000.00
17	8-20	Video Detection (TrafiSense Camera)	6	EA	$ 6,000.00	$ 36,000.00
18	8-20	Induction Loops	9	EA	$ 1,500.00	$ 13,500.00
19	8-22	Paint Line, 6 Inch	5157	LF	$ 2.00	$ 10,314.00
20	8-22	Plastic Line, 6 Inch	729	LF	$ 7.50	$ 5,464.97
21	8-22	Plastic Crosswalk Line	3460	SF	$ 20.00	$ 69,200.00
22	8-22	Plastic Stop Line	135	LF	$ 15.00	$ 2,025.00
23	8-22	Plastic Traffic Arrow	21	EA	$ 350.00	$ 7,350.00
24	8-22	Plastic Bicycle Lane Symbol	44	EA	$ 385.00	$ 16,940.00
25	8-22	Plastic Induction Loop Symbol	9	EA	$ 350.00	$ 3,150.00
26	8-22	Green Bicycle Lane Treatment	2106	SF	$ 25.00	$ 52,650.00
27	8-22	Removing Pavement Marking	1	LS	$ 4,000.00	$ 4,000.00
28	8-23	Temporary Pavement Marking	1	LS	$ 1,750.00	$ 1,750.00
					SubTotal	**$ 654,218.37**
					+ 10% Prelim. Design Contingency	**$ 65,421.84**
					+Police Officers	**$ 7,500.00**
					+10% Construction Management	**$ 65,421.84**
					+ 10% Contingency	**$ 65,421.84**
					Construction Total	**$ 857,983.89**
					Design & Permitting Total (15% of Construction)	**$ 128,697.58**
					Project Total (Design + Construction)	**$ 986,681.47**

Preliminary cost estimates to be finalized and determined by City, this range is an approximation completed in 2023.

Corridor 3

CITY OF BELLEVUE
TRANSPORTATION DEPARTMENT

BIKE BELLEVUE
NE 12TH ST / BEL-RED RD CORRIDOR

CITY MANAGER
BRAD MIYAKE

MAYOR
LYNNE ROBINSON

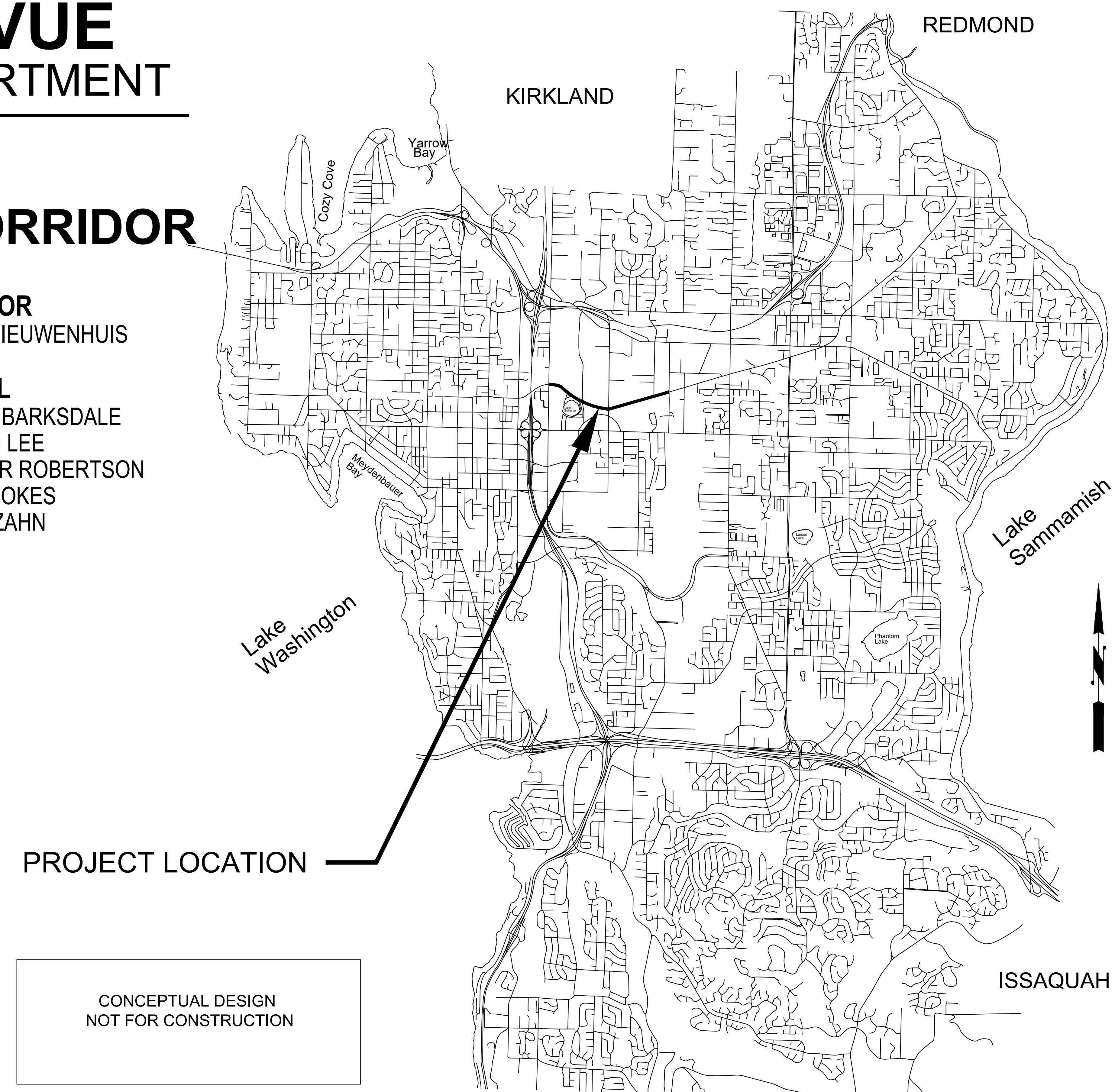
DIRECTOR OF TRANSPORTATION
ANDREW SINGELAKIS

DEPUTY MAYOR
JARED NIEUWENHUIS

CITY COUNCIL
JEREMY BARKSDALE
CONRAD LEE
JENNIFER ROBERTSON
JOHN STOKES
JANICE ZAHN

SCHEDULE OF DRAWINGS

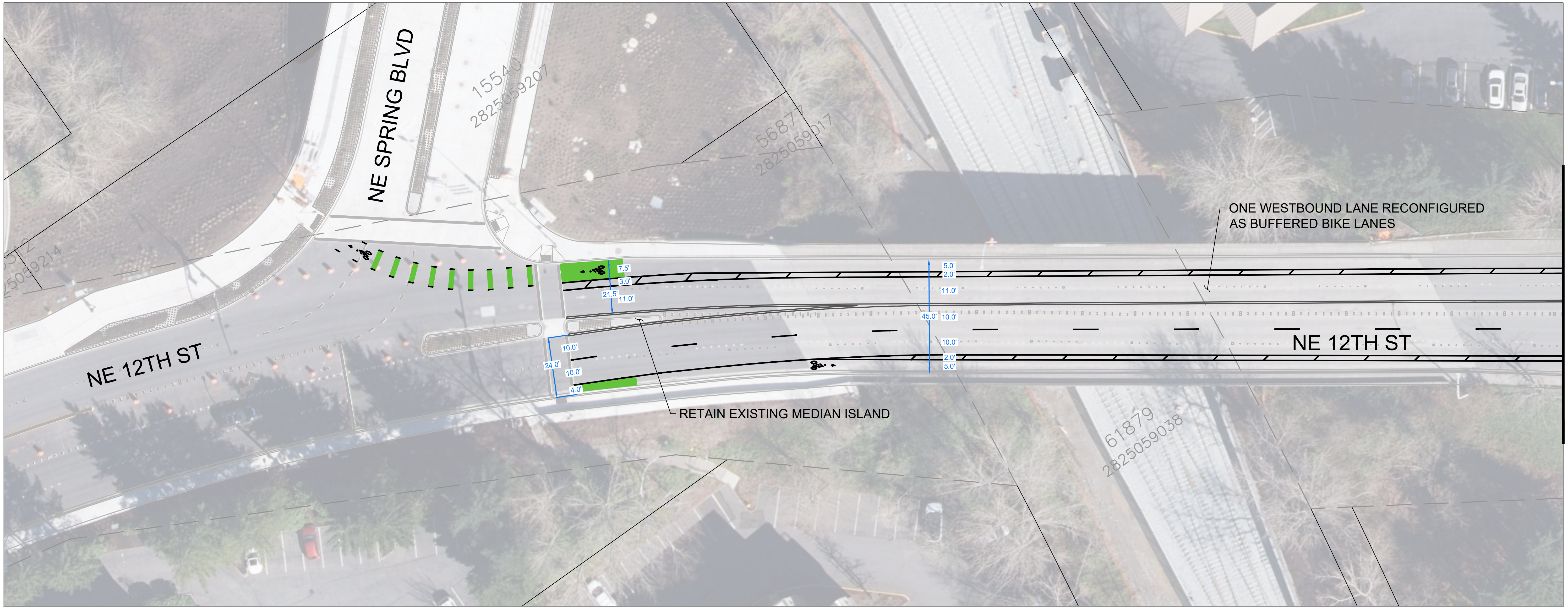
SHEET	DRAWINGS
1	COVER SHEET
2-10	ROADWAY PLANS



CONCEPTUAL DESIGN
NOT FOR CONSTRUCTION

C.I.P. NUMBER xxxxxx

Design to be coordinated with 2025 Pavement Overlay



SCALE IN FEET

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alta

NO.	DATE	BY	APPR.	REVISIONS

KP	6/14/21
DESIGNED BY	DATE
KP	6/14/21
DRAWN BY	DATE
-	-
CHECKED BY	DATE

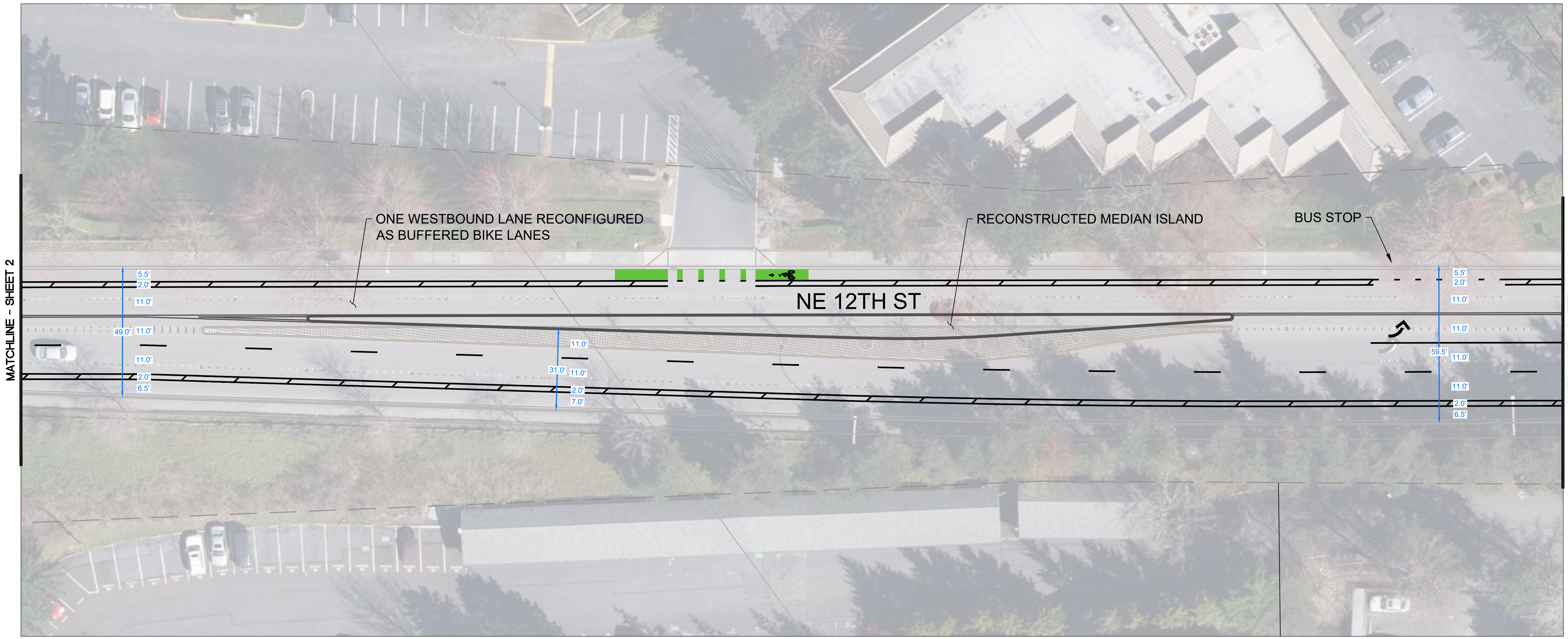
City of Bellevue
Transportation Department

PRELIMINARY DESIGN

BIKE BELLEVUE
NE 12TH STREET / BEL-RED ROAD CORRIDOR

CONCEPTUAL PLAN

SHT 2 OF 10



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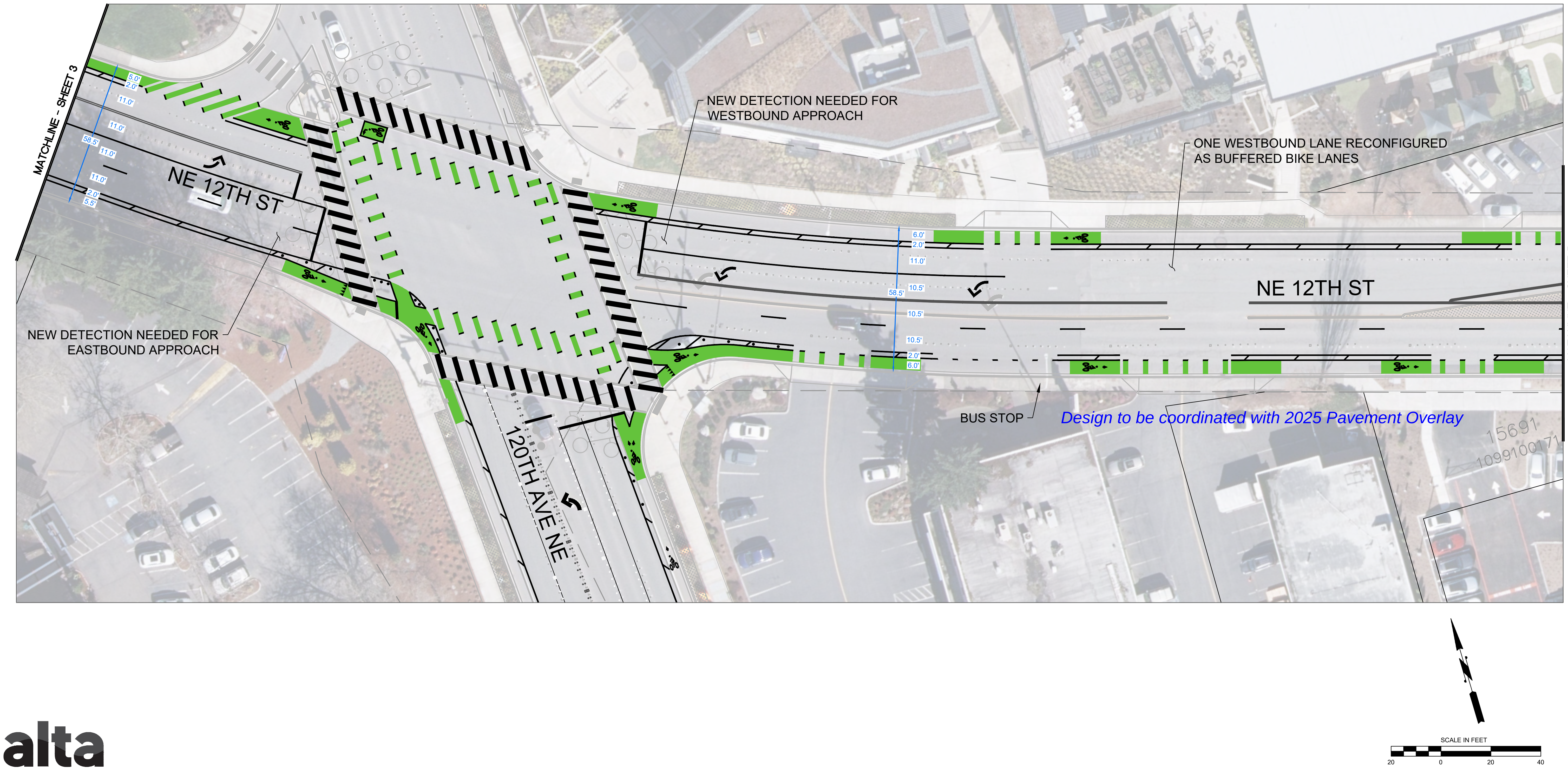
City of Bellevue
Transportation Department

PRELIMINARY DESIGN

BIKE BELLEVUE
NE 12TH STREET / BEL-RED ROAD CORRIDOR

CONCEPTUAL PLAN

SHT 3 OF 10



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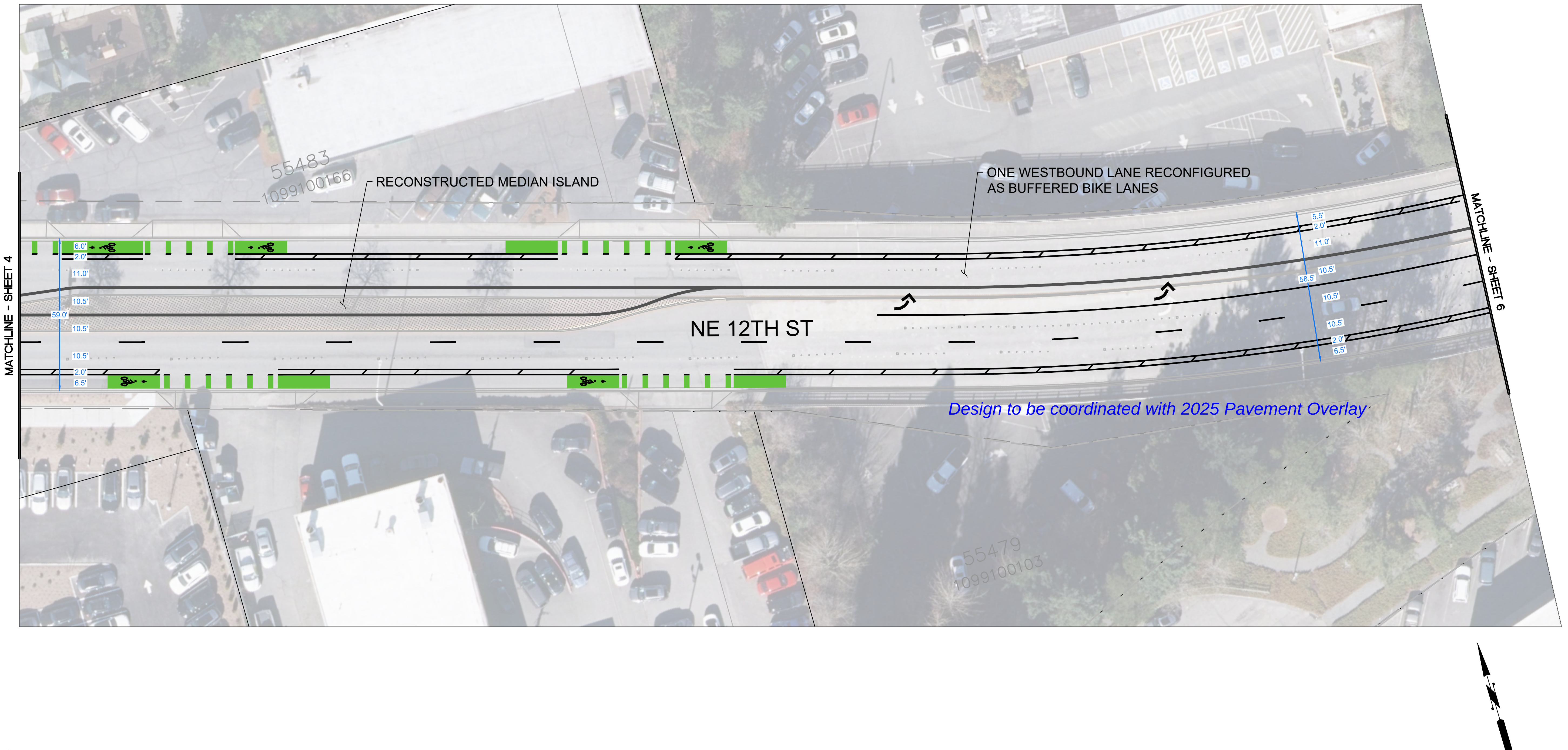
City of Bellevue
Transportation Department

PRELIMINARY DESIGN

BIKE BELLEVUE
NE 12TH STREET / BEL-RED ROAD CORRIDOR

CONCEPTUAL PLAN

SHT 4 OF 10



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KP 6/14/21
DESIGNED BY DATE
KP 6/14/21
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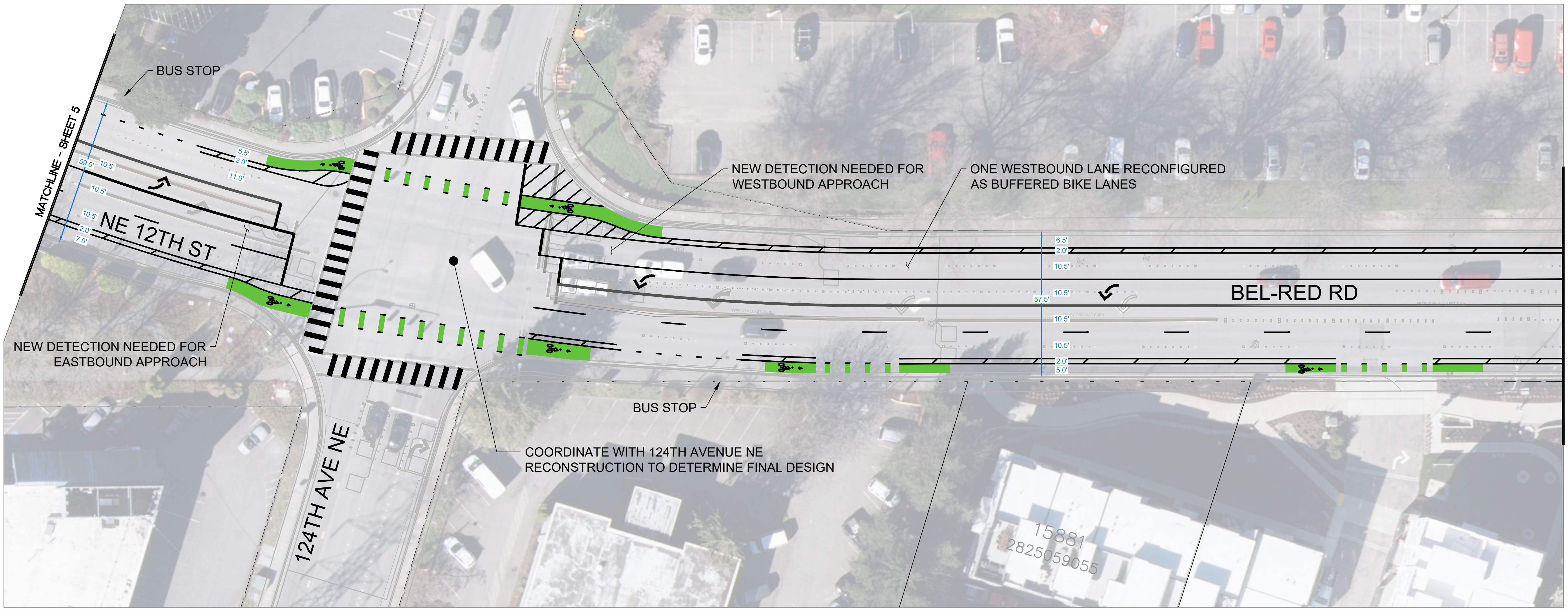
City of Bellevue
Transportation Department

PRELIMINARY DESIGN

BIKE BELLEVUE
NE 12TH STREET / BEL-RED ROAD CORRIDOR

CONCEPTUAL PLAN

SHT 5 OF 10



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Transportation Department

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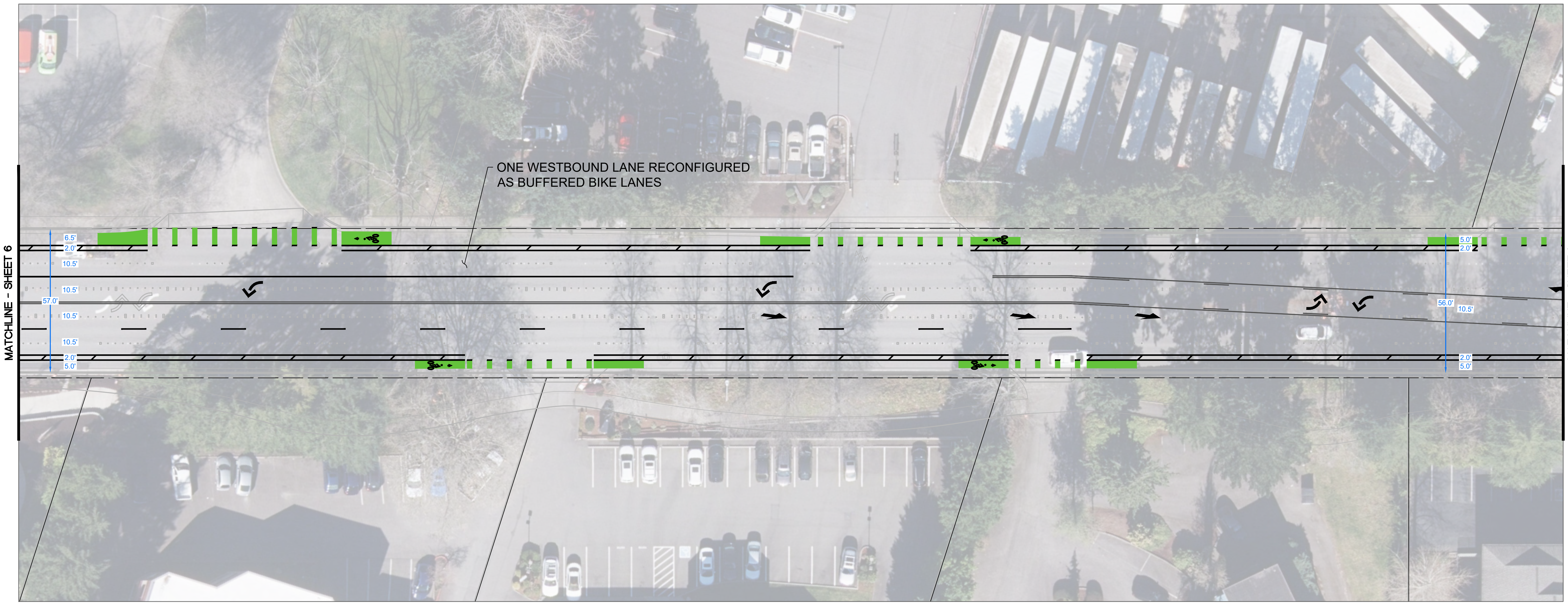
BIKE BELLEVUE
NE 12TH STREET / BEL-RED ROAD CORRIDOR

CONCEPTUAL PLAN

SHT 6 OF 10



SCALE IN FEET

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KP 6/14/21
DESIGNED BY DATE
KP 6/14/21
DRAWN BY DATE
CHECKED BY DATE

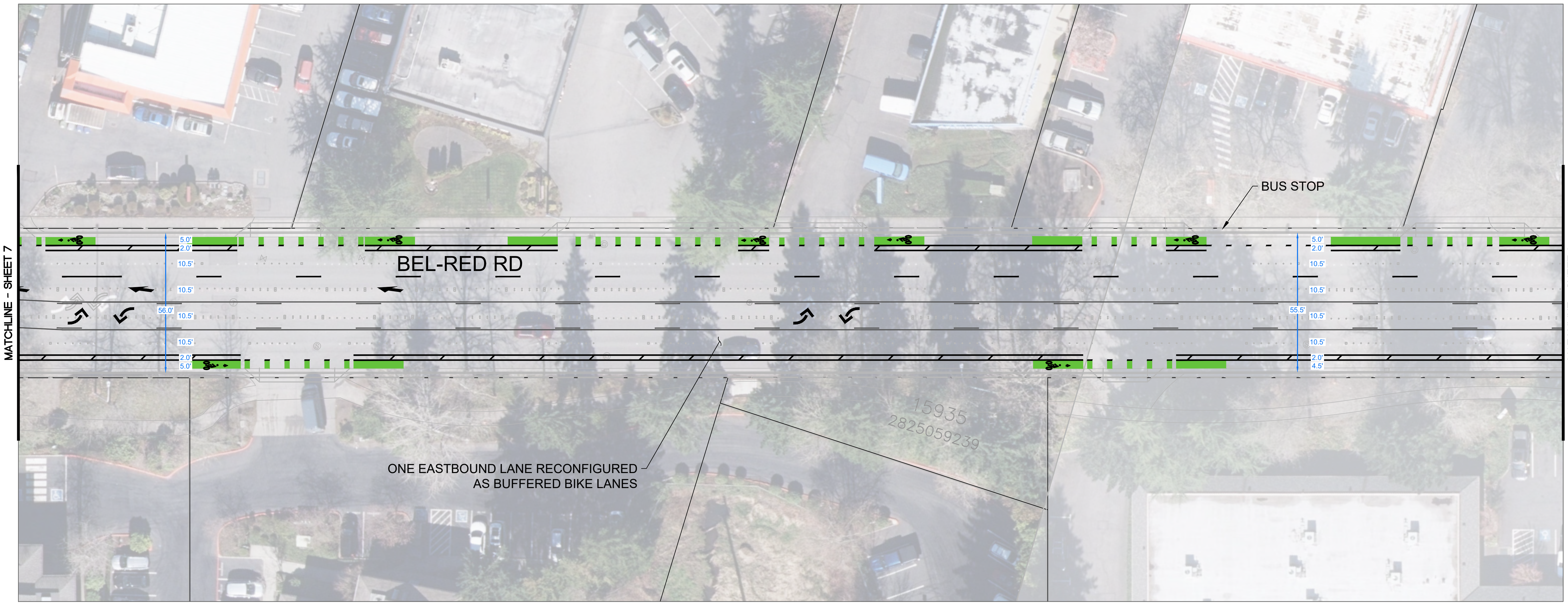
City of Bellevue
Transportation Department

PRELIMINARY DESIGN

BIKE BELLEVUE
NE 12TH STREET / BEL-RED ROAD CORRIDOR

CONCEPTUAL PLAN

SHT 7 OF 10



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NO.	DATE	BY	APPR.	REVISIONS

KP 6/14/21
DESIGNED BY DATE
KP 6/14/21
DRAWN BY DATE
CHECKED BY DATE

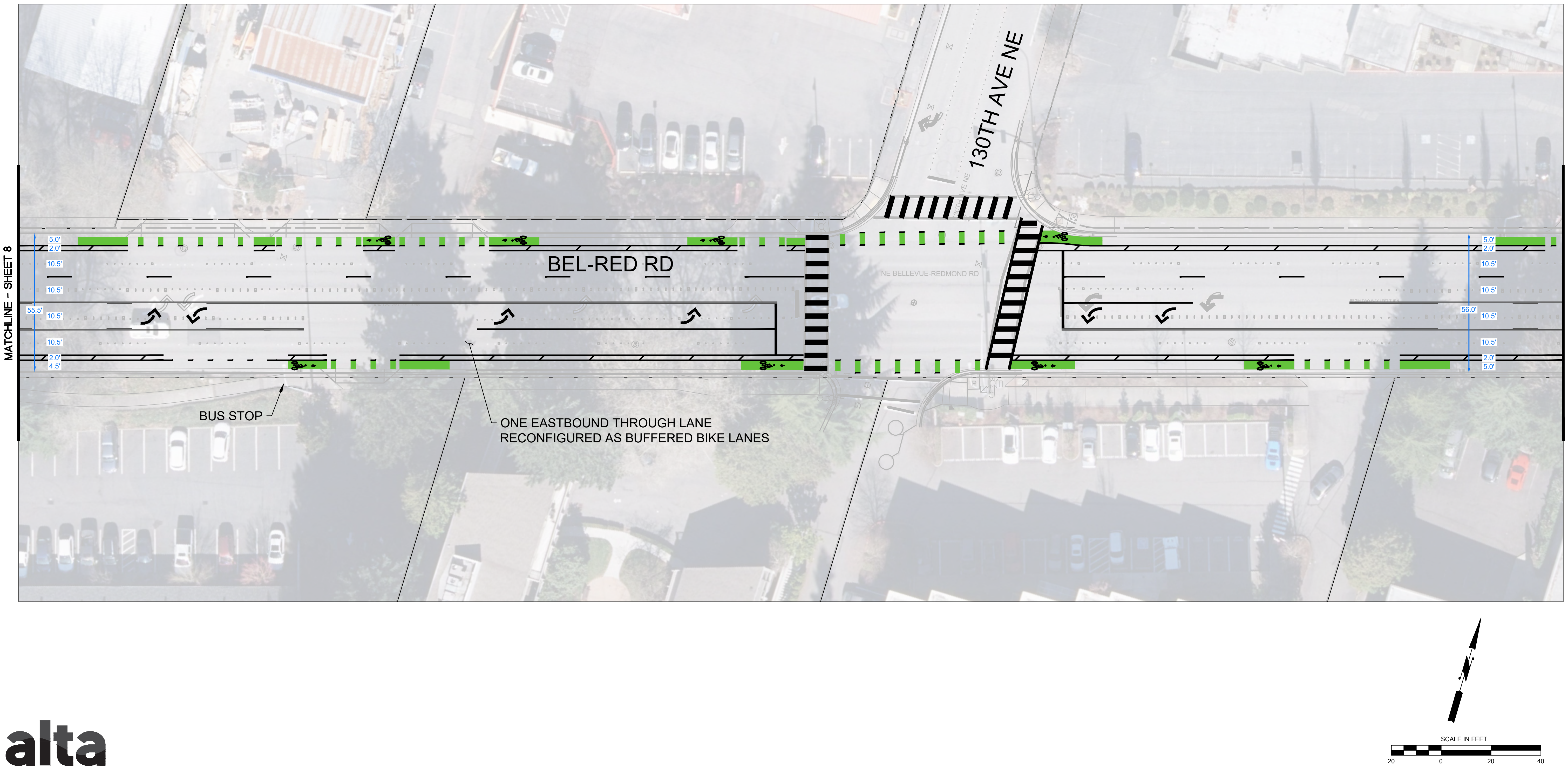
City of Bellevue
Transportation Department

PRELIMINARY DESIGN

BIKE BELLEVUE
NE 12TH STREET / BEL-RED ROAD CORRIDOR

CONCEPTUAL PLAN

SHT 8 OF 10



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DESIGNED BY	DATE
KP	6/14/21
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CHECKED BY	DATE

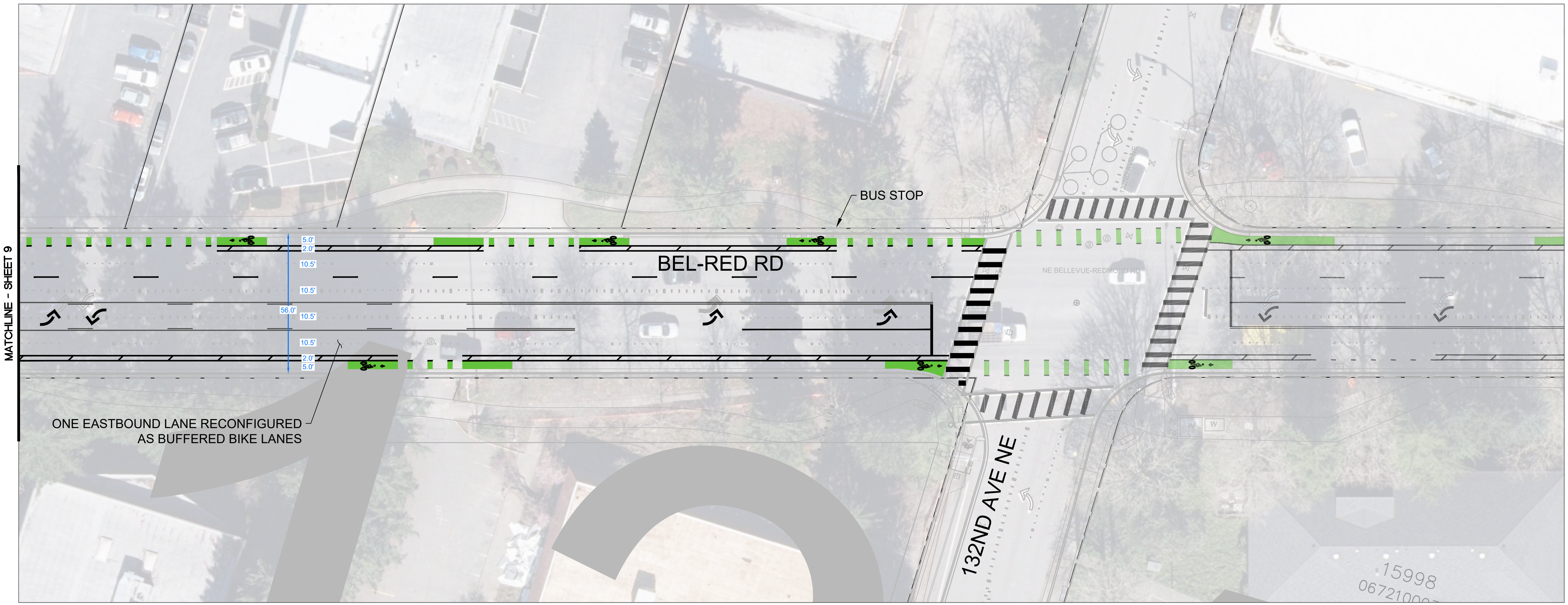
City of Bellevue
Transportation Department

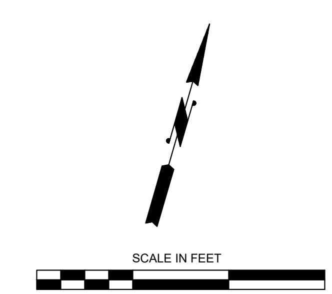
PRELIMINARY DESIGN

BIKE BELLEVUE
NE 12TH STREET / BEL-RED ROAD CORRIDOR

CONCEPTUAL PLAN

SHT 9 OF 10





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NO.	DATE	BY	APPR.	REVISIONS

KP 6/14/21
DESIGNED BY DATE
KP 6/14/21
DRAWN BY DATE
CHECKED BY DATE

City of Bellevue
Transportation Department

PRELIMINARY DESIGN

BIKE BELLEVUE
NE 12TH STREET / BEL-RED ROAD CORRIDOR

CONCEPTUAL PLAN

SHT 10 OF 10

Location: NE 12th St ~350ft E-O 120th Ave NE
Date Range: 4/26/2022 - 5/2/2022
Site Code: 02

	Tuesday			Wednesday			Thursday			Friday			Saturday			Sunday			Monday					
	4/26/2022			4/27/2022			4/28/2022			4/29/2022			4/30/2022			5/1/2022			5/2/2022			Mid-Week Average		
Time	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total
12:00 AM	42	28	70	42	35	77	49	27	76	37	48	85	84	87	171	72	65	137	46	30	76	44	30	74
1:00 AM	24	12	36	29	11	40	28	27	55	24	23	47	58	55	113	41	49	90	21	16	37	27	17	44
2:00 AM	16	10	26	23	19	42	20	20	40	21	17	38	23	27	50	31	39	70	14	11	25	20	16	36
3:00 AM	13	5	18	17	4	21	21	10	31	15	9	24	32	17	49	28	13	41	12	5	17	17	6	23
4:00 AM	31	11	42	25	13	38	24	19	43	25	12	37	34	24	58	13	8	21	22	11	33	27	14	41
5:00 AM	69	42	111	72	42	114	64	33	97	75	47	122	37	27	64	16	10	26	51	33	84	68	39	107
6:00 AM	181	122	303	156	115	271	179	112	291	156	102	258	72	42	114	38	25	63	104	103	207	172	116	288
7:00 AM	437	317	754	450	281	731	447	278	725	391	237	628	102	83	185	56	44	100	261	160	421	445	292	737
8:00 AM	592	511	1,103	562	498	1,060	592	461	1,053	560	460	1,020	232	194	426	137	105	242	443	407	850	582	490	1,072
9:00 AM	596	483	1,079	578	494	1,072	587	488	1,075	543	454	997	363	318	681	225	189	414	499	493	992	587	488	1,075
10:00 AM	533	512	1,045	551	528	1,079	531	486	1,017	543	532	1,075	518	439	957	329	271	600	511	458	969	538	509	1,047
11:00 AM	587	558	1,145	590	579	1,169	638	553	1,191	634	578	1,212	660	520	1,180	503	412	915	594	569	1,163	605	563	1,168
12:00 PM	736	586	1,322	698	676	1,374	728	633	1,361	784	654	1,438	769	662	1,431	560	502	1,062	653	568	1,221	721	632	1,352
1:00 PM	682	530	1,212	694	651	1,345	780	531	1,311	758	627	1,385	826	642	1,468	591	460	1,051	641	566	1,207	719	571	1,289
2:00 PM	697	598	1,295	690	641	1,331	671	600	1,271	801	664	1,465	796	632	1,428	565	465	1,030	654	594	1,248	686	613	1,299
3:00 PM	797	675	1,472	673	702	1,375	705	641	1,346	938	766	1,704	759	578	1,337	556	433	989	703	652	1,355	725	673	1,398
4:00 PM	786	699	1,485	899	766	1,665	817	730	1,547	910	755	1,665	667	574	1,241	537	449	986	763	681	1,444	834	732	1,566
5:00 PM	842	708	1,550	1,014	790	1,804	842	745	1,587	854	775	1,629	604	589	1,193	490	465	955	819	662	1,481	899	748	1,647
6:00 PM	694	569	1,263	714	590	1,304	741	574	1,315	694	570	1,264	580	472	1,052	448	375	823	623	471	1,094	716	578	1,294
7:00 PM	506	436	942	484	411	895	522	426	948	565	473	1,038	420	415	835	392	326	718	450	358	808	504	424	928
8:00 PM	402	301	703	355	312	667	433	308	741	463	339	802	376	294	670	283	221	504	327	258	585	397	307	704
9:00 PM	234	185	419	265	194	459	236	206	442	298	252	550	253	222	475	192	134	326	191	173	364	245	195	440
10:00 PM	134	135	269	125	129	254	134	119	253	194	155	349	170	155	325	90	115	205	87	102	189	131	128	259
11:00 PM	70	69	139	75	58	133	82	64	146	105	98	203	114	86	200	65	53	118	59	55	114	76	64	139
Total	**9,701**	**8,102**	**17,803**	**9,781**	**8,539**	**18,320**	**9,871**	**8,091**	**17,962**	**10,388**	**8,647**	**19,035**	**8,549**	**7,154**	**15,703**	**6,258**	**5,228**	**11,486**	**8,548**	**7,436**	**15,984**	**9,784**	**8,244**	**18,028**
Percent	**54%**	**46%**	-	**53%**	**47%**	-	**55%**	**45%**	-	**55%**	**45%**	-	**54%**	**46%**	-	**54%**	**46%**	-	**53%**	**47%**	-	**54%**	**46%**	-

1. Mid-week average includes data between Tuesday and Thursday.

Mark Skaggs:425-250-0777
mark.skaggs@idaxdata.com

Location: NE 12th St ~750ft W-O 120th Ave NE
Date Range: 4/26/2022 - 5/2/2022
Site Code: 04

idax DATA SOLUTIONS

	Tuesday			Wednesday			Thursday			Friday			Saturday			Sunday			Monday					
	4/26/2022			4/27/2022			4/28/2022			4/29/2022			4/30/2022			5/1/2022			5/2/2022			Mid-Week Average		
Time	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total
12:00 AM	28	31	59	34	34	68	22	40	62	41	31	72	70	71	141	49	47	96	22	32	54	28	35	63
1:00 AM	8	17	25	12	18	30	21	22	43	18	13	31	40	49	89	39	25	64	11	10	21	14	19	33
2:00 AM	8	14	22	10	13	23	15	12	27	15	15	30	23	14	37	26	27	53	6	11	17	11	13	24
3:00 AM	3	9	12	2	10	12	6	18	24	5	12	17	13	21	34	7	18	25	5	7	12	4	12	16
4:00 AM	5	18	23	8	19	27	13	20	33	4	18	22	14	24	38	11	8	19	8	22	30	9	19	28
5:00 AM	28	48	76	29	55	84	17	49	66	28	59	87	15	30	45	11	8	19	21	54	75	25	51	75
6:00 AM	79	143	222	85	126	211	86	151	237	71	122	193	29	56	85	20	23	43	77	126	203	83	140	223
7:00 AM	254	389	643	234	388	622	220	376	596	195	331	526	68	81	149	38	51	89	220	347	567	236	384	620
8:00 AM	481	514	995	465	446	911	408	483	891	410	441	851	170	164	334	100	119	219	447	478	925	451	481	932
9:00 AM	459	463	922	477	484	961	449	470	919	427	438	865	274	274	548	166	168	334	455	430	885	462	472	934
10:00 AM	465	445	910	492	468	960	441	402	843	496	440	936	412	366	778	265	262	527	427	436	863	466	438	904
11:00 AM	543	471	1,014	532	446	978	515	485	1,000	498	457	955	469	492	961	381	376	757	518	460	978	530	467	997
12:00 PM	563	603	1,166	635	575	1,210	584	558	1,142	591	568	1,159	608	549	1,157	457	423	880	542	521	1,063	594	579	1,173
1:00 PM	491	589	1,080	670	571	1,241	500	573	1,073	585	606	1,191	608	625	1,233	420	437	857	547	511	1,058	554	578	1,131
2:00 PM	570	510	1,080	640	574	1,214	586	550	1,136	623	598	1,221	573	597	1,170	419	435	854	549	507	1,056	599	545	1,143
3:00 PM	655	600	1,255	691	495	1,186	629	518	1,147	735	716	1,451	522	574	1,096	383	393	776	624	531	1,155	658	538	1,196
4:00 PM	666	608	1,274	746	674	1,420	699	627	1,326	713	675	1,388	507	477	984	405	399	804	682	575	1,257	704	636	1,340
5:00 PM	677	689	1,366	734	772	1,506	731	651	1,382	744	627	1,371	524	483	1,007	388	371	759	620	606	1,226	714	704	1,418
6:00 PM	523	520	1,043	520	556	1,076	507	553	1,060	464	516	980	447	415	862	365	356	721	445	462	907	517	543	1,060
7:00 PM	399	359	758	376	363	739	407	378	785	403	432	835	393	336	729	299	299	598	317	344	661	394	367	761
8:00 PM	265	322	587	265	259	524	265	311	576	294	339	633	250	273	523	212	211	423	250	249	499	265	297	562
9:00 PM	161	165	326	165	198	363	180	190	370	210	236	446	186	189	375	113	140	253	146	143	289	169	184	353
10:00 PM	105	103	208	108	95	203	101	100	201	126	131	257	132	138	270	102	61	163	82	57	139	105	99	204
11:00 PM	59	53	112	59	59	118	55	68	123	87	74	161	78	83	161	38	45	83	48	51	99	58	60	118
Total	**7,495**	**7,683**	**15,178**	**7,989**	**7,698**	**15,687**	**7,457**	**7,605**	**15,062**	**7,783**	**7,895**	**15,678**	**6,425**	**6,381**	**12,806**	**4,714**	**4,702**	**9,416**	**7,069**	**6,970**	**14,039**	**7,647**	**7,662**	**15,309**
Percent	**49%**	**51%**	-	**51%**	**49%**	-	**50%**	**50%**	-	**50%**	**50%**	-	**50%**	**50%**	-	**50%**	**50%**	-	**50%**	**50%**	-	**50%**	**50%**	-

1. Mid-week average includes data between Tuesday and Thursday.

Mark Skaggs:425-250-0777
mark.skaggs@idaxdata.com

Bike Bellevue - Corridor 3 (NE 12 St/Bel-Red Rd - Spring Blvd to 132 Ave NE)

City of Bellevue Transportation Department

Estimate - 8/28/2023

Planning Level Estimate

Item No.	Sect. No.	Item	Quantity	Unit	Unit Cost	Total Cost
1	1-09	Mobilization	1	LS	$ 180,000.00	$ 180,000.00
2	1-10	Traffic Control Supervisor	1	LS	$ 25,000.00	$ 25,000.00
3	1-10	Pedestrian Traffic Control	1	LS	$ 4,500.00	$ 4,500.00
4	1-10	Sequential Arrow Sign	720	HR	$ 5.50	$ 3,960.00
5	1-10	Flaggers and Other Traffic Control Labor	1440	HR	$ 70.50	$ 101,520.00
6	1-10	Other Temporary Traffic Control	1	LS	$ 20,000.00	$ 20,000.00
7	2-01	Tree Removal	12	EA	$ 750.00	$ 9,000.00
8	2-01	Roadside Cleanup	1	FA	$ 8,500.00	$ 8,500.00
9	2-02	Removing Traffic Island	4800	SF	$ 5.00	$ 24,000.00
10	2-02	Removing Asphalt Concrete Pavement	1000	SY	$ 25.00	$ 25,000.00
11	2-02	Removing PreCast C-Curb	1020	LF	$ 10.00	$ 10,200.00
12	2-03	Roadway Excavation Incl. Haul	100	CY	$ 80.00	$ 8,000.00
13	4-04	Crushed Surfacing Base Course	320	TON	$ 80.00	$ 25,600.00
14	5-04	HMA Cl 1/2" PG 58H-22	1250	TON	$ 220.00	$ 275,000.00
15	5-04	Planing Bituminous Pavement	7600	SY	$ 20.00	$ 152,000.00
16	5-05	Patterned Concrete	535	SY	$ 250.00	$ 133,750.00
17	8-01	Erosion Control and Water Pollution Prevention	1	LS	$ 5,000.00	$ 5,000.00
18	8-01	Turbidity and pH Monitoring	45	EA	$ 110.00	$ 4,950.00
19	8-02	Topsoil Type A	60	CY	$ 80.00	$ 4,800.00
20	8-02	Trees	12	EA	$ 850.00	$ 10,200.00
21	8-02	Property Restoration	1	FA	$ 8,200.00	$ 8,200.00
22	8-04	Cement Conc. Curb	1350	LF	$ 80.00	$ 108,000.00
23	8-07	Dual Faced Mountable Precast Curb	5720	LF	$ 35.00	$ 200,200.00
24	8-09	Raised Pavement Marking Type 1	3600	EA	$ 10.00	$ 36,000.00
25	8-09	Raised Pavement Marking Type 2	1100	EA	$ 15.00	$ 16,500.00
26	8-09	Removing Raised Pavement Marker	1	LS	$ 10,900.00	$ 10,900.00
27	8-10	Flexible Guide Posts	352	EA	$ 150.00	$ 52,800.00
28	8-20	Traffic Signal System Modfications Complete - NE 12th St & Spring Blvd	1	LS	$ 30,000.00	$ 30,000.00
29	8-20	Traffic Signal System Modfications Complete - NE 12th St & 120th Ave NE	1	LS	$ 60,000.00	$ 60,000.00
30	8-20	Traffic Signal System Modfications Complete - Bel-Red Rd & 124th Ave NE	1	LS	$ 60,000.00	$ 60,000.00
31	8-20	Traffic Signal System Modfications Complete - Bel-Red Rd & 130th Ave NE	1	LS	$ 100,000.00	$ 100,000.00
32	8-20	Induction Loops	47	EA	$ 1,500.00	$ 70,500.00
33	8-20	Video Detection (TrafiSense Camera)	8	EA	$ 6,000.00	$ 48,000.00
34	8-22	Paint Line, 6 Inch	16212	LF	$ 2.00	$ 32,424.00
35	8-22	Plastic Line, 6 Inch	811	LF	$ 7.50	$ 6,082.50
36	8-22	Plastic Stop Line	205	LF	$ 15.00	$ 3,075.00
37	8-22	Plastic Crosswalk Line	1400	SF	$ 20.00	$ 28,000.00
38	8-22	Plastic Traffic Arrow	33	EA	$ 350.00	$ 11,550.00
39	8-22	Plastic Bicycle Lane Symbol	49	EA	$ 385.00	$ 18,865.00
40	8-22	Plastic Induction Loop Symbol	47	EA	$ 350.00	$ 16,450.00
41	8-22	Green Bicycle Lane Treatment	10289	SF	$ 25.00	$ 257,225.00
42	8-22	Plastic Bicycle Box	57	SF	$ 30.00	$ 1,710.00
43	8-22	Removing Pavement Marking	1	LS	$ 16,300.00	$ 16,300.00
44	8-23	Temporary Pavement Marking	1	LS	$ 8,200.00	$ 8,200.00
					SubTotal	**$ 2,231,961.50**
					+ 10% Prelim. Design Contingency	**$ 223,196.15**
					+Police Officers	**$ 35,000.00**
					+10% Construction Management	**$ 223,196.15**
					+ 10% Contingency	**$ 223,196.15**
					Construction Total	**$ 2,936,549.95**
					Design & Permitting Total (15% of Construction)	**$ 440,482.49**

Project Total (Design + Construction) $ 3,377,032.44

Preliminary cost estimates to be finalized and determined by City, this range is an approximation completed in 2023.

Corridor 4

CITY OF BELLEVUE
TRANSPORTATION DEPARTMENT

BIKE BELLEVUE
BEL-RED ROAD CORRIDOR

CITY MANAGER
BRAD MIYAKE

MAYOR
LYNNE ROBINSON

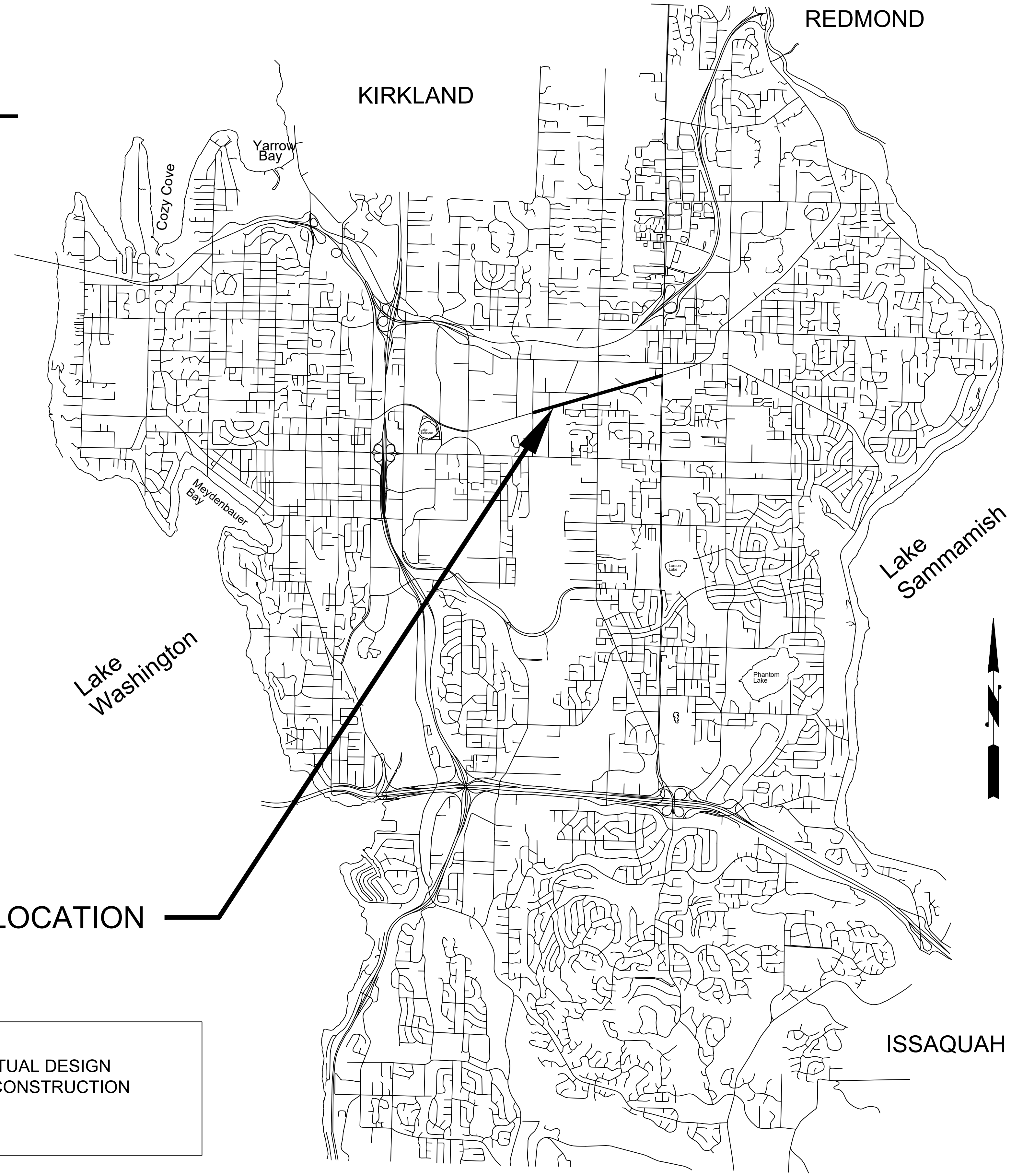
DIRECTOR OF TRANSPORTATION
ANDREW SINGELAKIS

DEPUTY MAYOR
JARED NIEUWENHUIS

CITY COUNCIL
JEREMY BARKSDALE
CONRAD LEE
JENNIFER ROBERTSON
JOHN STOKES
JANICE ZAHN

SCHEDULE OF DRAWINGS

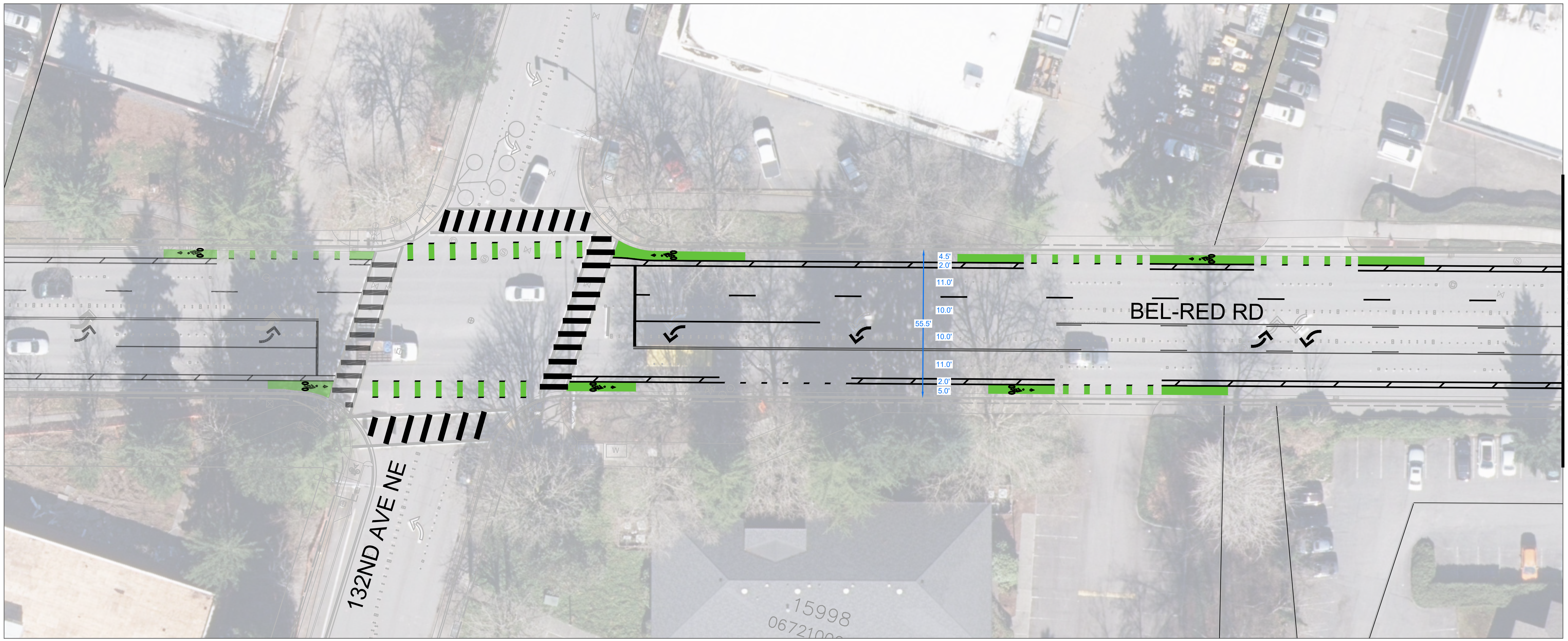
SHEET	DRAWINGS
1	COVER SHEET
2-11	ROADWAY PLANS



PROJECT LOCATION

CONCEPTUAL DESIGN
NOT FOR CONSTRUCTION

C.I.P. NUMBER xxxxxx



SCALE IN FEET

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alta

NO.	DATE	BY	APPR.	REVISIONS

KP 12/19/22
DESIGNED BY DATE
KP 12/19/22
DRAWN BY DATE
CHECKED BY DATE

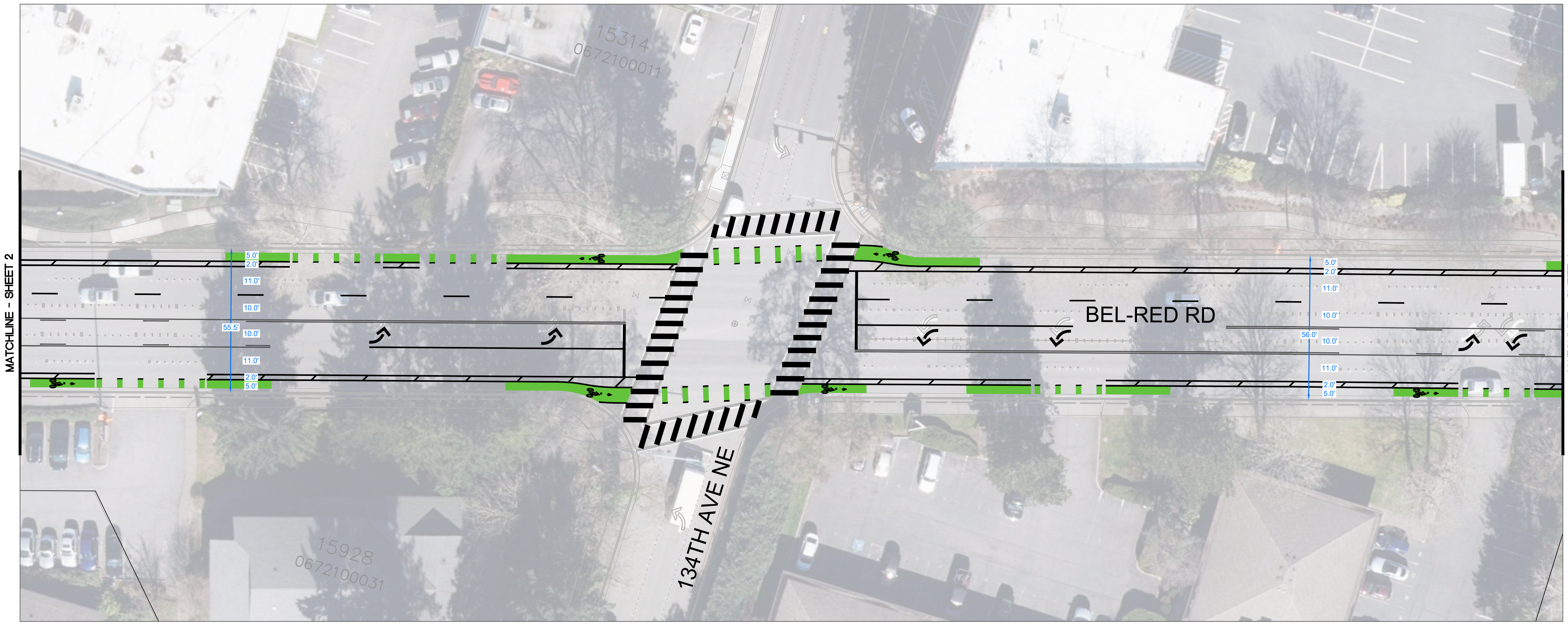
City of Bellevue
Transportation Department

PRELIMINARY DESIGN

BIKE BELLEVUE
BEL-RED ROAD CORRIDOR

CONCEPTUAL PLAN

SHT 2 OF 11



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KP 12/19/22
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CHECKED BY DATE

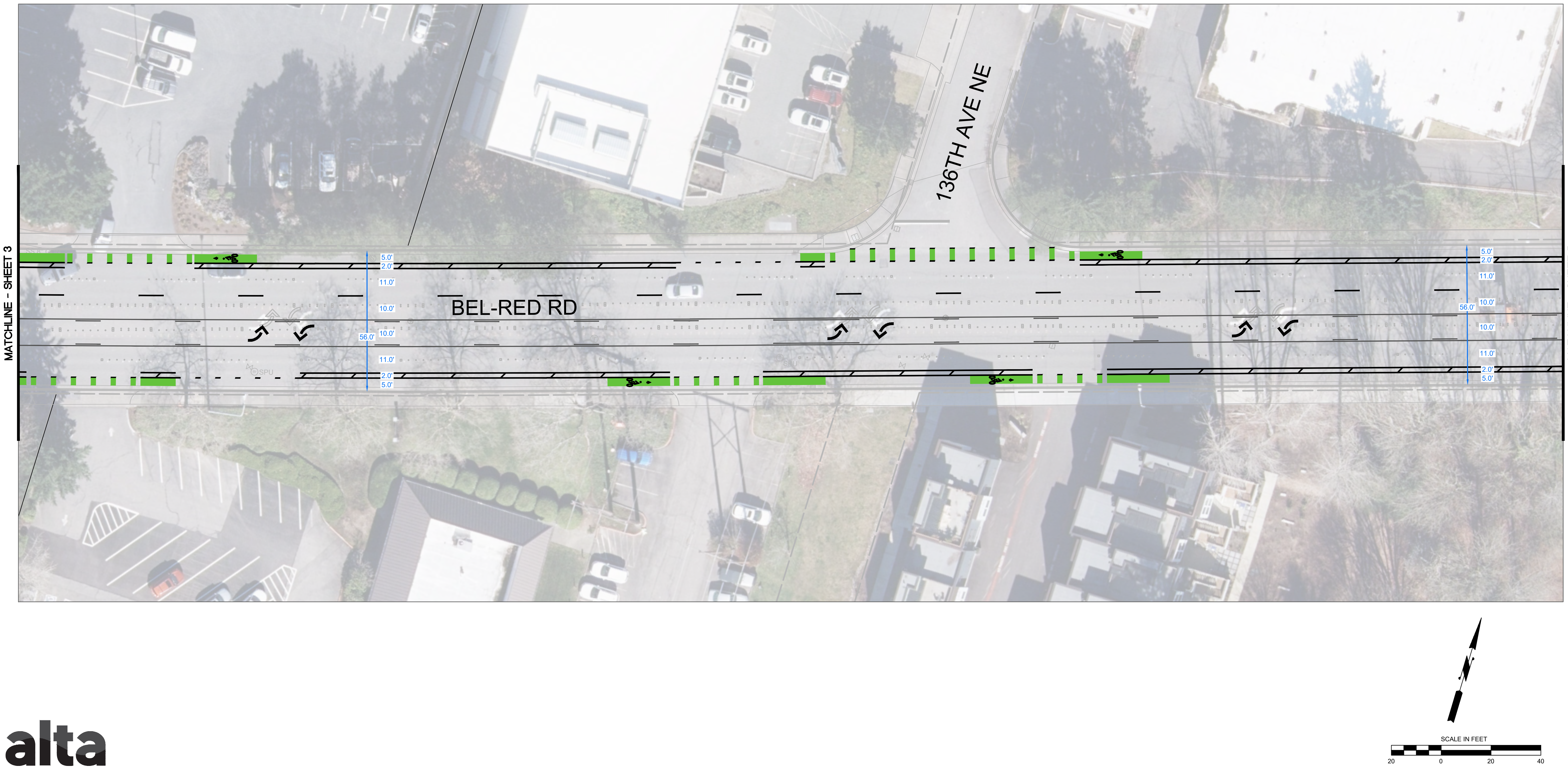
City of Bellevue
Transportation Department

PRELIMINARY DESIGN

BIKE BELLEVUE
BEL-RED ROAD CORRIDOR

CONCEPTUAL PLAN

SHT 3 OF 11



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NO.	DATE	BY	APPR.	REVISIONS

KP 12/19/22
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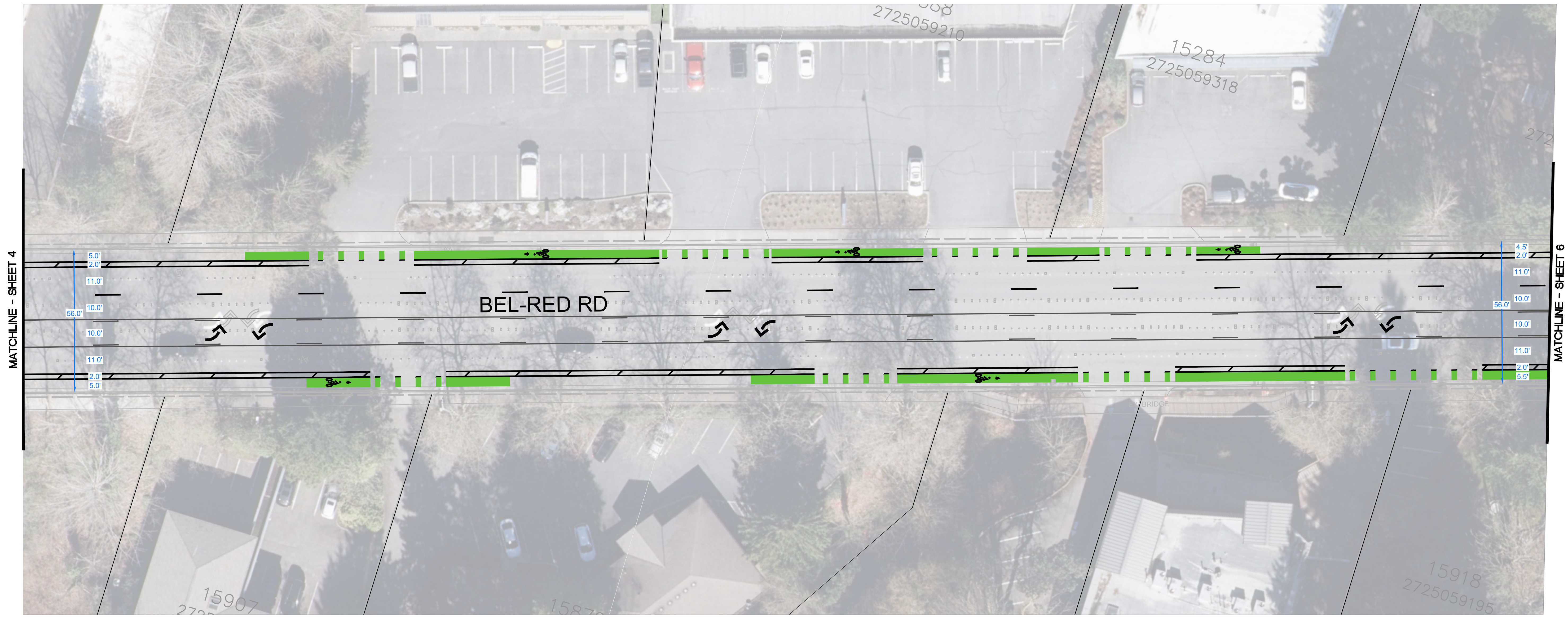
City of Bellevue
Transportation Department

PRELIMINARY DESIGN

BIKE BELLEVUE
BEL-RED ROAD CORRIDOR

CONCEPTUAL PLAN

SHT 4 OF 11



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NO.	DATE	BY	APPR.	REVISIONS

KP 12/19/22
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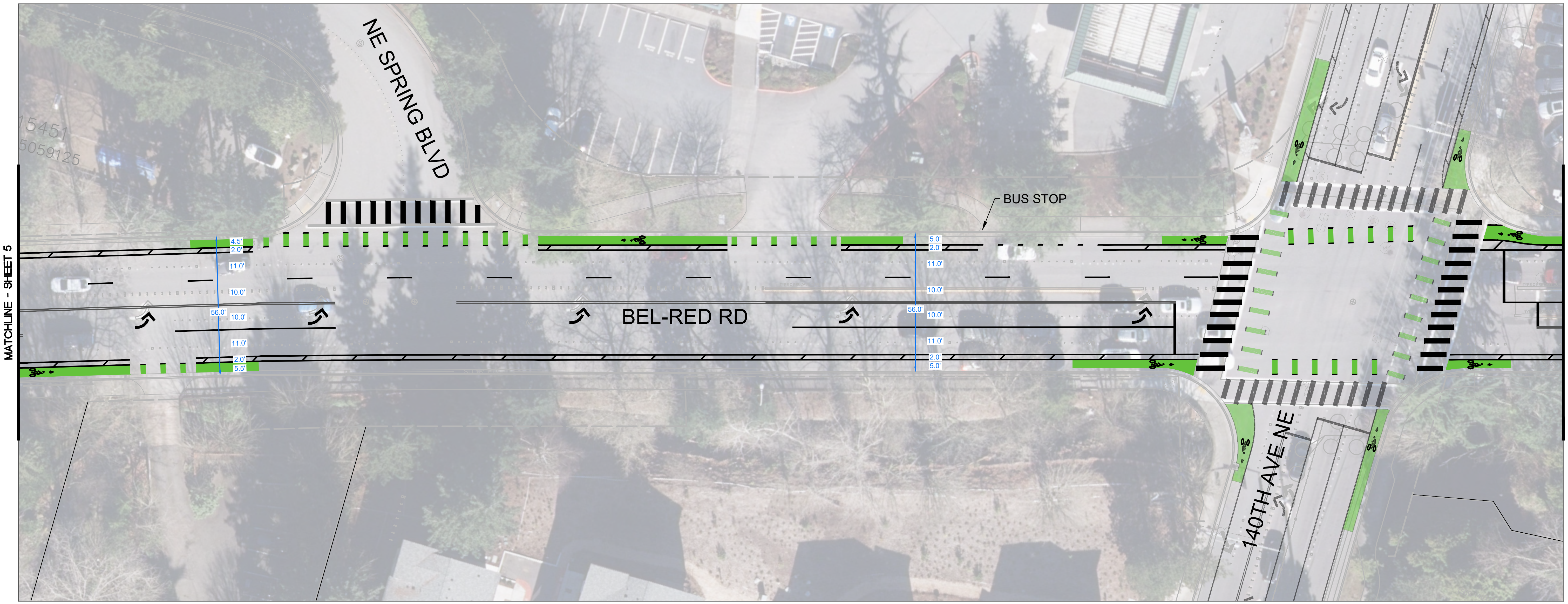
City of Bellevue
Transportation Department

PRELIMINARY DESIGN

BIKE BELLEVUE
BEL-RED ROAD CORRIDOR

CONCEPTUAL PLAN

SHT 5 OF 11



SCALE IN FEET
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NO.	DATE	BY	APPR.	REVISIONS

KP 12/19/22
DESIGNED BY DATE
KP 12/19/22
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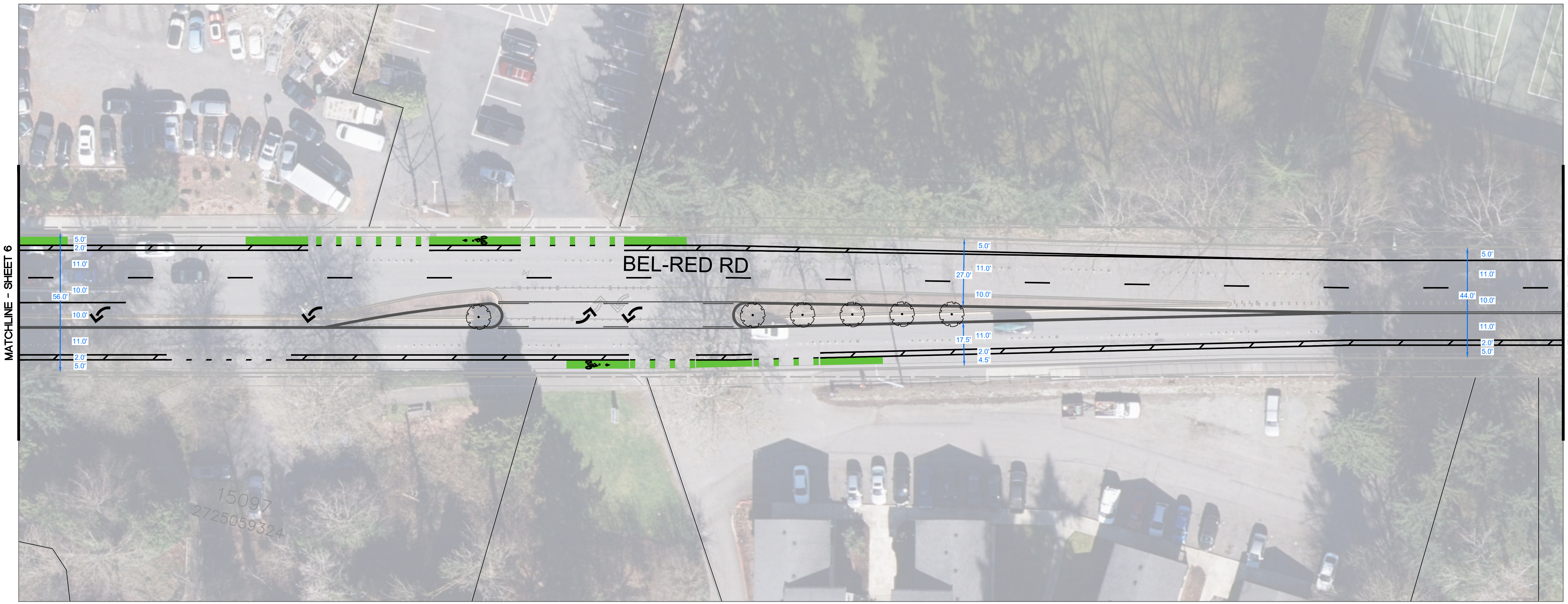
City of Bellevue
Transportation Department

PRELIMINARY DESIGN

BIKE BELLEVUE
BEL-RED ROAD CORRIDOR

CONCEPTUAL PLAN

SHT 6 OF 11



SCALE IN FEET

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NO.	DATE	BY	APPR.	REVISIONS

KP	12/19/22
DESIGNED BY	DATE
KP	12/19/22
DRAWN BY	DATE
-	-
CHECKED BY	DATE

City of Bellevue

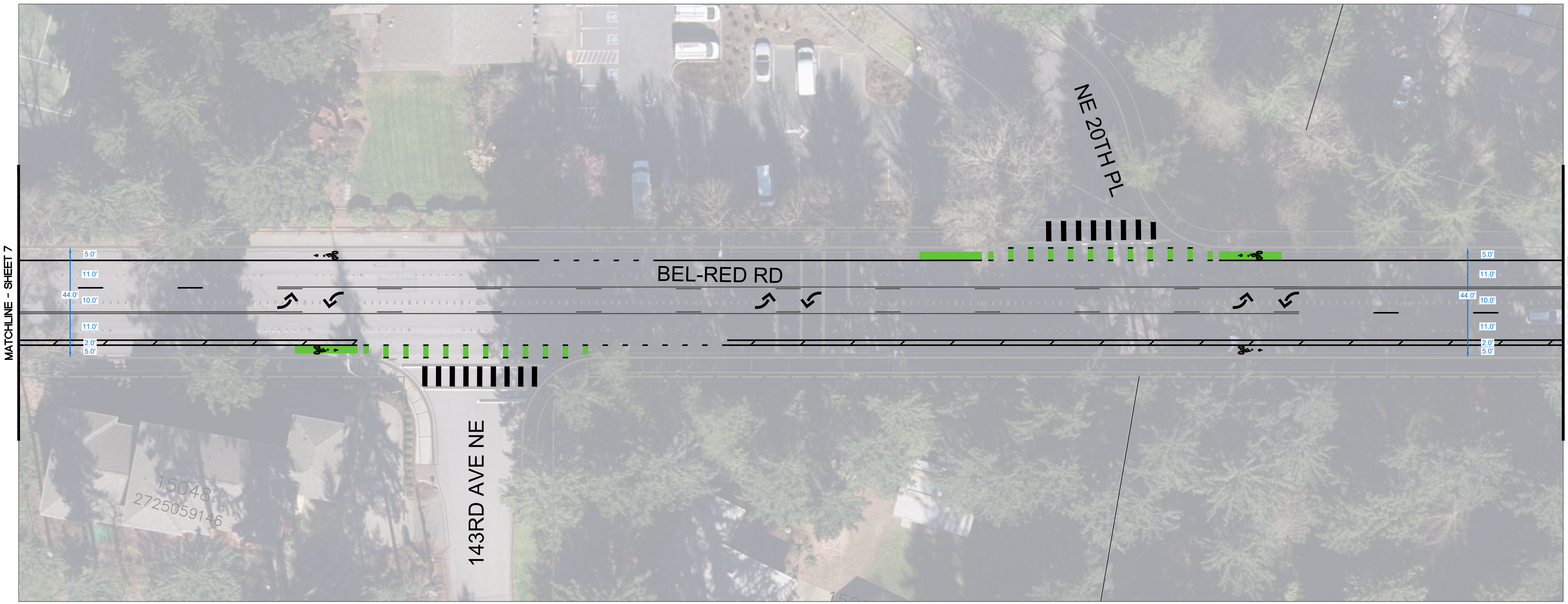
Transportation Department

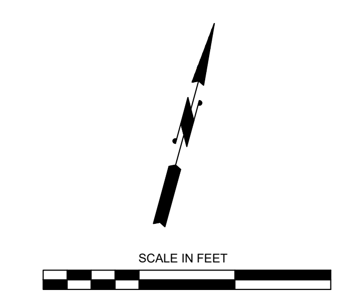
PRELIMINARY DESIGN

BIKE BELLEVUE
BEL-RED ROAD CORRIDOR

CONCEPTUAL PLAN

SHT 7 OF 11





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NO.	DATE	BY	APPR.	REVISIONS

KP 12/19/22
DESIGNED BY DATE
KP 12/19/22
DRAWN BY DATE
CHECKED BY DATE

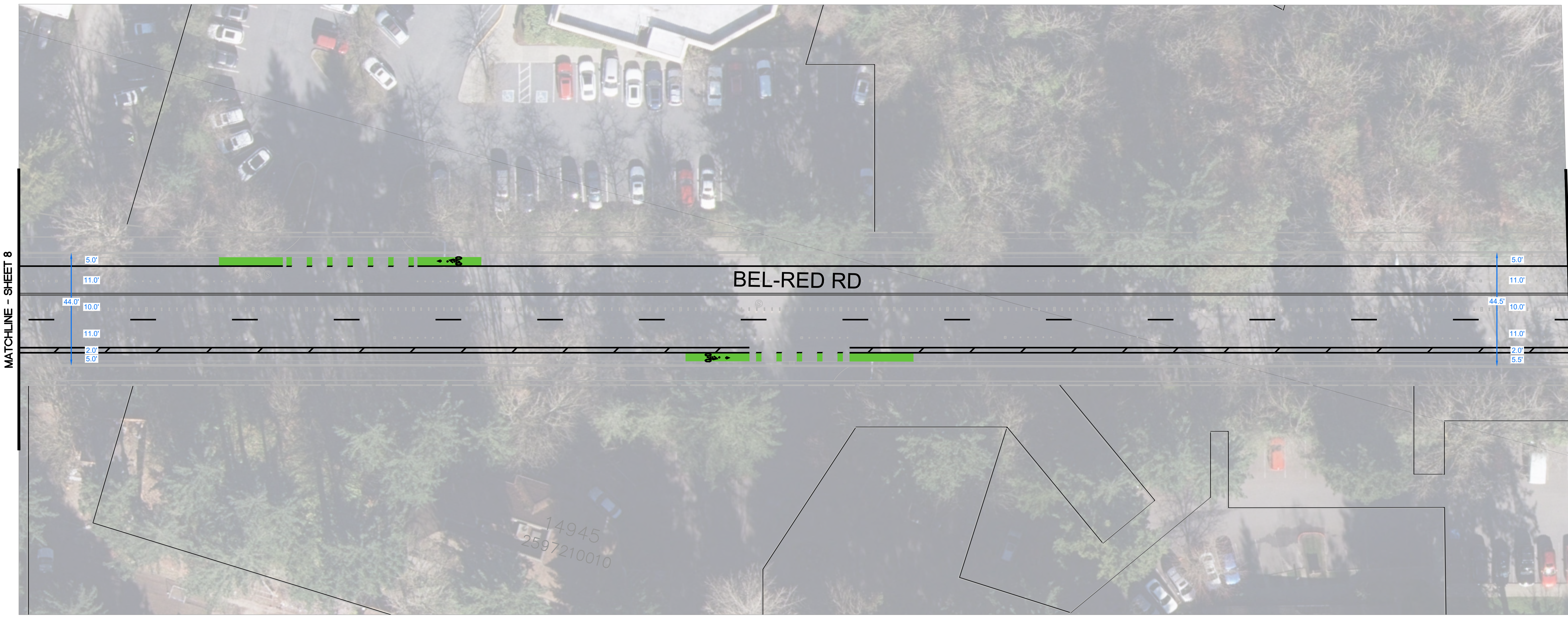
City of Bellevue
Transportation Department

PRELIMINARY DESIGN

BIKE BELLEVUE
BEL-RED ROAD CORRIDOR

CONCEPTUAL PLAN

SHT 8 OF 11



SCALE IN FEET

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NO.	DATE	BY	APPR.	REVISIONS

KP	12/19/22
DESIGNED BY	DATE
KP	12/19/22
DRAWN BY	DATE
-	-
CHECKED BY	DATE

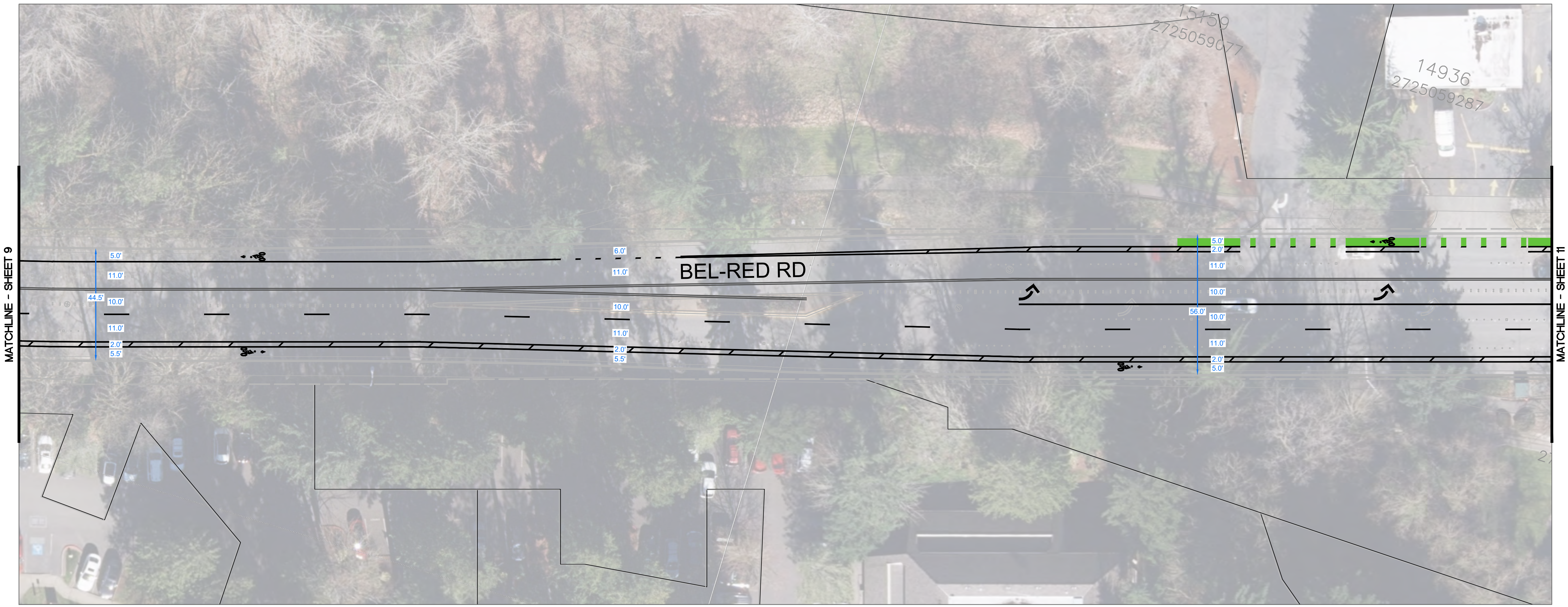
City of Bellevue
Transportation Department

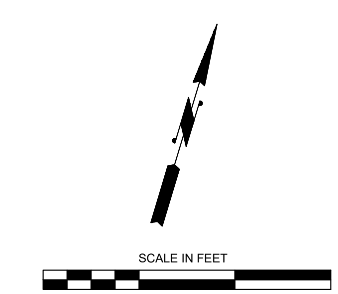
PRELIMINARY DESIGN

BIKE BELLEVUE
BEL-RED ROAD CORRIDOR

CONCEPTUAL PLAN

SHT 9 OF 11





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NO.	DATE	BY	APPR.	REVISIONS

KP 12/19/22
DESIGNED BY DATE
KP 12/19/22
DRAWN BY DATE
- -
CHECKED BY DATE

City of Bellevue
Transportation Department

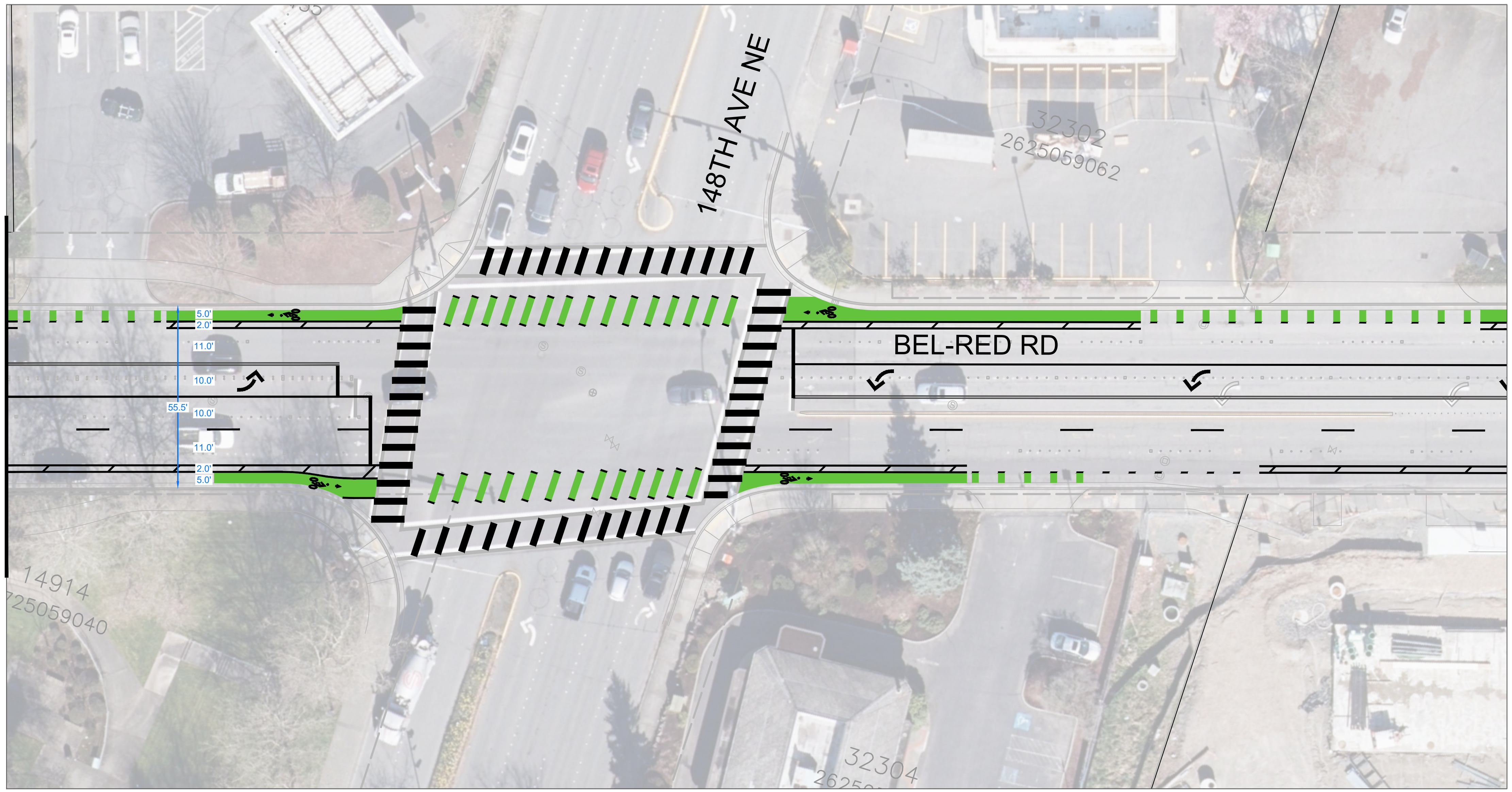
PRELIMINARY DESIGN

BIKE BELLEVUE
BEL-RED ROAD CORRIDOR

CONCEPTUAL PLAN

SHT 10 OF 11

MATCHLINE - SHEET 10



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NO.	DATE	BY	APPR.	REVISIONS

KP	12/19/22
DESIGNED BY	DATE
KP	12/19/22
DRAWN BY	DATE
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City of Bellevue
Transportation Department

PRELIMINARY DESIGN

BIKE BELLEVUE
BEL-RED ROAD CORRIDOR

CONCEPTUAL PLAN

SHT 11 OF 11

Bike Bellevue - Corridor 4 (Bel-Red Rd - 132 Ave NE to 148 Ave NE)

City of Bellevue Transportation Department

Estimate - 08/28/2023

Planning Level Estimate

Item No.	Sect. No.	Item	Quantity	Unit	Unit Cost	Total Cost
1	1-09	Mobilization	1	LS	$ 150,000.00	$ 150,000.00
2	1-10	Traffic Control Supervisor	1	LS	$ 30,000.00	$ 30,000.00
3	1-10	Pedestrian Traffic Control	1	LS	$ 4,500.00	$ 4,500.00
4	1-10	Sequential Arrow Sign	880	HR	$ 5.50	$ 4,840.00
5	1-10	Flaggers and Other Traffic Control Labor	1760	HR	$ 70.50	$ 124,080.00
6	1-10	Other Temporary Traffic Control	1	LS	$ 23,400.00	$ 23,400.00
7	2-01	Tree Removal	9	EA	$ 750.00	$ 6,750.00
8	2-01	Roadside Cleanup	1	FA	$ 8,200.00	$ 8,200.00
9	2-02	Removing Traffic Island	2768	SF	$ 5.00	$ 13,840.00
10	2-02	Removing Asphalt Concrete Pavement	330	SY	$ 25.00	$ 8,250.00
11	2-02	Removing PreCast C-Curb	285	LF	$ 10.00	$ 2,850.00
12	2-03	Roadway Excavation Incl. Haul	50	CY	$ 80.00	$ 4,000.00
13	4-04	Crushed Surfacing Base Course	85	TON	$ 80.00	$ 6,800.00
14	5-04	HMA Cl 1/2" PG 58H-22	1000	TON	$ 220.00	$ 220,000.00
15	5-04	Planing Bituminous Pavement	5600	SY	$ 20.00	$ 112,000.00
16	5-05	Patterned Concrete	185	SY	$ 250.00	$ 46,250.00
17	8-01	Erosion Control and Water Pollution Prevention	1	LS	$ 3,500.00	$ 3,500.00
18	8-01	Turbidity and pH Monitoring	55	EA	$ 110.00	$ 6,050.00
19	8-02	Topsoil Type A	25	CY	$ 80.00	$ 2,000.00
20	8-02	Trees	5	EA	$ 850.00	$ 4,250.00
21	8-02	Property Restoration	1	FA	$ 8,200.00	$ 8,200.00
22	8-04	Cement Conc. Curb	650	LF	$ 80.00	$ 52,000.00
23	8-07	Dual Faced Mountable Precast Curb	5300	LF	$ 30.00	$ 159,000.00
24	8-09	Raised Pavement Marking Type 1	4300	EA	$ 10.00	$ 43,000.00
25	8-09	Raised Pavement Marking Type 2	1200	EA	$ 15.00	$ 18,000.00
26	8-09	Removing Raised Pavement Marker	1	LS	$ 10,900.00	$ 10,900.00
27	8-10	Flexible Guide Posts	360	EA	$ 150.00	$ 54,000.00
28	8-20	Traffic Signal System Modfications Complete - Bel-Red Rd & 132 Ave NE	1	LS	$ 60,000.00	$ 60,000.00
29	8-20	Traffic Signal System Modfications Complete - Bel-Red Rd & 134 Ave NE	1	LS	$ 20,000.00	$ 20,000.00
30	8-20	Traffic Signal System Modfications Complete - Bel-Red Rd & 140 Ave NE	1	LS	$ 75,000.00	$ 75,000.00
31	8-20	Traffic Signal System Modfications Complete - Bel-Red Rd & 148 Ave NE	1	LS	$ 25,000.00	$ 25,000.00
32	8-20	Induction Loops	44	EA	$ 1,500.00	$ 66,000.00
33	8-20	Video Detection (TrafiSense Camera)	8	EA	$ 6,000.00	$ 48,000.00
34	8-22	Paint Line, 6 Inch	16010	LF	$ 2.00	$ 32,020.00
35	8-22	Plastic Line, 6 Inch	725	LF	$ 7.50	$ 5,437.50
36	8-22	Plastic Crosswalk Line	3180	SF	$ 20.00	$ 63,600.00
37	8-22	Plastic Stop Line	135	LF	$ 15.00	$ 2,025.00
38	8-22	Plastic Traffic Arrow	48	EA	$ 350.00	$ 16,800.00
39	8-22	Plastic Bicycle Lane Symbol	44	EA	$ 385.00	$ 16,940.00
40	8-22	Plastic Induction Loop Symbol	38	EA	$ 350.00	$ 13,300.00
41	8-22	Green Bicycle Lane Treatment	9964	SF	$ 25.00	$ 249,100.00
42	8-22	Removing Pavement Marking	1	LS	$ 16,300.00	$ 16,300.00
43	8-23	Temporary Pavement Marking	1	LS	$ 8,200.00	$ 8,200.00
					SubTotal	**$ 1,844,382.50**
					+ 10% Prelim. Design Contingency	**$ 184,438.25**
					+Police Officers	**$ 50,000.00**
					+10% Construction Management	**$ 184,438.25**
					+ 10% Contingency	**$ 184,438.25**
					Construction Total	**$ 2,447,697.25**
					Design & Permitting Total (15% of Construction)	**$ 367,154.59**
					Project Total (Design + Construction)	**$ 2,814,851.84**

Preliminary cost estimates to be finalized and determined by City, this range is an approximation completed in 2023.

Corridor 5

CITY OF BELLEVUE
TRANSPORTATION DEPARTMENT

BIKE BELLEVUE
BEL-RED ROAD CORRIDOR
(148TH TO 156TH AVE NE)

CITY MANAGER
BRAD MIYAKE

MAYOR
LYNNE ROBINSON

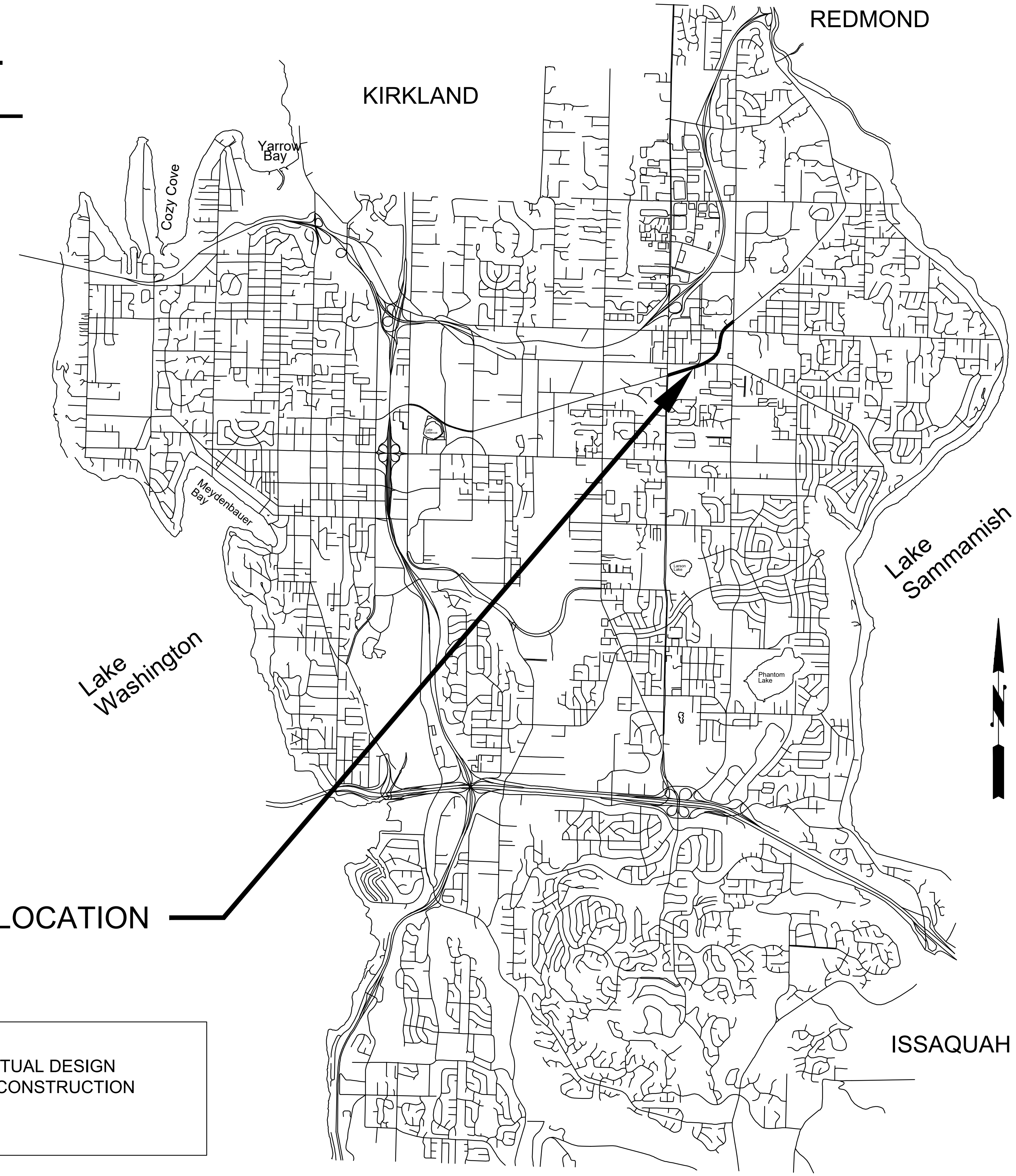
DIRECTOR OF TRANSPORTATION
ANDREW SINGELAKIS

DEPUTY MAYOR
JARED NIEUWENHUIS

CITY COUNCIL
JEREMY BARKSDALE
CONRAD LEE
JENNIFER ROBERTSON
JOHN STOKES
JANICE ZAHN

SCHEDULE OF DRAWINGS

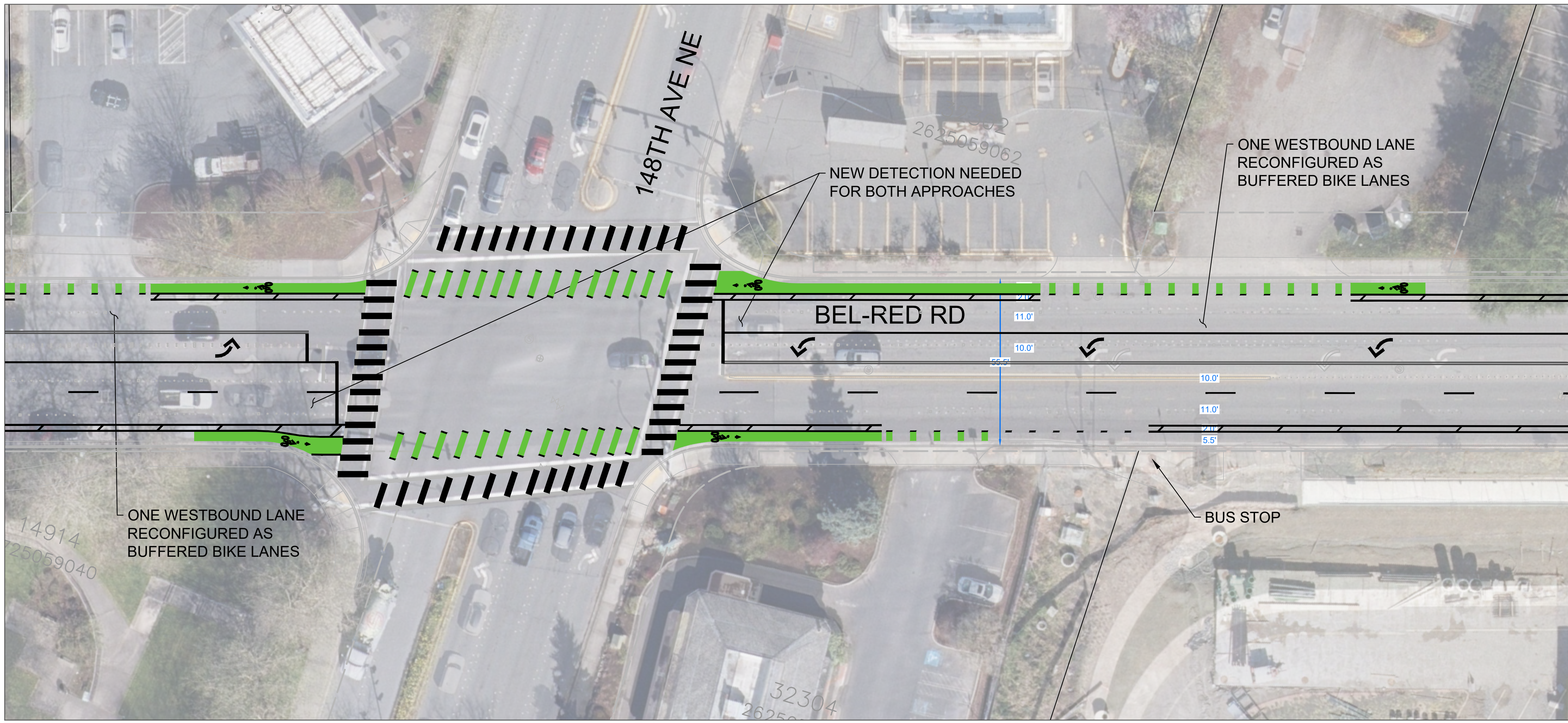
SHEET	DRAWINGS
1	COVER SHEET
2-9	ROADWAY PLANS



CONCEPTUAL DESIGN
NOT FOR CONSTRUCTION

C.I.P. NUMBER xxxxxx

Design to be coordinated with Redmond 152nd Ave Bikeway improvements



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SCALE IN FEET

20 0 20 40

NO.	DATE	BY	APPR.	REVISIONS

KP	12/19/22
DESIGNED BY	DATE
KP	12/19/22
DRAWN BY	DATE
-	-
CHECKED BY	DATE

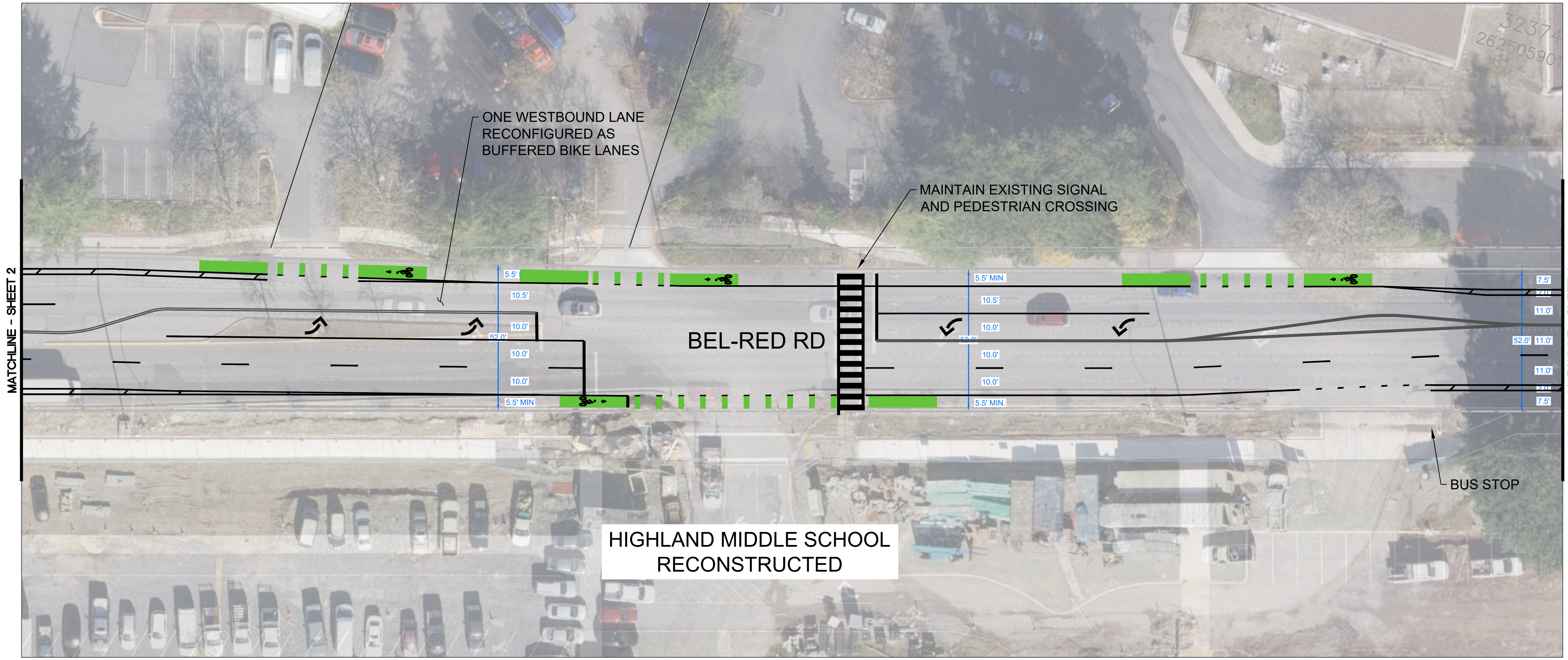
City of Bellevue
Transportation Department

PRELIMINARY DESIGN

BIKE BELLEVUE
BEL-RED ROAD CORRIDOR

CONCEPTUAL PLAN

SHT 2 OF 9



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NO.	DATE	BY	APPR.	REVISIONS

KP 12/19/22
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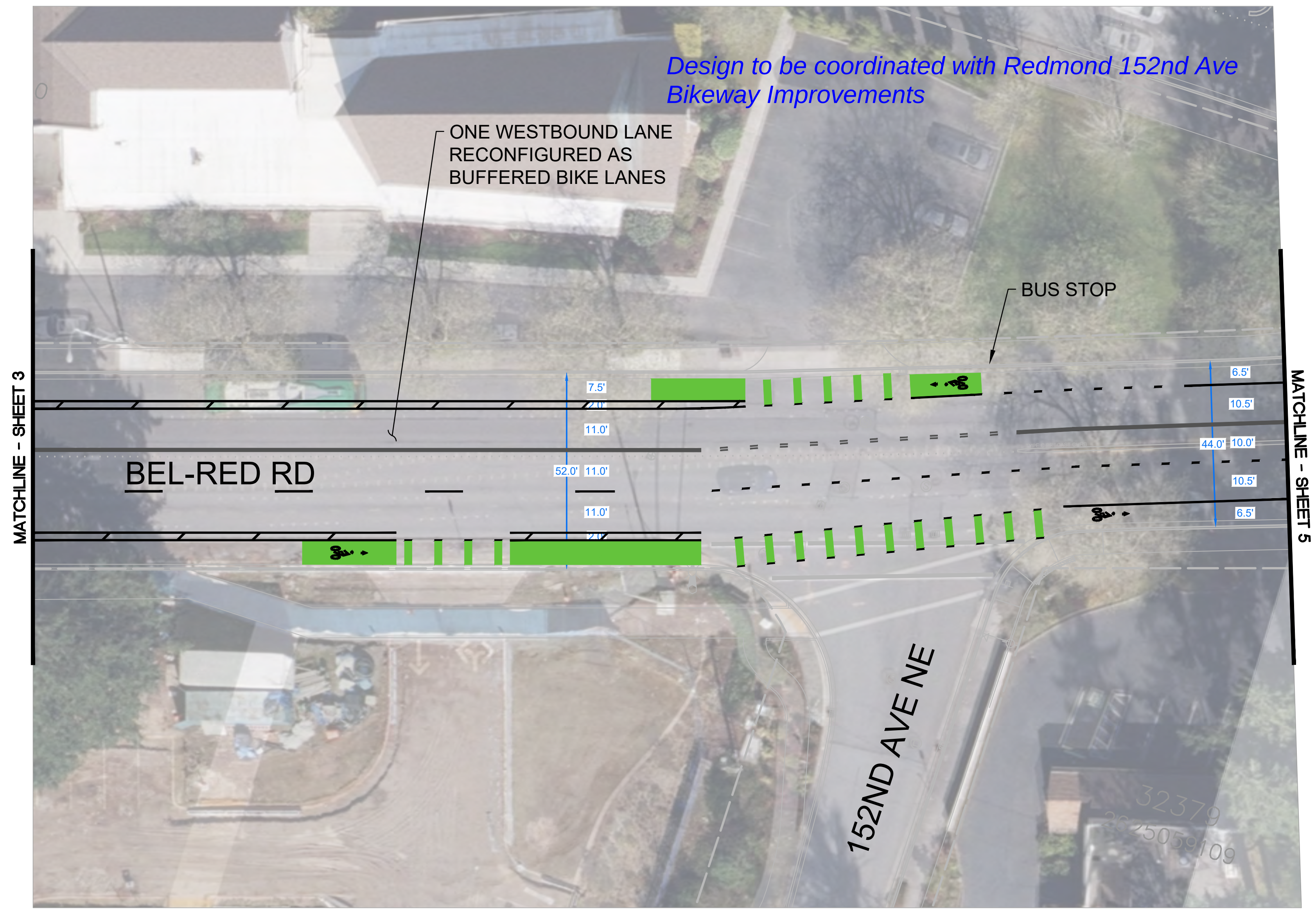
City of Bellevue
Transportation Department

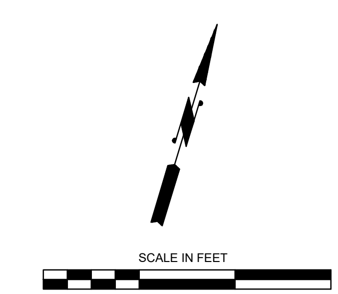
PRELIMINARY DESIGN

BIKE BELLEVUE
BEL-RED ROAD CORRIDOR

CONCEPTUAL PLAN

SHT 3 OF 9





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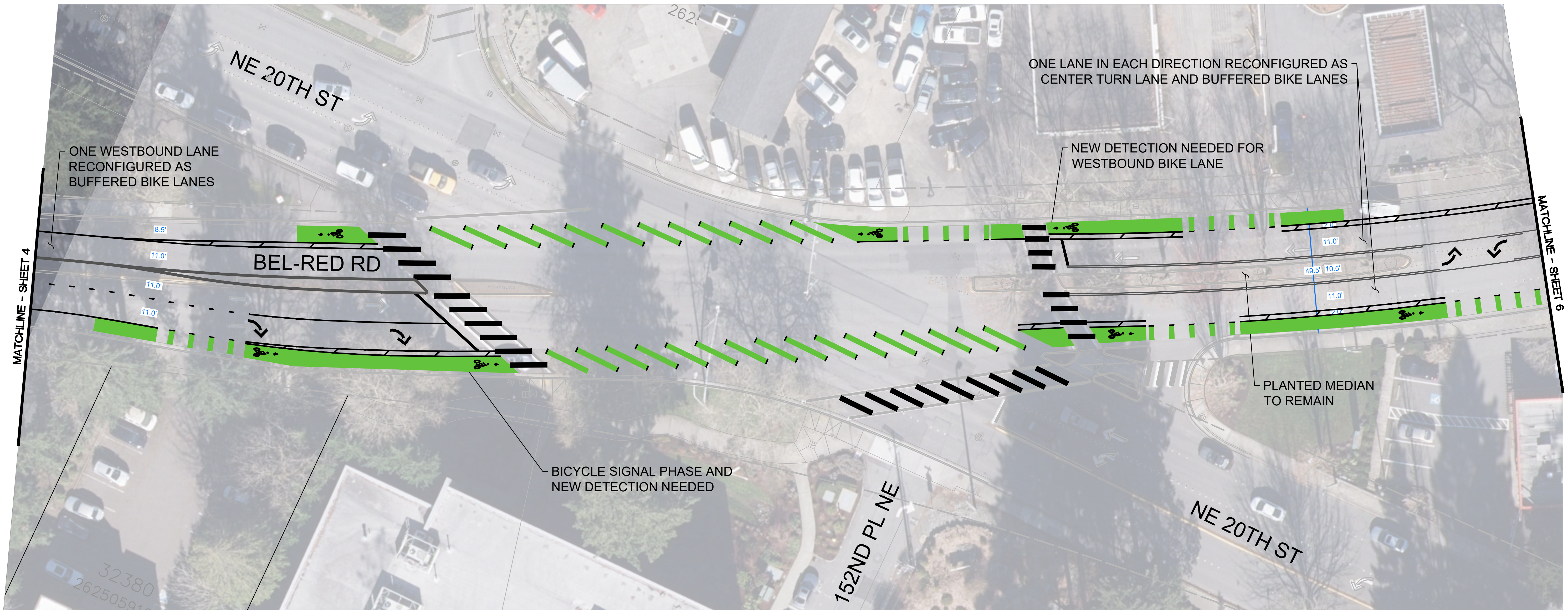
City of Bellevue
Transportation Department

PRELIMINARY DESIGN

BIKE BELLEVUE
BEL-RED ROAD CORRIDOR

CONCEPTUAL PLAN

SHT 4 OF 9



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NO.	DATE	BY	APPR.	REVISIONS

KP	12/19/22
DESIGNED BY	DATE
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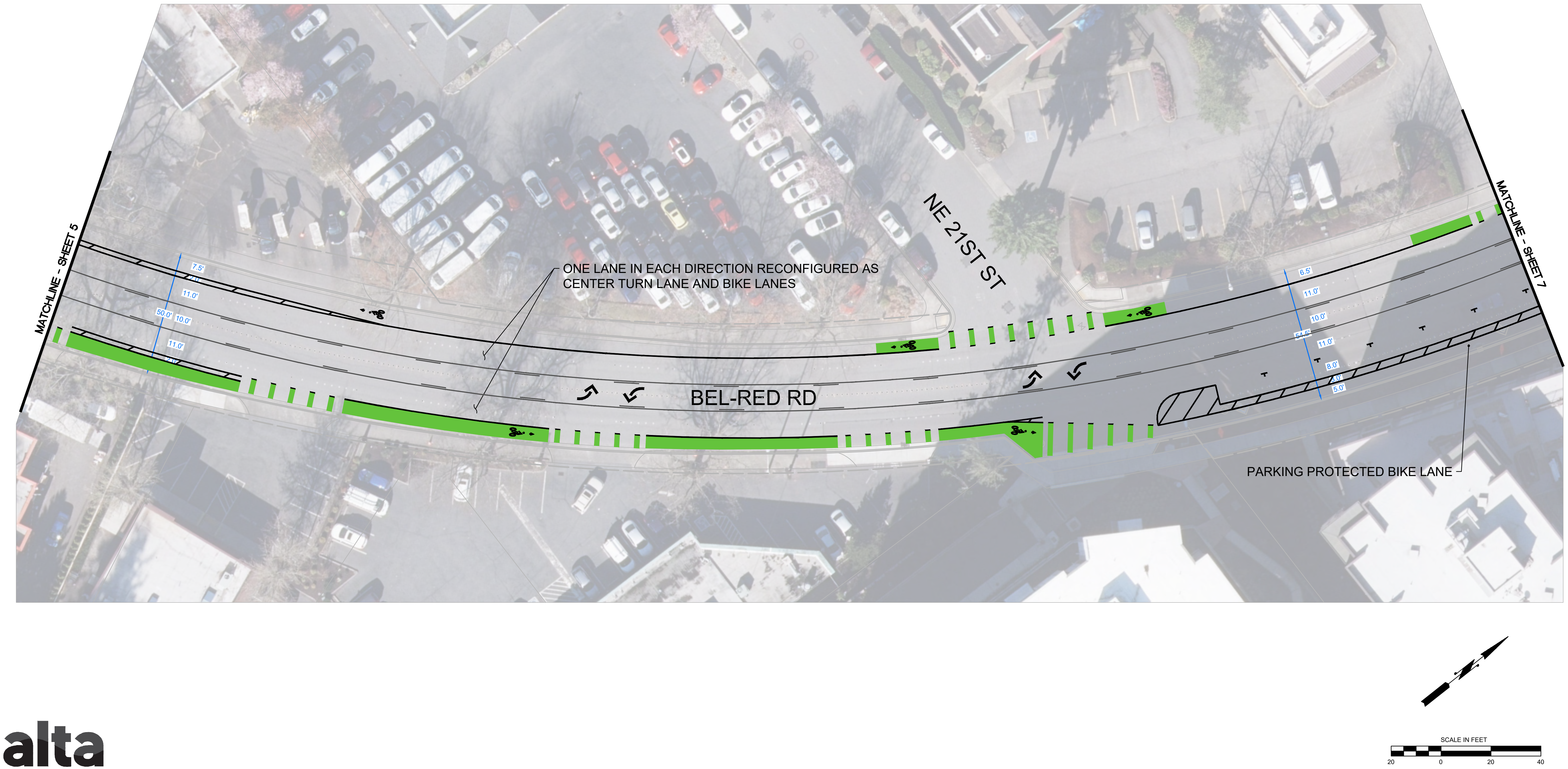
City of Bellevue
Transportation Department

PRELIMINARY DESIGN

BIKE BELLEVUE
BEL-RED ROAD CORRIDOR

CONCEPTUAL PLAN

SHT 5 OF 9



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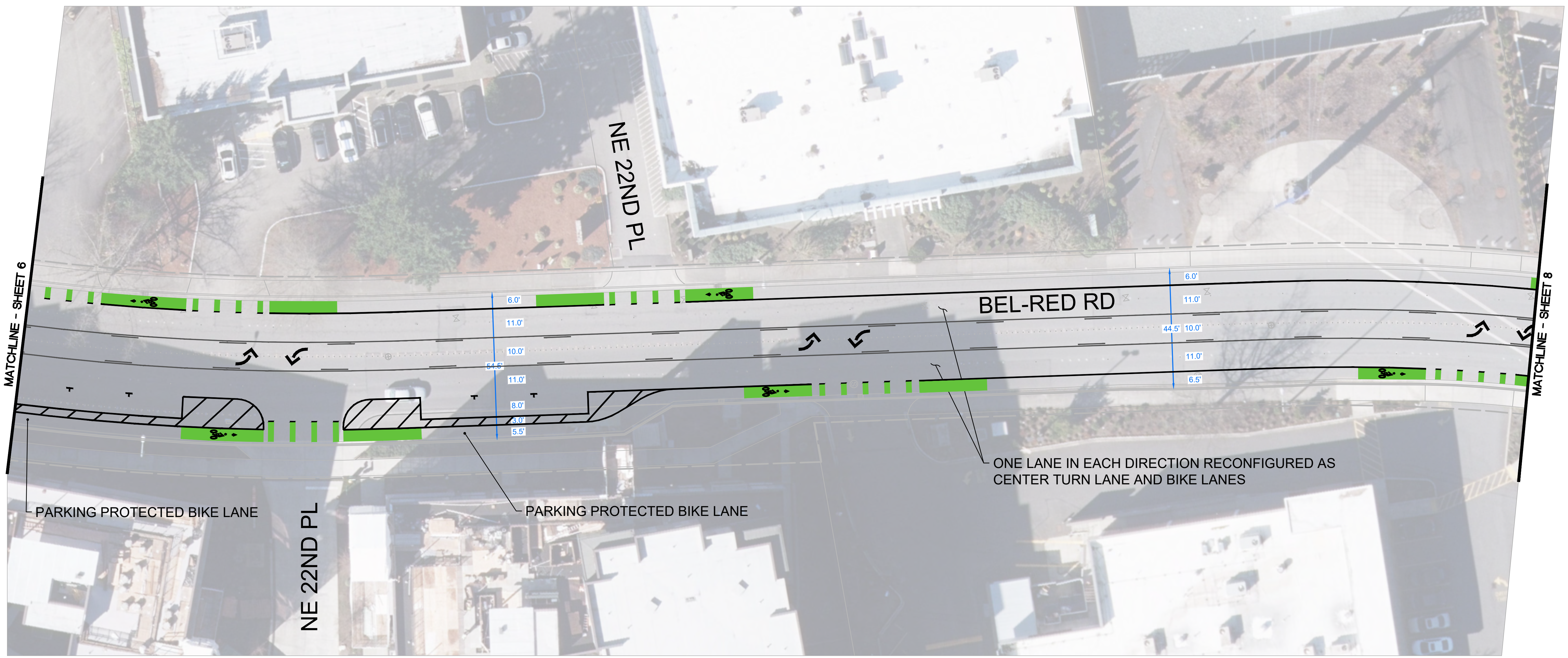
City of Bellevue
Transportation Department

PRELIMINARY DESIGN

BIKE BELLEVUE
BEL-RED ROAD CORRIDOR

CONCEPTUAL PLAN

SHT 6 OF 9



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NO.	DATE	BY	APPR.	REVISIONS

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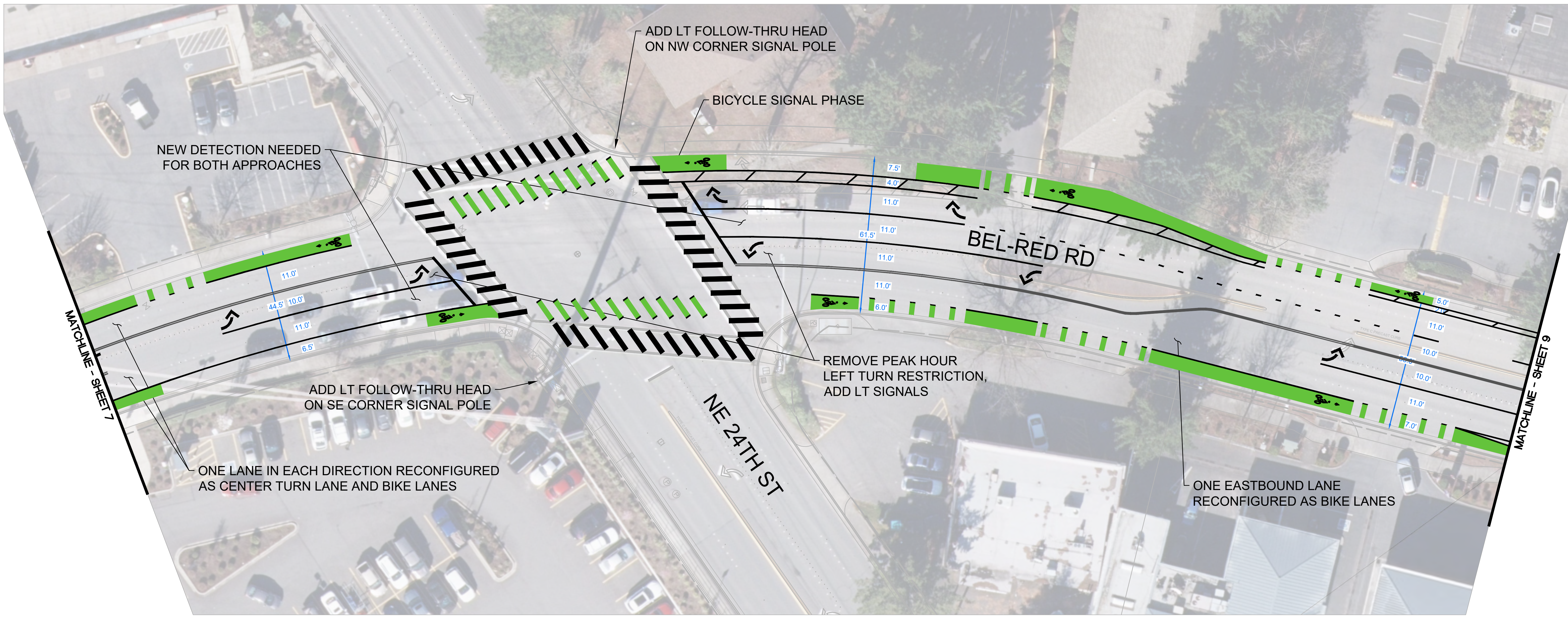
City of Bellevue
Transportation Department

PRELIMINARY DESIGN

BIKE BELLEVUE
BEL-RED ROAD CORRIDOR

CONCEPTUAL PLAN

SHT 7 OF 9



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NO.	DATE	BY	APPR.	REVISIONS

KP 12/19/22
DESIGNED BY DATE
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CHECKED BY DATE

City of Bellevue
Transportation Department

PRELIMINARY DESIGN

BIKE BELLEVUE
BEL-RED ROAD CORRIDOR

CONCEPTUAL PLAN

SHT 8 OF 9

SCALE IN FEET

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DESIGNED BY DATE
KP 12/19/22
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CHECKED BY DATE

City of Bellevue
Transportation Department

PRELIMINARY DESIGN

BIKE BELLEVUE
BEL-RED ROAD CORRIDOR

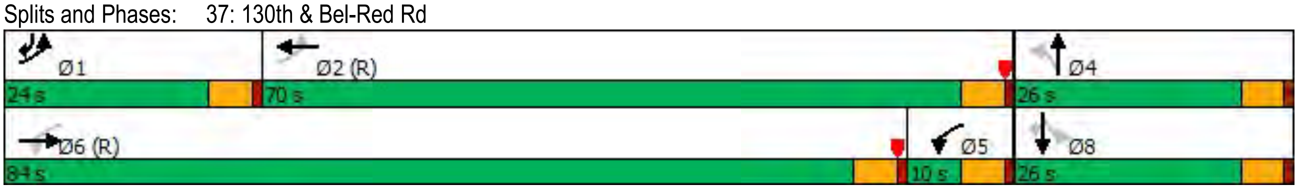
CONCEPTUAL PLAN

SHT 9 OF 9

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	160	899	3	1053	9	7	101	2	235
Future Volume (vph)	160	899	3	1053	9	7	101	2	235
Turn Type	D.P+P	NA	D.P+P	NA	Perm	NA	Perm	NA	pm+ov
Protected Phases	1	6	5	2		4		8	1
Permitted Phases	2		6		4		8		8
Detector Phase	1	6	5	2	4	4	8	8	1
Switch Phase									
Minimum Initial (s)	5.0	7.0	5.0	7.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	17.0	10.0	24.0	24.0	24.0	22.0	22.0	10.0
Total Split (s)	24.0	84.0	10.0	70.0	26.0	26.0	26.0	26.0	24.0
Total Split (%)	20.0%	70.0%	8.3%	58.3%	21.7%	21.7%	21.7%	21.7%	20.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0		-2.0		-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0		3.0		3.0	3.0
Lead/Lag	Lead	Lead	Lag	Lag					Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes					Yes
Recall Mode	None	C-Max	None	C-Max	None	None	None	None	None
Act Effct Green (s)	94.7	95.7	97.1	85.0		16.3		16.3	26.0
Actuated g/C Ratio	0.79	0.80	0.81	0.71		0.14		0.14	0.22
v/c Ratio	0.43	0.64	0.01	0.49		0.10		0.56	0.63
Control Delay	10.1	21.7	2.0	9.5		34.9		58.5	33.8
Queue Delay	0.0	0.0	0.0	0.2		0.0		0.0	0.0
Total Delay	10.1	21.7	2.0	9.7		34.9		58.5	33.8
LOS	B	C	A	A		C		E	C
Approach Delay		20.0		9.7		34.9		41.3	
Approach LOS		B		A		C		D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 10 (8%), Referenced to phase 2:EBWB and 6:EBWB, Start of Red	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.64	
Intersection Signal Delay: 18.3	Intersection LOS: B
Intersection Capacity Utilization 74.4%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 37: 130th & Bel-Red Rd



Lane Group	EBL	EBT	WBL	WBT	NBT	SBT	SBR
Lane Group Flow (vph)	168	953	3	1213	22	108	247
v/c Ratio	0.43	0.64	0.01	0.49	0.10	0.56	0.63
Control Delay	10.1	21.7	2.0	9.5	34.9	58.5	33.8
Queue Delay	0.0	0.0	0.0	0.2	0.0	0.0	0.0
Total Delay	10.1	21.7	2.0	9.7	34.9	58.5	33.8
Queue Length 50th (ft)	72	646	1	165	11	79	119
Queue Length 95th (ft)	116	873	m0	411	34	132	177
Internal Link Dist (ft)		847		620	254	784	
Turn Bay Length (ft)	500		285				200
Base Capacity (vph)	532	1484	405	2468	304	274	535
Starvation Cap Reductn	0	0	0	455	0	0	0
Spillback Cap Reductn	0	13	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.65	0.01	0.60	0.07	0.39	0.46

Intersection Summary

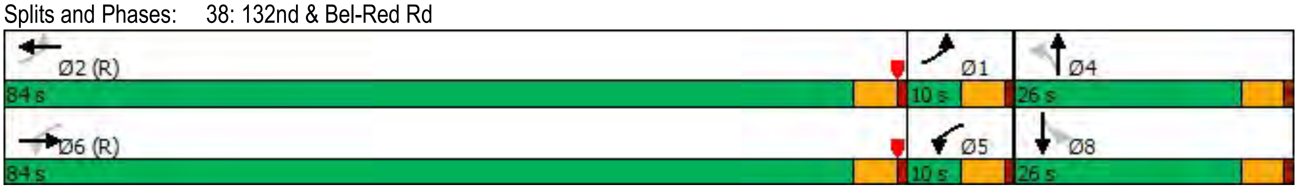
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	160	899	7	3	1053	100	9	7	6	101	2	235
Future Volume (veh/h)	160	899	7	3	1053	100	9	7	6	101	2	235
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		0.99	1.00		0.97	0.99		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	168	946	7	3	1108	105	9	7	6	106	2	247
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	461	1251	9	385	2239	212	79	59	36	245	4	379
Arrive On Green	0.06	0.68	0.67	0.09	0.91	0.90	0.18	0.18	0.17	0.18	0.18	0.18
Sat Flow, veh/h	1781	1854	14	1781	3278	310	206	333	202	1037	23	1558
Grp Volume(v), veh/h	168	0	953	3	600	613	22	0	0	108	0	247
Grp Sat Flow(s),veh/h/ln	1781	0	1868	1781	1777	1812	742	0	0	1060	0	1558
Q Serve(g_s), s	3.2	0.0	40.6	0.0	6.7	6.9	0.2	0.0	0.0	0.0	0.0	17.1
Cycle Q Clear(g_c), s	3.2	0.0	40.6	0.0	6.7	6.9	13.9	0.0	0.0	13.8	0.0	17.1
Prop In Lane	1.00		0.01	1.00		0.17	0.41		0.27	0.98		1.00
Lane Grp Cap(c), veh/h	461	0	1261	385	1214	1238	175	0	0	249	0	379
V/C Ratio(X)	0.36	0.00	0.76	0.01	0.49	0.50	0.13	0.00	0.00	0.43	0.00	0.65
Avail Cap(c_a), veh/h	660	0	1261	385	1214	1238	193	0	0	267	0	399
HCM Platoon Ratio	1.00	1.00	1.00	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.90	0.90	0.90	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	4.6	0.0	12.9	20.6	2.0	2.1	41.6	0.0	0.0	46.1	0.0	41.0
Incr Delay (d2), s/veh	0.2	0.0	4.3	0.0	1.3	1.3	0.1	0.0	0.0	0.4	0.0	2.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	16.5	0.0	1.9	1.9	0.6	0.0	0.0	3.0	0.0	6.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	4.8	0.0	17.2	20.6	3.3	3.4	41.7	0.0	0.0	46.6	0.0	43.6
LnGrp LOS	A	A	B	C	A	A	D	A	A	D	A	D
Approach Vol, veh/h		1121			1216			22			355	
Approach Delay, s/veh		15.3			3.4			41.7			44.5	
Approach LOS		B			A			D			D	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	10.6	85.0		24.4	11.6	84.0		24.4				
Change Period (Y+Rc), s	5.0	5.0		5.0	5.0	5.0		5.0				
Max Green Setting (Gmax), s	19.0	65.0		21.0	5.0	79.0		21.0				
Max Q Clear Time (g_c+I1), s	5.2	8.9		15.9	2.0	42.6		19.1				
Green Ext Time (p_c), s	0.4	6.0		0.0	0.0	5.4		0.3				
Intersection Summary												
HCM 6th Ctrl Delay			14.0									
HCM 6th LOS			B									

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	50	906	50	1056	50	50	50	50
Future Volume (vph)	50	906	50	1056	50	50	50	50
Turn Type	D.P+P	NA	D.P+P	NA	Perm	NA	Perm	NA
Protected Phases	1	6	5	2		4		8
Permitted Phases	2		6		4		8	
Detector Phase	1	6	5	2	4	4	8	8
Switch Phase								
Minimum Initial (s)	5.0	7.0	5.0	7.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	21.0	10.0	22.0	25.0	25.0	26.0	26.0
Total Split (s)	10.0	84.0	10.0	84.0	26.0	26.0	26.0	26.0
Total Split (%)	8.3%	70.0%	8.3%	70.0%	21.7%	21.7%	21.7%	21.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag	Lead	Lag	Lead				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	C-Max	None	C-Max	Min	Min	Min	Min
Act Effct Green (s)	95.8	90.8	95.8	90.8	11.2	11.2	11.2	11.2
Actuated g/C Ratio	0.80	0.76	0.80	0.76	0.09	0.09	0.09	0.09
v/c Ratio	0.14	0.72	0.16	0.44	0.54	0.56	0.55	0.61
Control Delay	3.0	7.8	3.3	4.9	69.5	44.3	70.2	47.7
Queue Delay	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	3.0	8.1	3.3	5.0	69.5	44.3	70.2	47.7
LOS	A	A	A	A	E	D	E	D
Approach Delay		7.9		4.9		52.7		55.2
Approach LOS		A		A		D		E

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 115 (96%), Referenced to phase 2:EBWB and 6:EBWB, Start of Red	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.72	
Intersection Signal Delay: 12.1	Intersection LOS: B
Intersection Capacity Utilization 70.8%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 38: 132nd & Bel-Red Rd



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	53	1007	53	1165	53	106	53	106
v/c Ratio	0.14	0.72	0.16	0.44	0.54	0.56	0.55	0.61
Control Delay	3.0	7.8	3.3	4.9	69.5	44.3	70.2	47.7
Queue Delay	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	3.0	8.1	3.3	5.0	69.5	44.3	70.2	47.7
Queue Length 50th (ft)	2	63	5	103	40	53	40	53
Queue Length 95th (ft)	m13	386	m11	134	77	102	77	103
Internal Link Dist (ft)		620		600		468		731
Turn Bay Length (ft)	285		250		75		100	
Base Capacity (vph)	375	1395	338	2655	185	323	183	297
Starvation Cap Reductn	0	27	0	216	0	0	0	0
Spillback Cap Reductn	0	76	0	0	0	1	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.76	0.16	0.48	0.29	0.33	0.29	0.36

Intersection Summary

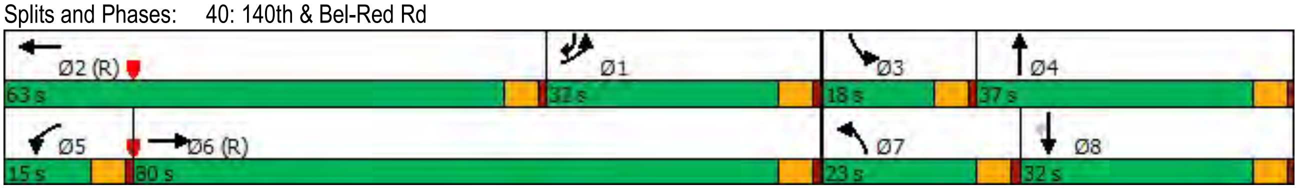
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	906	50	50	1056	50	50	50	50	50	50	50
Future Volume (veh/h)	50	906	50	50	1056	50	50	50	50	50	50	50
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		0.99	0.98		0.96	0.97		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	53	954	53	53	1112	53	53	53	53	53	53	53
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	523	1155	64	574	2272	108	157	113	113	156	114	114
Arrive On Green	0.16	1.00	1.00	0.16	1.00	1.00	0.13	0.13	0.13	0.13	0.13	0.13
Sat Flow, veh/h	1781	1754	97	1781	3452	164	1268	840	840	1256	848	848
Grp Volume(v), veh/h	53	0	1007	53	572	593	53	0	106	53	0	106
Grp Sat Flow(s),veh/h/ln	1781	0	1852	1781	1777	1839	1268	0	1681	1256	0	1695
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	4.8	0.0	7.0	4.9	0.0	6.9
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.0	0.0	0.0	11.8	0.0	7.0	11.9	0.0	6.9
Prop In Lane	1.00		0.05	1.00		0.09	1.00		0.50	1.00		0.50
Lane Grp Cap(c), veh/h	523	0	1219	574	1170	1211	157	0	226	156	0	228
V/C Ratio(X)	0.10	0.00	0.83	0.09	0.49	0.49	0.34	0.00	0.47	0.34	0.00	0.46
Avail Cap(c_a), veh/h	523	0	1219	574	1170	1211	209	0	294	207	0	297
HCM Platoon Ratio	2.00	2.00	2.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.72	0.00	0.72	0.85	0.85	0.85	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	4.1	0.0	0.0	4.0	0.0	0.0	53.4	0.0	48.0	53.5	0.0	47.9
Incr Delay (d2), s/veh	0.0	0.0	4.8	0.0	1.2	1.2	0.5	0.0	0.6	0.5	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	1.6	0.3	0.4	0.4	1.6	0.0	3.0	1.6	0.0	3.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	4.1	0.0	4.8	4.0	1.2	1.2	53.8	0.0	48.5	53.9	0.0	48.5
LnGrp LOS	A	A	A	A	A	A	D	A	D	D	A	D
Approach Vol, veh/h		1060			1218			159			159	
Approach Delay, s/veh		4.7			1.3			50.3			50.3	
Approach LOS		A			A			D			D	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	14.9	84.0		21.1	14.9	84.0		21.1				
Change Period (Y+Rc), s	5.0	5.0		5.0	5.0	5.0		5.0				
Max Green Setting (Gmax), s	5.0	79.0		21.0	5.0	79.0		21.0				
Max Q Clear Time (g_c+I1), s	2.0	2.0		13.8	2.0	2.0		13.9				
Green Ext Time (p_c), s	0.0	6.1		0.3	0.0	6.2		0.3				
Intersection Summary												
HCM 6th Ctrl Delay			8.7									
HCM 6th LOS			A									

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	212	687	102	989	161	482	124	419	425
Future Volume (vph)	212	687	102	989	161	482	124	419	425
Turn Type	Prot	NA	Prot	NA	Prot	NA	Prot	NA	pm+ov
Protected Phases	1	6	5	2	7	4	3	8	1
Permitted Phases									8
Detector Phase	1	6	5	2	7	4	3	8	1
Switch Phase									
Minimum Initial (s)	5.0	4.0	5.0	4.0	5.0	4.0	5.0	4.0	5.0
Minimum Split (s)	10.0	28.0	10.0	28.0	10.0	26.0	10.0	23.0	10.0
Total Split (s)	32.0	80.0	15.0	63.0	23.0	37.0	18.0	32.0	32.0
Total Split (%)	21.3%	53.3%	10.0%	42.0%	15.3%	24.7%	12.0%	21.3%	21.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	Min	C-Max	None	None	None	None	None
Act Effct Green (s)	27.0	76.0	10.2	59.2	17.0	31.0	12.7	26.8	53.8
Actuated g/C Ratio	0.18	0.51	0.07	0.39	0.11	0.21	0.08	0.18	0.36
v/c Ratio	0.72	0.97	0.89	0.85	0.88	0.90	0.90	0.72	0.78
Control Delay	72.0	58.4	107.9	39.7	102.6	73.2	117.7	65.3	31.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	72.0	58.4	107.9	39.7	102.6	73.2	117.7	65.3	31.4
LOS	E	E	F	D	F	E	F	E	C
Approach Delay		61.2		45.5		79.5		57.1	
Approach LOS		E		D		E		E	

Intersection Summary	
Cycle Length: 150	
Actuated Cycle Length: 150	
Offset: 17 (11%), Referenced to phase 2:WBT and 6:EBT, Start of Green	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.97	
Intersection Signal Delay: 59.0	Intersection LOS: E
Intersection Capacity Utilization 90.9%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 40: 140th & Bel-Red Rd



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	230	888	107	1164	175	639	135	455	462
v/c Ratio	0.72	0.97	0.89	0.85	0.88	0.90	0.90	0.72	0.78
Control Delay	72.0	58.4	107.9	39.7	102.6	73.2	117.7	65.3	31.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	72.0	58.4	107.9	39.7	102.6	73.2	117.7	65.3	31.4
Queue Length 50th (ft)	215	829	107	606	170	314	133	223	223
Queue Length 95th (ft)	314	#1138	m#146	m601	#300	#413	#262	286	322
Internal Link Dist (ft)		1977		1262		329		1200	
Turn Bay Length (ft)	300		125		150		300		175
Base Capacity (vph)	318	918	120	1373	212	730	153	637	592
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.72	0.97	0.89	0.85	0.83	0.88	0.88	0.71	0.78

Intersection Summary

\#   95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m   Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	212	687	130	102	989	117	161	482	106	124	419	425
Future Volume (veh/h)	212	687	130	102	989	117	161	482	106	124	419	425
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		0.93	1.00		0.93
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	230	747	141	107	1041	123	175	524	115	135	455	462
Peak Hour Factor	0.92	0.92	0.92	0.95	0.95	0.95	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	341	781	147	119	1235	146	197	576	126	154	633	567
Arrive On Green	0.19	0.51	0.51	0.07	0.39	0.39	0.11	0.20	0.20	0.09	0.18	0.18
Sat Flow, veh/h	1781	1526	288	1781	3195	377	1781	2854	622	1781	3554	1478
Grp Volume(v), veh/h	230	0	888	107	579	585	175	325	314	135	455	462
Grp Sat Flow(s),veh/h/ln	1781	0	1814	1781	1777	1795	1781	1777	1699	1781	1777	1478
Q Serve(g_s), s	18.0	0.0	70.2	8.9	44.4	44.5	14.5	26.8	27.2	11.2	18.1	9.8
Cycle Q Clear(g_c), s	18.0	0.0	70.2	8.9	44.4	44.5	14.5	26.8	27.2	11.2	18.1	9.8
Prop In Lane	1.00		0.16	1.00		0.21	1.00		0.37	1.00		1.00
Lane Grp Cap(c), veh/h	341	0	928	119	687	694	197	358	343	154	633	567
V/C Ratio(X)	0.67	0.00	0.96	0.90	0.84	0.84	0.89	0.91	0.92	0.87	0.72	0.82
Avail Cap(c_a), veh/h	341	0	928	119	687	694	214	379	363	154	640	570
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.55	0.00	0.55	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	56.3	0.0	35.0	69.5	41.8	41.9	65.8	58.5	58.6	67.7	58.1	20.9
Incr Delay (d2), s/veh	2.4	0.0	13.8	52.0	12.0	11.9	30.5	24.0	26.6	37.5	3.9	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	8.4	0.0	33.9	5.8	21.5	21.8	8.3	14.5	14.2	6.7	8.5	10.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	58.6	0.0	48.8	121.6	53.8	53.8	96.3	82.5	85.2	105.2	62.0	29.8
LnGrp LOS	E	A	D	F	D	D	F	F	F	F	E	C
Approach Vol, veh/h		1118			1271			814			1052	
Approach Delay, s/veh		50.8			59.5			86.5			53.4	
Approach LOS		D			E			F			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	33.7	63.0	18.0	35.3	15.0	81.7	21.6	31.7
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	27.0	58.0	13.0	32.0	10.0	75.0	18.0	27.0
Max Q Clear Time (g_c+I1), s	20.0	46.5	13.2	29.2	10.9	72.2	16.5	20.1
Green Ext Time (p_c), s	0.2	5.7	0.0	1.1	0.0	1.7	0.0	2.8

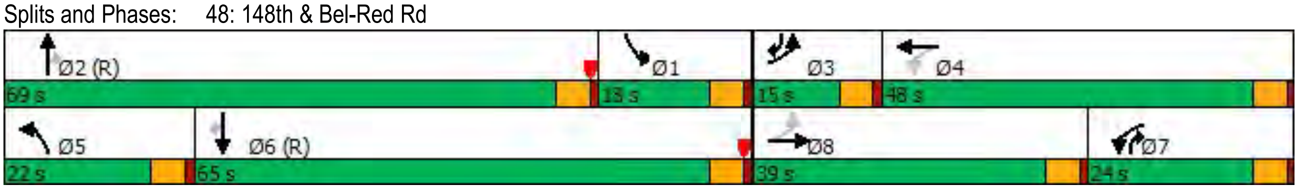
Intersection Summary	
HCM 6th Ctrl Delay	60.9
HCM 6th LOS	E

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	161	440	179	514	179	960	201	51	1296	237
Future Volume (vph)	161	440	179	514	179	960	201	51	1296	237
Turn Type	pm+pt	NA	pm+pt	NA	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	3	8	7	4	5	2	7	1	6	3
Permitted Phases	8		4				2			6
Detector Phase	3	8	7	4	5	2	7	1	6	3
Switch Phase										
Minimum Initial (s)	5.0	7.0	5.0	7.0	5.0	7.0	5.0	5.0	7.0	5.0
Minimum Split (s)	10.0	29.0	10.0	30.0	10.0	26.0	10.0	10.0	24.0	10.0
Total Split (s)	15.0	39.0	24.0	48.0	22.0	69.0	24.0	18.0	65.0	15.0
Total Split (%)	10.0%	26.0%	16.0%	32.0%	14.7%	46.0%	16.0%	12.0%	43.3%	10.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lead	Lag	Lag	Lead	Lead	Lag	Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	None	None	C-Max	None
Act Effct Green (s)	30.6	30.6	43.0	43.0	17.0	67.6	90.0	11.4	60.0	70.0
Actuated g/C Ratio	0.20	0.20	0.29	0.29	0.11	0.45	0.60	0.08	0.40	0.47
v/c Ratio	1.01	0.85	0.55	1.08	0.97	0.65	0.22	0.41	1.00	0.36
Control Delay	114.1	80.2	59.2	111.1	122.4	35.5	3.3	74.5	67.4	16.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	114.1	80.2	59.2	111.1	122.4	35.5	3.3	74.5	67.4	16.1
LOS	F	F	E	F	F	D	A	E	E	B
Approach Delay		87.6		98.2		42.3			60.0	
Approach LOS		F		F		D			E	

Intersection Summary

Cycle Length: 150
Actuated Cycle Length: 150
Offset: 25 (17%), Referenced to phase 2:NBT and 6:SBT, Start of Red
Natural Cycle: 130
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.08
Intersection Signal Delay: 65.2 Intersection LOS: E
Intersection Capacity Utilization 100.2% ICU Level of Service G
Analysis Period (min) 15

Splits and Phases: 48: 148th & Bel-Red Rd



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	169	604	188	570	195	1043	218	55	1409	258
v/c Ratio	1.01	0.85	0.55	1.08	0.97	0.65	0.22	0.41	1.00	0.36
Control Delay	114.1	80.2	59.2	111.1	122.4	35.5	3.3	74.5	67.4	16.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	114.1	80.2	59.2	111.1	122.4	35.5	3.3	74.5	67.4	16.1
Queue Length 50th (ft)	168	305	148	~619	193	432	11	52	718	94
Queue Length 95th (ft)	m#176	m318	221	#857	#358	513	48	100	#889	156
Internal Link Dist (ft)		1317		1595		1002			651	
Turn Bay Length (ft)	300		400		300		300	150		150
Base Capacity (vph)	167	784	343	529	200	1594	986	153	1415	723
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.01	0.77	0.55	1.08	0.97	0.65	0.22	0.36	1.00	0.36

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	161	440	134	179	514	28	179	960	201	51	1296	237
Future Volume (veh/h)	161	440	134	179	514	28	179	960	201	51	1296	237
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	0.98		0.98	1.00		0.98	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	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	169	463	141	188	541	29	195	1043	218	55	1409	258
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	167	525	158	337	504	27	202	1516	909	154	1421	730
Arrive On Green	0.07	0.20	0.20	0.16	0.29	0.29	0.11	0.43	0.43	0.09	0.40	0.40
Sat Flow, veh/h	1781	2667	805	1781	1757	94	1781	3554	1548	1781	3554	1561
Grp Volume(v), veh/h	169	307	297	188	0	570	195	1043	218	55	1409	258
Grp Sat Flow(s),veh/h/ln	1781	1777	1696	1781	0	1851	1781	1777	1548	1781	1777	1561
Q Serve(g_s), s	10.0	25.2	25.6	9.4	0.0	43.0	16.3	35.7	0.0	4.4	59.1	15.8
Cycle Q Clear(g_c), s	10.0	25.2	25.6	9.4	0.0	43.0	16.3	35.7	0.0	4.4	59.1	15.8
Prop In Lane	1.00		0.47	1.00		0.05	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	167	350	334	337	0	531	202	1516	909	154	1421	730
V/C Ratio(X)	1.01	0.88	0.89	0.56	0.00	1.07	0.97	0.69	0.24	0.36	0.99	0.35
Avail Cap(c_a), veh/h	167	403	384	337	0	531	202	1516	909	154	1421	730
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	0.52	0.00	0.52	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	59.7	58.5	58.7	55.8	0.0	53.5	66.2	34.9	15.1	64.6	44.7	25.6
Incr Delay (d2), s/veh	73.3	17.6	20.0	0.6	0.0	50.3	53.1	2.6	0.6	0.5	21.9	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.9	13.0	12.8	6.5	0.0	27.2	10.4	15.9	3.8	2.0	29.9	6.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	132.9	76.1	78.6	56.5	0.0	103.8	119.3	37.5	15.7	65.1	66.6	26.9
LnGrp LOS	F	E	E	E	A	F	F	D	B	E	E	C
Approach Vol, veh/h		773			758			1456			1722	
Approach Delay, s/veh		89.5			92.1			45.2			60.6	
Approach LOS		F			F			D			E	

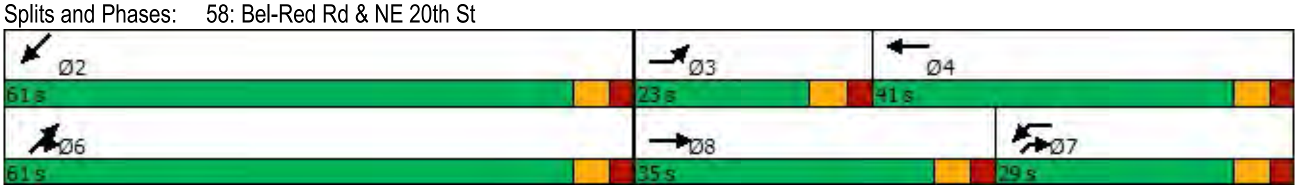
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	18.0	69.0	15.0	48.0	22.0	65.0	28.5	34.5
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	13.0	64.0	10.0	43.0	17.0	60.0	19.0	34.0
Max Q Clear Time (g_c+I1), s	6.4	37.7	12.0	45.0	18.3	61.1	11.4	27.6
Green Ext Time (p_c), s	0.0	9.2	0.0	0.0	0.0	0.0	0.1	1.9

Intersection Summary	
HCM 6th Ctrl Delay	65.6
HCM 6th LOS	E

Lane Group	EBL	EBT	WBL	WBT	NET	NER	SWT
Lane Configurations							
Traffic Volume (vph)	132	560	191	426	381	314	508
Future Volume (vph)	132	560	191	426	381	314	508
Turn Type	Prot	NA	Prot	NA	NA	pt+ov	NA
Protected Phases	3	8	7	4	6	6 7	2
Permitted Phases							
Detector Phase	3	8	7	4	6	6 7	2
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0	5.0	7.0		7.0
Minimum Split (s)	11.0	31.0	11.0	36.0	36.0		21.0
Total Split (s)	23.0	35.0	29.0	41.0	61.0		61.0
Total Split (%)	18.4%	28.0%	23.2%	32.8%	48.8%		48.8%
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6		3.6
All-Red Time (s)	2.4	2.4	2.4	2.4	2.4		2.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0		6.0
Lead/Lag	Lead	Lead	Lag	Lag			
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			
Recall Mode	None	None	None	None	Max		Max
Act Effct Green (s)	12.8	23.1	16.8	27.1	55.4	78.2	55.4
Actuated g/C Ratio	0.11	0.20	0.15	0.24	0.49	0.69	0.49
v/c Ratio	0.70	0.82	0.77	0.58	0.44	0.30	0.79
Control Delay	68.1	53.5	66.4	40.6	22.6	8.3	33.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.1	53.5	66.4	40.6	22.6	8.3	33.6
LOS	E	D	E	D	C	A	C
Approach Delay		56.3		48.2	16.1		33.6
Approach LOS		E		D	B		C

Intersection Summary	
Cycle Length: 125	
Actuated Cycle Length: 113.4	
Natural Cycle: 85	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.82	
Intersection Signal Delay: 38.4	Intersection LOS: D
Intersection Capacity Utilization 79.8%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 58: Bel-Red Rd & NE 20th St



Lane Group	EBL	EBT	WBL	WBT	NET	NER	SWT
Lane Group Flow (vph)	139	589	201	482	401	331	704
v/c Ratio	0.70	0.82	0.77	0.58	0.44	0.30	0.79
Control Delay	68.1	53.5	66.4	40.6	22.6	8.3	33.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.1	53.5	66.4	40.6	22.6	8.3	33.6
Queue Length 50th (ft)	100	217	143	162	190	88	418
Queue Length 95th (ft)	177	298	234	223	321	150	#738
Internal Link Dist (ft)		1236		809	1595		1409
Turn Bay Length (ft)	150		300			150	
Base Capacity (vph)	267	911	361	1079	909	1081	888
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.65	0.56	0.45	0.44	0.31	0.79

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	132	560	0	191	426	32	0	381	314	0	508	161
Future Volume (veh/h)	132	560	0	191	426	32	0	381	314	0	508	161
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	0	1870	1870	1870	0	1870	1870	0	1870	1870
Adj Flow Rate, veh/h	139	589	0	201	448	0	0	401	331	0	535	169
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	0	2	2	2	0	2	2	0	2	2
Cap, veh/h	168	760	0	232	887		0	925	975	0	674	213
Arrive On Green	0.09	0.21	0.00	0.13	0.25	0.00	0.00	0.49	0.49	0.00	0.49	0.49
Sat Flow, veh/h	1781	3647	0	1781	3647	0	0	1870	1555	0	1362	430
Grp Volume(v), veh/h	139	589	0	201	448	0	0	401	331	0	0	704
Grp Sat Flow(s),veh/h/ln	1781	1777	0	1781	1777	0	0	1870	1555	0	0	1793
Q Serve(g_s), s	8.5	17.4	0.0	12.3	12.0	0.0	0.0	15.4	0.0	0.0	0.0	36.4
Cycle Q Clear(g_c), s	8.5	17.4	0.0	12.3	12.0	0.0	0.0	15.4	0.0	0.0	0.0	36.4
Prop In Lane	1.00		0.00	1.00		0.00	0.00		1.00	0.00		0.24
Lane Grp Cap(c), veh/h	168	760	0	232	887		0	925	975	0	0	886
V/C Ratio(X)	0.83	0.78	0.00	0.87	0.50		0.00	0.43	0.34	0.00	0.00	0.79
Avail Cap(c_a), veh/h	272	926	0	368	1118		0	925	975	0	0	886
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	49.5	41.2	0.0	47.5	35.8	0.0	0.0	18.1	9.9	0.0	0.0	23.4
Incr Delay (d2), s/veh	4.9	2.6	0.0	7.5	0.2	0.0	0.0	1.5	0.9	0.0	0.0	7.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.0	7.8	0.0	5.9	5.2	0.0	0.0	6.9	3.9	0.0	0.0	16.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.4	43.8	0.0	54.9	36.0	0.0	0.0	19.6	10.9	0.0	0.0	30.7
LnGrp LOS	D	D	A	D	D		A	B	B	A	A	C
Approach Vol, veh/h		728			649			732			704	
Approach Delay, s/veh		45.9			41.9			15.6			30.7	
Approach LOS		D			D			B			C	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		61.0	16.5	33.8		61.0	20.5	29.8				
Change Period (Y+Rc), s		6.0	6.0	6.0		6.0	6.0	6.0				
Max Green Setting (Gmax), s		55.0	17.0	35.0		55.0	23.0	29.0				
Max Q Clear Time (g_c+I1), s		38.4	10.5	14.0		17.4	14.3	19.4				
Green Ext Time (p_c), s		3.0	0.1	2.0		2.3	0.2	2.0				

Intersection Summary			
HCM 6th Ctrl Delay			33.3
HCM 6th LOS			C

Notes

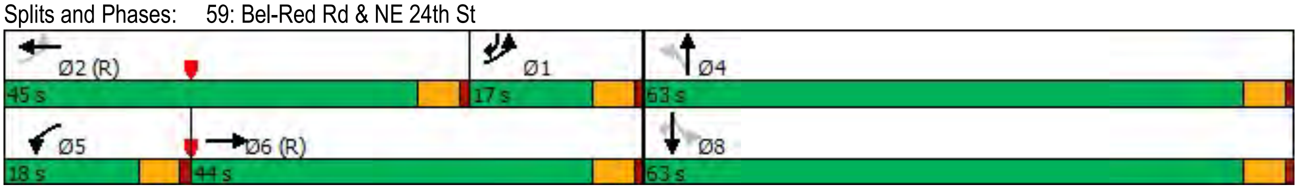
User approved changes to right turn type.

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

Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT	SBR
Lane Configurations								
Traffic Volume (vph)	230	719	94	341	417	2	546	273
Future Volume (vph)	230	719	94	341	417	2	546	273
Turn Type	D.P+P	NA	Prot	NA	NA	Perm	NA	pm+ov
Protected Phases	1	6	5	2	4		8	1
Permitted Phases	2					8		8
Detector Phase	1	6	5	2	4	8	8	1
Switch Phase								
Minimum Initial (s)	5.0	7.0	5.0	7.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	26.0	10.0	26.0	30.0	27.0	27.0	10.0
Total Split (s)	17.0	44.0	18.0	45.0	63.0	63.0	63.0	17.0
Total Split (%)	13.6%	35.2%	14.4%	36.0%	50.4%	50.4%	50.4%	13.6%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lead	Lead				Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				Yes
Recall Mode	None	C-Max	None	C-Max	None	None	None	None
Act Effct Green (s)	64.8	53.6	11.2	52.8	45.2	45.2	45.2	57.2
Actuated g/C Ratio	0.52	0.43	0.09	0.42	0.36	0.36	0.36	0.46
v/c Ratio	0.44	0.55	0.63	0.25	0.82	0.02	0.85	0.35
Control Delay	22.6	30.4	79.0	19.8	45.3	19.0	44.3	3.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0
Total Delay	22.6	30.4	79.0	19.8	45.3	19.0	45.0	3.5
LOS	C	C	E	B	D	B	D	A
Approach Delay		28.6		32.3	45.3		31.2	
Approach LOS		C		C	D		C	

Intersection Summary	
Cycle Length: 125	
Actuated Cycle Length: 125	
Offset: 0 (0%), Referenced to phase 2:EBWB and 6:EBT, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.85	
Intersection Signal Delay: 33.0	Intersection LOS: C
Intersection Capacity Utilization 71.5%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 59: Bel-Red Rd & NE 24th St



Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	242	816	99	370	539	2	575	287
v/c Ratio	0.44	0.55	0.63	0.25	0.82	0.02	0.85	0.35
Control Delay	22.6	30.4	79.0	19.8	45.3	19.0	44.3	3.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0
Total Delay	22.6	30.4	79.0	19.8	45.3	19.0	45.0	3.5
Queue Length 50th (ft)	96	254	82	63	383	1	452	16
Queue Length 95th (ft)	175	385	m118	107	460	m2	m505	m27
Internal Link Dist (ft)		1728		341	1409		527	
Turn Bay Length (ft)	300		175			150		175
Base Capacity (vph)	545	1494	191	1486	843	142	864	819
Starvation Cap Reductn	0	0	0	0	0	0	81	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.44	0.55	0.52	0.25	0.64	0.01	0.73	0.35

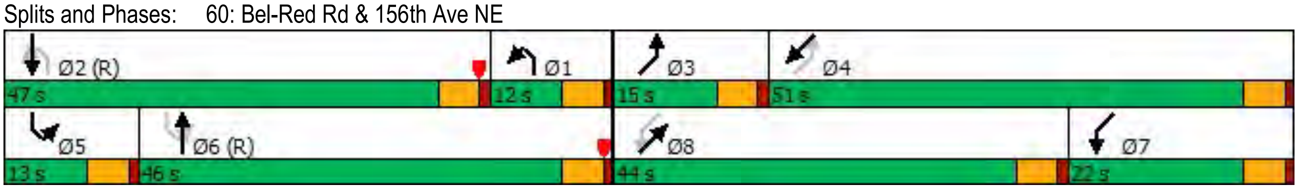
Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	230	719	56	94	341	10	0	417	95	2	546	273
Future Volume (veh/h)	230	719	56	94	341	10	0	417	95	2	546	273
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.98		0.97	1.00		0.96	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	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	242	757	59	99	359	11	0	439	100	2	575	287
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	732	1593	124	121	1125	34	58	491	112	101	624	881
Arrive On Green	0.23	0.48	0.48	0.14	0.64	0.64	0.00	0.33	0.33	0.33	0.33	0.33
Sat Flow, veh/h	1781	3332	260	1781	3515	107	641	1470	335	866	1870	1565
Grp Volume(v), veh/h	242	404	412	99	181	189	0	0	539	2	575	287
Grp Sat Flow(s),veh/h/ln	1781	1777	1815	1781	1777	1845	641	0	1805	866	1870	1565
Q Serve(g_s), s	0.0	19.2	19.2	6.8	5.8	5.8	0.0	0.0	35.4	0.3	37.0	0.0
Cycle Q Clear(g_c), s	0.0	19.2	19.2	6.8	5.8	5.8	0.0	0.0	35.4	35.7	37.0	0.0
Prop In Lane	1.00		0.14	1.00		0.06	1.00		0.19	1.00		1.00
Lane Grp Cap(c), veh/h	732	849	868	121	569	591	58	0	603	101	624	881
V/C Ratio(X)	0.33	0.48	0.48	0.82	0.32	0.32	0.00	0.00	0.89	0.02	0.92	0.33
Avail Cap(c_a), veh/h	732	849	868	185	569	591	141	0	838	214	868	1085
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.92	0.92	0.92	0.00	0.00	0.85	0.90	0.90	0.90
Uniform Delay (d), s/veh	20.7	22.0	22.0	53.2	16.3	16.3	0.0	0.0	39.5	56.5	40.0	14.8
Incr Delay (d2), s/veh	0.1	1.9	1.9	8.0	1.4	1.3	0.0	0.0	6.5	0.0	9.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.7	8.4	8.6	3.1	2.3	2.4	0.0	0.0	16.6	0.1	18.2	4.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.8	23.9	23.9	61.2	17.7	17.7	0.0	0.0	46.0	56.5	49.1	14.8
LnGrp LOS	C	C	C	E	B	B	A	A	D	E	D	B
Approach Vol, veh/h		1058			469			539			864	
Approach Delay, s/veh		23.2			26.9			46.0			37.8	
Approach LOS		C			C			D			D	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	33.3	45.0		46.7	13.5	64.8		46.7				
Change Period (Y+Rc), s	5.0	5.0		5.0	5.0	5.0		5.0				
Max Green Setting (Gmax), s	12.0	40.0		58.0	13.0	39.0		58.0				
Max Q Clear Time (g_c+I1), s	2.0	7.8		37.4	8.8	21.2		39.0				
Green Ext Time (p_c), s	0.3	1.4		2.3	0.0	3.3		2.8				
Intersection Summary												
HCM 6th Ctrl Delay			32.3									
HCM 6th LOS			C									

Lane Group	NBL	NBT	SBL	SBT	NEL	NET	SWL	SWT
Lane Configurations								
Traffic Volume (vph)	12	283	100	861	129	442	253	485
Future Volume (vph)	12	283	100	861	129	442	253	485
Turn Type	D.P+P	NA	D.P+P	NA	D.P+P	NA	D.P+P	NA
Protected Phases	1	6	5	2	3	8	7	4
Permitted Phases	2		6		4		8	
Detector Phase	1	6	5	2	3	8	7	4
Switch Phase								
Minimum Initial (s)	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0
Minimum Split (s)	10.0	24.0	10.0	24.0	10.0	27.0	10.0	27.0
Total Split (s)	12.0	46.0	13.0	47.0	15.0	44.0	22.0	51.0
Total Split (%)	9.6%	36.8%	10.4%	37.6%	12.0%	35.2%	17.6%	40.8%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	None	C-Max	None	None	None	None
Act Effct Green (s)	55.7	45.3	52.7	52.9	52.3	36.4	52.3	43.2
Actuated g/C Ratio	0.45	0.36	0.42	0.42	0.42	0.29	0.42	0.35
v/c Ratio	0.09	0.40	0.30	0.83	0.39	0.93	0.94	0.45
Control Delay	9.3	9.2	23.1	38.9	33.8	73.5	86.0	32.2
Queue Delay	0.0	0.0	0.0	0.1	0.0	0.0	17.8	0.0
Total Delay	9.3	9.2	23.1	39.0	33.8	73.5	103.8	32.2
LOS	A	A	C	D	C	E	F	C
Approach Delay		9.2		37.8		65.0		55.6
Approach LOS		A		D		E		E

Intersection Summary	
Cycle Length: 125	
Actuated Cycle Length: 125	
Offset: 116 (93%), Referenced to phase 2:NBSB and 6:NBSB, Start of Red	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.94	
Intersection Signal Delay: 43.1	Intersection LOS: D
Intersection Capacity Utilization 93.6%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 60: Bel-Red Rd & 156th Ave NE



Lane Group	NBL	NBT	SBL	SBT	NEL	NET	SWL	SWT
Lane Group Flow (vph)	13	497	105	1207	136	501	266	548
v/c Ratio	0.09	0.40	0.30	0.83	0.39	0.93	0.94	0.45
Control Delay	9.3	9.2	23.1	38.9	33.8	73.5	86.0	32.2
Queue Delay	0.0	0.0	0.0	0.1	0.0	0.0	17.8	0.0
Total Delay	9.3	9.2	23.1	39.0	33.8	73.5	103.8	32.2
Queue Length 50th (ft)	2	134	50	431	88	417	157	170
Queue Length 95th (ft)	m5	124	88	#684	m121	#582	#311	222
Internal Link Dist (ft)		355		1201		527		1432
Turn Bay Length (ft)	120		300		275		300	
Base Capacity (vph)	157	1248	363	1448	357	575	300	1293
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	16	0	0	33	8
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.40	0.29	0.84	0.38	0.87	1.00	0.43

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	12	283	189	100	861	286	129	442	34	253	485	35
Future Volume (veh/h)	12	283	189	100	861	286	129	442	34	253	485	35
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	13	298	199	105	906	301	136	465	0	266	511	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	268	829	536	386	877	290	358	500		291	1135	
Arrive On Green	0.04	0.13	0.13	0.05	0.34	0.34	0.07	0.27	0.00	0.12	0.32	0.00
Sat Flow, veh/h	1781	2045	1323	1781	2609	864	1781	1870	0	1781	3647	0
Grp Volume(v), veh/h	13	258	239	105	616	591	136	465	0	266	511	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1591	1781	1777	1695	1781	1870	0	1781	1777	0
Q Serve(g_s), s	0.0	16.5	17.1	4.3	42.0	42.0	6.3	30.3	0.0	12.7	14.3	0.0
Cycle Q Clear(g_c), s	0.0	16.5	17.1	4.3	42.0	42.0	6.3	30.3	0.0	12.7	14.3	0.0
Prop In Lane	1.00		0.83	1.00		0.51	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	268	720	645	386	597	570	358	500		291	1135	
V/C Ratio(X)	0.05	0.36	0.37	0.27	1.03	1.04	0.38	0.93		0.91	0.45	
Avail Cap(c_a), veh/h	268	720	645	413	597	570	382	584		323	1308	
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.93	0.93	0.93	1.00	1.00	1.00	0.65	0.65	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	53.0	39.3	39.6	21.1	41.5	41.5	26.5	44.6	0.0	52.1	33.8	0.0
Incr Delay (d2), s/veh	0.0	1.3	1.5	0.1	45.3	47.7	0.2	13.6	0.0	26.2	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	8.1	7.6	1.8	25.6	24.9	2.7	15.8	0.0	10.2	6.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	53.0	40.6	41.1	21.2	86.8	89.2	26.7	58.2	0.0	78.3	33.9	0.0
LnGrp LOS	D	D	D	C	F	F	C	E		E	C	
Approach Vol, veh/h		510			1312			601			777	
Approach Delay, s/veh		41.2			82.6			51.1			49.1	
Approach LOS		D			F			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.8	47.0	13.3	44.9	11.1	55.7	19.8	38.4
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	7.0	42.0	10.0	46.0	8.0	41.0	17.0	39.0
Max Q Clear Time (g_c+I1), s	2.0	44.0	8.3	16.3	6.3	19.1	14.7	32.3
Green Ext Time (p_c), s	0.0	0.0	0.0	2.3	0.0	2.0	0.1	1.1

Intersection Summary	
HCM 6th Ctrl Delay	62.0
HCM 6th LOS	E

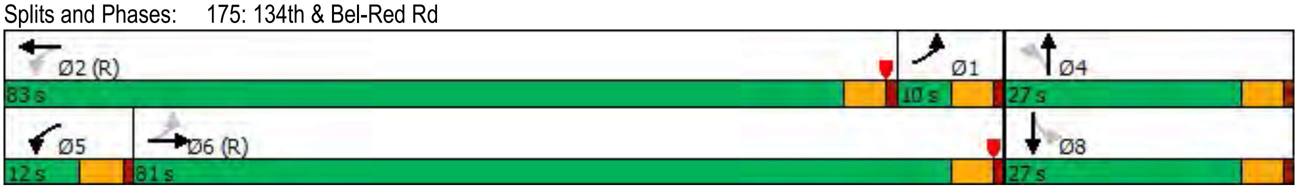
Notes

Unsignalized Delay for [NER, SWR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	50	900	100	1150	15	15	50	50
Future Volume (vph)	50	900	100	1150	15	15	50	50
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases	1	6	5	2		4		8
Permitted Phases	6		2		4		8	
Detector Phase	1	6	5	2	4	4	8	8
Switch Phase								
Minimum Initial (s)	5.0	7.0	5.0	7.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	19.0	10.0	21.0	26.0	26.0	27.0	27.0
Total Split (s)	10.0	81.0	12.0	83.0	27.0	27.0	27.0	27.0
Total Split (%)	8.3%	67.5%	10.0%	69.2%	22.5%	22.5%	22.5%	22.5%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lead	Lead				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	C-Max	None	C-Max	None	None	None	None
Act Effct Green (s)	85.8	85.8	90.6	90.6	11.4	11.4	11.4	11.4
Actuated g/C Ratio	0.72	0.72	0.76	0.76	0.10	0.10	0.10	0.10
v/c Ratio	0.17	0.78	0.39	0.52	0.21	0.31	0.44	0.65
Control Delay	4.9	13.3	9.0	7.5	54.1	24.0	60.8	44.6
Queue Delay	0.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.9	14.8	9.0	7.5	54.1	24.0	60.8	44.6
LOS	A	B	A	A	D	C	E	D
Approach Delay		14.3		7.6		30.4		49.2
Approach LOS		B		A		C		D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 5 (4%), Referenced to phase 2:WBTL and 6:EBTL, Start of Red	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.78	
Intersection Signal Delay: 13.6	Intersection LOS: B
Intersection Capacity Utilization 82.4%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 175: 134th & Bel-Red Rd



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	54	1032	109	1359	16	59	54	136
v/c Ratio	0.17	0.78	0.39	0.52	0.21	0.31	0.44	0.65
Control Delay	4.9	13.3	9.0	7.5	54.1	24.0	60.8	44.6
Queue Delay	0.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.9	14.8	9.0	7.5	54.1	24.0	60.8	44.6
Queue Length 50th (ft)	7	255	20	203	12	12	40	60
Queue Length 95th (ft)	m10	#1006	44	305	34	51	79	122
Internal Link Dist (ft)		600		1977		694		631
Turn Bay Length (ft)	250		300		100		100	
Base Capacity (vph)	318	1317	286	2636	149	328	239	351
Starvation Cap Reductn	0	136	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.87	0.38	0.52	0.11	0.18	0.23	0.39

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	900	50	100	1150	100	15	15	40	50	50	75
Future Volume (veh/h)	50	900	50	100	1150	100	15	15	40	50	50	75
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		1.00	0.99		0.96	0.97		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	54	978	54	109	1250	109	16	16	43	54	54	82
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	402	1241	69	442	2149	187	122	55	149	183	84	128
Arrive On Green	0.19	1.00	1.00	0.04	0.65	0.65	0.13	0.13	0.13	0.13	0.13	0.13
Sat Flow, veh/h	1781	1755	97	1781	3306	288	1236	435	1169	1302	660	1002
Grp Volume(v), veh/h	54	0	1032	109	670	689	16	0	59	54	0	136
Grp Sat Flow(s),veh/h/ln	1781	0	1852	1781	1777	1817	1236	0	1604	1302	0	1662
Q Serve(g_s), s	0.0	0.0	0.0	2.9	25.4	25.6	1.5	0.0	4.0	4.7	0.0	9.3
Cycle Q Clear(g_c), s	0.0	0.0	0.0	2.9	25.4	25.6	10.8	0.0	4.0	8.7	0.0	9.3
Prop In Lane	1.00		0.05	1.00		0.16	1.00		0.73	1.00		0.60
Lane Grp Cap(c), veh/h	402	0	1309	442	1155	1181	122	0	205	183	0	212
V/C Ratio(X)	0.13	0.00	0.79	0.25	0.58	0.58	0.13	0.00	0.29	0.30	0.00	0.64
Avail Cap(c_a), veh/h	402	0	1309	474	1155	1181	191	0	294	255	0	305
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.63	0.00	0.63	0.44	0.44	0.44	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	14.2	0.0	0.0	9.0	11.8	11.8	54.9	0.0	47.4	51.4	0.0	49.7
Incr Delay (d2), s/veh	0.0	0.0	3.1	0.0	0.9	0.9	0.5	0.0	0.8	0.9	0.0	3.2
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	0.7	0.0	1.1	1.1	9.5	9.8	0.5	0.0	1.7	1.6	0.0	4.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.2	0.0	3.1	9.1	12.7	12.8	55.4	0.0	48.2	52.2	0.0	53.0
LnGrp LOS	B	A	A	A	B	B	E	A	D	D	A	D
Approach Vol, veh/h		1086			1468			75			190	
Approach Delay, s/veh		3.7			12.5			49.7			52.8	
Approach LOS		A			B			D			D	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	16.7	83.0		20.3	9.9	89.8		20.3				
Change Period (Y+Rc), s	5.0	5.0		5.0	5.0	5.0		5.0				
Max Green Setting (Gmax), s	5.0	78.0		22.0	7.0	76.0		22.0				
Max Q Clear Time (g_c+I1), s	2.0	27.6		12.8	4.9	2.0		11.3				
Green Ext Time (p_c), s	0.0	13.1		0.2	0.0	12.1		0.6				
Intersection Summary												
HCM 6th Ctrl Delay			12.8									
HCM 6th LOS			B									

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	NE 20th St Eastbound UT	LT	TH	RT	NE 20th St Westbound UT	LT	TH	RT	Bel-Red Rd Northbound UT	LT	TH	RT	Bel-Red Rd Southbound UT	LT	TH	RT	15-min Total	Rolling One Hour
4:00 PM	0	0	1	0	0	2	2	0	0	0	0	6	0	0	4	0	15	0
4:15 PM	0	0	0	0	0	0	2	0	0	0	1	1	0	0	3	1	8	0
4:30 PM	0	0	3	0	0	1	3	0	0	0	0	1	0	0	1	0	9	0
4:45 PM	0	0	2	0	0	1	0	0	0	0	0	1	0	0	2	0	6	38
5:00 PM	**0**	**0**	**2**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**4**	**0**	**9**	32
5:15 PM	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**3**	27
5:30 PM	**0**	**0**	**2**	**0**	**0**	**1**	**2**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**1**	**0**	**8**	26
5:45 PM	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**2**	**0**	**5**	**25**
Count Total	0	0	10	0	0	7	12	0	0	0	2	13	0	0	18	1	63	0
Peak Hour	**0**	**0**	**4**	**0**	**0**	**3**	**5**	**0**	**0**	**0**	**1**	**4**	**0**	**0**	**8**	**0**	**25**	**0**

Two-Hour Count Summaries - Bikes

Interval Start	NE 20th St Eastbound LT	TH	RT	NE 20th St Westbound LT	TH	RT	Bel-Red Rd Northbound LT	TH	RT	Bel-Red Rd Southbound LT	TH	RT	15-min Total	Rolling One Hour
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	1	1	0	0	0	0	2	0
4:45 PM	0	1	0	0	0	0	0	0	0	0	0	0	1	3
5:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	3
5:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	3
5:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	1
5:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Count Total	0	1	0	0	0	0	1	1	0	0	0	0	3	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	NE 24th St Eastbound				NE 24th St Westbound				Bel-Red Rd Northbound				Bel-Red Rd Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	0	4	0	0	1	3	0	0	0	1	1	0	0	4	1	15	0
4:15 PM	0	0	2	0	0	0	5	0	0	0	0	0	0	0	1	0	8	0
4:30 PM	0	1	2	0	0	1	2	1	0	1	0	0	0	0	0	0	8	0
4:45 PM	**0**	**0**	**4**	**0**	**0**	**0**	**8**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**14**	45
5:00 PM	**0**	**0**	**2**	**0**	**0**	**0**	**2**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**8**	38
5:15 PM	**0**	**1**	**3**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**8**	38
5:30 PM	**0**	**0**	**2**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**3**	**0**	**8**	**38**
5:45 PM	0	0	2	0	0	0	0	0	0	0	2	0	0	0	1	0	5	29
Count Total	0	2	21	0	0	2	24	2	0	1	6	1	0	0	14	1	74	0
Peak Hour	**0**	**1**	**11**	**0**	**0**	**0**	**14**	**1**	**0**	**0**	**3**	**0**	**0**	**0**	**8**	**0**	**38**	**0**

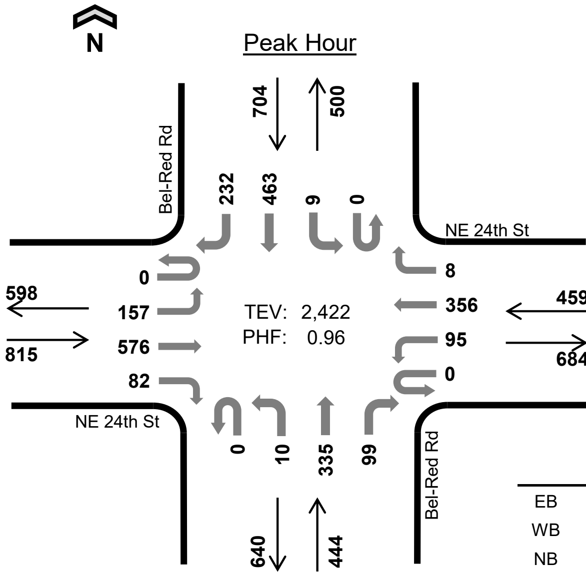
Two-Hour Count Summaries - Bikes

Interval Start	NE 24th St Eastbound			NE 24th St Westbound			Bel-Red Rd Northbound			Bel-Red Rd Southbound			15-min Total	Rolling One Hour
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	1
5:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	1
5:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	1
5:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	0	0	0	0	0	0	0	1	0	0	0	0	1	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	**0**

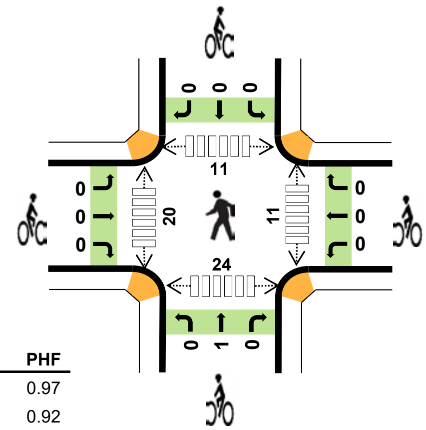
Note: U-Turn volumes for bikes are included in Left-Turn, if any.

Bel-Red Rd
NE 24th St

Date: 06-14-2022
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:45 PM to 5:45 PM



	HV %:	PHF
EB	1.5%	0.97
WB	3.3%	0.92
NB	0.7%	0.91
SB	1.1%	0.87
TOTAL	1.6%	0.96



Two-Hour Count Summaries

Interval Start	NE 24th St Eastbound UT	LT	TH	RT	NE 24th St Westbound UT	LT	TH	RT	Bel-Red Rd Northbound UT	LT	TH	RT	Bel-Red Rd Southbound UT	LT	TH	RT	15-min Total	Rolling One Hour
4:00 PM	0	43	125	15	0	34	111	1	0	4	72	25	0	4	74	7	515	0
4:15 PM	0	29	128	10	0	25	91	1	0	3	74	29	0	4	64	48	506	0
4:30 PM	0	32	135	14	0	14	95	1	0	7	72	22	0	3	68	62	525	0
4:45 PM	**0**	**30**	**139**	**32**	**0**	**27**	**95**	**3**	**0**	**1**	**93**	**28**	**0**	**2**	**87**	**48**	**585**	2,131
5:00 PM	**0**	**41**	**144**	**15**	**0**	**23**	**95**	**3**	**0**	**3**	**82**	**26**	**0**	**3**	**133**	**64**	**632**	2,248
5:15 PM	**0**	**42**	**144**	**18**	**0**	**21**	**80**	**1**	**0**	**3**	**80**	**18**	**0**	**4**	**144**	**55**	**610**	2,352
5:30 PM	**0**	**44**	**149**	**17**	**0**	**24**	**86**	**1**	**0**	**3**	**80**	**27**	**0**	**0**	**99**	**65**	**595**	**2,422**
5:45 PM	0	28	145	18	0	21	78	2	0	6	84	26	0	1	110	40	559	2,396
Count Total	0	289	1,109	139	0	189	731	13	0	30	637	201	0	21	779	389	4,527	0
Peak Hour All	**0**	**157**	**576**	**82**	**0**	**95**	**356**	**8**	**0**	**10**	**335**	**99**	**0**	**9**	**463**	**232**	**2,422**	**0**
Peak Hour HV	**0**	**1**	**11**	**0**	**0**	**0**	**14**	**1**	**0**	**0**	**3**	**0**	**0**	**0**	**8**	**0**	**38**	**0**
Peak Hour HV%	**-**	**1%**	**2%**	**0%**	**-**	**0%**	**4%**	**13%**	**-**	**0%**	**1%**	**0%**	**-**	**0%**	**2%**	**0%**	**2%**	**0**

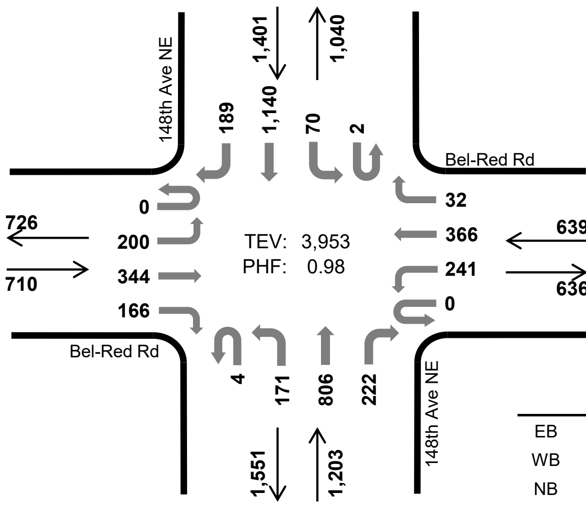
Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

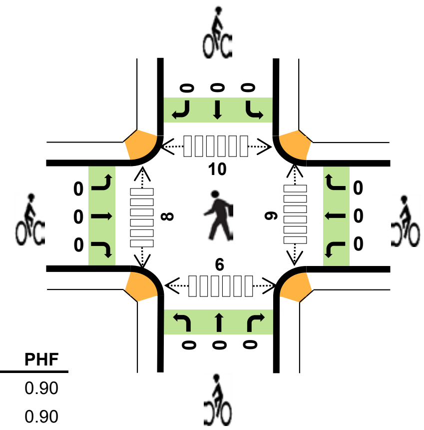
Interval Start	Heavy Vehicle Totals EB	WB	NB	SB	Total	Bicycles EB	WB	NB	SB	Total	Pedestrians (Crossing Leg) East	West	North	South	Total
4:00 PM	4	4	2	5	*15*	0	0	0	0	*0*	3	9	2	9	*23*
4:15 PM	2	5	0	1	*8*	0	0	0	0	*0*	2	2	6	3	*13*
4:30 PM	3	4	1	0	*8*	0	0	0	0	*0*	2	7	2	10	*21*
4:45 PM	**4**	**8**	**1**	**1**	***14***	**0**	**0**	**1**	**0**	***1***	**5**	**7**	**4**	**10**	*26*
5:00 PM	**2**	**3**	**0**	**3**	***8***	**0**	**0**	**0**	**0**	***0***	**1**	**2**	**2**	**4**	*9*
5:15 PM	**4**	**2**	**1**	**1**	***8***	**0**	**0**	**0**	**0**	***0***	**2**	**3**	**3**	**5**	*13*
5:30 PM	**2**	**2**	**1**	**3**	***8***	**0**	**0**	**0**	**0**	***0***	**3**	**8**	**2**	**5**	*18*
5:45 PM	2	0	2	1	*5*	0	0	0	0	*0*	7	5	11	5	*28*
Count Total	23	28	8	15	*74*	0	0	1	0	*1*	25	43	32	51	*151*
Peak Hour	**12**	**15**	**3**	**8**	***38***	**0**	**0**	**1**	**0**	***1***	**11**	**20**	**11**	**24**	***66***

148th Ave NE
Bel-Red Rd

Date: 10/19/2021
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:30 PM to 5:30 PM

Peak Hour





	HV %:	PHF
EB	1.4%	0.90
WB	1.6%	0.90
NB	1.7%	0.91
SB	0.8%	0.92
TOTAL	1.3%	0.98

Two-Hour Count Summaries

Interval Start	Bel-Red Rd Eastbound				Bel-Red Rd Westbound				148th Ave NE Northbound				148th Ave NE Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	60	71	30	0	64	86	19	0	39	177	49	0	14	257	51	917	0
4:15 PM	0	47	82	27	0	58	85	8	0	32	216	58	1	15	297	34	960	0
4:30 PM	**0**	**49**	**81**	**40**	**0**	**61**	**72**	**9**	**1**	**40**	**194**	**55**	**0**	**16**	**319**	**47**	**984**	0
4:45 PM	**0**	**50**	**88**	**36**	**0**	**57**	**93**	**6**	**1**	**38**	**194**	**47**	**1**	**10**	**316**	**45**	**982**	3,843
5:00 PM	**0**	**49**	**78**	**42**	**0**	**62**	**108**	**7**	**1**	**47**	**203**	**52**	**0**	**23**	**255**	**49**	**976**	3,902
5:15 PM	**0**	**52**	**97**	**48**	**0**	**61**	**93**	**10**	**1**	**46**	**215**	**68**	**1**	**21**	**250**	**48**	**1,011**	**3,953**
5:30 PM	0	50	86	41	0	43	75	6	0	36	192	59	3	21	293	47	952	3,921
5:45 PM	0	52	98	21	0	59	81	10	1	39	190	57	2	9	229	60	908	3,847
Count Total	0	409	681	285	0	465	693	75	5	317	1,581	445	8	129	2,216	381	7,690	0
Peak Hour All	**0**	**200**	**344**	**166**	**0**	**241**	**366**	**32**	**4**	**171**	**806**	**222**	**2**	**70**	**1,140**	**189**	**3,953**	**0**
Peak Hour HV	**0**	**4**	**4**	**2**	**0**	**2**	**7**	**1**	**0**	**2**	**14**	**5**	**0**	**1**	**9**	**1**	**52**	**0**
Peak Hour HV%	**-**	**2%**	**1%**	**1%**	**-**	**1%**	**2%**	**3%**	**0%**	**1%**	**2%**	**2%**	**0%**	**1%**	**1%**	**1%**	**1%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	4	6	2	5	*17*	0	0	0	0	*0*	0	1	3	0	*4*
4:15 PM	1	6	4	7	*18*	0	0	0	0	*0*	2	4	5	0	*11*
4:30 PM	**1**	**5**	**8**	**4**	***18***	**0**	**0**	**0**	**0**	***0***	**2**	**4**	**2**	**2**	*10*
4:45 PM	**3**	**4**	**5**	**1**	***13***	**0**	**0**	**0**	**0**	***0***	**2**	**2**	**4**	**1**	*9*
5:00 PM	**5**	**0**	**3**	**3**	***11***	**0**	**0**	**0**	**0**	***0***	**3**	**0**	**3**	**1**	*7*
5:15 PM	**1**	**1**	**5**	**3**	***10***	**0**	**0**	**0**	**0**	***0***	**2**	**2**	**1**	**2**	***7***
5:30 PM	0	1	6	3	*10*	0	0	0	0	*0*	1	2	4	3	*10*
5:45 PM	1	1	3	1	*6*	0	0	0	0	*0*	1	0	0	4	*5*
Count Total	16	24	36	27	*103*	0	0	0	0	*0*	13	15	22	13	*63*
Peak Hour	**10**	**10**	**21**	**11**	***52***	**0**	**0**	**0**	**0**	***0***	**9**	**8**	**10**	**6**	***33***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	Bel-Red Rd				Bel-Red Rd				156th Ave NE				156th Ave NE				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	0	0	0	0	0	1	0	0	0	7	0	0	0	3	2	13	0
4:15 PM	0	0	1	0	0	0	2	0	0	0	3	0	0	0	4	1	11	0
4:30 PM	0	0	2	0	0	2	0	0	0	0	5	0	0	0	3	0	12	0
4:45 PM	0	1	0	0	0	0	0	0	0	0	3	0	0	0	5	2	11	47
5:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**4**	**1**	**8**	42
5:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	**1**	**0**	**0**	**3**	**1**	**9**	40
5:30 PM	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**2**	**1**	**0**	**0**	**3**	**0**	**7**	35
5:45 PM	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**1**	**0**	**0**	**3**	**1**	**11**	**35**
Count Total	0	1	3	1	0	3	4	0	0	0	31	3	0	0	28	8	82	0
Peak Hour	**0**	**0**	**0**	**1**	**0**	**1**	**1**	**0**	**0**	**0**	**13**	**3**	**0**	**0**	**13**	**3**	**35**	**0**

Two-Hour Count Summaries - Bikes

Interval Start	Bel-Red Rd			Bel-Red Rd			156th Ave NE			156th Ave NE			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:00 PM	0	0	0	0	0	0	0	0	0	0	1	0	1	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	1	0	1	2
5:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**1**	2
5:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**2**	4
5:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**2**	6
5:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	**6**
Count Total	0	0	0	0	0	0	0	1	0	0	7	0	8	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**5**	**0**	**6**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	Bel-Red Rd				Bel-Red Rd				148th Ave NE				148th Ave NE				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	0	2	2	0	0	5	1	0	0	1	1	0	1	3	1	17	0
4:15 PM	0	0	1	0	0	1	5	0	0	2	2	0	0	0	6	1	18	0
4:30 PM	**0**	**0**	**0**	**1**	**0**	**1**	**3**	**1**	**0**	**1**	**5**	**2**	**0**	**1**	**3**	**0**	**18**	0
4:45 PM	**0**	**2**	**1**	**0**	**0**	**1**	**3**	**0**	**0**	**1**	**3**	**1**	**0**	**0**	**1**	**0**	**13**	66
5:00 PM	**0**	**2**	**2**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**2**	**1**	**11**	60
5:15 PM	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**3**	**2**	**0**	**0**	**3**	**0**	**10**	**52**
5:30 PM	0	0	0	0	0	0	1	0	0	0	6	0	0	0	3	0	10	44
5:45 PM	0	0	1	0	0	0	1	0	0	0	3	0	0	0	1	0	6	37
Count Total	0	4	8	4	0	3	19	2	0	4	26	6	0	2	22	3	103	0
Peak Hour	**0**	**4**	**4**	**2**	**0**	**2**	**7**	**1**	**0**	**2**	**14**	**5**	**0**	**1**	**9**	**1**	**52**	**0**

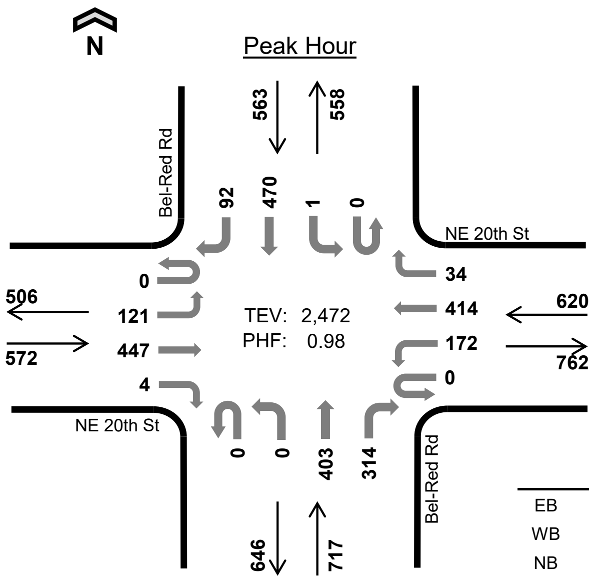
Two-Hour Count Summaries - Bikes

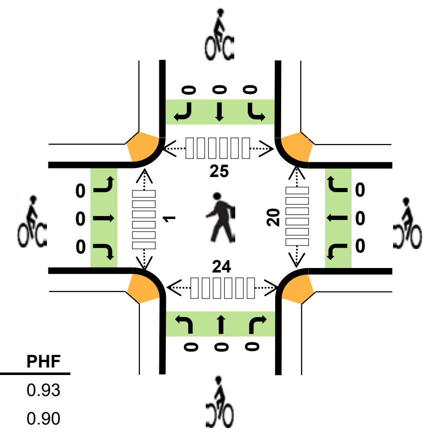
Interval Start	Bel-Red Rd			Bel-Red Rd			148th Ave NE			148th Ave NE			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
4:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
5:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
5:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

Bel-Red Rd
NE 20th St

Date: 06/16/2022
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 5:00 PM to 6:00 PM





	HV %:	PHF
EB	0.7%	0.93
WB	1.3%	0.90
NB	0.7%	0.96
SB	1.4%	0.94
TOTAL	1.0%	0.98

Two-Hour Count Summaries

Interval Start		NE 20th St				NE 20th St				Bel-Red Rd				Bel-Red Rd				15-min Total	Rolling One Hour
		Eastbound				Westbound				Northbound				Southbound					
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM		0	23	105	1	0	43	95	9	0	0	76	81	0	0	72	20	525	0
4:15 PM		0	28	103	0	0	48	75	7	0	0	83	59	0	0	124	28	555	0
4:30 PM		0	27	113	0	0	38	102	5	0	0	98	60	0	0	76	29	548	0
4:45 PM		0	19	110	0	0	35	92	11	0	0	77	73	0	0	113	36	566	2,194
5:00 PM		**0**	**28**	**107**	**3**	**0**	**37**	**100**	**8**	**0**	**0**	**115**	**65**	**0**	**0**	**118**	**32**	**613**	2,282
5:15 PM		**0**	**22**	**112**	**0**	**0**	**46**	**93**	**11**	**0**	**0**	**100**	**87**	**0**	**0**	**113**	**28**	**612**	2,339
5:30 PM		**0**	**30**	**123**	**1**	**0**	**42**	**119**	**11**	**0**	**0**	**89**	**80**	**0**	**1**	**118**	**16**	**630**	2,421
5:45 PM		**0**	**41**	**105**	**0**	**0**	**47**	**102**	**4**	**0**	**0**	**99**	**82**	**0**	**0**	**121**	**16**	**617**	**2,472**
Count Total		0	218	878	5	0	336	778	66	0	0	737	587	0	1	855	205	4,666	0
Peak Hour	**All**	**0**	**121**	**447**	**4**	**0**	**172**	**414**	**34**	**0**	**0**	**403**	**314**	**0**	**1**	**470**	**92**	**2,472**	**0**
	HV	**0**	**0**	**4**	**0**	**0**	**3**	**5**	**0**	**0**	**0**	**1**	**4**	**0**	**0**	**8**	**0**	**25**	**0**
	HV%	**-**	**0%**	**1%**	**0%**	**-**	**2%**	**1%**	**0%**	**-**	**-**	**0%**	**1%**	**-**	**0%**	**2%**	**0%**	**1%**	**0**

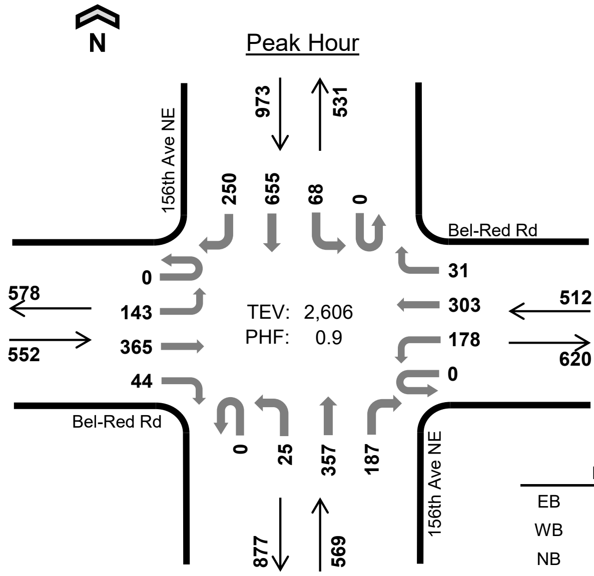
Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

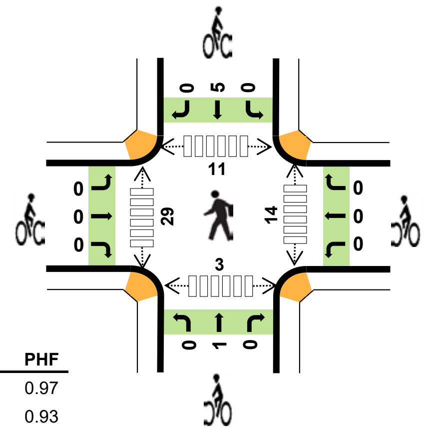
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	1	4	6	4	*15*	0	0	0	0	*0*	5	1	6	3	*15*
4:15 PM	0	2	2	4	*8*	0	0	0	0	*0*	4	0	5	6	*15*
4:30 PM	3	4	1	1	*9*	0	0	2	0	*2*	2	0	7	8	*17*
4:45 PM	2	1	1	2	*6*	1	0	0	0	*1*	4	0	13	8	*25*
5:00 PM	**2**	**1**	**2**	**4**	***9***	**0**	**0**	**0**	**0**	***0***	**1**	**0**	**5**	**2**	*8*
5:15 PM	**0**	**2**	**0**	**1**	***3***	**0**	**0**	**0**	**0**	***0***	**8**	**1**	**10**	**6**	*25*
5:30 PM	**2**	**3**	**2**	**1**	***8***	**0**	**0**	**0**	**0**	***0***	**4**	**0**	**5**	**5**	*14*
5:45 PM	**0**	**2**	**1**	**2**	***5***	**0**	**0**	**0**	**0**	***0***	**7**	**0**	**5**	**11**	*23*
Count Total	10	19	15	19	*63*	1	0	2	0	*3*	35	2	56	49	*142*
Peak Hour	**4**	**8**	**5**	**8**	***25***	**0**	**0**	**0**	**0**	***0***	**20**	**1**	**25**	**24**	***70***

project.manager.wa@idaxdata.com

156th Ave NE
Bel-Red Rd

Date: 06/16/2022
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 5:00 PM to 6:00 PM





	HV %:	PHF
EB	0.2%	0.97
WB	0.4%	0.93
NB	2.8%	0.89
SB	1.6%	0.83
TOTAL	1.3%	0.90

Two-Hour Count Summaries

Interval Start		Bel-Red Rd Eastbound				Bel-Red Rd Westbound				156th Ave NE Northbound				156th Ave NE Southbound				15-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM		0	26	66	12	0	41	73	3	0	8	76	46	0	8	136	43	538	0
4:15 PM		0	25	77	7	0	37	75	7	0	6	69	27	0	13	148	63	554	0
4:30 PM		0	41	86	13	0	47	64	5	0	7	80	40	0	6	127	46	562	0
4:45 PM		0	37	78	12	0	40	67	4	0	5	81	46	0	5	137	82	594	2,248
5:00 PM		**0**	**33**	**94**	**14**	**0**	**44**	**84**	**10**	**0**	**7**	**83**	**39**	**0**	**19**	**156**	**54**	**637**	2,347
5:15 PM		**0**	**31**	**88**	**12**	**0**	**58**	**74**	**5**	**0**	**6**	**94**	**60**	**0**	**13**	**201**	**79**	**721**	2,514
5:30 PM		**0**	**46**	**87**	**9**	**0**	**39**	**90**	**6**	**0**	**4**	**76**	**45**	**0**	**19**	**161**	**57**	**639**	2,591
5:45 PM		**0**	**33**	**96**	**9**	**0**	**37**	**55**	**10**	**0**	**8**	**104**	**43**	**0**	**17**	**137**	**60**	**609**	**2,606**
Count Total		0	272	672	88	0	343	582	50	0	51	663	346	0	100	1,203	484	4,854	0
Peak Hour	All	0	143	365	44	0	178	303	31	0	25	357	187	0	68	655	250	2,606	0
	HV	0	0	0	1	0	1	1	0	0	0	13	3	0	0	13	3	35	0
	HV%	-	0%	0%	2%	-	1%	0%	0%	-	0%	4%	2%	-	0%	2%	1%	1%	0

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	0	1	7	5	*13*	0	0	0	1	*1*	3	6	2	1	*12*
4:15 PM	1	2	3	5	*11*	0	0	0	0	*0*	6	3	3	0	*12*
4:30 PM	2	2	5	3	*12*	0	0	0	0	*0*	2	4	1	2	*9*
4:45 PM	1	0	3	7	*11*	0	0	0	1	*1*	5	5	4	0	*14*
5:00 PM	**0**	**1**	**2**	**5**	***8***	**0**	**0**	**0**	**1**	***1***	**3**	**10**	**1**	**2**	*16*
5:15 PM	**0**	**0**	**5**	**4**	***9***	**0**	**0**	**0**	**2**	***2***	**1**	**8**	**0**	**0**	*9*
5:30 PM	**0**	**1**	**3**	**3**	***7***	**0**	**0**	**0**	**2**	***2***	**7**	**3**	**6**	**0**	*16*
5:45 PM	**1**	**0**	**6**	**4**	***11***	**0**	**0**	**1**	**0**	***1***	**3**	**8**	**4**	**1**	*16*
Count Total	5	7	34	36	*82*	0	0	1	7	*8*	30	47	21	6	*104*
Peak Hour	**1**	**2**	**16**	**16**	***35***	**0**	**0**	**1**	**5**	***6***	**14**	**29**	**11**	**3**	***57***

Bike Bellevue - Corridor 5 (Bel-Red Rd - 132nd to 148th Ave NE)

City of Bellevue Transportation Department

Estimate - 8/29/2023

Planning Level Estimate

Item No.	Section No.	Item	Quantity	Unit	Unit Cost	Total Cost
1	1-09	Mobilization	1	LS	$90,000	$90,000
2	1-10	Traffic Control Supervisor	1	LS	$45,000	$45,000
3	1-10	Other Temporary Traffic Control	1	LS	$45,000	$45,000
4	2-02	Sawcut	1194	LF	$10	$11,940
5	2-02	Removing Cement Conc. C-Curb and Curb and Gutter	848	LF	$10	$8,480
6	2-02	Removing Raised Concrete Median	810	SF	$5	$4,050
7	4-04	Crushed Surfacing Top Course	34	TON	$80	$2,693
8	5-04	HMA Cl 1/2" PG 58H-22	31	TON	$220	$6,820
9	8-02	Removing Raised Pavement Marker	6832	LF	$3	$20,496
10	8-09	Raised Pavement Marker, Type 1	24	HUND	$1,000	$24,000
11	8-09	Raised Pavement Marker, Type 2	5	HUND	$1,500	$7,500
12	8-20	Traffic Signal System Modfications Complete - 148 Ave NE & Bel-Red Rd	1	LS	$80,000	$80,000
13	8-20	Traffic Signal System Modfications Complete - Highland MS & Bel-Red Rd	1	LS	$20,000	$20,000
14	8-20	Traffic Signal System Modfications Complete - NE 20 & Bel-Red Rd	1	LS	$20,000	$20,000
15	8-20	Traffic Signal System Modfications Complete - NE 24 & Bel-Red Rd	1	LS	$20,000	$20,000
16	8-20	Induction Loop Detector	37	EA	$1,500	$55,500
17	8-20	Video Detection (TrafiSense Camera)	8	EA	$6,000	$48,000
18	8-21	Permanent Signing	16	EA	$1,000	$16,000
19	8-22	Removing Plastic Line	632	LF	$5	$3,160
20	8-22	Removing Plastic Traffic Marking	22	EA	$200	$4,400
21	8-22	Paint Line, White, 6 Inch	7970	LF	$2	$15,939
22	8-22	Plastic Line, 6 Inch	842	LF	$8	$6,311
23	8-22	Green Bicycle Lane Treatment	12894	SF	$25	$322,358
24	8-22	Plastic Stop Line	222	LF	$15	$3,330
25	8-22	Plastic Crosswalk Line	3140	SF	$20	$62,800
26	8-22	Plastic Traffic Arrow	36	EA	$350	$12,600
27	8-22	Plastic Bicycle Lane Symbol	36	EA	$385	$13,860
28	8-22	Signal Induction Loop Marker	7	EA	$350	$2,450
29	8-22	C-Curb	1194	LF	$80	$95,520
30	8-22	Raised Concrete Median	451	SF	$25	$11,275
					SubTotal	**$1,079,482**

+ 10% Prelim. Design Contingency	**$**	**107,948.16**
+10% Construction Management	**$**	**107,948.16**
+ 10% Contingency	**$**	**107,948.16**
Construction Total	**$**	**1,403,326.07**
Design & Permitting Total (15% of Construction)	**$**	**210,498.91**

Project Total (Design + Construction) $ 1,613,824.98

Preliminary cost estimates to be finalized and determined by City, this range is an approximation completed in 2023.

Corridor 6

CITY OF BELLEVUE
TRANSPORTATION DEPARTMENT

BIKE BELLEVUE
NE 1ST ST / NE 2ND ST CORRIDOR

CITY MANAGER
BRAD MIYAKE

MAYOR
LYNNE ROBINSON

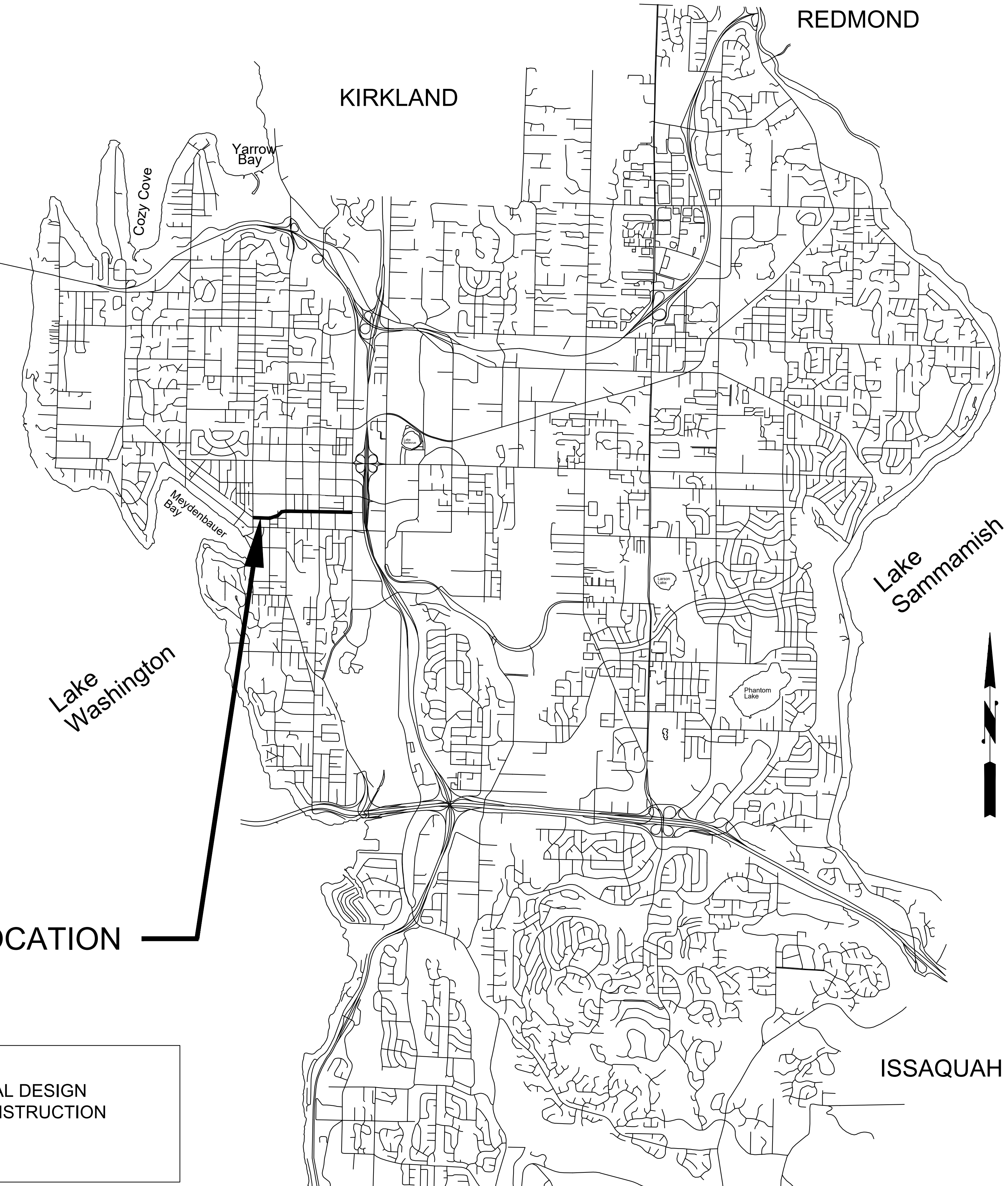
DIRECTOR OF TRANSPORTATION
ANDREW SINGELAKIS

DEPUTY MAYOR
JARED NIEUWENHUIS

CITY COUNCIL
JEREMY BARKSDALE
CONRAD LEE
JENNIFER ROBERTSON
JOHN STOKES
JANICE ZAHN

SCHEDULE OF DRAWINGS

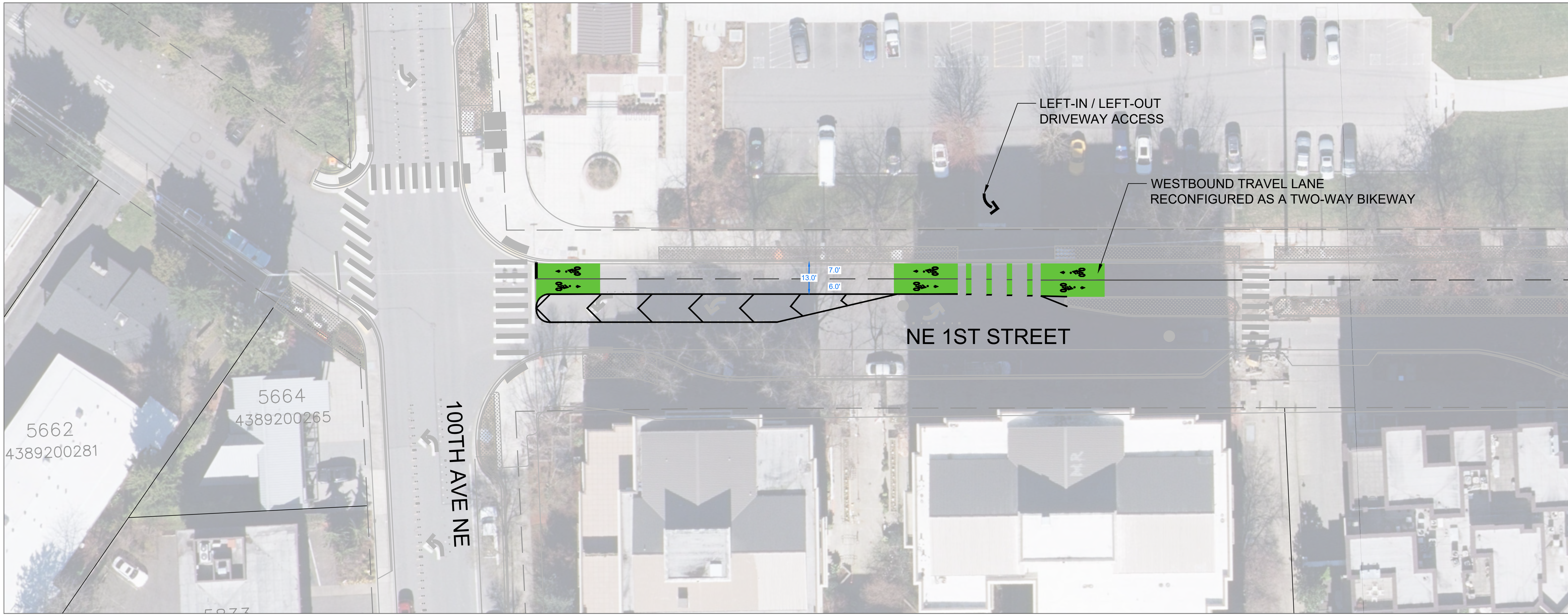
SHEET	DRAWINGS
1	COVER SHEET
2A-9A	ROADWAY PLANS



CONCEPTUAL DESIGN
NOT FOR CONSTRUCTION

Design to be coordinated with BOSA Park and Main St

C.I.P. NUMBER xxxxxx



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NO.	DATE	BY	APPR.	REVISIONS

KP 6/14/21
DESIGNED BY DATE
KP 6/14/21
DRAWN BY DATE
CHECKED BY DATE

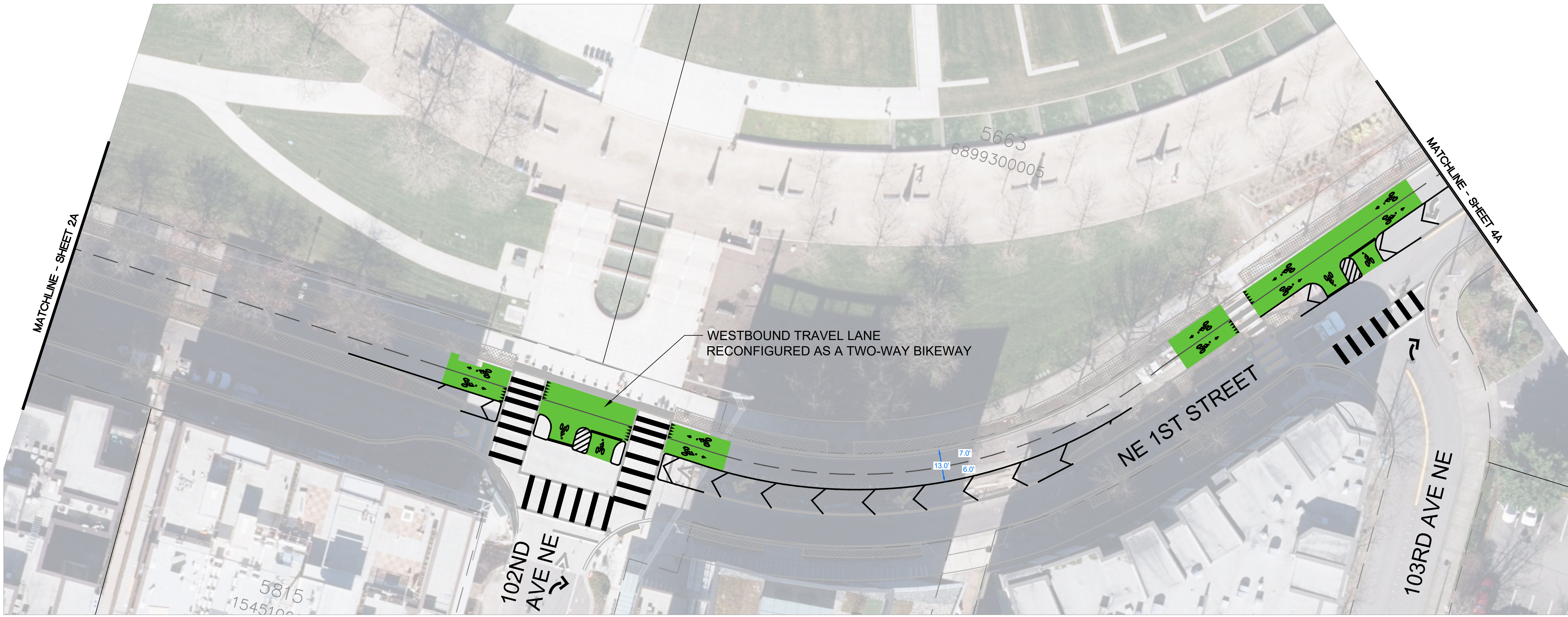
City of Bellevue
Transportation Department

PRELIMINARY DESIGN

BIKE BELLEVUE
NE 1ST STREET / NE 2ND STREET CORRIDOR

CONCEPTUAL PLAN

SHT 2A OF 9



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DESIGNED BY DATE
KP 6/14/21
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CHECKED BY DATE

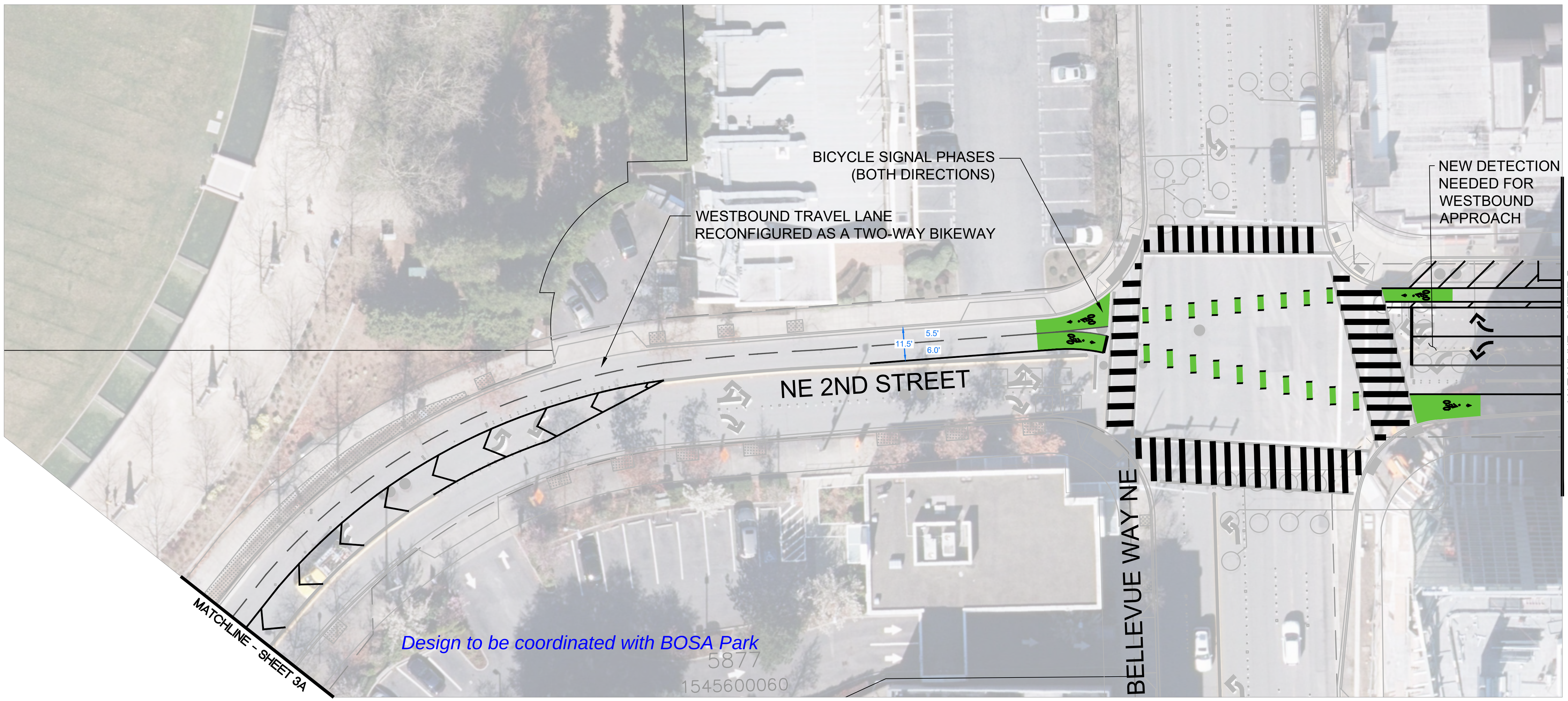
City of Bellevue
Transportation Department

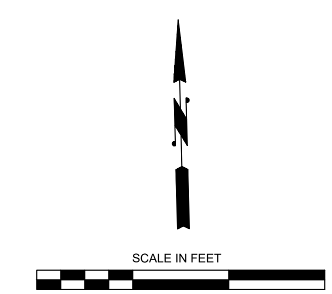
PRELIMINARY DESIGN

BIKE BELLEVUE
NE 1ST STREET / NE 2ND STREET CORRIDOR

CONCEPTUAL PLAN

SHT 3A OF 9





NO.	DATE	BY	APPR.	REVISIONS

KP 6/14/21
DESIGNED BY DATE
KP 6/14/21
DRAWN BY DATE
\- -
CHECKED BY DATE

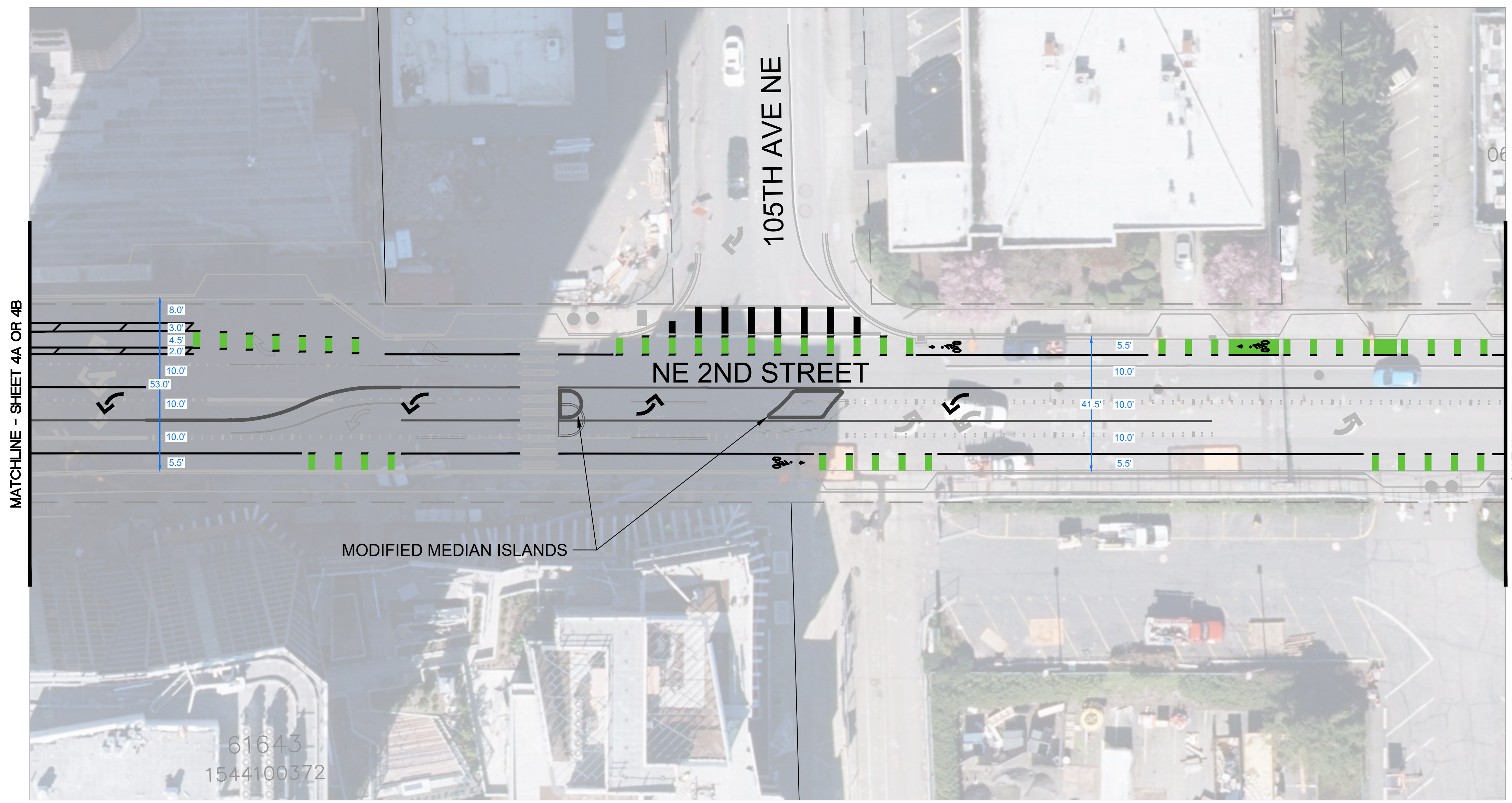
City of Bellevue
Transportation Department

PRELIMINARY DESIGN

BIKE BELLEVUE
NE 1ST STREET / NE 2ND STREET CORRIDOR

CONCEPTUAL PLAN

SHT 4A OF 9



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KP 6/14/21
DESIGNED BY DATE
KP 6/14/21
DRAWN BY DATE
CHECKED BY DATE

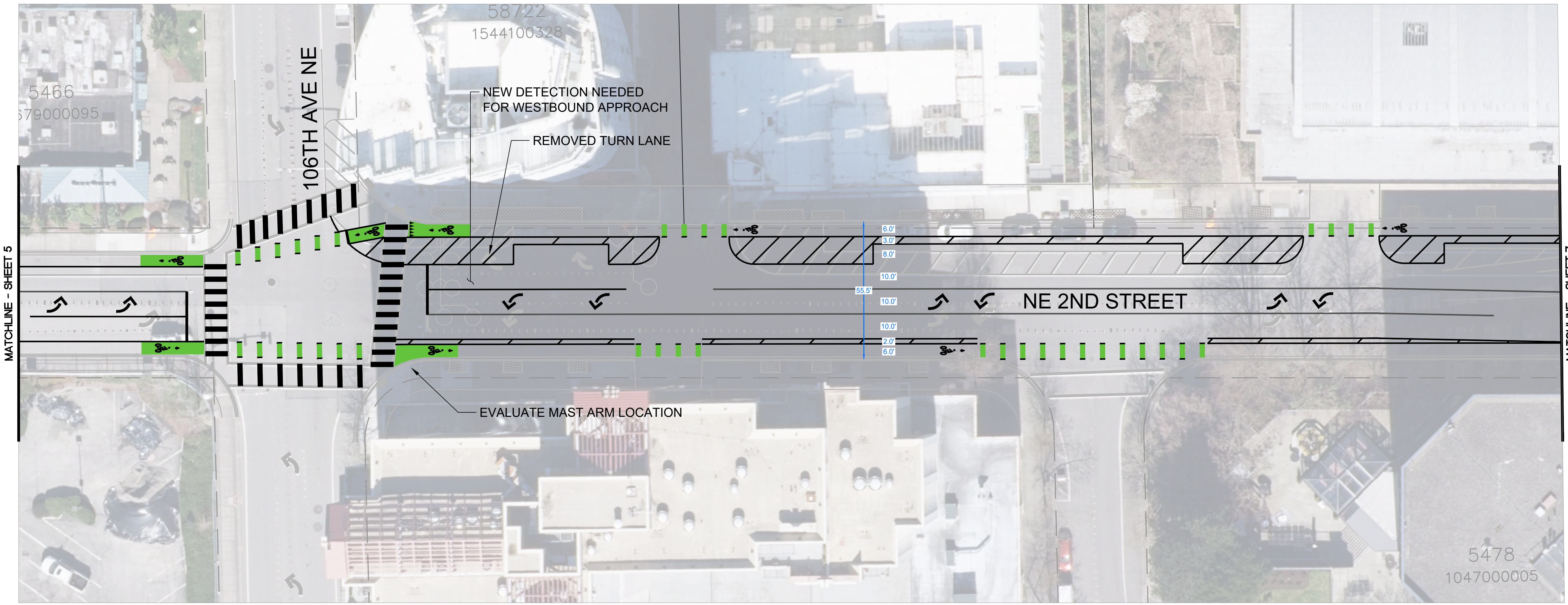
City of Bellevue
Transportation Department

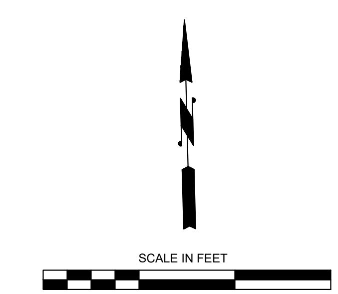
PRELIMINARY DESIGN

BIKE BELLEVUE
NE 1ST STREET / NE 2ND STREET CORRIDOR

CONCEPTUAL PLAN

SHT 5 OF 9





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NO.	DATE	BY	APPR.	REVISIONS

KP 6/14/21
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KP 6/14/21
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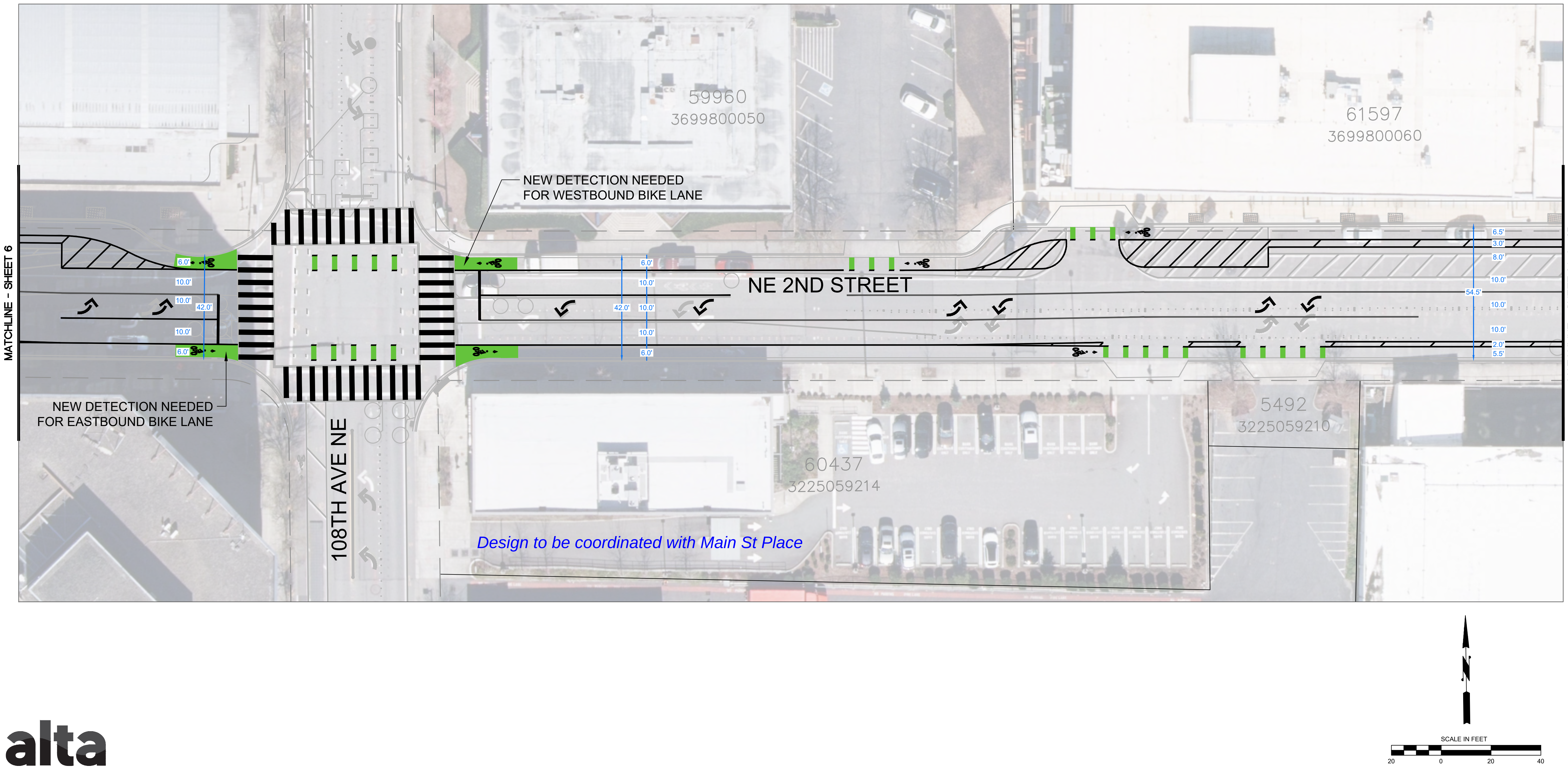
City of Bellevue
Transportation Department

PRELIMINARY DESIGN

BIKE BELLEVUE
NE 1ST STREET / NE 2ND STREET CORRIDOR

CONCEPTUAL PLAN

SHT 6 OF 9



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NO.	DATE	BY	APPR.	REVISIONS

KP 6/14/21
DESIGNED BY DATE
KP 6/14/21
DRAWN BY DATE
CHECKED BY DATE

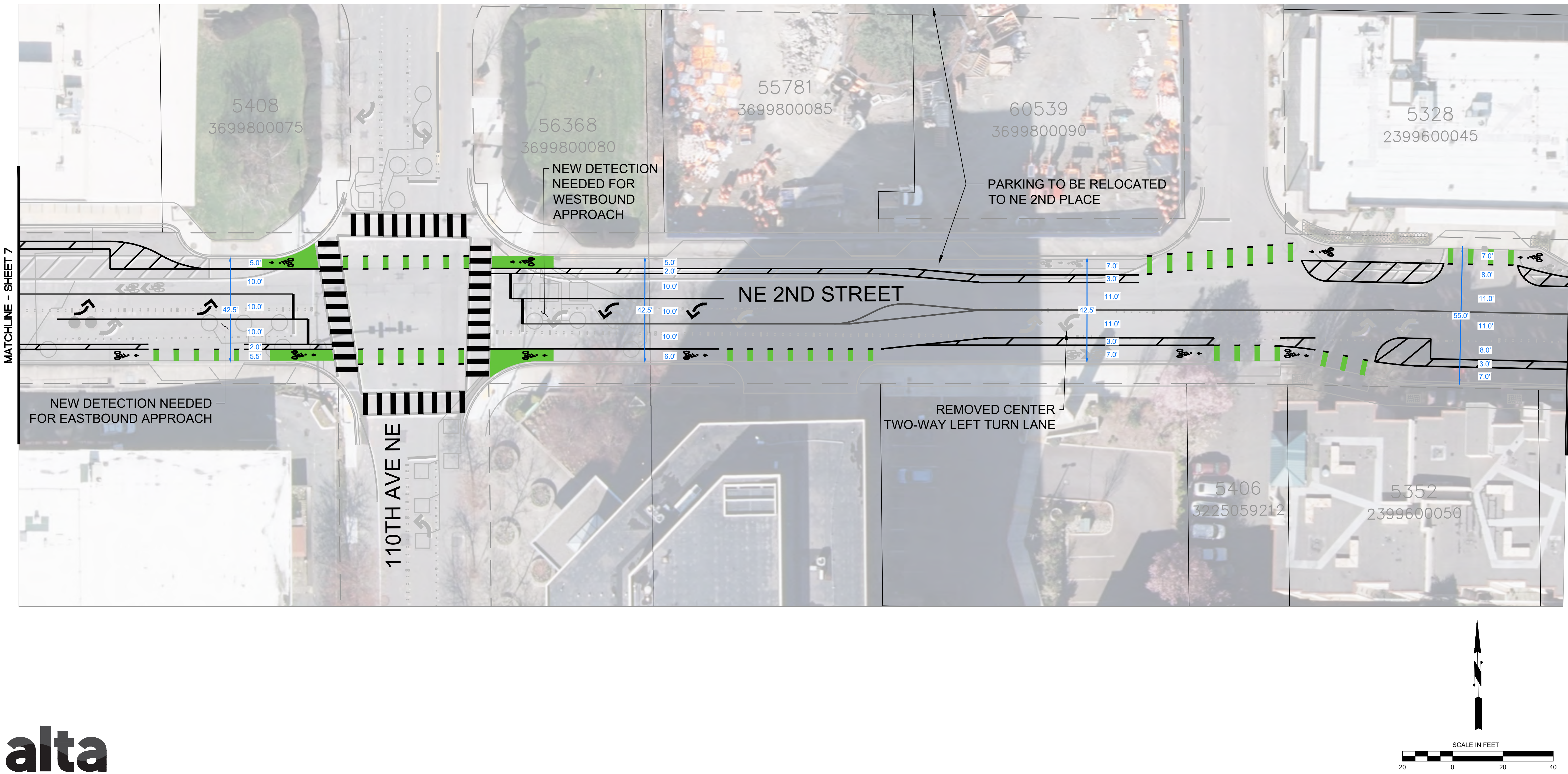
City of Bellevue
Transportation Department

PRELIMINARY DESIGN

BIKE BELLEVUE
NE 1ST STREET / NE 2ND STREET CORRIDOR

CONCEPTUAL PLAN

SHT 7 OF 9



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NO.	DATE	BY	APPR.	REVISIONS

KP 6/14/21
DESIGNED BY DATE
KP 6/14/21
DRAWN BY DATE
CHECKED BY DATE

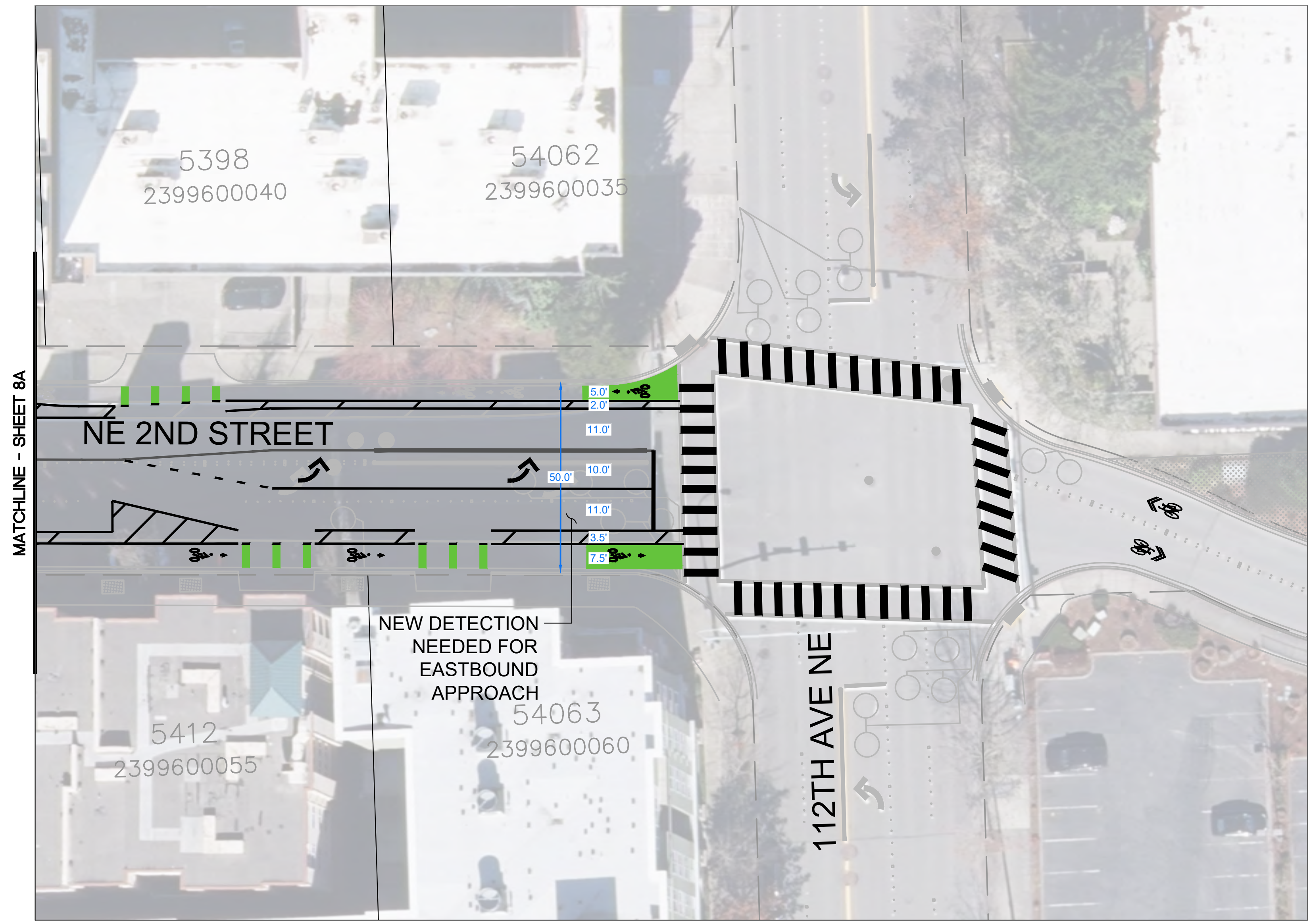
City of Bellevue
Transportation Department

PRELIMINARY DESIGN

BIKE BELLEVUE
NE 1ST STREET / NE 2ND STREET CORRIDOR

CONCEPTUAL PLAN

SHT 8A OF 9



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DESIGNED BY DATE
KP 6/14/21
DRAWN BY DATE
- -
CHECKED BY DATE

City of Bellevue
Transportation Department

PRELIMINARY DESIGN

BIKE BELLEVUE
NE 1ST STREET / NE 2ND STREET CORRIDOR

CONCEPTUAL PLAN

SHT 9A OF 9

Bike Bellevue - Corridor 6 (NE 1st Street/NE 2nd Street - Bellevue Way NE to 110th Ave NE)

City of Bellevue Transportation Department

Estimate - 8/29/2023

Planning Level Estimate

Item No.	Sect. No.	Item	Quantity	Unit	Unit Cost	Total Cost
1	1-09	Mobilization	1	LS	$68,300	$68,300
2	1-10	Traffic Control Supervisor	1	LS	$34,124	$34,124
3	1-10	Other Temporary Traffic Control	1	LS	$34,124	$34,124
4	2-02	Sawcut	150	LF	$10	$1,500
5	2-02	Removing Asphalt Concrete Pavement	48	SY	$25	$1,200
6	2-02	Removing Cement Conc. Pavement	24	SY	$40	$960
7	2-02	Removing Cement Conc. Curb and Gutter	93	LF	$20	$1,860
8	4-04	Crushed Surfacing Top Course	12	TON	$80	$960
9	5-04	HMA Cl 1/2" PG 58H-22	11	TON	$220	$2,420
10	5-05	Cement Concrete Pavement	22	SY	$150	$3,300
11	8-04	Cement Conc. Traffic Curb and Gutter	84	LF	$80	$6,720
12	8-14	Detectable Warning Surface	2	EA	$500	$1,000
13	8-09	Raised Pavement Marker, Type 1	19	HUND	$1,000	$19,000
14	8-09	Raised Pavement Marker, Type 2	4	HUND	$1,500	$6,000
15	8-02	Removing Raised Pavement Marker	3783	LF	$3	$11,349
16	8-02	Traffic Signal Modifications Complete - Bell Way and NE 2nd	1	LS	$30,000	$30,000
17	8-20	Bicycle Signal Head	2	EA	$1,200	$2,400
18	8-20	Blank-Out Sign	2	EA	$5,000	$10,000
19	8-20	Video Detection (TrafiSense Camera)	10	EA	$6,000	$60,000
20	8-20	Induction Loop Detector	35	EA	$1,500	$52,500
21	8-21	Permanent Signing	1	LS	$35,000	$35,000
22	8-22	Removing Paint Line	3632	LF	$3	$10,896
23	8-22	Removing Plastic Line	1441	LF	$5	$7,205
24	8-22	Removing Plastic Traffic Marking	57	EA	$200	$11,400
25	8-22	Removing C-Curb	79	LF	$10	$790
26	8-22	Paint Line, White, 6 Inch	3900	LF	$2	$7,800
27	8-22	Plastic Line, 6 Inch	6680	LF	$8	$50,100
28	8-22	Green Bicycle Lane Treatment	8389	SF	$25	$209,725
29	8-22	C-Curb	153	LF	$80	$12,240
30	8-22	Plastic Crosswalk Line	5148	SF	$20	$102,950
31	8-22	Plastic Stop Line	220	LF	$15	$3,300
32	8-22	Plastic Traffic Arrow	29	EA	$350	$10,150
33	8-22	Plastic Bicycle Lane Symbol	56	EA	$385	$21,560
34	8-22	Bicycle Shared Lane Marking	2	EA	$385	$770
35	8-22	Signal Induction Loop Marker	21	EA	$350	$7,350
					SubTotal $	**838,953.50**

+ 10% Prelim. Design Contingency	**$**	**83,895.35**
+10% Construction Management	**$**	**83,895.35**
+ 10% Contingency	**$**	**83,895.35**
Construction Total	**$**	**1,090,639.55**
Design & Permitting Total (15% of Construction)	**$**	**163,595.93**
Project Total (Design + Construction)	**$**	**1,254,235.48**

Preliminary cost estimates to be finalized and determined by City, this range is an approximation completed in 2023.

Corridor 7

CITY OF BELLEVUE
TRANSPORTATION DEPARTMENT

BIKE BELLEVUE
LAKE WASHINGTON BLVD CORRIDOR
(99TH AVE SE TO 100TH AVE NE)

CITY MANAGER
BRAD MIYAKE

MAYOR
LYNNE ROBINSON

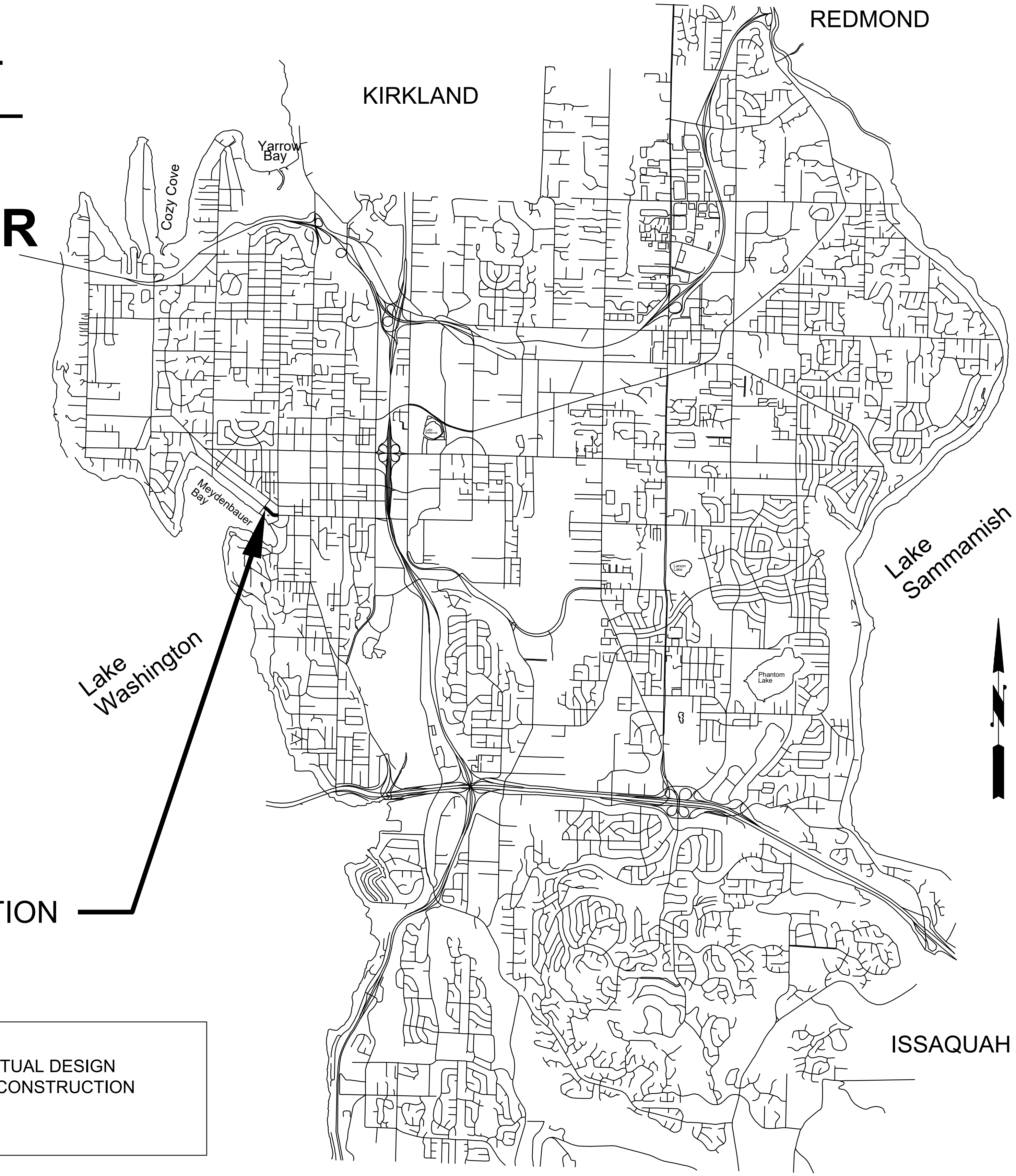
DIRECTOR OF TRANSPORTATION
ANDREW SINGELAKIS

DEPUTY MAYOR
JARED NIEUWENHUIS

CITY COUNCIL
JEREMY BARKSDALE
CONRAD LEE
JENNIFER ROBERTSON
JOHN STOKES
JANICE ZAHN

SCHEDULE OF DRAWINGS

SHEET	DRAWINGS
1	COVER SHEET
2-3	ROADWAY PLANS

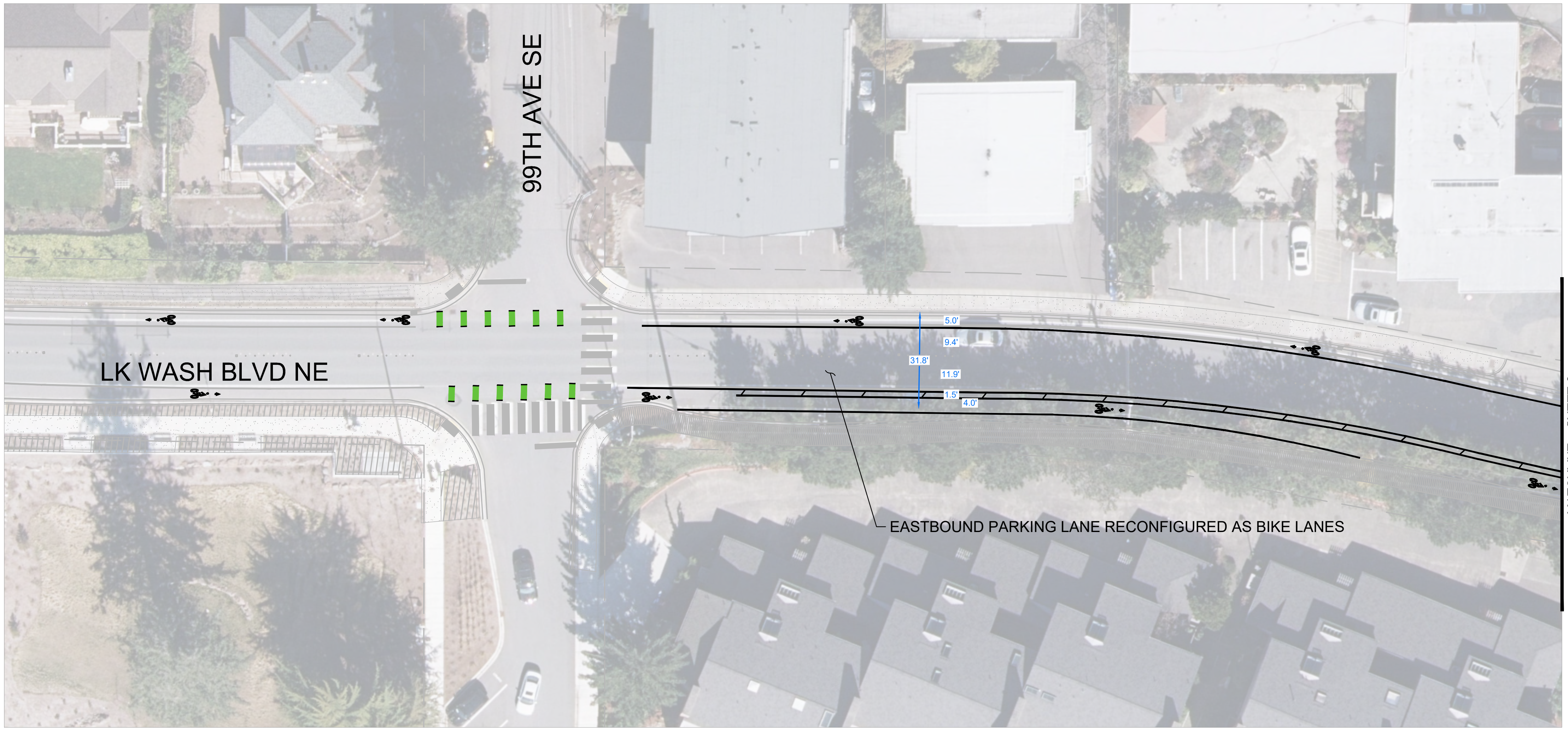


PROJECT LOCATION

CONCEPTUAL DESIGN
NOT FOR CONSTRUCTION

C.I.P. NUMBER xxxxxx

Design to be coordinated with Eight One Hundred Main



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NO.	DATE	BY	APPR.	REVISIONS

H. JIN	12/20
DESIGNED BY	DATE
T.MOTA	6/23
DRAWN BY	DATE
C.IVERSON	12/20
CHECKED BY	DATE

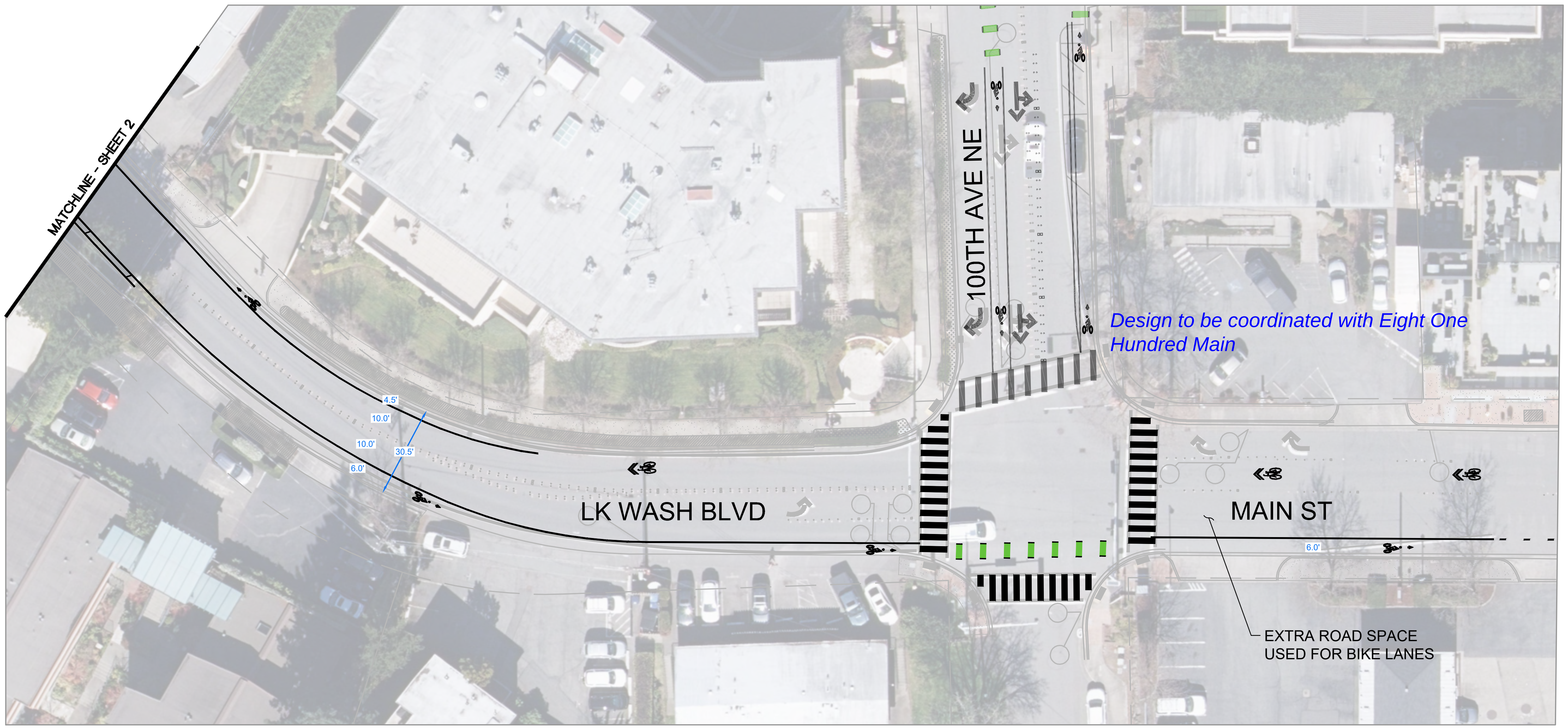
City of Bellevue
Transportation Department

PRELIMINARY DESIGN

BIKE BELLEVUE
LAKE WASHINGTON BOULEVARD CORRIDOR

CONCEPTUAL PLAN

SHT 2 OF 3



SCALE IN FEET
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NO.	DATE	BY	APPR.	REVISIONS

H. JIN	12/20
DESIGNED BY	DATE
T.MOTA	6/23
DRAWN BY	DATE
C.IVERSON	12/20
CHECKED BY	DATE

City of Bellevue
Transportation Department

PRELIMINARY DESIGN

BIKE BELLEVUE
LAKE WASHINGTON BOULEVARD CORRIDOR

CONCEPTUAL PLAN

SHT 3 OF 3

Location: Lake WA Blvd 600ft W-O 99th Ave NE
Date Range: 4/26/2022 - 5/2/2022
Site Code: 07

	Tuesday			Wednesday			Thursday			Friday			Saturday			Sunday			Monday					
	4/26/2022			4/27/2022			4/28/2022			4/29/2022			4/30/2022			5/1/2022			5/2/2022			Mid-Week Average		
Time	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total
12:00 AM	6	8	14	5	2	7	5	4	9	8	5	13	25	17	42	25	26	51	7	6	13	5	5	10
1:00 AM	1	1	2	2	1	3	2	1	3	1	2	3	12	6	18	22	11	33	2	5	7	2	1	3
2:00 AM	2	0	2	1	0	1	1	1	2	2	1	3	10	3	13	9	11	20	2	1	3	1	0	2
3:00 AM	0	3	3	0	4	4	1	2	3	1	3	4	3	1	4	8	9	17	3	2	5	0	3	3
4:00 AM	11	7	18	9	9	18	10	8	18	12	9	21	3	6	9	6	5	11	7	7	14	10	8	18
5:00 AM	26	20	46	9	21	30	23	17	40	14	21	35	13	7	20	10	8	18	24	17	41	19	19	39
6:00 AM	33	113	146	39	97	136	35	126	161	30	104	134	13	15	28	13	24	37	35	97	132	36	112	148
7:00 AM	226	271	497	240	263	503	205	284	489	216	278	494	56	51	107	29	23	52	213	253	466	224	273	496
8:00 AM	229	251	480	233	250	483	215	266	481	211	247	458	73	71	144	57	62	119	239	262	501	226	256	481
9:00 AM	139	215	354	156	214	370	167	193	360	154	152	306	122	99	221	119	89	208	129	152	281	154	207	361
10:00 AM	156	156	312	171	174	345	145	176	321	137	157	294	153	146	299	162	118	280	126	131	257	157	169	326
11:00 AM	172	168	340	185	149	334	188	189	377	220	184	404	166	149	315	192	145	337	154	145	299	182	169	350
12:00 PM	173	158	331	239	217	456	186	191	377	180	190	370	192	204	396	184	181	365	143	163	306	199	189	388
1:00 PM	186	196	382	234	226	460	188	186	374	212	183	395	192	204	396	194	173	367	150	154	304	203	203	405
2:00 PM	249	194	443	266	219	485	305	205	510	334	238	572	218	185	403	209	199	408	244	182	426	273	206	479
3:00 PM	346	263	609	383	195	578	411	242	653	399	290	689	227	207	434	194	182	376	339	237	576	380	233	613
4:00 PM	279	188	467	340	196	536	332	201	533	336	207	543	223	229	452	172	170	342	272	170	442	317	195	512
5:00 PM	263	218	481	324	179	503	256	207	463	296	219	515	212	196	408	160	162	322	187	199	386	281	201	482
6:00 PM	228	185	413	253	188	441	201	175	376	258	194	452	226	184	410	138	138	276	149	163	312	227	183	410
7:00 PM	138	118	256	139	133	272	162	140	302	165	167	332	174	173	347	96	135	231	108	119	227	146	130	277
8:00 PM	92	106	198	98	100	198	82	118	200	122	121	243	117	124	241	80	93	173	63	83	146	91	108	199
9:00 PM	53	104	157	78	86	164	71	106	177	71	112	183	79	118	197	38	42	80	45	75	120	67	99	166
10:00 PM	19	46	65	28	46	74	26	56	82	48	98	146	48	69	117	27	40	67	23	23	46	24	49	74
11:00 PM	15	13	28	8	14	22	7	16	23	35	55	90	38	55	93	16	10	26	15	11	26	10	14	24
Total	**3,042**	**3,002**	**6,044**	**3,440**	**2,983**	**6,423**	**3,224**	**3,110**	**6,334**	**3,462**	**3,237**	**6,699**	**2,595**	**2,519**	**5,114**	**2,160**	**2,056**	**4,216**	**2,679**	**2,657**	**5,336**	**3,235**	**3,032**	**6,267**
Percent	**50%**	**50%**	-	**54%**	**46%**	-	**51%**	**49%**	-	**52%**	**48%**	-	**51%**	**49%**	-	**51%**	**49%**	-	**50%**	**50%**	-	**52%**	**48%**	-

1. Mid-week average includes data between Tuesday and Thursday.

Mark Skaggs:425-250-0777
mark.skaggs@idaxdata.com

Bike Bellevue - Corridor 7 (Lake Washington Blvd - 99th to 100th Ave)

City of Bellevue Transportation Department

Estimate - 8/29/2023

Planning Level Estimate

Item No.	Sect. No.	Item	Quantity	Unit	Unit Cost	Total Cost
1	1-09	Mobilization	1	LS	$ 10,000.00	$ 10,000.00
2	1-10	Traffic Control Supervisor	41	HR	$ 80.00	$ 3,280.00
3	1-10	Flaggers & Other Traffic Control Labor	90	HR	$ 65.00	$ 5,850.00
4	7-05	Adjust Catch Basin	1	EA	$ 2,000.00	$ 2,000.00
5	8-20	Video Detection (TrafiSense Camera)	2	EA	$ 6,000.00	$ 12,000.00
6	8-22	Removing Raised Pavement Marker	21	EA	$ 3.00	$ 63.00
7	8-22	Removing Paint Line	8607	LF	$ 3.00	$ 25,821.00
8	8-22	Raised Pavement Marker Type 2	12	EA	$ 15.00	$ 180.00
9	8-22	Raised Pavement Marker Type 1	2	EA	$ 10.00	$ 20.00
10	8-22	Plastic Stop Line	15	LF	$ 20.00	$ 300.00
11	8-22	Plastic Line, 4 inch	196	LF	$ 7.50	$ 1,470.00
12	8-22	Plastic Line, 6 inch	0	LF	$ 7.50	$ -
13	8-22	Plastic Crosswalk Line	560	SF	$ 20.00	$ 11,200.00
14	8-22	Paint Line, 6 inch	8933.5	LF	$ 2.00	$ 17,867.00
15	8-22	Plastic Dashed Line, 6-inch	20	LF	$ 7.50	$ 150.00
16	8-22	Green Bicycle Lane Treatment	520	SF	$ 25.00	$ 13,000.00
17	8-22	Permanent Signing, 1-2 signs per post	4	EA	$ 1,000.00	$ 4,000.00
18	8-22	Plastic Bicycle Lane Symbol	67	EA	$ 385.00	$ 25,795.00
19	8-24	Shared Lane Symbol	14	EA	$ 385.00	$ 5,390.00
20	8-22	4-inch Yellow Paint Line	33	LF	$ 2.00	$ 66.00
					SubTotal	**$ 138,452.00**
					+ 10% Prelim. Design Contingency	**$ 13,845.20**
					+10% Construction Management	**$ 13,845.20**
					+ 10% Contingency	**$ 13,845.20**
					Construction Total	**$ 179,987.60**
					Design & Permitting Total (15% of Construction)	**$ 26,998.14**
					Project Total (Design + Construction)	**$ 206,985.74**

Preliminary cost estimates to be finalized and determined by City, this range is an approximation completed in 2023.

Corridor 8

CITY OF BELLEVUE
TRANSPORTATION DEPARTMENT

BIKE BELLEVUE
100TH AVENUE CORRIDOR
(MAIN ST TO NE 10TH ST)

CITY MANAGER
BRAD MIYAKE

MAYOR
LYNNE ROBINSON

DIRECTOR OF TRANSPORTATION
ANDREW SINGELAKIS

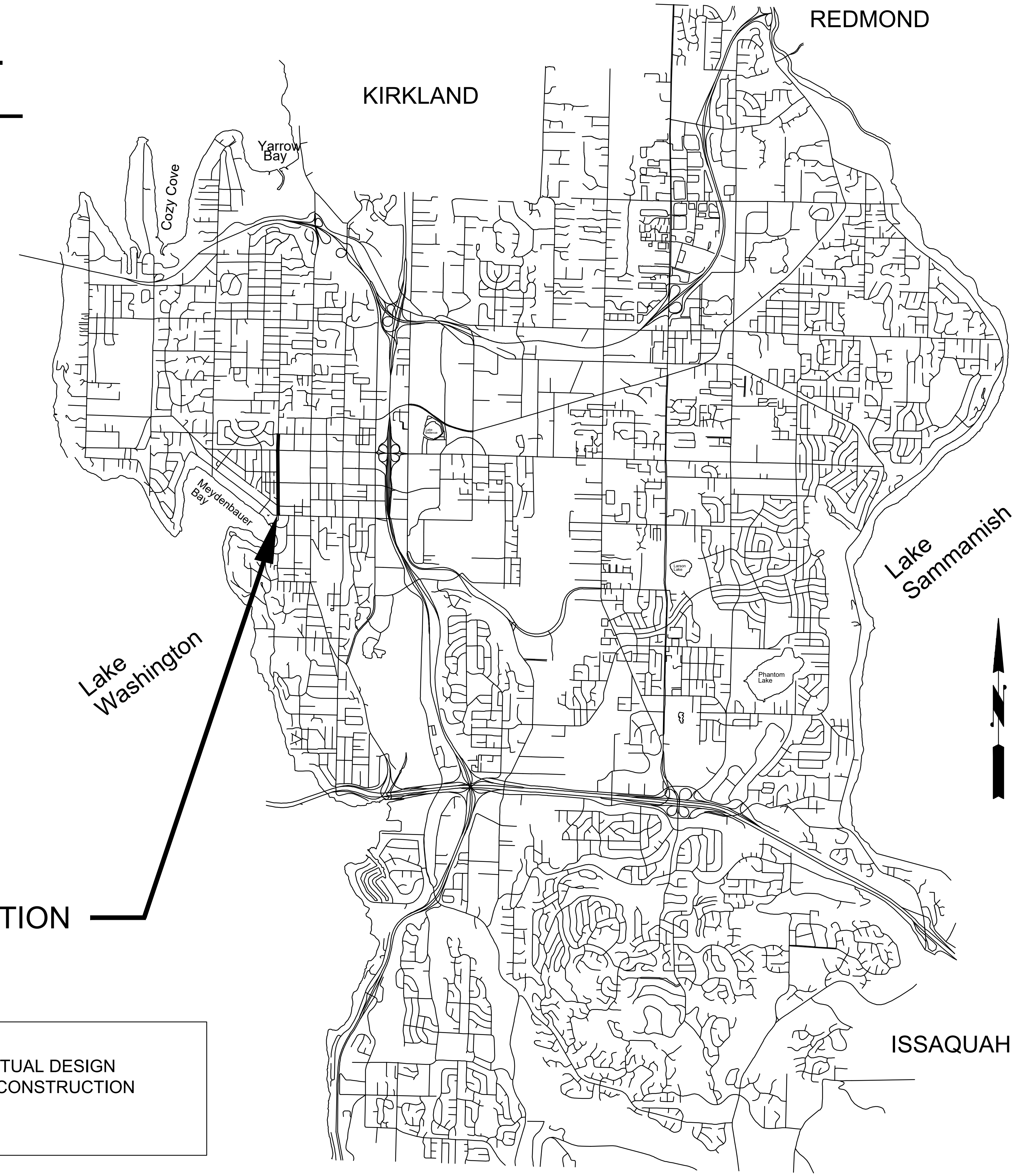
DEPUTY MAYOR
JARED NIEUWENHUIS

CITY COUNCIL
JEREMY BARKSDALE
CONRAD LEE
JENNIFER ROBERTSON
JOHN STOKES
JANICE ZAHN

SCHEDULE OF DRAWINGS

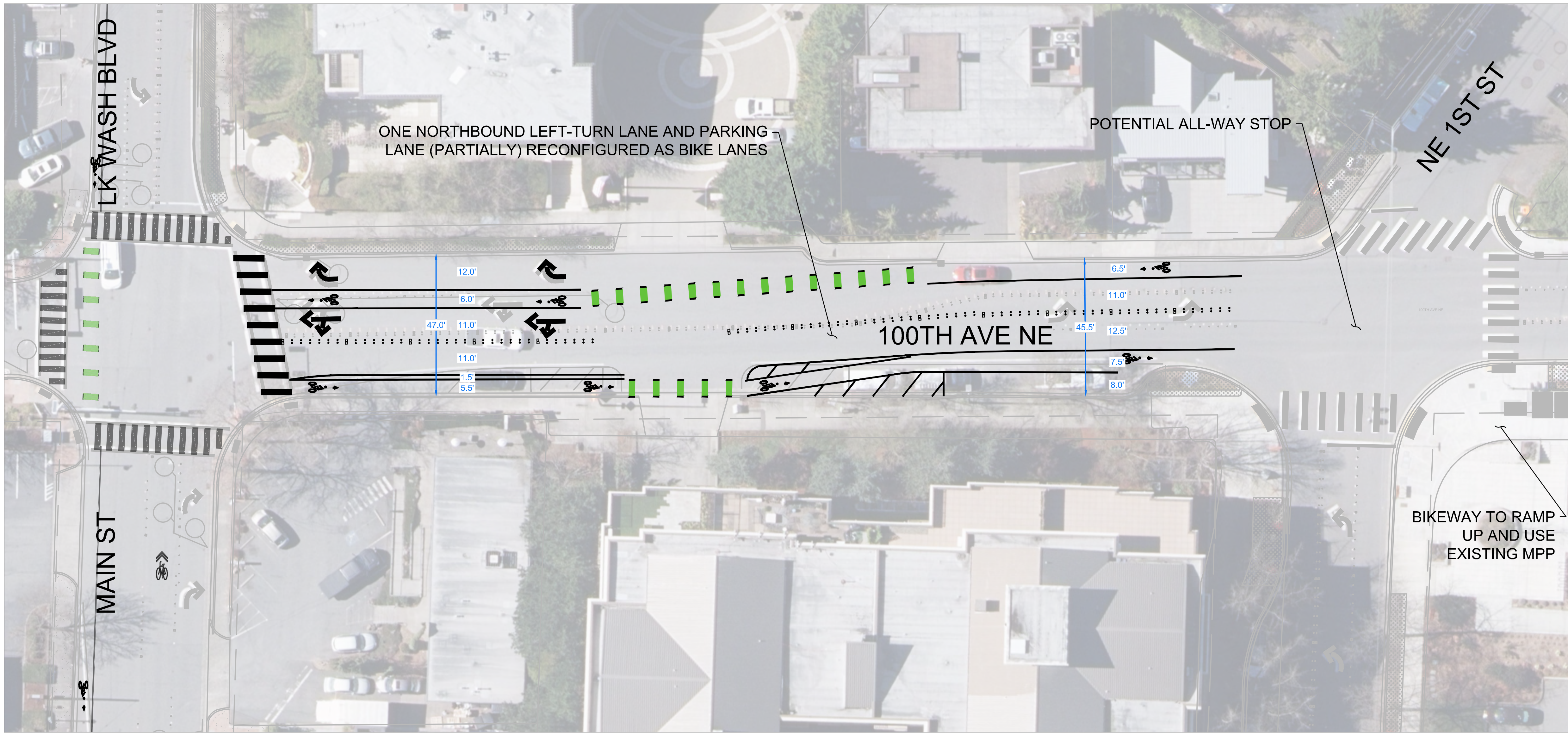
SHEET	DRAWINGS
1	COVER SHEET
2-7	ROADWAY PLANS

PROJECT LOCATION



CONCEPTUAL DESIGN
NOT FOR CONSTRUCTION

C.I.P. NUMBER xxxxxx



SCALE IN FEET
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alta

NO.	DATE	BY	APPR.	REVISIONS

H. JIN	3/21
DESIGNED BY	DATE
T.MOTA	6/23
DRAWN BY	DATE
C.IVERSON	3/21
CHECKED BY	DATE

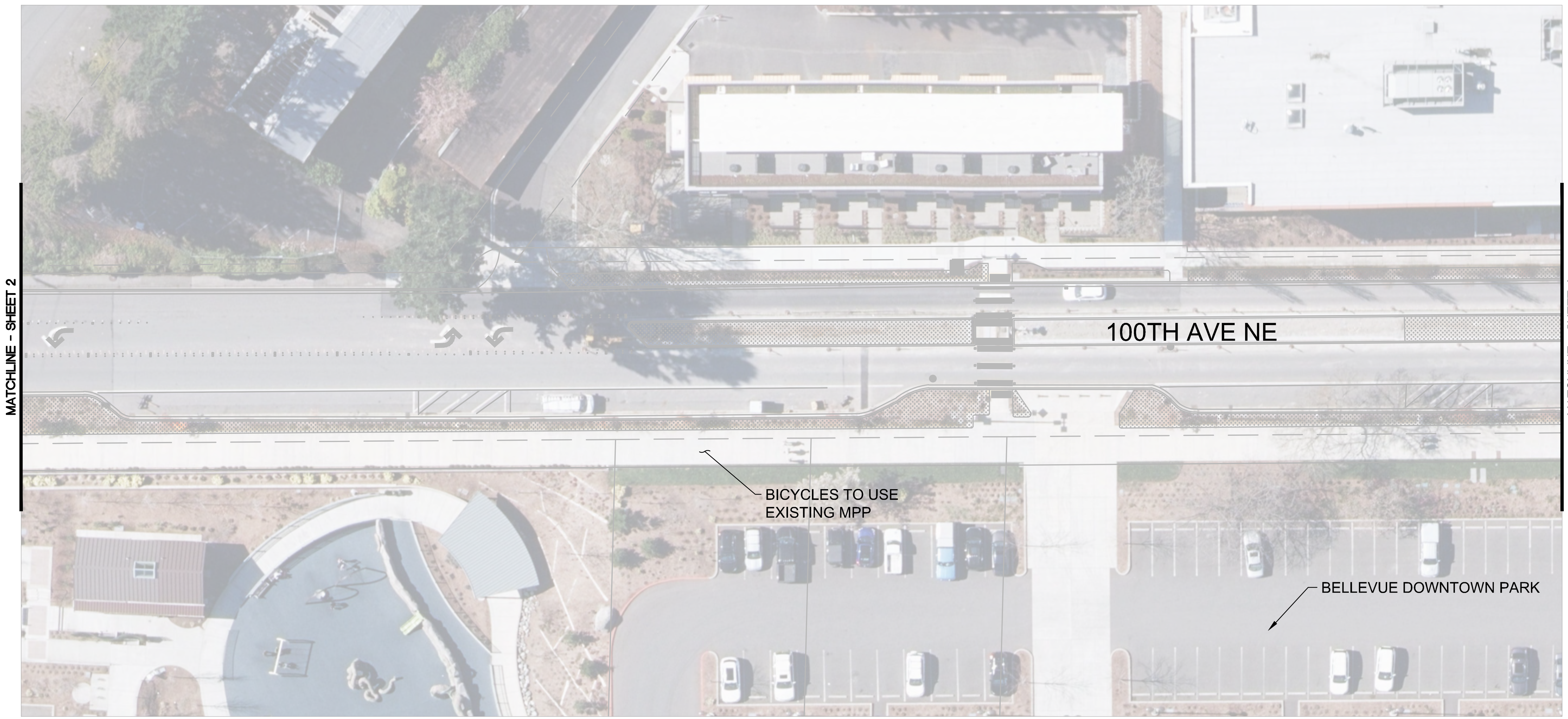
City of Bellevue
Transportation Department

PRELIMINARY DESIGN

BIKE BELLEVUE
100TH AVE NE CORRIDOR

CONCEPTUAL PLAN

SHT 2 OF 7



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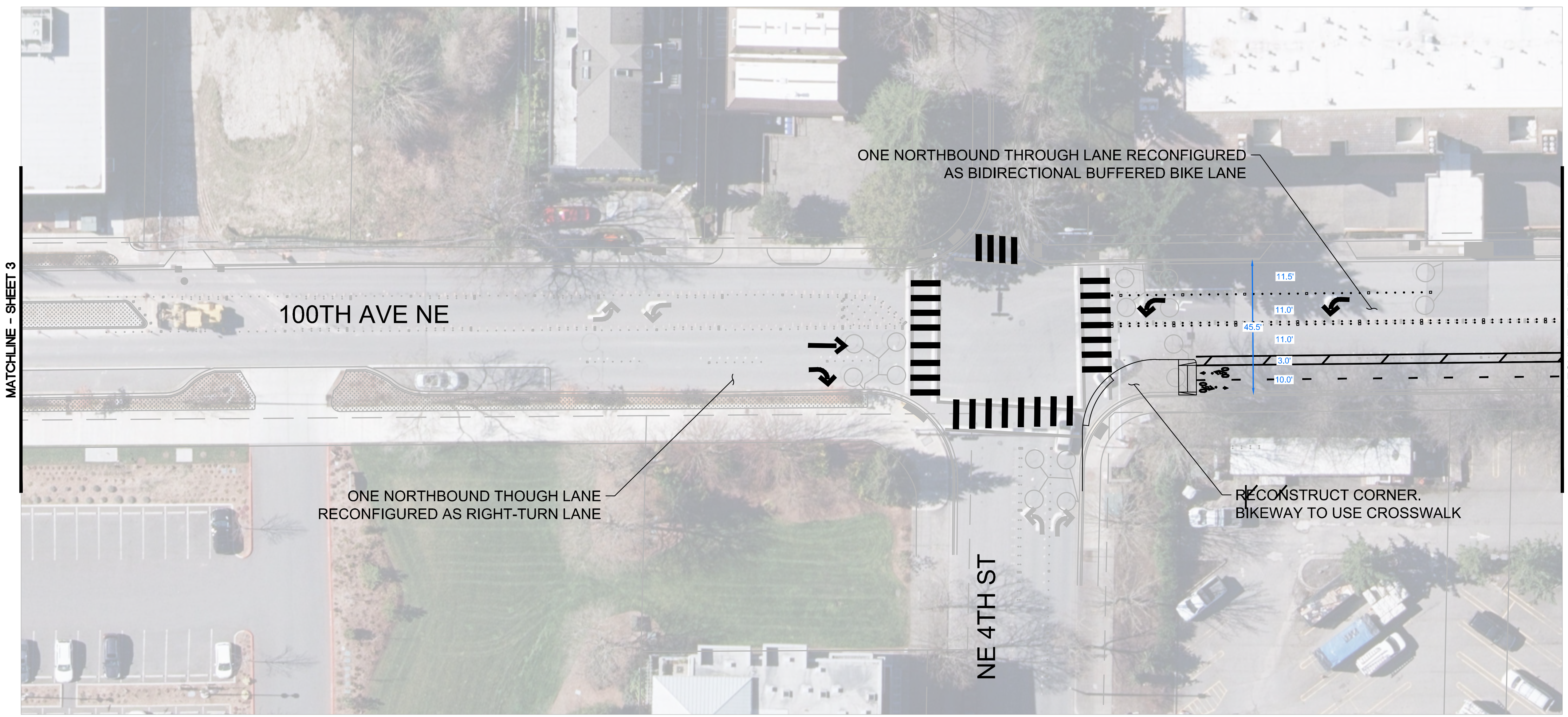
City of Bellevue
Transportation Department

PRELIMINARY DESIGN

BIKE BELLEVUE
100TH AVE NE CORRIDOR

CONCEPTUAL PLAN

SHT 3 OF 7



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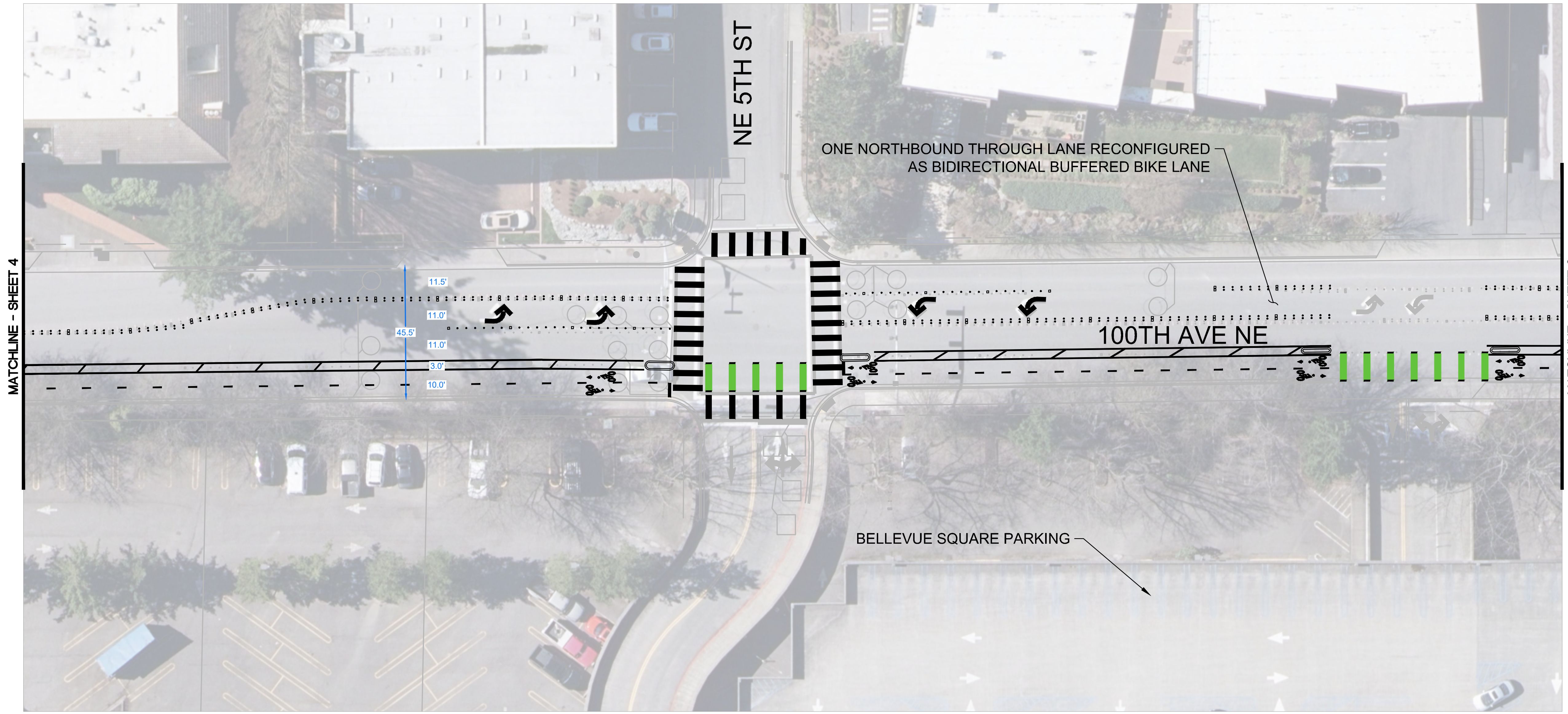
City of Bellevue
Transportation Department

PRELIMINARY DESIGN

BIKE BELLEVUE
100TH AVE NE CORRIDOR

CONCEPTUAL PLAN

SHT 4 OF 7



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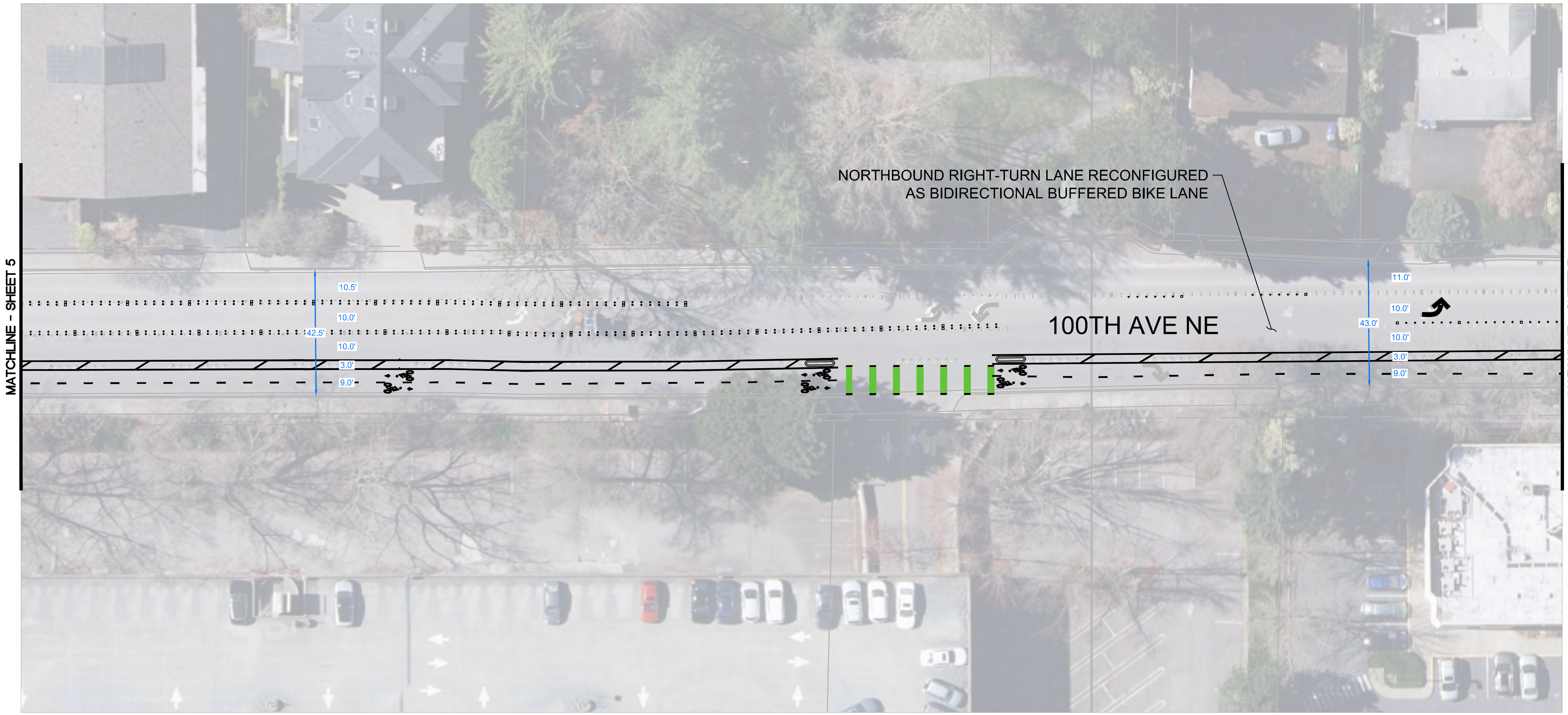
City of Bellevue
Transportation Department

PRELIMINARY DESIGN

BIKE BELLEVUE
100TH AVE NE CORRIDOR

CONCEPTUAL PLAN

SHT 5 OF 7



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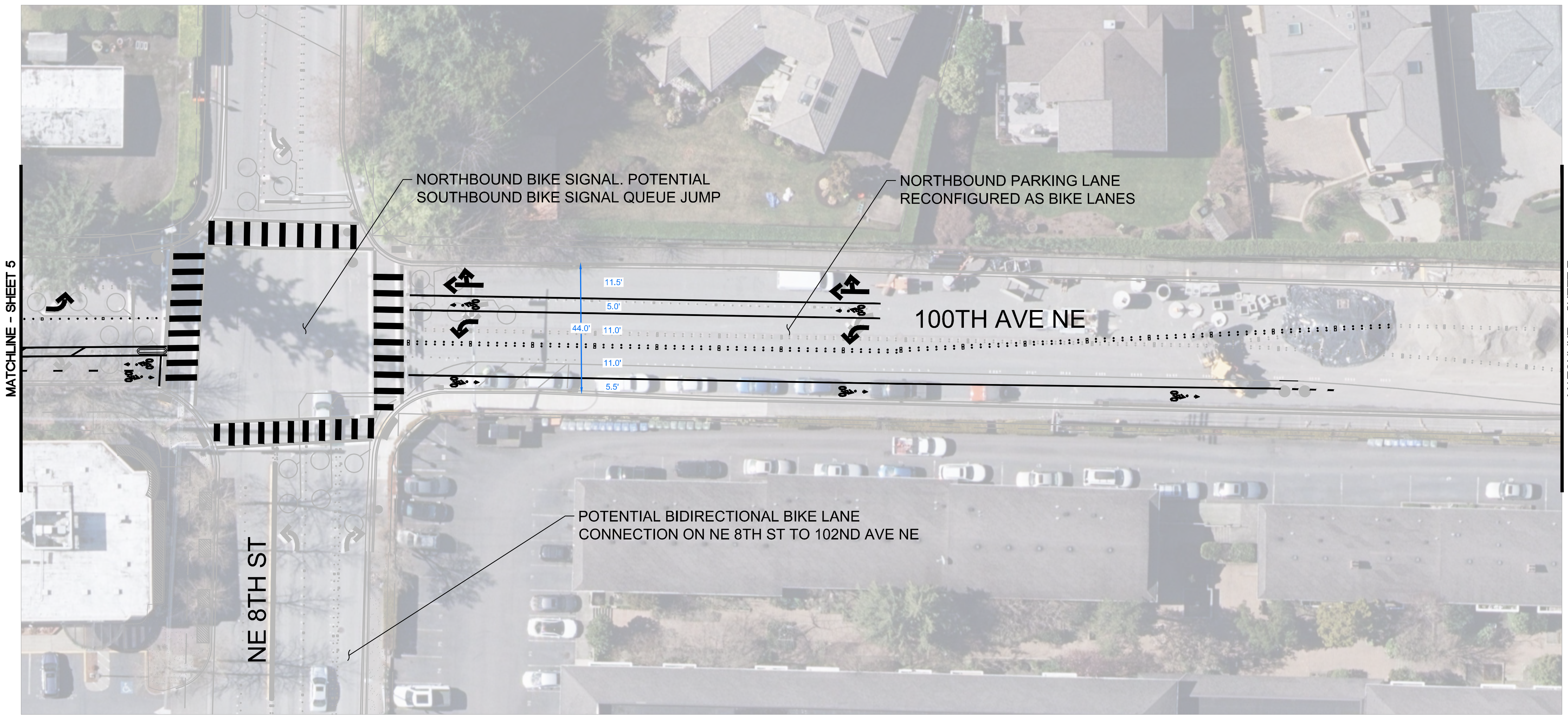
City of Bellevue
Transportation Department

PRELIMINARY DESIGN

BIKE BELLEVUE
100TH AVE NE CORRIDOR

CONCEPTUAL PLAN

SHT 6 OF 7



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T.MOTA 6/23
DRAWN BY DATE
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City of Bellevue
Transportation Department

PRELIMINARY DESIGN

BIKE BELLEVUE
100TH AVE NE CORRIDOR

CONCEPTUAL PLAN

SHT 7 OF 7

Bike Bellevue - Corridor 8 (100th Ave NE - Main to NE 10th St)

City of Bellevue Transportation Department

Estimate - 8/29/2023

Planning Level Estimate

Item No.	Section	Item	Quanitity	Unit	Unit Price	Total Price
1	1-07	Potholing	1	FA	$10,000.0	$10,000
3	1-09	Mobilization	1	LS	$40,000.0	$40,000
4	1-10	Traffic Control Supervisor	3	LS	$15,000.0	$45,000
5	1-10	Flaggers, Spotters, and Other Traffic Control Labor	112	HR	$70.0	$7,840
6	1-10	Other Temporary Traffic Control	0	LS	$15,000.0	$0
7	2-02	Removing Asphalt Concrete Pavement	137	SY	$25.0	$3,414
8	2-02	Removing Cement Conc. Sidewalk	98	SY	$40.0	$3,902
9	2-02	Removing Cement Conc. Curb and Gutter	99	LF	$20.0	$1,980
10	4-04	Crushed Surfacing Top Course	45	TON	$150.0	$6,750
11	5-04	HMA Cl. 1/2", PG 64-22	45	TON	$220.0	$9,790
12	7-05	Adjust Manhole	0	EA	$350.0	$0
13	7-05	Adjust Catch Basin	1	EA	$500.0	$500
14	7-12	Adjust Water Valve Box	0	EA	$500.0	$0
15	8-01	Drainage Modification	1	EA	$10,000.0	$10,000
16	8-01	Erosion/Water Pollution Control	1	LS	$2,000.0	$2,000
17	8-01	CSWPPP and TESC Plans	0	LS	$2,500.0	$0
18	8-02	Removing Raised Pavement Marker	1727	LF	$3.0	$5,181
19	8-04	Cement Conc. Traffic Curb and Gutter	122	LF	$80.0	$9,760
20	8-07	Bikeway Buffer Vertical Protection	1450	LF	$35.0	$50,750
21	8-09	Raised Pavement Marker, Type 1	1181	EA	$10.0	$11,810
22	8-09	Raised Pavement Marker, Type 2	186	EA	$15.0	$2,790
23	8-09	Removing Raised Pavement Marker	1	LS	$2,000.0	$2,000
24	8-13	Adjust Monument Case and Cover	0	EA	$250.0	$0
25	8-14	Cement Conc. Sidewalk	87	SY	$125.0	$10,931
26	8-14	Cement Conc. Curb Ramp Type Perpendicular A	29	SY	$275.0	$8,097
27	8-14	Cement Conc. Curb Ramp Type Diagonally-Oriented Parallel	28	SY	$300.0	$8,333
28	8-20	Induction Loop Detector	0	EA	$4,000.0	$0
29	8-20	Traffic Signal System Modifications Complete, 1. 100th Ave NE & NE 8th St	1	LS	$17,000.0	$17,000
30	8-20	Traffic Signal System Modifications Complete, 2. 100th Ave NE & NE 5th St	1	LS	$26,000.0	$26,000
31	8-20	Traffic Signal System Modifications Complete, 2. 100th Ave NE & NE 4th St	0	LS	$0.0	$0
32	8-20	Adjust Junction Box	0	EA	$500.0	$0
33	8-20	Temporary Vehicle Detection	0	EA	$450.0	$0
34	8-20	Video Detection (TrafiSense Camera)	6	EA	$6,000.0	$36,000
35	8-21	Permanent Signing	0	LS	$5,000.0	$0
36	8-22	Removing Paint Line	694	LF	$3.0	$2,082
37	8-22	Removing Plastic Line	214	LF	$5.0	$1,070
38	8-22	Removing Plastic Traffic Marking	9	EA	$150.0	$1,350
39	8-22	Paint Line, White, 6 Inch	2540	LF	$2.0	$5,080
40	8-22	Paint Line, Yellow, 6 Inch	405	LF	$2.0	$810
41	8-22	Plastic Line, 6 Inch	590	LF	$7.5	$4,425
42	8-22	Green Bicycle Lane Treatment	535	SF	$25.0	$13,375
43	8-22	Large Green Bike Box	0	EA	$20,000.0	$0
44	8-22	Bike Dots	8	EA	$150.0	$1,200
45	8-22	Small Green Bike Box	0	EA	$2,500.0	$0
46	8-22	Trail Green Bike Box	0	EA	$3,500.0	$0
47	8-22	Plastic Stop Line	10	LF	$15.0	$150
48	8-22	Plastic Crosswalk Line	1740	SF	$20.0	$34,800
49	8-22	Plastic Traffic Arrow	10	EA	$350.0	$3,500
50	8-22	Plastic Bicycle Lane Symbol	28	EA	$385.0	$10,780
51	8-22	Signal Induction Loop Marker	8	EA	$350.0	$2,800
						$ 411,250.22

+ 10% Prelim. Design Contingency	**$**	**41,125.02**
+10% Construction Management	**$**	**41,125.02**
+ 10% Contingency	**$**	**41,125.02**
Construction Total	**$**	**534,625.29**
Design & Permitting Total (15% of Construction)	**$**	**80,193.79**
Project Total (Design + Construction)	**$**	**614,819.08**

Preliminary cost estimates to be finalized and determined by City, this range is an approximation completed in 2023.

Corridor 9

CITY OF BELLEVUE
TRANSPORTATION DEPARTMENT

BIKE BELLEVUE
WILBURTON CORRIDOR

CITY MANAGER
BRAD MIYAKE

MAYOR
LYNNE ROBINSON

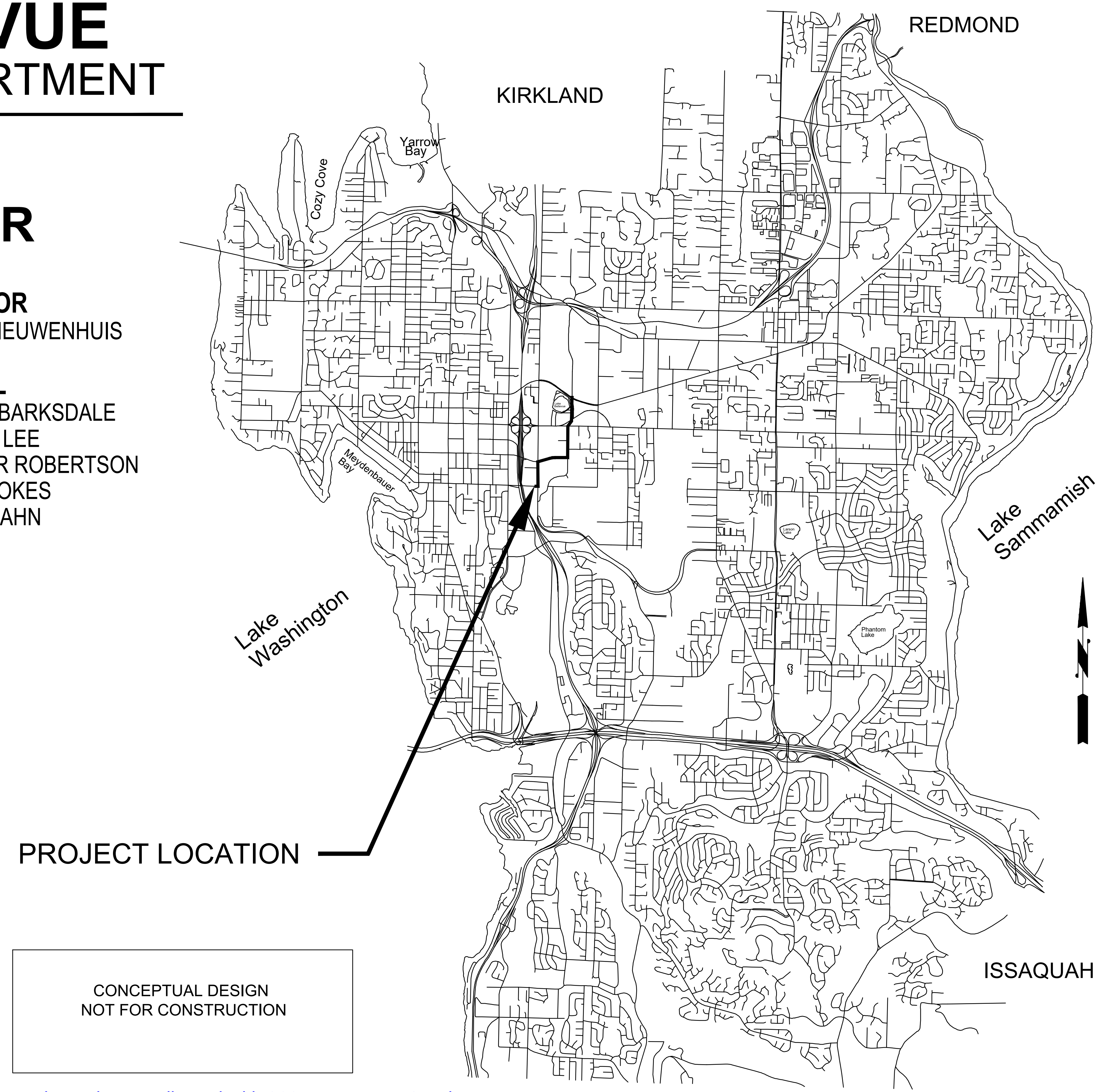
DIRECTOR OF TRANSPORTATION
ANDREW SINGELAKIS

DEPUTY MAYOR
JARED NIEUWENHUIS

CITY COUNCIL
JEREMY BARKSDALE
CONRAD LEE
JENNIFER ROBERTSON
JOHN STOKES
JANICE ZAHN

SCHEDULE OF DRAWINGS

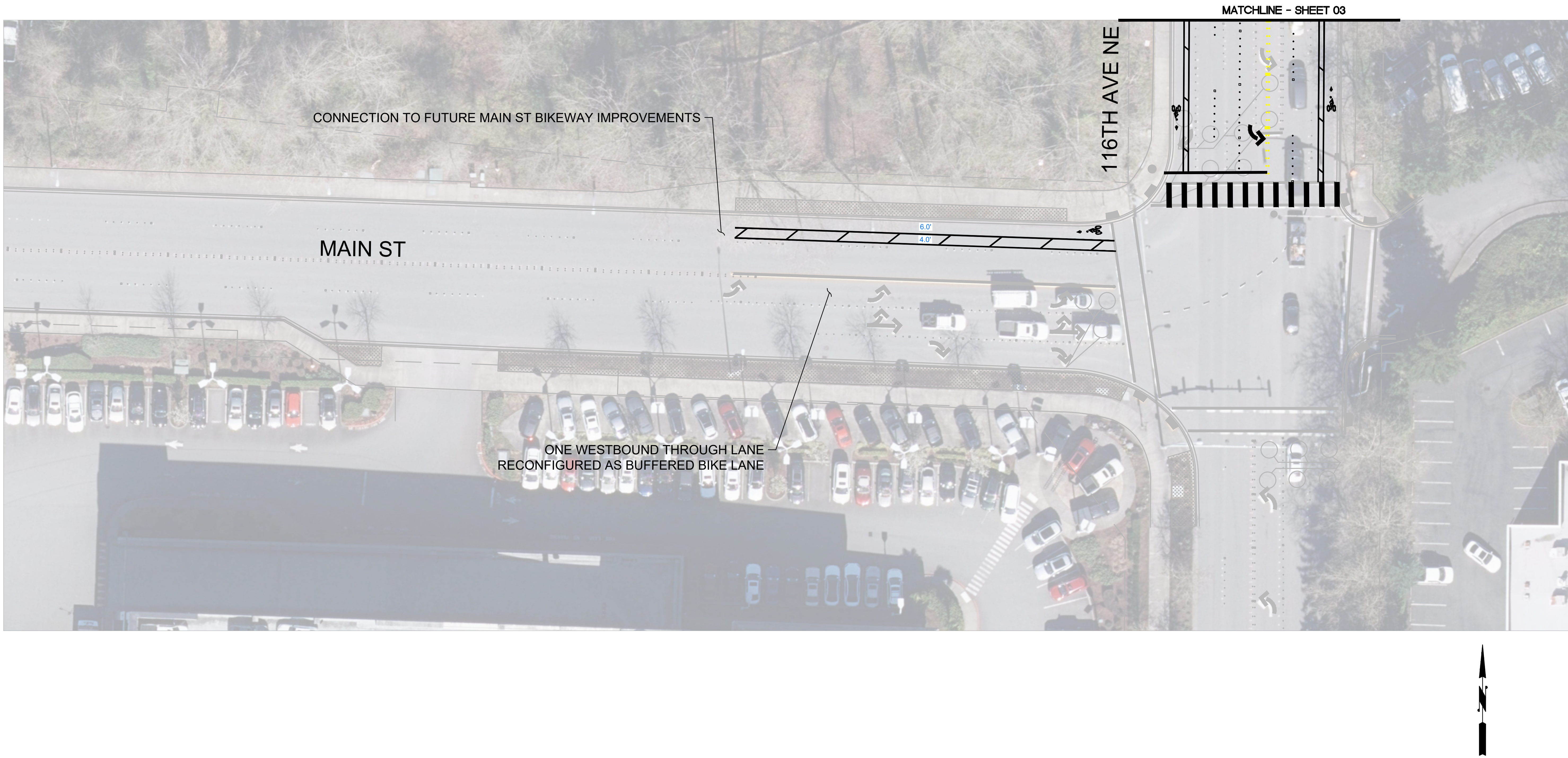
SHEET	DRAWINGS
1	COVER SHEET
2-10	ROADWAY PLANS



CONCEPTUAL DESIGN
NOT FOR CONSTRUCTION

C.I.P. NUMBER PW-R-199

Design to be coordinated with 2025 Pavement Overlay



NO.	DATE	BY	APPR.	REVISIONS

DESIGNED BY DATE
DRAWN BY DATE
CHECKED BY DATE

City of Bellevue
Transportation Department

BIKE BELLEVUE
WILBURTON CORRIDOR

CONCEPTUAL PLAN

SHT 2 OF 11

SCALE IN FEET
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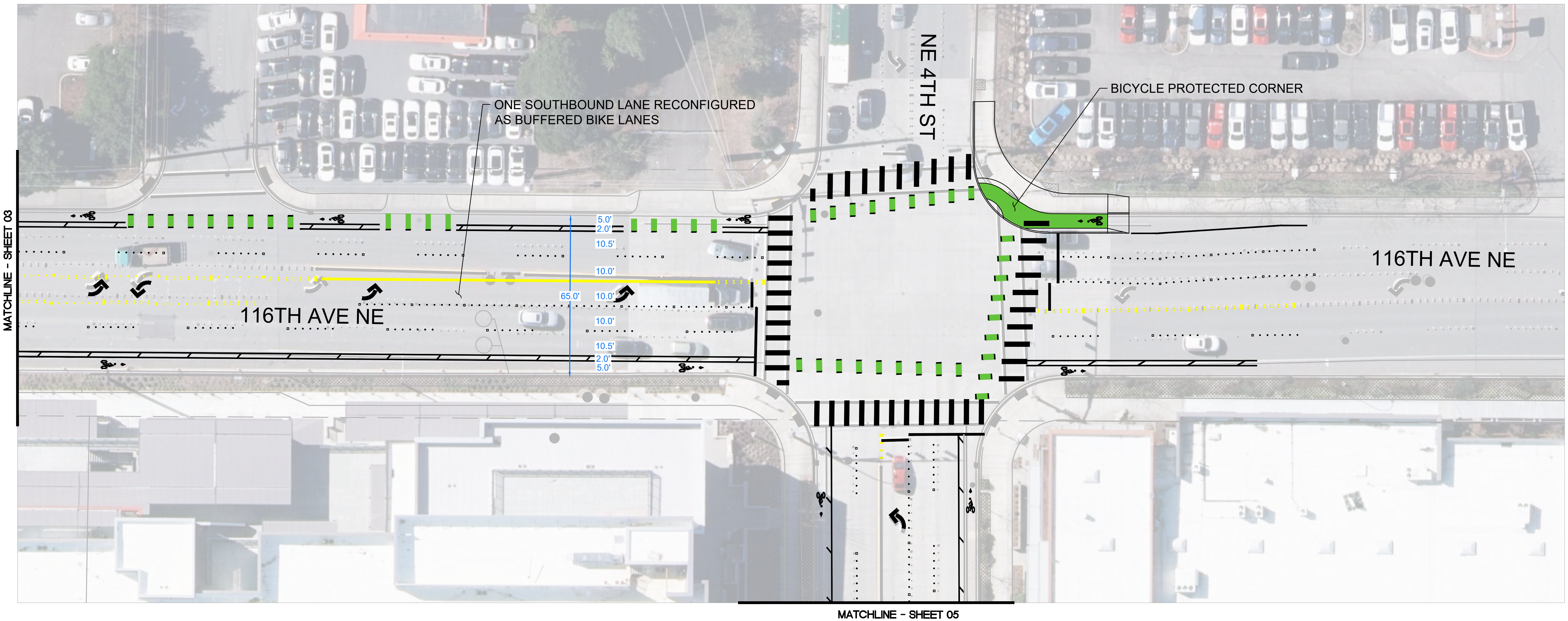
City of Bellevue
Transportation Department

BIKE BELLEVUE
WILBURTON CORRIDOR

CONCEPTUAL PLAN

SHT 3 OF 11



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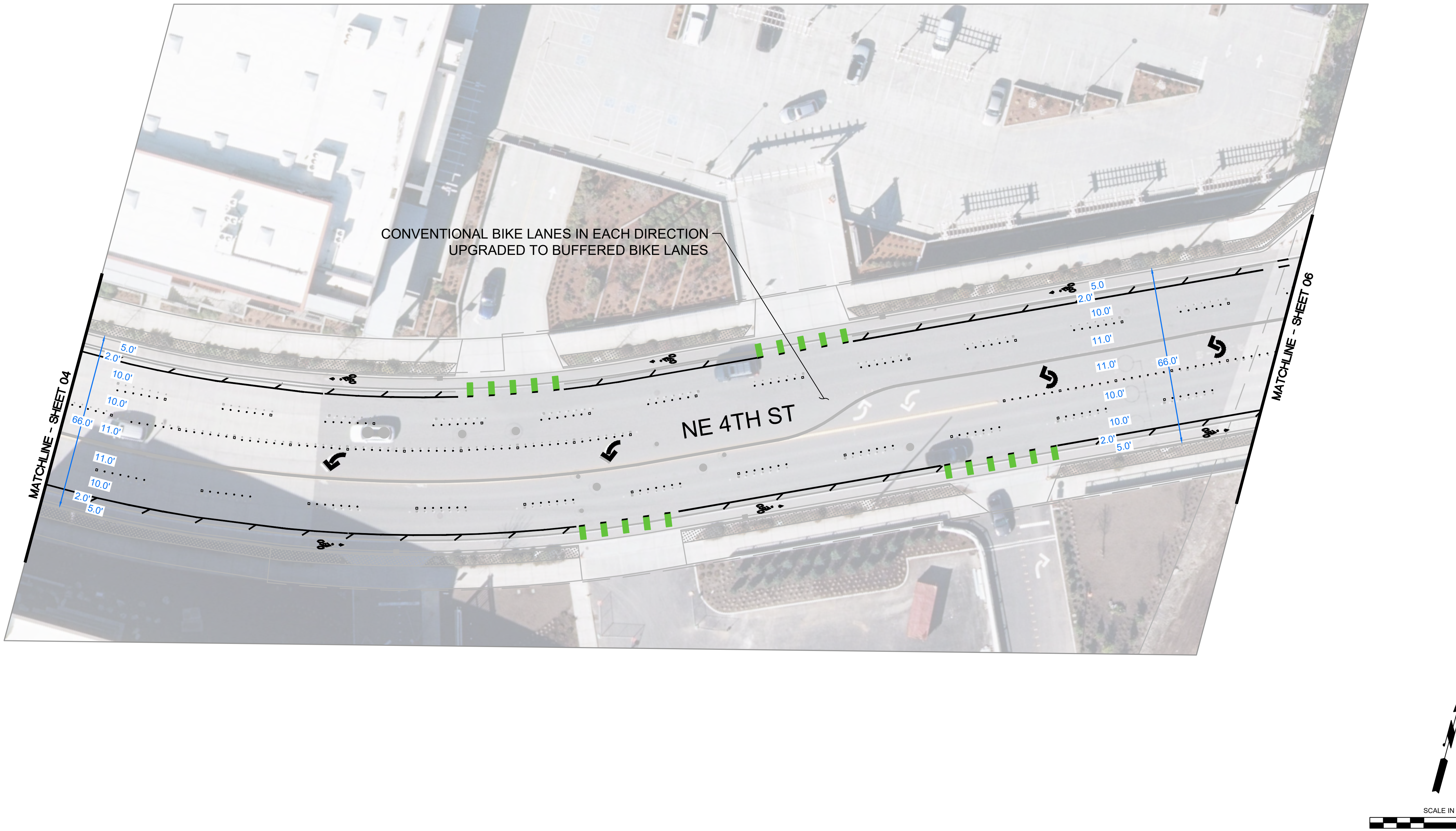
City of Bellevue
Transportation Department

BIKE BELLEVUE
WILBURTON CORRIDOR

CONCEPTUAL PLAN

SHT 4 OF 11



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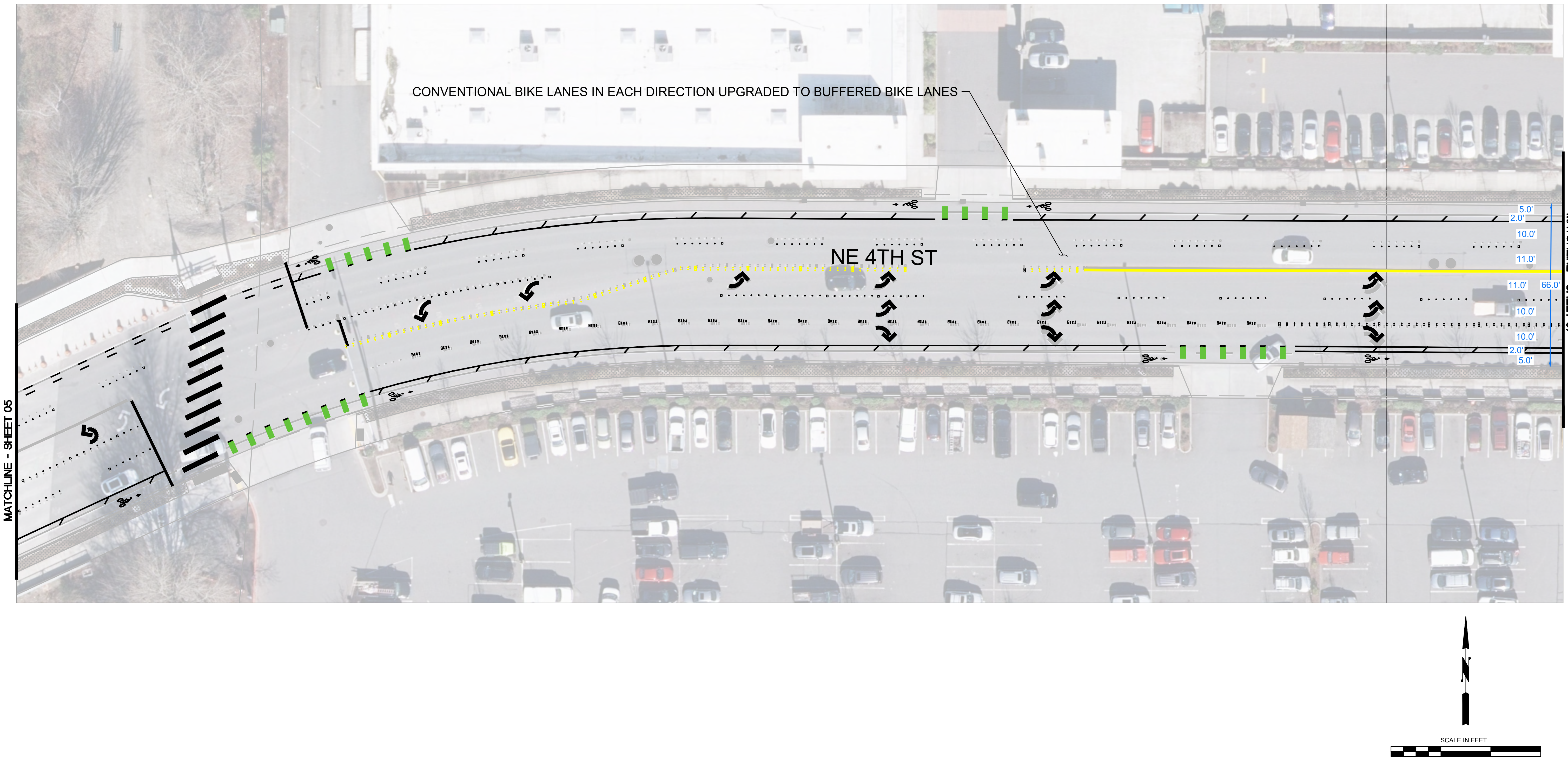
City of Bellevue
Transportation Department

BIKE BELLEVUE
WILBURTON CORRIDOR

CONCEPTUAL PLAN

SHT 5 OF 11



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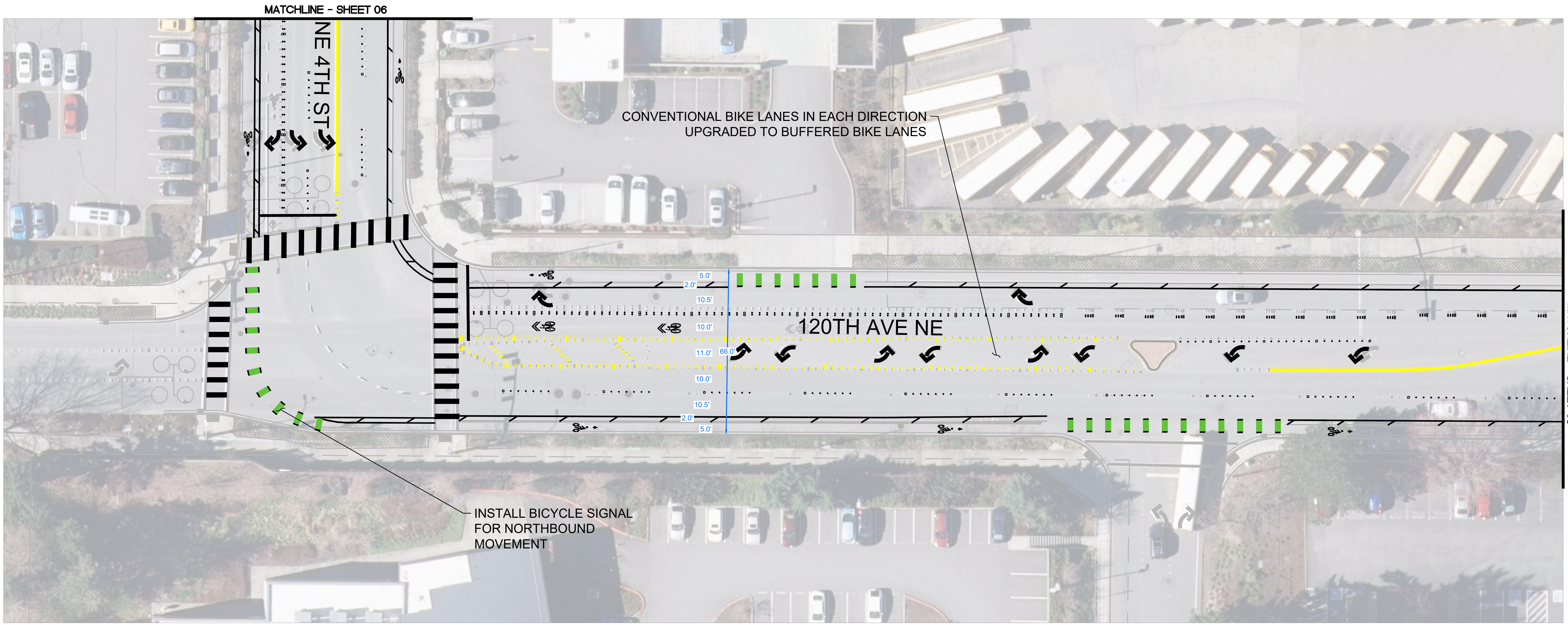
City of Bellevue
Transportation Department

BIKE BELLEVUE
WILBURTON CORRIDOR

CONCEPTUAL PLAN

SHT 6 OF 11



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SCALE IN FEET
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NO.	DATE	BY	APPR.	REVISIONS

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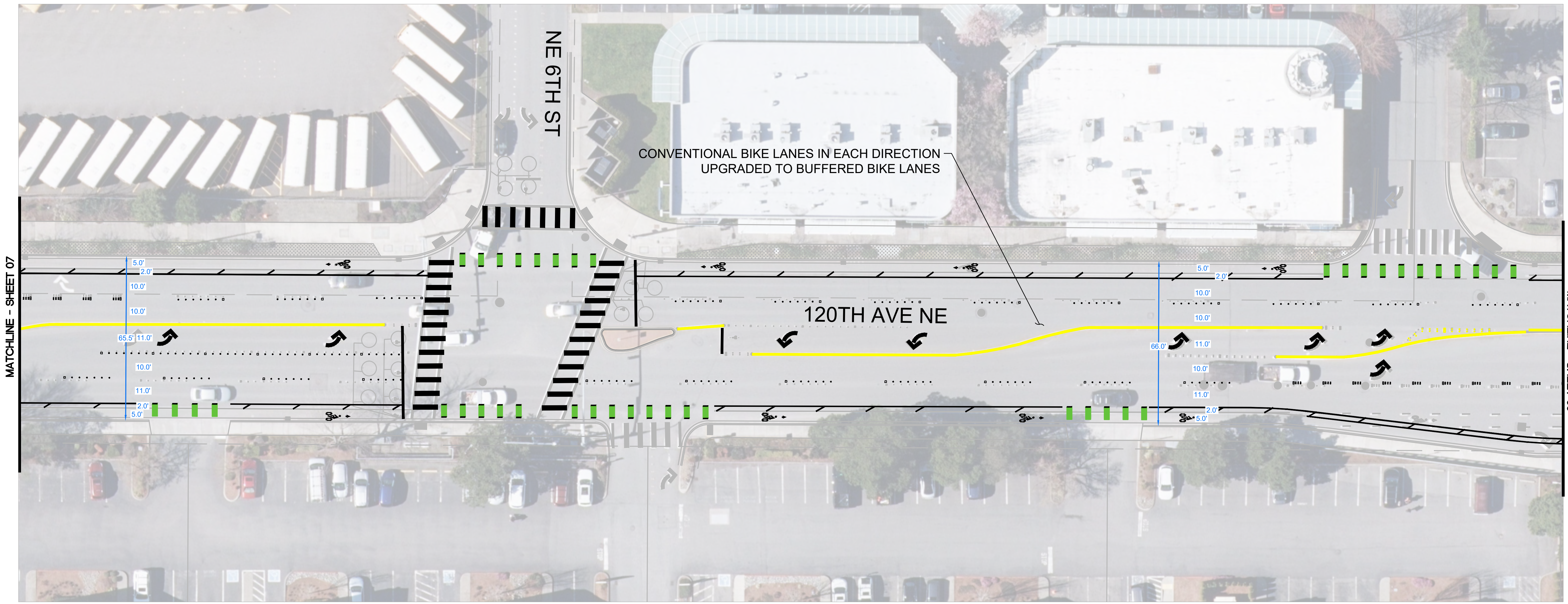
CHECKED BY DATE

City of Bellevue
Transportation Department

BIKE BELLEVUE
WILBURTON CORRIDOR

CONCEPTUAL PLAN

SHT 7 OF 11



SCALE IN FEET

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NO.	DATE	BY	APPR.	REVISIONS

DESIGNED BY DATE

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CHECKED BY DATE

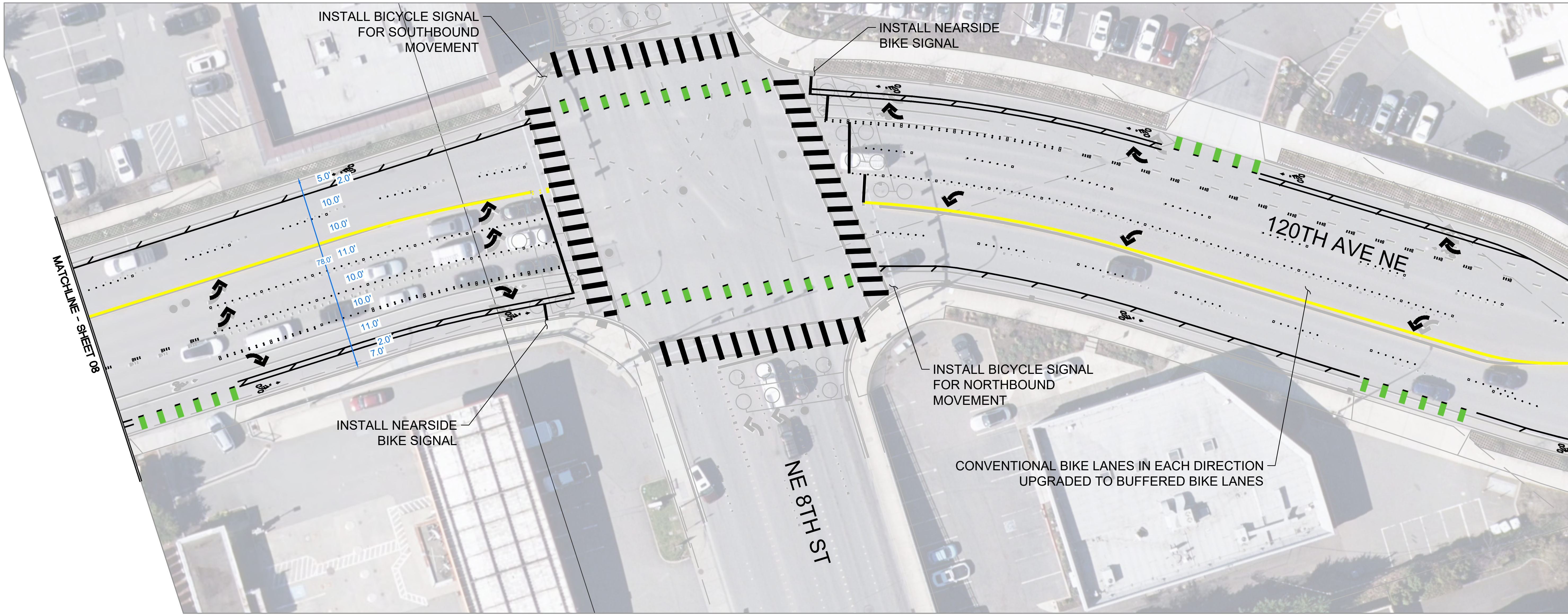
City of Bellevue

Transportation Department

BIKE BELLEVUE
WILBURTON CORRIDOR

CONCEPTUAL PLAN

SHT 8 OF 11



SCALE IN FEET

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DESIGNED BY DATE

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CHECKED BY DATE

City of Bellevue

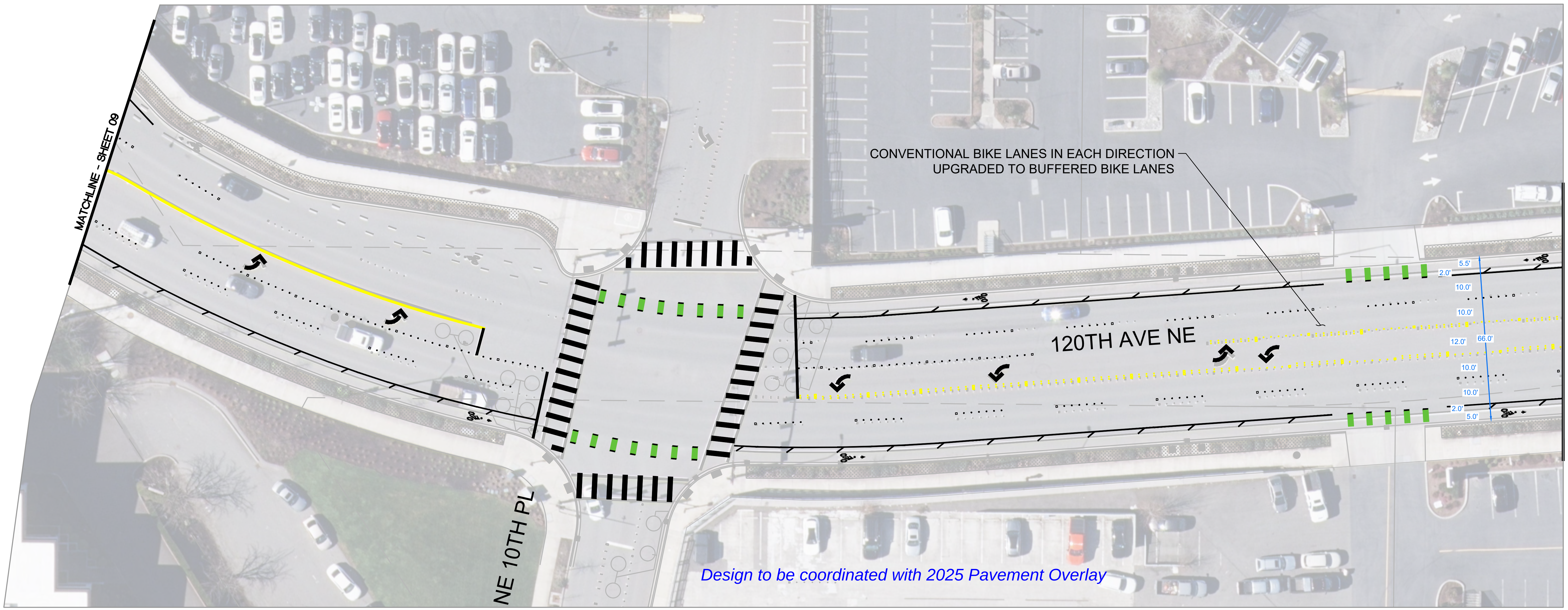
Transportation Department

BIKE BELLEVUE

WILBURTON CORRIDOR

CONCEPTUAL PLAN

SHT 9 OF 11



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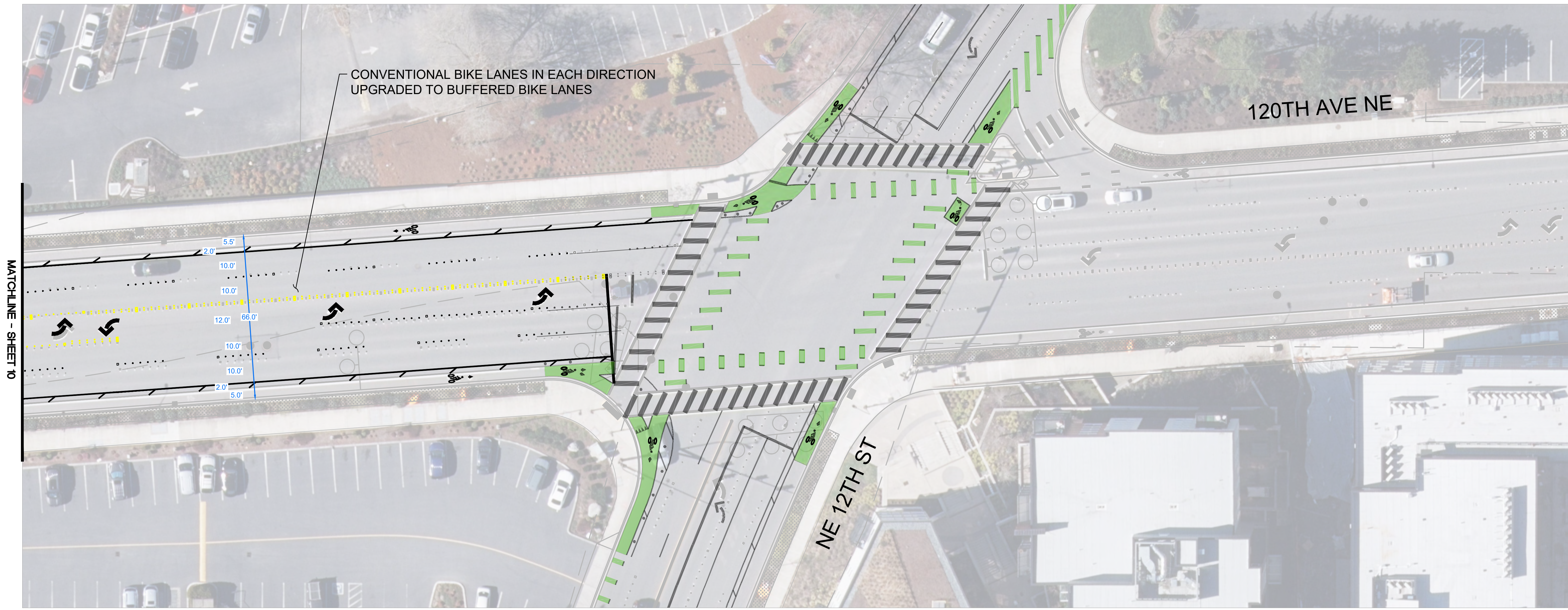
City of Bellevue
Transportation Department

BIKE BELLEVUE
WILBURTON CORRIDOR

CONCEPTUAL PLAN

SHT 10 OF 11



SCALE IN FEET
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NO.	DATE	BY	APPR.	REVISIONS

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City of Bellevue
Transportation Department

BIKE BELLEVUE
WILBURTON CORRIDOR

CONCEPTUAL PLAN

SHT 11 OF 11

Location: 120th Ave NE ~1000ft N-O NE 12th St
Date Range: 5/17/2022 - 5/23/2022
Site Code: 21

	Tuesday			Wednesday			Thursday			Friday			Saturday			Sunday			Monday					
	5/17/2022			5/18/2022			5/19/2022			5/20/2022			5/21/2022			5/22/2022			5/23/2022			Mid-Week Average		
Time	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total
12:00 AM	7	2	9	6	2	8	5	4	9	6	5	11	6	10	16	0	5	5	4	5	9	6	3	9
1:00 AM	1	1	2	2	3	5	5	2	7	5	2	7	3	5	8	2	5	7	0	3	3	3	2	5
2:00 AM	3	1	4	3	2	5	4	4	8	0	1	1	4	3	7	3	2	5	3	1	4	3	2	6
3:00 AM	2	9	11	1	9	10	0	10	10	0	5	5	0	3	3	0	5	5	0	6	6	1	9	10
4:00 AM	6	22	28	3	19	22	3	25	28	3	20	23	4	21	25	0	1	1	2	27	29	4	22	26
5:00 AM	15	32	47	15	28	43	13	23	36	11	24	35	4	12	16	3	4	7	13	30	43	14	28	42
6:00 AM	41	54	95	29	60	89	32	55	87	35	51	86	11	18	29	5	13	18	30	54	84	34	56	90
7:00 AM	94	153	247	96	130	226	89	122	211	73	95	168	26	36	62	7	8	15	65	99	164	93	135	228
8:00 AM	164	259	423	127	246	373	132	240	372	135	181	316	54	80	134	22	22	44	121	187	308	141	248	389
9:00 AM	179	266	445	173	242	415	166	239	405	161	198	359	69	88	157	37	43	80	140	191	331	173	249	422
10:00 AM	190	207	397	169	204	373	183	165	348	184	175	359	106	130	236	60	58	118	143	137	280	181	192	373
11:00 AM	204	210	414	204	207	411	182	204	386	159	158	317	148	141	289	90	82	172	161	180	341	197	207	404
12:00 PM	271	247	518	213	221	434	217	188	405	215	238	453	164	190	354	89	69	158	189	186	375	234	219	452
1:00 PM	274	233	507	227	209	436	195	184	379	209	206	415	152	165	317	92	83	175	186	191	377	232	209	441
2:00 PM	259	213	472	214	207	421	243	215	458	220	229	449	144	206	350	94	114	208	209	188	397	239	212	450
3:00 PM	216	232	448	201	268	469	208	242	450	220	231	451	131	154	285	92	74	166	207	197	404	208	247	456
4:00 PM	216	216	432	220	240	460	183	228	411	311	238	549	119	129	248	75	88	163	181	213	394	206	228	434
5:00 PM	220	188	408	217	231	448	225	190	415	194	226	420	115	124	239	81	59	140	165	179	344	221	203	424
6:00 PM	141	115	256	164	127	291	133	102	235	131	144	275	79	75	154	69	65	134	99	114	213	146	115	261
7:00 PM	65	67	132	80	84	164	100	75	175	80	71	151	75	73	148	60	43	103	80	58	138	82	75	157
8:00 PM	57	42	99	66	48	114	57	51	108	56	35	91	43	26	69	34	39	73	54	40	94	60	47	107
9:00 PM	30	28	58	34	42	76	28	33	61	27	30	57	33	23	56	14	21	35	32	20	52	31	34	65
10:00 PM	20	16	36	19	20	39	19	12	31	14	9	23	13	6	19	11	10	21	17	9	26	19	16	35
11:00 PM	4	6	10	6	6	12	11	5	16	17	9	26	9	8	17	11	2	13	9	7	16	7	6	13
Total	**2,679**	**2,819**	**5,498**	**2,489**	**2,855**	**5,344**	**2,433**	**2,618**	**5,051**	**2,466**	**2,581**	**5,047**	**1,512**	**1,726**	**3,238**	**951**	**915**	**1,866**	**2,110**	**2,322**	**4,432**	**2,534**	**2,764**	**5,298**
Percent	**49%**	**51%**	-	**47%**	**53%**	-	**48%**	**52%**	-	**49%**	**51%**	-	**47%**	**53%**	-	**51%**	**49%**	-	**48%**	**52%**	-	**48%**	**52%**	-

1. Mid-week average includes data between Tuesday and Thursday.

Mark Skaggs:425-250-0777
mark.skaggs@idaxdata.com

Bike Bellevue - Corridor 9 (Wilburton - Main to Spring)

City of Bellevue Transportation Department

Estimate - 8/29/2023

Planning Level Estimate

Item No.	Section	Item	Quanitity	Unit	Unit Cost	Total Cost
1	1-07	Potholing	1	FA	$10,000.0	$10,000
2	1-09	Mobilization	1	LS	$110,000.0	$110,000
3	1-10	Traffic Control Supervisor	1	LS	$20,000.0	$20,000
4	1-10	Flaggers, Spotters, and Other Traffic Control Labor	240	HR	$70.0	$16,800
5	1-10	Other Temporary Traffic Contro	1	LS	$35,000.0	$35,000
6	2-02	Removing Asphalt Concrete Pavement	111	SY	$25.0	$2,778
7	2-02	Removing Cement Conc. Sidewalk	85	SY	$40.0	$3,400
8	2-02	Removing Cement Conc. Curb and Gutter	95	LF	$10.0	$950
9	4-04	Crushed Surfacing Top Course	35	TON	$150.0	$5,250
10	5-04	HMA Cl. 1/2", PG 64-22	70	TON	$220.0	$15,400
11	5-05	Cement Concrete Pavement	372	SY	$150.0	$55,733
12	7-05	Adjust Manhole	0	EA	$350.0	$0
13	7-05	Adjust Catch Basin	0	EA	$500.0	$0
14	7-12	Adjust Water Valve Box	0	EA	$500.0	$0
15	8-01	Drainage Modification	1	EA	$10,000.0	$10,000
16	8-01	Erosion/Water Pollution Control	1	LS	$2,000.0	$2,000
17	8-01	CSWPPP and TESC Plans	0	LS	$2,500.0	$0
18	8-02	Removing Raised Pavement Marker	14000	LF	$3.0	$42,000
19	8-04	Cement Conc. Traffic Curb and Gutter	100	LF	$80.0	$8,000
20	8-07	Bikeway Buffer Vertical Protection	4000	LF	$35.0	$140,000
21	8-09	Raised Pavement Marker, Type 1	3870	EA	$10.0	$38,700
22	8-09	Raised Pavement Marker, Type 2	730	EA	$15.0	$10,950
23	8-09	Removing Raised Pavement Marker	1	LS	$2,000.0	$2,000
24	8-13	Adjust Monument Case and Cover	0	EA	$250.0	$0
25	8-14	Cement Conc. Sidewalk	141	SY	$130.0	$18,344
26	8-14	Cement Conc. Curb Ramp Type Perpendicular A	67	SY	$275.0	$18,333
27	8-14	Cement Conc. Curb Ramp Type Diagonally-Oriented Paralle	0	SY	$300.0	$0
28	8-20	Induction Loop Detector	68	EA	$1,500.0	$102,000
29	8-20	Traffic Signal System Modifications Complete, 1. 116th Ave NE and Main S	1	LS	$5,000.0	$5,000
30	8-20	Traffic Signal System Modifications Complete, 1. 116th Ave NE and NE 4th S	1	LS	$5,000.0	$5,000
31	8-20	Traffic Signal System Modifications Complete. NE 4th St and Trail Crossing	1	LS	$5,000.0	$5,000
32	8-20	Traffic Signal System Modifications Complete, 2. 120th Ave NE and NE 4th S	1	LS	$30,000.0	$30,000
33	8-20	Traffic Signal System Modifications Complete, 2. 120th NE and NE 8th S	1	LS	$30,000.0	$30,000
34	8-20	Video Detection (TrafiSense Camera)	8	EA	$6,000.0	$48,000
35	8-20	Adjust Junction Box	2	EA	$500.0	$1,000
36	8-20	Temporary Vehicle Detection	0	EA	$450.0	$0
37	8-21	Permanent Signing	0	LS	$5,000.0	$0
38	8-22	Removing Paint Line	1780	LF	$3.0	$5,340
39	8-22	Removing Plastic Line	60	LF	$5.0	$300
40	8-22	Removing Plastic Traffic Marking	68	EA	$150.0	$10,200
41	8-22	Removing C-Curb	2180	LF	$10.0	$21,800
42	8-22	Paint Line, White, 6 Inch	7000	LF	$2.0	$14,000
43	8-22	Paint Line, Yellow, 6 Inch	0	LF	$2.0	$0
44	8-22	Plastic Line, 6 Inch	2000	LF	$7.5	$15,000
45	8-22	Green Bicycle Lane Treatment	2841	SF	$25.0	$71,025
46	8-22	C-Curb	2255	LF	$80.0	$180,400
47	8-22	Bike Dots	0	EA	$150.0	$0
48	8-22	Small Green Bike Box	0	EA	$2,500.0	$0
49	8-22	Trail Green Bike Box	0	EA	$3,500.0	$0
50	8-22	Plastic Stop Line	0	LF	$15.0	$0
51	8-22	Plastic Crosswalk Line	4900	SF	$20.0	$98,000
52	8-22	Plastic Traffic Arrow	71	EA	$350.0	$24,850
53	8-22	Plastic Bicycle Lane Symbol	38	EA	$385.0	$14,630
54	8-22	Signal Induction Loop Marker	7	EA	$350.0	$2,450
						$ 1,249,633.89

+ 10% Prelim. Design Contingency	**$**	**124,963.39**
+10% Construction Management	**$**	**124,963.39**
+ 10% Contingency	**$**	**124,963.39**
Construction Total	**$**	**1,624,524.06**
Design & Permitting Total (15% of Construction)	**$**	**243,678.61**
Project Total (Design + Construction)	**$**	**1,868,202.66**

Preliminary cost estimates to be finalized and determined by City, this range is an approximation completed in 2023.

Corridor 10

CITY OF BELLEVUE
TRANSPORTATION DEPARTMENT

BIKE BELLEVUE
116TH AVE NE CORRIDOR

CITY MANAGER
BRAD MIYAKE

MAYOR
LYNNE ROBINSON

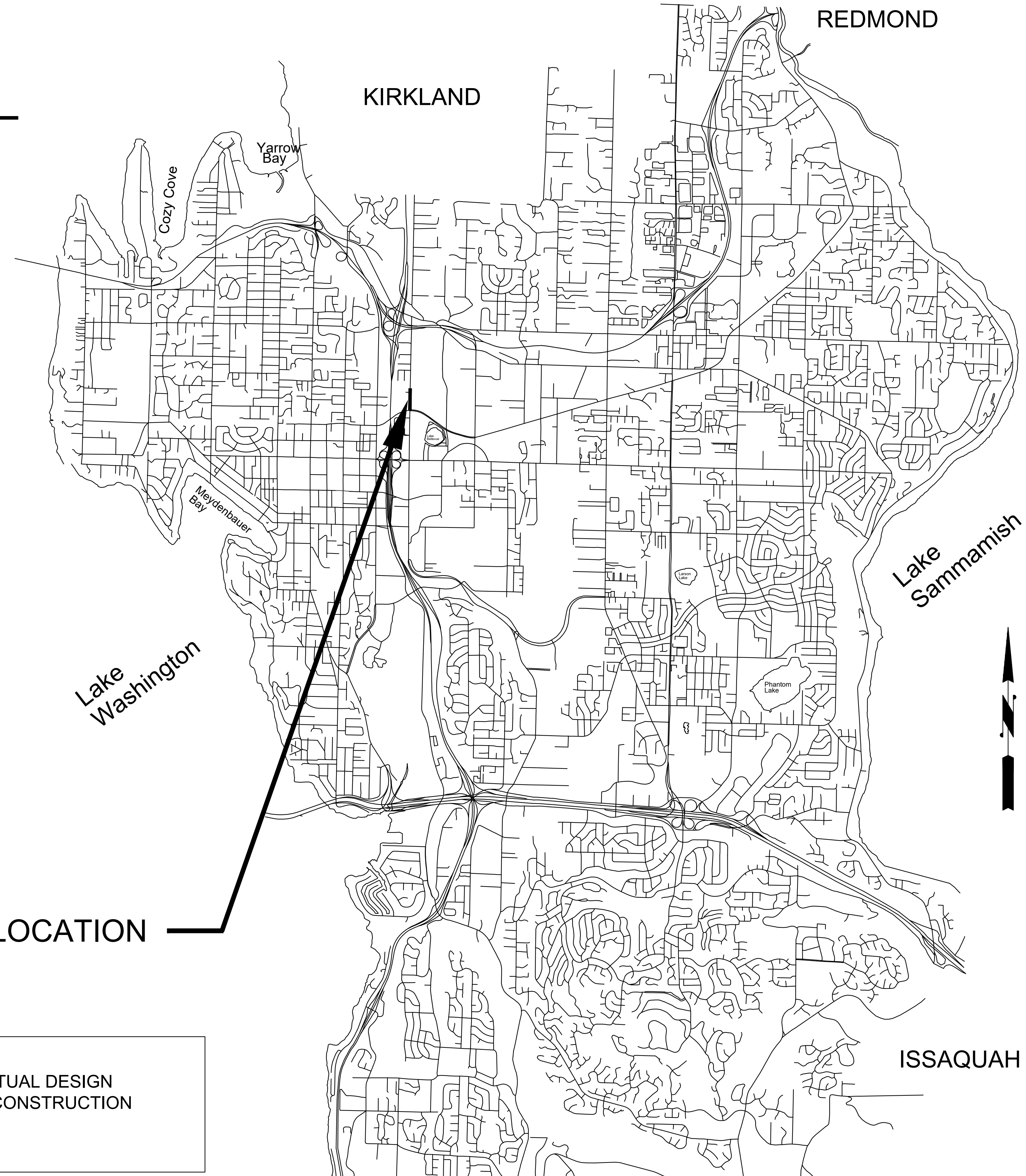
DIRECTOR OF TRANSPORTATION
ANDREW SINGELAKIS

DEPUTY MAYOR
JARED NIEUWENHUIS

CITY COUNCIL
JEREMY BARKSDALE
CONRAD LEE
JENNIFER ROBERTSON
JOHN STOKES
JANICE ZAHN

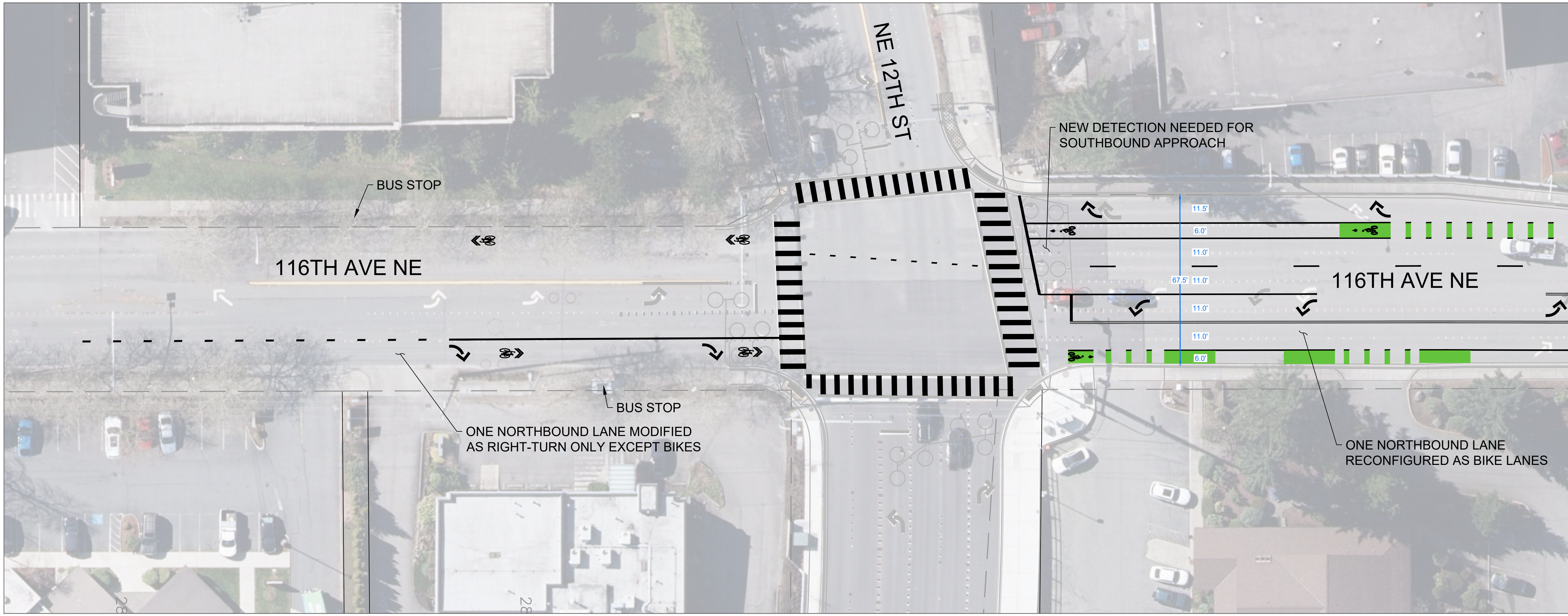
SCHEDULE OF DRAWINGS

SHEET	DRAWINGS
1	COVER SHEET
2-3	ROADWAY PLANS



CONCEPTUAL DESIGN
NOT FOR CONSTRUCTION

C.I.P. NUMBER xxxxxx



SCALE IN FEET
20 0 20 40

alta

NO.	DATE	BY	APPR.	REVISIONS

KP 12/19/22
DESIGNED BY DATE
KP 12/19/22
DRAWN BY DATE
CHECKED BY DATE

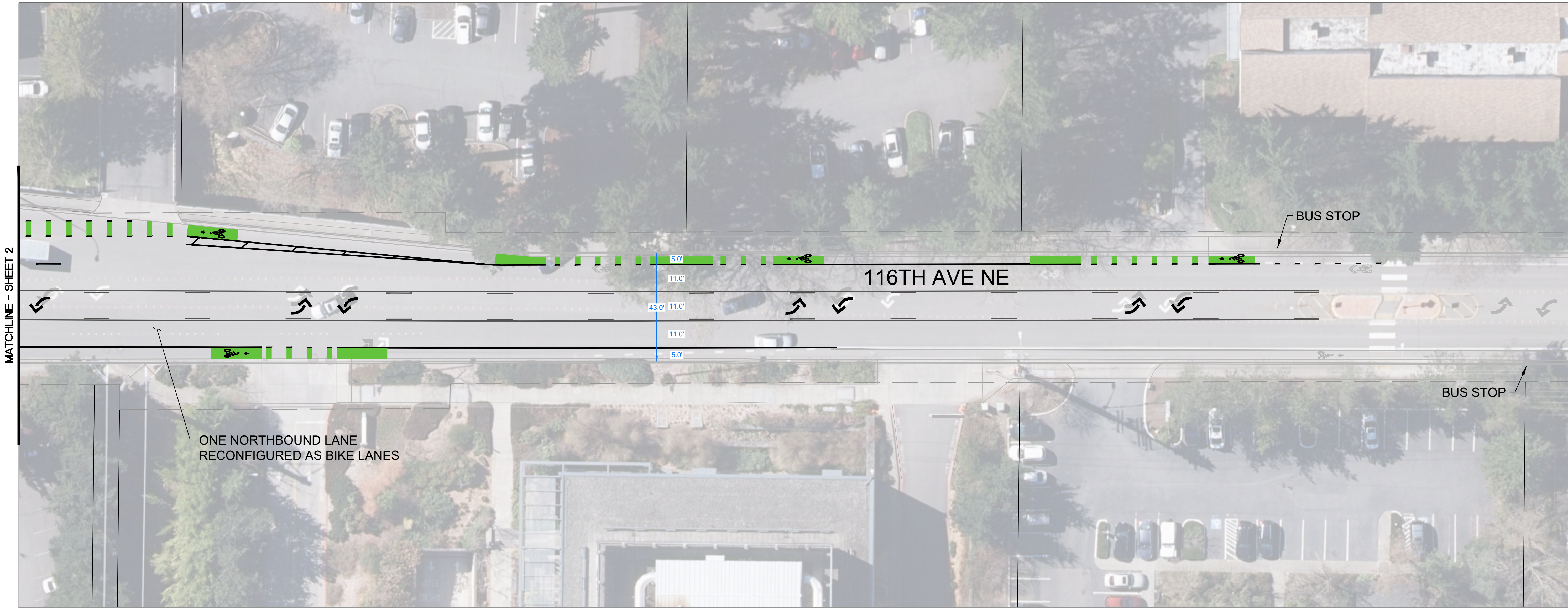
City of Bellevue
Transportation Department

PRELIMINARY DESIGN

BIKE BELLEVUE
116TH AVE NE CORRIDOR

CONCEPTUAL PLAN

SHT 2 OF 3



SCALE IN FEET
20 0 20 40

alta

NO.	DATE	BY	APPR.	REVISIONS

KP 12/19/22
DESIGNED BY DATE
KP 12/19/22
DRAWN BY DATE
CHECKED BY DATE

City of Bellevue
Transportation Department

PRELIMINARY DESIGN

BIKE BELLEVUE
116TH AVE NE CORRIDOR

CONCEPTUAL PLAN

SHT 3 OF 3

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	253	648	126	880	71	141	435	204	98	481	254
Future Volume (vph)	253	648	126	880	71	141	435	204	98	481	254
Turn Type	Prot	NA	Prot	NA	pm+ov	D.P+P	NA	Perm	D.P+P	NA	pm+ov
Protected Phases	1	6	5	2	3	7	4		3	8	1
Permitted Phases					2	8		4	4		8
Detector Phase	1	6	5	2	3	7	4	4	3	8	1
Switch Phase											
Minimum Initial (s)	5.0	7.0	5.0	7.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	25.0	10.0	28.0	10.0	10.0	30.0	30.0	10.0	25.0	10.0
Total Split (s)	27.0	48.0	22.0	43.0	10.0	16.0	40.0	40.0	10.0	34.0	27.0
Total Split (%)	22.5%	40.0%	18.3%	35.8%	8.3%	13.3%	33.3%	33.3%	8.3%	28.3%	22.5%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lead	Lag	Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	None	C-Max	None	None	None	None	None	None	None
Act Effct Green (s)	20.7	45.1	17.0	41.3	51.3	37.9	32.9	32.9	37.9	27.8	53.5
Actuated g/C Ratio	0.17	0.38	0.14	0.34	0.43	0.32	0.27	0.27	0.32	0.23	0.45
v/c Ratio	0.90	0.68	0.55	0.79	0.10	0.58	0.93	0.37	0.79	0.64	0.35
Control Delay	80.2	34.0	57.0	41.8	2.0	36.0	67.5	6.4	66.8	45.4	9.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	80.2	34.0	57.0	41.8	2.0	36.0	67.5	6.4	66.8	45.4	9.8
LOS	F	C	E	D	A	D	E	A	E	D	A
Approach Delay		44.9		41.0			45.8			37.1	
Approach LOS		D		D			D			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 24 (20%), Referenced to phase 2:WBT and 6:EBT, Start of Red	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.93	
Intersection Signal Delay: 42.2	Intersection LOS: D
Intersection Capacity Utilization 83.3%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 29: 116th Ave NE & NE 12th St

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	275	890	137	957	77	153	473	222	107	523	276
v/c Ratio	0.90	0.68	0.55	0.79	0.10	0.58	0.93	0.37	0.79	0.64	0.35
Control Delay	80.2	34.0	57.0	41.8	2.0	36.0	67.5	6.4	66.8	45.4	9.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	80.2	34.0	57.0	41.8	2.0	36.0	67.5	6.4	66.8	45.4	9.8
Queue Length 50th (ft)	208	300	100	364	0	80	348	2	55	190	53
Queue Length 95th (ft)	#354	376	168	450	15	132	#532	59	#123	250	113
Internal Link Dist (ft)		771		899			899			312	
Turn Bay Length (ft)	500		200		250	150		150	150		200
Base Capacity (vph)	324	1306	250	1218	739	276	543	616	135	855	806
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.85	0.68	0.55	0.79	0.10	0.55	0.87	0.36	0.79	0.61	0.34

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	253	648	171	126	880	71	141	435	204	98	481	254
Future Volume (veh/h)	253	648	171	126	880	71	141	435	204	98	481	254
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	275	704	186	137	957	77	153	473	222	107	523	276
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	301	996	263	289	1249	623	272	507	430	152	823	635
Arrive On Green	0.17	0.36	0.36	0.16	0.35	0.35	0.08	0.27	0.27	0.04	0.23	0.23
Sat Flow, veh/h	1781	2781	734	1781	3554	1585	1781	1870	1585	1781	3554	1585
Grp Volume(v), veh/h	275	450	440	137	957	77	153	473	222	107	523	276
Grp Sat Flow(s),veh/h/ln	1781	1777	1738	1781	1777	1585	1781	1870	1585	1781	1777	1585
Q Serve(g_s), s	18.2	26.1	26.1	8.4	28.7	3.7	7.8	29.6	9.4	5.0	15.9	15.2
Cycle Q Clear(g_c), s	18.2	26.1	26.1	8.4	28.7	3.7	7.8	29.6	9.4	5.0	15.9	15.2
Prop In Lane	1.00		0.42	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	301	637	623	289	1249	623	272	507	430	152	823	635
V/C Ratio(X)	0.91	0.71	0.71	0.47	0.77	0.12	0.56	0.93	0.52	0.70	0.64	0.43
Avail Cap(c_a), veh/h	327	637	623	289	1249	623	291	546	462	152	859	651
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	33.1	33.1	45.6	34.5	23.2	32.4	42.7	16.3	35.5	41.5	26.1
Incr Delay (d2), s/veh	26.5	6.5	6.6	0.4	4.5	0.4	1.1	21.7	0.4	11.6	1.1	0.2
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	10.3	12.3	12.0	3.8	13.1	1.5	3.4	16.6	3.5	2.8	7.1	5.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	75.5	39.6	39.7	46.1	39.0	23.6	33.5	64.4	16.7	47.1	42.6	26.3
LnGrp LOS	E	D	D	D	D	C	C	E	B	D	D	C
Approach Vol, veh/h		1165			1171			848			906	
Approach Delay, s/veh		48.1			38.9			46.3			38.1	
Approach LOS		D			D			D			D	

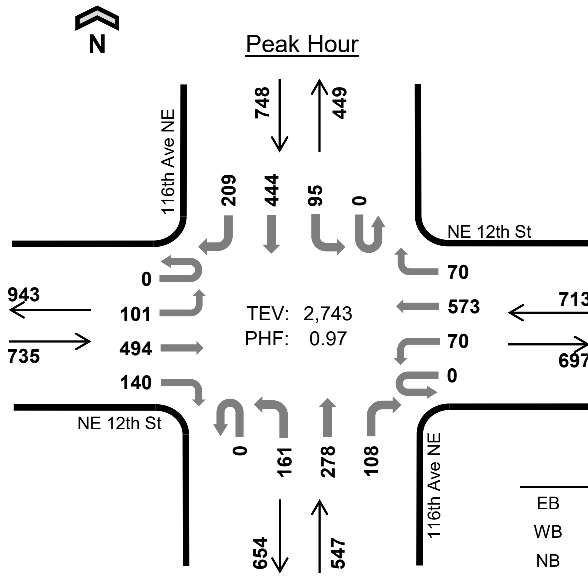
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	25.3	47.2	10.0	37.5	24.5	48.0	14.7	32.8
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	22.0	38.0	5.0	35.0	17.0	43.0	11.0	29.0
Max Q Clear Time (g_c+I1), s	20.2	30.7	7.0	31.6	10.4	28.1	9.8	17.9
Green Ext Time (p_c), s	0.1	3.0	0.0	0.9	0.1	3.5	0.0	2.3

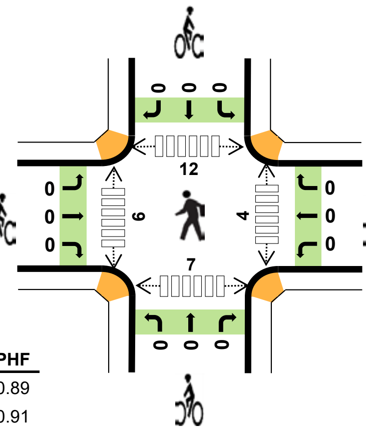
Intersection Summary	
HCM 6th Ctrl Delay	42.9
HCM 6th LOS	D

116th Ave NE
NE 12th St

Date: 11/03/2021
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:30 PM to 5:30 PM

Peak Hour





	HV %:	PHF
EB	1.0%	0.89
WB	1.4%	0.91
NB	1.5%	0.80
SB	1.1%	0.93
TOTAL	1.2%	0.97

Two-Hour Count Summaries

Interval Start		NE 12th St				NE 12th St				116th Ave NE				116th Ave NE				15-min Total	Rolling One Hour
		Eastbound				Westbound				Northbound				Southbound					
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM		0	27	121	29	0	27	113	17	0	19	60	39	0	17	123	46	638	0
4:15 PM		0	30	128	25	0	14	150	15	0	24	61	37	0	14	94	41	633	0
4:30 PM		**0**	**24**	**118**	**32**	**0**	**18**	**127**	**14**	**0**	**57**	**79**	**34**	**0**	**21**	**126**	**49**	**699**	0
4:45 PM		**0**	**27**	**122**	**32**	**0**	**21**	**142**	**20**	**0**	**30**	**70**	**20**	**0**	**22**	**93**	**60**	**659**	2,629
5:00 PM		**0**	**29**	**133**	**44**	**0**	**16**	**138**	**21**	**0**	**41**	**60**	**24**	**0**	**27**	**132**	**43**	**708**	2,699
5:15 PM		**0**	**21**	**121**	**32**	**0**	**15**	**166**	**15**	**0**	**33**	**69**	**30**	**0**	**25**	**93**	**57**	**677**	**2,743**
5:30 PM		0	26	139	40	0	19	144	12	0	34	45	19	0	19	111	46	654	2,698
5:45 PM		0	27	117	29	0	19	160	14	0	31	45	15	0	16	61	48	582	2,621
Count Total		0	211	999	263	0	149	1,140	128	0	269	489	218	0	161	833	390	5,250	0
Peak Hour	**All**	**0**	**101**	**494**	**140**	**0**	**70**	**573**	**70**	**0**	**161**	**278**	**108**	**0**	**95**	**444**	**209**	**2,743**	**0**
	HV	**0**	**1**	**6**	**0**	**0**	**5**	**4**	**1**	**0**	**3**	**5**	**0**	**0**	**1**	**6**	**1**	**33**	**0**
	HV%	**-**	**1%**	**1%**	**0%**	**-**	**7%**	**1%**	**1%**	**-**	**2%**	**2%**	**0%**	**-**	**1%**	**1%**	**0%**	**1%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	4	3	2	3	*12*	0	0	0	0	*0*	0	3	1	0	*4*
4:15 PM	5	4	2	3	*14*	0	0	0	0	*0*	0	1	1	4	*6*
4:30 PM	**1**	**5**	**3**	**3**	***12***	**0**	**0**	**0**	**0**	***0***	**1**	**4**	**1**	**4**	*10*
4:45 PM	**1**	**1**	**2**	**1**	***5***	**0**	**0**	**0**	**0**	***0***	**1**	**0**	**6**	**1**	*8*
5:00 PM	**1**	**3**	**1**	**2**	***7***	**0**	**0**	**0**	**0**	***0***	**1**	**1**	**2**	**1**	*5*
5:15 PM	**4**	**1**	**2**	**2**	***9***	**0**	**0**	**0**	**0**	***0***	**1**	**1**	**3**	**1**	***6***
5:30 PM	1	5	2	2	*10*	0	0	0	0	*0*	3	1	0	2	*6*
5:45 PM	0	0	3	2	*5*	0	0	0	0	*0*	0	1	3	2	*6*
Count Total	17	22	17	18	*74*	0	0	0	0	*0*	7	12	17	15	*51*
Peak Hour	**7**	**10**	**8**	**8**	***33***	**0**	**0**	**0**	**0**	***0***	**4**	**6**	**12**	**7**	***29***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	NE 12th St Eastbound				NE 12th St Westbound				116th Ave NE Northbound				116th Ave NE Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	0	2	2	0	1	2	0	0	0	2	0	0	0	1	2	12	0
4:15 PM	0	2	2	1	0	0	4	0	0	0	1	1	0	0	2	1	14	0
4:30 PM	**0**	**0**	**1**	**0**	**0**	**2**	**2**	**1**	**0**	**1**	**2**	**0**	**0**	**1**	**2**	**0**	**12**	0
4:45 PM	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**1**	**0**	**5**	43
5:00 PM	**0**	**1**	**0**	**0**	**0**	**2**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**2**	**0**	**7**	38
5:15 PM	**0**	**0**	**4**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**1**	**1**	**9**	**33**
5:30 PM	0	0	1	0	0	2	3	0	0	0	2	0	0	0	2	0	10	31
5:45 PM	0	0	0	0	0	0	0	0	0	2	1	0	0	0	1	1	5	31
Count Total	0	3	11	3	0	8	13	1	0	5	11	1	0	1	12	5	74	0
Peak Hour	**0**	**1**	**6**	**0**	**0**	**5**	**4**	**1**	**0**	**3**	**5**	**0**	**0**	**1**	**6**	**1**	**33**	**0**

Two-Hour Count Summaries - Bikes

Interval Start	NE 12th St Eastbound			NE 12th St Westbound			116th Ave NE Northbound			116th Ave NE Southbound			15-min Total	Rolling One Hour
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
4:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
5:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
5:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

Bike Bellevue - Corridor 10 (116th Ave NE)

City of Bellevue Transportation Department

Estimate - 8/29/2023

Planning Level Estimate

Item No.	Sect. No.	Item	Quantity	Unit	Unit Cost	Total Cost
1	1-09	Mobilization	1	LS	$11,300	$11,300
2	1-10	Traffic Control Supervisor	1	LS	$5,621	$5,621
3	1-10	Other Temporary Traffic Control	1	LS	$5,621	$5,621
4	8-02	Removing Raised Pavement Marker	1950	LF	$3	$5,850
5	8-09	Raised Pavement Marker, Type 1	7	HUND	$1,000	$7,000
6	8-20	Video Detection (TrafiSense Camera)	2	EA	$6,000	$12,000
7	8-09	Raised Pavement Marker, Type 2	2	HUND	$1,500	$3,000
8	8-20	Induction Loop Detector	7	EA	$1,500	$10,500
9	8-21	Permanent Signing	1	LS	$6,000	$6,000
10	8-22	Removing Plastic Line	0	LF	$5	$0
11	8-22	Removing Plastic Traffic Marking	12	EA	$200	$2,400
12	8-22	Paint Line, White, 6 Inch	1107	LF	$2	$2,213
13	8-22	Plastic Line, 6 Inch	150	LF	$8	$1,121
14	8-22	Green Bicycle Lane Treatment	1438	SF	$25	$35,945
15	8-22	Plastic Stop Line	51	LF	$15	$765
16	8-22	Plastic Crosswalk Line	1000	SF	$20	$20,000
17	8-22	Plastic Traffic Arrow	14	EA	$75	$1,050
18	8-22	Plastic Bicycle Lane Symbol	7	EA	$385	$2,695
19	8-22	Bicycle Shared Lane Marking	4	EA	$385	$1,540
20	8-22	Signal Induction Loop Marker	1	EA	$350	$350
					SubTotal	**$ 134,971.85**

+ 10% Prelim. Design Contingency	**$ 13,497.19**
+10% Construction Management	**$ 13,497.19**
+ 10% Contingency	**$ 13,497.19**
Construction Total	**$ 175,463.41**
Design & Permitting Total (15% of Construction)	**$ 26,319.51**
Project Total (Design + Construction)	**$ 201,782.92**

Preliminary cost estimates to be finalized and determined by City, this range is an approximation completed in 2023.

Corridor 11

CITY OF BELLEVUE
TRANSPORTATION DEPARTMENT

BIKE BELLEVUE
140TH AVENUE NE CORRIDOR

CITY MANAGER
BRAD MIYAKE

MAYOR
LYNNE ROBINSON

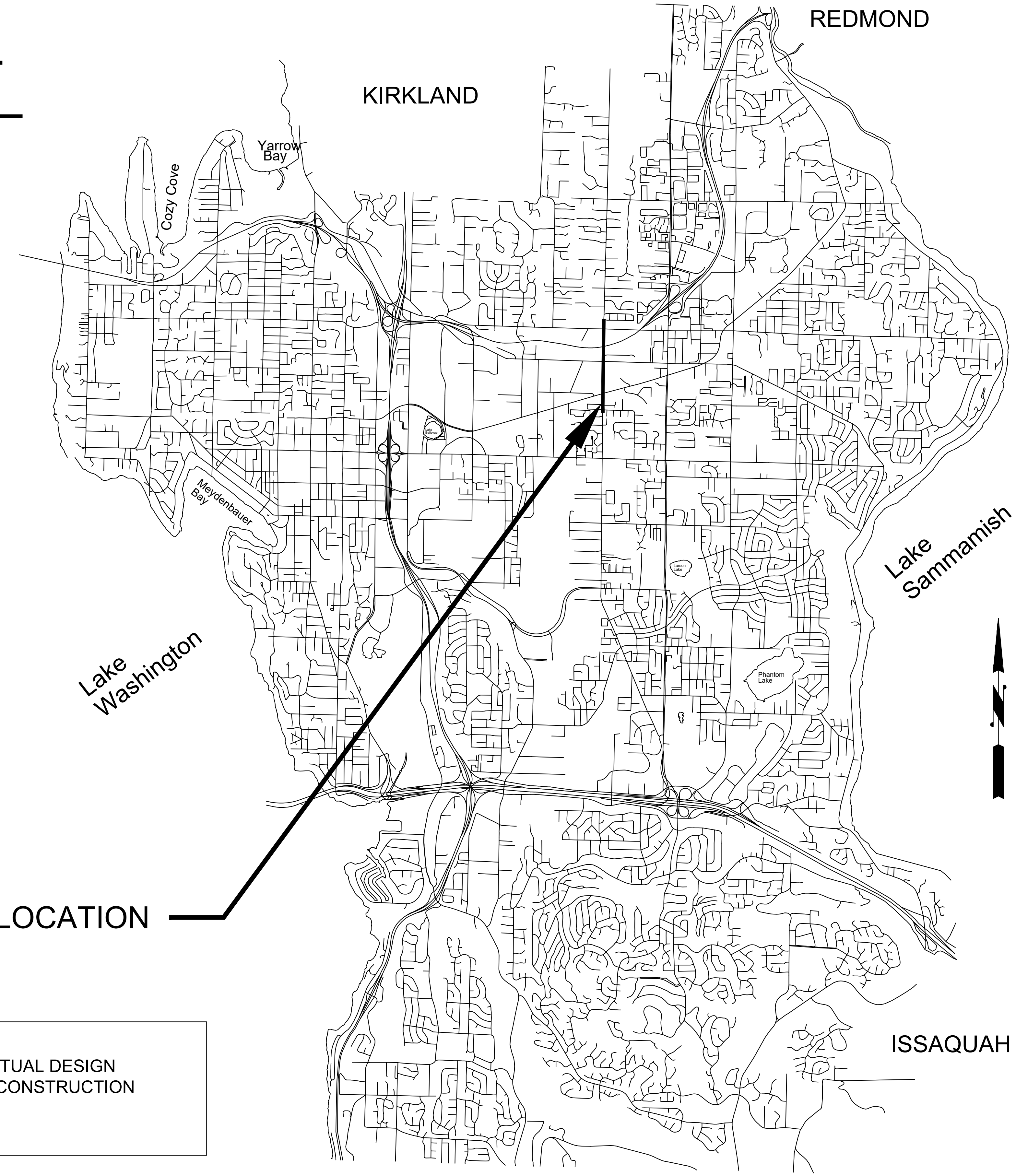
DIRECTOR OF TRANSPORTATION
ANDREW SINGELAKIS

DEPUTY MAYOR
JARED NIEUWENHUIS

CITY COUNCIL
JEREMY BARKSDALE
CONRAD LEE
JENNIFER ROBERTSON
JOHN STOKES
JANICE ZAHN

SCHEDULE OF DRAWINGS

SHEET	DRAWINGS
1	COVER SHEET
2-7	ROADWAY PLANS



PROJECT LOCATION

CONCEPTUAL DESIGN
NOT FOR CONSTRUCTION

C.I.P. NUMBER xxxxxx

SCALE IN FEET
20 0 20 40

alta

NO.	DATE	BY	APPR.	REVISIONS

KP 8/17/21
DESIGNED BY DATE
KP 8/17/21
DRAWN BY DATE
CHECKED BY DATE

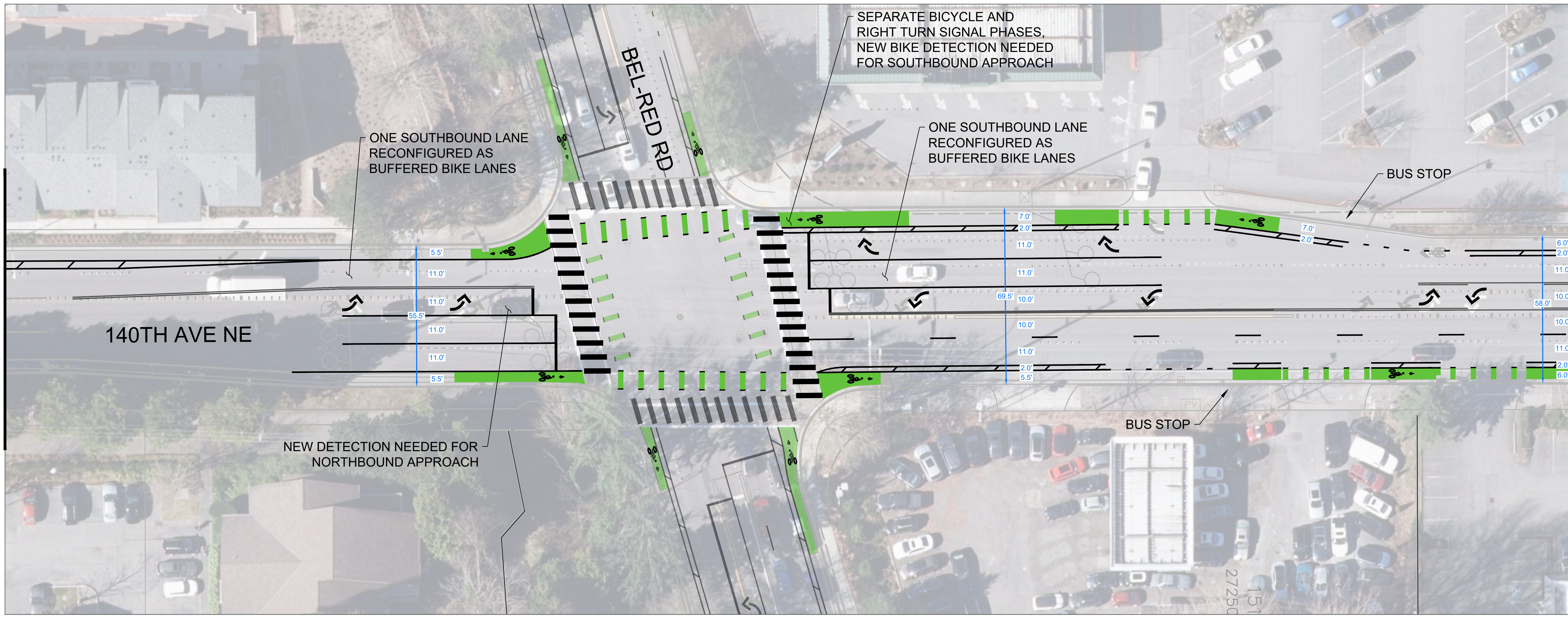
City of Bellevue
Transportation Department

PRELIMINARY DESIGN

BIKE BELLEVUE
140TH AVENUE NE CORRIDOR

CONCEPTUAL PLAN

SHT 2 OF 7



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NO.	DATE	BY	APPR.	REVISIONS

KP 8/17/21
DESIGNED BY DATE
KP 8/17/21
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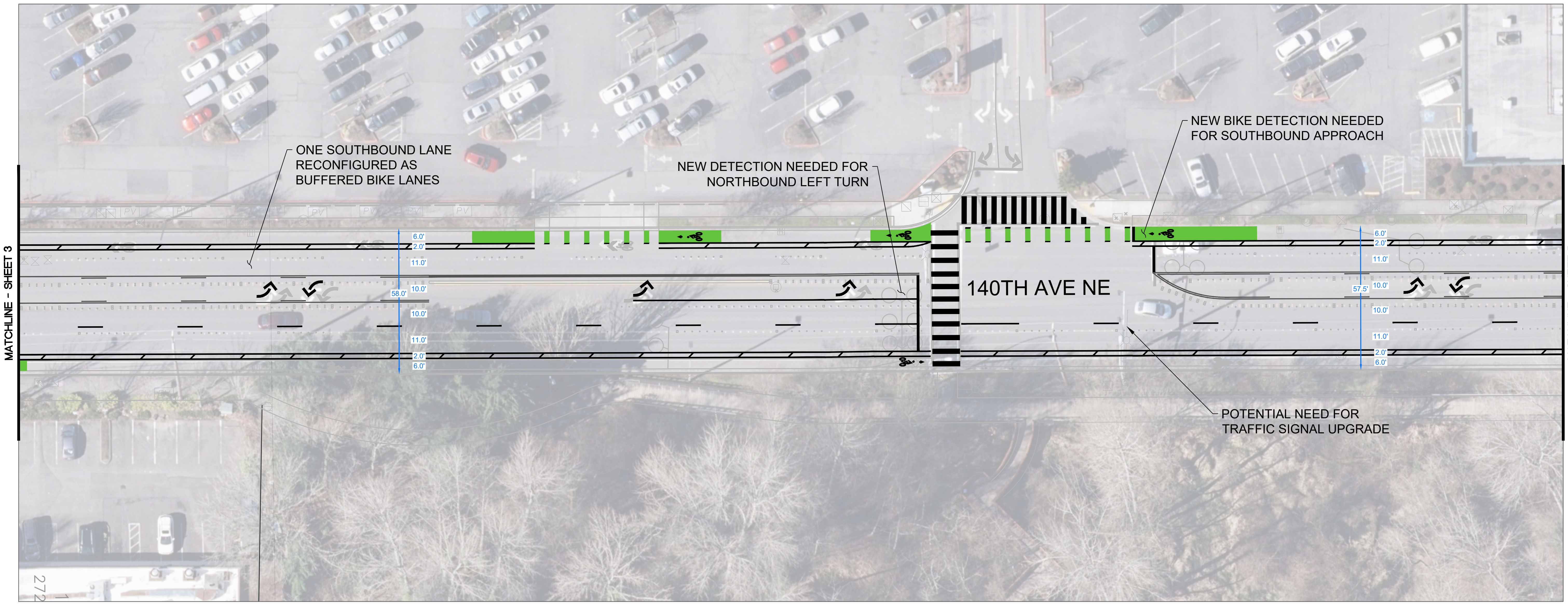
Transportation Department

PRELIMINARY DESIGN

BIKE BELLEVUE
140TH AVENUE NE CORRIDOR

CONCEPTUAL PLAN

SHT 3 OF 7



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KP	8/17/21
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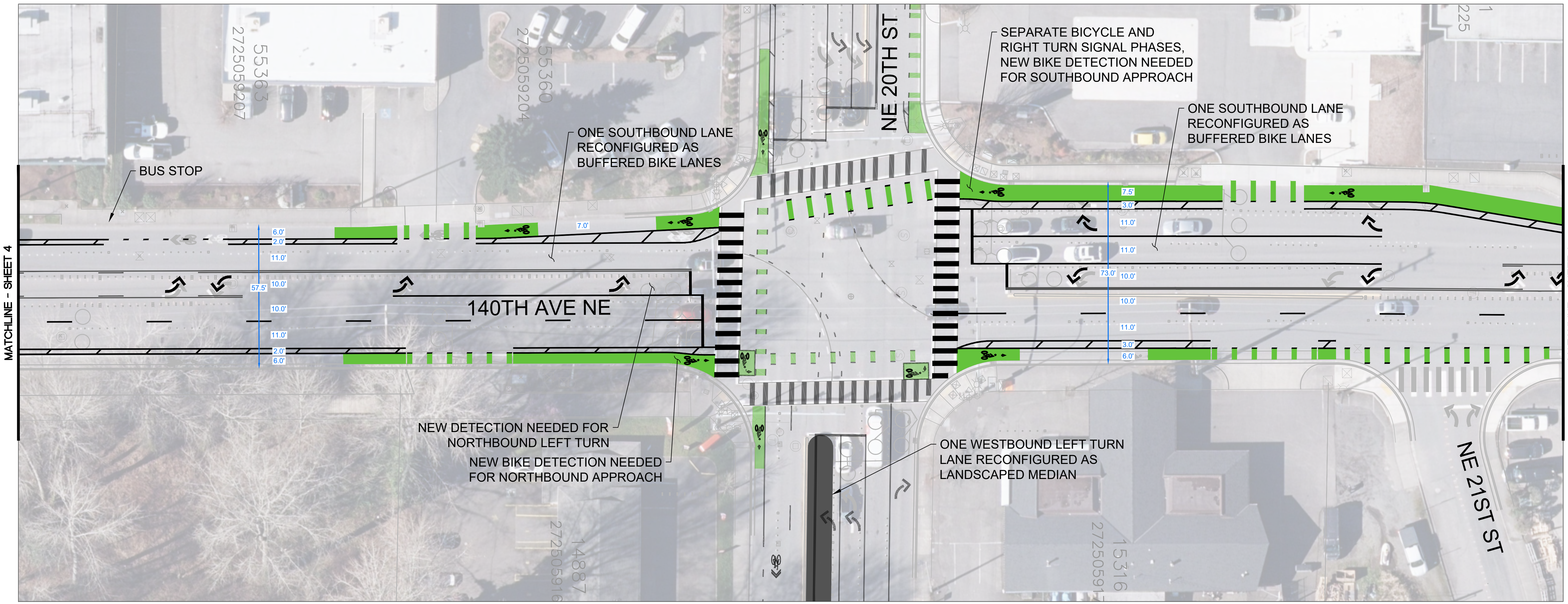
City of Bellevue
Transportation Department

PRELIMINARY DESIGN

BIKE BELLEVUE
140TH AVENUE NE CORRIDOR

CONCEPTUAL PLAN

SHT 4 OF 7



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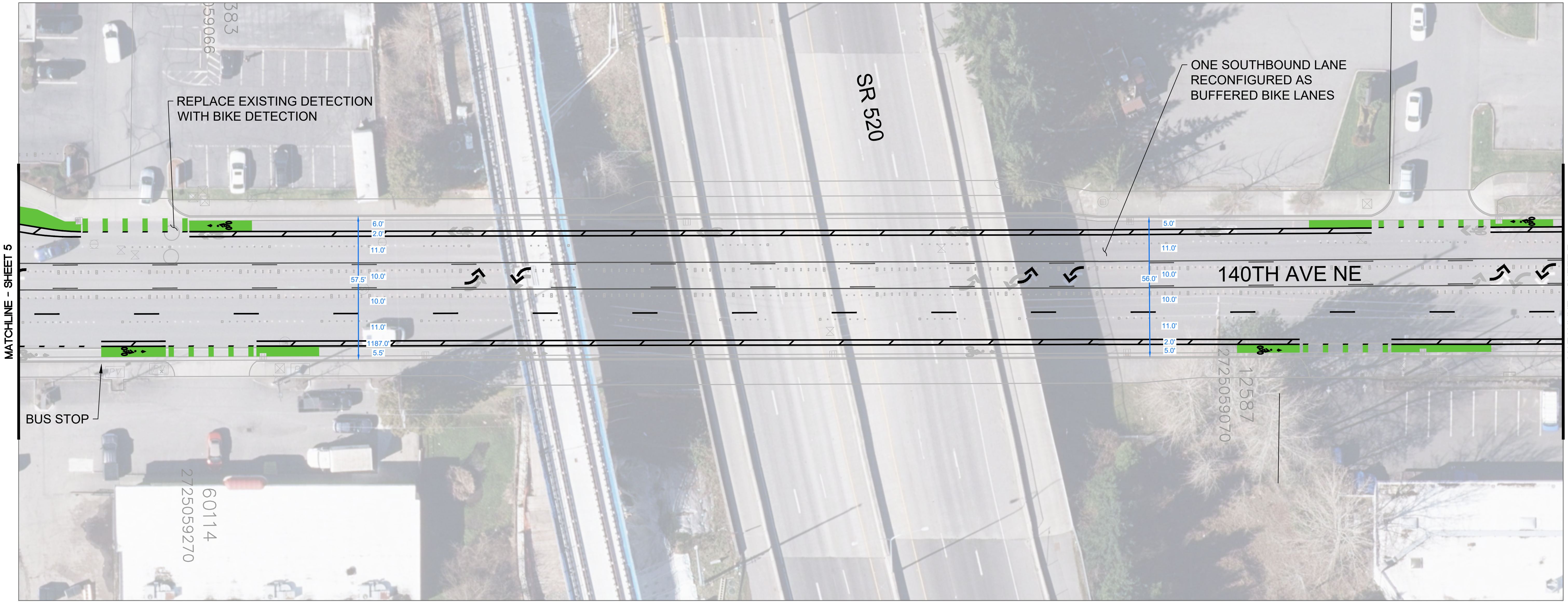
City of Bellevue
Transportation Department

PRELIMINARY DESIGN

BIKE BELLEVUE
140TH AVENUE NE CORRIDOR

CONCEPTUAL PLAN

SHT 5 OF 7



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KP 8/17/21
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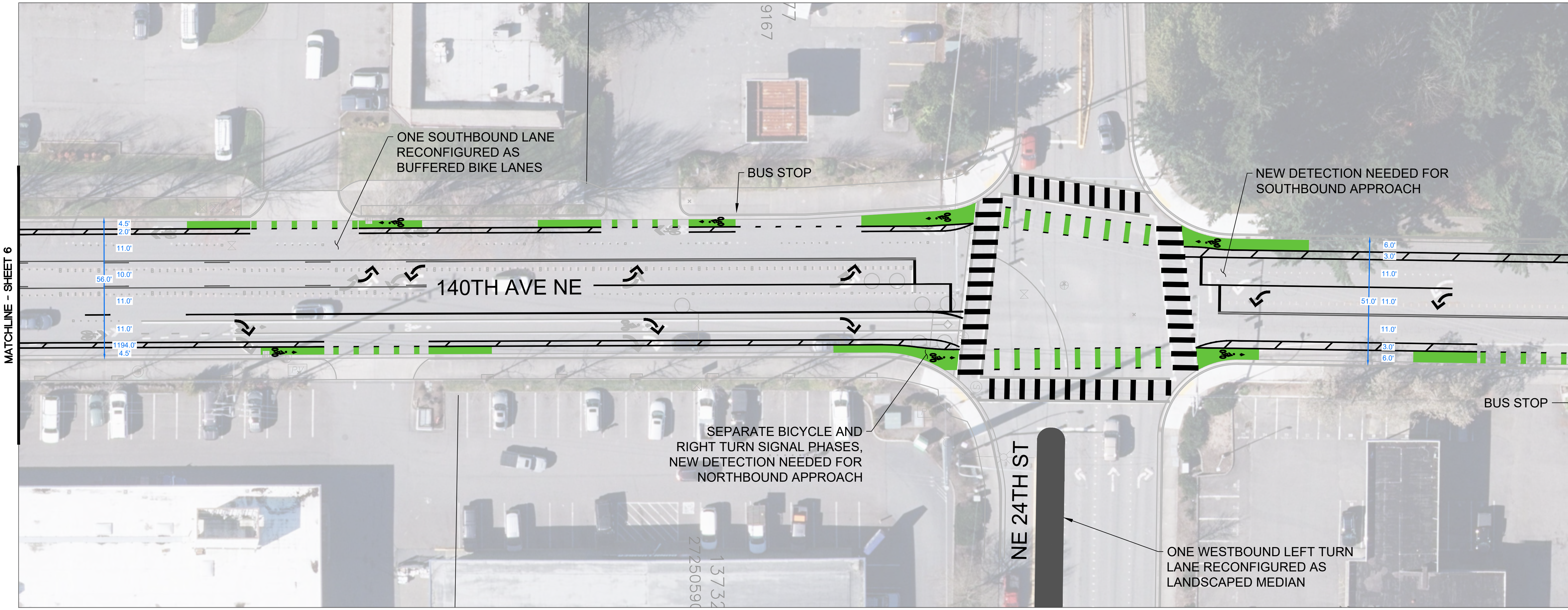
City of Bellevue
Transportation Department

PRELIMINARY DESIGN

BIKE BELLEVUE
140TH AVENUE NE CORRIDOR

CONCEPTUAL PLAN

SHT 6 OF 7



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BIKE BELLEVUE
140TH AVENUE NE CORRIDOR

CONCEPTUAL PLAN

SHT 7 OF 7