

City of
Bellevue



Transportation Commission Study Session

DATE: September 16, 2021

TO: Chair Marciante and Members of the Transportation Commission

FROM: Kevin McDonald, Principal Transportation Planner, 425-452-4558
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SUBJECT: Mobility Implementation Plan: Review Vehicle Facility Performance Approach

DIRECTION REQUESTED

Action

Discussion/Direction

Information

This memorandum summarizes the staff recommendation for setting Vehicle Performance Targets for the Mobility Implementation Plan (MIP). The Vehicle Performance Targets are set for each of the Performance Management Areas defined in the Transportation Commission's September 9, 2021 meeting. At the September 23, 2021 meeting, staff seeks the Commission's input and concurrence on the Vehicle Performance Targets in order to continue advancing the Mobility Implementation Plan. Staff plans to present a decision-making framework on how to address Performance Target gaps, identify potential projects, and prioritize projects in the Commission's October 14, 2021 meeting.

Background Data

Based on feedback from the Commission throughout the MIP process, staff is using a data-driven approach to recommending the Vehicle Performance Targets. Principally, this approach considers the expected performance of the System Intersections and Primary Vehicle Corridors when factoring in the following data:

1. New trips (vehicle, transit, walk, and bike) resulting from land use growth allocated to Bellevue from King County¹
2. New trip capacity provided by Bellevue through transportation projects currently funded in the CIP and those projects included in the proposed 2033 Transportation Facilities Plan (TFP)
3. New trip capacity provided by other agencies (Sound Transit, King County Metro, WSDOT, neighboring cities)

The effects of the land use growth and continued investment in the transportation system are modeled using the City’s travel demand forecasting tool, BKRCast. For this analysis, 2044 land use growth targets from King County are assumed along with the 2033 TFP investments and other regional transit and roadway projects. The BKRCast tool provides a forecast of the intersection v/c ratio for each System Intersection and the travel speed/travel time for the Primary Vehicle Corridors.

Land Use Growth

Table 1 summarizes the forecast land use growth in Bellevue between 2019 and 2044. In accordance with the Comprehensive Plan, most of the growth is focused in the City’s higher-density mixed use areas like Downtown, BelRed, and Wilburton/East Main.

Table 1. Existing and Forecast Land Use Growth in Bellevue

Area	2019 (Existing)		2044 (Forecast)		2019-2044 Growth	
	Jobs	Housing Units	Jobs	Housing Units	Jobs	Housing Units
Downtown	59,870	9,960	111,180	23,320	51,310	13,360
Bel-Red	15,430	1,840	31,370	15,020	15,940	13,180
Wilburton/East Main	8,580	710	21,770	4,260	13,190	3,550
Crossroads	2,730	4,150	2,670	4,330	-60	180
Eastgate	18,670	1,590	17,340	2,490	-1,330	900
Factoria	8,630	1,590	7,710	2,130	-920	540
Residential Areas	23,810	44,540	25,920	47,800	2,110	3,260
Grand Total	137,720	64,380	217,960	99,350	80,240	34,970

Source: City of Bellevue, 2021

¹This land use growth has been allocated to Bellevue by King County based on state and regional forecasts for new residents and jobs. The City of Bellevue has committed to accommodate this growth under its obligations under the Growth Management Act (GMA) to accommodate its share of regional growth. For the MIP, this land use growth is an input to the model and not a variable that can be adjusted.

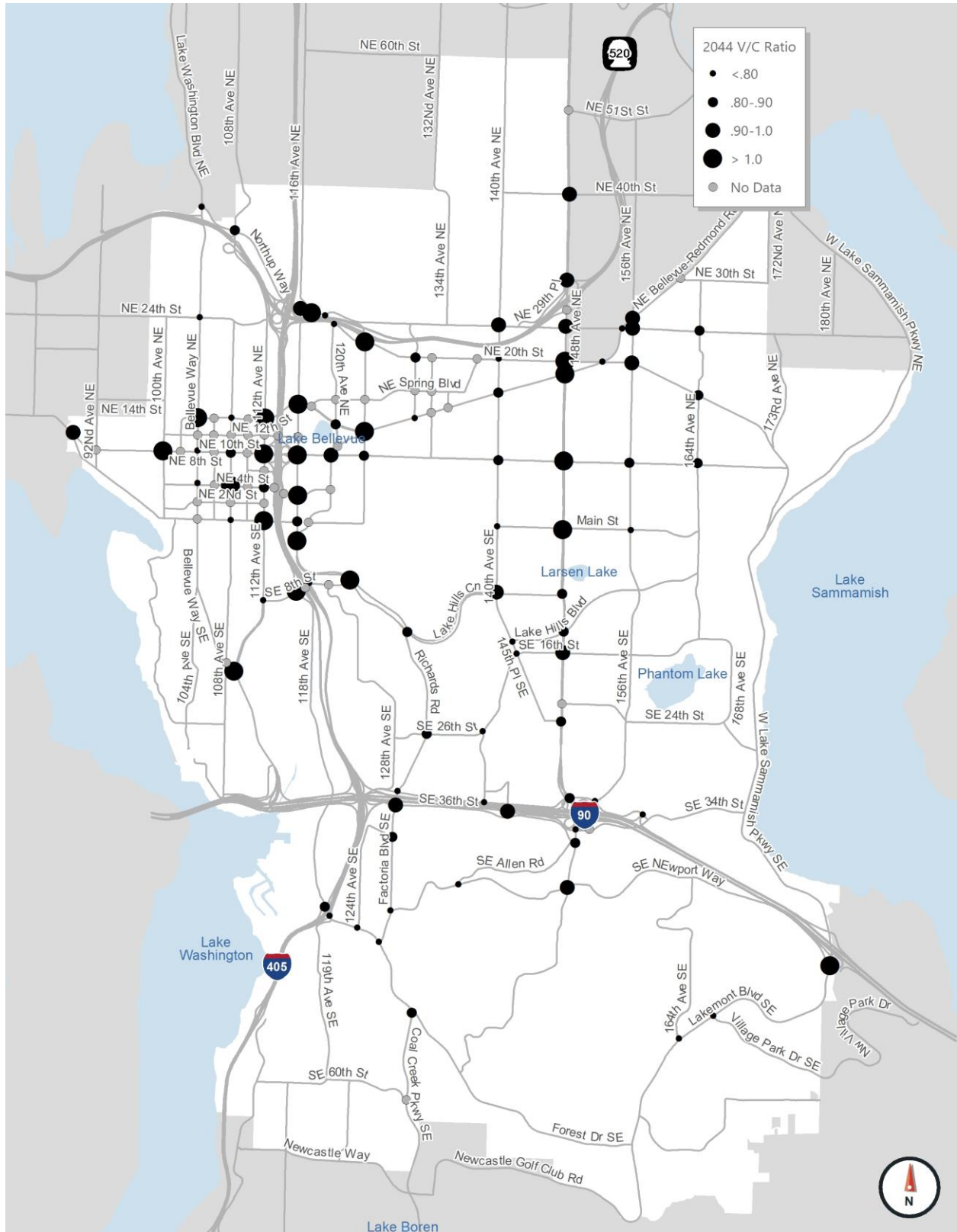
System Intersection V/C Ratio Results

The results of the 2044 System Intersection v/c ratio forecast are shown in **Figure 1** and tabulated in **Attachment A** to this memo. To facilitate a comparison to 2019 existing conditions, Attachment A also includes the 2019 intersection v/c ratios.² **Attachment B** includes a list of the TFP capacity projects included in the BKRCast model.

Consistent with the pattern of land use growth, there are increases in the v/c ratio at System Intersections across the city, but the ratios increase the most in the fastest growing areas like Downtown, Wilburton/East Main, and BelRed. Some intersections in areas like Eastgate have a slightly lower v/c ratio because of TFP projects that add capacity.

² Note that the System Intersection results only include the System Intersections used in Bellevue's legacy transportation concurrency program. This is because the newly identified system intersections from the September 9, 2021 Transportation Commission meeting have not yet had base-year data collected or been programmed into the BKRCast v/c calculation tool.

Figure 1. 2044 System Intersection v/c Ratios



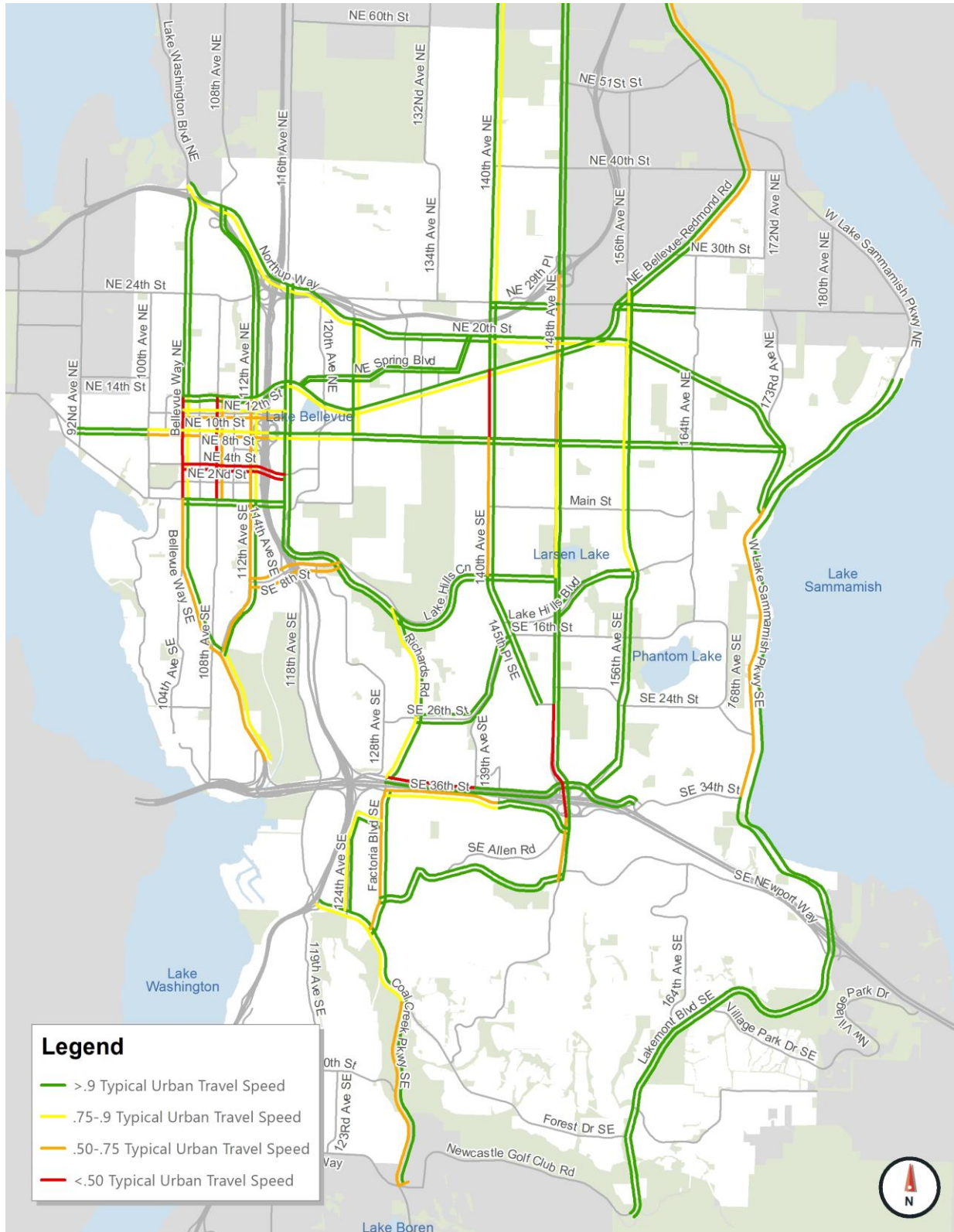
Source: City of Bellevue, Fehr & Peers, 2021.

Primary Vehicle Corridor Travel Speed Results

The Transportation Commission defined a Primary Vehicle Corridor on September 9 – these are arterials that connect System intersections, have over 10K daily vehicle trips and are more than a half mile long. The results of the 2044 Primary Vehicle Corridor speed analysis³ is shown in **Figure 2** and tabulated in **Attachment C** to this memo. To facilitate a comparison to 2019 existing conditions, Attachment C also includes the 2019 corridor travel speed ratios. The results of the travel speed analysis generally mirror that of the intersection v/c ratio; however, there are several corridors that show degraded travel speed as a result of growth in vehicle trips. Corridors that stand out include Bellevue Way near I-90, Richards Road and Eastgate Way near I-90, 148th Avenue SE near I-90, and West Lake Sammamish Parkway.

³ The “typical urban travel speed of a vehicle travelling along the subject arterial, assuming LOS D conditions for an urban arterial corridor as defined by Chapter 16 of the Highway Capacity Manual, 6th Edition. This equates to an average speed of about 40% of the posted speed limit. Note that this urban travel speed metric assumes that drivers will inevitably experience some delay at traffic signals.

Figure 2. 2044 Primary Vehicle Corridor Travel Speed



Source: City of Bellevue, Fehr & Peers, 2021

Staff Recommended Vehicle Performance Targets

Staff and the Consultant team closely reviewed the results of the System Intersection v/c ratios and Primary Vehicle Corridor travel speeds under 2044 conditions to inform the recommendation of Vehicle Performance Targets. This focus on future conditions is important when setting the Performance Targets as it acknowledges the effects of growth on the transportation system while also accounting for the \$100 million transportation investment that is embodied in the preliminary 2033 TFP. These recommended Performance Targets reflect the vehicle congestion levels within available funding when considering substantial local and regional growth.

Some of the key considerations of the review can be summarized as follows:

- The densest growth areas of the city as defined in the Comprehensive Plan will see improvements in accessibility (through higher density and more mixed-use development) and investments in modal connections through light rail, bus service, a better-connected street grid, sidewalk/crossing improvements, and new bicycle network facilities. This means that driving, while still an option, will be a less-attractive mode in these dense, mixed-use areas of Bellevue.
- The residential areas of the city will have new employment and service opportunities that are closer in proximity as the growth areas of Bellevue develop further. These additional opportunities will shorten the average trip length for all modes; this is true for vehicles in particular.
- Traffic volume will increase most in the densest growth areas of Bellevue, even with improved multimodal access and infrastructure.
- Traffic volume is also forecast to increase on corridors that connect the major growth areas to the regional highway network and routes that parallel congested corridors like I-405.

With these considerations in mind, staff recommends the Vehicle Performance Targets for the Performance Management Areas in Bellevue shown in **Table 2**.

Table 2. Staff Recommended Vehicle Performance Targets

Performance Management Area Typologies and Performance Targets		
PMA Type	Performance Management Area	Performance Target
1	<ul style="list-style-type: none"> Downtown BelRed Wilburton/East Main 	<ul style="list-style-type: none"> 1.0 v/c ratio at System Intersections >0.5 typical urban travel speed for Primary Vehicle Corridors
2	<ul style="list-style-type: none"> Crossroads Eastgate Factoria 	<ul style="list-style-type: none"> 0.90 v/c ratio at System Intersections >0.75 typical urban travel speed for Primary Vehicle Corridors
3	<ul style="list-style-type: none"> Residential Area 	<ul style="list-style-type: none"> 0.85 v/c ratio at System Intersections >0.9 typical urban travel speed for Primary Vehicle Corridors

Note that staff recommends setting the same Vehicle Performance Targets for each Performance Management Area within each “PMA Type” because these areas possess similar land use characteristics and mobility options. Therefore, all the Type 1 PMAs are recommended to have the same System Intersection and Primary Vehicle Corridor Performance Targets. However, since the PMAs within each PMA type are used to track performance and to plan implementation for the other modes, staff sees value in retaining the seven PMAs.

Compared to the legacy system of v/c ratios at System Intersections used for transportation concurrency, the proposed changes can be summarized as follows (there is no available comparison for corridor travel speed):

- The greater land use accessibility and available mobility options within the “Orange” Type 1 PMAs support a higher v/c ratio compared to the legacy v/c standard (a change from 0.90-0.95 to 1.0). This Performance Target reflects that the Type 1 PMAs are activity centers with high density land use, light rail service, and many mobility options that provide access. The City will prioritize access by walking, biking, and transit and will monitor and address congested conditions in these areas.
- The Performance Targets for the “Yellow” Type 2 PMAs are similar to the legacy v/c standards in these areas (v/c ratio changed from 0.95 to 0.90 in Factoria). This Performance Target reflects that these areas have strong bus service, moderately dense, mixed-use developments that are accessible via walking, and biking from within the PMAs and from nearby residential areas.
- The Performance Targets for the “Green” Type 3 PMA is similar to the legacy v/c standards and is recommended at 0.85. Many trips in these primarily residential parts of the city will continue to be made by vehicles, although the City is committed to increasing the availability of other modes through better access to transit, sidewalks/crossings, and bicycle facility connections between neighborhoods.

By setting the Vehicle Performance as defined above, Bellevue will emphasize a more sustainable multimodal system in the parts of the city where the land use density and mix of uses complements more walking, biking, and transit trips. However, in all parts of the City, Bellevue will continue to monitor traffic congestion as the vehicle mode will remain an important way for people to travel to their destinations, particularly in the lower density, residential parts of Bellevue.


Applying the Vehicle Performance Targets to Current and Future Conditions

The primary objective of setting Vehicle Performance Targets is to identify current and future gaps that may warrant investment recommendations in the Transportation Facilities Plan when considering the constraints of adding vehicle capacity and the needs of other modes. This section summarizes existing and 2044 conditions under staff's recommended Vehicle Performance Targets. Following the Attachments list, **Figure 3** and **Figure 4** present 2019 existing conditions Vehicle Performance Target gaps and **Figure 5** and **Figure 6** present 2044 Vehicle Performance Target gaps.

At Transportation Commission meetings in October, staff will present a framework for how the Commission could address Performance Target gaps for all modes when factoring in land use/built environment, right of way, environmental, equity, regional connectivity, and other considerations.

ATTACHMENTS

 Att A. 2044 System Intersection vc ratio forecast .pdf

 Att B. TFP Capacity Projects List.pdf


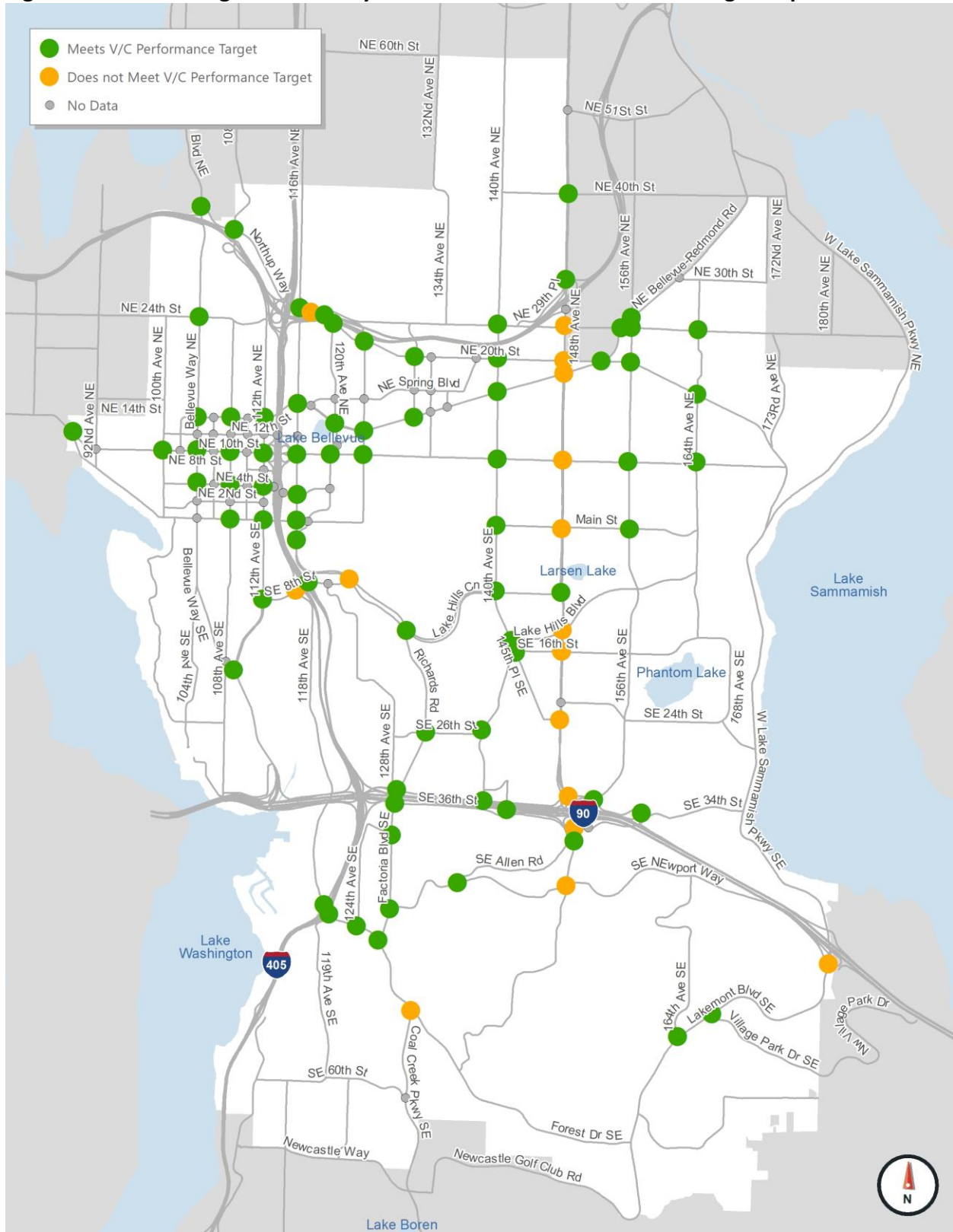
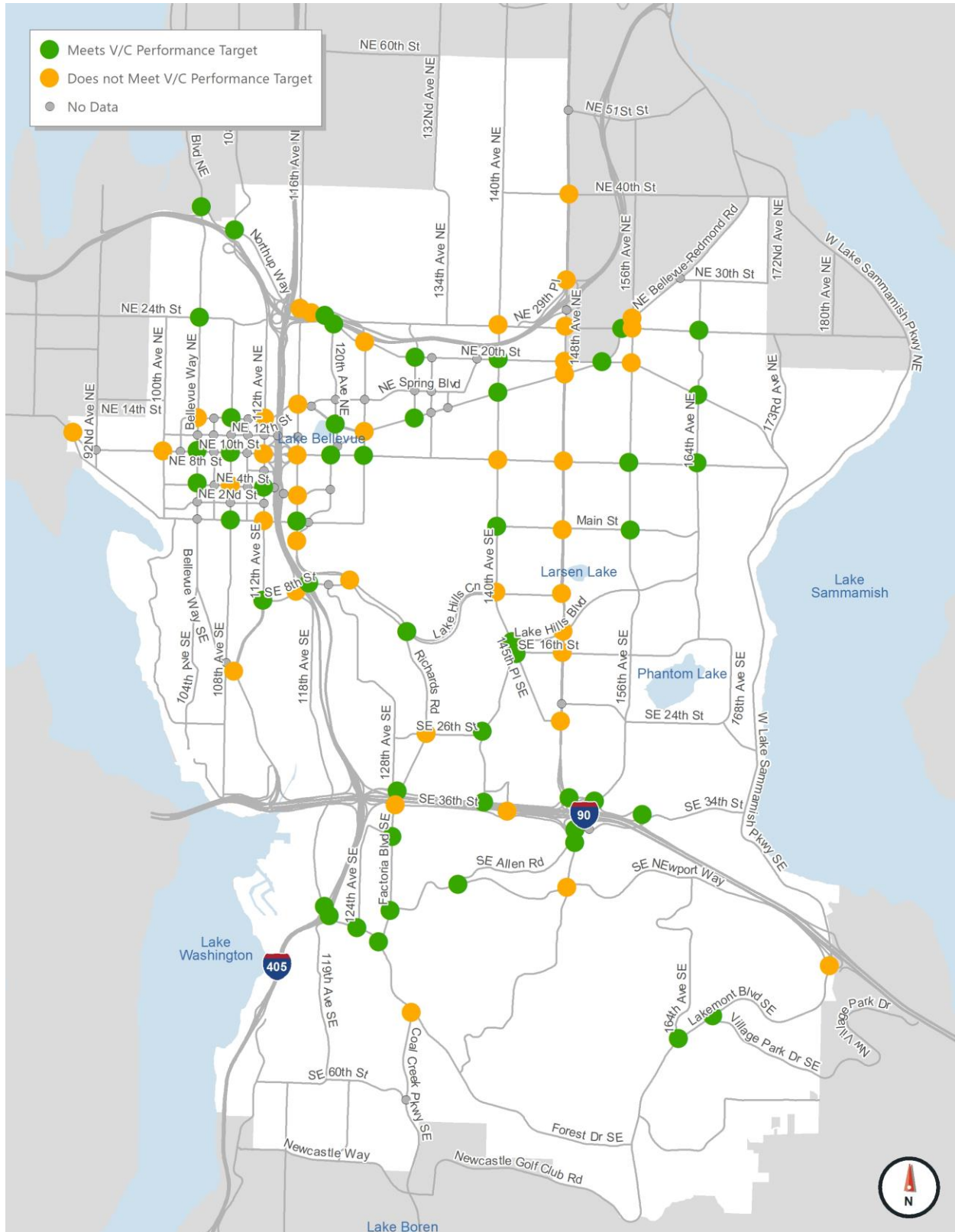
 Att C. 2044 Primary Vehicle Corridor speed analysis.pdf

Figure 3. 2019 Existing Conditions System Intersection Performance Target Gaps



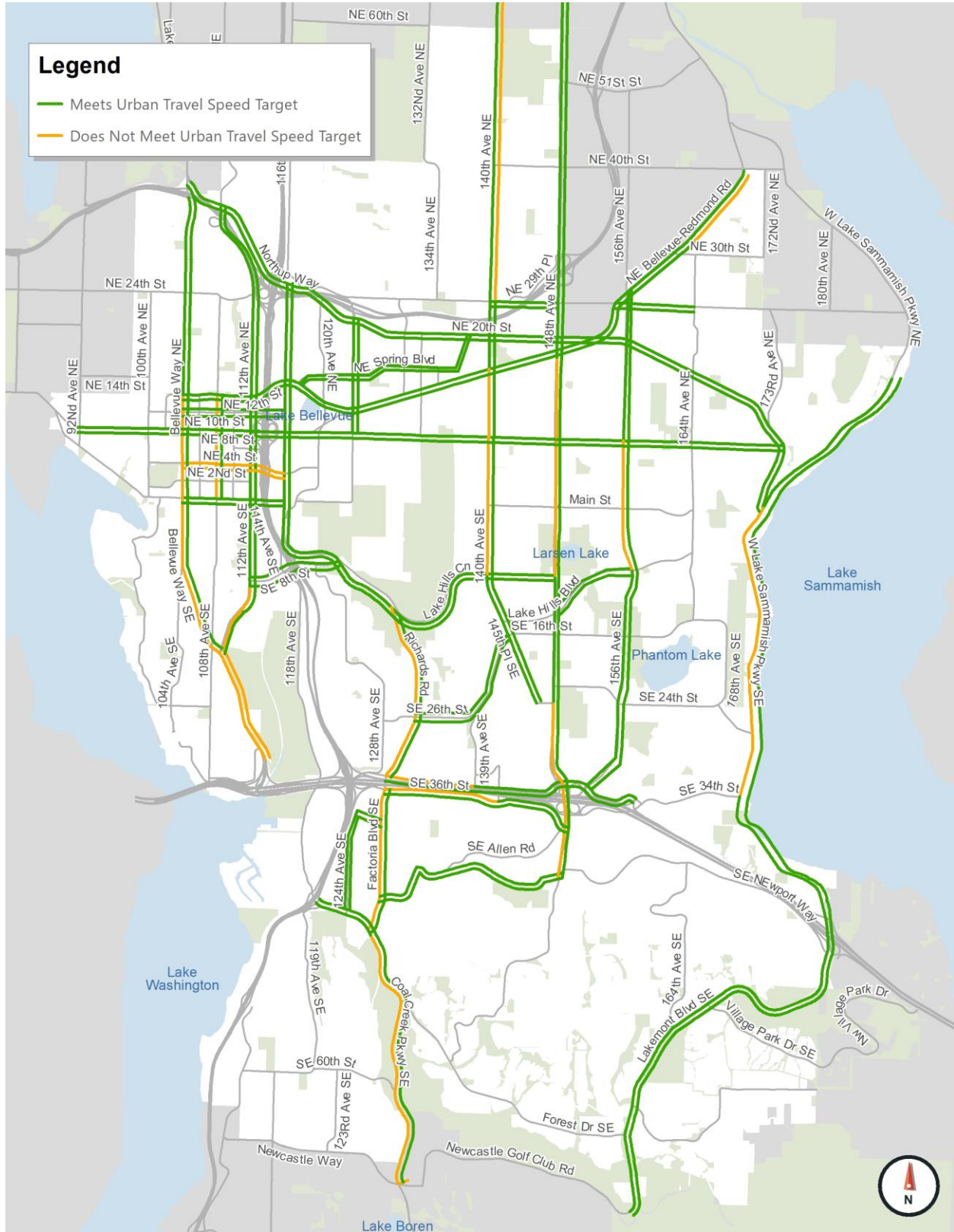
Source: City of Bellevue, Fehr & Peers, 2021.

Figure 5. 2044 System Intersection Performance Target Gaps



Source: City of Bellevue, Fehr & Peers, 2021.

Figure 6. 2044 Primary Vehicle Corridor Speed Performance Target Gaps



Source: City of Bellevue, Fehr & Peers, 2021.