MEMORANDUM

DATE: October 3, 2023

TO: Chair Ramos and Transportation and Mobility Commission members

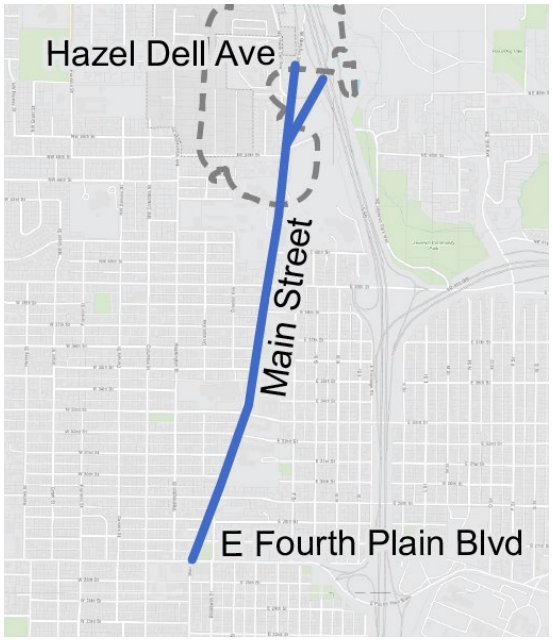
CC: Rebecca Kennedy, Deputy Director, Community Development Department; Ryan Lopossa, Streets and Transportation Manager, Public Works Department

FROM: Maggie Derk, Senior Transportation Planner, Community Development Department, Laurel Priest, Associate Transportation Planner, Community Development Department Kate Drennan, Principal Transportation Planner, Community Development Department,

RE: **Upper Main Street Safety and Mobility Project: Traffic Findings and Engagement Kickoff**

Introduction

The Upper Main Street Safety and Mobility Project is evaluating potential changes to improve safety and mobility for all road users on Main Street between E Fourth Plain Boulevard and NE Hazel Dell Avenue. The Project will evaluate how Main Street can better meet the needs of people using transit, walking, biking, using a mobility device, and driving. This project is being completed in coordination with planned repaving in 2025, and the ongoing C-TRAN Highway 99 Bus Rapid Transit Project. The future Bus Rapid Transit (BRT) line will operate along this section of Main Street, connecting the length of Highway 99/Main Street from downtown Vancouver to Washington State University Vancouver and the Salmon Creek Park and Ride. Upper Main Street from Fourth Plain Boulevard to the Vancouver city limit has emerged as a focus of subarea planning through the Comprehensive Plan and is identified as a civic spine in the Westside Mobility Study. Traffic Analysis conducted in Phase 1 of the project, along with community feedback and collaboration with partners, will inform the design of potential complete street alternatives.



Overview/Preview

The Upper Main Street Safety and Mobility Project area is between Fourth Plain Boulevard in the south to the northern city limits around NE Hazel Dell Avenue (~1.7 miles). Within the Project area are the Carter Park, Shumway, Lincoln, and

West Minnehaha neighborhoods. Main Street is identified on the Transportation System Plan (TSP) Modal Networks as a:

- Primary Pedestrian Corridor
- Enhanced Transit Corridor
- Bike and Small Mobility Corridor north of 39th Street to trail connections

Informed by the Transportation System Plan network designations, and city priorities, the goals of the project are to improve pedestrian safety by adding/upgrading crossings and filling sidewalk gaps; improve bike and small mobility connectivity by addressing network gaps and connections to regional trails; explore transit speed and reliability treatments and improve transit stop access in anticipation for C-TRAN's Highway 99 BRT project.

Phase 1 Traffic Analysis

The workshop will provide information on the phase 1 traffic analysis work. This includes a snapshot of existing traffic conditions, and an overview of the traffic simulation results for the future-year build scenarios on the Upper Main Street corridor. The build scenarios present two roadway configuration alternatives under consideration in conjunction with the opening of the Vine BRT. The purpose is to identify predicted background traffic congestion, evaluate future BRT operations alongside impacts to general traffic, and assess the effectiveness of other improvements considered in both BRT alternative scenarios.

This study analyses BRT and traffic operations under two alternative build scenarios. The current Main St. corridor has 9 to 10 ft lanes making it difficult for buses to maneuver and stay within the lane as well as disconnected bicycle and pedestrian facilities. The two proposed roadway alternatives address these issues and accommodate improved transit service via the opening of the Vine BRT line. The two alternatives are described below:

Alternative 1 examined removing on travel lane in the northbound section of Main Street from north of 29th Street until the I-5 overpass, widening vehicle travel lanes to at least 11 ft lane widths through the study area, and adding a protected two-way mobility lane in the northern section of the network. The following changes to the existing network are included in alternative 1:

- Addition of the Vine BRT line
- Removal of Line 71 (to be replaced by the Vine BRT along the same route)
- Route change for Line 31: its final southern stop will be near Main Street and 40th Street. The northbound route will likewise begin around 40th Street.
- Modifying signals from protected-only to protected/permissive left turns at Main Street and 45th Street, 40th Street, 39th Street and 33rd Street.
- Inclusion of a two-way protected mobility lane: along Main Street, the mobility lane would begin immediately north of 40th Street and continue along the east side of Main Street until it connects with the Discovery Trail at I-5.

- Re-channelization of northbound Main Street to one-thru lane from north of 29th Street to I-5. The lane reduction would be necessary to ensure adequate lane widths for BRT coaches. Left turn bays would remain with their existing pocket lengths. North of 40th Street, the space opened by the lane reduction would be used to add the two-way protected mobility lane on the east side of Main Street.
- Installation of a Rectangular Rapid Flashing Beacon (RRFB) ped-crossing on the north side of the intersection of Main Street and 29th Street.
- Modification of Main Street and 28th Street, to include a new traffic signal, a southbound left turn pocket, and pavement to accommodate a BRT coach to turn left from Main Street to the 28th Street slip lane toward Broadway Street going south.
- Transit signal priority (TSP) at each signalized intersection along the future BRT route

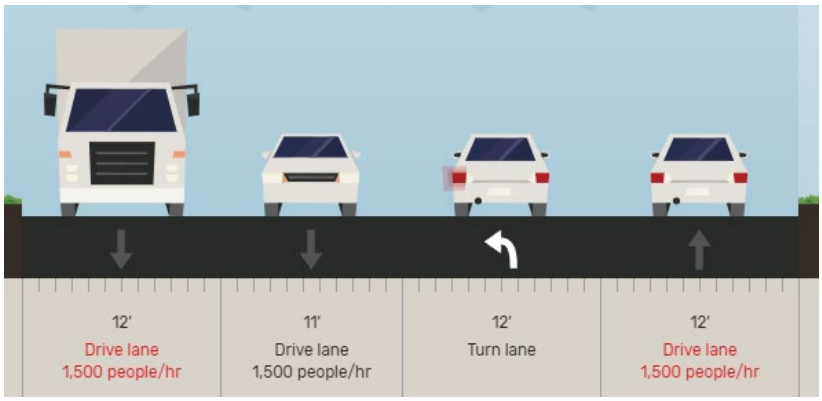


Figure 1. Example of Lane Widths and Capacity

Alternative 2 follows the same cross-section and includes all the elements as in Alternative 1 with one northbound lane on Main St, however the outside lane on southbound Main St. is converted to a BAT (Business Access and Transit) lane. General purpose vehicles are restricted from using the BAT lanes for thru movements but are permitted to use themfor right turns. Alternative 2 is different from Alternative 1 due to:

- A Business Access Transit (BAT) lane included along southbound Main Street, beginning north of 40th Street and ending south of 33rd Street, where the BRT would merge with general vehicles at the existing lane drop. At the lane drop, buses would merge left into the general traffic stream, as opposed to its existing condition where vehicles merge into the right-hand lane.
- Re-configuring the intersection of Broadway Street and Fourth Plain Boulevard, prohibiting southbound left turns and changing the north and south phases from running split phased to running concurrently.

Diversion Analysis

A diversion analysis was performed to assess the impact of a roadway reconfiguration on Main Street from 45th to the split with Broadway Street at 29th Street. The diversion model assumed Main Street was reduced from five lanes to three lanes. No speed changes or other network changes were made in the model. The assigned volumes in the roadway reconfiguration models were compared against the original models to determine where and what level of diversion occurs.

Figure 2. Volume diversion with Main Street roadway reconfiguration for the year 2040 AM peak period

In the AM peak period, diversion only occurs in the southbound direction. Approximately 100 vehicles (20%) divert off Main Street and back onto I-5. A small number of vehicles diverted to 45th street to head west instead of staying on Main Street until 40th. The overall impact of diversion in the AM peak period is low due to baseline volumes being within the capacity for one southbound lane.

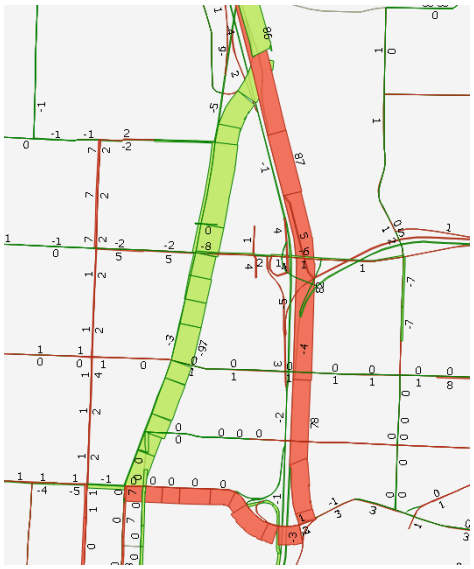


Figure 3. Volume diversion with Main Street roadway reconfiguration for the year 2040 PM peak period

In the PM peak period, diversion only occurs in the northbound direction. Approximately 90 vehicles (25%) divert off Main Street directly back on to the freeway at Fourth Plain. Most vehicles diverting use Main Street to access I-5 from the Main Street entrance instead of at Fourth Plain Boulevard. So, if Main Street becomes less desirable as a cut-through route, travelers may use I-5 instead. The overall impact of diversion in the PM peak period is low due to baseline volumes being within the capacity for one northbound lane.

The reduction in lanes in the build conditions will impact people using Main Street as a cut-through route to avoid freeway congestion. This is not expected to divert large amounts onto local streets based on the results of this analysis.

Intersection Operation Results

. **Alternative 1**

During the **AM peak**, with the peak direction southbound, the vehicle lane reduction on Main Street northbound did not result in poor operations or long queues. Southbound operations generally resembled baseline conditions, with some queues from 39th Street extending back to 40th Street. Vehicles were able to clear during each signal cycle and queues did not cumulatively back up through 40th Street, except for a few cycles. East- and west-bound traffic along 39th Street likewise did not show poor operations or significant queues.

PM peak operations with the lane reduction along Main Street northbound saw a more noticeable drop in network performance for vehicles. In the northern part of the study area, the Main Street and 39th Street intersection was the main source of congestion: going north, queues extended from this intersection back around a quarter mile, between 39th Street and 33rd Street. Northbound and westbound vehicles often required two light cycles to make it through the intersection. While the intersection ran over-capacity during some peak hours, queues were not cumulative and on average began to dissipate by the end of the peak hour.

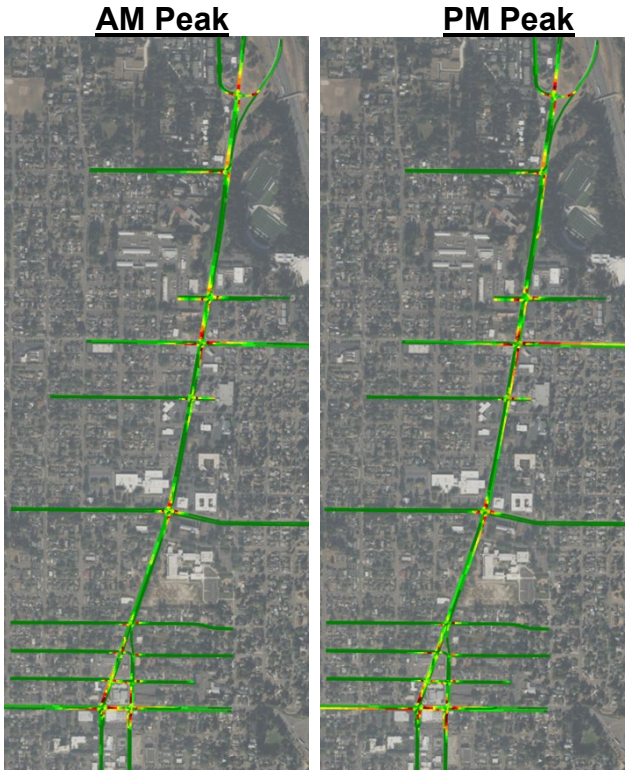


Figure 4: Congestion Plot – 2040 Future Year, Alternative 1

Alternative 2

Alternative 2 effectively brings Main Street to one through lane in each direction for the majority of Main Street through the study area. During the **AM Peak** southbound was the dominant direction. Due to this, morning operations were more impacted in comparison to the baseline (existing configuration) or Alternative 1 models. While 40th Street (where the BAT lane begins) showed some higher delay, the main source of congestion was at 39th Street, with queues extending back through 40th Street and approaching 45th Street to the north. Other approaches at Main Street and 39th Street did not face these significant backups.

PM peak operations along Main Street generally resembled those of Alternative 1. Southbound operations did not show significant impacts from the BAT lane, while northbound operations remained congested due to the lane reduction.

Overall, intersection delay remained consistent with the baseline conditions through the AM and PM peak periods. Notably, AM peak operations show an increase in delay at 40th with the introduction of the BAT lane, while 39th experiences less delay due to increased green time on Main going southbound.

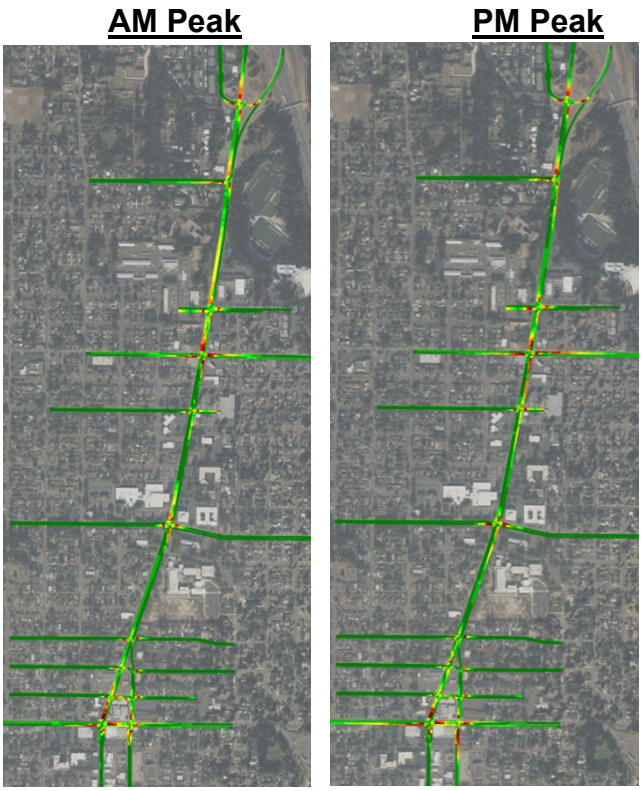


Figure 5: Congestion Plot – 2040 Future Year, Alternative 2

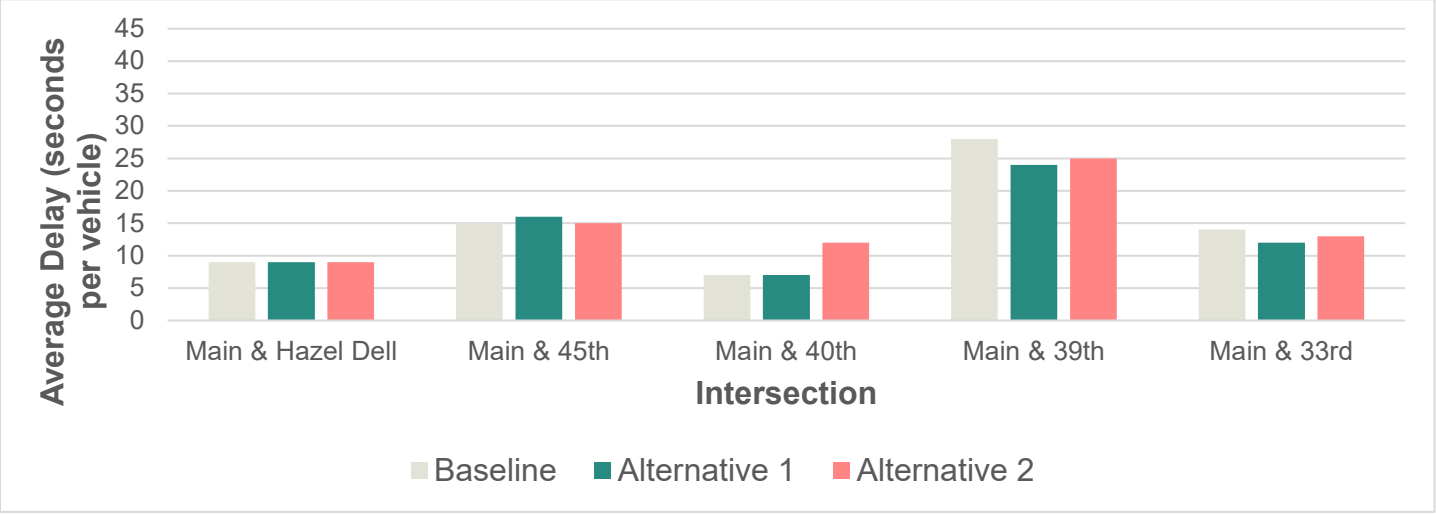
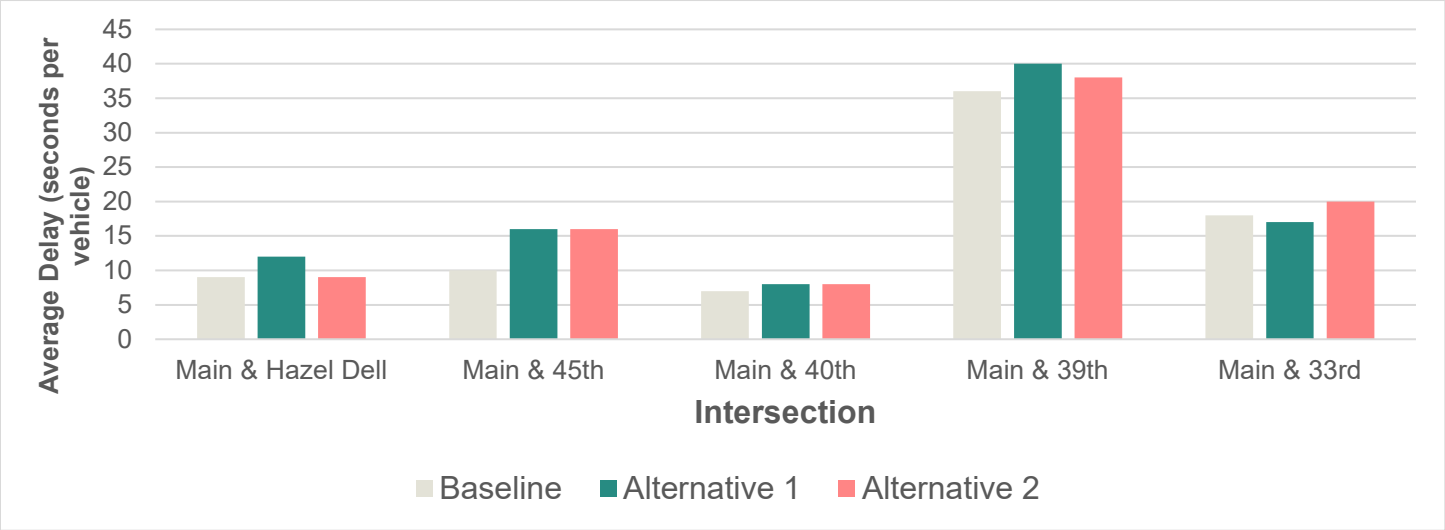


Figure 6. AM Peak Delay at Selected Intersections

In the PM peak period, the lane reduction and BAT lane causes a slight increase in delay to intersections at 45th and 39th and a slight decrease at 33rd.



Key Takeaways

Each of the build condition alternatives included closing one through lane going northbound on Main Street. While AM peak operations were not significantly affected, afternoon volumes were higher northbound and saw some more severe spillbacks from 39th Street. The additional green time needed for Main Street also resulted in heavier congestion along 39th Street, especially westbound from I-5. While Alternative 1 retains both through lanes southbound on Main Street, Alternative 2 closes one through lane to build a BAT lane; this caused some congestion around 39th Street southbound, but only in the AM peak.

Phase 2 Outreach Overview
The project team is currently developing a project engagement plan and project materials including a 1-page fact sheet and mailer. Early engagement will include coordination with C-TRAN and other key stakeholders such as outreach to neighborhood groups and adjacent businesses. In addition, the Project Team is considering outreach methods that include door to door canvassing efforts, tabling events, in-person and online public meetings, and use of e-newsletters, website information and social media. The Project Team is currently identifying key community audiences and stakeholders to connect with and are seeking feedback from the TMC on outreach methods, and what other formal or informal groups should be included in this community consultation.

Next Steps
The Project Team will develop the public engagement plan and begin work on existing conditions related to pedestrians and mobility users and incorporate traffic findings into development of design alternatives. The Project Team will return to the TMC with information on what the public shared in Round 1, and design alternatives under consideration.

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