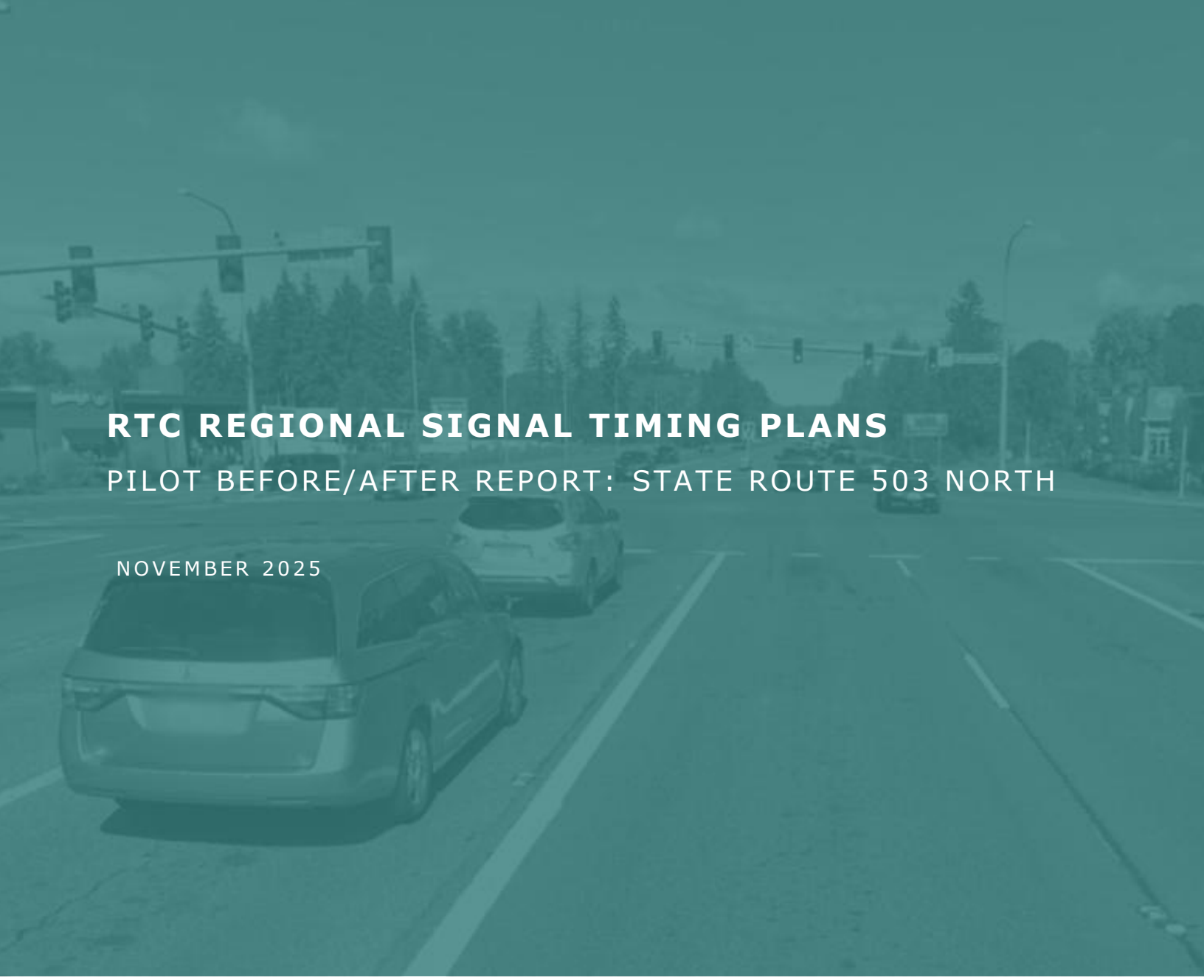

RTC REGIONAL SIGNAL TIMING PLANS

PILOT BEFORE/AFTER REPORT: STATE ROUTE 503 NORTH

NOVEMBER 2025

PREPARED FOR:

Southwest Washington
Regional Transportation Council

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PROJECT BACKGROUND

The Southwest Washington Regional Transportation Council (RTC) is managing a new regionally competitive grant program, the Carbon Reduction Program (CRP), established by the Infrastructure Investment and Jobs Act (IIJA). The CRP authorizes grant funding for projects designed to reduce transportation emissions.

As part of this effort, RTC was awarded funds to develop updated traffic signal timing to improve traffic flow, air quality, and safety on prioritized corridors in the Clark County urban area. RTC, in coordination with local agencies in Clark County, Washington and DKS, are developing regional signal timing plans along major corridors in Clark County.

The list of corridors considered in the prioritization process utilized the RTC Congestion Management Process (CMP) corridors as the candidates for updated signal timing. Major tasks for this project include evaluating and prioritizing non-freeway CMP corridors to develop and apply new signal timing strategies based on existing conditions and regional goals.

The process involved evaluating historical performance data, applying a weighted ranking scheme, and incorporating agency input. This approach guided the selection of 7 pilot corridors and helped define the project goals of **improving traffic flow, air quality, and safety**. The full prioritization methodology is documented in the project's *Corridor Prioritization Memorandum*, included as Appendix A, outlining the 3-step approach used to prioritize corridors for the regional signal timing plans pilot.

PILOT CORRIDOR EVALUATION: STATE ROUTE 503 NORTH

This report summarizes the evaluation completed under the regional signal timing plans pilot for State Route (SR) 503, from NE 119th Street to NE 244th Street, including eight study intersections. While the study corridor is defined as beginning at NE 119th Street, the analysis and signal retiming efforts started at NE 149th Street. This is due to the absence of any signalized intersections between 119th and 149th Streets, and the distance between them was too great to support meaningful coordination. Additionally, four signals along State Route 502 / Main Street (SR 502) from 20th Avenue to 5th Avenue, were evaluated to determine whether corridor operations could benefit from coordination with the SR 503 corridor.

Among the twelve study intersections, four currently operate in coordination mode during all peak periods, and an additional four operate in coordination mode only during the evening period. Four signals operate in free mode during all peak periods. A review of existing conditions was conducted to assess corridor operations and identify key needs. The findings are detailed in the *Existing Conditions Memorandum*, included as Appendix B.

Extending approximately six-miles north to south with a 55 miles per hour (MPH) posted speed limit, the SR 503 corridor serves as a key route connecting Battle Ground, Brush Prairie, and the surrounding communities in central Clark County, Washington. The residents and businesses along this corridor attract a mix of local commuters, freight and regional recreational traffic. In January 2025, weekday counts were taken along SR 503 north of Eaton Boulevard to estimate average annual daily traffic (AADT) and 24,161 vehicles were counted on this section of the corridor. C-TRAN bus routes 7 and 47 travel along the SR 503 corridor from the Van Mall Transit Center to

Main Street. Bus route 7 continues east on Main Street, connecting to the Battle Ground Library, while bus route 47 continues north, connecting to Downtown Yacolt, Washington.

Updates to the signal timing plans include optimizing local and coordination timings, sequences, and offsets to enhance operational performance. In addition to the project goals, the benefits of these updates also support improved traffic flow as well as reduced delays for side streets and left turn phases.

Coordinated signal timing aims to enhance directional traffic flow by creating vehicle platoons that can move through multiple intersections with fewer stops. Note that signal timings along SR 502 are coordinated under an east-west coordination plan during all peak periods. The offsets will tie together the eight coordinated intersections from the coordination plan along SR 503 to progress all movements effectively.

Table 1 below presents a comparison of the before and after signal timing plans, shown as cycle lengths by weekday and weekend Time of Day (TOD) schedules. Adjustments to the TOD time intervals were also part of the update as follows:

- Morning (AM) plan: 6:00 a.m. to 9:00 a.m.
- Midday (MD) plan: 9:00 a.m. to 2:00 p.m.
- Evening (PM) plan: 2:00 p.m. to 6:30 p.m.
- Weekend (WKN) plan: 10:00 a.m. to 6:00 p.m.

TABLE 1: TIMING PLAN CYCLE LENGTHS FOR STUDY INTERSECTIONS ALONG THE PROJECT CORRIDOR (IN SECONDS)

CROSS STREET	BEFORE				AFTER			
	AM	MD	PM	WKN	AM	MD	PM	WKN
SR 503 NORTH-SOUTH COORDINATION								
NE 149TH ST	Free				Free; signal timings updated			
SW 179TH ST TO SW SCOTTON WAY	Free	Free	110	Free	125	120	125	125
SR 502 / MAIN ST	115	115	125	125	125	120	Cycle length unchanged; signal timings updated	Cycle length unchanged; signal timings updated
NW ONSDORFF BLVD TO NE 244TH ST	Free				Free; signal timings updated	Free; signal timings updated	125	Free; signal timings updated
SR 502/ MAIN STREET EAST-WEST COORDINATION								
NW 20TH AVE	115	115	125	120	125	120	Cycle length unchanged; signal timings updated	125
NW 15TH AVE TO SAFEWAY	115	115	125	125	125	120	Cycle length unchanged; signal timings updated	Cycle length unchanged; signal timings updated
NW 5TH AVE	Free				125	120	125	125

PERFORMANCE ANALYSIS

An analysis was conducted to compare the performance of the updated ("after") coordinated signal timing plans against the former ("before") plans. The analysis aims to address three key areas that align with the project goals of improving traffic flow, enhancing air quality, and promoting safety. analysis includes:

- Travel time performance, based on real-world traffic data
- Emission impacts, derived from simulation model
- Safety impacts, a brief qualitative review based on signal timing updates and corresponding performance measures

TRAVEL TIME COMPARISON

Travel time data along the study corridor was obtained from TomTom, a location-based company that provides traffic analytics using Global Positioning System (GPS)-based data. TomTom provides high-resolution, anonymized GPS data aggregated from a wide range of connected devices, including navigation devices, mobile applications, and fleet vehicles. TomTom allows users to select routes between two points along roadways and produce cumulative travel time results for the selected routes.

This analysis evaluates the project corridor directionally, both northbound and southbound along SR 503 and eastbound and westbound along SR 502 / Main Street. The updated signal timing along the project corridor was implemented during the week of May 19th, 2025. For the before period, data was obtained from a full month of historical records. April 2025 was selected as the before dataset after reviewing data from September 2024 through May 2025 before the implementation. September 2024 travel time were noticeable higher than all other months, indicating potential outliers; therefore, April 2025 was used as it also represents a typical school-in-session month and provides a more reliable baseline for comparison.

The after period would ideally be based on data the following month after implementation. However, K-12 school in the area is out for summer vacation starting in June, which causes a shift in travel patterns along the project corridor. Therefore, the June 2025 data does not accurately reflect the after conditions and would not serve as comparable data for the before and after analysis. Additionally, due to further operational adjustments made after the implementation, a continuous four-week dataset could not be obtained. As a result, the after period draws from different data windows for different peak periods.

The analysis periods are defined as follows:

- Before (weekday): Tuesdays, Wednesdays, and Thursdays from April 7th to May 4th, 2025
- Before (weekend): Saturdays from April 7th to May 4th, 2025
- After (weekday): Tuesdays, Wednesdays, and Thursday from September 15th to November 12th, 2025
    - AM Peak: October 13th to November 12th, 2025, excluding October 30th, 2025 (outlier) and November 11th, 2025 (Veterans day), but included 12 days of travel time data
    - Midday Peak: October 6th to October 12th, 2025, and October 20th to November 12th, 2025, excluding October 30th, 2025 (outlier) and November 11th, 2025 (Veterans day) but included 12 days of travel time data
    - PM Peak: September 15th to October 12th, 2025
- After (weekend): Saturdays from October 6th to November 16th, 2025 excluding October 18th, 2025 (due to a protest in the area impacting travel times) and November 1st, 2025 (outlier), but included four days of travel time data

For each direction of travel, data was aggregated by 15-minute time-of-day intervals. Average travel times were calculated for each interval over the corresponding analysis period. It should be noted that the travel time savings shown in Table 2 and Table 3 below are based on common peak periods for consistency since the before and after periods have different TOD intervals. In addition, for the 24-hour conditions, travel time before the AM peak begins will use the AM peak analysis

period, and travel time after the PM peak ends will use the PM peak analysis periods. Additionally, the weekend analysis includes only four Saturdays in both the before and after periods. This limited dataset may result in gaps or variability in the results. It is anticipated that using a longer data range would help eliminate these data gaps and produce more reliable outcomes.

FULL PROJECT CORRIDOR

Travel time data was analyzed for the coordinated grouping of signals along the project corridor to evaluate the overall impact of the updated signal timing plans. Table 2 summarizes the average travel time savings for each direction and evaluation period for the full corridor limits.

TABLE 2. AVERAGE TRAVEL TIME SAVING FOR THE FULL PROJECT CORRIDOR

ANALYSIS PERIOD	TIME PERIOD	TRAVEL TIME SAVINGS (SEC)	
		NORTHBOUND (149TH ST TO 244TH ST)	SOUTHBOUND (244TH ST TO 149TH ST)
WEEKDAY	AM Peak: 7am to 9am	0 (0.0%)	-11 (1.6%)
	MD Peak: 11am to 1pm	-18 (2.8%)	-22 (3.3%)
	PM Peak: 4pm to 6pm	-43 (5.7%)	-2 (0.2%)
	Daily (24-hour)	-4 (0.8%)	-4 (0.6%)
WEEKEND	WKN Peak: 11am to 1pm	-25 (3.9%)	-32 (4.8%)
ANALYSIS PERIOD	TIME PERIOD	TRAVEL TIME SAVINGS (SEC)	
		EASTBOUND (20TH AVE TO 5TH AVE)	WESTBOUND (5TH AVE TO 20TH AVE)
WEEKDAY	AM Peak: 7am to 9am	-9 (5.9%)	-6 (4.2%)
	MD Peak: 11am to 1pm	-16 (9.2%)	-16 (8.4%)
	PM Peak: 4pm to 6pm	-22 (12.5%)	-12 (6.4%)
	Daily (24-hour)	-8 (5.5%)	-7 (4.6%)
WEEKEND	WKN Peak: 11am to 1pm	-33 (17.4%)	-43 (20.1%)

Table 3 summarizes the average travel time savings for the north-south direction and evaluation period over a selected portion of the corridor. While the full SR 503 limits extend from 119th Street to 244th Street, the segment between 119th Street and 179th Street spans approximately three miles and includes only one signal at 149th Street, which operates in free mode. Because this segment operates largely at free-flow speeds, travel times are influenced by driver behavior rather than by signal operations for this portion. To better show the benefits of the updated coordinated signal timing plans, Table 3 reports travel time savings beginning at the start of the coordinated signal grouping, where most coordinated signals are located.

TABLE 3. AVERAGE TRAVEL TIME SAVING FOR THE 179TH ST TO 244TH ST SEGMENT OF THE PROJECT CORRIDOR

ANALYSIS PERIOD	TIME PERIOD	TRAVEL TIME SAVINGS (SEC)	
		NORTHBOUND (179TH ST TO 244TH ST)	SOUTHBOUND (244TH ST TO 179TH ST)
WEEKDAY	AM Peak: 7am to 9am	-6 (1.7%)	-6 (1.6%)
	MD Peak: 11am to 1pm	-26 (6.3%)	-23 (5.8%)
	PM Peak: 4pm to 6pm	-48 (9.7%)	+1 (0.4%)
	Daily (24-hour)	-9 (2.5%)	-4 (0.9%)
WEEKEND	WKN Peak: 11am to 1pm	-30 (7.7%)	-23 (5.7%)

Figures 1 through 8 complement the summary in Table 2 and Figures 9 through 12 complement the summary in Table 3, showing before and after travel time data through the corridor. These figures present average travel time in 15-minute intervals throughout the day for both all directions, across weekdays and weekends, with the implemented TOD plan periods indicated for reference.

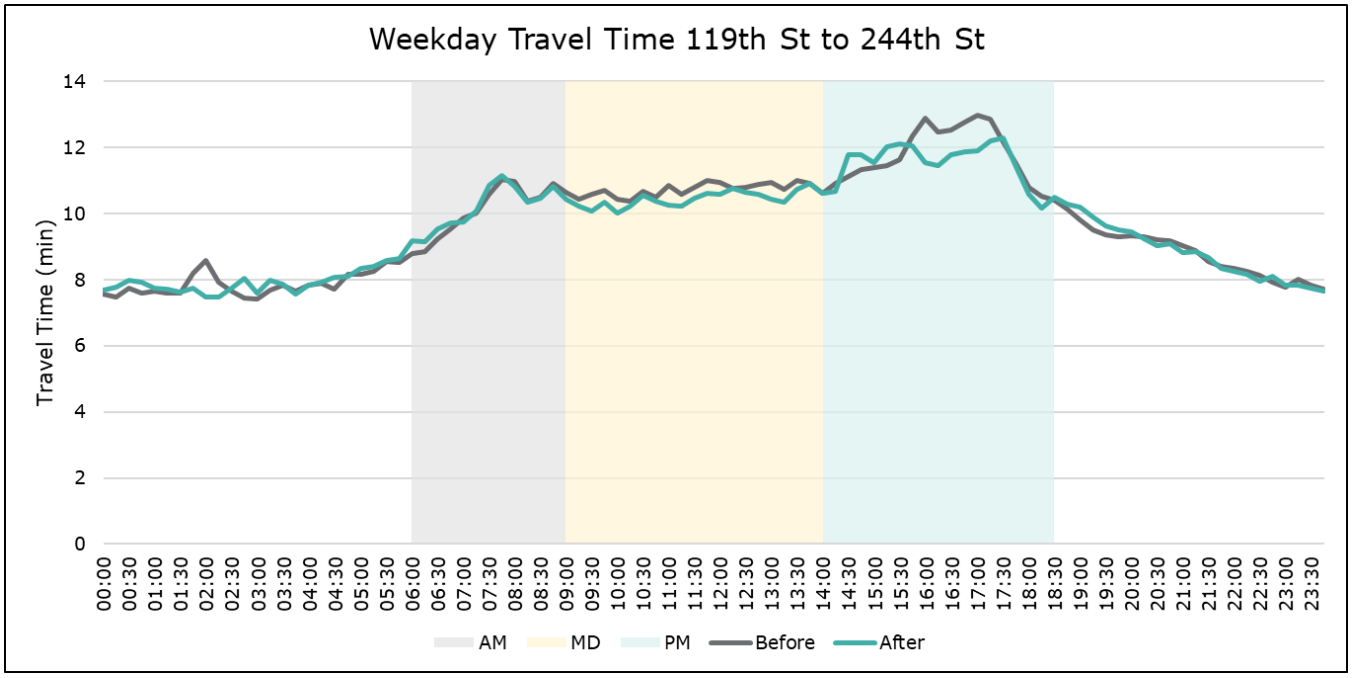

FIGURE 1. TRAVEL TIME COMPARISON FOR PROJECT CORRIDOR ALONG SR 503 (NORTHBOUND, WEEKDAY)

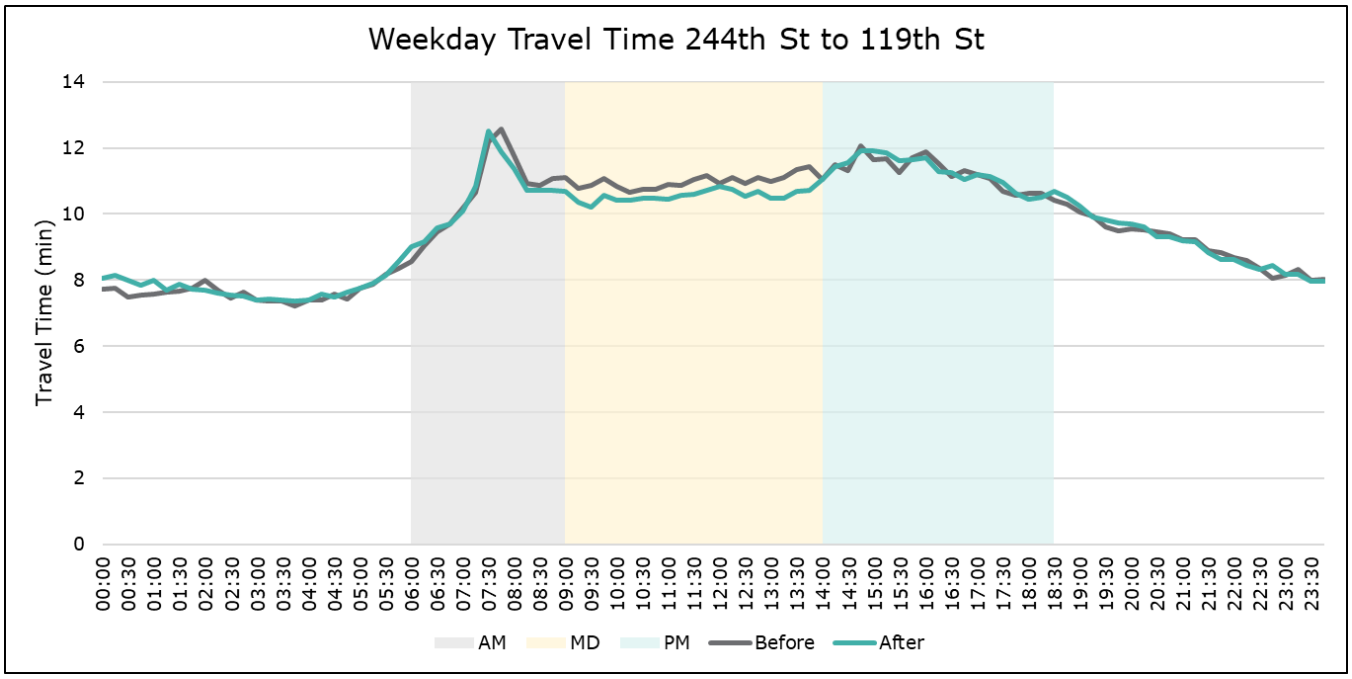

FIGURE 2. TRAVEL TIME COMPARISON FOR PROJECT CORRIDOR ALONG SR 503 (SOUTHBOUND, WEEKDAY)

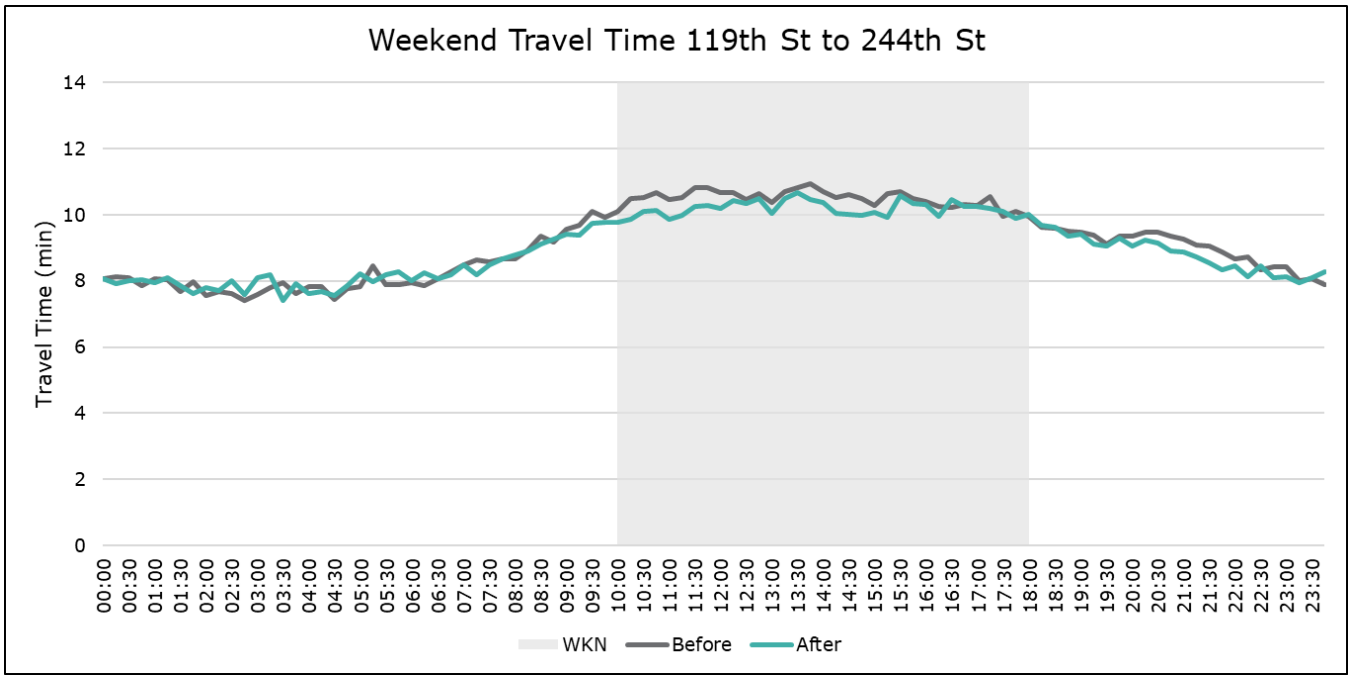

FIGURE 3. TRAVEL TIME COMPARISON FOR PROJECT CORRIDOR ALONG SR 503 (NORTHBOUND, WEEKEND)

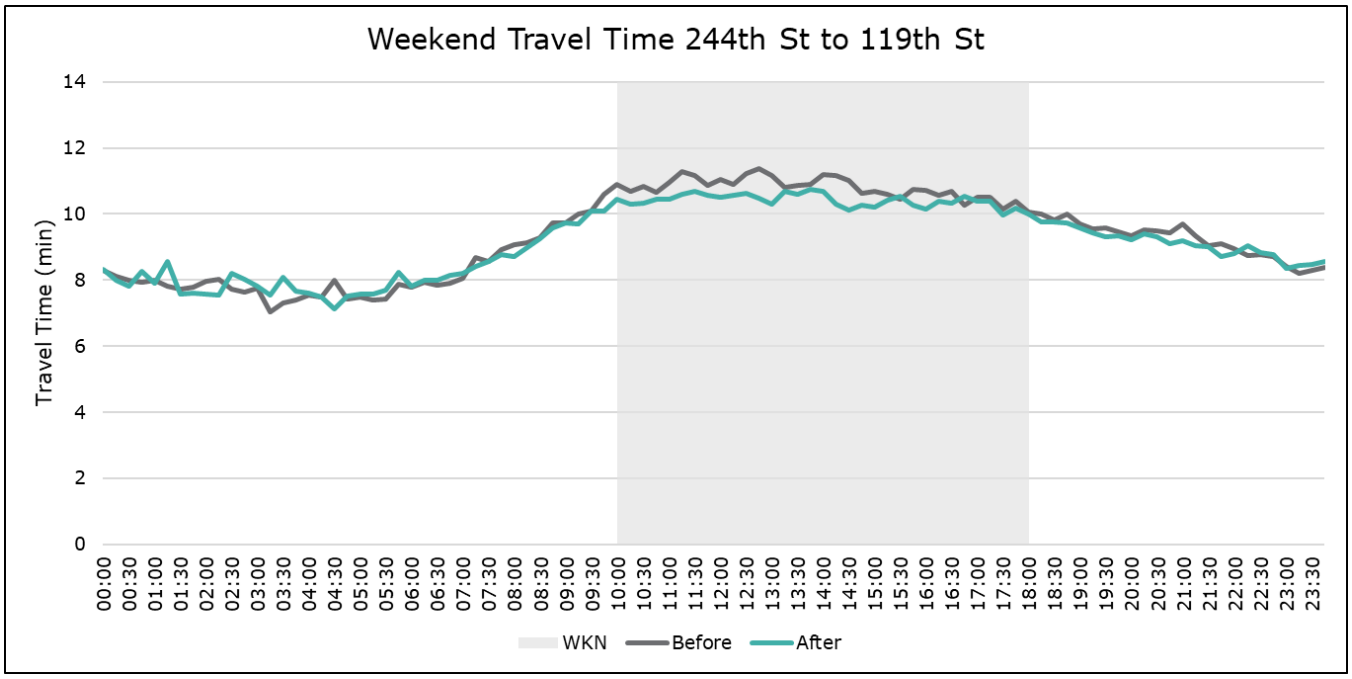

FIGURE 4. TRAVEL TIME COMPARISON FOR PROJECT CORRIDOR ALONG SR 503 (SOUTHBOUND, WEEKEND)

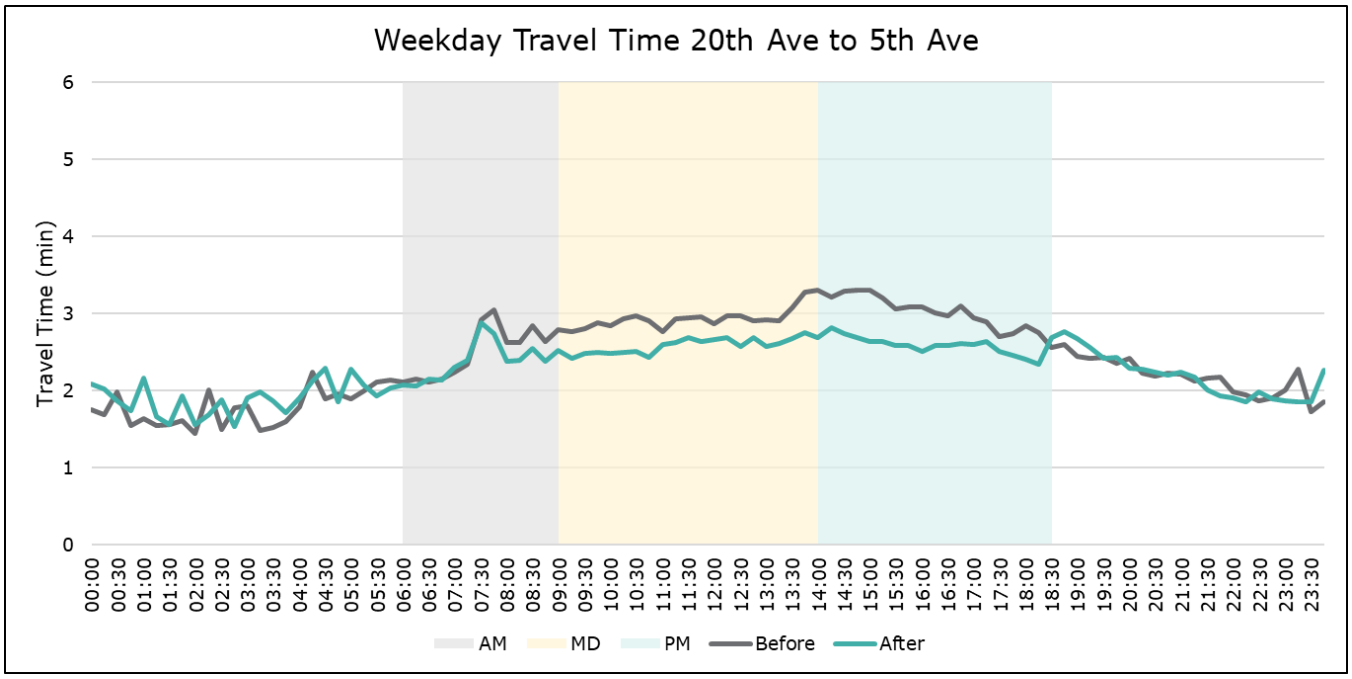

FIGURE 5. TRAVEL TIME COMPARISON FOR PROJECT CORRIDOR ALONG SR 502 / MAIN STREET (EASTBOUND, WEEKDAY)

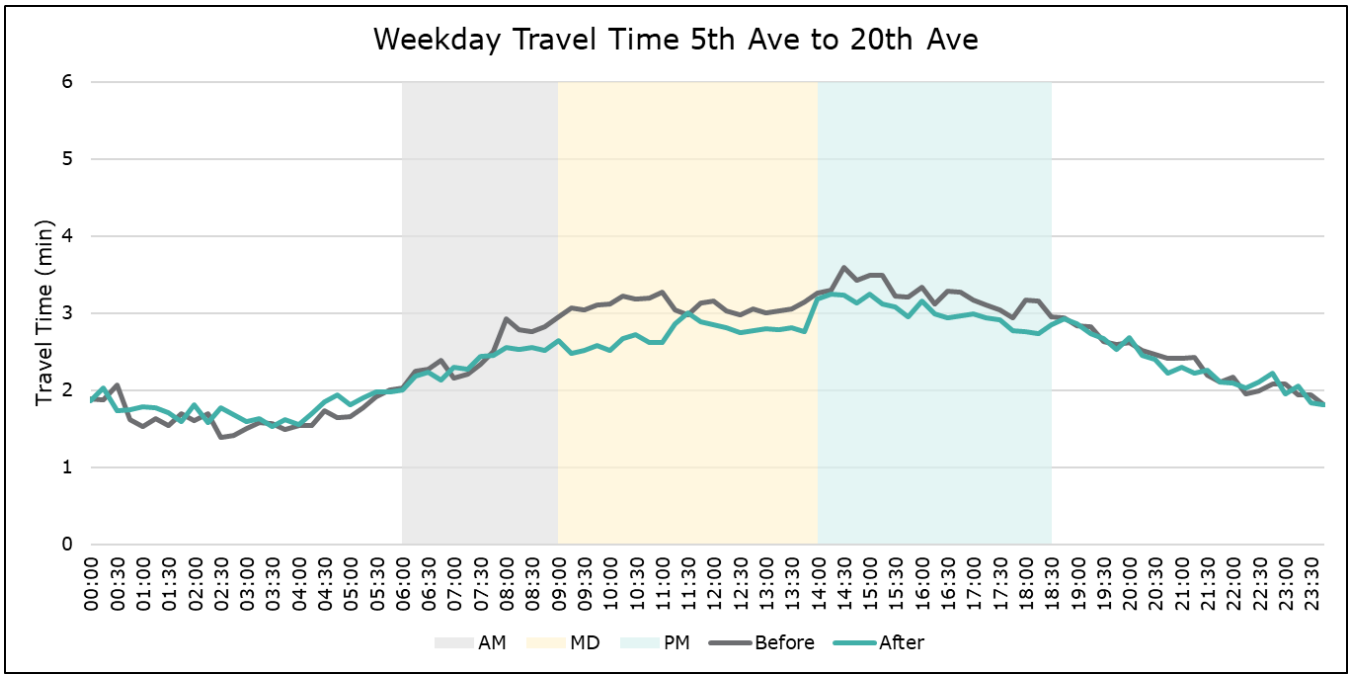

FIGURE 6. TRAVEL TIME COMPARISON FOR PROJECT CORRIDOR ALONG SR 502 / MAIN STREET (WESTBOUND, WEEKDAY)

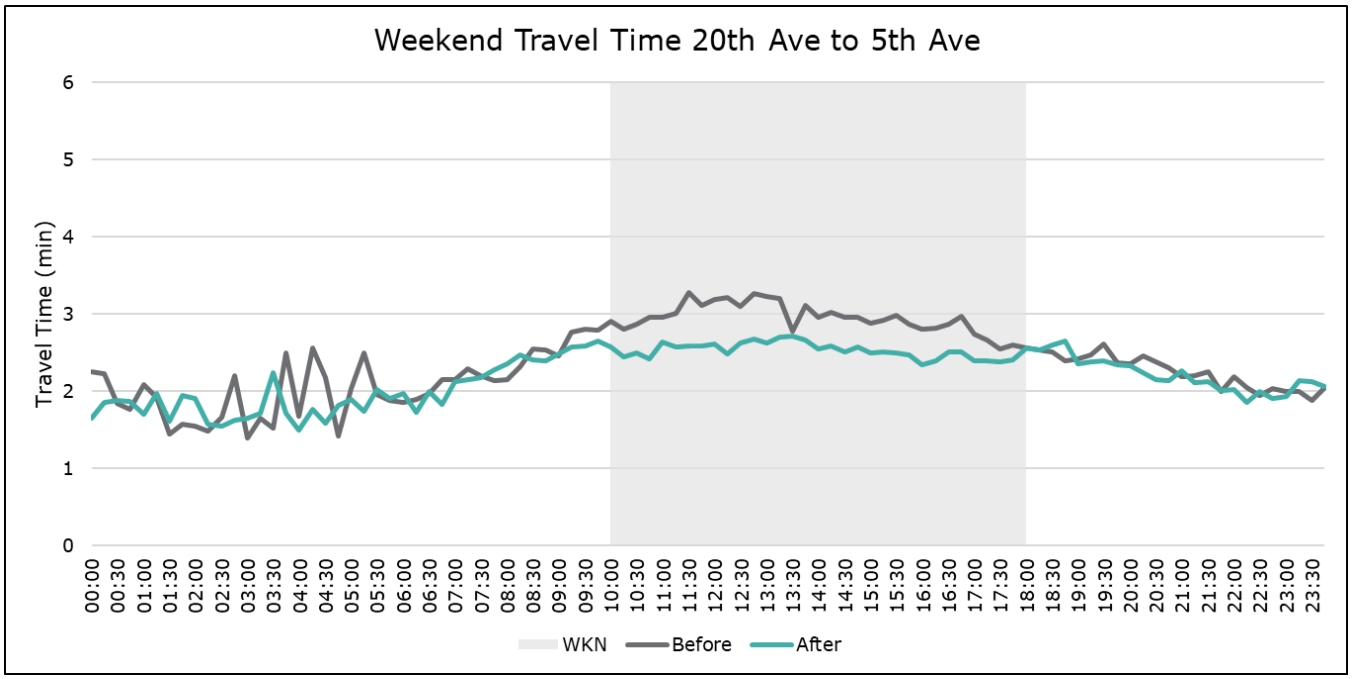

FIGURE 7. TRAVEL TIME COMPARISON FOR PROJECT CORRIDOR ALONG SR 502 / MAIN STREET (EASTBOUND, WEEKEND)

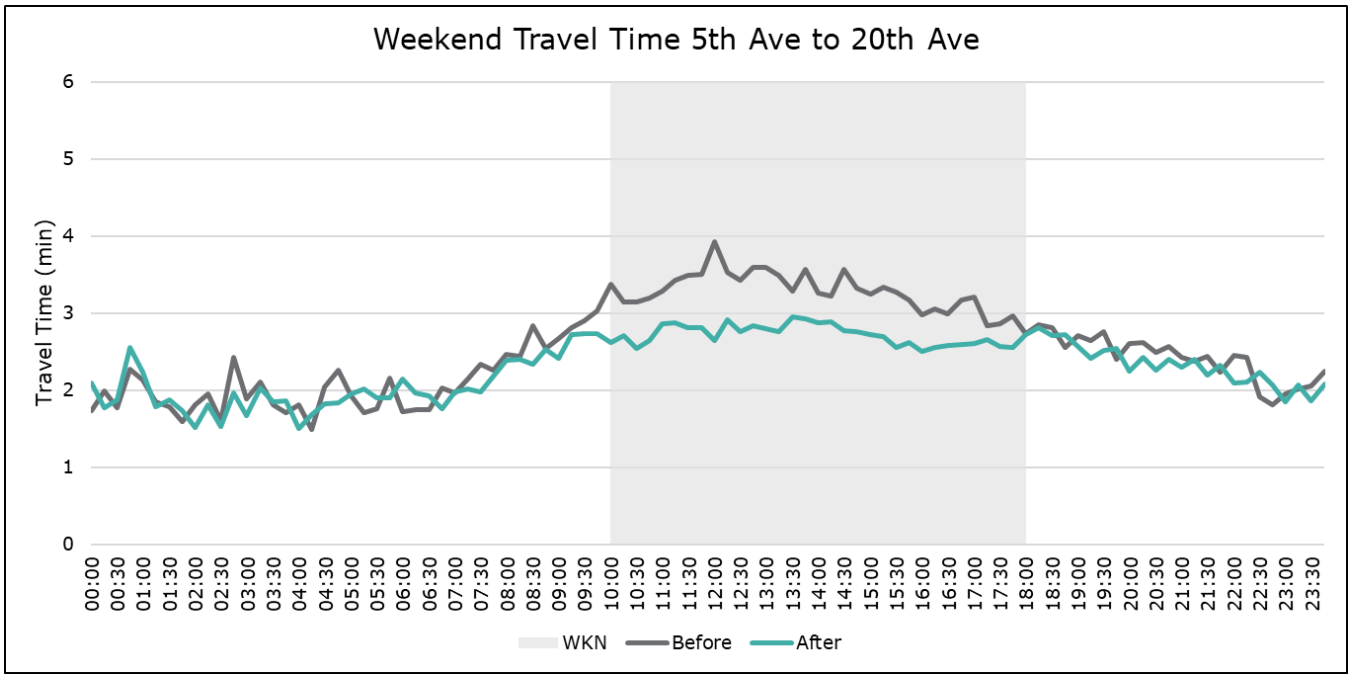

FIGURE 8. TRAVEL TIME COMPARISON FOR PROJECT CORRIDOR ALONG SR 502 / MAIN STREET (WESTBOUND, WEEKEND)

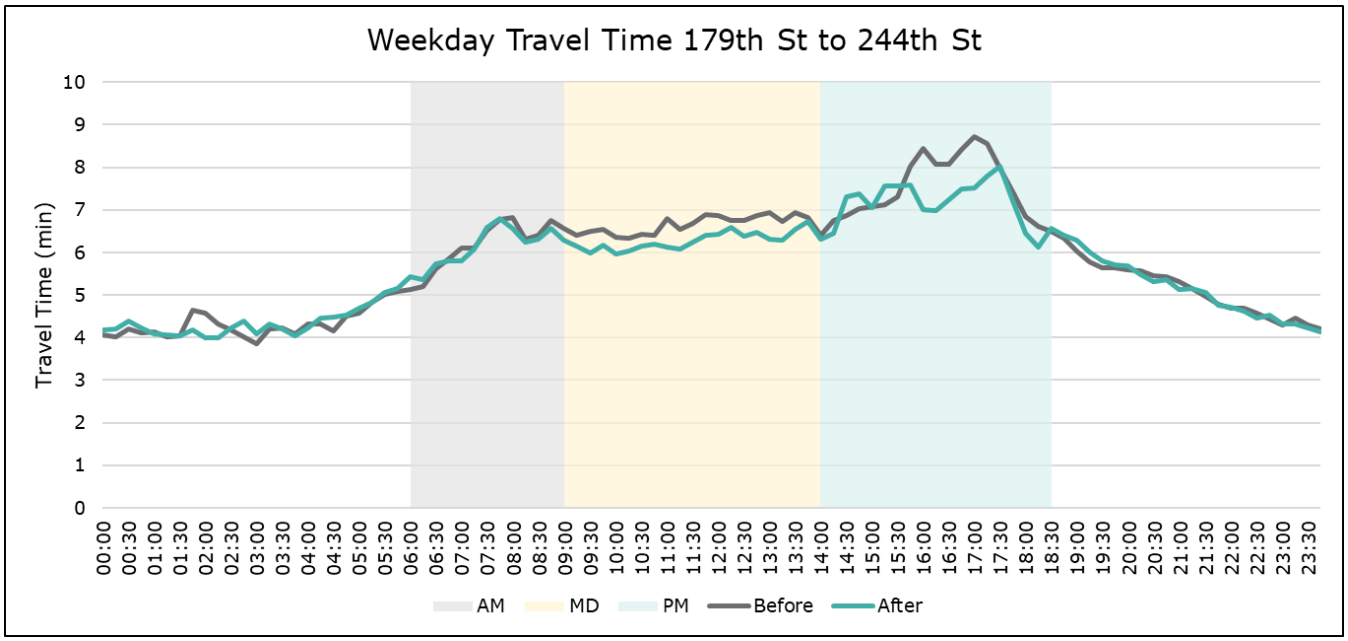

FIGURE 9. TRAVEL TIME COMPARISON FOR PROJECT CORRIDOR ALONG SR 503 (NORTHBOUND, WEEKDAY)

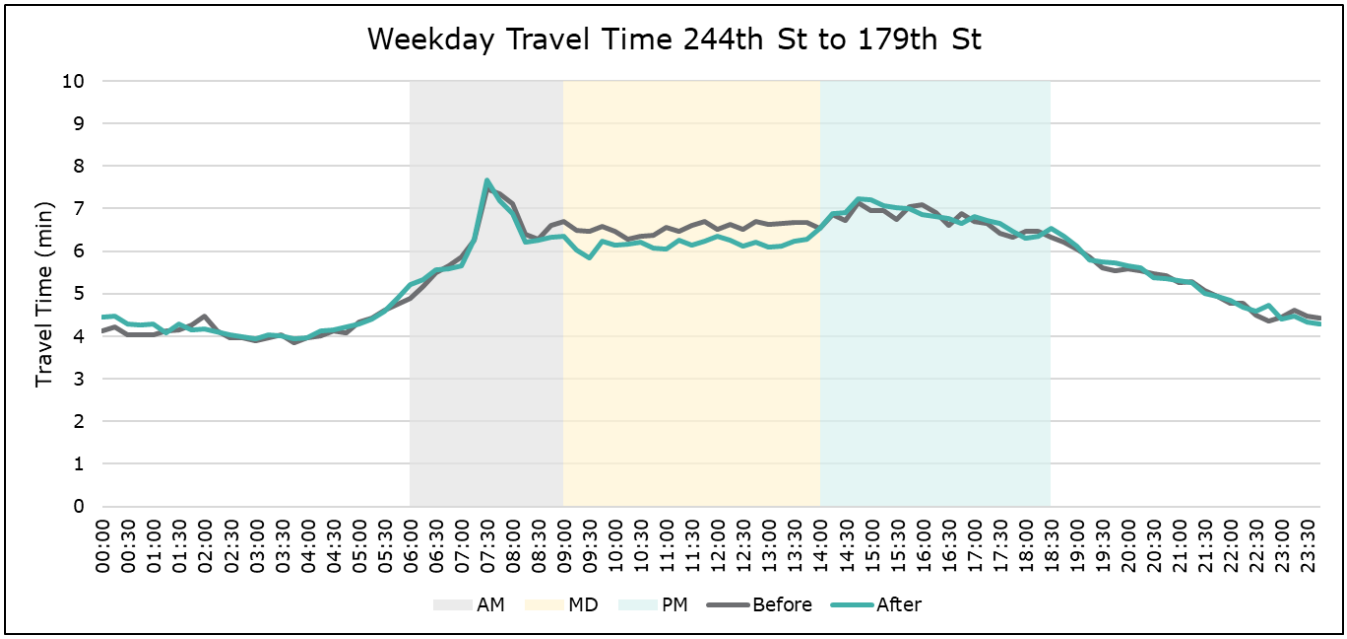

FIGURE 10. TRAVEL TIME COMPARISON FOR PROJECT CORRIDOR ALONG SR 503 (SOUTHBOUND, WEEKDAY)

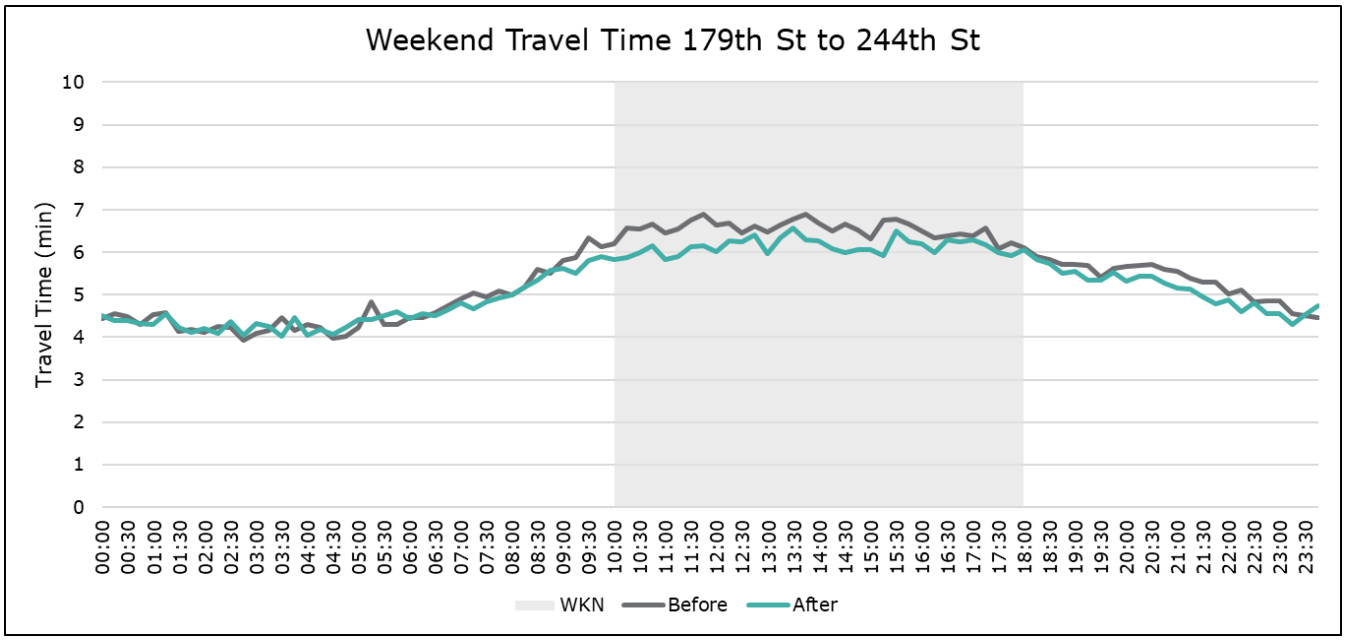

FIGURE 11. TRAVEL TIME COMPARISON FOR PROJECT CORRIDOR ALONG SR 503 (NORTHBOUND, WEEKEND)

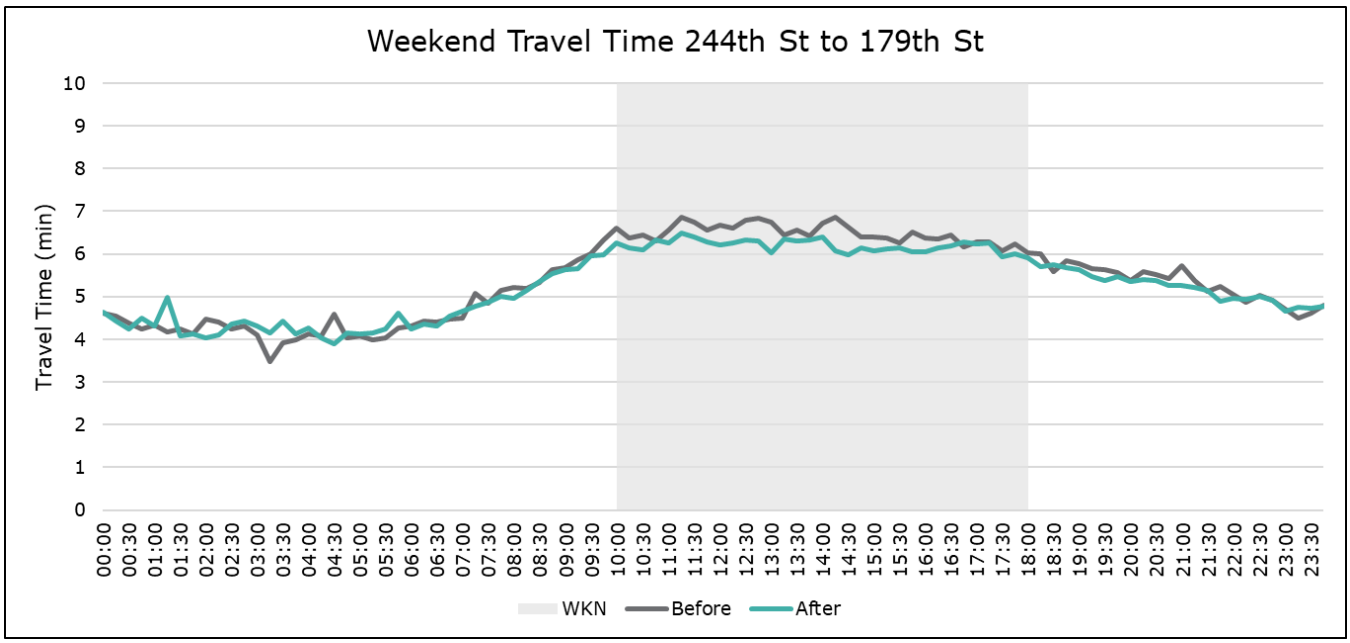

FIGURE 12. TRAVEL TIME COMPARISON FOR PROJECT CORRIDOR ALONG SR 503 (SOUTHBOUND, WEEKEND)

One of the primary objectives of this project was to improve mainline progression along the SR 503 corridor and the SR 502 / Main Street corridor. Under existing conditions, traffic congestion was most prominent at the SR 503 and SR 502 / Main Street intersection and the SR 503 and Eaton Boulevard intersection. The corridor also includes several schools, and traffic associated with school drop-off and pick-up periods further increases congestion during the morning and afternoon peaks.

Under proposed conditions, daily travel time savings resulted across all analysis periods for the project corridor. The general shape of the travel time curves remains consistent before and after implementation, but notable reductions are observed during the peak periods, especially in the weekday northbound direction for the PM peak and the weekend periods in both directions along the SR 503 corridor, and the weekday eastbound direction and the weekend periods in both directions along the SR 502 direction.

For weekdays along the SR 503 corridor, southbound travel time improvements are greater than the northbound direction in the AM and midday periods, while the northbound direction is greater than the southbound direction in the PM period as shown in both figures and tables above. A common challenge in implementing coordinated signal timing is achieving a balance between both travel directions since optimizing offsets to favor one direction can often reduce performance in the opposite direction. In this case, the updated timing plans appear to favor northbound progression more for the PM period for vehicles without significantly impacting northbound flow. For weekends, southbound travel time improvements are greater than the northbound direction but show similar improvements in both directions.

For weekdays along the SR 502 / Main Street corridor, eastbound travel time improvements are greater than the westbound direction as shown in both figures and tables above. The updated AM and midday period timing plans appear more consistent between both directions, but the updated PM period timing plans appear to favor eastbound direction but still produce notable westbound

travel time reductions. For weekends, westbound travel time improvements are greater than the eastbound direction but show notable improvements in both directions. This could be due to the inclusion of 5th Avenue on the easternmost end of the corridor previously operating in free mode.

While the tabulated results present average travel time savings over the two-hour peak period, the travel time plots illustrate that the most significant improvements occur during the most congested portions of each period along the SR 502 / Main Street corridor, including eastbound reductions of more than 30 seconds during the PM peak and westbound reductions of nearly 40 seconds during the midday period. The greatest improvements are observed during the weekend period, where eastbound travel times decrease by nearly 45 seconds and westbound travel times by up to almost a minute and a half.

Along the 179th Street to 244th Street segment of the SR 503 corridor, the travel time plots similarly show that the most significant savings occur during the most congestion portions of each period. Northbound reductions of almost 20 seconds are observed during the AM period, and southbound reductions of more than 30 seconds during the midday period. While southbound travel times average a slight one second increase over the PM period, there are portions of the period with reductions of nearly 15 seconds. The greatest improvements are northbound during the PM period, where travel times decrease by nearly a minute and a half, and during the weekend periods, travel times decrease by more than 40 seconds in both directions.

The schools along the corridor between Onsdorff Boulevard and Main Street (Battle Ground High School, Cam Academy, Chief Umtuch Middle School, and Captain Strong Primary School) were found to have a large impact on corridor travel times and overall travel time reliability in the southbound direction between 244th Street to SR 502 / Main Street during the AM period. Across the 12 days of AM weekday travel time data collected, travel times for this segment varied by more than a minute, and by almost two minutes across the full SR 503 project corridor, indicating inconsistent congestion. This daily travel time variability is likely related to school traffic, as different school start times and changing schedules generate large southbound volumes concentrated within short periods on a single southbound lane. Battle Ground High School begins at 7:55 AM with one-hour late starts on Wednesdays, Cam Academy begins at 7:55 AM with at home learning on Wednesdays, Chief Umtuch Middle School begins at 8:10 AM with one hour late starts on Wednesdays, and Captain Strong Primary School and Maple Grove Primary School begin at 9:00 AM with one hour late starts on Wednesdays. These staggered and variable schedules concentrate traffic within short periods, contributing to the high southbound travel time variability.

Additionally, this corridor carries substantial side-street and left-turn volumes, highest at the Eaton Boulevard intersection during Maple Grove School drop-off and pick-up times. Reallocating green time to these movements has minimized their delays and improved overall intersection operations. As a result, all movements along the corridor operate well, reflecting a balanced improvement rather than mainline-only optimization.

Across the corridor, should additional funding become available, capital improvement projects beyond signal timing adjustments should be evaluated at the SR 503 and Eaton Boulevard intersection. The City of Battle Ground has identified a capital improvement project to reconstruct SW Eaton Boulevard to a 3 lane section between SW 20th Avenue and SR 503. An eastbound right turn lane and second westbound left turn lane will be added to the intersection of SW 503 and

Eaton Boulevard. The project is towards the end of the preliminary engineering and Right-of-Way stages, and construction is anticipate to begin in 2027.[1] Signal optimization alone provides limited long-term benefit under increasing demand, and additional geometric or capacity improvements are likely needed to achieve further operational benefits.

[1] City of Battle Ground Capital Improvement Projects, SW Eaton Boulevard Improvements: https://www.cityofbg.org/848/SW-Eaton-Boulevard-Improvements

EMISSION COMPARISON

Emission performance was evaluated using reports generated by Synchro, a traffic signal optimization and simulation tool that estimates intersection-level measures of effectiveness (MOEs), including but not limited to total delay, number of stops, fuel consumed, Carbon Monoxide (CO) emissions, and Nitrogen Oxides (NO_X) emissions.

Two Synchro models were used for this analysis:

- Existing model, representing the before conditions
- Fine-tuned model, reflecting the updated signal timing plans

It should be noted that Synchro provides an effective and widely accepted method for assessing the relative emission benefits of signal timing improvements. Though the results are based on modeled estimates and may not fully represent realistic conditions.

Additionally, the results from Synchro do not account for the presence of hybrid and electric vehicles, which produce significantly lower or zero emissions. According to Washington State vehicle registration data, approximately 4 percent of residential vehicles in Clark County were hybrids and 2 percent were electric as of 2024. While this could theoretically reduce the estimated emission savings to some extent, the impact is not included in this analysis due to the current limitations of the modeling tool. Table 4 through Table 6 show the performance measures for the updated signal timing plans along each corridor and for the network.

TABLE 4. PERFORMANCE MEASURES FOR SR 503 NORTH CORRIDOR COORDINATION (NE 149TH STREET TO NE 244TH STREET, EIGHT SIGNALS)

CORRIDOR PERFORMANCE MEASURES	BEFORE				AFTER			
	AM	MD	PM	WKN	AM	MD	PM	WKN
TOTAL DELAY (HOURS)	173	132	174	184	156 (-9.8%)	114 (-13.6%)	172 (-1.1%)	157 (-14.7%)
TOTAL STOPS (STOPS)	12788	11520	13411	14934	11144 (-12.9%)	10263 (-10.9%)	12760 (-4.9%)	12645 (-15.3%)
FUEL CONSUMED (GAL)	714	635	800	787	672 (-5.9%)	598 (-5.8%)	789 (-1.4%)	726 (-7.8%)
CO EMISSIONS (KG)	49.9	44.35	55.92	55.01	47.0 (-5.8%)	41.82 (-5.7%)	55.14 (-1.4%)	50.77 (-7.7%)
NO_X EMISSIONS (KG)	9.71	8.63	10.88	10.7	9.14 (-5.9%)	8.14 (-5.7%)	10.73 (-1.4%)	9.88 (-7.7%)

TABLE 5. PERFORMANCE MEASURES FOR SR 502 / MAIN STREET CORRIDOR COORDINATION (NW 20TH AVENUE TO N 5TH AVENUE, FIVE SIGNALS)

CORRIDOR PERFORMANCE MEASURES	BEFORE				AFTER			
	AM	MD	PM	WKN	AM	MD	PM	WKN
TOTAL DELAY (HOURS)	66	66	106	105	63 (-4.5%)	62 (-6.1%)	99 (-6.6%)	93 (-11.4%)
TOTAL STOPS (STOPS)	5753	6165	8644	8479	5044 (-12.3%)	5360 (-13.1%)	7520 (-13.0%)	7213 (-14.9%)
FUEL CONSUMED (GAL)	217	223	308	300	211 (-2.8%)	216 (-3.1%)	291 (-5.5%)	283 (-5.7%)
CO EMISSIONS (KG)	15.19	15.57	21.52	20.98	14.76 (-2.8%)	15.09 (-3.1%)	20.31 (-5.6%)	19.78 (-5.7%)
NO_X EMISSIONS (KG)	2.96	3.03	4.19	4.08	2.87 (-3.0%)	2.94 (-3.0%)	3.95 (-5.7%)	3.85 (-5.6%)

TABLE 6. PERFORMANCE MEASURES FOR CORRIDOR COORDINATION FOR THE NETWORK (SR 503 CORRIDOR AND SR 502 / MAIN STREET CORRIDOR, 12 SIGNALS)

CORRIDOR PERFORMANCE MEASURES	BEFORE				AFTER			
	AM	MD	PM	WKN	AM	MD	PM	WKN
TOTAL DELAY (HOURS)	207	170	236	240	189 (-8.7%)	150 (-11.8%)	234 (-0.8%)	204 (-15.0%)
TOTAL STOPS (STOPS)	16222	15569	19186	20245	14070 (-13.3%)	13551 (-13.0%)	17787 (-7.3%)	16856 (-16.7%)
FUEL CONSUMED (GAL)	827	761	976	951	782 (-5.4%)	720 (-5.4%)	959 (-1.7%)	877 (-7.8%)
CO EMISSIONS (KG)	57.82	53.18	68.24	66.47	54.68 (-5.4%)	50.32 (-5.4%)	67.02 (-1.8%)	61.28 (-7.8%)

CORRIDOR PERFORMANCE MEASURES	BEFORE				AFTER			
	AM	MD	PM	WKN	AM	MD	PM	WKN
NO_x EMISSIONS (KG)	11.25	10.35	13.28	12.93	10.64 (-5.4%)	9.79 (-5.4%)	13.04 (-1.8%)	11.92 (-7.8%)

As shown in Table 4 through Table 6, the performance measures for the updated timing plans along the SR 503 project corridor and along SR 502 / Main Street indicate significant improvements in total delay, number of stops, and emissions. Overall, the updated timing plans resulted in reductions across all performance measures during the analysis periods:

- Total network delay reduced between 1 and 15 percent along the SR 503 corridor. The most significant changes were during the midday peak period and weekends.
- Total network delay reduced between 5 and 11 percent along the SR 502 / Main Street corridor. The most significant change was during the weekend.
- Total stops reduced by up to 15 percent along the SR 503 corridor and up to 15 percent along the SR 502 / Main Street corridor, suggesting improvement of progression and fewer interruptions.
- Fuel consumption, CO emissions, and NOX emissions were reduced by 1 to 8 percent along the SR 503 corridor and by 3 to 6 percent along the SR 502 / Main Street corridor.

The reductions indicated that the updated plans improve corridor efficiency by providing smoother flow and reducing vehicle idling during the analysis periods. All periods show reductions in total delay, total stops, fuel consumption, CO emissions, and NO_x emissions, indicating overall operational improvements.

The model outputs for total delay and fuel consumption savings were used to estimate the cost-related benefits of the updated signal timing. The outputs from Synchro models were estimated based on peak hour volumes. Therefore, a TOD factor, calculated using 24-hour tube count volumes along the corridor, was applied to convert the peak hour savings into daily savings. It should be noted that only weekday output was included in the daily benefit calculations.

Re-timing signals in congested transportation corridors is a low cost, transportation systems management and operations strategy that can improve travel time and reduce delay. This strategy can also reduce the number of collisions due to smoother traffic flow and fewer stops and can minimize the number of drivers who divert to side streets to avoid congestion on the main corridor. This project provides an opportunity to quantitatively demonstrate that signal timing is a cost-effective approach to addressing operational challenges in the Clark County region.

The benefits for the SR-503 North corridor were estimated using delay savings and fuel savings. The reduced hours of delay was multiplied by a dollar-per-hour value. This value represents the 2024 average value of time, adjusted using the Consumer Price Index[2] (CPI) from the U.S. Bureau of Labor Statistics. For fuel savings, the dollar-per-gallon value was based on the 2024 annual

[2] https://www.bls.gov/cpi/data.htm

average gasoline price in Washington State, obtained from the U.S. Energy Information Administration. Based on these assumptions, the estimated annual delay savings in dollars is $927,763, while the fuel consumption savings in dollars is $388,547, resulting in a combined annual benefit of $1,316,310, with an estimated three-year total of $3,394,931 to reflect the anticipated duration of improvements.

SAFETY

Arterial corridors serve various needs that can affect roadway safety. Many of these segments are characterized by high vehicle volumes and relatively high motor vehicle operating speeds, while also featuring mixed land use (e.g., residential, commercial, and services) that encourage walking, cycling, and public transit use. This results in a mix of local and through corridor traffic demands, increasing the potential for conflicts between vehicles, pedestrians, cyclists, and transit users using the corridor for different purposes, presenting potential safety challenges.

According to the Crash Modification Factors[3] (CMF) Clearinghouse, coordinated signal timing has been associated with a 17 percent reduction in crashes of all severities, including property damage only (PDO) crashes. Coordination can also offer the following additional benefits:

- **Reduce Arrivals on Red.** Improving coordination can lower the number of drivers who arrive during the red phase, which also reduces stops. This decreases the likelihood of several crash types, including angle collisions (by reducing the opportunity for red-light running) and rear-end collisions.
- **Influence Operating Speeds.** By timing signal coordination based on a desired motor vehicle operating speed and messaging that to drivers, a coordinated system can reduce speeds and reduce speed differential through the corridor, both of which can reduce the number and severity of collisions.
- **Reduce Left Turn Crashes.** Permissive left turn phases are a common safety challenge at signalized intersections. Improved platooning can result in larger gaps for those left-turning drivers, reducing the likelihood of a collision with opposing through vehicles.
- **Reduced Anxiety to Support Decision-making**. Congestion can increase the stress level of motorists, negatively affecting how they interact with the system and each other. Reducing the frustration of driving by reducing congestion, changing stop-and-go traffic along a corridor to a smoother, more comfortable experience, can result in reduced aggression on the road, leading to a safer corridor.

[3] Crash Modification Factors Clearinghouse (CMF ID: 6856)

APPENDIX

Southwest Washington
Regional Transportation Council

APPENDIX A. CORRIDOR PRIORITIZATION MEMORANDUM

DKS 1050 SW 6TH AVENUE, SUITE 600 • PORTLAND, OR 97204 • 503.243.3500 • DKSASSOCIATES.COM

PRIORITIZATION METHODOLOGY MEMO

DATE: June 4, 2024

TO: Judith Perez Keniston | RTC

FROM: Maggie Lin & Michael Mauch | DKS Associates

SUBJECT: SWRTC Regional Signal Timing Plans Project #24070-000
FINAL Corridor Prioritization Memorandum

PROJECT BACKGROUND

Southwest Washington Regional Transportation Council (RTC) is the metropolitan planning organization (MPO) for Clark County, Washington. The Carbon Reduction Program (CRP) was established by the Bipartisan Infrastructure Law (BIL) to provide funds for projects designed to reduce vehicle greenhouse gas (GHG) emissions. RTC is leading this project, with the support of other VAST TSMO Steering Committee members, and will use CRP funds to implement updated signal timing plans along priority corridors within urban Clark County.

As a growing community, Clark County has seen significant population growth in the last decade and estimates a population of nearly 700,000 by 2045. The region's public roadway network includes both major interregional corridors and major arterial corridors that connect cities and communities. The intent of the regional traffic signal timing project is to help the region lower GHG emissions by making more efficient use of the existing transportation system, particularly as economic and population growth within the region continues.

PROJECT OVERVIEW

The goals of this project include improving mobility, safety, and air quality; while meeting the demands of all modes by reducing traffic signal delay. To accomplish this, the key components of the project scope include prioritizing and improving traffic signal timing and coordination along priority transportation corridors:

- Review the existing conditions along the signalized roadway corridors within urban Clark County,
- Prioritize the corridors based on screening criteria,
- Develop and deploy improved traffic signal coordination plans that meet the operational objectives and project goals.

The project team identified a list of corridors to be considered in the corridor prioritization process and potential candidates for updating the corridor signal timing. The RTC Congestion Management Process (CMP) corridors were used as the basis for corridor identification. The CMP corridors include freeway and arterial corridors. This project only considers the non-freeway CMP corridors. Figure 1 provides a map of the non-freeway CMP corridors and traffic signal locations in the region. Note that the signals shown in this map were from data collected in 2021. Any updates to the signal locations are not reflected in this map as it only intends to provide a high-level overview of the signal locations in the region. An online version of this map is also available through this link: https://shorturl.at/akCH9

FIGURE 1 CORRIDORS TO BE CONSIDERED FOR PRIORITIZATION

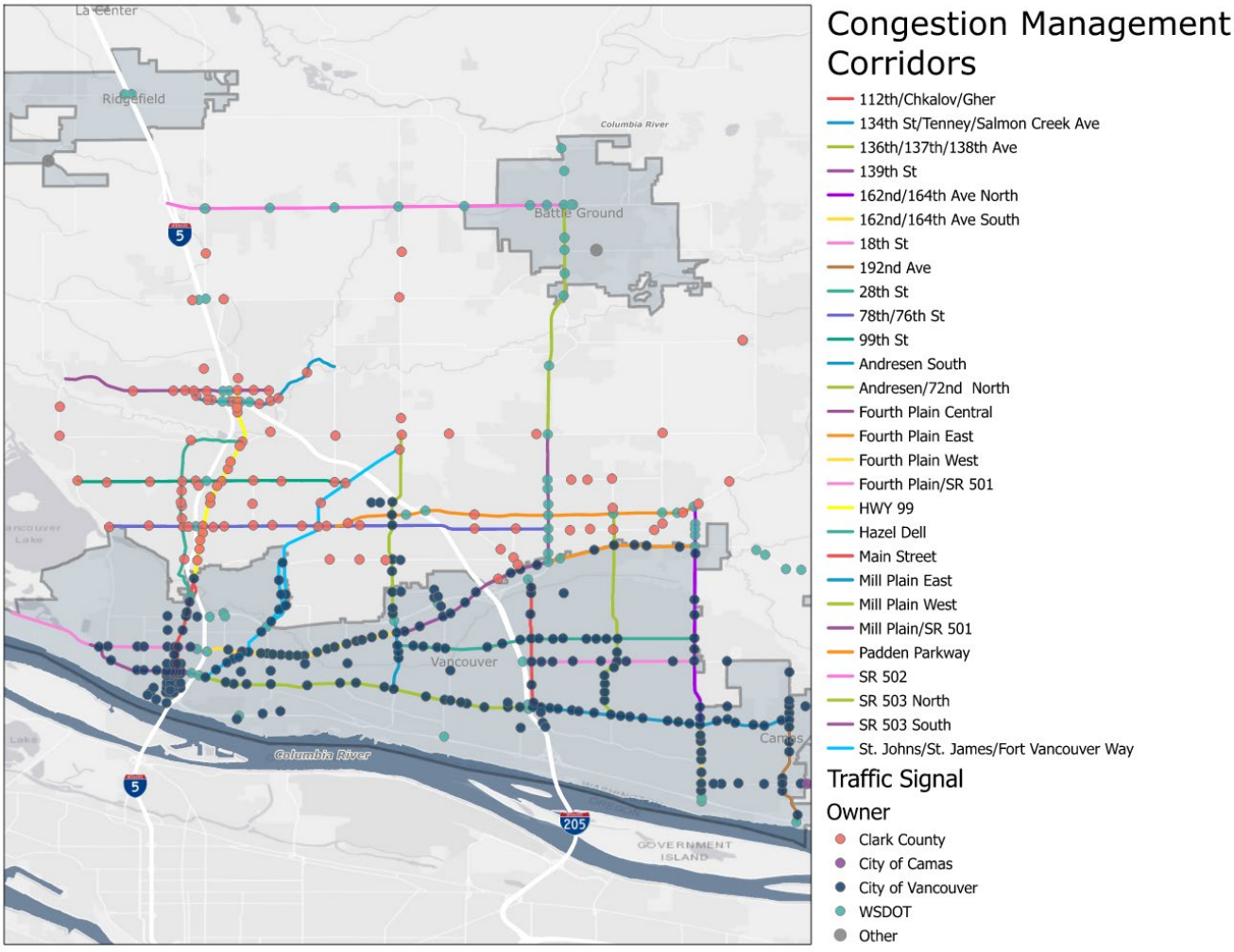

Table 1 lists the 28 CMP corridors identified for prioritization by the VAST/TSMO Steering Committee. The corridors are arranged in alphabetical order.

TABLE 1: CORRIDORS BEING EVALUATED

CORRIDOR NAME AND DESCRIPTION
112TH/CHKALOV/GHER (FROM SR 500 TO MILL PLAIN)
134TH ST/TENNEY/SALMON CREEK AVE (FROM NE 139TH ST TO NE 50TH AVE)
136TH/137TH/138TH AVE (FROM PADDEN PKWY TO MILL PLAIN)
139TH ST (FROM NW 36TH ST TO NE 29TH AVE)
162ND/164TH AVE NORTH (FROM WARD RD TO MILL PLAIN)
162ND/164TH AVE SOUTH (FROM MILL PLAIN TO SR 14)
18TH ST (FROM 112TH AVE TO 162ND AVE)
192ND AVE (FROM SE 1ST ST TO SR 14)
28TH ST (FROM ANDRESEN RD TO 162ND AVE)
78TH/76TH ST (FROM LAKESHORE AVE TO SR 503/117TH AVE)
99TH ST (FROM LAKESHORE AVE TO ST JOHN RD)
ANDRESEN SOUTH (FROM SR 500 TO MILL PLAIN)
ANDRESEN/72ND NORTH (FROM 119TH ST TO SR 500)
FOURTH PLAIN CENTRAL (FROM ANDRESEN RD TO SR 503/117TH AVE)
FOURTH PLAIN EAST (FROM SR 503/117TH AVE TO 162ND AVE)
FOURTH PLAIN WEST (FROM I-5 TO ANDRESEN RD)
FOURTH PLAIN/SR 501 (FROM NW LOWER RIVER RD TO I-5)
HAZEL DELL (FROM HWY 99 TO 63RD ST)
HWY 99 (FROM 139TH ST TO ROSS ST)
MAIN STREET (FROM ROSS ST TO MILL PLAIN)
MILL PLAIN EAST (FROM I-205 TO 192ND AVE)
MILL PLAIN WEST (FROM I-5 TO I-205)
MILL PLAIN/SR 501 (FROM FOURTH PLAIN TO I-5)
PADDEN PARKWAY (FROM 78TH ST TO 162ND AVE)
SR 502 (FROM I-5 TO SR 503)
SR 503 NORTH (FROM SR 502 TO 119TH ST)
SR 503 SOUTH (FROM 119TH ST TO FOURTH PLAIN/SR 500)
ST. JOHNS/ST. JAMES/FORT VANCOUVER WAY (FROM NE 72ND AVE TO MILL PLAIN)

CORRIDOR PRIORITIZATION METHODOLOGY

This section describes the methodology to evaluate the existing corridor performance and prioritize the corridors for the signal coordination efforts. As mentioned in the previous section, CMP corridors and key urban corridors confirmed by VAST TSMO Steering Committee members were used as the initial list of corridors considered for this project.

A three-step approach was used to prioritize the needs for updating the traffic signal timing plans for the County's urban corridors. Each of the steps are described in the subsections below.

1. Evaluate the corridor performance based on historical data.
2. Develop a weighting scheme and corridor ranking.

3. Obtain agency input on additional information and identify the set of corridors to be re-timed.

STEP 1. EVALUATE CORRIDOR PERFORMANCE BASED ON HISTORICAL DATA

For each of the County's urbanized CMP corridors considered in this process, the following corridor performance measures were quantified and evaluated:

- **Traffic Volume** – to measure and compare the utilization of each corridor (in vehicles per hour during the peak hour on an average non-holiday weekday).
- **Travel Time and Travel Time/Mile** – to measure the impacts of congestion on the signalized corridors, two measures will be used: corridor travel time and travel-times per mile (sometimes called "pace"). TomTom travel time data served as the primary data source for the travel time measures.
- **Speed/Posted Speed Percent** – The peak period speed to posted speed ratio (expressed as a percentage) captures the impact of peak period traffic congestion on the corridor's overall performance.
- **CCI (Corridor Capacity Index)** – The corridor capacity index is an indicator of congestion. The higher the ratio, the more traffic congestion a driver is likely to experience. The corridor capacity index is an aggregation of the volume/capacity ratios for the individual general-purpose segments that make up a facility within a corridor.
- **Transit ridership** – To gauge transit utilization within each corridor, the measure selected was the count of transit riders utilizing the study corridors.
- **Safety** – Three measures were selected to quantify safety along the study corridors:
  1) Total corridor crashes (2017 -2022),
  2) Crashes per centerline-mile of the corridor, and
  3) A binary "high crash corridor" designation as identified in local road safety plans.

The performance of the corridors may vary by time of day; that is, the AM peak, midday, and PM peak performance may differ. For the vast majority of the analysis corridors in the region, PM peak dominated the corridor utilization; therefore, PM peak period was used in the evaluation for all of the analysis corridors. In addition, four of the corridors also experienced significant AM period utilization, so AM peak period was also used in the evaluation for those three corridors, i.e. Main Street, Andresen/72nd North, 139th Street, and Mill Plain/SR501.

STEP 2. DEVELOP WEIGHTING SCHEME AND CORRIDOR RANKING

DKS developed a corridor ranking methodology based on the relative importance of the performance metrics listed in Step 1. "Weights" are assigned to each of the performance metrics and represent the comparative level of importance.

Table 2 shows the draft criteria weighing factors proposed by DKS in this process.

TABLE 2: DRAFT WEIGHTING FACTORS

PERFORMANCE MEASURE	WEIGHTING FACTOR
TRAFFIC VOLUME	5
TRAVEL TIME	0
TRAVEL TIME/MILE	2
SPEED / POSTED SPEED PERCENT	4
CCI	2
2019 TRANSIT RIDERS	3
TOTAL CORRIDOR CRASHES (2017-2022)	0
CRASHES/MILE	3
HIGH CRASH CORRIDOR	0

A few of the corridor performance metrics identified in Step 1 were not used (with a zero weight) in the draft weighting factors, either because they were redundant or because another performance measure more appropriately captured the underlying phenomena or events. For example, corridor travel time is directly dependent on the corridor distance; including this would favor longer corridors over shorter ones. As such, it was given a "0" weight. Instead, the corridor's travel times per mile (Travel Time/Mile) was used, which normalized the corridors' performance, removing the bias toward longer corridors. Likewise, the Total Corridor Crashes was not used, and Crashes/Mile was selected to represent the corridors crash rates.

A corridor prioritization workshop was included during the April 24th VAST/TSMO Steering Committee meeting. Local agency staff were asked to collaboratively review the draft weighting criteria and develop the final weighting factors based on consensus from the group. Table 3 lists the agency's inputs on weighting collected during the meeting and the final weighting factor used in the process.

TABLE 3: FINAL WEIGHTING FACTORS

PERFORMANCE METRIC	AGENCY INPUT					FINAL WEIGHTING FACTOR
	WSDOT	CLARK COUNTY	VANCOUVER	C-TRAN	RTC	
TRAFFIC VOLUME	5	5	5	4	5	**4.8**
TRAVEL TIME	0	0	0	0	0	**0**
TRAVEL TIME/MILE	3	2	2	2	2	**2.2**
SPEED / POSTED SPEED PERCENT	2	3	3	3	3	**2.8**
CCI	4	4	4	4	4	**4**
2019 TRANSIT RIDERS	3	4	4	5	4	**4**
TOTAL CORRIDOR CRASHES (2017-2022)	0	0	0	0	0	**0**
CRASHES/MILE	4	4	3	3	3	**3.4**
HIGH CRASH CORRIDOR	0	0	0	0	0	**0**

The corridor ranking was updated based on the final weighting factors and presented to the VAST members during the April 24th meeting.

TABLE 4: CORRIDOR RANKING RESULTS

CORRIDOR RANKING	CORRIDOR NAME AND DESCRIPTION	PEAK PERIOD
1	SR 503 South (from 119th St to Fourth Plain/SR 500)	PM
2	Mill Plain East (from I-205 to 192nd Ave)	PM
3	112th/Chkalov/Gher (from SR 500 to Mill Plain)	PM
4	Fourth Plain West (from I-5 to Andresen Rd)	PM
5	162nd/164th Ave South (from Mill Plain to SR 14)	PM
6	Fourth Plain East (from SR 503 (117th Ave) to 162nd Ave)	PM
7	18th St (from 112th Ave to 162nd Ave)	PM
8	Main Street (from Ross St to Mill Plain)	AM
9	HWY 99 (from 139th St to Ross St)	PM
10	SR 503 North (from SR 502 to 119th St)	PM
11	136th/137th/138th Ave (from Padden Pkwy to Mill Plain)	PM
12	Mill Plain West (from I-5 to I-205)	PM
13	Andresen/72nd North (from 119th St to SR 500)	AM
14	162nd/164th Ave North (from Ward Rd to Mill Plain)	PM
15	Andresen South (from SR 500 to Mill Plain)	PM
16	28th St (from Andresen Rd to 162nd Ave)	PM
17	139th St (from NW 36th St to NE 29th Ave)	AM
18	78th/76th St (from Lakeshore Ave to SR 503 (117th Ave))	PM
19	99th St (from Lakeshore Ave to St John Rd)	PM
20	Fourth Plain Central (from Andresen Rd to SR 503 (117th Ave))	PM
21	192nd Ave (from SE 1st St to SR 14)	PM
22	Mill Plain/SR 501 (from Fourth Plain to I-5)	AM
23	134th St/Tenney/Salmon Creek Ave (from NE 139th St to NE 50th Ave)	PM
24	SR 502 (from I-5 to SR 503)	PM
25	Padden Parkway (from 78th St to 162nd Ave)	PM
26	Hazel Dell (from Hwy 99 to 63rd St)	PM
27	St. Johns/St. James/Fort Vancouver Way (from NE 72nd Ave to Mill Plain)	PM
28	Fourth Plain/SR 501 (from NW Lower River Rd to I-5)	PM

Table 4 shows the resulting corridor ranking using the weighting factors listed in Table 3. As noted in Step 1, four of the corridors had both AM and PM peak performance metrics considered. Only the higher ranking between AM and PM of each corridor is presented in this table.

STEP 3. ADDITIONAL AGENCY INPUTS

At the April 24th meeting, the agencies also discussed other factors needing to be considered in the development of a final list of prioritized corridors. Several agencies also provided additional information after the meeting. Consideration factors that may impact the decision of whether to prioritize a corridor for signal retiming included:

- Whether a recent signal timing effort has been conducted on a corridor
- Whether a signal timing effort is planned/programmed for a corridor in the next few years
- Whether a construction project is planned/schedule for a corridor and if it has an impact on this project
- Whether a corridor is identified as an existing or future BRT route

These factors will be considered in the development of signal timing plans. For example, a corridor with a construction project schedule in 2025 may be removed from the priority list for developing updated signal timing plans as this project would likely be completed by the end of 2025. These details will be discussed between RTC, the local agencies, and DKS and the final decisions will be documented.

NEXT STEPS

DKS will start to collect data and develop existing conditions models for the top two corridors in May 2024, and move forward with developing updated signal timing plans for the top two corridors and deploying the new timing plans afterwards. Additional corridors will be added throughout the study, with the project concluding in December 2025.

APPENDIX B. EXISTING CONDITIONS MEMORANDUM

DKS 1050 SW 6TH AVENUE, SUITE 600 • PORTLAND, OR 97204 • 503.243.3500 • DKSASSOCIATES.COM

TECHNICAL MEMORANDUM - DRAFT

DATE: March 12, 2025

TO: Judith Perez Keniston | RTC

FROM: Aaron Yan, Ilana Burstein, P.E., Pam O'Brien, P.E., PTOE | DKS Associates

SUBJECT: SWRTC Regional Signal Timing Plans
Task 4 Existing Conditions

Project #24070-000

This memorandum highlights the existing conditions, the data used, and traffic operation observations along Corridor 10: SR503 from NE 149th Street to NE 244th Street and along SR502 from SW 20th Avenue to NW 5th Avenue.

EXISTING CONDITIONS

The traffic signals along State Route 503/SW 10th (SR503) Avenue are owned and operated by the Washington Department of Transportation (WSDOT). WSDOT signals also include 20th, and 15th, along State Route 502 (SR502). Traffic signals owned by WSDOT use Trafficware local software. The City of Battle ground own the signals at the Safeway and NW 5th Avenue on W Main Street. These signals also use Trafficware local software.

The signals along SR503 operate free during the AM and Midday peak periods, except for SR503 and SR502 which operates in coordination. During the PM peak period, the signals along SR 503 from 179th Street to Scotton Way operate in coordination. The signals along SR502 operate in coordination during all peak periods. Figures 1, 2, and 3 below summarize the timing plans according to the weekday and weekend Time of Day (TOD) schedule.

DATA

For some intersections WSDOT provided hourly Turning Movement Counts (TMCs) collected by GRIDSMART technology on March 10th, 2022, March 15th, 2022, March 17th, 2022, March 22nd, 2022, and May 17th, 2023 for 24-hours. IDAX provided AM period turning movement counts on January 30th, 2025, Midday and PM turning movement counts on January 16th, 2025, and Saturday turning movement counts on January 18th, 2025. Signal as-build, phasing plans, and signal timings were provided by WSDOT.

Additional data was provided by WSDOT at the intersection of SR503 and NE 189th Street that included trip distribution and traffic volumes for the new Woodin Creek subdivision development east of the corridor. The additional data comes from an intersection control evaluation report.

FIGURE 1: SR503 NORTH WEEKDAY TIMING PLAN SCHEDULE

TOD Schedule - Weekday

Intersection	0:00	6:00	6:30	7:00	7:30	8:00	8:30	9:00	9:30	10:00	10:30	11:00	11:30	12:00	12:30	13:00	13:30	14:00	14:30	15:00	15:30	16:00	16:30	17:00	17:30	18:00	18:30	19:00	19:30	23:59
NE 149th Street	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
NE 179th Street	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	1	1	1	1	1	1	1	1	1	F	F	F	F
NE 189th Street	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	1	1	1	1	1	1	1	1	1	F	F	F	F
SW Eaton Boulevard	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	1	1	1	1	1	1	1	1	1	F	F	F	F
SW Scotten Way	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	1	1	1	1	1	1	1	1	1	F	F	F	F
SR502	F	F	F	2	2	2	F	F	F	F	F	3	3	3	3	3	3	4	4	4	4	5	5	5	5	5	F	F	F	F
NW Onsdorff Boulevard	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
NE 244th Street	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
NW 5th Avenue	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
BG Safeway	F	F	F	2	2	2	F	F	F	F	F	3	3	3	3	3	3	4	4	4	4	5	5	5	5	5	F	F	F	F
NW 15th Avenue	F	F	F	2	2	2	F	F	F	F	F	2	2	2	2	2	2	3	3	3	3	4	4	4	4	4	F	F	F	F
NW 20th Avenue	F	F	F	2	2	2	F	F	F	F	F	2	2	2	2	2	2	3	3	3	3	4	4	4	4	4	F	F	F	F
	AM Plan											Midday Plan									PM Plan								Free	

Pattern 1 = 110s | Pattern 2 = 115s | Pattern 3 = 115s | Pattern 4 = 120s | Pattern 5 = 125s

FIGURE 2: SR503 NORTH SATURDAY TIMING PLAN SCHEDULE

TOD Schedule - Saturday

Intersection	0:00	6:00	6:30	7:00	7:30	8:00	8:30	9:00	9:30	10:00	10:30	11:00	11:30	12:00	12:30	13:00	13:30	14:00	14:30	15:00	15:30	16:00	16:30	17:00	17:30	18:00	18:30	19:00	19:30	23:59
NE 149th Street	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
NE 179th Street	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
NE 189th Street	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
SW Eaton Boulevard	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
SW Scotten Way	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
SR502	F	F	F	F	F	F	F	F	F	6	6	6	6	7	7	7	7	7	7	7	7	7	7	7	7	7	F	F	F	F
NW Onsdorff Boulevard	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
NE 244th Street	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
NW 5th Avenue	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
BG Safeway	F	F	F	F	F	F	F	F	F	6	6	6	6	7	7	7	7	7	7	7	7	7	7	7	7	7	F	F	F	F
NW 15th Avenue	F	F	F	F	F	F	F	F	F	3	3	3	3	5	5	5	5	5	5	5	5	5	5	5	5	5	F	F	F	F
NW 20th Avenue	F	F	F	F	F	F	F	F	F	3	3	3	3	5	5	5	5	5	5	5	5	5	5	5	5	5	F	F	F	F
	AM Plan											Midday Plan									PM Plan								Free	

Pattern 6 = 120s | Pattern 7 = 125s

FIGURE 3: SR503 NORTH SUNDAY TIMING PLAN SCHEDULE

TOD Schedule - Sunday

Intersection	0:00	6:00	6:30	7:00	7:30	8:00	8:30	9:00	9:30	10:00	10:30	11:00	11:30	12:00	12:30	13:00	13:30	13:45	14:00	14:30	15:00	15:30	16:00	16:30	17:00	17:30	18:00	18:30	19:00	19:30	23:59
NE 149th Street	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
NE 179th Street	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
NE 189th Street	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
SW Eaton Boulevard	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
SW Scotten Way	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
SR502	F	F	F	F	F	F	F	F	F	6	6	6	6	6	7	7	7	7	6	6	6	6	6	6	6	6	6	F	F	F	F
NW Onsdorff Boulevard	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
NE 244th Street	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
NW 5th Avenue	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
BG Safeway	F	F	F	F	F	F	F	F	F	6	6	6	6	6	7	7	7	7	6	6	6	6	6	6	6	6	6	F	F	F	F
NW 15th Avenue	F	F	F	F	F	F	F	F	F	3	3	3	3	3	5	5	5	5	3	3	3	3	3	3	3	3	3	F	F	F	F
NW 20th Avenue	F	F	F	F	F	F	F	F	F	3	3	3	3	3	5	5	5	5	3	3	3	3	3	3	3	3	3	F	F	F	F
	AM Plan											Midday Plan										PM Plan								Free	

Pattern 6 = 120s | Pattern 7 = 125s | Pattern 3 = 115s | Pattern 5 = 125s

OBSERVED TRAFFIC ISSUES

DKS conducted field observations of traffic conditions along the SR503 North study corridor from NE 149th Avenue to NE 244th Avenue, and SR502 from NW 5th Avenue to NW 20th Avenue, on January 14th, 2025 and February 12th, 2025, during weekday peak periods.

The following sections summarize notable observed characteristics at each intersection. All the observed issues will be considered when the new signal timing plans are developed.

SR503 & NE 149TH STREET

- The minor streets had relatively little volume, and SR503 had long northbound and southbound platoons.
- All queues were adequately served during all peak periods. All storage lengths were sufficient. No prominent issues need to be addressed.

SR503 & NE 179TH STREET

- This intersection is coordinated under a north-south coordination plan during the PM peak period.
- The minor streets had relatively little volume, and SR503 had long northbound and southbound platoons.
- All queues were adequately served during all peak periods. All storage lengths were sufficient. No prominent issues need to be addressed.

SR503 & NE 189TH STREET

- This intersection is coordinated under a north-south coordination plan during the PM peak period.
- The eastbound approach had relatively little volume and the westbound approach had no volume during all observation periods. The southbound left movement had no turning volume during all observation periods. SR503 had long northbound and southbound platoons.
- All queues were adequately served during all peak periods. All storage lengths were sufficient.
- WSDOT provided additional data from the Woodin Creek Intersection Evaluation that included trip distributions and additional traffic volumes that would impact existing condition volumes. These were added to the existing conditions Synchro model.

SR503 & SW EATON BOULEVARD (199TH)

- This intersection is coordinated under a north-south coordination plan during the PM peak period.
- During the AM and midday peak periods, high traffic volumes on the northbound, southbound, and westbound approaches resulted in moderate congestion. Moderate queues formed in the northbound and southbound through movements during the minor street phases; however, all queues cleared within a single cycle.
- The northbound approach experienced long queues during the PM peak period, and often experienced split failure. However, traffic does not wait for more than two cycles before being served. The westbound left-turn storage lane reached full capacity, causing vehicles to spillback into the westbound through lane.

SR503 & SW SCOTTON WAY

- This intersection is coordinated under a north-south coordination plan during the PM peak period.
- All queues were adequately served during all peak periods. All storage lengths were sufficient.
- The turning movement counts collected for this intersection appeared to have a data error for the AM, midday, and PM peak hours with the eastbound right turn movement. The counts showed no eastbound right turning vehicles in all peak periods, which does not match observations. A volume adjustment was applied in Synchro to volume balance with SW Eaton Boulevard.

SR503 & SR502

- This intersection is coordinated under an east-west coordination plan.
- Long queues were observed for the northbound movements and the eastbound through movement during the PM peak hour. The westbound and eastbound left-turn lanes operated near capacity.
- Long northbound left-turn queues were observed during all peak periods. In the midday and PM peak periods, the northbound left green phase was not always sufficient to clear queues; up to 10 vehicles waited more than a cycle. The westbound left green phase was not always sufficient to clear queues; up to 5 vehicles occasionally waited more than a cycle.
- The northbound left turn approach lane utilization factor in Synchro was adjusted to account for the higher volume in the outside turning lane. This lane utilization could be from the large residential area and commercial areas along SR502.
  - Northbound left lane utilization factor - fLU= $\frac{179}{(2\ x\ 170)}$ = 0.75
- The westbound left turn approach lane utilization factor in Synchro was adjusted to account for the higher volume in the inside turning lane. This lane utilization could be from the commercial area west of SW Scotten Way.
  - Westbound left lane utilization factor - fLU= $\frac{170}{(2\ x\ 114)}$ = 0.75

SR503 & NW ONSDORFF BOULEVARD

- All queues were adequately served during all peak periods, and all storage lengths were sufficient except for the northbound left turn lane during the PM peak hour. Northbound left turn vehicles would spillback into the northbound through lane.

SR503 & NE 244TH STREET

- All queues were adequately served during all peak periods. All storage lengths were sufficient.
- This location has a pre-warning interval timed for the SB movement from the existing prepare to stop when flashing system (PTSWF). This can potentially become a factor if this intersection is put in coordination.

W MAIN STREET & NW 5TH STREET

- All queues were adequately served during all peak periods. All storage lengths were sufficient.

W MAIN STREET & SAFEWAY

- This intersection is coordinated under an east-west coordination plan.
- During the midday peak period, long westbound through queues occasionally extended to the adjacent intersection (SR502 & NW 5th street).
- During the midday and PM peak periods, long eastbound through queues occasionally extended to the adjacent intersection (SR503 & SR502).

W & NW 15TH STREET

- This intersection is coordinated under an east-west coordination plan.
- Long eastbound through queues occurred during the midday and PM peak hours. However, the queues at the intersection were adequately served, and all storage lengths were sufficient.

SR502 & NW 20TH STREET

- This intersection is coordinated under an east-west coordination plan.
- All queues were adequately served during all peak periods. All storage lengths were sufficient.