RTC REGIONAL SIGNAL TIMING PLANS

PILOT BEFORE/AFTER REPORT: 18TH STREET

NOVEMBER 2025

PREPARED FOR:

Southwest Washington Regional Transportation Council

PREPARED BY DKS ASSOCIATES

Brianna Velasquez, EIT

Eileen Chai, EIT

Aaron Yan, EIT

Ilana Burstein, P.E.

Pamela O'Brien, P.E., PTOE

Bob Hart

Brian Chandler, P.E., PTOE, RSP_{2IB}, PMP

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PROJECT BACKGROUND

The Infrastructure Investment and Jobs Act (IIJA) established the Carbon Reduction Program (CRP), a new regionally competitive grant program managed by the Southwest Washington Regional Transportation Council (RTC). The CRP authorizes grant funding for projects designed to reduce transportation emissions. 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: 18TH STREET

This report summarizes the evaluation completed under the regional signal timing plans pilot for 18th Street from the I-205 Northbound Off Ramp to 162nd Avenue, a total of 10 study intersections. The nine signals along 18th Street are owned and operated by the City of Vancouver, while the signal at the I-205 Off Ramp is owned by Washington State Department of Transportation (WSDOT). All study intersections, except 162nd Avenue, currently operate in free mode. 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.

This three-mile long east-west study corridor with a 35 miles per hour (MPH) posted speed limit and two through-lanes in each direction is a key route connecting Vancouver, and the surrounding communities in east and central Clark County, Washington. The residents along this corridor attract a mix of local commuters, and freight traffic. In addition, Evergreen High School is located off 141st Avenue and contributes to higher traffic volumes in the AM drop-off and after school pick-up periods. In 2024, weekday counts were taken along 18th Street at NE 138th Avenue to estimate average annual daily traffic (AADT) and 20,251 vehicles were counted on this section of the corridor. Currently, no transit routes travel along the corridor. However, Routes 30 and 74 pass through the intersection at NE 162nd Avenue with a frequency of about every 30 minutes. Route 80 also passes through the intersection at 136th with a 30-minute frequency.

Updates to the signal timing plans include optimizing local and coordination timings, adding leading pedestrian intervals (LPIs) at locations that do not currently have Accessible Pedestrian Signals (APS) push buttons, sequences, and offsets to enhance operational performance. In addition to the

project goals, the benefits of these updates also support improved traffic flow along 18th Street and 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 timing at the 18th Street and 162nd Avenue intersection will be coordinated with the signals on the north/south 162nd Avenue/164th Avenue corridor.

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. The new TOD schedule is as follows:

- Morning (AM) plan: 6:00 a.m. to 9:30 a.m.
- Midday (MD) plan: 9:30 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 18TH STREET CORRIDOR (IN SECONDS)

CROSS STREET	BEFORE				AFTER			
	AM	MD	PM	WKN	AM	MD	PM	WKN
I-205 NB OFF RAMP TO 112TH AVENUE	Free				Free; signal timings updated			
17TH STREET/ FOUR SEASONS LANE TO VILLAGE GREEN DRIVE	Free				90	80	90	80
136TH/138TH AVENUE TO 155TH AVENUE	Free				Free; signal timings updated			
162ND AVENUE	120	120	120	120	120	120	120	120

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 eastbound and westbound. The updated signal timing along the project corridor was implemented during the week of September 15th, 2025. Before data was obtained from a full month of historical records, while after data was selected from the period of September 22nd to October 25th, 2025, representing five weeks following implementation. To better represent typical traffic conditions after the timing update, this period was selected as the after period since it's after the summer break, making it a more stable and representative timeframe with the schools along the corridor in session.

The before period is based on data from the same month in the previous year, September 23rd to October 19th, 2024 and serves as a reliable baseline for the before and after analysis.

The analysis periods are defined as follows:

- Before (weekday): Tuesdays, Wednesdays, and Thursdays from the period of September 23rd to October 19th, 2024
- Before (weekend): Saturdays from September 23rd to October 19th, 2024
- After (weekday): Tuesdays, Wednesdays, and Thursday from September 22nd to October 18th, 2025

  After (weekend): Saturdays from September 22nd to October 25th, 2025 excluding October 18th, 2025 (due to a protest in the area impacting travel times), 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 below are based on common peak periods for consistency since the before and after periods have different TOD intervals. 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.

TABLE 2. AVERAGE TRAVEL TIME SAVING FOR THE PROJECT CORRIDOR

ANALYSIS PERIOD	TIME PERIOD	TRAVEL TIME SAVINGS (SEC)	
		EASTBOUND (I-205 RAMP TO 162ND AVE)	WESTBOUND (162ND AVE TO I-205 RAMP)
WEEKDAY	AM Peak: 7am to 9am	-18 (4.3%)	-20 (5.3%)
	MD Peak: 11am to 1pm	-13 (3.4%)	-4 (1.3%)
	PM Peak: 4pm to 6pm	-26 (5.4%)	-7 (1.8%)
	Daily (24-hour)	-21 (5.7%)	-13 (4.1%)
WEEKEND	WKN Peak: 11am to 1pm	-14 (3.6%)	-7 (2.1%)

Figures 1 through 4 complement the summary in Table 2, 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 eastbound and westbound directions, across weekdays and weekends, with the implemented TOD plan periods indicated for reference.

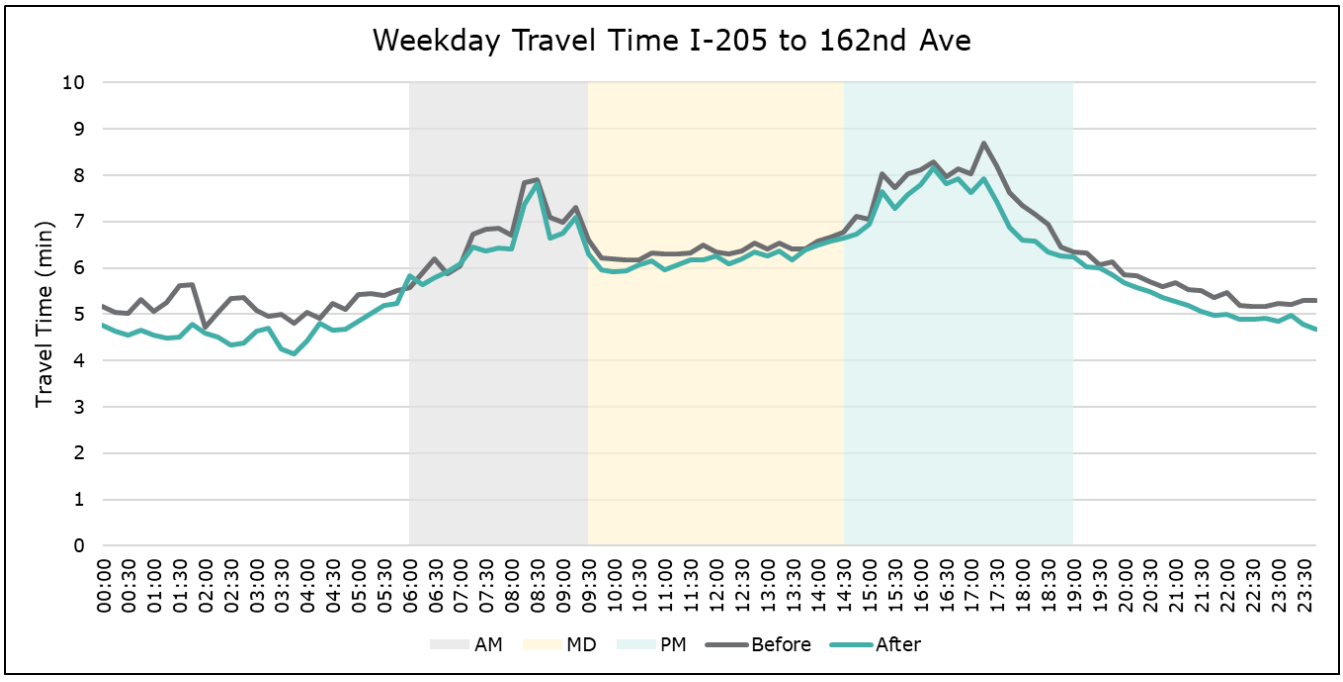

FIGURE 1. TRAVEL TIME COMPARISON FOR PROJECT CORRIDOR (EASTBOUND, WEEKDAY)

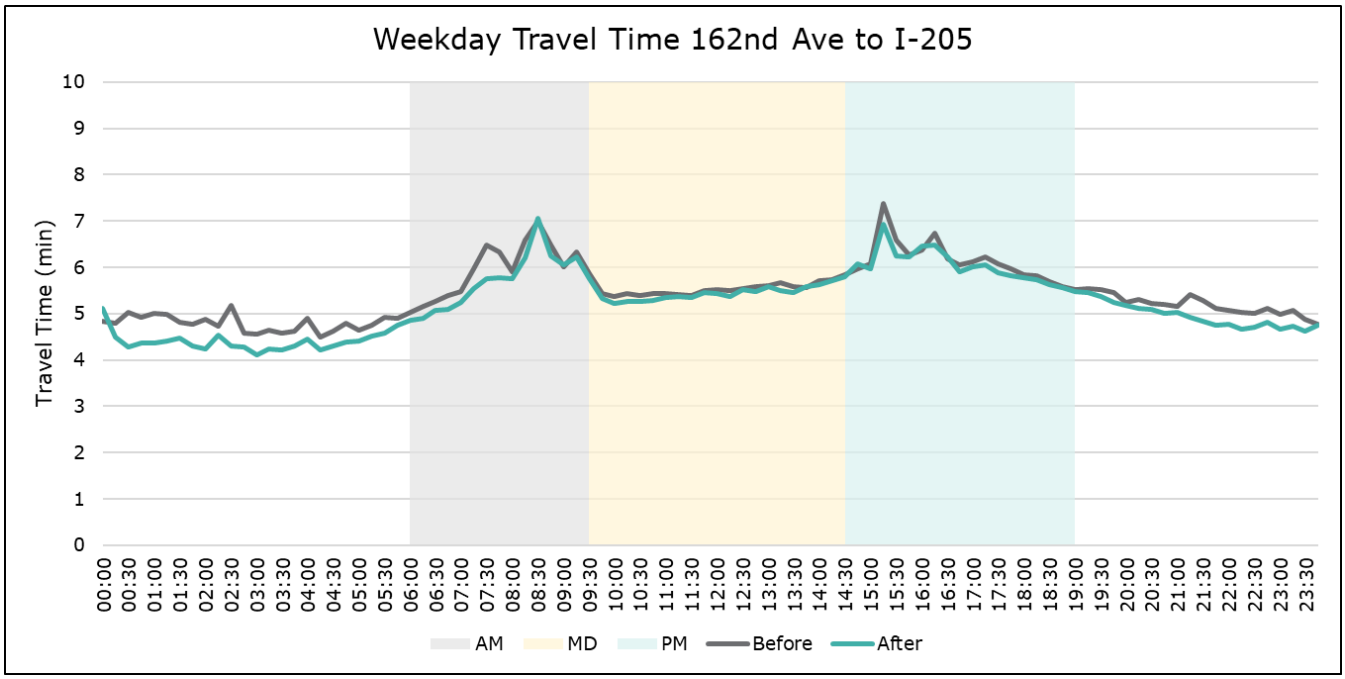

FIGURE 2. TRAVEL TIME COMPARISON FOR PROJECT CORRIDOR (WESTBOUND, WEEKDAY)

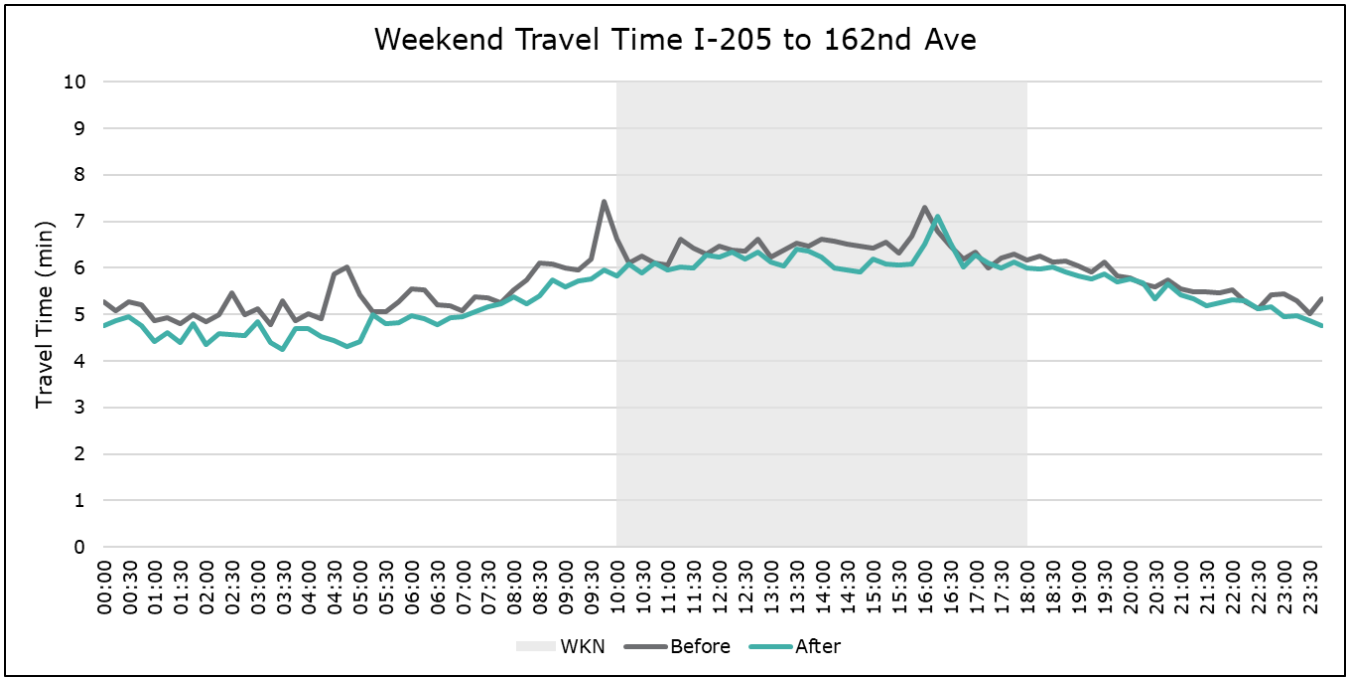

FIGURE 3. TRAVEL TIME COMPARISON FOR PROJECT CORRIDOR (EASTBOUND, WEEKEND)

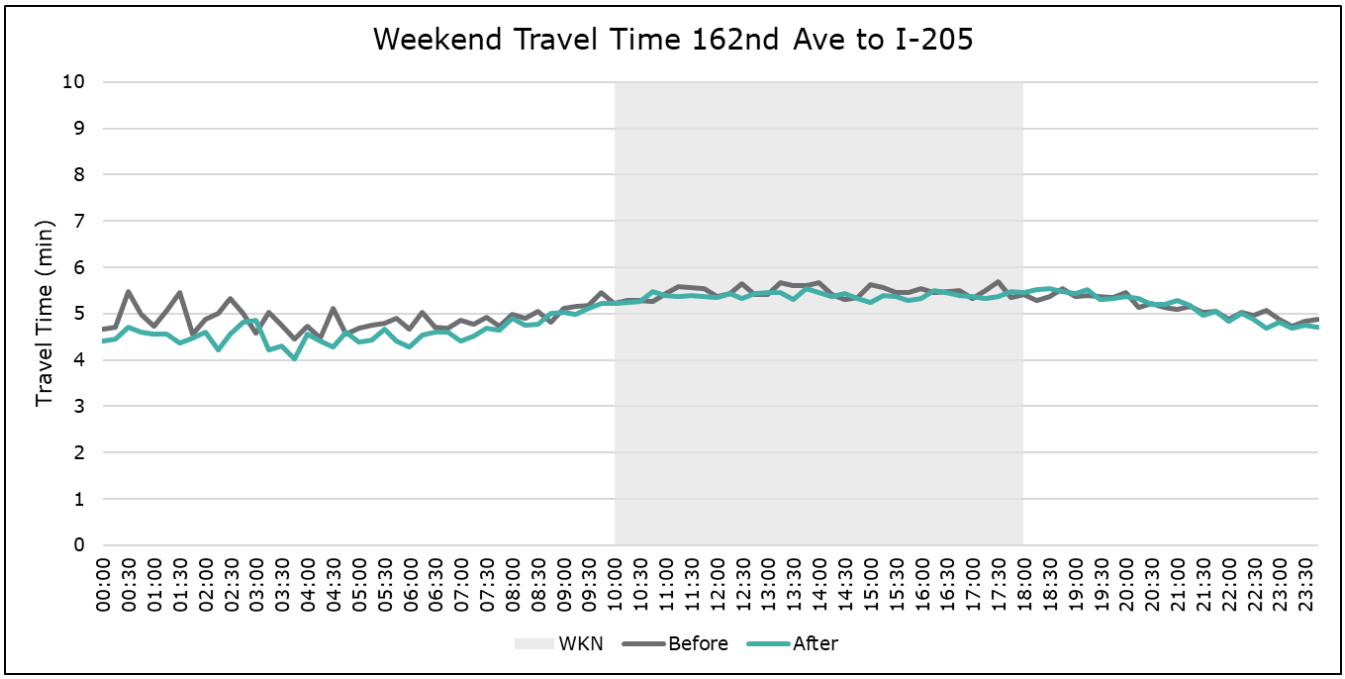

FIGURE 4. TRAVEL TIME COMPARISON FOR PROJECT CORRIDOR (WESTBOUND, WEEKEND)

One of the primary objectives of this project was to improve traffic flow at the high-volume intersections. Under existing conditions, traffic congestion was most prominent at 112th Avenue, 138th Avenue, and 162nd Avenue. Additionally, Cascade Middle School and Evergreen High School are located along the corridor, with entrances and exits at 138th Street and 141st Street. These schools generate frequent school bus activity during pick-up and drop-off periods. Many buses make multiple stops along the corridor and extend their stop arm signals, legally requiring vehicles in both direction to stop for student crossings. This temporarily slows corridor traffic.

Under proposed conditions, daily travel time savings resulted across all analysis periods for the project corridor between I-205 Ramp and 162nd Avenue. 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 eastbound direction.

For the midday and PM peak periods during weekdays and during the weekend peak period, eastbound travel time improvements are greater than the westbound direction as shown in both figures and table 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 eastbound progression more for vehicles and still produced notable westbound travel time reductions. For the AM period, both directions are balanced with similar travel time improvements for the eastbound and westbound directions.

It should be noted that the existing and proposed travel times are not a direct comparison. The updated signal timing plans introduced LPIs and longer pedestrian crossing times, reallocating some green time from the major streets to relatively lower-volume side streets. This adjustment

likely reduced the apparent travel time benefits but improved overall corridor safety, discussed in the safety section.

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 3 shows the performance measures for the updated signal timing plans for the project corridor.

TABLE 3. SYNCHRO PERFORMANCE MEASURES FOR THE PROJECT CORRIDOR

CORRIDOR PERFORMANCE MEASURES	BEFORE				AFTER			
	AM	MD	PM	WKN	AM	MD	PM	WKN
TOTAL DELAY (HOURS)	94	75	127	95	90 (-4.3%)	73 (-2.7%)	124 (-2.4%)	91 (-4.2%)
TOTAL STOPS (STOPS)	10540	8244	13080	10439	9191 (-12.8%)	7529 (-8.7%)	11581 (-11.5%)	9258 (-11.3%)
FUEL CONSUMED (GAL)	370	310	462	378	357 (-3.5%)	304 (-1.9%)	448 (-3.0%)	365 (-3.4%)
CO EMISSIONS (KG)	25.86	21.69	32.32	26.41	24.92 (-3.6%)	21.22 (-2.2%)	31.33 (-3.1%)	25.48 (-3.5%)

CORRIDOR PERFORMANCE MEASURES	BEFORE				AFTER			
	AM	MD	PM	WKN	AM	MD	PM	WKN
NO_X EMISSIONS (KG)	5.03	4.22	6.29	5.14	4.85 (-3.6%)	4.13 (-2.1%)	6.10 (-3.0%)	4.96 (-3.5%)

As shown in Table 3, the performance measures for the updated timing plans along 18th Street indicate general improvements in total delay, stops, and emissions. In general, the updated timing plans resulted in reductions across most measures during the analysis periods:

- Total delay reduced between two and four percent on the weekdays.
- Total stops reduced by up to 13 percent, suggesting improvement of progression and fewer interruptions.
- Fuel consumption, CO emissions, and NO_X emissions were reduced by two to four percent.

The reductions indicated that the updated plans improve corridor efficiency by providing smoother flow and reducing vehicle idling during the weekday and weekend peak periods.

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 18th Street 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[1] (CPI) from the U.S. Bureau of Labor Statistics. For fuel savings, the dollar-per-gallon value was based on the 2024 annual 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 $210,266, while the fuel consumption savings in dollars is $126,834, resulting in a combined annual benefit of $337,100, with an estimated three-year total of $1,011,301 to reflect the anticipated duration of improvements.

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

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[2] (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.

Additionally, this corridor adds LPIs at locations that do not currently have APS push buttons. An LPI allows pedestrians to enter the crosswalk at an intersection 3-7 seconds before vehicles are given a green indication. Pedestrians can better establish their presence in the crosswalk before vehicles make their turns, making them more visible to drivers. Research indicates a 13 percent reduction in pedestrian-involved crashes at signalized intersections when LPIs are added[3].

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

[3] Crash Modification Factors Clearinghouse (CMF ID: 9918)

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

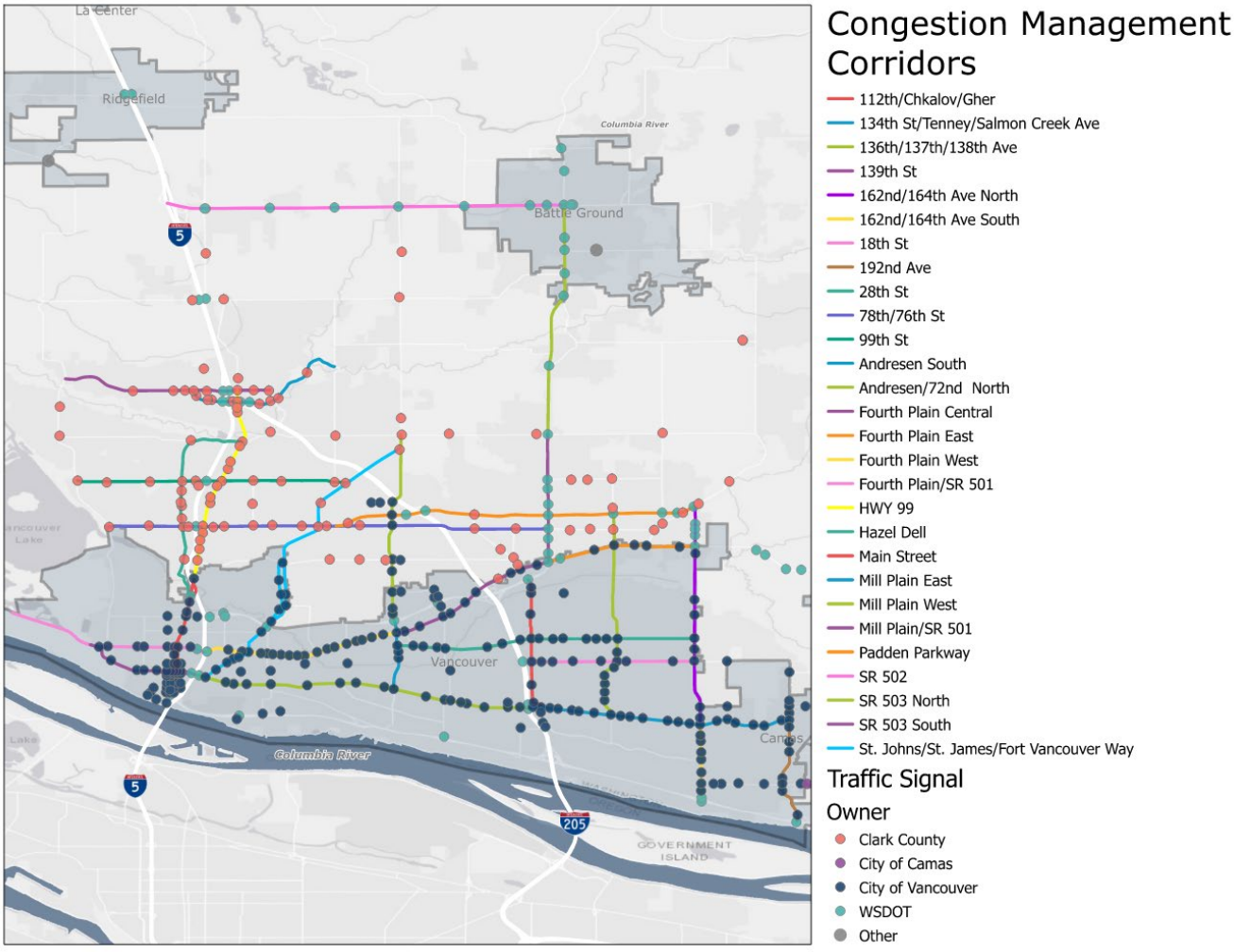

Table 1 lists the 28 CMP corridors identified for prioritization by the VAST/TSMO Steering Committee. The corridors are arranged in alphabetical order.

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

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TECHNICAL MEMORANDUM - DRAFT

DATE: March 20, 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 7: 18th Street from NE 112th Avenue to NE 162nd Avenue.

EXISTING CONDITIONS

The traffic signals along 18th Street are owned and operated by the City of Vancouver (City). Traffic signals owned by the City use Q-Free MaxTime local software and are connected to the City's MaxView central system via their communications network.

The signals mostly operate in free mode, with 18th Street & 162nd Avenue operating in coordination with other signals along the 162nd corridor. Figure 1 and Figure 2 below summarize the timing plans according to the weekday and weekend Time of Day (TOD) schedule.

DATA

Weekday Turning Movement Counts (TMCs) were collected November 19th at all intersections except 18th Street & 112th Avenue which were collected in 2023 from Parametrix for AM and PM peaks, and May 30th, 2024 for the midday peak hour. Weekend midday peak hour (11 a.m. to 1:00 p.m.) TMCs were collected November 16th, 2024 at all intersections except 18th Street & 112th Avenue which were collected June 1st, 2024. Signal as-build, phasing plans and signal timings were provided by City and WSDOT.

Special signal strategies, such as Leading Pedestrian Interval (LPI), are implemented at intersections along the study corridor. Table 1 lists the intersections where these strategies are applied.

FIGURE 1: 18TH EXISTING WEEKDAY TIMING PLAN SCHEDULES

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	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
112th	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
Four Seasons	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
118th	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
125th	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
Village Green	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
138th	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
141st	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
155th	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
162nd	F	F	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	3	3	3	3	3	3	F	F	F
	AM Plan											Midday Plan								PM Plan									Free

Pattern 2 = 120 sec Pattern 1 = 120 sec Pattern 3 = 120 sec

FIGURE 2: 18TH EXISTING WEEKEND TIMING PLAN SCHEDULES

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	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
112th	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
Four Seasons	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
118th	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
125th	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
Village Green	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
138th	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
141st	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
155th	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
162nd	F	F	F	F	F	F	F	F	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	F	F
	AM Plan											Midday Plan								PM Plan									Free

Pattern 1 = 120 sec

TABLE 1. SPECIAL SIGNAL OPERATION STRATEGIES

CROSS STREET	LPI (PHASE)	LPI DURATION
NE 112TH AVE	6	5 seconds
FOUR SEASONS LN	4,8	4 seconds
118TH AVE	4,8	5 seconds
125TH	4,8	4 seconds
VILLAGE GREEN DR	4,8	4 seconds
141ST AVE	2,6	5 seconds
	4,8	15 seconds
155TH	4,8	4 seconds

OBSERVED TRAFFIC ISSUES

DKS conducted field observations of traffic conditions along the NE 18th Street study corridor from NE 112th Avenue to NE 162nd Avenue during morning, midday, and evening peak periods.

The following sections summarize the observed issues. It should be noted that observations were made in rainy conditions. All the observed issues will be considered when the new signal timing plans are developed.

The following section summarizes the notable observed characteristics of each intersection and input from the City.

112TH AVENUE & 18TH STREET

- High traffic volumes on the eastbound approach were observed during the PM peak period from vehicles exiting I-205 towards residential areas.
- Eastbound left turn vehicles would spill back into the eastbound through lane and often to the exit ramp.

18TH STREET & FOUR SEASONS LANE

- High traffic volumes on the eastbound approach were observed during all peak periods.
- During the midday and PM peak periods, eastbound through and westbound through queues formed during the minor street movements.

18TH STREET & 118TH AVENUE

- Large platoons were observed for the eastbound and westbound approaches with approximately 50 seconds between platoons, during the PM peak period.

18TH STREET & 125TH AVENUE

- Medium queues were observed during the AM peak period.
- Low traffic volumes were observed during the midday peak period.
- High traffic volumes were observed for the northbound and southbound approaches during the PM peak period.

18TH STREET & VILLAGE GREEN DRIVE

- The south approach had long green phases with extra time that was not used by vehicles resulting in westbound queueing during the PM peak hour.

18TH STREET & 138TH AVENUE

- The westbound left movement had long queues during the AM peak period.
- Medium levels of queueing were observed for all approaches during the midday peak period.
- Long eastbound queues were observed during the PM peak period, the eastbound left green phase was not always sufficient to clear queues.

18TH STREET & 141ST AVENUE

- Medium sized platoons were observed for the eastbound approach during the midday peak period.

18TH STREET & 151ST AVENUE

- Long eastbound queues were observed during the PM peak period.

18TH STREET & 162ND AVENUE

- This intersection is coordinated under a north-south coordination plan.
- The southbound left turn storage length operated near capacity during the AM peak period.
- Medium levels of queues were observed for all approaches during the midday peak period.
- Long queues were observed for all approaches during the PM peak period. The northbound left, southbound left, and eastbound left movement green phases were not sufficient to clear queues and vehicles waited more than one cycle.
- Eastbound left turn vehicles would spill back to the eastbound through lanes.