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# PRIORITIZATION METHODOLOGY MEMO

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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**

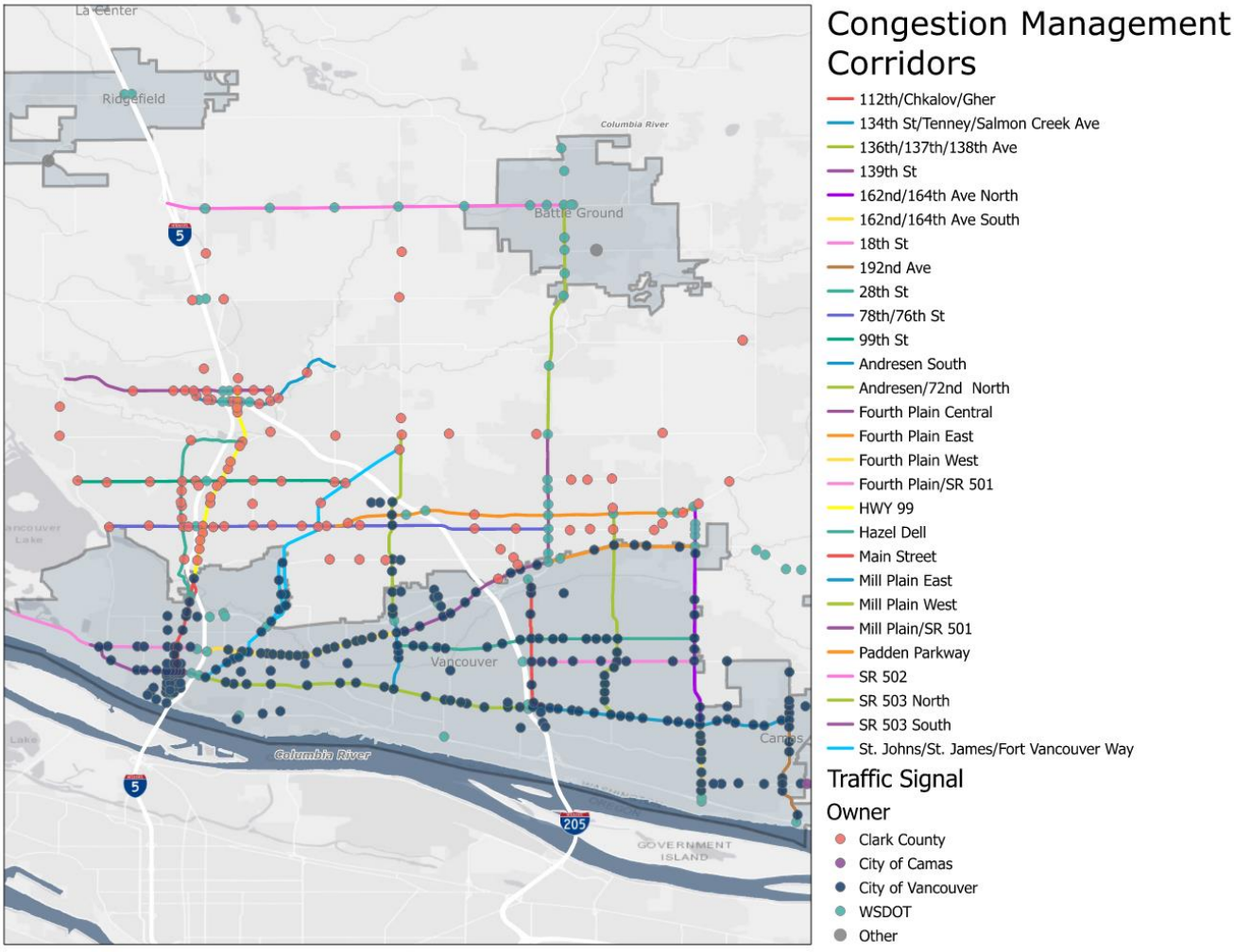


Table 1 lists the 28 CMP corridors identified for prioritization by the VAST/TSMO Steering Committee. The corridors are arranged in alphabetical order.

**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.