2022-2024 Regional Flexible Funds Project Application

Clackamas County: Clackamas County Regional Freight ITS Project – Phase 2B

Contact: *Bikram Raghubansh, PE, PTOE*
Senior Traffic Engineer/Project Manager
(503) 742-4706
bikramrag@clackamas.us

APPLICANT INFORMATION

1. Jurisdiction name: *Clackamas County*
2. Contact info: Name, phone #, email:
   Bikram Raghubansh, PE, PTOE, Senior Traffic Engineer/Project Manager
   (503) 742-4706
   bikramrag@clackamas.us
3. Funding category (check one): ☐ Active Transportation ■ Freight ☐ Both
4. Project name: *Clackamas County Regional Freight ITS Project Phase 2B*
5. Describe the project purpose. What problems or issues is the project intended to address?

Clackamas County is home to many large warehousing and distribution centers due to its proximity to the I-5 corridor and central location in the Portland metropolitan area. The businesses that operate in these facilities generate significant amounts of freight trucking activity to distribute goods to businesses and residences of the region. In 2018, Clackamas County completed Phase 1 of Clackamas County Regional Freight ITS Project by completing County's first Freight ITS action plan to address improvements to travel time reliability and safety of the regional freight system by reducing freight vehicle delay in known congested areas in Clackamas County by focusing on smart intelligent transportation system (ITS) technology solutions. The planning phase (Phase 1) of this project considered two geographically study areas, the Clackamas Industrial Study Area (see figure 1) and the Wilsonville Industrial Study Area (see figure 2) and focused on the first and last mile arterial connections. This action plan incorporates input from agency and freight industry stakeholders to identify freight transportation needs and address them with cost-effective ITS strategies that align with Clackamas County and regional transportation goals. The Clackamas County Regional Freight ITS Project – Phase 2B is intended to complete the unfunded portion of existing County Freight ITS Action plan.

In the project evaluation and screening process, Clackamas County identified six (6) feasible ITS strategies with full implementation cost estimate of approximately $4.27 million. The total estimate for full deployment exceeds the approximately $2.3 million that is currently available for project design and construction of Phase 2A. With 2022-2024 RFFA funding, a request for $1.97 million will be used to complete the unfunded portion Freight ITS strategies and corridors during Phase 2B of the project.

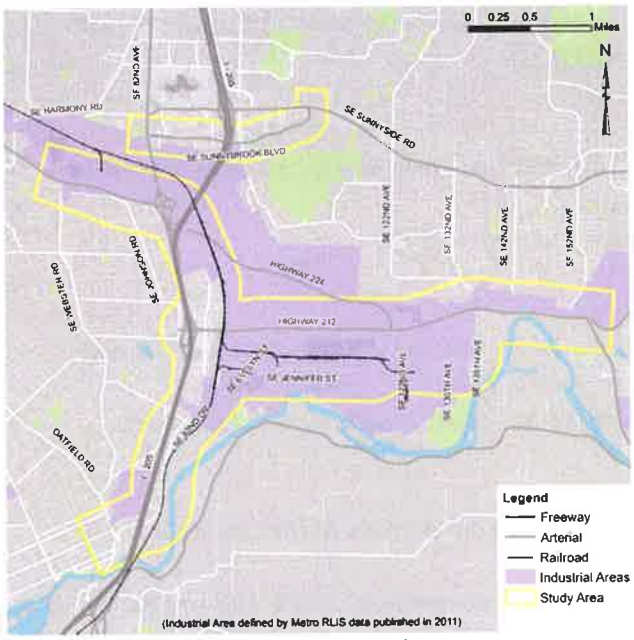


Figure 1 – Clackamas Industrial Area

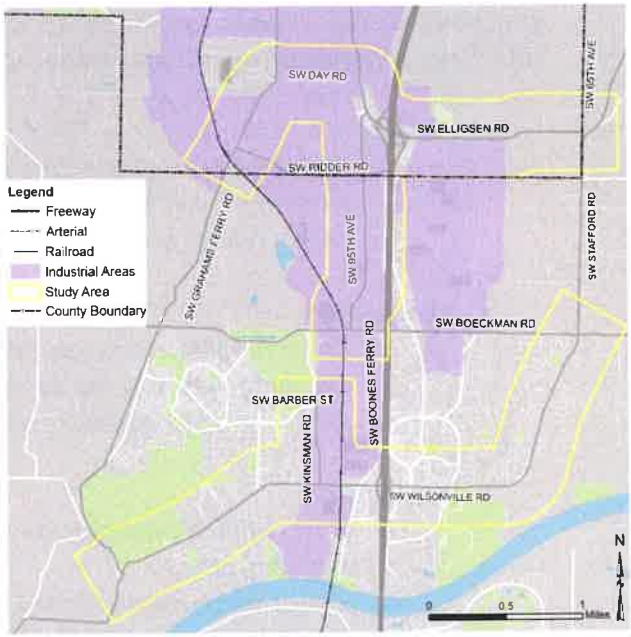


Figure 2 – Wilsonville Industrial Area

Clackamas Industrial Area *- The Clackamas Industrial Area is defined by OR 224, OR 212, and SE 82nd Ave/Dr, as shown in Figure 1. The separated northern portion of this study area captures the employment and commercial activities along SE Sunnybrook Blvd. The Union Pacific railroad (UPRR) mainline travels through the area with a spur line providing rail access for industrial businesses adjacent to SE Jennifer St. While the UPRR mainline is grade separated through the Clackamas Industrial Area, there are several at-grade crossings of the spur line.*

Identified Issues *- Freight specific issues identified in the Clackamas industrial area are grouped into three categories; safety, operations, and congestion.*

- ***Safety***
  - *High crash rates identified at key intersections and along corridors (based on five-year crash data from 2011 through 2015).*
  - *Most crashes are turning movement collisions (34%)*
- ***Operations***
  - *Signal timing currently does not favor freight traffic.*
  - *Truck queuing at OR 212/Fred Meyer driveway.*
  - *Power outages and dirty power conditions cause traffic signal down time and accelerate electronic component failure.*
- ***Congestion***
  - *Areas of heavy congestion during specific time periods of the day negatively impact traffic.*

Wilsonville Industrial Area *- The Wilsonville Industrial Study Area, as shown in Figure 2, is defined by SW Grahams Ferry Rd, SW Day Rd, and SW Boones Ferry Rd/SW Elligsen Rd in the north; the middle of the study area is defined by SW 95th Ave and SW Boeckman Rd; and the southern portion of the study area is defined by SW Wilsonville Rd and SW Kinsman Rd. The Portland and Western short line railroad and TriMet WES commuter rail pass through Wilsonville with at-grade crossings at SW Wilsonville Rd, SW Barber St, and SW Boeckman Rd.*

Identified Issues *- Freight specific issues identified in the Wilsonville industrial area are grouped into three categories; safety, operations, and congestion.*

- ***Safety***
  - *High crash rates identified at key intersections and along corridors (based on five-year crash data from 2011 through 2015).*
  - *Most crashes are turning movement collisions (50%)*

- ***Operations***
  - *Some freight drivers use SW Wilsonville Rd as a connection between I-5 and Newberg, which is not designed to handle the heavy vehicle traffic.*
  - *Power outages and dirty power conditions cause traffic signal down time.*

- ***Congestion***
  - *Areas of heavy congestion during specific time periods of the day negatively impact traffic.*
  - *Traffic incidents on I-5 and/or I-205 create congestion on SW Elligsen Rd and the SW Wilsonville Rd/SW Stafford Rd corridor.*

Proposed Freight ITS Strategies *- The proposed freight ITS system will be comprised of strategies listed below.*

- ***Truck Signal Priority*** *– Install vehicle detection that can be used for dilemma zone protection and program the truck signal priority parameters in traffic signal controller. Traffic signal will likely require remote communications and have the ability to collect performance measure data. Truck signal priority is composed of a detector that detects heavy vehicles and sends the message to the traffic signal controller. The controller either extends the green when an oncoming truck is detected in the dilemma zone, or extends the all-red interval when a truck is detected entering the intersection late. Upgrades to the traffic signal controllers and signal timing parameters are needed where truck signal priority is used.*

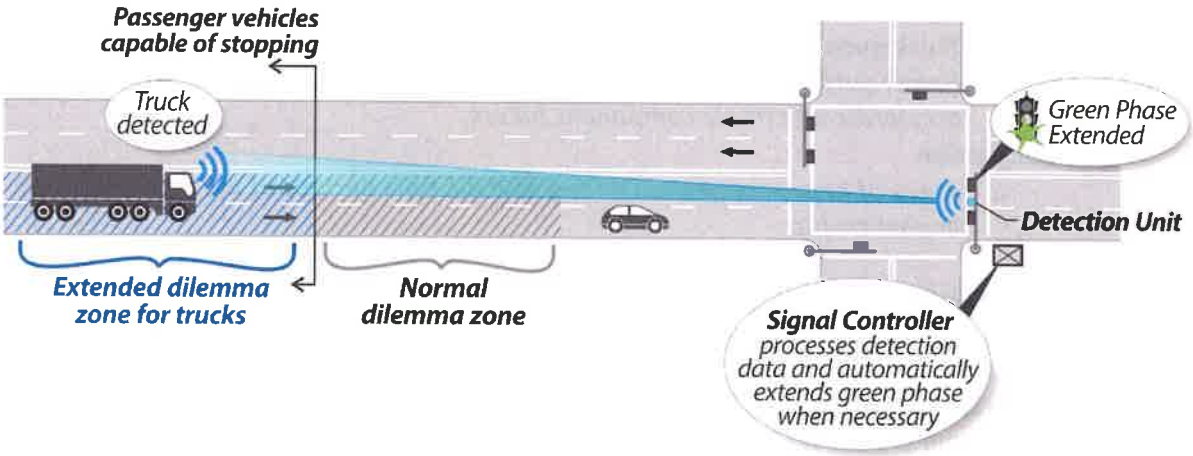


Figure 3 – Truck Signal Priority Concept

The following locations are where truck signal priority is planned to be installed in the Clackamas Industrial Area and the Wilsonville Industrial Area.

Clackamas Industrial Area

- *OR 224*
- *OR 212*
- *SE 82nd Dr*

Wilsonville Industrial Area

- *SE 95th Ave at SE Ridder Rd*
- *SW Elligsen Rd at I-5 SB*
- *SW Wilsonville Rd*

- ***Traffic Signal Battery Backup*** *- Install uninterrupted power supply (UPS) battery backup systems at critical intersections. Traffic signals require continuous power to operate. Without power, traffic signals turn dark, which leads to an all-way stop condition. This can cause congestion, queuing and delay for travelers. It is also a safety issue as some drivers do not realize they need to stop when the traffic signal is dark.*

  With a UPS battery backup system in place, the traffic signal will continue to operate in the event of a power outage or dirty power. The power source seamlessly transitions over to the UPS battery backup, without a lapse in service. To prevent queues onto freeways, the most critical locations for battery backup systems are the traffic signals near the entrance and exit ramps. Queuing onto freeways is a key safety concern due to the higher travel speeds and more severe resulting crashes.

  Additional locations that could benefit from a safety and operational perspective from UPS battery backup include traffic signals that are interconnected or close to railroad crossings.

  The following locations are proposed to install UPS battery backup systems.

Clackamas Industrial Area

- *SE 82nd Dr*
- *SE Jennifer St*
- *SE Sunnybrook Blvd*
- *OR 212*
- *OR 224*

Wilsonville Industrial Area

- *SW Wilsonville Rd (Note: at SW Wilsonville Rd/SW Stafford Rd/SW Boeckman Rd/SW Advance Rd*
- *SW Elligsen Rd*
- *SW 95th Ave*
- *SW Kinsman Rd*

- ***Traffic Surveillance*** *- Install pan-tilt-zoom (PTZ) camera systems to monitor critical intersections. The traffic surveillance includes pan-tilt-zoom (PTZ) cameras for visual surveillance. The cameras send images back to the traffic operations center where operators can view real-time conditions and remotely control the cameras to view different angles and perspectives. Images from the cameras are also publically available via ODOT's TripCheck website.*

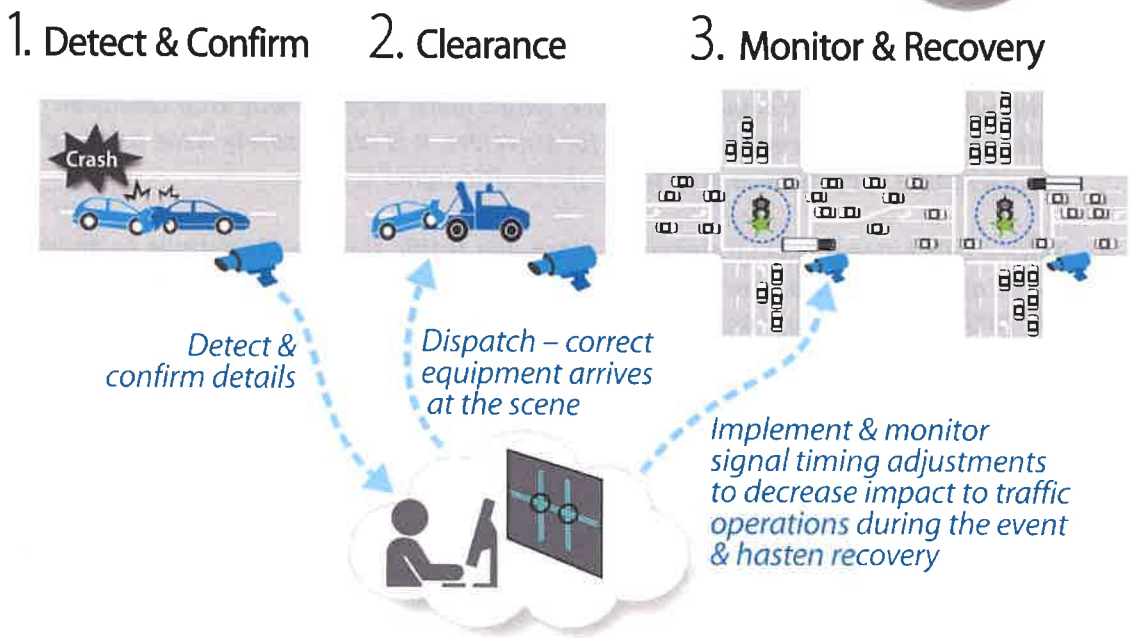


Figure 4 – Traffic Camera Concept

PTZ cameras are proposed at the critical intersection on these corridors:

Clackamas Industrial Area

- *SE 82nd Dr*
- *SE Jennifer St*
- *SE Sunnybrook Blvd*
- *OR 212*
- *OR 224*

Wilsonville Industrial Area

- *SW Wilsonville Rd*
- *SW Elligsen Rd*
- *SW 95th Ave*
- *SW Kinsman Rd*

- ***Count Stations*** *- Install permanent traffic counting systems at key locations with remote communications. The count station includes permanent traffic counting devices for automatic data collection (vehicle volumes, bicycle volumes, vehicle classification, speed, and vehicle classification), communications for data transmission, and archiving system to store and manage data collected. The count stations are recommended at mid-block locations, and will likely pull power and communications from the nearest traffic signal. Count stations are proposed at the following locations:*

Clackamas Industrial Area

- *SE 82nd Dr*
- *SE Jennifer St*
- *SE Sunnybrook Blvd*
- *OR 212*
- *OR 224*

Wilsonville Industrial Area

- *SW Wilsonville Rd*
- *SW Elligsen Rd*
- *SW 95th Ave*
- *SW Kinsman Rd*

- ***Travel Time Measurement*** *- Install travel time monitoring sensors on key corridors with remote communications. Travel time measurement includes devices for travel time collection, communications for data transmission, and archiving system to store and manage data collected. Specific routes of travel time measurement can be configured with the proposed device locations and based on project needs.*

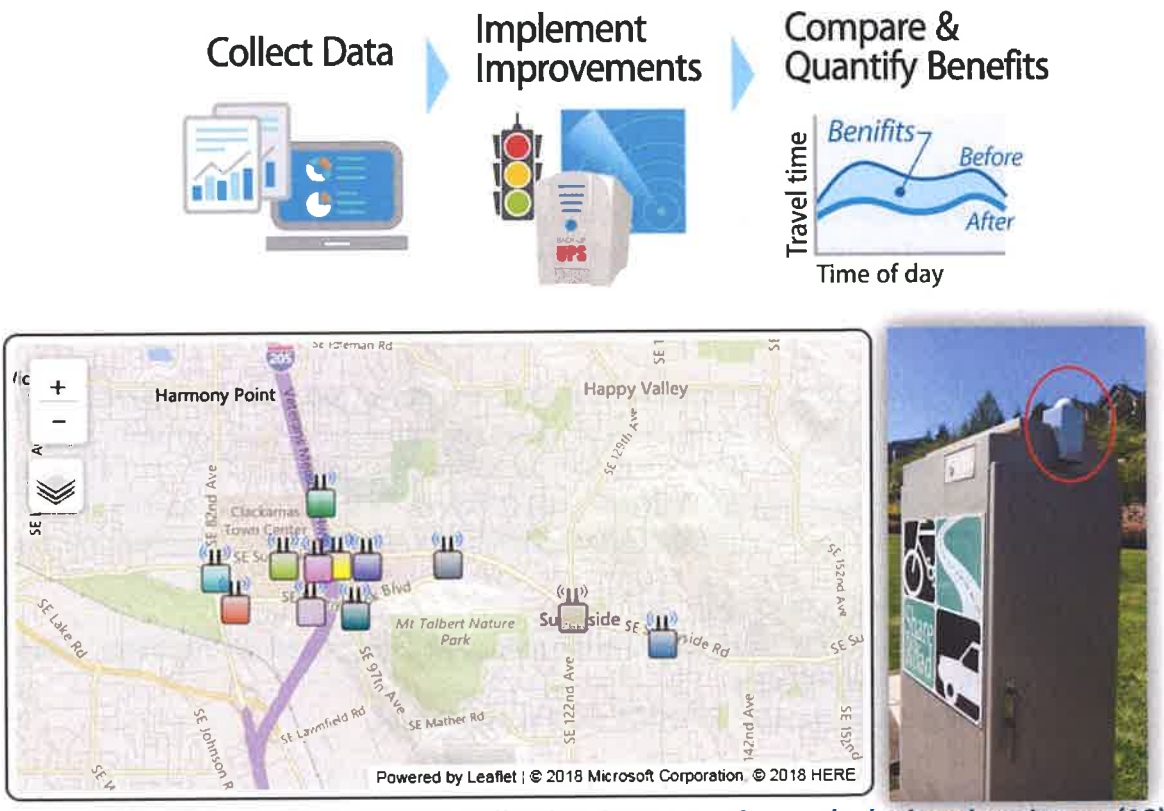


Figure 5 – Travel Time and Data Collection Concepts. Currently deployed at sixteen (16) locations within Clackamas Town Center and Happy Valley area.

Proposed locations for installing count stations include the following corridors:

Clackamas Industrial Area

- *SE 82nd Dr*
- *SE Jennifer St*
- *SE Sunnybrook Blvd*
- *OR 212*
- *OR 224*

Wilsonville Industrial Area

- *SW Wilsonville Rd*
- *SW Elligsen Rd*
- *SW 95th Ave*
- *SW Kinsman Rd*

- ***Portable Monitoring Trailer*** *- Deploy a Portable Monitoring Trailer (see example photo) with radar detectors, cameras, and vehicle counters to monitor facilities. The portable monitoring trailer includes an easy-to-move trailer with equipment that can direct traffic and monitor facilities. The features of the portable trailer will include video recording, travel time measurement, traffic speed measurement, traffic volume measurement, and variable message sign. The trailer needs to connect to central systems via cellular communications.*

  Portable trailers can be used to monitor traffic, such as trucks that bypass Weigh in Motion stations. They can be moved easily to be deployed at work zones or temporary events.

PROJECT READINESS

The following questions intend to gather information about how developed the project is and the steps that will still be required to complete the project. This section will be used for screening project feasibility.

Project Detail

6. Is this project on the 2018 RTP Constrained list? ☐ Yes ■ No *This project is not specifically identified in the 2018 RTP Constrained list as a stand along project. However, the original Clackamas County Regional Freight ITS Project was identified in previous RTP list. This project is an extension of the previously RFFA funded project phases. In addition, most of the proposed Freight ITS strategies are identified in Metro's region-wide regional TSMO program investments for 2018-2027.*
7. What is the RTP Project ID #? *N/A*
8. In which RTP network and policy map(s) is the project included? Check all that apply, indicate specific functional classification.
   - ☐ High Injury Corridor (or ODOT ARTS Hotspot map)
   - ☐ Bicycle:
   - ☐ Pedestrian:
   - ■ Freight: *Arterials*
   - ☐ Transit
9. List the project beginning and ending points. What specific streets/intersections are included in the project area?
   Full implementation of Freight Action ITS Plan (separated by Phases 2A & 2B) is slated for the following corridors and intersections within Clackamas Industrial Area (See Table 1) and Wilsonville Industrial Area (See Table 2). Freight ITS Project - Phase 2B will only impact corridors and intersections with ITS items listed in phase 2B.

Table 1 - Summary of Strategy Locations and Quantities for Clackamas Industrial Area

Corridor	Intersection	Truck Priority	UPS Battery Backup	Traffic Surveillance	Count Station	Travel Time Measurement
	Project phases	2A/2B	2A/2B	2A/2B	2A/2B	2A/2B
SE 82nd Dr	SE 82nd Dr @ SE Sunnybrook Blvd	0/3	0/1	0/1	0/0	0/0
	SE 82nd Dr @ SE Tolbert St	0/2	0/1	Ex	1/0	0/1
	SE 82nd Dr @ OR 212	4/0	1/0	1/0	1/0	1/0
	SE 82nd Dr @ Fred Meyer Driveway North	0/2	1/0	0/0	0/0	0/0
	SE 82nd Dr @ Fred Meyer Driveway South	0/2	0/1	1/0	0/0	0/0
	SE 82nd Dr @ SE Evelyn St	3/0	0/1	1/0	1/0	1/0
	SE 82nd Dr @ I-205 NB Ramps	0/0	1/0	Ex	0/0	1/0
	SE 82nd Dr @ I-205 SB Ramps	0/0	1/0	Ex	0/0	1/0
	SE 82nd Dr @ Oatfield Rd	3/0	1/0	1/0	1/0	1/0
SE Jennifer St	SE Jennifer @ SE Evelyn St	4/0	1/0	Ex	0/0	1/0
OR 212	OR 212 @ OR 224	2/2	1/0	Ex	0/0	1/0
	OR 212-224 @ SE 142nd Ave	2/2	0/1	1/0	0/1	0/0
	OR 212-224 @ SE 135th Ave	2/2	0/1	Ex	0/0	1/0
	OR 212-224 @ SE 130th Ave	2/2	0/1	0/0	0/0	0/0
	OR 212 @ SE 122nd Ave	4/0	1/0	Ex	1/0	1/0
	OR 212 @ Fred Meyer Access	2/0	0/1	0/1	0/0	0/0
	OR 212 @ SE 102nd Ave / SE Evelyn St	4/0	1/0	0/1	0/1	1/0
	OR 212 @ I-205 SB Ramps	0/0	1/0	0/0	0/0	1/0
	OR 212 @ I-205 NB Ramps	0/0	1/0	Ex	0/0	1/0
OR 224	OR 224 @ to I-205 NB Ramp	0/0	1/0	Ex	0/0	1/0
	OR 224 @ I-205 SB Ramp / SE 82nd Ave NB Ramp	0/0	1/0	Ex	0/0	1/0
	OR 224 @ SE 82nd Ave SB Ramp	0/4	1/0	Ex	0/0	1/0
	OR 224 @ SE Johnson Rd	2/0	1/0	Ex	1/0	1/0
	OR 224 @ SE Pheasant Ct	2/0	0/1	0/0	0/0	0/0
	OR 224 @ SE Lake Rd	2/0	1/0	Ex	0/1	1/0
SE Sunnybrook Blvd	SE Sunnybrook Blvd @ SE Sunnyside Rd	3/0	1/0	0/0	0/0	0/0
	SE Sunnybrook Blvd @ SE 97th Ave	0/2	1/0	0/0	1/0	0/0
	SE Sunnybrook Blvd @ I-205 NB Ramps	0/0	1/0	0/0	0/0	1/0
	SE Sunnybrook Blvd @ I-205 SB Ramps	0/0	1/0	0/0	0/0	1/0
	SE Sunnybrook Blvd @ SE 93rd Ave	0/2	1/0	0/0	0/0	0/1
	SE Sunnybrook Blvd @ SE Oak Bluff Blvd	0/2	0/1	0/0	0/1	0/0
	SE Sunnybrook Blvd @ Mall Entrance	0/0	0/1	0/0	0/0	0/0
	SE Sunnybrook Blvd @ SE 84th Ave	0/2	0/1	0/0	0/0	0/1
	Total by phase	40/29	21/12	5/3	6/5	19/3

Note: Phase 2A – Funded, Phase 2B – Not funded, Ex - Existing

Table 2 - Summary of Strategy Locations and Quantities for Wilsonville Industrial Area

Corridor	Intersection	Truck Priority	UPS Battery Backup	Traffic Surveillance	Count Station	Travel Time Measurement
	Project phases	2A/2B	2A/2B	2A/2B	2A/2B	2A/2B
SW 95th Ave	SW 95th Ave @ SW SW Boones Ferry Rd	3/0	1/0	1/0	0/0	1/0
	SW 95th Ave @ SW Commerce Cir	2/0	0/1	0/0	0/0	1/0
	SW 95th Ave @ SW Ridder Rd	2/0	0/1	0/0	0/0	1/0
	SW 95th Ave @ Boeckman Rd	2/0	0/1	Ex	0/0	1/0
SW Elligsen Rd	SW Elligsen Rd @ I-5 SB Ramp	0/0	1/0	Ex	0/0	1/0
	SW Elligsen Rd @ I-5 NB Ramp	0/0	1/0	Ex	0/0	1/0
	SW Elligsen Rd @ SW Parkway Ave	2/0	1/0	1/0	0/0	0/1
	SW Elligsen Rd @ Parkway Center Dr	2/0	0/1	0/0	1/0	1/0
	SW Elligsen Rd @ Canyon Creek Rd N	0/0	0/1	0/0	0/0	0/1
SW Kinsman Rd	SW Kinsman Rd @ SW Barber St	0/0	0/0	Ex	0/0	1/0
SW Wilsonville Rd	SW Wilsonville Rd @ Willamette Way E	0/0	0/1	0/0	0/0	1/0
	SW Wilsonville Rd @ SW Brown Rd	0/0	0/1	0/0	0/0	1/0
	SW Wilsonville Rd @ SW Montebello Dr	0/0	0/1	0/0	0/0	0/1
	SW Wilsonville Rd @ SW Kinsman Rd	0/2	0/1	0/0	0/0	1/0
	SW Wilsonville Rd @ SW Boones Ferry Rd	0/0	1/0	Ex	0/0	1/0
	SW Wilsonville Rd @ I-205 SB Ramps	0/0	1/0	Ex	0/0	1/0
	SW Wilsonville Rd @ I-205 NB Ramps	0/0	1/0	Ex	0/0	1/0
	SW Wilsonville Rd @ SW Town Center Lp W	0/0	1/0	Ex	0/0	1/0
	SW Wilsonville Rd @ Rebekah St	0/0	0/0	0/0	0/0	0/0
	SW Wilsonville Rd @ SW Town Center Lp E	0/0	0/1	0/0	0/0	1/0
	SW Wilsonville Rd @ SW Meadows Loop	0/0	0/1	0/0	0/0	0/0
	SW Wilsonville Rd @ SW Meadows Pkwy	0/0	0/1	0/0	0/0	1/0
	SW Wilsonville Rd @ Stafford/Advance/Boeckman	0/0	0/1	Ex	0/0	1/0
	Total by phase	13/2	8/13	2/0	1/0	17/3

Note: Phase 2A – Funded, Phase 2B – Not funded, Ex - Existing

10. Is the project included in an adopted local transportation safety plan or audit? ☐ Yes ■ No
Please describe. *This project is identified in Clackamas County Freight ITS Action Plan. Which is a subset of Clackamas County overall ITS Plan.*

11. Describe the non-RFFA funding sources available and amounts necessary for the project to be completed. How secured is the funding for each funding source (Certain, Probable, or Competitive?)
In the previous RFFA funding through Metro, Clackamas County has been obligated approximately $2.3 million (with local match) to complete Freight ITS Action Plan (Phase 1), design engineering and construction of approximately half of the high priority projects identified

in Freight ITS Action plan in Phase 2A. Additional $1.97 million will be necessary to complete the full implementation during Phase 2B. (See Table 3 below)

Table 3 – Project Phasing

Project Phases	***Cost Estimate***	***Funding***
Phase 1 *– Planning (Freight ITS Plan, Systems Engineering/Concept of Operation)*	*$200K*	*2014-15 RFFA*
Phase 2A *– Engineering & Construction*	*$2.1M*	*2014-15/2016-18 RFFA*
Phase 2B *– Engineering & Construction*	***$1.97M***	***2022-2024 RFFA Request*** *Unfunded ($1.77M)* *Local Match ($200K)*
Total:	*$ 4.27M*	

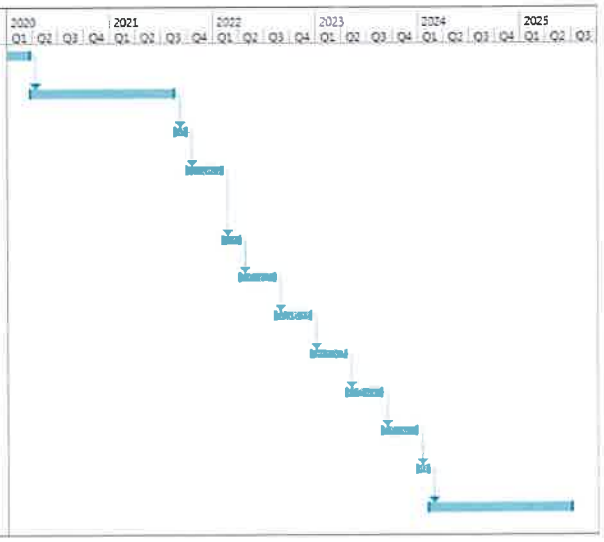
12. Which Project Development Stages are to be considered for RFFA funding?
The project development stages proposed for RFFA funding are preliminary engineering, preparation of construction plans, bid letting and construction for phase 2B of Freight ITS project.

13. If your project is found to not be as far along as indicated or has specific challenges that need to be (re)addressed to improved technical feasibility, are you interested in RFFA funding for project development activities? ☐ Yes ■ No

14. Attach or describe the project schedule and include information about important schedule considerations or drivers.
As described above, Clackamas County Freight ITS Action Plan was completed during Phase 1 of the project. Phase 2A, which involves design and construction of initial deployment plan, is scheduled to complete the design by December of 2020 and construction by July of 2022. Phase 2B (if funded through 2022-2024 RFFA grant), will start design around fall of 2022 and complete construction around summer of 2025. (See proposed Phase 2B project schedule below)

Clackamas County Regional Freight ITS Project
Phase 2B
Project Schedule

Task Name	Duration	Start	Finish	Predecessors
2022-2024 RFFA Award	60 days	Wed 01/01/20	Tue 03/24/20	
IGA Process/Approval	365 days	Wed 03/25/20	Tue 08/17/21	1
NTP	30 days	Wed 08/18/21	Tue 09/28/21	2
Consultant RFP/Negotiations	90 days	Wed 09/29/21	Tue 02/01/22	3
Survey	45 days	Wed 02/02/22	Tue 04/05/22	4
Draft/Final DAP	90 days	Wed 04/06/22	Tue 08/09/22	5
Preliminary Engineering	90 days	Wed 08/10/22	Tue 12/13/22	6
Advance PS&E	90 days	Wed 12/14/22	Tue 04/18/23	7
Final PS&E	90 days	Wed 04/19/23	Tue 08/22/23	8
Ad, Bid, Award	90 days	Wed 08/23/23	Tue 12/26/23	9
NTP	30 days	Wed 12/27/23	Tue 02/06/24	10
Construction	365 days	Wed 02/07/24	Tue 07/01/25	11



Project Completeness

15. At what stage of the project development process is the project, and what is the status of each project stage (refer to Defining Project Development Stages above)?
Clackamas County has completed the planning stage for this project by completing Freight ITS Action Plan during summer of 2018. This plan was completed through engagement with local stakeholders (County, ODOT, local cities, and freight community). Through the project screening process, list of ITS strategies and projects with the greatest potential to effectively address the County's goals and objectives were identified. During this process, ITS Systems Engineering Planning documents were developed along with ITS Architecture Compliance (Rule 940) ODOT Checklist. The project development stages proposed for RFFA funding are preliminary engineering, preparation of construction plans, bid letting and construction.

16. Is right of way (ROW) acquisition likely? Will the project need any unique ROW requirements such as temporary easements, special coordination with other agencies? What is the status of the ROW acquisition task of the project?
Since the proposed ITS project strategies are low cost & low risk solutions, no additional right of way acquisition is anticipated on the project. All of ITS deployment will be on existing signal infrastructure.

17. What project development (project study reports, transportation safety plan, safety audit, feasibility studies) has been completed? How recent are these reports or this project development, and are they still relevant? Are they in digital format for possible transfer?
In 2018, Clackamas County completed Clackamas County Regional Freight ITS Action Plan (see attached report). In addition, ITS Systems Engineering Planning documents, Needs Assessment, Concept of Operation, System Requirements, and ITS Architecture Compliance (Rule 940) ODOT Checklist has been developed. These reports are available in digital format.

18. Does the project area intersect with Title 13 resource areas[1], wetlands, cemeteries, railroad tracks, Native American burial grounds, protected species habitat, or any other qualifiers that would require permitting?
No.

19. To what extent has environmental permitting been scoped or completed?
No environmental permitting is anticipated with this project since most of the work will be on existing signal infrastructure.

Community Support

20. What needs expressed by community members (e.g., unsafe crossing; egregiously long red lights) does the project address?

With outreach to Freight (Trucking) Association, members of the trucking association are concerned with long delays and reliability of travel time. They are also desiring wider level of deployment of travel time information via ODOT Tripcheck with travel delay, real-time travel time speeds, and traffic monitoring cameras along truck routes.

21. Which community partners are involved?

The community partners involved in the Clackamas County Regional Freight ITS project are:

ODOT, City of Wilsonville (Transportation and Police), City of Gladstone, City of Milwaukie Public Works, Oregon Trucking Association, Metro, and Clackamas County Motor Carrier.

22. Describe the agency and community support (and any opposition) for the project. Discuss the focus on equity and stakeholder engagement process.

During the planning process, there were outreach to all project stakeholders. During this process, project strategies were developed based on stakeholder involvement. Please refer to Freight ITS Action Plan.

Interagency Connections

23. Are TriMet, SMART, or adjacent or overlapping jurisdictions (counties, cities) involved in and supportive of the project?
As described above, ODOT, City of Wilsonville, City of Gladstone, and City of Milwaukie were involved during the project planning process.

24. Is the project on or does it connect with a separate agency facility? Indicate all potentially involved agencies' awareness of and cooperation with the project. Potential agencies include Oregon Department of Transportation (ODOT) (Highway, Rail divisions and others as required), railroads, utilities, Bonneville Power Administration, or Port of Portland.

Yes, this project during Phase 2B will deploy Freight ITS strategies (field devices) on County, ODOT, City of Wilsonville owned signal infrastructure. During the planning process, ODOT and local agencies were involved in development of County Regional Freight ITS Plan.

25. Will utilities need to be relocated? Who owns the utilities and what is their level of awareness and support for the utility relocation?
No. Since most of the work will be on existing signal infrastructure, no utility relocation is anticipated with this project phase.

26. Do you have design control consistently across the project area? If other agencies are affected by this project, do you have the necessary documentation of agreement regarding design elements reflected within this project? (Please obtain signatures as indicated on the Signature Page of this application.)
Clackamas County adheres to ODOT's design standards and specification. As for intergovernmental agreement with local agencies, County currently has maintenance agreement with both ODOT, and City of Wilsonville. These agreements can be amended to include new ITS deployment. Project level agreements will be completed during phase 2A of the project and continue into phase 2B of the project.

Project Risks

The following questions intend to identify potential risks to project completion.

27. Has a person(s) with the proper authority reviewed and agreed to the project design, and signed off on this application? ■ Yes ☐ No

28. Are there any anticipated risks for the following:

a. Right of way (ROW)
   i. Are ROW acquisition costs included in the cost estimate?
   No ROW will be needed with this project.
   ii. Were the federal Right of Way Uniform Act's acquisition and negotiation processes performed during the ROW acquisition stage or considered in the schedule and budget, for those projects which have not yet performed ROW acquisition?
   N/A.

b. Utility Relocation
   i. Are utility relocation costs included in the cost estimate?
   No utility relocation is anticipated with this project.

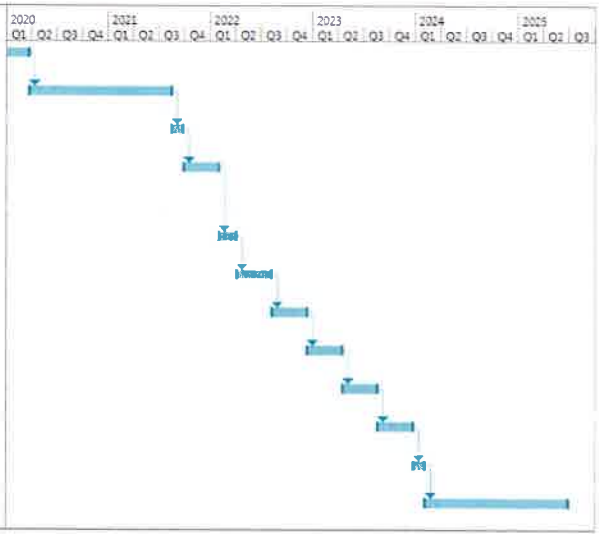
c. Stormwater considerations
   i. Water quantity
      No water quantity impact is anticipated with this project.
   ii. Water quality
      No water quality impact is anticipate with this project.

d. Environmental and Permitting
   i. Have potential State environmental (SEPA)/ National Environmental Policy Act (NEPA) impacts been identified?
      N/A.

e. Schedule
   The anticipated project schedule for Phase 2B is shown below.

Clackamas County Regional Freight ITS Project
Phase 2B
Project Schedule

Task Name	Duration	Start	Finish	Predecessors
2022-2024 RFFA Award	60 days	Wed 01/01/20	Tue 03/24/20	
IGA Process/Approval	365 days	Wed 03/25/20	Tue 08/17/21	1
NTP	30 days	Wed 08/18/21	Tue 09/28/21	2
Consultant RFP/Negotiations	90 days	Wed 09/29/21	Tue 02/01/22	3
Survey	45 days	Wed 02/02/22	Tue 04/05/22	4
Draft/Final DAP	90 days	Wed 04/06/22	Tue 08/09/22	5
Preliminary Engineering	90 days	Wed 08/10/22	Tue 12/13/22	6
Advance PS&E	90 days	Wed 12/14/22	Tue 04/18/23	7
Final PS&E	90 days	Wed 04/19/23	Tue 08/22/23	8
Ad, Bid, Award	90 days	Wed 08/23/23	Tue 12/26/23	9
NTP	30 days	Wed 12/27/23	Tue 02/06/24	10
Construction	365 days	Wed 02/07/24	Tue 07/01/25	11



f. Budget *With previous round of RFFA grant allocation, planning phase of the project has been completed, and the remaining balance of $2.1M is currently available to complete the Phase 2A of this project. With 2022-24 RFFA funding of $1.97M, Phase 2B of this project will start after completion of Phase 2A.*

g. Staff availability
   i. Does the agency have sufficient and qualified staffing resources to lead, manage, and deliver the project? Please describe. *Yes. Clackamas County is certified by ODOT to manage and design federally funded projects. County has trained transportation engineers (PE), certified professional traffic operations engineers (PTOE), ITS experts, and project managers qualified to complete this project.*

PROJECT DESIGN

Project designs will be scored on the level of safety and environmental improvements they can provide. A project that includes as many safety and environmental mitigation elements as feasible will more completely meet the criteria.

29. Describe the project elements and countermeasures that address safety.
Implement truck priority – Install truck signal dilemma zone protection/truck signal priority with remote communications and performance measure data collection. The technology detect

trucks and either extends green when an oncoming truck is detected in the dilemma zone, or extends the all red when a truck is detected entering the intersection late. Studies have found this technology can reduce angle crashes by 44% and all injury crashes by 11%.
Battery Backup System (BBS) at Signalized Intersection – Install uninterruptible power supply (UPS) battery backup system at critical intersections on arterials roads within the study area. Crash reduction may occur during power outages by reducing the frequency and length of signal downtime from power outages. In the event of catastrophic event, these critical signalized intersections with BBS can continue to operate if there is likelihood of interruption to power service.

30. What countermeasures are included that reduce conflicts between modes (vehicles, pedestrians, bicycles, railroad crossings) and improve safety? (Use Appendix C design checklist, check all that apply) *Intelligent Transportation System (ITS) – Smart truck signal priority at signalized intersection.*

31. What specific project design elements are aimed at reducing environmental impacts (street trees, bioswales, etc.)? *Intelligent Transportation System (ITS) – Smart truck signal priority at signalized intersection.*

32. Are there additional design elements or countermeasures not on the checklist that are included in the project design that will improve safety and environmental outcomes? *Truck priority signal timing is expected to reduce number of run light running at signalized intersection and sudden stops. This will also help reduce stops and delay and in turn save fuel, reduce emissions, pavement wear, and tire and brake wear.*

Project Outcomes

Projects will be scored in terms of their ability to create positive outcomes that align with RFFA priorities and regional goals. The following questions aim to gather details directly related to those potential outcomes. Please provide all relevant data to support your response, using Metro-provided data or additional sources. Metro staff will provide data to the scoring committee to confirm

Affordability/Equity

33. Is the project in an Equity Focus Area? ■ Yes ☐ No Please indicate which Focus Area.
As noted, portions of this project will be in the Clackamas/Sunnyside area of Clackamas County unincorporated area and other portions will be in the City of Wilsonville. The majority of the Clackamas County project area, east of I-205 between OR 212 and Sunnyside Road is in the Equity Focus Areas. Census tracts 221.03 and 221.05 are in the "People of Color and/or Limited English Proficiency area." Census tract 221.07 is in the "People of Color and/or Limited English Proficiency and/or Low Income" Equity Focus Area.

34. List the community places[ii], affordable housing, and Title 1 schools within ¼ mile of project.

- *Title 1 School: There are no Title 1 schools within ¼ mile of either the Clackamas/Sunnyside portion of the project or the Wilsonville portion of the project.*
- *Community Places: This project will provide improvements in two large geographic areas. The Community Places in each of the two geographic areas are identified below:*

  Clackamas/Sunnyside Area:

  - *Medical: Kaiser Permanente Sunnyside Medical Center, and Kaiser Permanente Mt. Scott Medical Office*
  - *Retail and Service Businesses: Clustered in the area of Sunnyside Rd / Steven's Rd, and along OR 212 between I-205 and 135th Ave, and along 82nd Dr from OR 224 to I-205.*

- *Affordable Housing:*
- *Parks and Natural Areas: Mt. Talbert Nature Park, and Riverside Park are within ¼ mile of the project location. In addition the Sunrise Multiuse Path extends from SE 98th Court in the Clackamas Industrial Area to the intersection of OR 212 / 122nd Ave.*

Wilsonville Area:

- *Medical: Wilsonville Health Care, and Providence Medical Clinic – Wilsonville*
- *Retail and Service Businesses: Many retail and service businesses are located within ¼ mile of the project on Wilsonville Rd and on Elligsen Rd.*
- *Affordable Housing: Within Wilsonville there are many affordable housing units including 142 mobile home units, about 500 rental units for which occupants are paying 30% or less of their household income, and about 250 owner-occupied units for which occupants are paying 30% or less of their household income.*
- *Parks and Natural Areas: Wilsonville Memorial Park, Town Center Park, Wilsonville Tranquil Nature Park, and Graham Oaks Nature Park.*
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- *Affordable Housing – The Clackamas/Sunnyside area has many affordable housing units within ¼ mile of the project including 830 mobile home units, over 1,000 rental units for which the occupants are paying 30% or less of their household income, and over 1,000 owner occupied units for which the occupants are paying 30% or less of their household income. Within ¼ mile of the Wilsonville portion of the project there are 142 mobile home units, about 500 rental units for which occupants are paying less than 30% of their household income and about 250 owner-occupied housing units for which the occupants are paying less than 30% of their household income.*

35. What are the estimated totals of low-income, low-English proficiency, non-white, seniors and youth, and persons with disabilities who will benefit from this project?

All of the improvements proposed as part of this project are intended to improve operational efficiency on major road corridors with the Clackamas/Sunnyside area and also in Wilsonville. These improvements will benefit all modes of transportation using those major road corridors, including freight, transit, bicyclists and pedestrians. The major road corridors improved in the Clackamas/Sunnyside area include Sunnyside Rd between I-205 and 152nd Ave, OR 212 between I-205 and 152nd Ave, and 82nd Dr between OR 224 and I-205. The census tracts served by those major roads include CT 215, CT 221.03, CT 221.05, CT 221.07 and CT 221.08. In Wilsonville the major road corridors are Wilsonville Rd, and also Elligsen Rd / Boones Ferry Road which are main east-west corridors and serve the entire population of Wilsonville.

- *The total estimated population of the Clackamas/Sunnyside Rd project area is 25,500 and the total number of households in the project area is 10,027. The total population of Wilsonville 22,789 and the total number of households is 9,090.*
- *The median household income for the Oregon portion of the Portland Urban Area is $66,614. Of the households in the region 24.5% are very low income (below 50% of median household income) and 15.7% are low income (between 50% and 80% of median household income) for a total of 40.2% of regional households that are either low or very low income. Using regional median household income and most recent data, the Clackamas/Sunnyside project area was determined to have 2,096 very low income households below 50% of the regional*

median household income, and 2,077 low income households between 50% and 80% of the regional median household income for a total of 4,173 low or very low income households. Since there are 10,027 households in the Clackamas/Sunnyside project area this means that 20.9% of households in the project area are very low income, and 20.7% are low income, for a total of 41.6% very low or low income. In the Wilsonville project area there are 2,038 very low income households, and 1,661 low income households, for a total of 3,699 very low and low income households. The Wilsonville project has a total of 9,090 households meaning that the project area has 22.4% very low income households and 18.3% low income households meaning that the Wilsonville project area has 40.7% low or very low income households compared with 40.2% for the region. Combined both project areas have 7,872 households below 80% of the regional household income, or 41.2% of households below the regional median. This figure is slightly above the regional figure of 40.2% lower income households.

- *The number of persons reporting that they spoke English "not-well" or "not at all" in the Clackamas/Sunnyside area is 559 or 2.3% of the project area population, and in the Wilsonville project area is 278 or 1.3% of the population. In both project areas a total of 837 people spoke English "not well" or "not at all" or 1.9% of the population 5 years of age or greater. This is a slightly lower share of the population than in the region where 3.9% of the Oregon portion of the Portland Urban Area reported that they spoke English "not well" or "not at all."*
- *The non-white population (including non-white Latinos) is 16.4% of the Clackamas/Sunnyside project area population or 4,174 people and the non-white population of the Wilsonville project area is 3,673 people or 16.1% of the population. Overall, there are 7,847 individuals that are non-white in the two project areas making up 16.3% of the population. This is somewhat below the Portland Urbanized Area rate of 21.1% of people who are non-white.*
- *The youth (below 18 years) is 7,292 or 15.1% of the total population. This is below the regional figure of 21.5% below the age of 18 years.*
- *The senior population (65 or above) is 6,642 or 13.8% of the total population. This is slightly above regional figure of 12.7%.*
- *The number of persons with disabilities is 4,564 or 9.8% of the area population. This is slightly below the regional figure which is 10.3%.*

The following table summarizes the equity analysis for the Freight ITS – Phase 2B project area:

Equity Group	Portland Urbanized Area	Freight ITS Project Area
Low Income	40.2%	41.2%
Low English Proficiency	3.9%	1.9%
Non-white	21.1%	16.3%
Seniors	12.7%	13.8%
Youth	21.5%	15.1%
People with Disabilities	10.3%	9.8%

36. What are the barriers faced by these communities that the project addresses or overcomes, and how will these populations benefit from this project?

All of the improvements proposed as part of this project are intended to improve operational efficiency on major road corridors with the Clackamas/Sunnyside area and also in Wilsonville. These improvements will benefit all modes of transportation using those major road corridors, including freight, transit, bicyclists and pedestrians.

37. What contracting opportunities are available to Office for Business Inclusion and Diversity (COBID) firms through this project? What is your agency's policy, history, or removing of barriers to hire and advance COBID firms in infrastructure projects?
Clackamas County has been very active in providing opportunities for COBID firms in infrastructure projects. Clackamas County is an ODOT Local Certified Agency. As such Clackamas County is given targets by ODOT for inclusion and diversity among firms receiving contracts for both professional services and construction. Clackamas County has always been able to meet the targets given by ODOT. In addition, to encourage submittal of proposals and bids from inclusively from all types of businesses, Clackamas County distributes RFPs and bid materials not only to the typical clearinghouses but also for those that specifically encourage business diversity and inclusion such as ORPIN. Beyond infrastructure, the Clackamas County Procurement Office aggressively seeks proposals and bids from minority-owned, women-owned and service-disabled veteran-owned businesses for the materials and services required throughout the county government.

Safety

38. How many fatal or serious injury crashes have occurred in the project area in the last 5 years (or most recent 5 years of available crash data)? *During the planning phase (see existing conditions memo), the following intersections within industrial areas were identified with various number of crashes and severity for 5 years spanning from 2011 to 2015.*

Table 4 - Clackamas Industrial Area Freight Needs (See figure 6)

No.	Needs	Category
S-1	*Need to reduce crashes at high frequency intersections and corridors, locations with **eight or more** crashes over study period, or a Fatal or Injury A crash (2011-2015):* • *OR 212/I-205 interchange – 16 crashes, including 1 Injury A* • *OR 224/SE Lake Road/SE Webster Road - 12 crashes* • *OR 224/SE Pheasant Court – 1 Fatal crash, turning movement* • *OR 224/Near SE Johnson Road – 8 crashes*	*Safety*
S-2	*Need to reduce crashes at intersections and corridors, locations with **three or more** crashes over study period (2011-2015):* • *OR 224/At ramp to SE 82nd Avenue, east side of SE 82nd Avenue – 4 crashes (two turning movement related)* • *OR 212/SE 135th Avenue - 3 crashes* • *OR 212/SE 114th Avenue - 4 crashes (all turning movement related)* • *OR 212/130th Avenue - 3 crashes* • *OR 212 – between SE 130th Avenue and SE 135th Avenue - 3 crashes* • *I-205 NB at exit to 82nd Drive - 4 crashes (geometry issues with super-elevation)* • *SE 82nd Drive near SE Herbert Court (east of I-205 and west of OR 224) – 3 crashes* • *SE Jennifer Street/SE 122nd Avenue – 3 crashes, (all turn movement related)*	*Safety*
S-3	*Need to reduce crashes at intersections with **two** crashes over study period (2011-2015):* • *OR 212/SE 82nd Drive (all turning movement related)* • *OR 212/SE 122nd Avenue*	*Safety*

	• *OR 212/SE 152nd Avenue* • *OR 212/OR 224 junction east of SE 152nd Avenue (all turning movement related)* • *SE Jennifer Street/SE 120th Avenue* • *SE Jennifer Street/SE Evelyn Street (all turning movement related)*	

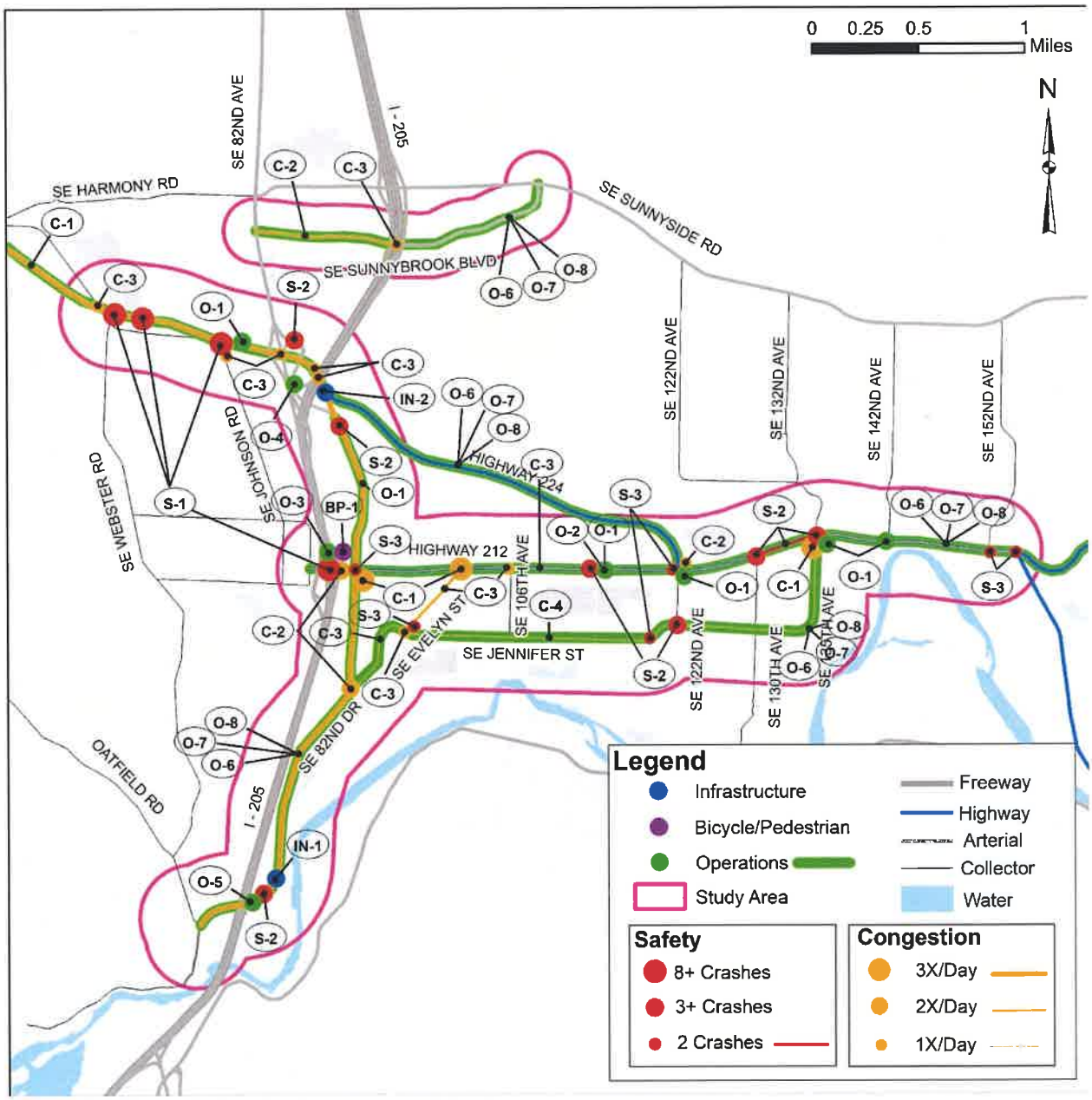

Figure 6 – Needs in the Clackamas Industrial Area

Table 5 - Wilsonville Industrial Area Freight Needs (See figure 7)

No.	Needs	Category
S-1	*Need to reduce crashes at locations with **three or more** crashes over study period, or a Fatal or Injury A crash (2011-2015):* • *SW 95th Avenue and SW Ridder Road– 3 crashes, two turning movement related and one sideswipe*	*Safety*

S-2	*Need to reduce crashes at locations with **two** crashes over study period (2011-2015):* • *SW Elligsen Road/I-5 SB interchange* • *SW Wilsonville Road – SW Boones Ferry Road to I-205 NB ramps*	*Safety*

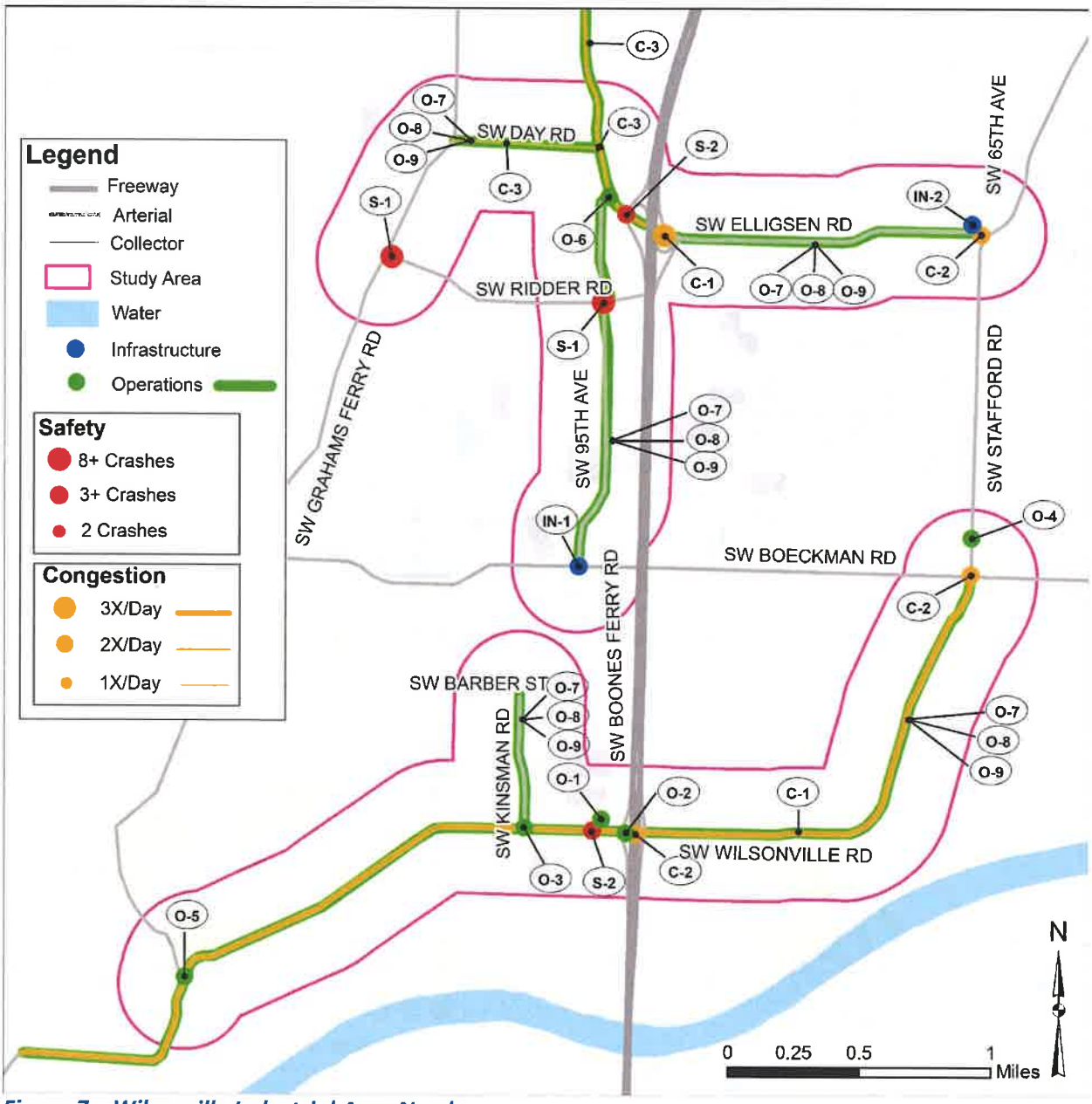

Figure 7 – Wilsonville Industrial Area Needs

39. How does the project aim to reduce the number of fatal or serious injury crashes?

Truck Signal Priority *– Truck-related crashes were reduced by 0.5% in one study involving dilemma zone protection combined with an advanced warning (Appiah et al., 2011. CMF ID 4856). The same system also reduced angle crashes by 44% and all injury crashes by 11%. Another study found that dilemma zone detection (for all types of vehicles) based on connected vehicle data can reduce crashes by 20% with only a 2% decrease in efficiency.)*

40. How does the project remove or mitigate conflicts, with (including) active transportation, railroad crossings, turning movements, and others? (Use Appendix C design checklist, indicate all that apply) *Intelligent Transportation System (ITS) elements – Truck Priority Signal Timing, Advanced Traffic Signal (ATC) Controllers.*

System Completion

41. What network gap(s) will be completed by this project? How will system connectivity or network deficiencies be improved? *No.*
42. How will access to active transportation be improved? What specific barriers in addition to the network gaps identified above will the project eliminate? *N/A.*

Multimodal Travel, Mode Share, and Congestion

43. How will the project reduce transit delay and improve transit reliability? *N/A.*
44. How does the project improve connections to transit and employment or residential sites/areas? *N/A.*
45. How will the project reduce vehicle trips or VMT (other than freight-related trips)? *N/A.*
46. How does the project reduce the need for throughway expansion?

Climate Change and Environmental Impact

47. Describe the measures included to specifically mitigate the project's greenhouse gas emissions and environmental impact. *Implementing truck signal priority at signalized intersection may also improve carbon emission and reduce pavement damage (reducing hard stop of heavy vehicles) by reducing total number of stop by 1% to 7% for all vehicle and 9% to 16% for trucks only at major truck moving direction.*
48. What specific project design elements are aimed at reducing environmental impacts (street trees, bioswales, etc.)?

Freight Related Impact

49. How does the project address freight travel time reliability and reoccurring or nonrecurring congestion affecting freight goods movement? *Yes, this project proposes to implement ITS strategies to improve freight operations and service reliability on corridors identified in the Clackamas and Wilsonville Industrial areas. According to PSU/PBOT's 2014 project report on Evaluation of Truck Signal Priority at N Columbia Blvd and Martin Lurther King Jr. Blvd intersection, the following conclusions were drawn from the report:*
    - *"Priority may contribute to improved truck operations and its service reliability. When priority was provided, 13% to 21% improvements occurred in the travel delay and 20% to 32% improvements occurred in the stopped delay at major truck moving direction."*
    - *"Priority may contribute to improved operations and service reliability for all vehicles in the major truck travel direction. When priority was provided, 0% to 8% improvements occurred in the travel delay and 2% to 9% improvements occurred in the stopped delay for all vehicles at major truck moving direction."*
    - *"Provision of priority resulted in improved truck travel delay and reduced number of stops with little to no negative impacts on all traffic at the intersection."*
50. Is this project on a "Reduction Review Route" (defined and stipulated by statute; OAR 731-012 and ORS 366.215) and to what extent has coordination occurred with the freight industry? *Yes. During the planning phase of Freight ITS project, meeting was held with Oregon Trucking Association to discuss project goals and identify deficiencies related freight congestion, operation, and safety within the Clackamas and Wilsonville industrial area.*
51. If there is freight delay along the corridor, when does this delay occur, to what extent is there delay, and how does this project address that delay?

During the needs assessment, the following corridors within Clackamas and Wilsonville industrial area were identified as experiencing "near congestion" at various times of weekday periods (locations of "near congestion" are identified in tables 6 & 7 and figures 6 & 7 above).

Table 6 - Clackamas Industrial Area Freight Needs

No.	Needs	Category
C-1	*Need to reduce congestion at the following locations that experience "near congestion" during **THREE** time periods of the day (a.m., mid, p.m.):* *Segments:* • *OR 224, west of I-205 (a.m. and mid – EB and WB, p.m. – EB severe)* • *SE 82nd Drive NB and SB (a.m., mid, p.m.)* *Intersections:* • *OR 212/SE 82nd Drive (a.m., mid, p.m.)* • *OR 212/SE Evelyn Street/SE 102nd Avenue (a.m., mid, p.m.)* • *OR 212/SE 135th Avenue (a.m., mid, p.m.)*	*Congestion*
C-2	*Need to reduce congestion at the following locations that experience "near congestion" during **TWO** time periods of the day:* *Segments:* • *SE Sunnybrook Boulevard, west of I-205 EB and WB (mid, p.m.)* *Intersections:* • *I-205/OR 212 (a.m., p.m.)* • *SE 82nd Drive/SE Jennifer Street (mid, p.m.)* • *OR 224/OR 212 (a.m., p.m.)*	*Congestion*
C-3	*Need to reduce congestion at the following locations that experience "near congestion" during **ONE** time period of the day:* *Segments:* • *SE Evelyn Street, between OR 212 and SE Jennifer Street NB and SB (mid)* • *OR 212 between I-205 and OR 224 junction east of SE 152nd Avenue, EB and WB (p.m.)* *Intersections:* • *I-205/OR 224 (p.m.)* • *I-205/SE 82nd Drive Interchange (a.m.)* • *I-205/SE Sunnybrook Boulevard interchange (p.m.)* • *OR 224/SE 82nd Avenue (mid)* • *OR 224/SE Johnson Road (a.m.)* • *OR 224/SE Lake Road (p.m.) – also noted need during interview session and that Alder Creek Middle School is on the south side of this intersection.* • *SE Evelyn Street and SE Jennifer Road (a.m.)*	*Congestion*
C-4	*Need to address growing congestion on SE Jennifer Street eastbound and westbound between OR 212 and SE 82nd Drive, which is used as an alternate route to avoid congestion on OR 212.*	*Congestion*

Table 7 - Wilsonville Industrial Area Freight Needs

No.	Needs	Category
C-1	*Need to reduce congestion at the following locations that experience "near congestion" during THREE time periods of the day (a.m., mid, p.m.):* *Segments:* • *SW Wilsonville Road EB and WB (a.m. – east of I-5 Boeckman Road to Rose Lane and west of I-5 to Graham Oaks Nature Park, mid – Wilsonville Town Center to Brown Road, and p.m.- Wilsonville Town Center to Graham Oaks Nature Park)* *Intersections:* • *I-5 and SW Elligsen Road Interchange (a.m., mid, p.m.)*	*Congestion*
C-2	*Need to reduce congestion at the following locations that experience "near congestion" during TWO time periods of the day:* *Intersections:* • *I-5 and SW Wilsonville Road Interchange (mid, p.m.)* • *SW Wilsonville Road/Boeckman Road (a.m., mid)* • *SW 65th Avenue/SW Elligsen Road/SW Stafford Road (a.m., p.m.)*	*Congestion*
C-3	*Need to reduce congestion at the following locations that experience "near congestion" during ONE time period of the day:* *Segments:* • *SW Day Road, EB (p.m.)* • *SW Elligsen Road, west of I-5 NB(p.m.)* *Intersections:* • *SW Day Road and SW Elligsen Road (p.m.)*	*Congestion*

The comprehensive "toolbox" of freight ITS treatments and Freight ITS Project Performance Measures will provide a variety of ITS system improvements that will help enhance travel time reliability and reduce freight traffic delay in the project area.

Employment/Economic Development

52. Describe the employment area(s) served by this project. What is the number of current and projected jobs in traded sectors? *Clackamas County and Wilsonville industrial areas. Project corridors are adjacent to industrial land uses with businesses that generate significant truck activity.*

53. Describe how the project supports and catalyzes low-carbon and resource efficient economic sectors. *This project proposes to improve travel the time reliability and safety of the regional freight system. Reduction in freight delays and stops at signalized intersection will likely result reduction in carbon emissions.*

Project Leverage

54. How does this project leverage other funding sources? *County has been authorized to contribute local match of $200K (10.27% match) from road funds for this project. In addition, this project will be re-utilizing the PS&E delivery, project intergovernmental agreements, and permitting process from Phase 2A of the Freight ITS project.*

55. Will the receipt of RFFA funding position the region to take advantage of federal and state funding opportunities as they arise? If so, explain. *No.*

56. Will this help advance any Transportation Systems Management and Operations (TSMO) goals and strategies? *Yes, this project addresses all four major goals (improve travel time reliability,*

improve safety, improve air quality, and provide traveler information) are identified in TSMO Plan.

57. Is this project on the Regional Emergency Transportation Network?[iii] Will this project help improve resiliency of the transportation network? If so, describe how. *Yes, this project limits include corridors within the Regional Emergency Transportation Network. By improving truck detection at various signals, optimizing signal timing, deploying traffic monitoring cameras, posting traffic cameras on ODOT Tripcheck (traveler information) website, and installing battery backup system at critical signals improve resiliency of the transportation network.*

PROJECT COST ESTIMATE

58. What is the source of the project cost estimate?

☐ **Conceptual:** These cost estimates are used where a significant need has been identified but a detailed project scope has not been developed. These cost estimates have the potential to change significantly as the project scope becomes more defined.

■ **Planning level:** These cost estimates are based on a generally defined scope. Cost estimates are usually based on limited field-work and general cost assumptions. No actual design work has been done prior to the development of these cost estimates. The cost estimate could still change significantly as design work begins, but the estimate is more reliable than the conceptual estimates. (e.g., comprehensive plan, TSP, Metro cost estimate worksheet, corridor plan).

☐ **Engineering level:** These cost estimates are based on actual preliminary design work. If done for all facets of the project and there are no further additions to the project scope, these estimates should represent a fairly accurate cost for the project. (e.g. detailed planning report, preliminary engineering, final design, NEPA documentation, etc.)

59. During what project development stage (refer to page 9 of the RFFA application guidebook) was the cost estimate created?

☐ Planning

■ Alternatives Identification and Evaluation

☐ Preliminary Design

☐ Final Design

60. What year was the cost estimate created? Does it include any escalation factors and to what year? *Using project list from 2018 Freight ITS Plan, unit cost for ITS strategies were adjusted to 2019 average unit. Assuming project obligation will be funded in 2022, this cost estimate assumes project escalation of 3.5% (increase) per year from 2019 to 2022. (See cost estimate in Table 7 below)*

61. To what extent were the following considered during cost estimating?

a. Right of way (ROW) – *No impact.*
b. Utility relocation or underground – *No impact.*
c. Stormwater considerations – *No impact.*
d. Environmental mitigation strategies – *No impact.*
e. Bridge, railroad, or major facility impacts – *No impact.*
f. Retaining walls – *No impact.*
g. Clearing and grading – *No impact.*
h. Removal of current pavement or facilities – *No impact.*
i. Signing and pavement markings – *No impact.*
j. Sidewalk and street furniture – *No impact.*
k. Street trees, landscaping, irrigation – *No impact.*
l. Mobilization, staging, and traffic control - *Large project limits. Contractor will have to conduct rolling mobilization within the project area.*
m. Staff availability or need for outside services -

62. Please attach your cost estimate. Verify that it includes the following items:

a. Unit cost assumptions – *See Table 8 below*.

b. Contingency assumptions – *Since this project proposes to primarily install ITS field devices on existing signal cabinets and signal poles, there is very low risk with this project. Project assumes 10% contingency.*

Table 7 – Phase 2B project cost estimate

2022-2024 RFFA - COST ESTIMATE - 2019 Clackamas County					
HIGHWAY: Various	Clackamas County Regional Freight ITS Project - Phase 2B			COUNTY: Clackamas	
PROJECT NUMBER	KIND OF WORK: Traffic Signal Modification and ITS	LENGTH: 0	DATE: 06/19/2019	PREPARED BY: Clackamas	
ITEM NUMBER	ITEM DESCRIPTION	UNIT	AMOUNT	UNIT COST	TOTAL
0210-0100000A	MOBILIZATION	LS	1	$ 110,160.00	$ 110,160.00
0225-0101000A	TEMPORARY WORK ZONE TRAFFIC CONTROL, COMPLETE	LS	1	$ 81,600.00	$ 81,600.00
0990-0102000A	SIGNAL MODIFICATION, SE 82nd Dr	LS	1	$ 202,500.00	$ 202,500.00
0990-0102000A	SIGNAL MODIFICATION, OR 212	LS	1	$ 227,000.00	$ 227,000.00
0990-0102000A	SIGNAL MODIFICATION, OR 224	LS	1	$ 91,000.00	$ 91,000.00
0990-0102000A	SIGNAL MODIFICATION, SE Sunnybrook Blvd	LS	1	$ 185,000.00	$ 185,000.00
0990-0102000A	SIGNAL MODIFICATION, SE 95th Ave	LS	1	$ 61,000.00	$ 61,000.00
0990-0102000A	SIGNAL MODIFICATION, SW Elligsen Rd	LS	1	$ 59,000.00	$ 59,000.00
0990-0102000A	SIGNAL MODIFICATION, SW Wilsonville Rd	LS	1	$ 194,500.00	$ 194,500.00
CONSTRUCTION SUBTOTAL					$ 1,211,760.00
	Preliminary Engineering (Consultant)	LS	1	$ 100,000.00	$ 100,000.00
	Construction Engineering (Consultant)	LS	1	$ 45,000.00	$ 45,000.00
	Clackamas County PE Costs	LS	1	$ 45,000.00	$ 45,000.00
	Clackamas County CE Costs	LS	1	$ 75,000.00	$ 75,000.00
	ODOT Admin Cost	LS	1	$ 25,000.00	$ 25,000.00
	Signal Timing with Before & After Report (including counts) (Consultant)	LS	1	$ 150,000.00	$ 150,000.00
	System Engineering/Other Phase	LS	1	$ -	$ -
	Escalation (3.5% increase per year from 2019 to 2022)		3.5%		$ 179,576.00
AGENCY & CONSULTANT SERVICES SUBTOTAL					$ 619,576.00
	Construction and Risk Contingency		10%		$ 139,052.25
TOTAL PROJECT COST - (2022 DOLLARS ROUNDED)					$ 1,970,400.00
	Local Match (10.27%) Rounded		10.27%	$ -	$ 202,361.00
	2022-2024 RFFA Grant		89.73%	$ -	$ 1,768,040.00

Table 8 – Cost breakdown by project corridor (Clackamas Industrial Area)

00990	SIGNAL MODIFICATION, SE 82nd Dr	Item Description	Unit	Amount	Unit Cost	Total
		ATC CONTROLLER (WITH MAXVIEW LICENSE)	EA	9	$4,000.00	$36,000.00
		Truck Priority Detection - Two radar system	EA	3	$22,000.00	$66,000.00
		Truck Priority Detection - Three radar system	EA	1	$29,500.00	$29,500.00
		Truck Priority Detection - Four radar system	EA	0	$37,000.00	$0.00
		UPS Battery Backup	EA	4	$15,000.00	$60,000.00
		Traffic Surveillance	EA	1	$6,500.00	$6,500.00
		Count Station	EA	0	$15,000.00	$0.00
		Travel Time Measurement	EA	1	$4,500.00	$4,500.00
						$202,500.00

00990	SIGNAL MODIFICATION, OR 212	Item Description	Unit	Amount	Unit Cost	Total
		ATC CONTROLLER (WITH MAXVIEW LICENSE)	EA	9	$4,000.00	$36,000.00
		Truck Priority Detection - Two radar system	EA	4	$22,000.00	$88,000.00
		Truck Priority Detection - Three radar system	EA	0	$29,500.00	$0.00
		Truck Priority Detection - Four radar system	EA	0	$37,000.00	$0.00
		UPS Battery Backup	EA	4	$15,000.00	$60,000.00
		Traffic Surveillance	EA	2	$6,500.00	$13,000.00
		Count Station	EA	2	$15,000.00	$30,000.00
		Travel Time Measurement	EA	0	$4,500.00	$0.00
						$227,000.00

00990	SIGNAL MODIFICATION, OR 224	Item Description	Unit	Amount	Unit Cost	Total
		ATC CONTROLLER (WITH MAXVIEW LICENSE)	EA	6	$4,000.00	$24,000.00
		Truck Priority Detection - Two radar system	EA	0	$22,000.00	$0.00
		Truck Priority Detection - Three radar system	EA	0	$29,500.00	$0.00
		Truck Priority Detection - Four radar system	EA	1	$37,000.00	$37,000.00
		UPS Battery Backup	EA	1	$15,000.00	$15,000.00
		Traffic Surveillance	EA	0	$6,500.00	$0.00
		Count Station	EA	1	$15,000.00	$15,000.00
		Travel Time Measurement	EA	0	$4,500.00	$0.00
						$91,000.00

00990	SIGNAL MODIFICATION, SE Sunnybrook Blvd	Item Description	Unit	Amount	Unit Cost	Total
		ATC CONTROLLER (WITH MAXVIEW LICENSE)	EA	7	$4,000.00	$28,000.00
		Truck Priority Detection - Two radar system	EA	4	$22,000.00	$88,000.00
		Truck Priority Detection - Three radar system	EA	0	$29,500.00	$0.00
		Truck Priority Detection - Four radar system	EA	0	$37,000.00	$0.00
		UPS Battery Backup	EA	3	$15,000.00	$45,000.00
		Traffic Surveillance	EA	0	$6,500.00	$0.00
		Count Station	EA	1	$15,000.00	$15,000.00
		Travel Time Measurement	EA	2	$4,500.00	$9,000.00
						$185,000.00

Table 9 – Cost breakdown by project corridor (Wilsonville Industrial Area)

00990	SIGNAL MODIFICATION, SE 95th Ave	Item Description	Unit	Amount	Unit Cost	Total
		ATC CONTROLLER (WITH MAXVIEW LICENSE)	EA	4	$4,000.00	$16,000.00
		Truck Priority Detection - Two radar system	EA	0	$22,000.00	$0.00
		Truck Priority Detection - Three radar system	EA	0	$29,500.00	$0.00
		Truck Priority Detection - Four radar system	EA	0	$37,000.00	$0.00
		UPS Battery Backup	EA	3	$15,000.00	$45,000.00
		Traffic Surveillance	EA	0	$6,500.00	$0.00
		Count Station	EA	0	$15,000.00	$0.00
		Travel Time Measurement	EA	0	$4,500.00	$0.00
						$61,000.00

00990	SIGNAL MODIFICATION, SW Elligsen Rd	Item Description	Unit	Amount	Unit Cost	Total
		ATC CONTROLLER (WITH MAXVIEW LICENSE)	EA	5	$4,000.00	$20,000.00
		Truck Priority Detection - Two radar system	EA	0	$22,000.00	$0.00
		Truck Priority Detection - Three radar system	EA	0	$29,500.00	$0.00
		Truck Priority Detection - Four radar system	EA	0	$37,000.00	$0.00
		UPS Battery Backup	EA	2	$15,000.00	$30,000.00
		Traffic Surveillance	EA	0	$6,500.00	$0.00
		Count Station	EA	0	$15,000.00	$0.00
		Travel Time Measurement	EA	2	$4,500.00	$9,000.00
						$59,000.00

00990	SIGNAL MODIFICATION, SW Wilsonville Rd	Item Description	Unit	Amount	Unit Cost	Total
		ATC CONTROLLER (WITH MAXVIEW LICENSE)	EA	12	$4,000.00	$48,000.00
		Truck Priority Detection - Two radar system	EA	1	$22,000.00	$22,000.00
		Truck Priority Detection - Three radar system	EA	0	$29,500.00	$0.00
		Truck Priority Detection - Four radar system	EA	0	$37,000.00	$0.00
		UPS Battery Backup	EA	8	$15,000.00	$120,000.00
		Traffic Surveillance	EA	0	$6,500.00	$0.00
		Count Station	EA	0	$15,000.00	$0.00
		Travel Time Measurement	EA	1	$4,500.00	$4,500.00
						$194,500.00

2022-2024 RFFA Project Application

All relevant applicant agency and other agency staff with authority must attest to the design and cost estimates of the project, and that proper coordination and cooperation exists between all parties. Please attach additional signature pages as warranted.

Applicant agency staff signatures:

Project manager _____

Engineering _____

Right of Way Sharan Hanso-Sa Duncan, SR/WA

Environmental N/A

Other agency signatures (as required):

ODOT Highway _____

ODOT Rail _____

TriMet _____

SMART _____

Utilities _____

_____

_____

Railroads _____

Other (please indicate) _____ City Engineer
City of Wilsonville, OR. 6/20/19

[i] Available for download at: oregonmetro.gov/urban-growth-management-functional-plan
[ii] Community places are defined as key local destinations such as schools, libraries, grocery stores, pharmacies, hospitals and other medical facilities, general stores, parks, greenspaces, and other places that provide key services and/or daily needs.
[iii] oregonmetro.gov/sites/default/files/2019/04/05/Regional_Emergency_Transportation_Routes_2006.pdf