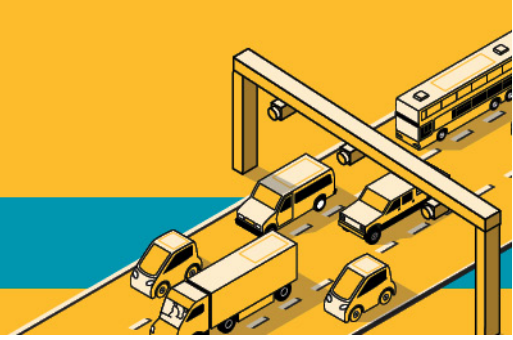

UPDATED

PERFORMANCE MEASURES

October 7, 2021

The following document details ODOT's updated performance measure for the I-205 Toll Project after receiving detailed feedback from the Equity and Mobility Advisory Committee (EMAC). This committee reviewed these measures for their impacts to equity and how it pertains specifically to transit and multimodal transportation options, neighborhood health and safety, and affordability.

The performance measures for the I-205 Toll Project will be the basis for creating performance measures for the Regional Mobility Pricing Project (RMPP), which will occur in early 2022.

EQUITY FRAMEWORK INFORMED PERFORMANCE MEASURES THAT GO BEYOND WHAT IS FEDERALLY REQUIRED

Goal	Objective	Performance Measure	How	Tool or Data Source
Provide benefits for historically and currently excluded and underserved communities	Maximize benefits and minimize burdens associated with implementation of tolling	Identify impacts to safety and health for locations near roadways experiencing traffic volume changes due to the project; delineate between general population and Equity Framework communities (EFC)	<u>Quantitative:</u> Traffic volume changes on select roadways (AM peak hour, PM peak hour, off-peak) <u>Qualitative:</u> Maps will be overlaid with output from the traffic models identifying roadways with vehicle rerouting (AM peak hour, PM peak hour, off-peak) to assess impacts based on best professional practices for analysis	Regional travel demand model (RTDM) for off-peak traffic volume changes and transportation analysis zones (TAZs) identified as representative samples for EFC, which includes environmental justice populations.[1] Dynamic Traffic Assignment (DTA) model results for AM and PM peak hour traffic volume changes within the Transportation Area of Potential Impact (API). Transportation data and mapping that identifies high injury and crash corridors and locations. Social resource maps, which include: schools, religious organizations, medical facilities, nursing homes, libraries, parks or natural areas. Existing heat islands and health outcomes/existing conditions.[2]
		Change in vehicle operating costs in the Portland metro area; delineate between general population and Equity Framework communities (EFC)	<u>Quantitative</u> Model outputs for TAZs that represent areas with EFC <u>Qualitative</u> Evaluation based on best professional practices for analysis	Benefit Cost Analysis (BCA) Model and Multi-Criteria Evaluation (MCE) Toolkit.
		Change in travel costs as a percentage of household income; delineate between general population and Equity Framework communities (EFC)	<u>Quantitative</u> Model outputs for the general population and selected transportation area zones (TAZs) that represent areas with EFC	Regional travel demand model (RTDM) to identify number of community places one can access from a TAZ during peak hours within a mode-specific travel time threshold.[3] TAZ measures are aggregated to report average impacts for region and API, based on weighted average of households in each TAZ. Regional travel demand model (RTDM) to identify number of jobs one can access from a TAZ during peak hours within a mode-specific travel time threshold.[4] TAZ measures are aggregated to report average impacts for region and API, based on weighted average of households in each TAZ. For environmental justice and social resources and communities, use TAZs identified as representative for EFC to identify changes in access.

[1] Environmental Justice populations include low income and minorities. This is consistent for all performance measures that indicate environmental justice.
[2] We will be using a research paper on urban flooding and extreme heat from Portland State University and data from a Community Health Needs Assessment for the Portland metro area.
[3] For community places, peak period travel time thresholds of 30 minutes by auto, 45 minutes by transit, 30 minutes by bike, and 20-minute walk are applied. These times are consistent by mode for community place and medical facilities for all performance measures.
[4] For jobs, peak period travel time thresholds of 20 minutes by auto, 30 minutes by transit, 15 minutes by bike, and 20-minute walk are applied. These times are consistent by mode for jobs for all performance measures.

Goal	Objective	Performance Measure	How	Tool or Data Source
Provide benefits for historically and currently excluded and underserved communities	Support equitable and reliable access to job centers and community places, such as grocery stores, schools, and gathering places	Change in travel time, reliability, and access by mode to community places and jobs; delineate between general population and Equity Framework communities (EFC)	Quantitative Model outputs for accessibility to community places by mode (auto, transit) for the general population and selected TAZs that represent areas with EFC for the region and Area of Potential Impact (API) Model outputs for accessibility to jobs by mode (auto, transit) for the general population and selected TAZs that represent areas with EFC for the region and API Change in travel time by mode (auto, transit) for representative scenarios during average weekday peak periods and selected off-peak period times that represent the general population and EFC travel patterns Qualitative Evaluation of effect on reliability based on best professional practices based on level of congestion, travel time change and representative scenarios and informed by targeted community engagement	Regional travel demand model (RTDM) to identify number of community places one can access from a TAZ during peak hours within a mode-specific travel time threshold. TAZ measures are aggregated to report average impacts for region and API, based on weighted average of households in each TAZ. Regional travel demand model (RTDM) to identify number of jobs one can access from a TAZ during peak hours within a mode-specific travel time threshold. TAZ measures are aggregated to report average impacts for region and API, based on weighted average of households in each TAZ. Dynamic Traffic Assignment (DTA) model for travel time change during AM and PM peak hours. Regional travel demand model (RTDM) for travel time changes during off-peak hours. For environmental justice and social resources and communities, use TAZs identified as representative for EFC to identify changes in access. Social resource maps, which include: schools, religious organizations, community centers, health centers, regulated affordable housing, nursing homes, libraries, and parks or natural areas. Targeted community engagement informed by TAZs identified as representative for EFC.

Goal	Objective	Performance Measure	How	Tool or Data Source
Provide benefits for historically and currently excluded and underserved communities	Support equitable and reliable access to health promoting activities (e.g. parks, trails, recreation areas) and health care facilities	Change in travel time, reliability, and access by to health promoting activities (i.e. parks, open spaces, and trails) and health care facilities; delineate between general population and Equity Framework communities (EFC)	<u>Quantitative</u> Model outputs for accessibility to medical facilities by mode (auto, transit) for the general population and selected TAZs that represent areas with EFC for the region and Area of Potential Impact (API) Model outputs for accessibility to health promoting activities by mode (auto, transit) for the general population and selected TAZs that represent areas with EFC for the region and API Mode shift from auto travel to active transportation travel modes (transit, bicycle, and pedestrian) for the region and Transportation API Change in travel time by mode (auto, transit) for representative scenarios during average weekday peak periods and selected off-peak period times that represent the general population and EFC travel patterns <u>Qualitative</u> Evaluation of effect on reliability based on best professional practices based on level of congestion, travel time change and representative scenarios and informed by targeted community engagement	Regional travel demand model (RTDM) to identify number of health promoting activities one can access from a TAZ during peak hours within a mode-specific travel time threshold. TAZ measures are aggregated to report average impacts for region and API, based on weighted average of households in each TAZ. Regional travel demand model (RTDM) to identify number of health care facilities one can access from a TAZ during peak hours within a mode-specific travel time threshold. TAZ measures are aggregated to report average impacts for region and API, based on weighted average of households in each TAZ. Regional travel demand model (RTDM) for estimates of mode shift auto travel to active transportation travel. Dynamic Traffic Assignment (DTA) model for travel time change during AM and PM peak hours. RTDM for travel time changes during off-peak hours. For environmental justice and social resources and communities, use TAZs identified as representative for EFC to identify changes in access. Social resource maps, which include: schools, religious organizations, community centers, health centers, regulated affordable housing, nursing homes, libraries, and parks or natural areas. Targeted community engagement informed by TAZs identified as representative for EFC.
	Design the toll system to support travel options for people experiencing low incomes	Compare the benefit of mitigation, strategy, and policy commitments for Equity Framework communities (EFC) relative to the general population	<u>Qualitative</u> Using selected performance measures to study proposed investments to advance equity Evaluation based on best professional practices and informed by targeted community engagement for analysis based on comparison of benefits of mitigations, strategies, and commitments	Consideration of the following: • Policy, strategy, or mitigation commitments • Topics identified in Step #3 of the Equity Framework • Targeted community engagement

Goal	Objective	Performance Measure	How	Tool or Data Source
Limit additional traffic diversion from tolls on I-205 to adjacent roads and neighborhoods	Design the toll system to limit rerouting from tolling	Change in auto volumes by freeway and non-freeway roadways in the region, Transportation Area of Potential Impact (API); delineate between general population and Equity Framework communities (EFC)	Quantitative Change in freeway and non-freeway vehicle miles traveled (VMT) within region, API and TAZs identified as representative for EFC Change in travel time during average weekday peak hours and selected off-peak period times on key corridors for selected travel routes	Regional travel demand model (RTDM) for Vehicle Miles Traveled (VMT) measures and TAZs identified as representative for EFC. Dynamic Traffic Assignment (DTA) model results for AM and PM peak hour travel times within the Transportation API.
	Design the toll system to avoid and minimize impacts to quality of life factors, such as health, noise, safety, job access, travel costs, and environmental quality for local communities from traffic rerouting	Change in the quality of life in areas impacted by diversion; delineate between the general population and Equity Framework communities (EFC)	Qualitative Evaluation based on best professional practices for analysis to impact to quality of life	Consideration of the following: • Other performance measured for the project • Topics identified in Step #3 of the Equity Framework • Targeted community engagement
Support safe travel regardless of mode of transportation	Enhance vehicle safety on I-205 by reducing congested conditions and increasing use of transit or higher occupancy vehicles	Change in I-205 safety conditions, which includes frequency and/or severity of vehicular crashes, as well as mode shift	Quantitative Estimated change in number of crashes on I-205. Change in total daily auto trips in region and Transportation Area of Potential Impact (API) Analysis of crash history on I-205	Regional travel demand model (RTDM) and Dynamic Traffic Assignment (DTA) model results for traffic volume changes and mode shift estimates. Highway Safety Manual Part C Methodology for corridors. Analysis of existing safety conditions based on crash history database.
	Support safe multimodal travel options (e.g. pedestrians, bicycles, transit, and automobiles) on roadways affected by tolling, especially in high crash corridors	Change in roadway safety conditions by mode (transit, auto, bike, and walk) for areas impacted by diversion, especially for high crash corridors and/or locations that result in injury or death	Quantitative Analysis of crash history in Transportation API Qualitative Evaluation based on best professional practices for analysis to impact to safety	Regional travel demand model (RTDM) and Dynamic Traffic Assignment (DTA) model results for traffic volume changes. Transportation data and mapping that identifies high injury and crash corridors and locations. Multi-Criteria Evaluation (MCE) Toolkit for region. LTS (Level of stress) tool for bicyclists and pedestrians. Social resource maps, which include: schools, religious organizations, community centers, health centers, regulated affordable housing, nursing homes, libraries, and parks or natural areas. Targeted community engagement informed by TAZs identified as representative samples for EFC.

Goal	Objective	Performance Measure	How	Tool or Data Source
Contribute to regional improvements in air quality and reduced contributions to climate change effects	Contribute to reduced vehicle air pollutants and greenhouse gas emissions in the Portland metro area through reducing congestion, resulting in more consistent vehicle speeds, less vehicle idling, and fewer overall motor vehicle emission hours on I-205 and on local roadways affected by tolling	Change in annual regional vehicle emissions of Mobile Source Air Toxics (MSATs)[5] from vehicle operations	Quantitative Change in regional vehicle emissions	MOVES model (motor vehicle emissions simulator) - using 24-hour vehicle miles traveled (VMT) output by vehicle class and speed bin from the regional travel demand model (RTDM). MSAT emissions are estimated as part of the project's air quality analysis using volume and speed data from individual roadway segments in the Air Quality API, accounting for localized increases and decreases, to develop a regional estimate.
	Reduce localized air pollutants through reduced congestion and improved travel efficiency, particularly in community areas where pollutants may be concentrated due to traffic congestion	Change in annual regional energy consumptions and CO2e[6] emissions from vehicle operations	Quantitative Change in regional vehicle energy consumption	MOVES model - using 24-hour vehicle miles traveled VMT output by vehicle class and speed bin from the regional travel demand model (RTDM). Operational energy consumption from transportation projects is an evaluation of fuel used by vehicles traveling on the project roadways. Total energy consumption in units of British thermal units (Btu) and regional CO_2e emissions are estimated as part of the I-205 Toll Project's energy analysis using volume and speed data from individual roadway segments in API, accounting for localized increases and decreases, to develop a regional estimate.

[5] MSATs are a set of 9 pollutants (1,3-butadiene, acetaldehyde, acrolein, benzene, diesel particulate matter (diesel PM), ethylbenzene, formaldehyde, naphthalene, and polycyclic organic matter) for which the Federal Highway Administration requires an evaluation as part of its NEPA approval process. The 9 pollutants have been identified by the Environmental Protection Agency as being among the national and regional-scale cancer risk drivers or contributors with significant contributions from mobile sources (cars, trucks, and other on-road vehicles).

[6] CO_2 Equivalents (CO_2e) is a combined measure of greenhouse gas (GHG) emissions weighted according to the global warming potential of each gas, relative to carbon dioxide (CO_2). CO_2e from vehicle exhaust is be determined using contributions of CO_2, nitrous oxide (N_2O), and methane (CH_4).

Goal	Objective	Performance Measure	How	Tool or Data Source
Support multimodal transportation choices	Support shifts to higher occupancy vehicles (including carpooling) and other modes of transportation (transit, walk, bike, telework)	Change in regional person trips by single occupancy vehicles compared to other modes (transit, vanpooling, or carpooling); delineate between impact to general population and Equity Framework-identified communities (EFC)	Quantitative Change in regional person trips by mode, including high and single occupancy vehicles (HOV and SOV), transit, bike, and walk Qualitative Evaluation based on best professional practices for analysis on potential impacts to carpool, vanpool, paratransit, and shared ride modes	Regional travel demand model (RTDM) for change in mode share estimates. Targeted community engagement informed by TAZs identified as representative samples for EFC and feedback from the Transit Multimodal Work Group (TMWG).
		Change in level of traffic stress for bicycle and pedestrian corridors impacted by traffic volume changes due to the project	Quantitative LTS (level of stress) for bicycle and pedestrian Qualitative Evaluation based on best professional practices for analysis on the impact to roadway corridors	LTS (Level of traffic stress) tool for bicyclists and pedestrians. Targeted community engagement informed by TAZs identified as representative samples for Equity Framework communities (EFC).
		Identify barriers and opportunities to encourage greater use of higher occupancy vehicles and other modes of transportation for the general population and Equity Framework communities (EFC)	Qualitative Evaluation based on best professional practices for analysis from community engagement	Targeted community engagement informed by TAZs identified as representative samples for EFC and feedback from the Transit Multimodal Work Group (TMWG).
		Change in transit level of service during peak periods and selected off-peak period times	Quantitative Roadway corridor MMLOS (level of service) for transit	MMLOS (level of service) for transit users for study corridors within the Transportation Area of Potential Impact (API) (areas possibly impacted by diversion).
		Identify barriers and opportunities to improve feeling of safety and ease for transit, carpooling, and vanpools users within areas impacted by diversion; delineate between the general population and Equity Framework communities (EFC)	Qualitative Evaluation based on best professional practices for analysis from community engagement	Targeted community engagement informed by TAZs identified as representative samples for EFC and feedback from the Transit Multimodal Work Group (TMWG).
	Collaborate with transit providers to support availability and enhancements to transit services in the I-205 corridor, especially for historically and currently excluded and underserved communities	Change in transit level of service and travel times during peak periods and selected off-peak period times	Quantitative Roadway corridor MMLOS (level of service) for transit Change in travel time on transit-service roadways within the Transportation Area of Potential Impact (API) Qualitative Evaluation based on best professional practices and informed by targeted community engagement for analysis.	Regional travel demand model (RDTM) for travel time changes on transit-service roadways within the Transportation API during the off-peak hours Dynamic Traffic Assignment (DTA) model for travel time changes on transit-service roadways within the Transportation API during the AM and PM peak hours. MMLOS (level of service) for transit users for study corridors within the Transportation API (areas possibly impacted by diversion).

Goal	Objective	Performance Measure	How	Tool or Data Source
Support regional economic growth	Provide for reliable and efficient regional movement of goods and people through the I-205 corridor and on local roadways affected by tolling	Vehicle and transit travel time savings; delineate between the general population and Equity Framework communities (EFC)	<u>Quantitative</u> Vehicle and transit travel time savings using TAZs from regional model Change in travel time by vehicle and transit for representative scenarios during average weekday peak periods and selected off-peak period times that represent EFC travel patterns <u>Qualitative</u> Evaluation based on best professional practices for analysis of the impact to EFC	Dynamic Traffic Assignment (DTA) model results for peak hour travel times within the Transportation API. Changes in transit travel times during peak hours will be estimated based on changes in general travel times on transit service roadways from the DTA model. Regional Travel Demand Model (RTDM) for travel time changes during off-peak hours. Regional travel demand model (RTDM) to identify number of community places one can access from a TAZ during peak hours within a mode-specific travel time threshold. TAZ measures are aggregated to report average impacts for region and Transportation API, based on weighted average of households in each TAZ. For environmental justice and social resources and communities, use TAZs identified as representative samples for EFC, which includes to identify changes in access.
		People throughput on I-205 segments between Stafford Road and OR 213	<u>Quantitative:</u> Vehicle volume by vehicle type and conversion to person trip	Regional travel demand model (RTDM) for off-peak hours and Dynamic Traffic Assignment (DTA) model for peak hours.
	Improve regional access to jobs and employment centers, especially for historically and currently excluded and underserved communities	Change in jobs accessible by mode (auto, transit); delineate between the general population and Equity Framework communities (EFC)	<u>Quantitative</u> Jobs accessible by mode (auto, transit). Change in access will be assessed for region and Transportation Area of Potential Impact (areas possibly impacted by diversion), and model outputs from transportation area zones (TAZs) that represent areas with EFC <u>Qualitative</u> Evaluation of effect on reliability based on best professional practices based on level of congestion, travel time change and representative scenarios and informed by targeted community engagement	Regional travel demand model (RTDM) to identify number of jobs one can access from a TAZ during peak hours within a mode-specific travel time threshold. TAZ measures are aggregated to report average impacts for region and API, based on weighted average of households in each TAZ. Dynamic Traffic Assignment (DTA) model for travel time change during AM and PM peak hours. Regional travel demand model (RTDM) for travel time changes during off-peak hours. For environmental justice and social resources and communities, use TAZs identified as representative for EFC to identify changes in access. Social resource maps, which include: schools, religious organizations, community centers, health centers, regulated affordable housing, nursing homes, libraries, and parks or natural areas. Targeted community engagement informed by TAZs identified as representative for EFC.

Goal	Objective	Performance Measure	How	Tool or Data Source
Support management of congestion and travel demand	Design the toll system to improve efficient use of roadway infrastructure and improve travel reliability	Change in vehicle miles traveled (VMT) and vehicle hours traveled (VHT) for highway and non-highway travel in the region and Transportation Area of Potential Impact (API)	<u>Quantitative</u> Change in daily VMT and VHT for region and API Change in peak hour VHT for API <u>Qualitative</u> Evaluation based on best professional practices for analysis for representative scenarios	Regional travel demand model (RTDM) for daily VMT and VHT results. Dynamic Traffic Assignment (DTA) model for peak hour VHT results.
		Change in person trips by mode (auto, transit) for the region	<u>Quantitative</u> Change in daily regional mode share	Regional travel demand model (RTDM).
Maximize integration with future toll systems	Design a toll system that can be expanded in scale, integrated with tolling on other roadways, or adapted to future toll system applications	Potential to expand system in future to a broader tolling system including other state facilities or different tolling structures	<u>Qualitative</u> Evaluation based on best professional practices for analysis for known project or studies that are ongoing or forthcoming	Cumulative impact analysis report references known projects or studies that are ongoing or forthcoming, such as: • Interstate Bridge Replacement Project • Rose Quarter Improvement Project • I-205 Improvements Project • Boone Bridge Improvements Project • Regional Mobility Pricing Project • Congestion Pricing by Portland Bureau of Transportation or Metro
Maximize interoperability with other transportation systems	Design a toll system that is interoperable with other transportation systems in the region	Potential to integrate the toll system with other transportation systems, such as transit, carpooling, vanpooling, ride-hailing, and scooter or bike sharing, that could support a shared system for payment or service to increase accessibility	<u>Qualitative</u> Evaluation based on best professional practices for analysis based on feedback from partner mobility service providers and community engagement	Targeted community engagement informed by TAZs identified as representative samples for Equity Framework communities (EFC) and feedback from the Transit Multimodal Work Group (TMWG) and mobility service providers.

FEDERALLY REQUIRED ANALYSIS

Performance Measure(s)	Tool and/or Data Source
Impacts from (current or new) traffic diversion on identified business concentrations in the study area	Primary research and analysis of identified commercial corridors or concentrations, Metro Regional Travel Demand Model (RTDM) for daily and off-peak diversion patterns; Dynamic Traffic Assignment (DTA) model for peak hour diversion patterns.
Changes in economic conditions (employment, labor income, economic activity) from project construction	IMPLAN economic modeling software
Changes in economic conditions (employment, labor income, economic activity) from collection and use of toll revenue	IMPLAN economic modeling software
Change in reliability, travel times, and travel costs for freight users	Dynamic Traffic Assignment (DTA) model for peak hour travel time changes, Regional Travel Demand Model (RTDM) for off-peak travel time changes and Multi-Criteria Evaluation (MCE) Toolkit
Freight or commercial vehicle throughput on I-205 and nearby roadways impacted by volume changes due to toll project	Regional Travel Demand Model (RTDM)
Monetary value of vehicle travel time savings to users	Benefit Cost Analysis (BCA) Model and Multi-Criteria Evaluation (MCE) Toolkit
Monetary value of changes in safety, emissions, noise. pavement maintenance costs, and other identified impacts	Benefit Cost Analysis (BCA) Model
Number of contaminated sites (low, medium, and high risk) disturbed by project constructed	Data will be collected from Federal and state environmental databases for potential sites within the API, historical and existing land uses, previously prepared environmental reports, and review of historical data regarding land use and geologic and groundwater conditions.
Number, type, and location of historic properties (including archaeological sites) directly impacted by the project	Development footprint of the tolling gantries, associated signage, and utilities.

Performance Measure(s)	Tool and/or Data Source
Number, type, and location of historic properties (including archaeological sites) indirectly impacted by the project	Information obtained from Regional Travel Demand Model (RTDM) showing forecasted changes in daily traffic volumes that would result from tolling on roadways adjacent to historic properties.
Land area by type (vacant, open space, right-of-way) converted (temporary and permanent) from non-transportation uses to transportation improvements	GIS and/or AutoCAD output of impact and acquisition areas for permanent and temporary transportation improvements by parcel and for land use and zoning designations using Metro's Regional Land Information System (RLIS).
Change in land use character as a result of the Project	GIS and/or AutoCAD total impact areas by land use and zoning designation using RLIS.
Change in access (temporary and permanent) as a result of the Project	Location of temporary and permanent changes to access points on project design plans.
Construction easements needed and their effect on existing land uses	Project design plans showing construction easements and existing land use layer in RLIS.
Changes to current and planned land uses located near roadways affected by vehicle rerouting	Current land use and zoning designations in RLIS and agency future land use maps and subarea plans outside the API along road corridors experiencing changes in traffic volumes based on Information obtained from traffic model.
Location, scale, and schedule of future development projects based on agency input	Conversation with agency planning and development review staff.
Number of sensitive noise receptors experiencing noise levels that reach the ODOT Noise Abatement Approach Criteria	Comparison of modeled traffic noise levels to ODOT Noise Abatement Approach Criteria.
Number of sensitive noise receptors experiencing noise levels that reach the ODOT Substantial Increase (10 dBA over existing noise levels)	Comparison of modeled traffic noise levels to ODOT Substantial Increase.
Anticipated construction noise levels and duration of construction noise at sensitive noise receptors	Qualitative assessment consistent with ODOT Noise Manual.
Distance of noise impact contour from future project alignment to undeveloped properties	Graphical representation of modeled Noise Abatement Approach Criteria distance for ODOT Land Use Activity Categories B and C using FHWA TNM 2.5 and graphics software.

Performance Measure(s)	Tool and/or Data Source
Area of ground disturbance for project construction	Approximate locations of direct impacts from construction of toll gantries and relocated utilities will be determined from Project drawings. Additional information will be obtained from the Areas of Potential Impact (APIs) of land use and utilities and any changes that may occur.
Physical changes to park and recreation resources	Presence of park and recreation resources within the limits of construction and an assessment of short-term and long-term direct impacts to the identified resources.
Changes to access to park and recreation resources located near roadways affected by vehicle rerouting	Information obtained from Regional Travel Demand Model (RTDM) showing forecasted changes in traffic volumes that would result from tolling on roadways adjacent to park and recreation resources.
Change in intersection volume-to-capacity (v/c) ratios, level of service (LOS), delay and queuing	Synchro
Changes in LOS on I-205 between Stafford Road and OR 213	Highway Capacity Software
Change in travel time reliability on I-205 between Stafford Road and OR 213	Regional Integrated Transportation Information System (RITIS)
Change in hours of congestion on I-205 between Stafford Road and OR 213	Regional travel demand model (RTDM)
Change in travel times on I-205 between Stafford Road and OR 213 and along other study corridors within the transportation API	Dynamic Traffic Assignment (DTA) model
Regional and study area vehicle hours traveled (VHT) for freeway and non-freeway travel	Regional travel demand model (RTDM)
Relative effort associated with implementation	Evaluation based on professional best practices for analysis.
Flexibility to respond to changes in traffic conditions in the project vicinity	Evaluation based on professional best practices for analysis
Eligibility under preferred federal tolling authority program	Evaluation based on professional best practices for analysis

Performance Measure(s)	Tool and/or Data Source
Gross toll revenue (less estimated revenue leakage)	Net Revenue Model
Operation and Maintenance (O&M) costs associated with physical tolling infrastructure including (but not limited to): gantries, equipment cabinets, cameras, fixed signage, dynamic message signs, and telecommunications infrastructure as well as procurement of vendor services and vendor transition on a periodic basis	Net Revenue Model
O&M costs associated with toll collections including (but not limited to): banking fees for credit card transactions, toll equipment maintenance, back-office systems support, customer service center operations, ODOT and consultant staffing, and administrative costs	Net Revenue Model
Net revenue (Adjusted gross toll revenue collected less toll O&M costs and highway O&M costs)	Net Revenue Model
Capital costs associated with implementing the physical toll infrastructure and procuring toll vendor services	Net Revenue Model
Utility relocations required due to Project construction	Existing utility locations will be identified using the ITIC program and other available sources. Use project design plans to identify any potential utility relocations
Temporary disruptions to existing electrical and communication services during construction when new utility connections for the tolling equipment are established	Use existing electrical and communication services information from ITIC and other available sources and project design plans to identify potential service disruptions
New utility lines/connections (electrical and communications) required to operate tolling equipment	Use project design plans to identify new utility lines and connections
Area of direct impacts to vegetation, wildlife, or aquatic species and their habitat	The approximate project footprint (limits of cut/fill) will be established from the project drawings, and this footprint will be overlain on the vegetation, wildlife, and aquatic species mapping to estimate an approximate quantity of direct impact to vegetation, wildlife, or aquatic species and their habitat.

Performance Measure(s)	Tool and/or Data Source
Area of indirect impacts to vegetation, wildlife, or aquatic species and their habitat	The approximate project footprint (limits of cut/fill) will be established from the project drawings. Scientific Evaluation based on best professional practices for analysis will be used to determine the extent of any indirect impacts to vegetation, wildlife, or aquatic species and their habitat.
Change in visual quality resulting from installation of toll gantries	Visual quality will be evaluated by comparing proposed project elements to existing visual conditions and documenting how visual impacts would affect viewers. Visual impacts will be based on data and process provided in the FHWA Guidelines for visual impact assessment.
Area of wetlands/waters filled	The approximate project footprint (limits of cut/fill) will be established from the project drawings, and this footprint will be overlain on the wetlands/waters resource mapping to estimate an approximate quantity of direct wetland impact.
Area of wetlands/waters indirectly affected	The approximate project footprint (limits of cut/fill) will be established from the project drawings. Scientific Evaluation based on best professional practices for analysis will be used to determine the extent of any indirect impacts to wetlands/water resources.

DEFINITIONS AND DESCRIPTIONS

The following table provide definitions and descriptions for technical terms referenced in the performance measures:

Definitions of technical terms

Term	Definition
24-hour VMT output	Vehicle miles traveled (VMT) in one 24-hour period. VMT means the total number of miles driven on the Portland metro area roadway network in an average weekday.
AM/PM peak hour and off-peak	Generally, the highest traffic-volume time period in the morning and afternoon. In the Portland region, this is between 7 a.m. to 9 a.m. and 4 p.m. to 6 p.m. Off-peak means travel that occurs outside of 7 a.m. to 9 a.m. and 4 p.m. to 6 p.m. peak periods.
Annual toll cost estimate	Average total cost that toll users would pay in one year.
Corridor	The corridor for this project has not been specifically defined. Generally, a corridor can mean the roadway and the surrounding area, including frontage roads, on and off ramps, parallel routes, other transportation facilities (like bus stops), and adjacent land uses.
Environmental justice populations	Low-income populations and minority populations are collectively referred to as environmental justice populations by the federal government. During the National Environmental Policy Act (NEPA) process, populations in addition to the environmental justice populations will be considered, such as older adults, people with limited English proficiency and people experiencing a disability.
Equity Framework communities (EFC)	The Oregon Toll Program published an Equity Framework in December 2020 (Toll Projects' Equity Framework), identifying communities and populations disproportionately affected by local transportation projects. These include, but are not limited to low-income and minority populations, older adults, people with limited English proficiency and people experiencing a disability.
Home and Activity Locations	"Home" locations are where people reside or start a trip. "Activity" locations are community resources at which people end their trip such as a workplace, school, park or medical facility.
Indexed scenario comparison	A comparison in which performance measures are normalized to more easily compare relative differences between the Build and No Build scenarios.
Interoperability	The ability of payment technology to transfer between systems; to pay for not only tolls in the project area, but also tolls in other regions or transit fare (e.g., TriMet).

Term	Definition
Metro Equity Focus Areas	As defined by Metro's Regional Transportation Plan this includes: people of color, people with low income, and people with limited English proficiency.
Mode (or travel mode)	The various methods for travel. In this context, mode refers to walking (non-motorized travel), biking, driving a vehicle, riding in a vehicle as a passenger, riding transit, and truck trips.
Model	A technical tool that represents travel patterns and evaluates differences between alternative scenarios. Several models are using in the analysis of toll projects including the Metro Regional Travel Demand Model (RTDM).
Social and community resources	Places that are serve the social and physical health of a community, for example: social service providers, religious organizations, schools, libraries, and parks.
Speed bin	Groupings of vehicle travel speeds. (e.g., 40-49mph, 50-59mph).
Transportation Analysis Zones (TAZs)	Geographical areas used in travel models to represent the travel behavior of categories of transportation system user groups. There are approximately 2,000 TAZs in Metro's region (Multnomah, Clackamas, and Washington counties).
Toll cost range	The identified maximum and minimum that someone would pay for any given trip. With variable rate tolling, the range could change over the course of the day as well as on the distance travelled on tolled roadways.
Vehicle class	Types of vehicles included in the travel demand model roadway volumes. These include: single-occupancy vehicle (driving alone), high-occupancy vehicle (driving with at least one passenger), and various truck sizes.

Tools and data sources

Tool/Data	Description
Benefit Cost Analysis (BCA) model	This is a technical analysis tool, developed and used by the project team, that evaluates economic impacts including benefits and costs. This assess the economic benefits and costs of a transportation investment where benefits and costs are broadly defined and are quantified in monetary terms to the extent possible.
Best professional practices	Judgment exercised on the work as informed by the education and experience of credentialed professionals. Credentialed professionals typically hold degrees from accredited institutions, and many have professional certifications that govern ethics and practice standards, such as American Institute of Certified Planners (AICP), Professional Engineer (PE) and Professional Transportation Planners (PTP).
Census data (American Community Survey 5-year estimates)	The American Community Survey is an ongoing survey, conducted by the United States Census Bureau, that provides information on a yearly basis about the population in the United States. This information includes demographic characteristics.
Census tracts	Census tracts are small, relatively stable and consistently defined geographic areas that usually have a population between 2,500 and 8,000 persons, roughly corresponding to the size of an average American neighborhood. The minimum population of 2,500 allows for statistically significant data analysis, while the maximum population of 8,000 facilitates the ability to create useful geographic blocks. There are approximately 490 census tracts in the Portland-Vancouver metro area.
Dynamic Traffic Assignment (DTA)	This is a type of traffic model being developed for the for I-205 subarea. It refines the Regional Travel Demand Model (RTDM) results for the purposes of peak-hour traffic analysis near the study area.
FHWA Traffic Noise Model Version 2.5	This is the Federal Highway Administration's most current version of a noise model. A traffic noise model helps predict the noise level of a specific roadway under various scenarios.
GIS	GIS stands for geographic information system, and it is a framework for gathering, managing and analyzing data related to spatial location and geography.
Highway Safety Manual Part C Methodology	The American Association of State Highway and Transportation Officials Highway (AASHTO) produces and uses a highway safety manual. Part C of this manual defines the methods for predictive safety analysis.
MOVES model	This is the motor vehicle emissions simulator. The project team uses this tool to estimate motor vehicle emissions at the regional level.

Tool/Data	Description
Multi-Criteria Evaluation (MCE) Toolkit	The MCE toolkit associates Regional Travel Demand Model (RTDM) outcomes for specific Transportation Analysis Zones (TAZs) with demographic data provided by the Census Bureau.
Multimodal Level of Service (MMLOS) calculation tool	The Oregon Department of Transportation (ODOT) uses this tool to calculate the quality of travel by walking, biking, or transit. ODOT does not use this tool for evaluating the quality of service for people driving vehicles.
Qualitative	This refers to project team evaluations that are generally not directly tied to specific numerical measures, but rather informed by evaluation based on best professional practices for analysis and informed by technical results as available.
Regional Travel Demand Model (RTDM)	This tool is used by Portland Metro to represent travel behavior and patterns in the region. It is a primary tool used for projecting growth in future travel demand using assumptions about expected growth in population (households) and jobs (employment).
Vehicle operating costs	This includes the cost of fuel, maintenance and repair, replacement of tires, and the depreciation of the vehicle over time.

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