

Methodology Report

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# Transportation System Development Charges

Prepared For  
Clackamas County



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In Association with DKS Associates and Randy Young

# Executive Summary

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## Background

Oregon Revised Statutes 223.297-223.314 authorize local governments to charge System Development Charge (SDCs) for transportation and other capital improvements. Local governments rely on System Development Charges (SDCs) to collect money for capital improvements on a variety of infrastructure systems, such as roads, water, sewer, storm drains and schools.

Transportation System Development Charges (TSDCs) are one-time fees assessed to new or expanded developments to help cover the cost of adding to the capacity of transportation facilities (for motorists, bicyclists and pedestrians) to accommodate new trips added by the development. The TSDC fees are based on the number of vehicle trips a particular land use generates, and are paid by the developer when a building permit is issued.

Clackamas County (the County) embarked on an effort to update its transportation system development charges (TSDCs) in 2016, in conjunction with the City of Happy Valley (the City). The City and County have a Joint Area TSDC, adopted through an intergovernmental agreement (IGA) in 2007.

The purpose of the Transportation SDC Update Project (the Project) was to review the current methodology in the context of current industry practices, statutory requirements and infrastructure funding needs. In addition to the methodology review, a major component of the Project was to update the transportation system development charge capital project lists to reflect recently completed Transportation System Plans (TSP), and to review service area boundaries.

Over the course of the Project, the City and County agreed to terminate the existing Joint Area TSDC Program, and instead pursue development of TSDCs and TSDC Capital Project Lists specific to each entity. This report presents the methodology, project list, and updated TSDCs for the County.

## Stakeholder Involvement and Outreach

A Work Group made up of stakeholders and technical staff was convened to provide input during the TSDC methodology update. Members represented a wide range of interests and included residential and commercial real estate developers, residential and commercial builders, engineering firms and business associations. County and City staff participated in Working Group meetings to provide technical expertise and information.

## Online Open Houses

County and City staff invited the public to participate in online open houses through emails, press releases, website announcements, newsletter articles, and social media outreach. The online open houses included background information about the TSDC update, a geographic interactive map of potential projects and survey questions. The public was invited to learn about the TSDC update and provide their input on the project list, the rates and the traffic impact being measured. In total, about 230 people visited the online open houses, and 45 people submitted completed comment forms.

Feedback collected through work group meetings and the online open houses helped formulate the Project recommendations.

## Summary of Methodology

The transportation SDC is based on a system-wide cost per trip, where the costs associated with meeting future growth needs are divided by the projected system-wide growth in trips. The updated TSDC methodology is structured as an improvement fee only, as provided under Oregon law. As such, the cost per trip is calculated by dividing the growth-related capacity costs from the TSDC Capital Project List by the 471,812 additional daily trips (from the regional traffic model).

In addition to the fee structure, local governments have flexibility in selecting among other methodological approaches, in order to meet local policy objectives. Components considered during the Project include the growth share bases, measuring the traffic impact, adjustments to traffic impact and the land use categories used to develop the rate table.

## TSDC Capital Project List

Unlike the current methodology, which only considers the added trips by vehicles on the County system; the updated TSDC methodology considers the added trips by all modes of travel (auto, pedestrian, and bicycle). Rather than focusing on building large capacity projects, the new project list also incorporates solutions that provide more efficient travel on existing roads.

The Draft TSDC Capital Project List was developed from two sources:

- Transportation System Plan (TSP); and
- Clackamas Regional Center (CRC) Project List

Combined, these two project lists included over 438 projects with a total cost in excess of \$2.82 billion. The work group selected criteria that focuses on growth created by new development for identifying projects from these two plans to remain on the list and become eligible for TSDC funding.

- Increase traffic connections to daily needs and services.
- Reduce congestion at intersections.
- Located in or near a current or future employment area.
- Improve safety on roads.
- Provide the greatest benefit to the entire community by keeping projects on roads with significant amounts of traffic, such as arterials and collectors.
- Projects planned for construction in the next 10-years.

The resulting prioritization produced a Draft TSDC Capital Project List containing 76 projects with total project costs of \$476 million. Of the total project costs, \$210 million is attributable to growth, and therefore eligible for SDC Funding.

The process used to develop the TSDC Capital Project List is detailed in Section 2-1.

The full project list can be found in Appendix A (Table A-1).

## Proposed TSDC Schedule

TSDC rates differ by land use based on the number of trips a new or expanded development is estimated to add to the transportation system. For example, the TSDC fee for an average single-family home is lower than the fee for a large grocery store because it generates fewer trips. The proposed SDCs for single-family residential development are based on one of three dwelling size categories. Additionally, two categories of accessory dwelling units (ADUs) are also proposed.

Currently, Clackamas County has a long list of rates, one for each specific type of nonresidential land use. The new plan focuses on streamlining and simplifying the program for our customers by considering a short consolidated nonresidential rate list in place of our current long rate list.

The proposed rates consolidate similar uses and reduce the number of rates making it easier for developers and the public to identify the correct rate and reducing the likelihood that commercial tenant improvements in an existing structure will trigger a TSDC fee.

The process used to develop the TSDC Rate Schedule is detailed in Section 3-1.

The updated TSDC rate schedule is shown in Appendix B.

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## Data Rounding

The data presented in tables of this report are exported from computer spreadsheets. In some tables, there will be very small variations from the results that would be obtained using a calculator. These variations are not material, and result from the fact that the spreadsheet was allowed to calculate figures to more decimal places than the tables shown in this report.

## SECTION 1

# Introduction

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## Background

Oregon Revised Statutes 223.297-223.314 authorize local governments to assess System Development Charge (SDCs) for transportation and other capital improvements. In addition to specifying the infrastructure systems for which SDCs may be assessed, the SDC legislation provides guidelines on the calculation and modification of SDCs, accounting requirements to track SDC revenues, and the adoption of administrative review procedures.

Clackamas County (the County) last updated in transportation system development charges (TSDCs) in 2007, in conjunction with the City of Happy Valley (the City).

## Project Objectives

The purpose of the Transportation SDC Update Project (the Project) was to review the current methodology in the context of current industry practices and statutory requirements and infrastructure funding needs. In addition to the methodology review, a major component of the Project was to update the TSDC capital project list to reflect projects and priorities from the updated Transportation System Plan (TSP) adopted in 2013.

Specific Project objectives included:

- Development of TSDCs that balance the need to fund transportation improvements while taking into account the impact on overall development costs.
- Identify ways to simplify the TSDC rate structure, making it easier for developers and community members to estimate fees.
- Involve key stakeholders in the process to give feedback on project list selection criteria and the updated methodology and ordinance.
- Review the current service area boundaries.

With respect to the latter issue of service area boundaries, as part of the Project, the City and County agreed to terminate the existing Joint Area TSDC Program, and instead pursue development of TSDCs and capital project lists specific to each entity. A new IGA was authorized in August 2017 that outlined the terms of separation for the program. The City and County worked collaboratively on the review and development of the new TSDC methodologies and ordinances that will serve as the framework for the individual TSDC programs going forward. This report presents the methodology, project list, and updated TSDCs for the County. While the general framework is consistent between the two entities, the individual TSDC programs also reflect policies and objectives specific to each.

# Stakeholder Involvement

A Working Group made up of stakeholders and technical staff was convened to provide input to help shape the TSDC methodology update and rates. The group met eight times between December 2015 and August 2017. Members reviewed and provided input on the following topics:

- TSDC project list and selection criteria
- Method used to calculate growth share of projects
- TSDC rate calculation and schedule
- Ordinance for administration of TSDCs, including a review of the language governing

Members represented a wide range of interests and included residential and commercial real estate developers, residential and commercial builders, engineering and planning firms, and business associations. County and City staff participated in Working Group meetings to provide technical expertise and information. Stakeholder members included representatives from the following groups:

- Home Builders Association
- Gramor Development
- Perkins Coie
- AKS Engineering
- Doug Bean & Associates
- Holt Homes
- North Clackamas Chamber of Commerce

## Online Open Houses

The public was invited to learn about the TSDC update and provide their comments on specific elements of the methodology and project list. Comments were primarily gathered through two online open houses for the County and the City between April 18 and May 19, 2017. The online open houses included background information about the TSDC update, a geographic interactive map of potential projects, and survey questions. Participants were asked specific questions about the criteria used to select projects for the TSDC project list; approaches to simplifying the rates used to calculate TSDC fees; and options for calculating traffic impacts of new developments.

County and City staff invited the public to participate in the online open houses through more than 1,600 direct emails to interested parties, press releases, website announcements, newsletter articles and social media (Facebook and Twitter) outreach.

In total, about 230 people visited the online open houses, and 45 people submitted completed comment forms. This feedback helped formulate the Project recommendations.



## SECTION 2

# TSDC Capital Project List Development

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## Introduction

The first step in updating the countywide TSDC was to identify the list of capital projects eligible to receive TSDC revenue, because that sets the foundation for calculating the rates for different kinds of development.

The Draft TSDC Capital Project List was developed from two sources: the Transportation System Plan (TSP) and the Clackamas Regional Center (CRC) Project List. Combined, the two project lists included over 438 projects with a total cost in excess of \$2.82 billion.

## Project Prioritization

TSDC funds can only be used to build projects that accommodate additional traffic generated by new development. The current County TSP built on the foundation of existing county assets with a fiscally responsible approach that protects and improves the existing transportation system and implements a cost-effective system to meet future needs. Rather than focusing on building large capacity projects to improve our existing network, the plan incorporates solutions that provide more efficient travel on existing roads. As a result, there was a need to identify the capacity increasing projects that were eligible for TSDC funding.

The work group chose the following criteria that focuses on growth created by new development for selecting projects from the Transportation System Plan (TSP) and other locally adopted plans that will remain on the list and become eligible for TSDC funding.

- Increase traffic connections to daily needs and services.
- Reduce congestion at intersections.
- Located in or near a current or future employment area.
- Improve safety on roads.
- Provide the greatest benefit to the entire community; on roads with significant amounts of traffic, such as arterials and collectors.

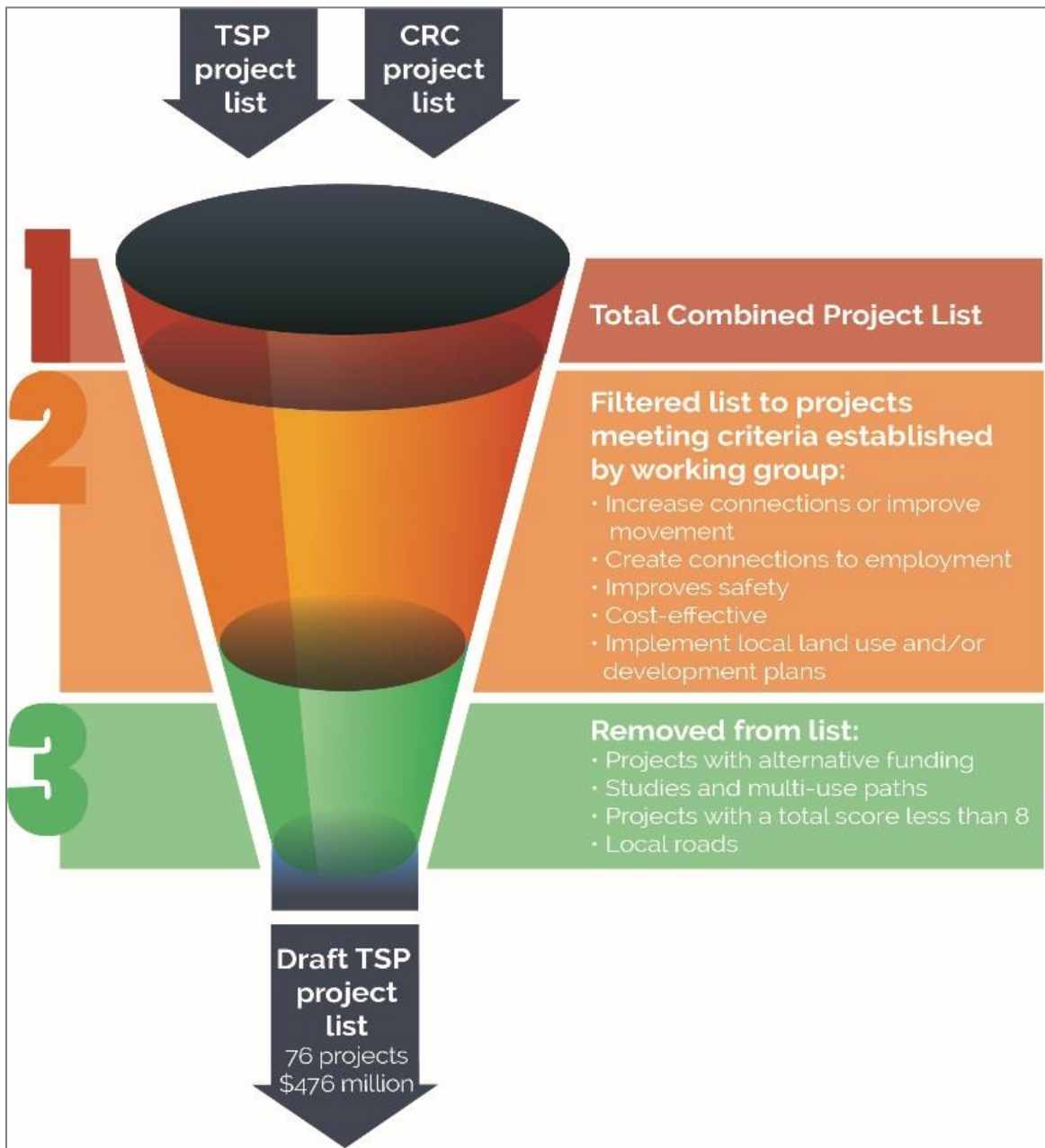
Only those projects on the CRC Project list with capacity enhancing elements were kept; however, in order to minimize potential increases to the final TSDC rates, the work group needed to reduce the number of projects from the 20-year TSP that would become eligible for TSDC funding. During development of the TSP each project was scored for their achievement of six goals on a scale of (-1) to 2. Using the original scoring, which was vetted during the public outreach for the TSP, work group members chose to keep TSP projects scoring higher than 0 on the following goals for the draft TSDC Capital Project list:

- Goal 2: Local Businesses and Jobs
- Goal 3: Livable and Local
- Goal 4: Safety and Health



In addition to the above prioritization, the following were removed from the draft TSDC Capital Project List:

- Projects with alternative funding
- Studies and multi-use paths
- Projects with less than a total score of 8 (The combined score from all six TSP goals)
- Local Roads



The result of these prioritization efforts is a draft TSDC Capital Project List containing 76 projects with total project costs of \$476 million. Of the total project costs, \$210 million of the total estimated construction cost is eligible for TSDC Funding.

# Project Cost Estimation

The project costs identified in the TSDC Capital Project List are based on the cost estimates developed as part of the TSP or CRC studies. Appendix C –County Transportation System Plan Update Cost Estimate Assumptions documents the assumptions made in preparing cost estimates for the projects on the Master List for the Clackamas County Transportation System Plan (TSP) Update.

All TSP and CRC project costs have been updated to reflect estimated inflation since the original project costs were developed. The total estimated cost of the prioritized list is \$476 million, as shown in Table 2-1 below.

## TSDC Capital Project List

The prioritization outlined above produced a Draft TSDC Capital Project List containing 76 projects with total project costs of \$476 million. Of the total project costs, \$210 million is attributable to growth, and therefore eligible for SDC Funding. The full project list can be found in Appendix A (Table A-1).

A summary of the TSDC improvement project costs by project type is provided in Table 2-1.

**Table 2-1**  
Summary of TSDC Capital Project List Costs

Location	Mode			Total	TSDC-Eligible
	Auto	Ped	Bike		
Urban	\$32,453,596	\$132,363,431	\$61,892,355	\$226,709,382	\$105,388,058
Rural	248,502,038	1,060,062	-	249,562,100	104,920,618
<b>Total</b>	<b>\$280,955,634</b>	<b>\$133,423,493</b>	<b>\$61,892,355</b>	<b>\$476,271,482</b>	<b>\$210,308,676</b>
<i>Percent</i>	59%	28%	13%	100%	44%

The full project list can be found in Appendix A (Table A-1).

# TSDC Methodology

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## Introduction

The transportation SDC is based on a system-wide cost per trip, where the costs associated with meeting future growth needs are divided by the projected system-wide growth in trips. The TSDC for a particular development is then determined by multiplying the cost per trip by the number of trips associated with the development. These calculations are outlined below.

## System-Wide Cost per Trip

The updated TSDC methodology is structured as an improvement fee, as provided under Oregon law. An improvement fee is designed to recover costs of *planned future* capital improvements needed to add system capacity for future users. As such, the cost per trip is calculated by dividing the growth-related capacity costs from the TSDC Capital Project List by the future growth in trips.

## Growth in Trips

To evaluate the roadway capacity needs and the amount of vehicle trips that are generated by growth, the Metro regional travel demand model was utilized. Table 3-1 shows the projected growth in the number of average daily trip ends, broken down by trip ends that have both an origin and destination within the County's SDC collection area (internal-internal), and trip ends that have one end outside of the County's SDC collection area (internal-external & external-internal). The total projected number of average daily trip ends is 471,812.

**Table 3-1**

*Model Vehicle Trip Ends Growth (Average Daily)*<sup>1</sup>

	Internal-Internal	Internal-External & External-Internal	Total
<b>Growth Trip Ends</b>	<b>110,530</b>	<b>361,282</b>	<b>471,812</b>
<sup>1</sup> Based on Metro Regional Travel Model; Daily trips 8.5% of PM Peak Hour trips			

## Growth Share of Project Costs

A key component of the TSDC methodology is determining growth's share of future facility improvement costs from the TSDC Project List. According to statutory requirements:

Improvement fees must be based on a methodology that demonstrates consideration of the projected cost of capital improvements needed to increase system capacity to meet the needs of future users [ORS 223.304]. Furthermore:

*"An increase in system capacity may be established if a capital improvement increases the level of performance or service provided by existing facilities or provides new facilities. The portion of the improvements funded by improvement fees must be related to the need for increased capacity to provide service for future users." [ORS 223.307(2)]*

Table 3-1 presented the system-wide capacity requirements of growth; however, for purposes of determining potential SDC-eligibility, individual projects from the TSDC Capital Project List are analyzed to determine the portion of costs needed for future growth capacity versus costs associated with raising the level of service for existing development.

Two general methods are used for project cost allocations:

1. **"Standards -Based" Approach (used for new facilities and expansion of existing facilities for capacity needs only)** – Existing development paid for existing facilities; new development will pay for its share of system capacity thru funding the next increment of expansion, less costs associated with correcting any existing deficiency. Deficiencies are evaluated based on current performance relative to the appropriate planning/design standard for the particular improvement. For roadways and intersections, the standard is a "volume-capacity ratio (v/c ratio)"<sup>1</sup>. For multimodal improvements, the standard is miles per capita of bikeways and pedestrian ways.
2. **"Capacity Utilization" Approach (used for upgrades to existing facilities to improve level of performance)** – Improvements to existing facilities to address safety, modernization, and other performance considerations provide capacity for growth and enhanced performance for existing development, so the costs are allocated in proportion to the utilization of the facilities (as measured by growth's share of future trips specific to a facility).

Application of the growth share approaches is discussed in more detail below.

### **New Roadway and Intersection Facilities; Existing Facility Expansion (Capacity Only)**

New roadways and expansions driven by future development capacity requirements are allocated 100% to growth, since the capacity is needed entirely for new development.

Similarly, new facilities at intersections (e.g., turn lanes and signals) that are not needed to meet existing mobility standards, but are needed once the growth trips are added to the intersection, are assumed to be 100% funded by growth, since there is no existing deficiency.

Data was compiled from recently completed studies (e.g., the TSP and CRC studies) to determine if facilities were operating with a volume/capacity ratio less than the required standard.

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<sup>1</sup> Volume-to-capacity ratio is defined as the ratio between the PM peak hour motor vehicle trips divided by the hourly capacity of the facility to serve those trips.

### Upgrades to Roadways and Intersections (Improved Level of Performance)

For upgrade of existing facilities (i.e., realignments, modernization of rural roads, and other improvements), trip volume data by roadway link (from the regional travel demand model) were used to quantify growth’s utilization of future roadway and intersection capacity.

Growth capacity utilization is estimated based on the growth in trips over the planning period, as a percentage of total future trips for individual roadway links.

### New Multimodal Facilities

Unlike roadway and intersection projects, trip data for bike and pedestrian improvements is not available. Therefore, growth capacity needs for bike and pedestrian facilities are evaluated based on the planned level of service (LOS). The planned LOS is defined as the quantity of future facilities per capita served.

The following equation shows the calculation of the planned LOS:

$$\frac{\text{Existing}Q + \text{Planned}Q}{\text{Future Population Served}} = \text{Planned}LOS$$

Where:

*Q* = quantity (miles of bike or pedestrian facilities), and  
*Future Population Served* = 183,678 (unincorporated Clackamas County only<sup>2</sup>)

The existing and future miles of bike and pedestrian facilities are shown in Table 3-2.

**Table 3-2**  
*Existing and Future Bike and Pedestrian Facilities (miles)*

	Existing	New (TSDC Capital Project List)	New (Other Funding Sources)	Future  (Total)
Bicycle Lanes	96.1	21.2	12.3	129.6
Bicycle Shoulders	45.9	90.1	0.0	135.9
Pedestrian Facility	114.5	39.5	14.7	168.7

Population data for the estimated base year (2015) and future year (2025) are presented in Table 3-3. Growth during the planning period is estimated to be 17,441.

**Table 3-3**  
*Population Growth (Unincorporated Clackamas County)*

	Base Year (2015)	Future Year (2025)	Population Growth
Population	166,237	183,678	17,441
Source: 2015 population based on Metro 2040 Household Forecast; 2025 estimated based on 2040 forecast (adjusted for 10-year period)			

<sup>2</sup> For purposes of the active mode LOS analysis, a 10-year planning period was assumed per County staff, reflecting the TSDC Capital Project List prioritization period.

Table 3-4 presents the existing and planned LOS for bike and pedestrian facilities, based on the existing and planned future facilities presented in Table 3-2 divided by the estimated existing and projected population presented in Table 3-3. (For purposes of this analysis, population figures are divided by 1,000 in order to show the planned LOS per 1,000 population in Table 3-4.)

**Table 3-4**  
*Existing and Planned LOS (miles per 1,000 population)*

	Existing LOS	Planned LOS
Bike Lanes	0.58	0.71
Bike Shoulders	0.28	0.74
Pedestrian Facility	0.69	0.92

The capacity requirements, or number of miles, needed for the existing population and for the growth population are estimated by multiplying the planned (future) LOS for each facility type (from Table 3-4) by the estimated population (in 1,000's) of each group (from Table 3-3).

These calculations are shown in Table 3-5; each column is then described following the table.

**Table 3-5**  
*Existing and Growth Capacity Needs for Bike and Pedestrian Facilities (Miles)*

	Existing Population Need (1)	Existing Inventory + Other Sources (2)	Existing Need from TSDC Project Improvements (3)	Growth Need from TSDC Project Improvements (4)
Bike Lanes	117.3	108.4	8.9	12.3
Bike Shoulders	123.0	45.9	77.1	12.9
Pedestrian Facility	152.7	129.3	23.4	16.0

**(1) Existing Population Need**

The need for the existing population is equal to the planned LOS multiplied by the estimated base year population in 1,000's (166,237).

**(2) Existing Inventory + Other Sources**

Existing users' needs are assumed to be met first by the existing inventory of facilities, plus facilities funded through other (non TSDC) sources; Table 3-5 (column 2) shows the sum of existing facility and new miles (from other funding sources) from Table 3-2.

**(3) Existing Need from TSDC Project Improvements**

The difference between columns 1 and column 2 is the portion of existing development's need that will be met by the TSDC Capital Project List improvements.

#### (4) Growth Need from TSDC Project Improvements

The total capacity need required by growth is equal to the planned LOS (from Table 3-4) multiplied by the projected increase in population over the planning period in 1,000's (17,441).

Table 3-6 shows the distribution of existing and growth allocation for the total planned improvements by project type. For growth, the allocated improvements are assumed to equal the total growth need (from Table 3-5).

**Table 3-6**  
*Existing and Growth Share of TSDC Project List Improvements*

	<b>Total Planned Improvements</b> (TSDC Project List)	<b>Existing Share</b>	<b>Existing %</b>	<b>Growth Share</b>	<b>Growth %</b>
Bike Lanes	21.2	8.9	42%	12.3	58%
Bike Shoulders	90.1	77.1	86%	12.9	14%
Pedestrian	39.5	23.4	59%	16.0	41%

As shown in Table 3-6, the growth share ranges from 14% for bike shoulders to 58% for additional bike lanes.

### Compliance Charge

Local governments are entitled to include in the TSDCs, a charge to recover costs associated with complying with the SDC statutes. Compliance costs include costs related to developing and administering the SDC methodology, project list (including but not limited to TSP and other studies), and credit system; as well as annual accounting costs.

The compliance charge per trip is estimated to be 3% of the base TSDC cost. Table 3-7 shows the calculation of the compliance charge per trip, which is about \$13.50.

**Table 3-7**  
*Compliance Costs*

<b>Category</b>	<b>Annual \$</b>
County Administration	\$80,000
SDC Methodology (1)	\$66,000
TSP (2)	\$66,000
Total Compliance Costs per Year	\$212,000
Estimated Annual Growth Trips	15,727
<b>Compliance Cost per Trip</b>	<b>\$13.48</b>
(1) Annual costs reflect amortization of total cost over 5 years	
(2) Growth share of TSP costs amortized over 10 years	

## System-wide Unit Cost

The total growth costs reflect the calculated growth share of individual projects from the TSDC Capital Project List; detailed information on the SDC project costs and growth share by mode is provided in Table A-1 of Appendix A. The growth share percentages reflect the approaches described above for each project type and mode.

As shown in Table 3-8, the total growth-related improvement costs are estimated to be \$210.3 million. Dividing the total TSDC-eligible costs by the projected growth in Average Daily Trips (from Table 3-1), the system-wide average cost per trip end is \$446.

Adding the compliance charge calculated in Table 3-7, brings the total cost per trip to \$459, as shown in Table 3-8.

**Table 3-8**  
*System-Wide Cost per Trip*

Item	Amount
Total TSDC Eligible Costs (1)	\$210,308,676
Growth Trip Ends (2)	471,812
<b>SDC per Trip End</b>	<b>\$446</b>
<b>Cost per Trip End with Compliance Charge (3%)</b>	<b>\$459</b>
(1) From Project List (Appendix A)	
(2) Unincorporated Clackamas County (from Table 3-1; based on regional traffic model)	

## TSDC Assessment

The transportation SDC for an individual development is based on the cost per trip and the number of trips attributable to that particular development, where the number of trips is computed as follows:

$$\text{Number of Development Trips} =$$

$$\text{Traffic Impact Measure} \times \text{Adjustment Factor(s)} \times \text{Development Units}$$

Calculating the final TSDC assessment requires the review of multiple components: the traffic impact measure, identifying appropriate traffic impact adjustments, establishing the land use categories and consideration of any discounts available under the program. Each of these components are discussed in more detail below.

The proposed TSDC Rate Schedule is shown in Appendix B in Table B-1.

### Traffic Impact Measure

TSDCs are one-time fees assessed to new or expanded developments to help cover the cost of adding capacity to transportation facilities (for motorists, bicyclists and pedestrians) to accommodate new trips generated by the development. TSDC fees are based on the number of trips a particular land use generates, and are paid by the developer when a building permit is issued.

The updated and current methodology uses “Average Daily Trips” as the basis for the TSDC assessment. Under this approach, TSDCs reflect the total traffic added by the development throughout an average weekday. TSDCs based on average daily trips recognize the overall system capacity use of the different types of land uses.



## Traffic Impact Adjustments

The current methodology adjustments for trip length have been eliminated, as available data to reasonably estimate average trip length for a given land use type in comparison to other uses is extremely limited. Trip length is attributable to location within an area and the availability of other similar uses in the area, not simply the type of use.

The updated methodology includes pass-by and diverted linked trip adjustments only.

The updated methodology adjustments are discussed in more detail below.

### Pass-by Trips

Pass-by trips refer to trips that occur when a motorist is already on the roadway, such as a traveler stopping by a fast-food restaurant on the way home from work. In this case, the motorist making a stop while “passing by” is counted as a trip generated by the restaurant, but it does not represent a new (or primary) trip on the roadway.

Pass-by trip adjustments in the updated methodology are based on published data by land use from the Institute of Transportation Engineers (ITE).

### Diverted Link Trips

Diverted Link trips are another type of non-primary trip. In this case, the motorist will divert from a primary route to access a nearby use (e.g., a vehicle may turn off a major roadway onto an intersecting street to access a land use), and then return to the original route to complete the trip.

As with the pass-by trip adjustments, the diverted link trip adjustments included in the updated methodology are based on reported ITE data.

## Land Use Categories

The current methodology includes 94 separate rate categories based on development (or land use type). The updated methodology is based on consolidated land use categories (e.g., different types of schools in a single education category, different types of industrial in another, etc.).

Table B-1 (in Appendix B) includes the updated TSDC rates and traffic impact assumptions for the new categories, but also indicates which land use codes from the ITE Trip Generation Manual have been consolidated into the general categories. The new methodology reduces the number of specific rates and would eliminate the need to capture fees on a change of use if the proposed use falls within the same use category.

In determining the traffic impact assumptions for consolidated land use categories, data from the ITE Trip Generation Manual (9<sup>th</sup> edition) was evaluated.

In some cases, a straight average of the individual trip rates for land uses that comprise the new category was the basis for the assumptions shown in Table B-1.

Trip rates based on less than three traffic studies were eliminated from the averages.

When average daily trips were not available for a particular category, the traffic impact was estimated from the P.M. Peak trip rates, based on a system-wide average P.M. Peak percent of average weekday trips of 8.5%.

For land uses that are not explicitly identified in Table B-1, County staff will make a determination of the appropriate TSDC rate, based on the specific use.

The updated TSDC ordinance will also specify parameters for individual traffic studies.

### Single Family Residential TSDCs by Dwelling Size Category

Oregon Household Activity Survey (OHAS) data were used to develop a tiered single family residential SDC structure, based on dwelling unit size, as measured by square footage. The OHAS data analyzed were limited to single family residential observations located in Clackamas County or elsewhere within the Portland metropolitan area with similar densities and dwelling sizes to those in Clackamas County.

From the OHAS information, vehicle trip rates by household size (i.e., number of people) were calculated. These data were then spatially linked to the Regional Land Information System (RLIS) tax lot data, which provides information about dwelling square footage. From this analysis, household vehicle-trip rates by dwelling size were calculated.

Data on County single family residential building permits since 2010 were then used to determine the historical distribution of new dwellings by size (based on square footage of living space, excluding garage and deck space) for selection of three dwelling size categories. In addition to the permit data, consideration was also given to the degree to which average trip rates for different square footage categories were statistically different within various square footage groupings with adequate sample sizes.

Unlike trip rates from ITE, the trip generation information from household survey data include travel generated from household members only and exclude trips made by visitors, including friends, deliveries, and service workers. Because of this difference between trip generation data sources, the rates calculated from household travel surveys are used to create *relative* adjustments to the current fee schedule. The resulting trip rate adjustments for each dwelling size category are shown in Table 3-9.

These adjustments by dwelling size category are applied to the ITE trip rates in the TSDC Rate Schedule (Appendix B, Table B-1) to determine the TSDCs for each Single Family Residential category.

**Table 3-9**  
*Single Family Residential Trip Rate Adjustments by Dwelling Category*

Dwelling Square Footage Category	<1,700	1,700-2,999	≥3,000
Avg. (weighted) Vehicle Trip Rate <sup>1</sup>	3.70	4.22	4.46
Relative Adjustment <sup>2</sup>	87.5%	99.8%	105.4%
<sup>1</sup> Source: 2011 OHAS & RLIS			
<sup>2</sup> Source: Computed from analysis of OHAS & RLIS and Regional Average Trip Rate of 4.23 trips			

## **Accessory Dwelling Unit (ADU) TSDCs by Dwelling Size Category**

Few observations exist in existing travel model data for smaller homes comparable to ADUs. Therefore, the proposed TSDCs for two size categories of ADUs are based on the ITE trip rates Condo/Townhomes, as follows:

- Large ADU 450 -900 square feet = 100 percent of Condo/Townhome trip rate
- Small ADU 450-200 square feet = 50 percent of Condo/Townhome trip rate

The TSDC Rate Schedule (Appendix B, Table B-1) shows the proposed ADU trip rates and TSDCs based on current ITE data.

## **TSDC Discounts**

The County currently provides a system of TSDC discounts for qualifying developments. Specifically, discounts apply as follows:

- Mixed-use development can receive reductions of 7-18%, depending on floor area ratio (FAR) and residential/retail/commercial mixtures on the site.
- Transit oriented development can receive reductions of 5-20% depending on floor area ratio (FAR), proximity to transit, and type of transit system. This discount applies only to permanent transit routes/lines, such as SAM, CAT, SMART, or TriMet.

No changes to the current discounts are proposed under the new methodology.

## **Annual Inflationary Adjustments**

The fees included in the Proposed TSDC Rate Schedule will be adjusted annually based on an inflationary index as specified in the County TSDC ordinance. The County intends to use the Engineering News Record (ENR) Northwest (Seattle, Washington) Construction Cost Index as the basis for adjusting the TSDCs.

# **Appendix A – TSDC Capital Project List**

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**Table A-1**  
Clackamas County Draft TSDC Project List 2017

PROJECT DETAILS						SDC ELIGIBLE	
#	Location	Project	Segment/Location	Description	Total Project Cost	Total % Eligible	Total \$ Eligible
1004	Urban	122nd Ave	Sunnyside Rd to Timber Valley Dr	Add bikeways and turn lanes at major intersections	\$3,010,000	62.04%	\$1,867,496
1006	Urban	142nd Ave	Sunnyside Rd to OR 212	Add bikeways and pedways	\$14,060,000	51.53%	\$7,245,291
2017	Rural	362nd Ave	Skogan Rd to OR 211 (excludes state facilities)	Add paved shoulders	\$5,980,000	29.40%	\$1,758,120
AI S1	Urban	82nd Avenue	82nd Ave/Hinkley (excludes state facilities)	Install traffic separator on 82nd Avenue to convert accesses at SE Hinckley at Columbia Bank/Union 76 on east side of 82nd Avenue to right-in/right-out. Create new circulation to route traffic to signal at SE Lindy.	\$4,182	24.00%	\$1,009
AI S2	Urban	82nd Avenue	82nd Ave MP 8.50 (excludes state facilities)	In the vicinity of MP 8.50 put in enhanced pedestrian crossing to connect east side pedestrian ramp with walkway to neighborhood to west.	\$82,000	9.00%	\$7,786
AI S4	Urban	82nd Avenue	82nd Ave North entrance to Clackamas Town Center (excludes state facilities)	North entrance to Clackamas Town Center on 82nd make right in, right out only and remove signal. Perform traffic analysis as needed to evaluate traffic diversion to adjacent roadways and intersections.	\$69,700	24.00%	\$16,503
AI S5	Urban	82nd Avenue	Sunnyside to 82nd Ave (excludes state facilities)	Install double left, westbound Sunnyside to southbound 82nd Ave (east to south). Add median island for pedestrian crossing. Standardize NB right-turn lane 82nd to Sunnyside, including bike lane.	\$734,891	79.00%	\$583,169
AI S7	Urban	82nd Avenue	Sunnyside Rd to Sunnyside Dr	Install traffic separator from Sunnyside Rd to Sunnyside Dr (MP 9.15), advance street names.	\$17,712	24.00%	\$4,185
AI S8	Urban	82nd Avenue	82nd Ave Monterey to Harmony/Sunnyside (excludes state facilities)	Traffic separator Monterey to Harmony/Sunnyside.	\$98,400	24.00%	\$23,299
1008	Urban	82nd Dr	OR 212 to Lawnfield Rd	Fill in bikeways and pedways gaps	\$680,000	40.60%	\$276,106

**Table A-1 (Continued)**  
 Clackamas County Draft TSDC Project List 2017

PROJECT DETAILS						SDC ELIGIBLE	
#	Location	Project	Segment/Location	Description	Total Project Cost	Total % Eligible	Total \$ Eligible
1009	Urban	85th Ave	Causey Ave to Monterey Ave	Add sidewalks and bikeways. Perform Pedestrian Safety Audit to verify lighting, crosswalk striping and signing at Causey Ave.	\$30,000	47.77%	\$14,332
1010	Urban	92nd Ave	Johnson Creek Blvd to Emmert View Ct	Fill gaps in pedways	\$480,000	40.60%	\$194,898
AI S12	Urban	97th Avenue	Sunnybrook Blvd to Mather Rd	Investigate improved striping including outside fog lines, and rumble striping. Verify lighting, drainage, surface friction. From Sunnybrook Blvd to Mather Rd	\$49,200	35.00%	\$17,193
1049	Rural	Amisigger Rd / Kelso Rd	OR 224 to Kelso / Richey Rd (excludes state facilities)	Add paved shoulders, turn lanes at Amisigger/OR 212 and Kelso/Richey; smooth curves.	\$13,010,000	57.05%	\$7,422,839
2029	Rural	Arndt Rd Extension	Barlow to OR 99E (excludes state facilities)	Construct new 2 or 3 lane roadway	\$17,040,000	100.00%	\$17,040,000
2030	Rural	Barlow Rd	Knights Bridge Rd to OR 99E	Add paved shoulders	\$5,400,000	19.97%	\$1,078,492
1097	Rural	Beavercreek Rd	Henrici Rd to Yeoman Rd/Steiner Rd	Add paved shoulders and turn lanes at major intersections	\$11,630,000	16.25%	\$1,890,216
AI S9	Urban	Bob Schumacher Road	Bob Schumacher Road	Investigate improved striping, including centerline rumble stripe.	\$49,200	30.00%	\$14,765
1081	Rural	Borland Rd	Tualatin city limits to Stafford Rd	Add paved shoulders in accordance with the Active Transportation Plan and turn lanes at major intersections	\$5,680,000	30.59%	\$1,737,528
1082	Rural	Borland Rd	Stafford Rd to West Linn city limits	Add paved shoulders	\$10,290,000	43.23%	\$4,448,713
1013	Urban	Boyer Dr / 85th Ave / Spencer	OR 213 to I-205 bike path (excludes state facilities)	Add bikeways	\$40,000	57.96%	\$23,183
1099	Rural	Canby-Marquam Highway	Canby-Marquam Hwy / Lone Elder Rd intersection	Reconstruct intersection; install northbound left-turn lane and southbound right-turn lane	\$3,850,000	30.77%	\$1,184,615
1014	Urban	Causey Ave	Fuller Rd to I-205 (excludes state facilities)	Add bikeways and shared facility markings in accordance with the Active Transportation Plan.	\$50,000	57.96%	\$28,979
AI S6	Urban	Causey Avenue	Causey Ave/85th Ave	Pedestrian Safety Audit - verify lighting, crosswalk striping, signing, at Causey Ave/85th Ave	\$30,750	9.00%	\$2,920
1101	Rural	Clarkes Four Corners Intersecti	Beavercreek Rd / Unger Rd	Reconstruct intersection	\$4,490,000	17.14%	\$769,714

**Table A-1 (Continued)**  
 Clackamas County Draft TSDC Project List 2017

PROJECT DETAILS						SDC ELIGIBLE	
#	Location	Project	Segment/Location	Description	Total Project Cost	Total % Eligible	Total \$ Eligible
2001	Urban	Clatsop St / Luther Rd	72nd Ave to Fuller Rd	Add turn lanes and signals at OR 213 intersection; add bikeways, pedways and traffic calming	\$8,118,000	47.93%	\$3,891,198
1062	Urban	Concord Rd	River Rd to Oatfield Rd	Fill gaps in pedway	\$7,410,800	40.60%	\$3,009,065
1063	Urban	Courtney Ave	OR 99E to Oatfield Rd (excludes state facilities)	Fill gaps in pedestrian facilities and bikeways	\$1,860,000	48.86%	\$908,737
1064	Urban	Courtney Ave	River Rd to OR 99E (McLoughlin Blvd) (excludes state facilities)	Construct pedestrian facilities / complete gaps on the south side; add bikeways	\$5,010,000	42.88%	\$2,148,400
2034	Rural	Dryland Rd	Macksburg Rd S to Macksburg Rd N	Realign to form one intersection at Dryland Rd	\$3,400,000	26.25%	\$892,500
1055	Rural	Eagle Creek Rd	Currin Rd to Duus Rd	Remove horizontal curve, relocate intersection, add paved shoulders and turn lanes at major intersection; investigate speed zone south of Currin Rd	\$10,500,000	53.43%	\$5,610,294
2018	Rural	Eagle Creek Rd	OR 211 to Duus Rd (excludes state facilities)	Add paved shoulders	\$14,780,500	21.67%	\$3,202,442
2002	Urban	Evelyn St	OR 224 to Jennifer St (excludes state facilities)	Add bikeways and pedways	\$1,681,000	40.84%	\$686,599
2019	Rural	Firwood Rd	Wildcat Mountain Dr to US 26	Add paved shoulders and turn lanes at major intersections.	\$16,840,000	17.50%	\$2,947,000
1019	Urban	Flavel Dr	Alberta Ave to County boundary	Add bikeways in accordance with the Active Transportation plan	\$2,410,000	57.96%	\$1,396,796
1085	Urban	French Prairie Bridge	Willamette River near I-5 (excludes state facilities)	Construct a bridge in accordance with the Active Transportation Plan	\$9,790,000	20.78%	\$2,034,242
1020	Urban	Fuller Rd	Otty St to Johnson Creek Blvd	Add pedestrian facilities, turn lanes, on-street parking, central median and landscaping.	\$7,580,000	67.88%	\$5,145,111
1022	Urban	Harmony Rd	OR 213 to OR 224	Construct bikeways and pedways	\$9,760,000	48.40%	\$4,724,074
2035	Rural	Hattan Rd	Fischers Mill Rd to Gronlund Rd	Add paved shoulders and turn lanes at major intersections	\$15,426,300	45.50%	\$7,018,339
1108	Rural	Henrici Rd	Beavercreek Rd to Ferguson Rd	Add paved shoulders and turn lanes at major intersections. Remove horizontal and vertical curves	\$4,900,000	46.15%	\$2,261,538
2036	Rural	Henrici Rd	OR 213 to Beavercreek Rd (excludes state facilities)	Add paved shoulders and turn lanes at major intersections	\$5,196,800	44.67%	\$2,321,284



**Table A-1 (Continued)**  
 Clackamas County Draft TSDC Project List 2017

PROJECT DETAILS						SDC ELIGIBLE	
#	Location	Project	Segment/Location	Description	Total Project Cost	Total % Eligible	Total \$ Eligible
2037	Rural	Henrici Rd	Ferguson Rd to Redland Rd	Add paved shoulders and turn lanes at major intersections. Remove horizontal and vertical curves	\$17,870,000	43.79%	\$7,824,507
1066	Urban	Hull Ave	Willmot St to Tims View Ave	Fill gaps in pedestrian facilities	\$4,130,000	40.60%	\$1,676,936
3013	Urban	I-205 Ped / Bike Overpass	Between Causey Ave and Sunnyside Rd	Construct a bike / ped crossing over I-205 to connect transit services, businesses and residents	\$4,900,000	20.78%	\$1,018,160
2005	Urban	Jennifer St	82nd Dr to 135th Ave (excludes state facilities)	Add pedways	\$16,082,300	40.60%	\$6,530,022
2021	Urban	Jennings Ave	Oatfield Rd to Webster Rd	Widen to 2-lane urban minor arterial standard with bikeway and pedway infill	\$13,659,827	66.19%	\$9,041,080
1030	Urban	Johnson Creek Blvd	Johnson Creek Blvd / OR 213 intersection (excludes state facilities)	Extend westbound left-turn lane and rebuild median; install dual northbound and southbound left-turn lanes	\$890,000	100.00%	\$890,000
AI MV3	Urban	Johnson Creek Boulevard	92nd/Johnson Creek Blvd	Turn lane improvements at 92nd/Johnson Creek Boulevard	\$467,400	14.00%	\$66,545
2022	Urban	Lake Oswego to Milwaukie Bridge	Between Sellwood and Oregon City	Construct bike/pedestrian crossing over the Willamette River in accordance with the Active Transportation Plan	\$10,130,000	20.78%	\$2,104,890
2006	Urban	Lake Rd	Milwaukie City limits east to OR 224 (excludes state facilities)	Fill gaps in pedways	\$5,670,000	40.60%	\$2,302,234
2007	Urban	Linwood Ave	Linwood Ave / Monroe St intersection	Add curbs/sidewalks, improve horizontal alignments	\$7,605,500	31.54%	\$2,398,729
1112	Rural	Lone Elder Rd Bridge	~5,800 feet east of Barlow Rd	Replace bridge (nearing the end of its useful life) and include paved shoulders	\$450,000	15.00%	\$67,500
1115	Rural	Molalla Ave Flooding	Just south of city of Molalla	Construct bridge to resolve flooding issues	\$720,000	44.86%	\$322,971
2010	Urban	Monroe St / 72nd Ave / Thompson	Linwood Ave to Fuller Rd	Add pedestrian facilities	\$3,970,000	40.60%	\$1,611,970
AI MV2	Urban	Monterey Ave	Monterey Ave	North-south roadway between project AI MV1 and Monterey Ave	\$4,258,545	100.00%	\$4,258,545
2039	Rural	Mulino Rd (13th St segment)	Canby city limits to OR 213 (excludes state facilities)	Add paved shoulders and turn lanes at major intersections	\$24,890,000		\$13,498,038
1069	Urban	Oak Grove Blvd	Oatfield Rd to River Rd	Fill gaps in pedways and bikeways	\$2,590,000	44.32%	\$1,147,763



**Table A-1 (Continued)**  
 Clackamas County Draft TSDC Project List 2017

PROJECT DETAILS						SDC ELIGIBLE	
#	Location	Project	Segment/Location	Description	Total Project Cost	Total % Eligible	Total \$ Eligible
1071	Urban	Oatfield Rd	Oatfield Rd / Park Rd intersection	Install traffic signal and add turn lanes	\$1,060,000	32.56%	\$345,116
1072	Urban	Oatfield Rd	Oatfield Rd / McNary Rd intersection	Add southbound and eastbound left-turn lanes	\$570,000	20.16%	\$114,912
1041	Urban	Otty Rd	Fuller Rd to 92nd Ave	Improve consistent with Fuller Road Station Plan; improve curb radius; add turn lanes, on-street parking, central median, landscaping, bikeways and pedestrian facilities. Install pedestrian crossing between Fuller Rd and I-205 and near 91st Ave.	\$1,216,000	50.39%	\$612,765
1073	Urban	Park Ave	River Rd to OR 99E (McLoughlin Blvd)	Add pedestrian facilities	\$1,750,000	40.60%	\$710,566
2042	Rural	Redland Rd	Redland Rd / Fischers Mill Rd / Henrici Rd intersection	Install eastbound left-turn, eastbound right-turn and westbound right-turn lanes at Henrici Rd	\$860,000	39.78%	\$342,141
1058	Rural	Richey Rd	Kelso Rd to OR 212 (excludes state facilities)	Add paved shoulders and left turn lane at Richey Rd and OR 212	\$4,200,000	49.52%	\$2,079,756
1074	Urban	River Rd	Lark St to Courtney Ave	Add pedways	\$4,880,000	40.60%	\$1,981,465
1075	Urban	River Rd	Oak Grove Blvd to Risley Ave	Fill gaps in bikeways and pedways	\$5,710,000	42.14%	\$2,406,226
2023	Urban	Roots Rd	Webster Rd to McKinley Rd	Add pedways	\$4,838,000	40.60%	\$1,964,411
1086	Rural	Rosemont Rd	Stafford Rd to West Linn	Add paved shoulders and turn lanes at major intersections	\$8,790,000	29.28%	\$2,573,402
1125	Rural	Springwater Rd	Hattan Rd to Bakers Ferry Rd	Add paved shoulders and turn lanes at major intersections	\$6,330,000	33.54%	\$2,123,279
1088	Rural	Stafford Rd	Rosemont Rd to I-205 (excludes state facilities)	Add paved shoulders and turn lanes at major intersections	\$8,600,000	35.62%	\$3,062,991
2028	Rural	Stafford Rd / 65th Ave	I-205 to Boeckman Rd / Advance Rd (excludes state facilities)	Add paved shoulders and turn lanes at major intersections	\$22,078,500	46.18%	\$10,196,598
AI MV1	Urban	Stevens Road	Stevens Rd to High Creek Rd	East-west roadway connecting Stevens Road to High Creek Road. Include sidewalk and bike lanes	\$9,414,874	77.00%	\$7,288,420

**Table A-1 (Continued)**  
 Clackamas County Draft TSDC Project List 2017

PROJECT DETAILS						SDC ELIGIBLE	
#	Location	Project	Segment/Location	Description	Total Project Cost	Total % Eligible	Total \$ Eligible
2015	Urban	Sunnyside Rd	OR 213 to 97th Ave	Modified boulevard treatment including lane redesign, medians, beautification, curb extensions, reconstructed sidewalks, landscaping, south side bikeways. Consider flashing yellow arrow for left-turns at signalized intersections.	\$5,330,000	19.92%	\$1,061,986
1077	Urban	Thiessen Rd	Thiessen Rd / Aldercrest Rd intersection	Add turn lanes on Thiessen Rd; consider converting to two-way stop controlled	\$570,000	20.42%	\$116,366
2024	Urban	Thiessen Rd	Oatfield Rd to Webster Rd	Add bikeways and pedways	\$24,425,800	50.85%	\$12,419,625
2025	Urban	Webster Rd	OR 224 to Gladstone (excludes state facilities)	Fill gaps in bikeways and pedways	\$19,485,300	46.47%	\$9,053,989
1059	Rural	Welches Rd	US 26 to Birdie Ln (excludes state facilities)	Add paved shoulders; add pedestrian facilities in Welches rural center; evaluate pedestrian crossing near Stage Stop Rd; add multi-use path	\$6,360,000	19.59%	\$1,245,800
<b>Total Project Count</b>		<b>76</b>			<b>\$476,271,481</b>	<b>44.16%</b>	<b>\$210,308,676</b>

# Appendix B – Proposed TSDC Rate Schedule

Table B-1  
TSDC Rate Schedule

Land Use Category	Units	ITE Codes Included	Traffic Impact <sup>1,2</sup>	Adjustments		Adjusted Traffic Impact	Updated TSDC per Unit <sup>3</sup>	Updated TSDC per Unit <sup>3</sup> [Effective 07-01-19; 4.9307% CPI Increase]
				% Diverted Link Trips	Pass-by %			
Transit Parking	Parking Space	90, 93	4.50	-	-	4.50	\$2,068	\$2,170
Industrial/ Manufacturing/Warehouse	1,000 Gross Square Feet	110, 120, 130,140, 150, 151, 170	4.21	-	-	4.21	\$1,936	\$2,031
Small Detached Single-Family Home (dwelling units 1,699 square feet or less)	Dwelling Unit	210	9.52	-	-	8.33	\$3,827	\$4,016
Medium Detached Single-Family Home (dwelling units 1,700-3,000 square feet)	Dwelling Unit	210	9.52	-	-	9.50	\$4,366	\$4,581
Large Detached Single-Family Home (dwelling units more than 3,000 square feet)	Dwelling Unit	210	9.52	-	-	10.03	\$4,610	\$4,838
Apartment	Dwelling Unit	220	6.65	-	-	6.65	\$3,056	\$3,206
Residential Condo/Townhouse	Dwelling Unit	230	5.81	-	-	5.81	\$2,670	\$2,801
Small Accessory Dwelling Unit (200-449 square feet)	Dwelling Unit	220	5.81	-	-	5.81	\$2,670	\$2,801
Large Accessory Dwelling Unit (450-900 square feet)	Dwelling Unit	220	5.81	-	-	2.91	\$1,335	\$1,401
Mobile Home in Park	Space	240	4.99	-	-	4.99	\$2,293	\$2,406
Assisted Living	Beds	254, 620	2.70	-	-	2.70	\$1,241	\$1,302
Senior Housing	Dwelling Unit	251, 253, 255	3.06	-	-	3.06	\$1,404	\$1,473
Hotel/Motel	Room	310, 320	8.17	-	-	8.17	\$3,754	\$3,939

Table B-1 (Continued)  
TSDC Rate Schedule

Land Use Category	Units	ITE Codes Included	Traffic Impact <sup>1,2</sup>	Adjustments		Adjusted Traffic Impact	Updated TSDC per Unit <sup>3</sup>	Updated TSDC per Unit <sup>3</sup> [Effective 07-01-2019; 4.9307% CPI Increase]
				% Diverted Link Trips	Pass-by %			
Parks	Acre	411, 412	2.09	-	-	2.09	\$958	\$1,005
Campground/RV Park	Site	416	2.30	-	-	2.30	\$1,055	\$1,107
Marina	Berths	420	2.96	-	-	2.96	\$1,360	\$1,427
Golf Course	Holes	430	35.74	-	-	35.74	\$16,422	\$17,232
Golf Driving Range	Tee/ Drive Position	432	10.63	-	-	10.63	\$4,882	\$5,123
Recreation Community Center	1,000 Gross Square Feet	435, 495	33.82	-	-	33.82	\$15,540	\$16,306
Bowling Alley	Bowling Lanes	437	12.84	-	-	12.84	\$5,897	\$6,188
Movie Theater	Movie Screens	443, 444, 445	115.94	-	-	115.94	\$53,272	\$55,899
Casino/Video Lottery Establishment	1,000 Gross Square Feet	473	114.16	-	-	114.16	\$52,452	\$55,038
Soccer Complex	Field	488	71.33	-	-	71.33	\$32,775	\$34,391
Racquet/Tennis Club	Court	491	38.70	-	-	38.70	\$17,782	\$18,659
Health/Fitness Club	1,000 Gross Square Feet	492	30.01	-	-	30.01	\$13,787	\$14,466
Military Base	Employees	501	1.78	-	-	1.78	\$818	\$858
Education	Student	520, 522, 530, 536, 540, 550	1.51	-	-	1.51	\$695	\$729
Church	1,000 Gross Square Feet	560	9.11	-	-	9.11	\$4,186	\$4,392
Day Care	Student	565	4.38	56	-	1.93	\$886	\$929
Library	1,000 Gross Square Feet	590	56.24	-	-	56.24	\$25,841	\$27,115

**Table B-1 (Continued)**  
TSDC Rate Schedule

Land Use Category	Units	ITE Codes Included	Traffic Impact <sup>1,2</sup>	Adjustments		Adjusted Traffic Impact	Updated TSDC per Unit <sup>3</sup>	Updated TSDC per Unit <sup>3</sup> [Effective 07-01-2019; 4.9307% CPI Increase]
				% Diverted Link Trips	Pass-by %			
Hospital	Beds	610	12.94	-	-	12.94	\$5,946	\$6,239
Medical-Dental	1,000 Gross Square Feet	720, 630	36.13	-	-	36.13	\$16,601	\$17,420
Office	1,000 Gross Square Feet	710, 714, 715, 730, 750, 760, 770	10.44	-	-	10.44	\$4,796	\$5,033
State Motor Vehicles Department	1,000 Gross Square Feet	731	166.02	-	-	166.02	\$76,283	\$80,044
Post Office	1,000 Gross Square Feet	732	108.19	-	17	89.80	\$41,260	\$43,295
Building & Hardware	1,000 Gross Square Feet	812, 816	48.23	-	37	30.72	\$14,115	\$14,811
Free-Standing Discount Store	1,000 Gross Square Feet	813, 815	54.00	35	22	23.38	\$10,743	\$11,272
Nursery	1,000 Gross Square Feet	817, 818	68.10	-	34	44.95	\$20,652	\$21,670
Factory Outlet Center	1,000 Gross Square Feet	823	26.59	-	34	17.55	\$8,064	\$8,461
Automobile Sales	1,000 Gross Square Feet	841	32.30	-	34	21.32	\$9,795	\$10,278
Automobile Parts Sales	1,000 Gross Square Feet	843	61.91	-	43	35.29	\$16,214	\$17,014
Tire Stores	1,000 Gross Square Feet	848, 849	22.62	-	28	16.28	\$7,482	\$7,851
Supermarket	1,000 Gross Square Feet	850, 854	102.24	38	36	26.58	\$12,214	\$12,816
Convenience Market	1,000 Gross Square Feet	851, 852	612.39	11	51	232.71	\$106,924	\$112,196

**Table B-1 (Continued)**  
TSDC Rate Schedule

Land Use Category	Units	ITE Codes Included	Traffic Impact <sup>1,2</sup>	Adjustments		Adjusted Traffic Impact	Updated TSDC per Unit <sup>3</sup>	Updated TSDC per Unit <sup>3</sup> [Effective 07-01-2019; 4.9307% CPI Increase]
				% Diverted Link Trips	Pass-by %			
<b>Shopping/Retail</b>	1,000 Gross Square Feet Leasable Area	820, 826, 862, 863, 867	43.63	13	34	23.21	\$10,665	\$11,191
<b>Pharmacy</b>	1,000 Gross Square Feet	880, 881	93.49	14	51	33.27	\$15,288	\$16,042
<b>Furniture Store</b>	1,000 Gross Square Feet	890	5.06	-	53	2.38	\$1,093	\$1,147
<b>Bank</b>	1,000 Gross Square Feet	911, 912	148.15	26	35	57.78	\$26,548	\$27,857
<b>Restaurants</b>	1,000 Gross Square Feet	925, 931, 932	108.55	27	44	32.75	\$15,048	\$15,790
<b>Fast Food</b>	1,000 Gross Square Feet	933, 934	496.12	23	50	133.95	\$61,548	\$64,583
<b>Coffee/Donut Shop</b>	1,000 Gross Square Feet	936, 937	818.58	-	89	90.04	\$41,373	\$43,413
<b>Quick Lubrication Veh. Shop</b>	Service Positions	941	44.12	-	42	25.59	\$11,757	\$12,336
<b>Automobile Care Center</b>	1,000 Gross Square Feet	942	26.44	-	42	15.33	\$7,045	\$7,392
<b>Service Stations</b>	Fueling Positions	853, 944, 945, 946	161.39	32	51	27.11	\$12,456	\$13,070

<sup>1</sup> Based on Average Weekday Trips

<sup>2</sup> Italicized daily trip rate calculated as PM

<sup>3</sup> Includes compliance cost

# **Appendix C – County TSP Cost Estimate Assumptions**

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## Cost Estimate Assumptions

Date: January 7, 2013 Project #: 11732

To: Project Management Team

From: Susan L. Wright, P.E.; Marc A. Butorac, P.E., P.T.O.E.; Kelly M. Laustsen; and Erin M. Ferguson, P.E.; Kittelson & Associates, Inc; Gary Alfson, Otak

Project: Clackamas County Transportation System Plan Update

Subject: Cost Estimate Assumptions

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The following list documents the assumptions made in preparing cost estimates for the projects on the Master List for the Clackamas County Transportation System Plan (TSP) Update.

- The unit costs for each roadway classification was computed per lineal foot based on the classification provided in the Functional Classification and Urban or Rural columns in the KAI master spreadsheet and the attached table (Roadway Cost Estimates.xlsx) prepared by Otak.
- The total project costs have been estimated based on the length and roadway classification data provided in the KAI spreadsheet.
- Roadway costs were computed assuming reconstruction of the existing roadway when upgrading to full standards.
- Intersection improvement costs have been estimated using 500 feet per leg of the side street using the Rural Arterial classification section. This length was doubled for state highway intersections.
- Added turn lane costs have been estimated using 500 feet of a left turn lane of Rural Arterial classification, widening only one side of the existing roadway for right turn lanes and both sides for left turn lanes. This length was doubled for state highway intersections.
- For projects that included "turn lanes at major intersections," it was assumed the project will include left turns at all side streets of arterial and collector classifications. The intersections at the beginning and end of the segment were included.
- Driveways and private drives have not been included.



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- Projects listed as bikeways have been estimated using the “Bike lane widening, urban” classification, unless otherwise noted. The cost for this item also includes the construction of landscape strips and sidewalks.
  - Projects listed as pedways have been estimated using the “Sidewalk widening, urban” classification, unless otherwise noted.
  - Projects that listed the percentage of bikeway and pedways already completed have a percentage assigned to the overall length of improvements as follows:
    - 1-25% complete: improve 87.5% of project length
    - 26-50% complete: improve 62.5% of project length
    - 51-75% complete: improve 37.5% of project length
    - Not specified : improve 100% of project length.
  - Safety audit costs have been input at \$30,000 per mile in urban areas, \$15,000 per miles in rural areas.
  - Road closure costs have been input at \$30,000 each.
  - The costs for vertical realignment have not been included.
  - The cost for horizontal realignment has not been included beyond the length of the roadway improvements or the 500 foot long leg of intersection improvements.
  - The costs for right-of-way have not been included.
  - Water quality or detention facilities are not included.
  - Wetland impacts or sensitive area mitigation not included.
  - The estimated project costs have been taken from the “cost estimate from existing plans” or have not been provided when there is a lack of adequate information to estimate the project.
  - Estimates do not include traffic signal retrofit work, irrigation, culvert crossings, retaining walls, or sound walls. These could add significant costs to the project.
  - Bridge locations and lengths were estimated from Google Earth images when no other resource was available.
  - The undercrossing projects have been estimated using the bridge unit cost.

- Costs for public or franchise utilities are not included (water, sanitary sewer, power, natural gas, cable, telephone).
- Striping assumes thermoplastic materials.
- Signing frequency set at 200' o.c. in urban areas, 400' o.c. in rural areas.
- Earthwork based on 1.25' excavation/embankment across entire ROW. No rock excavation. Assumes 12" stripping (haul-off)
- Pavement section is assumed and may vary based on geotechnical recommendations and traffic volumes.