[DRAFT] Methodology Report

Transportation System Development Charges

Prepared For

City of Bend

March 29, 2011

Executive Summary

Background

The City of Bend (the City) embarked on an effort to update its transportation system development charges (SDCs) in January 2009. This effort was to include an analysis of a potential new overlay (also referred to as "supplemental") SDC for an area in north Bend, as well as an update to the City-wide SDCs. The overlay SDC was being considered as a potential funding source for the City's share of improvements to the Highway 97 and Cooley Road intersection project. Total City funding needs for Highway 97 and Cooley Road intersection improvements were estimated at approximately $50 million (including construction of the mid-term improvements, formation of a TMA in Juniper Ridge, and first phases of implementing the NE Bend Transportation Study projects), and were to be funded through a combination of SDC, urban renewal and land sales revenues.

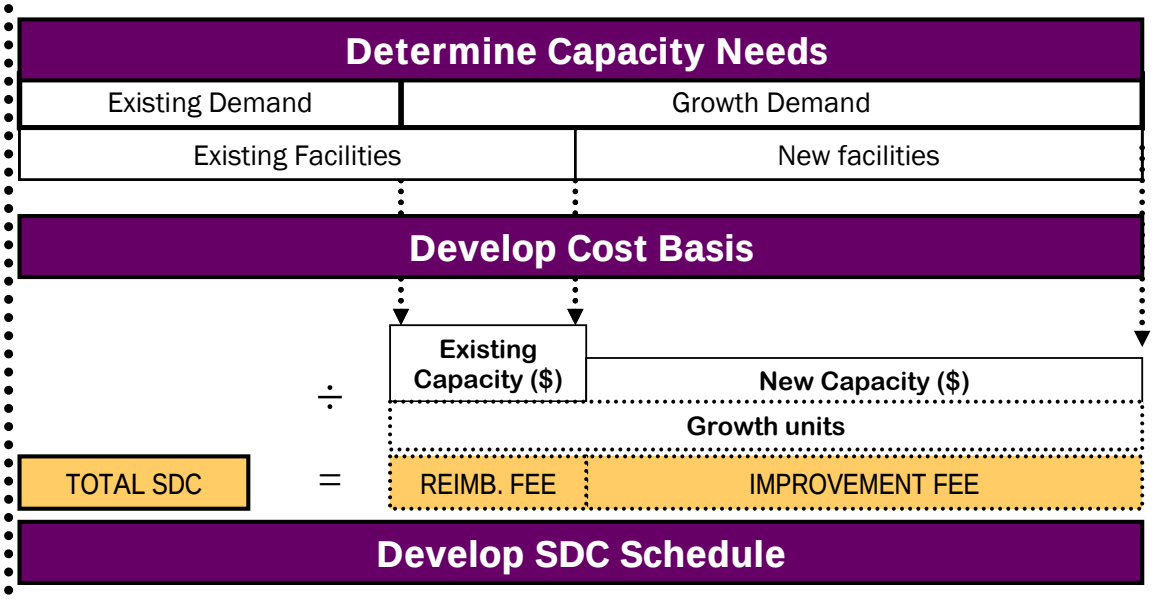
The objectives of the City-wide SDC update were to develop a new SDC project list and SDC fees that reflected current project needs and cost estimates, and to update the methodology consistent with current industry standards.

Summary of Methodology

The recommended SDC methodology is based on a combined reimbursement and improvement structure. This structure, which is shown graphically in Figure 1, consists of the following three elements:

- Determine capacity needs
- Develop cost basis
- Develop SDC rate schedule

FIGURE 1-1—OVERVIEW OF RECOMMENDED SDC METHODOLOGY



The reimbursement fee is based on the value of available capacity in the system that will serve growth. The improvement fee is based on future capital costs associated with providing growth's additional capacity needs (above what is already available in the system). Together, the reimbursement and improvement fees recover costs equal to growth's capacity needs.

The cost basis of existing capacity is divided by the forecast growth units (trips) to determine the reimbursement fee per trip. The cost basis of new capacity is divided by the forecast growth units to determine the improvement fee per trip. Finally, the reimbursement fee and improvement fee for individual developments are determined by multiplying the fees per trip by the number of trips attributed to the development. As discussed below, a compliance charge is added to determine the total SDC payable (reimbursement fee plus improvement fee plus compliance charge).

Major Findings

Potential Overlay SDC

The Transportation SDC update included an analysis for a possible Transportation SDC overlay area that would contribute funds to the US 97/ Cooley Road intersection improvements. At the time the overlay SDC concept was first envisioned, the intersection of US 97/Cooley Road was operating near capacity and above ODOT's mobility standard, restricting the ability to approve significant land uses in the area. The improvements identified for US 97/Cooley Road (i.e., the Mid-Term Concept) to provide relief from congestion were not necessarily part of ODOT's long-term corridor solution and therefore, non-ODOT funding sources were needed for project implementation. The overlay SDC was evaluated as an equitable funding option, as the improvements envisioned for the intersection could potentially provide a disproportionate benefit to new development within the overlay area, compared to development elsewhere in the city.

The SDC analysis determined that potential overlay SDCs would range from $2,500 per trip to over $6,000 per trip, depending on the methodology used. A memorandum summarizing the overlay SDC analysis and methods is included in Appendix A of this report.

Over the course of the SDC Update project, development and other conditions continued to evolve with respect to the overlay area and the planned improvements. Specifically, traffic volumes and near-term development pressures were reduced (as a result of the economic recession) and the improvements were being viewed as part of a longer-term solution that provided City-wide benefit in addition to supporting development in the overlay area. Discussions with ODOT on the nature of the improvements continued, with smaller scale 'practical design' options being considered. In addition, the City and ODOT were pursuing a funding partnership for the improvements as part of the Juniper Ridge Employment Sub-District rezone agreements.

As both the nature of the improvements and potential funding sources changed, the rationale for an overlay SDC was reduced. As a result, various improvements for the north area of Bend are included in the City-wide project list, for the purposes of the current SDC Update. In the future, if local development pressure increases and ODOT is unable to fund their portion of the improvements in a desirable timeline, the overlay SDC may be reconsidered as a viable option.

City-Wide SDC Update

Improvement Fee Cost Basis

A summary of the SDC improvement project costs by project type is provided in Table ES-1. The full project list can be found in Appendix B (Table B-1). As shown in Table ES-1, the SDC Project list includes 206 planned improvements within the 2030 planning period. The planned improvements include new facilities and upgrades to existing facilities in order to increase capacity and improve the level of performance of the transportation system.

Table ES-1
SDC Project List
Summary of Improvement Projects by Category and Need

Category	# of Projects	Total $	Growth $	Growth %	% of Total Growth Cost
New Road Construction					
Capacity	7	$25,800,974	$25,800,974	100%	17.4%
Safety	11	$29,056,078	$7,606,657	26%	5.1%
Modernization					
Capacity	14	$46,721,482	$14,198,746	30%	9.6%
Safety	22	$39,703,143	$12,352,803	31%	8.3%
Multimodal	63	$13,372,578	$13,372,578	100%	9.0%
Intersections					
Capacity	32	$49,841,606	$49,256,606	99%	33.3%
Safety	23	$19,243,982	$5,540,682	29%	3.7%
Multimodal	2	$1,482,000	$1,482,000	100%	1.0%
Other	3	$1,966,000	$603,866	31%	0.4%
Crossing	9	$16,623,563	$5,840,419	35%	3.9%
Other	1	$35,000	$7,933	23%	0.0%
ODOT					
Capacity (Performance)	8	$37,400,000	$10,545,667	28%	7.1%
Safety	2	$210,000	$46,443	22%	0.0%
Multimodal	9	$1,333,934	$1,333,934	100%	0.9%
Total Improvement Projects	**206**	**$282,790,340**	**$147,989,307**	**52%**	**100%**

The total estimated costs of the planned improvements are $282.8 million.[1]

Project Cost Allocations

Table ES-1 shows that of the total costs on the SDC improvement project list, almost $148 million (52 percent of costs) are growth-related, based on a capacity analysis of each project. These project cost allocations reflect the following methods for determining growth's share:

1. New Road and Intersection Capacity Projects; Multimodal Projects – capacity analysis uses a "standards-based" approach, whereby growth costs are equal to total future project costs less any existing deficiencies, where existing deficiencies are defined by:
    - Roadways and Intersections – current volume to capacity ratios > 1.0

[1] Projects included in the safety, multimodal and other categories may increase capacity and the costs attributable to the increase in capacity may be allocated to improvement fees.

- Multimodal Projects – existing population capacity need (as determined by the current population X the future planned linear feet of bike and pedestrian facilities per capita), less current linear feet of bike and pedestrian facilities.

2. Level of Performance Improvements (Improvements to existing facilities to address safety and other performance considerations) – capacity analysis uses a "capacity utilization" approach, where the growth share is equal to the percent of future 2030 trips, generated by new development in the City's UGB, based on data from the Bend MPO travel demand model.

Using these approaches, new roadway and multimodal project costs are allocated 100 percent to new development, as there are no existing deficiencies. Intersection capacity costs are allocated 99 percent to growth, reflecting an existing deficiency for the 4th Street/Butler Market intersection only. The remaining project categories reflect an allocation to growth of 22 percent to 35 percent, based on the average of individual trip volume allocations within the category.

Reimbursement Fee Cost Basis

The reimbursement fee is calculated based on the original cost of reserve capacity from arterial and collector street improvements built with city funds (exclusive of grants and developer contributions) since 1996. Specific projects included in the reimbursement fee cost basis are shown in Table B-2. The total value of the completed projects is $73.1 million, of which $21.0 million is allocated to growth, based on new development's share of the future 2030 traffic volumes on each roadway segment and intersection.

Maximum-Allowable SDC Schedule

Based on the project lists and the cost allocation approaches described above, the maximum-allowable cost per trip is equal to $7,975, and is comprised of the following components:

$6,948 (improvement fee) + $1,027 (reimbursement fee) = $7,975 combined fee

The reimbursement fee includes a portion of historical interest costs, associated with debt financing of completed projects. In addition, local governments are entitled to include in the SDCs, a charge to recover costs associated with complying with the SDC law. Compliance costs include costs related to developing and administering the SDC methodology, project list, and credit system, as well as annual accounting costs. The compliance charge per trip is calculated to be $83 per trip.

The transportation SDC for an individual development is based on the cost per trip ($8,058, including the compliance charge), and the number of trips attributable to a particular development, where the number of development trips is computed as follows:

Number of Development Trips = Trip Generation Rate X Adjustment Factor X Development Units

The standard practice in the transportation industry is to use Institute of Transportation Engineers (ITE) trip generation rates to determine the SDCs for *individual* developments. Adjustments are limited to pass-by trip factors for retail land uses. Pass-by trips refer to trips that occur when a motorist is already on the roadway, as in the case of 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 trip on the roadway.

Fiscally-Constrained SDC

Tables ES-1 and B-1 represent the total project costs that have been identified to meet the needs of existing and future development through 2030. In order to maintain the transportation SDC at current levels (about $4,500 per trip), staff prioritized improvement projects and developed a fiscally-constrained list, as shown in Table C-1 (Appendix C). The total costs of the projects included on the fiscally-constrained list are $111.7 million, or which $72.8 million is related to meeting the capacity needs of future growth. Using the fiscally-constrained project list, the combined SDC is $4,444 without the compliance charge ($4,527 with compliance charge.)

$3,417 (improvement fee) + $1,027 (reimbursement fee) = $4,444 combined fee

Example SDCs, based on the fiscally constrained unit costs are shown in Table C-2. The SDC for a single family dwelling unit is $4,572, based on the current (Volume 8) Trip Generation handbook. The SDCs shown in Table C-2 include the reimbursement fee, the improvement fee, and the compliance charge.

Report Contents

This report is organized as follows:

- **Executive Summary** – Provides a summary of the SDC methodology and major project findings.
- **Section 1 – Introduction** – Provides background on transportation SDCs in Bend, and summarizes the project objectives and SDC statutory requirements.
- **Section 2 – Project List Development** – Provides information on the project identification and cost estimation process.
- **Section 3 – Capacity Analysis** – Presents the approaches used to allocate project costs between existing development and growth.
- **Section 4 – Cost Basis** – Summarizes the maximum-allowable reimbursement and improvement costs, based on the approaches and assumptions presented in Section 3.
- **Section 5 – SDC Schedule** – Provides information on maximum-allowable system-wide unit costs, the process for assessing SDCs to individual developments, and method for updating for future cost escalation.
- **Section 6** – **Fiscally-Constrained SDC** – Presents a modified improvement fee cost basis and SDC comparable to existing transportation SDC levels.
- **Section 7 – Implementation Considerations** – Provides information on process for amending SDCs, providing credits, and other implementation issues.

Appendix A – Overlay SDC Analysis

Appendix B – SDC Improvement Project Lists and Completed Project List (Reimbursement Fee)

Appendix C – Fiscally-Constrained SDC Project List and Sample SDCs

SECTION 1

Introduction

Background

The City of Bend (City) adopted its current transportation system development charge (SDC) methodology in 2003 (documented in the report, "Transportation System Development Charge Methodology Review", FCS Group). The current methodology is based on the uniform application of SDCs city-wide (i.e., there are no geographically-differentiated SDCs). The City is projecting the need for significant investment in high priority major transportation road projects city-wide, including improvements on state facilities such as Highway 97 at Cooley Road (i.e., the Mid-Term Project). The City and ODOT have signed an intergovernmental agreement (IGA) that defines the funding and timing for the Mid-Term project. The Mid-Term project is needed to facilitate approval from ODOT for rezoning and development in the north area of Bend and relates to the first major land rezoning in Juniper Ridge.

The City embarked on an effort to update its transportation SDCs, including evaluation of a new overlay (also referred to as "supplemental") SDC for an area in north Bend, as well as an update to the City-wide SDCs. 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 the City's infrastructure funding needs. A major component of the Project was to update the transportation system capital project list. The City's Transportation System Plan (TSP) has not been updated since the current SDCs were adopted; however, some projects and costs have been refined through the capital improvement planning process, as well as area-specific studies (e.g. Northeast Bend Transportation Study and other corridor studies). Furthermore, the City has experienced significant growth and construction of facilities since the current SDCs were adopted.

Project Objectives

Specific project objectives included:

- Evaluation of a supplemental SDC that, along with property sales and urban renewal resources, would provide funding for the Mid-Term project.
- Development of a city-wide SDC methodology that will result in an equitable and defensible allocation of transportation improvement costs to new development within the planning period.
- Key stakeholders will be informed of the process and provided the opportunity to give feedback on the preliminary analysis and recommendations.

This report describes the updated SDC methodology and calculations for the City's transportation system. The revised methodology and calculations are consistent with the framework set forth by Oregon SDC legislation (ORS 223.297-314).

Stakeholder Involvement

As part of the Project, the City engaged a number of stakeholders in the project list and methodology development process. Major stakeholders included the following:

- **Bend City Council**: Council met in work sessions to review the SDC overlay proposal and the SDC methodology.
- **Juniper Ridge Management Board**: The Board reviewed the proposed SDC Overlay methods and proposals.
- **Central Oregon Builders Association (COBA):** City staff met three times with a sub-committee of COBA to review and comment on the methodology, project lists and costs.
- **Existing City residents:** The SDC report that includes the methodology and project list will be reviewed during the City Council adoption process.

Feedback collected through these meetings helped formulate the Project recommendations.

Oregon SDC Law

Oregon Revised Statutes 223.297-223.314 authorize local governments to assess SDCs for the following types of capital improvements:

- Drainage and flood control (i.e., storm water)
- Water supply, treatment, and distribution
- Wastewater collection, transmission, treatment, and disposal
- Transportation
- Parks and recreation

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. A summary of key provisions is provided below.

SDC Structure

Oregon law allows that an SDC may include a reimbursement fee, an improvement fee, or a combination of the two.

Reimbursement Fee

The reimbursement fee is based on the value of available reserve capacity associated with capital improvements already constructed or under construction. The methodology used to calculate the reimbursement fee must consider the cost of existing facilities, prior contributions by existing users, the value of unused capacity, grants, and other relevant factors. The objective of the reimbursement fee methodology is to require new users to contribute an equitable share of the capital costs of existing facilities. When new users connect, they pay for their share of the available reserve capacity through the SDC reimbursement fee, and the money received can be used to retire existing debt or to fund other capital needs.

Improvement Fee

The improvement fee is designed to recover all or a portion of the costs of planned capital improvements that add system capacity to serve future customers. Revenues generated through the improvement fees are dedicated to funding capacity-increasing capital improvements or the repayment of debt on capacity-increasing improvements.

Credits

The legislation requires that a credit be provided against the improvement fee for the construction of "qualified public improvements." Qualified public improvements are improvements that are required as a condition of development approval, identified in the system's capital improvement program, and either (1) not located on or contiguous to the property being developed, or (2) located in whole or in part, on or contiguous to, property that is the subject of development approval and required to be built larger or with greater capacity than is necessary for the particular development project to which the improvement fee is related.

Review and Notification Requirements

The methodology for establishing or modifying improvement or reimbursement fees shall be available for public inspection. The local government must maintain a list of persons who have made a written request for notification prior to the adoption or amendment of such fees. The notification requirements for changes to the fees that represent a modification to the methodology are 90-day written notice prior to first public hearing, with the SDC methodology available for review 60 days prior to public hearing.

Other Provisions

Other provisions of the legislation require:

- Preparation of a capital improvement program or comparable plan (prior to the establishment of a SDC), that includes a list of the improvements that the jurisdiction intends to fund with improvement fee revenues and the estimated timing, cost, and eligible portion of each improvement.
- Deposit of SDC revenues into dedicated accounts and annual accounting of revenues and expenditures, including a list of the amount spent on each project funded, in whole or in part, by SDC revenues.
- Creation of an administrative appeals procedure, in accordance with the legislation, whereby a citizen or other interested party may challenge an expenditure of SDC revenues.

The provisions of the legislation are invalidated if they are construed to impair the local government's bond obligations or the ability of the local government to issue new bonds or other financing.

SECTION 2

Project List Development

Introduction

The project list was developed in close coordination with City staff, and was informed by previous project lists (previous SDC list, adopted Capital Improvement Program, Transportation System Plan, Bike and Pedestrian Priority Lists, and Corridor Studies). The objective was to prepare a comprehensive transportation improvement project list in order to determine the full extent of system needs and costs, for potential use in calculation of the updated SDCs.

Project Identification

Identification of projects for the updated Project List followed a four-step process:

1. The 2006 SDC Project List was reviewed and updated by City staff to reflect projects completed since the last SDC Project List completion.
2. The project list was expanded to include 2009 Transportation System Plan projects. The resulting list includes projects inside and outside the current Urban Growth Boundary.
3. Additional documents were used to develop the overall project list including the Murphy Road Corridor Study, Reed Market Road Corridor Study, and the Empire Road Corridor Study. In addition, staff reviewed bike priority lists developed by the Deschutes County Bike and Pedestrian Committee, Safety priority projects developed by the Traffic Safety Advisory Committee, and projects identified in consultation with the City ADA Manager.
4. From the complete project list, projects outside the current UGB or with a project date beyond 20 years (2030) were identified for exclusion from the SDC Project List.

The SDC Project List is set up using corridors as the main identifier. Corridors were established around the City to help group potential projects together. Under each corridor, the project is identified by street and location as well as a project description. Additional information is included to help sort and filter the list. This includes whether the project is within the current UGB, related to the Juniper Ridge Special Planned Area, or related to the Murphy Crossing project. Each project also has the adopted plan or program identified, what type of improvement is planned, the need for the improvement, and the project timeline. Additional information regarding the project list is included below.

The SDC Project List is shown in Appendix B.

Project Types

A total of 10 different typical project types were estimated, as follows:

1. New road construction - projects in areas where no improvements currently exist

2. Full modernization - projects requiring full reconstruction
3. Partial modernization - projects not anticipated to need full reconstruction, but will require partial improvements
4. Intersection modernization – intersection improvement projects
5. Crossing structures – bridges and other structures
6. Others – uncategorized projects
7. Completed – completed projects
8. Studies – traffic, corridor, and area studies
9. ODOT facilities – projects within ODOT facilities, some of the projects do not have associated costs because they are anticipated to be completed by ODOT
10. TSP project, no improvement planned - projects from the TSP list which are not anticipated to be completed

Project Drivers/Needs

The need for each project is identified and classified as:

- Capacity - Capacity related projects are mainly intersection and corridor improvement related and are needed to improve traffic operations.
- Safety - Projects which have safety issues, but not necessarily capacity issues are identified with a safety need. However, safety projects often provide some increase in capacity through improved performance.
- Multi-modal - Multi-modal projects are identified projects to improve bike and pedestrian mobility and increase capacity for bike and pedestrian traffic
- Others - The projects not specifically tied to one of the first three categories are identified as others.

Project Timeline

Each project has an anticipated date the project will be needed. The project timelines have been categorized as:

- Immediate (short term need)
- Future (within 20 year planning period - 2030)
- Developer (private developers will complete by 2030)
- Beyond 2030 (outside of current planning window)

Project Cost Estimation

The project description was used to develop the project improvement and estimated project costs were developed for each project description. Based upon the project type, and previous cost estimates completed, as described below, these could be either lump sum or lineal foot estimates. These costs are to be used for general use and attempt to present

representative project costs for each project type. While individual projects may be higher or lower as detailed designs and estimates will later determine, these estimates are based on the best information regarding average costs, and the total costs are intended to represent a sum of the average costs to construct typical projects.

Table 2-1 presents a summary of key unit cost estimates.

Table 2-1
Unit Price Assumptions

Project Description	Estimated Unit Cost	Units
Capacity Three Lane Arterial	$606	/LF
Full Signal/Intersection Improvements	$770,000	LS
Multi-Lane Roundabout	$2,800,000	LS
Muli-use Trail, Curb, Sidewalk Infill and ADA Ramps	$409	/LF
New 2-Lane Collector	$546	/LF
New 3-Lane Arterial	$687	/LF
New 3-Lane Collector	$550	/LF
New 5-Lane Arterial	$786	/LF
New Bridge	$1,890,000	LS
New Traffic Signal	$378,000	LS
Partial Widening, Curb, Bike Lanes, Sidewalk Infill and ADA Ramps	$183	/LF
Roundabout Upgrade	$308,000	LS
Sidewalk Infill and ADA Ramps	$70	/LF
Signal Modification	$210,000	LS
Signal Modification/Lane Addition	$350,000	LS
Single Lane Roundabout	$1,120,000	LS
Upgrade 2-lanes to 3-lanes (left turn)	$581	/LF
Upgrade 2-lanes to 3-lanes (left turn) with bike lanes and sidewalks	$492	/LF
Upgrade 3-Lane Arterial	$504	/LF

Roadways

Roadway project costs were developed using lineal-foot cost estimations. A general understanding of each project description was used to determine the improvements needed. Unit costs were applied to the line item improvements to develop a construction cost estimate for each project. The unit costs were developed by reviewing past project bids, including private development projects, capital improvement projects, and the ODOT Region 4 Weighted Average Item Price Report by Region, Item, and Quarter from July 2007 through June 2009. Examples of past projects reviewed include private development such as recent NorthWest Crossing projects and City improvements such as the Cooley Road & 18th Street improvements and the Butler Market and Brinson intersection improvements. Engineering, surveying, construction administration, inspection, and contingencies were then added as a percentage of the construction estimate. The intent of the project costing is to utilize unit costs that do not represent either previous peak prices or the current trough. Rather, the costs should represent median unit prices.

The lineal-foot project cost was then applied to each project using the project length included in the project list development. Using aerial photos, a percentage of length requiring improvement was developed for the partial modernization projects. This percentage is then applied to the overall project cost to make allowance for segments that are already improved.

Other Projects

A lump sum project estimate was prepared for projects which do not fit into a lineal-foot type project. These include work from previous project developments (i.e. corridor studies), intersections, and structures. For the lump sum projects, either the estimate completed with previous project development or a general average of similar previous projects was used for the estimate. The complexity and variables involved with intersection and structure projects are the reason these were reviewed as lump sum projects. Little or no design has been completed on these projects, so an estimate was completed to obtain an average project cost. Some improvements will be less extensive and expensive than the estimate, some more. Engineering, surveying, construction administration, inspection, and contingencies were then added to develop an estimated project cost. If these "soft costs" were included in the estimates from prior project development, they were not included separately.

Based upon common industry practices, the following percentages of total construction costs were used for the soft costs;

- Engineering/Surveying 15%
- Construction Administration/Inspections 15%
- Contingency 10%

Right of Way

Right of way costs were estimated for each project type. If right of way costs were included in prior project development estimates, they were left as part of the construction cost estimation. Right of way needs were reviewed for new road construction, full road modernization, and intersections. It is assumed small partial modernization projects will not require additional right of way.

New road construction and full road modernization projects were reviewed based upon current right of way for these areas. These rights of way were then upgraded to meet current City of Bend standards based upon road classification. Through work with the City, the intersection right of way costs were developed separately. Due to the potential variations in right of way needs for each intersection type and geometry, a standard cost per intersection was developed for each intersection type for the purposes of the cost estimates. For a single lane roundabout, it is assumed the purchase of one corner lot is required as well as partial purchases of the remaining lots impacted. For a multi-lane roundabout, the purchase of two corner lots as well as partial purchases of the remaining lots impacted is assumed. Signalized intersections are assumed to require partial purchases of the impacted lots primarily at four corners.

Right of way costs do not include additional building purchase costs except for those included in the full lot purchases with the roundabout projects. Relocation costs are not included in the right of way costs.

SECTION 3

Determine Capacity Needs

Introduction

The capacity analysis forms the basis for determining the costs that will be recovered from growth through the SDCs. To comply with Oregon SDC law and industry standard practices, new development cannot be charged for costs associated with capacity needed for existing development conditions – either in the form of used capacity on existing facilities or future expansion needed to remedy existing deficiencies. To be defensible, the methodology must:

- Specify how capacity will be defined (e.g., pm peak volume, volume/capacity ratio, etc.)
- Evaluate existing facility capacity to determine whether existing mobility standards are being met, or if there are existing deficiencies
- Identify the list of projects needed to address growth needs and remedy existing deficiencies
- Allocate project costs between growth and existing development, based on the portion of each project that relates to providing capacity for growth vs. addressing an existing deficiency or future service level enhancement related to existing development.

This section describes the approach to determining growth capacity needs in general, and the methodologies used to determine growth's share of costs for different types of improvements.

System-Wide Growth Capacity Requirements

Like most infrastructure systems, roadway systems are designed to accommodate peak rates of use, which typically occur during the weekday afternoon period between the hours of 4 and 6 p.m. (the "PM peak"). Therefore, roadway system capacity is typically measured by trip generation and mobility standards during the PM peak.

To evaluate the roadway capacity needs and the amount of vehicle trips that are generated within Bend during the weekday PM peak, the Bend MPO regional travel demand model was utilized. The base year travel demand model was utilized to approximate the existing number of trips using the City street network. The future year (2030) travel demand model (including the ODOT STIP and City SDC network improvements) was utilized to determine the growth in trips generated within the City's currently acknowledged Urban Growth Boundary (UGB), as well as to evaluate how the "growth trips" would utilize the roadway network within the City.

Table 2-1 lists the total number of trip ends for the base year and future year scenarios, broken down by trips that stay within the City's UGB and trips that have one end outside of the City's UGB. As listed, the total number of PM peak trips is forecasted to grow from approximately 38,000 trips ends to approximately 59,300 trip ends. The growth in PM peak trips (approximately 21,300) represents 36 percent of the total year 2030 trip ends within the City's UGB.

Table 3-1
Model Vehicle Trip Ends Growth (Within the City's currently acknowledged UGB)

	Internal-Internal	Internal-External & External-Internal	Total
Existing Trip Ends	27,900	10,100	38,000
Projected Trip Ends	41,900	17,400	59,300
Growth Trip Ends	**14,000**	**7,300**	**21,300**

Project Cost Allocations

The system-wide growth in trips will be accommodated by existing roadway reserve capacity, as well as planned future capacity expansion. Therefore, a key component of the SDC methodology is allocation of existing facility and planned future facility costs to growth, in proportion to estimated capacity requirements. According to SDC statutory requirements:

> *"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 are analyzed to determine the portion of costs needed for future growth capacity requirements versus costs associated with raising the level of service or correcting deficiencies for existing development. Two general methods are used for project cost allocations:

1. **New facilities** – "standards-based" approach, where the allocation of costs to existing development is limited to correcting any existing deficiency. Existing 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)"[2]. For multimodal improvements, the standard is linear feet per capita of bikeways and pedestrian ways.

2. **Level of performance improvements** – capacity utilization approach (as measured by share of 2030 trips). Improvements to existing facilities to address safety, modernization, and other performance considerations provide capacity for growth

[2] Volume-to-capacity ratio is defined as the ratio between the PM peak hour demand in motor vehicle trips divided by the hourly capacity of the facility to serve those trips. For intersections, the capacity of the intersection was determined by the *2000 Highway Capacity Manual Methodology* for stop-sign and traffic signal control and by the City of Bend's roundabout methodology for roundabout intersections. For roadway corridor segments, the average link capacity was determined by the link capacity values utilized in the Bend MPO regional travel demand model.

and enhanced performance for existing development, so the costs are allocated in proportion to the utilization of the facilities, as determined for each improvement individually.

Table 3-2 provides a summary of the allocation basis for existing and future development by major project type.

Table 3-2
Summary of Project Cost Allocations – Future Improvements

Project Type	Existing Share	Future Development Share
New Roadways Facilities (Capacity only)	Limited to existing deficiency (i.e., v/c ratio > 1.0)	100% - Existing Deficiency
New Intersection Facilities (Capacity only)	Limited to existing deficiency (i.e., v/c ratio > 1.0)	100% - Existing Deficiency
New Multimodal Facilities	Limited to existing deficiency (i.e., increase in level of service defined by linear feet per capita)	100% - Existing Deficiency
Level of Performance Improvements – Roadway and intersection safety and modernization (other than multimodal); crossings, ODOT, and other improvements	Existing development trips as a percent of total future 2030 trips	Future development trips as a percent of total future 2030 trips

The project cost allocations establish the maximum potential SDC-eligibility for each project. The City may elect to reduce the resulting SDC by funding few projects, or smaller portion of project costs from SDCs.

The cost allocation methodologies are discussed in more detail below.

Future Improvements -- New Roadway and Intersection Facilities (Capacity only)

New roadways and extensions driven by future development capacity requirements are allocated 100 percent to growth, since the capacity is needed entirely for new development. Similarly, new facilities at intersections 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 percent growth-related, since there is no existing deficiency.

To determine if projects were eligible for this category (i.e., no existing deficiency), existing operating conditions were evaluated to determine if facilities were operating with a v/c ratio less than the required standard. For roadways, the Bend MPO 2030 travel demand model was utilized to compare base year volumes to roadway capacity. For intersections, data was complied from recently completed studies (e.g., the Bend MPO MTP, the Bend UGB Expansion Analysis, the Juniper Ridge Employment Sub-District Transportation Study, and various City corridor studies) and new counts and evaluations were conducted as needed to evaluate each intersection improvement location. The only improvement location that was found to currently exceed operating standards is the intersection of Butler Market Road/4th Street.

Future Improvements – Level of Performance Improvements

For expansion/upgrade of existing facilities (i.e., roadway capacity projects, urban upgrades, and non-development driven intersection improvements), trip volume data by roadway link (from the Bend MPO 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.

The determination of growth's utilization of future roadway and intersection capacity was evaluated by a unique approach utilizing the travel demand model. Traditionally in SDC methodologies, the growth share of total future volume for each improvement is determined by a simple comparison of model volumes in a base year scenario and a future year scenario. However, this comparison does not take into account that existing "users" of the roadway network can change trip choices (destinations and routes) based on the conditions present in the future. For example, if a home owner today drives across town using 3rd Street to reach Home Depot, but in the future uses 18th Street and Cooley Road instead to avoid highway congestion, their utilization of the roadway network changes. Or maybe there is a closer home improvement store that the home owner can drive to in the future and avoid travelling to the north end of town. To address this factor in the SDC evaluation, the "existing share" for each roadway link and intersection improvement was determined by estimating a base year travel demand that takes into account future year destination choices (i.e., scaled 2030 trip-table to base year generation levels) and assigning those trips in the roadway network considering the network conditions that existing in the future year (i.e., year 2030 improved network with year 2030 congestion levels).

Future Improvements – 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) basis. The planned LOS is defined as the quantity of future facilities per capita served.

The following equation shows the calculation of the planned LOS:

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

Where:

Q = quantity (miles of bike or pedestrian facilities), and
Future Population Served (within the UGB) =119,009

The existing and future miles of bike and pedestrian facilities are shown in Table 3-3. As indicated, the total future linear feet (lft) of bikeways are 596,240, including the 501,600 lft. existing. Existing and future linear feet of pedestrian facilities are 702,240 and 934,931, respectively.

Table 3-3
Existing and Future Bike and Pedestrian Facilities

	Existing (lft)	Future (lft)	New
Bicycle Facility TOTALS	501,600	596,240	94,640
Pedestrian Facility TOTALS	702,240	934,931	232,691

Population for estimated existing (base year) and 2030 conditions is presented in Table 3-4. Growth during the planning period is estimated to be 36,729.

Table 3-4
Population Growth

	Estimated Base Year	Year 2030	Population Growth
Population	82,280	119,009	36,729

Table 3-5 presents the existing and planned LOS for bike and pedestrian facilities, based on the existing and planned future facilities presented in Table 3-3 divided by the estimated existing and projected 2030 population presented in Table 3-4.

Table 3-5
Existing and Planned LOS (lft. per capita)

	Existing LOS	Planned LOS
Bike	6.1	5.0
Pedestrian	8.5	7.9

The capacity requirements, or number of linear feet, needed for the existing population and for the growth population are estimated by multiplying the planned (future) LOS for each facility type (from Table 3-5) by the estimated population of each group (from Table 3-4). The need for the existing population is equal to the planned LOS multiplied by the estimated base year population (82,280). Existing users' needs are assumed to be met first by the existing inventory of facilities; any shortfall is assumed to come from planned improvements. The total capacity need required by growth is equal to the product of the planned LOS and the projected increase in population over the planning period (36,729).

Total capacity needs for the estimated existing and growth populations are shown in Table 3-6, based on the LOS and estimated population information shown in Tables 3-5 and 3-4. The additional need for facilities by the estimated existing population is equal to the total inventory needed less the existing inventory (from table 3-3). As Table 3-6 indicates, there is no current deficiency for the estimated base population, as the existing inventory exceeds the existing need. Furthermore, the growth need exceeds the additional capacity added by the improvements.

Table 3-6
Existing and Growth Capacity Needs for Bike and Pedestrian Facilities

	Estimated Base Population Need	Existing Inventory	Base Need from Improvements	Growth Need	Growth Need from Improvements
Bike	412,226	501,600	0	184,014	94,640
Pedestrian	646,389	702,240	0	288,542	232,691

Table 3-7 shows the existing and growth allocation for the planned improvements by project type. For growth, the allocated improvements are assumed to equal the total growth need (from Table 3-6) or the total additional planned units (from Table 3-3 and shown also in Table 3-6), whichever is less. In cases where the additional planned units are less than the total growth need, a portion of the existing inventory will be needed to fully serve growth. This is true for both bike and pedestrian facilities.

Table 3-7 Existing and Growth Allocation

	Total Planned Improvements (lf)	Existing Allocation (lf)	Existing %	Growth Allocation (lf)	Growth %
Bike	94,640	0	0%	94,640	100%
Pedestrian	232,691	0	0%	232,691	100%

As shown in Table 3-7, for bike and pedestrian facilities, the LOS decreases so there is no existing deficiency and all future improvements are needed to expand capacity in the system for growth.

Completed Projects

For recently constructed facilities, the travel demand model was used to determine new development's share of the future 2030 traffic volumes on each roadway segment and intersection, similar to the analysis used to determine growth's share of the future project improvements.

SECTION 4

Cost Basis

Introduction

The improvement and reimbursement cost bases represent the total costs of growth related capacity through 2030, as determined by the cost allocation analysis described in Section 3. Table 4-1 shows a summary of the improvement and reimbursement cost bases, by major component.

Table 4-1
Improvement and Reimbursement Cost Basis

Category	Total $	Growth $	Growth %
Improvement Fee Cost Basis			
New Road Construction			
Capacity	$25,800,974	$25,800,974	100%
Safety	$29,056,078	$7,606,657	26%
Modernization			
Capacity	$46,721,482	$14,198,746	30%
Safety	$39,703,143	$12,352,803	31%
Multimodal	$13,372,578	$13,372,578	100%
Intersections			
Capacity	$49,841,606	$49,256,606	99%
Safety	$19,243,982	$5,540,682	29%
Multimodal	$1,482,000	$1,482,000	100%
Other	$1,966,000	$603,866	31%
Crossing	$16,623,563	$5,840,419	35%
Other	$35,000	$7,933	23%
ODOT			
Capacity (Performance)	$37,400,000	$10,545,667	28%
Safety	$210,000	$46,443	22%
Multimodal	$1,333,934	$1,333,934	100%
Total Improvement Cost Basis	**$282,790,340**	**$147,989,307**	**52%**
Reimbursement Fee Cost Basis			
Completed Projects	$73,095,147	$20,989,477	29%
Financing Costs	$2,844,765	$880,315	31%
Total Reimbursement Cost Basis	**75,939,912**	**21,869,792**	**29%**

Improvement Fee

The improvement fee cost basis reflects allocation of individual projects from the SDC Project List; detailed information on the SDC project costs and allocations is provided in Table B-1 of Appendix B. Project cost allocation percentages reflect the approaches described in Section 3 for each project type.

As shown in Table 4-1, the total improvement costs are estimated to be $282.8 million, of which, $148.0 million (52 percent) is allocated to growth.

Reimbursement Fee

The reimbursement fee is calculated based on the original cost of reserve capacity from arterial and collector street improvements built with city funds (exclusive of grants and developer contributions) since 1996. Specific projects included in the reimbursement fee cost basis are shown in Table B-2. As shown in Table 4-1, the total value of the completed projects is $73.1 million, of which $21.0 million is allocated to growth, based on the capacity analysis described in Section 3.

Financing Costs

A portion of the completed projects were debt financed, and therefore carry additional financing costs. Table 4-2 shows the present value of remaining interest owed on the 2000 and 2003 bond issues. There are currently two bonds: Healy Bridge Improvements ($11,385,519 issued in 2003) and Olney Street ($5,892,817 issued in 2001). The growth share for each bond is calculated based on the projects financed. The total financing costs, associated with completed projects is $0.9 million.

Table 4-2

Financing Costs

2000 Bond (Refunded in 2010)	
Remaining Financing costs (1)	$741,667
Growth Share	22%
Growth financing costs	$163,167
2003 Bond	
Remaining Financing costs (1)	$2,103,098
Growth Share	34%
Growth financing costs	$717,148
Total Growth Financing Costs	**$880,315**

(1) Present value of future interest payments @ 3.2% and 3.5%

As shown in Table 4-1, the total reimbursement cost basis is $21.9 million, including financing costs.

SECTION 5

SDC Schedule

Introduction

The transportation SDC for an individual development is based on a unit cost per trip – the SDC cost basis divided by the system-wide growth in trips -- and the number of trips attributable to a particular development. This section presents the maximum-allowable unit costs per trip, based on the approaches described previously, and the growth in trips estimated in the City's traffic model.

Maximum-Allowable Unit Costs ($/Trip)

Based on the SDC Project List presented in Section 2, and the cost allocation approaches outlined in Sections 3, the maximum-allowable cost per trip is equal to $7,975, as shown in Table 5-1, and is comprised of the following components:

$6,948 (improvement fee) + $1,027 (reimbursement fee)

Table 5-1
Maximum Allowable Transportation Unit Costs of Capacity ($/Trip)

	Improvement SDC	Reimbursement SDC	Combined SDC
Cost Basis (1)	$147,989,307	$21,869,792	$169,859,100
Growth Trip Ends (2)	21,300	21,300	21,300
SDC per Trip End	**$6,948**	**$1,027**	**$7,975**

(1) From Table 4-1
(2) From Table 3-1

Compliance Charge

Local governments are entitled to include in the SDCs, a charge to recover costs associated with complying with the SDC law. Compliance costs include costs related to developing and administering the SDC methodology, project list (including but not limited to Transportation System Plan, and corridor studies), and credit system, as well as annual accounting costs.

Table 5-2 shows the calculation of the compliance charge per trip, which is $83.

Table 5-2
Compliance Costs

Category	**Annual $**
Finance	$12,597
Planning	$11,805
Engineering	$4,814
Building Department	$300
Transportation Engineering	$19,150
Public Works Administration	$3,952
City Administration	$10,800
SDC Methodology (1)	$14,000
TSP & Corridor Studies (1)	$11,429
Total Compliance Costs per Year	$88,847
Estimated Annual Growth Trips (2)	1,065
Compliance Cost per Trip	**$83**

(1) Annual costs reflect amortization of total cost over 10 years

(2) 21,300 trip ends divided by 20 years

SDC Assessment

The transportation SDC for an individual development is based on the cost per trip (including the reimbursement and improvement fees, and the compliance charges) and the number of trips attributable to a particular development, where the number of development trips is computed as follows:

Number of Development Trips = Trip Generation Rate X Adjustment Factor X Development Units

An adjustment factor for trip-length has been considered in the past for several jurisdictions adoption SDCs. However, the available data to reasonably estimate average trip length for a given land use type in comparison to other uses is extremely limited. Furthermore, trip length may be more directly attributable to location within an area and the availability of other similar uses in the area than it is to simply the type of use. Therefore, trip-length adjustments are not included in this methodology.

Trip Generation Rates

The City uses Institute of Transportation Engineers (ITE) trip generation rates to determine the SDCs for *individual* developments. Use of ITE trip generation manuals is standard in the transportation industry. ITE trip rates by land use are based on studies from around the country, and in the absence of local data, represent the best available source of trip data for specific land uses.

Pass-By Trip Adjustments

Pass-by trip adjustments are applied to the ITE trip rates for certain land use types. Pass-by trips refer to trips that occur when a motorist is already on the roadway, as in the case of 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 trip on the roadway. Trip adjustments are generally limited to retail land uses. Diverted-link trips are not included as part of the pass-by trip adjustment.

Annual Inflationary Adjustments

Per the City's current SDC policy, the transportation SDCs should continue to be adjusted based on an inflationary index. The City uses the Engineering News Record (ENR) 20 City Construction Cost index as the basis for adjusting all of its SDCs.

SECTION 6

Fiscally-Constrained SDC

Introduction

The project costs summarized in Sections 4 and 5 (and provided in detailed in Appendix B), represent the total project costs that have been identified to meet the needs of existing and future development through 2030. In order to maintain the transportation SDC at current levels (about $4,500 per trip), staff prioritized improvement projects and developed a fiscally-constrained improvement list and SDC, presented in this section.

Fiscally-Constrained Unit Costs ($/Trip)

The total costs of the projects included on the fiscally-constrained list (Table C-1 in Appendix C) are $111.7 million, or which $72.8 million is related to meeting the capacity needs of future growth. Using the fiscally-constrained project list, the combined SDC is $4,444, as shown in Table 6-1.

Table 6-1
Fiscally-Constrained Transportation Unit Costs of Capacity ($/Trip)

	Improvement SDC	Reimbursement SDC	Combined SDC
Cost Basis (1)	$72,785,261	$21,869,792	$94,655,053
Growth Trip Ends (2)	21,300	21,300	21,300
SDC per Trip End	$3,417	$1,027	$4,444

As for the maximum-allowable SDCs, compliance costs of $83 per trip are added, for a total cost per trip of $4,527.

Sample SDCs

Example SDCs, based on the fiscally constrained unit costs are shown in Table C-2. The SDC for a single family dwelling unit is $4,572, based on the current (Volume 8) Trip Generation handbook. The SDCs shown in Table C-2 include the reimbursement fee, the improvement fee, and the compliance charge.

SECTION 7

Implementation Considerations

Impact on Credits for Qualified Public Improvements

As indicated in Section 1, Oregon SDC statutes require that the City provide credits against the improvement fees for construction of "qualified public improvements." Credits will be provided according to applicable provisions of the Bend Code.

Alternative Trip Generation Calculation

The City's local land use code contains provisions to require a Traffic Impact Analysis (TIA) to be submitted and approved for certain types of developments. Developments that must comply with the TIA requirements are provided with an opportunity to combine that process with a request for an alternate trip rate calculation.

Amending the Project List

It may be necessary to amend the fiscally constrained project list in Table C-1 as projects are built or as development patterns change. Any amendments to Table C-1 would be adopted following the procedures listed in the Bend Code and state SDC statutes.

Appendices

MEMORANDUM

Transportation SDC Update – Revised Overlay Calculations

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DATE: September 25, 2009

Introduction

In July 2009, the Consultant Team developed preliminary estimates of transportation system development (SDC) calculations for the overlay area, reflecting the alternatives presented in a memorandum from March 2009: *Overlay Concept, Evaluation Criteria and Preliminary Alternatives*. That memorandum defined the alternatives based on three variables

1. **SDC Model –** how the SDCs will be assessed to new development, either:

   - Portland overlay model: SDCs differ in overlay area vs. city-wide, with the overlay area subject to a uniform overlay SDC to recover mid-term improvement costs. The overlay charge would be in addition to the City-wide SDC.
   - Wilsonville overlay model: SDC for mid-term improvements would vary by TAZ throughout the City, based on each TAZ's estimated impact (trips) on the corridor. The overlay charge would be in addition to the City-wide SDC.
   - City-wide: The mid-term improvement costs would be included in the City-wide SDC, so all costs would be spread across new growth throughout the City and a single SDC would apply to all new development.

Preliminary discussions with staff on July 24, and August 13, 2009 indicated a preference for the Portland model, if an overlay SDC is to be implemented. The Portland model would likely be easier to implement (i.e, significantly less administrative effort compared to the Wilsonville model) and explain to the public, as all new development in the overlay area would be assigned a uniform cost per trip.

2. **Planning horizon variations –** application of different trip rate and land use assumptions based on:

   - 2015 model (ITE trip rates applied to overlay area land uses; mid-term capacity improvements fully utilized by 2015)
   - 2030 (MPO Model used as basis for trip generation – mid-term capacity improvements fully utilized by 2030)

Preliminary discussions with staff indicated a preference for the 2015 planning horizon, as this approach assigns a greater share of the cost responsibility to development within the overlay area which is consistent with the Council goal to focus investment for economic development.

Furthermore, the 2030 analysis is based on the current Bend MPO travel demand model, which is influenced by UGB uncertainties; the 2015 analysis reduces this bias from UGB assumptions

3. **Capacity analysis –** (see Technical Memorandum #2 for more detail) growth allocation determined either by:

   - Trip generation: (growth share = growth trips/total future trips)
   - Standards v/c basis (1.0 vs. 0.8 standard): growth share = 100% assuming v/c = 1.0 (intersection is currently meeting standard, so no existing deficiency)

A final decision has not been made on how growth costs will be determined – either based on trip generation (the basis for the current City-wide SDC methodology), or based on v/c ratios. However, the trip generation basis – which results in a shared allocation of costs between SDCs and other funding sources – may better reflect the City's plans to apply a portion of urban renewal and land sales revenues to the project, thus reducing the SDC burden on development in the overlay area.

Preliminary Calculations

Table 1 presents a summary of the preliminary results based on the 2015 planning horizon and the Portland model, including both growth allocation alternatives. Using trip generation to allocate costs between existing and new development, results in an existing development being responsible for $18.2 million of project costs, in addition to $12.7 million attributable to through trips (trips with neither an origin nor destination in the City limits). In this case, growth is allocated $19.1 million, of which growth in the overlay area is allocated $18.0 million, resulting in an SDC of $2,449 per new trip end. The City-wide SDC under the trip generation basis, would increase the city-wide SDC by $53 per trip end, thus the total SDC increase for new development in the overlay area would be $2,503.

Table 1
City of Bend Transportation SDC Update
Summary of Preliminary Overlay SDC Calculations

	Costs ($ Million)	SDC ($/Trip End)
Total Project Costs	$50.0	Na
Trip generation basis		
Existing trips	$18.2	Na
Through trips	$12.7	Na
Growth		
Overlay	$18.0	$2,449
City-Wide	$1.1	$53
Total	***$50.0***	***$2,503***
V/C basis		
Existing (deficiency)	$0.0	Na
Growth		
Through Trips	$2.1	Na
Overlay	$45.1	$6,154

City-Wide	$2.8	$133
Total	***$50.0***	***$6,287***

As shown in Table 1, when a V/C basis is used, there is no existing deficiency, as the intersection is currently performing below the required standard of 1.0. Therefore, all of the costs are potentially growth-related, though the SDCs cannot recover capacity costs related to through trips where represent about 4 percent of capacity needs. Growth in the overlay area is allocated $45.1 million (90 percent of costs), based on an analysis of impacting trips. The overlay SDC would be $6,154 per trip end under this alternative. City-wide growth would pay the remaining 6 percent of costs ($2.8 million), resulting in an increase in the City-wide SDC of $133.

Additional Considerations

Updated Traffic Volume Data

Subsequent to the development of the preliminary analysis described above, the City, in conjunction with DKS Associates, updated existing traffic volumes to current year 2009 data along the Mid-Term project corridor as part of the Juniper Ridge Employment Lands Transportation Study. The updated data show a decrease in existing volumes (compared to 2007), reflecting current economic conditions that have resulted in higher vacancy rates and commercial activity in the area, as well as reduced tourism-related traffic. While existing traffic volumes have decreased, the *capacity requirements* for existing development have not decreased, as trip volumes associated with existing development is likely to return to previous levels following economic recovery. This recovery of existing land use trips will not be assessed additional SDCs, unless an existing development expands it use. Therefore, the allocation of costs associated with the Mid-Term improvement do not change, nor do the preliminary SDCs presented in Table 1.

Update of Base Year Analysis for 2030 Alternatives

As part of our earlier discussions on the overlay alternatives, it was noted that the base year (existing) trip end data used in the 2030 alternatives were based on 2003 data (reflecting the Bend MPO model). Subsequent to development of the preliminary alternatives, the growth trip generation estimates were updated to reflect a base year of 2009 by assuming a straight-line growth from 2003 to 2030. The base year adjustment resulted in changes for the 2030 alternatives calculations. However, this modification does not impact the 2015 analysis (presented in Table 1), which was based on more recent data and assumptions.

Revised Project Configuration

The City and ODOT continue to have discussions about the transportation improvements needed in northeast Bend and how funding responsibility will be shared. The analysis presented in Table 1 is based on implementing the US 97/Cooley Road Mid-Term improvement concept and assumed City funding responsibility of $50 million. Potential alternatives now being discussed include replacement of the US 97/Cooley Road Mid-Term project with a 2-part project, comprised of 1) Cooley Road grade separation of the railroad and US 97, and 2) improvements to construct a North interchange with an 18th Street extension, along with other

City improvements. It is important to note that the preliminary analysis, as presented in Table 1, would not apply to a revised project configuration due to the following factors:

- Cooley Road grade separation without a connection to US 97 would not necessarily yield additional capacity for the overlay area.
- The North interchange and 18th Street extension improvements would require additional analysis to determine impacting trips in the overlay area relative to city-wide benefit, as the improvements would likely provide more benefit to lands east of US 97 compared with the US 97/Cooley Road improvements that also benefit the retail triangle area.
- Other city improvements (e.g., the Cooley Road extension to Deschutes Market Road and widening of 18th Street from Cooley Road to Empire Avenue) would likely serve a broader area than the overlay area, so additional analysis of impacting trips would be required.

Table B-1
SDC Project List
Planned Projects within 2030 Planning Period

Corridor	Street Name	From	To	Category (1)	Need (2)	Description	Total $	NonGrowth $	Growth $	Growth %
14TH/CENTURY	14TH ST	GALVESTON	SIMPSON	3	B	Common turn lane, Sidewalk Infill	271,656	186,711	84,945	31%
14TH/CENTURY	14TH ST	NEWPORT	GALVESTON	3	C	Sidewalk Infill	70,000	-	70,000	100%
14TH/CENTURY	CENTURY DR	MT. WASHINGTON	UGB (2000)	3	C	Sidewalk Infill	617,400	-	617,400	100%
15th ST.	15TH ST	KNOTT INTERSECTION	N/A	4	A	Single Lane Roundabout	1,300,000	-	1,300,000	100%
15TH ST.	15TH ST	WILSON INTERSECTION	N/A	4	B	Single Lane Roundabout	1,300,000	1,019,111	280,889	22%
15th ST.	15TH ST	FERGUSON	KNOTT ROAD	3	C	Curb, Sidewalk Infill	686,000	-	686,000	100%
15TH ST.	15TH ST	REED MARKET	FERGUSON	3	C	Sidewalk Infill	146,300	-	146,300	100%
18TH ST.	18TH ST	TALUS	US97 CONNECTION RD	1	A	New 3-Lane Arterial	7,253,630	-	7,253,630	100%
18TH ST.	18TH ST	YEOMAN	EMPIRE	3	A	Upgrade to 3-lane Arterial	926,425	565,054	361,371	39%
18TH ST.	18TH ST	TOWN CENTER INT.	N/A	4	A	Multi-lane Roundabout	3,110,000	-	3,110,000	100%
18TH ST.	18TH ST	EMPLOYMENT LOCAL INT.	N/A	4	A	Multi-lane Roundabout	3,110,000	-	3,110,000	100%
18TH ST.	18TH ST	COOLEY RD.	YEOMAN	3	B	Upgrade to 3-lane Arterial	3,349,382	1,897,329	1,452,053	43%
27TH ST. (N)	27TH ST, NE	WELLS ACRES INT.	N/A	4	A	Single Lane Roundabout	1,300,000	-	1,300,000	100%
27TH ST. (N)	27TH ST, NE	CONNERS INTERSECTION	N/A	4	A	Single Lane Roundabout	1,300,000	-	1,300,000	100%
27TH ST. (N)	27TH ST, NE	BUTLER MKT. RD.	NEFF ROAD	3	B	Sidewalk Infill	122,500	84,992	37,508	31%
27TH ST. (N)	27TH ST, NE	NEFF RD. INT	N/A	4	B	Signal Modification/Lane Addition	450,000	339,139	110,861	25%
27TH ST. (N)	27TH ST, NE	BEALL INTERSECTION	N/A	4	B	Single Lane Roundabout	1,300,000	907,292	392,708	30%
27TH ST. (S)	27TH ST, SE	REED MARKET RD	FERGUSON	2	A	New 3- Lane Arterial	5,434,452	3,757,338	1,677,114	31%
27TH ST. (S)	27TH ST, SE	BEAR CREEK RD.	REED MARKET RD	2	A	New 3- Lane Arterial	4,682,780	3,429,166	1,253,614	27%
2ND ST.	2ND ST	SCOTT	WILSON	3	C	Curb, Sidewalk Infill	98,000	-	98,000	100%
2ND ST.	SCOTT AVE	PARKWAY ST.	SE 2ND.	3	C	Sidewalk Infill	25,200	-	25,200	100%
3RD ST. (N)	HWY. 20 (N) / 3RD ST.	GREENWOOD INT.	N/A	9	B	Signal Modification	210,000	163,557	46,443	22%
3RD ST. (N)	HWY. 20 (N) / 3RD ST.	HWY 97 (N)	EMPIRE	9	C	Curb, Bike Lanes, Sidewalk Infill	348,810	-	348,810	100%
3RD ST. (N)	HWY. 20 (N) / 3RD ST.	DIVISION ST. (N)	REVERE	9	C	Curb, Bike Lanes, Sidewalk Infill	234,654	-	234,654	100%
3RD ST. (N)	HWY. 20 (N) / 3RD ST.	REVERE	GREENWOOD	9	C	Curb, Sidewalk Infill	274,400	-	274,400	100%
3RD ST. (N)	HWY. 20 (N) / 3RD ST.	EMPIRE	DIVISION ST. (N)	9	C	Curb, Sidewalk Infill	181,790	-	181,790	100%
3RD ST. (S)	3RD ST, SE	FRANKLIN INT.	N/A	4	A	Signal Modification	210,000	-	210,000	100%
3RD ST. (S)	3RD ST, SE	BADGER INT.	N/A	4	B	Signal Modification	210,000	152,506	57,494	27%
3RD ST. (S)	3RD ST, SE	POWERS INT.	N/A	4	A	Signal Modification	210,000	-	210,000	100%
3RD ST. (S)	3RD ST, SE	REED LANE INT.	N/A	4	B	Signal Modification	210,000	157,415	52,585	25%
3RD ST. (S)	3RD ST, SE	FRANKLIN	WILSON	3	C	Curb, Sidewalk Infill	416,500	-	416,500	100%
3RD ST. (S)	3RD ST, SE	WILSON	DIVISION (S)	3	C	Curb, Sidewalk Infill	284,200	-	284,200	100%
3RD ST. (S)	3RD ST, SE	GREENWOOD	FRANKLIN	3	C	Curb, Sidewalk Infill	142,100	-	142,100	100%
3RD ST. (S)	3RD ST, SE	DIVISION (S)	POWERS	3	C	Curb, Sidewalk Infill	116,620	-	116,620	100%
3RD ST. (S)	3RD ST, SE	POWERS	MURPHY	3	C	Curb, Sidewalk Infill	113,190	-	113,190	100%
3RD ST. (S)	3RD ST, SE	HAWTHORNE INT.	N/A	4	C	HAWK Signal	182,000	-	182,000	100%
4TH ST.	4TH ST. NE	OLNEY INT.	N/A	4	A	New Traffic Signal	413,000	-	413,000	100%
4TH ST.	4TH ST. NE	BUTLER MKT. INT.	N/A	4	A	Single Lane Roundabout	1,300,000	585,000	715,000	55%
4TH ST.	4TH ST, NE	GREENWOOD INT.	N/A	4	B	New Traffic Signal	413,000	321,924	91,076	22%
4TH ST.	4TH ST, NE	REVERE INT.	N/A	4	B	New Traffic Signal	413,000	306,275	106,725	26%
4TH ST.	4TH ST, NE	GREENWOOD	FRANKLIN	3	C	Bike Lanes, Sidewalk Infill	97,915	-	97,915	100%
4TH ST.	4TH ST, NE	FRANKLIN	GLENWOOD (ALDEN)	3	C	Curb, Bike Lanes, Sidewalk Infill	170,050	-	170,050	100%
4TH ST.	4TH ST, NE	REVERE	GREENWOOD	3	C	Curb, Bike Lanes, Sidewalk Infill	111,000	-	111,000	100%
4TH ST.	4TH ST. NE	BUTLER MKT. RD.	REVERE	3	C	Curb, Bike Lanes, Sidewalk Infill	463,760	-	463,760	100%
4TH ST.	ALDEN/ GLENWOOD	4th St.	9TH ST.	3	C	Curb, Sidewalk Infill	194,040	-	194,040	100%
8TH/9TH ST.	8TH ST, NE	REVERE	GREENWOOD	3	A	Sidewalk Infill	68,600	50,812	17,788	26%
8TH/9TH ST.	8th St., NE	GREENWOOD INT.	N/A	4	A	Full Signal/Intersection Improvements	950,000	-	950,000	100%
8TH/9TH ST.	9TH ST, SE	WILSON INTERSECTION	N/A	4	A	Single Lane Roundabout	1,300,000	-	1,300,000	100%
8TH/9TH ST.	8TH ST, NE	BUTLER MKT. RD.	REVERE	3	C	Curb, Sidewalk Infill	299,880	-	299,880	100%
8TH/9TH ST.	9TH ST, SE	WILSON	REED MARKET RD.	3	C	Curb, Sidewalk Infill	264,600	-	264,600	100%
8TH/9TH ST.	8TH/9TH ST NE/SE	FRANKLIN	WILSON	3	C	Sidewalk Infill	154,000	-	154,000	100%

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Corridor	Street Name	From	To	Category (1)	Need (2)	Description	Total $	NonGrowth $	Growth $	Growth %
8TH/9TH ST.	8th St., NE	GREENWOOD	FRANKLIN	3	C	Sidewalk Infill	52,500	-	52,500	100%
9TH/12TH, NW	9TH, NW	TRENTON	NEWPORT	3	C	Sidewalk Infill	50,050	-	50,050	100%
9TH/12TH, NW	12TH, NW	SUMMIT AVE.	TRENTON	3	C	Sidewalk Infill	87,500	-	87,500	100%
AMERICAN LANE	AMERICAN LN (NEW)	CANAL CROSSING	N/A	5	A	CANAL CROSSING	1,687,640	1,155,530	532,110	32%
AMERICAN LANE	AMERICAN LN (NEW)	REED MKT. RD.	AMERICAN LN. (OLD)	1	B	New 3- Lane Collector	247,280	170,113	77,167	31%
AMERICAN LANE	AMERICAN LN	AMERICAN LN. (NEW)	BROSTERHOUS	3	C	Curb, Bike Lanes, Sidewalk Infill	291,730	-	291,730	100%
ARCHIE BRIGGS	ARCHIE BRIGGS RD.	RIVER CROSSING	N/A	5	C	New Bridge	1,890,000	945,000	945,000	50%
AWBREY	AWBREY	PORTLAND	NEWPORT	3	C	Bike Lane Infill (Parking Removal)	18,900	-	18,900	100%
AWBREY	AWBREY	SAGINAW	PORTLAND	3	C	Bike Lanes, Sidewalk Infill	29,700	-	29,700	100%
BEAR CREEK	BEAR CK. RD	27TH ST.	UGB (2000)	2	B	New 3- Lane Arterial	2,394,600	1,580,260	814,340	34%
BEAR CREEK	BEAR CK. RD	PETTIGREW	27TH ST.	3	B	New 3- Lane Arterial	892,960	649,350	243,610	27%
BEAR CREEK	BEAR CK. RD	PETTIGREW INT.	N/A	4	B	Single Lane Roundabout	1,300,000	996,013	303,987	23%
BEAR CREEK	BEAR CK. RD	15 TH ST.	PETTIGREW	3	C	Curb, Bike Lanes, Sidewalk Infill	309,170	-	309,170	100%
BLAKELY	HWY 97:FRONTAGE	PARKWAY (OFFRAMP)	PONDEROSA	1	B	New 2- Lane Collector (C1)	4,033,359	3,835,122	198,237	5%
BLAKELY	HWY 97:FRONTAGE	MURPHY ROAD	PARKWAY (OFFRAMP)	1	B	New 2- Lane Collector (C2 & C3)	7,424,590	5,029,043	2,395,547	32%
BLAKELY	HWY 97:FRONTAGE	BADGER ROAD	MURPHY ROAD	1	B	New 2- Lane Collector (F1 & F2)	3,568,984	2,352,700	1,216,284	34%
BLAKELY	BLAKELY RD	BADGER	POWERS	3	C	Curb, Bike Lanes, Sidewalk Infill	75,150	-	75,150	100%
BOND/WALL	WALL ST	PORTLAND	GREENWOOD	3	B	New Channelization, Sidewalk infill	47,040	38,179	8,861	19%
BOND/WALL	WALL ST	BOND INT.	N/A	4	B	New Channelization	375,000	305,835	69,165	18%
BOND/WALL	BOND	COLUMBIA INT.	N/A	4	B	Single Lane Roundabout	1,300,000	926,206	373,794	29%
BOYD ACRES	BOYD ACRES RD	EMPIRE	BUTLER MARKET	3	A	Upgrade 3-Lane Arterial	2,571,370	1,840,834	730,536	28%
BOYD ACRES	BOYD ACRES RD	CANAL CROSSING	N/A	5	A	2-Canal Crossing Structures	1,750,000	1,259,939	490,061	28%
BOYD ACRES	BOYD ACRES RD	Fred Meyer Int.	N/A	4	B	Channelization	130,000	99,655	30,345	23%
BOYD ACRES	BOYD ACRES RD	Morningstar Int.	N/A	4	B	Channelization	130,000	95,484	34,516	27%
BOYD ACRES	BOYD ACRES RD	BRINSON INT.	N/A	4	B	Single Lane Roundabout	1,300,000	904,049	395,951	30%
BOYD ACRES	BOYD ACRES RD	COOLEY	EMPIRE	3	C	Curb, Bike Lanes, Sidewalk Infill	613,590	-	613,590	100%
BRITTA	BRITTA	MARINER	HALFWAY	3	C	Partial Widening, Curb, Bike Lanes, Sidewalk Infill	118,950	-	118,950	100%
BROOKSWOOD	BROOKSWOOD	POWERS	PINEBROOK	3	A	New 3- Lane Arterial	2,198,050	1,334,024	864,026	39%
BROOKSWOOD	BROOKSWOOD	POWERS INT.	N/A	4	A	Single Lane Roundabout	1,300,000	-	1,300,000	100%
BROOKSWOOD	BROOKSWOOD	LODGEPOLE	POPLAR	3	C	Sidewalk Infill	149,450	-	149,450	100%
BROOKSWOOD	BROOKSWOOD	REED MKT. RD.	POWERS	3	C	Sidewalk Infill	25,760	-	25,760	100%
BROSTERHOUS	BROSTERHOUS	KNOTT INTERSECTION	N/A	4	A	Single Lane Roundabout	1,300,000	-	1,300,000	100%
BROSTERHOUS	BROSTERHOUS	THIRD STREET	AMERICAN LANE	2	B	New 2- Lane Collector	3,579,300	2,351,517	1,227,783	34%
BROSTERHOUS	BROSTERHOUS	MURPHY	KNOTT	3	C	Curb, Bike Lanes, Sidewalk Infill	705,550	-	705,550	100%
BROSTERHOUS	BROSTERHOUS	AMERICAN LANE	MURPHY	3	C	Sidewalk Infill	21,560	-	21,560	100%
BUTLER MARKET	BUTLER MKT. RD	WELLS ACRES RD. INT.	N/A	4	B	Single Lane Roundabout	1,300,000	946,739	353,261	27%
BUTLER MARKET	BUTLER MKT. RD	PURCELL INTERSECTION	N/A	4	A	Single Lane Roundabout	1,300,000	-	1,300,000	100%
BUTLER MARKET	BUTLER MKT. RD	8TH ST	UGB (2000)	3	C	Curb, Sidewalk Infill	706,188	-	706,188	100%
BUTLER MARKET	BUTLER MKT. RD	BOYD ACRES RD.	8TH ST.	3	C	Sidewalk Infill	47,250	-	47,250	100%
CLAUSEN	CLAUSEN DRIVE	(N. TERMINUS)	CLAUSEN DR (E/W)	3	C	Sidewalk Infill	28,875	-	28,875	100%
COLLEGE/ PORTLAND	PORTLAND AVE	WALL ST. INT.	N/A	4	A	Upgrade Traffic Signal/Intersection	295,000	-	295,000	100%
COLLEGE/ PORTLAND	PORTLAND AVE	COLLEGE WAY	WALL ST	3	C	Curb, Bike Lanes, Sidewalk Infill	443,950	-	443,950	100%
COLLEGE/ PORTLAND	COLLEGE WAY	NEWPORT	SAGINAW	3	C	Sidewalk Infill	63,000	-	63,000	100%
COLORADO	COLORADO	COLUMBIA INT.	N/A	4	A	Single Lane Roundabout	1,300,000	-	1,300,000	100%
COLORADO	COLORADO	CENTURY DR.	INDUSTRIAL WAY	3	C	Bike Lanes, Sidewalk Infill	34,600	-	34,600	100%
COLORADO	COLORADO	BOND	PARKWAY	3	C	Sidewalk Infill	28,000	-	28,000	100%
COLORADO	COLORADO	INDUSTRIAL WAY	BOND	3	C	Sidewalk Infill	18,900	-	18,900	100%
COOLEY	COOLEY RD	NE 18TH ST.	UGB (2000)	1	A	New 3- Lane Arterial	3,711,160	-	3,711,160	100%
COOLEY	COOLEY RD	HWY 20	HWY 97 (N)	2	A	New 3- Lane Arterial	4,347,560	3,194,564	1,152,996	27%
COOLEY	COOLEY RD	HUNNEL RD. (W) INT.	N/A	4	A	Single Lane Roundabout	1,300,000	-	1,300,000	100%
COOLEY	COOLEY RD	HUNNEL RD. (E) INT.	N/A	4	A	Single Lane Roundabout	1,300,000	-	1,300,000	100%

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COOLEY	COOLEY RD	PURCELL INTERSECTION	N/A	4	B	Single Lane Roundabout	1,300,000	735,965	564,035	43%
Cooley MTC Overlay	HWY 97 (N)	COOLEY INTERCHANGE	N/A	9	A	Mid-Term Concept	34,150,000	24,579,333	9,570,667	28%
DIVISION	DIVISION ST.	HWY 20 (N)	REVERE	3	C	Curb, Sidewalk Infill	199,430	-	199,430	100%
EMPIRE AVE.	EMPIRE AVENUE	US 97	SOUTHBOND RAMP	4	A	Install Traffic Signal; realignment; new lanes; new	3,600,000	-	3,600,000	100%
EMPIRE AVE.	EMPIRE AVENUE	US 97	NORTHBOND RAMP	4	A	Widen ramp; add through lanes	1,500,000	-	1,500,000	100%
EMPIRE AVE.	EMPIRE AVENUE	PURCELL	BUTLER MARKET RD.	1	A	New 3- Lane Arterial	2,060,670	-	2,060,670	100%
EMPIRE AVE.	EMPIRE AVENUE	BOYD ACRES RD.	18TH ST.	2	A	Upgrade 2-lanes to 5-lanes (left turn) with bike la	2,947,450	1,998,185	949,265	32%
EMPIRE AVE.	EMPIRE AVENUE	3RD/HWY20 (N)	PARKWAY RAMPS	3	A	New 5-Lane Arterial	608,970	444,129	164,841	27%
EMPIRE AVE.	EMPIRE AVENUE	18TH ST. INTERSECTION	N/A	4	A	Multi-lane Roundabout	3,387,904	-	3,387,904	100%
EMPIRE AVE.	EMPIRE AVENUE	PURCELL INTERSECTION	N/A	4	A	Multi-lane Roundabout	3,100,000	-	3,100,000	100%
EMPIRE AVE.	EMPIRE AVENUE	3RD/HWY 20(N) INT.	N/A	4	A	Signal Modification/Lane Addition	430,000	-	430,000	100%
EMPIRE AVE.	EMPIRE AVENUE	BUTLER MKT. INT.	N/A	4	A	Upgrade signal to multi-lane roundabout	3,100,702	-	3,100,702	100%
EMPIRE AVE.	EMPIRE AVENUE	18TH ST.	PURCELL	3	B	Upgrade 2-lanes to 3-lanes (left turn) with bike la	983,375	697,408	285,967	29%
EMPIRE AVE.	EMPIRE AVENUE	O.B. RILEY RD.	3RD/HWY20 (N)	3	B	Upgrade 2-lanes to 3-lanes (left turn) with bike la	737,530	431,681	305,849	41%
EMPIRE AVE.	EMPIRE AVENUE	JAMISON INTERSECTION	N/A	4	B	Restriction	10,500	6,196	4,304	41%
EMPIRE AVE.	EMPIRE AVENUE	CANAL CROSSING	N/A	5	C	CANAL CROSSING	1,687,640	1,197,520	490,120	29%
FRANKLIN	FRANKLIN	4TH ST. INTERSECTION	N/A	4	B	New Traffic Signal	378,000	264,600	113,400	30%
FRANKLIN	FRANKLIN	WALL	PARKWAY	3	C	Bike Lane Infill (Parking Removal)	50,400	-	50,400	100%
FRANKLIN	FRANKLIN	UNDERCROSSING	N/A	5	C	Bike Lanes, Sidewalk Infill	63,643	52,584	11,059	17%
GALVESTON	RIVERSIDE	GALVESTON	WALL	3	C	Bike Lane Infill (Parking Removal)	350,000	-	350,000	100%
GALVESTON	GALVESTON AVE	14TH ST., NW	RIVERSIDE AVE.	3	C	Sidewalk Infill	8,050	-	8,050	100%
GREENWOOD (E)	HWY. 20 (E) / GREENWC	27TH. ST.	UGB (2000)	9	C	Curb, Bike Lanes, Sidewalk Infill	99,890	-	99,890	100%
GREENWOOD (E)	HWY. 20 (E) / GREENWC	12TH ST. INT.	N/A	9	C	Pedestrian Crossing	8,165	-	8,165	100%
GREENWOOD (E)	HWY. 20 (E) / GREENWC	6TH ST. INT.	N/A	9	C	Pedestrian Crossing	150,000	-	150,000	100%
GREENWOOD (E)	HWY. 20 (E) / GREENWC	12TH ST.	PURCELL	9	C	Pedestrian Crossing	-	-	-	100%
GREENWOOD (E)	HWY. 20 (E) (GREENWO	3RD ST. , NE	12TH ST.	9	C	Sidewalk Infill	36,225	-	36,225	100%
GREENWOOD (W)	GREENWOOD AVE	WALL	3RD ST., NE	3	C	Bike Lane Infill (Parking Removal)	58,800	-	58,800	100%
GREENWOOD (W)	SHEVLIN PK. RD	UGB (2008)	MT. WASHINGTON	3	C	Multi-use Trail, Curb, Sidewalk Infill	866,850	-	866,850	100%
GREENWOOD (W)	SHEVLIN PK. RD	MT. WASHINGTON	COLLEGE WAY	3	C	Multi-use Trail, Curb, Sidewalk Infill	1,294,500	-	1,294,500	100%
GREENWOOD (W)	NEWPORT	COLLEGE WAY	12TH ST.	3	C	Sidewalk Infill	49,980	-	49,980	100%
HAWTHORNE	HAWTHORNE/ OREGON	WALL ST.	PARKWAY	3	B	Bike Lanes, Sidewalk Infill	47,000	39,981	7,019	15%
HAWTHORNE	HAWTHORNE AVE	NE 4TH	NE 5TH	3	C	Bike Lanes, Sidewalk Infill	60,050	-	60,050	100%
Hwy 97/Parkway	HWY 97 (S)	EMPIRE	BUTLER MARKET RD.	9	A	ODOT FACILITY	3,250,000	2,275,000	975,000	30%
JAMISON	JAMISON	EMPIRE	(N. OF N. FIRE STATION)	3	C	Curb, Sidewalk Infill	270,970	-	270,970	100%
KNOTT	KNOTT RD	CHINA HAT INT.	N/A	4	B	Single Lane Roundabout	1,300,000	1,178,487	121,513	9%
KNOTT	KNOTT RD	COUNTRY CLUB INT.	N/A	4	C	Single Lane Roundabout	1,300,000	-	1,300,000	100%
KNOTT	KNOTT RD	CANAL CROSSING	N/A	5	C	Sidewalk Infill over Canal	175,000	161,688	13,312	8%
LEMHI	LEMHI PASS	NW CROSSING	SKYLINERS	1	A	2 lane collector	982,235	-	982,235	100%
MT. WASH	MT. WASHINGTON	SIMPSON INT.	N/A	4	B	Single Lane Roundabout	1,300,000	832,947	467,053	36%
MURPHY	RAMP O2	Parkway	HWY 97: FRONTAGE	1	A	Ramp (O2)	1,618,757	-	1,618,757	100%
MURPHY	RAMP O3	3RD ST.	Parkway	1	A	Ramp (O3)	5,443,097	-	5,443,097	100%
MURPHY	MURPHY ROAD	PARRELL ROAD	BROSTERHOUS	2	A	Upgrade 2-lanes to 3-lanes with bike lanes and si	7,684,600	4,932,482	2,752,118	36%
MURPHY	MURPHY ROAD	BROSTERHOUS	SE 15TH ST.	1	B	New 2- Lane Collector	3,964,750	2,558,335	1,406,415	35%
MURPHY	MURPHY ROAD	FRONTAGE INT. (N)	N/A	1	B	Single Lane Roundabout (F1)	1,120,000	1,065,960	54,040	5%
MURPHY	MURPHY ROAD	HWY 97:FRONTAGE INT. (S)	N/A	1	B	Single Lane Roundabout	1,300,000	853,975	446,025	34%
MURPHY	MURPHY ROAD	COUNTRY CLUB INT.	N/A	4	B	Single Lane Roundabout	524,000	343,310	180,690	34%
MURPHY	MURPHY ROAD	BROSTERHOUS INT.	N/A	4	B	Single Lane Roundabout	412,000	265,738	146,262	36%
MURPHY	MURPHY ROAD	RAILROAD CROSSING	N/A	5	B	Overpass of the existing railroad	7,507,000	4,844,044	2,662,956	35%
NEFF/OLNEY	NEFF RD/PENN	8TH ST. INT.	N/A	4	A	Single Lane Roundabout	1,300,000	-	1,300,000	100%
NEFF/OLNEY	NEFF RD	27TH ST	UGB (2000)	3	B	New 3- Lane Arterial	2,266,750	1,913,353	353,397	16%
NEFF/OLNEY	NEFF RD/PENN	8TH ST	PURCELL	3	B	Sidewalk Infill	92,400	73,625	18,775	20%

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Corridor	Street Name	From	To	Category (1)	Need (2)	Description	Total $	NonGrowth $	Growth $	Growth %
NEFF/OLNEY	NEFF RD	PURCELL INTERSECTION	N/A	4	B	New Traffic Signal/ Lane Addition	2,588,482	1,737,980	850,501	33%
NEFF/OLNEY	OLNEY AVE	RAILROAD CROSSING	N/A	6	C	Rail Crossing for Bike Lanes & Sidewalk	35,000	27,067	7,933	23%
NW CROSSING	NW CROSSING	SKYLINE RANCH RD.	MT. WASH. DRIVE	3	C	Partial Widening, Curb, Bike Lanes, Sidewalk Infill	329,350	-	329,350	100%
OB RILEY	O.B. RILEY	UGB (2008)	HWY 20 (N)	2	A	New 3- Lane Arterial	7,500,380	5,250,266	2,250,114	30%
PARRELL	PARRELL RD	BROSTERHOUS	CHINA HAT	2	B	New 3- Lane Collector	11,046,950	7,435,041	3,611,909	33%
PETTIGREW	PETTIGREW	BEAR CREEK RD.	REED MKT. RD.	2	B	New 3- Lane Collector	4,435,520	3,362,625	1,072,895	24%
PONDEROSA/CHINA H/	LODGEPOLE	MAHOGANY	POPLAR	3	C	Curb, Bike Lanes, Sidewalk Infill	221,970	-	221,970	100%
PONDEROSA/CHINA H/	CHINA HAT	CANAL CROSSING	N/A	5	C	Sidewalk Infill over Canal	175,000	149,074	25,926	15%
POWERS/CHASE	POWERS	3RD ST. INT.	N/A	4	A	Signal Modification/Lane Addition	430,000	-	430,000	100%
POWERS/CHASE	CHASE RD	MOWITCH	BROSTERHOUS	1	B	New 2- Lane Collector	2,018,530	1,345,687	672,843	33%
POWERS/CHASE	CHASE RD	PARRELL RD.	MOWITCH	2	B	New 2- Lane Collector	491,120	345,603	145,517	30%
POWERS/CHASE	POWERS	3RD STREET	PARRELL RD.	2	B	New 3- Lane Collector	890,170	575,572	314,598	35%
POWERS/CHASE	POWERS	BROOKSWOOD	3RD STREET	2	B	New 5-Lane Arterial	3,205,870	2,131,094	1,074,776	34%
POWERS/CHASE	CHASE RD	PARRELL INT.	N/A	4	B	Single Lane Roundabout	1,300,000	860,432	439,568	34%
PURCELL	(OLD DESCH. RD)	COOLEY ROAD EXT.	YEOMAN ROAD	1	A	New 2- Lane Collector	4,731,425	-	4,731,425	100%
PURCELL	PURCELL BLVD.	HOLIDAY AVE. (N)	HOLIDAY AVE. (S)	1	B	New 2- Lane Collector	2,287,670	1,654,360	633,310	28%
PURCELL	PURCELL BLVD.	YEOMAN ROAD	BUTLER MKT RD.	3	B	Curb, Bike Lanes, Sidewalk Infill	221,970	120,850	101,120	46%
PURCELL	PURCELL BLVD.	HWY 20 (E)	BEAR CR. RD.	3	B	Upgrade to 3-Lane Collector	461,725	378,927	82,798	18%
PURCELL	PURCELL BLVD.	BUTLER MKT. RD.	OCKER DR.	3	C	Bike Lane Infill (Parking Removal)	56,700	-	56,700	100%
REED MARKET RD. (E)	REED MKT. RD	SE 15TH ST.	SE 27TH ST.	2	A	Upgrade 2-lanes to 3-lanes (left turn)	3,294,560	2,381,352	913,208	28%
REED MARKET RD. (E)	REED MKT. RD	AMERICAN LN. INT. (NEW).	N/A	4	A	Interim Signal	135,000	-	135,000	100%
REED MARKET RD. (E)	REED MKT. RD	SE 15TH ST. INT.	N/A	4	A	Multi-lane Roundabout	2,265,000	-	2,265,000	100%
REED MARKET RD. (E)	REED MKT. RD	SE 3RD ST. INTERSECTION	N/A	3	A	Multi-lane Roundabout	3,400,000	2,509,751	890,249	26%
REED MARKET RD. (E)	REED MKT. RD	BROSTERHOUS/3RD INT.	N/A	4	A	Multi-lane Roundabout	3,680,000	-	3,680,000	100%
REED MARKET RD. (E)	REED MKT. RD	DIVISION INTERSECTION	N/A	4	A	Multi-lane Roundabout	3,560,000	-	3,560,000	100%
REED MARKET RD. (E)	REED MKT. RD	27TH ST. INT.	N/A	4	A	Upgrade Traffic Signal/Intersection	295,000	-	295,000	100%
REED MARKET RD. (E)	REED MKT. RD	SE 27TH ST.	UGB (2000)	1	B	New 3- Lane Collector	2,081,650	1,715,689	365,961	18%
REED MARKET RD. (E)	REED MKT. RD	SE 3RD ST.	SE 15TH ST.	3	B	Capacity Three Lane Arterial	3,346,800	2,440,016	906,784	27%
REVERE	REVERE	DIVISION	3RD STREET	3	B	Capacity Three Lane Arterial	545,675	412,412	133,263	24%
REVERE	REVERE	3RD STREET	4TH ST.	3	B	Capacity Three Lane Arterial	272,850	203,814	69,036	25%
REVERE	REVERE	4TH St.	8th St.	3	C	Sidewalk Infill	63,000	-	63,000	100%
SIMPSON	SIMPSON AVE	MT. WASHINGTON	14TH ST.	3	C	Curb, Bike Lanes, Sidewalk Infill	380,520	-	380,520	100%
SIMPSON	SIMPSON AVE	14TH ST., NW/SW	COLORADO	3	C	Sidewalk Infill	15,400	-	15,400	100%
SIMPSON	SIMPSON AVE	COLORADO INT.	N/A	4	D	Roundabout Upgrade	333,000	237,347	95,653	29%
SIMPSON	SIMPSON AVE	14TH ST. INT.	N/A	4	D	Roundabout Upgrade	333,000	228,513	104,487	31%
SIMPSON	SIMPSON AVE	COLUMBIA INT.	N/A	4	D	Single Lane Roundabout	1,300,000	896,273	403,727	31%
WILSON	WILSON	SE 3RD	SE 9TH ST.	2	A	Upgrade to 3-Lane Collector	1,056,285	834,779	221,506	21%
WILSON	WILSON	3RD ST. INT.	N/A	4	A	Upgrade Traffic Signal/Intersection	460,000	-	460,000	100%
YEOMAN	YEOMAN (E/W)	18TH STREET	DESERT SAGE	1	B	New 2- Lane Collector	1,009,265	868,437	140,828	14%
YEOMAN	YEOMAN (E/W)	CANAL CROSSING	N/A	5	B	CANAL CROSSING	1,687,640	1,017,765	669,875	40%
	WELLS ACRE RD	BUTLER MKT RD	NE 27TH	3	C	Bike Lane Infill (Parking Removal), Sidewalk Infill	298,480	-	298,480	100%
	STUDIO RD	4TH ST., NE	BUTLER MARKET RD.	3	C	Curb, Sidewalk Infill	92,610	-	92,610	100%
	BRINSON	BOYD ACRES ROAD	BUTLER MKT RD	3	C	Sidewalk Infill	189,000	-	189,000	100%
	HUNNEL RD	COOLEY RD.	ROBAL LANE	3	C	Sidewalk Infill	70,000	-	70,000	100%
	ROBAL LANE	HWY 20	HUNNEL	3	C	Sidewalk Infill	55,440	-	55,440	100%
	Improvement Projects						**282,790,340**	**134,801,032**	**147,989,307**	**52%**

(1) Category Legend
1 = New Road Construction, 2 = Full Modernization, 3= Partial Modernization, 4 = Intersection Modernization, 5 = Crossing Structures, 6 = Others, 7 = Completed, 8 = Studies, 9 = ODOT Facility, 10 = TSP Project No Improvement Planned
(2) Need Legend
A = Capacity, B = Safety, C= Multimodal, D= Other

Table B-2
SDC Project List
Completed Projects

Street Name	From	To	Total $	NonGrowth $	Growth $	Growth %
15TH ST	BEAR CR.	HWY 20	$2,588,916	$1,973,723	$461,390	20%
27TH ST, NE	NEFF ROAD	HWY 20 E	$3,834,122	$2,837,513	$996,609	26%
27TH ST, NE	HWY 20 (E)	BEAR CREEK RD.	$210,497	$156,344	$54,153	26%
AWBREY	MT. WASHINGTON	SAGINAW	$144,726	$101,308	$43,418	30%
BOND	COLORADO AVE.	INDUSTRIAL WAY	$700,000	$560,000	$140,000	20%
BOND	INDUSTRIAL WAY	Reed Market	$2,623,731	$2,111,249	$512,482	20%
BOND	WILSON AVE.	Bond/Wilson Roundabout	$550,612	$413,864	$136,748	25%
WALL ST.	REVERE	PORTLAND	$125,519	$102,196	$23,324	19%
BRITTA	HARDY	MARINER	$175,002	$121,665	$53,337	30%
BUTLER MKT. RD	BRINSON INTERSECTION	N/A	$182,620	$130,966	$51,653	29%
FRANKLIN	3RD ST	4TH ST.	$470,053	$389,243	$80,810	19%
FRANKLIN	4TH ST	8TH ST.	$650,545	$542,448	$108,097	19%
MT. WASHINGTON	PUTNAM	SUMMIT	$1,144,309	$652,256	$492,053	43%
MT. WASHINGTON	SKYLINERS RD.	TROON	$661,576	$390,384	$271,192	41%
OLNEY AVE.	3RD ST., NE	8TH ST.	$3,168,138	$2,545,123	$623,015	22%
NEFF RD.	PURCELL	27TH ST.	$203,333	$165,215	$38,118	19%
OLNEY AVE.	WALL (HILL)	3RD ST., NE	$785,288	$625,798	$159,491	23%
NW CROSSING	MT. WASH. DRIVE	SHEVLIN PARK RD	$669,556	$281,214	$388,342	58%
PURCELL BLVD.	NEFF	HWY 20	$118,698	$100,334	$18,364	15%
REED MKT. RD.	CENTURY DR.	PARKWAY	$13,706,624	$9,032,718	$4,673,906	34%
SKYLINE RANCH ROAD	SHEVLIN PARK RD.	SHEVLIN MEADOW	$380,293	$305,465	$74,829	20%
WILSON	BOND ST.	PARKWAY	$2,450,126	$1,906,266	$543,860	23%
MT. WASHINGTON	MT. WASHINGTON BRIDGE		$3,312,526	$2,273,744	$1,038,782	32%
NEWPORT	AWBREY	WALL	$6,532,590	$4,934,917	$1,597,673	26%
BUTLER MKT. RD	BOYD ACRES RD.	N/A	$183,785	$139,007	$44,778	26%
EMPIRE AVENUE	BOYD ACRES INT.	N/A	$3,199,243	$2,282,633	$916,610	30%
27TH ST, NE	NEFF RD. INT.	N/A	$584,263	$441,324	$142,940	25%
27TH ST, NE	REED MKT. INT.	N/A	$1,269,468	$946,609	$322,859	26%
BUTLER MKT. RD	PURCELL INTERSECTION	N/A	$118,284	$84,876	$33,408	29%
COLORADO	SIMPSON INT.	N/A	$627,303	$455,155	$172,148	29%
PORTLAND AVE	HILL INT.	N/A	$236,690	$183,085	$53,604	24%
REED MKT. RD.	15TH ST. INT. DESIGN	N/A	$748,822	$554,119	$194,702	27%
GALVESTON AVE	14TH INT.	N/A	$508,284	$361,392	$146,892	31%
SIMPSON AVE	14TH INT.	N/A	$246,862	$170,457	$76,405	31%
NEWPORT	14TH INT.	N/A	$729,542	$476,479	$253,063	37%
NEWPORT	COLLEGE WAY INT.	N/A	$463,323	$281,032	$182,291	42%
BUTLER MKT. RD	8TH ST. INT.	N/A	$115,671	$86,397	$29,274	26%
NEWPORT	9TH ST. INT.	N/A	$640,827	$445,160	$195,667	33%

Table B-2
SDC Project List
Completed Projects

Street Name	From	To	Total $	NonGrowth $	Growth $	Growth %
HWY 20	PURCELL INTERSECTION	N/A	$141,200	$108,256	$32,944	23%
COOLEY RD.	HWY 97 INT. STUDY	N/A	$13,582	$9,860	$3,722	28%
18TH ST.	HWY 97 INT. STUDY	N/A	$97,453	$85,234	$12,219	13%
ARIZONA/COLORADO	COUPLET	N/A	$3,692,451	$2,695,489	$996,962	27%
18TH ST.	SAFETY	N/A	$107,933	$75,553	$32,380	30%
GREENWOOD AVE	10TH ST.	PROVIDENCE	$1,232,476	$997,019	$235,457	21%
EMPIRE AVENUE	EXTENSION PHASE 1	N/A	$1,381,629	$958,500	$423,129	32%
EMPIRE AVENUE	MEADOW	DESERT LANE	$500,950	$346,743	$154,207	32%
NEFF ROAD	NEFF CORRIDOR 12-27	N/A	$168,779	$136,357	$32,422	20%
MTN. NEER	HICI	N/A	$349,517	$215,189	$134,328	39%
GALVESTON AVE	REVERE	17TH ST.	$168,053	$125,082	$42,971	28%
MURPHY ROAD	EXTENSION TO 15TH ST. DE	N/A	$979,262	$631,889	$347,373	35%
REED MKT. Corridor			$1,179,535	$777,318	$402,217	34%
Mt Washington Drive	Awbrey Village		$59,855	$41,899	$17,957	30%
American Lane	American Lane Industrial Park		$128,497	$89,948	$38,549	30%
20 & 27th	20 & 27th turn lane		$148,958	$104,271	$44,687	30%
Brentwood and Brosterhous	Brentwood		$136,021	$95,215	$40,806	30%
27th Street	Bridgecliff/Gallagher/Desert Skies		$35,830	$25,081	$10,749	30%
American Lane	Carmen Loop - 20652		$17,975	$12,583	$5,393	30%
Robal and Hunnel Rd	Cascade Village/Mountain View		$182,618	$127,833	$54,785	30%
Chase Street	Chase Village		$49,872	$34,911	$14,962	30%
Regency Drive	Copperstone at Awbrey Glen		$93,547	$65,483	$28,064	30%
Wilson & 97th	Del Taco		$16,222	$11,356	$4,867	30%
	East Empire Business Park		$168,767	$118,137	$50,630	30%
Empire Ave	Empire Village		$199,848	$139,894	$59,954	30%
Hunnell & Cooley Rd	Highland Commercial Pk		$317,398	$222,179	$95,220	30%
Purcell	Holliday Park, 3rd Addition		$141,228	$98,860	$42,368	30%
Purcell & Yeoman	Lava Ridges		$380,790	$266,553	$114,237	30%
Skyliners Road	Miller Elementary School		$114,953	$80,467	$34,486	30%
Reed Market	Mt Bachelor Village		$11,202	$7,842	$3,361	30%
Beall Drive	Oakview Ph 8 & 9		$105,606	$73,924	$31,682	30%
Brookswood	Poplar Park		$36,315	$25,421	$10,895	30%
Parrell Rd	Shady Pines Estates		$36,388	$25,471	$10,916	30%
Murphy Road	Stonehaven		$7,711	$5,398	$2,313	30%
Parrell Rd	South Village		$35,958	$25,171	$10,788	30%
Brosterhous Rd	South Point		$4,901	$3,431	$1,470	30%
Brosterhous Rd	Sun Meadow		$219,965	$153,976	$65,990	30%
Copperfield Ave	Sundance Meadows		$30,059	$21,041	$9,018	30%

Table B-2

SDC Project List

Completed Projects

Street Name	From	To	Total $	NonGrowth $	Growth $	Growth %
Shevlin Park Rd	Three Pines/Shevlin Commons		$134,274	$93,992	$40,282	30%
Mt. Washington Drive & Century	Village at Southern Crossing		$23,016	$16,111	$6,905	30%
Brookswood & Powers	Millbrook Estates		$131,305	$91,914	$39,392	30%
Reed Mrkt/Century Drive andReed Mrkt/Mt Bachelor Village Roundabouts			$1,060,955	$694,926	$366,029	35%
Round-a-bouts = NW Crossing/Mt.Washington, Shevlin Park/Mt. Washington, Skyliner/Mt.Washington, Galveston/14			$1,673,007	$936,884	$736,123	44%
Mt. Washington Drive, 14th & Galveston roundabout, Reed Market/Century Drive, Skyliner Road widening and Mt. W			$1,117,980	$704,327	$413,652	37%
14th/Simpson Roundabout. Century Drive/Median			$846,970	$584,829	$262,141	31%
Shevlin Park Road and Roundabout @ Newport			$130,675	$79,712	$50,963	39%
Reed Mrkt/Century Drive			$221,893	$148,668	$73,225	33%
Reimbursement Projects			**$73,095,147**	**$51,951,866**	**$20,989,477**	**29%**

Table C-1
Fiscally-Constrained SDC Project List
Proposed Projects with Allocated Funding

Corridor	Street Name	From	To	Category (1)	Need (2)	Description	Total $	NonGrowth $	Growth $	Growth %
14TH/CENTURY	14TH ST	GALVESTON	SIMPSON	3	B	Common turn lane, Sidewalk Infill	271,656	186,711	84,945	31%
14TH/CENTURY	14TH ST	NEWPORT	GALVESTON	3	C	Sidewalk Infill	70,000	-	70,000	100%
14TH/CENTURY	CENTURY DR	MT. WASHINGTON	UGB (2000)	3	C	Sidewalk Infill	617,400	-	617,400	100%
15th ST.	15TH ST	FERGUSON	KNOTT ROAD	3	C	Curb, Sidewalk Infill	686,000	-	686,000	100%
15TH ST.	15TH ST	REED MARKET	FERGUSON	3	C	Sidewalk Infill	146,300	-	146,300	100%
15th ST.	15TH ST	KNOTT INTERSECTION	N/A	4	A	Single Lane Roundabout	1,300,000	-	1,300,000	100%
15TH ST.	15TH ST	WILSON INTERSECTION	N/A	4	B	Single Lane Roundabout	1,300,000	1,019,111	280,889	22%
18TH ST.	18TH ST	YEOMAN	EMPIRE	3	A	Upgrade to 3-lane Arterial	926,425	565,054	361,371	39%
18TH ST.	18TH ST	COOLEY RD.	YEOMAN	3	B	Upgrade to 3-lane Arterial	3,349,382	1,897,329	1,452,053	43%
27TH ST. (N)	27TH ST, NE	BUTLER MKT. RD.	NEFF ROAD	3	B	Sidewalk Infill	122,500	84,992	37,508	31%
27TH ST. (N)	27TH ST, NE	WELLS ACRES INT.	N/A	4	A	Single Lane Roundabout	1,300,000	-	1,300,000	100%
27TH ST. (N)	27TH ST, NE	CONNERS INTERSECTION	N/A	4	A	Single Lane Roundabout	1,300,000	-	1,300,000	100%
2ND ST.	2ND ST	SCOTT	WILSON	3	C	Curb, Sidewalk Infill	98,000	-	98,000	100%
2ND ST.	SCOTT AVE	PARKWAY ST.	SE 2ND.	3	C	Sidewalk Infill	25,200	-	25,200	100%
3RD ST. (N)	HWY. 20 (N) / 3RD ST.	GREENWOOD INT.	N/A	9	B	Signal Modification	210,000	163,557	46,443	22%
3RD ST. (N)	HWY. 20 (N) / 3RD ST.	HWY 97 (N)	EMPIRE	9	C	Curb, Bike Lanes, Sidewalk Infill	348,810	-	348,810	100%
3RD ST. (N)	HWY. 20 (N) / 3RD ST.	DIVISION ST. (N)	REVERE	9	C	Curb, Bike Lanes, Sidewalk Infill	234,654	-	234,654	100%
3RD ST. (N)	HWY. 20 (N) / 3RD ST.	REVERE	GREENWOOD	9	C	Curb, Sidewalk Infill	274,400	-	274,400	100%
3RD ST. (N)	HWY. 20 (N) / 3RD ST.	EMPIRE	DIVISION ST. (N)	9	C	Curb, Sidewalk Infill	181,790	-	181,790	100%
3RD ST. (S)	3RD ST, SE	FRANKLIN	WILSON	3	C	Curb, Sidewalk Infill	416,500	-	416,500	100%
3RD ST. (S)	3RD ST, SE	WILSON	DIVISION (S)	3	C	Curb, Sidewalk Infill	284,200	-	284,200	100%
3RD ST. (S)	3RD ST, SE	GREENWOOD	FRANKLIN	3	C	Curb, Sidewalk Infill	142,100	-	142,100	100%
3RD ST. (S)	3RD ST, SE	DIVISION (S)	POWERS	3	C	Curb, Sidewalk Infill	116,620	-	116,620	100%
3RD ST. (S)	3RD ST, SE	POWERS	MURPHY	3	C	Curb, Sidewalk Infill	113,190	-	113,190	100%
3RD ST. (S)	3RD ST, SE	FRANKLIN INT.	N/A	4	A	Signal Modification	210,000	-	210,000	100%
3RD ST. (S)	3RD ST, SE	POWERS INT.	N/A	4	A	Signal Modification	210,000	-	210,000	100%
3RD ST. (S)	3RD ST, SE	BADGER INT.	N/A	4	B	Signal Modification	210,000	152,506	57,494	27%
3RD ST. (S)	3RD ST, SE	HAWTHORNE INT.	N/A	4	C	HAWK Signal	182,000	-	182,000	100%
4TH ST.	4TH ST, NE	GREENWOOD	FRANKLIN	3	C	Bike Lanes, Sidewalk Infill	97,915	-	97,915	100%
4TH ST.	4TH ST, NE	FRANKLIN	GLENWOOD (ALDEN)	3	C	Curb, Bike Lanes, Sidewalk Infill	170,050	-	170,050	100%
4TH ST.	4TH ST, NE	REVERE	GREENWOOD	3	C	Curb, Bike Lanes, Sidewalk Infill	111,000	-	111,000	100%
4TH ST.	4TH ST, NE	REVERE INT.	N/A	4	B	New Traffic Signal	413,000	306,275	106,725	26%
4TH ST.	4TH ST. NE	BUTLER MKT. RD.	REVERE	3	C	Curb, Bike Lanes, Sidewalk Infill	463,760	-	463,760	100%
4TH ST.	4TH ST. NE	BUTLER MKT. INT.	N/A	4	A	Single Lane Roundabout	1,300,000	585,000	715,000	55%
4TH ST.	4TH ST. NE	OLNEY INT.	N/A	4	A	New Traffic Signal	413,000	-	413,000	100%
4TH ST.	ALDEN/ GLENWOOD	4th St.	9TH ST.	3	C	Curb, Sidewalk Infill	194,040	-	194,040	100%
8TH/9TH ST.	8TH ST, NE	REVERE	GREENWOOD	3	A	Sidewalk Infill	68,600	50,812	17,788	26%
8TH/9TH ST.	8TH ST, NE	BUTLER MKT. RD.	REVERE	3	C	Curb, Sidewalk Infill	299,880	-	299,880	100%
8TH/9TH ST.	8TH/9TH ST NE/SE	FRANKLIN	WILSON	3	C	Sidewalk Infill	154,000	-	154,000	100%
8TH/9TH ST.	9TH ST, SE	WILSON	REED MARKET RD.	3	C	Curb, Sidewalk Infill	264,600	-	264,600	100%
8TH/9TH ST.	9TH ST, SE	WILSON INTERSECTION	N/A	4	A	Single Lane Roundabout	1,300,000	-	1,300,000	100%
8TH/9TH ST.	8th St., NE	GREENWOOD	FRANKLIN	3	C	Sidewalk Infill	52,500	-	52,500	100%
8TH/9TH ST.	8th St., NE	GREENWOOD INT.	N/A	4	A	Full Signal/Intersection Improvements	950,000	-	950,000	100%
9TH/12TH, NW	9TH, NW	TRENTON	NEWPORT	3	C	Sidewalk Infill	50,050	-	50,050	100%
9TH/12TH, NW	12TH, NW	SUMMIT AVE.	TRENTON	3	C	Sidewalk Infill	87,500	-	87,500	100%
AMERICAN LANE	AMERICAN LN	AMERICAN LN. (NEW)	BROSTERHOUS	3	C	Curb, Bike Lanes, Sidewalk Infill	291,730	-	291,730	100%
AMERICAN LANE	AMERICAN LN (NEW)	REED MKT. RD.	AMERICAN LN. (OLD)	1	B	New 3- Lane Collector	247,280	170,113	77,167	31%
AMERICAN LANE	AMERICAN LN (NEW)	CANAL CROSSING	N/A	5	A	CANAL CROSSING	1,687,640	1,155,530	532,110	32%
ARCHIE BRIGGS	ARCHIE BRIGGS RD.	RIVER CROSSING	N/A	5	C	New Bridge	1,890,000	945,000	945,000	50%

Table C-1
Fiscally-Constrained SDC Project List
Proposed Projects with Allocated Funding

Corridor	Street Name	From	To	Category (1)	Need (2)	Description	Total $	NonGrowth $	Growth $	Growth %
BEAR CREEK	BEAR CK. RD	15 TH ST.	PETTIGREW	3	C	Curb, Bike Lanes, Sidewalk Infill	309,170	-	309,170	100%
BEAR CREEK	BEAR CK. RD	PETTIGREW INT.	N/A	4	B	Single Lane Roundabout	1,300,000	996,013	303,987	23%
BLAKELY	BLAKELY RD	BADGER	POWERS	3	C	Curb, Bike Lanes, Sidewalk Infill	75,150	-	75,150	100%
BOYD ACRES	BOYD ACRES RD	COOLEY	EMPIRE	3	C	Curb, Bike Lanes, Sidewalk Infill	613,590	-	613,590	100%
BRITTA	BRITTA	MARINER	HALFWAY	3	C	Partial Widening, Curb, Bike Lanes, Sidewalk In	118,950	-	118,950	100%
BROOKSWOOD	BROOKSWOOD	LODGEPOLE	POPLAR	3	C	Sidewalk Infill	149,450	-	149,450	100%
BROOKSWOOD	BROOKSWOOD	REED MKT. RD.	POWERS	3	C	Sidewalk Infill	25,760	-	25,760	100%
BROOKSWOOD	BROOKSWOOD	POWERS INT.	N/A	4	A	Single Lane Roundabout	1,300,000	-	1,300,000	100%
BROSTERHOUS	BROSTERHOUS	THIRD STREET	AMERICAN LANE	2	B	New 2- Lane Collector	3,579,300	2,351,517	1,227,783	34%
BROSTERHOUS	BROSTERHOUS	MURPHY	KNOTT	3	C	Curb, Bike Lanes, Sidewalk Infill	705,550	-	705,550	100%
BROSTERHOUS	BROSTERHOUS	AMERICAN LANE	MURPHY	3	C	Sidewalk Infill	21,560	-	21,560	100%
BROSTERHOUS	BROSTERHOUS	KNOTT INTERSECTION	N/A	4	A	Single Lane Roundabout	1,300,000	-	1,300,000	100%
BUTLER MARKET	BUTLER MKT. RD	8TH ST	UGB (2000)	3	C	Curb, Sidewalk Infill	706,188	-	706,188	100%
BUTLER MARKET	BUTLER MKT. RD	BOYD ACRES RD.	8TH ST.	3	C	Sidewalk Infill	47,250	-	47,250	100%
BUTLER MARKET	BUTLER MKT. RD	PURCELL INTERSECTION	N/A	4	A	Single Lane Roundabout	1,300,000	-	1,300,000	100%
BUTLER MARKET	BUTLER MKT. RD	WELLS ACRES RD. INT.	N/A	4	B	Single Lane Roundabout	1,300,000	946,739	353,261	27%
CLAUSEN	CLAUSEN DRIVE	(N. TERMINUS)	CLAUSEN DR (E/W)	3	C	Sidewalk Infill	28,875	-	28,875	100%
COLLEGE/ PORTLAND	COLLEGE WAY	NEWPORT	SAGINAW	3	C	Sidewalk Infill	63,000	-	63,000	100%
COLLEGE/ PORTLAND	PORTLAND AVE	COLLEGE WAY	WALL ST	3	C	Curb, Bike Lanes, Sidewalk Infill	443,950	-	443,950	100%
COLLEGE/ PORTLAND	PORTLAND AVE	WALL ST. INT.	N/A	4	A	Upgrade Traffic Signal/Intersection	295,000	-	295,000	100%
COLORADO	COLORADO	CENTURY DR.	INDUSTRIAL WAY	3	C	Bike Lanes, Sidewalk Infill	34,600	-	34,600	100%
COLORADO	COLORADO	BOND	PARKWAY	3	C	Sidewalk Infill	28,000	-	28,000	100%
COLORADO	COLORADO	INDUSTRIAL WAY	BOND	3	C	Sidewalk Infill	18,900	-	18,900	100%
COLORADO	COLORADO	COLUMBIA INT.	N/A	4	A	Single Lane Roundabout	1,300,000	-	1,300,000	100%
COOLEY	COOLEY RD	HUNNEL RD. (E) INT.	N/A	4	A	Single Lane Roundabout	1,300,000	-	1,300,000	100%
DIVISION	DIVISION ST.	HWY 20 (N)	REVERE	3	C	Curb, Sidewalk Infill	199,430	-	199,430	100%
EMPIRE AVE.	EMPIRE AVENUE	PURCELL	BUTLER MARKET RD.	1	A	New 3- Lane Arterial	2,060,670	-	2,060,670	100%
EMPIRE AVE.	EMPIRE AVENUE	3RD/HWY20 (N)	PARKWAY RAMPS	3	A	New 5-Lane Arterial	608,970	444,129	164,841	27%
EMPIRE AVE.	EMPIRE AVENUE	18TH ST.	PURCELL	3	B	Upgrade 2-lanes to 3-lanes (left turn) with bik	983,375	697,408	285,967	29%
EMPIRE AVE.	EMPIRE AVENUE	O.B. RILEY RD.	3RD/HWY20 (N)	3	B	Upgrade 2-lanes to 3-lanes (left turn) with bik	737,530	431,681	305,849	41%
EMPIRE AVE.	EMPIRE AVENUE	US 97	SOUTHBOND RAMP	4	A	Install Traffic Signal; realignment; new lanes; r	3,600,000	-	3,600,000	100%
EMPIRE AVE.	EMPIRE AVENUE	US 97	NORTHBOND RAMP	4	A	Widen ramp; add through lanes	1,500,000	-	1,500,000	100%
EMPIRE AVE.	EMPIRE AVENUE	18TH ST. INTERSECTION	N/A	4	A	Multi-lane Roundabout	3,387,904	-	3,387,904	100%
EMPIRE AVE.	EMPIRE AVENUE	PURCELL INTERSECTION	N/A	4	A	Multi-lane Roundabout	3,100,000	-	3,100,000	100%
EMPIRE AVE.	EMPIRE AVENUE	3RD/HWY 20(N) INT.	N/A	4	A	Signal Modification/Lane Addition	430,000	-	430,000	100%
EMPIRE AVE.	EMPIRE AVENUE	BUTLER MKT. INT.	N/A	4	A	Upgrade signal to multi-lane roundabout	3,100,702	-	3,100,702	100%
EMPIRE AVE.	EMPIRE AVENUE	JAMISON INTERSECTION	N/A	4	B	Restriction	10,500	6,196	4,304	41%
EMPIRE AVE.	EMPIRE AVENUE	CANAL CROSSING	N/A	5	C	CANAL CROSSING	1,687,640	1,197,520	490,120	29%
FRANKLIN	FRANKLIN	WALL	PARKWAY	3	C	Bike Lane Infill (Parking Removal)	50,400	-	50,400	100%
FRANKLIN	FRANKLIN	UNDERCROSSING	N/A	5	C	Bike Lanes, Sidewalk Infill	63,643	52,584	11,059	17%
GALVESTON	GALVESTON AVE	14TH ST., NW	RIVERSIDE AVE.	3	C	Sidewalk Infill	8,050	-	8,050	100%
GALVESTON	RIVERSIDE	GALVESTON	WALL	3	C	Bike Lane Infill (Parking Removal)	350,000	-	350,000	100%
GREENWOOD (E)	HWY. 20 (E) (GREENWOOD)	3RD ST. , NE	12TH ST.	9	C	Sidewalk Infill	36,225	-	36,225	100%
GREENWOOD (E)	HWY. 20 (E) / GREENWOOD	27TH. ST.	UGB (2000)	9	C	Curb, Bike Lanes, Sidewalk Infill	99,890	-	99,890	100%
GREENWOOD (E)	HWY. 20 (E) / GREENWOOD	6TH ST. INT.	N/A	9	C	Pedestrian Crossing	150,000	-	150,000	100%
GREENWOOD (W)	GREENWOOD AVE	WALL	3RD ST., NE	3	C	Bike Lane Infill (Parking Removal)	58,800	-	58,800	100%
GREENWOOD (W)	NEWPORT	COLLEGE WAY	12TH ST.	3	C	Sidewalk Infill	49,980	-	49,980	100%
GREENWOOD (W)	SHEVLIN PK. RD	UGB (2008)	MT. WASHINGTON	3	C	Multi-use Trail, Curb, Sidewalk Infill	866,850	-	866,850	100%
GREENWOOD (W)	SHEVLIN PK. RD	MT. WASHINGTON	COLLEGE WAY	3	C	Multi-use Trail, Curb, Sidewalk Infill	1,294,500	-	1,294,500	100%

Table C-1
Fiscally-Constrained SDC Project List
Proposed Projects with Allocated Funding

Corridor	Street Name	From	To	Category (1)	Need (2)		Description	Total $	NonGrowth $	Growth $	Growth %
Hwy 97/Parkway	HWY 97 (S)	EMPIRE	BUTLER MARKET RD.	9	A		ODOT FACILITY	3,250,000	2,275,000	975,000	30%
JAMISON	JAMISON	EMPIRE	(N. OF N. FIRE STATION)	3	C		Curb, Sidewalk Infill	270,970	-	270,970	100%
KNOTT	KNOTT RD	CHINA HAT INT.	N/A	4	B		Single Lane Roundabout	1,300,000	1,178,487	121,513	9%
KNOTT	KNOTT RD	COUNTRY CLUB INT.	N/A	4	C		Single Lane Roundabout	1,300,000	-	1,300,000	100%
KNOTT	KNOTT RD	CANAL CROSSING	N/A	5	C		Sidewalk Infill over Canal	175,000	161,688	13,312	8%
LEMHI	LEMHI	NW CROSSING	SKYLINERS	1	A		2 lane collector	982,235	-	982,235	100%
MT. WASH	MT. WASHINGTON	SIMPSON INT.	N/A	4	B		Single Lane Roundabout	1,300,000	832,947	467,053	36%
MURPHY	MURPHY ROAD	COUNTRY CLUB INT.	N/A	4	B		Single Lane Roundabout	524,000	343,310	180,690	34%
MURPHY	MURPHY ROAD	BROSTERHOUS INT.	N/A	4	B		Single Lane Roundabout	412,000	265,738	146,262	36%
NEFF/OLNEY	NEFF RD	PURCELL INTERSECTION	N/A	4	B		New Traffic Signal/ Lane Addition	2,588,482	1,737,980	850,501	33%
NEFF/OLNEY	NEFF RD/PENN	8TH ST	PURCELL	3	B		Sidewalk Infill	92,400	73,625	18,775	20%
NEFF/OLNEY	OLNEY AVE	RAILROAD CROSSING	N/A	6	C		Rail Crossing for Bike Lanes & Sidewalk	35,000	27,067	7,933	23%
NW CROSSING	NW CROSSING	SKYLINE RANCH RD.	MT. WASH. DRIVE	3	C		Partial Widening, Curb, Bike Lanes, Sidewalk I	329,350	-	329,350	100%
PETTIGREW	PETTIGREW	BEAR CREEK RD.	REED MKT. RD.	2	B		New 3- Lane Collector	4,435,520	3,362,625	1,072,895	24%
PONDEROSA/CHINA HA	CHINA HAT	CANAL CROSSING	N/A	5	C		Sidewalk Infill over Canal	175,000	149,074	25,926	15%
PONDEROSA/CHINA HA	LODGEPOLE	MAHOGANY	POPLAR	3	C		Curb, Bike Lanes, Sidewalk Infill	221,970	-	221,970	100%
POWERS/CHASE	CHASE RD	MOWITCH	BROSTERHOUS	1	B		New 2- Lane Collector	2,018,530	1,345,687	672,843	33%
POWERS/CHASE	CHASE RD	PARRELL RD.	MOWITCH	2	B		New 2- Lane Collector	491,120	345,603	145,517	30%
POWERS/CHASE	CHASE RD	PARRELL INT.	N/A	4	B		Single Lane Roundabout	1,300,000	860,432	439,568	34%
POWERS/CHASE	POWERS	3RD STREET	PARRELL RD.	2	B		New 3- Lane Collector	890,170	575,572	314,598	35%
POWERS/CHASE	POWERS	BROOKSWOOD	3RD STREET	2	B		New 5-Lane Arterial	3,205,870	2,131,094	1,074,776	34%
POWERS/CHASE	POWERS	3RD ST. INT.	N/A	4	A		Signal Modification/Lane Addition	430,000	-	430,000	100%
PURCELL	PURCELL BLVD.	YEOMAN ROAD	BUTLER MKT RD.	3	B		Curb, Bike Lanes, Sidewalk Infill	221,970	120,850	101,120	46%
PURCELL	PURCELL BLVD.	BUTLER MKT. RD.	OCKER DR.	3	C		Bike Lane Infill (Parking Removal)	56,700	-	56,700	100%
REED MARKET RD. (E)	REED MKT. RD	SE 15TH ST.	SE 27TH ST.	2	A		Upgrade 2-lanes to 3-lanes (left turn)	3,294,560	2,381,352	913,208	28%
REED MARKET RD. (E)	REED MKT. RD	SE 3RD ST. INTERSECTION	N/A	3	A		Multi-lane Roundabout	3,400,000	2,509,751	890,249	26%
REED MARKET RD. (E)	REED MKT. RD	SE 3RD ST.	SE 15TH ST.	3	B		Capacity Three Lane Arterial	3,346,800	2,440,016	906,784	27%
REED MARKET RD. (E)	REED MKT. RD	AMERICAN LN. INT. (NEW)	N/A	4	A		Interim Signal	135,000	-	135,000	100%
REED MARKET RD. (E)	REED MKT. RD	SE 15TH ST. INT.	N/A	4	A		Multi-lane Roundabout	2,265,000	-	2,265,000	100%
REED MARKET RD. (E)	REED MKT. RD	BROSTERHOUS/3RD INT.	N/A	4	A		Multi-lane Roundabout	3,680,000	-	3,680,000	100%
REVERE	REVERE	4TH St.	8th St.	3	C		Sidewalk Infill	63,000	-	63,000	100%
SIMPSON	SIMPSON AVE	MT. WASHINGTON	14TH ST.	3	C		Curb, Bike Lanes, Sidewalk Infill	380,520	-	380,520	100%
SIMPSON	SIMPSON AVE	14TH ST., NW/SW	COLORADO	3	C		Sidewalk Infill	15,400	-	15,400	100%
SIMPSON	SIMPSON AVE	COLORADO INT.	N/A	4	D		Roundabout Upgrade	333,000	237,347	95,653	29%
SIMPSON	SIMPSON AVE	14TH ST. INT.	N/A	4	D		Roundabout Upgrade	333,000	228,513	104,487	31%
SIMPSON	SIMPSON AVE	COLUMBIA INT.	N/A	4	D		Single Lane Roundabout	1,300,000	896,273	403,727	31%
WILSON	WILSON	3RD ST. INT.	N/A	4	A		Upgrade Traffic Signal/Intersection	460,000	-	460,000	100%
	BRINSON	BOYD ACRES ROAD	BUTLER MKT RD	3	C		Sidewalk Infill	189,000	-	189,000	100%
	HUNNEL RD	COOLEY RD.	ROBAL LANE	3	C		Sidewalk Infill	70,000	-	70,000	100%
	ROBAL LANE	HWY 20	HUNNEL	3	C		Sidewalk Infill	55,440	-	55,440	100%
	STUDIO RD	4TH ST., NE	BUTLER MARKET RD.	3	C		Curb, Sidewalk Infill	92,610	-	92,610	100%
	WELLS ACRE RD	BUTLER MKT RD	NE 27TH	3	C		Bike Lane Infill (Parking Removal), Sidewalk In	298,480	-	298,480	100%
								-			
	Improvement Projects							**111,671,071**	**38,885,809**	**72,785,261**	**65%**

(1) Category Legend
1 = New Road Construction, 2 = Full Modernization, 3= Partial Modernization, 4 = Intersection Modernization, 5 = Crossing Structures, 6 = Others, 7 = Completed, 8 = Studies, 9 = ODOT Facility, 10 = TSP Project No Improvement Planned
(2) Need Legend
A = Capacity, B = Safety, C= Multimodal, D= Other

ITE Trip Generation Manual Grouped Land Use Codes

Table C-2

Sample Trip Generation Rates and Pass-by Trip Factor

ITE Code (Vol 8)	Name	Units [1]	Peak-Hour Trips (ITE Trip Gen. 8th Edition)	Pass-By Trip Factor (ITE Trip Gen. Handbook 2nd Edition)	Fiscally-Constrained SDC per Unit
INDUSTRIAL					
110	General Light Industrial	KSF	0.97	1	$4,391
120	General Heavy Industrial	KSF	0.68	1	$3,078
130	Industrial Park	KSF	0.86	1	$3,893
140	Manufacturing	KSF	0.73	1	$3,305
150	Warehouse	KSF	0.32	1	$1,449
151	Mini-Warehouse	KSF	0.26	1	$1,177
152	High-Cube Warehouse	KSF	0.1	1	$453
RESIDENTIAL					
210	SF Detached	DU	1.01	1	$4,572
220	Apartment	DU	0.62	1	$2,807
230	Condo/Townhouse	DU	0.52	1	$2,354
240	Mobile Home	Occupied DU	0.59	1	$2,671
252	Senior Adult Housing - Attached	Occupied DU	0.16	1	$724
253	Congregate Care Facility	Occupied DU	0.17	1	$770
LODGING					
310	Hotel	Room	0.59	1	$2,671
320	Motel	Room	0.47	1	$2,128
RECREATION					
411	City Park	Acres [3]	0.16	1	$720
417	Regional Park	Acres	0.2	1	$905
430	Golf Course	Holes	2.78	1	$12,585
435	Multipurpose Recreation Facility	KSF	3.58	1	$16,207
444	Movie Theater w/ Matinee	KSF	3.8	1	$17,203
493	Athletic Club	KSF	5.96	1	$26,981
495	Recreational Community Center	KSF	1.45	1	$6,564
INSTITUITION					
520	Elementary School	Student	0.15	1	$679
522	Middle School	Student	0.16	1	$724
530	High School	Student	0.13	1	$589
540	Junior/Community College	Student	0.12	1	$543
550	University/College	Student	0.21	1	$951
560	Church	KSF	0.55	1	$2,490
565	Day Care	KSF	12.46	1	$56,406
591	Lodge/Fraternal Organization	Members	0.03	1	$136
MEDICAL					
610	Hospital	KSF	1.14	1	$5,161
720	Medical-Dental Office	KSF	3.46	1	$15,663
OFFICE					
710	General Office [4]	KSF	1.49	1	$6,745
715	Single Tenant Office Building	KSF	1.73	1	$7,832
750	Office Park	KSF	1.48	1	$6,700
760	Research & Development Center	KSF	1.07	1	$4,844
770	Business Park	KSF	1.29	1	$5,840
RETAIL					
812	Building Materials & Lumber	KSF	4.49	1	$20,326

Table C-2

Sample Trip Generation Rates and Pass-by Trip Factor

ITE Code (Vol 8)	Name	Units [1]	Peak-Hour Trips (ITE Trip Gen. 8th Edition)	Pass-By Trip Factor (ITE Trip Gen. Handbook 2nd Edition)	Fiscally-Constrained SDC per Unit
813	Free-Standing Discount Super Store	KSF	4.61	0.72	$15,026
814	Specialty Retail	KSF	2.71	1	$12,268
815	Discount Store	KSF	5.00	0.83	$18,787
816	Hardware/Paint Store	KSF	4.84	0.74	$16,214
817	Nursery(Garden Center)	KSF	3.80	1	$17,203
820	Shopping Center [4]				
	< 100,000 sq ft	KSF	6.4 at 100,000 sq ft	0.76	$22,019
	100,000 - 300,000 sq ft	KSF	5.1 at 200,000 sq ft	0.74	$17,085
	Over 300,000 sq ft	KSF	4.4 at 300,000 sq ft	0.7	$13,943
841	New Car Sales	KSF	2.59	1	$11,725
843	Auto Parts Sales	KSF	5.98	1	$27,071
848	Tire Store	KSF	4.15	0.72	$13,527
850	Supermarket	KSF	10.50	0.64	$30,421
851	Convenience Market (24 hour)	KSF	52.41	0.39	$92,531
854	Discount Supermarket	KSF	8.9	0.77	$31,024
861	Sporting Goods Superstore	KSF	3.1	1	$14,034
862	Home Improvement Superstore	KSF	2.37	0.52	$5,579
863	Electronics Superstore	KSF	4.50	1	$20,372
880	Pharmacy w/o drive through	KSF	8.42	0.47	$17,915
881	Pharmacy w/ drive through	KSF	10.35	0.51	$23,896
890	Furniture Store	KSF	0.45	0.47	$957
911	Walk-In Bank	KSF	12.13	1	$54,913
912	Drive-In Bank	KSF	25.82	0.53	$61,950
931	Quality Restaurant	KSF	7.49	0.56	$18,988
932	High Turnover (Sit-Down) Restaurant	KSF	11.15	0.57	$28,771
933	Fast Food w/o Drive-Thru	KSF	26.15	1	$118,381
934	Fast Food With Drive-Thru	KSF	33.84	0.5	$76,597
935	Fast Food WithOut Drive-Thru With No Indoor	KSF	153.85	0.11	$76,613
936	Coffee/Donut Shop w/o Drive Through Window	KSF	40.75	1	$184,475
944	Gas Station	Fueling Positions	13.87	0.58	$36,418
945	Gas/Service Station with Convenience Market	Fueling Positions	13.38	0.44	$26,651
947	Self-Service Car Wash	Wash Stalls	5.54	1	$25,080
948	Automated Car Wash	Wash Stalls	77.5	1	$350,843

SOURCE: Institute of Transportation Engineers,*Trip Generation*, Eighth Edition, 2008

NOTES:

[1] Land Use Units:

KSF = 1,000 gross square feet building area
DU = dwelling unit
Room = number of rooms for ren
Fueling Positions = maximum number of vehicles that can be served simultaneously
Student = number of full-time equivalent students enrolle

[2] Supplemental local trip surveys are highly recommended for uses characterized by 3 or fewer surve
ITE recommends a minimum of 3, and prefers 5 or more survey

[3] Based on the ratio of City Park (411) rates from weekday picnic sites to weekday acr

[4] Regression equations published in ITE Trip Generation may be used instead of average trip rat
The equation may provide a better estimate of activity than the average rate method for these land u