

CIP White Paper

Department Name: Seattle Department of Transportation

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Section 1 - Overview

The Seattle Department of Transportation (SDOT) develops, maintains, and operates a transportation system that promotes the safe and efficient mobility of people and goods, and enhances the quality of life, environment, and economy of Seattle and the surrounding region. The transportation infrastructure is valued at over \$13 billion. Major system assets include: 1,540 lane-miles of arterial streets, 2,412 lane-miles of non-arterial streets, 147 bridges, 582 retaining walls, 22 miles of seawalls, 1,045 signalized intersections, 45 miles of bike trails, 223 miles of on-street bicycle facilities, 35,000 street trees, 2,200 pay stations, 300 parking meters, 26,000 curb ramps, and 1.6 million lane markers.

Transportation activities in the City of Seattle reflect its role as a mature major city. Roughly a quarter of the land area within city limits is dedicated to travel.

As a mature city, Seattle rarely creates new road transportation facilities. The City optimizes or redevelops existing facilities to make them safer, more efficient and supportive of diverse urban needs. The City also maintains or improves critical transportation infrastructure of regional, statewide and national significance in cooperation with external partners.

SDOT's capital budget includes four broad categories of investment. See Exhibit 1-1 for examples of projects/programs included in each category.

The four investment categories are defined as follows:

- *Large Capital Projects* are individual projects that stand out among the City's transportation needs because of their size or complexity, potential community impact, high cost, or coordination with outside partners.
- *Maintenance and Rehabilitation Programs* optimize existing facilities by keeping facilities and equipment in good condition and good operating order.
- *Neighborhood Programs* are similar to system improvements, but generally comprise smaller-scale projects identified through community input.
- *System Improvements Programs* fill in gaps or make extensions to networks that are identified through subarea or modal plans.

The Transportation Capital Improvement Program includes planned spending of \$1.34 billion over the 2012-2017 six-year period. Funding for TCIP projects comes from a combination of Bridging the Gap (16%), other local revenues (30%), long-term financing (15%), or external funding, which includes state grants, federal grants, and partnership funds (33%). About 6% of TCIP funding is to be determined, based on funding availability. More detailed information SDOT's full capital program can be found in the 2012-2017 Proposed CIP online here: <http://www.seattle.gov/financedepartment/1217proposedcip/default.htm>

Some funding uncertainties are not reflected in the TCIP. One example involves additional funding gaps not shown for projects that are in the TCIP but are currently on hold for lack of funds (e.g., Magnolia Bridge replacement). Another example of uncertain funding availability includes grant awards. The long-term annual average grant funding revenue for SDOT is \$22 million; in 2010, SDOT successfully competed for over \$87 million in grant awards. Lastly, specific grant-eligibility requirements can cause a capital project to advance ahead of higher-priority projects in order to take advantage of available funding.

Exhibit 1-1

TRANSPORTATION CAPITAL IMPROVEMENTS PROGRAM - EXAMPLE ACTIVITIES

MAINTENANCE & REHABILITATION		NEIGHBORHOOD PROGRAMS	
Bridge Rehabilitation and Repair	TC366850	NSF / CRF Neighborhood Program	TC365770
Retaining Wall Repair and Restoration	TC365890	Duwamish Truck Mobility Program	TC365850
Sidewalk Safety Repair	TC365120	Neighborhood Traffic Control Program	TC323250
Arterial Asphalt & Concrete Program	TC365440	[Pioneer Sq] Hazard Mitigation Program	TC365480
Landslide Mitigation Program	TC365510	Center City Access Strategy Program	TC366600

LARGE CAPITAL PROJECTS	
Linden Ave Complete Streets	TC366930
Chief Sealth Trail	TC365690
King Street Station Multimodal Hub	TC366810
Mercer Corridor	TC365500
Magnolia Bridge Replacement	TC366060

SYSTEM IMPROVEMENTS	
Pedestrian Master Plan Implementation	TC367150
Bicycle Master Plan Implementation	TC366760
Transit Corridor Projects	TC366860
Intelligent Transportation Systems (ITS)	TC365870
Street Lighting Program	TC366900

Section 2 - Summary of Upcoming Budget Issues and Challenges

In the past few years, with City and gas tax revenues down from previous years, support for transportation has been limited. Excluding Bridging the Gap, SDOT's base funding in 2010 was 6% below 2000 budgeted levels after adjusting for inflation. More recently, the decline has been steeper. Relative to inflation-adjusted 2008 levels, budgeted support from gas tax revenues was down 7% in 2010, the City's General Subfund contribution had declined 25%, and support from Real Estate Excise Tax (REET) revenues had decreased 62%. In addition to these challenges, in 2010 the department faced a \$7.8 million shortfall in its General Subfund and gas tax funding. This was partially due to a citywide need for mid-year reductions, which resulted in \$1.2 million in General Subfund cuts to some of the most basic programs and services provided by SDOT. In addition, the department had an internal imbalance due to the depletion of gas tax reserves in 2009, earlier than planned. The early depletion was caused, in part, by requirements for emergency services activities, which have historically been underfunded, and the unbudgeted cleanup of homeless encampments.

While 2010 mid-year reductions addressed the 2010 shortfall, the City faced additional financial challenges in 2011. In developing the 2011 Adopted Budget, the City of Seattle's General Fund was facing a \$67 million shortfall for 2011. The 2011 Adopted and 2012 Endorsed Budget includes reductions for all General Fund-dependent functions to close this gap. In addition, SDOT is also experiencing funding constraints from its other funding sources, resulting in reductions in real estate excise tax and gas tax-funded programs.

Following the trend of recent years, the amount of revenue from many of these sources continues to decrease in 2012. General Fund budget pressures in 2012 and future years require that SDOT make further budget reductions in the 2012 Proposed Budget, and SDOT is also experiencing funding decreases from other sources. Taken together with the General Fund reductions, SDOT's 2012 Proposed Budget closes a \$10 million gap.

Looking to the future, SDOT faces a large backlog of unfunded maintenance needs, as described in this White Paper. Deferred maintenance leads to more costly repairs in the long run, and the City lags far behind industry standards for repair and replacement cycles in many functional areas. With the guidance of the Citizens Transportation Advisory Committee (CTAC 3), and the collaborative efforts of the Executive and City Council, SDOT hopes to continue the conversation of how to adequately address the transportation needs of Seattle's residents in the years to come. One important step in this direction is a public vote in November 2011 on a \$60 Vehicle License Fee (VLF) measure. This measure, which was placed on the ballot by the Seattle Transportation Benefit District Board (comprised of City Council members) and supported by the Mayor, would provide additional funding for major maintenance, transit, and bike and pedestrian facilities. These funds are not built into the 2012 Proposed Budget, and will be added to the budget by City Council action if this measure is approved.

Section 3 - Thematic Priorities

The role of the transportation system is to connect people, places and products. To accomplish this, SDOT's thematic priorities for building and maintaining its capital infrastructure are:

- Productivity – shared prosperity and economic security.
- Livability – support for neighborhoods as safe and healthy places to live, work, learn, and play
- Equity – fairness and inclusiveness for all
- Sustainability – stewardship of the natural and built environments as well as financial stewardship.

These themes align with the Mayor's key values and the Seattle Comprehensive Plan's fundamental principles. Additionally, in 2010 the Mayor launched a Walk Bike Ride initiative aimed at making walking, biking and riding transit the easiest ways to get around Seattle. These modes of transportation directly support and enhance the thematic priorities.

Projects are initiated through a number of methods including planning processes (modal, subarea, neighborhood planning), preservation, operations and safety needs assessment, regulatory requirements, elected official direction and, in some instances, from neighborhood input such as the Neighborhood Street Fund program.

Stakeholders have significant input in development of all SDOT plans through public involvement processes. Seattle's Pedestrian, Bicycle and Freight Advisory Boards also provide input on project/program needs.

A number of factors can impact SDOT's project and funding decisions. These can include regulatory requirements, state and federal law (such as the Americans with Disabilities Act) and construction seasons. Opportunities to leverage the City's limited funding with grants or coordinated projects with other agencies can also affect SDOT's decisions.

In every case SDOT strives to implement the City's policy goals laid out in Seattle's Comprehensive Plan and individual policy initiatives such as Complete Streets, the Race and Social Justice Initiative and the Environmental Management Initiative. SDOT's Transportation Strategic Plan, modal plans and subarea plans provide an overall framework for implementing these goals.

SECTION 4: PROJECT SELECTION CRITERIA

While SDOT has characterized its CIP investments into four broad categories--**Large Capital Projects, Maintenance and Rehabilitation, Neighborhood Programs and System Improvements**--each program/project within these categories uses different

criteria (based on the thematic priorities as tailored to specific program purposes) to rank and select projects as highlighted below.

LARGE CAPITAL PROJECTS

Large Capital Projects stand out among the City's transportation needs because of their size or complexity, potential community impact, high cost or coordination with outside partners. The current adopted *2011 – 2016 Capital Improvement Program* contains 30 such projects.

Projects are first screened to meet three criteria prior to moving forward. They must be a stand-alone capital facility improvement. Each project must include a project scope / description with specific locations and extent. Lastly, the description/scope of work must also support a minimum estimated cost of over \$500,000.

Each project is then scored on eight quantitative criteria derived from SDOT's thematic priorities of livability, equity, productivity and sustainability (total of 100 possible points):

- **Assess total collision rate:** calculate a normalized comparison of project area accidents frequency; more accidents equal a higher score (maximum 10 points)
- **Assess bicycle and pedestrian collisions:** calculate a normalized comparison of area roadway accidents specifically involving bicyclists or pedestrians; more accidents equal a higher score (maximum 10 points)
- **Improve infrastructure conditions:** assess the number and type of infrastructure assets in fair or poor condition within the project limits; more identified assets equal a higher score (maximum 10 points)
- **Promote environmental stewardship:** identify whether a project reduces greenhouse gas emissions, improves water quality or reduces vehicle miles traveled; 0 or 5 points each (maximum 15 points)
- **Support community equity and health:** identify projects located within statistically significant concentrations of populations needing enhanced transportation access: low income, disabilities, obesity, diabetes, low car ownership; 0 or 2 points each (maximum 10 points)
- **Support priority corridors:** award points based on the project location's rank among city's planned modal corridors: bicycle, pedestrian, transit, freight and road; maximum of 3 points for each mode (maximum 15 points)
- **Advance complete streets implementation:** award points for how many, and how well, non-single occupancy vehicle modal improvements are incorporated into the project scope (maximum 15 points)

- **Support areas of future growth:** prioritize projects that support transportation needs in designated urban centers, manufacturing/industrial centers or villages (maximum 15 points)

The above criteria are intended to result in higher scores for projects that make improvements to the environments for walking, biking and riding transit. Projects that focus solely on improvements for automobile travel are not able to achieve maximum points in all categories. Once the projects have been quantitatively evaluated (**see Exhibit 4-1**), projects are additionally assessed for qualitative “balancing factors” that can influence each project’s ranking priority beyond the raw score (**see Exhibit 4-2**):

- **Leveraging opportunities:** identify opportunities to ameliorate traffic or community impacts using timing, weather conditions or similar activities with other projects
- **Other funding availability:** projects that require specific windows of partner participation (e.g., utilities, other agencies), are eligible for specific grant awards, or offer a significant cost savings opportunity
- **Community support:** projects that have the support of major / multiple constituencies, are identified as part of an neighborhood plan or feature private / public partnerships
- **Existing commitments:** projects subject to a signed agreement, memorandum of understanding or contract, special levy, elected official commitment, or that have completed prior phases and are “ready to go” for additional work
- **Geographic equity:** look for a fair distribution of investments, functional benefits / impacts and community access to transportation systems

The Revenue and Capital Develop group of SDOT Policy and Planning Division compiles the projects and initial scores and ranking. The CIP Working Group, a committee of division directors and senior managers, reviews the scoring and subsequent ranking prior to Department Director approval.

MAINTENANCE & REHABILITATION

Arterial Asphalt and Concrete Program (AAC)

Arterial Asphalt and Concrete is Seattle’s largest paving program. It is the primary means by which SDOT renews its 1,534 lane-miles of arterial street surfaces and systematically maintains its street network in a state of good repair. AAC paving projects also include construction of curb ramps at intersections (bringing street crossings into compliance with federal American Disabilities Act requirements), installation of stormwater detention and treatment systems as mandated by City code, and “Complete Streets” ordinance elements. A pavement management system is used to track street condition, estimate maintenance needs, and to establish priorities and select the streets to be rehabilitated each year.

The basic criteria SDOT uses to establish paving priorities are: street condition (specifically the current 2011 Pavement Condition Index Survey); cost and cost effectiveness of treatment (using life cycle costs to weigh preservation opportunities against full street reconstruction); traffic volume; transit, freight, bicycle and pedestrian use; citizen complaints and claims; grant funding opportunities; and geographic balance across the city. The AAC program aims to deliver over time the greatest area of improved street surface to the largest number and widest array of users.

As part of the Bridging the Gap (BTG) levy, a nine-year paving plan was developed. The plan is published online at <http://www.seattle.gov/transportation/paving.htm> (scroll to bottom of page) along with maps showing the location of planned work. The nine-year plan is updated annually to reflect changes in pavement conditions, construction costs and to take advantage of coordination opportunities.

Since BTG's inception in 2007, the AAC program has delivered 132.3 lane-miles of paving (33.3 in 2010, 28.7 in 2009, 41.5 in 2008, and 28.8 in 2007). AAC expects to average 20 to 25 lane-miles per year over the life of the BTG initiative.

Arterial Major Maintenance (AMM)

Arterial Major Maintenance is SDOT's largest crew paving program. It is primarily an asphalt program, although concrete work is sometimes included. As with the Arterial Asphalt and Concrete Program, pavement management data (specifically the current 2011 Pavement Condition Index Survey) is used to track street conditions and plan work. In addition, the AMM program is also used to respond to emerging needs. It allows SDOT to quickly and cost effectively remedy developing pavement problems that are too large to be addressed with a pothole repair, yet are too small to be efficiently contracted. Funding for AMM in 2011 is \$1.471 million and the program expects to pave approximately 3.0 lane-miles at 15 locations across the city. City crews budgeted against this work are also those who respond to emergency events.

Non-Arterial Street Resurfacing (NAA) and Concrete Rehabilitation (NAC)

Non-arterial Asphalt Street Resurfacing (NAA) and Non-arterial Concrete Rehabilitation (NAC) are SDOT's only non-arterial paving programs. Seattle has 2,412 lane-miles of non-arterial streets, the less traveled roadways that nevertheless are critical to residents and businesses. While the amount of paving accomplished is negligible in scale to the system, these two small programs address a few critical streets used by transit and industry, or around hospitals and other locations with heavy pedestrian traffic crossing the street. In 2011, funding for NAA is \$97,000 and NAC is \$228,000. This will allow for about 0.5 to 1.0 lane-miles of spot paving on local streets. City crews budgeted against this work are also those who respond to emergency events.

Bridge Rehabilitation and Replacement

Currently, there is not a City annual program that funds Bridge Rehabilitation and Replacement. The Program's needs compete with other SDOT large capital projects for funding. The Federal Highway Administration (FHWA) does provide Bridge Rehabilitation and Replacement Program (BRRP) funding as part of the larger Transportation

authorization bill. Seattle must compete, state-wide for the BRRP dollars which are managed through the State Local Agency Programs, Bridge Replacement Advisory Committee (BRAC).

SDOT performs bridge condition and safety inspections on all SDOT bridges in compliance with the National Bridge Inspection Standards (NBIS). The inspections collect detailed information about the condition of the bridge, which is used to calculate a sufficiency rating (SR) on a scale of 100. The rating is used to compare all bridges within the country as to their relative condition. In addition, the NBIS sets standards for determining if a bridge is structurally deficient (SD) or functionally obsolete (FO). Although, the NBIS is a good tool for comparing bridge condition between different cities, counties and states, it does not take into account local factors that may contribute to the prioritization of a bridge project. Therefore, SDOT combines the NBIS ratings with project rating criteria that include the following local factors:

- a. Ensure public safety
- b. Preserve public investment in City's bridges
- c. Economic benefits
- d. Social Equity
- e. Support all transportation modes

Final numerical ratings are a result of combining the National numerical ratings with the local Project Rating Criteria. The resulting list of high priority projects are then considered and matched with available local funding such as Bridging the Gap (BTG) or FHWA funding through BRAC. Although, this system assures that the highest priority bridges are apparent, funding does not always match the list. An example is the Magnolia Bridge, which rates as one of Seattle's top priority bridges for replacement; however, due to the very high cost, it does not fit well with the BTG program criteria nor does it fit well with the FHWA BRAC criteria and thus it continues to be an unfunded need.

The NBIS criteria were established by the FHWA over 20 years ago. Starting 10 years ago, SDOT combined the NBIS ratings with project rating criteria. These criteria have been updated over time to better align with the Pedestrian Master Plan, Bike Master Plan, the Transportation Strategic Plan, Walk, Bike Ride Initiative and the Race and Social Justice Initiative.

Bridge Seismic Retrofit

Currently, there is not a City annual program that funds Bridge Seismic Retrofitting. The City Council funded the Bridge Seismic Retrofit Phase 1 Program in 1993 and the Bridging-the-Gap Bridge Seismic Retrofit Phase 2 Program in 2007.

Criteria were developed in 1991 for phase I of the program. The criteria remained the same with the implementation of phase II in 2007; however the prioritization of bridges was different due to an emphasis in Traffic Importance {see Step 2 below}.

The following description represents the prioritization process followed for the Phase 1 and Phase 2 programs. FHWA in conjunction with the American Association of State Highway and Transportation Officials (AASHTO) has developed guidelines used to prioritize bridges for seismic retrofitting. SDOT followed these guidelines as well as looked to CalTrans and WSDOT for leadership in developing prioritization criteria. The SDOT process follows the following steps.

Step 1: Determine Seismic Vulnerability – This process is a technical review of the bridge, considering factors that would make a particular bridge more or less likely to sustain significant damage during an earthquake. These factors include:

- Bridge age. If a bridge is to be replaced or removed relatively soon a significant investment in seismic retrofit would not be prudent. Was the bridge built after recent seismic code changes?
- Structure type. Considers ductility, redundancy, truss, fracture critical or multiple load paths.
- Structure material. Are the material properties subject to brittle failure?
- Design features with seismic vulnerabilities. Short bearing seat width, non-symmetrical lateral stiffness, load path discontinuities, significant changes in longitudinal stiffness.
- Previous seismic retrofits. Has the bridge had a previous retrofit?
- Structure condition. Are there documented conditions that may cause weakness during a seismic event?
- Geotechnical hazards. Seismic settlement, liquefaction, lateral spreading and slope stability

Step 2: Determine the Traffic Importance – This process looks at both the importance of the transportation route that is carried by the bridge and the route that may pass under the bridge, should the bridge collapse. Emphasis is placed on understanding the transportation “route” and not simply a single bridge on the route. It is understood that the value of a bridge, post earthquake, is the value it provides to the transportation corridor, and the ability to provide emergency services to neighborhoods. These criteria include:

- Emergency routes – proximity to police stations, fire stations, and hospitals
- Transit routes
- Freight routes
- Available detours
- School routes
- Average Daily traffic
- Economic impact / social equity

Many of Seattle’s initiatives are embedded in the evaluation of the Traffic Importance criteria. Additionally, the criteria align with SDOT’s Disaster Readiness and Response Plan and the City’s Emergency Response Plan.

The two rating criteria are combined to develop groups of bridges within a relative priority. Thus, Group A, Group B, Group C, etc., with Group A having the highest combined Seismic Vulnerability and Traffic Importance.

Next, a Concept Design Report is prepared to provide enough engineering to validate the cost benefit of performing a seismic retrofit. An Expert Peer Review Panel consisting of subject experts from Caltrans, WSDOT, FHWA, and University of Washington, participate in reviewing the Concept Design Reports. This review provides an early, high level validation that the retrofit concept will provide the anticipated benefit. Some candidate projects may drop in the priority list based on this peer review analysis. An example is the Magnolia Bridge. Although, this bridge rated high in both seismic vulnerability and traffic importance, the Concept Design Report determined that significant liquefaction risk existed throughout much of the bridge and resulted in a cost to retrofit in excess of the budget for all bridges. This was validated by the Expert Review Panel.

Finally, projects are matched with the available budget.

Bridge Painting

Painting of city-owned bridges plays an important part in the overall preservation of the bridge. In our harsh northwest climate, with salt spray coming off Elliott Bay, Seattle's steel bridges are uniquely vulnerable to corrosion-induced deterioration. There are 24 steel bridges in Seattle that are maintained by SDOT. There are also bridges that have steel components, such as railing that require periodic painting.

SDOT follows the Federal Highway Administration (FHWA) guidelines for both the condition inspection of the coating and the frequency of re-coating steel bridges. Life cycle analysis is used to understand the most cost effective time to re-coat. Currently, the coating cycle averages once every 18 years. Inspection of the coating condition occurs at least once every 24 months.

Life-cycle analysis for bridges exposed to our northwest environment recommends that re-coating occurs when 3% to 5% of the coating has failed. Coating failure follows an exponential curve. As the coating ages the failure rate rapidly increases. To delay re-coating into the future will result in greater costs due to the significant increase in areas of failed coating and expose structural steel elements to weakening due to corrosion-induced section loss.

The bridge painting program is reviewed annually. Bridges that are programmed for re-coating over the next five years are analyzed for their percent of coating failure. The condition of bridge paint is assessed at least once in every 24 months. If the coating failure rate is greater than predicted or less than predicted the programmed re-coating date is adjusted. In the past, available funding also has affected the prioritization process.

The Bridge Painting prioritization process has been in place for the past 20 years. As the program is truly preservation/maintenance of existing steel bridges, bridges are prioritized

based on life cycle analysis that minimizes the cost of painting. No specific City initiatives are included in the selection criteria.

Stairway Rehabilitation

The annual Stairway Rehabilitation Program provides funding to rehabilitate existing stairways that have significant condition and safety defects. SDOT performs routine inspection on stairways and assesses their condition. Element level ratings are given to the different parts of a stairway. This information is used to develop a numerical condition rating.

From the list developed by the numerical ranking of condition, additional rating criteria, reflected below, are applied to rank projects for consideration in the annual work plan. In addition to the guidelines listed below, geographical location is considered to fairly spread annual rehabilitation projects throughout Seattle. Available funding is also considered, as one stairway may exceed available funds, and thus a decision may be made to delay the rehabilitation to the next year or schedule the work to span two years.

1. Safety

- Differential settlement and tilting of landings or treads
- Non-standard railing, railing is low, no grip rail or no railing exist
- Condition of tread surface

2. Function

- Does the stair geometry meet current design standards
- Does the stair have standard connections at both ends
- Would this route benefit from a bicycle feature

3. Condition

- Cracked or deteriorated treads
- Cracked or deteriorated riser
- Cracked or deteriorated stringer
- Damaged or weak railing
- Slope instability

4. Use

- Number of users
- Stair is on or connects a school route
- Stair is on or connects a transit route
- Length of detour route
- Neighborhood connectivity

5. Neighborhood Plan

- Part of the Neighborhood Plan
- Part of Pedestrian Master Plan
- Part of Bike Master Plan

The current criteria were developed in 2007 and are re-evaluated annually to support Neighborhood Plans, and better align with the Pedestrian and Bike Master Plans and the Transportation Strategic Plan.

Hazard Mitigation - Areaways

The Hazard Mitigation – Areaways Program is funded to inventory and repair areaways that present a public safety concern. All areaways exist in the downtown urban center with a majority in Pioneer Square, International and Central Business districts. Many of these areaways were constructed in the late 1800s or early 1900s and more than 100 years old. Known areaways are inspected for condition. Based on condition ratings of the various structural elements, the areaway is given a numerical condition rating. Areaways with the most severe defects are grouped together for consideration for repair.

There have been two strategies used to eliminate the public safety hazard posed by deteriorated areaways: 1) SDOT has filled the areaway eliminating the void space and thus the hazard; and 2) SDOT has restored the areaway, rebuilding the structural elements to a current standard. SDOT works closely with the Pioneer Square Preservation Board and other community groups to discuss the best way to preserve the historic nature of Seattle’s areaways.

Project cost greatly enters into the project selection process and can range from \$200,000 for filling an areaway to over one million to rebuild an areaway. The following criteria are used to select an areaway for repair or replacement.

1. Public Safety
2. Available funding / project costs

This prioritization process has been in place since 1999.

Retaining Wall Rehabilitation

The Retaining Wall Rehabilitation Program funds relatively small emergency repairs of existing retaining walls managed by SDOT, including the Alaskan Way Seawall. With over 580 retaining walls with a value of over \$600 million, the funding level does not allow for a fully integrated asset management approach to retaining wall management. The current level of funding is less than 0.1% of the asset replacement value.

Retaining walls are targeted for inspection on a 7-year cycle. Based on established inspection guidelines that assess the retaining wall’s structural sufficiency, the condition of the retaining walls is given a numeric value. Complete failure is rated at a value of 100 and excellent condition is rated at a value of zero. Conditions of the retaining wall that can affect the rating include: concrete cracks, steel corrosion, section loss, bulging, tilting, sliding, and erosion. Retaining walls fall into good, fair, poor categories based on condition. From the list of poor category retaining walls the following criteria are applied to select candidates for repair.

The criteria to replace or rehabilitate a retaining wall are:

- Public safety
- Condition rating
- Social equity (geographic location)
- Available funding

This prioritization process was established 15 years ago and was recently updated to include the Race and Social Justice Initiative.

Sidewalk Safety Repair Program (SSRP)

The SSRP Program is funded by BTG through 2015 for repairing sidewalks, curb ramps, and curb. It does not design, construct, or install new sidewalks. City Code assigns the responsibility for sidewalk repair to the abutting property owner except where the city has contributed to or caused damage.

An initial list of candidate locations for sidewalk repair was created in 2006 from citizen requests, locations with claims history, staff or other agency identification. In addition to this list, data has been added from a 2008 Sidewalk Inventory, a 2009 Sidewalk Condition Assessment of Urban Villages, and the list of other Capitol Projects as part of a complete streets approach. Street Maintenance estimates there is a 1,000-year back log of repair with current BTG funding levels.

Prioritization criteria for preparing a working list for repairs separate from emergent issues was created in 2007 and revisited after the adoption of the Pedestrian Master Plan. The following documents and initiatives were used to guide ranking criteria:

- Bridging-the-Gap
- Pedestrian Master Plan
- Urban Forestry Management Plan
- Transportation Strategic Plan
- Complete Streets
- Right-of-Way Improvement Manual
- Sustainable Communities Initiative

The SSRP Program tends to focus projects along the busier walking routes, typically adjacent to street trees, applying the following selection criteria:

1. Located on a sidewalk, pedestrian ramp, or curb adjacent to on street parking
Adjacent to city-owned property (facilities, street trees planted and/or maintained by the city)
2. Adjacent to an arterial street
3. Within the boundaries of an urban village
4. Within three blocks of a community facility such as a school, park, library, clinic, hospital, transit stop, or senior housing.

5. Leveraging opportunities (add to other existing projects, cost share, support complete streets)
6. Safety concern or claim response
7. Geographic & social justice distribution
8. Identified as a departmental priority (Pedestrian Master Plan or otherwise determined)
9. Constructability & cost

There are so many high-level needs that final projects are often determined subjectively and the list of identified annual projects exists as a working document. The types of projects selected include:

1. Emergent Issues (“make-safe” shims to un-programmed repairs)
2. Implement the intent of the [2007 Complete Streets Ordinance](#).
3. Neighborhood priority identified for Neighborhood Street Funding
4. All Other Repairs

The attached spreadsheet (**Exhibit 4-3**) shows sidewalk safety and repair projects in priority order and the criteria used to rank them.

Landslide Mitigation Program

This program enables SDOT to address and repair landslide concerns that affect the right-of-way. It provides SDOT with staff and resources to identify and prioritize landslide concerns to undertake reconnaissance engineering and geotechnical studies of problem areas, and to make repairs at the highest priority locations, usually where landslide concerns have caused the roadway to be partially or completely closed.

According to recommendations outlined in the “Landslide Policies for Seattle” plan dated June 1, 1998, SDOT commissioned the preparation of the Risk Assessment for Slope Hazards, Phase 1 – Arterial Streets. The goal was to create a systematic process to select landslide mitigation projects to protect city streets within the public road right-of-way. The consultant interviewed City staff and then developed a matrix to prioritize the sites. Based on staff interviews, eight criteria were selected in the matrix:

1. Slope hazard condition
2. Traffic volume
3. SDOT street segment condition
4. Access
5. Adjacency to other public facilities
6. Slope modification history
7. Joint projects
8. Adjacency to private facilities.

Two values are assigned to each criterion for specific location. They are called Decision Factor Weight and Utility Value Score. The Decision Factor Weight is fixed for each criterion (e.g., Slope Hazard Condition carries a weight of 36 which is the largest, and Adjacent to Private Facilities is weighted 4.5 which is smallest). The Utility Value Score changes from one to seven with one (1) being the lowest and seven (7) the highest priority.

Because of the nature of a landslide which most of time falls into an emergency situation, it is very difficult to plan and select a mitigation project with limited annual budget while several landslides requires a response most every inclement weather season. This is why some of the completed landslide projects in the past ten years were not in our circa 2000 "Risk Assessment..." prioritized list. Examples include 41st Ave NE retaining wall, Lakeside Place NE retaining wall, Gilman Drive W retaining wall, 47th Ave SW retaining wall, 20th Ave E retaining wall, Ferry Ave SW retaining wall etc. Some of these projects were funded by the Federal Emergency Management Agency (FEMA) or FHWA stemming from a federal emergency declaration in which the City utilized Landslide Mitigation funds provided the local match to leverage federal funds, typically at 87.5% reimbursement rate or higher, to accomplish permanent slope stabilization objectives. Please refer to Exhibit 4-4 for a prioritized list of street segments that have been identified as high risk.

Other Maintenance Prioritization Decision Tools

SDOT's asset management (AM) efforts have focused on building a knowledge base for the transportation infrastructure to better inform decisions regarding maintenance approach, both for corrective or routine work and for major repair or replacement. This knowledge base includes inventory status and condition information for roughly 75% (on replacement value) of the department's \$13 billion infrastructure. In total, 55% of the infrastructure is rated Good; and the balance, 45%, is either Fair or Poor, in roughly equal proportions.

Condition information is available to guide decision-makers in programming maintenance. For example, poor condition guardrail replacement has been programmed by the Traffic Management Division. Similarly, signal assemblies with components in poor condition have been identified and prioritized for maintenance as funding allows. Formal incorporation of risk and condition into the budget and capital program development process will occur as the department produces asset plans; the first one is planned for 2011. Condition information is included in the criteria to prioritize large capital projects as well. Projects that eliminate the risk presented by assets in poor or fair condition, either by rehabilitation or replacement are awarded up to ten points in the prioritization matrix.

For more on SDOT's AM efforts, see: <http://inweb/sdot/am/overview.htm>

NEIGHBORHOOD PROGRAMS

Neighborhood Street Fund/Cumulative Reserve Subfund (NSF/CRS) Neighborhood Program

This program specifically addresses transportation needs identified by the community. The projects selected tend to have high community involvement. The NSF/CRS Neighborhood Program has two complementary elements: Neighborhood Projects Funds (NPF) and Large Neighborhood Street Fund (NSF).

- 1) Neighborhood Projects Funds – Citizens submit projects estimated to cost less than \$100,000. These small projects are prioritized by each of the 13 Neighborhood District Councils. SDOT reviews the projects and provides suggestions concerning scope and budget. Each individual Neighborhood District Council prioritizes the projects differently; SDOT is not involved in this selection/prioritization process.

- 2) Large NSF – This is a relatively new program, funded by the 2006 Bridging-the-Gap funding package. It identifies projects estimated between \$100,000 and \$500,000 that are prioritized by the community at large and a project review team. Once every three years, each of the 13 Neighborhood District Councils identifies their top three projects. After SDOT reviews the projects and develops conceptual designs and cost estimates, the projects are forwarded to the Bridging the Gap Oversight Committee to prioritize for funding.

Large NSF projects are ranked using the 2009 Pedestrian Master Plan criteria, including pedestrian demand, equity and corridor function. See the PMP methodology: http://www.seattle.gov/transportation/pedestrian_masterplan/append.htm.

The BTG Oversight committee also uses criteria that are based upon site visits and how much value the project would add to the community:

- Bang for the buck;
- Quality of life;
- Safety;
- Neighborhood District Council ranking
- Geographic mix.

Typical improvements may include projects, such as sidewalk construction, repairs and replacement, curb bulb installation or other traffic calming devices, and improvements to marked crosswalks. The program enhances the safety, quality and condition of the pedestrian and neighborhood environments.

Exhibit 4-5: Triennial NSF Project List

District	Project #	Description	PMP * Score	DC** Rank
GDDC	2010-089	8th Ave S from S Director to Concord St	25.6	2
GDDC	2007-054	S Orcas St between Beacon Ave S and Martin Luther King Jr. Way S	22.8	1
SE	2010-2	S Othello St from Seward Park Ave to the Chief Sealth Trail	24.6	1
SW	2010-052	35th Ave SW between SW 97th and 104th St - option 1	24.6	1
Delridge	2010-055	18th Ave SW from SW Myrtle to Holly St (Croft Place Housing)	22.6	1
North	2007-015	33rd Ave NE from NE 130th to 125th St	22.75	3
NE	2007-234	Ravenna Ave NE from 85th Street to Lake City Way	20.75	2
NW	2007-494	N 143rd St from Palatine to Aurora Ave N	18.5	1
Downtown	SDOT-D	Maynard St between S Jackson and Dearborn St	16.6	1
Lake Union	2007-370	Fairview Ave E and Fairview Ave N intersection	22.6	1
Central	2007-233	Garfield Superblock: 23rd Ave	21.6	1

*Pedestrian Master Plan

** District Council

Neighborhood Traffic Control

The Neighborhood Traffic Control Program (NTCP) is an ongoing program that installs traffic calming devices citywide on both arterial and non-arterial streets, in response to investigations of resident requests. These devices include traffic circles, speed humps, radar speed signs, speed cushions, chicanes, and other devices.

The program responds to resident inquiries about speeding, vehicle and pedestrian safety, and similar concerns on their street. The project selection process varies depending on the specific nature of the request/concern: traffic circle, speeding on neighborhood streets, or speeding on arterial streets.

On an annual basis, all traffic circles on the priority list are subjected to a formula that considers the number of documented collisions, traffic speeds, and traffic volumes. The highest ranking circles are prioritized for funding the following year.

Residents who are concerned about speeding traffic or specifically request other types of traffic calming devices, such as speed humps, on their non-arterial streets are enrolled in the Neighborhood Traffic Calming Program. This is a two-phase program. The first phase consists of education and implementation of low-cost speed reduction devices such as signs. If speeds are still high (generally, if 85% of drivers are exceeding 30 mph) at the

conclusion of phase 1 of the program, the street is eligible for phase 2, meaning more aggressive traffic calming devices, such as speed humps, may be constructed. Generally, these are prioritized for construction in order of highest speeds first.

Requests for traffic calming measures on arterials have been prioritized and ranked in terms of three main criteria: documented speeds, the history of reported collisions on the corridor, and the corridor’s priority in the Pedestrian Master Plan.

The traffic circle program has the most formal criteria, which were last refined in 2008. Traffic circle candidate locations are evaluated according to collision history, traffic volumes and traffic speeds.

Exhibit 4-6: Traffic Circle Prioritization Criteria

Collision History - average number of reported accidents over the past three years.	
Points	Collisions in the last three years
0.5	If accidents on a midblock section of street exceed 2 per year over the last three years.
2	0.876 - 1.250
3	1.251 - 1.625
4	1.626 - 2.000
5	2.001 - 2.375
Traffic Volumes - Vehicles per Day - Average Weekday Traffic	
Points	Traffic Volumes
0.5	500 - 1100
1.0	1101 - 1700
1.5	1701 - 2300
2.0	2301 - 2700
Traffic Speeds - 85th Percentile Speed	
Points	Traffic Volumes
0.5	26 - 29
1.0	29.1 - 32
1.5	32.1 - 35
2.0	35.1 - 38
2.5	38.1 - 41
3.0	41.1 - 44

The typical traffic calming project that SDOT funds and builds will be located in a low-density residential neighborhood with a documented collision history and speeding problem. Please note that our analysis does not always comport with the neighborhood’s perception of traffic on their street.

Exhibit 4-7: 2009 Traffic Circle Candidate List

	Location	# Collisions/3 years	# Collisions/year	Points	85th - Percentile Speed	Points	AWD T	Points	Total Points	Rank
1	44 Ave S & S Warsaw St	7	2.333	5	25.3	0	440	0	5	1
2	Mary Ave NW & NW 92 St	5	1.667	4	29.1	1	494	0	5	2
3	Burke Ave N & N 47th St	4	1.333	3	24.4	0	441	0	3	3
4	Palatine Ave N & N 117 St	3	1.000	2	27.7	0.5	527	0.5	3	4
5	1 Ave W & W Lee St	3	1.000	2	25.1	0	828	0.5	2.5	5
6	24 Ave & E Columbia St	3	1.000	2	25.6	0	624	0.5	2.5	6
7	Corliss Ave N & N 44 St	3	1.000	2	23.9	0	602	0.5	2.5	7
8	1 Ave NW & NW 81 St	3	1.000	2	24.5	0	370	0	2	8
9	25 Ave SW & SW Findley St	3	1.000	2	25.4	0	437	0	2	9
10	9th Ave NW & NW 50th St	2	0.667	1	27.3	0.5	606	0.5	2	10
11	39 Ave S & S Andover St	2	0.667	1	24.1	0	523	0.5	1.5	11
12	49 Ave S and S Adams St	2	0.667	1	27	0.5	339	0	1.5	12
13	6th Ave NW and NW 74th St	2	0.667	1	27.8	0.5	279	0	1.5	13
14	9th Ave NW & NW 51st St	2	0.667	1	25.9	0	506	0.5	1.5	14
15	Fremont Ave N and N 101st St	2	0.667	1	26	0.5	265	0	1.5	15
16	33 Ave S & S Brandon ST	2	0.667	1	25.4	0	257	0	1	16
17	Densmore Ave N & N 39 St	2	0.667	1	24.1	0	236	0	1	17

Yellow shading denotes projects that have been constructed.

SYSTEM IMPROVEMENTS

Pedestrian Master Plan Implementation

The 2009 Pedestrian Master Plan Implementation program builds sidewalks, installs ADA-compliant curb ramps and signal improvements, and makes small-scale pedestrian crossing and safety improvements, as identified by the Seattle Pedestrian Master Plan (PMP), as well as implements policy improvements.

The Pedestrian Master Plan evaluated every street and intersection in the city to identify locations where improvements could benefit pedestrian safety and comfort, as well as specified policy changes needed to create the most pedestrian-friendly city in the county. See the PMP methodology:

http://www.seattle.gov/transportation/pedestrian_masterplan/append.htm. SDOT uses these identified locations, sidewalk and other pedestrian infrastructure inventories, and requests made by the traveling public and other agencies as the needs list to which PMP criteria are applied.

Improvements that have the highest priority are determined by a data-driven assessment that looks at three factors: pedestrian-demand, equity and corridor function.

- Locations with high pedestrian demand are where people walk and where destinations attract pedestrians such as colleges, transit stops, parks and local business districts.
- The equity criteria examines demographic data in order to serve residents who most need to walk due to restricted income, limited access to a car or limited mobility due to disability or other health-related issues.
- Corridor function prioritizes locations that have the most direct access to transit routes, or have high volumes of traffic and need more pedestrian improvements to help walkers get to transit and major destinations.

Each location identified in the PMP is evaluated against criteria based on these factors. The prioritization process includes several different steps:

- Step 1: Base Analysis
 - 1a. Potential Pedestrian Demand
 - 1b. Equity
 - 1c. Corridor Function
- Step 2: High Priority Areas
 - Combine the results of the potential pedestrian demand, equity and corridor function analyses from Step 1 in order to identify High Priority Areas
- Step 3: Needs Assessment
 - Assess pedestrian needs through an analysis of conditions walking “Along the Roadway” and “Crossing the Roadway”
- Step 4: Development of Project Lists
 - Combine the High Priority Areas analysis and the needs assessment to identify projects where conditions are difficult and where people need to be able to walk the most

Once this analysis is completed and a prioritized list of projects has been compiled, SDOT field checks each high priority location to ensure feasibility. Finally, projects are selected from the list of high-priority, feasible projects.

Projects are selected using Pedestrian Master Plan criteria. This means that most projects are located in areas with highest pedestrian demand. Below is a sample of part of the 2010 prioritized list of sidewalks that were built in this program.

Exhibit 4-8: Samples from PMP prioritized “Along the Roadway” List

Location	Score	Action/Recommendation
4 th Av S between S Fidalgo St and S Front St	47	Programmed for 2011/12 (east side).
Myers Way S between Olson Pl SW and city limit	47	Do not build – no pedestrian generators or destinations.
S Cloverdale St between Cloverdale St off ramp and 5 th Av S	47	Do not build - connects to limited access facility.
Greenwood Av N between N 134 th St and N 136 th St	47	Built in 2008.
4 th Av S between S Front St and S Michigan St	47	Built in 2008.
Airport Way S between 13 th AV S and S Hardy St	47	Do not build – missing segment is on east side with no pedestrian generators. Spot improvements on west side planned for 2011.
Greenwood Av N between N 140 th St and N 143 rd St	47	Refer to CIP due to size.
Sand Point Way NE between NE 70 th St and NE 74 th St	47	Refer to CIP – would require extensive retaining wall and drainage.
Sand Point Way NE between NE 52 nd St and 47 th Av NE	47	Built in 2010 (east side)
...		
Westlake Av N between Halladay St and Newell St	45	Do not build - parallels a multi-use path.
15 th Av NE between NE 107 th St and NE Northgate Wy	45	Built in 2010 (east side)
Sand Point Way NE between NOAA Dr and Inverness Dr NE	45	Partially built - Fairway Estates to BGT spur built in 2010 (west side)

Bicycle Master Plan Implementation

This ongoing program implements the recommendations in the 2007 Seattle Bicycle Master Plan. Typical improvements may include installing bike lanes and sharrows, bicycle route signing, completing key links in the urban trails network, adding bicycle/pedestrian signals to complete the network, and reconstructing key sections of the trails. The goals of the program are to increase bicycle safety and access, while reducing bicycle collisions.

Projects are selected on an annual basis for study and implementation. The project selection process utilizes prioritization criteria and a set of balancing factors to score projects. Projects with the highest scores, as well as projects with leveraging opportunities, are evaluated for feasibility study. The number of projects per project type is determined by Bridging the Gap deliverable numbers set by a combination of program goals, budget and the Bridging the Gap oversight committee. Once high scoring projects are evaluated, an annual work plan is presented to Seattle Bicycle Advisory Board.

There are five criteria categories used to rank Bicycle Master Plan projects. Each category provides conditional points from which projects are scored based on the project’s geographic location. These categories are:

- 1) *System completion (20 pts)*: Is the project within the Bicycle Master Plan recommendations;
- 2) *Safety (30 pts)*: Is the project near or at a high collision location;
- 3) *Mobility Improvement (40 pts)*: Does the project help to cross a major barrier, expand the existing network and/or provide a connection to transit;

- 4) *Anticipated Demand (20 pts)*: What is the project’s proximity to an urban village, neighborhood commercial district, school, park, library, major employer etc. ; and
- 5) *Equity (20 pts)*: Does the project occur in an area where it will serve residents with the greatest needs i.e. low car ownership, lower income, low physical activity.

The points are assigned to each project via a geographic information system (GIS) analysis. Once the list is created, balancing factors are applied to the list. Balancing factors include geographic balance, funding opportunity, community interest, interagency coordination and pavement conditions.

Typical improvements may include installing bike lanes and sharrows, bicycle route signing, completing key links in the urban trails network, adding bicycle/pedestrian signals to complete the network, and reconstructing key sections of the trails.

Exhibit 4-9: Excerpt from Signed Bike Route Project List Illustrating How Projects Are Ranked

ANNUAL PROJECT LIST: Signed Routes														
#	Project	Completes	Safety	Linkages	Barriers	Modal	Land Use	Access	Equity	Score	Study Yr	Comp Yr	Facility type	Length (Miles)
	2011													
1	I90 BIKE TRAIL: 23rd Ave S to I-90 Bridge	20	10	10	5	4	7	10	20	86	2011	2011	signed bike route	0.8
2	GREEN LAKE WAY N: Green Lake Dr N to E Green Lake Dr N, E Green Lake Wy N to Green Lake Wy N to N 50th St to Fremont Ave N	20	30	0	5	2	7	10	5	79	2011	2011	signed bike route	2.60

Transit Priority Corridor Improvements

Transit priority corridors were originally identified through a City of Seattle/King County Metro (KCM) process to allocate voter-approved Bridging the Gap and KCM “Transit Now” funding for bus capital and service improvements in Seattle.

Transit priority corridors include “Seattle Connections” lines identified in the Seattle Transit Plan, several of which are future KCM RapidRide (bus rapid transit) routes.

Projects include corridor-length projects as well as strategic spot improvements. All are along “Seattle Connections” lines. The overall intent of the program is to achieve a 10% or greater improvement in transit travel times. The following results should be present in any project within the program:

- Be consistent with Seattle Transit Plan
- Improve the speed and reliability of bus service along major core routes
- Reduce greenhouse gas emissions and improve air quality through increased transit ridership
- Improve efficient use of public right-of-way to move people and freight
- Ensure consistency with the Complete Streets ordinance
- Reduce the differential in travel time between single-occupant vehicles and transit by providing transit with priority over other traffic
- Support Seattle’s investment in different modes of transit service
- Provide faster and more efficient commuting options
- Support growth management and the health and vitality of business districts and communities with efficient transit service

Specific criteria for prioritizing corridors within the program are:

- *Transit Improvement (40%)*
 1. Projected time savings along the length of the corridor
 2. Weekday boardings on all routes that use the corridor
 3. Ridership on primary bus route in the corridor
 4. Bus vehicle trips on primary bus route in the corridor
 5. Current transit reliability on the corridor
- *Land Use (25%)*
 1. Number of households
 2. Number of jobs
 3. Residential density
 4. Employment density
- *Race and Social Justice (35%)*
 1. Average minority population
 2. Median income
 3. Car ownership

Spot improvement criteria include:

1. Number of riders that would benefit

2. Routes and connections served
3. Cost
4. Constructability

Additional considerations applied to all projects include:

- Funding availability, including local, grant and partnership funds
- Metro level of priority

Selected projects include a range of types, such as installation of intelligent transportation systems (ITS) fiber optics for transit signal priority and bus schedule information infrastructure, bus stop bulb-outs, traffic signal improvements, bus stop upgrades, bus lanes, and electric trolley bus infrastructure.

Freight Mobility Spot Improvements

The Freight Mobility Spot Improvement program makes small-scale mobility improvements to the city's street system to improve connections between the port, railroad intermodal yards, industrial businesses, the regional highway system, and the first and last miles of the supply chain. Typical projects include small-scale turning radius improvements, new signage (truck routes, steep grades, etc.), pavement repair, and railroad crossing improvements (in partnership with the railroads).

Projects are identified through the neighborhood plans for Seattle's two Manufacturing and Industrial Centers (MICs), through direct input from freight operators and other stakeholders, and through staff identification of potential improvement opportunities.

Criteria for project prioritization include whether the location is on a Major Truck Street or in a MIC, and the extent to which it will improve freight mobility and safety.

Freight spot improvement projects that are located on a major truck street or in a MIC are the highest priority for this program. Improvements that are not on major truck streets or in MICs are implemented as funding allows.

SDOT is seeking to identify funding to complete a Freight Master Plan that will provide a framework for a more robust project identification and prioritization process.

New Signals

The New Traffic Signal program selects, designs and builds low-cost traffic signals using city staff and crews. Projects may be half signals for pedestrians or bikes or full signals for all modes.

SDOT receives many requests for new signals every year. Current funding levels allow between two and five signals each year.

Using national guidelines, SDOT performs an analysis of traffic conditions, measuring auto and pedestrian volumes, traffic delay and collisions. Those locations that meet one or

more of the eight possible warrants¹ are placed on a needs list for consideration. Each signal candidate location is measured against its benefit to transit, freight, pedestrians, and bicycles. Prioritized locations are balanced against the possibility of alternative treatments, suggested for further monitoring, put on the CIP list due to high cost, or prioritized to build.

Each candidate location is rated according to the criteria below. These criteria were developed and first used in 2008 to select signals to be built in 2009. The project's score is the sum of the points received in each category.

Exhibit 4-10: New Signal Prioritization Criteria

Transit - 10 points max	
Helps w/ access, safety or turning on a transit route	10
helps w/ progression on a transit route	5
Freight - 10 points max	
helps w/ turning, safety or access for freight on a Major Truck Street	10
helps w/ turning, safety or access for freight on any arterial	5
helps progression on Major Truck Street (looking for 1/4 mile spacing)	5
PMP - 10 points max	
Tier 1 location or area	10
Tier 2 location or area	5
BMP - 10 points max	
Identified as a priority in the BMP	10
Improves crossing on a bike corridor	10
Signal-Correctable Collisions	
Collisions that, according to MUTCD guidelines, a signal could prevent	2 x number of collisions
Warrants	
7 points per warrant	7 x number of warrants

¹ The warrants are in the Manual on Uniform Traffic Control Devices (Sec. 4C). They define minimum conditions under which traffic control signals are justified.

Below is the prioritized signal list, including 2011 projects.

Exhibit 4-11: New Signal Priorities

Location	Score	2011 Recommended Action
15th Av W & W Howe St	53	Follow up with developer regarding turn restrictions or funding.
5th Av NE & NE Banner St	52	Refer project again to unfunded CIP list.
12 th Ave NE & NE 50 th St	50	Build in 2011. Phase curb ramp installation.
Aurora Av N & N 95 St	48	Hold pending grant decision. If grant funded, build in 2012.
Sand Point Wy NE & NE 40 St	47	Refer project again to unfunded CIP list.
N 34 th ST & Troll	45	Evaluate operational changes while laying groundwork for possible 2012 project.
Avalon Wy SW & SW Genesee St	41	Coordinate operational changes and/or possible signal with existing CIP project.
8th Av NE & NE 70th St	40	Discuss with WSDOT. Collisions have continued to decline since the 2008 channelization changes. Continue to monitor.
Westlake Av & Thomas St	37	Build in 2011.
15th Av E & E Aloha St	32	Remove from list. Drivers appear to be able to navigate this intersection reasonably well with the existing controls.
12 th Av & E Marion St	29	Possible 2012 project. Crosswalk compliance is high.
Elliott & Vine half signal	27	Build in 2011.
3rd Ave NW & NW 125th ST	25	Recheck next year. Drivers appear to be able to navigate this intersection reasonably well with the existing controls.
47 th SW & Admiral Way	21	PMP crossing program will install a median island to complement the recent channelization changes. Monitor for possible future signal.
1 Ave S (4-lanes) & S Orcas ST	20	Low pedestrian volume. Monitor for possible future signal.

Pay Station Installation

This project funds the purchase and installation of multi-space parking pay stations for on-street parking. Seattle has installed more than 2,200 pay stations. These pay stations are used to replace single-space, mechanical meters using new, multi-space technology and to implement new paid parking locations.

Since 2004, SDOT has systematically replaced nearly all mechanical meters. New areas of paid parking are identified because neighborhoods request parking management or because they are located in urban areas where improved parking management will benefit local business districts.

Once a neighborhood business district has been selected for parking management consideration, SDOT conducts a parking study to identify levels of occupancy and compliance. When occupancy nears 75% and compliance with time limits is low, SDOT considers installing paid parking. Outreach, neighborhood collaboration and plan development takes place, and then a final plan is approved and moves forward. Requests to purchase pay stations occur through the annual budget process, so a lag of one to two years can occur between announcement of the final parking plan and actual implementation.

In the previous four years, approved community parking plans have included new or expanded paid parking in South Lake Union, Westlake Avenue North, Uptown Triangle, Denny Triangle, Fremont, Pike-Pine, Capitol Hill and First Hill. Community parking plans without new paid parking have included Upper Queen Anne, West Seattle Junction and Madison Valley.

Pedestrian Lighting

Historically, the Pedestrian Lighting Program has selected projects based on leveraging opportunities with other capital projects and neighborhood support. Currently, SDOT is in the process of developing a Pedestrian Lighting Master Plan which will be part of the Pedestrian Master Plan. One of the goals of the Lighting Plan is to create a clear set of criteria for prioritizing lighting projects.

Currently, the following criteria are used in selecting pedestrian lighting projects:

- Proximity to a business district
- Inclusion on a Neighborhood Plan
- Prevalence of mature trees that shade the pedestrian path
- Support from Department of Neighborhoods
- Support from Seattle Police Department
- Proximity to major transit transfer points
- Opportunity for cost sharing
- History of night time vehicle collisions
- History of night time pedestrian collisions
- Importance in the urban design/place making
- Inclusion on the Bicycle Master Plan
- Opportunity of use of a high efficiency light source
- Efficiency of the light distribution created
- Proximity to projects previously funded by this program
- Cost
- Location in an economically challenged area
- Proximity to a pedestrian generator

The criteria outlined above have been in place since 2008. There are new criteria being developed as part of the Pedestrian Lighting Master Plan. These are expected to be in place in 2012, to be used for planning for 2013 and beyond.

For the Pedestrian Light Master Plan maps are being generated that will objectively prioritize projects based on:

- Pedestrian demand
- Social equity
- Crime statistics

These maps provide a basis for prioritizing future investments in pedestrian lighting, locating lighting where pedestrians need it most, and in turn increasing pedestrian access to transit, retail and services, schools, and other pedestrian locations.

The new Pedestrian Lighting Master Plan criteria are based on several objectives outlined in the Pedestrian Master Plan. Within the Pedestrian Master Plan there are strong elements of the Race and Social Justice Initiative and Walk Bike Ride. Additionally, the new criteria will incorporate information regarding street and night-time related crime hotspots, as part of SPD's Evidence-based policing initiative.

Historically, pedestrian lighting implementation has been focused in neighborhood business districts, which overlap substantially with the City's Urban Centers and Urban Villages.

SECTION 5 – ALIGNING INFRASTRUCTURE WITH PLANNED GROWTH

The City's growth management strategy is to direct growth and most new public services and infrastructure to designated urban centers and urban villages. Currently, there are six urban centers (three of the centers have a total of 11 designated urban center villages within them), two manufacturing and industrial centers, six hub urban villages and 18 residential urban villages.

LARGE CAPITAL PROJECTS

The Large Capital Project selection process explicitly evaluates projects on the extent to which they support transportation needs for a designated Urban Center, Manufacturing Industrial Center, Urban Village or Residential Village. Up to 15 points of each project's cumulative score (out of 100 total possible points) can be awarded for alignment with planned growth as follows:

- 15 points Is located within more than one Urban Center or MIC
- 12 points Is located within one Urban Center or MIC
- 9 points Serves one or more Urban Center or MIC
- 6 points Is located within or serves a Hub Urban Village

- 3 points Is located within or serves a Residential Village
- 0 points Is not located within and does not serve a designated Village or Center

MAINTENANCE AND REHABILITATION

Arterial Asphalt and Concrete Program

The AAC program’s focus is rehabilitating the busiest urban arterials, with an emphasis on those which serve transit and alternate travel modes. These streets are the primary means by which people and goods move about the city and between urban centers and urban villages. Although this program fully supports planned growth, it focuses primarily on preservation of existing assets.

Arterial Major Maintenance

Arterial Major Maintenance (AMM) work occurs on arterial streets, which link together Urban Centers and Urban Villages. Paving is often coordinated with other improvements such as the striping of a new bike lane, construction of a bus stop, or installation of in-pavement crosswalk lighting. Although this program fully supports planned growth, it focuses primarily on preservation of existing assets.

Non-Arterial Street Resurfacing (NAA) and Concrete Rehabilitation (NAC)

NAA and NAC work occurs mainly in urban centers and urban villages. Typical projects include paving on local streets around the hospitals on First Hill, in the International District, Downtown, and on industrial streets in the Greater Duwamish and Ballard-Interbay industrial areas. Paving is coordinated with other improvements where possible and these funds have also been used to form public/private paving partnerships with local businesses. Although this program fully supports planned growth, it focuses primarily on preservation of existing assets.

Bridge Rehabilitation and Replacement & Bridge Seismic Retrofit Programs

Bridge Rehabilitation and Replacement Program (BRRP) and Bridge Seismic Retrofit Program (BSRP) work occur primarily on arterial streets, which provide vital connections through and between the City’s Urban Center and Urban Villages.

The BRRP and BSRP incorporate, in their prioritization process, other SDOT capital and major maintenance project and programs slated for design and construction, such as: Transit improvements, Streetcar development, paving and re-channelization and bike and pedestrian safety improvements. These project and programs provide an indication of future plans for economic development, transit expansion and truck mobility needs. They often include the addition of bike lanes and pedestrian lighting, sidewalk repair and signal installation, which lead to BRRP and BSRP design updates. For example, the type and size of the bridge structure and deck may need to be re-sized to meet the future needs of a specific transportation corridor.

Bridge Painting

Prioritization for the painting of the 24 steel bridges in Seattle is predicated on the expected life cycle and regularly assessed condition of a bridge's paint. There is no direct link between planned projects and infrastructure needs in the City's urban center and urban villages.

Stairway Rehabilitation

There are approximately 494 stairways that are SDOT's responsibility to repair and maintain, many of which provide vital pedestrian connections through and between neighborhoods and to City Urban Villages. While safety is the primary criteria in prioritizing these projects, decisions are made with input from neighborhood plans and the Pedestrian and Bike Master Plans.

Hazardous Mitigation - Areaways

A majority of Seattle's areaways exist in the Pioneer Square, International and Central Business districts and were constructed in the late 1800's or early 1900's.

Retaining Wall Rehabilitation

Public safety is the primary criteria in prioritizing Retaining Wall Rehabilitation projects. Those projects that rank high are most often adjacent to roads and sidewalks with high vehicle and pedestrian volumes, often connecting to and through City Urban Villages.

Sidewalk Safety Repair Program (SSRP)

Pedestrian mobility, and directly-related transit access, is a key component of any urban densification planning effort. The sidewalk conditions in Urban Villages have been rated as Good, Fair & Poor and these are mapped in GIS for assisting with setting priorities. Therefore we tend to apply more of our resources to the higher pedestrian volume sections of the City; yet all other repairs benefit mobility between urban villages. Although this program fully supports planned growth, it focuses primarily on preservation of existing assets.

Landslide Mitigation Program

Since landslides happen in landslide prone areas with steep slope, there is no direct link between planned project and infrastructure needs in the City's urban centers and urban villages. However, during prioritization process, some of the criteria in the matrix do add more weight if the protected street is in city's Urban Center due to its high traffic volume and associated impacts to mobility resulting from emergency detours. Although this program fully supports planned growth, it focuses primarily on preservation of existing assets.

NEIGHBORHOOD PROGRAMS

NSF/CRS Neighborhood Program

Generally projects are selected for both the Neighborhood Projects Fund (NPF) and Large NSF in the city's urban centers and urban villages. Typical improvements are sidewalk construction, repairs and replacement, curb bulb installation or other traffic calming devices, or improvements to marked crosswalks. The program enhances the safety, quality and condition of the pedestrian and neighborhood environments.

Neighborhood Traffic Control

The Neighborhood Traffic Calming and Traffic Circle programs are primarily responsive to resident requests, and most requests originate in lower density residential areas, outside of the urban villages. As such, funding prioritization does not factor in the presence of urban villages.

The Arterial Traffic Calming program indirectly align with urban village locations in that a portion of its criteria for prioritization will be based on pedestrian needs as identified in the citywide pedestrian master plan (2009), many of which are closely aligned with the presence of urban villages and other areas of planned growth.

SYSTEM IMPROVEMENTS

Pedestrian Master Plan Implementation

Because the Pedestrian Master Plan prioritization process includes pedestrian demand as a key component, many of the high priority areas identified in the plan are within Urban Villages.

Bicycle Master Plan Implementation

The Bicycle Master Plan Program prioritizes projects that connect through and to Urban Villages and Urban Centers. Criterion 4 of the Bicycle Master Plan prioritization assigns 10 points to projects with both ends in different Urban Villages or Urban Centers, 7 points are assigned to projects with one end in an Urban Village or Urban Center, projects with one end in a Neighborhood Commercial Area are assigned 5 points and projects that are entirely within Residential Areas receive 0 points. In addition, points are received if a project is in close proximity to a major employer, or important neighborhood destination.

Transit Priority Corridor Improvements

Transit Priority Corridor Improvements projects are focused on improving performance, facilities, and ridership along transit routes that provide connections between urban villages, and connect villages with centers. Improvements occur both within urban centers and villages and on primary transit corridors connecting these locations.

Freight Mobility Spot Improvements

The program addresses small-scale infrastructure improvement needs in Seattle's two Manufacturing and Industrial Centers: Duwamish and Ballard/Interbay/Northend, as well as on arterials throughout the city.

New Signals

The New Signal program addresses the infrastructure needs in the city's Urban Centers and Urban Villages by using criteria associated with those hubs: transit needs, pedestrian needs, bicycle demands, and increases in congestion. Using these criteria, we are able to best meet the needs of the public in an efficient and effective manner.

Pay Station Installation

As neighborhoods increase in density, good parking management becomes more important to lively urban neighborhoods. Since 2004, SDOT has studied parking in 13 of the City's urban centers and villages and both of the Manufacturing and Industrial Centers (MICs). Other urban centers and villages are on the list for future study.

Pedestrian Lighting

Historically, pedestrian lighting implementation has been focused in neighborhood business districts, which overlap substantially with the City's Urban Center and Urban Villages.

SDOT is in the process of updating the selection criteria for the Pedestrian Lighting Program to reflect outcomes that better fit customer needs. These criteria include pedestrian demand, social equity and use of crime statistics.

Section 6 – Future Projects/What is on the Horizon?

LARGE CAPITAL PROJECTS

The adopted *2011 - 2016 Capital Improvements Program* includes 30 large capital projects with the City of Seattle as the lead agency. Of these, 20 are fully funded, such as the First Hill Streetcar (Sound Transit levy) and the Linden Avenue N Complete Streets project. The other 10 CIP projects are partially funded, with remaining fund sources to be determined.

Three notable partially-funded CIP projects include replacement of the Elliott Bay Seawall, replacement of the Magnolia Bridge main structure, and creation of a grade separation for rail and truck freight traffic at South Lander Street. These three projects together have an estimated funding gap of about \$1 billion. SDOT has an additional 80 large capital projects identified but unfunded as of 2011, comprising about \$1.5 billion in unmet capital project needs.

In most large capital projects, there is both rehabilitation and replacement of a facility as well as improvements or upgrades over what exists. For example, a project such as Linden Avenue complete streets will install new bike and pedestrian facilities and rehabilitate the

asphalt street pavement. The new sidewalk and bicycle facility will marginally add to the Department's overall operations and maintenance costs, while the street repaving does not add to the pavement inventory.

Importantly, many large capital projects ongoing operations and maintenance needs are not adequately identified and funded. One of the key reasons for this situation is that SDOT does not have a specific project development function within the department to identify and standardize project components and ongoing maintenance and operations estimates during planning. Because ongoing costs are not budgeted at the time of capital project implementation, the resultant approach has been to defer maintenance and/or make periodic system improvements.

It should also be noted that infrastructure replacement and rehabilitation are more likely to be time-critical (to prevent failure) than planned transportation system improvements, which influences City investment strategies. Strategic investments within an identified maintenance program can create significant cost savings for the City farther in the future.

As part of SDOT's asset management program, asset life cycle costs are under development and will enable better forecasting of ongoing operations and maintenance costs; however, a multi-year effort will be required to document all assets. For example, this year the department will develop just one asset plan (for sidewalks).

MAINTENANCE & REHABILITATION

Arterial Asphalt and Concrete Program

Seattle has a large backlog of paving needs that has accumulated through decades of underinvestment in basic street maintenance. As of 2010, SDOT estimates the backlog of deferred maintenance on Seattle's arterial streets alone is approaching \$600 million, comprised of approximately 400 lane-miles of pavement at a condition level which indicates a paving need.

With the Bridging the Gap transportation levy, Seattle is doing more paving and has rehabilitated some of the City's most critical streets. Examples of completed levy paving projects include: N/NE 45th St in Wallingford and the University District, 2nd Ave and 4th Ave downtown, Boren Ave and Madison St on First Hill and Capitol Hill, 1st Ave S in SODO, 15th Ave W between Ballard and Lower Queen Anne, S Columbian Way on Beacon Hill, and Fauntleroy Way SW in West Seattle. This work would not have been possible before BTG.

The current backlog of *arterial* deferred maintenance is estimated at \$578M. Arterials are 39% of the street system. Pavements deteriorate with traffic loading, weathering, and other factors. Like other infrastructure, pavements are designed balancing serviceability and economy. Typical pavement design life is 20 to 50 years, depending on the material used (asphalt or concrete). This means that the backlog of deferred maintenance will grow over time if investments in pavement rehabilitation do not pace deterioration.

SDOT's pavement management system models pavement performance using pavement type, age, condition, and paving budget/costs. Based on those factors, it is estimated:

1. An average annual investment of \$37 million is required to maintain Seattle's arterial street network at its current condition level, with deferred maintenance stable in the \$600 million range.
2. An annual investment of \$65 million is required to improve the condition of the arterials and eliminate deferred maintenance by the year 2030.
3. Over the remaining life of the BTG initiative, 2011 to 2015, the City's main arterial paving fund source (Arterial Asphalt and Concrete Program, TC365440) averages approximately \$20.3 million per year. (Note: Over the 9-year life of BTG, spending will average approximately \$21M annually.) This indicates that the condition of Seattle's arterials will continue to decline overall and deferred maintenance will grow.

The [2011.07.14 Pavement Condition Update](#) and [2011.07.12 Paving Needs 2010 and Paving 2007-2015](#) describe Seattle's current pavement conditions in greater detail.

Since 2000, paving costs have increased with the rise in oil prices (which fuels heavy construction operations, especially asphalt paving), the federal mandate to install ADA curb ramps, electric trolley bus line de-energization restrictions, Stormwater Code requirements and funding shifts, and the "Complete Streets" ordinance. Seattle's streets are also carrying heavier buses, which have made life extending paving treatments, such as asphalt pavement resurfacing impractical. Transit streets often need to be completely reconstructed, a more costly and time consuming rehabilitation activity. Although contract bids have been favorable in the recession, paving dollars buy fewer lane-miles in 2011 than a decade ago.

The AAC program maintains existing arterial street surfaces. It does not widen streets or build new roadways that would add to the street network and increase ongoing operating and maintenance costs. Adequately funded, the AAC program could effectively reduce operating costs, as pavements in good condition generally require less maintenance attention like pothole filling. Rehabilitation of the City's extensive assets is an immediate and ongoing need.

Arterial Major Maintenance

Seattle has a large backlog of paving needs that has accumulated through decades of underinvestment in basic infrastructure renewal. Demand for pavement repairs exceeds available funding. AMM paving does not widen streets or build new roadways, therefore future operating and maintenance costs are not increased. Rehabilitation of the City's extensive assets is an immediate and ongoing need.

Non Arterial Asphalt and Concrete Rehabilitation

As with arterial streets, demand for non-arterial pavement repairs exceeds available funding. SDOT is presently funded to do 0.5 to 1.0 lane-miles of non-arterial paving each year out of a 2,414 lane-mile network. This amounts to 0.02% to 0.04% of the local street system each year; a 2,414-to-4,828 year replacement cycle. SDOT does not have a funded pavement management program for non-arterial streets, so it cannot even assess maintenance needs on the basis of condition. However, a typical low-use pavement replacement cycle for asphalt in a mild climate might be 20 to 40 yrs, and for concrete 50 to 100 years. Some of Seattle's most durable non-arterial pavements, made of concrete, are as old as 90 years and remain serviceable. Still, the current replacement cycle, in the thousands of years, is far beyond the expected life of any pavement.

The NAA and NAC programs maintain existing street surfaces. They do not widen streets or build new roadways, therefore future operating and maintenance costs are not increased by adding pavement to the system. Rehabilitation of the City's extensive assets is an immediate and ongoing need.

Bridge Rehabilitation and Replacement & Bridge Seismic Retrofit Programs

Beyond Bridging the Gap funds allocated for these purposes, SDOT does not have annual programs that fund Bridge Rehabilitation and Replacement or Bridge Seismic work. FHWA does provide Bridge Rehabilitation and Replacement Program (BRRP) funding as part of the larger Transportation authorization bill, but Seattle must compete statewide for these dollars.

The replacement value of the City's bridges is \$1.5 billion. Compared to most bridge owners (states and cities) across the country, Seattle owns and maintains larger and older bridges. SDOT bridges are approximately four times larger and more than 10 years older than the national average. In addition, of the approximately 113 bridges in the City's inventory, 20% have a sufficiency rating of poor.

Bridge Rehabilitation and Replacement and Bridge Seismic programs have funding gaps in the 2011-2016 Capital Improvement Program (CIP) as well as future years.

Bridge Painting

In the 2009 City budget, the Bridge Painting Program was funded at \$2.4m per year. Funding has been reduced, resulting in the Program extending painting cycles beyond the current recommended 18 years. This delay will result in greater future costs due to the significant increases in areas of failed coating, exposing structural elements to weakening due to corrosion. The program is funded within the six-year CIP.

Stairway Rehabilitation

Current funding allows for the Program to address only those stairways that are in the poorest of conditions. Fifty-one percent of the City's stairways currently have a condition rating of fair or poor.

If proposed cuts to the program are accepted, the program will no longer be able to perform systematic stairway inspections and will have a level of funding to only reconstruct stairways in the worst condition, posing the most critical safety hazard.

Hazardous Mitigation – Areaways

Program funding allows for inspection of recorded areaways and minor repair and preservation work. There are currently 236 known areaways that will become increasingly more expensive to maintain as they age. Costs for proposed projects can range from \$200K to fill an areaway to over \$1M to rebuild. The program has a gap in the 2011-2016 CIP and into the future.

Retaining Wall Rehabilitation

With over 580 retaining walls with a value of over \$600 million, current funding does not allow for a fully integrated asset management approach to retaining wall management. The current level of funding is less than 0.1% of the asset replacement value. Fifty-seven percent of the City’s retaining walls currently have a condition rating of fair or poor.

Sidewalk Safety Repair Program (SSRP)

SDOT will continue to leverage funding within the TCIP, such as Safe Routes to School, NSF/CRS neighborhood programs, Transit, etc. while also being responsive to emergent needs and safety issues. SDOT has numerous arterial corridors that all rate very highly for sidewalk repair, particularly where there are older, mature street trees that have outgrown the planting strips, and whose roots uplift sidewalk panels. Some of these sidewalks do not meet the Americans with Disabilities Act (ADA) guidelines and require expensive repairs that may be short lived in order to add years of useful life to the street trees. Examples of such root uplift damaged sidewalk corridors include:

- 23rd Ave between S. Jackson & E Madison
- Northgate WY b/t 15th NE & 5th Ave N
- Portions of Delridge WY SW
- California Ave SW b/t Erskine WY SW and SW Brandon
- 35th Ave NE between NE 85th and Lake City WY NE
- E Madison between 8th – Lake WA Blvd
- East Thomas between 22nd Ave E and 15th Ave E
- 34th Avenue between Union and Cherry
- Beacon Ave S between 14th Av S & S Spokane and S Alaska to S Barton
- 15th Ave S between Beacon Ave S & S Atlantic

Rehabilitation of the City’s extensive assets is an immediate and ongoing need.

Landslide Mitigation Program

As mentioned previously, it is very difficult to plan and select a mitigation project with limited annual budget when several landslide emergencies occur during a winter. However the “Risk Assessment for Slope Hazard” report is very helpful for the City to anticipate where future slide events are likely to occur. Future projects will primarily address

emergent needs in response to storm events. This program will continue to add to the City's asset inventory of slope stabilization measures (retaining walls, reinforced slopes, etc.), theoretically reducing the number and locations of unstable slopes.

As a result of last December's rainstorm, the following projects are considered during 2012 depending on funding situation.

- 200 block Lake Dell Retaining Wall
- 6000 block Beach Drive SW Retaining wall and Sidewalk
- Highland Park Way SW near Othello Street – Rock Buttress

After these projects, if no emergency slide events occur in subsequent winters, the projects will be selected from the attached Prioritized Street Segment Table 6.1 from the "Risk Assessment for Slope Hazard" report. Rehabilitation of the City's extensive assets is an immediate and ongoing need.

NEIGHBORHOOD PROGRAMS

NSF/CRS Neighborhood Program

Since the Large NSF program is new with Bridging the Gap and did not exist prior to 2007, there is no plan to fund this program in the absence of a continuation of the Bridging the Gap Levy in 2015. The Large NSF program does not include funding for maintenance. This is also true for the new sidewalks, signals and traffic calming projects funded and constructed through this program. Currently, there is no standard practice at SDOT to identify and secure funding for on-going maintenance of new infrastructure.

Neighborhood Traffic Control Program (NTCP)

The NTCP should be evaluated in the next one to two years to determine if it should continue primarily as a program that is reactive to resident requests, or more proactive in accordance with documented needs, or a combination of both. In addition, the program is expected to continue to increase its alignment with other SDOT programs, such as the high collision program and pedestrian/bicycle programs, to make use of joint funding and combined needs, particularly on arterial streets.

The Neighborhood Traffic Control Program is the CIP side of the Neighborhood Traffic Operations program. While there is an operations and maintenance project, its funding pays only for operations and customer service for the program. There is no on-going maintenance of the traffic calming devices installed. As noted above, currently, there is no standard practice at SDOT to identify and secure funding for on-going maintenance of new infrastructure.

SYSTEM IMPROVEMENTS

Pedestrian Master Plan Implementation

At the current level of funding, the program is able to build 10 sidewalks, approximately 200 curb ramps and walking routes at 5 schools each year. In addition, the program is able to make 50 low-cost crossing improvements each year. In order to accelerate implementation of the PMP, or to include higher cost projects, additional funding would be needed.

Federal standards for curb ramp construction are changing. The new standards, known as PROWAG, will improve accessibility of the ramps for people with disabilities. This means that many older ramps will be out of compliance and will eventually have to be replaced. These new standards will be more expensive to implement. Additionally, since ramps are located at intersections with heavy vehicle traffic, they often need to be maintained or replaced as the roadway deteriorates. In addition, the city is working with the Department of Justice on a settlement agreement related to the city's compliance with the Americans with Disabilities Act. This will certainly result in a large number of curb ramp retrofit projects.

Each pedestrian improvement installed must be maintained, including emergency repair and major maintenance well into the useful life of the improvement. Each year, maintenance budgets should be adjusted upwards to reflect the new sidewalks, curb ramps and other improvements that are added through this program and stand-alone CIP projects. Due to funding constraints, this has not regularly been the case.

Bicycle Master Plan Implementation

The vast majority of large projects identified in the BMP, including structures, signals, crossings, and trails, are not funded.

For the BMP there will be ongoing costs associated with new infrastructure including at this point 113 miles of on street facilities. Current budget through the BTG levy will fund remarking 30 miles per year; a similar statement can be made for the signed routes which are again funded solely through the BTG levy.

As bicycle ridership increases in Seattle, there will be more demands to address the pavement condition needs.

Transit Priority Corridor Improvements

The Transit Master Plan (under development) will provide additional guidance in selecting future projects. While Metro partnership funding might be jeopardized as a result of fiscal issues that are not in SDOT control, SDOT has been successful in securing grant funding for several large bus speed and reliability projects.

Ongoing costs associated with this program are primarily the operations and maintenance costs of the improvements. Lifecycle costs impacts from these improvements range from

the repair and maintenance of hardscape, such as curb bulbs, to the operating costs and repair/replacement of transit priority electronics, such as signals and information signs.

Freight Mobility Spot Improvements

SDOT would like to develop a freight plan, similar to the pedestrian and bicycle master plans, in the near future. This will likely result in the identification of new project ideas, many of which would be beyond the current funding level of this program.

New Signals

High-cost signal locations are included in the unfunded large project CIP list. Typically a grant is required to fund one of the higher cost locations.

With changes in project requirements and scope, the cost of installing new signals sometimes exceeds the limit for crew work set in state law (RCW 35.22.610). This can impact how the program delivers new signals. In addition, in response to changes in national standards, SDOT is adopting additional criteria that make it easier to warrant new signals for pedestrians, so the list of “warranted” signals can be anticipated to grow.

With the current process, only the locations for the current build year are known, since the needs list is very fluid and changes annually, along with where each project falls in the priorities. Funding for the program has fluctuated over the years, and will likely do so in the future, which will dictate how many locations can be constructed. In addition, each signal installed must be maintained, including annual preventative maintenance, emergency repair and major maintenance well into the useful life of the signal. Each year, the Signal Operations and Maintenance budgets should be adjusted upwards to reflect the new signals that are added through this program and stand-alone large CIP projects. This has not regularly been the case.

Pay Station Installation

Of the remaining urban villages that have not yet been studied, a majority would likely not be good candidates for installation of new paid parking; however, at least one neighborhood per year would likely require some paid parking (whether as a new neighborhood or as potential expansion of existing paid parking in the neighborhood.) The capital replacement plan for aging pay stations will be a significant expense, and should begin in 2014. This will cost approximately \$35 million over the course of the seven-year period 2014-2020.

The Seattle City Council adopted a Statement of Legislative Intent directing SDOT to set parking rates based on measured occupancy that will result in an average of 1 to 2 open spaces per block throughout the day. In 2011, SDOT reported to Council on the feasibility of pricing parking by time of day as soon as 2012, with rates changed as often as quarterly. This effort could lead to a recommended investment strategy that includes purchase of newer pay station technology and parking data acquisition technology in order to most effectively implement a variable paid parking pricing system.

Operating costs associated with installation of paid parking include: credit card processing fees (currently 6.6% of the amount of credit card transaction amounts; approximately 83% of pay station revenue is credit card-based); per unit communications and data costs; paper and spare parts replacement costs; pro rata costs of maintenance and troubleshooting by SDOT crews.

In addition, the pay stations SDOT has purchased come with a 5-year warranty but a 10-year lifespan, meaning the costs of maintaining the pay stations off-warranty after the 5th year must be factored in.

Pedestrian Lighting

As Seattle continues to encourage our citizens to walk more, the need for additional and improved pedestrian lighting is of high priority. Also, lighting technology has improved in both efficiency and reliability. The City is moving towards high efficiency light sources, such as LED. These sources have a higher initial investment, but over time the City will save maintenance and energy costs. The current cost to replace existing fixtures is approximately \$2,500 per luminaire for system-wide replacement of 10,000 for a total of \$25m. The project is currently funded at \$100k per year which barely keeps up with the current requests for lighting as identified in neighborhood plans. The program has a gap in the 2011-2016 CIP and into the future.

New Facilities

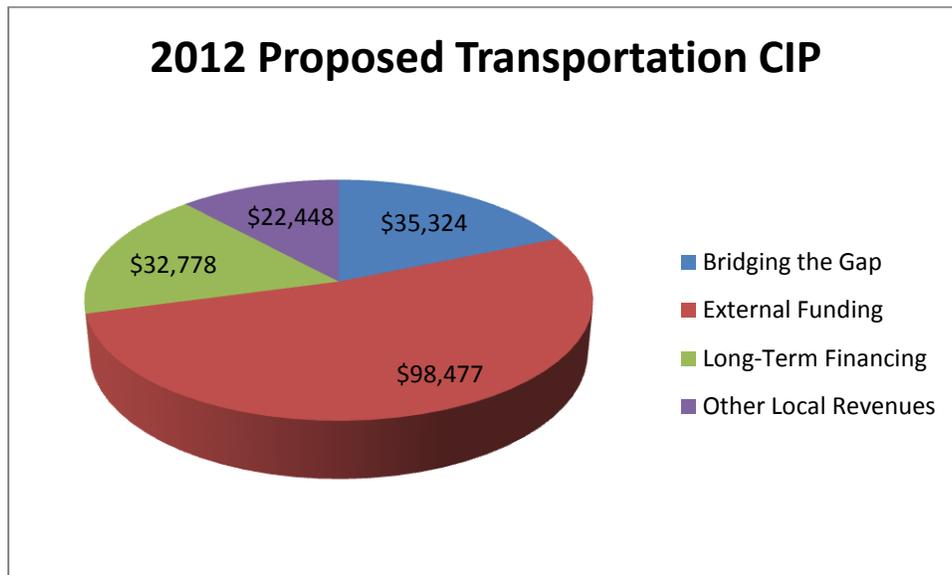
In the future, SDOT will need additional space (building and yard space) to accommodate operations and capital projects. Temporary trailers are currently housing Bridge Maintenance and Urban Forestry operations until a long-term solution can be identified and funded. In addition, as street car operations expand, it may be necessary to acquire replacement space for other SDOT operations currently located at Charles Street.

Section 7 - CIP Revenue Sources

The Transportation CIP is funded by multiple sources including Gas Tax, General Fund, Cumulative Reserve REET II, Bridging the Gap Levy LID Lift and Commercial Parking Tax, long-term financing (general obligation bonds) supported by the Commercial Parking Tax, federal and state grants and various funding partners, such as Sound Transit and the Washington State Department of Transportation. In 2012, the Proposed CIP budget is \$189 million and is funded as follows:

Exhibit 7-1: SDOT's 2012 CIP Funding Sources

(in thousands)



Local Revenues

There are several local funding sources for the Transportation Capital Improvement Program including Gas Tax, General Fund, Cumulative Reserve REET II, Cumulative Reserve Street Vacation, and the new \$20 Vehicle License Fee. These revenues are used for annual programs that either improve or maintain the City's transportation system or provide local match to SDOT's funding partners on large capital projects. As discussed previously, the economic downturn has reduced significantly the support received from the General Fund and Cumulative Reserve REET II Subfund. Additionally, gas tax revenue has been declining for a number of years as a result of higher gas prices and people choosing alternative modes of transportation rather than driving.

To help shore up the funding for SDOT's budget, the Executive and Council approved a \$20 Vehicle License Fee as part of the 2011 budget process. The Citizens Transportation Advisory Committee III (CTAC III) developed a plan for how the funding is programmed in 2012 and beyond. Additionally, the Executive and Council increased the commercial parking tax by 2.5% as part of the financing strategy for the Alaskan Way Viaduct and Seawall and associated projects.

Bridging the Gap

In 2006, the City successfully moved forward the Bridging-the-Gap initiative to repair and improve Seattle's streets, bike trails, sidewalks, and bridges. The funding package included a commercial parking tax, an employee hours tax (EHT), and a property tax levy that was approved by Seattle citizens in November 2006. The property tax levy is set to expire in 2015 and the City will need to go back to the voters to have it renewed.

The revenues received to date from the commercial parking tax have exceeded initial projections. Due to the strength of this revenue stream and the difficulty in administering

the employee head tax, the Executive and Council decided to repeal the EHT. It was believed that any loss in EHT revenue would be made up by Commercial Parking tax. The repeal of EHT was effective January 1, 2010 per Ordinance 123150.

Long-Term Financing

Approximately 17% of the 2012 Proposed Transportation CIP is funded with long-term financing (general obligation bonds) supported by the Commercial Parking Tax and other local revenues. Bonds support major projects such as King Street Station Multimodal, Spokane Street Viaduct and Alaskan Way Viaduct & Seawall projects. They also support Bridging-the-Gap major maintenance programs, Bridge Rehabilitation and Replacement and Bridge Seismic Retrofit Phase II. The newly approved 2.5% portion of the Commercial Parking Tax will pay the debt service for the Alaskan Way Viaduct & Seawall and associated projects.

Outside Funding Sources

Over 50% of the CIP is funded by outside sources in 2012. SDOT is highly successful in securing state and federal grants. The majority of grants are applied for through competitive processes. Applications are submitted, reviewed and rated based on the grant program's rating system. Projects that rate high based on SDOT's project priority list may not be competitive when rated by the outside granting agencies. The majority of grant programs require the local jurisdiction to provide a set amount of local match for the grant and they limit reimbursement for indirect costs.

SDOT also has many projects with funding from other agencies within the City as well as outside organizations. Seattle City Light and Seattle Public Utilities are partners in major projects such as Mercer Corridor and Spokane Viaduct. SDOT also partners with other public agencies such as the Washington State Department of Transportation and Sound Transit to implement regionally important transportation improvements.

Section 8 - CIP Spending by Major Category

As discussed in the overview, the Seattle Department of Transportation's (SDOT) capital budget includes four categories of investment.

- ***Maintenance and Rehabilitation Programs*** optimize existing facilities by keeping facilities and equipment in good condition and good operating order. Examples include Arterial Asphalt and Concrete and Bridge Seismic Retrofit Phase II programs.
- ***System Improvements Programs*** fill in gaps or make extensions to networks that are identified through subarea or modal plans. Examples include Pedestrian Master Plan Implementation and Transit Corridor programs.

- **Neighborhood Programs** are similar to system improvements, but generally comprise smaller-scale projects identified through community input. Examples include NSF/CRF Neighborhood and Neighborhood Traffic programs.
- **Large Capital Projects** are individual projects that stand out among the City's transportation needs because of their size or complexity, potential community impact, high cost, or coordination with outside partners. Examples include Linden Avenue North Complete Streets and Mercer Corridor projects.

The following table displays the Proposed 2012-2017 Capital Improvement Program in these categories.

Exhibit 8-1: Proposed 2012-2017 Capital Improvement Program by Category

[in thousands]

	2012	2013	2014	2015	2016	2017	Total
Large Capital Projects	121,296	156,459	177,527	172,111	243,682	143,852	1,014,927
Maintenance & Rehabilitation	35,436	30,876	43,955	29,901	27,897	27,973	196,038
Neighborhood Programs	4,889	2,833	2,898	2,963	3,017	3,083	19,683
System Improvements	27,406	16,778	16,364	17,999	14,961	15,283	108,791
All Categories	189,027	206,946	240,744	222,974	289,557	190,191	1,339,439