

**CITY COUNCIL AGENDA ITEM  
CITY OF SHORELINE, WASHINGTON**

<b>AGENDA TITLE:</b>	Discussion of the Aurora 30% Design
<b>DEPARTMENT:</b>	Public Works
<b>PRESENTED BY:</b>	Mark Relph, Public Works Director Kirk McKinley, Aurora Project Manager Kris Overleese, Capital Projects Manager

**PROBLEM/ISSUE STATEMENT:**

The purpose of this agenda item is to update Council on the progress of the Aurora Corridor Improvement Project (N 165<sup>th</sup> to N 185<sup>th</sup>). The project is at the 30% design milestone, which is an excellent time in the design and acquisition process to share information with the Council on progress to date. We are currently on schedule in the design, have a 30% cost estimate that is consistent with the budget and previous estimates, and have met with 40 of the 45 property owners from which we need to purchase right-of-way, and/or acquire easements and other property rights. We are using the Flexible Design Alternative adopted by Council on July 23, 2007 as the base alternative, and have been incorporating the Implementation Strategies into the design as well.

The major item for discussion on May 5 will be our approach on stormwater management for the project. This staff report evaluates the options available to provide a stormwater system that is significantly improved over the existing system. It is the goal of our project to exceed the requirements on both flow control and on water quality, to test various techniques, to use these treatment types as an educational tool, and to set an example for future projects. Our recommendations on how to accomplish this are included in this report. The proposed tentative locations for the use of Low Impact Development (LID) tools fall within the "Town Center" from N 175<sup>th</sup> to N 185<sup>th</sup> Street, and are indicated on Attachment A.

**WHAT IS 30% DESIGN AND WHERE ARE WE IN THE PROCESS?**

Thirty percent design is a major milestone in the design process. At this time, we have: completed base map and field survey, layout of project footprint, roadway grades, sidewalk and driveway locations, traffic channelization, and utility information. Based on field survey and coordination with utility providers, we know where the utilities are and generally what utilities may have to be relocated. Later design will determine how utilities will co-exist under the roadway and sidewalk. We have also begun urban design and landscaping.

The intent of the 30% design review is to give key staff, stakeholders, utilities, and others an opportunity to identify any major project concerns or to propose substantive changes. Major changes in the design after 30% are problematic, costly to accommodate, and could negatively impact property owners. Changes resulting from recent meetings with property owners (and sometimes tenants), if not already incorporated in the 30%, will be incorporated in the 60% design.

The project team is in the process of holding appraisal meetings with property owners and tenants (as appropriate) to discuss the project's property needs and rights for construction. The first property offers were made in April and it is anticipated that appraisals and offers will be made over the next several months. Negotiation with property owners will continue until all property is purchased for the project.

The next major design step is 60%, which we are anticipating in mid-late summer 2008. This step has a higher level of design detail, and a more refined cost assessment. At 60%, we will also get the first draft of the construction specifications. There is opportunity for continued minor changes at 60%, but it is the intent that major changes or redesigns would have been identified at 30%. The last major milestone, before final plans, specifications and cost estimate (PS&E) are finalized for advertisement, will be 90%. We expect to receive 90% later this year. The final PS&E (the construction plans) will be prepared by March/April for a May 2009 advertisement and award. The advertising/award date is contingent on a smooth right-of-way acquisition process.

## **COORDINATION WITH OTHER PROJECTS:**

There are several other planning and capital project efforts that are related to and have interaction with the Aurora Project design process. These include the design and construction of the Civic Center (and associated frontage improvements), the scoping and design of the future park north of Walgreens, and the Town Center planning efforts.

### **Civic Center**

The Aurora Team and Civic Center Team are working closely together on design and timing, with the goal of avoiding duplicate work and minimizing costs. The Aurora project will be reconstructing and widening N 175<sup>th</sup> in front of the Civic Center property. Staff is exploring the potential to sequence the Aurora Project construction of the N 175<sup>th</sup> Street City Hall frontage improvements to coincide with completion of the Civic Center.

### **Town Center Planning**

The Aurora Team and the Planning Department have been working with the University of Washington Landscape Architecture class for the past four months. Some ideas, such as strengthening the "gateway" concept at 175<sup>th</sup> and 185<sup>th</sup>, as well as integration or common threads of design between Aurora, the park, and the Civic Center, are being considered in the Aurora design.

### **Park**

The city-owned portion of this park currently consists of the Ronald Place right-of-way, from Walgreens to where Ronald Place intersects Aurora Avenue N. The Aurora project will likely acquire the McCaughan properties located immediately north of

Walgreens (currently occupied by two used-car dealerships), because after the property is purchased for the project, the parcels will be small and likely uneconomic to the property owner. If this occurs, then the acquired land could be used as part of the public space for the park.

In any case, the project will create improvements along the frontage of these properties from the north side of Walgreens to the intersection of Ronald Place. The Aurora Team is working very closely with the Parks Department and the Storm Water Manager to ensure that the frontage can support future park needs, as well as serve as a demonstration of storm water low-impact design techniques. Because the Interurban Trail will be serving as the sidewalk for Aurora from Walgreens to N 185<sup>th</sup>, the Aurora project and park design will collaboratively identify the design of the pedestrian link from the Walgreens sidewalk to the Trail.

### **DESIGN UPDATE:**

Overall, the design is progressing well, as are the meetings with property owners. A brief review of the highlights is presented below.

#### **Value Engineering Study**

We held a Value Engineering (VE) study exercise during the week of April 7, 2008. The purpose of the VE process is to utilize independent experts to assist in the review of the project, and to utilize their expertise to reduce costs and impacts of the project. The results of the VE study are still being finalized, but the session was very productive in identifying some cost savings and efficiencies in the design documents that should give us better bids, and a more smooth and efficient construction process. The VE study team evaluated the potential to close the project down for at least two weeks between Thanksgiving and New Year's, to lessen the impact on retail sales during this important shopping season. The study is making other recommendations for further investigation on how to construct this middle mile faster than the first mile, and is also examining the potential to encapsulate the construction into smaller geographic sections to reduce construction impacts.

#### **Interim/Flexible Frontage Improvements**

The adopted design concept had approximately 6% of the frontage improvements as "interim" (designed to a lesser standard). As a result of recent design meetings with property owners, one additional property has been identified as needing partial interim sidewalk to minimize impacts. The adopted design also suggested sharing driveways in order to maximize parking for those sites where the building is close to the roadway. These discussions are continuing.

#### **Roadway Design**

We have submitted the channelization plans to Washington State Department of Transportation (WSDOT). WSDOT has final decision authority on the design of the channelization, signing and signalization between the curbs. WSDOT has reviewed the channelization, and has provided comments, which we are still working to resolve in order to meet their approval. As with the first mile, we are proposing deviations to WSDOT standards for shortening the length of turn pockets, tightening the curb layout

to provide more storage within the pockets, and a few other items. Some turn pockets have been shifted or adjusted, and these discussions have included property owners.

### **Seattle City Light Coordination**

Seattle City Light (SCL) is a major partner in this project, and staff has worked closely with them through the planning and design process to date. SCL is designing the undergrounding of the overhead distribution line system, and have met our design schedule milestones. We are close to submitting the paperwork to SCL for the land we need to acquire from them for the project. The City will purchase property needed on the north and south sides of N 175<sup>th</sup> and N 185<sup>th</sup> Streets. SCL and Shoreline have verbally agreed that the property needed on the east side of Aurora (between N 178<sup>th</sup> Street and N 185<sup>th</sup> Street) will be "traded" for property along Midvale on a 1:1 basis.

### **Coordination with Other Partner Agencies and Utilities**

Staff has held several Utility meetings to coordinate information, schedules, and scopes with the utilities. These have been well attended by all, and all have acknowledged the schedule. We are continuing to work closely with Seattle Public Utilities on the water system – we want to ensure that the system we build can be accessed (or tapped) without having to tear up Aurora after it is constructed. We also need to ensure that there is adequate flow and pressure for fire protection for future growth along Aurora. We have also been in close contact with Metro Transit on the bus stop locations and design. The project will construct the standard Aurora blue shelters (with the water systems art on the roof). In 2013, Metro will be implementing the Bus Rapid Transit (BRT) on Aurora, which will involve new shelter design. We will accommodate the future shelter design needs, such as footings and wiring, dependent on Metro's design schedule.

### **RIGHT OF WAY ACQUISITION UPDATE:**

Right-of-way acquisition for the project has begun. The Washington State Department of Transportation (WSDOT) has approved the right-of-way plan for the project (identification of property purchase areas) and the forms to be used for acquisition. Staff from Universal Field Services, the acquisition consultant, has been attending the property owner meetings with the design team. After the design meetings, the acquisition team (including property appraisers) visits the site to begin evaluation of property value and impact to property owners and tenants. The acquisition team receives a copy of tenant leases and they meet with tenants (as appropriate) to ensure that tenant rights during the acquisition process are upheld. The first property/compensation offers were made in April 2008. It is anticipated that all appraisal meetings will be held by mid-2008 and all offers are expected to be made in this timeframe as well. Negotiations will continue until all property is purchased for the project.

### **FINANCIAL IMPACT AND FUNDING:**

We have adequate budget/resources to design, acquire property and construction rights, and to construct the project from N 165<sup>th</sup> to N 185<sup>th</sup> Street. Staff continues to pursue additional funding to complete the project to 205<sup>th</sup>. We are pursuing funding at all levels and sources. The next regional competition for federal SAFETEA-LU is in

2009. We will continue to seek earmarks with the assistance of our federal representatives. We will pursue additional funding from the Transportation Improvement Board (TIB), and any other state programs that have funding. We are also pursuing funding for the last mile through the Sound Transit 2020 plan development, and are still trying to partner with Seattle and Metro for Federal Transit Authority funding.

The table below indicates our current committed resources of approximately \$38.5 million for the middle mile, and approximately \$8.8 million for the last mile.

<b>Funding Sources</b>	<b>Amount</b>
Roads Capital Fund	\$5,895,804
Federal STP – C	\$6,164,979
SAFETEA – LU	\$1,112,114
Surface Transportation Program (STP)	\$3,600,000
STP –U	\$525,361
King County	\$2,101,742
Nickel Gas Tax Funding	\$2,100,000
Transportation Partnership Act (TPA)	\$8,000,000
Regional Mobility Grant	\$2,500,000
Surface Water Funds	\$500,000
Transportation Improvement Board	\$6,000,000
<b>Total</b>	<b>\$38,500,000</b>

## **STORMWATER LOW IMPACT DESIGN:**

### **History**

In the planning stages for this project in 2006 and 2007, Council encouraged staff to incorporate low-impact development (LID) elements into the remaining segments of the Aurora Corridor Improvement project. Council has also developed Goal #6, which promotes sustainability citywide. In response to Council and community goals, staff worked with the Aurora Business Team in 2007 to develop a natural stormwater system toolkit and to update the project's Implementation Strategies (formerly known as the 32 Points). The toolkit included concepts such as box filters, raingardens, biofiltration swales, and porous materials. The project will also completely upgrade the conventional stormwater system. This will reduce local flooding. Staff also coordinated a "stormwater charrette" that included leading local experts on water quality, staff, consultants and three councilmembers in 2007.

As reported in the project's environmental documentation, the Aurora N 165<sup>th</sup> to N 185<sup>th</sup> Street Project is predominantly within the Boeing Creek basin. The north area, beginning at approximately N 183<sup>rd</sup> Street, drains to Echo Lake, which is in the McAleer Creek basin. Boeing Creek is susceptible to erosion during storms and higher flows.

Water quality is a more significant concern for Echo Lake, although controlling flows would benefit the McAleer Creek system as a whole.

### **Requirements**

At a minimum, the project must meet the requirements of the City-adopted 1998 King County Surface Water Design Manual and Shoreline Municipal Code stormwater regulations. As the project is reducing impervious surface overall, flow control is not required. Even though the overall amount of impervious surface is being reduced, over 1,500 square feet of pollution-generating surface is being replaced, which requires basic water quality treatment (80% removal of total suspended solids). Oil control is also required at the N 175<sup>th</sup> and N 185<sup>th</sup> Street Aurora intersections. Staff believes the project will exceed requirements with a higher level of flow control, and significant water quality improvements will be made.

### **Stormwater Toolkit**

Since development of the stormwater toolkit, the project's designers, HDR Engineering, Inc., have taken a close look at the technologies listed below. As the soils along Aurora Avenue are glacial till, infiltration is not a significant component of the stormwater toolkit. We are recommending that most of these be incorporated in the project, not only to improve water quality, but also to serve as an education and demonstration opportunity. The Attachment A map shows locations in the town center area where we are proposing the installation. Attachment B compares key information on the toolkit items discussed below, including construction costs, maintenance costs, and relative benefit. Fortunately, we have the opportunity in the town center area with a variety of site-specific existing situations to apply the different technologies in the toolkit.

**Box filters:** Box filters and tree-box filters are generally used in amenity zones and parking lots. The box contains amended soils that remove pollutants, and the plants (small trees or shrubs) uptake water. Runoff from the street is directed into the box, and filters through the soil to be used by the plants. The water that is not retained by the plants is then sent via an underdrain system to the conventional stormwater system. These also can be used in intersections to replace the need for catch basin inserts to separate the oil from the water. Staff is considering these at N 175<sup>th</sup> and N 185<sup>th</sup> Street intersections to address the oil issues, as well as support the "gateway" concept at these two key intersections. Because of the limited "root" capacity of these boxes, shrubs are recommended for installation.

**Ecology Embankment:** This is a stormwater treatment device developed by the Washington Department of Transportation that can be placed linearly alongside a roadway. It consists of a gravel strip, narrow filter strip, an ecology mix bed, gravel underdrain, and connection to the conventional stormwater system. Water sheet flows off the roadway and into the ecology mix media for treatment. The treated water then flows into the gravel trench to be conveyed offsite. This treatment is approved by the department of Ecology for removal of suspended solids, zinc, and phosphorus (particularly important in the Echo Lake basin). We are considering these along the east side of Aurora from Walgreens to N 185<sup>th</sup>.

**Bioretention Swale & Raingarden:** These engineered, unboxed depressions contain plants, mulch, rocks and amended soils. They can be designed with a ponding depth to

store water during storm events. While the project's amenity zone is too constricted for bioswales and rain gardens, they could be used in areas where right of way is wider, such as in front of the Fire Administration building, Doug's Hummer, Schucks, and Hollywood Video.

Stormwater Planter Boxes: Stormwater planter boxes are similar to rain gardens and bioretention swales, but they are typically contained by small concrete walls along their perimeter. They can have an open or closed bottom. They are more defined in shape than raingardens, and are suitable for confined urban settings such as amenity zones. Planter boxes can be used to control stormwater flows and improve water quality. This technique has been used in Portland, Oregon, but generally needs more width than a four-foot (amenity) zone to be cost-effective.

Silva Cell/Porous pavers: Silva Cell is a new product that allows for healthier tree growth and stormwater treatment. Trees in the urban environment are confined and the root space and soils often prevent healthy and substantive growth. The Silva Cell system is a network of blocks that hold soil for tree roots to grow into. The Silva Cells provide a structural network that sidewalk can be placed over. Water enters the tree pit from the roadway, filters through the soils and into an underdrain. The water quality is likely improved (similar to a rain garden and box filter), and the trees can use the water for nutrients. Porous pavers can also be used on top of the Silva Cells to provide additional water for the trees. This technology is new and not yet approved by the state Department of Ecology for water quality treatment. The City could utilize this technology and be part of a nationwide analysis of this product.

Stormwater filters: Stormwater filters are underground boxes and/or drums that contain filter cartridges to remove sediments, heavy metals and nutrients such as phosphorus. To provide water quality improvements for the first mile of the Aurora Project (N 145<sup>th</sup> to N 165<sup>th</sup> Street), three large stormwater filters were installed as part of the conventional stormwater system. In these filters, over 150 cylinders/cartridges were installed for pollutant removal. These filters must be replaced when they become full of contaminants.

Vortex separators: This water quality treatment option uses a catch basin combined with a pollutant separator. This technology uses vortex separation (the water swirls as it flows through the unit) to clean the water by removing sediment. The separator unit acts like a catch basin and is cleaned like a catch basin with a vactor truck. This technology was used in one location on the Aurora Project (N 145<sup>th</sup> to N 165<sup>th</sup> Street).

Catch basin inserts: Filter inserts can be placed in traditional catch basins to control pollutants, especially oil. These inserts are typically placed around intersections where oil control is required due to higher traffic volumes. When full, these filters must also be replaced.

Subsurface detention: Conventional stormwater systems can include flow control underground. This can be accomplished through very large (and expensive) pipes and vaults. Staff is exploring oversizing some of the conventional pipes to assist in flow control.

**Dry well:** The project's value engineering study suggested investigation of dry wells for flow control. A dry well is a drilled shaft filled with rock that takes water from the surface, down through the soil's till layer, to ultimately disperse in outwash soils. Additional deep soil excavation and soils tests would need to be performed to see if dry wells could be a project option. Dry wells present the risk of dispersing pollutants into the groundwater and of creating flooding in unexpected places.

### **Analysis**

The use of natural stormwater system elements provides low-maintenance, aesthetic stormwater quality improvement. They also provide a low level of flow control. It is estimated that water quality improvement requirements can be reached through the utilization of natural and traditional stormwater treatment facilities. Staff recommends utilizing a variety of low-impact development stormwater tools in the area between N 175<sup>th</sup> Street and N 185<sup>th</sup> Street and an upgraded conventional system throughout the corridor. Staff recommends pursuing the following tools in this Town Center area:

- Tree box filters at intersections for oil control;
- Raingardens/bioswales in front of the Fire Station, Doug's Hummer, Schucks and Hollywood Video;
- Ecology embankment adjacent to Seattle City Light property (south of N 185<sup>th</sup> Street);
- Silva Cells and porous pavers on N 175<sup>th</sup> Street adjacent to City Hall and potentially other locations. As this technology is not approved by Ecology for stormwater enhancement, the opportunity exists to be part of national research and testing;
- Box filters in the amenity zone.

The concentration and variety of natural stormwater systems that could be installed in the Town Center area, combined with great pedestrian mobility, would make this an ideal area for a natural stormwater system educational walking tour.

Staff's goal is to provide a high level of water quality improvement with these tools. Staff will then investigate utilizing traditional stormwater elements outside the Town Center area to provide added benefit. We asked our consultant team to investigate the potential for natural stormwater treatments in the landscaped medians. Although the medians are fairly large, to design them as bioswales or raingardens would be costly to construct and problematic to maintain, as well as a safety hazard to jaywalkers. Maintenance would require closing lanes or turnpockets. We are not recommending special LID treatment in the medians, but instead plant them with low-growing, drought-tolerant plants and trees in a similar design to the first mile. We have asked our landscape architect to revisit the plants and landscape design from the first mile with an eye to increasing the density and impact of the plants. This will include revisiting the plant types as well.

Attachment B is a chart that summarizes the effectiveness, relative cost and benefits from each of the potential LID techniques.



**SUMMARY:**

Staff will review the above information at the Council meeting, and will bring illustrations/photos of the stormwater treatment options to the meeting. The 30% design is a significant milestone, and the project continues to be on schedule and making good progress toward mid-2009 construction. Staff is very positive about the opportunities to install and test the viability and future applicability of the various stormwater treatments.

**RECOMMENDATION**

There is no official action required; however, input and comments from the Council will be helpful.

Approved By:

City Manager



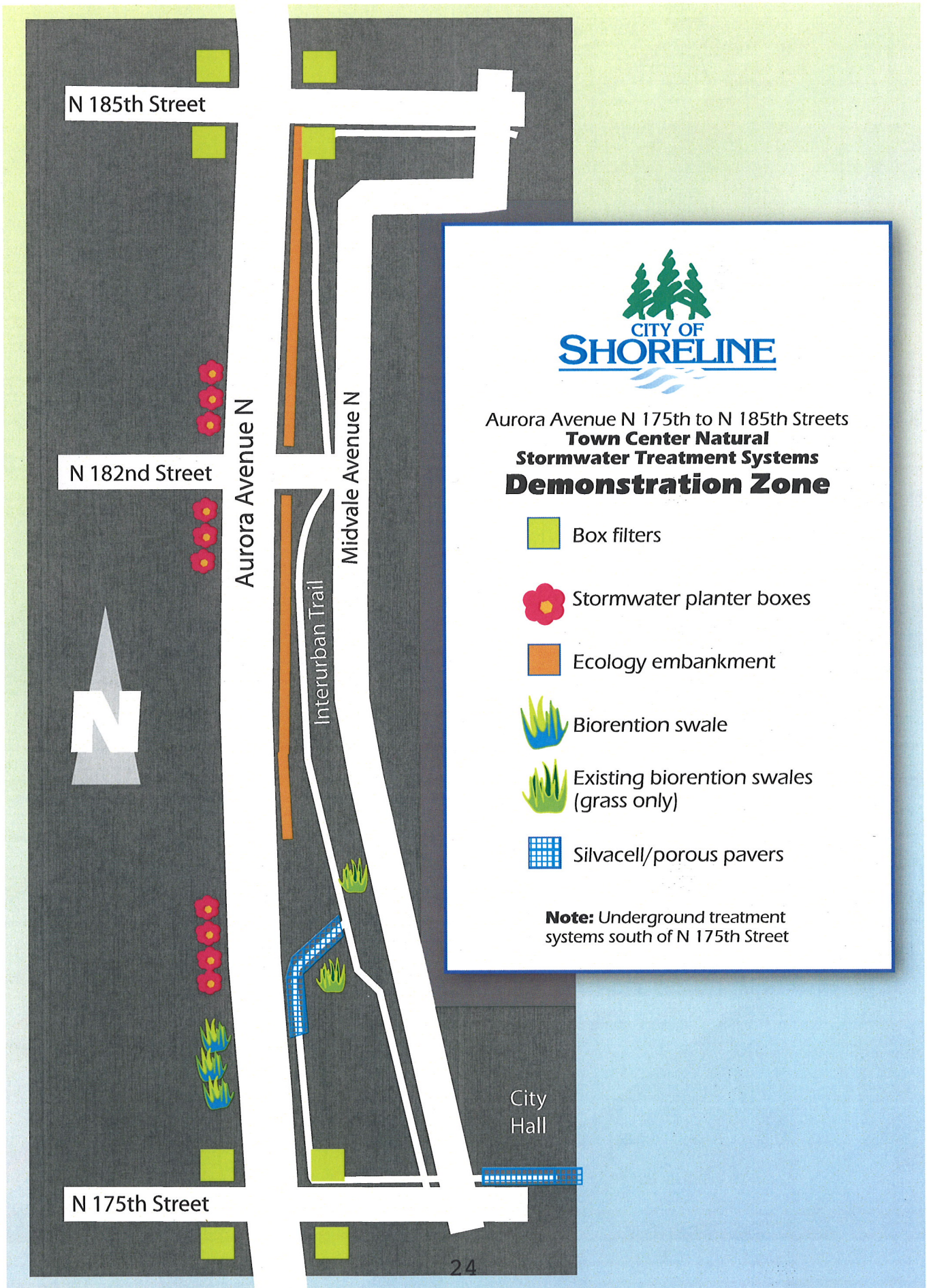
City Attorney

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**ATTACHMENTS**

Attachment A – Map of Town Center Proposed Natural Stormwater Treatment Systems

Attachment B –Water Quality Treatment Matrix





## AURORA CORRIDOR IMPROVEMENT PROJECT WATER QUALITY FACILITY COMPARISON



Treatment Method	Basic Treatment	Enhanced Treatment & Phosphorus Treatment	LID Technology	Oil Treatment	SF of Roadway Treated / 1 SF of Water Quality Facility	Overall Rating	Ease of Maintenance	Maintenance Interval	Cost / SF Roadway Surface	Annual Maintenance Cost / SF Roadway Surface
Wet Pond	X				103 (d)	●	●	●	\$ 0.75	\$ 0.10
Wet Vault	X			X*	173	●	●	●	\$ 2.00	\$ 0.15
StormFilter	X			X	605	●	●	●	\$ 1.30	\$ 0.20
Rain Garden/Planter	X		X		4	○	○	●	\$ 10.80	\$ 0.20
Vegetated Swale	X		X		55 (a)	●	●	○	\$ 0.50	\$ 0.10
Large Wetpond	X	X			70 (d)	●	●	●	\$ 1.00	\$ 0.10
Ecology Embankment	X	X	X		8 (b)	●	●	●	\$ 1.11	\$ 0.10
Filter Box	X	X	X	X	314 (c)	●	●	○	\$ 1.65	\$ 0.10
Catch Basin Insert				X	1500 (e)	●	●	●	\$ 0.08	\$ 0.05

\* Wet Vault can provide oil control with the addition of baffles in the vault.

a. Vegetated Swale treatment is based up the minimum Vegetated Swale size of 100 feet long by 8 feet wide for a total of 800 SF.

b. Ecology Embankment treatment is based upon the allowable maximum roadway width of 75 feet and the minimum embankment width of 9 feet.

c. Box treatment is based upon the minimum box size of 176 SF.

d. Wet Pond costs include buying real estate. Assumed \$50 / SF for real estate costs.

e. Only provides oil control, additional treatment is required to meet Basic or Enhanced level of treatment.

**Notes:**

Treatment Methods in bold font are proposed for project use.

Treatment methods cannot be used in all areas.