

LWVTC Comments on Olympia's 2010 Comprehensive Plan Update Regarding Water Resources (3-7-10)

A. Introduction

The proposed goals set forth in this document for Drinking Water, Storm & Surface Water, Waster Water and Climate Change& Sea Level Rise are based on research by the Water Resources Subcommittee of the League of Women Voters of Thurston County (LWVTC) Committee to Comment on Olympia's 2010 Comprehensive Plan Update and existing LWVTC positions . Based on a study of water resources in Thurston County, "Thurston County Water Realities in Relation to Planned Development" (2008), the LWVTC took the following positions on the subject:

Our League believes that concerning water resources, the overriding consideration should be protecting the quantity and quality of the water resource.

Our League Advocates:

- Enforcement of existing and future water laws supported with adequate funding, reliable data, and public education.
- Additional state legislation to reduce or eliminate the use of exempt wells. Re-defining water use realistically to reflect the maximum withdrawal limit for private residential use. There should be provisions for recognizing historic use. Local governments should require all wells, including exempt wells, to be metered for compliance with withdrawal limits and to charge for water use with incentives for conservation.
- Population forecast models should reflect water availability. There should be concurrency of water availability and demand required under the Growth Management Act (GMA) for comprehensive planning and plat approval. Demand analysis should incorporate both consumptive and in-stream uses and consider the effects of climate change. Adequate water availability can be improved by conservation, low-impact development and gray water recharge to aquifers. Boundaries can be defined by Water Resource Inventory Areas (WRIAs).
- A cost effective management system for the collection of water resources data. There is a need for consistent data with standardized protocols, available in a centralized repository with internet access. Adequate funding for data collection is essential.

The current Olympia Comprehensive Plan addresses Water Resources generally as follows: Chapter 2 (Environment) recites the creation of plans for all utilities (including Drinking Water, Storm & Surface Water, Waste Water, Solid Waste and Parks, Arts and Recreation) as accomplishments. In Chapter 5 (Utilities and Public Services), Goal PF1 states that utility and land use plans must be integrated and be concurrent with anticipated population growth. Goal PF 3.1 states that utility functions for Drinking Water, Waste

Water, and Surface Water should be coordinated and asserts the Olympia's Water System is planned and managed from the perspective of the full hydrological cycle. It should be noted that Olympia's water service area includes its UGA, Tanglewilde, Thompson Place, Evergreen State College and the City of Lacey, so it is somewhat regional in nature. For reasons which are fully set forth below, the following general water resources goal is proposed.

General Goal: Drinking Water, Surface/Storm Water, Wastewater, Shoreline, and Climate Change are all part of the hydrological cycle, should be evaluated together, and should be addressed regionally by watershed. Although some of the existing plans on these subjects incorporate groundwater quality and quantity, responsibility for Ground Water Protection should be clearly assigned in Olympia's Comprehensive Plan Update, as should responsibility for planning and responding to Climate Change. All the jurisdictions in Thurston County should have a unified water plan so that these subjects are managed in an integrated manner, including a simplified legal and policy framework. LOTT is the best example of this approach and could be expanded to plan for other water resources. Specifically, Goal PF 3.1 stating that utility functions for Drinking Water, Waste Water, and Surface/Storm Water should be coordinated and that Olympia's Water System should be planned and managed from the perspective of the full hydrological cycle, should be renewed in Olympia's Comprehensive Plan Update. The subjects of Ground Water, Shoreline, and Climate Change should be added to this Goal. Finally, the City should establish performance measures for Comprehensive Plan goals. The measures can be subjective or objective, but including them allows the City and its citizens to assess whether the Plan's goals have been achieved during the Plan period.

The LWVTC believes the scope of the Comprehensive Plan amendment process should include all of the sections for which it has developed comments and proposed revisions, and some suggested selection criteria are included in section I of this document.

B. Drinking Water

Attached hereto is a chart of goals and policies related to drinking water from the current Comprehensive plan. Ordinance 6517 updated the drinking water plan in 2007, thus there is much in such plan that should be preserved in the City's current update. However, some consolidation of goals and policies would simplify the plan and make it easier to implement, and those suggestions are noted in the chart. Determining proper policies for the next twenty years to ensure the availability and quality of drinking water is a complex and technical subject, which will be driven by the costs and benefits of such policies. The chart indicates some changes to the current plan that are intended to improve the chance that the policies will lead to the highest net benefit for the least cost. Proposed new goals are:

Goal 1: Acquire water rights and identify additional water supplies to provide for anticipated increases in population and development over the next 20-30 years.

Goal 2: Use cost benefit methodology to determine the most effective use of public resources making major capital investments.

Goal 3: Encourage peak demand conservation measures during periods of dry weather.

C. Storm & Surface Water

It is imperative the City of Olympia's 2010 Comprehensive Plan update include stormwater management policies that contain Low Impact Development guidelines, Green Stormwater Infrastructure (GSI), and Street Edge Alternative (SEA), for implementation in city planning and development for the next 20 years.

Within the 24 square miles of the City of Olympia there are nine streams, four lakes, four large wetlands, six miles of shoreline and several thousand acres of public and private forest. These shorelines, streams and Capitol Lake comprise twelve watersheds within Olympia. The City of Olympia's Public Works department maintains over one-hundred and thirty miles of underground pipe, over 6,300 storm drains, and forty stormwater ponds that carry stormwater runoff from roads and rooftops to our streams and Budd Inlet, according to the City of Olympia Storm and Surface Water website.

Further, the City of Olympia's website states that Olympia is growing at a very rapid rate and as the city grows forests are replaced with roads, buildings and parking lots. It is important to note that stormwater starts as rain, but picks up pollutants from streets, sidewalks, and lawns as it runs off and enters pipes that quickly discharge into our streams and wetlands. Polluted and untreated stormwater is harmful to animals, people and our natural environment. Therefore, it is important to take care of stormwater where it falls as much as possible green infrastructure design and low impact development.

Much of the land located within the Olympia Urban Growth Area (UGA) is zoned low impact development (LU1). However the Comprehensive Plan has no mention of the city's goal and objective as it relates to low impact development. It is important for policies be set relating to low impact to guide future development and redevelopment within the City of for the next 20 years.

Cities such as Seattle, Portland, Kansas City and Los Angeles have all sought to create livable and attractive communities through the use of Green Infrastructure and Low Impact Development techniques through the guidance and support of the Federal Environmental Protection Agency (2). Since 1999, the city of Seattle has incorporated Natural Drainage Systems (NDS) into their redevelopment plans as well as other Low Impact development guidelines (3). In Kansas City Missouri the "10,000 Rain Gardens initiative" project, demonstrated through reduction of run-off through low impact best management practices (BMPs), there can be cost saving for construction of stormwater management over tradition practices as well as a reduction in maintenance cost (4). The City of Los Angeles, California is currently working on an ordinance that will require all new development and major redevelopment within the city to met LID standards (5). See section G of this document for references and additional resources.

Though the City of Olympia has a good Stormwater Manual, the amount of polluted stormwater that presently is dumped into waterways indicates a need for improvement. Studies indicate that stormwater, when well managed, can do much to improve the lives

of our waterways and environment as well as the lives of humans and animals. It behooves the City to work to achieve best practices for stormwater through the use of green infrastructure innovations today around, and the articles are regularly featured in trade journals, newspapers and magazines.

The goals proposed below are intended to serve as a foundation from which the City of Olympia can incorporate green infrastructure development techniques into the City's 2010 Comprehensive Plan Update. GSI development takes forethought, planning and standards in order to be effective. Without standards, low impact development is just another form of high impact development (Holtz, Thomas W.).

Goal 1: Implement Green Stormwater Infrastructure, Low Impact Development and Street Edge Alternatives in all future City development and re-development projects in order to reduce pollution of stormwater, as well as to gain many other benefits such as the following: mitigation of urban heat islands, protection of wildlife corridors, reduction of light pollution, inclusion of aesthetic community garden features to improve property values and encourage neighborhood interaction. These strategies have improved the looks and functionality of homes, increasing their overall attractiveness and value.

Rain gardens located within a community serve as microhabitats and the benefits of rain gardens spread to the animals, birds and bees. The GSI design cleanses stormwater through a series of natural functions. The plants and soils filter pollutants as rainwater moves through the swales and ponds, preventing them from traveling downstream to sensitive water bodies such as creeks lakes and the Sound.

GSI practices may be implemented in built environments by retrofit and should be incorporated in all development planning. An important consideration is the natural drainage basins and existing stormwater ponds, both natural and man-made, in existing neighborhoods. GSI should be implemented in such existing stormwater ponds. There should be access to these areas (now often fenced away, hence the term "stormwater prisons") for both the neighborhood and for native animals. Well planted and grown stormwater ponds invite the neighborhood to visit and enjoy the local access to nature. Other changes include the provision of simple paths, of dog-dropping bags on a post and discrete signage indicating drainage areas are an extension of the neighborhood. Drainage areas can also work to provide "connected paths" and permit ease of passage through neighborhoods. Neighborhoods should be encouraged to "adopt" the drainage area and to institute improvements, such as weeding, mulching and planting of native trees, bushes, grasses and sedges. In addition, SEA provides streets with a "soft edge" and encourages neighbors to go out and enjoy the shared spaces.

It is hoped that community residents would become interested in how to keep the rain from their home's gutters and downspouts by means of rain gardens. Rain gardens, planted with native vegetation suitable for the location, are an improvement for all. Bacteria within healthy soils can also help break down carbon-based pollutants like motor oil. Grasses, sedges and rushes physically filter pollutants out of stormwater. The designs must follow the concept of "right plant, right place," selecting non-invasive species that can survive with little maintenance in our local climate. Trees with smaller

root systems fit more easily within the right-of-way; larger trees should be planted where appropriate. Plants that thrive in wetlands should be placed in the lower, moist areas of the stormwater swales and ponds.

The landscape design should include mostly native Pacific Northwest species and some ornamentals. Once planted, the goal is to support the plantings such that 90% survive. The goal is to improve stormwater absorption through natural means. In addition, the right-of-way becomes beautiful as well as useful. If neighbors like the way the street looks, as it changes from season to season, they are more likely to help care for it. Accompanying the drainage improvements, GSI will create a sense of place and community in each neighborhood where it is implemented. The beauty and ease of maintenance of native plantings will encourage more citizens to incorporate native plantings in their private yards. Soils improvements and education on the problems of invasive species, such as scotch broom and English ivy, will further encourage the homeowners to remove these noxious invasive and replace them with plantings appropriate for the microclimate in their own gardens. Studies indicate the pollinators: birds, bees and bats, all are finding the suburban built environment a new niche. Community stewardship can promote neighborhood cohesiveness and shared observation as wildlife returns to the stormwater ponds and trails. The landscape elements serve an important role in both providing an aesthetic benefit as well as contributing to the management of rainfall. Native trees, such as fir, cedar, spruce, as well as deciduous trees, help to restore more of the evaporation and transpiration that was present before development. Wherever possible these trees should be spared from removal. The City has a tree ordinance that is seen as protective by some, but punitive by others. Trees are best protected when the citizens understand and appreciate the services they provide. The City should attempt to educate neighborhoods on their shared benefits from their native plants and to discourage the planting and cultivation of invasive plants.

Neighborhood associations should be encouraged to take an active role in promoting stormwater retention in their neighborhoods. Homeowners can learn to keep more runoff on their own properties by means of rain gardens. WSU Extension Services provide educational programs describing the best practices when homeowners wish to divert the run-off from their roofs to rain gardens or cisterns. The goal should be to educate the individual homeowners of the benefits of rain gardens and the benefits to the whole community of maintaining the water on their property, wherever possible. Where conditions do not permit, due to steep slopes or small properties, a properly enclosed cistern can provide a fair means of forestalling rain running off roofs from becoming stormwater.

Seattle's pilot Street Edge Alternatives Project (SEA Streets) was completed in the spring of 2001. It is designed to provide drainage that more closely mimics the natural landscape prior to development than traditional piped systems. To accomplish this, we reduced impervious surfaces to 11 percent less than a traditional street, provided surface detention in swales, and added over 100 evergreen trees and 1100 shrubs. Two years of monitoring show that SEA Street has reduced the total volume of stormwater leaving the street by 99 percent."(6).

Goal 2: To require clustering of development to promote ground and surface water protection, conservation of environmentally sensitive and critical areas; protection of aquatic habitat and related species, protection of buffers, trail corridors, and areas with steep topography, and the protection of stands of trees and open spaces. Developers should be encouraged to evaluate their home-location on the basis of how best to preserve the natural terrain and drainage. Aesthetic concerns, such as where there are existing large trees and natural run-off areas, should be a priority, and should be protected before any clearing occurs. The choice should be, location of structures in clusters, preserving the highest aesthetic or environmentally sensitive areas of the property, in a natural state. GSI, including streets that use natural drainage systems, should be the norm, not the occasional pilot project. The drainage goals should be to minimize the flow of stormwater off-site. The “65/10/0” ratio should be promoted to all developers. 65% of the property should remain undisturbed, 10% built, 0% of run-off.

SEA moves water away from the roadway and homes and into planted swales along both sides of the road. The road can have soft edges, such that run-off from the street goes on to the property adjacent, and sinks into the soil, with grasses and sedges that readily absorb the water. Where needed, water can be channeled off the street and into rain gardens adjacent to the road, and between the road and the sidewalk. Building codes should reflect this requirement and developers should be educated as to the benefits to their development of the protection of aesthetic and natural areas. Building codes should also provide for flexibility in lot sizes and setback requirements to facilitate clustered development.

Goal 3: Identify, in advance of development, sites for parks, open space, wildlife corridors and the protection of native vegetation making stormwater accommodation a critical part of the planning, such that the goals of Green Stormwater Infrastructure are foremost. Obtain or secure (e.g., by obtaining the right of first refusal) such sites as early as possible in the development of an area to ensure that the facilities are well located to serve the area and to minimize acquisition costs. In attempting to implement GSI, recognize the opportunities of retrofitting (see SEA project in Seattle GSI below) in existing neighborhoods.

Goal 4: Downtown, and all fully built-out commercial/industrial areas in Olympia, should be slated for upgrading, over time, to pervious pavement and the installation of cisterns for rainwater harvesting and green roofing. Commercial building owners should be given incentives for these improvements, such as lowered building permit costs. Retrofitting to meet the standards for green roofing on flat roofs and the removal of impervious paved areas is expensive. However, studies indicate the cooling effect of green roofs and the infiltration of rainwater through pervious pavement make their use an excellent upgrade that benefits the whole community. Rainwater harvesting, in the form of water cisterns, above or below ground, are being explored as good alternatives for maintaining the grown environment during drought, wherever they are used. Recent legislation has withdrawn the pall of criminality in rainwater harvest debates, and cities throughout Washington have begun saving rainwater.

Goal 5: Reduction of culverted waters wherever possible. Culverts must dump water

somewhere, and wherever they convey water, it becomes fast moving and destructive of wildlife habitat. If not possible to eliminate or “daylight”, a culvert should end in a pooling where the water can “seep” slowly into any creek, lake or the Sound. This pooling area could become a swamp and potentially provide wildlife with feeding areas with eel grass, etc. Adequate lands for such “swamp reclamation” should be purchased by the City.

D. Waste Water

According to Olympia’s Utilities Waste Water Website and inquiries of staff, the wastewater system within Olympia and its urban growth area consists of approximately 200 miles of gravity pipes, 35 miles of pressure pipes, 27 pump stations, and 1,500 STEP systems owned and maintained by the City; 4,000 privately owned and maintained onsite sewage systems; and regional collection and treatment facilities owned by the LOTT Alliance (Lacey-Olympia-Tumwater-Thurston County). See section H of this document for a glossary of waste water terminology.

Wastewater, also known as sewage, comes from residential, commercial, and industrial users. Wastewater is a combination of water, suspended solids, and dissolved solids. Flow from storm drains is not generally combined with wastewater, although there are limited exceptions, including most of downtown and some locations in east Olympia. This increases the risks of sea level rise downtown. If combined WW/SW systems back-up into the streets, such water will be contaminated with sewage.

Even at low to moderate housing densities, unfavorable soil conditions combined with shallow groundwater levels, challenge development served by septic systems. Water quality problems associated with septic systems in our region are well documented. Even properly functioning septic systems still discharge only partially treated wastewater to the environment. Under the authority of the Clean Water Act, the State of Washington has listed several Olympia streams as impaired by bacteria and the State is developing recovery plans. Failing septic systems are also a principal cause of shellfish harvesting restrictions in Henderson Inlet, although there has been recent progress in removing some restrictions due to the efforts of the non-profit Puget Sound Restoration Fund to improve water quality (The Olympian, 2/11/10). The Olympia City Council approved revisions to the municipal code establishing the Septic to Sewer program (effective August 17, 2009). The voluntary program provides incentives for residential connection of septic systems to sanitary sewer as well as cost recovery mechanisms for the City to make sewer extension projects possible.

The Waste Water Utility also has funding available to construct a limited number of neighborhood sewer extension projects. Property owners that choose to connect with a new sewer project will be required to reimburse the City some portion of the cost of constructing the sewer infrastructure. In neighborhoods selected for a sewer extension project, the City will: (1) Provide a fixed cost up front prior to construction to help property owners prepare for financing; (2) Provide a payment plan (\$200 per month) for properties that connect to the sewers that are constructed, (3) Cover payment of half of the sewer infrastructure cost over \$20,000; and (4) Defer City general facility charges for

septic conversions to sewer, \$2500. Neighborhood sewer extension projects will be selected based on the following criteria: (1) Neighborhood interest and commitment; (2) Occurrences of septic system failures; (3) Proximity to surface water and wellhead protection areas; and (4) Conditions which contribute to the likelihood of system failures as the age of septic systems, poor soil conditions, and shallow groundwater.

Based on the LOTT Website and inquiries of staff, LOTT's long-range Wastewater Resource Management Plan (WRMP) sets the stage for new decentralized approaches to wastewater management in the Lacey-Olympia-Tumwater area. To help implement the plan, LOTT's governance and operating structure is defined in an Interlocal Cooperation Act Agreement for Wastewater Management dated November 5, 1999 to which Lacey, Olympia, Tumwater and Thurston County are parties ("LOTT Partners"). LOTT is funded through sewer connection fees and monthly sewer rates. LOTT's facilities now extend outside the geographic boundaries of the City of Olympia into Tumwater and Lacey, and will be expanding further as the Capital Improvement Program is implemented. According to a recent study done by the U.S. Environmental Protection Agency and the Washington State Department of Ecology, LOTT wastewater treatment plants do a better job than most in the Puget Sound Region of keeping chemicals found in pharmaceuticals and personal care products out of the environment (The Olympian 2/1/10).

The reclaimed water facility at LOTT's Budd Inlet Treatment Plant was the first of LOTT's planned reclaimed water facilities to be completed. The Hawks Prairie Reclaimed Water Satellite (including the Martin Way Reclaimed Water Plant, Hawks Prairie Ponds and Recharge Basins, and three miles of reclaimed water distribution pipeline) was completed in 2006. In addition, LOTT's long range plan calls for construction of two other satellite reclaimed water treatment plants – Tumwater and Chambers Prairie. Each satellite would initially be built to treat at least one million gallons per day (mgd) and be expandable up to five mgd. Building the satellites in small increments is intended to allow "just-in-time" construction to meet future wastewater treatment capacity needs. Conversion of a pipeline to add Tumwater Valley's use of reclaimed water from the Budd Inlet Treatment Plant is underway. LOTT is emphasizing expansion of the Budd Inlet and Martin Way Reclaimed Water Plants over the next several years, postponing construction of the other two facilities.

The WRMP is also known as the "Highly Managed Plan" because it involves a virtually constant process of monitoring and planning. Annual assessments are conducted of capacity in the existing system, including treatment capacity, capacity to use or discharge treated water, and conveyance pipeline capacity. An annual flow and capacity analysis is conducted and the data is used to identify changes or additions to planned capital projects or programs. With extensive new urban development occurring around the Budd Inlet Treatment Plant, it is important that LOTT ensure it will be able to maintain and improve the facilities and services to continue meeting the community's wastewater needs. Over \$92 million in improvements are planned under the Wastewater Resource Management Plan for the Budd Inlet Treatment Plant through 2018. Goals of LOTT's Asset Management Program are to: (1) Provide a long-term sustainable wastewater treatment infrastructure for the growth management area; (2) Maximize the investment and

reinvestment of ratepayer dollars; (3) Achieve the lowest overall life cycle costs of LOTT physical assets; and (4) Enable LOTT to maintain its existing rate structure.

"Biomass" refers to the broad array of plant and animal solid waste (yard waste, garbage, etc.), and includes bio-solids resulting from treating waste water. 100% of LOTT's bio-solids are currently transported to other locations for beneficial use as a fertilizer or soil amendment, so they are used as an asset. LOTT recently implemented a co-generation project to use virtually all of its methane production for generating heat and electricity.

The City of Olympia Water Utility provides distribution services for reclaimed water from the facility at the Budd Inlet Plant. Current uses include: (1) Irrigation at the State's Heritage Park and Marathon Park; (2) Irrigation at City park facilities along Percival Landing; (3) Irrigation and dust suppression at the Port, and in the future equipment wash down, and boat washing; (4) Irrigation, pump seals, and cleaning at the Budd Inlet Treatment Plant; and (5) Cleaning of the pump house and wet well at LOTT's Capitol Lake Pump Station. Some other uses will be LOTT's new Administrative/Education Center, currently under construction, for toilet flushing, a fountain, a stream shaped pond across the front of the building and irrigation. Reclaimed water will also be a focal point for the East Bay Public Plaza, which is currently in the planning stages. The stream like pond will be extended across the street from LOTT's building and across the width of the plaza.

At LOTT's 1/27/10 meeting, updated supply and demand projections were presented, resulting in a possible need to re-negotiate waste water distributions among the LOTT Partners. This is because potential uses of both reclaimed water and its by-product bio-solids are rapidly expanding. Some of these uses include recharging aquifers and providing mitigation credits in support of new water right applications by the Partners. There are also possible new participants in recharge projects, such as the Squaxin Tribe and Yelm.

According to Olympia's 2007-2012 Waste Water Management Plan, it was developed in response to the challenges facing the Utility in managing this system: (1) Past development has resulted in a leapfrog pattern of sewer lines, leaving many neighborhoods without sewer service. (2) Rapid current and projected growth challenges the City's ability to plan systematically for future infrastructure expansion. (3) Meeting the needs of future development must be balanced with the need to maintain existing infrastructure. While most existing sewer pipes and pumps can meet capacity needs for many years, about half of the infrastructure is past its design life or susceptible to corrosion. Given the need to protect public health, repair and replacement of failing sewer systems typically cannot be deferred until convenient. (4) STEP systems installed in the last decade to serve new development have left the City with major ongoing maintenance responsibilities and a long term liability. (5) Many onsite sewage systems, especially in older parts of the City, are beyond or approaching their design life, presenting the potential for widespread failure and risk to public and environmental health. (6) Onsite sewage system policies and regulations leave the City and County with overlapping or ambiguous authority. (7) Construction costs are high and increasingly beyond the City's current capacity to support. Private costs of converting an onsite

system or connecting a new residence are also high. Waste Water, along with Drinking Water and Storm & Surface Water, are in the Water Resources business line of the Olympia Public Works department.

This Plan takes a proactive approach to planning and managing the future development of the wastewater system. In the long term (20 – 50 years), the City aims to: (1) Maximize the gravity sewer system as efficiently as possible (i.e., using a minimum number of pump stations). The City and its growth area will ultimately be served entirely by a City-owned gravity sewer system that is designed to prevent leakage and overflows and to provide sufficient capacity for projected demand. (2) Replace STEP systems in Olympia and its growth area through extension of gravity sewers where feasible. The current number of STEP systems will decline over time. (3) Replace onsite sewage systems in Olympia and its growth area through extension of gravity sewers. The number of onsite sewage systems will decline over time.

Implementation of this Plan over the current term will be focused on specific actions that further these long-term goals. The Plan: (1) Allocates two-thirds of capital expenses to repair and replacement of existing infrastructure. (2) Allocates the remaining one-third to discretionary projects. These include extending a sewer mainline on South Bay Road, and providing sewer service along 18th Avenue and Yelm Highway as these roadways are reconstructed. (3) Initiates a publicly funded program to extend sewers in developed neighborhoods to allow conversion of onsite sewage systems. (4) prohibits new onsite sewage systems within the City and requires/encourages the conversion of existing systems, with financial assistance. (5) Increases the City's management of existing onsite systems to ensure proper functioning, in cooperation with Thurston County. (6) Allows the use of grinder pump systems as an alternative to onsite treatment. (7) Confirms the 2005 decision that no new STEP systems would be allowed in the Service area.

In *Thurston County v. Cooper Point Ass'n*, 148 Wn. 2d (2002), a divided WA Supreme Court held that utility extensions into rural areas are prohibited by the GMA, unless necessary to protect basic public health, safety and the environment. This decision ignores the up-side to extension of sewer services into rural areas. Such services are metered and monitored for tightness and illegal use, whereas many rural septic systems and water wells are not. The following waste water goals are proposed based on the foregoing research.

Goal 1: Olympia's Comprehensive Plan Update should encourage re-use of treatment by-products, such as bio-solids and methane, to offset the costs of such treatment.

Goal 2: Olympia's Comprehensive Plan Update should continue the Goal and related Policies related to replacing all STEP and all onsite systems in the Service Area with gravity sewers. The highest priority should be given to replacing any remaining combined storm water and sewer flows with separate ones, targeting completion of such replacement within the Plan period.

Goal 3: Given the number of privately owned on-site systems and their potential to contaminate ground water, lakes, and Puget Sound, Olympia's Comprehensive Plan

Update and the associated Waste Water Management Plan should include a Goal and related Policies to monitor such systems, in cooperation with the County, including implementation of onsite system inspection reporting and the use of advanced technologies, such as Geographic Information Systems to provide information about on site system location, age, inspection, failures, certifications and hookups.

E. Climate Change & Sea Level Rise

Much of the research on this topic comes from Olympia Climate Action, and Olympia’s Comprehensive Plan Update should take advantage of this research, which is summarized in this document. The City has undertaken many efforts that demonstrate its concern with the effects of climate change. According to its website, “Olympia was one of the first local jurisdictions in the United States to develop a plan for responding to climate change.”

Vince McGowan wrote an article entitled *Climate Change - Olympia is Concerned*, detailing the City’s historical concern about climate change, which goes back to 1990. The article, which was originally published in the South Sound Green pages in 2007, is on the City’s website and has been updated as of December 14, 2009 (included as Attachment 1). The City Council had formed an interdepartmental Global Warming Task Force, which prepared a background report in 1991 entitled *City of Olympia’s Response to the Challenge of Global Climate Change*. The Council then passed Resolution 1306, which recognized that “most actions in response to global warming, ozone depletion, and surface air pollution will result in such short term benefits as cleaner air and water, cost savings, greater economic competitiveness, and more energy security...”. The Resolution committed the City to “a long-term strategy to reduce greenhouse gas emissions, increase tree cover and prepare for climate change.”

McGowan’s article describes the effect of sea level rise under various scenarios on downtown Olympia, the LOTT regional wastewater treatment plant, the City’s drinking water supply source at McAllister Springs, and the coastal wetlands, tide flats and estuaries. The City’s efforts at “Putting Policies into Action” in addressing climate change and sustainability are also described.

A 2007 report, *Olympia’s Response to The Challenge of Climate Change*, includes a summary of the effects of climate change as Table 5 on page 25, “Key Climate Change Impacts in South Puget Sound”. This list includes the following sea level rise impacts:

System	Impact
Shoreline	Increased coastal erosion.
	Inundation of low-lying areas.
	Loss of coastal wetlands and shoreline habitats.
	Increased risk of contamination from coastal hazardous waste sites.
Aquatic Habitat	Loss of near-shore habitat and coastal wetlands to sea level rise where sufficient space for habitat migration is not available.
	Shifts in species range and distribution. Loss of species unable to adapt. Increased competition from invasive species.

Potential impacts or benefits to marine food webs from wind-driven changes in coastal and offshore ocean conditions.

Based on the foregoing impacts, it follows that the City should add the elements of sea level rise and climate change to the Comprehensive Plan (see suggested General Goal above), and the zoning, building and land use requirements that flow from such plan. Further, the City should conduct a cost comparison of building the infrastructure needed to protect existing buildings from sea level rise versus purchasing property and letting it return to its natural state as sea level rise occurs. The City should try to minimize the area that needs to be protected from sea level rise and should not develop land subject to flooding by sea level rise. Such areas should return to their natural state and used by the public as parks.

The City should consider appointing a Climate Task Force that would look at the interconnectedness of sea level rise, transportation, food security, environmental pollution, environmental protection, protection and expansion of green space, and the preservation and improvement of the City’s walkability. The City should also consider creating a climate change prevention / impacts community education program, like the Septic to Sewer Program.

Other water related climate change impacts include:

System	Impact
Hydrology	Increased stream and river flooding.
	Changing surface water quality.
	Increased drought, lower groundwater levels, and reduced summer stream flows.
	Reduced soil moisture in summer and fall.
	Saltwater intrusion into coastal aquifers due to sea level rise.
	Warmer surface water temperatures.

Based on the foregoing impacts, the City should restrict building on land subject to inundation. Regarding drinking water, the City should (1) Raise the cost of potable water and lower the wastewater fee to reward for low usage, reduced impervious surface, rain gardens, etc. (2) Evaluate aquifer capacity and re-visit water rights if supplies dwindle. Regarding waste water and exterior water uses, the City should (3) Expand purple pipe reclamation for all exterior usage. (4) Educate the public on use of grey water and composting toilet systems. (5) Require drought resistant landscaping for all new municipal and commercial development. (6) Restrict summer watering, and (7) Consider changing climate when planting native vegetation. Regarding Stormwater, the City should (8) Plan better for flooding and flood refuges, in the event of increased heavy precipitation events that lead to flooding – disrupting transportation, health and emergency food supplies. (9) Manage stormwater on site, using catchments, rain barrels, etc. (10) Capture storm water by planting vegetated swales in parking lots and along roadsides, diverting downhill runoff. (11) Require all new paving to be pervious. These specific recommendations are consistent with the goals proposed in this document.

F. Acknowledgements

The members of the Water Resources Subcommittee of the League of Women Voters of Thurston County (LWVTC) Committee to Comment on Olympia's 2010 Comprehensive Plan Update and the authors of this document are Clydia Cuykendall, Zena Hartung, Karen Veldheer, Phil Schulte and Barbara Scavezze.

G. Storm and Surface Water References and Additional Resources

- (1) City of Olympia, Surface and Stormwater web site
<http://www.ci.olympia.wa.us/en/city-utilities/storm-and-surface-water.aspx>
- (2) Environmental Protection Agency <http://epa.gov/nps/lid/>
- (3) City of Seattle Green Stormwater Infrastructure code compliance
http://www.seattle.gov/util/About_SPU/Drainage_&_Sewer_System/GreenStormwaterInfrastructure/StormwaterCodeCompliance/index.htm
- (4) Kansas City, Missouri <http://www.werf.org/livablecommunities/pdf/benefits.pdf>
- (5) City of Los Angeles LID Ordinance
<http://www.lacitysan.org/wpd/Siteorg/program/LID/lidintro.htm>
- (6) Seattle Street Edge Alternative (SEA)
http://www.seattle.gov/util/About_SPU/Drainage_&_Sewer_System/GreenStormwaterInfrastructure/NaturalDrainageProjects/StreetEdgeAlternatives

Additional resources: EPA Low Impact Development (LID) Literature Review and Fact Sheets <http://www.epa.gov/owow/nps/lid/lidlit.html>, Low Impact Development Center, Inc. Sustainable Design and Water Quality Research, <http://www.lowimpactdevelopment.org/>, Urban Design Tools <http://www.lid-stormwater.net/>.

H. Waste Water Glossary

"Gravity Pipelines" means pipelines that convey waste water or reclaimed water without pumping, whereas a "force main" means a pipeline from a pump station that transports wastewater under pressure.

"Greywater" includes wastewater from sinks, showers, and laundry fixtures, but does not include toilet waters.

"Purple pipe" means a pipeline that conveys reclaimed water. Purple is the standard (and required) color-coding for pipelines, valves, and other infrastructure or devices that convey reclaimed water.

"Reclaimed water" means water derived in any part from a wastewater with a domestic wastewater component that has been adequately and reliably treated so that it can be used for beneficial purposes. The term does not apply to stormwater flows. LOTT produces Class A Reclaimed Water only. The enhanced biological nutrient removal portion of LOTT's process also helps to substantially reduce pharmaceuticals in the wastewater.

"Recharge" means the downward movement of water through soil to groundwater. "Groundwater recharge" applies to artificially replenishing groundwater through infiltration (percolation) basins or injection wells. Infiltration/percolation is accomplished by applying the water to the surface and letting it filter down to the groundwater aquifer. Injection wells send the water directly to the aquifer. The aquifer may also be used for storage and tapped for later retrieval of the water.

"STEP" means Septic Tank Effluent Pump systems that consist of a tank where wastewater solids are collected and a pump that conveys wastewater liquids via a low-pressure pipe into the downstream gravity sanitary sewer system for treatment at a LOTT facility.

I. Criteria for Selecting Sections of the Comprehensive Plan to be Updated

The City should develop specific criteria to decide which sections of its Comprehensive Plan will be updated. There are a number of possibilities, such as the following:

1. The frequency that the issue came up in public forums (Imagine Olympia)
2. How critical the service is for maintaining the quality of life for citizens
3. The operating cost of maintaining the service
4. The amount of capital investment required for the period of new comp plan
5. The recency of the last update to the Comp plan
6. Interrelationships with other parts of the Plan which are being updated
7. Success or failure in meeting the existing goals and policies
8. Changes in Federal, state or local requirements which make existing language obsolete
9. Need for performance measures or metrics for increased accountability
10. Correcting errors or inconsistencies in the existing plan which make development or other policies less certain and clear to citizens and businesses
11. Consistency of the existing plan with countywide planning efforts in areas like transportation, water, growth etc
12. Opportunities for new goals and policies which would provide long term benefits for the community
13. Accommodating Growth and shifts in land use in areas, such as West Olympia and Downtown (city hall, Port projects, Percival Landing, West Bay etc.)
14. Changes in socioeconomic conditions, community values and technology
15. New issues such as climate change, green development opportunities
16. Areas where a large number of exceptions or changes have been necessary, indicating that the goals or policies need revision
17. Need to standardize plan language and approaches
18. Updated technical information, such as population growth projections, road usage
19. Financial feasibility of proposed improvements
20. The availability of City staff and other resources given the deadline for completing the plan