Aspirations and investments

Section 3D

Investments the public makes – in roads and light rail, parks and schools, water and sewer pipes, and in setting aside areas for both industry and for natural spaces – create the foundation of our communities.

Cities, counties, school and water districts, regional, state and federal government bodies all make investments in these critical community assets. These public investments, in turn, spur private investment in real estate and development. Our region has a history of successfully collaborating to make investments in the "built environment" in order to create the type of vibrant, economically healthy communities we desire.

Our region's communities have significant aspirations for growth and improvement of existing commercial centers, downtowns and mainstreets which further the goals of the 2040 Growth Concept. However, the region faces a significant challenge to making the investments and enacting the policy changes required to achieve these aspirations. A gap of at least $10 billion exists between our current public revenue sources and the investments required to maintain and improve our roads, parks, schools, and other infrastructure.

The next stage of the region's work should lead to the adoption of an integrated regional investment strategy focusing on our downtowns, main streets and employment areas consistent with the 2040 Growth Concept. This strategy should be focused on improving and building upon our existing communities, capitalizing on the value and capacity of existing infrastructure, and making targeted investments linked to local investments and leveraging private investment.

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Aspirations and Investments: Executive Summary

INTRODUCTION

Investments the public makes – in roads and light rail, parks and schools, water and sewer pipes, and in setting aside areas for both industry and for natural spaces – create the foundation of our communities. Cities, counties, school and water districts, regional, state and federal government bodies all make investments in these critical community assets. These public investments, in turn, spur private investment in real estate and development. Our region has a history of successfully collaborating to make investments in the "built environment" in order to create the type of vibrant, economically healthy communities we desire.

However, in recent years, it has become increasingly clear that our regional vision for growth and development faces a significant threat: a serious shortage of funding for needed infrastructure. A lack of finance for roads, sewers, and water pipes has stalled development in new expansion areas, development of the region's designated centers and corridors has not occurred at the expected pace, and the list of deferred repairs continues to grow. Nonetheless, increasing numbers of people continue to settle in our region and forecasts predict strong continued growth in population and employment.

In October 2006, our region's leaders gathered to discuss the challenge of meeting existing community investment needs while planning investments for the future. They received a stern warning about the results of failing to invest in critical infrastructure – less than a year later, the collapse of the Interstate-35 bridge in Minneapolis brought into stark relief the increasingly fragile state of our nation's infrastructure and brought a high level of public attention to the issue.

SUMMARY OF THE CHALLENGES

What Investments Do We Need?

Elected leaders, local government staff, and private sector representatives have worked since then to document the nature and extent of our investment needs over the next 20 to 30 years. What we have found is that:

- Locally and regionally, we have great aspirations to improve and develop our existing communities – we desire vibrant mainstreets and commercial districts, the ability to walk or bike, take transit or drive to work and to play, as well as access to parks and natural areas to enjoy the outdoors.
- The foundations of our communities – from roads and water pipes, to parks and schools – require additional investment, both to maintain and repair existing systems and to accommodate future growth.

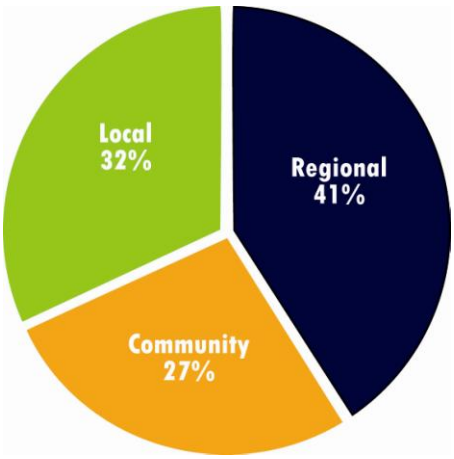
- Every community requires greater investment in infrastructure, but the needs vary widely throughout the region – redeveloping areas require investments in high capacity transit, school facilities, and upgrading antiquated roads and pipes; newer developments require upfront investments for sewer treatment facilities, road and sidewalk construction, and parks and schools.

The region has largely completed the work of identifying the types of investments we must make to maintain our community livability, the investments we aspire to make to enhance quality of life and create new jobs, and the investments we should make to accommodate future growth. The next stage of our work will be the development and implementation of a strategy to finance these investments.

The Infrastructure Advisory Committee's *Regional Infrastructure Analysis* (*Analysis*) found that vibrant communities are supported by a wide range of public investments, including:

- **Pipes, Pavement and Wires**: transportation, transit, sewer, water, stormwater and energy
- **Spaces and Structures**: urban parks and greenspaces, parking, schools, civic buildings and facilities (including police and fire stations, libraries, and plazas)

Levels of Public Investment Needs

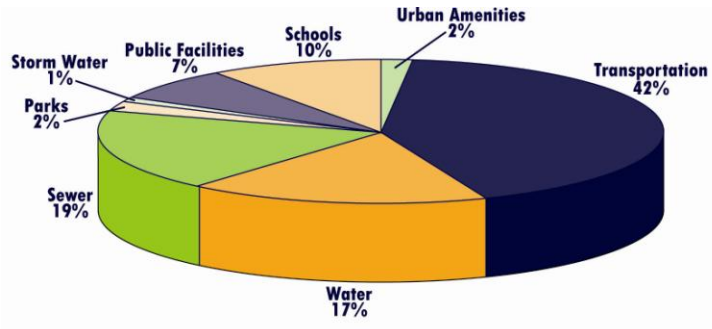


The *Analysis* also reported that the combined public costs of deferred maintenance and new infrastructure to accommodate growth are estimated at between $27 billion and $41 billion over the next 30 years. Only half of this cost estimate can be met with existing revenue sources, leaving a funding gap of between $10 and $20 billion. These costs include local infrastructure (streets, neighborhood parks, elementary schools, household water distribution), community infrastructure (minor arterial streets, parks and fields, high schools, civic buildings, sewer trunks and treatment facilities), and regional infrastructure (major arterial streets, highways and bridges, light rail transit, regional parks, cultural facilities, community colleges).

Funding needs differ greatly by type of infrastructure:

- **Transportation** represents the largest single expense, but also has the most numerous funding mechanisms.
- Rate-based **water and sewer** systems provide stable funding, but lack up-

Local Infrastructure Expenditures by Type



front capital to build and repair treatment and transmission facilities.

- **School** construction funding has been dependent on local property tax measures. Up to 150 new school facilities will be required by 2035.
- The region will need over 5,000 acres of new **urban parks** and over 8,000 acres of **natural areas**.
- Urban amenities such as **plazas** and **mainstreet improvements** and **development incentives** support redevelopment, but are hard to fund with existing finances.

Why The Funding Gap?

This gap between needed investments and existing public finance has grown because the traditional sources of funding for infrastructure and community investments are failing at the same time that costs are increasing:

- Existing funding mechanisms are insufficient:
    - Federal spending on infrastructure has been in decline for three decades.
    - State investments have also declined and most grant programs have evaporated.
    - Some traditional fees and taxes are now raising fewer dollars per person – for example, gas taxes raise less revenue as cars become more fuel efficient.
    - Local revenues, severely limited by property tax initiatives, have been largely directed to maintenance and operations of core programs.
    - System Development Charges (SDCs) are generally limited to local and community improvements, and are not available to fund most regional infrastructure.
- While traditional funding sources are in general decline, the cost of providing critical community investments has been increasing:
    - Construction and material costs – for example, for road repairs or steel and concrete for bridges and buildings – have increased much faster than inflation over the past decade.
    - The value of land has risen sharply, increasing the challenge of finding sites for parks, schools, or industrial sites as communities grow.

How We Grow

Both the *Analysis* and the *Infrastructure Case Studies* report document that more compact urban development supports more cost effective use of transportation, water/sewer, and other civic infrastructure. Infrastructure that incorporates pricing, incentives for conservation, and more efficient technologies can also reduce the need to expand road, water pipe, and other capacity, by reducing demand. However, our region will still face billions of dollars to repair and maintain our existing roads,

pipes, and buildings, and we will need to make improvements and add new pipes, parks, and plazas to maintain and build great communities.

Where we grow

The *Infrastructure Case Studies* tell us that serving development is generally less expensive where infrastructure is already in place, even if the existing infrastructure needs maintenance work or capacity upgrades. In comparing redevelopment and new urban development projects, the differences in cost per unit is highly dependent upon the individual circumstances. On the margin, redevelopment of underutilized lands and vacant lots, using the existing transit, road, sewer, water, and other infrastructure capacity provides the best return on public investment. However, public infrastructure is extremely expensive wherever development occurs, and successful develop is dependent upon significant private investments. Even in locations where existing infrastructure has adequate capacity and can be extended to serve redevelopments or newly developing properties, building and upgrading the roads, pipes, parks and schools is not cheap.

High Costs Wherever We Grow

The **North Bethany** area, 680 acres added to the UGB in 2002, is envisioned as a "community of distinction", with parks, open spaces, three new schools, and transportation connections to existing neighborhoods and employment areas. However, development has been stalled due to the lack of up-front funding for public infrastructure, estimated at more than $400 million. Many of these costs will be repaid by development impact fees, but not until development occurs.

The **Brewery Blocks**, a 4.6 acre redevelopment project in NW Portland, enjoyed plenty of transportation access, water and sewer capacity, but required a $40 million public investment for a parking structure to be viable. Being located in an urban renewal area made funding this project possible.

Aspirations

In order to understand how the region can work together to achieve the goals of the 2040 Growth concept, Metro collected and summarized cities' and counties' aspirations for how their communities will develop and function in the future. The *Investing and Great Places Matrix* presents the goals and priorities that each community has for the development of their downtowns, commercial districts, and main transportation corridors, as well as some of the barriers they face in achieving their aspirations.

What the *Matrix* tells us is:

- Our region's communities have significant aspirations for growth and improvement of existing commercial centers, downtowns and mainstreets which further the goals of the Region 2040 Growth Concept.
- There is significant capacity to accommodate new people and jobs within existing communities.

- Much of the planning work required for successful development is complete. Financial resources to make targeted investments remains the most significant obstacle cities and counties face.
- Many communities are working on increasing local finances to help achieve their aspirations, including using financial incentives and local urban renewal programs.
- Most community development aspirations are directly linked to regional investments and policies, in particular transportation-related investments such as high-capacity transit.

ACTION PLANS: Part I

Regional Investments: From Strategy to Action

For more than twenty years this region has made well-planned investments in transportation infrastructure that have led to increased travel choices, reduced pollution, and more efficient development patterns. The region has also been successful in establishing a parks and natural areas investment program, using regional bond measure funds to protect water quality, wildlife habitat, and publicly identified lands of special concern, which has become a model of local and regional collaboration. In addition to purchasing regional natural areas, this program provides a per-capita local share to invest in neighborhood parks, and competitive capital grants to restore nature in urban neighborhoods. Our track record of success in financing these regional infrastructure needs followed the development of regional strategy and concerted collaborative action by regional partners.

To place our past successes in context, however, since the early 1990s the region has only received about half of the state revenue that we assumed in our past transportation plans, and federal funding has actually diminished by nearly half over the past three decades. In developing the draft 2035 Regional Transportation Plan, the region's transportation leaders have put forward an ambitious transportation finance strategy to continue to pursue increased state and federal funding, while relying more on local sources of funding to meet the region's needs. In the realm of parks and natural areas, the places protected by voters have increased by thousands of acres, however, funding for long-term maintenance and increased public access has yet to be identified. At our current rate of investment, the region's trail system will take over 200 years to build.

The RTP financing strategy still depends upon concerted action by city, county, and regional governments to adopt envisioned revenue increases. Fully implementing the region's network of parks, trail and natural areas will require concerted action by local and regional partners to identify strategies to connect and fund the whole network. A new and evolving collaborative effort of business, non-profit and government entities is working together to implement this network, known as The Intertwine.

ACTION PLANS: Part II
Community Investments: From Aspirations to Strategy

Moving beyond roads, bridges, and transit to the lengthy list of the other investments required to create and support vibrant communities, the region has a well developed vision and significant aspirations, but lacks an integrated regional investment strategy to achieve those aspirations. The *Regional Infrastructure Analysis*, the *Case Studies*, and the *Investment Matrix* detail the numerous investment aspirations and challenges for upgraded water and sewer systems, new and improved parks, sidewalks and plazas, and for the public/private collaboration required to make residential, commercial and mixed-use development successful.

The next stage of the region's work should lead to the adoption of an integrated regional investment strategy focusing on our downtowns, main streets and employment areas consistent with the Region 2040 Growth Concept. To leverage limited resources, this strategy should focus on improving and building upon our existing communities, capitalizing on the value and capacity of existing infrastructure, and making targeted investments linked to local investments and leveraging private investment. Elements of the strategy should include:

1. **Maintain** the roads, sidewalks, water and sewer lines, parks, and other public assets we already have as our highest priority.
2. **Reuse and revitalize** dilapidated buildings, vacant and underused lots, and decaying infrastructure in already developed areas, accommodating growth efficiently and bringing increased activity to those areas.
3. **Get more from our regional investments by linking them to each other and to the aspirations and investments of local communities.**
4. **Leverage private investment** through strategic coordination of public investments with the private sector.
5. **Identify local and regional actions needed to pursue new sources of funding.**

An integrated regional investment strategy will become the basis for realizing our aspirations and enabling us to accommodate growth in our existing communities. This action plan should include two major elements:

- **<u>Transportation investment</u>: Implement the transportation investment strategy identified in the Regional Transportation Plan (RTP).**
  The RTP identifies existing revenues as well as aspirational revenue targets to fund a prioritized list of planned transportation projects. Local and regional follow-up actions are required to enact new revenue sources. The region's transportation leaders should create a "road map" identifying the local and regional action steps to generate the levels of revenue envisioned in the RTP.

- **<u>Other community investments</u>: Develop a regional action plan to make focused investments in the region's downtowns, main streets and employment areas.**
  In order to maintain our existing infrastructure and community assets, and to meet the region's collective aspirations for population and employment growth, regional leaders should develop a strategy for closing the finance gap between our aspirations for development and our current means. This strategy should:

  - Refine the investment needs identified in the "Regional Infrastructure Analysis" and "Investing in Great Places Matrix" to begin serving as a "project list" for targeting regional and local resources.

  - Identify and recommend local and regional revenue actions to increase the resources available to make the public investments required to implement Strategy 1.

Making the Greatest Place

Investing in Great Places matrix | September 15, 2009

Achieving local aspirations through strategic regional and local investments

09219 | *Printed on recycled paper*

Sept.15, 2009

Investing in Great Places matrix | August 2009

Achieving local aspirations through strategic regional and local investments to support them

Translating a vision into a reality is not a simple task. Often when people are asked to describe what they want their communities to be like in the future they use descriptions of how it should look and function. They describe the vibrant environment of people coming and going on the street, the inviting streetscapes of established neighborhoods and prosperous businesses that would anchor the community.

In 1995, with the support of the public and elected officials of the region, Metro adopted the 2040 Growth Concept as a vision to guide growth and development throughout the region over the coming decades. Since then, local governments have updated their zoning, targeted their investments and taken other steps to implement this vision. Though Metro works closely with cities and counties to track employment, zoning, household size and other data that indicate the potential for growth, it is a local government's investment in time, leadership and incentives that make a difference in how that community grows.

Through its comprehensive Making the Greatest Place effort, Metro has embarked on an integrated policy and investment program aimed at implementing the 2040 Growth Concept by focusing more growth and investment in the central city, town and regional centers, transportation corridors and employment areas while protecting valuable farm and forest land. This effort seeks to integrate long-term land use plans with public investments to achieve six outcomes that define a successful region:

1. People live and work in vibrant communities where they can choose to walk for pleasure and to meet their everyday needs.
2. Current and future residents benefit from the region's sustained economic competitiveness and prosperity.
3. People have safe and reliable transportation choices that enhance their quality of life.
4. The region is a leader in minimizing contributions to global warming.
5. Current and future generations enjoy clean air, clean water and healthy ecosystems.
6. The benefits and burdens of growth and change are distributed equitably.

Local aspirations and the Investment Matrix

In an effort to better understand how and where local communities intend to grow and how the region can support them, Metro recently asked officials from local cities and counties to summarize their aspirations for how their communities will develop and function over the next few decades. The aspirations reflect the communities' priorities for redevelopment, the values that guide their decisions and the challenges and barriers they anticipate to achieving these aspirations.

Achieving these aspirations require different types and amounts of investments by local governments, Metro and the private sector in order to achieve on-the-ground results. To better understand what is needed to fulfill these aspirations, Metro summarized the needs identified by local governments for 16 different types of investments in five community design types described in the 2040 Growth Concept: central city (Downtown Portland), corridors, employment areas (including industrial areas), town centers and regional centers in an Investment Matrix. This Investment Matrix, will inform local and regional policy and investment decisions and longer term efforts to refine tools that assist with the achievement of these aspirations.

The Investment Matrix allows the region to look at its proposed investments that leverage private development in centers, corridors, and employment areas. Having a clear picture of the connection between public investments and local development allows the region to make best use of limited dollars. These public funds can then be used to leverage necessary private investments that support the creation and enhancement of vibrant urban communities.

Information presented on the matrix reflects the stated aspirations of local cities and counties for where and how they desire to grow. In cases where a local government specified goals of certain numbers of new households or jobs desired, those numbers are indicated. In most cases, the local aspirations were described in more qualitative terms, often referring to the level of activity desired – active 18 hours per day, for example, or the look of a place, similar to Sellwood or Hillsdale. These references were included in the matrix when the information was available.

Local governments identified investments needed to achieve their aspirations.

The Investment Matrix highlights areas in the region that are the focus of future employment and residential development. The matrix includes four distinct sections: regional investments, local investments, shared responsibilities and private actions.

Each icon represents some form of investment.

Solid icons representing existing investments

Hollow icons represent investments that are proposed, committed or under consideration.

Half solid icons reflect that some investments have been completed and more are needed.

How the Investment Matrix informs policy decisions

The Urban Growth Boundary. By the end of 2009, the Metro Council is required by Oregon law to complete an analysis of the capacity of the existing urban growth boundary (UGB) to accommodate the population and employment growth projected over the next 20 years. If the analysis indicates that additional capacity is needed to accommodate projected growth, the Metro Council and local governments have until the end of 2010 to determine how best to add capacity to the boundary either through additional investments in centers , corridors and employment areas or by expanding the boundary.

Local and regional policy and investment commitments will largely determine the future capacity of the existing boundary. The Metro Council will be working with local governments throughout 2010 to achieve the most efficient use of existing resources to meet forecasted demands. The aspirations of local governments for centers, corridors and employment areas will affect regional policies and investment priorities.

If local and regional investments are insufficient to meet forecasted demand for new housing and employment capacity, then Metro Council will consider boundary expansion to meet additional demands.

Urban Reserves. By the end of 2009, the Metro Council and the boards of commissioners of Clackamas, Multnomah and Washington counties will reach agreements to designate areas outside the boundary as urban and rural reserves. Urban reserves will be areas that are suitable for accommodating urban development over the next 40 to 50 years. Rural reserves will include areas with high-value working farms and forests or important natural features that will be excluded from urban development. Land use actions to formally designate urban and rural reserves are scheduled to occur in 2010.

Per state law, urban reserves will be designated in a manner that supports development in existing centers, corridors and employment centers already inside the boundary. Urban reserves, once brought into the boundary, will need investments to support vibrant new centers, corridors and employment that sustain a diverse mix of housing and jobs while reducing global warming, protecting clean air and water and supporting healthy ecosystems. The Investment Matrix will inform the policy discussions around the designation of urban reserves in order to achieve these objectives.

The Regional Transportation Plan. As part of the solicitation for projects in the Regional Transportation Plan, Metro requested that local governments consider local aspirations for their community. The matrix reflects the transportation projects that local governments identified and illustrates their role in achieving the broader outcomes defined in the Regional Transportation Plan.

Investing in Great Places matrix | Definitions

Local aspiration profile

The Matrix includes only those areas that local governments identified as areas with aspirations in the profile

2040 Design: Existing design type defined in the 2040 Growth Concept (central city, corridor, employment area, regional center, town center).

Activity level goal: The level of activity identified by a local government in its local aspiration submission, using the activity spectrum included in Metro's State of the Centers Report. This level of activity indicates the hours of activity desired or the type of community that a local government seeks to emulate. The Matrix includes numerical targets if identified by the local aspiration.

Current development: This is defined in the State of the Centers Report using 2007 data from Environmental Systems Research Institute (ESRI) and InfoUSA.

Regional investment actions

Existing or proposed investments largely using regional funds

Bus Transit: Bus and frequent bus services.

High-capacity transit: Light rail, rapid bus service, streetcar or other high capacity service, or other related facilities including park and ride lots and transit centers.

Highways and arterials: New road capacity or new access points to existing roads, including interchange access and safety improvements. In freight areas, these investments also include multi-modal freight, rail and air.

Transportation system management and operations: Technological enhancements such as traffic signal optimization, access management, or other efforts that serve to increase the capacity of the existing transportation system. Also includes Transportation Management Associations, targeted marketing and other efforts that serve to reduce demand for trips made by single-occupant vehicles.

Transit-oriented Development: Investments by Metro in mixed-use development projects (commercial and residential) near light rail and frequent bus service.

Grants: Grant funds administered by Metro to encourage redevelopment of existing communities, including brownfield assessment grants, Nature in Neighborhood grants, planning grants funded through the regional Construction Excise Tax, and other regional grant programs.

Regional Greenspaces: Regional parks, natural areas and trails funded through regional bond measures or other regional funds.

Shared responsibilities

Those investments that require funding from local and regional sources and other partnerships

Enhanced pedestrian, bicycle and trail environment: Landscaping, median or curb extensions, sidewalks, bikeways, boulevard retrofits, trails.

Utilities and civic infrastructure: Includes sewer, water and stormwater pipes and facilities as well as civic infrastructure including schools, libraries and other public buildings.

Local actions

Existing or proposed actions largely requiring investments by local governments

Local streets and connectors: New street connections, new local road capacity, realignments of existing residential streets and arterials.

Supportive code: Mixed-use zoning or multi-family development zoning in centers, streamlined processes or other efficiencies in development permitting and inspections, bonuses or incentives that are included in code.

Parking strategies: Shared parking, changing minimum (or maximum) parking requirements for certain developments, providing structured or metered parking.

Financial incentives: Urban renewal, local improvement districts, business improvement districts, enterprise zones, main street programs, system development charge credits, variable system development charges, tax credits to support vertical housing development, other incentives financed by local general funds set in policy.

Direct project incentives: Land acquisition, joint development agreements, storefront improvement grants, marketing directed toward specific projects.

Local greenspaces: Local parks, trails and natural areas.

Private actions

Collaboration: Active partnerships between property owners and the public sector, establishment of public/private partnerships to engage development.

Investing in Great Places matrix | Central City

Achieving local aspirations through strategic regional and local investments

Proposed · Existing · In progress

Local aspiration profile [1,2]	Regional investment actions							Shared responsibilities		Local actions						Private actions
Current: 17,800 DU (2005), 150,500 jobs (2005) **Goal:** 50,000 to 60,000 additional DU; 75,000 additional jobs	Bus	High capacity transit	Highways and arterials	Transportation system management and operations	Transit oriented development	Grants	Regional greenspaces	Enhanced pedestrian, bike and trail environment	Utilities and civic infrastructure	Local streets and connectors	Supportive code	Parking strategies	Financial incentives	Direct project incentives	Local greenspaces	Collaboration
South Waterfront High density, mixed use, future OHSU campus expansion	Z	Z	Z	Z		Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z
University District PSU expansion; ECO District	Z	Z	Z	Z		Z		Z	Z	Z	Z	Z	Z	Z	Z	Z
Goose Hollow Mixed-use community	Z	Z	Z	Z	Z	Z		Z	Z	Z	Z	Z	Z	Z	Z	Z
River District Mixed-use community	Z	Z	Z	Z		Z		Z	Z	Z	Z	Z	Z	Z	Z	Z
Downtown Financial and regional retail center	Z	Z	Z	Z				Z	Z	Z	Z	Z	Z	Z	Z	Z
Lower Albina Industrial district	Z	Z	Z	Z				Z	Z	Z	Z	Z	Z	Z	Z	Z
Lloyd District Mixed use with emphasis on regional attractions; eco district	Z	Z	Z	Z	Z			Z	Z	Z	Z	Z	Z	Z	Z	Z
Central Eastside Industrial with incubator and emerging creative sector emphasis	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z

1. Current development source: 2007 Environmental Systems Research Institute and InfoUSA

2. Development goal source: Local aspirations submitted to Metro

Sept. 15, 2009

Investing in Great Places matrix | Regional Centers

Achieving local aspirations through strategic regional and local investments

Proposed · Existing · In progress

Local aspiration profile [1,2]		Regional investment actions							Shared responsibilities		Local actions						Private actions
	Development Current/Goal	Bus	High capacity transit	Highways and arterials	Transportation system management and operations	Transit oriented development	Grants	Regional greenspaces	Enhanced pedestrian, bike and trail environment	Utilities and civic infrastructure	Local streets and connectors	Supportive code	Parking strategies	Financial incentives	Direct project incentives	Local greenspaces	Collaboration
Beaverton Downtown	**Current:** 1,170 DU / 7,420 EMP	●	●	●	●	●		●	●	●	●	Z	●	●	●		●
Washington Square Tigard	**Current:** 1,270 DU / 13,770 EMP **Goal:** 50 DU/acre 2.0 FAR or greater	●	●	●	●	●	●	●	●		●	Z	P	●	●		●
Washington Square Beaverton		●	●	●	●			●	●	●	●	Z				●	
Hillsboro Downtown 18 hour activity	**Current:** 3,600 DU / 12,850 EMP 3,000 DU / 3,000 EMP	●	●		●	●		●	●	●		Z	P	●	●		●
Clackamas Town Center	**Current:** 2,680 DU / 4,140 EMP	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Oregon City Downtown	**Current:** 150 DU / 3,260 EMP	●	●	●	●			●	●	●	●	Z	P	●	●	●	●
Gresham Civic neighborhood,	**Current:** 440 DU / 1,070 EMP **Goal:** Total of 2,000 DU / 2,000 EMP	●	●			●	●		●	●	●	Z	P		●	●	
Gresham Downtown	**Current:** 440 DU / 1,070 EMP **Goal:** Total of 2,000 DU / 2,000 EMP	●	●			●			●	●	●	Z	P	●	●	●	●
Gateway (Portland)	**Current:** 3,500 DU / 7,190 EMP	●	●			●		●	●		●	Z	P	●	●	●	●

1. Current development source: 2007 Environmental Systems Research Institute and InfoUSA

2. Development goal source: Local aspirations submitted to Metro

Sept. 15, 2009

Investing in Great Places matrix | Town Centers

Achieving local aspirations through strategic regional and local investments

Proposed · Existing · In progress

Local aspiration profile [1,2]		Regional investment actions							Shared responsibilities		Local actions						Private actions
	Development Current/Goal	Bus	High capacity transit	Highways and arterials	Transportation system management and operations	Transit oriented development	Grants	Regional greenspaces	Enhanced pedestrian, bike and trail environment	Utilities and civic infrastructure	Local streets and connectors	Supportive code	Parking strategies	Financial incentives	Direct project incentives	Local greenspaces	Collaboration
Aloha	**Current:** 2,150 DU / 1,130 EMP	No information available															
Bethany	**Current:** 950 DU / 510 EMP	No information available															
Cedar Mill	**Current:**1,530 DU / 1,710 EMP	No information available															
Cornelius Aspiration to be a complete Town Center	**Current:** 3,240 DU / 2,270 jobs **Goal:** 2,800 DU and 7,100 jobs on an additional 640 acres by 2030	●	●	●	●				●	●	●	●	●	●	●	●	●
Damascus	**Current:** 90 DU / 550 EMP	No information available															
Forest Grove	**Current:** 180 DU / 800 EMP **Goal:** Double residential density (20 DU / acre to 40 DU / acre)	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Gladstone	**Current:** 270 DU / 310 EMP	No information available															
Happy Valley Existing Town Center 14 hour activity		●						●	●	●	●	●	●	●	●	●	●

1. *Current development source: 2007 Environmental Systems Research Institute and InfoUSA*

2. *Development goal source: Local aspirations submitted to Metro*

Sept. 15, 2009

Investing in Great Places matrix | Town Centers

Achieving local aspirations through strategic regional and local investments

Proposed · Existing · In progress

Local aspiration profile [1,2]		Regional investment actions							Shared responsibilities		Local actions						Private actions
	Development Current/Goal	Bus	High capacity transit	Highways and arterials	Transportation system management and operations	Transit oriented development	Grants	Regional greenspaces	Enhanced pedestrian, bike and trail environment	Utilities and civic infrastructure	Local streets and connectors	Supportive code	Parking strategies	Financial incentives	Direct project incentives	Local greenspaces	Collaboration
Hillsdale-Portland 18 hour activity	**Current:** 980 DU / 1,050 EMP	●				$			●	●		Z		$	$	●	●
Hollywood-Portland	**Current:** 800 DU / 4,200 EMP	●	●			$			●	●		Z	P	$	$	●	●
King City	**Current:** 410 DU / 720 EMP	No information available															
Lake Grove	**Current:** 300 DU / 2,840 EMP	●	●	●	●				●	●	●	Z	P	$	$	●	●
Lake Oswego	**Current:** 1,500 DU / 2,830 EMP	●	●	●	●			●	●	●	●	●	P	$	$	●	●
Lents-Portland	**Current:** 590 DU / 320 EMP	●							●		●	Z		$	$	●	●
Milwaukie	**Current:** 1,950 DU / 3,750 EMP	●	●	●	●	$	●	●	●	●	●	Z	P	$		●	●
Murray/ Scholls	**Current:** 1,980 DU / 10 EMP	●		●	●			●		●	●	Z				●	

1. Current development source: 2007 Environmental Systems Research Institute and InfoUSA

2. Development goal source: Local aspirations submitted to Metro

Sept. 15, 2009

Investing in Great Places matrix | Town Centers

Achieving local aspirations through strategic regional and local investments

Proposed
Existing
In progress

Local aspiration profile [1,2]		Regional investment actions							Shared responsibilities		Local actions						Private actions
	Development Current/Goal	Bus	High capacity transit	Highways and arterials	Transportation system management and operations	Transit oriented development	Grants	Regional greenspaces	Enhanced pedestrian, bike and trail environment	Utilities and civic infrastructure	Local streets and connectors	Supportive code	Parking strategies	Financial incentives	Direct project incentives	Local greenspaces	Collaboration
Orenco	**Current:** 1,590 DU / 790 EMP	No information available															
Pleasant Valley	**Current:** 20 DU / 10 EMP																
Raleigh Hills	**Current:** 870 DU / 1,600 EMP	No information available															
Rockwood	**Current:** 4,360 DU / 1,990 EMP **Goal:** 7,000 DU / 3,500 EMP total																
Sherwood	**Current:** 110 DU / 570 EMP																
St. Johns-Portland	**Current:** 290 DU / 1,009 EMP																
Sunset Transit Center	**Current:** 160 DU / 1,760 EMP																
Tanasbourne/ AmberGlen 18 hour activity	**Current:** 3,820 DU / 4,680 EMP **Goal:** Additional 6,800 DU / 6,580 jobs total																

1. *Current development source: 2007 Environmental Systems Research Institute and InfoUSA*

2. *Development goal source: Local aspirations submitted to Metro*

Sept. 15, 2009

Investing in Great Places matrix | Town Centers

Achieving local aspirations through strategic regional and local investments

Proposed
Existing
In progress

Local aspiration profile [1,2]		Regional investment actions							Shared responsibilities		Local actions							Private actions
	Development Current/Goal	Bus	High capacity transit	Highways and arterials	Transportation system management and operations	Transit oriented development	Grants	Regional greenspaces	Enhanced pedestrian, bike and trail environment	Utilities and civic infrastructure	Local streets and connectors	Supportive code	Parking strategies	Financial incentives	Direct project incentives	Local greenspaces	Collaboration
Tigard Downtown	**Current:** 560 DU / 2,310 EMP **Goal:** 2,500 DU; 1.9 million sq. ft. employment/office/ commercial	●	●		●	●	●		●		●	Z	P	●	●	●	●
Troutdale 18 hour activity	**Current:** 970 DU **Goal:** Additional 530 DU	●		●			●	●			●	●	P	$			●
Tualatin 18 hour activity	**Current:** 2,390 residents / 3,860 jobs **Goal:** 2,500-3,400 residents / 6,700-8,400 jobs	●	●	●	●				●	●	●	Z	P	$		●	●
West Linn Bolton	**Current:** 1,820 EMP	●		●	●				●	●		Z					
West Linn Willamette		●							●	●	●	Z		$		●	●
West Portland HIllsdale typology	**Current:** 1,530 DU/1,670 EMP		●	●					●		●	Z					
Wilsonville	**Current:** 400 DU / 1,850 EMP	●	●	●	●		●	●	●	●	●	Z	●	$	$	●	●
Wood Village/ Fairview Fairview Village	**Current:** 760 DU / 960 EMP	●		●		$	●	●	●	●	●	Z		$		●	●
Wood Village/ Fairview Wood Village		●	●	●								Z	P	$			

1. Current development source: 2007 Environmental Systems Research Institute and InfoUSA

2. Development goal source: Local aspirations submitted to Metro

Sept. 15, 2009

Investing in Great Places matrix | Corridors

Achieving local aspirations through strategic regional and local investments

Proposed Existing In progress

Local aspiration profile [1,2]		Regional investment actions							Shared responsibilities		Local actions						Private actions
	Development Current/Goal	Bus	High capacity transit	Highways and arterials	Transportation system management and operations	Transit oriented development	Grants	Regional greenspaces	Enhanced pedestrian, bike and trail environment	Utilities and civic infrastructure	Local streets and connectors	Supportive code	Parking strategies	Financial incentives	Direct project incentives	Local greenspaces	Collaboration
Beaverton Walker and 158th	**Goal:** Wish to explore options, current zoning: 750 DU / 3,080 EMP by 2020	●		●	●				●	●	●	Z				●	
Beaverton Beaverton Hillsdale Hwy	**Goal:** Wish to explore options, current zoning: 290 DU / 3,390 EMP by 2020	●			●		●		●	●	●	Z					
Fairview Sandy Blvd.	**Current:** 91 acres of vacant and redevelopable land	◢		●			●	●	●	●		Z				●	
Forest Grove Hwy 8, Commercial		●	●	●		$	●		●	●	◢	◢			$	$	
Milwaukie King Rd. to Harrison		●					●		●		●	Z					
Sherwood Pacific Highway							●	●							$	$	
Sherwood Sherwood Blvd							●	●							$	$	
Sherwood Oregon St.							●	●							$	$	

1. Current development source: 2007 Environmental Systems Research Institute and InfoUSA

2. Development goal source: Local aspirations submitted to Metro

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Investing in Great Places matrix | Corridors

Achieving local aspirations through strategic regional and local investments

Proposed
Existing
In progress

Local aspiration profile [1,2]		Regional investment actions							Shared responsibilities		Local actions						Private actions
	Development Current/Goal	Bus	High capacity transit	Highways and arterials	Transportation system management and operations	Transit oriented development	Grants	Regional greenspaces	Enhanced pedestrian, bike and trail environment	Utilities and civic infrastructure	Local streets and connectors	Supportive code	Parking strategies	Financial incentives	Direct project incentives	Local greenspaces	Collaboration
Sunnyside Happy Valley		●		●		●	●				●	Z	P	●		●	●
Sunnyside Clackamas Co.		◔		◔				◔	◔	◔	◔	◔		◔	◔	◔	◔
Tigard Hwy 99	**Goal:** 40 - 50 DU / acre, 20 - 40 EMP / acre; 2.0 FAR	●	●	●	⋮	●	●	●	●	●	●	Z	P	●		●	●
Wood Village Sandy Blvd		●			⋮				●			Z	P	●		●	
Wood Village Halsey St		●			⋮				●			Z	P	●		●	
Gresham 162nd		●		●					●		◔						
Gresham 181st		◔		◔	⋮				◔		◔						
Gresham Eastman/223rd		●		●					●		◔						

1. Current development source: 2007 Environmental Systems Research Institute and InfoUSA

2. Development goal source: Local aspirations submitted to Metro

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Investing in Great Places matrix | Corridors

Achieving local aspirations through strategic regional and local investments

Proposed Existing In progress

Local aspiration profile [1,2]		Regional investment actions							Shared responsibilities		Local actions						Private actions
	Development Current/Goal	Bus	High capacity transit	Highways and arterials	Transportation system management and operations	Transit oriented development	Grants	Regional greenspaces	Enhanced pedestrian, bike and trail environment	Utilities and civic infrastructure	Local streets and connectors	Supportive code	Parking strategies	Financial incentives	Direct project incentives	Local greenspaces	Collaboration
Gresham 257th/Kane		●		●	●				●		●	◔					
Gresham Sandy		●		●								◔					
Gresham Halsey		●		●					●			◔					
Gresham Glisan		●		●					●			◔					
Gresham Stark		●		●					◔			◔					
Gresham Burnside		●		●					●			◔					
Gresham Division		●		●					●			◔					
Gresham Powell		●	●	●					●			◔					

1. *Current development source: 2007 Environmental Systems Research Institute and InfoUSA*

2. *Development goal source: Local aspirations submitted to Metro*

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Investing in Great Places matrix | Corridors

Achieving local aspirations through strategic regional and local investments

Proposed Existing In progress

Local aspiration profile [1,2]		Regional investment actions							Shared responsibilities		Local actions							Private actions
	Development Current/Goal	Bus	High capacity transit	Highways and arterials	Transportation system management and operations	Transit oriented development	Grants	Regional greenspaces	Enhanced pedestrian, bike and trail environment	Utilities and civic infrastructure	Local streets and connectors	Supportive code	Parking strategies	Financial incentives	Direct project incentives	Local greenspaces	Collaboration
Portland Interstate Avenue	**Goal:** 3,250 DU / 1,220 jobs from 2005-2030		●			●			●	●	●	Z		●	●		
Portland 82nd Avenue			●		●	●			●	●		Z		●	●		●
Portland Sandy Boulevard		●	●						●			Z	P	●			●
Portland Martin Luther King Jr. Boulevard			●			●			●			Z	P	●	●		
Portland Cully Boulevard		●							●		●	Z		●	●	●	
Portland Barbur Boulevard		●	●		●	●			●	●	●	Z	P	●			●

1. Current development source: 2007 Environmental Systems Research Institute and InfoUSA

2. Development goal source: Local aspirations submitted to Metro

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Investing in Great Places matrix | Corridors

Achieving local aspirations through strategic regional and local investments

Proposed Existing In progress

Local aspiration profile [1,2]		Regional investment actions							Shared responsibilities		Local actions							Private actions
	Development Current/Goal	Bus	High capacity transit	Highways and arterials	Transportation system management and operations	Transit oriented development	Grants	Regional greenspaces	Enhanced pedestrian, bike and trail environment	Utilities and civic infrastructure	Local streets and connectors	Supportive code	Parking strategies	Financial incentives	Direct project incentives	Local greenspaces	Collaboration
Portland NE Killingsworth Street		●							●			Z	P	$	$		●
Portland Powell Boulevard		●	●						●			Z	P	$			
Portland 102 Ave.			●						●		●	Z		$	$	●	●
Portland Foster Road			●						●		●	Z		$			
Portland SE Belmont			●						●			Z		$	$		
Portland SE Hawthorne			●						●			Z	P	$	$		
Portland SE Division									●	●		Z		$	$		●

1. Current development source: 2007 Environmental Systems Research Institute and InfoUSA

2. Development goal source: Local aspirations submitted to Metro

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Investing in Great Places matrix | Corridors

Achieving local aspirations through strategic regional and local investments

Proposed Existing In progress

Local aspiration profile (1,2)		Regional investment actions						Shared responsibilities		Local actions						Private actions
	Development Current/Goal	Bus	High capacity transit	Highways and arterials	Transportation system management and operations	Transit oriented development	Grants	Regional greenspaces	Enhanced pedestrian, bike and trail environment	Utilities and civic infrastructure	Local streets and connectors	Supportive code	Parking strategies	Financial incentives	Direct project incentives	Local greenspaces	Collaboration
Portland Kenton/Denver			●						●		●	Z		$			
Portland Milwaukie Avenue			●						●			Z		$			
Portland Tacoma Street									●			Z					
Portland 122nd Avenue			●						●		●	Z					●

1. Current development source: 2007 Environmental Systems Research Institute and InfoUSA

2. Development goal source: Local aspirations submitted to Metro

Sept. 15, 2009

Investing in Great Places matrix | Employment

Achieving local aspirations through strategic regional and local investments

Proposed Existing In progress

Local aspiration profile [1,2]		Regional investment actions							Shared responsibilities		Local actions						Private actions
	Development Current/Goal	Bus	High capacity transit	Highways and arterials	Transportation system management and operations	Transit oriented development	Grants	Regional greenspaces	Enhanced pedestrian, bike and trail environment	Utilities and civic infrastructure	Local streets and connectors	Supportive code	Parking strategies	Financial incentives	Direct project incentives	Local greenspaces	Collaboration
Beaverton 217 East	**Goal:** Wish to explore options, current zoning: 3,7540 jobs projected by 2020	●		●	●				●	●	●	Z		$			
Beaverton 217 West	**Goal:** Wish to explore options, current zoning: 1,510 jobs projected by 2020	●		●					●	●	●	Z					
Beaverton Arctic and Western	**Goal:** Wish to explore options, current zoning: 270 jobs projected by 2020	●							●	●	●	Z					
Beaverton Millikan	**Goal:** Wish to explore options, current zoning: 1,410 jobs projected 2020		●						●	●	●	Z				●	
Beaverton Cornell Corridor	**Goal:** Wish to explore options, current zoning: 3,690 jobs projected by 2020	●							●	●	●	Z				●	
Beaverton Cornell Oaks	**Goal:** Wish to explore options, current zoning: 4,400 jobs projected by 2020	●							●	●	●	Z				●	
Forest Grove	**Goal:** Additional 6,000 jobs	●	●	●			●	●	◔	◔	●	◔	P	◔	$	●	●

1. Current development source: 2007 Environmental Systems Research Institute and InfoUSA

2. Development goal source: Local aspirations submitted to Metro

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Investing in Great Places matrix | Employment

Achieving local aspirations through strategic regional and local investments

Proposed Existing In progress

Local aspiration profile [1,2]		Regional investment actions							Shared responsibilities		Local actions							Private actions
	Development Current/Goal	Bus	High capacity transit	Highways and arterials	Transportation system management and operations	Transit oriented development	Grants	Regional greenspaces	Enhanced pedestrian, bike and trail environment	Utilities and civic infrastructure	Local streets and connectors	Supportive code	Parking strategies	Financial incentives	Direct project incentives	Local greenspaces	Collaboration
Gresham General																	
Gresham Springwater																	
Gresham Southshore																	
Happy Valley Rock Creek Employment Center																	
Hillsboro Evergreen Employment area	**Goal:** 20,000 jobs																
Lake Oswego Kruseway																	

1. *Current development source: 2007 Environmental Systems Research Institute and InfoUSA*

2. *Development goal source: Local aspirations submitted to Metro*

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Investing in Great Places matrix | Employment

Achieving local aspirations through strategic regional and local investments

Proposed Existing In progress

Local aspiration profile [1,2]		Regional investment actions							Shared responsibilities		Local actions						Private actions
	Development Current/Goal	Bus	High capacity transit	Highways and arterials	Transportation system management and operations	Transit oriented development	Grants	Regional greenspaces	Enhanced pedestrian, bike and trail environment	Utilities and civic infrastructure	Local streets and connectors	Supportive code	Parking strategies	Financial incentives	Direct project incentives	Local greenspaces	Collaboration
Milwaukie North Industrial Area		●	●	●		●		●				Z					
Milwaukie Johnson Creek Blvd.		●		●				●	●			Z					
Milwaukie International Way		●		●	●				●			Z					
Oregon City Beavercreek Rd	**Goal:** 3,600 jobs	◔		●				●	●		$	Z				●	●
Portland Columbia Corridor Swan Island NW Industrial	**Current:** 81,000 jobs **Goal:** 25,000 jobs	●		●	●	●	●	●	●	●	$	Z		$	$	●	●

1. Current development source: 2007 Environmental Systems Research Institute and InfoUSA

2. Development goal source: Local aspirations submitted to Metro

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Investing in Great Places matrix | Employment

Achieving local aspirations through strategic regional and local investments

Proposed · Existing · In progress

Local aspiration profile [1,2]		Regional investment actions							Shared responsibilities		Local actions						Private actions
	Development Current/Goal	Bus	High capacity transit	Highways and arterials	Transportation system management and operations	Transit oriented development	Grants	Regional greenspaces	Enhanced pedestrian, bike and trail environment	Utilities and civic infrastructure	Local streets and connectors	Supportive code	Parking strategies	Financial incentives	Direct project incentives	Local greenspaces	Collaboration
Sherwood Pacific Highway and Tualatin-Sherwood Rd		●		●				●	●		●	Z		$	$		
Tigard Employment lands 14 hour	**Goal:** 30-40 Employees/acre	●	●	●	●		●		●		●	Z		$			
Tigard Tigard Triangle	**Goal:** 30-40 DU / 2.0 FAR or greater	●	●	●	●		●		●			◢		$		●	●
Tualatin *areas outside of existing city* Southwest Concept Plan South Tualatin	**Goal:** 5,970-12,470 jobs	●		●			●		●	●	●	Z				●	●
Tualatin Existing Industrial/ Employment Lands	**Goal:** 7,710 jobs	●		●						●	●	Z					
Wilsonville Coffee Creek Industrial Area	**Goal:** 1,500 jobs	●	◢	◢	●		●	●	●	◢	◢	Z	P	$		●	●
Columbia Cascade River District Troutdale Wood Village Gresham Fairview	**Goal:** 32,500 jobs	●		◢			●	●	◢	●	◢	Z		$		●	●

1. Current development source: 2007 Environmental Systems Research Institute and InfoUSA

2. Development goal source: Local aspirations submitted to Metro

Sept. 15, 2009

METRO

REGIONAL INFRASTRUCTURE ANALYSIS

JULY 2008

COGAN OWENS COGAN

FCS GROUP
Solutions-Oriented Consulting

otak

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REGIONAL INFRASTRUCTURE ANALYSIS

EXECUTIVE SUMMARY

As a number of recent incidents have graphically illustrated, the United States faces an infrastructure crisis of epic proportions. Congressman Earl Blumenauer has observed that the nation has no plan for building the roads, bridges, water and sewer lines, energy facilities, and other physical projects that support our communities.

"We're losing this battle," says Blumenauer. "We're investing less in infrastructure than in any time in our history."

The Portland region is not immune to this serious problem. Past plans that guided investments are outdated. The lack of adequate financing mechanisms has led to maintenance being postponed and neglected. Despite widespread recognition that sound infrastructure is critical to maintaining and enhancing regional economic growth, competitiveness, productivity and quality of life, current approaches to the planning, development and financing of critical community support systems are not working.

To make matters worse, approximately one million more people are expected to live in the seven-county Portland metropolitan area within thirty years. The estimated cost of building the public and private facilities needed to accommodate growth in jobs and housing in the three-county Portland region through 2035 is $27-41 billion. Traditional funding sources are expected to cover only about half that amount. Even if the region does not experience this projected growth, $10 billion is needed just to repair and rebuild our existing infrastructure.

Systems development charges, gas taxes and other revenue sources are not keeping pace with rising infrastructure costs, while voter-approved tax limitations and other ballot initiatives have crippled the ability of communities to fund these services. Rate-funded services tend to enjoy more stable and predictable funding, but can face significant difficulties in obtaining large amounts of up-front capital needed to make major improvements or expand capacity.

All of this leads to one unavoidable conclusion: we cannot continue to do things as we have in the past. New and creative solutions are essential.

Expenditures to improve public infrastructure are investments. As with other types of investments, the public should expect a return on its investments in public infrastructure.

That return can take many different forms, including quantitative measures such as higher tax revenues, improved housing or more jobs. Other "returns" could include more qualitative benefits, such as strong and livable communities. Although investing in infrastructure is expensive, the return on that investment directly improves the lives of the people who live and work here. Public investment is also necessary to make private investment possible and profitable, and private investment is what ultimately builds great communities.

In 1995, the Portland region adopted the 2040 Growth Concept, a long-range plan to guide future growth and development. This innovative blueprint for the future is based on a set of shared values that continue to resonate with residents of the region: thriving neighborhoods and communities, abundant economic opportunity, clean air and water, choices in housing and transportation, access to nature, and a sense of place that, taken together, are the reason people love to live here.

However, this vision will not become a reality unless we can provide the infrastructure to support it. Local and regional leaders have identified the lack of adequate infrastructure funding as a key barrier to successfully realizing the aspirations embodied in the 2040 Growth Concept.

To address this issue, Metro initiated a process to identify infrastructure needs, assess the funding gap, and explore financing and other policy options. The analysis focuses on eight infrastructure types needed to make and sustain great communities:

- Civic buildings, parking structures, public plazas
- Energy
- Schools
- Roads, transit, bike lanes and sidewalks (transportation)
- Stormwater
- Urban parks and open spaces
- Wastewater (sewers)
- Water

It is important that the region continue its legacy of coordination among local jurisdictions and the general public to identify and address the highest priorities for providing infrastructure to serve both existing and future residents. Political leadership and public engagement efforts will be needed to raise awareness of infrastructure needs and issues and garner support for agreed-upon solutions. Metro, along with its local government partners, plays a key role in leading this regional dialogue and building consensus.

Infrastructure planning, development and finance strategies are organized into the following four approaches:

Efficient Service Delivery

Fragmented delivery systems often result in reduced efficiencies. Better coordination among service providers can lead to cost

savings through sharing facilities and service delivery, adjusting service areas, merging service districts, and reallocating funding responsibilities for community and regional facilities. Improved maintenance of existing infrastructure systems ensures a maximum return on past investments. Potential strategies include:

- Shared public facilities
- Regional coordination and planning
- Systems maintenance

Demand Management

Reducing the demand for services can help prevent or delay the need for major capacity investments. Components of demand management include focusing growth to use existing capacity first, using pricing and other incentive-based strategies to reduce demand and shift it to off-peak times, and educating the public on conservation strategies. Potential strategies include:

- Compact development patterns
- Peak-use pricing
- Public education and resource conservation

Innovative Planning and Design

Emerging technologies provide opportunities to increase efficiencies and conserve resources over the long term. Investments in research and development of innovative approaches to infrastructure planning, design and construction can make infrastructure systems more sustainable and build community support. Preparing for the impacts of new technologies will result in long-term cost savings. Potential strategies include:

- Infrastructure recycling and reuse
- Sustainable infrastructure (e.g., natural systems, co-generation facilities)
- Emerging technologies (e.g., electric cars and water reuse systems)

New Funding

New funding sources are needed to enable the region to upgrade and replace deteriorating infrastructure systems and provide services to newly urbanizing areas. The region also needs to identify and remove barriers to public and private investments in infrastructure. Communities in the region can work together to secure funds at the local, community and regional levels and to leverage federal and state investments. A regional approach to financing basic infrastructure could help achieve the region's long-term vision. Potential strategies include:

- Pursuit of new state and regional revenue sources
- Public-private partnerships
- Strategic land acquisition

CONSIDERATIONS FOR MOVING FORWARD

Changing times require new approaches to infrastructure provision and finance. This analysis describes the region's infrastructure challenges and begins to quantify the problem and lay out some options to address the region's infrastructure needs. However, tough questions remain as the region moves forward:

- There will never be enough money for everything – how can we most efficiently guide public investment decisions to strategically target limited resources?
- Can managing demand reduce the need to expand the capacity of infrastructure?
- Are we providing infrastructure services at the most efficient level (geographical or jurisdictional), or are there opportunities to achieve economies of scale or efficiencies?
- How can we best address competing fiscal demands for new infrastructure, maintenance needs, and upgrades of existing facilities?
- Do service providers currently have the capacity to research and share information with counterparts nationally and globally to facilitate the adoption of innovations in service delivery?
- Will incorporating global climate change and sustainability into public messages help manage consumption?
- How can government deepen public understanding of the infrastructure challenges and increase public support for infrastructure finance?

RECOMMENDATIONS FOR ACTION

The time is right for decisive action by elected and appointed leaders across the region to address our infrastructure needs. Recommended actions:

- Coordinate regional partners to identify state legislative changes that would increase our capability to finance regional infrastructure needs.
- Convene regional partners to explore opportunities to implement solutions that increase efficiency and better manage demand.
- Increase public awareness of infrastructure needs and the importance of setting priorities with limited resources.
- Recognize return on investment when making public investment decisions in both urban and newly urbanizing areas.
- Encourage and facilitate implementation of new technologies that increase the efficiency and sustainability of infrastructure systems.

INTRODUCTION

The Portland region is facing a significant challenge to maintain, preserve and provide adequate infrastructure to meet the needs of current and future populations. Public investments made today will shape the region for years to come. The region is projected to grow more rapidly than expected since the region endorsed the 2040 Growth Concept in 1995. More people and the accompanying need for land, jobs and housing are best served when urban lands are used and redeveloped efficiently. Rising costs for building and maintaining public facilities in existing communities further highlight this need. Geographic areas recently added to the region's urban growth boundary are still largely undeveloped and may remain so for some time due to a lack of necessary infrastructure.

Local and regional leaders have identified the need for additional funding for infrastructure as a key to successful implementation of the 2040 Growth Concept vision and accommodating expected population growth. Metro's Making the Greatest Place Initiative is an effort to identify what the region has been doing well to achieve the 2040 vision, capitalize on successes and increase efforts where needed. Metro Council and other leaders throughout the region are seeking better information to aid them in important policy decisions. To that end, Metro initiated this process to identify infrastructure needs, assess the funding/financing gap, and explore financing and other policy options in partnership with leaders throughout the region. The analysis focuses on eight types of infrastructure that make and sustain great communities:

- Civic buildings, parking structures, public plazas
- Energy
- Schools
- Roads, transit, bike lanes and sidewalks (transportation)
- Stormwater
- Urban parks and open spaces
- Wastewater (sewer)
- Water

The study explores the following:

- What infrastructure is needed to serve existing residents and accommodate future growth? What issues need to be addressed?
- What will it cost to provide needed infrastructure? Where do we experience the greatest cost efficiencies?
- What infrastructure is planned? What is the funding/financing gap?

The vision of the 2040 Growth Concept is to establish complete communities that include:

- safe and stable neighborhoods for families
- compact development that uses both land and money more efficiently
- a healthy economy that generates jobs and business opportunities
- protection of farms, forests, rivers, streams and natural areas
- a balanced transportation system to move people and goods
- housing for people of all incomes in every community

- What are potential planning, development and financing policy options? How can we target infrastructure investments to get the greatest return?

NEEDS AND ISSUES

NATIONAL TRENDS

National population growth and increasing maintenance needs have resulted in a demand for additional infrastructure funds. The United States population is expected to grow 33 percent by 2035. Approximately 94 million more people will live here than in 2000. In addition to the need for new infrastructure to accommodate this growth, existing infrastructure systems are aging and overburdened and require substantial maintenance and upgrades. Moreover, current designs cannot support projected population and economic growth. Deteriorating infrastructure threatens the economy, environment and quality of life. The American Society of Civil Engineers (ASCE) rates the nation's water, sewer and transportation systems a grade of D-minus. More than 72,000 miles of municipal water and sewer pipelines are more than 80 years old.

According to the ASCE, an estimated $1.6 trillion is needed over the next five years to repair the existing infrastructure in the U.S. Any delayed investment increases this cost by 12-20 percent annually. It will cost $250 billion annually over the next 50 years to ensure "good" infrastructure. The United States currently spends 40 percent of that each year.

The federal share of infrastructure funding has been declining since 1975 and many funds once available through state governments for capital improvements no longer exist. Financial tools such as the federal highway trust fund are being depleted.

Global climate change, increasing energy and fuel prices, an aging population and an increasing disparity in income and wealth will have significant effects on regional development. Drought in southern states due to climate change could accelerate population growth in the Portland region. In addition, climate change may reduce the water available from glaciers, increase winter storm events and decrease summer flows. This means greater demands on existing sources and the possibility of water being treated as a commodity and traded from wet to dry areas. Another likely result of climate change is a national greenhouse gas cap-and-trade system.

The Report of the City of Portland Peak Oil Task Force states that the availability of oil may have peaked and prices will continue to rise with demand. According to some, the expected outcome of increasing fuel prices will be more dense development patterns, increased use of alternative forms of transportation, an emphasis on efficiency and a diminished role for the automobile-dependent land use pattern. As baby boomers age, housing demand for older

people will grow while lower and middle-class families may increase their preference for smaller, centrally located and easier to maintain units.

Another trend that may affect infrastructure is sustainable development. Portland and Oregon are considered national leaders in this field. Sustainability could serve as a framework for considering infrastructure investments and their impact on the region. Furthermore, increases in the prices of commodities, such as metals, heightens the need to promote the reuse and recycling of resources throughout the region.

Finally, there is an urgent need to ensure the provision of services and protection of critical physical infrastructure through emergency preparedness. Comprehensive emergency plans are needed to address infrastructure planning, engineering design, construction, and operation and maintenance activities for the purposes of homeland security and in response to natural disasters.

LOCAL TRENDS

People moving to the Portland region cite a strong and diverse economy, high quality of life, abundant public amenities and superior environmental quality as reasons for choosing the region. Metro forecasts show that within the next 30 years, one million more people will live in the seven-county Portland metropolitan area.[1] About 70 percent of that growth is expected in the tri-county Portland region (region).[2] A population increase of approximately 680,000 people by 2035 is expected, bringing about 590,000 new jobs and 310,000 new households.

Policies in the 2040 Growth Concept encourage the efficient use of land by directing growth inward rather than outside the urban growth boundary (UGB). Growth is encouraged in centers and corridors with increased emphasis on infill and redevelopment and higher density development in areas where it is appropriate. The 2040 Growth Concept is designed to help communities find more efficient and less expensive ways to deliver services.

However, as communities in the region strive to create vibrant places to live, work and play, they have experienced slower than expected growth in designated centers and corridors and little to no development in areas recently added to the urban growth boundary. Infrastructure costs have been cited as major obstacles in both cases. The region faces significant challenges regarding how it can effectively maintain, preserve and expand public infrastructure.

Although the function and livability of our communities depend on reliable public services, infrastructure systems are fraught with investment and maintenance shortfalls, uneven funding systems and multi-layered

[1] The seven-county Portland metropolitan area includes Clackamas, Columbia, Multnomah, Washington and Yamhill counties in Oregon, as well as Clark and Skamania counties in Washington.

[2] The Portland region includes the existing and potentially urbanizing portions of the metro region within Clackamas, Multnomah and Washington counties.

jurisdictional patterns. In addition to the need to address aging infrastructure conditions and upgrades needed to meet new environmental and emergency preparedness standards, the increasing population and employment base noted previously will put additional demands on roadway, transit, water, sewer, parks, schools and energy systems. This is accompanied by a common issue of concern for all service providers, how to raise and maintain sufficient funds.

Estimates of infrastructure capital costs needed to accommodate growth in the region over the next 30 years range from $27 to 41 billion. Traditional funding sources are expected to cover only about half that amount. State initiatives such as Measures 5 and 50 have limited local revenue streams. Infrastructure provided through user fees or rate-payment systems benefit from more stable funding, but struggle to secure funding for large capital improvements. Non-rate-based infrastructure types are subject to the inconsistencies of voter-approved bonds. Systems development charges have not kept pace with rising infrastructure costs.

During the course of this analysis, Metro collected data from infrastructure service providers throughout the region. Sixty-four service providers completed questionnaires regarding local infrastructure planning and funding efforts. In addition, more than 125 service providers attended two workshops to discuss infrastructure needs and opportunities. A summary of needs and issues identified through this outreach process follows.

Civic Buildings and Facilities

Capital funds for civic structures such as police and fire stations are often subject to voter approval and must compete with other interests for scarce resources. Urban amenities such as plazas, streetscapes and some civic buildings – critical components of downtown redevelopment efforts – are often supported through urban renewal programs and public/private development agreements. There are no dedicated funding sources for operations and maintenance. Libraries are relatively well-supported with local bond levies for capital costs, but they also often lack adequate operations and maintenance funds. Land supply and price also are issues when jurisdictions consider sites for civic facilities.

Energy

Electric and gas utilities have a legal obligation to provide their chartered services, with rates established and monitored by the state Public Utilities Commission. Based on current trends, the region requires the equivalent of two to three new 400 megawatt power plants to supply adequate power by 2035. Siting of energy infrastructure in communities is an ongoing challenge for utility companies. Energy conservation efforts reduce revenues while also reducing demand for electricity, helping to defer the need to build expensive new facilities.

Technological advances not yet known are likely to change the region's energy supply and infrastructure needs. Another challenge will be integration of district energy production and distribution systems into developing and redeveloped areas.

The most prominent challenge for energy providers is coordination with other service providers, transportation in particular. Better coordination in the planning and installation of infrastructure could result in cost savings for developers and rate payers. For instance, there are opportunities to place new energy and utility transmission systems within existing and planned transportation corridors. However, increasing demand for access to rights-of-way and denser development patterns make it difficult and more expensive to locate and relocate facilities. Local development code requirements often aggravate these problems.

Emerging energy sources also face difficulties in regards to location. Solar panels are often subject to development and design codes that restrict their application. There are a number of concerns about the siting of liquefied natural gas (LNG) transmission lines, including the potential for spills due to accidents or attacks and their effect on wildlife habitat and the environment.

Schools

While some areas of the region have underutilized school facilities, population growth will bring new school-aged residents to newly urbanizing areas, creating a geographical mismatch between existing school capacity and new school capacity needs. Future legislative mandates, such as full-day kindergarten, may require additional classrooms. As land values increase, siting schools near population centers becomes increasingly expensive. Better coordination with local jurisdictions and developers in regards to new development could provide cost efficiencies. School districts benefit when new neighborhoods are built around schools and when planning for roads considers school access and bus routes. Funding for capital improvements, dependent on local voter approval, is inconsistent across the region and often restricted, as some jurisdictions do not allow new revenues to pay for operations and maintenance. The recently-approved construction excise tax will provide a new funding source, but only for land acquisition and planning.

Transportation

Transportation costs represent the largest portion of unmet infrastructure needs. Current state and local transportation resources for operations, maintenance and expansion of the system are limited. Oregon ranks last compared with other western states in total auto taxes collected. The Oregon Department of Transportation (ODOT) , cities and counties devote nearly all existing state and federal gas tax revenues to operation and maintenance of the existing road system. Generally, about three quarters of local annual transportation

and public utility capital improvement budgets are spent on maintenance, preservation and operation of existing transportation infrastructure. The result is little available funding to address new capital facility needs. Local roads are funded through development fees, local improvement districts (LIDs) and other mechanisms, which leverage additional private and public investments.

Payroll taxes have provided the primary source of revenue for transit operations and for routine expenditures such as fleet upgrades, vehicle purchases and replacements. Unlike the gas tax, payroll tax revenues expand as the region's economy grows and wages rise, allowing revenues to better keep pace with inflation. However, under its present statutory limitation, the payroll tax may be insufficient to support the system expansions needed to serve a rapidly growing ridership. Another challenge for transit providers like TriMet is developing partnerships with local governments and developers to provide complementary access to transit, such as sidewalks and transit-oriented development. Currently, sidewalks connect to only 69 percent of the transit stops in the region.

There is no dedicated source of revenue for development of new regional transportation systems such as bridges and highways, which are essential for the efficient movement of freight and, therefore, the region's economy. Additionally, insufficient funds for operations is a continuing challenge for all. Fuel costs continue to increase and gas tax revenues are expected to decrease as automobiles become more fuel-efficient. The state gas tax has not increased since 1993 and gas tax revenues have lost significant purchasing power due to inflation and dramatic increases in material costs. It appears likely that electric vehicles will become more prominent in the next decade, requiring a new type of electrical energy charging station. Fuel cost increases already are stimulating transit ridership and could impact regional development patterns and the travel mode mix.

Stormwater/Wastewater

Stormwater and wastewater systems are aging throughout the region. Many are more than 100 years old. Increasing permitting requirements for treatment and discharge result in significant additional compliance costs. Sewer providers often can issue bonds secured by existing and future rate increases, providing stable revenue for incremental construction. However, communities face a significant challenge in securing up-front capital as major construction projects, such as new sewer plants or major trunk lines, cannot be added incrementally in a cost-effective manner. Collaboration and consolidation among providers may provide service and cost efficiencies, but are challenging to realize. Siting new sewer facilities is increasingly difficult in light of community compatibility issues and local, state and federal environmental regulations.

Although stormwater facilities are most effective at the local (watershed) level, solutions to these systems have little to no excess capacity. There are, however, site-specific opportunities for stormwater management solutions such as green streets and open space/stormwater management facilities. These providers share many of the same challenges to implementing capital improvements faced by sewer providers, especially securing reliable funding for long-term maintenance.

Urban parks and open spaces

The availability and cost of land represent the most significant challenges for ensuring adequate parks and open spaces for a growing population. As urban communities increase in density, this becomes both more necessary and more expensive. Given population projections, the region likely will need 5,000 acres of new urban park space and 8,000 acres of open space by 2035. While voters have been generous in approving funding for new acquisitions for parks and open space, funds for maintenance and operations are scarce.

Water

While our region appears to have an existing adequate source of water supply, projected population growth will increase demand. Source development and transmission of water to new users are challenges. Water conservation, reuse and non-potable use are becoming increasingly important to reduce demand and delay the need to upgrade systems. Securing up-front capital represents the largest hurdle to meeting new capacity demands.

Many water providers use intergovernmental agreements (IGAs) to provide service across jurisdictions, but coordination continues to be a challenge. Water providers will need to work with non-potable water supplier to effectively build and manage a viable system to reuse water when feasible.

SUMMARY OF LOCAL TRENDS

As evidenced by this summary of infrastructure needs and issues, the Portland region lacks a coordinated system for planning, construction and maintenance of the infrastructure required to create great communities. Some challenges, such as the lack of a stable funding source, are common among all service providers and require solutions at the regional level. Other challenges are unique to each provider and may be more appropriately addressed locally.

COSTS AND INVESTMENTS

COSTS

Given current levels of service delivery, the capital needed to accommodate population and job growth in the region through 2035 could run as high as $41 billion. Total costs include approximately $10 billion for repairs and reconstruction that would likely be needed even if the region did not experience its projected population growth.

Figure 1. Local Infrastructure Expenditures by Type

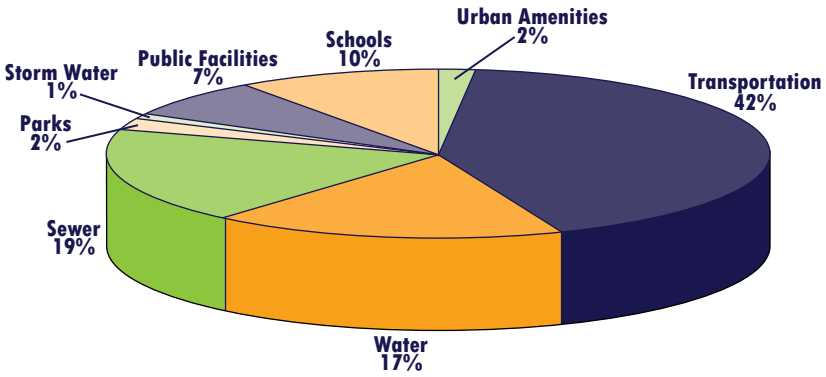


Figure 1 illustrates the allocation of local expenditures by infrastructure type in the Portland region. Transportation is by far the largest expenditure, accounting for 42 percent of local capital improvement plans. Sewer (19%) and water (17%) are the next highest cost items.

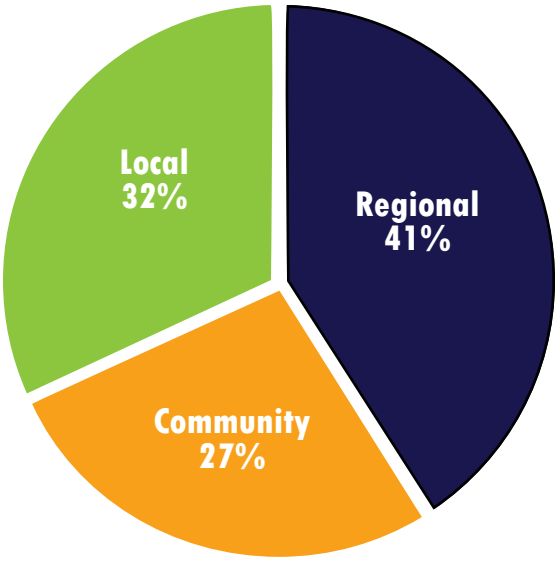
For the purposes of this cost analysis, infrastructure is separated into three levels of public investment: local, community and regional. The demand on local infrastructure is directly related to specific dwelling units. Though not necessarily on-site, community infrastructure may still be attributed to specific dwelling units. Regional infrastructure benefits the entire regional, though it is difficult to establish a nexus between the collective need for regional infrastructure and individual use. Table 1 provides examples of infrastructure at each level.

Regional infrastructure costs comprise 41 percent of total costs, followed by local infrastructure, 32 percent, and community infrastructure, 27 percent. Regional facilities are not usually funded by individual jurisdictions or developers.

Table 1. Levels of Infrastructure Investment

Local	Community	Regional
Local streets and sidewalks	Collectors and minor arterials	Major arterials and bridges; transit
Neighborhood parks	Community parks and fields; civic buildings (police, fire, libraries); parking garages	Regional parks, arts and cultural facilities
Household sewer and water collection and distribution pipes	Sewer trunk and treatment; water distribution, treatment and storage	Regional water and sewer facilities
Elementary and middle schools	High schools	Community colleges

According to an analysis of the 2035 Regional Transportation Plan (RTP) and local transportation system and public facility plans, the 2035 transportation system will cost approximately $23.7 billion, including approximately $4.7 billion for preservation/ reconstruction and $19 billion for capacity improvements. Of the $23.7 billion in transportation investment needed in the region, $14.2 billion will be needed for local/ community facilities and $9.5 billion for regional facilities.



COST INVESTMENTS

National research demonstrates that public infrastructure in urban settings and compact new development at the edge of existing systems is generally less expensive per unit than in areas with more land-extensive development patterns. Moreover, fragmented development patterns lead to loss of open space and agricultural lands, auto dependence, urban blight and disinvestment, and higher resource consumption.

Furthermore, compact regional development is shown to increase regional economic activity. A study by Joe Cortright, Vice President, Impresa Consulting, asserts that reduced transportation costs of $1.1 billion to $1.5 billion per year are tangible benefits of the Portland region's current transportation/land use system. The reduced transportation costs result in $800 million of additional economic activity in the region that would have benefited oil and auto companies outside the region.[3]

Case studies examining the cost of redevelopment in five existing urban centers and new development in twelve urbanizing areas in the Portland region found that while public infrastructure capital costs vary depending on specific location and access to existing infrastructure, they generally reflect this national pattern. Some urban case studies had lower costs than urbanizing case studies and vice versa. However, while local and community infrastructure costs per land area is generally higher in urban areas, the cost per job/dwelling unit is lower due to higher development densities. In fact, certain small scale infill development projects may have little or no infrastructure costs.

Urban and urbanizing areas usually have different public infrastructure requirements that vary by location, type, mix and scale of the development. Most urban developments occur where existing public facilities are already in place, but may require upgrading to accommodate increased demand. Projects often have no or little surplus vacant land to utilize for development phasing, and attempt

[3] Joe Cortright, Portland's Green Dividend. CEOs for Cities, 2007.

to optimize the available land with buildings, open space and parking. Parking usually is provided in above- or below-grade structures that are built early in the project and cannot be phased in over time. Many sites available for development in urban areas are "brownfields." While brownfield sites offer an excellent opportunity for redevelopment and cost savings due to their proximity to existing infrastructure, the potential cost of environmental remediation may make these sites impractical.

In contrast to urban area developments, urbanizing areas often require new public infrastructure or the expansion of existing systems. This often occurs on vacant or "greenfield" land with few constraints. Transportation infrastructure is the most critical investment needed to accommodate growth in these areas, comprising approximately fifty percent of the needed capital costs. Urban areas are generally more readily able to provide transportation, sewer and water services than newly urbanizing areas.

With respect to development density/design and resulting infrastructure demand, a key difference between the urban and urbanizing case studies is the timing of investment. Urban developments tend to require the majority of their infrastructure up-front (usually by year 15) while urbanizing developments can finance this in phases over many years. Therefore, while initial infrastructure costs tend to be the same or slightly higher in urban than in urbanizing areas, development in urban areas is often less expensive over time.

FUNDING AND FUNDING GAPS

To accommodate growth over the next 30 years, the Portland region will require infill utilities and upgrades to existing systems in urban areas and new systems to serve urbanizing areas. Demands are projected to be relatively consistent across the region, regardless of location. No one area within the region appears to be better prepared to accommodate future growth than another.

Traditional funding sources are expected to cover only about half the estimated $27 to 41 billion needed to accommodate growth by 2035. Compounding the decrease in federal funding for infrastructure are state initiatives which constrain the ability of local jurisdictions to raise revenue. Measures 5 and 50 place restrictions on property tax rates and increases in assessed property values. Thus, it is highly unlikely that local revenue can keep up with the cost of providing public services over the long term.

Some types of infrastructure, such as water, sewer, electricity and natural gas, are provided through rate-based funding systems. These tend to be stable and predictable because rates can be increased to cover additional costs. However, obtaining large amounts of up-front capital to make major improvements or expand capacity still are significant challenges.

Non-rate-based infrastructure, such as parks, school facilities, civic structures and transportation, generally do not have significant and stable sources for maintenance and operations and are subject to local budgetary constraints.

Parks and libraries tend to be fairly well supported with local bond levies for capital costs, but usually lack adequate operations and maintenance funding. Public investment in urban parking facilities and amenities such as landscaping, art and lighting are often funded through urban renewal programs or public-private development agreements. The current RTP identifies a $7 billion finance gap, which would be even higher if the full range of transportation costs to support great communities were identified.

Expanded or new local and community transportation facilities are often funded in part through system development charge (SDC) revenues, which leverage additional private and public investments. Metro's report, *Promoting Vibrant Communities with System Development Charges*, found that assessing differential SDCs in urban versus urbanizing areas can promote greater financial equity and the 2040 Growth Concept by reducing up-front costs of targeted developments. However, most local SDCs cover only 30-50 percent of the capital costs of local/community roadways or transit facilities. Moreover, they are subject to fluctuations based on the pace of new development, limited to certain types of infrastructure and can fund only capital improvements.

Among the other causes of funding gaps identified by service providers throughout the region are the following:

- Declining state and federal allocations.
- Lack of ongoing, reliable sources.
- Capital investment funds diverted to operating and/or maintenance.
- Funds diverted to unanticipated and/or emergency repairs.
- Rising construction costs.
- Small scale and fragmented development not allowing economies of scale.
- Low tax bases due to limited population size or low household incomes and/or voter reluctance to approve higher taxes.
- Funding adjustments that require political action.
- Lack of public support and/or political will.
- Competitive nature of funding sources based on geography.

PLANNING, DEVELOPMENT AND FINANCE

With a common understanding of the challenges facing the Portland region, the next step is to identify potential solutions to regional infrastructure needs and determine at what level of public investment each solution will be pursued. It is important that the region leverage its successful history of coordination among

local jurisdictions and the general public to effectively identify and address the highest priorities for providing infrastructure to serve both existing and future residents. Metro, along with other collaborative political bodies, plays a key role in leading a regional dialogue and building consensus. Leadership from elected officials and the private sector, as well as community engagement efforts will be needed to raise public awareness of infrastructure needs and issues and garner support for agreed-upon solutions.

Potential infrastructure planning, development and finance strategies are divided into the following four approaches:

Efficient Service Delivery – Explore ways to provide services more efficiently, decrease costs, conserve resources, and maximize current infrastructure investments.

Demand Management – Examining the need for infrastructure from conservation and land development perspectives can help prevent or delay the need for major capacity investments. Components of demand management include focusing growth to use existing capacity first; pricing usage to reduce and manage demand; educating the public on conservation strategies; and providing incentives to reduce demand.

Innovative Planning and Design – Research and implement innovative approaches to infrastructure planning and design to create vibrant communities. Plan for emerging technologies with potential to improve service delivery.

New Funding – Evaluate and pursue new local and regional funding sources to leverage state and federal investments. Identify and remove existing barriers to public and private investment.

The following pages outline strategies to address infrastructure needs and issues. A description of each strategy is accompanied by case studies for further clarification when applicable.

EFFICIENT SERVICE DELIVERY

Fragmented delivery systems often result in reduced efficiencies. For service providers, jurisdictional issues and daily operations can be barriers to working with adjacent service providers. Focused coordination among service providers can lead to shared facilities and service delivery, adjusting service areas, merging service districts, and allocating funding responsibilities for community and regional facilities.

Shared Public Facilities

Multiple goals can be met by coordinating public facility needs. Public facilities that serve more than one purpose make efficient use of public money. One way to accomplish this is to combine elements that serve two or more areas of public need. The groups served need not be mutually exclusive. Examples include combining a water reservoir with active park use and building library space inside a City Hall

building. Underutilized public space can be used for other activities. For example, utility corridors can be opened to public access for recreational use and public parking lots can be used for community gatherings and activities. Creating and developing public facilities that serve exclusive needs at opposite times of the year can be cost-effective. For example, a series of ball fields can double as a regional stormwater facility in the rainy season.

Case Studies

City of Sherwood Snyder Park

The City of Sherwood is in the process of constructing a new four million gallon covered reservoir in Snyder Park. To add to the amenities of this hill-top community park, the reservoir will be built partially underground, with two tennis courts constructed on top.

City of Sherwood Civic Building

The Sherwood Urban Renewal Plan Advisory Commission (SURPAC) recommended co-locating the new library inside the proposed City Hall building. In 2007, Sherwood opened the doors of the new 10,000 SF building to serve a growing population of approximately 16,000. The new facility was built with urban renewal dollars and general fund dollars (proceeds from sale of the Old Library and City Hall buildings). The City Hall includes a public plaza and a courtroom, which also function as a city council room and a community room.

Tualatin Hills Parks and Recreation District

Utilizing existing Bonneville Power Administration (BPA) right-of-way, the Tualatin Hills Parks and Recreation District operates several parks and trails throughout west Beaverton. Plans are underway to complete the 16-mile trail which runs underneath a BPA line from the Tualatin River north to Portland's Forest Park.

Sunnyside Village Green Park

A collaborative effort between North Clackamas Parks and Recreation and Clackamas County Water and Environment Services, this park is a multiuse facility integrating regional stormwater management with park facilities. The park includes a stormwater detention pond to reduce the rate of runoff in the basin and water quality treatment to stormwater flows. During summer months the dry depression zone serves as an open grass play area and amphitheater. During extreme storm events, water slowly fills the depression providing needed storage with overflows into a tributary to Sieben Creek.

City of Wilsonville

The City of Wilsonville is maximizing the use of open space within Villebois Village. Palermo Park is two acres of active park area including a basketball court and play areas with open lawn spaces and trails. This park also functions as a stormwater treatment facility during the winter months.

Shared Public Service Delivery

Efficiencies can be realized by streamlining fragmented service delivery and infrastructure

maintenance. Intergovernmental agreements are the most common form of coordination found in the Portland region. However, focused collaboration could lead to redistricting service areas, merging service districts, and allocating financing responsibilities for community and regional facilities. For example, the cities of Wood Village and Fairview have IGAs with Gresham for wastewater treatment and work closely to keep the cost of treatment down and prepare for future system demands. These efforts could lead to strategies that allow service providers to be more efficient with the resources and infrastructure systems that currently exist.

Case Studies

Portland Region

- The City of Portland sells wholesale water to 19 other service providers.
- The cities of Hillsboro, Gresham, Tigard and Portland use intergovernmental agreements (IGAs) for park facilities and services.
- The Tualatin Valley Water District is a partner in water resources and transmission in a venture with the Joint Water Commission, the Willamette River Water Coalition and the City of Portland. In addition, it provides contract water services to the cities of Beaverton and Sherwood, as well as Clean Water Services, Valley View Water District and Southwood Park Water District. The District works with the Regional Water Providers Consortium on regional planning, conservation and emergency preparation plans.
- The North Clackamas Water Commission has IGAs with Sunrise Water Authority, South Fork Water Bureau, and the cities of Gladstone and Lake Oswego for a variety of services.
- Gresham has intergovernmental agreements (IGAs) with Multnomah County to maintain County-owned Vance Park and with Metro Parks & Greenspaces for maintenance of co-owned parcels.
- Clean Water Services has IGAs with seven large cities in Washington County to implement local sewer and stormwater operations and maintenance.
- Gresham has maintenance IGAs with Multnomah County and the Multnomah County Drainage District to provide services for specific stormwater infrastructure.
- Washington County employs IGAs with its cities for roadway maintenance and project funding through both the county-wide Traffic Impact Fee and the Major Streets Transportation Improvement Program. The County works closely with its municipal partners through the County Coordination Committee.
- The City of Milwaukie contracts with Clackamas County to provide traffic signal operations and maintenance.
- During snow and ice events, the effort of clearing roadways across the region is shared among ODOT, PDOT, counties, and smaller cities via a coordinated agreement.

Equipment Sharing

Large equipment for infrastructure maintenance and construction can be shared among cities and counties to accomplish large projects or provide secondary relief in emergency situations. A regional approach could be taken and be justified on a cost-benefit basis.

Case Study

Portland Region

The cities of Troutdale, Fairview and Wood Village share stormwater equipment.

Regional Coordination

There are many issues that are most effectively addressed at a scale larger than the local level. State/interstate, regional, sub-regional, and local infrastructure needs, costs, and benefits should be clearly defined. Potential collaborators can be identified and solutions developed that are appropriate for the type and size of the need. For example, the need for bridge planning and financing can be addressed regionally if it is agreed that this is a regional priority.

Participating in local advocacy groups or nonprofit organizations offers opportunities to build support for large projects to attain long-term goals. For example, participating in regional meetings can provide smaller agencies or jurisdictions opportunities to spread the word regarding proposed utility changes.

Case Study

Regional Water Providers Consortium

The Regional Water Providers Consortium is a group of 23 water providers that serve Clackamas, Multnomah and Washington counties and Metro. The Consortium provides a forum for collaboration on water supply issues and conducts activities that provide service to customers in and around the Portland metropolitan area. This includes coordinating implementation of the Regional Water Supply Plan, studying and discussing water supply issues, and promoting cost-efficient use and stewardship of water resources.

Capital Improvement Coordination

Public agencies can benefit from the knowledge of proposed capital improvement plans of various infrastructure entities. Where projects overlap, they can link the construction schedules to eliminate mobilization and clean-up efforts as well as lower the overall costs and public impacts. This strategy can be problematic when services are provided by multiple agencies and funds are available at different times. Case studies are similar to some of those identified under “Shared Public Service Delivery.”

Alternative Standards for Public Construction

Where funds are limited, the public can benefit from specific infrastructure elements that meet health and safety standards, but are of a lesser standard than what is typical for new construction. For example, interim pedestrian trails could be built instead of formal sidewalks on urban streets.

The increasing cost of energy and the impact it will have on both personal mobility and utility operations will likely lead to changed standards for public construction. For instance, smaller cars will use less space on roads and in parking areas.

Case Study

City of Portland Pedestrian Design Guide

The City of Portland Department of Transportation's (PDOT) Pedestrian Design Guide supplies several alternative designs for constructing pedestrian facilities where the conventional city standards are not feasible. The design guide allows for alternate surfacing materials, widths, and locations for sidewalks that often cost less to design and install. Many have been applied to local improvement district (LID) projects.

Franchise Agreement Consistency

Clear, consistent agreements among private utility providers and similarly sized jurisdictions can save time and money when coordinating public improvements and upgrades. Included in this should be an attempt to treat each utility consistently when participating in large urban projects. A regional governing agency could develop a model franchise agreement. The model franchise agreement could state common conditions, requirements and obligations as well as exceptions where they are appropriate due to the nature of the infrastructure type or a particular utility provider. The desired result is to realize common expectations among public agencies and utility providers in the region. The benefits may also be a consistent and fair treatment of utility providers, as well as more timely response, better cooperation and less litigation among parties. For instance, clear management of the limited space in the right-of-way can minimize future relocations as improvements and upgrades are performed on existing infrastructure. Furthermore, coordination between energy and other infrastructure providers in advance of development could minimize future relocations and identify alternatives to the right-of-way when limited space will not accommodate multiple utilities, resulting in cost savings for developers and ratepayers.

Oregon Department of Transportation/American Public Works Association Specifications

In 1996, the Governor's Task Force on Transportation Efficiency was assigned the mission of finding new ways to use Oregon's gas tax money more efficiently. Representatives from the infrastructure and construction trades voted to create joint standards. In 2002, the Oregon Standard Specifications for Construction were completed and were updated in early 2008. This document allows construction work to occur across the state under a standardized method and payment system, ensuring that projects receive a consistent quality of construction. The effort also provides cost savings by allowing contractors to use consistent materials and machinery across various jurisdictional boundaries.

Annexation Planning

Efficiencies can be realized by planning annexation areas along growth corridors and growth centers, including the infrastructure to support this sequencing. Funding mechanisms should be put in place to support growth as it happens, responding to cycles in the economy and housing markets.

Systems Maintenance

Techniques used to assess maintenance needs that can prolong the life of facilities should be expanded.

Case Study

Portland Region

- PDOT's Pavement Management System.
- The City of Portland maintains a software system to conduct asset management.
- Street cleaning frequencies can be adjusted to prolong the life of stormwater piping systems, reducing the maintenance costs caused by debris entering pipes.

Life-Cycle Costing

Considering whole-life costs when making infrastructure investment decisions can reduce long-term costs. One method of implementation is to require life-cycle costing as a criterion for project approval and/or permitting fees.

DEMAND MANAGEMENT

The Portland region needs to examine infrastructure conservation measures to help prevent or delay the need for major capacity investments. Components of demand management include: focusing growth to use existing capacity first; pricing usage to reduce and manage demand; educating the public on conservation strategies and travel options; and providing incentives to reduce demand.

Compact Development Patterns

Compact urban land form (smaller lots and multi-family vs. single family) is a key factor in reducing demands on infrastructure and on water in particular. Continue to promote compact development as a key factor in efficiency for all infrastructure types. Focus on infill and redevelopment in existing urban areas as well as newly urbanizing with close proximity to existing systems targeted for compact, mixed-use and industrial development.

Peak-use Pricing

Infrastructure system capacity or sizing for capacity often is a function of peak demand versus usage. Peak events dramatically increase the demand on infrastructure systems. For example, peak rain events in Lake Oswego can increase the demand for wastewater service up to six times more than the average demand. Most services where peak demand is an issue do not charge for the time of day the resource is used. Conservation is necessary, but pricing measures that reduce overall demand as well as peak demand should be implemented. There are many opportunities to change behavior by reducing or minimizing peak use of a variety

of services. Leveling out peak demand can be an effective way to reduce infrastructure cost. Peak-use pricing uses real time monitoring systems that charge for the actual amount of the resource used or capacity consumed. This technique could be used for many types of infrastructure, including roadway and water usage. One example is implementing or increasing toll charges during the rush hour (congestion pricing). Another is implementing peak seasonal pricing for water use, including wastewater. The cost of technology used to implement daily peak pricing for water is prohibitive at this time.

Case Studies

Portland General Electric (PGE)

PGE's Critical Peak Pricing (CPP) program provides lower energy rates on non-CPP event days. Businesses can reduce energy bills by shifting energy usage away from peak days and hours.

Singapore

Singapore introduced the world's first congestion pricing program in 1975 and implemented electronic road pricing in 1998. New technology is used to predict prevailing and emerging traffic conditions and adjust pricing accordingly. Congestion charges are part of a comprehensive traffic management effort that includes an annual road tax, fuel taxes, custom duties and vehicle registration fees and investment in public transportation.

Public Education and Resource Conservation

Invest in public outreach efforts to inform the public of the current state of infrastructure in the region. Help people understand the real costs and benefits of their actions. Provide detailed information on strategies to reduce impacts on infrastructure, including conservation measures to help prevent or delay the need for major capacity investments. In particular, efforts to conserve water and energy and reduce driving could have a significant impact on the need to upgrade existing infrastructure systems. When possible, incentives should be used to encourage conservation efforts, such as lower use of utilities.

Case Studies

Portland Bureau of Environmental Services

The City of Portland provides a discount on sewer charges for properties that disconnect downspouts from the combined sewer system.

Regional Water Providers Consortium

The Regional Water Providers Consortium develops and implements water conservation programs that educate the public about water-related issues. The programs include a summer marketing campaign, website, schools programs, community events and partnerships, and public education and outreach.

Drive Less/Save More Campaign

The Drive Less/Save More Campaign is sponsored by Metro's Regional Travel Options Program, TriMet, ODOT and other public/

private partners. The campaign seeks to reduce single-person car trips by promoting travel options like public transit, car pooling, biking and walking and encouraging drivers to trip chain or combine multiple errands into single trips. The campaign website provides access to a number of resources at http://drivelesssavemore.com/.

INNOVATIVE PLANNING AND DESIGN

Traditional infrastructure facilities may be designed and provided in innovative ways that address sustainability and increase community support. Emerging technologies provide opportunities to increase efficiencies and lead to best practices.

Infrastructure Recycling and Reuse

Promote innovative ways to reuse or recycle existing infrastructure. For example, schools or unused transportation or utility corridors that are insufficient to serve one purpose can be used for other purposes to help reduce the need for new facilities to meet expanding demand.

Case Studies

Springwater Corridor

The Springwater Corridor is a former rail corridor; the Springwater Division Line was developed for rail service in 1903. Much of Springwater Corridor was acquired by the City of Portland in 1990, with additional acquisitions by Metro in the following years. Master planning for the Corridor began in 1991, and involved input from citizens, agencies, organizations, and municipalities, including Portland Department of Transportation; Oregon Department of Transportation; the cities of Gresham and Milwaukie; Metro; Clackamas and Multnomah counties; the 40-Mile Loop Land Trust; and the Johnson Creek Corridor Committee.

Banks–Vernonia State Trail

Recently completed, this is the first "rails-to-trails" state park built in Oregon. It is built on an abandoned railroad bed that stretches 21 miles from the town of Banks to the city of Vernonia. The railway line dates back to the 1920s, when it was used for moving logs and lumber from the Oregon-American lumber mill in Vernonia, and freight and passengers from Keasey to Portland. The line was abandoned and the rails salvaged in 1973. The right-of-way was then purchased by the state in 1974, and transferred to Oregon Parks and Recreation Department in 1990.

Green Infrastructure

Infrastructure innovation is evolving rapidly due to regional planning initiatives, market acceptance of the green building movement and interest in sustainable development. It may be possible to foster regional collaboration and leadership in various fields of green planning, design, engineering and development. An excellent example of this is Metro's work to foster green street designs to address storm water, urban design and other multiple benefits.

Examples of regional "green" infrastructure that might be developed include:

- Solid waste management and zero waste and economic development related to recycling industry
- Water conservation and reuse strategies
- Green buildings
- Eco-roofs for open space and storm water management
- Distributed renewable energy
- Waste water treatment systems as sources of bio-nutrients
- Metropolitan food transportation and distribution strategies

Case Studies

Metro Green Street Handbook

Metro's Green Street Handbook is an example of a green infrastructure initiative that documents the state of the art of stormwater management in the streetscape.

Sustainable Infrastructure Research and Development

Support the evolution of Portland State University (PSU) as a research and development and application center for innovative sustainable infrastructure. PSU currently houses significant assets that can help the region develop and apply innovative research, development, technological transfer, finance and operation techniques. These resources could potentially be organized into a regional infrastructure innovation center or network. This center could draw on the rich academic resources in civil engineering, transportation, biology, chemistry, energy and mechanical engineering, electrical engineering, nanoscience, urban and regional planning, public administration, business administration, finance and other disciplines to improve the capacity of the region to accommodate future growth.

Case Studies

Canada

The National Research Council of Canada, Center for Sustainable Infrastructure Research (http://irc.nrc-cnrc.gc.ca/csir/index_e.html) is a collaboration of universities, municipal governments and industrial partners in Regina, the Province of Saskatchewan and elsewhere. The collaboration is pursuing a multi-disciplinary research and development program to develop innovative technologies and decision support tools that address the economic, social, and environmental aspects of infrastructure sustainability. This effort will help develop a technology base that will give Saskatchewan a competitive advantage in sustainable infrastructure technologies.

Virginia

The Green Infrastructure Center (www.gicinc.org), in Charlottesville, VA, is a nonprofit organization founded in December 2006 to assist communities in developing strategies for protecting and conserving

their ecological and cultural assets through environmentally-sensitive decisions, lifestyles and planning. Green infrastructure includes the interconnected natural systems and ecological processes that provide clean water, air quality and wildlife habitat. Green infrastructure sustains a community's social, economic, and environmental health. The Center provides tools to help communities identify the services provided by natural systems, such as enhanced quality of life and economic benefits, and develop strategies to protect and sustain these resources.

Australia

The Natural Edge Project (TNEP) is an independent and highly developed Sustainability Think-Tank based in Australia. TNEP operates as a partnership for education, research and policy development on innovation for sustainable development. TNEP's mission is to contribute to and succinctly communicate leading research, case studies, tools and strategies for achieving sustainable development across government, business and civil society. See: http://www.naturaledgeproject.net/

Sustainable Infrastructure Standards

Long-term cost savings can be realized through sustainable infrastructure development. Sustainable infrastructure standards are evolving based on the strong market recognition of the U. S. Green Building Council's LEED rating system and related developments. Both the American Society of Civil Engineers (ASCE) and American Public Works Association (APWA) have infrastructure programs to support sustainability.

Case Studies

United States Green Building Council (USGBC)

According to the USGBC, LEED for Neighborhood Development integrates the principles of smart growth, urbanism and green building into the first national system for neighborhood design. LEED certification provides independent, third-party verification that the location and design of a project meet accepted high levels of environmentally responsible, sustainable development. The post-pilot version of the LEED ND rating system is expected to launch in 2009.

American Society of Civil Engineers

ASCE and the Canadian Society of Civil Engineers are formulating a joint sustainable development action plan for the profession.

See: http://content.coprinstitute.org/files/pdf/ASCESustainableDevelopmentActionPlan.pdf

Emerging Technologies

Plan for and utilize emerging technologies that can reduce costs and increase infrastructure services. Strategies include:

- Planning infrastructure to support the use of electric and other alternative-fuel cars.
- Integrating solar generation infrastructure into the urban form.

- Constructing facilities designed to generate power, such as systems to capture methane in wastewater treatment plants.
- Use advanced street lighting technology such as LEDs or super-conducting cables.
- Designing water reuse systems that include the use of bio-reactors.
- Utilizing GPS equipment to redistribute peak auto use on congested traffic ways.
- Smart meter technology to allow peak pricing.
- Smart signal systems to manage congestion.

NEW FUNDING

New funding sources are needed to upgrade and replace existing infrastructure systems as well as provide infrastructure to newly urbanizing areas. Communities in the region can support new investment by working together to pay for the infrastructure needed at the local, community and regional levels, and to leverage federal and state investments. This analysis should include identifying and removing barriers to public and private investments in infrastructure. A regional look at financing possibilities for basic infrastructure could help support implementation of the region's 2040 vision. Financing devices need to be put in place upfront by the responsible governments.

Support Federal Legislation

Support development of a national infrastructure plan proposed by Congressman Earl Blumenauer. Work with the regional congressional delegation to develop support for this plan and targeted federal funding. "The legislation calls for a new National Plan to define and finance the infrastructure required to support a sustainable economy, improve the livability of our cities and rural communities, provide jobs for Americans, and strengthen national security." The bill would create a Commission on Rebuilding America for the 21st Century and a national vision for infrastructure including specific recommendations and a set of model principles to inform future infrastructure investments.

Potential New State Revenue Sources for Oregon

Opportunities for funding community and regional infrastructure facilities, such as roads, bridges, transit systems, and water/sewer facilities should start at the state level, with new funding sources for strategic infrastructure investments identified during the 2009 legislative session. Examples from this region and other jurisdictions follow. Each of these tools has been used in other places, but implementation of any tool has inherent benefits and risks.

- Additional funds for the Oregon Infrastructure Bank to be dedicated to metropolitan areas.
- An expanded role for the Oregon Infrastructure Bank to provide credit-enhancement to local governments and service districts.

- Funding from the Oregon Strategic Transportation Initiative dedicated to strategic projects in metropolitan areas.
- State transportation project mitigation (traffic impact) fees for strategic regional projects.
- A real estate transfer fee with revenues dedicated to infrastructure.
- An increased Oregon fuel tax and additional revenues dedicated to strategic infrastructure.
- A lodging accommodations tax and dedicated revenues to infrastructure.
- Revenues from the Oregon weight-mile tax and dedicated revenues to regional freight mobility projects.
- An increased Oregon motor vehicle fee with revenues dedicated to strategic regional projects.
- Oregon income tax deductions for businesses and residents located within a designated Center, Corridor, Employment or Industrial area per the 2040 Growth Concept.
- State provisions to allow establishment of Special Benefit Assessment Districts with local taxing authority.

Case Studies

Oregon Special Public Works Fund

The Special Public Works Fund administered by the Oregon Community Development Division is primarily a loan program that provides funding for municipally-owned facilities that support economic and community development. Established in 1985 by the Oregon Legislature, the fund has grown to $160 million. Loans range in size from less than $100,000 to $15 million. Loan terms can be offered at tax-exempt rates for up to 25 years. Grants are limited to $500,000 or 85 percent of the project cost, or up to $5,000 per eligible job created or retained.

Oregon Water/Wastewater Fund

This is a loan and grant program administered by the Oregon Community Development Division to provide for the design and construction of public infrastructure needed to ensure compliance with the U.S. Safe Drinking Water Act or the Clean Water Act. Public entities, municipalities, ports and special districts may apply for funding improvement of drinking water, wastewater, or storm water systems. Loans range in size from less than $100,000 to $15 million. Loan terms can be offered at tax-exempt rates for up to 25 years. Grants are limited to $10,000 per hookup, with a maximum of $750,000 per project. An applicant is not eligible for grant funds if the annual median household income in the applicant's service area is more than the state average median household income level.

Oregon Transportation Infrastructure Bank (OTIB)

OTIB offers direct loans for eligible projects funded from available resources or through the sale of revenue bonds. Borrowers include cities, counties, transit districts, ports, tribal

governments, state agencies and private for-profit and non-profit entities. Uses of funding include various transportation and transit projects. Loan terms can include tax-exempt financing with repayment beginning within five years of project completion and must be repaid within 30 years or at the end of the useful life of the project. Projects are selected on a competitive basis with preference given to projects with quick loan repayment. Projects that receive OTIB funds may include federal money which requires the applicants to abide by applicable state and federal laws, rules and regulations including NEPA, Davis-Bacon Act, Buy America, etc. As of January 2005, the Oregon Transportation Commission had approved a $30 million non-revolving line of credit from the State Highway Fund for the OTIB.

State Transportation Mitigation Fees

Washington State Department of Transportation (WSDOT) allows local jurisdictions (cities and counties) to charge developers for their impacts on state transportation facilities. The WSDOT mitigation fee program has been used to fund the local share for capacity improvements to roadways in Pierce and Snohomish Counties in the greater Seattle Metropolitan Region. The mitigation fee is based on the capital cost of projects identified in the State Transportation Improvement Program and calculated annually by WSDOT staff. Each jurisdiction has the flexibility to charge the mitigation fee or waive it on a case by case basis. CALTRANS is also now considering a similar approach for funding the local share of strategic state transportation improvements.

Oregon Senate Bill 772, Public-Private Partnerships

In 2003, the Oregon Legislature approved a new bill that provides ODOT with tools to develop public-private partnerships for transportation projects, and raised the limit of funding for this program to $50 million. While no such partnerships have materialized, this program has the potential for creating opportunities to build large, badly-needed transportation projects.

Oregon House Bill 2278, expansion of ConnectOregon

This bill funds another $100 million of ConnectOregon through lottery bond sales and authorizes a statewide multimodal transportation study.

Washington Economic Development Finance Authority (WEDFA)

WEDFA can act as the issuing authority on tax exempt Industrial Revenue Bonds to finance eligible infrastructure investments by qualifying public or private entities. WEDFA issues bonds for up to $10 million on a single project, but does not provide any credit enhancement for borrowers. Washington state securities law requires that each borrower obtain a direct pay letter of credit from a lending institution equal to the principal plus 125 days interest. An alternative to the letter of credit provision is for

the borrower to work with a lender to arrange a "private placement" of the bond with an institutional investor or banking firm. WEDFA staff can assist with private placement efforts.

California Infrastructure and Economic Development Bank (I-Bank)

State financing authority provides tax exempt financing to public agencies and qualifying private and non-profit entities. Since 1999, the I-Bank has financed more than $6.5 billion in bonds and loans for economic development and public infrastructure projects. I-Bank also provided more than $300 million in loans from the Infrastructure State Revolving Fund Program since 2000. I-Bank leverages about $2.50 in added public and private investment for each $1.00 it lends. Public infrastructure projects financed by I-Bank include flood control, water, wastewater, public safety facilities, and public streets.

California Proposition 1B

Approved by voters in November 2006, Prop. 1B enacts the Highway Safety, Traffic Reduction, Air Quality, and Port Security Bond Act of 2006 and authorizes $19.925 billion of state general obligation bonds for specific purposes. Focus of this program is on high-priority transportation corridor improvements, trade infrastructure and port security projects, school bus replacement, passenger rail improvements, state/local transportation projects, bridge retrofits, railroad grade separation projects, and traffic safety.

California Proposition 1C

Approved by voters in November 2006, Prop. 1C enacts the Housing and Emergency Shelter Trust Fund Act. Funds are used for providing shelters for battered women and children, low income housing, homeownership assistance, and development programs targeted in urban areas near public transportation. The measure authorizes $2.85 billion in GO bonds to fund 13 new and existing housing and development programs. Funds are awarded on a competitive basis.

Potential New Regional Revenue Source or Authority

Particularly if federal or state funding efforts do not appear viable, a regional referendum should be considered to seek voter support for new or expanded fees that can be used to leverage state or federal funding to complete strategic infrastructure projects such as bridge construction or preservation, and new roadway, transit, multimodal, and urban amenity projects. If regional funds were to be collected by Metro, it is likely that the Legislature would need to increase Metro's spending cap. Examples of regional tools used in local and other jurisdictions follow. Each tool has inherent benefits and risks.

- Transportation project mitigation fees or system development charges for strategic regional projects.
- Real estate transfer fee dedicated to strategic regional infrastructure projects (this would be an increase in Washington County).

- Fuel tax, with dedicated funding for strategic regional projects.
- Lodging accommodations tax, with dedicated funding for infrastructure.
- Motor vehicle fee increase, with dedicated funding for strategic regional projects.
- Expansion and extension of the construction excise tax, with dedicated funding for strategic community or regional infrastructure projects.
- Expanded role for Metro to educate and inform citizens and businesses regarding the benefits of conservation.
- Expanded role for Metro to help coordinate utility district roles and responsibilities in conjunction with service providers.
- Revolving Loan Fund for location efficient mortgages for low and moderate income homebuyers.
- Carbon Impact Offset fee for new buildings that do not meet energy efficiency guidelines.

Case Studies

San Diego

The San Diego Association of Governments (SANDAG) is using innovative techniques to plan and fund their transportation system. A 5 percent sales tax dedicated to transportation improvements has been particularly successful.

Virginia

With the passage of a new transportation act, Virginia is pursuing what appears to be regional financing of transportation that locks together state and local financing of improvements and more regional control of land use. The overall approach allows the regional transportation authority to levy certain taxes and require that localities do likewise for transportation support. State funds will be tied to regional actions. As part of the transportation plan, Virginia is building "hot lanes" on the interstates that will toll individual drivers that use HOV lanes.

State or Regional Bond Bank

Bond banks are a financial intermediary that provides low cost funds through the sale of tax exempt bonds. Capital financing through bond banks allows borrowers to take advantage of the bank's high investment grade rating, low interest rates and reduced issuance and post issuance costs. Local governments are shareholders that participate in bank governance and in some cases make minimal stock subscription payments. For more information see the Appendix.

Case Studies

States of Alaska, Indiana, Maine, New Hampshire, Vermont

Alberta Province, Canada

Value-capture finance

Public improvements made today can lead to future increases in economic value. By capturing a share of future increases, these improvements can be made self-financing. Value-capture finance leverages future tax

receipts to pay for public infrastructure needed to support development for projected growth. In other words, private land value increases generated by new public investment are all or in part "captured" through a land related tax to pay for that investment.

Public and private sectors are constituent elements in the development process. Local government's role evolves as provider of infrastructure and promoter of development. New applications are possible as governments and private developers find it necessary and desirable to work together. Value-capturing finance shares the benefits and costs among partners so that private benefits are partially invested in public services. Those that benefit from new public investment in infrastructure and services pay for them. Examples include urban renewal districts.

Assessment and Taxation Districts

Special districts assess properties with added charges to recover the cost of special improvements made to them. They are not a burden on the general tax base and do not constitute general indebtedness. Moreover, this technique allows landowners to amortize payments over time. Special districts are a viable source of funding at the local or community level. It can be a challenge to explain this technique to the public. A common type of special district is the local improvement district (LID) where a public amenity is needed. Public agencies can encourage and/or aid the use of an LID to fund specific projects. With this source of private (often via property-owners) funding, many elements can be completed at little cost to the public agency.

The following are other types of assessment and taxation districts:

- Regional Improvement Districts
- Special Benefit Assessment Districts
- Business Improvement District
- Supplemental SDCs
- Reimbursement Districts
- Urban Renewal Districts

Case Studies

Washington State Local Infrastructure Financing Tool (LIFT)

Established during the 2006 legislative session, the LIFT program provides a new way to support public infrastructure, with focus on job creation and increasing local economic activity. LIFT is a competitive program that allows selected local governments to take advantage of tax revenue generated by new private developments in Revenue Development Areas (RDAs). Much like Oregon's urban renewal program, LIFT supports RDA's use of state and local tax increment revenues to repay bonds. Jurisdictions may apply for up to $2.5 million in annual LIFT authority, and in most cases only one RDA is allowed per county.

Community Facilities District Act ("Mello-Roos")

Mello-Roos enabled Community Facility Districts (CFD) to be established by local government agencies in California as a means of obtaining community funding. CFDs are areas where a special tax is imposed on property owners. The CFD has chosen to seek public financing through the sale of bonds for the purpose of financing certain public improvements and services.

Tax Revenues and Fees

Tax revenues and fees could be used to fund new infrastructure. Most taxes require voter approval and would likely be subject to a cap. Tax revenues and fees include:

- Impact Fees, Systems Development Charges
- Utility Charges/Fees (user charges)
- Motor Vehicle Registration Fees
- Fuel Tax (maximum allowed under state laws)
- Utility Franchise Fees
- Developer Connection Charges
- Real Estate Transfer Fee
- Construction Excise Tax
- Lodging Tax
- Toll Revenues
- Mitigation Fees
- Property Tax Levy
- Payroll Tax
- Road User Fee (establish a user fee paid by households, businesses, and industries to fund transportation system improvements and upgrades; similar to Portland Mayor-elect Sam Adams' Safe, Sound and Green Plan and the street utility fee in Hillsboro).
- Tax Increment Financing (establish a tax increment district to raise the funding for necessary public infrastructure improvements).

Public-Private Partnerships

Public-private partnerships (PPPs) are an effective means to develop infrastructure projects. A PPP is a contractual agreement between a public agency (federal, state or local) and a private sector entity. Through this agreement, the skills and assets of each sector (public and private) are shared in delivering a service or facility for use by the general public. In addition to the sharing of resources, each party shares in the risks and rewards potential in the delivery of the service and/or facility. PPPs can create wide opportunities for deeper funding and sources of creativity.

Successful PPPs have strong political leadership, shared burdens and rewards, commitment to plans, project timetables and clear, realistic funding sources. PPPs can be focused at various scales and structured in different ways (See the Appendix). Some are more applicable to infrastructure needs than others, and some more applicable to particular types of infrastructure. For instance, utilities such as water or sewer that have a user-paid revenue stream are better implemented

under some models, and road or highway infrastructure that may combine user fees with local, state, and federal capital contributions are better constructed under other models. They are used extensively in Europe, but with mixed success. Metro could develop a "toolkit" to define the range of PPPs and the criteria for success in developing and managing PPPs.

Case Studies

South Waterfront; Portland, OR

The South Waterfront project is a PPP among the City of Portland, the Portland Development Commission, and Oregon Health and Science University. Tax increment revenues and local private cost-sharing was used to provide needed improvements and desired amenities. Development agreements between the city and individual property owners provided a tool for negotiating public and private commitments to meet plan goals on a site-specific basis. PPPs were used to finance some improvements and long-term maintenance of public facilities. For example, local improvement districts assisted with streetcar, tram, parks and greenway installation and maintenance.

Metro

A transit-oriented development (TOD) Program aims to provide built examples of transit-oriented development projects and to demonstrate the potential of public-private partnerships for making great communities. The TOD program provides financial incentives and uses PPPs to enhance the economic feasibility of higher density mixed-use projects served by transit. The program has contributed to many of the successful TOD developments in the region and has acquired key opportunity sites at transit stations.

Cascade Station, Airport Light Rail Transit; Portland, OR

Bechtel, Trammel Crow, Port of Portland, PDOT, TriMet and PDC partnered to build light rail transit and retail / commercial infrastructure near the Portland Airport. Bechtel provided the private partner's contribution by constructing the infrastructure in exchange for the right to enter into 99-year leases that would allow private development of the Port's land. The Portland Development Commission was an intermediary and provided about $30 million in financing.

Land Acquisition

Investigate new approaches to land acquisition. Land acquisition is a major challenge preventing large scale development projects in the region. A handful of corporations now control the building of large residential housing developments in the United States. There is a need to plan for areas to be annexed by talking to these corporations to understand what large-scale development would look like and how to prepare for it. New approaches to land acquisition include:

- Planning for public transit and development patterns that support it is of particular importance. Obtain rights-of-way before

development occurs to dictate where linear infrastructure will go.

- Various landowners form a private limited liability corporation to spread costs and benefits and consolidate land for a single developer.
- Public sector uses a tool similar to urban renewal, but to purchase land in urbanizing areas for development purposes.
- Work with developers to get control of parcels with highest value to leverage process.

Patient Equity[4]

Patient equity is the capital committed to a development budget that does not have a defined payback schedule. Patient capital is not a substitute for other financing that sunsets in seven to ten years. Rather, it is additive, layered on top of a conventional development budget such that the overall cost of the project increases. Patient equity pays the increased costs and mitigates the risks of new development. Ultimately, it can facilitate a project's success and over time yield substantial return to its investors.

Patient equity is ideal for financing walkable, mixed-use projects. It allows conventional equity to take on a proportionally smaller piece of the total development budget. Investors of patient equity in walkable projects are likely to see substantial financial returns as the project matures and critical mass is achieved (ten or more years). However, current methodologies for evaluating equity investments are often biased toward short-term (one to seven years) investment decisions. Many of these methodologies are unable to evaluate cash flows beyond year five, which is when walkable, urban developments see their strongest financial performance. A similar method could be to establish a patient equity fund for long-term investments to be used in public-private partnerships.

Case Studies

Reston Town Center

Mobil Land owned the master planned community of Reston, Virginia, located in the Washington, D.C. metropolitan area. The 200-acre site includes more than one million square feet of office, hotel and retail space, and thousands of condominium and rental apartments. Current rental rates and sales prices demonstrate the premium that Reston Town Center's walkable urbanism commands. There is no direct evidence of how much patient equity was in the project but estimates of patient equity for the first phase of the Town Center are upwards of 50 percent of the development budget.

Century Theatre Block, Albuquerque

The Historic District Improvement Company (HDIC) developed the Century Theatre Block in Albuquerque as the catalytic project starting the revitalization of the downtown. The project consists of a 47,000 square foot, 14-screen

[4] Source: Leinberger, Christopher B. *The Need for Patient Equity in Creating Great Places.*

movie theater, 25,000 square feet of retail and 25,000 square feet of office space in a mixed-use, walkable form. The HDIC project had a 40% higher construction and tenant improvement budget than the conventional budget. The development budget became 5% conventional equity, 67% debt and 27% patient equity. The cash flows have recently surpassed the conventional projections and seem set to significantly surpass the conventional projections in the future.

AvalonBay Communities, Inc.

AvalonBay REIT concentrates on building and owning rental apartment projects in markets with high barriers to entry. As a result, over half of their portfolio is in walkable, urbane locations. This portfolio has earned AvalonBay a reputation as one of the premier rental apartment REITs in the United States. It has consistently been the most profitable apartment REIT and has provided the highest shareholder return for apartment REITs.

Remove Barriers to Investment

Identify and remove existing legal, regulatory and other barriers to public and private investment in new development and infrastructure. For instance, liability issues associated with superfund sites prevent redevelopment of brownfields due to fear of lawsuit. Unfunded mandates from federal and state governments also serve as obstacles to investments in infrastructure. Likewise, cities should revisit development codes to encourage investments, removing codes that prevent compact urban development.

Carbon and Ecosystem Service Markets

Due to the impact of climate change, there is a rapidly evolving set of markets in green house gas reduction or sequestration. The United States Congress is considering a national cap-and-trade system that could result in up to $1 trillion in capital exchange. It is likely that national legislation will pass within the next few years. The Western Governors' Climate Initiative also is developing a regional cap-and-trade system to reduce greenhouse gas emissions and several Oregon leaders are developing a similar concept designed to quantify and monetize the value of services provided by ecosystems and develop the market mechanisms where they can be sold, purchased, or traded. These opportunities are detailed in several presentations at: www.nebc.org/content.aspx?pageid=34

Case Studies

Climate Action Plan Tax, Boulder, Colorado

Boulder voters approved Initiative 202 in 2007, making this the first time in the nation that a municipal government will impose an energy tax on its residents to directly combat global warming. The energy tax is also referred to as a carbon tax since it is based on electricity consumed through the burning of coal which is directly related to carbon or greenhouse gas emissions. The average household will pay $1.33 per month and the average business will pay $3.80 per month. The tax will generate

about $1 million annually through 2012 when the tax is set to expire. Estimated energy cost savings from this measure are $63 million over the long term.

Oregon

There are significant efforts in Oregon to develop an ecosystem services market for the Willamette Valley and elsewhere to value and capitalize on ecosystem services provided by nature. Taken together with the emerging cap and trade carbon markets there are and will be major opportunities for funding for energy-efficient infrastructure, compact development and open space "greenfrastructure" needs of the region. Regional collaboration will be essential to fully participate in both markets.

CRITERIA FOR TARGETING REGIONAL FUNDS

While it is important to pursue strategies in all four categories, the reality is that new funding sources are crucial to providing needed infrastructure. The following matrix outlines a set of regional funding program eligibility criteria. These funding criteria could be applied to ascertain the relative advantages and disadvantages for the aforementioned funding programs, using a relative scoring method for each criterion ranging from 1 (least effective) to 5 (most effective). The highest scoring funding programs should be advanced for consideration by the appropriate legislative body and/or public-at-large.

Criteria	Evaluation Question to be Addressed	Comments
Legal precedence in Oregon	Is this technique allowed under Oregon law?	
Current use in Portland region	How many jurisdictions or districts use it today? Has it been successful?	
Overall simplicity (easy to understand/convey)	Can it be explained in 20 words or a simple graphic?	Important for public support
Implements 2040 policy objectives	Can funding be focused on centers, corridors, and employment and industrial areas?	
Equity among affected stakeholders	Who pays the cost? Are they the beneficiaries?	
Ease of integration with existing governments	How many inter-agency agreements/ modifications will be required?	Important to local agencies
Potential revenue generation	What is revenue generation potential: high, med., low?	Forecast over 30 years
Stability of annual revenues	How much does the revenue stream rely on variable factors, such as construction cycles?	Historical review of revenue system
Ability to be used for annual operations & maintenance	Can the revenue be used for annual operations & maintenance?	Important to local agencies
Flexibility of the revenues	Can the revenue address multiple infra needs?	Flexibility of technique
Annual implementation/ administrative costs	What will be the cost of administering this to local governments?	Forecast over 30 years
Ability to leverage federal or state funds	Can this revenue source leverage non-local grants?	Potential for all levels of government
Ability to leverage local public/ private funds	Can this revenue source leverage private investment?	Potential for all levels of government
Likely to receive voter approval	Is this the type of program voters generally support?	Important to elected officials
Consistency with other financing techniques used by local governments	How well does it fit in with contemporary patterns?	Helps sell program to citizens

* It is recommended that regional funding techniques be ranked according to these criteria on a scale of 1 to 5, with 1 being least effective and 5 being most effective, and use this as a basis for prioritizing funding programs.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

Changing times require new approaches to infrastructure provision and finance. This analysis describes the region's infrastructure challenges and begins to quantify the problem and lay out some options to address the region's infrastructure needs. However, tough questions remain as the region moves forward:

- There will never be enough money for everything – how can we most efficiently guide public investment decisions to strategically target limited resources?
- Can managing demand reduce the need to expand the capacity of infrastructure?
- Are we providing infrastructure services at the most efficient level (geographical or jurisdictional), or are there opportunities to achieve economies of scale or efficiencies?
- How can we best address competing fiscal demands for new infrastructure, maintenance needs, and upgrades of existing facilities?
- Do service providers currently have the capacity to research and share information with counterparts nationally and globally to facilitate the adoption of innovations in service delivery?
- Will incorporating global climate change and sustainability into public messages help manage consumption?
- How can government deepen public understanding of the infrastructure challenges and increase public support for infrastructure finance?

RECOMMENDATIONS

The time is right for decisive action by elected and appointed leaders across the region to address our infrastructure needs. Recommended actions:

- Coordinate regional partners to identify state legislative changes that would increase our capability to finance regional infrastructure needs.
- Convene regional partners to explore opportunities to implement solutions that increase efficiency and better manage demand.

- Increase public awareness of infrastructure needs and the importance of setting priorities with limited resources.
- Recognize return on investment when making public investment decisions in both urban and newly urbanizing areas.
- Encourage and facilitate implementation of new technologies that increase the efficiency and sustainability of infrastructure systems.

Public Infrastructure Costs

Case Studies

July 2009

Introduction

Purpose

The region is in the process of deciding where and how to grow. These decisions will have long-term financial costs and benefits for current and future residents. An understanding of the factors that contribute to infrastructure costs will be essential to making those decisions.

To assist in the region's discussions about growth management, this report focuses on the capital costs and capacity of public infrastructure provision for new and infill developments throughout the region. This report uses a variety of analyses and information to provide a beginning framework for future conversations on infrastructure investment. Local case studies analyzing residential and employment areas throughout the region help illustrate the distinct factors that influence infrastructure costs.

Report Findings and Conclusions

A few things are readily apparent from the information gained in this report:

- Public infrastructure is extremely expensive. Even in locations where existing infrastructure has adequate capacity and can be extended to serve newly developing properties, it is not cheap.

- There is so much variation from one site to the next that it is difficult to make meaningful comparisons. One site already has available infrastructure and the next does not. One has steep slopes and the next does not. One has good connectivity and the next does not. The list goes on.

- Infrastructure to serve development is generally less expensive where infrastructure is already in place, even if the existing infrastructure needs maintenance work or capacity upgrades.

- Only the developments that have been fully built-out can claim to have accurate information on infrastructure cost. All the rest are estimates. Even where sites have been fully developed, it is not possible to accurately identify all of the regional infrastructure costs that result.

- Public infrastructure is an essential part of our quality of life for both existing and future residents. Given that this region is attracting more people and jobs (current projections assume one million more residents in the next 20 to 30 years), enhancing the public's understanding of the costs of building and maintaining that infrastructure is critical. The

public will be asked to invest even more in infrastructure in the future and should demand a meaningful return on that investment.

- This report provides only a general estimate of the demands created by local development on regional infrastructure. Each case study includes data on average commute distances, but does not include specific cost estimates for regional infrastructure. Unlike local and community infrastructure costs, there is no mechanism in place to collect revenues from developments to pay for regional infrastructure.

Summary of Cost Findings

Some of the developments studied here have already been built, others are still at the concept planning stage. Some are intended exclusively for housing development, while others are intended to create new jobs. Most include both jobs and housing. The following list shows the range of cost estimates for local infrastructure that have been found. All of these cost estimates are for local and community infrastructure only, and do not include added regional infrastructure costs.

A review of the summary numbers that follow makes it obvious how varied these case studies are. Comparing the first four cases listed below (Shute Road, Coffee Creek, S.W. Tualatin and Lake View Village) shows how different they are – in spite of the fact that they are all planned for non-residential development. Additional to the infrastructure costs per job created, the following differences are noted:

Lake View Village is a commercial development within a downtown redevelopment area. While it created more than 200 jobs, its primary function was to support and stimulate redevelopment of the surrounding downtown properties. Most of its costs went for the development of a public parking structure; something not anticipated in the other three areas. The other three areas are primarily planned for industrial uses.

Shute Road has the lowest anticipated local infrastructure cost per job. That is primarily because of the existing infrastructure and road network in the area.

S. W. Tualatin will require major upgrades to its surrounding streets to be viable. On a per-job basis, these local transportation costs are expected to be more than four times as high as those of the Shute Road area.

The Coffee Creek area is expected to have local infrastructure costs that are almost as high as the Shute Road area, while resulting in less than half as much job creation.

Project status (as of April 2009):

*	Planning not complete
**	Plan complete (not necessarily adopted)
***	Development underway
****	Development complete

Job Creation Only

West Coast Paper site (Portland)****
276 jobs $60,000 local infrastructure cost: +/-$200/job

Tualatin Business Center (Tualatin)****
124 jobs $298,000 local infrastructure cost: +/-$2400/job

Shute Road area (Hillsboro)***
3,660 jobs $9,136,000 local infrastructure cost: +/-$2,500/job

Coffee Creek area (Wilsonville)**
1,474 jobs $8,058,000 local infrastructure cost: +/-$5,500/job

S.W. Tualatin*
5,760 jobs $60,627,000 local infrastructure cost: +/- $10,500/job

Lake View Village (Lake Oswego)****
207 jobs $5,116,000 local infrastructure cost: +/-$24,500/job

Housing Only

Witch Hazel area (Hillsboro)***
2,000 units $39,560,000 local infrastructure cost: +/- $20,000/unit

Park Place area (Oregon City)**
1,458 units $71,760,000 local infrastructure cost: +/-$49,000/unit

In other areas studied, which have been planned primarily (but not exclusively) for housing or for job creation, per unit and per job costs are somewhat more generalized and should be considered only as "order of magnitude" estimates. These include:

Primarily Job Creation

Brewery Blocks (Portland)****
2,440 jobs (113 units) $40,647,000 local infrastructure cost: +/- $13,500 to $15,000/job

Springwater (Gresham)**
15,330 jobs (1,456 units) $375,791,000 local infrastructure cost: +/- $16,500 to $24,000/job

Primarily Housing

Rock Creek (Happy Valley)***
2,932 units (619 jobs) $48,796,000 local infrastructure cost: +/- $14,000 to $16,000/unit

South Hillsboro**
10,182 units (879 jobs) $295,517,000 local infrastructure cost: +/- $26,000 to $28,500/unit

North Bethany (Washington County)**
5,000 units (276 jobs) $416,633,000 local infrastructure cost: +/- $79,000 to $82,500/unit

Job/Housing Mix

N. Main (Milwaukie)****
95 units (40 jobs) $919,000 local infrastructure cost

Civic (Gresham)****
636 units (2,433 jobs) $11,606,000 local infrastructure cost

Beavercreek Road (Oregon City)**
1,450 units (3.652 jobs) $115,900,000 local infrastructure cost

Pleasant Valley (Gresham and Portland)**
4,926 units (4,935 jobs) $304,073,000 local infrastructure cost

S. Waterfront (Portland)***
10,000 units (3,600 jobs) $323,457,000 local infrastructure cost

Damascus/East Happy Valley* (Planning complete for Happy Valley portion.)
21,934 units (45,000 jobs) $3,119,295,000 local infrastructure cost

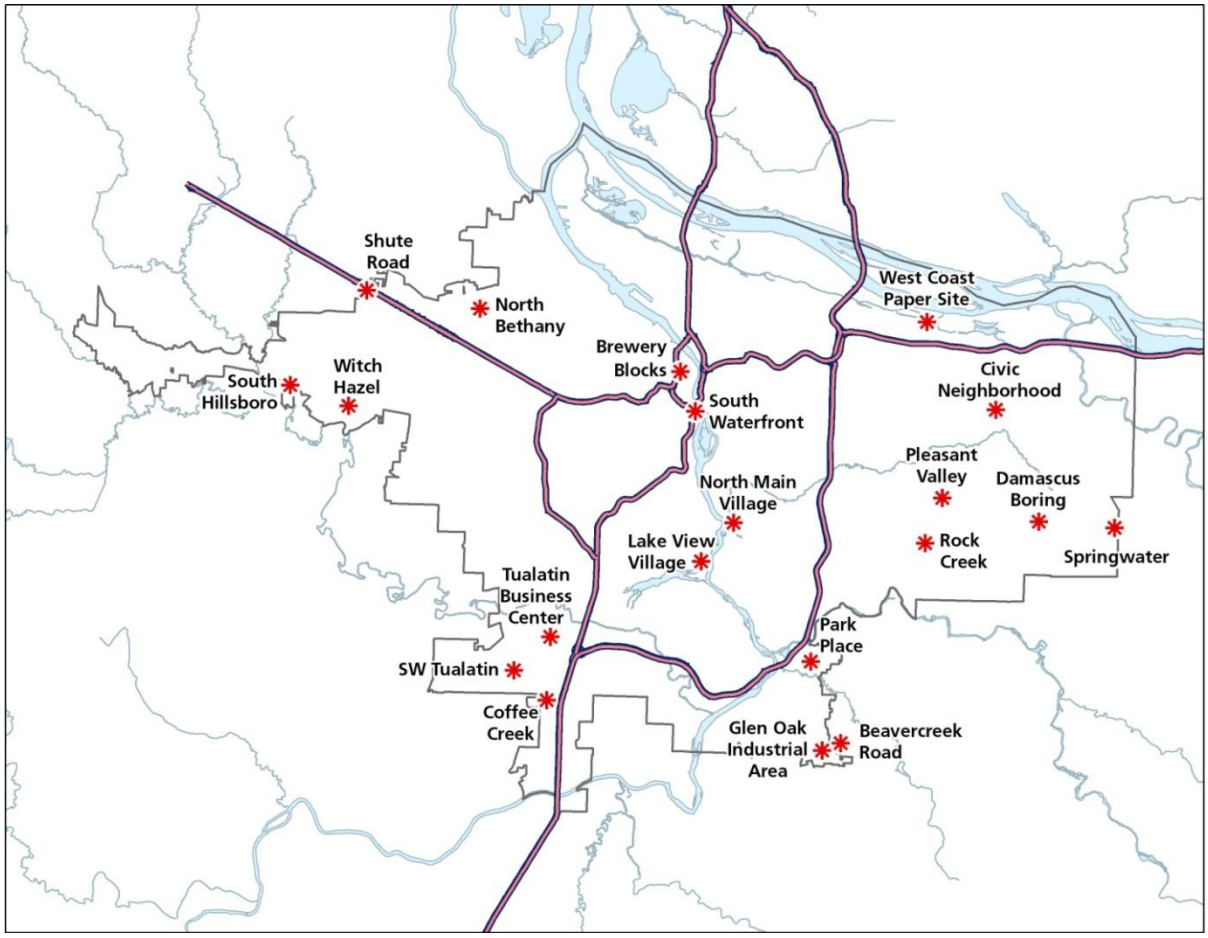
Local Case Study Analysis

The developments used in the local case study analysis are each unique, having different benefits, proposed uses, levels of service, surrounding uses, and topography. Since each case study is distinct, the analysis clearly shows factors that differ between case study areas. So, as a whole, the case studies help to illustrate the general lessons that can be learned from current infrastructure investments and provide one useful means of understanding what factors can influence infrastructure costs.

Although these case studies focus on specific geographic areas, each location exists as part of a larger community. Because of this, it is not possible to isolate every cost or benefit of the study areas relative to those larger communities. For instance, a study area may include amenities (e.g., a public park or a parking structure) that serve surrounding properties. In

another instance, properties near the study area may be providing amenities that benefit the study area. No effort has been made to attempt to quantify these characteristics.

Case study locations



Methods

Types of infrastructure considered

The focus of this analysis is on the following categories of infrastructure:

- Civic buildings, parking structures, public plazas
- Regional facilities such as marine and air ports
- Parks
- Sanitary Sewers
- Schools
- Stormwater
- Transportation
    - Roads, bridges, highways

    - Transit, bike, pedestrian
- Water

Reconciling differences between case studies

Generally speaking, one job will place fewer demands on infrastructure than will one household. However, different kinds of employment can place very different demands on infrastructure. It is also not possible to be exact in comparing costs from one unique geographic area to another.

Because the developments included in this analysis span several years, all costs have been shown in first quarter 2008 dollars.

Return on public investment

In an era of insufficient infrastructure funding, a primary concern for policy makers needs to be the cost effectiveness of different public infrastructure investments. This report is intended to allow for some discussion of the return on public investments in infrastructure. This report documents how much it costs to provide infrastructure to serve new households and employees in each study area. This analysis, however, does not incorporate all of the costs faced by the private sector in building out any given development.

The number of households and jobs created as a result of public infrastructure investment is by no means the only return that should be considered. The quality of the communities that are created through these investments and their possible contributions to local and regional goals are also essential considerations. This report does not attempt to judge the relative benefits of investments in different developments as each area is different.

Infill and Redevelopment

In addition to collecting information on the infrastructure costs of new developments, a survey of over 8,600 residential building permits issued in recent years was conducted in selected jurisdictions in an effort to understand the infrastructure costs of local infill development. These jurisdictions were also asked to report the on- and off-site improvements required for each type of development. The results of this survey, however, did not provide clear and consistent data from which to draw conclusions, due to differences in local jurisdiction's definitions of "infill/minor partitions" and "subdivisions/PUDs", and policies on when off-site infrastructure improvements are required. While there is significant infill and redevelopment activity, and low infrastructure costs associated with that activity, significant variations in policies at the local level made the inclusion of a clear analysis of regional infill costs for this report unfeasible

Types of costs

This analysis used case studies to evaluate and identify factors that can influence infrastructure costs, but it is limited in its scope. Specifically, this report only documents the capital costs of providing new local infrastructure. Nor does it include the cost of ongoing maintenance and operations of public facilities. It should be emphasized that those ongoing costs can be more significant than the initial costs of infrastructure. (A good example would be sewer service to a specific site. It might be initially less expensive to serve the area with pumps than with gravity, but the long-term costs of operating and maintaining a pump system could easily exceed the initial savings.) Finally, this report does not capture the infrastructure costs and savings to individual homeowners and employers in the region.

Different scales of infrastructure

This report divides infrastructure into two categories, depending on the infrastructure's user base:

- Local / community infrastructure
- Regional infrastructure

These two categories are described below.

Local / Community Infrastructure

Local / community facilities are those that are most directly necessitated by a particular development. The costs of these facilities are typically well documented and case studies are a useful way to understand them.

- Costs for newly urbanizing areas were taken from concept plans. These costs are early estimates that will, no doubt, change as plans are refined.

- Costs for urban redevelopment projects were provided by the responsible urban renewal and planning agencies and are for completed projects.

- Costs that were included in concept plans, but that can be categorized as regional costs (e.g., state highway improvements), were deducted from local/community costs.

- Local planning and urban renewal departments had the opportunity to review, comment on and correct case studies within their jurisdictions.

Regional Infrastructure

Regional infrastructure includes facilities such as highways, light rail, bridges, and marine and air terminals. Unlike local and community level facilities, it is difficult to link any particular development with the need for a regional facility. Instead, the need for regional facilities is cumulative in nature and their costs are rarely included in estimates for a particular development. It is also hard to separate the need to replace obsolete regional infrastructure from the need to replace regional infrastructure in order to increase capacity for increased population growth. However, local development does place certain demands on regional facilities and no direct method exists to pay for these regional costs to roads and bridges. Due to these factors, regional infrastructure costs can be difficult to completely isolate and understand, but still need to be considered in this analysis. Therefore, this report includes a general statement of the costs that these case study areas will place on regional infrastructure.

Past studies have focused on the costs of regional infrastructure. The cost assumptions listed below were based on these secondary sources: (Balboni, 2006) (Cogan, Sharpe, Cogan, 1990) (Sonny Conder Fiscal and Economic Consulting, 1991) (Speir & Stephenson, 2002) (United States Bureau of Economic Analysis, 1960-2005) (Waier, 2007).

Given that the trip generation patterns of different non-residential land uses vary so widely (e.g., from retail to warehousing) no effort has been made in this study to quantify the regional infrastructure costs that are attributable to each new job. Instead, each case study lists the projected commute distance in 2035 relative to the regional average, and the reader is encouraged to consider the regional cost implications of new jobs that result in different commute distances.

The estimated average cost of regional infrastructure per dwelling unit in the 7-county area (Clackamas, Multnomah, Washington, Clark, Yamhill, Marion, and Columbia counties) is approximately:

Transportation – transit (variable cost)	$ 3,000
Transportation – roads, bridges (variable cost)	$20,000
Transportation – marine, air (flat cost)	$ 1,500
Public facilities –civic buildings, regional open space, arts and cultural facilities	$ 5,500
Average cost per dwelling unit of regional infrastructure	**$ 30,000**

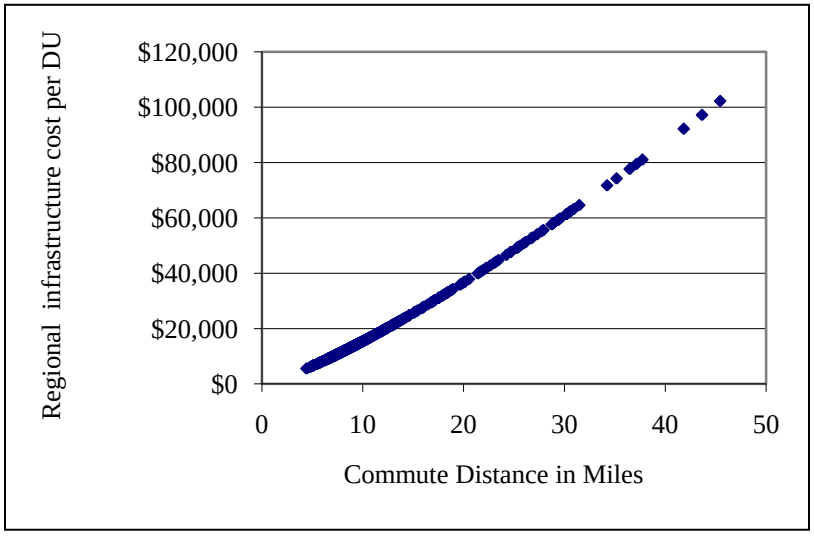
Flat regional infrastructure costs

Using the above-cited sources of cost estimates, flat costs can be applied to each new household (with a somewhat lower assumption for each new job) for marine, air, and other non-transportation regional facilities. These costs are not for specific facilities, but are, instead, intended to represent the typical regional infrastructure demands that new households and jobs create. The use of a flat cost for these facilities is based on the assumption that, generally speaking, most households in the study areas will place similar demands on these types of facilities[1].

Variable regional infrastructure costs

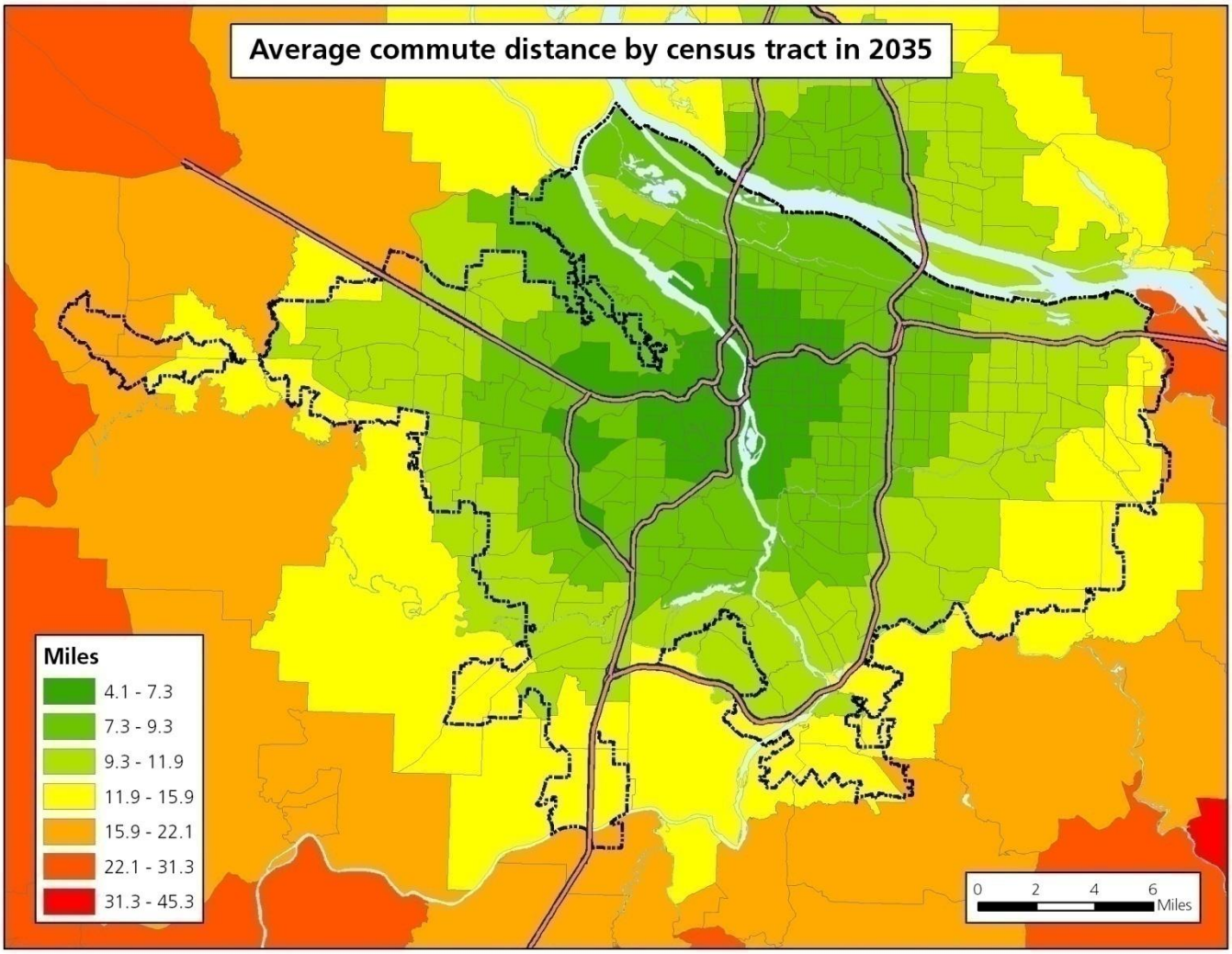
To more accurately represent the differences in demand that different case study locations may place on regional transportation facilities (such as highways, transit and bridges), variable costs can be attributed.

A household that makes longer distance trips places greater demands on transportation facilities than a household that makes shorter trips. A household's demand for regional transportation facilities was assumed to vary according to forecast commute distances[2].



[1] Though this is clearly not the case, a flat cost is used in the absence of a more accurate means of estimating how frequently a particular household may, for instance, use the airport or purchase goods that were received in our region's marine ports.

[2] Though commute travel is a relatively small portion of a household's total travel, it serves as a reasonable proxy for overall travel behavior. Households with relatively short commutes also tend to be relatively close to retail and other services, thereby reducing the length of other trips.



Using MetroScope[3], an integrated land use and transportation forecasting model, commute distances were estimated for new households and jobs in the region by the year 2035[4]. Commute distances that are reported in this analysis are one-way and calculated based on the job and household distributions that result from the modeled scenario.

The MetroScope model does not assume that all workers commute to the central city. Instead, the model measures commute distances from census tracts to a variety of employment centers throughout the region. As a result, proximity to any employment center in the region reduces the commute distance of a census tract.

[3] Because MetroScope cannot predict future policy changes made by cities or actions taken by firms or individuals, these forecasted commute distances are not a foregone conclusion. Policy changes and other dynamics (e.g. new regulations or changes in fuel costs) can serve to shorten or lengthen forecasted commutes. Generally, however, MetroScope scenarios can give reliable estimates of the likely outcomes of a given set of policy choices. The set of assumptions used in this scenario represents an extrapolation of past and current policy direction.

[4] Average commute distances are calculated at the census tract level.

Primary findings

Factors that can influence infrastructure costs

This case study analysis is not a statistical analysis that can definitively determine the effects of any particular factor on infrastructure costs. However, some general lessons can be gleaned. Some factors that can influence the costs of serving new development include:

- Site topography
- Environmental features
- Land ownership patterns
- Distance from existing infrastructure
- Presence or absence of existing infrastructure capacity
- Development density
- Proposed use
- Level of service or quality of amenities
- Travel behavior (of residents or employees)

Site topography

Flat sites tend to be less expensive to serve than sloped sites. For instance, sloped sites can either benefit or complicate the use of gravity systems for water or wastewater or can require the use of a non-grid street network. Sites with steep slopes are also typically built at lower densities, which can also have the effect of increasing the cost of infrastructure.

Environmental features

Though site features such as riparian areas or wetlands can be viewed as green infrastructure (for instance, as open space or as stormwater facilities), their presence can make an area more expensive to serve by reducing the potential development density of a site or by increasing actual construction costs.

Land ownership patterns

Fragmented land ownership patterns can require coordination with numerous land owners and can add time and cost to the development of an area. Having to cross multiple ownerships with streets, trails, or pipelines can add significantly to costs.

Distance from existing infrastructure

Increased distance from existing facilities can raise infrastructure costs. For instance, a new development that is further from existing facilities could require additional lengths of sewer pipe to connect to existing facilities or, an even more expensive proposition, the construction of a new sewage treatment plant.

Presence or absence of existing infrastructure capacity

In most cases, using existing infrastructure capacity before constructing new capacity makes sound financial sense. There is, however, a tipping point at which existing capacity will be fully utilized. This tipping point is inherently captured in these case studies. If additional capacity is necessitated by a particular development, the costs of those facilities have been included, where known.

Development density

Higher density developments tend to be less expensive to serve (on a per unit basis) than lower density developments. The relationship between residential density and infrastructure demand is fairly intuitive – larger lots require more lineal feet of pipes and pavement per household. These increased lengths generally

translate into higher infrastructure costs for both initial construction and long-term maintenance (Speir & Stephenson, 2002).

Despite this general rule, however, the lower density case study areas reveal a great deal of variation in the costs per job or per household. This variation is attributable to the many other factors that can influence costs. These factors may include level of service or the provision of amenities such as parks and sidewalks and other facilities such as schools.

Proposed uses

The case studies include both employment and residential uses and do not indicate that one type of use is inherently more expensive than the other. When considered on a cost-per-job basis, there are examples of both relatively inexpensive (e.g., Shute Road) and relatively expensive (e.g., Lake View Village) employment uses. This small sampling of case studies appears to indicate that variations in costs are contingent upon factors other than land use.

Level of service / quality of amenities

Two of the more important determinants of infrastructure cost are level of service and the presence of community amenities. Different case study areas need different facilities to support their intended use. Some of the case study developments require the entire gamut of new infrastructure facilities while others require little more than the addition of structured parking. This variation in the mix of facilities shows up in the information below. These facilities are all elements of creating great communities and it should be recognized that providing them is desirable.

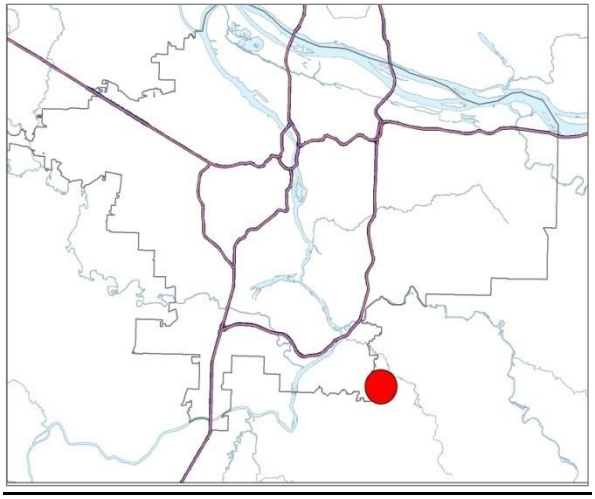
Redevelopment projects that make use of existing facilities can provide a high level of service/amenity, while also controlling costs. This is not to suggest that there are no costs associated with using existing infrastructure capacity, but merely that a large portion of those costs are already sunk and that it makes more sense to use that available capacity where possible.

Travel behavior

The relationship between travel behavior and infrastructure demand is intuitive. More frequent and longer trips place greater demands on the transportation system, resulting in a collective need for more highway, bridge and transit capacity. Residents of areas near employment centers tend to have shorter trips by all modes.

Beavercreek Road concept planning area

Oregon City



Estimated local infrastructure capital costs:
$115,900,000

Total acres:	453
Gross buildable acres:	292
Net new households:	1,450
Net new jobs:	3,652
Avg. commute miles in the year 2035:	17.09

Proposed Use

The plan for this newly urbanizing area envisions a diverse mix of uses (an employment campus north of Loder Road, mixed use districts along Beavercreek Road, and two mixed use neighborhoods). One purpose of the plan is to improve the jobs-housing balance in Clackamas County. Transit-oriented land uses are planned to increase the feasibility of transit service in the future. The concept area is adjacent to Clackamas Community College, providing workforce-training opportunities for future area residents and employees.

Existing Conditions and planned improvements – Beavercreek Road

Transportation

The site is adjacent to Beavercreek Road and south of the intersection of Highways 213 and 205. Traffic on Highway 213 is congested during peak hours. Beavercreek Road is a major local connector. There is very limited bike and pedestrian infrastructure. Of the projected infrastructure costs, 57% 0f the local share is for transportation improvements. It should also be noted that regional infrastructure costs will be affected

by average commute distances from the Beavercreek area that are nearly 5 miles longer than the regional average.

Commute Distances
Longer travel distances translate into a need for more regional infrastructure per household. Residents of the census tract that comprises the Beavercreek Road area are forecasted to have an average commute distance of 17.09 miles in the year 2035, significantly higher than the 7-county average (12.32 miles).

Water
Water is sourced from the Clackamas River. While there is sufficient water supply, the study area currently lacks an onsite distribution system.

Wastewater
An existing treatment plant has the capacity to serve the study area. There is a 12-inch sewer trunk that runs the length of Beavercreek Road, but this line lacks the capacity to serve the projected development.

Stormwater
The concept plan area drains into two basins, Abernethy Creek and Caufield Creek, both of which drain into the Willamette River, south of downtown Oregon City. Stormwater systems are largely undeveloped. This is one reason why stormwater infrastructure costs are expected to be significantly above the regional average at 22% of the total local infrastructure costs. The Beavercreek Road concept plan calls for green streets and onsite stormwater management. The plan also includes public open space in areas designated for natural stormwater treatment, which is intended to serve a dual function as both park and stormwater conveyance.

Parks, plazas, public places
There are no existing public parks within the plan area. There is an existing golf course on a portion of the site.

How do Beavercreek Road's infrastructure costs add up?

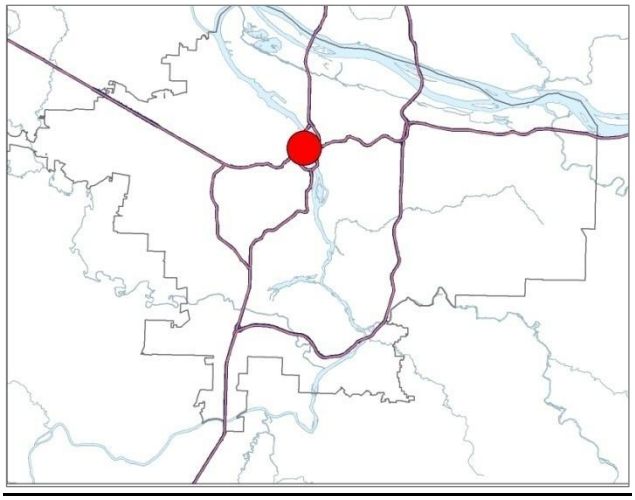
Estimated local infrastructure capital costs:

	Beavercreek Rd.
Transportation	$66,300,000
Transit, Bike, Pedestrian	-
Sewer	$8,500,000
Water	$15,900,000
Stormwater	$25,200,000
Parks	-
Other	-
Total	$115,900,000

Note that costs are related to both housing and job creation. Approximately 57% of costs are attributed to transportation infrastructure and approximately 22% are attributed to stormwater systems, including natural stormwater areas. The concept plan for the Beavercreek Road area does not project the need for any additional schools as a result of this development. Costs for regional transportation improvements (not included above) are significantly higher than average, due to commute distances projected to 2035.

Brewery Blocks

Portland



Estimated local infrastructure capital costs
$40,647,000

Total acres:	4.6
Gross buildable acres:	4.6
Net new households:	113
Net new jobs:	2,440
Avg. commute miles in the year 2035:	4.99

Proposed Use (completed project)

The Brewery Blocks redevelopment consists of a mix of high-density residential and commercial uses. The primary focus has been on job creation, with roughly 20 times as many new jobs as new housing units. It should be noted that the Brewery Blocks are located within a thriving redevelopment area of Portland, with the activities within this area completely interconnected with surrounding land uses. The Brewery Blocks have been able to take advantage of existing facilities, including transit, sewer, water, parks, and streets.

Existing Conditions – Brewery Blocks

Transportation

An urban street grid exists and the area is accessible by multiple modes. The streetcar system was developed as a part of the larger River District redevelopment. Many of the residents and employees within the Brewery Blocks are able to meet their transportation needs without their own motor vehicles.

Commute distance

Shorter travel distances translate into less regional infrastructure needed per household. Residents of the census tracts that include the Brewery Blocks are forecasted to have an average commute distance of 4.99 miles in the year 2035, considerably shorter than the 7-county average of 12.32 miles. This is expected to significantly reduce regional infrastructure costs over time.

Water
Sufficient water facilities already existed within the area in advance of development.

Wastewater
Sufficient wastewater facilities already existed within the area in advance of development.

Stormwater
Sufficient stormwater facilities already existed within the area in advance of development.

Parks, plazas, public places
Though there are no public parks within the Brewery Blocks, the development is able to take advantage of an existing park system that includes the North and South Park Blocks, Jamison Square, and Tanner Springs.

Structured parking and other improvements: The public costs associated with the redevelopment of the Brewery Blocks were attributed to the construction of structured parking, provision of street furnishings, and sidewalk improvements.

How do the Brewery Blocks' infrastructure costs add up?

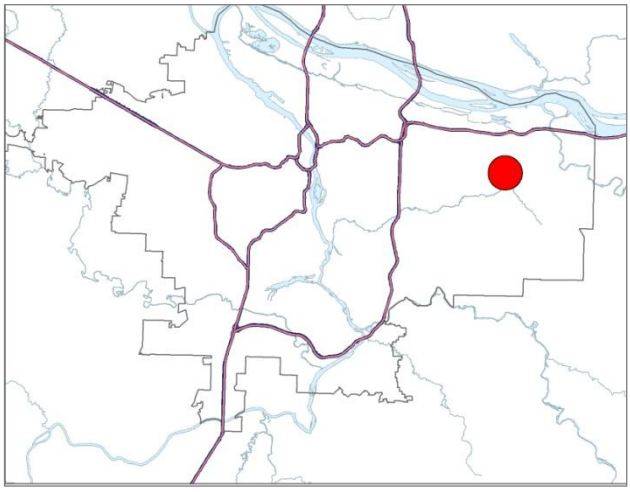
Estimated local infrastructure capital costs:

	Brewery Blocks
Transportation	-
Transit, Bike, Pedestrian	-
Sewer	-
Water	-
Stormwater	-
Parks	-
Other (See structured parking and other improvements, noted above)	$40,647,000
Total	$40,647,000

Note that, if all costs were related to job creation, the local infrastructure costs would average less than $17,000 per new job. Costs for regional transportation improvements attributed to the Brewery Blocks (not included above) are significantly lower than average, due to commute distances projected to 2035.

Civic Neighborhood

Gresham



Estimated local infrastructure capital costs: $11,606,000

Total acres:	5
Gross buildable acres:	5
Net new households:	636
Net new jobs:	2,433
Avg. commute miles in the year 2035:	11.13

Proposed Use

The City of Gresham intends the Civic Neighborhood, a redevelopment project, as an extension of its downtown. The area consists of a mix of residential, retail, and office uses served by transit. This case study area represents a 5 acre portion of the larger 130 acre Civic Neighborhood.

Existing Conditions and Planned Improvements – Civic Neighborhood

Transportation

The site is bisected by a light rail line and is served by four-lane major arterials and one local connector: Burnside Road, Division St., Eastman Parkway and the two-lane Wallula Road. Division St. was recently improved.

The bulk of projected Civic Neighborhood infrastructure costs are attributable to transit ($6,194,000) and transportation ($3,413,000) improvements.

Commute distance

Shorter travel distances translate into less regional infrastructure needed per household. Residents of the census tract that includes Civic Neighborhood are forecasted to have an average commute distance of 11.13 miles in the year 2035, more than a mile less than the 7-county average of 12.32 miles.

Water
The site is integrated into Gresham's existing water infrastructure.

Wastewater
The site is integrated into Gresham's existing sewer infrastructure.

Stormwater
Stormwater is handled by existing City of Gresham infrastructure.

Parks, plazas, public places
Though there are no parks within the Civic Neighborhood area, it is being developed with a pedestrian orientation.

Existing facilities: Civic Neighborhood is able to take advantage of existing facilities, including streets, sewer and water.

How do Civic Neighborhood's infrastructure costs add up?

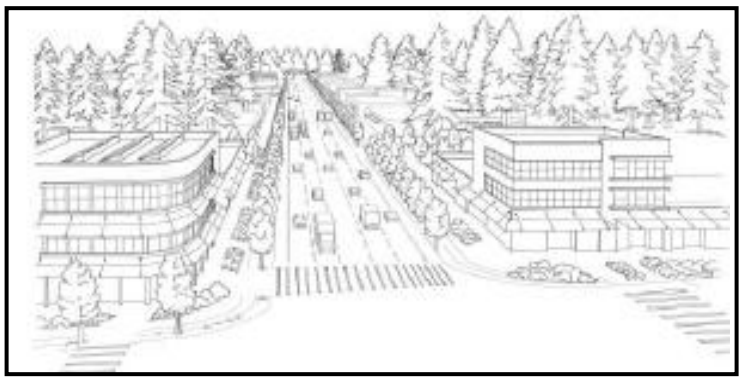
Estimated local infrastructure capital costs:

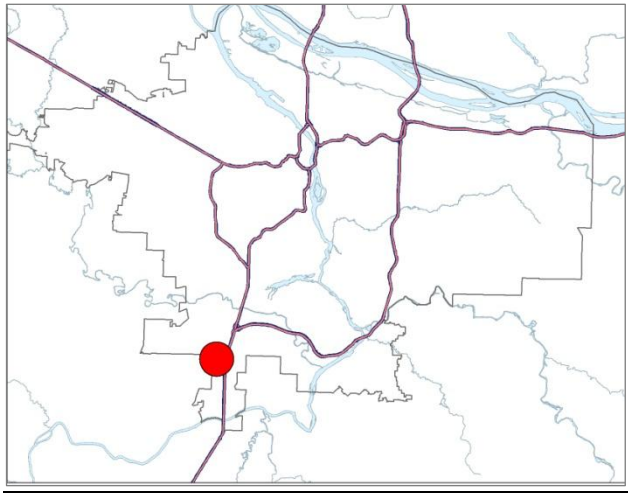
	Civic Neighborhood
Transportation	$3,413,000
Transit, Bike, Pedestrian	$6,194,000
Sewer	$366,000
Water	$266,000
Stormwater	$1,365,000
Parks	-
Other	-
Total	$11,606,000

Note that, even if all costs were related to job creation, the local infrastructure costs would average less than $5,000 per new job. More than 50% of all local infrastructure costs in the Civic Neighborhood are attributed to transit, bicycle, and pedestrian improvements. Costs for regional transportation improvements (not included above) are lower than average, due to commute distances projected to 2035.

Coffee Creek (1) master plan area

Wilsonville





Estimated local infrastructure capital costs:
$ 8,058,000

Total acres:	216
Gross buildable acres:	196
Net decrease in households:	10
Net new jobs:	1,474
Jobs per gross buildable acre:	7.5
Avg. commute miles in the year 2035:	12.82

Proposed Use

The Coffee Creek area is being planned as an employment area and is mapped as a Regionally Significant Industrial Area. Note that the area is planned to have no net increase in residential uses.

Existing Conditions and planned improvements – Coffee Creek

Transportation

The area is within 1/2 mile of the Wilsonville I-5 north interchange, with vehicle access via SW Lower Boones Ferry Road, Day Road and SW Grahams Ferry Road. There are few existing bicycle and pedestrian facilities and no transit service within the Coffee Creek Master Plan area. The closest transit stop is located nearby with a SMART bus line that provides stops along 95th Avenue and Commerce Circle (within ½ mile of the Master Plan area). West side commuter rail also provides service to the area. Over half of Coffee Creek's projected local infrastructure costs are attributable to transportation improvements ($4,518,000).

Commute distance

Longer travel distances translate into more regional infrastructure needed per household. Residents of the census tract that includes Coffee Creek are forecasted to have an average commute distance of 12.82 miles in the year 2035. This distance is ½ mile longer than the average for the 7-county region (12.32 miles).

Water
Water main transmission supply lines exist through the central and southern portions of the Master Plan area. An additional reservoir will be needed at some point to provide adequate peak capacity prior to build out of the Master Plan area.

Wastewater
Sewer main trunk links are located within the central portion of the Coffee Creek Master Plan area. Site survey work will need to occur and the City will need to update its sewer system model to determine on and offsite sewer system improvements and trunk line size/location, pump station requirements, and more detailed cost estimates.

Stormwater
The north tributary to Basalt Creek is located south of Day Road. Basalt Creek drains into Coffee Creek Lake and extends north of Day Road into the City of Tualatin UGB. The master plan area is relatively flat with topography that varies only a few feet in elevation, and gently slopes from north to south. The City requires each new development within the Coffee Creek Industrial Master Plan area to detain and treat run off.

Parks, plazas, public places
There are no existing park facilities within the Master Plan area.

How do Coffee Creek's infrastructure costs add up?

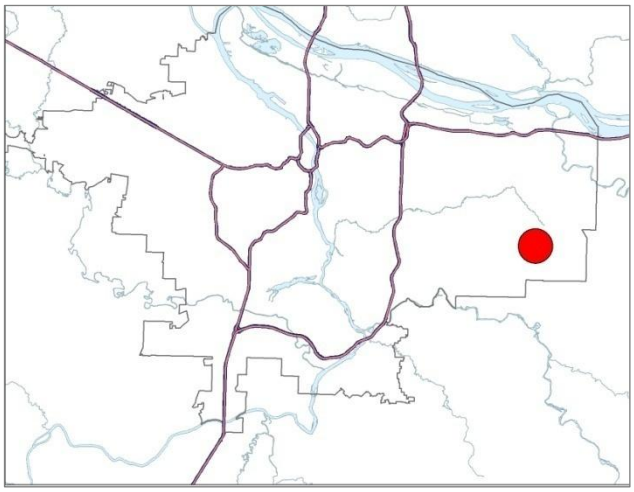
Estimated local infrastructure capital costs:

	Cost per job	Totals
Transportation	$3,065	$4,518,000
Transit, Bike, Pedestrian	-	-
Sewer	$1,038	$1,530,000
Water	$773	$1,140,000
Storm	$204	$300,000
Parks	$387	$570,000
Other	-	-
Total	$5,467	$8,058,000

Note that all costs are related to job creation. The local infrastructure costs are projected to average less than $5,500 per new job. More than 55% of all local infrastructure costs in the Coffee Creek area are attributed to transportation improvements. Costs for regional transportation improvements (not included above) are slightly higher than average, due to commute distances projected to 2035.

Damascus / East Happy Valley Concept Plan

Damascus and Happy Valley



Estimated local infrastructure capital costs: $3,119,295,000

Total acres:	12,200
Gross buildable acres:	5,739
Net new households:	21,934
Net new jobs:	45,000
Avg. commute miles in the year 2035:	13.5

Proposed Use

The Damascus area is a newly urbanizing area, and is being planned as a new community that will include a variety of housing densities, mixed-use areas, and employment zones. The study area includes both the City of Damascus and some land in eastern Happy Valley. The concept plan has not yet been adopted. With estimated local infrastructure capital costs totaling more than $3 billion, it is easy to see why creating a new city is so difficult.

Existing Conditions and planned improvements -- Damascus

Transportation

The area is served by a transportation system that was designed for farm-to-market travel purposes. The street system is primarily made up of narrow, two-lane roads that carry urban levels of traffic. Highway 212, 172nd Avenue, Foster Road, 242nd Avenue, 222nd Avenue and Sunnyside Road are the primary routes that connect the communities of Damascus and Boring to other parts of the region. Some roads perform adequately during rush hour, but significant congestion and safety issues exist in the current Damascus city center (where Sunnyside, Highway 212, and Foster Road converge). Streets do not have bicycle and pedestrian facilities, except for sidewalks along limited sections of Highway 212 in the Damascus and Boring rural centers. Transit service is limited to two bus lines; a park-and-ride lot is located in Carver. The majority of the study area is located outside of the TriMet service boundary. $1,731,623,000 of the

projected local infrastructure costs for Damascus are for transportation improvements. Regional transportation facilities (Sunrise Hwy) have not been included in the cost estimates.

Commute distance: Longer travel distances translate into more regional infrastructure needed per household. Residents of the census tracts that comprise the Damascus area are forecasted to have an average commute distance of 13.5 miles in the year 2035. This distance is more than a mile longer than the average for the 7-county region (12.32 miles).

Water
Two water districts, the Boring Water District and the Sunrise Water Authority, serve portions of the study area. Substantial portions of the area have no public water service.

Wastewater
Most of the primary study area has no sanitary sewer service. Only the far eastern edge of Damascus (Rock Creek corridor) has sanitary service. There are no sanitary sewage treatment facilities within the primary study area. There is a small, publicly-owned sanitary sewage treatment facility in the Boring rural center, but it is not available for additional hook-ups.

Stormwater: There is no existing public stormwater service in the study area.

Parks, plazas, public places
North Clackamas County contains a wide range of regional, state and county parks and recreation facilities. Metro owns a parcel in the Damascus Buttes area. Clackamas County, the City of Portland, and the state own the right-of -way for the Cazadero and Springwater trails, which are currently undeveloped. Clackamas County provides parks near the study area, including Barton Park, a 116-acre county recreation facility located along the Clackamas River.

Topography / natural features: Buttes and transition areas (15-25% slopes) cover large portions of the Damascus area. Riparian areas are also found throughout the concept plan area. These features reduce average densities, making each unit more expensive to serve. The topography is expected to split the wastewater system to the east and to the west, resulting in increased cost of collection and conveyance. Existing treatment facilities are located some distance from the urban centers.

How do Damascus' infrastructure costs add up?

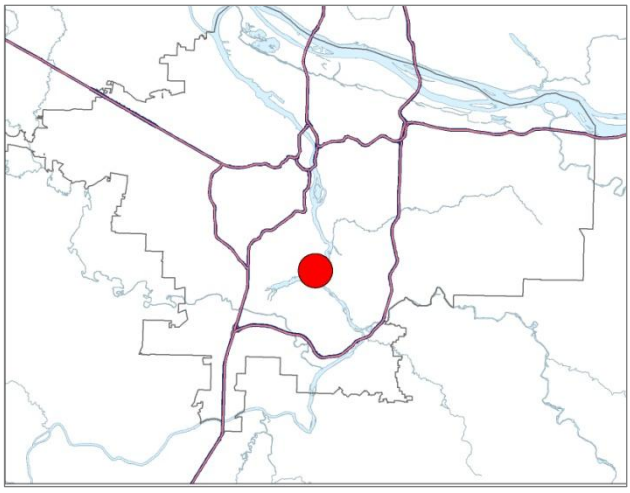
Estimated local infrastructure capital costs:

	Damascus
Transportation	$1,731,623,000
Transit, Bike, Pedestrian	-
Sewer	$162,200,000
Water	$282,843,000
Stormwater	$75,712,000
Parks	$390,203,000
Other	$476,674,000
Total	$3,119,295,000

Note that costs are related to both new housing and job creation. More than 55% of all local infrastructure costs in the Damascus area are attributed to transportation improvements. Costs for regional transportation improvements (not included above) are slightly higher than average, due to commute distances projected to 2035.

Lake View Village Center

Lake Oswego



Estimated local infrastructure capital costs: $5,116,000

Total acres:	2.39
Gross buildable acres:	2.39
Net new households:	0
Net new jobs:	207
New jobs per gross buildable acre:	86.6
Avg. commute miles in the year 2035:	8.83

Proposed Use (project completed)

Lake View Village Center is a redevelopment project that includes mixed uses (restaurant, retail, office) with structured parking. Although the Lake View Village Center development included no housing units, this commercial development has stimulated the construction of numerous housing units on surrounding blocks. The focus has been on job creation, and on stimulating new development in the rest of downtown Lake Oswego. The land uses resulting from redevelopment of this area are completely interconnected with surrounding land uses. This area has been able to take advantage of existing facilities, including sewer, water, parks, and streets.

Existing Conditions – Lake View Village Center

Transportation
An existing street network serves the area.

Commute distance: Shorter travel distances translate into less regional infrastructure needed per household. Residents of the census tracts that include Lake View Village are forecasted to have an average commute distance of about 8.83 miles in the year 2035, approximately 3 ½ miles less than the 7-county average of 12.32 miles

Water
Adequate water supply exists for the plan area.

Wastewater
Adequate sewer capacity exists in the plan area.

Stormwater
Adequate capacity to handle stormwater exists in the plan area.

Parks, plazas, public places
Millennium Plaza Park is adjacent to the project area.

Structured parking: Most of the local infrastructure costs are attributable to the construction of a structured parking garage which provides service to the subject area and to surrounding businesses.

How do Lake View Village's infrastructure costs add up?

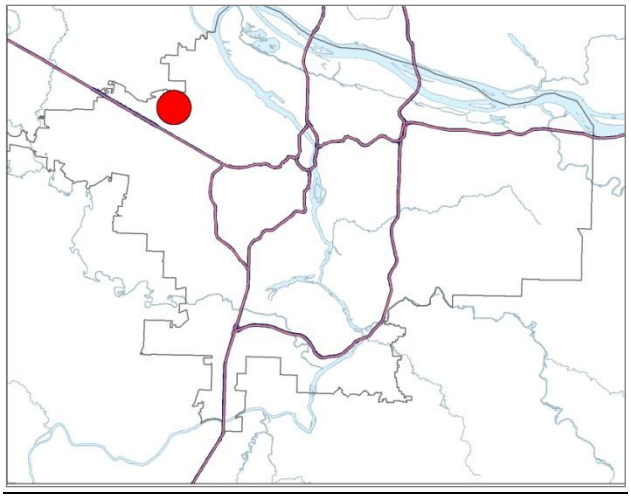
Estimated local infrastructure capital costs:

	Cost per job	Totals
Transportation	$3,850	$797,000
Transit, Bike, Pedestrian	-	-
Sewer	-	-
Water	-	-
Storm	-	-
Parks	-	-
Other	$20,865	$4,319,000
Total	$24,715	$5,116,000

Note that all costs are related to job creation. The local infrastructure costs averaged almost $25,000 per new job. More than 80% of all local infrastructure costs in the Lake View Village development are attributed to the construction of a public parking structure. Costs for regional transportation improvements (not included above) are considerably lower than average, due to average commute distances projected to 2035.

North Bethany concept planning area

Washington County



Estimated local infrastructure capital costs:
$416,633,000

Total acres:	800
Gross buildable acres:	680
Net new households:	5,000
Net new jobs:	276
Avg. commute miles in the year 2035:	11.92

Proposed Use

The North Bethany area is a newly urbanizing area that is being planned as a primarily residential community with ancillary commercial and institutional uses.

Existing Conditions and planned improvements – North Bethany

Transportation

Major transportation facilities in the vicinity of the plan area include Springville Rd., Kaiser, 185th, and Germantown Rd. There is bus service on Springville, 185th, and Kaiser. The Concept Plan includes costs for off-site improvements (Bethany Blvd. / US 26 overpass). Those costs have not been included in North Bethany's local infrastructure costs since they are regional facilities.

Commute distance

Shorter travel distances translate into less regional infrastructure needed per household. Residents of the census tract that comprises North Bethany are forecasted to have an average commute distance of 11.92 miles in the year 2035, slightly lower than the 7-county average (12.32 miles).

Water
The current source of water in the concept area is private wells. When developed, the area will be served by Tualatin Valley Water District.

Wastewater
Wastewater is currently handled on-site through the use of septic systems.

Stormwater
Stormwater runoff from the project site follows the natural topography, and is generally managed by several stream channels and culverts. The western end of the project site drains directly to Rock Creek. The remainder of the site is the headwaters of small drainages that are tributaries to Abbey Creek and Bethany Creek.

Topography and natural areas
The North Bethany area is relatively flat with the exception of the northern portion, which is sloped. A number of riparian zones cross the area.

Parks, plazas, public places
Though there are a number of open spaces, trails, and parks in the vicinity, there are no such areas that currently exist within the concept plan area. Envisioned as a "Community of Distinction," the North Bethany Concept Plan projects significant amounts of parkland ($38,700,000 estimated cost). These parks would match the level-of-service standards of the Tualatin Hills Park and Recreation District.

Schools: North Bethany's local infrastructure costs include the construction of 3 schools ($90 -$111 million). These projected costs include both land purchase and school construction.

How do North Bethany's infrastructure costs add up?

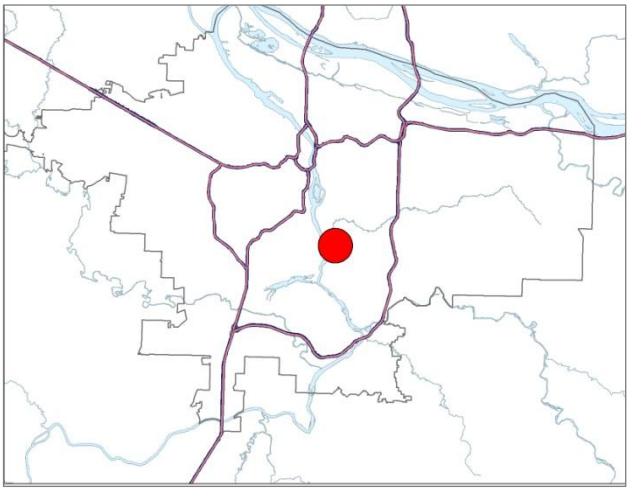
Estimated local infrastructure capital costs:

	North Bethany
Transportation (including Transit, Bike, Pedestrian)	$170,460,000
Sewer	$14,602,000
Water	$16,873,000
Stormwater	$14,926,000
Parks	$41,858,000
Other (schools, fire station and civic building)	$157,914,000
Total	$416,633,000

Note that, if all costs were related to housing, the local infrastructure costs would average about $83,500 per housing unit. More than 40% of all local infrastructure costs in the North Bethany area are attributed to transportation improvements. Washington County also calculated an additional $23,000,000 cost in providing affordable housing and another $131,300,000 in off-site transportation improvements (not included above). Costs for regional transportation improvements (not included above) are slightly lower than average, due to commute distances projected to 2035.

North Main Village

Milwaukie



Estimated local infrastructure capital costs
$ 919,000

Total acres:	1.9
Gross buildable acres:	1.9
Net new households:	95
Net new jobs:	40
Avg. commute miles in the year 2035:	7.99

Proposed Use (completed)

North Main Village is a redevelopment project located in downtown Milwaukie that consists of three-story townhomes, each with a garage and ground floor commercial element with two stories of living space above. The project also includes twenty condominium units.

Existing Conditions – North Main Village

Transportation

North Main Village's location in an already urbanized setting affords it access to existing transportation facilities including the Milwaukie Transit Center. However, transportation improvements are necessary to serve the area's growth.

Commute distance

Shorter travel distances translate into less regional infrastructure needed per household. Residents of the census tract that includes North Main Village are forecasted to have an average commute distance of 7.99 miles in the year 2035, considerably lower than the 7-county average of 12.32 miles. This is expected to reduce regional infrastructure costs over time.

Water
Existing water facilities are sufficient to serve North Main Village.

Wastewater
Existing wastewater facilities are sufficient to serve North Main Village.

Stormwater
Existing stormwater facilities are sufficient to serve North Main Village.

Parks, plazas, public places
North Main Village has no on-site parks, but a number of parks are nearby: Milwaukie Riverfront Park, Scott Park, and Dogwood Park.

Land write-downs
About $108,000 is attributable to land write-downs (included in "other" costs).

How do North Main Village's infrastructure costs add up?

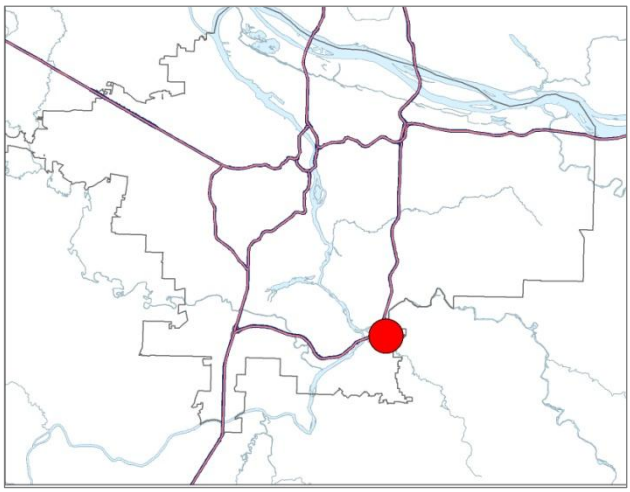
Estimated local infrastructure capital costs:

	North Main Village
Transportation	$811,000
Transit, Bike, Pedestrian	-
Sewer	-
Water	-
Stormwater	-
Parks	-
Other	$108,000
Total	$919,000

More than 88% of all local infrastructure costs in the North Main Village area are related to transportation improvements. Costs for regional transportation improvements (not included above) are significantly lower than average, when compared to commute distances projected to 2035.

Park Place concept planning area

Oregon City



Estimated local infrastructure capital costs:
$ 71,760,000

Total acres:	480
Gross buildable acres:	266
Net new households:	1,458
Net new jobs:	0
New households per gross buildable acre:	5.48
Avg. commute miles in the year 2035:	12.27

Proposed Use

Park Place is a newly urbanizing area, planned as a residential community with neighborhood retail and service uses. A developer has been consolidating ownership of over half of the plan area. It is hoped that ownership consolidation will simplify the provision of public facilities.

Existing Conditions and planned improvements – Park Place

Transportation

Isolated portions of the roadway system experience congestion and delays. The Highway 213 corridor is approaching capacity, particularly on the segment between Redland Road and the I-205 interchange. The public transit system provides limited service to this low-density, suburban location. The bicycle and pedestrian systems are incomplete, but plans exist to make incremental improvements. Park Place's transportation costs are projected to be $58,400,000, and make up the bulk of its local / community level infrastructure costs.

Commute distance

Travel distances correlate to more regional infrastructure needed per household. Park Place residents are forecasted to have an average commute distance of 12.27 miles in the year 2035. This distance is about average for the 7-county region (12.32 miles).

Water
Water conveyance facilities are limited within the study area. The Oregon City water system has sufficient water supply to serve the study area.

Wastewater
Limited wastewater collection facilities exist within the study area. Most properties are on septic systems. Two trunk interceptor lines, owned by the Tri-City Sewer District, pass through the study area. These interceptors connect with the Highway 213/ Newell interceptor, which conveys their flows to the wastewater treatment plant. These interceptors and the treatment plant have capacity to serve future development within the study area.

Stormwater
Stormwater is currently managed with roadside ditches and natural drainage channels. No other major stormwater facilities exist on site. All stormwater within the study area is conveyed to Abernethy Creek, Newell Creek, and Livesay Creek. Abernethy Creek and Newell Creek are subject to occasional flooding.

Topography / natural features
Large portions of the Park Place concept area have limited development potential because of constraints such as steep slopes and wetlands. These natural features provide valuable site amenities.

Parks, plazas, public places
Clackamas County and Metro own open spaces within the concept plan area.

How do Park Place's infrastructure costs add up?

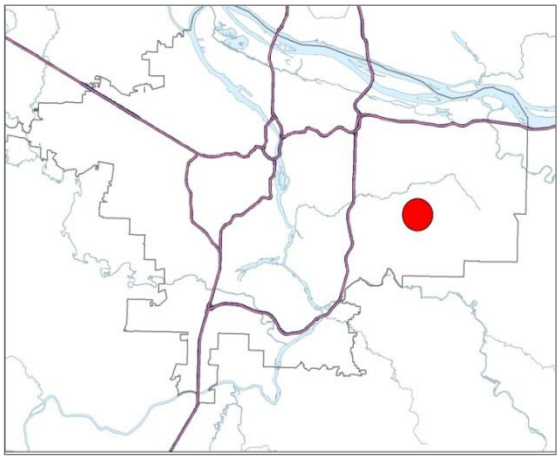
Estimated local infrastructure capital costs:

	Cost per housing unit	Totals
Transportation	$40,055	$58,400,000
Transit, Bike, Pedestrian	-	-
Sewer	$3,780	$5,520,000
Water	$2,606	$3,800,000
Storm	$562	$820,000
Parks	$2,209	$3,220,000
Other	-	-
Total	$49,218	$71,760,000

Note that all costs are related to new housing. The local infrastructure costs are projected to average more than $49,000 per housing unit. More than 80% of all local infrastructure costs in the Park Place area are attributed to transportation improvements. Costs for regional transportation improvements (not included above) are about average, due to commute distances projected to 2035.

Pleasant Valley concept planning area

Gresham and Portland



Estimated local infrastructure capital costs:
$304,073,000

	Phase I	Total Area
Total acres:	243	1,530
Gross buildable acres:	120	1,071
Net new households:	656	4,926
Net new jobs:	0	4,935
Avg. commute miles in the year 2035:	10.8	10.8

Proposed Use

Pleasant Valley is a newly urbanizing area that is planned with a town center, residential neighborhoods, and employment zones. Of the total planning area, approximately 290 acres are within the City of Portland and the remainder (1,140 acres) is in the City of Gresham. To date, Gresham has completed the sewer improvements for Phase I of the development of Pleasant Valley. The information for the Gresham Phase I land, households, and jobs is displayed in the table above, compared with the total concept plan area. Estimated costs for both the Gresham Phase I and the long range cost estimates over a 30-year time period that will be shared by Portland and Gresham are displayed in the table below.

Existing Conditions and Planned Improvements – Pleasant Valley

Transportation

Most new residents will access the development from 190th/Pleasant View Drive. This facility is currently a two-lane rural road, but under the plan will become a 4-5 lane, multi-modal roadway.

Commute distance

Shorter travel distances translate into less regional infrastructure needed per household. Residents of the census tracts that comprise the Pleasant Valley area are forecasted to have an average commute distance of about 10.8 miles in the year 2035, lower than the 7-county average (12.32 miles).

Water

The area is primarily served by private wells. Upon development, water will be served by the City of Gresham and the City of Portland.

Wastewater

Wastewater is handled with private septic systems. Upon development, water will be served by the City of Gresham and the City of Portland.

Stormwater
Stormwater is currently directed to ditches along local roads. Following development, the area will be served by a regional detention system, maintained by the City of Gresham.

Parks, plazas, public places
An open space and parks master plan has been developed for Pleasant Valley. Following development, the area will be served by an open space and parks system that meets current City of Gresham standards.

Topography
The Pleasant Valley area is mostly rolling, but has a number of riparian areas.

Green practices
Most of the streets will be green streets. All stream crossings will use bridges (no culverts).

How do Pleasant Valley's infrastructure costs add up?

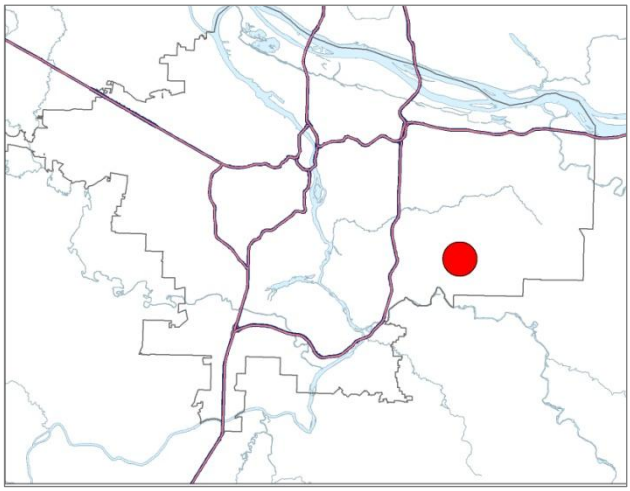
Estimated local infrastructure capital costs:

	Pleasant Valley	
	Phase I	**Total Area**
Transportation	$15,000,000	$103,823,000
Transit, Bike, Pedestrian	-	-
Sewer	$9,000,000 (completed)	$22,686,000
Water	$6,000,000	$21,172,000
Stormwater	-	$32,213,000
Parks	-	$70,186,000
Other	-	$53,993,000
Total	30,000,000	$304,073,000

Note that costs are related to a mix of new housing and new jobs. Approximately 34% of all local infrastructure costs in the Pleasant Valley area are attributed to transportation improvements. Costs for regional transportation improvements (not included above) are slightly lower than average, when compared to commute distances projected to 2035.

Rock Creek concept planning area

Happy Valley



Estimated local infrastructure capital costs
$ 48,796,000

Total acres:	670
Gross buildable acres:	357
Net new households:	2,815
Net new jobs:	619
Avg. commute miles in the year 2035:	10.72

Proposed Use

Rock Creek is a newly urbanizing area that is planned for residential, mixed-use, and employment uses.

Existing Conditions and Planned Improvements – Rock Creek

Transportation
Two-lane rural roads with soft shoulders and roadside drainage ditches are typical in the plan area. Approximately 2/3 of Rock Creek's local infrastructure costs are attributable to transportation improvements ($33,576,000). Roads, including Sunnyside Road, and 147th Avenue, have been improved to urban standards to provide multimodal access.

Commute distance
Shorter travel distances translate into less regional infrastructure needed per household. Residents of the census tracts that include the Rock Creek area are forecasted to have an average commute distance of 10.72 miles in the year 2035, less than the 7-county average (12.32 miles).

Water
Two wells and water from the Clackamas River supply the area. According to the Mt. Scott Water District, all necessary facilities are in place for any new developments in the planning area with the exception of a 12" water line for the higher areas.

Wastewater
There are three points of connection to the existing sewer system. There will need to be additional pumps installed in order to get the effluent to a point where a gravity flow system will work.

Stormwater
Storm drainage in the area is mostly over land, with some culverts under existing roads and ditches running alongside these roads. The area is split into two drainage areas that flow into Rock Creek and Sieben Creek.

Parks, plazas, public places
The area does not have any existing parks.

Topography
The Rock Creek area has slopes to the north (over 30% slopes) and Rock Creek and its tributaries flow through the area. South of Sunnyside Road, the area is relatively flat.

How do Rock Creek's infrastructure costs add up?

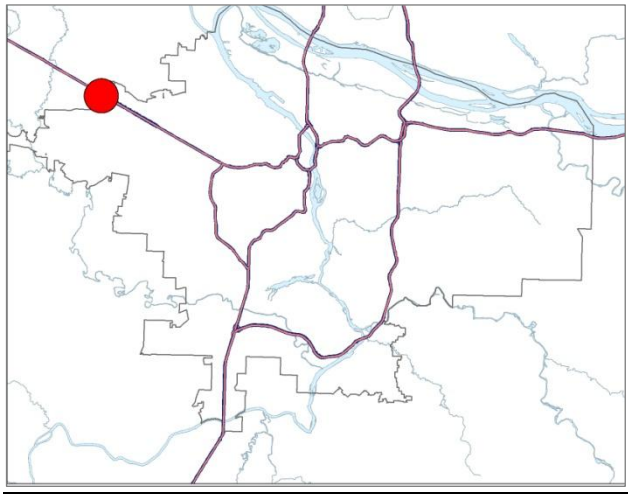
Estimated local infrastructure capital costs:

	Rock Creek
Transportation	$33,576,000
Transit, Bike, Pedestrian	-
Sewer	$1,076,000
Water	$3,185,000
Stormwater	$4,664,000
Parks	$6,295,000
Other	-
Total	$48,796,000

Note that most costs are related to housing. Almost 70% of all local infrastructure costs in the Rock Creek area are attributed to transportation improvements. Costs for regional transportation improvements (not included above) are slightly lower than average, when compared to commute distances projected to 2035.

Shute Road concept planning area

Washington County



Estimated local infrastructure capital costs:
$ 9,136,000

Total acres:	215
Gross buildable acres:	175
Net new households:	0
Net new jobs:	3,660
New jobs per gross buildable acre:	20.91
Avg. commute miles in the year 2035:	13.99

Proposed Use

The Shute Road concept area is a newly urbanizing area that is being planned to provide large lots for industrial uses. Genentech, an international biomedical manufacturer, has acquired nearly half of this site (85 acres). Genentech has developed phase 1 facilities and will provide 300-400 jobs in the first phase. Genentech has developed approximately 15% of the total planning area.

Existing Conditions and Planned Improvements – Shute Rd.

Transportation

The site is adjacent to the Shute Road exit of the Sunset Highway. Shute Road and Evergreen Road, both five-lane local connectors, intersect at the southwest corner of the site. Approximately 2/3 of local infrastructure cost for the Shute Road area is attributable to transportation improvements ($6,350,000).

Commute distance

Longer travel distances translate into more regional infrastructure needed per household. Residents of the census tract that comprises the Shute Rd. area are forecasted to have an average commute distance of 13.99 miles in the year 2035, longer than the 7-county average (12.32 miles).

Water

Water mains run along Shute Road and Evergreen Road, adjacent to the site.

Wastewater

There are currently no sanitary lines running though the site. One trunk line runs up Evergreen Road to the corner of the site and another line dead-ends into Shute Road near the center of the site.

Stormwater

Storm lines parallel water lines along Shute Road and Evergreen Road.

Parks, plazas, public places
There are no existing public parks or green spaces within the site.

Topography
The Shute Rd. concept area is relatively flat with a small riparian area associated with Waibel Creek. The area around the creek is not considered to be wetland.

How do Shute Road's infrastructure costs add up?

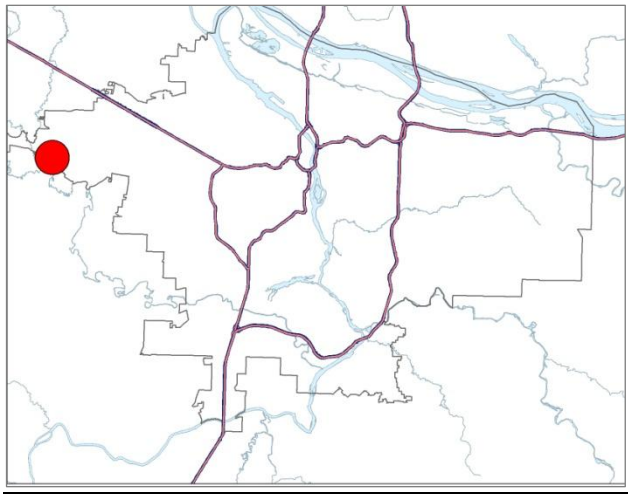
Estimated local infrastructure capital costs per new job:

	Cost per job	Totals
Transportation	$1,735	$6,350,000
Transit, Bike, Pedestrian	-	-
Sewer	$264	$967,000
Water	$169	$619,000
Stormwater	$328	$1,200,000
Parks	$387	$570,000
Other	-	-
Total	$2,496	$9,136,000

Note that all costs are related to new job creation. Approximately 70% of all local infrastructure costs in the Shute Road area are attributed to transportation improvements. Roughly 13% of costs are for stormwater conveyance. Costs for regional transportation improvements (not included above) are slightly higher than average, when compared to commute distances projected to 2035.

South Hillsboro concept planning area

Hillsboro



Estimated local infrastructure capital costs:
$295,517,000

Total acres:	1,565
Gross buildable acres:	1,030
Net new households:	10,182
Net new jobs:	879
Avg. commute miles in the year 2035:	12.2

Proposed Use

South Hillsboro is an area that includes land both inside and adjacent to the Urban Growth Boundary. The concept plan for the area includes residential, retail, and office uses. Note that the area is planned to include roughly 11 ½ housing units for each new job.

Existing Conditions and Planned Improvements – South Hillsboro

Transportation

Current transportation facilities generally consist of two lane sections without curbs. Drainage crossings are primarily culverts with some minor retaining / transition structures. At-grade railroad crossings connect the study area to Tualatin Valley Highway.

Commute distance

Longer travel distances translate into more regional infrastructure needed per household. Residents of the census tract that comprises the South Hillsboro area are forecasted to have an average commute distance of 12.2 miles in the year 2035, slightly less than the 7-county average.

Water
Existing 8" and 10" waterlines to the northwest of the study area provide distribution to current development in that area and will eventually be connected to the grid for the South Hillsboro planning area. An existing 42" transmission line is located at the south side of the railroad tracks along the north edge of the South Hillsboro planning area. Connection to this line will be made to serve south into the planning area.

Wastewater
A 24" trunk sewer in Davis Road extending from the River Road Pump Station to SW 234th Avenue is currently being constructed. The trunk sewer is designed to serve 525 acres, including a significant portion of the South Hillsboro planning area. Area 71 is within this service area. The Clean Water Services "Aloha Pump Station" on SW 209th Avenue near SW Stoddard Drive and the Cross Creek Pump Station further south on 209th Avenue near SW Murphy Lane can serve Area 69 of the South Hillsboro planning area.

Stormwater
Development to the west and north of the study area includes storm drainage conveyance, storage and treatment of the areas consistent with standards in place at the time of the respective land use action. Outfall from these systems is to natural drainage tributaries of the Tualatin River. Throughout the South Hillsboro planning area, ditches provide storm water management along roadways. Large agricultural tracts have surface ditches that direct flow to natural conveyances, including a number of creeks. No stormwater facility costs have been identified for the area.

Topography
The South Hillsboro area is relatively flat.

Parks, plazas, public places
The City of Hillsboro currently has no park or recreation facilities located within the South Hillsboro Community Plan Study Area. The Bonneville Power Administration right-of-way north of Tualatin Highway extends south into the study area and could accommodate a trail.

How do South Hillsboro's infrastructure costs add up?

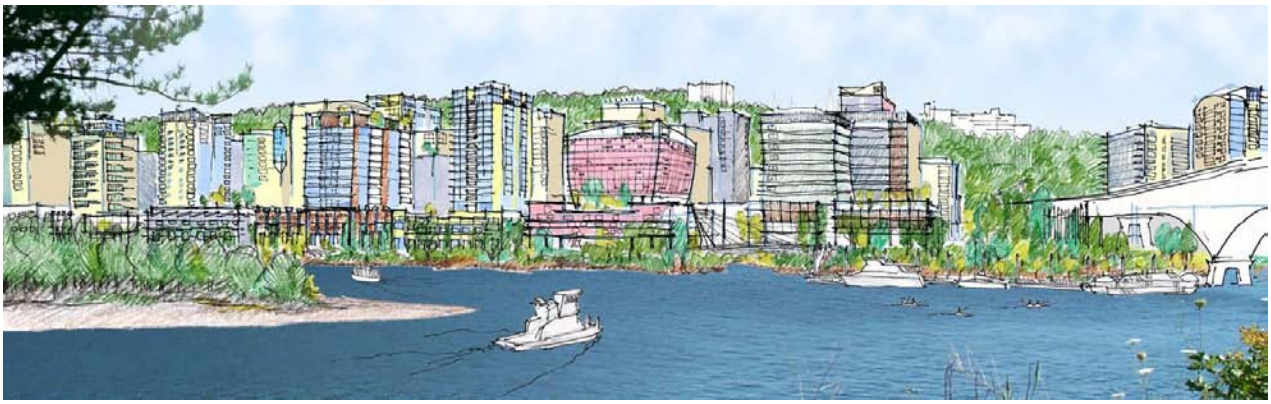
Estimated local infrastructure capital costs:

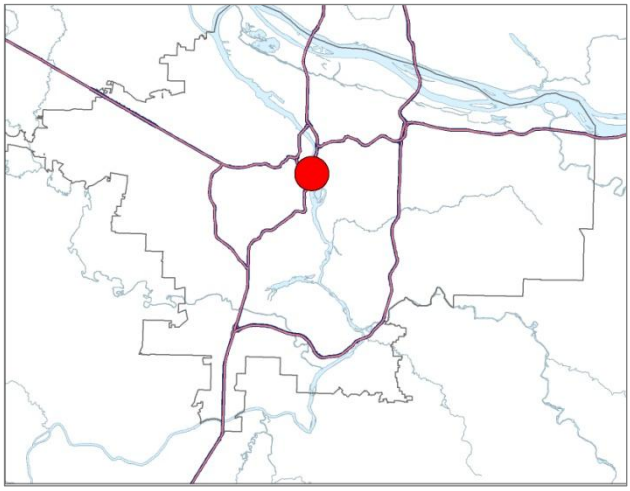
	South Hillsboro
Transportation	$203,057,000
Transit, Bike, Pedestrian	-
Sewer	$7,550,000
Water	$11,316,000
Stormwater	-
Parks	$56,894,000
Other	$16,700,000
Total	$295,517,000

Note that costs are related to both new housing and job creation. Approximately 69% of all local infrastructure costs in the South Hillsboro area are attributed to transportation improvements. No costs were projected for either schools or stormwater facilities. Costs for regional transportation improvements (not included above) are slightly lower than average, when compared to commute distances projected to 2035.

South Waterfront

Portland





Estimated local infrastructure capital costs:
$323,457,000

Total acres:	130
Gross buildable acres:	100
Net new households:	3,600
Net new jobs:	10,000
Avg. commute miles in the year 2035:	5.33

Proposed Use

The South Waterfront District offered a unique opportunity for redevelopment as it provided the largest block of vacant or underutilized land within the city's core. The district is being redeveloped with a mix of urban-scale offices, housing, hotels, parks and retail uses – with substantially more new jobs than housing units. The area is served by a multimodal transportation system and may serve as a transit hub for south downtown. Redevelopment in the district is meant to serve as a catalyst for the creation of a larger science and technology-based economy in the Central City.

Existing Conditions – South Waterfront

Existing facilities

South Waterfront is able to take advantage of existing streets, sewer, and water facilities. Most local / community costs are attributable to transportation ($148,445,000), transit / bike / pedestrian ($29,900,000), park ($92,553,000), and affordable housing requirements.

Transportation
Though the South Waterfront's central Portland location affords it extensive transportation connections, a substantial amount of redevelopment is contemplated.

Commute distance
Shorter travel distances translate into less regional infrastructure needed per household. Residents of the census tracts that include South Waterfront are forecasted to have an average commute distance of 5.33 miles in the year 2035, almost 7 miles shorter than the 7-county average of 12.32 miles. This is expected to significantly reduce regional infrastructure costs over time.

Water
Existing water facilities are sufficient to serve South Waterfront.

Wastewater
Existing sewer facilities are sufficient to serve South Waterfront.

Stormwater
Upgrades to the areas stormwater system will be necessary to serve the planned development.

Parks, plazas, public places
There is a park within the plan area. The plan also includes the restoration of the Willamette River Greenway through the site. Given the area's central location, numerous parks and trails are in the vicinity.

How do South Waterfront's infrastructure costs add up?

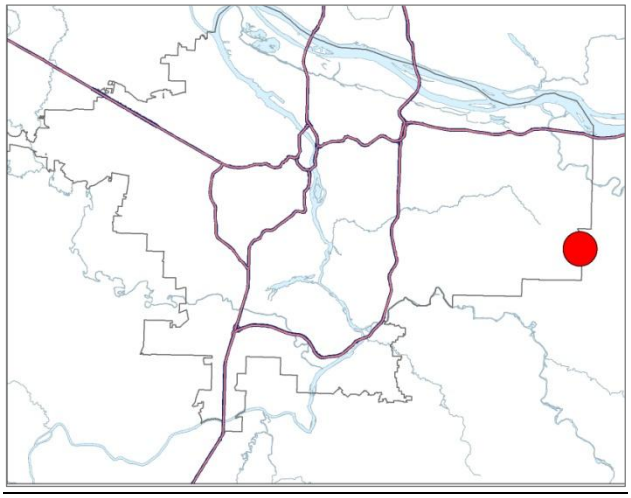
Estimated local infrastructure capital costs:

	South Waterfront
Transportation	$148,445,000
Transit, Bike, Pedestrian	$29,900,000
Sewer	-
Water	-
Stormwater	$710,000
Parks	$92,553,000
Other	$51,850,000
Total	$353,457,000

Note that costs are related to both new housing and job creation. Approximately 46% of all local infrastructure costs in the South Waterfront area are attributed to transportation improvements, with 29% for parks and open spaces. Costs for regional transportation improvements (not included above) are significantly lower than average, when compared to commute distances projected to 2035.

Springwater Community Plan

Gresham



Estimated local infrastructure capital costs
$375,791,000

Total acres:	1,272
Gross buildable acres:	762
Net new households:	1,609
Net new jobs:	15,330
Avg. commute miles in the year 2035:	12.82

Proposed Use

The Springwater area is a newly urbanizing area that is planned for industrial/high-tech campuses. To augment the mixed-use theme of the City as a whole, a village center with mixed retail and housing, and low-density residential development are also planned for areas too sloped for industrial use.

Existing Conditions and Planned Improvements -- Springwater

Transportation

The existing transportation system was designed primarily to serve rural residential and farm-to-market uses. The arterials are generally fast moving with most intersections either having no traffic control or only stop signs. Highway 26 is the major thoroughfare that traverses the study area, connecting Gresham with both Portland (to the west) and Sandy (to the southeast). Hogan Road/242nd Avenue also provides a north/south connection through the western portion of Springwater. Almost 2/3 of the projected local infrastructure costs ($237,231,000) for the Springwater area are attributable to transportation improvements.

Commute distance
Longer travel distances translate into more regional infrastructure needed per household. Residents of the census tract that includes the Springwater area are forecasted to have an average commute distance of 12.82 miles in the year 2035. This distance is ½ mile longer than the average for the 7-county region (12.32 miles).

Water
The area has no public water system. Private wells currently serve the area.

Wastewater
The area has no public sewer system. Waste is directed to private septic systems.

Stormwater
The area has no public stormwater system. Stormwater is directed to creeks and to drainage ditches along roads.

Parks, plazas, public places
The area has no public parks, but is bisected by the Springwater Corridor, a regional trail that connects Portland to Boring.

Topography / natural features
With the exception of its western portion, the Springwater area is relatively flat. The sloped, western portion of the area is planned for low-density residential development. The concept area also has a number of riparian areas. These features reduce average densities, making the area more expensive to serve, but may enhance property values.

How do Springwater's infrastructure costs add up?

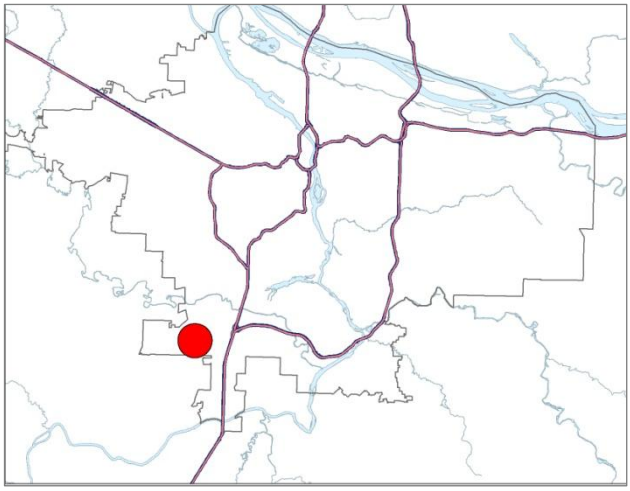
Estimated local infrastructure capital costs:

	Springwater
Transportation	$237,231,000
Transit, Bike, Pedestrian	-
Sewer	$28,894
Water	$35,032
Stormwater	$29,993
Parks	$44,642
Other	-
Total	$375,791,000

Note that costs are related primarily to job creation. Approximately 68% of all local infrastructure costs in the Springwater area are attributed to transportation improvements. Costs for regional transportation improvements (not included above) are slightly higher than average, when compared to average commute distances projected to 2035.

SW Tualatin Concept Plan

Tualatin



Estimated local infrastructure capital costs
$ 60,628,000

Total acres:	431
Gross buildable acres:	352
Net new households:	0
Net new jobs:	5,760
New jobs per gross buildable acre:	16.36
Avg. commute miles in the year 2035:	12.36

Proposed Use

SW Tualatin is a newly urbanizing area that is planned for industrial uses. Note that no residential uses are planned in this area.

Existing Conditions and Planned Improvements – SW Tualatin

Transportation

SW Tualatin-Sherwood Road, SW 115th Avenue and SW 120th Ave to the north and SW Tonquin Road and SW Waldo Way to the south serve the SW Tualatin concept area. A future SW 124th Avenue arterial connection is planned to connect Tualatin-Sherwood Road with SW Tonquin Road, and is expected to become a primary point of vehicle access in the future. This connection would be regarded as a community level facility as it would serve both Tualatin and Sherwood. SW 115th Avenue will serve as a secondary north-south access between SW Tualatin-Sherwood Road and SW Tonquin Road. A railroad line boarders the east boundary of the study area.

A substantial portion of the projected local infrastructure costs for SW Tualatin are attributable to transportation improvements. Since the writing of the concept plan, estimated costs for 124th Avenue have gone up significantly. Other transportation projects have also increased in cost since 2005, including SW 115 Avenue, SW Blake Street, SW 120 Avenue, Tonquin Road and Waldo Way. Tualatin now anticipates dividing a portion of those transportation costs with the county and state.

Commute distance

The SW Tualatin area is forecasted to have an average commute distance of 12.36 miles in the year 2035, roughly the same as the 7-county average (12.32 miles).

Water

No public water lines currently serve the study area.

Wastewater
No sanitary sewer system of adequate size to serve the proposed development exists on or near the study area.

Stormwater
No storm water system exists within the study area. The plan area rises gradually in elevation. Drainage is imperfect, but generally toward the north and toward the south, with a break point at approximately the middle of the Concept Plan area. Drainage in the northern portion around and in the quarry infiltrates through the fragmented basalt. Drainage to the south flows toward Coffee Lake Creek/Seely Ditch, which flows to the Willamette River.

Parks, plazas, public places
There are no existing parks within the concept area. However, there are long-term plans for a regional trail that would follow the Bonneville Power Administration easement through the area. Additionally, a forested area is envisioned west of a railroad line located in the eastern boundary of the study area to create a transition from residential to industrial uses.

How do S.W. Tualatin's infrastructure costs add up?

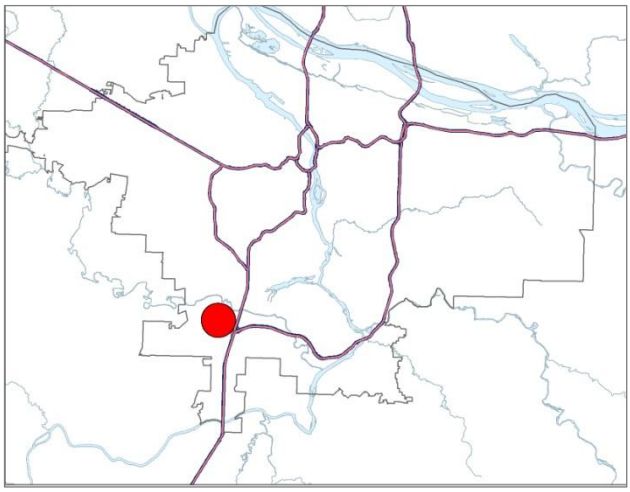
Estimated local infrastructure capital costs:

	Cost per job	Totals
Transportation	$7,147	$41,168,000
Transit, Bike, Pedestrian	-	-
Sewer	$1,680	$9,674,000
Water	$1,601	$9,224,000
Stormwater	$98	$562,000
Parks	-	-
Other	-	-
Total	$10,526	$60,628,000

Note that all costs are related to job creation. Approximately 68% of all local infrastructure costs in the S.W. Tualatin area are attributed to transportation improvements. Costs for regional transportation improvements (not included above) are about average, when compared to commute distances projected to 2035.

Tualatin Business Center

Tualatin



Estimated local infrastructure capital costs:
$298,000

Total acres:	12.5
Gross buildable acres:	7
Net new households:	0
Net new jobs:	124
Avg. commute miles in the year 2035:	12.2

Proposed Use

This area, along the Tualatin-Sherwood Highway, was planned and developed in 2001 by a private developer into 65,000 square feet of light industrial buildings. The site also houses motor vehicle fuel station and a car rental facility. The combined elements of the site are estimated to provide for 136 jobs.

Stormwater

This area was constrained by extremely high stormwater costs for mitigating off-site stormwater runoff. The developer faced a public requirement to mitigate on-site and off-site stormwater as a condition of approval for the project. As a result, costs for stormwater infrastructure were extra-ordinarily high at $298,000.

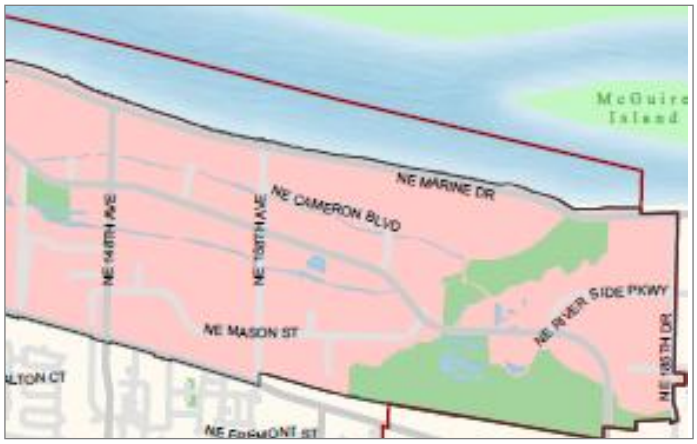
How do Tualatin Business Center's infrastructure costs add up?

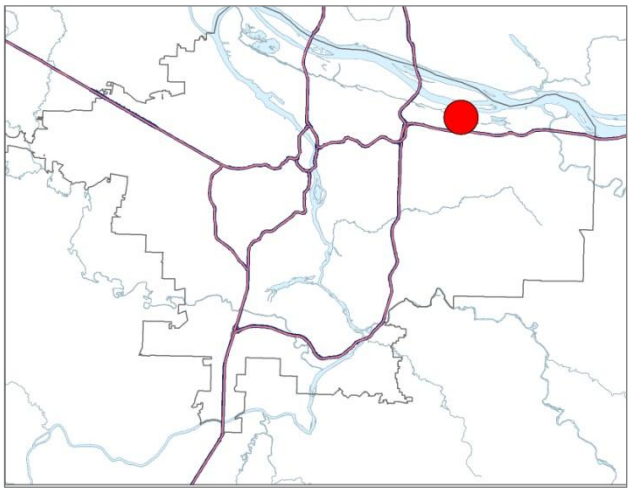
Estimated local infrastructure capital costs:

	Cost Per Job	Totals
Transportation	-	-
Transit, Bike, Pedestrian	-	-
Sewer	-	-
Water	-	-
Stormwater	$2,403	$298,000
Parks	-	-
Other	-	-
Total	$2,403	$298,000

West Coast Paper Site

Portland





Estimated local infrastructure capital costs:
$60,000

Total acres:	24.0
Gross buildable acres:	18.4
Net new households:	0
Net new jobs:	276
Avg. commute miles in the year 2035:	12.2

Proposed Use

This industrial site located near Marine Drive in Portland was completed in 2002 with the potential to accommodate 293,500 square feet of light industrial in two buildings and a total of 276 jobs.

Stormwater

Part of this site is constrained by environmental/water quality protection areas (5.6 acres) and the only local/community infrastructure costs identified for this development were environmental mitigation impacts. The developer also paid system development charges to offset additional infrastructure capacity improvements.

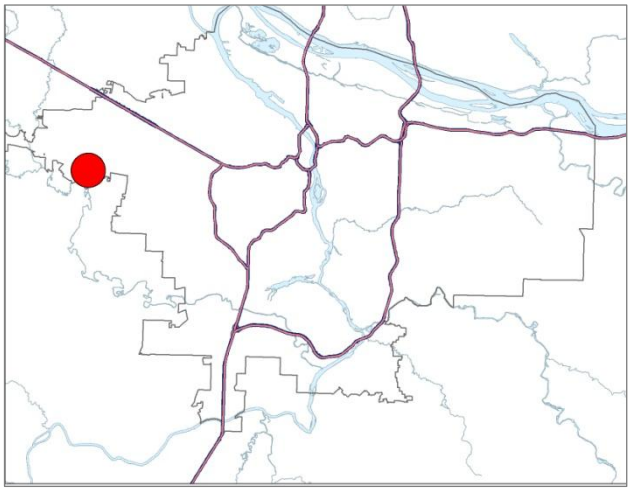
How do West Coast Paper site's infrastructure costs add up?

Estimated local infrastructure capital costs:

	Cost Per Job	Totals
Transportation	-	-
Transit, Bike, Pedestrian	-	-
Sewer	-	-
Water	-	-
Stormwater	$217	$60,000
Parks	-	-
Other	-	-
Total	$217	$60,000

Witch Hazel concept planning area

Hillsboro



Estimated local infrastructure capital costs:
$39,559,000

Total acres:	318
Gross buildable acres:	270
Net new households:	2,000
Net new jobs:	0
New households per gross buildable acre:	7.41
Avg. commute miles in the year 2035:	12.20

Proposed Use

Witch Hazel is a newly urbanizing area that is planned as a residential community with eventual mixed-use zones. At this time, however, the concept plan lists only new residential units in the area.

Existing Conditions and Planned Improvements – Witch Hazel

Transportation

Direct north-south access to the Witch Hazel Village plan area is provided by three county roadways: SW River Road (along the western edge), SW 247th / Brookwood Avenue (at the center), and SW 234th/Century Boulevard (along the eastern edge); and east-west access is provided by one city roadway, SE Alexander Street (along the northern edge). Except for River Road, which has a bike lane, the roads are without sidewalks, curbs and bike/pedestrian infrastructure.

Commute distance

Shorter travel distances translate into less regional infrastructure needed per household. Residents of the census tract that comprises the Witch Hazel area are forecasted to have an average commute distance of 12.2 miles in the year 2035, slightly less than the 7-county average (12.32 miles).

Water

Current residents are on private well systems. Water service exists to the north of the area. When the plan area is annexed to the City and is urbanized, water will be supplied by the City of Hillsboro.

Wastewater

With the exception of the new Witch Hazel Elementary School (which has sewer service), all developed properties within the plan area are currently served by private septic systems. Sanitary sewer service exists to the north of the area.

Stormwater
The existing stormwater system within the plan area includes pipes/culverts, subsurface tiling, overland flow, natural swales, irrigation and roadway drainage ditches, all of which flow to Witch Hazel Creek or Gordon Creek, eventually draining to the Tualatin River.

Parks, plazas, public places
There are no existing public parks within the Witch Hazel Village plan area. However, Clean Water Services owns a wetland area in the northwest portion of the concept area.

Schools
There is an existing public school in the area. Note that no capital costs for new school construction have been included in these estimates.

How do Witch Hazel's infrastructure costs compare to the regional average?

Estimated local infrastructure capital costs:

	Cost per housing unit	Totals
Transportation	$3,431	$6,862,000
Transit, Bike, Pedestrian	-	-
Sewer	$4,638	$9,275,000
Water	$4,288	$8,575,000
Stormwater	$5,118	$10,236,000
Parks	$2,306	$4,612,000
Other	-	-
Total	$19,780	$35,559,000

Note that all costs are related to new housing. Approximately 71% of all local infrastructure costs in the Witch Hazel area are attributed to a combination of sewer, water and stormwater improvements. Costs for regional transportation improvements (not included above) are about average, when compared to commute distances projected to 2035.

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