Ecolopolis 4.0: Livability in Cascadia

Portland State University

Ecolopolis 4.0
Livability in Cascadia

Contents

NOTE TO THE READER: This is a working document that is the result of class projects carried out in USP 549: Regional Planning and Metropolitan Growth Management, offered by the Toulan School of Urban Studies and Planning at Portland State University. Version 1.0 was prepared following the Spring, 2005 class, Version 2.0 in Spring, 2006, and Version 3.0 in the Spring, 2008. The version you are now reading, 4.0, has been produced by the Fall, 2009 class. We expect this series to grow and change with each year and the contributions of each group of students. Students contributing to these documents, to date, include:

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Introduction

What is an Ecolopolis?

Jean Gottman's "Megalopolis", first described in 1964 as the urbanized area stretching from Boston to Washington, DC, has inspired the contemporary use of the term "megapolitan" (or "mega-region") to describe linked cities and the micropolitan areas between them. However, does the East Coast's Megalopolis provide a model for potential Cascadian urban development and inter-action?

The heavily urbanized nature of Megalopolis immediately seems to clash with Cascadian sensibilities. After all, access to the outdoors, open space and preservation of agricultural land provide many residents here with a strong sense of place and pride. People are attracted to the quality of life in our cities. Proximity to pristine mountains, rivers and forests, and the ocean is a top draw for skilled workers and young people. Cascadia's competitive advantage lies, at least in part, in the fact that it is NOT a continuously urbanized region yet still provides cosmopolitan amenities like arts and culture, fine food, shopping and sports.

What kind of Pacific Northwest do we want to live in? Can celebrating our uniqueness be the cornerstone for boosting our competitiveness? How can we prosper, accommodate a growing population and remain livable? The answer lies in the commitment of decision makers, developers and citizens to develop the region into what we've called an "Ecolopolis" rather than a Megalopolis.

What is an ecolopolis? We have defined it as a networked metropolitan system consisting of the metropolitan areas for Portland, Seattle, and Vancouver, BC, and the vital working and wild landscapes between them. Ecolopolis in our view is a continental and global economic unit, and it is a reflection of the unique Pacific Northwest bioregion known as "Cascadia."

What have we learned so far?
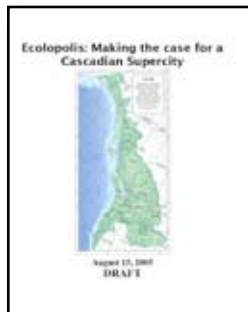
In "Ecolopolis 1.0: Making the Case for a Cascadian Supercity," we took up the challenge of investigating the nature and promise of a binational, tristate regional supercity in the territory referred to as Cascadia. For the purposes of this study, we concentrated on the three major metropolitan areas in the Pacific Northwest, namely Portland, Seattle, and Vancouver, BC.

The question we asked ourselves was what, besides locations in the northern temperate rainforest and the expectations of national interests outside of our respective corners of the Pacific Northwest, did these three metros share? What dynamics linking the three pointed to the promise of working to unite them under a common banner? More specifically, what would justify an investment in high(er) speed rail? If this is about economic competitiveness, what about current models of competitiveness suggested that the territory we should care about was Cascadian in scale?

What we found in that first effort was that local concerns trumped megaregional ties. Simply put, Cascadia was not yet at the point where megaregional projects would receive priority over local metropolitan and even statewide concerns. That said, we found strong suggestions for possible economic clusters organized and operating at a Cascadian scale, and clear allegiance to what can best be described as a Cascadian "brand." Both of these observations suggested the potential development of a competitiveness strategy for a Cascadian megaregion based on distinctive traits, landscapes, and culture. Further, work done on high and higher speed rail laid the groundwork for imagining a more connected and highly accessible Cascadian megaregion.

http://www.america2050.org
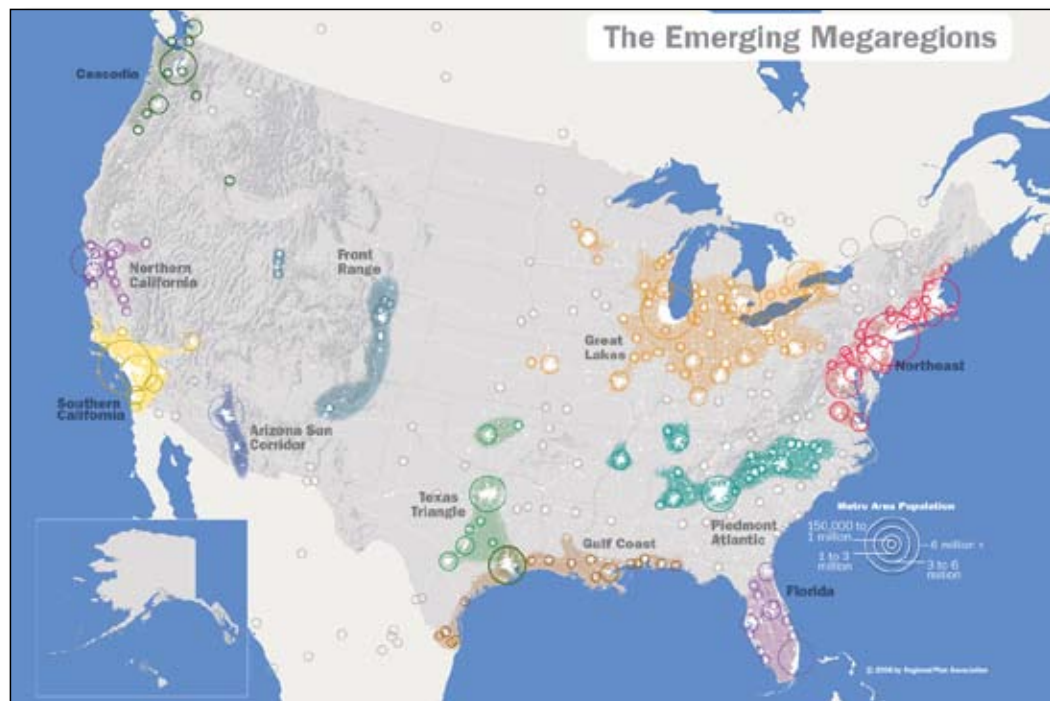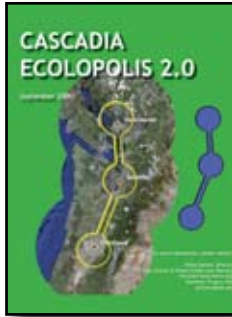
In "Ecolopolis 2.0" we identified a rationale for Cascadia-scale planning within global, national, and regional contexts. Globally, we found that Cascadia done right could become a laboratory and source for innovation in the world-wide search for more sustainable development patterns and life styles. Nationally, Cascadia provides an opportunity for exploring Federal-State and international relations aimed at creating both sustainable urban places and a better future for intervening rural areas and towns. Regionally, imagining Cascadian-scale strategies for global competitiveness, accessibility, and sustainable development opens up new opportunities not immediately apparent in the existing context provided by states and separated metropolitan regions.

Ecolopolis 2.0 began by documenting the history of the idea of Cascadia as a means for better understanding what a unified Cascadian brand might consist of. We analyzed conditions and trends for both rural Cascadia and for its metropolitan centers. Though we found many similarities linking the metropolitan regions of Cascadia, as in Ecolopolis 1.0 we also found many forces working against integration of efforts at a Cascadian scale. Nonetheless, we identified four strategies that could be used to both better integrate the Cascadian megaregion and to prepare Cascadia for engaging future national initiatives directed at megaregions:

- In light of the similar strategies for metropolitan growth management employed in Cascadian metropolitan regions, create an internationally recognized effort to learn from this experience;
- Save agriculture, and the working landscape more generally, to maintain separation between metropolitan areas;
- Develop industry clusters across Cascadia, particularly in areas like green building and software that are already operating at a Cascadian scale; and
- Increase accessibility through the development of high speed rail and other strategies linked to their strategic value at a Cascadian scale.

With "Ecolopolis 3.0" we took the next step towards defining a strategic agenda for Cascadia. Through the efforts of members of Congress and others, and due to the catastrophic collapse of the I-35W bridge in Minneapolis, new attention is being paid to the condition of the nation's infrastructure. Calls for a national infrastructure initiative are being made, echoing previous national initiatives in 1808, the Gallatin Plan, and 1908, President Theodore Roosevelt's plan for national conservation and development.

Whereas the Gallatin plan was about moving the natural resource bounty of the nation to the seaports in the east coast cities, and Roosevelt's effort focused on mitigating the impacts of rapid urbanization and industrialization, the focal point for this new effort remains undefined. Many expect that sustainability, energy conservation, and a fundamental response to climate change and uncertainty will emerge as organizing principles, at least in part, for this new endeavor. In ad-

dition, given the demands of global competition coupled with demographic shifts, realizing the promise for innovation emerging from the interaction of people in cities will likely become part of this new national conversation.

Nonetheless, the lead strategy is likely to be infrastructure planning and finance, with a new role for and sense of urgency on the part of the Federal government. Consequently, with Ecolopolis 3.0 we attempted to identify an infrastructure agenda for the Cascadian megaregion, one that is attuned to the objectives for creating an Ecolopolis, as outlined above. To do this, we approached Cascadia as being defined by three central elements:

- Competencies – the things that Cascadian metros and the megaregion itself are distinctly and perhaps uniquely good at, and which differentiate us from other megaregions in North America.
- Sustainability – patterns of resources use, settlement, and interaction that address core values in Cascadia underlying the turn towards growth management, resource conservation, green building, local food systems, and other core behaviors and activities associated with the Cascadian brand.
- Flows – the movement of people, goods, materials, capital, ideas, and information throughout the megaregion.

For each of these elements, we identified issues, trends, and the roles that infrastructure development can play in advancing them. Our intent was to both advance the idea of a unified and integrated Cascadia, and prepare Cascadian decisionmakers to be effective on behalf of the megaregion as the details got worked out in Washington DC.

What is Ecolopolis 4.0 about?
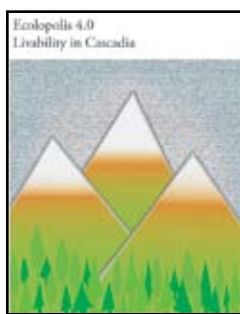
This latest iteration, Ecolopolis 4.0, examines the implications for Cascadia of the new federal livability partnership between the Environmental Protection Agency, the Department of Housing and Urban Development, and the Department of Transportation. This new interest in the role that Federal agencies can and should play in furthering goals for livability and smart growth presents Cascadia and other megaregions an opportunity to articulate their own livability agendas in anticipation of new initiatives emanating from Washington DC.

This document is a starting point for discussing both how the livability theme might be acted on here in Cascadia the increased engagement from federal partners. The report is divided into three parts:

- Defining Livability – all of the Cascadian metros, states, provinces, and major cities have worked with this idea in the past. We sought to document what "livability" means here, and what Cascadians have already identified as a livability agenda.
- Planning and Acting on Livability – planning and acting at the scale of the megaregion requires a focus on techniques and outcomes appropriate to that scale. Our task was to identify the techniques and objectives that made the most sense from the perspective of the Cascadia Ecolopolis.
- Understanding Livability from the Federal Perspective – similarly, each of the federal agencies involved in the Livability Partnership have, in the past, adopted and acted on a range of initiatives directed at what we're now calling livability themes. We wanted to better understand what those agencies were engaged in as a means for better understanding the intent and direction behind the seven Federal Livability Principles.

This report begins with a summary of what we've learned from this inquiry and how Cascadia might choose to join the livability dialogue playing out at the Federal level. It is followed by a series of appendices that present the details of the information collected by the teams during the course of the term.

As with our previous efforts, we welcome your comments and suggestions. Again, this is a work in progress, just as the very idea of Cascadia and conception of megaregions themselves are works in progress. We are optimistic in our belief that acting on behalf of the megaregion will ultimately prove to be a useful strategy for achieving the kind of future that residents of this megaregion would prefer for Cascadia in the years to come.
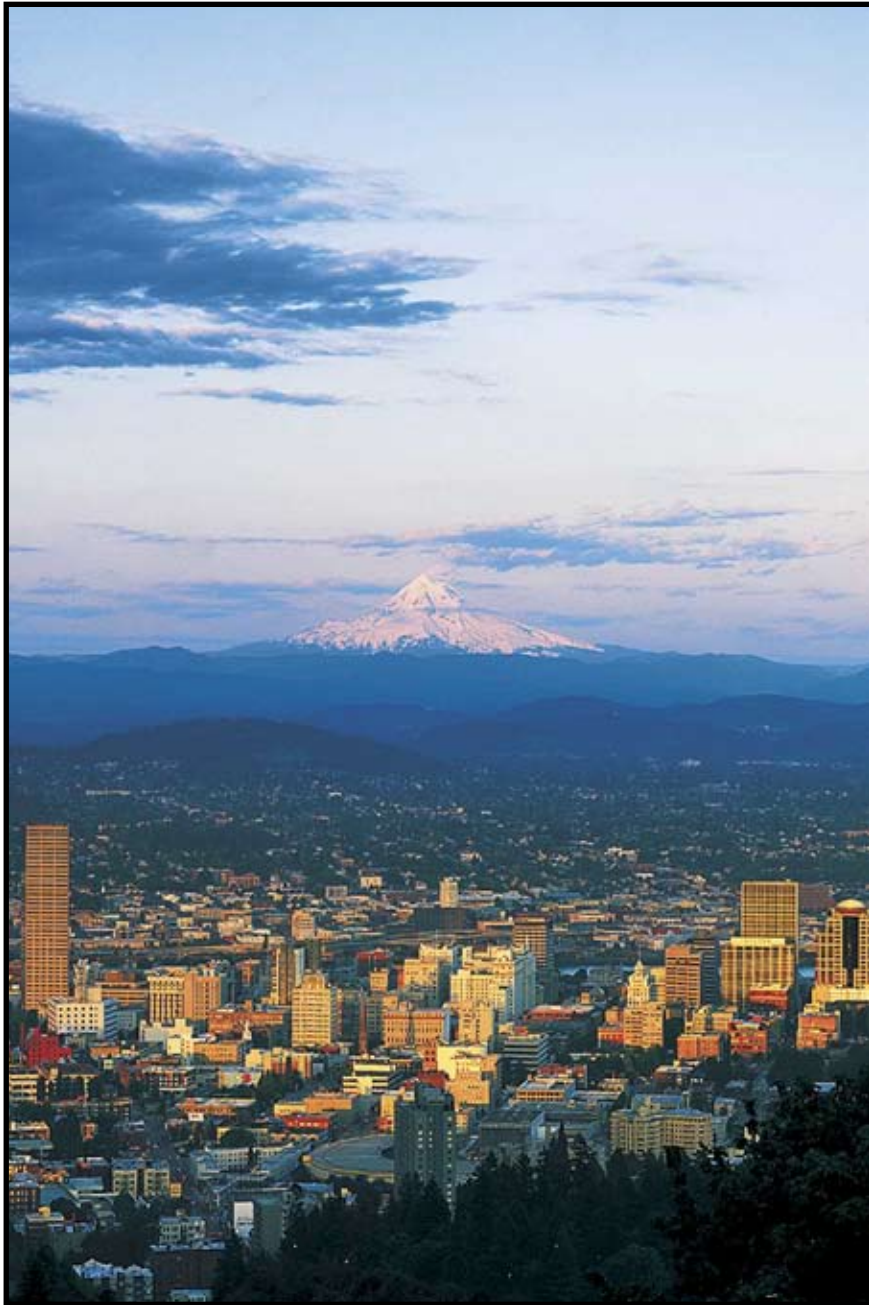
2010 Port of Portland

Livability in Cascadia

Livability in Cascadia

The term "livability" encompasses a broad range of human needs starting with meeting needs for survival (clean water, air, food, shelter and security) and extending to the built environment and infrastructure that supports meeting these basic needs. The term also refers to human desires such as beauty, cultural expression, and a sense of belonging to a community or a place that layer on top of more basic needs. Its roots date back to the Social Indicators Movement of the 1960s which focused on "quality of life" issues and questioned basic assumptions about the relationship between economic and social well-being and the complex nature of individual and social material and immaterial well-being (NRC, 5-8).

	Income	Share of College	Housing Values	Commute Time
Northeast	$70,158	30%	$133,275	29.0
Northern California	$70,122	30%	$176,431	26.5
Southern California	$61,777	24%	$133,824	27.0
Cascadia	$60,777	28%	$134,489	24.4
Midwest	$59,230	24%	$100,781	23.2
Texas Triangle	$58,881	25%	$ 73,967	25.7
Piedmont	$56,845	25%	$ 93,783	25.0
Arizona Sun Corridor	$56,845	25%	$100,130	24.7
Southern Florida	$55,563	22%	$ 93,366	25.2
Gulf Coast	$45,506	18%	$ 65725	23.3

Table 1: Characteristics of Megaregions in 2000
Source: 2000 U.S Census
Economic Geography of Megaregions, pg 22.

The concept of livability emerged as a means for beginning conversations within communities nationwide about how to protect valuable aspects of community, landscape, and culture. (Evans 16) Communities have used these discussions to unify their communities around shared values.

From the perspective of Cascadia, it is important to examine how livability is related to scale. Livability at a regional level is primarily defined by large-scale systems and environmental and economic indicators. Smaller geographic areas, such as cities and neighborhoods, tend to be more prescriptive about social indicators and how basic social needs relate to the economic and environmental systems within a community. Though it is important to protect the elements that contribute to a place's livability at several scales, communities are harder to define at regional and megaregional scales.

Case studies of planning efforts in the Vancouver, BC, Seattle, and Portland-Vancouver metropolitan regions show that livability has been a consistent theme and focal point throughout Cascadia (Appendix I). After reviewing those case studies and the experience in Cascadia, we can draw the following conclusions about what it might mean to plan for livability at the mega-regional scale:

1. **Livability is a broad and dynamic concept:** Defining livability is an important exercise for communities and has led to the progressive and proactive plans in all three major Cascadian metropolitan regions. However, social values, physical development patterns, and economic constructs across Cascadia are varied and always changing, making it necessary for definitions of livability to remain dynamic and flexible.

2. **Jurisdictional boundaries create problems:** The presence of multiple jurisdictions makes it difficult to collaborate and reach consensus around the elements of livability. Livability is a local quality that gets discussed in broader and more general terms as scale increases.

3. **Livability-related concepts in Cascadia are strong:** There is a lot of similarity among concepts of livability coming from all three metropolitan regions, probably due, in part, to overlapping community values. In fact, livability may be an easier concept to raise at a megaregional scale in the Pacific Northwest relative to the rest of the US.

4. **The focus for Livability in Cascadia is principally on preservation:** Cascadians are concerned with not losing certain qualities of life and landscape as growth and change occurs. This concern extends beyond urban areas to the working landscape and even more rural areas beyond the cities and suburbs of the metropolitan areas. Livability is seen to be working in tandem with sustainability to focus planning and implementation on actions that preserve a lifestyle rooted in landscape.

5. **Based on the planning experience in the major metrpolitan regions of Cascadia, livability in Cascadia can be defined as:**

The protection of the well-being of people and place by creating vibrant, safe, and healthy neighborhoods; protecting and enhancing the natural environment; offering economic opportunities for all; and providing for safe and efficient mobility. The contributing elements for this definition of livability have been directly addressed by government policy and civic action.

The Oregonian (http://www.oregonlive.com/opinion/index.ssf/2009/12/renewable_energy_and_the_orego.html)

Planning and Acting for Livability

Planning and Acting for Livability

Planning in the US is largely controlled and heavily influenced by local concerns. Metropolitan planning is evident in all US and Canadian metropolitan regions, but few metropolitan areas have willingly embraced metropolitan-scale planning and implementation authorities. Though this would suggest that megaregion-scale planning and implementation is even a more remote possibility, there are examples of planning at scales approaching that of the megaregion.

The best examples and potential models for Cascadia come from the work of states to address issues that cross boundaries. These forms of collaboration are developed on a case-by-case basis, where a common interest serves as a catalyst for action. (For additional examples, see Appendix III)

For example, water is a shared resource whose use and conservation must be managed among neighboring states and local jurisdictions. The ways in which one city or state uses (or abuses) adjacent bodies of water has direct impacts on neighboring jurisdictions as well as riparian and aquatic habitats. Two examples of water management on a broad scale stand out:

http://watersim.asu.edu/images/maps/ColoradoWatershed.png

1) **Colorado Compact** - The Colorado River, in its 1,400 mile journey to the Gulf of California, passes through seven states and two countries. Today, the Colorado River serves to provide drinking water, power, and irrigation for much of the desert southwest. As a result of competing claims to the river, in the early 20th century it was realized that a system of allocation was needed to ensure that the waters of the Colorado were fairly divided. The Colorado Compact of 1922 was an effort to sort out competing claims and to ensure that slower growing states would not be left without water rights. The agreement, signed by all basin states, apportioned water between the Upper Basin states (Colorado, Wyoming, Utah, and New Mexico) and Lower Basin states (Arizona, California, and Nevada) (Bates 117). The Colorado Compact has been criticized for how it ignored Mexico's water needs and further exploited the waters of the Colorado River. Nevertheless, it serves as an example of collaboration among multiple states to address an issue of mutual concern over a very broad area.

2) **The Great Lakes Regional Collaboration** - The Great Lakes Regional Collaboration (GLRC) came about after mounting concern over declining environmental quality in the Great Lakes basin. Officially launched in 2004, the GLRC is a cooperative effort of the eight Great Lakes states (Illinois, Indiana, Michigan, Minnesota, New York, Ohio, Pennsylvania, and Wisconsin) to implement a strategy for the "restoration, protection, and sustainable use of the Great

Lakes" (GLRC). The GLRC has established eight strategic priorities which have been adopted by participating members. (GLRC Framework). In January of 2009, based on the collaborative efforts of the GLRC, congressional representatives from the Great Lakes states introduced the Great Lakes Collaboration Implementation Act into the 111th Congress. If passed, the Great Lakes Collaboration Implementation Act will establish a collaborative program for environmental protection of the Great Lakes at the local and state level (Levin). The introduction of the Great Lakes Collaboration Implementation Act offers an example of approaching an issue with a unified voice to achieve federal recognition and support.

Similarly, growing concern over global climate change has prompted a number of states to collaborate on reducing greenhouse gas emissions. All three Cascadian states have recognized the potential impacts of climate change and have proved to be national leaders in the effort to think at the megaregional scale to address this issue. Two examples of megaregional approaches to address climate change are the West Coast Governors Global Warming Initiative (WCGGI) and the Western Climate Initiative (WCI). While neither the WCGGI nor the WCI are regulatory in their approach, they both are good examples of bringing together key decision makers to develop a shared vision to guide state and local decision making:
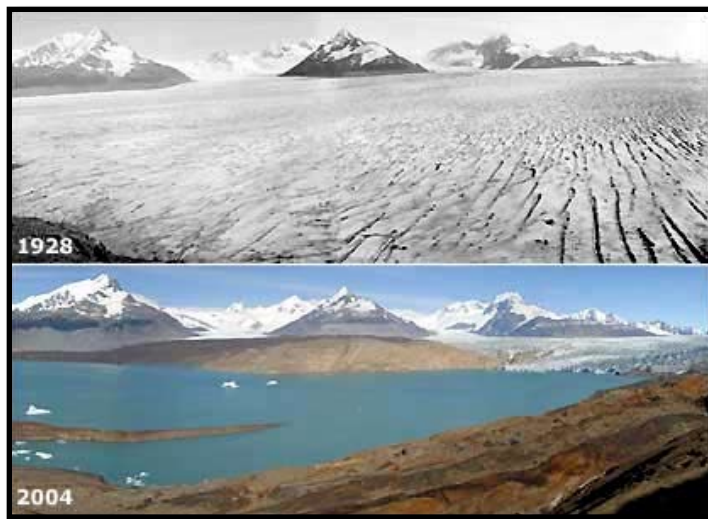
1) **West Coast Governors Global Warming Initiative -** "If the West Coast states were a country, their global warming emissions would rank 7th in the world" (Energy Foundation). In recognition of this fact and the consequences of global warming, the Governors of Washington, Oregon, and California launched the West Coast Governors Global Warming Initiative in September of 2003 (Energy Foundation). Through the initiative, each state committed to act individually and regionally to reduce green house gas emissions through strategies that "provide long-term sustainability for the environment, protect public health, consider social equity, and expand public awareness" (Executive Committee). Despite federal inaction, the West Coast states have acted regionally to address an issue of global importance.

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2) Western Climate Initiative – The Western Climate Initiative is a collaborative effort among various Western states and Canadian provinces to address climate change at a large scale. Beginning in February of 2007, the WCI has embraced two existing regional strategies to address climate change: the WCGGI (see above) and the Southwest Climate Change Initiative (Arizona and New Mexico). The WCI has added to these efforts by incorporating Montana and Utah as well as the Canadian Provinces of British Columbia, Manitoba, Ontario, and Quebec. The WCI has further broadened the scope of pervious efforts, like the WCGGI, by reaching across national boundaries to achieve reductions in greenhouse gas emissions.

http://www.westernclimateinitiative.org/wci-partners-and-observers-map
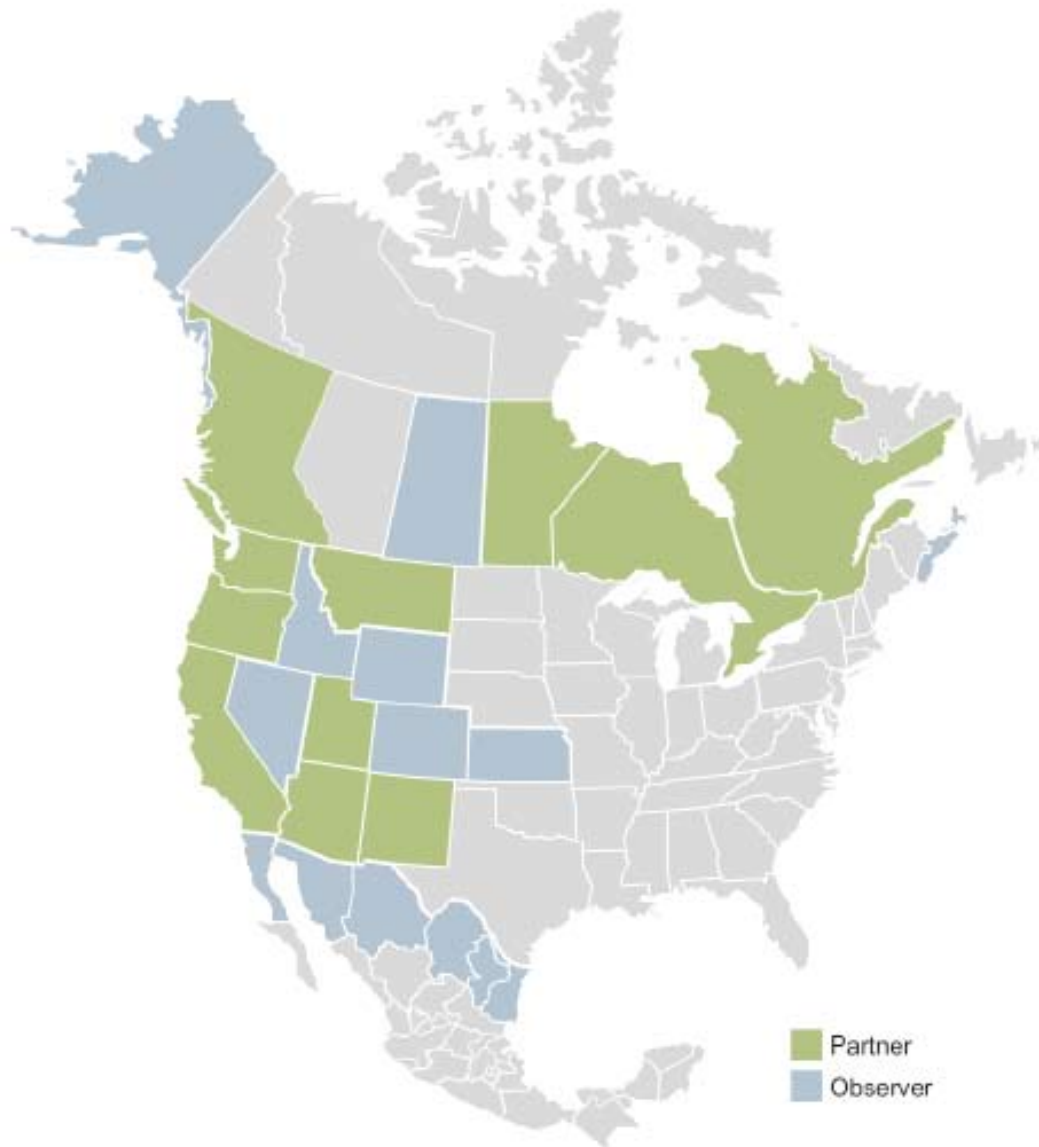
In the above examples, momentum for action originated in state government and engaged the Governors. Governors can play a strategic role in acting at the megaregional scale. Going forward, the National Governors Association (NGA) is a likely channel for instigating future megaregional collaboration. This is not to say that Governors are the only ones who possess the ability to act at the megaregional scale. While not as active as the NGA, the US Conference of Mayors has been a forum for mayors thinking outside municipal boundaries. State and federal legislatures also have the ability to develop and introduce policies that seek coordination among various jurisdictions.

Whatever the forum, the following elements have been shown to be central to effective megaregional collaboration:

- **Identification of Shared Interests –** Regional collaboration requires the articulation and recognition of shared interests.
- **Identification of Key Stakeholders -** If strategies aimed at addressing megaregional issues are to be realized, they need the support of individuals with the ability to make implementation and financing decisions. (Randolph 57).
- **Incorporation of Conflict Resolution -** Collaboration is a process of negotiation. Partnering agencies need to be aware that as a result of collaboration the costs to their constituents will not outweigh the benefits. This is an essential step in developing a shared vision (Randolph 56).
- **Development of a Shared Vision -** To act at the megaregional scale there needs to be a shared vision that key stakeholders can agree upon. The likelihood of a megaregional strategy being implemented and supported at the federal level is greater if it is supported by a unified voice (Randolph 56).
- **Search for Creative Solutions -** Megaregional planning is a relatively nascent idea with few past examples. It is likely that each situation will require a unique strategy for implementation and financing.
- **Sustained Collaboration –** The relationships associated with megaregion planning and action need to be stewarded over time. This is an ongoing task that needs to be embraced and led, and will not occur by itself.
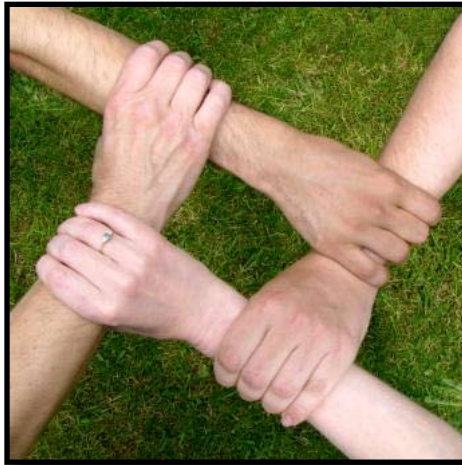
As unlikely as it might seem at first, planning and acting at a megaregional scale can be achieved. Further, maintaining and enhancing livability in Cascadia will require collaboration among states and jurisdictions that may be unaccustomed to working together in a sustained way. There is a Cascadian "brand" and ensuring that it survives will require a willingness to steward it across boundaries. To strengthen and enhance a shared sense of place in Cascadia, the following strategies should be pursued:

- **Form an ongoing Cascadia working group –** Megaregional government is not likely in Cascadia. However, a working group could unite Cascadia in addressing issues at a broader scale. A working group will serve to identify areas where megaregional collaboration is necessary and outline options for action. A working group could be formed through the development of a compact emerging from discussions among the Governors of Oregon and Washington and the Premier of British Columbia. It could also emerge as a joint effort among universities from throughout the region, as has been the case in the Piedmont and Texas Triangle megaregions.

- **Build upon existing relationships –** Build upon and strengthen existing relationships that cross political boundaries. Review the experiences of the WCI, Cascades Passenger Rail Service, Pacific Northwest Power Planning Council, the Pacific Northwest Economic Region, and other efforts to identify the strongest candidates for future activity.

- **Focus on Areas of True Common Concern –** Megaregional planning and action should concern itself with issues that uniquely operate at the scale of the megaregion. These issues could include: Water quality and quantity; Climate change mitigation and adaptation; Salmon and steelhead recovery; Connectivity: High speed rail, border crossing, freight rail and goods movement; Coordinated growth management; Ocean resource management.

USDOT　　　　　　　　　　HUD　　　　　　　　　　EPA

Livability and the Federal Agency Partners

Livability and the Federal Agency Partners

On June 16, 2009 the Secretaries of the US Department of Transportation (USDOT), US Department of Housing and Urban Development (HUD), and US Environmental Protection Agency (EPA) announced an interagency partnership for sustainable communities. This partnership announced a set six livability principles to guide their mission:

1. Provide more transportation choices
2. Promote equitable, affordable housing
3. Enhance economic competitiveness
4. Support existing communities
5. Coordinate and leverage federal policies and investment
6. Value communities and neighborhoods

Currently there is a federal system of agencies and programs that operate independently, working towards different missions. The partnership by the three agencies seeks to bridge these gaps by giving local, state and regional agencies and institutions the flexibility to develop their own creative solutions that meet community livability goals as well as addressing national priorities of mitigating the impact of climate change, preserving rural and agricultural lands, protecting water and air quality and providing equitable distribution of affordable housing.

This partnership is not intended to be a regulatory, top-down movement but rather incentive-based in order to encourage state and local communities to invest in livability at multiple scales. The partnership should strive for integration between disciplines and avoid single-outcome actions, instead focusing on producing multiple outcomes from one action. Outcome based measures of implementation and performance need to be developed, which will help guide the process of creating policies and patterns of funding. These assessments will help the federal government develop the best tools and strategies for the local and state agencies to use in investing that result in the best outcomes towards the national livability agenda.

The goal of this section is to identify ways to better align programs and resources from the EPA, USDOT, and HUD to meet the goals of the interagency partnership livability agenda. We identify existing programs in each of the agencies that have the greatest potential for overlap; propose new metrics and performance measures that are better suited to the livability agenda; and propose new programs that can improve coordination, efficiency and implementation. Additional information regarding the federal agencies and their programs can be found in Appendix II.

Livability is not a new concept for the three agencies and neither is collaboration toward that goal. EPA has been a major player in promoting and implementing urban sustainability and smart growth development since the early 1990s. And the Federal Transit Administration (FTA), a major livability player within USDOT, can trace its history to the Omnibus Housing Act of 1960.

When President Kennedy signed the Act, he said:

> "To conserve and enhance values in existing urban areas is essential. But at least as important are steps to promote economic efficiency and livability in areas of future development. Our national welfare therefore requires the provision of good urban transportation, with the properly balanced use of private vehicles and modern mass transport to help shape as well as serve urban growth" (FTA)

Despite this long tradition, implementation of federal livability goals remain fragmented. Countless studies have been conducted and dozens of programs exist to promote components of livability. Politics and the complex structure of federal bureaucracy have clearly contributed to this and will continue to be a challenge, but much can be learned from past attempts.

Current Overlap Between Agencies

With varying degrees of coordination, all three agencies have a history of working on issues pertaining to livability. For example, promoting transit-oriented development has been an objective for all three agencies. Many livability programs exist within the three agencies, but little interagency coordination has taken place. The diagram shows existing overlap between the three agencies.

All three agencies have influence over transit-oriented development. This goal helps meet all six
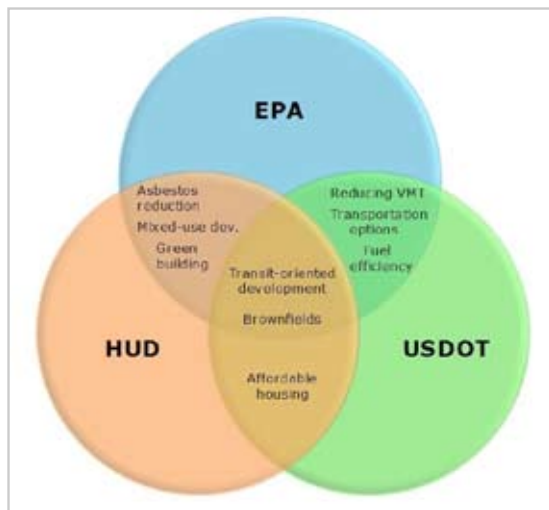
Figure 1: Overlaps within EPA-HUD-USDOT regarding policy and program options for achieving livability principles

of the livability principles by providing transportation options, affordable housing and increased accessibility. To date, this has been one of the more successful areas of collaboration between the three agencies, but coordination remains primarily at the project level. Promotion of "complete communities," with affordable and easy access to housing, jobs, transit, and day-to-day services, is similar but usually involves retrofitting existing neighborhoods, often on brownfield sites. This often falls under the broader umbrella of smart growth, which all three agencies have also been directly and indirectly involved with.

Recommendations

New Jurisdictional Framework

We propose establishing a Collaborative Office of Livability (COOL) to institutionalize the partnership between the federal agencies. Due to EPA's historic work in the areas of smart growth and environmental protection, we suggest that COOL be housed within that agency, but a be a true collaboration between all three agencies.

In order to make this livability initiative effective, the program must recognize regional differences. Some areas, such as Cascadia, have more implentation when it comes to focusing on issues of livability. To address these differences, COOL should take advantage of the overlap between HUD, EPA and FTA's regional jurisdictions to coordinate programs through existing regional offices. Agency representatives in each of the regions would coordinate research, funding and other programs.

It is important to note that the FHWA does not align through its regional jurisdictions, thus it is not recommended to join within the regional center overlap. However, FHWA should continue to pursue livability practices in its policies and programs. With the authorization of a new surface transportation bill the USDOT also has the opportunity to reform the organization structure of the agency and ensure that USDOT programs advance livability. If the need is to shift programs or funding from FHWA to FTA then that should be explored.

Because of its long history of livable and sustainable practices, Cascadia would be well-positioned under this new framework as a model for livability at a megaregional scale. Cities within Cascadia, including Portland and Seattle, are poised with the knowledge to implement livability-focused projects, but the lack of funding has hindered implementation. However, federal funding is now being made available that could move this vision forward in Cascadia and other regions. As projects develop over time and the interagency partnerships becomes stronger and more aligned, the nation may turn to Cascadia as a prime example of livability.

Data Sources and Collection

Better coordination of policies across the three agencies is one of the six livability principles. This effort must begin with better coordination of research and data sharing. Each agency has invaluable data and research at its disposal. A partial list of these sources is available in the appendix. However, agencies must conduct more joint research like the FTA-HUD collaboration, "Better Coordination of Transportation and Housing Programs" (2008), and better utilize existing reports and data from partner agencies. The creation of a virtual "livability library" within COOL could become a repository for reports and data related to livability from all corners of the federal government and beyond.

New Interagency Livability Grants

Recognizing that the funding structures of the three agencies are unlikely to undergo dramatic change, we recommend a new funding coordination program that pools existing discretionary

funds from EPA, HUD and USDOT for competitively awarded regional livability grants. These grants are intended to fund large-scale pilot projects that holistically address the livability principles laid out in the interagency livability partnership. Projects would be required to directly address and coordinate solutions to environmental, housing and transportation problems at a regional or mega-regional scale. Project leads could be MPOs, states, or bi-state commissions (compacts). Projects would be selected by a panel of administrators from each of the partnership agencies, with input from regional COOL representives.
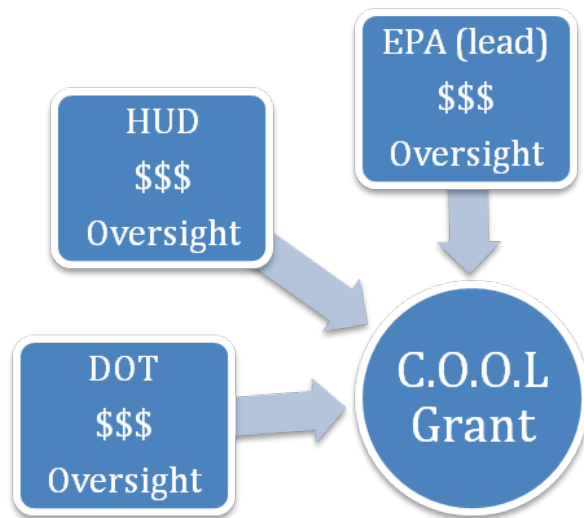
Funding should be adequate to fund 50-60 percent of planning and implementation of projects and be large enough in scale to incentivize additional interest in regional planning. We also propose tying the level of the federal match (sliding scale from 30-60 percent) to project performance based on a checklist of criteria similar in concept, but not substance to LEED and LEED-ND ratings. If the program is successful, additional Congressional appropriations should be sought with the goal that this coordinated grant program would eventually begin to replace some of the stand-alone project funding currently administered by the separate agencies.

Figure 2: C.O.O.L Grant Framework

The following is an example of project from an MPO that addresses each of the six principles and could be eligible for COOL Grant funding:

- A new regional light rail line
- Subsidized green-built, affordable mixed-used housing in master-planned station areas and at infill sites in existing neighborhoods
- Bike and pedestrian-oriented green street retrofits to treat storm-water runoff and improve non-motorized access to new stations
- A pilot project for congestion management pricing in the corridor
- Another example could come from a bi-state compact between Oregon and Washington that includes:
- Improvements to the existing inter-city rail corridor between Portland and Seattle or Eugene and Vancouver B.C. to provide a high speed, affordable and sustainable alternative to driving in the I-5 corridor
- Transit improvements to connect existing neighborhoods to improved high speed rail stations
- Redevelopment of brownfield sites adjacent to HSR stations into mixed-income housing and employment centers

A series of performance measures and metrics for evaluating COOL Grant applications is presented below.

Performance Measures

The partnership has stated that developing livability measures and tools is a main objective. This requires the use of evaluation techniques, which establish performance benchmarks and indicators that specifically measure existing conditions as well as outputs and outcomes of livability efforts.

Outside of the federal government, the need for concrete measures of livability is not new. Already, an estimated 170 state, regional and local jurisdictions have created quantifiable benchmarks, metrics and indices to gauge achievement on the path to livability (Walters 2008). As noted in the "Livability in Cascadia" section, even defining livability is difficult. This has resulted in measures that range from the very specific, such as levels of toxins in breast milk (Sightline Institute) to less precise and more subjective measures of community inclusion (Vancouver).

Sightline Institute's Cascadia Scorecard provides an obvious model of a livability index for the region, but it does not translate directly to the six federal livability principles. Below are suggestions for measures than can be operationalized to systematically evaluate COOL Grant applications and measure the overall impact of a federal livability agenda.

Performance Benchmarks: Standards that establish goals for performance improvement so individual communities, states and regions can measure existing conditions and progress towards achieving livability.

Performance Indicators: Qualitative indicators should be developed so that short- term, intermediate and long-term progress can be measured, and can be used to set clear targets and timeframes, determined at each stage of implementation. They should measure both outputs or efforts of actions and whether *outcomes* have been achieved.

The six livability principles were used as a framework for developing performance benchmarks and indicators. For the most part, the principles align closely with the notions of livability in Cascadia, but an additional principle was added to focus on environmental protection. Principles 4 & 6 were combined for the purposes of creating performance measures. Many proposed measures correspond to more than one livability principle, as illustrated in the following table.

Goal/Outcome	Measure	Principle*
Improve transit access	Number of people who live/work within 1/2 mile of transit service with 20 minute or better headways	1, 4
Increase the number of people living in complete neighborhoods	Proportion of population living in neighborhoods with quality transit, services and nearby employment	1, 2, 4
Decrease emissions from intercity travel within the megaregions	Carbon emissions per intercity mile travelled	1, 6
Make sustainable forms of intercity travel time and cost competitive	High speed rail time and cost compared to private vehicle	1, 3
Increase housing/travel affordability	Housing/Transportation Affordability Index (CNT)	2, 1
Create affordable housing near quality transit, existing services and job centers	Number of affordable housing units built in complete neighborhoods	2, 1, 4
Reduce income disparity	Oregon employment department measure (Oregonian)	3, 2
Create jobs through COOL Grant funded projects	Number of temporary and permanent living wage jobs created by COOL Grant funded projects	3
Increase access to educational achievement at all levels	Debt to income ratio of recent graduates of state institutions; graduation rates;	3
Invest in transit that serves existing communities	Proportion of transit investment being invested in existing neighborhoods	1, 4
Prioritize infill sites over greenfield development	Ratio of infill to greenfield housing units or square feet in a region	4, 6
Increase balance between jobs, housing and services	Standard index measures	4
Coordinate funding for projects that address livability holistically	Dollar amount of COOL Grant funding	5
Promote information sharing	Size of livability library research repository; number of between-partner citations within agency reports	5
Preserve Rural/Open space	Establish a baseline of the ratio of urban to rural land within a 20-mile buffer of I-5.	4,5,6
Water quality	Standard measures in use by EPA	6
Air quality & emissions	Standard measures in use by EPA	6
Rural resource base	Farm gate sales by county and province; acres of "foundation" land for farming and forestry; number of farms; timber harvest by county and province	3, 4, 6
Urban job growth/creation	Number of new living wage jobs	2, 3

Table 2: Performance Measures

Conclusions

Each agency has many programs that address specific aspects of the livability principles. In its current form, however, we do not believe the livability partnership will have a significant enough impact to address the severity of the issues we face. It does, however, present an opportunity to formalize the goals of livability within the three agencies by establishing a coordinating office, housed within EPA, which can better coordinate data collection and spearhead holistically minded regional and mega-regional livability pilot projects. We have shown that funding for collaborative projects does not require new funding, just better coordination of existing funding. The interagency partnership is a solid stepping block in the advancement of livability priorities, but declarations of partnership must be supported through actions, implementation and institutionalization. The recommendations we make for aligning the effort of the three agencies through a coordinating office, will provide forward momentum and an organizational framework for effective livability programs at both the regional and mega-regional scales.

Afterword

Since the writing of Cascadia 4.0, all three agencies have announced new programs that provide funding and support for many aspects of the livability agenda. On February 4th, 2010 HUD Secretary Shaun Donovan announced the creation of a new Office of Sustainable Housing and Communities while on a visit to Portland and Seattle. The same week, EPA announced its own new Office of Sustainable Communities. At this same time, a join project to develop brownfields was announced between HUD, EPA and DOT. Five pilot projects in Boston, Indianapolis, Denver, Iowa City and National City, California will receive assistance under the Sustainable Communities Partnership. This forward momentum is a welcome sign that the partnership is finding traction, but more than project level coordination will be necessary to achieve the long-term goals of the livability partnership.

Here are some examples of other developments since this report was written.

http://1.bp.blogspot.com/__UIs6-gaeYw/Rh5OUYM_B0I/ AAAAAAAAAyE/LdOBySoma3E/s400/cttransith2.jpg

• **Urban Circulator Systems & Livability Bus Program Grants**

In early December of 2009, funding was made available through unallocated discretionary funds. A total of $280 million was made available for urban circulator projects such as streetcars, buses and bus facilities to support communities, expand local economies and improve resident's quality of life while also creating jobs (Lindenberger 2009). Within the $280 million there are two separate funds:

1. $130 million in unallocated discretionary New Starts/Small Starts Program funds will focus on urban

circulator systems and projects selected will be $25 million or less and promote high-density developments and connect separate destinations.

2. $150 million come from unallocated discretionary Bus and Bus Facility funds to support the USDOT's Livability Bus Program. Selected projects must provide improve energy efficiency, reduce greenhouses gases and promote a more environmentally sustainable bus system.

• **High-Speed Rail Grants**
On January 28, 2010 President Obama announced the high-speed rail grants that were awarded from $8 billion dollars of the American Recovery and Reinvestment Act. States applied for funding from the Federal Railroad Administration on construction in their designated high-speed rail corridors. While Florida and California received the largest grants ($1.25 billion and $2.25 billion respectively), the corridor between Vancouver, Seattle, Portland and Eugene received $598 million.

http://intellistickoilcondition.files.wordpress.
com/2009/04/highspeedrail.jpg

• **Additional Federal Agency Changes**
In addition to these grants, on January 13, 2010, FTA announced a change in project evaluation criteria for grant purposes in its New Starts/Small Starts Program. Instead of solely relying on travel-time saving analyses for suburban commuters, transportation projects will be also take environmental, community, economic development benefits into account in project grant evaluation. This is an important step towards awarding funding towards transit projects that promote livability and encourage the overall federal agencies livability agenda.

Within the FY 2011 Federal Budget all three agencies proposed grants and programs that support the livability initiatives to the tune of $5 billion. HUD proposed $150 million to continue their Office of Sustainable Communities and provide planning grants that support linking transportation, housing policy and land use planning within communities. The USDOT proposed $527 million towards its Livable Communities Program which assists local and state governments to increase transportation choices and work with land-use and housing policies when making transportation decisions. The USDOT also requested additional funding for high-speed rail and for their New Starts/ Small Starts program. Finally, $10.9 million were proposed for smart growth technical assistance at the EPA.

Appendix I: Livability in Cascadia Case Studies

Portland-Vancouver Metropolitan Region Case Study

http://media-2.web.britannica.com/eb-media/51/96651-050-BEAE140F.jpg

Introduction to the Portland-Vancouver Metropolitan Region

The Portland-Vancouver Metropolitan Region comprises a seven-county area in northern Oregon and southern Washington, located at the confluence of the Columbia and Willamette Rivers, to the east of the Pacific Ocean and to the west of the Cascade Mountains (Portland Development Commission, 2007, p.2). The region is home to an estimated population of 2,191,785 (2008). Over 25% of this population, or 575,930 people, reside in Portland, Oregon, the region's largest city (Proehl, 2009, p.6, 17). According to Metro, the area's regionally elected government, an additional 600,000 people are expected to move to the region within the next 25 years (Metro [MET], 2009, Making Greatest Place brochure, p. 1). According to the non-profit marketing organization, Travel Portland, "Portland is big on livability, big on visibility, and is very accessible (Travel Portland, 2009, p.1)." If this is the case, how is livability defined and measured throughout the Portland-Vancouver Metropolitan Region, and in the state of Oregon?

Livability Defined at the State Level

At the state level, livability is not specifically defined by the state agency that oversees land planning, the Oregon Department of Land Conservation and Development. However, the desire to create livable communities is implicit in Oregon's Statewide Planning Goals and Guidelines in Oregon Statewide Planning Goal 14: Urbanization:

> "To provide for an orderly and efficient transition from rural to urban land use, to accommodate urban population and urban employment inside urban growth boundaries, to ensure efficient use of land, and to provide for livable communities (Oregon Department of Land Conservation and Development [ODLCD], 2009, p.1)."

Goal 14 is one of 19 statewide planning goals developed as guidelines for local municipalities in the state of Oregon. All local comprehensive plans throughout the state must serve these 19 goals. While not specifically defined in the goal, "livable" is used in reference to the creation of Urban Growth Boundaries in cities across the state.

Livability Defined at the Regional Level

At the regional level, "livability" as a term is used and discussed in vision-setting and planning documents by Metro. The agency is a unique, regionally elected government, consisting of a seven member Metro Council, with a diverse set of powers and responsibilities. Metro engages in regional land-use planning, including management of a metropolitan Urban Growth Boundary in the Oregon portion of the Portland-Vancouver metropolitan area. It also manages the Oregon Zoo, Oregon Convention Center, regional recycling and sanitation services, as well as a system of parks and green spaces (MET, 2009, About Metro, p.1).

The Metro charter, adopted by voters in 1992, identifies livability as a primary concern of the agency. In the Preamble of the Metro Charter, Metro's primary responsibility is identified as,

"planning and policy making to preserve and enhance the quality of life and the environment for ourselves and future generations" (MET, 2003, Charter, p.1). An entire section in the charter is devoted to "Protection of Livability of Existing Neighborhoods." Here, livability is to be maintained in neighborhoods by taking into consideration a myriad of issues ranging from environmental pollution, crime, public services, as well as accessibility to parks and open spaces (MET, 2003, Charter, p.3).

Concerns about livability at the regional level were further addressed when Metro developed a long-term plan to deal with the expected growth of the region (MET, 2008, 2040 Resolution, p.1). The plan, the "2040 Growth Concept," sought to look ahead 50 years from 1990 to envision how to develop broad-based strategies for managing growth in the region (MET, 2009, 2040 Growth Concept website, p.1). In the beginning stages of this plan, Metro sought input from citizens on the concept of livability and what needed protection. Responses from residents included:

> "a sense of community; the preservation of natural areas, forests and farmlands; quiet neighborhoods with easy access to shopping, schools, jobs, and recreational opportunities; the 'feel' of the region with open spaces, scenic beauty, and small town atmosphere; an individual community's character and assets; a balanced transportation system providing a range of choices, including transit, walking, biking, and cars (MET, 2000, The Nature of 2040, p.3)."

In the introductory letter to the Growth Concept, Metro councilors state that preserving access to nature and building better communities are the central goals of the plan, based on input they had received from citizens (MET, 1994, 2040 Growth Concept, p.1). Moreover, the councilors state that "the prevailing theme in what we have heard from citizens and our regional partners in this Region 2040 planning process is a broad consensus as to how we can enhance our region's livability (MET, 1994, 2040 Growth Concept, p. 2)."

With the stated goals of building better communities and preserving access to nature, Metro's 2040 Growth Concept provided a condensed public vision of livability in the region. Implementation of these goals is also discussed in the 2040 Growth Concept. Under GOAL II: URBAN FORM, a set of initiatives to maintain and enhance livability for the region are mentioned, including:

> "II.i. preserve environmental quality,
> II.ii. coordinate the development of jobs, housing, and public services and facilities, and
> II.iii. inter-relate the benefits and consequences of growth in one part of the region with the benefits and consequences of growth in another." (MET, 1994, 2040 Growth Concept, p.15)

In addition to the 2040 Growth Concept, another document provides useful insight into how Metro discusses and attempts to define livability. RESOLUTION NO. 08-3940, introduced by Metro Councilor Carl Hosticka in 2008, sets out to define the characteristics of a successful region. While the term "successful" varies in degree from "livability" (or livable), it appears that

the following list of characteristics comes closest to providing an agency definition of livability:

> "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 equally." (MET, 1994, 2040 Growth Concept Exhibit A)

Livability Defined at the City Level (Portland)

As Portland is the largest city in the Portland-Vancouver Metropolitan Region, it is also useful to look at how this jurisdiction attempts to define livability. Documents pertaining to the four-phase Portland Plan provide initial insight into how the term is discussed. The Portland Plan is a long-range plan being developed by the city to plan for expected growth in the region as well as to update the 1980 City Comprehensive Plan (City of Portland Bureau of Planning and Sustainability [CPBPS], 2009, Outreach Chronicle, p.1).

Similar to the 2040 Growth Concept, the creation of the plan has been informed by over 17,000 public comments through a public outreach program called visionPDX. From these conversations, the following three citizen values have emerged: "community connectedness & distinctiveness; equity and accessibility; and sustainability (CPBPS, 2009, Portland Plan, p.12)." Many of these values show similarities with public comments taken from citizens in the 2040 Growth Concept planning process. As the Portland Plan is only in Phase 2 (Goal Setting), these ideas have not been codified into specific language on livability (CPBPS, 2009, Outreach Chronicle, p.1).

Livability Defined at the City Level (Vancouver, WA)

The threats to livability were growing in many areas due to increases in population and density according to one of the city planners in Vancouver, which is why livability came to the forefront as a goal of that community (Wallace). The nature of growth there led to more of a focus on livability and led to the creation of the Strategic Plan in 2008. The indicators in Vancouver's Strategic Plan are a reflection of community voices.The Key Indicators that were created through these public processes include:

- **Clean Drinking Water:** Percent of citizens rating drinking water quality as "good" or "excellent"
- **Residents' View of City's Livability:** Percent of citizens rating city livability "good" or "excellent"
- **Managed Growth**: Percent of citizens rating growth management and planning within the city as "good" or "excellent"
- **Healthy Existing Tree Canopy:** Percent of city that is covered by a tree canopy
- **Improving Tree Canopy:** Number of new trees planted by the city in the calendar year as of December 31st
- **Preserving Open Space:** City has acquired sufficient park land to meet our residents' stated needs or goal
- **Reducing Trash:** Percent of total residential trash that is recycled or diverted from landfill
- **Accessible Parks:** Percent of residents within one-quarter mile of a park or other accessible open area

Unlike Portland, Vancouver does not take an active role in Metro's regional planning. Instead, Vancouver becomes involved on a project by project basis. Overall, Vancouver relies on Clark County as a mechanism for regional planning and focuses most of its efforts on neighborhood planning as a means to ensure that the goals of livability are being met at every level (Wallace).

Livability Defined at the Community Level

In addition to the public comments gathered from citizens in the 2040 Growth Concept and the Portland Plan, it is important to look at other community definitions of livability that exist in the region. One community organization that has tackled the issue of livability is the non-profit Coalition for a Livable Future (CLF). In 2001, the organization developed a campaign to protect livability in the Portland-Vancouver Metropolitan Region. In this campaign, the organization set out to create communities where:

> "Our neighborhoods are safe, walkable, affordable and vibrant;
> Our transportation system accommodates people, bikes and cars;
> There is easy access to parks and natural areas;
> Wildlife flourishes and our rivers and streams are healthy;
> People find a mix of housing types and costs throughout the region;
> We all have access to locally grown foods;
> All residents have access to decent, family-wage jobs;
> Citizens from all backgrounds engage in civic life."

(Coalition for a Livable Future, 2001, Connections, p.1)

In creating this campaign, the Coalition for a Livable Future added equity in the forefront of livability priorities. Since the creation of this campaign, the organization has also worked to create a Regional Equity Atlas. (CLF, 2009, p.1)

Conclusion

Several conclusions can be drawn about the meaning of "livability" in the Portland-Vancouver Metro Region:

> 1) Livability in the region is discussed more in terms of how to protect, enhance, or implement livable communities, rather than define the concept of livability itself.
>
> 2) In both the 2040 Growth Concept and the Portland Plan, the issue of defining the concept has been put to the public. Some of the common elements or values of these definitions include accessibility to nature, transit, and jobs, preserving the character of neighborhoods and the region, and equity.
>
> 3) The clearest definition of livability to emerge from the city and regional levels is Metro's 2008 Resolution defining a "successful" region. This definition illustrates an attempt to utilize common elements from various Metro planning documents. It also shows that in the end, livability as a concept in the Portland-Vancouver Metropolitan Region, exists more as a goal to strive towards rather than a concept that is concretely defined.

The Puget Sound Region Case Study

http://www.foundseattle.com/images/seattle05052_e5wh.jpg

Introduction to Seattle Metropolitan and Puget Sound Region

The Puget Sound region, claimed as the "jewel of the Pacific Northwest", is characterized by its unique natural features and wildness much like its neighboring metropolitan regions of Portland, Oregon, and Vancouver, British Columbia.. Even the region's most urban snapshot- the skyline of Seattle, complete with the Space Needle – would not be complete without the snow-capped Mount Rainer in the background.

The Seattle Metropolitan Statistical Area, as defined by the US Census, includes Snohomish, King, and Pierce counties, and is currently home to nearly 3.5 million residents. The federally designated metropolitan transportation planning organization, as well as the state-designated regional growth management entity, is the Puget Sound Regional Council, which includes the same three counties as the Census-designated MSA plus Kitsap County on the west side of the Puget Sound. Including Pierce County, the Puget Sound region houses nearly 3.7 million residents in 82 towns and cities (as of 2009).

Livability Defined at the State Level

The State of Washington approved the Growth Management Act in 1994 to require both county and local jurisdictions to develop comprehensive plans, and, in particular, to preserve "quality of life issues". (Washington City Planning Directors Association) Protecting and preserving by means of designating lands as "areas of concern" through various policies is a common theme throughout the Seattle-Puget Sound Region's vision for livability. The natural resources of the region play a prominent role not only in the identity of the region, but also in what land use policies the communities of the region support.

Livability Defined at the Regional Level

The Puget Sound Regional Council (PSRC), which provides regional growth management planning, economic development planning, and transportation planning, adopted its VISION 2040 plan in 2008. PSRC describes VISION 2040 as a, "regional strategy for accommodating the additional 1.7 million people and 1.2 million new jobs expected to be in the region by the year 2040" (PSRC). While the PSRC seems to explicitly avoid utilizing the word "livability," the document begins with the following statement:

> "Our vision for the future advances the ideals of our people, our prosperity, and our plan. As we work toward achieving the region's vision we must protect the environment, support and create vibrant, livable, and healthy communities, offer economic opportunities for all, provide safe and efficient mobility, and use our resources wisely and effectively." (VISION 2040, 1)

Additionally, VISION 2040 focuses on sustainability to carry the Puget Sound region into the next thirty years. It states: "A sustainable approach prevents degradation of land, air, and climate, while creating built environments that are livable, comfortable, safe and healthy, as well as promote productivity." (VISION 2040, 7)

Livability Defined at the City Level

The City of Seattle is undertaking a planning process for a new comprehensive plan during the fall and winter of 2009 entitled "Seattle 2030 & Beyond". Baseline research began in the summer of 2009, including various levels of public participation and community workshops. It is interesting to note that the outreach materials for the new comprehensive plan describe the City of Seattle as "becoming America's most livable city". Livability for the City of Seattle has become a key feature for its identity. Much like Portland, Seattle has benefited from increased growth as well as increased tourism related to being known as a livable city. The U.S. Conference of Mayors identified Seattle as the United State's "Most Livable City" in 2005.

Livability Defined by the Community

The Cascade Land Conservancy, a non-profit based in Seattle, plays a key role in the region's private and non-profit environmental action. Beyond the typical responsibility of a land conservancy of acquiring and conserving opens space, the organization has adopted the notion of livability of the region's urban area as a key factor to preserving the region's open space. The Cascade Land Conservancy launched the Cascade Agenda in May 2005 as a "design to answer [growth management] questions by offering a plan and call to action to protect the Puget Sound region's natural environmental by simultaneously conserving rural landscapes and creating more vibrant and livable communities." (Cascade Land Conservancy)

Much like PSRC and other Seattle-Puget Sound regional planning documents, the Cascade Agenda promotes a livability agenda that contrasts natural with urban, where livability is a positive and desirable characteristic of an urban environment. For example, the Cascade Agenda has two explicit goals:

> (1) "Our Lands – Goal of protecting 1 million acres of working forests (93% of existing lands) and farms (85% of current farms) and 265,000 acres of natural and recreation land" and
> (2) "our communities – Recognize that to save our natural and working lands, we must have vibrant and livable cities and towns where people want to live and work"

Much like its regional partner jurisdictions, the Cascade Agenda frames community and urban concerns as a function of preserving open space, and working farm and forestland.

The Washington Chapter of the AIA partnered with the Cascade Agenda and the University of Washington to host a two-day panel titled, "Design for Livability: Sustainable Cities Forum", with an implicit focus on the Seattle-Puget Sound region. The event was well-attended by 200 architects, planners, attorneys, and other smart growth professions and prominently featured the topics of growth management, complete streets, green building, and general community design. The academic and political momentum behind the Seattle-Puget Sound region's agenda for livability is gaining traction as Seattle is set to host the national New Partners for Smart Growth Conference in January 2010 which is well known for issues concerning livability.

Vancouver, BC Metropolitan Area Case Study

http://farm4.static.flickr.com/3499/3894975129_e9c33c8037_o.jpg

Introduction to the Vancouver, BC Region

The photo above was taken from Vancouver's Arbutus Ridge. Within this image there are two prominent elements, urban forms and natural forms, and despite the disparity of the two they are seamlessly integrated. The area depicted here looks livable, but why? This case study will explore what makes Vancouver, BC a livable place and attempt to reach a regional definition of livability.

Vancouver's natural habitat is a temperate rain forest. Lying at the mouth of the Frasier River it is surrounded by the Pacific Ocean to the west, the Coast Mountains to the north, the Frasier Valley Regional District to the east, and the state of Washington to the South. These surroundings provide mild weather, fertile land, and beautiful scenery. The area is home to around 2.1 million people and is ethnically diverse with 41.7% of that population being represented by minorities as well as a large number of "white" European immigrants. The region is a leader in urban planning and has been voted the world's most livable city by major publications across the globe. (Wikipedia).

Livability Defined at the Provincial Level

The government of the province of British Columbia is comprised of a collection of ministries and central agencies each responsible for a particular aspect of governance. The Ministry of Community and Rural Development deals most closely with the concept of livability. In its Annual Service Report the department describes its role in the province:

> "Equipping local governments with the tools they need to create more livable and economically resilient communities is at the heart of the Ministry of Community and Rural Development…meeting the diverse needs of communities, whether large or small, urban or rural, in every corner of British Columbia." (Ministry Service Plan, 3).

British Columbia doesn't attempt to define livability at the provincial scale. Instead, it accepts local conceptions of the term, and attempts to aid in the achievement of goals which are implemented at a variety of scales.

Livability Defined at the Regional Level

Metro Vancouver (a.k.a.) is the regional planning agency in the Vancouver metropolitan area. Formed in 1967 by the provincial government, Metro Vancouver has authority over a region of 282,000 hectares in size, and is comprised of 22 municipalities and one electoral area. Metro has three primary responsibilities. The first is the provision of services, which ranges from drinking water and solid waste management, to parks and affordable housing. The second is a political forum; a place where community issues can be not only discussed, but also acted upon. And third, planning and regulation, particularly in the areas of growth, waste, and air quality management.

Metro Vancouver and its predecessor, the Greater Vancouver Regional District or GVRD, has been planning for its region since 1967. The Livable Region was developed in 1975 in response to rapid growth that was occurring in the Vancouver metropolitan area. At the time of its publication the region had 1.2 million residents and projected to reach 1.5 million by 1986. The plan's mission is to "Let Vancouver continue to be a good place to live" (source) in the face of population growth. Metro Vancouver held a series of meetings in 1972 during which they asked citizens what livability meant to them. The findings from these meetings are included in this report in the form of eight main ideas:

> "1. People want to avoid the disruption to their lives which often accompanies rapid population growth — crowded schools, overloaded community services, and the complete lack of services, such as public transit, in some fast-growing areas.
> 2. People do not want pollution to ruin the clean air and clean water or shatter the quiet which has attracted so many of them here…
> 3. People want a broader range of community services near their homes. In addition to the usual shopping centres, they want recreation centres, business services, day-care centres, and educational opportunities.
> 4. People want to preserve the natural assets of the Region…They want natural places in and close to cities.
> 5. People want to reduce the time and effort involved in traveling. Eighty percent of the people working in the Region get to their jobs within 45 minutes. They would like to do it in less. They also want to be able to reach parks, beaches and the mountains easily.
> 6. People are worried about the high cost of housing. Many are worried about whether they can afford to buy any type of home, while others are concerned they may be forced to choose housing which does not have the qualities they want.
> 7. People are willing to rely less on their cars, but they want fast, frequent and convenient public transit to take them to work, shopping and recreation areas.
> 8. People want to participate in government decisions which affect their lives."
> (The Livable Region, 7).

Achieving livability is a principal goal of Metro's growth management and strategic plans. In 1996, the Livable Region Strategic Plan (LSRP) was adopted and continues to be utilized today. Its primary goal is to help maintain regional livability and protect the environment in the face of anticipated growth. Since its inception it has provided a framework for making regional land use and transportation decisions to Metro Vancouver and its partners. A definition for livability is not explicitly stated, but the LSRP's four fundamental strategies describe a livable region:

"**Protect the Green Zone:** The Green Zone protects Greater Vancouver's natural assets, including major parks, watersheds, ecologically important areas and resource lands such as farmland. It also establishes a long-term growth boundary.

Build complete communities: The plan supports the public's desire for communities with a wider range of opportunities for day-to-day life. Focused on regional and municipal town centers, more complete communities would result in more jobs closer to where people live and accessible by transit, shops and services near home, and a wider choice of housing types.

Achieve a compact metropolitan region: The plan avoids widely dispersed and accommodates a significant proportion of population growth within the "growth concentration area" in central part of the region.

Increase transportation choice: The plan supports the increased use of transit, walking and cycling by minimizing the need to travel (through convenient arrangement of land uses) and by managing transportation supply and demand." (LSRP, 10-3).

Choice in all things is a big part of a complete community and in turn livability, and the concept of choice can be implemented through a mix of land uses. This passage clarifies what transportation should be like in a livable place; choice is again key, but with an emphasis on transit, walking, and biking. Transportation must also be efficient and a mix of land uses achieves this as well.

In November 2009, Metro Vancouver released a draft of Metro Vancouver 2040: Shaping Our Future, a regional growth management plan and long-term framework for the development of the region. Livability is not directly defined in this report, but qualities are attributed to the term within the vision, goals, and strategies of the plan.   The key passages are quoted below:

> "Metro Vancouver is a region of diverse communities where people in all their infinite variety live, work and play in comfort and safety. Community well-being, economic prosperity and environmental health enhance the livability and sustainability of the region. The region's spectacular natural landscapes and waterways are protected from and integrated with urban development. Affordable and efficient transportation services and infrastructure support the people and businesses in the region and support the region's long-term development." (Metro Vancouver 2040, Vision).

Community well-being, economic prosperity, and environmental health make this region livable. These broad characteristics are then elaborated: for the economy to thrive there must be affordable transportation and infrastructure, and for the environment to be healthy, it must be protected and integrated with the urban environment.

> "Metro Vancouver has a vision to achieve what humanity aspires to on a global basis – the highest quality of life embracing cultural vitality, economic prosperity, social justice and compassion, all nurtured in and by a beautiful and healthy natural environment.
> We will achieve this vision by embracing and applying the principles of sustainability, not least of which is an unshakeable commitment to the well-being of

current and future generations and the health of our planet, in everything we do…" (Metro Vancouver 2040, Vision).

Here "the highest quality of life" alludes to livability, and a new piece of its definition emerges in "cultural vitality." Also the concepts of social justice and compassion begin to clarify what is meant by the more vague term "community well-being." The word "sustainability" appears in both of these passages, and it has an interesting relationship with livability. The terms imply many of the same things, and appear together so often it can become difficult to make a distinction between the two. Lee-Ann Garnett, a Senior Planner at Metro Vancouver, noted that: "The terms livability and sustainability are not considered to be interchangeable – sustainability is more encompassing. We can't be a livable place if we are not sustainable, and livability is almost a sub-set of sustainability. For example, a place could be very livable, yet use up all of its resources, which of course goes against all sustainability principles." (Garnett, 1).

The final reference to livability in this plan appears under Challenges and Responses:

> "…The challenge will be to manage this growth in ways which contribute to both the long term livability and sustainability of the region. Growth without sprawl implies greater density of development. Carefully structured, this can reduce congestion, improve the economics of transportation infrastructure and public services, increase the viability of retail and service centres, foster the creation of vibrant centres of culture and community activity, and maintain an attractive and diverse urban environment." (Metro Vancouver 2040, 8).

A compact urban environment illustrates and implements a number of livability concepts including, accessibility to services and opportunities, affordability, and diverse, cultural town centers.

Between these two signature planning efforts, a definition of "livability" can begin to take shape. A livable Metro Vancouver is characterized by:

- complete communities and a quality built environment
- protected and enhanced natural environment
- community well-being (including celebrating diversity and social justice)
- provisions for economic prosperity

These categories will serve as reference points to be compared and integrated with other conceptions of livability.

Livability Defined at the City Level

The City of Vancouver has a four-division planning. The Community Division creates plans that utilizes concepts such as livability. CityPlan, adopted in 1995, is a citywide plan that provides a framework for decisions about city programs, priorities, and actions for a twenty-year period. The achievement of livability is a guiding principle behind this framework:

"Vancouverites have developed a CityPlan which supports the broad objectives of the Greater Vancouver Regional District's (GVRD a.k.a. Metro Vancouver) Livable Region Strategic Plan. CityPlan springs from the needs of Vancouver residents but its directions to improve air and water quality, provide more jobs and housing opportunities in the City, and encourage walking, biking, and transit will all contribute to the larger region's livability." (CityPlan).

This plan was developed to be congruent with regional-level LSRP so CityPlan's conception of livability matches that of the region's very closely. However, the implementation is different at the city level:

"Speciality character and heritage areas, lively retail streets, waterfront walkways, and diverse plazas and open spaces will be welcoming public places for residents, employees, visitors, and tourists. Offices served by transit, people living near work, and pedestrian and bicycle friendly routes will help to minimize the traffic pressures of downtown activity."

Livability Defined at the Community Level

The Vancouver Foundation - Founded in 1943, this organization is the largest community foundation in the region. Funded through philanthropy, their focus is instituting programs that improve local communities and create a sense of place for all residents (i.e. promote livability). The Vital Signs report has been prepared annually for Metro Vancouver since 2006; the edition cited in this paper was compiled in 2008. Vital Signs examines the perceptions and reality of life in the Vancouver metropolitan area in an attempt to discover what matters to the people of the region, and to determine what improvements are needed in the community. Within the report twelve areas that define the region's livability and wellness are presented. They are:

- Arts and Culture
- Belonging and Leadership
- Changing Demographics
- Environment
- Gap Between Rich and Poor
- Getting Around
- Getting Started
- Health and Wellness
- Housing
- Learning
- Safety
- Work

Appendix II: Federal Agency Case Studies

Environmental Protection Agency

MISSION OF EPA: *"To protect human health and the environment."*

Joining the Livability Partnership was a natural progression for the Environmental Protection Agency. Their mission statement, to protect human health and the environment, is worked towards using a number of strategies such as:

- Developing and enforcing regulations to uphold environmental laws
- Giving grants
- Researching environmental issues
- Sponsoring partnerships between businesses, non-profits, and state and local governments
- Providing environmental education and publishing information.

Through EPA's work on sustainability, and particularly smart growth, some coordination with HUD and USDOT has already occurred, and this partnership will only enhance their capability for addressing livability issues. While collaboration is of utmost importance to make this alliance effective, it is important to understand the vantage point of each organization and how that will contribute uniquely to the livability agenda.
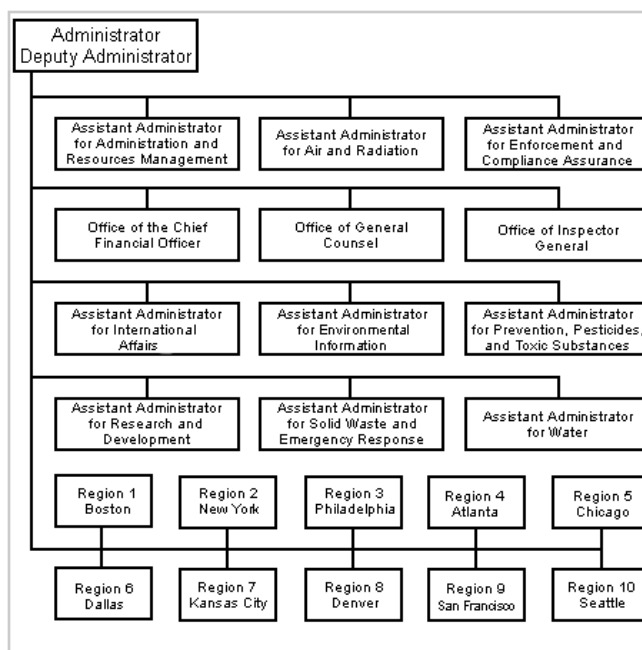
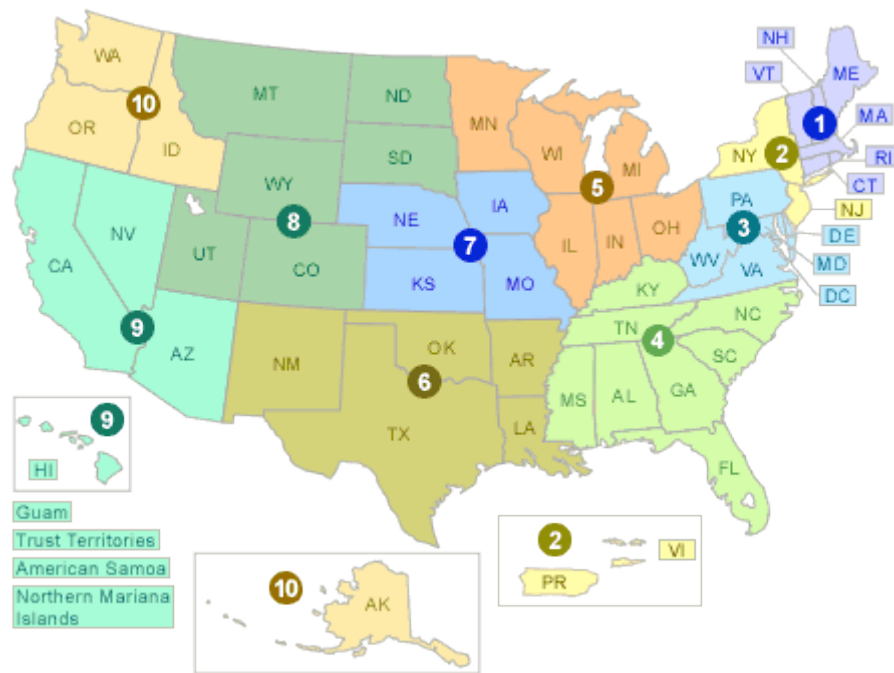Figure 1: Organizational Structure of EPA from epa.gov

Figure 2: Regional Branches of EPA
2009: EPA

While HUD, USDOT and EPA have established clear principles to guide their livability agenda, each organization undeniable has a different stake, and therefore interpretation, of what livability truly means. EPA Administrator Lisa Jackson, in a press release following EPA's addition to the partnership, stressed the importance of this by explaining, "It is important that the separate agencies working to improve livability in our neighborhoods are all pointed in the same direction. We're leading the way towards communities that are cleaner, healthier, more affordable, and great destinations for businesses and jobs" (EPA Administrator... 2009).

However, in her statement before the senate she explains further EPA's specific responsibilities, particularly concerning growth. Her concern is with our tendency to prioritize growth, even at the risk of human and environmental health. She mentions development that pollutes our waterways, dirties our air, contaminates our drinking water, and disproportionately harms those with the least amount of power to stop it. "This," she explains, "is a federal responsibility in general, and specifically an EPA responsibility" (Statement of... 2009).

The inherent connection of EPA to the livability partnership is evident in the work they have been carrying out for decades. Livability addresses the formative issues of EPA such as air and water quality as well as the greatest environmental challenge of our era, climate change. The remainder of this section will be dedicated to the programs EPA is currently working on that address concerns of the livability agenda. While these programs address key aspects of this agenda, it is important to recognize their shortfalls dealing with livability and the potential for this partnership to enhance these programs.

Smart Growth

EPA's Office of Smart Growth was founded with a mission to "help communities grow in ways that expand economic opportunity, protect public health and the environment, and create and enhance the places people love" (Office of SG 2009). This means developing in ways that will protect natural lands and environmental areas, protect air and water quality and reuse already developed land by promoting mixed-use development. The office has identified five target areas to achieve these goals (EPA SG Strategy 2003):

- Promoting infill and redevelopment
- Catalyzing smart growth transportation solutions
- Partnering for innovative development and building regulations
- Supporting state smart growth initiatives, and
- Ensuring that EPA policies recognize the environmental benefits of smart growth.

To achieve these goals the office focuses on developing best practices through evaluation of existing projects and assisting start-up projects of local, state, regional and tribal governments that wish to implement Smart Growth in their communities.

Overall the Smart Growth Program has been effective at working towards its goals, however it does not provide many resources for more advanced projects, like the projects that may begin to emerge from Cascadia. The Implementation Assistance Program appeals mostly to cities - where most assistance has been carried out - that are intrigued by smart growth but do not have the resources or knowledge to carry it out. While EPA is doing an effective job in these scenarios, its effect in areas with more resources and experience like Portland, Oregon is limited.

If the previous mentioned resolutions pass, EPA's ability to help beyond the initial steps of implementation will greatly increase. In the Cascadia region there are enough experienced planners with a clear smart growth understanding, but what we lack are the financial means to implement the more ambitious projects. By once again making smart growth implementation grants available Cascadia will be enabled to pursue these projects. Furthermore, Metro would be a perfect candidate for a Smart Growth Center for Excellence, and this would allow the more ambitious projects to serve as pilots for taking smart growth to the next level.

Implementation Assistance Program

The program contracts a team of experts to provide assistance with either policy analysis in order to assess barriers to smart growth development or the public participation process. The goals of the program are (Office of SG 2009):

- To support community's smart growth efforts
- To create regional examples to make similar projects easier
- To discern common barriers and opportunities to develop tools for other communities.

Smart Growth Grants

Early on in the program grant money was used to fund local and state smart growth projects, however since the creation of the Implementation Assistance Program the structure of these

smart growth grants have changed. EPA posts requests for grant proposals indicating a need of the office, and a cooperative agreement is awarded for the applicant that best meets their need. Examples of grant topics include (Office of SG 2009):

- National Smart Growth Conference
- Reducing the environmental impacts of school siting
- Creating the Smart Growth Network website

Partnership with the National Oceanic and Atmospheric Administration (NOAA)
This partnership provides smart growth assistance specifically to coastal communities. EPA and NOAA have identified four priority projects (Office of SG 2009):

- Community technical assistance;
- Policy analysis;
- Promotion of university based technical assistance and feedback through the sea grant program, a collaborative effort by universities to promote economic, social and environmental sustainability in coastal areas; and
- Developing and delivering training for state and local government officials.

There are two resolutions currently in the House that would increase EPA's smart growth authority:

The National Centers of Excellence for Regional Smart Growth Planning Act
This is intended to provide resources and allow EPA to identify at least three MPOs that have demonstrated strong regional planning ability and give them funds to create centers of excellence in Smart Growth. The MPOs would then collect and distribute information on best practices, make recommendations to EPA regarding research and development, work with universities, state and federal agencies to improve smart growth analysis, and to provide technical assistance to grant recipients. It also authorizes EPA to provide competitive grants relating to smart growth (Thomas… 2009).

Smart Planning for Smart Growth Act
An amendment to the Clean Air Act that would require urban areas (exceeding a population of 200,000) to submit plans for reducing greenhouse gas emissions from transportation to the Administrator of EPA and the Secretary of Transportation. This act requires goals to be set on a statewide basis and encourages specific transportation and land-use strategies that relate to smart growth. It also authorizes the distribution of competitive grants to achieve these goals (Thomas… 2009).

Energy

Energy Star does not make significant provisions for affordable housing. While in 2008 EPA partnered with HUD to build 6,000 Energy Star affordable housing units, most assistance programs are not administered through EPA, and often do not emphasize Energy Star (Energy Star 2009). The majority of the work that the Energy Star Program does to provide affordable housing is indirect. The resources they provide are not unique to affordable housing but repeat the

same information about reduced heating costs and efficient construction that they provide to all who are interested in Energy Star. What they have been successful in is providing inspiration. States have adopted Energy Star requirements at their own accord for affordable housing. For example, New Jersey requires that all new government-funded housing meets Energy Star qualifications. Thus while their standards have been helpful on a state level, the Energy Star Program has not resulted in an increase of affordable housing.

The Energy Star Program
EPA started this program in 1992 with the goal of helping people save money and protect the environment through energy efficient products and practices. In 1995 EPA partnered with the Department of Energy, and currently this label includes almost all household and office electronics, as well as homes themselves (Energy Star 2009). For businesses, the Energy Star program aids in improving energy efficiency by evaluating performance and identify areas that can be improved. Energy Star homes are homes that meet certain performance standards in terms of their energy efficiency. To meet their standards, homes must be at least 15% more efficient that homes built to the 2004 international residential code, however typically homes are 20-30% more efficient (Energy Star 2009).

Energy Star Mortgage Pilot Program
EPA is promoting the creation of this program to encourage energy efficient improvements to new and existing homes. Energy Star Mortgages include the cost of efficiency improvements so that these are included in the loan. These loans are low interest and are meant to be less expensive than a typical mortgage. There are currently pilot programs underway in Maine and Colorado.

Transportation and Air Quality
The Office of Transportation and Air Quality's (OTAQ) mission is to "reconcile the transportation sector with the environment by advancing clean fuels and technology, and working to promote more livable communities" (OTAQ 2009). The specific role of the office is to:

- Develop emissions standards
- Evaluate emission control technology
- Test vehicles, engines and fuels, and determine compliance with federal emission and fuel economy standards

While the Office of Transportation and Air Quality is making some headway towards creating more livable communities, its current framework could be greatly improved. The OTAQ addresses some needs of the livability principle by providing more transportation choices, but its focus on retrofitting existing vehicles fails to create lasting change. The Smart Way Program is ineffective at accomplishing its goal. While it is helpful at identifying vehicle choices that contribute less to pollution, it has no effect on actually increasing, or even providing information on, other transportation options. Their partnership with the freight sector could be very useful in promoting a multimodal industrial transport, but the program would have to expand beyond cars and trucks. The focus on retrofitting only contributes to small changes in actual emissions, and as

such this program is not aggressive enough to accomplish its goals.

The Transportation Conformity Regulation is a direct asset to the Livability Agenda. While some states have focused compliance on automobile transit, several have used the opportunity to incorporate multi-modal transit and progress towards more smart growth oriented planning. Atlanta, Georgia is a shining example, responding to poor air quality by creating a regional planning authority to integrate concerns of transportation and air quality, including adding significant provisions for transit to their transportation planning goals. The Smart Planning for Smart Growth Act would enhance this program because it specifically requires that land-use and transportation be incorporated into strategies to reduce emissions, thus fewer state's SIPs would focus solely on auto-emissions reductions.

The Smart Way Transportation Program
This program was started in 2004 to provide more environmentally friendly, fuel-efficient transportation options (Smart Way… 2009). To accomplish this, EPA partnered with the freight sector and many businesses throughout the country to create a certification program for clean cars. The focus of the program, through grants and finance programs, is on the trucking industry and retro-fitting existing fleets to improve their efficiency. There is also a program to raise awareness about how taking care of cars correctly can reduce emissions.

Transportation Conformity and the Clean Air Act
The purpose of the Transportation Conformity Program and the Clean Air Act is to ensure that federal funding and approval of transportation projects are given consistent with the state's Air Quality Implementation Plan (SIP). Each state has an SIP that establishes limits or work practices to minimize emissions. In states that have failed to meet air quality standards, approval of their SIP is required to ensure that they are pursuing projects that will improve air quality. The benefit of this program is it pushes states to develop innovative strategies to decrease emissions, integrating land-use and transportation decisions and working towards more integrated transportation systems. Administered through USDOT and EPA, EPA's role is to (The Bridge… 2006):

- Set federal conformity regulations,
- Issue national guidance,
- Develop emissions modeling tools,
- Provide conformity training and technical assistance, and
- Determine if the SIP's Motor Vehicle Emissions Budgets are adequate.

Water Quality and Infrastructure
The EPA has been involved with water quality, watershed protection, stream restoration and storm water management since the Clean Water Act was established in 1972; however, most attempts to address this have been overly prescriptive in controlling the negative effects of rapid development over the last thirty years. This kind of development has surpassed the capacity of our streams and rivers to provide clean water for drinking and recreation, vital parts of healthy communities (NPDES 2009).

Infrastructure needs are increasing in communities, which have to address challenges related to aging infrastructure and growing and shifting populations. But the problem is manageable if utilities undertake the work that needs to be done to address infrastructure and if the public understands the costs that will be needed to ensure that they have access to safe drinking water. This undertaking has increased the need to invest in green infrastructure to reduce the amount of runoff and pollution at the source in replacement of grey infrastructure.

EPA currently is engaged in numerous stormwater management practices and watershed protection through large-scale ecosystem management. There are many existing regulations that are based on performance and prescriptive requirements as well as an increasing comprehensive process involving preventative measures such as ordinance and incentives through low impact land use and urban designs. The use of preventative strategies will allow more involvement with USDOT if they incorporate green infrastructure in roadway construction and design that would minimize impervious surfaces, protect natural vegetation that would provide biological treatment. HUD can involve pollution prevention techniques by encouraging cluster development projects and carrying out such projects with phased grading and development stages. In addition HUD can integrate green building standards such as eco-roofs in their housing projects.

By moving towards watershed protection to protect water quality, the partnership will be able to engage multiple states and jurisdictions that exist within watershed boundaries. Watersheds also provide valuable ecosystem services for larger regions by naturally filtering out pollutants, similar to the concepts of small scale green infrastructures such as bio-swales and green roofs. These services could be extended to increase economic competitiveness of large regions by reducing the need for stormwater infrastructure investments. This would especially useful in Cascadia where the protection of the Columbia River and the coastal waters are vital in restoring salmon habitat and providing recreational opportunities to our region.

Existing Regulations and Permitting Programs that Work Towards Livability

National Pollution Discharge Elimination System (NPDES)
The NPDES permitting program was enacted as part of amendments made in the Federal Water Pollution Control Act (also known as the Clean Water Act) in 1972 in order to reduce the pollution load from harmful pollution point sources, mainly agricultural and industrial activities. It usually authorizes states to implement the entire program or only parts of the program. This program requires medium and large cities, counties, and construction projects. In addition to these entities, any stormwater system adjacent to roadways is required to manage stormwater runoff, and therefore there is the inclusion of state DOTs in this process, and provides opportunity for collaboration in the permitting process. Permitting requirements include technology based limits which requires onsite treatment of stormwater before it is discharged as well as defining Best Management Practices (BMP) to control runoff. To better address livability and green infrastructure, the NPDES process should begin to explore ways to incorporate green infrastructure credits, implementation guidelines, and requirements in their permits so that states, communities and transportation projects are encouraged to use these tools to fulfill technology limits and BMP requirements (NPDES 2009).

Watershed-based NPDES Program

Recently, EPA began exploring ways to include watershed-based approaches into the current NPDES framework with hopes of engaging local in watershed planning. This is a move in the right direction when addressing the large scale issues of livability because it helps shift the focus to watershed quality goals. The water quality services watershed ecosystems provide will also limit the need for further infrastructure investments and could produce potential cost-savings, therefore further enhancing economic competitiveness states and local communities (NPDES 2009).

Green Infrastructure Action Strategy

Developed by the Partners for Green Infrastructure, this Action Strategy is an example of a valuable collaboration of agencies, including EPA, to address green infrastructure benefits and implementation to improve water quality. The efforts detailed in this strategy are mainly on research, outreach, and demonstration projects and participation could be extended to include other agencies such as HUD and USDOT (NPDES 2009).

Existing Funding Programs

Clean Water State Revolving Fund (CWSRF)

This funding program has provided a variety of borrowers from communities of all sizes with more than $5 billion annually in recent years to fund water quality protection projects for wastewater treatment, nonpoint source pollution control, and watershed and estuary management. Overall, CWSRFs has funded over $68 billion, providing over 22,700 low-interest loans to date (NPDES 2009).

Targeted Watersheds Grants Program

A competitive grant program that provides funding to community watershed projects. Over $37 million has been awarded to 46 watershed organizations (NPDES 2009).

Drinking Water State Revolving Fund

Provides funds to drinking water systems and finances infrastructure improvements. The program also emphasizes providing funds to small and disadvantaged communities and to programs that encourage pollution prevention as a tool for ensuring safe drinking water.

Other Resource for research and data:

Clean Water Act Nonpoint Source Grant (Section 319 Grants)

Gives States, tribes and territories funding which supports a wide variety of activities related to the Nonpoint sources of stormwater pollution including:

- Technical and financial assistance
- Education
- Training
- Technology transfer
- Demonstration projects
- Monitoring to assess implementation success

Brownfield and Infill Development

The EPA has led the way in environmental clean-up since the establishment of the Brownfield program in 1995 (Brownfields 2009). Since then, the program has generated over $6.5 million in funds to assist private and public investors to identify, remediate and redevelop contaminated sites. However, because of the existing laws such as the Resource Conservation and Recovery Act and the Superfund Act, strict standards exist as barriers for developers or proprietors of contaminated property, which tends to scare off investors because of the litigious process involved in cleaning up these sites for public use. Rather than reuse former urban industrial sites, businesses instead moved to suburban or rural "greenfields," which carry fewer perceived risks to development (Randolph 2004).

There are also environmental justice concerns over those communities that reap the benefits of Brownfield redevelopment. Much of the redevelopment efforts made by investors is located in already profitable, commercially vibrant communities and usually excludes low-income, minority neighborhoods. This disinvestment poses an unequal distribution of human and environmental health threats to those populations. There have been numerous attempts to offset the unfair distribution of benefits and negative environmental impacts through the Community Reinvestment Act (CRA), which requires banks, and other lenders to make funds available in low- and moderate-income urban neighborhoods (Brownfields 2009). However, funding aside there still remains the issue of prioritizing the brownfield site clean-up to environmental justice areas.

Encouraging the use of Brownfield cleanup as well as infill development in this partnership will be a valuable tool for supporting existing communities and enhance economic competitiveness. The clean-up and redevelopment of Brownfield sites will not only remove the inherent environmental hazards that threaten clean air and water, but will focus development within urban centers protecting rural land for open-space as well as use existing infrastructure to offset development cost.

EPA is aiming towards identifying and removing barriers that limit investment and incentivize development of low-income communities. This is especially true when considering the potential for incorporating HUD redevelopment efforts, which has its own protocols for developing brownfields for residential use. If HUD combined its efforts and funds with the grants provided by EPA for brownfield and environmental justice projects, barrier like these are more likely to be addressed and removed. Furthermore, cleaning up brownfield sites in environmental justice area as part of mixed-use, transit-oriented development projects would involve USDOT and leverage an even greater amount of resources.

Current Funding Opportunities

- Assessment Grants
- Revolving Loan Fund Grants
- Cleanup Grants
- Job Training Grants
- Training, Research, and Technical Assistance Grants
- Targeted Brownfields Assessments

Environmental Justice Grants and Cooperative Agreements

- Environmental Justice and Small Grants Program
- Environmental Justice Collaboration Agreement Programs
- State Environmental Justice Cooperative Agreements Program

US Department of Transportation

MISSION OF FHWA - "To improve mobility on our nation's highways through national leadership, innovation and program delivery."

The USDOT is a mammoth agency, overseeing thirteen separate sub-agencies, 56,000 employees, thousands of projects and a budget of over $70 billion. In order to focus on the departments that would most affect livability it was decided to focus on the Federal Highway Administration (FHWA), Federal Transit Administration (FTA) and the Federal Railroad Administration (FRA) due to their focus on surface transportation. Overarching goals in terms of livability are present between all three agencies as transportation plays an essential role in the livability principles.

Livable communities are often times referred to as communities where car ownership can be optional and multiple modes of transit are available to provide accessible, affordable, safe and efficient transportation. Transportation plays a role in every one of the six livable principles that the interagency partnership established. The relationship between the three agencies is a dependent and coalescent system as the US EPA Secretary Lisa Jackson stated before the Senate Banking, Finance and Urban Affairs Committee (Transportation for America, 2009):

> "Where you live affects how you get around, and how you get around often affects where you live. Both decisions affect our environment. Working together rather than independently, our three agencies can improve the environment, the transportation system, and homes and communities throughout the United States."

In the past decade there has been a shift towards moving USDOT away from operating as a series of silos, with each transportation mode functioning as a separate entity. Instead, multi-modal forms of transportation and their respective administrations are beginning to communicate and coordinate with one another. However, this level of cooperation leaves much to be desired and improvements must be made in order to advance partnerships between the agencies themselves, the communities that they serve and the livability principles that they strive towards.

Federal Highway Administration
The Federal Highway Administration (FHWA) is a subdivision of the U.S. Department of Transportation and was founded in the late 1930s. Initially called the Bureau of Public Roads, the agency was charged with the development of the national highway system.

While the 163,000-mile national highway system only accounts for 4 percent of the nation's total road mileage, it carries approximately 45 percent of the nation's traffic (Who We Are, 2009). The agency itself is divided into fifty-two division offices that are located in the same cities as State Departments of Transportation (DOT). There are also four metropolitan offices that are extensions of the division offices. The metropolitan offices are operated jointly with the FTA. Regionally, the FHWA has 3 Directors of Field services that report to the FHWA Executive Director in Washington D.C and divide the U.S. into three geographic sections; Western, Central and Eastern (The Organization, 2008). Unfortunately this regional structure does not align with any of the other agencies (FTA, HUD, EPA), an issue that was addressed earlier in this report.
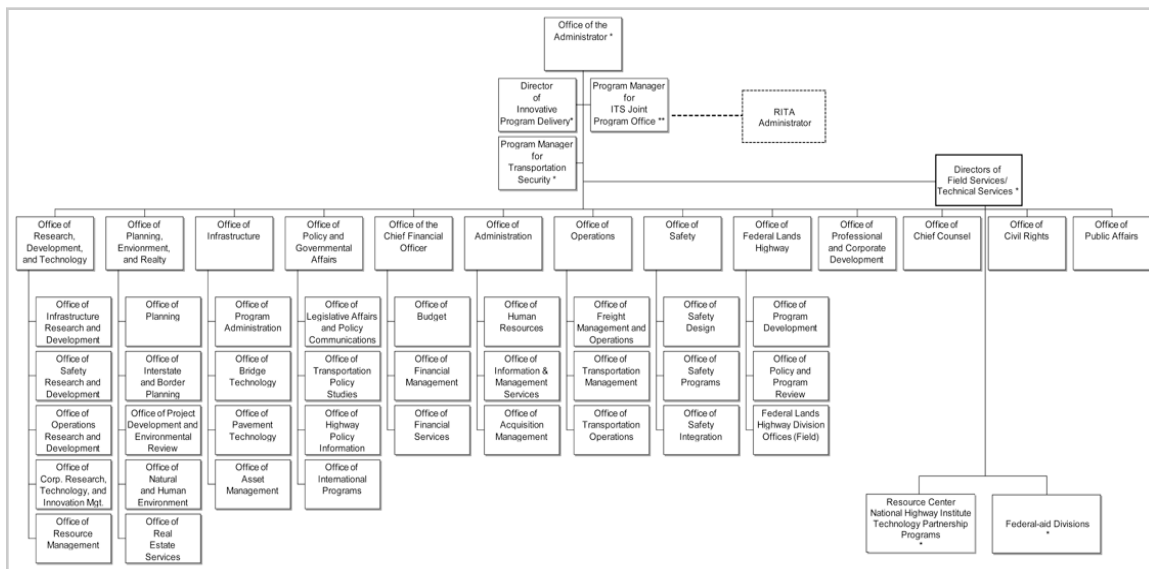

Figure 3: Federal Highway Administration
Organization Chart

While no official livability definition was found for the FHWA, Jeffrey Graham, an FHWA liaison engineer with the Oregon Department of Transportation defined livability in terms of what it meant to the FHWA as "enhancing the economic and social well-being of all citizens by creating and maintaining a safe, reliable, intermodal and accessible transportation network that provides choices for transportation users, provides easy access to employment opportunities and other destinations, and promotes positive effects on the surrounding community" (Graham, 2009).

The FHWA has identified four strategic issues that allow the agency to focus on specific targets while also addressing the needs of the highway and in turn also addresses some of the interagency partnership livability priorities (FHWA Strategic Plan, 2008). The strategic issues are:

1. Leadership – FHWA leads in defining, developing and implementing solutions for national transportation needs
2. Program Delivery Role – To ensure Federal Highway Programs are delivered effectively through risk-based oversight and value-added stewardship as well as successful partnerships
3. System Performance - Ensuring the national highway system, as part of a multimodal system, provides effective, reliable, safe and sustainable mobility for all users
4. Corporate Capacity – Emphasizing the importance of using all available resources to meet current and future project needs

These strategic issues allow the FHWA to focus its resources on areas where performance gaps have been identified and improvement can be attained. In focusing on these issues certain livability principles are also addressed. Congestion, safety and sustainability, all issues addressed in the livability principles, lie within the core of these strategic issues. In addition, by identifying itself as a transportation leader with a goal to improve program delivery, the FHWA is poised to be a critical player in the development and success of the interagency partnership. While these strategic issues do not address all of livability principles established by the interagency partnership it does provide a solid starting block for the FHWA to further the agency's livability practices.

In order to target these strategic issues the FHWA implements various programs and policies with specific objectives. Some of these programs and policies simultaneously address livability principles and may have overlaps with other federal agencies (FTA, EPA, HUD). As in many federal agencies, funding dictates much of the size and implementation of programs within the FHWA. The FHWA is divided into two arms of funding, the Federal-Aid Highway Program and the Federal Lands Highway Program. The majority of funding, which is acquired through the federal gasoline tax and motor exercise tax, passes through the FHWA's Federal-aid Highway Program and provides State DOTs with financial resources to preserve, improve and construct the national highway system. The Federal Lands Highway Program provides funding for public roads and highways within federally owned lands.

While the majority of funding to FHWA programs is formulaic, the reauthorization of the surface transportation act provides the possibility of raising the importance and prominence of livability driven programs within the FHWA by increasing funding to these programs. Currently 43 percent of FHWA's funding goes solely towards maintenance and construction on the national highway system and highway bridges. There is a need to increase funding in multi-modal forms of transit and improve asset management practices to begin moving towards achieving the interagency partnership's livability principles.

Program	FY 2009	% of Total FY 2009
Interstate Maintenance	$5,023,747,825	14.03%
National Highway System	$6,134,849,840	17.14%
Surface Transportation Program	$6,460,940,078	18.05%
Highway Bridge	$4,292,566,341	11.99%
Congestion Mitigation & Air Quality Improvement	$1,751,404,066	4.89%
Highway Safety Improvement	$1,073,816,623	3.00%
Appalachian Dev. Highway System	$470,000,000	1.31%
Recreational Trails	$84,160,000	0.24%
Metropolitan Planning	$303,966,566	0.85%
Railway-Highway Crossings	$220,000,000	0.61%
Coordinated Border Infrastructure	$210,000,000	0.59%
Safe Routes to School	$180,000,000	0.50%
Equity Bonus	$9,594,053,923	26.80%
Total	$35,799,505,262	

Table 2: FHWA FY 2009 Interstate and non-Inter-state funds allocated to States by formula

The programs listed below are housed within the FHWA and have goals and proposed outcomes that reflect the livability principles established by the interagency partnership. These programs demonstrate the commitment of the FHWA towards a sustainable future as well as the presenting the opportunity for possible program or policy overlaps with the FTA, HUD and EPA.

Safe Routes to School

The Federal Safe Routes to School (SRTS) Program, which began in 2005, assists communities in increasing the number of children that bike or walk to school. The SRTS program allocates funding for projects and programs that increase the infrastructure or incentives for children to walk / bike or school. Projects include building safer street crossings, constructing sidewalk infrastructure and developing programs that teach children how to walk to school safely. The program received $612 million through the previous federal surface transportation act, Safe, Accountable, Flexible, Efficient, Transportation, Equity Act: A Legacy for Users (SAFETEA-LU). Funding was distributed by the FHWA to State DOTs with a legislative formula over five federal fiscal years. Proposed future funding comes from the reauthorization of the surface transportation act through a Safe Routes to School Program Bill and proposes tripling the program funding (Safe Routes to School National Partnership, 2009). Allowing children to walk to school will positively affect neighborhood connectivity, reduce greenhouse gases and promote the use of mixed modes of transit with the youth of America.

Transportation Enhancements Program

The Transportation Enhancement (TE) Program offers funding to States through formulas based on amounts made available from the Surface Transportation Program. On average, each State receives 10% of its STP funds to use toward TE programs that target to either expand or enhance transportation choices and demonstrate a relationship to surface transportation (Transportation Enhancement Activities, 2008). The projects eligible for TE program funds are listed below:

1. Provision of facilities for pedestrian and bicycles
2. Provision of safety and education activities for pedestrian and bicyclists
3. Acquisition of scenic or historic easements and sites
4. Scenic or historic highway programs including tourist and welcome centers
5. Landscaping and scenic beautification
6. Historic Preservation
7. Rehabilitation and operation of historic transportation buildings, structures, or facilities
8. Conversion of abandoned railway corridors to trails
9. Control and removal of outdoor advertising
10. Archaeological planning and research
11. Environmental mitigation of highway runoff pollution, reduce vehicle-caused wildlife mortality, maintain habitat connectivity
12. Establishment of transportation museums

The Transportation Enhancement activities have a focus on environmental and cultural retention while also addressing surface transportation. This combination allows for multiple results to be obtained from a single action allowing the projects to be cross-disciplinary and multifaceted. Programs such as this, which avoid single action outcomes, will benefit the livability partnership as they promote projects that affect various disciplines at one time.

Congestion Mitigation and Air Quality Improvement Program (CMAQ)

One of the longest lasting relationships within the interagency partnership is between USDOT and EPA. In 1990, Congress amended the Clean Air Act (CAA) to improve America's efforts in

attaining the National Ambient Air Quality Standards (NAAQS) (Congestion Mitigation and Air Quality [CMAQ] Improvement Program, 2009). The NAAQS required there to be a strong relationship between transportation and air quality planning, due to the coalescence between the two disciplines. Since that time the CMAQ has continued to receive funding for projects that contribute to air quality improvements and reduce congestion.

Currently CMAQ funding accounts for approximately 5 percent of the FHWA's yearly budget and is determined through a formula that takes into account an area's population as well as ozone and carbon monoxide problems in the area. Funding is available for State DOTs, Metropolitan Planning Organizations (MPOs) and transit agencies to invest in projects that reduce particular air pollutants from transportation-related sources over a five-year period (Congestion Mitigation and Air Quality [CMAQ] Improvement Program, 2009). It is important to note that neither national standards nor set regulations exist for how a CMAQ program should be structured which allows for State DOTs and MPOs to develop a program for the area's particular needs.

The CMAQ improvement program demonstrates the ability of the FHWA to partner with the EPA. Over a decade ago EPA set NAAQS and the FHWA developed a program in which to meet those requirements. In the future it would be encouraging to see more of partnership between EPA and the FHWA instead of a regulatory relationship.

The Transportation Planning Capacity Building Program
The Transportation Planning Capacity Building (TPCB) Program is a joint venture between the FHWA and the FTA that provides products, resources and services to transportation professionals that plan the nation's surface transportation system (About TPCB, 2009). Three program elements are at the core of the TPCB: Planning Resources, Training and Information Dissemination and Outreach. Through these programs the TPCB achieves its objective of providing transportation planning information, improving technical skills and knowledge and acting as a hub for information to be exchanged between professionals. The program is mainly run through a website that provides transportation planning information and resources, technical reports, regulations, policies and individuals to contact for additional information.

Programs such as this one allow for local jurisdictions and MPOs to develop long-range transportation plans without needing a full technical staff. The TPCB also provides a strong platform through which the FHWA and FTA can reach out to other partners to implement policy changes or program reforms. As the interagency partnership develops the TPCB may provide the FHWA and FTA with a base for collaboration and a path in which the agencies can reach transportation planners at local, state and regional levels.

The TPCB is one of USDOT's capacity building programs that provide transportation agencies at all levels with planning tools and resources. Additional USDOT capacity building programs include:

- Environmental Competency Building Program
- Freight Professional Development Program
- Intelligent Transportation Systems Program
- Roadway Safety Program
- Highway Infrastructure Security and Emergency Management
- Transportation Curriculum Coordination Council
- Right-of-Way Outreach and Program Research
- Travel Model Improvement Program

Context-Sensitive Solutions

Context-Sensitive Solutions (CSS) began in the FHWA in 1969 with the National Environmental Policy Act that stated that transportation agencies had to consider the adverse effects that transportation projects had on the natural environment and work towards mitigating these effects (What Is CSS, 2005). Since then, CSS has developed core principles to be applied to the transportation process, outcomes and decision-making in order to improve the results of transportation projects on the environment, communities and economy. It is a tool through which the FHWA can lead community planning movements and improve current practices and an outlet which FHWA can use to reach out to local jurisdictions regarding transportation planning.

Programs, such as the ones listed above, are crucial in FHWA's role in meeting the livability principles. However, as aforementioned, most programs in the FHWA are determined through formula-based funding structures. This funding structure should be challenged and reviewed to reflect the FHWA's commitment to livability, ensuring that projects that address the livability principles receive adequate funding. In the current administration the possibility to reconstruct the FHWA's funding structure is possible through the reauthorization of the surface transportation act, an option that is discussed in more detail later on.

Federal Transit Administration
Like the Federal Highway Administration, the Federal Transit Administration (FTA) is a subdivision of the U.S. Department of Transportation. Since its creation in 1964 (then the Urban Mass Transportation Administration), the agency's mission has been to provide financial assistance for planning, construction, improvement and operation of all kinds of public transit systems.

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Federal Transit Administration

> *MISSION OF FTA - "To ensure personal mobility and America's economic and community vitality by supporting high quality public transportation through leadership, technical assistance and financial resources."*

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FTA has promoted livability directly and indirectly throughout its existence. In fact, the funding that led to the creation of FTA's predecessor organization came not from a transportation bill but from the Omnibus Housing Act of 1961, signed by President Kennedy. As noted in the introduction, Kennedy even used the word "livability" when he signed that Act. In his address to Congress, USDOT Secretary Ray LaHood again highlighted FTA's role in promoting livability through coordination of housing and transportation with HUD.

No official definition of livability could be found specific to FTA. When asked to define livability, Secretary LaHood was quoted by streetsblog.org as saying, "If you don't want an automobile, you don't have to have one" (Schor 2009). This seemingly flippant remark is actually quite consistent with USDOT and FTA's efforts to promote and provide transportation choices for Americans.

The primary substantive organizational divisions within FTA are:

- Budget and Policy;
- Planning & Environment;
- Program Management;
- Research and Demonstration; and
- Administration

In addition, FTA has regional field offices in each of the 10 federal regions, which correspond to EPA and HUD regions. Washington, Oregon, Idaho and Alaska comprise region 10, which is based in Seattle and has 16 full time employees.
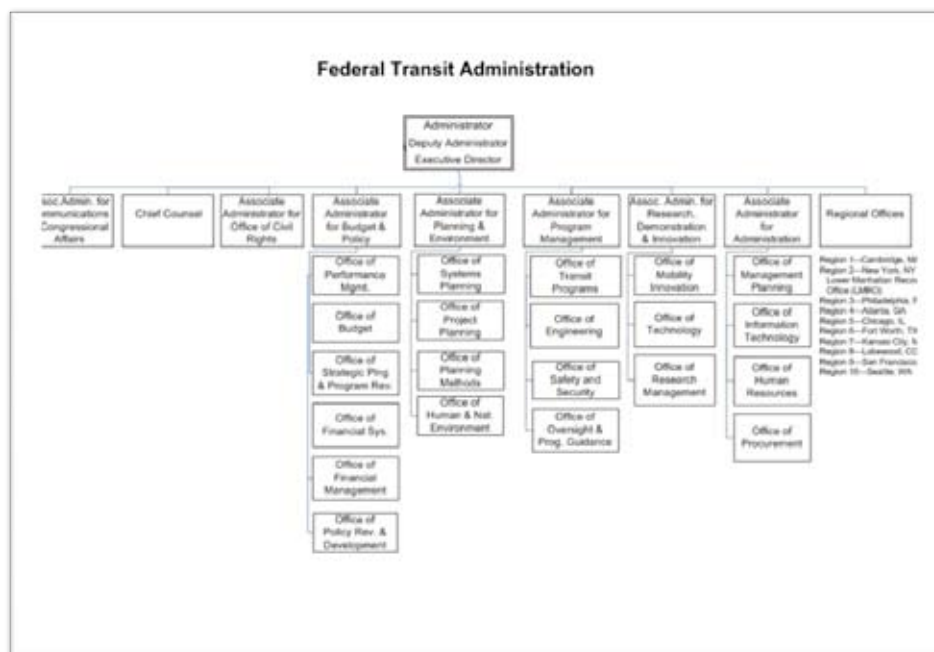
Figure 4: Federal Transit Administration
Organization Chart

Programs

FTA has no regulatory authority, so its ability to promote livability stems entirely from its various funding mechanisms. The proposed FY 2009 budget for FTA is $10.1 billion (FTA Budget). The vast majority of this money (83 percent) is allocated to states based on complicated formulas based on a states' share of urban population, total population, and/or baseline transit use. The remaining 17 percent are discretionary funds allocated to states, local governments, MPOs, and transit agencies based on project-specific competitive grants.

Table 2: FTA Financial Assistance Programs (FTA Budget)

Formula Grants	Recipient/Scale	FY2009 Budget
Urbanized Area Programs	MPO	$6,200,000,000
Bus and Bus Facilities	State, Local, MPO, Agency, Multi-state	$984,000,000
Non-urbanized Area Formula	State	$538,100,000
Jobs Access and Reverse Commute	State	$164,500,000
Elderly And Individuals with Disabilities	State	$133,500,000
Planning	State, MPO	$113,500,000
New Freedom	State	$92,500,000
Alternative Transportation in Public Parks	Parks	$26,900,000
		$8,253,000,000
Non-Formula Funding		
Research and University Grants	Universities	$59,600,000
Major Capital Investment Grants		
Existing Full Funded Grant Agreements	State, Local, MPO, Agency	$1,139,600,000
Pending Full Funded Grant Agreements	State, Local, MPO, Agency	$160,000,000
Final Design	State, Local, MPO, Agency	$85,000,000
Small Starts	State, Local, MPO, Agency	$200,000,000
Clean Fuels Grant Program	State, Local, MPO, Agency	$51,500,000
Other		$37,200,000
		$1,732,900,000

Capital Investments Program

The approximately $1.8 billion in annual discretionary funding, represents FTA's greatest opportunity for pushing its livability agenda. The bulk of this discretionary funding is distributed through the Capital Investment Program. This discretionary funding is competitively awarded to states, local governments, MPOs, or transit agencies for specific projects. This program is broken down into the four subareas: Bus and bus related projects for new buses or facilities improvements; Fixed Guideway Modernizations for improving existing rail transit service; New Starts, for new rail transit systems or additions to current systems; and Small Starts, a relatively new program meant to pay for smaller scale projects such as urban streetcars or bus rapid transit.
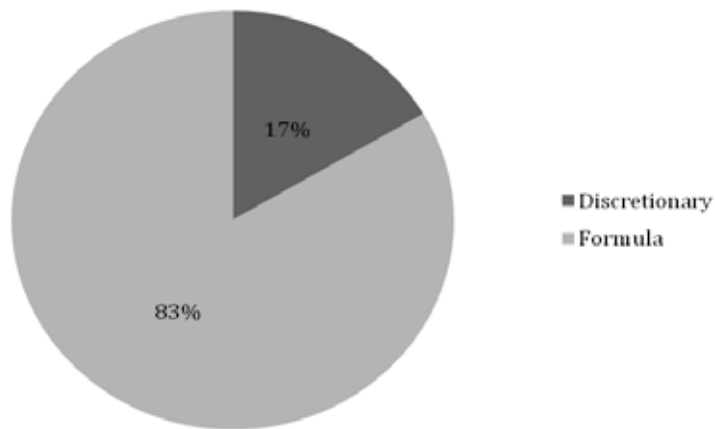

Figure 6: Formula vs. Discretionary in FTA FY 2009 Budget

New Starts is the largest of these grant programs and has been a major source of funding for rail transit and bus rapid transit systems in Cascadia. FTA typically pays for between 50 and 60 percent of projects, with the rest being matched with state and local funds.

SAFETEA-LU inserted livability further into the New Starts program by adding a "Transit Supportive Land Use and Future Patterns" criterion into its project justification criteria [Table 3: New Starts Project Selection Criteria]. More recently, FTA has made it easier for recipients to use project funds to purchase property that can later be jointly developed into transit-oriented housing or jobs. This emphasis on transit as a redevelopment tool aligns well with EPA's smart growth and brownfields programs and HUD efforts to promote transit accessible housing.

Criterion	Metric
Mobility Improvements	■ Normalized Travel Time Savings (Transportation System User Benefits per Project Passenger Mile) ■ The Number of Transit Dependent Riders Using the Proposed New Starts Project ■ Transit Dependent User Benefits per Passenger Mile on the Project ■ The Share of User Benefits Received by Transit Dependents Compared to the Share of Transit Dependents in the Region
Environmental Benefits	• EPA Air Quality Designation
Cost Effectiveness	• Incremental Cost per Hour of Transportation System User Benefit • Incremental Cost per New Rider (for informational purposes only)
Transit Supportive Land Use and Future Patterns	• Existing Land Use • Transit Supportive Plans and Policies • Performance and Impacts of Policies
Other Factors	➔ Economic Development ➔ Making the Case for the Project ➔ Congestion Pricing ➔ Optional Considerations

Table 3: New Starts Project Selection Criteria 2009: FTA

The bulk of FTA's funding is distributed directly to states by formulas established by Congress. The formula funded programs most relevant to USDOT's livability agenda are described below.
Urbanized Area Program
The Urbanized Area Program funds a wide array of transit planning, capital construction, maintenance, and vehicle acquisition. This the largest of FTA's funding programs.

Planning Program
Under the Planning Program, states and MPOs are awarded funding for transit planning. This money is meant to ensure that each region, regardless of wealth, has the planning capacity to compete for FTA discretionary funds.

Jobs Access and Reverse Commute
The Jobs Access and Reverse Commute program provides money to states for projects that improve transportation for welfare recipients and other low income commuters. Emphasis is place on reverse-commute services from central cities to suburban employment centers. States must select projects based on a competitive grant application process.
Non-Urbanized Area Program

Each state presents a list of projects for the Non-Urbanized Area Program, which can include transit operations, capital and administration

Rural Transportation Assistance

Rural Transportation Assistance provides money to states, which then distribute funds to local governments based on competitive grants.

Formula-based funding programs are critical to FTA's work toward livability goals. But because states, local governments and MPOs control how this money is spent, they offer relatively little leverage for federal involvement in decision-making. Congressional reauthorization of the surface transportation act, however, presents an opportunity to establish strong links to the livability principles. These opportunities are discussed in further detail below.

Federal Railroad Administration

The Federal Railroad Administration is a relative newcomer to promoting livability. Since the early 1990s, FRA has been home to the United States' nascent high-speed rail program. Eleven corridors are currently designated high-speed rail corridors by the federal government, but only one has been completed: between Boston, New York, and Washington, D.C. As part of the TIGER economic development program, $8 billion in grants for these corridors was authorized by the Obama administration. According to TransportPolitic.com, more than $100 billion in proposals were submitted for the $8 billion in grants.

Figure 7: Highspeed Rail Corridors Approved by the Federal Railroad Administration

High-speed rail is a key component of promoting livability at the megaregional scale and for Cascadia in particular. The federally designated corridor linking Eugene, Portland, Seattle and Vancouver, B.C. is central to the regions efforts to build a more sustainable transportation system with fast, direct connections to vibrant urban centers in cities ranging from Salem and Bellingham to Seattle and Portland. The states of Oregon and Washington, which together operate Amtrak's Cascades service along the corridor, submitted grant proposals totaling nearly $4 billion. Decisions on which projects will be awarded funding are expected in early 2010, but the White House calls the $8 billion only a down payment on continued future investment (White House, 2009)

Assets	Barriers
Train sets capable of high speeds already in operation	*Congested, shared tracks keeps speeds low and service unreliable*
Strong support of both Oregon and Washington	*Lack of dedicated Federal funding source*
Three principle airports are connected to train stations by light rail	*Lack of clearly defined roles in management of passenger rail*

Timetable for City Pairs	Approximate Completion Year	Projected Costs in Millions	Service Goals for Daily Round Trips	Service Goals for Scheduled Running Times	Max Speed	Number of Train Sets
Portland/Seattle	2007	$316.6	4	3:25	79	5
Seattle/Vancouver		$8.4	2	3:55	79	
Portland/Seattle	2009	$623.2	5	3:20	79	6
Seattle/Vancouver		$71.8	2	3:55	79	
Portland/Seattle	2012	$871.7	8	3:00	79	7
Seattle/Vancouver		$1,022.6	3	3:25	79	
Portland/Seattle	2016	$546.7	10	2:55	110	9
Seattle/Vancouver		None	3	3:25	79	
Portland/Seattle	2018	$349.7	12	2:45	110	11
Seattle/Vancouver		None	3	3:25	79	
Portland/Seattle	2023	$1,260.6	13	2:30	110	12
Seattle/Vancouver		$1,584.1	4	2:37	110	

Source: Washing State Draft Long Range Plan for Amtrak Cascades

Reauthorization of the Surface Transportation Act

As the Safe, Accountable, Flexible, Efficient, Transportation, Equity Act: A Legacy for Users (SAFETEA-LU) comes to a close, Congress has the opportunity to reform and guide the U.S. transportation system's priorities towards the interagency partnership's livability principles. Congressman James Oberstar and Congressman Peter DeFazio, proposed a bill called 'The Surface Transportation Authority Act of 2009', presenting the USDOT with an opportunity to streamline its programs, restructure funding towards policies and programs that support livability and improve its partnership with affiliated agencies. The delay in the bill's authorization, caused by the delayed approval of the health care bill, allows Congress the opportunity to continue modifying and improving the bill until it is passed.

This extended review time may be beneficial to the bill as individuals have cited issues that should be resolved before implementation. While The Surface and Transportation Authority Act of 2009 does address the issue of livability it leaves much to be desired, especially in defining the funding structure for programs (Davis, 2009). Formulas to allocate funding, sources of funding and dollar amounts for programs are not identified in detail (Schor, 2009). Funding is a crucial element of the proposed bill and will drive the focus of programs. Without funding, the creation of programs, no matter how livable their intentions and goals, will be fruitless.

Also, while the proposed Office of Livability demonstrates the USDOT's commitment to livability, the proposed office its place within the agency should be examined. It is slated to be housed within the FHWA but could instead span across the silos of transportation modes that reside under the USDOT umbrella. Even expanding the Office of Livability to incorporate the FTA would improve a partnership within the USDOT and allow a horizontal partnership between the two transportation agencies.

In terms of promise, The Surface Transportation Authority Act of 2009 does shine in certain areas. In particular, the reconfiguration and streamlining of USDOT programs is received as a welcome change. The bill proposes to eliminate 75 of the 108 existing federal programs, redefining and restructuring the Federal role in surface transportation (The Surface Transportation Authorization Act of 2009). The main focus on the consolidation is to restructure funding into core areas within highways and transit. Both highways and transit programs are brought together to focus on four core categories. The highway programs are focused on increasing safety, reducing greenhouse gases, increasing capacity and ensuring highway infrastructure is in a state of good repair. Transit programs focus on restoring transit rail systems, increasing mobility and accessibility for transit-dependent individuals, ensuring rural and urban transit systems remain in a state of good repair and developing new intermodal transit facilities (The Surface Transportation Authorization Act of 2009).Hopefully this will allow for a more cohesive and guided approach to transit investments in the future.

The reauthorization of the surface transportation act provides the U.S. government the opportunity to restructure, reform and revitalize the entire transportation system. Livability principles should be highlighted and emphasized in the reauthorization to ensure that the policies, programs

and funding structure reflect the federal agency's commitment to livability targets and a sustainable transportation system. As the reauthorization will guide the U.S.'s transportation system over the next six years it must correctly identify the federal agency's goals and provide the framework to attain the desired outcomes.

Department of Housing and Urban Development

MISSION OF HUD - "To increase homeownership, support community development and increase access to affordable housing free from discrimination. To fulfill this mission, HUD will embrace high standards of ethics, management and accountability and forge new partnerships--particularly with faith-based and community organizations--that leverage resources and improve HUD's ability to be effective on the community level."

The Department of Housing and Urban Development (HUD) is a cabinet-level agency of the federal government dedicated to enacting housing and urban policy. This includes providing affordable housing, working towards healthy communities, and encouraging individuals to purchase homes. The department provides grants and aid to state and local agencies, as well as conducts research. In FY2009, the department had a budget of $42 billion (FY 2010 Budget 2009).

The department has five program offices and seventeen support offices covering all facets of public and private housing. For administrative purposes, it divides the country into ten regions. Cascadia falls into Region X. There are field offices in all fifty states, Washington, DC, and various American territories.
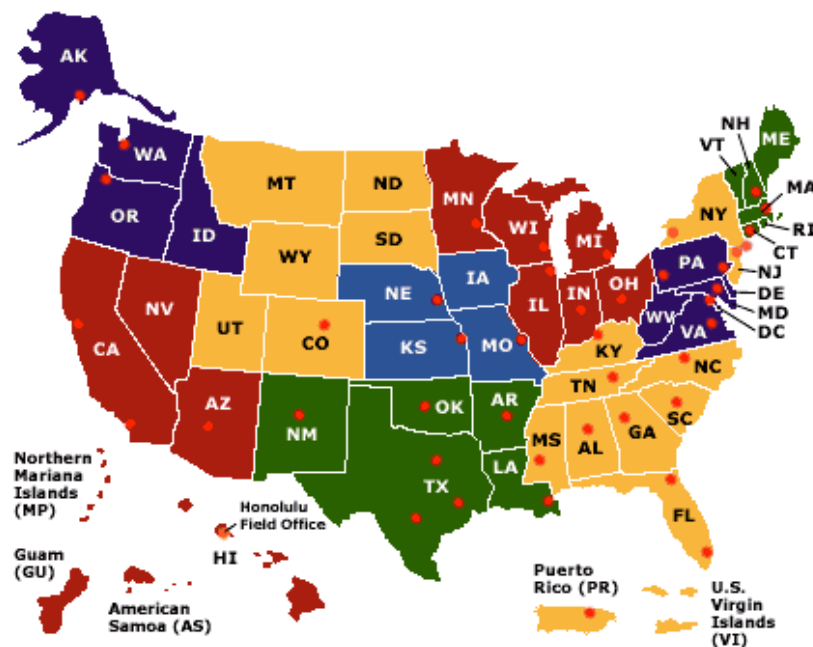

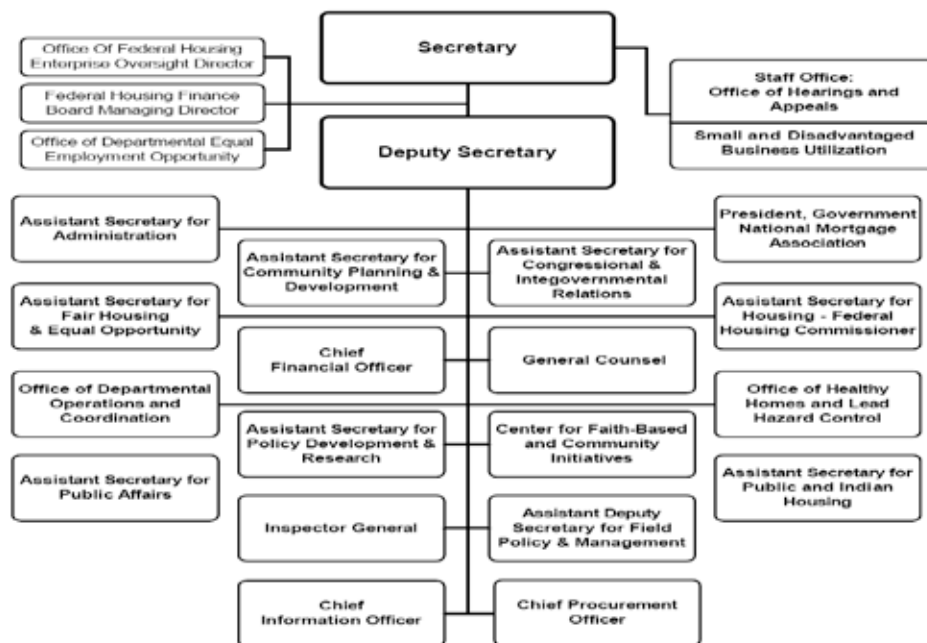Figure 8: Map of 10 HUD Regions
2009 HUD

Figure 9: HUD organizational chart

HUD Structure and Livability

As of November 2009, HUD is just beginning to explicitly address livability. However, all six of the livability principles outlined by the HUD-USDOT-EPA partnership speak to areas that HUD has some influence over. Since HUD can target funding for certain types of housing projects, it has a major voice in encouraging smart growth methods such as transit-oriented design.

HUD can work towards livability by focusing where and how it stimulates new development. By encouraging development in walkable neighborhoods or near major public transit depots, HUD can bring citizens to transportation. (USDOT is the other half of this equation: They can bring transit to the citizens.) These well-sited homes would provide convenient access to job, education, and work sites.

The second livability principle, "promoting equitable, affordable housing" is almost completely the domain of HUD. This is already part of HUD's mission, so including it in the livability framework merely reinforces its importance.

All three departments must take an equal partnership in the fifth livability principle: Enhancing collaboration between the agencies and removing barriers to promoting

> **Livability Principles**
>
> 1. Provide more transportation choices.
>
> 2. Promote equitable, affordable housing.
>
> 3. Enhance economic competitiveness.
>
> 4. Support existing communities.
>
> 5. Coordinate policies and leverage investment.

livability. As discussed later, HUD is creating an Office of Sustainable Housing and Communities to coordinate with EPA and USDOT.

HUD's mission already speaks towards many of these livability principles. Others can be addressed through additional grant criteria that focus on livability. In many ways, HUD has been working towards this for a long time, though it has only recently added the word "livability" to its vocabulary.

HUD Programs and Livability

Of the three agencies in the partnership, HUD is the latecomer to the livability party. Though agency goals such as affordable housing are central to livability, HUD has until now taken a piecemeal approach to the concept. It may provide some funds for brownfields, some funds for low-income housing, and some funds for energy efficiency, but it does not tie all of them together to target the creation of livable neighborhoods. However, it has some funding proposed for the FY2010 budget that would allow the agency, for the first time, to directly address livability.

Office of Sustainable Housing and Communities

Like EPA and USDOT, HUD is creating an office to better work with other federal agencies. In HUD's case, this is the Office of Sustainable Housing and Communities. It will be in charge of inter-agency collaboration (Donovan, 2009). Having just one office whose focus is working with other agencies is of course a reform, rather than the revolutionary change of ensuring that all corners of the HUD agency become livability-focused, multi-agency-cooperating offices.

SIDEBAR: Offices Responsible for Livability
"EPA - Smart Growth Program
HUD - Office of Sustainable Housing and Communities
USDOT - Office of Livability"

Brownfields Economic Development Initiative

HUD's Brownfields Economic Development Initiative provides funds on a competitive basis for the cleanup of environmentally contaminated sites that will be used for economic and community development. It encourages these new uses to benefit low- and middle-income households by designing the sites to attract and/or retain businesses and jobs. FY2009 saw $20 million devoted to these grants, down from a high of $32 million in FY2007 (Brownfields Economic Development Initiative 2009). However, there is presently no money allocated for the brownfields program in the FY2010 budget (FY 2010 Budget).

New Proposed Programs in FY2010 Budget

Many of the ways that HUD intends to specifically address livability are still pending budget approval. HUD's FY2010 budget request includes $240 million explicitly for livable communities. A majority of the funding, $140 million, is earmarked for 2 competitive grant programs, while the remaining $100 million is designated for Sustainable Communities Planning Grants. Eligibility criteria are not yet set but money would be targeted towards developing tools for communities to enhance livability. Both these funding programs are in the current versions of both house and senate bill, so it is likely that they will be included in the final FY2010 budget (Transcript for

CTE National Broadcast Program TC-44 2009).

Neighborhood Stabilization Program
The Neighborhood Stabilization Program, though not directly linked to livability, also helps address several of the livability principles. This program allows communities to purchase abandoned and foreclosed property in order to reduce urban decay, focusing on areas hardest hit by the recent economic crisis. The first round of funding provided $3.9 billion to 309 grantees on a formula basis through the 2008 Housing and Economic Recovery Act. Additionally, the 2009 American Recovery and Reinvestment Act (ARRA, commonly known as the federal stimulus bill) allocated $1.9 billion for a competitive grant process (Neighborhood Stabilization Program Grants 2009). This $6 billion supports the fourth and sixth livability principles, supporting existing communities and valuing neighborhoods. By attempting to arrest blight through redevelopment, the program attempts to preserve neighborhoods faced with widespread abandonment. Additionally, since the funds can be used to help low-income individuals purchase homes, the program supports the second livability principle, providing affordable housing.

ARRA Funds for Public Housing
HUD's retrofit program also supports livability by reducing energy consumption. This is also a logical overlap between EPA and HUD. ARRA had $900M in funds available for public housing agencies to build new or retrofit existing buildings, with a goal of improving energy efficiency (HUD Announces $300 Million... 2009, HUD Announces $500 Million... 2009). This money would primarily be used to improve existing facilities. Most of these public housing facilities were built nearly fifty years ago, and have had minimal major maintenance done over the years. Given the monumental leaps in energy efficiency between their construction and now, these retrofits will allow local housing agencies and their residents to realize serious energy savings.

Energy Innovation Fund
The proposed Energy Innovation Fund works with private, residential properties in the same way the retrofit program works with large public housing agencies. Part of HUD's FY2010 budget, the $100 million fund would "leverag[e] private sector (utility and other third party) financing to stimulate the development of model residential energy efficiency retrofit initiatives" (Donovan). Additionally, it would allow energy efficiency to be a consideration in HUD-backed mortgages. The energy savings from both the public housing and private residential programs addresses the fifth livability principle, coordinating policies between departments and leveraging investments.

Information Sharing
There are already numerous tools and resources that could provide data and guide the process of establishing the measures mentioned above. EPA already uses and distributes over 50 data sources including databases, models, inventories and registry's as well as participating in ongoing research to improve methods and data. Involving HUD and USDOT will allow them to incorporate their own housing and transportation data into one platform, for example within a Geographic Information Systems (GIS) software model, which would allow analysis and tracking progress at multiple spatial scales. Among such tools and resources already available within these agencies are:

EPA

Smart Growth Index – A tool which uses GIS to model smart growth scenarios in a given geographical area. It evaluates the business as usual scenario using existing plans and compares it to Smart Growth approaches.

Smart Growth Network – A group of nonprofits working to raise public awareness, promote smart growth best practices, develop and share information on policies, tools, and ideas, and develop strategies to address barriers to advancement of smart growth.

Facility Registry System (FRS) – Provides a source of environmental information about facilities across EPA, states, and other places of interest. Could be further adapted to incorporate livability development registry and be used to register brownfield site information.

Grants Reporting and Tracking System (GRTS) - The primary tool for management and oversight of EPA's Nonpoint Source (NPS) Pollution Control Program. This system provides a grant reporting system that could report grant information of other stormwater, and green infrastructure projects.

Air Quality System (AQS) – Database that contains measurements of air pollutant concentrations and could be used to house air pollution data of livability pilot program areas to measure success towards the goal of improved air quality.

Watershed Funding Resource Center – Website created to provide tools, databases, and information about sources of funding to practitioners and funders that serve to protect watersheds (Data Source 2009).

HUD

Office of Policy and Research – Responsible for maintaining current information on housing needs, market conditions, and existing programs, as well as conducting research on priority housing and community development issues. Data collected by this agency is vital for livability performance measurements.

USDOT

The Research and Innovative Technology Administration (RITA) – Coordinates the U.S. Department of Transportation's (USDOT) research programs and technologies It is responsible for activities such as coordinating, facilitating and reviewing the Department's research and development programs and activities; and performing comprehensive transportation statistics research, analysis and reporting. This administration has the capacity to replace, or supplement transportation data and analysis methods used by EPA. EPA and RITA should collaborate so that there is not redundant, or inaccurate data produced that might contradict results of livability metrics.

FHWA's Digital Highway Measurement System (DHM) - A high-accuracy roadway and roadside data collection vehicle, which is capable of collecting and processing data to generate outputs for roadside inventories, measure pavement surface and subsurface conditions. This real-world data would be a valuable component for transportation data in addition to models that are commonly used.

Appendix III: Planning and Acting for Livability Case Studies

The case studies below are examples of planning practices that exist at a megaregional level in various forms of governance. These examples of megaregional planning are closely related to the livability agenda identified at the Federal level and highlight best practices in megaregional planning, with an emphasis on applications in Cascadia.

2010 Port of Portland

Water

Great Lakes Regional Collaboration
As noted previously, the Great Lakes Regional Collaboration includes eight states and Canada. Although numerous public and private entities have bee involved, the collaboration has been successful in developing a plan. All involved parties participated in developing an eight issue strategy as part of the plan. The strategic recommendations cover: aquatic invasive species, habitat/species, coastal health, AOC/sediments, nonpoint source, toxic pollutants, indicators and information and sustainable development. The cost of implementing this strategy is estimated to be $20 billion over a five-year period. The strategy will be funded through existing state and federal programs. The strategy "does not propose a specific governance structure or plan for coordination," and questions arise about "who is in charge, what are the federal and state roles in restoration, and how the implementation of the strategy be governed" (Great Lakes Regional Collaboration).

Central Orange County Integrated Regional and Coastal Watershed Management Plan
The Central Orange County Integrated Regional and Coastal Watershed Management Plan (IRCWM) was created to connect coordinate existing watershed planning efforts and allow "for more effective collaboration and greater opportunity to leverage agency resources across jurisdictions" (Central Orange County Integrated Regional and Coastal Watershed Management Plan). The IRCWM Plan was drafted by local agencies and stakeholders "to improve and better coordinate water resource protection efforts" (Central Orange County Integrated Regional and Coastal Watershed Management Plan). Furthermore, it also qualifies for grant funding from the State of California Integrated Regional Water Management Planning process. This process was set up in Proposition 50 and was passed by California voters in 2002. The State of California Integrated Regional Water Management Planning process was created to coordinate water resource management efforts at the regional level and enable local entities to apply for project funding grants under Proposition 50. Proposition 50 "authorized $3.4 billion in general obligation bonds to fund a variety of specified water and wetlands projects and also set aside $380 million for IRWM Plan related grants" (Central Orange County Integrated Regional and Coastal Watershed Management Plan).

The IRCWM Plan serves as a bridge for previous planning efforts as well as ongoing efforts within the region. The plan offers better advantages than individual efforts due to its ability to create project linkages, incorporate multiple strategies, and leverage agency resources (Central Orange Country Integrated Regional and Coastal Watershed Management Plan).

Air

1991 US-Canada Air Quality Agreement and 2000 Ozone Annex
The 1991 US-Canada Air Quality Agreement illustrates successful air shed management across national borders. It was put in place to address "trans-boundary air pollution leading to acid rain" (Environment Canada). The United States and Canada agreed to reduce sulphur dioxide and nitrogen oxide emissions – the leading cause of acid rain. The collaboration between these two Nations worked on the shared values of each country to create clean air for residents of both countries. The proximity of the United States and Canada is another factor that makes air quality an important issue. By both countries consenting to reduce emissions, it ensures that the negative effects caused by Canada will not affect the United States, and vice versa.

In 2000, the Ozone Annex was amended to the US-Canada Air Quality Agreement to address a growing concern about air pollution – reducing high concentrations of ground-level ozone which directly contributed to smog. The United States and Canada were required and committed to reduce emissions of nitrogen oxides and volatile organic compounds in the hope to improve air quality (1991 US Canada Air Quality Agreement Progress Report).

Under Article VIII of the 1991 US-Canada Air Quality Agreement, the Canadian and U.S. governments "established a bilateral Air Quality Committee to assist with implementation of the Agreement, to review progress made and to prepare progress reports at least every two years. Environment Canada and the United States Environmental Protection Agency are the lead agencies on the committee" (1991 US Canada Air Quality Agreement Progress Report). The 2008 Progress Report highlights the improvements made towards satisfying the commitments of the agreement. The report concluded that Canada and the United States have been successful in reducing emissions and continue to meet commitments outlined in the agreement. As of 2006, Canada has seen a 35-percent reduction in sulfur dioxide emissions. By 2000, the United States had reduced their sulfur dioxide levels by 10 million tons. Nitrogen Oxide emissions in Canada were reduced 100,000 tons. The United States has reduced Nitrogen Oxide emissions by 2 million tons. The two countries also hold negotiations each year to follow up on progress and determine future directions towards a healthy environment.

Northwest Ports Clean Air Strategy
The Northwest Ports Clean Air Strategy was implemented in December 2007, and was "developed to reduce maritime and port-related diesel and greenhouse gas emissions in the Pacific Northwest that affect air quality and climate change" in the shared Georgia Basin- Puget Sound air-shed as shown in Figure 1 (Northwest Ports Clean Air Strategy Implementation Report). The Ports of Tacoma and Seattle and the Vancouver Port Authority in British Columbia are currently located in areas that meet federal, state and local air quality standards. Nevertheless, there is growing concern that the Pacific Northwest might have trouble meeting standards in the future. The strategy will use the Puget Sound Maritime Air Emissions Inventory as a baseline and also utilize effective emission reduction strategies implemented by other ports in the area. The Puget

Sound Maritime Air Emissions Inventory is a study that over 20 groups, including shipping lines, tugboat companies, and ports, participated in. This study provides greater understanding of maritime related air emissions and their effects on the environment and human health. The performance standards implemented are expected to reduce particulate matter by 70% from ships at berth and 30% from cargo handling equipment by 2010 (Northwest Ports Clean Air Strategy). Presently, all ports are on track to meet these standards. The Strategy also includes emissions from port-related trucks and trains and addresses long-term goals for reducing emissions. Each port will report their emissions annually, and they will come together on goal years in 2010 and 2015 to combine their findings.

Each port has different actions to reach a shared vision for clean air. Seattle is one of two Ports in the US that is able to "make shore power available to cruise ships, and the only North American port where two ships can simultaneously plug into the electrical grid" (Port of Seattle). This allows ships to shut off their engines and connect to the grid while they are docked. Also, all cargo cranes were converted from diesel to electric and larger cranes were installed to "handle cargo more efficiently, reducing the time spent at the dock (Port of Seattle). The Port of Tacoma has all terminal operations running on clean-burning fuels. In addition, the Port of Tacoma is also experimenting with hybrid and electric vehicles (Port of Tacoma). Similar to the Port of Seattle, the Metro Vancouver port has a shore power installation for cruise ships. They are also increasing vessel size to increase efficiency (Metro Vancouver Port).

The Ports of Tacoma, Seattle and Vancouver are having great success improving air quality. Their success has been magnified by their willingness to collaborate in order to tackle this important issue. Again, this shows the positive outcomes of mega-regional planning.

Climate Change

Western Climate Initiative
The Western Climate Initiative is a collaborative effort that addresses greenhouse gas emissions at a regional level. The Governors of Arizona, California, New Mexico, Oregon and Washington "signed an agreement directing their respective states to develop a regional goal for reducing greenhouse gas emissions, participate in a multi-state registry to track and manage these emissions in the region, and develop a market-based program to in order to reach the goal" (Western Climate Initiative). Each of the jurisdictions represented in the WCI have recommended a broad cap-and-trade program as part of their effort to reach the WCI regional goal of a 15% reduction in greenhouse gas emission below 2005 levels by 2020 (Western Climate Initiative). These jurisdictions believe this is the most efficient way to achieve this reduction. Cap and Trade is defined as "an environmental policy tool that delivers results with a mandatory cap on emissions while providing sources flexibility in how they comply" (Environmental Protection Agency). The plan allows flexibility by letting each state choose their own strategies for enacting policies that fit the broader framework. The states involved will be responsible for devising their own strategy for meeting this regional agreement. Full implementation of these plans will occur in 2012. Once the program is fully realized in 2015, "it will cover nearly 90% of greenhouse gas emissions in WCI

Partner states and provinces, including those from electricity, industry, transportation, and residential and commercial fuel use" (Western Climate Initiative).

Transportation

Japan
"Japan was the first country in the world to develop high speed rail operations, which occurred in 1964 with the opening of the Shinkansen between Tokyo and Osaka." (GAO 2009, p. 85) The initial infrastructure investment was funded by the government. However, reforms in the late 1980's granted the railway's operational duties to a group of private companies who were responsible for a franchise fee. These private enterprise fees are paid back to the public entity responsible for railway construction. The collaboration between national and local governments with private enterprise is a method of minimizing risk to all parties involved. In short, the government is not responsible for the oversight and management of service, and private enterprise is given subsidies for a service that assists with the high overhead.

France
High speed passenger rail in the France is funded by a combination of regional, national, and European Union sources. The Réseau Ferré de France (RFF) was created in 1997 to take responsibility from the federal government. The RFF owns the infrastructure and receives payment for access by rail operators, which along with the rest of the European Union, will be open to public and private companies beginning in 2010. (GAO 2009) The French model provides a clear distinction between infrastructure and operations. Moreover, the high upfront costs of infrastructure are paid for by the government through the RFF.

Economy

Iowa
The National Renewable Energy Laboratory presented an Iowa case study on the economic development impacts of wind energy projects. The presentation informed the Iowa Energy Office about the economic opportunities of wind energy at the state level. These economic opportunities included land lease revenues, tax revenues and green jobs. The research and data indicated that 1000 MW of wind development provided $4 million a year in land lease payments, $6 million a year in property tax revenue and created over 1600 jobs at assembly and manufacturing plants across the state. Overall, wind development contributed valuable economic development and manufacturing employment to Iowa.

The economic development and tax revenues realized by Iowa can translate to stimulate the megaregional economy in Cascadia. With the megaregion's dwindling manufacturing industry, wind development can establish new employment and provide valuable tax benefits to emerging and established rural communities that depend on this manufacturing employment to remain

competitive in a difficult economic climate.

Furthermore, direct green jobs would provide the forestry and agriculture industries with a niche in biomass technology. Biomass is the single largest source of non-hydro renewable energy in the United States. ("Aspen Power Case") With the rising cost of fossil fuels and natural gas, the demand for this energy is expected to increase. Logging debris, mill and municipal solid waste and landfill gas can be used as a sustainable alternative fuel to power commercial and residential buildings. The electricity generated from biomass energy utilizes existing transmission lines and does not require specialized systems to be installed. Because biomass plants require proximity to logging debris or mill and municipal solid waste, biomass can provide new economic development for the rural forestry and agriculture communities in Cascadia.

Aspen Power
In a case study of bioelectricity, Aspen Power, LLC was contracted to construct Texas's first biomass power plant in the small city of Lufkin. The plant was estimated to cost $87 million and would be financed by tax free bonds and company investments. The 67 acre site has a 45,000 ton capacity for logging debris, municipal waste, ironwoods chipping and mill waste and converts 1,500 tons of logging materials into electricity each day. Contracts with local logging contractors and regional timber entities provide a framework for utilizing over 8.4 million acres of logging debris that was left to rot in Texas forests. At the same time, the company has agreements with several cities and municipalities to acquire 12,000 tons of wood biomass from various city construction projects. Over the next 10 years, the City of Lufkin's Economic Development Department indicated that the plant would provide over 400 jobs and over $12 million in benefits for local taxing districts.

Aspen Power's case study provides a valuable illustration of the economic and social benefits of biomass technology on rural communities. Not only does biomass provide a clean and inexpensive source of electricity, it also doubles as an effective mechanism for waste management. As a result, the forestry sector would receive an injection of needed employment while rural communities will continue to expand their local tax districts.

Equity

Chicago
The Chicago region provides a framework to address housing affordability within a metropolitan region, led by Metropolitan Planning Council (MPC) and CNT to encourage a comprehensive review oriented solution to address housing affordability and equity. To address housing affordability MPC created Employer Assisted Housing (EAH) program and Housing Choice Vouchers (HCV) to expand housing affordability through means other than new construction (MPC 11). The strategies behind these programs were to leverage greater private sector investment and leadership around affordable housing in the region's high job growth areas. Since 2000, more than 70 employers are now engaged and have assisted more than 1,800 employees to buy homes. The

State of Illinois provides both tax credits and matching funds to encourage these public-private partnerships (MPC 11). The premise behind the programs of EAH and HCV is to create more opportunities for low income workers to find quality affordable homes closer to secure decent paying jobs. These programs offer effective tools for individuals in the Chicago region ability to move closer to a good job. The work done by MPC and CNT in the Chicago region has been successful in its creativity in addressing equity for the region. The Chicago experience provides a best practice example in addressing housing affordability for metropolitan regions and communities within Cascadia, but not for the megaregion as a whole.

Europe and territorial cohesion
In the U.S there has been an absence of large scale planning let alone strategies that simultaneously seek economic competitiveness and equity. As a result, in March of 2009, two dozen scholars and economic development practitioners for an America 2050 research seminar set out to explore new economic development strategies for the nation's underperforming regions within the emerging megaregions (America 2050). These organizations were inspired by the European Union's economic development strategies from the territorial cohesion program, which promotes balanced economic development (Hagler et al. 5). The strategy behind the territorial cohesion program is to create a form of spatial equity that favors development in one region over selective migration to locations of greater opportunity. The program has identified economic prosperous regions, rural and declining regions; then sought to integrate the economies between regions and reduce their economic disparities between European Member States. In contrast, U.S economic development strategies that have been pursued have emphasized productivity and competitiveness over cohesion (Hagler et al. 5).

The European Union stands in deep contrast in terms of large scale planning with the U.S. The EU provides Cascadia with an example of how to reduce disparities between regions, while becoming economically competitive in a global market while. The EU created the territorial cohesion program, as an economic strategy to integrate the economies of regions and reduce the economic disparities between European Member States. This strategy has simultaneously increased the competitiveness of the EU in the global market (Faludi 24).

High speed rail is one tool that the European model uses in improving interconnectivity and reducing disparities between regions. Moreover, interconnection also implies: good broadband internet access, links between research centers and businesses, and ensuring that the special needs of disadvantaged groups are met (Commission of the European Communities 7). The territorial cohesion program also emphasizes that European citizens should not be disadvantaged with regards to employment opportunities, housing conditions, access to public services and the like, simply by living in one region and not another (Inforegio 5). European leaders point to the fact that economic development, public transportation, access to healthcare, higher education and training facilities all span regional borders and is essential that territorial cohesion policies interconnect these sectors in an equitable, sustainable and competitive fashion.

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Figure 1 Economy Carbon Free Prosperity Pg. 4 – 2008 – Clean Edge, Inc.

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