A Cost-Driven Policy Approach for Development of On-Street and Off-Street Bicycle, Multi-Use and Single-Use Paths and Related Facilities

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Project Abstract

This study examines policy/cost issues related to bicycle lanes, multi-purpose, and single use-paths based on an explicit process from the American Association of State Highways and Transport Officials (AASHTO) and empirical analysis of several case studies. Research continues to identify criteria for the planning and design of appropriate bicycle facilities and pedestrian systems, but the selection and costs of these modes of transportation depend on many factors including planning organization, public support, funding, traffic type and characteristics, adjacent land use, expected growth patterns, terrain, path size and materials, and even the potential economic impact on and physical health measures of a community. Research on application of the three phase AASHTO process (planning, design/build, and maintenance) in cities and towns across the nation can yield cost-saving strategies based on experience and be made available to policy makers for increased productivity.

Executive Summary

A volume of recent literature suggests that bicycle-pedestrian systems are very cost effective from a number of perspectives, yet as a nation less than .5% of commuter trips are made by Americans using these modes of transportation; this is in contrast to 25% or more of this mode share use in several nations around the world.

Nine on-site interviews in progressive U.S. municipalities with pro-active bicycle/pedestrian facilities/programs (plus investigation of several case studies of smaller municipalities and rural communities that are implementing varying degrees of active transportation systems) revealed the need for improved cost-effective policy in the planning, design/build, and maintenance phases of the American Association of State Highway and Transportation Officials (AASHTO) bicycle transportation planning process. Recommendations fall into three interrelated areas of focus across the process, which are: behavioral, legal, and economic.

Behavioral recommendations focus on changing the mindset of transportation planners, developers, and the public consumer; these groups are traditionally focused on automobile-based transportation, yet attitudinal shifts are underway toward accepting active transportation systems as a result of intra-/inter-agency and intra-/inter-departmental cooperation, implementation of such systems, and increased public education.

- **Redefine priorities as necessary by reorganizing traditional transportation departments as central players in a master plan-driven department of municipal development, using a project-based, multi-professional team approach to planning and designing bicycle and pedestrian paths and facilities as active transportation segments of a complete transportation system.**
- **Reward transportation departments that design complete transportation systems with a stronger emphasis on bicycle and pedestrian facilities.**
- **Link improved bicycle/pedestrian facilities to stronger, more comprehensive, and phased educational programs to increase safety while ensuring that the**

public is encouraged to seek the many benefits of active transportation systems.

Policy recommendations focusing on legal issues and the ability of planning agencies to create new directions suggest a need for better land-use planning linked to complete transportation systems. Contemporary planning proposed by Smart Growth or groups such as Congress for the New Urbanism continue to call for more compact, less sprawling mixed-use development where walking and biking to destinations is both practical and rewarding. These recommendations also require a behavioral shift that supports a more comprehensive, integrated, and cost-effective approach to transportation planning and development.

- **Direct land-use and transportation development, through comprehensive zoning and the permit process, to legally assure equal or better access by foot or bicycle to educational, recreational, retail, commercial office, and other service-sector types of development.**
- **Cluster commercial and residential development in higher density centers, rather than extend such development in linear strips along roads.**
- **Require, through the permit process, mixed land uses of residential, retail, commercial office, and other types of compatible development to provide an environment that is safe and convenient for pedestrian and bicycle travelers and gives people a choice of shorter travel distances between origins and destinations.**

In areas where levee agencies or other agencies have primary jurisdiction, legislation is needed to create policies that create or enhance safe, efficient bicycle and pedestrian system access, especially along rivers and drainage ways.

In terms of economic issues, new funding policies need to be adopted at the state and local levels to increase the implementation and use of bicycle and pedestrian systems. While the federal government has called for adoption of these systems, most states and municipalities have allocated little of their transportation budgets to bicycle/pedestrian facilities. Those municipalities that have devoted a higher percentage of their transportation budget to bicycle/pedestrian facilities often linked to mass transit have realized a successful mode-share conversion to these facilities with measurable economic and community benefits that are discussed in detail in the body of this report.

- **Insure that states and municipalities set targeted increases in bicycle/pedestrian mode share over measurable time periods with an adequate percentage of their total transportation budget set aside for bicycle/pedestrian systems and facilities.**

In regard to the design and construction phase of the AASHTO process, cost data varied greatly but revealed an average cost for ten-foot-wide off-road asphalt multi-use trails on a six-inch gravel base to be around $250,000 a mile, though more grading, bridges, lighting, and other amenities can double or even triple this figure. Packed gravel paths are being used by some municipalities in flat terrain with some cost savings (provided later in this report). Other cost savings may be found where street width allows adequate parking and marked bike lanes and where these facilities are constructed as part of larger infrastructure projects. Cost savings were often realized by municipalities that carried out basic grading and surfacing in-house as opposed to contracting the work out, with the exception of path bridges. Further cost savings to the tax payer are found where progressive land-use planning requires that developers shoulder the cost of these facilities.

- **Insure that new development pays for bicycle/pedestrian facilities as a routine development cost through progressive planning and zoning.**

<u>Management and maintenance</u> issues cited in interviews suggest the need for policy that insures funding in these areas that can also boost safety. Without proper education, both drivers of cars and bicycles can be a menace to one another, even with properly designed bike lanes. The final recommendation under the behavioral section above is germane here as well.

Maintenance of roads with and without bicycle facilities is primarily initiated by public complaints, as reported by a number of the municipalities interviewed across the nation. This is clearly not a sustainable or safe approach as may be perceived by recent, tragic failures of several road bridges across the U.S. Therefore:

Adopt a policy that assures timely, integrated maintenance of paths and streets with adequate funding. This must be achieved through aggressive use of pavement management as a multidisciplinary practice. This requires "not only civil engineers but also the knowledge and input of systems analysts, computer engineers, electronics experts, business leaders, finance experts, economists, and others to develop a truly successful system approach."
referenced online June 2009 at http://onlinepubs.trb.org/Onlinepubs/millennium/00084.pdf

The rationale for these recommendations and a more complete set of recommendations from the interviews and case studies follow the introduction and review of cost analysis approaches. The middle section of the report indicates actual as-built cost data of on-road and off-road bicycle and pedestrian facilities derived from a number of specific case studies. Further strategies to ameliorate costs of bicycle lanes and multi-use paths complete the study.

<u>Introduction</u>

Federal transportation funding has reached a critical crossroads where investment in a more diverse transportation system that provides viable choices to walk, bike, and use public transportation will lead to a far more efficient use of transportation resources. Half of the trips in America are within a 20-minute walk yet people typically drive to these close destinations often due to a lack of the proper transportation infrastructure. Early efforts to provide this missing link in our transportation system are now proving that more people will choose bicycling or walking for short trips where choice-based alternative pedestrian and cycling facilities are available. Additionally, communities that invest in well planned facilities promote increased property values, cleaner air, a richer and denser mix of compatible land uses which in turn leads to shorter and more enjoyable trip duration, increased sense of community, and increased public health benefits. Recent research is for the first time quantifying these benefits from prioritizing bicycling and walking nationally as part of a more diverse transportation system that is also supported by the public (Figure 1).

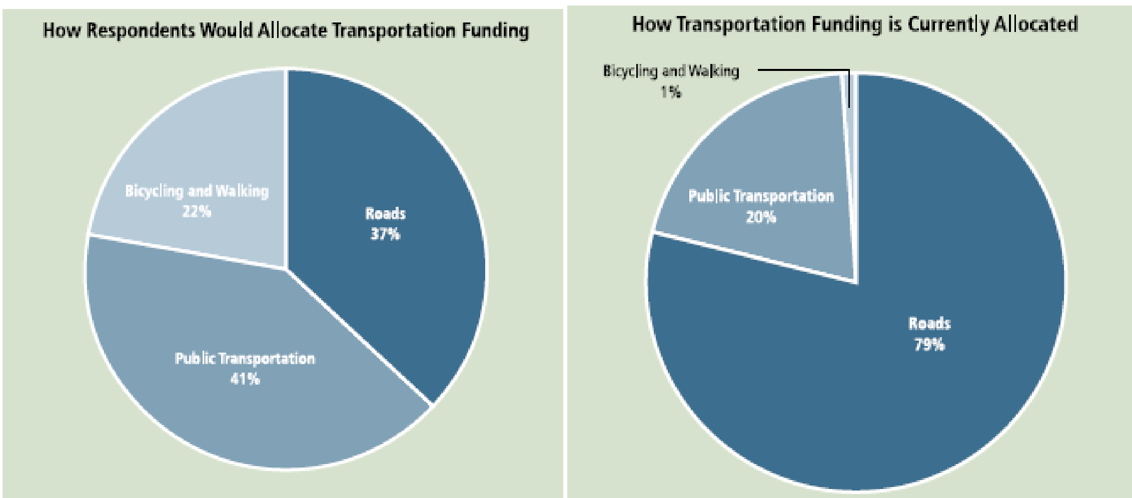


Figure 1 - National transportation poll commissioned by Transportation for America,
(Active Transportation for America, Rails to Trails Conservancy, 2008)

Investing in bicycling and pedestrian infrastructure (aka *active transportation* infrastructure) is inexpensive compared to increasing street/road capacity for the nation's automobile fleet, especially in light of the severe vehicular congestion plaguing virtually every U.S. metro area. A single mile of four-lane urban highway costs between $20 to $80 million; yet alleviating the resultant congestion from vehicular pressures on new roadways can cost much more. For example, an interchange in Springfield, Virginia, cost $676 million to build; this amount alone would pay for ***active transportation*** systems in over a dozen cities across the United States. (Active Transportation for America, Rails to Trails Conservancy, 2008, accessed online April 2009)

The *City of Madison, Wisconsin, Platinum Bicycling Committee Report* speaks to increasing mode share, an important strategy in obtaining ongoing funding.

> "Bicycle mode share is the percent of transportation trips made by bicycle. The decennial US Census tracks mode share for the journey to work only. Bicycle mode share for trips other than the journey to work can be difficult to determine, and usually requires a scientific survey or study, often called a Household Travel or Transportation Survey. These surveys are often undertaken by communities for the purpose of developing air quality models…. As

mentioned above, in the United States there is not good, consistent data on TOTAL bicycle trips by city, but a few of the cities with the highest bicycling COMMUTING to work mode share are shown below."

City	Bicycle Mode Share	City	Bicycle Mode Share
Amsterdam, Netherlands	50%	Seattle, Washington	2%
Beijing, China	48%	Tucson, Arizona	2%
Tokyo, Japan	25%	Portland, Oregon	1.76%, (3.51% in 2005)
Moscow, Russia	24%	Oakland, California	1.20
Copenhagen, Denmark	20%	Washington, D.C.	1.16
Davis California	14%	Philadelphia, Pa.	0.86%
Boulder, Colorado	9%	Los Angeles, California	0.61
Santa Cruz, California	4%	Chicago, Illinois	0.50
Madison Wisconsin	3%	New York, New York	0.47%
London, U.K.	3%	Houston, Texas	0.46%
Ottawa, Canada	2%	Baltimore, Maryland	0.33%
San Francisco, California	2%	Nationwide Average	0.38%

Figure 2. - U.S. Bicycle Mode Share of People Commuting to Work from 2000 Census compared with European Cities (Note: Numbers over 2% rounded off and modified after data tables in Madison, Wisconsin, and Washington D.C., Bicycle Master Plans)

The true potential of the bicycle and walking modes of transportation is just beginning to be realized in America with a present mode share nationally of 1 % Vs. Europe's 5%. However, in Amsterdam, Holland, where winter weather is common, for the first time this year, one news report suggested that more trips were made by bicycling and walking than were made by automobile with overall bicycle mode share in the flat Netherlands at around 27% (Web site referenced March, 2008 http://www.worldwatch.org/node/6022) . This suggests that a much higher mode-share from this active transportation sector is eventually possible in some urban areas in the U.S. if designed and implemented with the proper vision and transportation policy.

More importantly it is critical to understand that research in the Netherlands, Denmark, and Germany suggests conversion to bicycle and pedestrian options is critically dependent on a "…wide range of supportive government **policies** to make cycling convenient and safe." (Pucher, John and Buehler, Ralph, *At The Frontiers of Cycling*, World Transport Policy and Practice, Page 9, Volume 13, Number 3, December, 2007 http://www.eco-logica.co.uk/pdf/wtpp13.3.pdf)

Another recent study states:

> "Cities such as Portland, Davis, and Boulder have already shown the potential of bicycling with just a modest investment–Boulder has achieved a 21% mode share with just 15-20% of their transportation going toward bicycling. Portland's bicycle coordinator, Roger Geller, estimates that for his city to raise its bicycling mode share from 8% to 25% would cost just 100 million dollars (50 for the city and 50 for the region), making the total investment for the city alone just 105 million dollars,

equivalent to less than one freeway interchange." (Jacobson, Daniel, *Practical or Pork Barrel: The Practical Impacts of Bicycle Infrastructure in America*, Stanford University Research Paper, 2009. accessed April 11, 2009 online at http://21stcenturyurbansolutions.files.wordpress.com/2009/03/bicycle-infrastructure-essay-final.pdf)

Portland increased the mode share of bicycling trips in the city from less than 1% in 1990 to around 6% in 2008with just under 1% of the city's transportation infrastructure budget spent on bicycle facilities. Furthermore, for each $1 million invested in Federal Highway Administration-approved paved bicycle or multiuse trail, initial studies indicate that the local economy gains 65 jobs and $50 million to $100 million in local economic benefits. Because bike and ped projects are smaller in scale, they can be completed — and used — sooner than complex highway projects. http://www.rollcall.com/features/Transportation_Infrastructure_Infrastructure-2009/tandi/32464-1.html

Yet, even during the stimulus debate there continues to be controversy in Congress over expenditures for these types of cost-effective transportation enhancements. Many people who can't or won't ride bicycles or walk of course remain consumers of auto-centered transportation solutions; this same camp often won't support viable models of more diverse transportation systems that are highly cost-effective, supportive of national security in terms of lessening dependence on foreign oil, and proven as viable in a number of applications in rural and urban areas both here and abroad.

Case Study Approach

AASHTO has established a three-phase bicycle planning process (planning, design/construction, maintenance) that was expanded and shown in Figure 1 to help focus discussions with bicycle coordinators, transportation engineers, planners, and contacts at professional planning firms (such as ALTA) whose focus is on non-motorized transportation solutions. Respondents were encouraged to reflect on what parts of the process were working and which parts of the process were problematic especially in terms of policy at all levels. Interviews at 9 sites nationally were open-ended to promote an opportunity for people to share the strengths and weaknesses of the process from a planning, design/construction, and maintenance and management perspective at their locale. Recommendations were then crafted for use by policy makers with an eye toward increasing productivity and/or cost effectiveness.

The author picked locations for interviews on the West Coast, in the American heartland, and on the East Coast. Several cities are well known for their work in active transportation such as San Francisco, Portland, Minneapolis, Madison, and Washington, D.C., and several were picked because they were less well known but actively pursuing active transportation systems. All sites but the Outer Banks of North Carolina were visited in the list below.

1. Albuquerque, New Mexico
2. Madison Wisconsin
3. Municipality of Grayslake, Illinois
4. Oakland, California
5. Outer Banks of North Carolina (rural study)
6. Portland, Oregon
7. Presidio Trust, San Francisco
8. Minneapolis, Minnesota
9. San Francisco, California
10. Washington, D.C.

Case studies involving smaller communities and rural locations were also investigated where information was available from past reports or on-line studies and these case studies may be found in the middle section of this report (including appendices with specific cost data). Early during the investigation, it became apparent that there are several mechanisms and approaches communities and cities use to gauge success emanating from active transportation allocations, including mode-share and economic return on investment. To make recommendations on policy planning and strategies, it is important to understand the rationale behind these approaches.

Evaluation Approaches

To create an argument that shifts transportation funds to active transportation modes through political will that is supported by the public as a whole, there is a need for reliable information on how to value these modes and supporting facilities. Tools to value active transportation impacts can advance understanding of how investment and operations of such facilities can be optimized as well as how the infrastructure "assets" of these facilities are managed, all of which can then be reflected in wise policy and decision making. Some of these approaches can be predictive, such as some cost/benefit analysis which has recently been adapted for active transportation but the cost/benefit approach does not appear to be widely used from our brief survey. The argument is that benefit/cost analysis compares the value of the benefits with the cost of the investment and requires converting both the costs and the benefits into dollar amounts. Some benefits of bicycle facilities, however—such as reduced traffic congestion, increased safety, healthy activity, and improved air quality—are not easily quantifiable…at least this is the argument.

However, this challenge of capturing multiple benefits could change as recent research has provided quantifiable numbers for several of these variable factors that are commonly cited as a rationale for active transportation infrastructure growth.
(See *Transportation for America*, Rails to Trails Conservancy, 2008)

Part of one cost/benefit research project in Minneapolis indicated that simply building a bicycle path tended to increase the rate of bicycle commuting in the areas around the cycling facilities and distance-decay curves support the fact that bicycle use falls off after a mile's distance from a well-designed bicycle path. While this research holds promise and has resulted in an online cost-estimation evaluation tool, this approach was not in use by any of the sites visited, though several interviews suggested it might be appropriate.
(Krizek, Kevin J., Guidelines for Benefit-Cost Analysis of Bicycle Facilities: Refining Methods for Estimating the Effect of Bicycle Infrastructure on Use and Property Value, 2007 accessed online February23, 2009, at: http://www.mrutc.org/research/0607/Benefit-Cost Analysis of Bicycle Facilities_FINAL2.pdf)

Time is also used as justification for economic expenditures. For example, one study in Seattle supports an average bicycle commute time of 20 minutes with a substantial time saving for

PEDESTRIAN AND BICYCLE TRANSPORTATION PLANNING PROCESS

PLANNING PHASE

PUBLIC INPUT

User group committees
Questionnaires & Surveys
Public meetings etc

SITE INVENTORY AND ANALYSIS

Site opportunities and constraints defined

GOALS AND POLICIES
TRANSPORTATION AND LAND USE
Transportation and Land-Use policies – Legal framework at national, state, regional, metro, and municipal level

FUNDING OPPORTUNITIES

Public and Private

Plan for Improvements

Bicycle Transportation Plan
Corridors and/or Districts
Selection of Facility Type(s)

DESIGN AND CONSTRUCTION PHASE
FACILITY TYPE CHOICES
(Relative to Skill Level , Safety, Funding)

Shared Roadway
Sign Shared Roadway
Bike Lanes
Bike Boulevards
Multi Use Paths

Ancillary Considerations
Parking Facilities
Changing Facilities
Bike Share Systems

MAINTENANCE AND MANAGEMENT PHASE

Sweeping, Resurfacing, etc
Education, Safety,
Enforcement & **Evaluation**

Figure 3 – Expanded AASHTO Planning Process

cyclists over driving congested routes in their urban areas.
(http://www.bicyclinglife.com/Library/Moritz1.htm#timedist)

The International Monetary Fund (IMF) evaluates potential time saving for bicycling infrastructure projects in funding international projects around the world in locales where traffic congestion is rife. While the Federal Highway Administration (FHWA) has created a *Guidebook on Methods to Estimate Non-Motorized Travel,* which addresses cost implications, most of the case studies investigated appear to focus on a before-and-after approach of return on investment after the bicycle or pedestrian system has been built and the impact on local economies measured by this approach. This is commonly known as an economic impact analysis (EIA) and this approach was certainly prevalent for the projects reviewed, especially the more rural projects related to tourism.

For example, an EIA examines the economic benefits from tourists who visit for a specific tourist attraction or event. The benefits largely result from tourist spending on food, lodging, and entertainment—which are fairly easy to quantify.

The other major approach that was used to justify further active transportation funding by communities and especially cities was increasing the mode share of bike/pedestrian facilities while reducing bicycle and pedestrian accidents through improved design and law enforcement. In these situations, there is little doubt that providing for bicycling infrastructure in municipalities is cost effective and from their perspective it is more important to set ever increasing targets for mode share of bike/pedestrian transportation to obtain all the well known positive benefits. Both interviews and reports suggest that bicycle transportation return on investment is perceived from the positive perspectives of increased health and fitness, increased social connectivity, reduced pollution, reduced traffic congestion, reduced taxpayer burden, lowered parking demand, energy savings, more efficient land and road use, increased mobility, individual monetary savings, and decreased transportation time to reach destinations in urban areas. There is now enough research to support these claims in dollar amounts. In some cases, bike paths are beginning to stimulate not only tourism but also adjacent land development and occasionally to increase real estate value.
(*The Economic and Social Benefits of Off Road Bicycle and Pedestrian Facilities*, NBPC Technical Brief, National Bicycle and Pedestrian Clearinghouse, Technical Assistance Series, Number 2, September 1995 http://www.imba.com/resources/science/econsoc_benefits.html)

Interviews and Case Studies

Prior to site visits and interviews a number of documented case studies were investigated, many of which focused on the value of active transportation on local economies through increased tourism. Eight of these studies are cited in Appendix A and point to the potential positive economic effects from progressive and integrated transportation policy at the state, county, and local levels. The following rural case study is particularly significant and representative of an economic impact analysis approach.

Outer Banks of North Carolina– A rural paved-shoulder and multiuse bike path system. Since the late 1980s, North Carolina's Department of Transportation (DOT) and local governments invested $6.7 million in public funds to construct an extensive network of bicycle facilities that consisted of 55 miles of wide-paved shoulders and multiuse pathways along the northern coastal Outer Banks. This translates roughly to $122,000 a mile, which is reasonable by today's standards. The state wanted to know if further funds should be spent to create more active transportation throughout the two-county Outer Banks area. The Institute for Transportation Research and Education (ITRE) at North Carolina State University produced an economic impact analysis that estimated an annual economic impact of $60 million and 1,407 jobs supported from the 40,800 visitors for whom bicycling was an important reason for choosing to come to the area. Seventeen percent of the visitors to the area spent some time biking. Nearly two-thirds of respondents indicated that additional bicycle facilities should be built with public funds.

Conclusion: The investment annually yields an economic return approximately nine times the initial expenditure, suggesting that public investment in a network of bicycle facilities in other coastal and resort areas could return similar benefits whether the area attracts tourists primarily for bicycling or for other reasons. Properly designed off- and on-road active transportation facilities can be designed to accommodate tourists, providing pleasure riding and local mobility to shops, restaurants, and other tourist destinations with a substantial return on investment. The effort was well supported by a coordinated effort between the state, Dare, and Currituck counties and local governments. The NCDOT actively promotes bicycling by providing detailed maps for tourists to many regions on its Web site and continues to expand the system in key areas of the state. Further data on the project may be found in Appendix 1 with other case studies of this nature.

(Judson, Lawrie J., Norman, Thomas P., Meletiou, Marymele, O'Brian, Sarah W., *Bikeways to Prosperity, Accessing the economic impact of Bicycle Facilities*) Institute for Transportation Research and Education (ITRE) at North Carolina State University, TR News, January-February 2006. Accessed on-line January, 2009 at:
http://onlinepubs.trb.org/Onlinepubs/trnews/trnews242rpo.pdf
http://atfiles.org/files/pdf/NCbikeinvest.pdf (map and synopsis of research report)

Policy recommendation:

Active transportation must be supported through policy that stresses a proactive, coordinated effort among state, county, metro-area, and local governments to insure a continuous connection of active transportation systems for citizen mobility and cycling tourism throughout a region.

The Presidio, San Francisco, California

Planning Context

From 1848 until 1994 the U.S. Army controlled The Presidio. In 1994, control was transferred to the National Park Service (NPS) to become part of the Golden Gate National Recreation Area. NPS completed a comprehensive land use plan (General Management Plan Amendment or GMPA) that defines the direction for resource preservation, parameters for visitor and lessee use, and a proposal for a comprehensive trails and bikeways plan. In 1996, Congress passed the Presidio Trust Act which gave NPS jurisdiction over the park's non-coastal area or around 80% of the land. The Presidio Trust Management Plan (PTMP) was adopted in August 2002. Coastal land under the NPS calls for an increase in pedestrian and bicycle use with increased safety, resource protection, user access, amenities, and trails connections. The PTMP is the Trust's comprehensive land use plan and defines objectives for resource preservation/enhancement and public access and calls for a comprehensive bicycle and pedestrian network with policies regarding transportation demand management, public use, and accessibility. A Presidio Vegetation Management Plan was prepared jointly by NPS and the Trust in 2001 to aid with restoration/maintenance goals, which are

1. Natural, native, plant zones
2. Cultural, planted, or ornamental landscape zones and
3. Historic forest zones

All proposed trails and bikeway improvements must respond to and be consistent with this plan.

The Trails Plan also considers regional trails and bikeways to enhance connections to:

1. San Francisco Bicycle Plan
2. The San Francisco Bay Trail Plan
3. The San Juan Bautista de Anza National Historic Trail Plan
4. The Area Ridge Trail planning documents

The Presidio is a valuable case study because it provides a wide range of trail types in a relatively small area (1480 acres or 2.31 square miles). The Presidio traffic engineering professional plans and coordinates all the trails and bike path improvements on the Presidio Trust site and interacts with the NPS on the coastal portion of the Presidio. While planning is comprehensive for the whole site, trail design/construction is primarily implemented in segments related to other capital improvement projects such as building rehab projects, road resurfacing, stream bank reclamation, and landscaping, etc.

Planning Process

The Presidio Trail and Bikeway Master Plan and Environmental Assessment reflect the planning process typified in the top part of Figure 1 but originally the process focused on developing a number of alternatives for planning and public input after analyzing opportunities and constraints of the site and the environmental character of areas ranging from urban to natural.

1. Alternative A – *No action plan:* maintains the Presidio's 2003 trails and bikeways network
2. Alternative B – *Mixed Use Alternative*: mix of urban and natural visitor experiences with widest range of trail types and connection (the preferred alternative)
3. Alternative C – *Shared Use Alternative*: provides the widest multi-use trails to accommodate large numbers of different types of visitors on the same trail

4. Alternative D – *Dispersed Use Alternative*: emphasizes separation of pedestrian and bicycles with most trails for pedestrians only.

The alternatives created a forum for discussion with concerned agencies, coalitions, and the public at large, and Plan B was chosen as the most appropriate planning approach consistent with Presidio Trust and NPS goals.

Environmental consequences and cultural/historical resource impacts were addressed and interagency reviews carried out to complete the master plan report with public input.

Funding

Most of Presidio trails and bikeways funding is being driven by a substantial grant from a private entity which can be used in several ways, including matching funds to lever other public and private grants. The Presidio Trust was established under a mandate to become financially self-sufficient by 2013, which it achieved eight years early by leasing space for new developments such as the Digital Arts Letterman Complex (which has drawn tenants George Lucas and Robert Redford) and rehabbing structures for commercial and housing leases.

Design and Construction

The master plan focuses on CALTRAN Class 1 (off road multi-use paths) and Class II trails (marked bike lanes on roads). However Class 1 multi-use paths may consist of unpaved, stabilized gravel of varying width (as on The Presidio portion of the natural Bay Area Ridge Trail or 10-foot wide paved urban, landscaped bike/pedestrian paths (as on The Presidio Promenade Trail). The Presidio portion of the 550-plus-mile Bay Area Ridge Trail system forms a strong connection to the Golden Gate Bridge while The Presidio Promenade Trail forms a strong east-west connection with the Golden Gate Bridge and the Letterman Digital Arts Center on the east. These major developments are enhanced with a number of built and planned Class II facilities as shown in the master plan.

CALTRAN, AASHTO, the Accessible Guide for Outdoor Developed Area (AGODA) and ADA standard are all used in trail design but often these documents do not address the complexity of issues on The Presidio where cultural and historical resources require special design considerations. Standards may conflict, so it is difficult to resolve design issues in a timely manner. On the other hand, standards in AASHTO may be too broad at times to be of value where conflicting interests occur. There is a need to codify these documents into a more comprehensive single document with alternatives driven by a review of case studies. The lack of consistency of design standards tends to slow down the project design phase.

Recommendation: Have AASHTO and/or local governments review all existing standards and codify them into a set of flexible standards to avoid ambiguity and conflicting standards, which can lead to losses of time/money during the planning, design, and implementation phases.

The Presidio Trust has great flexibility in awarding contracts relative to the National Park Service. This has resulted in The Presidio using a qualified bidder list made of contractors that have a proven track record. The National Park Service, by contrast, is often bound to take the lowest bid and this has resulted in litigation from some contractors who exploit this low-bid status to increase their profit margin through cost addendums awarded later.

Recommendation: Allow entities to use a qualified bidders list with a proven track record for quality rather than demanding lowest bid contractors who may embroil clients with legal issues to raise the final cost of the project and/or deliver questionable workmanship.

The Presidio Trust stays abreast of the latest pavement technologies, which may cost less than traditional approaches. For example, on roads that are being resurfaced and re-marked for 11-foot roadways with 5-foot bicycle lanes, it was suggested that *Cape Seal* costs around a tenth as much as grinding two inches of old, cracked pavement and adding a two-inch asphalt finish surface. The Presidio conducts on-site inspection during the road resurfacing projects to insure the new technologies are correctly applied.

Design/Build Recommendation: On roads with adequate width and in need of repaving and/or restriping to include bike lanes, use the latest cost-effective re-pavement technology to minimize costs.

The final issue has to do with flexibility of facility types based on character of experience rather than only on traffic capacity. Because The Presidio has control of 80% of the site, they can quickly adopt design guidelines based on quality of experiences, ranging from natural and wild to urban. Interviews revealed that many municipalities support Class II (on-road bicycle lane) systems under transportation planning/engineering; these departments are traditionally interested primarily in traffic movement. Class I off-road multi-use paths emanate from parks departments that value site-context aesthetics and the experiential side of path planning and design. This approach can lead to duplication and misunderstandings between the two entities. The Presidio manages all classes of trails as a unified and coordinated time-saving approach that integrates aesthetic and experiential quality with all its different trails and roads by responding to the varied site contexts and character rather than only to people moving .

Recommendation: Consider aesthetics and experience as potential criteria in all bicycle and pedestrian projects. This "value-added" approach to planning and design can enhance the use of bicycles and walkways.

Maintenance – Unlike several locations where interviews took place, The Presidio actively uses a Pavement Management System that helps guide their decision-making process.

San Francisco, California

Home to 808,976 residents (2008) and an estimated day population of 1.1 million, San Francisco's 47-square mile area ranks as one of the most densely populated urban environments in the nation at 6712 people per square mile. It is the financial, cultural, and transportation center of the larger San Francisco Bay Area Region of over 7 million people. Several unique challenges to planning bicycle transport in San Francisco include steep topography, limited rights of way, and high motor vehicle traffic volumes, but census data suggest at least 2.5% of the population uses bicycles to go to work, compared to 33% using public transit. BART trains and city busses accommodate bicycles. Some 6% of all trips in San Francisco are made by bicycle on 23 miles of bicycle path, 45 miles of bicycle lane (with 34 miles more planned in the near term), and 140 miles of signed bicycle routes (a total of 208 miles of existing facilities).

San Francisco's Transit First Policy, adopted in 1973 and updated since, identifies mass transit, bicyclists, and pedestrians as San Francisco's top transportation priorities. An update of the 1997 Bicycle Plan was initiated in 2002 and approved by a Board of Supervisors in 2005. However, a temporary injunction to stop implementation of the Bicycle Plan improvements was issued in 2006 by the Superior Court of California at the request of groups seeking greater environmental review of the proposed policy framework. The injunction is expected to be lifted during the summer of 2009 following an Environmental Impact Report opening the way for a backlog of projects to be implemented.

Planning Process

The San Francisco Municipal Transportation Agency (SFMTA) is responsible for managing the City's ground transportation system that includes pedestrians, bicycles, transit, parking, private automobiles, and taxis. Adhering to principles set forth in the City and County's *Transit First* policy, and as outlined in its own 2008-2012 Strategic Plan, the SFMTA's vision mandates the provision of "timely, convenient, safe and environmentally friendly transportation alternatives." With the *Transit First* policy and the Climate Action Plan to reduce emissions, the SFMTA has developed a comprehensive updated Bicycle Plan with eight major goals and 80 supporting actions or objectives. The plan's 8 goals are:

1. Grow and Refine bicycle network (presently 208 miles with 56 identified projects in 10 districts)
2. Provide a place for bicycle parking
3. Extend accessibility to public transit and bridges
4. Further bicycle safety and education
5. Improve bicycle safety through targeted enforcement
6. Promote and encourage safe bicycling (to increase ridership across all ages)
7. Adopt bicycle-friendly practices and policy (to integrate bicycle planning into all roadway planning, design, and construction
8. Prioritize and increase bicycle funding

A technical advisory committee is made of some 20 San Francisco government agency representatives who help implement the plan and an Oversight Committee provides guidance on development of vision, goals, and objectives The vast majority of planning focuses on class II facilities and marking bicycle lanes on existing streets with correct signage on class III projects. A few class I facilities are under the purview of the San Francisco Parks Department.

Public hearings are a requirement for project implementation but groups such as the San Francisco Bicycle Coalition help identify projects that can garner public support. The process is weighted toward public approval of projects, which can be difficult if a majority of local residents do not cycle or see the value in bicycle transportation.

The proposed Near-Term Plan appears to use a spatial organization that places some type of bicycle facility roughly on a mile grid with major adjustments for population density, terrain, and land use. Project-based plans consider geographic equity but less population density and terrain difficulty and demand can result in fewer projects in some areas. The plan makes extensive use of *sharrows* (arrow markings on shared roadways with cars) as an alternative to dedicated bike lanes, especially in hilly terrain where provision of bicycle lanes can be difficult.

Efficiency in the planning phase is sometimes lost on projects that have the support of the bicycle community but less support of the community as a whole. Unnecessary costs are incurred when projects become shelved due to changing administrative support reflecting public resistance to bicycle transportation. This may require a stronger policy to insure projects have clear administrative support from the beginning or a policy to identify projects that can reach fruition, even with moderate public resistance, when they are necessary to complete a transportation system.

Unnecessary planning costs may also be incurred when some infrastructure projects are begun and the opportunity to create a “complete street” including bicycle facilities is not recognized in early planning phases.

Recommendation:
Consider the opportunity to create a “complete street” or at least bicycle/walking facilities as part of other infrastructure projects whenever possible to incur cost savings inherent to a single project over several smaller projects.

Funding

Funding is from a combination of operating budget, grants, and part of the sales tax strictly for bicycle and pedestrian transportation. More specifically, the budget is partially covered by a local-option sales tax – the projected annual budget may vary significantly in coming years, but is derived generally from an average annual budget of $4 million – with the $800k in sales tax funds covering roughly 20% of costs. The rest of the budget comes from the agency's general operating budget and a variety of local, regional, state, and federal grants. Some of the sales tax funding is shared with the Parks Department who is primarily responsible for Class I (off-road multi- purpose trail) projects.

Design and Construction:

The majority of work in this highly urban environment is on class II facilities, which requires designated bike lanes typically from 4 to 5 feet from the curb and ideally 9' to 12' parking strips though 7' to 9 ' are also used where existing space restrictions are limited. The extra parking space width is to allow for driver door openings. Correct signage is emphasized on both CALTRAN class II and III projects and San Francisco is experimenting with pavement signage that is yet to be adopted by the proper authorities. Bicycle parking facilities are being provided at a number of points noted on a well published bicycle map but little funding has been aimed at changing facilities to date.

Designing for replacement parking is a critical issue in San Francisco and in several of the cities interviewed but new standards are available that reduce lane width, lower speed, and increase safety for all users. For example, designing for back-in angular parking over conventional angular parking to maximize use of pavement surface is only one strategy. A number of strategies for addressing the issue of adequate car parking may be found at: http://www.oregon.gov/ODOT/HWY/BIKEPED/docs/OBP_Plan/Chapter_2_Restriping.pdf

Recommendation: Create a cost-effective policy that recognizes new lane width, parking, and bike lane standards adopted within acceptable ODOT & AASHTO minimums that allow adequate parking in urban areas. This approach will save time by garnering better public support.

Management and Maintenance

San Francisco's goals for management through education are particularly strong and ongoing. The San Francisco Bicycle Coalition hosts two-part bike education classes for adults to teach safe and confident urban cycling. A new $500,000 federal Safe Routes to School grant that will be in place this fall (2009) in San Francisco schools encourages more and safer riding among the city's youth. There is also strict enforcement of where bicycles are parked on bus lines and rapid transit (BART) trains, which do accommodate bicycles.

Maintenance schedules that require street improvements are linked to plans for bicycle improvements for the most part. However, a lot of maintenance is complaint-driven by the public, suggesting a stronger need to address this issue in a more aggressive manner. This particular issue surfaced at most of the sites visited and suggests that nationally, local governments need more aggressive use of pavement management systems and strategies for funding maintenance accounts in a more timely manner over the life of the transportation system.

Recommendation: Adopt a stronger policy regarding maintenance of paths and streets that recognizes adequate funding tied to use of pavement management as a multidisciplinary

practice. This requires "not only civil engineers but also the knowledge and input of systems analysts, computer engineers, electronics experts, business leaders, finance experts, economists, and others to develop a truly successful system approach."
(Accessed online June 2009 at http://onlinepubs.trb.org/Onlinepubs/millennium/00084.pdf)

Oakland, California

Oakland is a major port city of 56.1 square miles on San Francisco Bay with a highly diverse ethnic population of over 400,000 people and a population density of 7126 per square mile (2006). Oakland is home to several major corporations including Kaiser Permanente and Clorox as well as corporate headquarters for national retailers like Dreyer's and Cost Plus World Markets. Oakland International Airport is linked to BART, which provides rapid rail service throughout the Bay Area. Muni provides light rail service in San Francisco, Cal Train provides commuter rail service between San Francisco and San Jose, and VTA provides light rail service in Santa Clara County.

The waterfront is undergoing a major renewal that will create an opportunity for Class I multi-use bike and pedestrian facilities. By 1999, the City of Oakland had installed over 87 miles of bicycle lanes and routes driven by user groups with minimal strategic planning. But the Oakland Bicycle Master Plan approved in December of 2007 calls for a completed bikeway network with 218 miles of bikeways. This plan has been adopted as part of Oakland's General Plan and encourages safety and accessibility for bicyclists throughout the city.

Planning

An overarching mission of the Oakland Bicycle Master Plan is to measure progress toward stated goals by publicly striving to become a Bicycle Friendly Community by 2012, as recognized by the League of American Bicyclists. Three main goals guide the plan.

1. Infrastructure: Develop the physical accommodations, including a network of bikeways and support facilities, to provide for safe and convenient bicycle access
2. Education: Improve the safety of bicyclists and promote bicycling skills through education, encouragement and community outreach.
3. Coordination: Provide a policy framework and implementation plan for the routine accommodation of bicyclists in Oakland's projects and programs.

A comprehensive planning approach emphasizes connection to other forms of transportation (especially BART) by creating a ½-mile grid over the existing transportation infrastructure adjusted for population density and competing transportation uses and terrain. Classification has been improved for CALTRAN Category III roads with the addition of two more sub-categories to accommodate hilly areas. The Transportation Services Division is made up of three subdivisions which are Capital Improvements, Traffic Calming and constituent-based projects, and Planning. The bicycle coordinator is under the Planning Division of Transportation.

A technical Advisory Committee is made up of over twenty internal and external agencies. Feasibility studies are typically contracted out as there is not enough in-house staff to conduct them; staff is typically involved with the design phase preparing for construction. Public interaction is garnered on a project basis with most of the call-in work carried out by the Traffic Calming subdivision.

Oakland has also carried out pedestrian-way planning as a separate study and makes a case that *pedestrian and bikeway planning should not always be lumped together as their goals are* different. They also suggest large-scale corridor planning for pedestrians may not always be the most cost-effective approach.

Recommendation

Instead of expending resources on planning and developing long pedestrian corridors, consider creating connections between neighborhoods and develop a plan for the linkages between transit stops and pedestrian facilities to complement bicycle transportation
http://www.fhwa.dot.gov/planning/landuse/oaklandcs.pdf)

Funding:

Two sources of strong funding come from a portion of state gas-tax revenue given to the county that provides $300,000 a year but more comes from a half-cent county sales tax, 5% of which is set aside for bicycle and pedestrian path implementation. This translates to over a million dollars a year. Grants also contribute to the program.

Maintenance budgets for badly needed road resurfacing are not enough to keep pace with bicycle lane creation. Funds are often appropriated from bicycle infrastructure funds to complete work in a timely manner. Thus the final recommendation on a well-funded pavement management system under *San Francisco Bicycle Plan* is strongly advised.

Oakland has funding for bikeway improvements but could use more funding for staff. This situation indicates a need reflected in several of the surveys for a monetary policy that is flexible enough to insure adequate staffing matched to project funding.

Recommendation:

Insure more flexibility in active transportation budgets to move money from construction funds to hire personnel or vice versa when necessary.

Another issue that seems to be common in several case studies is the lack of awareness at the policy-making level to insure integration of pedestrian and bicycle infrastructure into all transportation planning. This attitude is a remnant of years of focus on vehicular transportation and will require strong policy measures to ensure compliance. In one state highway department, bicycle planners had to constantly send plans back to engineering to request these considerations, with a resulting loss of time and money.

Recommendation:

Insure policies that all transportation planners and engineers have adequate interdisciplinary on-the-job training or retraining to consider active transportation in their work tied to routine performance evaluations.

Portland, Oregon

Context

Portland, Oregon, is a technology center and major grain-export port city on the Willamette River of 145 square miles and a population of 575,000. Population density is around 4288 per square mile (2008). Portland is considered one of the most bicycle friendly cities in the U.S. with its first Bicycle Plan developed in 1973 by a residents' task force that led to creation of the Portland Office of Transportation's Bicycle Program. The Bicycle Advisory Committee is made up of residents appointed by City council. Portland's downtown has a pleasant human scale with streets a rather narrow 64-foot width between buildings and square compact blocks of 200 feet on a side that encourage easy walking and relatively valuable corner lots. The Portland metro area government has linked transportation services to proactive land-use planning and transit-oriented development with a defined urban growth boundary so commuters have several well developed options of bus, light rail, trolley, and bicycle/pedestrian paths. An extensive transit mall (Portland Mall) limits private vehicles and provides connections between more than fifty bus lines, MAX light rail, and the Portland Streetcar. Tri-Mets' entire bus fleet is equipped with bicycle racks and cyclists can park at over 1400 publically installed bicycle racks or long-term space rentals at one of 190 bicycle lockers. Central bike stations provide showers, change facilities, and long-term bicycle storage. A number of bicycle shops provide critical services to the cyclists and an impressive array of advocacy, educational, and riding groups support city efforts.

Planning

Over half the residents of Portland own a bicycle and over half ride a bicycle at least occasionally. Bicycle share in the inner city has been verified at 3.3. percent from census data but is overall probably closer to 6% based on some preliminary surveys. Portland's current bikeway network supports over 300 miles out of a planned 630 miles of bicycle transportation and use has doubled and then tripled since 2001. The present mileage count is

1. 170 miles of Class II bike lanes
2. 70 miles of Class 1 multi-use paths
3. 30 miles of bike boulevards
4. 30 miles of Class III signed routes

Portland pioneered the use of a ½-mile grid network over the existing grid, adjusted for population density and topography, as a departure point for making the city bicycle friendly. Where arterial roads are not deemed appropriate for bicycle lanes, parallel streets are used to complete the plan.

Portland increased the mode share of bicycling trips in the city from less than 1% in 1990 to 6% in 2008. They achieved this while spending just under 1% of the city's transportation infrastructure budget on bicycle facilities. Portland considers their bicycle facilities to be the greatest transportation bargain in their budget--there is no other model whose mode share is 6 times its share of the transportation budget.

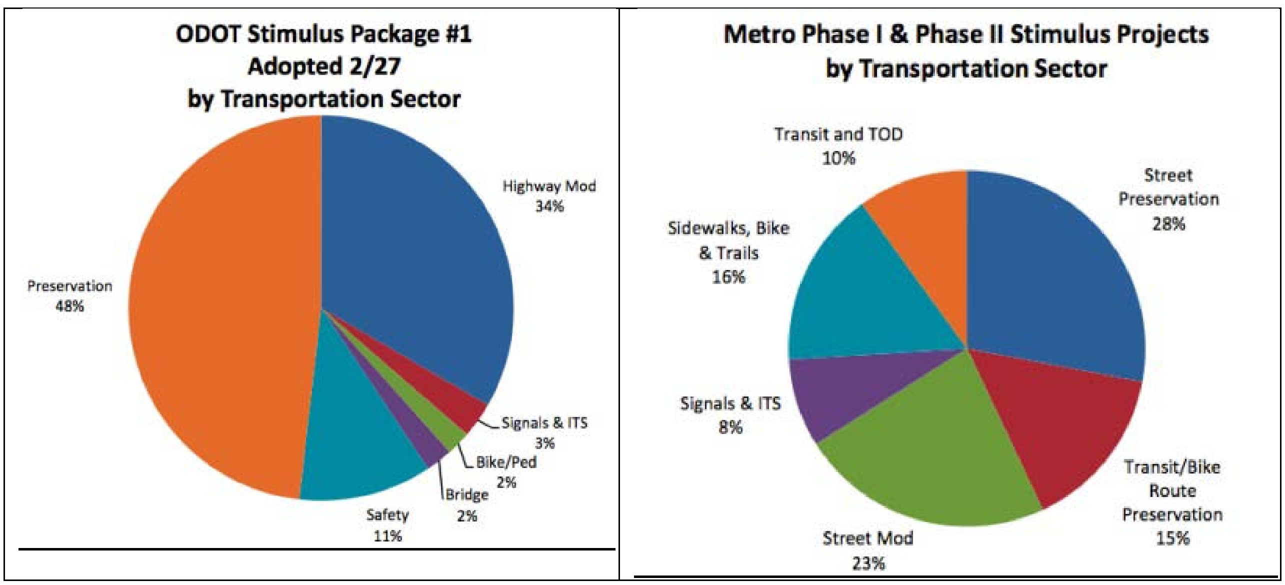


Figure 4 - ODOT has allocated 82% of their federal funds to highway preservation (repaving) and modification (widening), just 2% on bike/ped, and 0% on transit. Metro's pie has ample pieces of bike, pedestrian, transit, and street preservation projects. Accessed May 11, 2009 online at: http://bikeportland.org/2009/03/09/bike-parking-smoother-bike-lanes-and-more-a-federal-stimulus-funding-wrap-up/

Of significance is the fact that the metropolitan-area planning body creates significant linkage of Portland's bike paths to areas beyond the city's urban growth boundaries, which is tied to progressive land-use planning.

The International Bicycle fund suggests that the following goals can be incorporated into comprehensive-, land use-, transportation-, and/or non-motorized plans to enhance safety, proximity, and access. Portland appears to have achieved a number of these transportation/land-use planning goals, which form the following recommendations**.**

Recommendation

- "Direct land use and transportation development, through the permit process, to issue equal or better access by foot or bicycle to education, recreation, retail, commercial office and other appropriate types of development.
- Design and locate retail, office and public service buildings to be convenient for pedestrian, bicycle and transit users.
- Cluster commercial and residential development in higher density centers, rather than extended in linear strips along roads.
- Require, through the permit process, mixed land uses of residential, retail, commercial office and other types of compatible development, to provide an environment which is safe and convenient for pedestrian and bicycle travel, and give people shorter travel distances between origins and destinations.
- Restrict development of neighborhood commercial areas to a pedestrian scale and design.
- Coordinate land use decisions with existing and planned public transportation services and the needs for non-motorized access."

Site accessed on May 12th, 2009 at: http://www.ibike.org/engineering/landuse.htm

Portland has a strong strategic approach to planning with its emphasis on making the whole city bicycle =-friendly that goes well beyond the typical corridor sprawl approach. Recently they have adopted a district approach over a corridor approach that allows them to fine-tune projects at the neighborhood level to reflect needs of public user-groups more completely.

Recommendation:

While traditional planning for bike/ped has focused on a corridor approach, cities with adequate density should consider the ½-mile grid as a rough guide for bicycle friendly development to encourage this mode of travel for a wider group of potential users. Additionally, consider the use of a district approach that reflects local cycling conditions and needs over a corridor approach as the execution of the bicycle master plan matures.

Grayslake, Illinois

> "Grayslake was one of the first communities in the Chicago region to create a comprehensive development plan for trails, bike paths and sidewalks. In cooperation with Grayslake Park and School Districts, the Village has implemented several additions to the trail system that will allow residents and students greater access to and from the Village neighborhoods, schools, the downtown business district, parks and other amenities. This community-wide system also encourages a healthy lifestyle; boosts property values and reduces the reliance on the automobile. The result is the most extensive and complete community-wide trail system in the region" (from site accessed Web site on June 15, 2009 at http://www.villageofgrayslake.com/info/biketrail.html)

Grayslake, Illinois, is 40 miles north of Chicago with a population of around 22,000, and covers an area of 9.4 square miles, creating a relatively light density of around 2340 persons per square mile. It is served by two rail lines, one of which is fully dedicated to passenger service and another that shares freight and passenger service. It was historically a farm village but is now somewhat of a bedroom community for Chicago and Milwaukee.

In the late 1980s, the city decided it would zone to minimize congestion and protect against too much growth while preserving open space and creating pedestrian/bicycle systems. The system is or will be linked to county parks and the Des Plaines River Trail that extends 7 miles to the east. The 1989 comprehensive plan goals reflected policies to minimize the impact of new land uses upon the existing transportation systems and minimize the adverse impact of regional through-traffic and congestion on major streets and intersections. A major policy statement spoke to providing safe, efficient bicycle routes and pedestrian trails from the beginning of the land use planning process.

Grayslake is home of Prairie Crossing, an ecologically oriented housing development where natural ecosystems are encouraged and managed. A special elementary school contracts with an adjacent organic farm to help teach children about sustainable agriculture and farm practices. The development has an extensive, fine-gravel eight-foot primary perimeter system of off street bike/pedestrian paths that the public can use with internal private paths.

Grayslake is a significant model because the city has been able to integrate issues of density, land- use, and pedestrian/bicycle transportation in a way that allows developers to pay for the vast majority of bicycle and pedestrian trails and paths. A coordinator was employed by the city to insure strategic location of the paths that began to link schools with parks and the downtown prior to much of the later development. This system has been complemented with connections to a number of open spaces and parks with paths funded by the county. In town, trails are paved for the most part though a few trails are fine gravel. It is interesting to note that several housing developments have opted for the gravel trails because they look more natural and the county often uses gravel trails in less-urban settings. This may effectively slow bicycles down though the trails may require a little more maintenance in the relatively flat landscape. In Grayslake, all of the bike/pedestrian paths are off-street multi-use paths but are often parallel to the street. Even the county attempts to keep these facilities off the road pavement where possible. The private commercial sector has placed bicycle racks at strategic locations and the city has increased bicycle racks at the train station for commuters. Kiosks are placed at key areas with bicycle maps and information. In snowy months, some of the trails are open for skimobiles but none are plowed as in Madison.

The lesson from Grayslake is to understand the powerful role land-use planning can play in creating effective transportation systems before development arrives. Not only has the city avoided construction costs, but many of the trails are maintained by homeowners' associations. Conservations easements are used to insure public use of major trails over private development.

Some paths are often dedicated to the city, suggesting a need to think about a long-term maintenance budget for the paths. Most paths are only 8-feet wide and present-day costs for what little the city has to provide are around $200 a linear foot of paved trail, which includes trail amenities. The fine, sandy gravel trails cost around 20% less.

Recommendation:

Growing, smaller towns and counties need to create coordinated land-use controls that are pro-active in locating major bicycle and pedestrian facilities so that new development can shoulder the cost of complete transportation systems that include bicycle and pedestrian trails and amenities. Long-term management of the facilities should be addressed as part of this process.

Another lesson from Grayslake: the design/build aspect of the AASHTO process is the potential use of packed gravel paths in city codes in relatively flat areas and the savings incurred from their use. This alternative final surface must be based on the availability of the correct natural resource, frequency of use, and site conditions. The Presidio project in San Francisco has a CALTRAN Class 1 gravel trail designed to follow the contours of the site. Wisconsin, which suffers from extreme temperatures and frost-heave, considers the flexibility of the surface an advantage in some locations while interviews in other states suggested a higher maintenance cost associated with gravel trails thus this surface is not specified where snowplows routinely operate. See also Grayslake section on use of gravel for primary bike/ped paths. Kansas Department of Transportation (KDOT) indicates a potential cost savings from this approach (data available in the latter part of this report).

Recommendation:

As a cost-saving strategy, consider the use of gravel trails where use patterns are light, natural resources are available, and site conditions permit.

Madison, Wisconsin

Madison is the capitol of Wisconsin, the county seat of Dane County, and is also home to the University of Wisconsin, Madison. The 2006 population estimate for Madison was 223,389 (with a gross area around 85 square miles including water areas) and the city has a density of around 3030 people per square mile. The metro area population was around 557,000 at the time of the 2000 census. It is a government and university center with growth in consumer services and a high-tech base related to health, biotech, and advertising.

Good public bus service exists but a public light-rail system remains in the planning stages. Madison has a long history of bicycle use and today in the metro area there are currently 129 miles of off-street multi-use paths, 147 miles of streets with bicycle lanes or paved shoulders, and 149 miles of signed bicycle route system

Serious efforts began with ISTEA funds and a 1991 Bicycle Transportation Plan for Madison and Dane County that followed a comprehensive approach to planning and covered the four E's of: engineering (facility improvement), education, encouragement, and enforcement. A Vision 2020 Dane County Land Use and Transportation Plan (1997) provided the overall policy framework for transportation and included a Bicycle Plan Element. The September 2000 Madison Urban Area and Dane County Bicycle Transportation Plan acknowledged over 50 miles of shared-use path with rural town roads and county roads providing for bicycling in the county. Two major state bicycle trails run through the county and the Capital City trail connects one of these trails (the Military Ridge Trail) to the downtown John Nolen Drive/Isthmus Bicycle Path. More recently, the State Street Pedestrian Mall has been redesigned for use by pedestrians, bicycles, bus, and service vehicles and provides a critical link between the University and the state Capitol in the heart of downtown. It is only a few blocks from there to the waterfront and the John Nolen Drive Trail along the edge of Lake Monona. The September 2000 plan identifies on-street bicycle facilities, typically a bike lane/paved shoulder, and bicycle routes for the Madison urban area and Dane County. An analysis plan indicated the suitability for bicycling on the existing roadways in Madison and the county and identified low bike-compatibility corridors and lack of relatively direct alternative routes. Existing land-use, transportation, and parks/open space were integrated into the 2000 plan. The three main goals of the plan are:

1. Provide for safe, convenient and enjoyable travel by bicyclists in the Madison urban area and throughout the county
2. Increase levels of bicycling throughout Dane County, doubling the number of trips made by bicycle
3. Reduce crashes involving bicyclist and motor vehicle by at least 10%

The 2007 City of Madison, Wisconsin Mayor's Platinum Bicycling Committee Report entitled Making Madison the Best Place in the Country to Bicycle, reflects a restatement of vision and goals to complement the 2000 bicycle plan. Today the Mayor has adopted a vision to "make bicycling an integral part of daily life in Madison, thereby making Madison a model for health promotion, environmental sustainability, and quality of life."

The report suggests that "approximately 44% of all trips in Madison are less than 2 miles in length –which represents a 10-minute bike ride or a 30-minute walk……30% of trips are less than a mile." (City of Madison, Wisconsin, Platinum Bicycling Committee Report, Adopted by Madison Common Council, April 8, 2008)
http://www.cityofmadison.com/trafficEngineering/documents/PlatinumAdopted040808sm.pdf

More importantly the report looks at the need to change policies in the planning, design, and management of both on-street and off-street facilities. In terms of funding, the report recommends:

> ***"If the City of Madison wishes to advance bicycle/pedestrian projects in a timely manner, additional funding and staff resources will need to be allocated to these projects. New funding sources may need to be developed, as well. These sources may include impact fees, special assessments, and the proposed Regional Transportation Authority sales tax." (p. 15)***

What this suggests is that true multi-modal transportation has yet to be fully embraced and funded and this situation will require a fundamental, aggressive policy shift especially at the state and municipal levels. The US Congress and the US Department of Transportation have passed legislation and policies that intend to encourage complete streets (also known as "routine accommodation") that embrace all forms of transportation, but few states and cities follow them very aggressively.

Recommendation: Create economic incentives to favor bicycle and pedestrian transportation systems where population density and/or potential tourism demand favor this form of transportation.

The Platinum Bicycling Committee Report recognizes efforts made toward complete streets over the years, and strongly recommends formalizing and implementing these policies.

Recommendation

Insure that all design/construction drawing of every transportation project reflects opportunities for and impacts on potential active transportation systems. Consider creation of special administrative units to insure this approach.

Little progress can be made if departments within city government do not communicate their plans and actions to one another, the public, stakeholders and other governments in the region. Improvements need to be made to ensure neighboring communities communicate effectively. There are several cost implications to this observation and Madison was not the only municipality to mention the need for better communication among departments.

Recommendation

Create city interdepartmental staff teams where necessary to meet routinely to improve communication and joint planning for future pedestrian/bike facilities linked to land-use planning and transportation efforts. Maintain an updated Intranet that presents proposed and currently funded projects in all phases of implementation and how projects interconnect with departmental agendas. This will save both time and money in the long run.

Albuquerque, New Mexico

Albuquerque is the largest city in New Mexico and is the county seat of Bernalillo County on the Rio Grande River. City population was 518,271 as of 2007 in an area of 181.3 square miles, creating a relatively light population density of 2, 483.4 people per square mile. Albuquerque is the 6th fastest growing city in America with a metro population of 845,913 square miles and is home to the University of New Mexico, Kirtland Air Force Base, and Sandia National Laboratories.

Road transportation hubs on the junction of north/south Interstate 25 paralleling the Rio Grande River and east/west Interstate 40. BSNF freight railroad lines are complemented with a daily AMTRACK service and a new, light Rail Runner with space for bicycles now connects Santa Fe, Sandoval, Bernalillo, and Valencia counties with ten station stops, including three stops within Albuquerque. ABQ RIDE operates a variety of bus routes with a complementary Rapid Ride express bus service, all equipped with external bicycle racks.

Albuquerque transportation planners are combating air pollution and traffic congestion with a plan consisting of five components: moving traffic more efficiently on existing roads, building new roads, increasing mass-transit ridership, expanding use of alternate forms of transportation such as carpooling and bicycling, and reducing the number of (or changing the timing of) work trips. Transit stations and bus stops are strategically located to garner pedestrians.

With mountain trails in the Sandia range just east of the city and flat terrain in the city, Albuquerque has increased its transportation options in the sunny desert climate. The access roads to the city's flood-control canals have become a car-free system of paths and people of all age groups bike or walk the Paseo del Bosque trail along the Rio Grande adjacent to Old Town and the Albuquerque Botanical Garden, both popular tourist destinations. The trail network is an integral and essential part of the bikeway system as there are numerous barriers within the metropolitan area such as rivers, interstates, drainage channels, and arroyos. The trail network serves both commuting and recreational travel in tandem with the on-street bikeway system. The city is scheduled to launch a bicycle-rental program called Q Bike this year, with the completion of the Silver Street Bicycle Boulevard. http://www.good.is/post/sorry-portland/

The major goal of the bicycle master plan is to significantly increase the bicycle-commute mode share and reduce the number of bicycle fatalities and injuries by 2020. The 1998 transportation plan called for enhanced transportation alternatives including increased bicycle facilities and also identified three major deficiencies in the areas of facilities, information-knowledge, and motivation. Increased use of alternative transportation systems would provide benefits of increased health, better transportation, increased economic returns, environmental benefits, and increased quality of life. The three major goals of the plan were:

1. Achieve a bicycle mode share by 5% by the year 2005 and 10% by the year 2020
2. Achieve a bicycle mode share of 5% of all trips by the year 2020
3. Reduce by 10% the number of accidents and injuries by the year 2020

Albuquerque Bicycle Infrastructure	2007
Miles of bike land (2 lanes/mile)	278
Signed bike routes (2 lanes/mile)	250
Multi-use trails	125
Total	653

Figure 5. Albuquerque trail type and miles in 2007 (accessed online May 16, 2009 at http://www.cabq.gov/progress/public-infrastructure/dcc-21/indicator-21-3

Planning

From a planning perspective, the bicycle plan has major north/south and east/west components somewhat paralleling the interstate system, with good coverage of major bike lanes and trails on approximately a one-mile grid with adjustments for population density and geography. More importantly, activity hubs with concentrations of work or shopping activity have been identified to insure that these major people-generators are linked to residential communities. Major capitol project improvements will help bridge the interstate system so a cohesive plan can be achieved.

In addition to a system of primary trails, secondary trails are identified in the *Trails and Bikeways Facility Plan* that interconnects both the primary trails and the on-street bikeway system. These trails can be paved or unpaved trails to meet the needs of equestrians, pedestrians, and bicyclists. At historic funding levels, it is estimated it will take approximately 10 years to complete the primary trail network, not including major grade-separated crossings such as bike-ped bridges over the interstates which are expensive but well along in the planning process.

(Accessed online June 5, 2009 at http://www.cabq.gov/aes/s5tran.html)

Funding

Funding has been identified from several sources and presently, five percent of the local transportation funds are dedicated to on-street bikeways and off-street paths/trails. Additional funds are available from Federal transportation and air-quality funds, which compete with other transportation construction, service, or enhancement projects.

Three recommendations came out of the visit to the Albuquerque site, one of which is a reinforcement of the need for policy that will lead to organization and total integration of the many types of professionals who work in transportation planning.

Albuquerque transportation planning appears to have achieved this to some degree by blurring the boundaries between engineers, planners, landscape architects, etc., which is reflected in the title: The Department of Municipal Development that "brings together the individuals needed to plan, manage, and build these (transportation) projects, providing us with the opportunity to achieve our goal: **Building Albuquerque...better, faster!"** This improves upon the last recommendation under the Madison, Wisconsin, section, which reads:

Create city interdepartmental staff teams where necessary to meet routinely to improve communication and joint planning for future pedestrian/bike facilities linked to land use planning and transportation efforts.

"In Boulder, Colorado, the problem has been redefined to be one of moving people in a multimodal system, with a strong emphasis on bicycles, pedestrians and transit. This mindset has been institutionalized throughout the city's transportation division."
(Web site accessed June1, 2009 at http://www.walkinginfo.org/library/details.cfm?id=4299)

Recommendation

Redefine the role of transportation departments to address transportation with a stronger emphasis on bicycles, pedestrians, and transit, or reorganize transportation as part of a department of municipal development, using a project-based, multi-professional team approach to planning and designing bicycle and pedestrian paths and facilities as part of a complete transportation system.

The second recommendation has to do with funding. Albuquerque has recognized the need for a fixed percentage of the annual transportation budget for bicycle/pedestrian systems so that progress can occur in a timely and economically sound manner. By comparison, Boulder, Colorado, allocated 49 percent of its 07-08 transportation budget to bicycle, pedestrian, transit, and transportation demand management projects. Though the number fluctuates over time as major projects move forward, each year is marked by a significant investment in multimodal projects. Prior to this time, at least 15% of the Boulder transportation budget was allocated to bike/pedestrian transit, and transportation demand management projects.

Recommendation: Insure alternative transportation by insuring a substantial percentage of the city budget will always be available for bicycle/pedestrian systems and support facilities.

The third recommendation has to do with landmark legislation enacted by the governor that allowed more public trail access to ditch and levee systems owned by irrigation and conservancy districts in New Mexico. Obviously the correct, protective physical barriers are necessary in planning paths to deter people from naturally dangerous currents, bluffs, rain events, etc., but this legal access is important to interconnected alternative transportation systems.

Recommendation: Create legislation and policies that allow more public path access to drainage and levee systems where other agencies have primary ownership. This approach can reduce right-of-way purchases and provide important linkages throughout the bike/ped system.

Washington, D.C.

Washington, D.C., was chosen as a site because is boasts the first self-service, public bike rental program in America though these programs have been experimented with in Europe for some time. SmartBike DC is a new and alternative transportation network that uses the latest technologies to facilitate user access and, with support from Clear Channel Outdoor advertising, is structured to enhance the city's public transportation system.

The nation's capitol covers an area of 61 square miles of land with a resident population of 591,833; however, because of commuters from the surrounding suburbs, its population rises to over one million during the workweek. The D.C. metro area, of which the District is a part, has a population of 5.3 million. Population density is one of the highest in America at around 9000 people per square mile and bicycle commuting is at least 1.16% overall, just below Portland, Oregon, according to the D.C. Master Plan, April 2005. However, some central areas have closer to 5%- 8% commuting by bicycle. It is also important to note that some 37% of the resident population does not own a car, well above the nation's 10%, making the bicycle a potential cost-effective option for many people with the correct infrastructure and support facilities.

The vision statement states "The District of Columbia will be a world-class bicycling city that offers a safe and convenient network of bikeways for all types of trips." Three major goals with supportive objective recommendations drive the master plan.

1. Create more and better bicycle facilities
2. Create more Bicycle-Friendly Policies
3. Create More Bicycle-related Education, promotion, and enforcement

Planning

The results of one study indicated that impact of growth allocation as forecast in the Washington master transportation plan 2005-2030 will worsen system travel time by 12% and cause 67% higher variation in travel times among counties by 2030, compared to travel with optimal land-use growth allocation under stated assumptions. Obviously, alternative transportation including bicycle facilities can diminish automobile use, but more significantly, all transportation planning must be tied to stronger land-use planning to achieve a truly integrated transportation system.
(Allocation of Regional Growth to Enhance Mobility: Study in Washington, D.C**.,** Accession Number: 01089204 Transportation Research Board Annual Meeting 2008 Paper #08-2398 accessed on line June 23rd, 2009 at http://pubsindex.trb.org/document/view/default.asp?lbid=848545)

The Washington, D.C., Bicycle Master Plan is based on a process that reflects strong public input combined with GIS data on bicycle crash locations, bicycle-oriented destinations and roadway inventory of location and characteristics tied to an explicit Bicycle Level of Service (LOS) Analysis. Only 130 miles of the 407 miles of road earned a rating with a LOS in the A, B, or C category for consideration of bicycle use in 2005. Generally the bicycle lanes or paths will provide access to most people within a half-mile of their home. Care has been taken to integrate bicycle routes with other transportation modes and with National Capital and Regional Plans.

Over 40 of the 60 miles of planned bike lanes over a ten-year period have been built with connections to a number of bicycle paths that extend into the metro area. Over a thousand bike racks have been placed at strategic locations and a Bicycle Transit Center is being built at Union Station. This 1,700 square foot facility is the first of its kind on the East Coast and offers bicycle parking, rentals, repairs and retail accessories. Bicycles are allowed on Metro trains and bicycle racks are on many buses. As previously mentioned, the plan has evolved to encompass the first self-service public bike rental program America.

Funding

Washington, D.C., transportation is funded more like a state than a city due to its unique status. This means Federal funds are allocated annually directly from the Federal Highway Administration but typically funding for bicycle and pedestrian facilities comes from Transportation Enhancement Funds. Washington, D.C., must use 3% of their highway funds for Transportation Enhancements; bicycle and pedestrian projects are only one of the eligible purposes for the funding. In addition, the remaining 97% of the highway funding presents an opportunity to create complete streets. The American Recovery and Reinvestment Act (ARRA) made significant new funding available for transportation projects of all types this year. The Enhancement Funds came out to $3.7 million this year out of a total of $123.5 million that was allocated for the District. Another $3 million have been allocated for bike sharing and $4 million for Safe Routes to Schools.
(Referenced online on June 8th 2009 at http://www.waba.org/takeaction/Stimulus_DC.php)

Maintenance and Management

Washington D.C. does not consider gravel bicycle paths in its urban environments and suggests increased maintenance as a reason but management can be an issue and some officials would like to increase enforcement on cyclists who violate traffic laws. For example, a DOT-run bicycle-mounted enforcement team could issue tickets for failing to stop at stop signs or stop lights but laws cyclists are supposed to follow were written for drivers so auto laws don't always make sense for cyclists due to the many differences between bikes and cars.

Recommendation: Bicycle transportation enforcement is necessary thus consider creating a cost-effective body of law tailored for bicycle users and linked with appropriate enforcement strategies prior to creating an enforcement group.

Bike Share Programs

The district's experimental bike share program can be used one-way for either mono-modal or intermodal trips. As a flexible mobility option, they can be considered as an additional part of the public transport system. The role of bike sharing is still a minor one but it seems that a big step could be made in the future as a number of U.S. cities are considering bike share programs, including Denver, Colorado, Boston, Massachusetts, and New York City. Commuters, recreational-errand riders, and tourists are the three main groups of users and the user fees or dues are attractive to those who do wish to purchase, store, and maintain a bicycle in high-density urban areas.

A recent report prepared for New York City suggests, "Small pilot programs do not work. Successful bike-share programs that produce real and demonstrable transportation, economic, and health benefits depend on a high density of kiosks and widespread program coverage. Often, financial viability increases with larger programs."
http://www.gothamgazette.com/article/transportation/20090421/16/2893

Since 2007 in Paris, France, millions of dollars have apparently been saved by providing alternative public transportation to 3 million subscribing Parisians with over 20,000 bicycles, parked throughout the city. So far, bike-sharing has reduced car trips by 6 million miles. The model provides one bike per two hundred residences in the city, which is working seamlessly with the good public transportation that already exists--the Paris Metro. Maintenance and theft of the bicycles is problematic but not insurmountable.

Bike-share programs can serve as a missing link in the public transit system by reducing a city's travel-related carbon footprint and providing additional 'green' jobs related to system management and maintenance. According to the ALTA Planning Group, *"Funding for public bicycle systems commonly comes through a combination of advertisements, user fees, and public government funds and operates as a public-private partnership."* This is how Washington D.C., is managing their bike-share program.

Site accessed June 24th 2009 at http://www.marinbike.org/Resources/bike_sharing_whitepaper.pdf

Recommendation: Cities with high-density neighborhoods should investigate the potential of bike-share systems as part of their transportation planning methodology linked to an understanding that funding for public agencies typically requires an operating partner, as most bike share systems are not yet financially self-sustaining.

Other Case Studies with Cost Data

During each interview, materials costs were discussed to determine bike-ped path costs. Given the number of variables and constantly fluctuating energy costs over time, it was difficult to make any generalizations. However, a general discussion follows based on a number of other case studies explored primarily on the Internet; these studies provided a rationale for several further recommendations across the AASHTO process regarding cost-saving strategies for policy-makers.

Many communities are primarily interested in off-street multi-use paths; however, many of our community streets have adequate widths to make on-street bikeways a first consideration for economic reasons. "Bike routes" are streets of adequate width to be designated as a bikeway through the addition of signs and minor improvements such as drainage-grate modification with minimal costs. Bike routes typically lack painted, designated lanes.

For new construction, independent, off-street multi-use paths cost the most and bike routes/ shared-use vehicle lanes cost the least, with road-shoulder bike lanes in the middle cost-wise. Shoulder bike lanes and shared-use roadways, when constructed at the same time as a roadway is constructed or substantially reconstructed, have incremental or marginal costs that can be exceptionally modest; e.g., $10,000-$20,000 per mile- see Appendix B; however, O'Fallon, Illinois, recently estimated the total cost of a completed on-street bikeway system (73 miles) using a number of existing streets that averaged $85,000 per mile. Retrofitted projects that have to remove curb and gutter and construct additional lane width obviously cost more. (Executive City Meeting Summary, found at http://www.ofallon.org/public_documents/OFallonIL_ParksRec/bike_facil_plan/Exec_Summ

Generally, on-street bike paths are one-way with the flow of traffic and a minimum width is 4 feet adjacent to a curb or shoulder. If the speed of the road exceeds 35 mph or there is heavy truck traffic, then a 5-foot bike lane should be considered. Bike lanes that run against the traffic should have a 4 ½' high barrier between the path and vehicular traffic. Vertical clearance to overhead trees and other objects should be 8 feet and any tunnels ideally 10-feet tall. Most retrofitting costs where road width is adequate are related to replacement of grates and pavement/curb grade filling (to insure a flat surface) in addition to proper lane painting and signage. (See AASHTO Task force on Geometric Design, Guide for the development of Bicycle Facilities, Washington D.C. 1999)

For off-street situations, the recommended width for a two-way multipurpose path that includes bicycle traffic is 10-feet, though 8-feet width is considered a minimum where good site

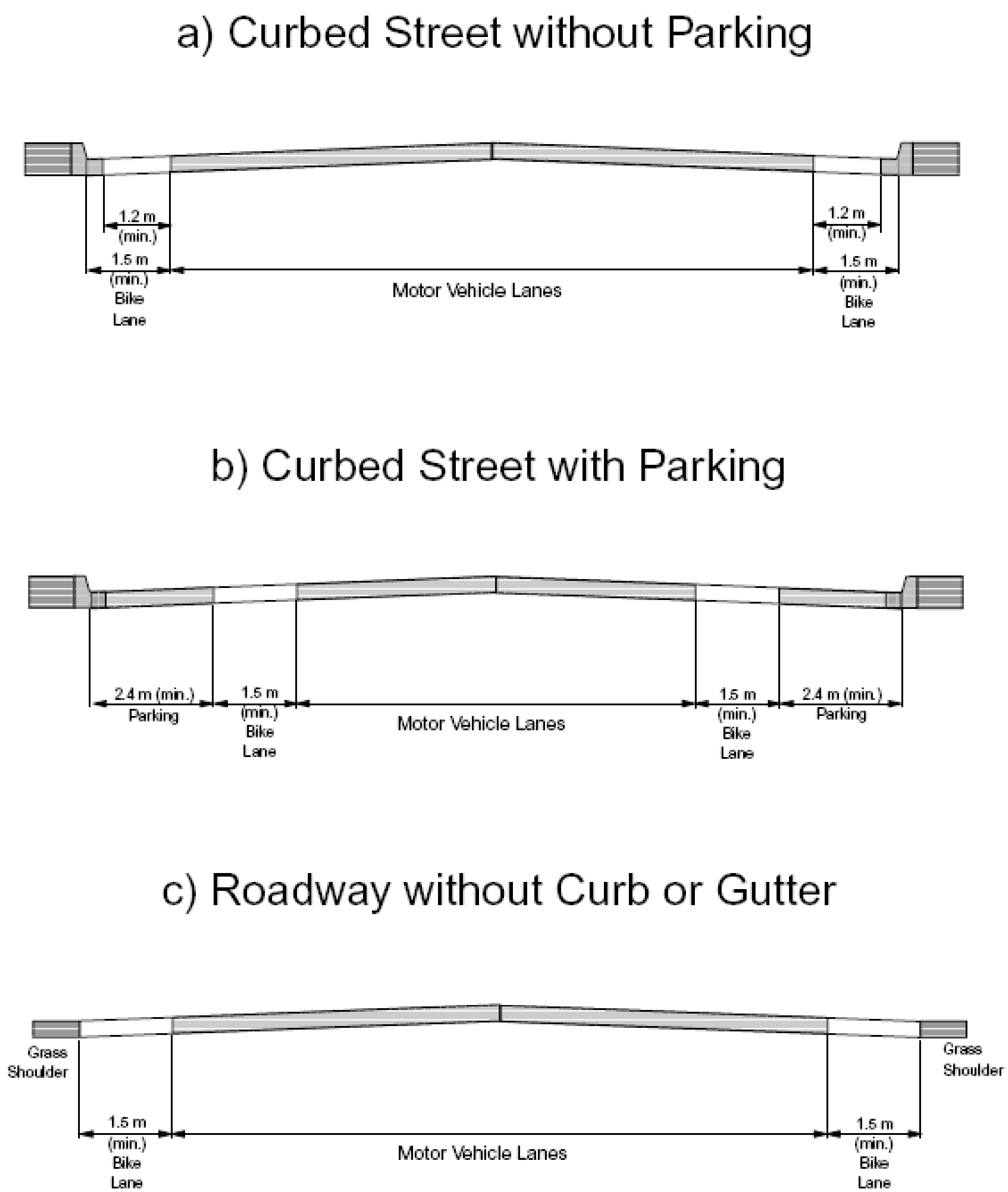


Figure 1. Typical Bike Lanes Cross Sections – lanes are typically marked with paint and adequate signage is provided. (Source: Florida Bicycle Facilities Planning and Design Handbook , Chapter4, 2000)

distance and low pedestrian/bike traffic are encountered. Heavily used paths with multiple user types may require 12-foot paths to insure safety. Right-of-way (ROW) should be a total of at least 20 feet, though 30 feet is a desirable measure. A one-way bicycle path can be only 5-feet wide but enforcing the one-way rule may require close enforcement. There should also be a minimum 2-foot cleared area on either side of the path and 3 feet is a recommended.
(A Guide to Site Planning, Harvey M. Rubenstein, John Wiley and Son)

Bike paths are recommended to not exceed 5% elevation to avoid excessive speed downhill and minimize uphill exertion for a broad spectrum of age groups. Paths are typically paved with asphalt or concrete to reduce maintenance. Downhill bike lanes may be omitted where bicycle speed matches vehicular speeds.

Construction Costs of Multi-purpose Paths

The cost of new multi-purpose path construction can only be generalized because of the many variables involved. Right of way, trail surface material, width, location, needed structures, signage, and amenities all affect total construction cost.

Fayetteville, Arkansas, now offers 16 miles of paved off road multi-purpose trails primarily along an active rail corridor and several creeks. The Fayetteville Alternative Transportation and Trails Master Plan identifies 129 miles of future trails that will connect parks, neighborhoods and citizens for years to come. The city considers the construction cost of a multi-purpose path is around $250,000 a mile for a 12 foot wide, 3"-deep asphalt-surfaced path on 6" of gravel and a foot of red hill-side clay. These costs include a little lighting and bridges in key areas. Right-of-way costs are less than one percent of construction costs as much right of way is in the stream floodway and is assessed at half the value of most urban land. Land donors also obtain a tax break from their gift to the city. Fayetteville has achieved significant cost savings by carrying out the vast majority of work with city crews rather than contracting the work out. Several examples follow provided by the bicycle coordinator for the City of Fayetteville.

Trail Name	Location	Undercut & Hillside	Year Completed	Completed In-House	Contractor
Frisco Trail	Center to Prairie	No	2005		x
St. Paul Trail	Morningside to Armstrong	No	2006	x	
Hamestring Creek Trail	Wildwood Park	Yes	2007	x	
Mud Creek Trail		No	2003		x
Scull Creek Trail	Scull Creek Corridor	Yes	2008	x	
Lake Fayetteville Trail	North side to Hwy 265	Yes	2005	x	
Shiloh Trail	Mt. Ranch	Yes	2009		x

The chart below (of the trails shown above) shows the contractor cost data in boldface.

Length L.F.	Length Miles	Project Cost	Cost per L.F.	Cost per S.F.	Cost per L.F. Trail Only	Cost per S.F. Trail Only
2,411	**0.46**	**$ 410,073**	**$ 170.08**	**$ 14.17**	**$ 111.20**	**$ 9.27**
4,118	0.78	$ 111,708	$ 27.13	$ 2.26	$ 27.13	$ 2.26
2,743	0.52	$ 201,873	$ 73.60	$ 6.13	$ 68.01	$ 5.67
9,989	**1.89**	**$ 903,453**	**$ 90.44**	**$ 7.54**	**$ 90.44**	**$ 7.54**
22,999	4.36	2,481,724	$ 107.91	$ 8.99	$ 70.18	$ 5.85
11,521	2.18	$ 449,035	$ 38.98	$ 3.25	$ 37.84	$ 3.15
2,028	**0.38**	**$ 119,000**	**$ 58.68**	**$ 4.89**	**$ 58.68**	**$ 4.89**

The results of this study show that in most cases the city is able to build the 10-12 foot multipurpose trails in-house for significantly less than contractor built trails and now the city only contracts out items such as bridges and lighting. Towns such as Fayetteville, with a population over 60,000 often have road departments that can use or increase crews to build bicycle trails in house cheaper than contracting the work out. This approach suggests a cost-saving strategy.

Recommendation

Use in house road building crews with an in-house trails coordinator to design and build trails rather than contracting the work out for routine trail construction.

Fayetteville uses a landscape architect for a trails coordinator embedded in the civil engineering department where he can interface with engineers in the specific design of trail segment which he has planned with both transportation needs and aesthetics criteria in mind. In most cases the land has been donated as much of it is in restricted flood plains along drainage corridors and the trails benefit the adjacent houses and businesses built on adjoining land.

Additional cost information on the first five trails is shown again with the trails built totally by outside contractors highlighted. The last trail had no bridges or lighting.

Bridges	Lighting	Materials	Labor	Equipment	Contractor
$ 33,760	**$ 108,210**				
$ -	$ -	$ 37,002	$ 52,435	$ 8,999	$ 13,272
$ 15,320	$ -	$ 100,972	$ 85,892	13,713	$ 1,296
$ 466,045	**$ 206,338**	**$ 552,299**	**$ 616,733**	**$ 162,656**	**$ 282,433**
$ 13,080	$ -	$ 154,635	$ 207,693	40,855	$ 34,747

Data from four summaries in Milwaukee County and the City of Milwaukee provide a cross section of realistic construction costs associated with multi-use trails.   The construction estimates includes trail amenities, bridges, signage, and drainage.

- Honey Creek Parkway Construction of bike trail from Portland Ave to 70th St, not including bridge construction, is $149,206 per mile for 10-foot wide asphalt trail
- Root River, from 60th St. under Hwy 100 to Rainbow Airport, not including boardwalk is $301,014 per mile for 10-foot wide asphalt trail*
- South Side Trail (a.k.a. Kinnickinnic River Bicycle Trail) for base construction including trail amenities, signage, and drainage issues is $176,470 per mile for a 10-foot wide asphalt trail
- Milwaukee County's estimate for construction of the 6.5 mile Hank Aaron State Trail (West Allis Line) is $224,307 per mile for a 10-foot wide asphalt trail (including retrofit of bridges)

*The major increase in the Root River project is due to drainage culverts and railings

In Ashville, North Carolina multi-use paths right-of-way (ROW) estimated costs range from $110,000 to $200,000 per mile. ISTEA sections 1024 and 1025 include provisions that can be directly linked to rail corridor acquisition and rail-trail development which is especially useful in acquiring abandoned railroad ROW.

Ashville, North Carolina uses the following figures in estimating trail costs base on experience.

12-foot Soil-Cement Multi-Purpose Trail	$80,000 per mile
12-foot Aggregate/Stone Trail	$100,000 per mile
12-foot Asphalt Multi-Purpose Trail	$300,000 per mile
12-foot Concrete Multi-Purpose Trail$	$500,000 per mile
12-foot Wood Deck/Boardwalk	$1,800,000 per mile

The Kansas Department of Transportation (KDOT) has researched the probable cost of one trail with several different construction techniques that may provide some potential cost saving strategies in certain areas of the United States where resources are available and site conditions permit. Areas of high frost heave such as Wisconsin also see some advantage in using gravel trails where asphalt cracking occurs as a result of frost heave. The use of gravel trails may be found on primary trails in Grayslake, Illinois, and for secondary bicycle trails in Albuquerque, New Mexico. Clearly there is a place for the use of gravel trails in complete transportation systems.

ENGINEER'S ESTIMATE OF PROBABLE COST OF TURKEY CREEK BICYCLE/PEDESTRIAN TRAIL

Option 1 – 10'-Wide Asphalt Trail Generally Meeting AASHTO/KDOT Standards

Construction of Main Trail (Antioch to Metcalf with Access to Foster) $1,072,920

Construction of Access trail to Lowell 243,003
Land Acquisition 150,000
Survey, Engineering, Testing 219,111
Total Cost $1,685,034

Advantages of Option 1:
- Generally meets AASHTO/KDOT requirement thus eligible for KDOT funding
- Constructed to acceptable standards consistent with area trails (width, slope, surface, etc.)
- Accessible for emergency vehicles
- Maintenance requirements similar to existing trails in the City

Disadvantages of Option 1:

- High cost of construction
- Significant site impacts due to grading and construction of retaining walls

Option 2 – 10' Wide Asphalt Trail with Variances from AASHTO/KDOT

Construction of Main Trail (Antioch to Metcalf with Access to Foster) $ 929,732
Construction of Access Trail to Lowell 243,004
Land Acquisition 150,000
Survey, Engineering, Testing 194,209
Total Cost
$1,516,945

Advantages of Option 2:

- Somewhat lower cost of construction
- Accessible for emergency vehicles
- Maintenance requirements similar to existing trails in the City

Disadvantages for Option 2:

- Varies from AASHTO/KDOT requirement, thus less likely to be eligible for KDOT funding.
- Constructed with steeper running slopes, making it more difficult for users
- Significant site impact due to grading and construction of retaining walls

Option 3 – 6' Wide Limestone Screenings Trail with Variances from AASHTO/KDOT

Construction of Main Trail (Antioch to Metcalf with Access to Foster) $ 429,790
Construction of Access Trail to Lowell 144,624

Land Acquisition 150,000
Survey, Engineering, Testing 95,094
Total Cost $ 819,508

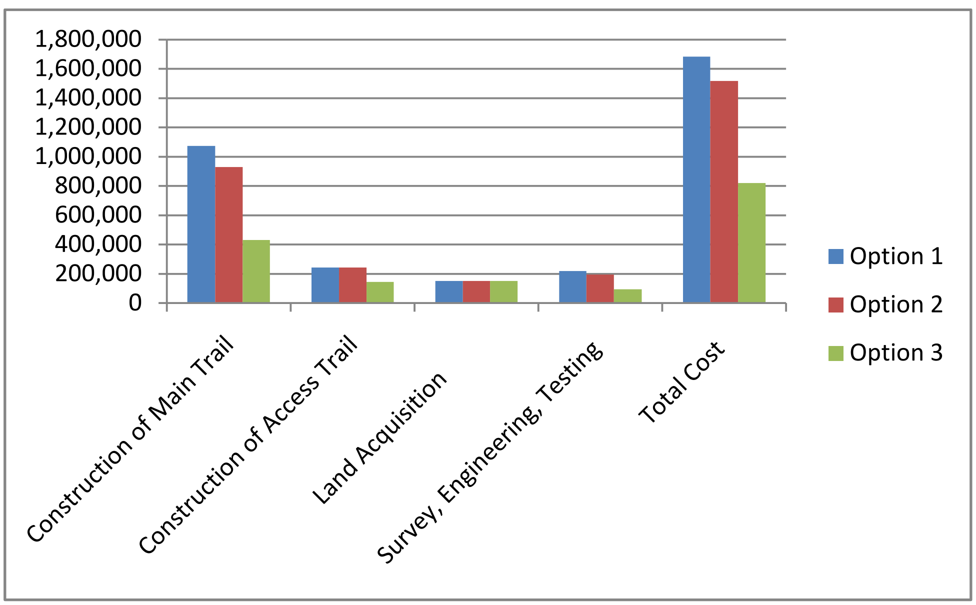
Advantages of Option 3

- Lower construction costs
- reduced site impacts

Disadvantages of Option 3:

- Would likely not be eligible for KDOT funding
- Higher maintenance costs
- More difficult for users due to steep slopes and loose surface material and would not comply with ADA requirements
- Limited access for emergency vehicles

(Source: http://www.opkansas.org/_Assets/agendas/cd/2006/02-01/INF-1-2.PDF)



Graph of KDOT estimated cost of three trail construction types for the same trail

It is also useful to compare cost of hard-surfacing materials, e.g., asphalt and concrete. The following chart compares asphalt and concrete trail costs in Colorado.

COST COMPARISON OF PAVEMENT TYPES IN COLORADO METROPOLITAN AND RURAL REMOTE AREAS-SEPTEMBER, 2001:

The pavement thicknesses presented are generally accepted standards in the industry. Actual construction costs will vary depending on project specifics, grading requirements, location and local pricing differences, and distance from concrete or asphalt supplier plants.

1. 10' WIDE PATH - COST PER LINEAL FOOT*- METROPOLITAN AREA

PAVEMENT THICKNESS	ASPHALT	CONCRETE	ASPHALT SAVINGS
MINIMUM CONCRETE = 4" ASPHALT = 3"	$7.50 to $9.50	$16.00 to $18.00	50 %
VEHICLE USE CONCRETE = 6" ASPHALT = 5"	$12.00 to $14.00	$19.00 to $21.00	30 %

10' WIDE PATH - COST PER LINEAL FOOT*- REMOTE AREA

PAVEMENT THICKNESS	ASPHALT	CONCRETE	ASPHALT SAVINGS
MINIMUM CONCRETE = 4" ASPHALT = 3"	$13.00 to $15.00	$34.00 to $38.00	60 %
VEHICLE USE CONCRETE = 6" ASPHALT = 5"	$28.00 to $30.00	$39.00 to $45.00	30 %

* Cost estimates obtained from Colorado contractors and are for paving costs only, assuming a fine-graded mix. (Source: Eric West, PE Trail Design and Construction, Technical Aspects of the Asphalt Trail at http://www.americantrails.org/resources/trailbuilding/AsphaltCO.html)

MAINTENANCE COSTS

In addition to construction costs, maintenance costs should be considered. Regardless of trail surface type, there are many other factors that can affect the cost of maintenance. The main factor affecting cost is the operational difference in agencies that maintain and operate trails. Each agency will have different labor costs, access to different machinery and equipment, and may or may not have a volunteer base to subsidize costs.

While the majority of multi-use trails are predominantly asphalt, some places such as Milwaukee have used concrete but are considering more use of crushed-gravel paths, especially in rural areas where snow-plowing is not required.

Maintenance of asphalt, concrete, and crushed-gravel trails differs due to the different properties of the materials. Periodic maintenance of a crushed-gravel path is usually greater since it is more susceptible to adverse weather conditions e.g., rainstorms and erosion from run-off. Heavy amounts of water running on the trail can cause ruts to form and soften the trail as a whole. More use on a soft trail will cause greater damage to the overall smooth surface and require ongoing grading. One advantage of a crushed gravel trail is that it is less affected by the freeze/thaw cycle that exists in the northern areas and western mountainous areas. Although asphalt and concrete trails are generally not affected by rain and water erosion, freeze/thaw cycles can cause buckling, creating potholes and cracks which can be dangerous and costly to repair in some parts of the United States such as Wisconsin.

> "Maintenance and operation costs can also have a broad definition. In the case of Milwaukee, Wisconsin, maintenance and operation costs are classified as routine maintenance. Routine maintenance can be defined as maintenance that is needed to keep the trail operating in a safe and usable condition, not involving major trail development for reconstruction. Below is a list of routine maintenance activities:

- Yearly facility evaluation to determine the need for minor repairs
- Removing encroaching vegetation
- Mowing
- Map/signage updates
- Trash removal/litter clean-up
- Flood or rain damage repair: silt clean up, culvert clean out, etc.
- Patching, minor regrading, or concrete panel replacement
- Planting, pruning, and general landscaping"

> Research was conducted to determine annual per mile maintenance costs for off-street trails. Some estimates found were specific to a trail surface type and others were not. **Interestingly, in Milwaukee, maintenance and operation costs are very similar whether a surface is crushed gravel or asphalt.** However, gravel paths are not suitable for snowplowing. Due to the low amount of concrete bike trails, a routine maintenance figure could not be generated for these trails alone. Below is a list of maintenance costs from various sources:

> $1,500 per mile provided in the Iowa Trails 2000 plan by the Iowa Department of Transportation (includes a mixture of different trail surfaces)

> $2,525 per mile summarized by the Milwaukee County Park System (all asphalt paths)

> $1,200 per mile (as an absolute minimal cost) in the Rail Trail Maintenance & Operation Manual provided by the Rails-to-Trails Conservancy

> $2,077 per mile for government run trails provided in the Rail Trail Maintenance & Operation Manual provided by the Rails-to-Trails Conservancy

$2,042.06 per mile of unpaved trail in the Trail Cost Model - Draft by the Wisconsin Department of Natural Resources

Snow removal costs range from $24.13/mile on the Glacial Drumlin Trail - E to $154.13/mile on the Red Cedar State Trail. Although snow removal does occur on portions of Milwaukee County's Oak Leaf Trail, no cost estimate could be separated out."

(Source: **From Draft Milwaukee County Trails Network Plan, 2007,** Milwaukee County Dept. of Parks, Recreation, and Culture at http://www.americantrails.org/resources/ManageMaintain/MilwMaintcost.html)

The City of Raleigh currently spends $4,000 per mile to maintain their 40-mile green-way system every year. This includes a number of stabilized soil and paved trails.

Ashville, NC, shows a similar cost per mile of trail with the following activity breakdown:

Drainage and storm channel maintenance (4 x/year)	$500.00
Sweeping/blowing debris off trail tread (20 x/year)	$1,200.00
Pick-up and removal of trash (20 x/year)	$1,200.00
Weed control and vegetation management (10 x/year)	$1,000.00
TOTAL MAINTENANCE COST PER MILE OF TRAIL	$3900.00

Source: (http://www.ashevillenc.gov/uploadedFiles/Residents/Parks_and_Recreation/Greenways/Estimates_of_Cost_and_Return.pdf.)

Further Strategies to Ameliorate Costs of Bicycle Lanes and Multi-use Paths

Strategies to lower costs are related to the process of Planning, Design/Construction, and Management Phases as reflected in the *AASHTO Geometric Design, Guide for the Development of Bicycle Facilities, 1999.* Several of these strategies reinforce previously mentioned approaches to reducing cost.

"The Nation needs a new and integrated systems architecture approach to transportation planning and operation that will maximize public and private-sector investments in meeting both our transportation needs and our societal needs." (MIT Vision 2050, An Integrated National Transportation System, http://web.mit.edu/aeroastro/www/people/rjhans/docs/vision2050.pdf)

"Nationwide, 72 percent of all Americans have reported wanting a community-based planning structure which makes walking, running or bicycling an integral part of their area's transportation system."

(http://www.americantrails.org/resources/railtrails/IntegrateRailTrail.html)

The most successful multi-use regional trails are located along corridors that have the same trip origins and destinations as motorists. These trails link neighborhoods, parks, and open space areas with schools, business sites, employment centers, and other **regional** destinations. A good example of large scale planning is Georgia's DOT plan State Transportation Board approved plan dated August 21, 1997. It focuses on the goal of developing a statewide, primary pedestrian and bicycle route network coordinated with a number of multi-modal transportation goals. The network contains 14 routes totaling 2,943 miles.

Planning Strategy 1.

Use a regional planning approach - Many multi-use trails are often planned and funded at the community level, but cost savings can accrue by planning a multi-modal system at the state or regional level. Bike-paths should not be planned in isolation from the rest of the multi-use transportation system, but should be part of an increasing move toward multi-modal forms of energy-efficient transportation such as light-rail. ISTEA emphasizes a need for long-term planning on the local, metropolitan, and state levels. Long-term multi-use path plans should be included in all comprehensive plans and transportation improvement plans.

Planning strategy 2

Land Use Planning to reduce automobile use, congestion and related costs

- Direct land use and transportation development, through the permit process, to issue equal or better access by foot or bicycle to education, recreation, retail, commercial office and other appropriate types of development.
- Require, through the permit process, mixed land uses of residential, retail, commercial office and other types of compatible development, to provide an environment which is safe and convenient for pedestrian and bicycle travel, and give people shorter travel distances between origins and destinations.
- Little attention has been devoted to either the pedestrian or bicycling environment to and from transit stations. Insure this critical linkage during the conceptual planning stages to minimize later unintended cost. (land use planning statement source: David Moser, Planning for Livability, International Biking Fund http://www.ibike.org/engineering/landuse.htm)

Planning Strategy 3

Use of rail corridors - "In heavily populated or developed areas, railroad corridors represent some of the only open space that remains for trail development. Unless rail corridor preservation and rail- trail conversion are institutionalized in the new transportation planning process, most of the rail corridors that will be abandoned in coming years will be lost forever for transportation purposes." Acquiring these right-of-

ways now can save acquisition funds in the future.
(http://www.americantrails.org/resources/railtrails/IntegrateRailTrail.html)

Planning Strategy 5

Developer incentives can also greatly help in the creation of on-street and off-street paths by including these amenities as an integral part of plans for new development. New paving materials are available that are pervious, thereby reducing runoff impacts. Local governments can encourage path and trail development by providing guidelines and incentives and removing barriers to connectivity between existing and new developments. Insure that local and regional governments create an incentive system for developers who connect their development to the regional or community multi-use path system.

Planning Strategy No. 6

Single-use paths. Federal funding sources appear to favor multi-use trails though there are known conflicts between various types of users such as bicyclists and joggers. The AASHTO Guide for the Development Bicycle Facilities (the engineering profession's "bible" of bikeway design) says “In general, multi-use paths are undesirable: bicycles and pedestrians do not mix well.” A secondary system of cheaper gravel-surface paths might be considered. More research is needed in this area but it would appear wise to consider a system of single user type paths and trails based on a clear analysis of user type to avoid potential conflicts especially in heavily populated areas. (Weyrich, Noel and Soetebier, Bob. Meeting the “Bike Path” Challenge: Five steps for Making the Multi-Use Trail Movement Work for Road Cyclists. (http://www.parrett.net/~rralston/bpath.html)

Planning strategy No. 7

Larger municipalities may find planning and construction cost savings by permanently hiring professional planning personnel that can coordinate transportation efforts, apply for multi-use path grant monies, and oversee path construction to keep costs in house as opposed to hiring private consultants and using private contractors.

Design/Construction Strategies to reduce cost

These strategies focus on cost savings that might be accrued through changes in design of trail features such as right-of-way width, trail width, and alternative surface materials.

Right-of-way width and path width are driven both by issues of safety and the size of construction equipment. Many municipalities have accepted the 10’ multi-use path standard without much understanding that path systems, like road systems, are hierarchical.

Alternatively, path systems may eventually suffer from "traffic generation" or the phenomena that demand increases as the path or roadway comes into operation over time. In this case the 10' minimum path width may be considered a helpful minimum.

On the other hand, low volume use areas may not need the full 10' width. Developers in Richmond, just across the bay from San Francisco, have occasionally used 8' multi-use paths that are part of the 10 to 12 foot system around the San Francisco Bay. Access paths are only 3 to 6 feet wide. Parts of the major municipal trail also separates pedestrian and bicycle traffic with a fence in heavily used areas. So far the system is working and plans to create a multi-use path on the side of Bay Bridge to reduce traffic congestion into the city are in the planning phase.

> Design Recommendation No 1
>
> Ensure that traffic counts, level of service, and analysis of user profiles are required prior to determining path width in the planning and design phases. Transportations systems are hierarchical and multi-use path systems need to address potential user needs and safety to address path width rather than using a one size fits all approach. (See: Hein Botma, Method to Determine Level of Service for Bicycle Paths and Pedestrian-Bicycle Facilities, Transportation Record No 1502, pp 38-44, Washington D.C. 1995.)

Right-of-Way Width -- In most cases 20' of ROW appears to be the minimum necessary for construction equipment to operate in. Municipalities such as Fayetteville, AR, typically build dedicated multi-use paths with standard road building equipment (trucks, graders, asphalt paving equipment) though specialized equipment does exist for trail building. Trail building miniature rock crushers, specialized small dozers, and smaller trucks or motorized wheel barrows exist but most municipalities do not have or have the inclination to purchase this specialized equipment for path construction and maintenance.

Twenty feet of ROW is not excessive and allows enough room for onsite drainage improvements, lighting, fences, benches, and use of standard maintenance equipment and crews. Fayetteville obtains 30' of ROW in areas where certain landscape features are considered valuable or where on-site improvements require more space. Obviously a good right-of-way allows for increasing the surfaced path width at a later time. Unfortunately right-of-way can be as expensive as construction costs of the multi-use path and this leads to a second recommendation.

> Design Recommendation No. 2
>
> It is possible to acquire smaller right-of-ways where expense becomes a determining factor but this may require the use of specialized equipment and longer construction times. This specialized equipment may be essential for smaller right-of-way cost efficiencies if a true multi-modal system is to be

achieved. The tradeoffs need to me measured in terms of the long term transportation analysis and planning needs.

Design Recommendation No 3

Instead of purchasing additional Right of Way, use streets than can function as a "bicycle boulevards" with traffic calming benefits and landscaping of the existing public roadways.

Path Surface--Strategies for reducing path surface and path width have been investigated briefly by the Kansas Department of Transportation mentioned earlier in this report. In their case study, use of limestone screenings on a path varying from 3 to 6 feet wide cut the cost of trail construction in half compared to a 10-foot asphalt path. Obviously drainage design has to be particularly thorough to insure these paths will not suffer from erosion in critical areas. In northern climates, there is an added benefit to paths surfaced with screenings; they absorb buckling due to freezing and thawing. Milwaukee maintenance reports suggest that the cost of maintenance for gravel and asphalt paths are roughly the same and the city is considering additional use of gravel paths in some areas.

In Fayetteville, asphalt paths suffer from drying and cracking. The lack of car traffic on asphalt does not keep the surface oils spread which leads to premature cracking. This results in added maintenance costs an annual basis. Perhaps gravel paths and other alternatives do have applications and advantages that need more research to lower overall design and construction costs. In fact, one can envision a whole secondary system of gravel-surfaced paths similar to many county roads being gravel-surfaced. It should be noted that most municipalities feel they are reducing maintenance costs with asphalt paths.

Design Recommendation No 4

To lower construction costs consider the use of gravel paths or soil cement. Consider the use of materials other than asphalt and concrete on well drained, lesser used parts of a site and use harder materials in more intensively used or problematic areas. In some cases, local contractors are not comfortable with different surfacing materials beyond asphalt and concrete so it is wise to insure that contractors are knowledgeable on alternative surface treatments.

Maintenance Strategies to Reduce Costs

Maintenance costs ranged from 2000 to $4000 a mile per year in a number of studies which is around $40,000-80,000 over a twenty year life cycle for each mile of path. Considering that a mile costs around $250.000 to $300,000 a mile to build, approximately a quarter of the total cost over a twenty year period can be in maintenance. This is not an insignificant amount and strategies to address and reduce maintenance costs are well worth considering.

Maintenance strategy No. 1

Insure that all drainage issues are thoroughly addressed and resolved during the planning and design/construction process to minimize erosion problems. Develop curvilinear alignments in the planning and design phases that contour paths across the landscape at appropriate grades to provide for stable tread conditions. This approach will help minimize maintenance costs.

Maintenance strategy No 2

Landscaped areas along the trail will require some periodic maintenance, but good design can keep this to a minimum. Low maintenance and drought resistant trees, shrubs, and ground covers can also minimize upkeep activities.

Maintenance strategy No 3

One means to underwrite maintenance of transit systems used in San Francisco, are Transit Development Fees, which are levied on real estate development projects downtown, in proportion to the costs of their developments. In downtown San Francisco, where more automobile parking is discouraged, the MUNI bus and railway system is funded in part by local real estate developers. This approach extends to maintenance of multi-use paths.

Maintenance Strategy No 4

Use Business Improvement Districts to help fund maintenance. A common strategy to ameliorate conditions in commercial areas, special assessment districts can be created to subsidize landscaping, streetscape improvements, and other amenities for local residents and employees. San Francisco's Union Square presents a successful model of this strategy; revenues from local businesses currently fund a program to keep streets clean and safe.

Maintenance Strategy No 5.

Organize volunteer community groups to help with maintenance. Insure that a low-cost source of labor can be used to maintain trails. Some states such as California have monies to provide meaningful work and educational opportunities to assist young men and women, while protecting and enhancing the environment, human resources and communities.

Maintenance Strategy No 6.

Insure access to ISTEA funds. A portion of the federal Transportation Legislation, TEA-21, the Recreational Trails program, is notable because it is commonly used for path and trail maintenance.

Maintenance Strategy No 7.

Management of on-street bike paths and shared use off-street paths requires ongoing training of all transportation facility users. Good ongoing training programs and policing must be established as non-motorized transportation is integrated into upcoming multi-modal systems.

Conclusion

A well integrated bikeway and path system at national, state, and municipal levels would help support the major concerns of the MIT Vision 2050 Integrated National Transportation System Report that states the following goals:

• An integrated national transportation system that can economically move anyone and anything anywhere, anytime, on time;

• A transportation system without fatalities and injuries; and

• A transportation system that is not dependent on foreign energy and is compatible with the environment (e.g., with respect to noxious emissions, Green-house gasses, noise)
(http://web.mit.edu/aeroastro/www/people/rjhans/docs/vision2050.pdf)

Public policy must play a significant role in reshaping America's transportation system. Several opportunities exist for improving transportation sustainability through changes in travel behavior which require policy implementation with a long term perspective. In conclusion, the final synopsis of recommendations follow.

1. Understand the economics and organization required behind the use of less polluting cars, driving at non-peak hours and more use of public transportation including walking and bicycling from the planning stages through design and construction to maintenance and ongoing management of alternative transportation systems.

2. Create policy that truly Integrates transit, cycling, and walking that are publicly and politically feasible with less dependence on the automobile.

3. Fully coordinate and integrate land use planning and transportation to promote transit-oriented development while discouraging car-dependent sprawl

4.Create public information and education to make changes feasible in schools, events and in the media to show all the benefits of more sustainable policies including walking and bicycling.

5. Implement local and regional government internal policies in stages that rewards cooperation across disciplines and consider team base approaches to transportation and land use planning that is comprehensive and reflects consideration of bicycle pedestrian paths and facilities.

Appendix A Further Economic Impact Analysis Case Studies (contributed by Easton Outdoors, Inc., Fayetteville, Arkansas, 2009)

THE BUSINESS OF TRAILS

CASE STATEMENT

Trails and their users generate substantial economic benefits. With minimal research, a plethora of case studies and economic impact statements are available for review and analysis. The economic impacts of comprehensive trail systems exemplifies the proven assertion that trails bring new business and economic life to American cities, towns, and communities.

Providing alternate transportation routes and easy commuting to and from work via active transportation helps individuals and families offset impacts of gasoline inflation and soaring healthcare costs. With increased financial resources due to transportation and healthcare savings, other purchases that fuel retail spending, home buying and associated economic development projects return to the private sector.

For more than 20 years, states, cities, and national organizations across America have been documenting the economic impacts of trails. Studies, as early as 1974, began asserting the economic value of such resources. In recent years, 2000 – 2008, the number and quality of those studies have increased dramatically.

The following quote typifies the importance placed on trails based on studies conducted by the U.S. DOT, Federal Highway Administration in 1994 after the establishment of the Transportation Enhancements Program as Part of the U.S. Federal Highway Administration Transportation Budget.

This is the vision–to create a changed transportation system that offers not only choices among travel modes for specific trips, but more importantly presents these options so that they are real choices that meet the needs of individuals and society as a whole. Making this vision a reality must begin now. – USDOT Federal Highway Administration.

Economic Impact of Trails – 2002 Consumer Survey by the National Association of Realtors and National Association of Homebuilders

Other organizations whose economic development are impacted by the inclusion of trails and trail systems include the National Association of Realtors (NAW) and the National Association of Homebuilders (NAHB). With no bias and an agenda to determine what most appeals to new homebuyers, these organizations united in 2002 to conduct a Consumers Survey. The Sample of 2,000 households was derived from a national panel of respondents who purchased a primary residence within the last 48 months.

Survey respondents were ask to rate the importance of the following community amenities that would seriously influence you to move to a new community, realizing that these features, in varying degrees, may increase the cost of the home or involve higher homeowner association fees or local taxes.

Out of eighteen categories, 44% of respondents listed highway access as the most important amenity, followed by walking/jogging/bike trails at 36%. Sidewalks on both sides of the street ranked third at 28%, with parks areas and playgrounds following at 26% and 21% respectively. Shops within walking distance of home ranked 6th, at 19%. Amenities like golf courses, tennis courts, club houses, and baseball/softball fields ranked less 8%.

When asked "Which of the following statements about homes and neighborhoods do you agree with?" **Twenty-seven percent (27%) of respondents agreed with the statement I wish I could walk more places from my home.** The only category with a larger rate of agreement was "I wish my home were larger" with 64% of respondents in agreement.

The demographic make-up of the study included 79% over the age of 35; 60% with incomes higher than $50,000; and 64% married couples.

In a follow-up Growth and Transportation Consumer Survey in 2007, findings concluded that:

> *Three-fourths of Americans believe that being smarter about development and improving public transportation are better long-term solutions for reducing traffic congestion than building new roads, according to a survey sponsored by* ***the National Association of Realtors® and Smart Growth America.***

The 2007 Growth and Transportation Survey details what Americans think about how development affects their immediate community, and traffic congestion was a top concern.

Nearly half of those surveyed think improving public transit would be the best way to reduce congestion, and 26 percent believe developing communities that reduce the need to drive would be the better alternative. Only one in five said building new roads was the answer.

An earlier report conducted by the University of Nebraska entitiled *"Omaha Recreational Trails – Their Effects on Property Values and Public Safety* in June 2000 reported similar findings. *The results indicated that 65% of respondents felt their home **would be** easier to sell and 42% of respondents reported that their homes **were** easier to sell because of the nearby trail's presence.*

A clear majority of residents (63.8%) who bought their homes after the construction of trails reported that the trail had positively influenced their purchase decision. Seventy-five percent (75%) of respondents identified a correlation between trails and a positive impact on the quality of life in their neighborhood.

Economic Impacts of Bicycling Tourism

(Des Moines) Register's Annual Great Bicycle Ride Across Iowa (RAGBRAI)

The Register's Annual Great Bicycle Ride Across Iowa (RAGBRAI) is an event sponsored by the Des Moines Register since 1973. The Annual Bicycle Ride has become, in some cases, the largest economic impact event for towns and cities in the state.

Due to the popularity of the event and the large number of registrants, a lottery was established to selected applications for ridership limiting the number of participants to 8,500 with an additional 1,500-day riders for each of the consecutive 6 days of the event.

In 2007, alone, more than 800 applications (over the 8,500 rider limit) were received.

Since it's inception, there have been more than 255,650 riders covering 15,535 miles at RAGBRAI. Seven hundred sixty one (761) Iowa towns or 78% of all towns in Iowa, have enjoyed substantial economic impacts due to RAGBRAI since the first event in 1973.

> *"We've seen towns that get 20,000 – 30,000 people associated with RAGRAI," said T.J. Juskiewicz, the ride's director. "That's a lot of dollars. The economic impact has been reported at $2 million per town."*

Because of the economic impact, more than 200 other rides have been established throughout the years taking their inspiration from RAGBRAI, including bicycle rides in *Kansas, Nebraska, Oklahoma, Georgia, Tennessee, Florida, Colorado, Oregon, Maryland, Ohio, Maine, Missouri, Illinois, Virginia, Rhode Island, Minnesota, Delaware, New Mexico, Michigan, North Dakota, New York, California, Washington, Arizona, Wyoming, Mississippi, Texas, Kentucky, Utah, Wisconsin, Indiana, New Hampshire, District of Columbia, Massachusetts and North Carolina.*

In studies conducted by the Maryland Department of Transportation, a $191,893 investment in Maryland's Northern Central Rail Trail increased state revenues by $303,750 the same year the trail opened. *"Analysis of Economic Impact of the Northern Central Rail Trail", Maryland Department of Transportation (1994).*

In another important 1999 study, it was determined that the **The Great Allegheny Passage brought in $14 million in direct economic benefit (rentals, meals, lodging, trinket purchases) even as it was only half completed.** (Stephen Farber, University of Pittsburg and Pennsylvania Economic League, "An Economic Study for the Allegheny Trail" (1999).

CASE STUDIES

Washington and Old Dominion Trails in Virginia – Prepared for the Virginia Department of Conservation (2004)

The Washington and Old Dominion Trail (W&OD) is a 45-mile long transportation and recreation corridor running from Arlington, Virginia, west to Purcellville.

This report focuses on the Washington and Old Dominion Trail (W&OD. The first section includes statistical information about user demographics, trip profiles, attitudes and management preferences. The next part of the results section explores the economic benefits accruing to trail users and the economic impacts on the region stimulated by trail use.

A representative sampling procedure described above was used to obtain 1,426 completed questionnaires from trail users between May 2003 and April 2004. Information from completed questionnaires was combined with on-site summer visitor counts at various trail segments to arrive at an annual estimate of adult visits (aged 16 and older) of 1,707,353. Of this number 5.24% or 89,807 of the visits, amounting to 33,262 group trips were from users living outside the northern Virginia area. The remainder if the visits, 1,617,546, were from local residents.

An estimated 1.7 million adult W&OD users spent in total about $12 million annually related to their use recreational use of the trail.

Of this amount, about $7 million was spent directly in the northern Virginia economy by locals and non-locals using the trail. *The estimated 1.6 million local visits accounted for about $5.3 million of spending directly related to the use of the W&OD.*

Trail users were primarily white (85%) and evenly split along gender lines. Asians were the leading minority group at 6 percent. The largest two age cohorts were those aged 36-45 and 46- 55. Average annual household income for users was just under $100,000. About 84 percent of users reported being employed, 63 percent in the private sector. The average user group size for all visitors was 1.7, but more than 57 percent of visitors were using the trail alone.

Finally, while access to the trail is "free," there is nevertheless considerable economic value that accrues to W&OD users. This net economic value or consumer surplus is a dollar measure of the amount of welfare that users would lose if the trail were unavailable.

Using conventional economic methods, it was determined that, on average, a trip to the W&OD was worth between $9 and $14 dollars per person more than the average cost to use the trail.

Extrapolating this net economic benefit across 1.7 million adult visits, of which 93 percent were for the primary purpose of visiting the W&OD, leads to an annual net economic benefit of trail access to users of between $14.4- and $21.6 million. Because the W&OD is primarily a local resource (95% of visits are by locals) rather than a destination trail, the vast majority of these net economic benefits accrue to northern Virginia residents. *Source: J.M. Bowker, USDA Forest Service Southern Forest Research Station; John C. Bergstrom and Joshua Gill, University of Georgia Department of Agricultural and Applied Economics; Ursula Lemanski, National Park Service.*

Maximizing Economic Benefits from a Rails-to-Trails Project in Southern West Virginia: A Case Study of the Greenbrier River Trail

A recent report from West Virginia provides more data on the economic and tourism benefits of trails. It presents the results of a 10-month project designed to inventory the recreation opportunities in the Greenbrier River Trail corridor, to assess the level of trail use and its economic impact, and to generate broad-based cooperative efforts to expand marketing and promotion.

"The results of this project clearly indicate that there are opportunities to enhance the economic impact of the Greenbrier River Trail on the area."

A trail-user survey was developed to assess both user preferences and trends and, at the same time, amass basic economic impact data on trail use. During October 2000, trail-side surveys were conducted, while several state agencies, commercial businesses, and travel and tourism offices solicited survey responses from the trail users they encountered.

Survey analysis showed that trail users tend to be highly educated with family incomes over $60,000 per year, and that more than 60% were residents of other states. It was also found that the amount of money spent by out-of-state visitors far exceeded that spent by West Virginia residents.

Ninety percent of the out-of-state visitors indicated that they were highly likely to plan a return visit to the area. This has profound implications for expanded promotion and marketing opportunities.

The overall economic impact on the area by trail users was significant. Out-of-state visitors purchased the broadest range of goods and services and made the greatest total expenditures. Visitors were very pleased with the quality of their trail experiences, the trail itself, and the surrounding environment.

The project began with an inventory all leisure industry providers, points of interest, and infrastructure. Next, a survey of trail users was conducted, followed by public meetings in an effort to create a broad-based support group for economic enhancement. The final step was to produce the documentation of trail user demographics and economic impact.

Trail user survey results show economic benefits

The following is a summary of some of the findings of the West Virginia economic impacts study of the Greenbrier River Trail:

Sex and group size of visitors

Trail users were almost evenly divided between male (53%) and female users (47%). This may have positive implications for future marketing and promotion efforts. If use were skewed heavily toward one gender, marketing and promotion would be more challenging in many respects.

The most frequently reported group size was two people (42%), followed by four.

Age

The age classes representing the greatest trail use were 25-39 (34%) and 40-59 (44%). Only 10% of users were in the 16-24 age class, and 12% were 60 and over. Of particular interest is that West Virginia has one of the highest senior citizen populations in the country, and an increasing percentage of out-of-state visitors are retired. Opportunities abound to market the Greenbrier River Trail to this age class. During summer vacation periods the proportion of younger users is probably be much higher.

Education Level

The results of this survey strongly suggest that there may be a high correlation between use of the Greenbrier River Trail and the education level of the users: 90% of the trail users hold college degrees or have attended college.

Profession and family income

Of those surveyed 52% were white-collar workers. Only 9% were retired, indicating this group may be a prime target for marketing. Incomes were consistent with education level and profession: 54% reported family incomes over $60,000.

Residence

The fact that 63% of the respondents were from out of state has profound implications for marketing strategies, as does the discovery that only 16% were residents of the two trail corridor counties. Virginia zip codes accounted for 37% of the out-of-state visitors, indicating that Virginia would be a prime target market for promotional campaigns.

Principal type of trail activity

The most popular type of trail use reported was overwhelmingly bicycling (75%). Future marketing and promotion strategies should attempt to focus on this user group. While walking and jogging are significant uses (20%), they are probably restricted to relatively short sections of the trail near trailheads while bicycle use extends over much longer sections.

Items for which visitors spent money in the area

Food, travel, and lodging headed the list of items on which visitors spent money. As expenditures on equipment rental or purchase, guide services,and clothing were almost non-existent, it is obvious these are areas that require more effective marketing and promotion efforts. Only souvenirs showed a moderate level of expenditure outside of the top three, perhaps because of limited opportunities for such purchases.

Duration of visit

The duration of visits was about evenly distributed among one-day (34%), overnight (27%), and multiple-day visits (39%). Of the reported visits, 93% occurred during a one- to four-day period; and only 7% of the reported visits occurred during periods longer than five days. Marketing and promotion strategies, from a cost effectiveness perspective, might be best focused on the one- to four-day visitor.

Estimated total expenditure for this trip

58% spent between $100 and $500. Those who reported spending less than $100 were those who lived within the corridor. Of the 39% who spent more than $500 on their trips, virtually all resided outside West Virginia.

Is this your first trip to the Greenbrier River Trail?

The 47% who indicated "yes" is an extraordinarily high first-time visitor figure. Any tourist-related industry would cherish a first-time attendance rate of 47%. Perhaps this can be attributed to the fact that almost half of the visitors indicated that word-of-mouth was the greatest influence on their decision to visit the Greenbrier River Trail.

What influenced your visit to the trail?

More visitors (47%) were influenced by word-of-mouth than were by electronic and print media combined (39%). The fact that 54% of the visitors did not seek or receive printed or electronic information about the trail is further evidence that a broader marketing and promotion effort could positively influence visitation in the corridor.

Quality of trail, surroundings, and experience

When viewed together, scenic quality, physical condition, quality of experience, and likelihood of planning a return visit provide excellent opportunities for future marketing and promotion efforts. An overwhelming percentage of the respondents ranked these items very highly.

It is clear that visitors appreciated and enjoyed their trail-related activity and that almost every one of them plans a return visit. An expanded promotion activity should obtain mailing addresses of trail users in order to mail printed information to them within a few months after their visits.

Other recreation activities in the area

As 48% indicated their trip included other visits or recreation activities in the corridor, it is apparent that trail users who have a greater awareness of other activities and facilities in the area are more likely to extend their visit to take advantage of these opportunities.

The 59 other outdoor recreation activities reported by trail users are clear evidence that many trail users are interested in other outdoor recreation opportunities when available. The economic impact of these other outdoor recreation opportunities could possibly be enhanced through expanded promotion and marketing efforts in the area.

Additional conclusions

Officials of state government agencies and convention and visitors bureaus have suggested that the results of the trail user survey are probably very conservative because use of the Greenbrier River Trail is considerably higher in the summer months. They have suggested that the economic impact results would be significantly greater if a similar survey were conducted during the summer.

The results of this project clearly indicate that there are opportunities to enhance the economic impact of the Greenbrier River Trail on the area. The key to success will be to find ways to develop cooperative promotion and marketing agreements among all agencies and organizations that now promote and market in a more narrow focus.

Analysis of Impacts of the Northern Central Rail Trail – Prepared for the Maryland Greenways Commission, a division of the Maryland Department of Natural Resources – PFK Consulting (1994).

The NCRT is clearly recognized by residents as an asset for the region, especially the local community. As the survey findings demonstrate, nearly 100 percent of the Trail's users come from Baltimore County, and as a percentage of Trail users nearly 80 percent use the Trail at least once per week.

While some greenways have diverse attendance segments and can significantly increase tourism, others like the (NCRT) are used primarily as a passive recreation resource (walking, biking) primarily by local residents. Not only did the surveys indicate this, but the visitor logs from Monkton Station from 1989-1993 all support this finding. The reason for the NCRT's use primarily by residents can be attributed to both its location (in a suburban to rural bedroom market for Baltimore), it's relatively new presence in the market (10 years), limited signage to the resource from major travel corridors, and lack of commercial development along its length.

Consequently, there are relatively few establishments to capture tourism dollars. However, this market is beginning to grow as is shown by the emergence of tourist related businesses at Monkton Station and elsewhere along the trail. The NCRT's recognition as a local resource is a remarkable accomplishment.

Before it was redeveloped as a greenway, the rail corridor was a "magnet" for illegal dumping, vandalism, and illicit uses by adolescents and others. Now, as a prized local resource, the NCRT is "policed' by residents and problems along the corridor have decreased dramatically.

With regard to user expenditures detailed in the economic impacts section of this report, Trail users who had purchased goods for use on the Trail spent an average of $203 in 1993. Similarly, users who purchased soft goods (food etc.) before or after using the Trail spent an average of $6.30 per visit.

To understand the Trail's success one must recognize the forces that have led to its popularity. Two general areas of interest lead: safety and passive recreation. The interest in safety for walkers, runners and especially bicyclists (who together make up almost 98 percent of the Trail's users) reflects a lack of other safe areas to congregate. To that end, the NCRT fills a critical gap for the surrounding region. Tied into this need are some basic trends:

1) An aging population - in six more years, at the turn of the century over 40 percent of the U.S. population will be over 60 years of age - and already Baltimore County has the second oldest population per capita of any county in the U.S. (Dade County, Florida is number one.)

2) More bicycles are sold in the United States than are automobiles. Nearly all respondents mentioned there are relatively few places near their homes where bicyclists can safely ride.

The most popular recreation activity in the United States is walking; over 100 million Americans participate in this activity 2 to 3 times per week.

4) Current land development and housing patterns remain focused outside urban core areas and center on rural and suburban areas. These areas provide relatively inexpensive land, good travel corridors, better schools, support facilities (shopping areas) and less crime than more urban settings.

Park Trail Usage Patterns and Public Sentiment Toward Maintenance and Operation Cost - *From the East Bay Regional Park District Trail System ---- Alameda and Contra Costa Counties, California (2003)*

Survey looks at public willingness to pay for trails

Executive Summary

A large majority of voters in the East Bay Regional Park District (88%) agree that the system of regional parks and trails is a "valuable public resource." Most voters also recognize the need to properly maintain this public resource (86%). *When asked directly whether they would support or oppose a special benefit assessment of $5 per year on parcel owners in the district "in order to provide funds to operate and maintain a safe and aesthetically attractive system of trails and related facilities, which would include funds for park ranger services, safety patrols, fire suppression, and weed abatement,"*

> *77% indicated support for a $5 special benefit assessment per year on parcel owners in the district, 5% indicated that they were unsure, and 18% indicated opposition to a $5 assessment.*

"Voters are well aware of the valuable public resource that exists in the East Bay regional park and trail system. "

In addition, those voters who were initially uncertain, or who opposed the proposed $5 benefit assessment, were given a short list of possible consequences to the trail system if additional funds were not raised for maintenance. After hearing the list of consequences to the trail system, an additional 4 percent changed from their initial position and indicated that they would support the $5 assessment. **Thus, when voters are reminded of the need, overall support for the proposed assessment increases to 81%.**

Voters' Trail Usage Patterns

Very few voters (17%) say that they never use the regional trails. About 18 percent say they use the trails rarely. The remaining 64 percent use the trails "sometimes" (34%) or "often" (30%).

Implementing Trail-Based Economic Development Programs: A Handbook for Iowa Communities

The Iowa Department of Transportation places serious economic emphasis on the development of statewide trail systems. To assist communities with measuring economic impacts, a handbook, ***"Implementing Trail-based Economic Development Programs – A Handbook for Iowa Communities*** **was** prepared by Iowa Department of Transportation Office of Systems Planning.

This handbook outlines ways in which governments, businesses, chambers of commerce, tourism promoters, and individuals can help their communities develop and implement trail-based economic development programs.

Introduction

As new recreational trails are developed throughout Iowa, many more people will benefit from additional outdoor recreation opportunities. The benefits of trails extend well beyond fitness and leisure pastimes. Trails hold tremendous potential for economic and community development. To make sure that Iowa's communities truly benefit from new trails, this handbook outlines ways to capitalize on the economic development potential associated with both new and existing trails. Its intended audiences are communities and agencies throughout the State of Iowa.

This handbook draws upon the histories of many trails and towns from all over the United States. In recent years, communities have come up with a variety of innovative and effective approaches to trail-based economic development. The case studies in this handbook describe programs from throughout the Midwest and examine these approaches in detail.

> *"Trails generate economic impacts by delivering additional spending to businesses. As businesses become more productive, new jobs and tax revenues follow."*

No two communities will approach trail-based economic development in the same way, as illustrated by the case studies found throughout this handbook. Communities that succeed at promoting community and economic development through trail recreation may approach the process from many angles, but all began with clear visions of how they wanted the trail system to help their communities.

Case Studies (Iowa Handbook)

In planning for trail-based economic development, it helps to be aware of the experiences of other communities. For this purpose, a number of "case studies" are included. These case studies document how different public and private entities use trail recreation as a tool for economic development.

Three types of case studies are included: cities and towns; businesses; and festivals. The various perspectives provided by these different cases provide valuable insights for a wide range of community leaders.

Cities and Towns

How a city or town capitalizes on a nearby recreational trail depends on several factors. These factors include:

* type of trail (motorized, non-motorized);
* size of community;
* existing physical character of community;
* existing visitor attractions in community;
* level of public support for trails;
* commitment from elected officials and business leaders;
* proximity to potential recreational users.

Since so many variables exist, cities and towns have taken a wide variety of approaches. Case studies for cities and towns examine three different ways in which towns have used recreational trails to promote development:

1. Regional Economic Development: packaging trails as a quality of life enhancement to retain or recruit businesses and residents.

2. Tourism Development: using trails as a way to attract hotels, restaurants and other tourism-related businesses.

3. Main Street Revitalization: linking trails with historic business districts in order to channel demand retail shops, restaurants, and services.

Businesses

Businesses profiled as case studies include outfitters, lodging places, restaurants, and other merchants. Although these businesses fill different needs, they share a common thread: they could not exist without the boost provided by being located on or near trails. Thus, the business case studies focus on enterprises that either opened as a direct response to demand created by trail recreation or that transformed themselves in response to new markets presented by trail users.

Festivals

Many cities and towns stage annual festivals in order to build and promote unique identities. *In many cases, the festival itself becomes synonymous with the place, as with Sturgis, South Dakota, home of the Sturgis Motorcycle Rally and Races. The festivals profiled in this handbook do more than provide an annual boost to their local economies;they also help promote year-round activities in their surrounding areas. both motorized and non- motorized recreation.* The local visitor experience goes well beyond recreation, and local tourism promoters are careful not to just promote to niche groups like cross- country skiers or mountain bikers. Marketing strategies instead target families, packaging recreation with attractions like cherry orchards, festivals, arts and crafts, historic hotels and resorts, and natural scenery.

Top 10 Lessons from Case Studies

Reviewing the case studies in this handbook provides many insights to communities. The following list summarizes the top 10 considerations from the case studies, in no particular order:

1. Trails are one element of a larger visitor experience, and providing other opportunities (both recreational and non-recreational) draws a more diverse group of visitors. In turn, this allows for a greater variety of businesses.

2. Establishing a community as a viable trail destination mandates that individual businesses must take individual risks as entrepreneurs while simultaneously working together with other businesses to build critical mass.

3. Trail users pass along knowledge to others by word of mouth, as well as learning about destinations from travel articles, on the Internet, etc. To ensure outstanding peer recommendations, towns and businesses must provide a quality visitor experience to each individual trail user.

4. Year-round activity is crucial to the survival of many trail-related businesses. Even if recreational trail use is seasonal, communities can provide off-season attractions that provide different experiences.

5. Trail planning in urban areas requires cooperation and coordination not only from different political jurisdictions, but also among various public and private entities within each jurisdiction.

6. Slogans and marketing themes are meaningless unless the entire community buys into them. Building a true community identity requires the support of political leaders, businesspeople, and the public.

7. Recreation alone will not induce visitors to stay overnight. Communities must provide quality lodging, and dining activities to supplement the draw of recreation.

8. Different types of trail users behave differently. For example, snowmobilers are more likely to travel in larger parties, stay longer, and spend more money than bicyclists. As a result, the types of users on a given trail will go a long way toward determining the character of a trail community.

9. A festival only creates economic impacts for a few days each year. To be effective economic development tools, festivals must become points-of-entry for year-round experiences.

10. **In the global economy, companies can locate just about anywhere and many will make location decisions based on quality of life.**

> *A community with ample opportunities for trail recreation can leverage this advantage for economic development purposes.*

A Case Study of the North Carolina Northern Outer Banks Trail (April, 2004)
By the Institute for Transportation Research and Education at North Carolina State University

The North Carolina Department of Transportation (NCDOT) Division of Bicycle and Pedestrian Transportation (DBPT) commissioned a study to examine the value of public investment in bicycle facilities. The northern Outer Banks region was selected for the study because of existing high levels of bicycle activity and the presence of an extensive system of special bicycle facilities. **Over the past ten years, an estimated $6.7 million of public funds was spent to construct off-road paths and add wide paved shoulders to roads in the region.**

The Economic Benefit Study Concluded that:

** Bicycling activity in the northern Outer Banks provides substantial economic benefis to the area: **an estimated $60 million annually.***

** The bicycle facilities in the area are an important factor for many tourists in deciding to visit the region.*

** Investment in bicycle facilities improves the safety of the transportation system for all users and also benefits health and fitness, quality of life, and the environment.*

** 53% report bicycling as a strong influence in decision to return for subsequent visit.*
** 43% report bicycling as an important factor in selecting this area for vacation.*

"Mountain bicycling is a sustainable, environmentally sound type of trail use. Trail erosion can be effectively reduced by proper trail construction and maintenance."

Bicycle Facilities Encourage Tourism and Boost the Economy

The study determined that an estimated 680,000 tourists engage in some bicycling activity while in the northern Outer Banks area annually. This represents 17% of all visitors to the area. The quality of bicycling was an important factor in choosing to visit the area for 43% of bicyclists who were surveyed. While other tourists may not choose to visit the Outer Banks specifically because of its bicycle facilities, many may choose the area over another resort community because of these amenities.

Bicycling visitors and tourists have a direct and substantial economic impact on the area,according to the study. A conservative estimate of bicyclists' expenditures in the northern Outer Banks is $60 million annually.

> *These visitor expenditures are expected to produce many other widespread benefits to the local economy, including:*
>
> - *1,400 jobs are created or supported annually.*
> - *Increased retail sales to local restaurants, lodging establishments and retail stores.*
> - *Subsequent expenditures by local merchants to suppliers of materials and services.*

Bicycling Facilities Extend Vacations and Encourage a Return to Area

The longer tourists stay in an area, the more they generally spend. This means that the duration of bicyclists' trips was an important economic factor to measure. **Twelve percent of respondents reported that the duration of their visit was longer because of bicycling, by an average of four days.** The average bicyclist surveyed on the facilities reported riding on 69% of the days of their trip while in the area. This high rate of bicyclist activity— as well as decisions to extend the duration of visits— may have been influenced by safety. Two-thirds of respondents reported that the bicycle facilities made them feel safer while riding. In addition to encouraging more bicycling and extending bicyclists' stays, the study found that the quality of bicycling was important in decisions to return to the area. In fact,a higher percentage of respondents said that bicycling would be more important in deciding to return (53%) than it was in their decision to come to the area (43%). The research suggests, therefore, that once exposed to the quality of bicycling in the region, visitors are more likely to come back.

Bicyclists Tend to Be Well Educated and Earn Higher Incomes

The northern Outer Banks study found that bicycling tourists may have a good deal of purchasing power: they tend to be well educated with fairly high incomes. And, they love to bicycle. Study findings revealed the following bicyclist characteristics:

> ***Profile of a Bicycling Tourist****
>
> - *87% earn more than $50,000 annually.*
> - *78% completed college.*
> - *73% rate themselves as an intermediate skill-level cyclist who rides 10-49 miles per month.*
>
> ** The average person surveyed rode 14 miles per day on five days of his/ her trip.*

Clearly, bicycle tourists drawn to the good bicycling opportunities on the northern Outer Banks are having a positive economic impact on this area.

The Economic Benefit of Bicycle Facilities Outweighs their Costs

The northern Outer Banks study found that bicycling tourists represent a high economic impact for the resort communities. But how does that compare against the cost of building the bicycle facilities? Approximately $6.7 million of municipal, state and federal funds were used to construct the special bicycle facilities in the northern Outer Banks.

> *The annual economic impact of cyclists ($60 million) is estimated to be almost nine times greater than the one-time expenditure of public funds to construct the bicycle facilities.*

The measurable economic benefits of bicycle facilities may begin with increased tourist expenditures in the region, but further intangible results may be seen long after the visitors leave. In addition to the positive economic impact versus the cost of bicycle facilities, the study observed that other, less quantifiable, economic benefits may result from the bicycle facilities, including:

* Enhancement of nearby property values along areas that feature bike paths and trails.

* Reduced healthcare costs that may result from increased opportunities for healthful exercise.

- Less damage to roads and preservation of the highway infrastructure resulting from wider paved shoulders.

Trails and Tourism: The Missing Link
Issues in Partnering with the Tourism Industry: A European Perspective
By Bernard Lane, Rural Tourism Unit, University of Bristol, UK and Journal of Sustainable Tourism, 1999

The growth of the tourism industry has been one of the success stories of the post war world. International arrivals across the world have grown over 20 fold in the last fifty years. Globally, tourism now provides 10% of world employment, 12% of GDP, and is predicted to provide up to 100 million new jobs by 2010. Within that growth picture tourism is changing rapidly. There is an expansion in special interest tourism, in city based cultural tourism, in activity holidays and in rural tourism. The purpose built traditional resort is now paralleled by the concept of the world as a whole as a living resort.

> *"In Europe, tourism is increasingly seen as a possible partner for trail development and maintenance activities."*

Trails can benefit from financial and political support from tourism and local / regional development agencies. Tourism benefits from additional product, from new market opportunities and from image building. The economic benefits of well-managed trails are now well documented: for the UK see *Cope's 1998 paper in Journal of Sustainable Tourism: for the US* *see the 1998 publication by Roger Moore for the US Dept. of the Interior*. This paper looks at how trail development has progressed in Europe, and why, from the 1980s onwards, trails and tourism development have begun to come together. It examines the key elements necessary for a successful relationship, and looks at issues for the future.

Trail Development: The 2 stages.

1930 - 1980: The Visionary Long Distance Routes

This period was characterized by the planning and realization by pressure groups and state agencies of a series of long distance trails - typically in excess of 60 miles - a length which requires more than a long weekend's walking.

There are now 12 National Trails in Britain, with a total length of 2,000 miles administered by the Countryside Agency, a fusion of the conservation body, the Countryside Commission, and the Rural Development Commission: the new Agency began work on 1st April 1999. Many other European countries have similar systems.

These trails were never designed as tourist routes. They were essentially utopian creations designed to allow access across the countryside as a grand political gesture. They are challenge routes, used by a walking elite, typically middle aged professional men. They are not effectively marketed, few luggage transfer facilities are available, packaging of trail holidays does not go on.

There is no agency responsible for increasing their use to boost tourism revenues to the areas they traverse. And the routes were not designed to be interesting, or easy to use. Long distance usage is small: they are symbols of freedom and hope rather than living usership reality. They are almost exclusively walking routes.

1980 - 2000 Short distance routes and trails as tools for development

This period has seen a boom in trail development, and in the whole concept of the trail. Growing demand for outdoor recreation and rural tourism has coincided with a period where European Union, national, regional and local public sector agencies have become active in creating new trails. The motives of those agencies have been many but include job creation, rural diversification, urban regeneration, and tourism development and management. Many of the new trails are short distance trails, and some of them are effective in tourism terms.

But new types of long distance trails are also being created. Some of these long distance trails have captured the market's mood and its dreams and have become successful tourism products. Examples include Austria's Danube Trail, Britain's coast to coast C2C Trail, and Spain's revived Santiago de Compostela Pilgrimage Trail. In Britain, a national charity, Sustrans, is developing an 8,000 miles national cycle trail. Its free market, company sponsored counterpart , the National Byway, is developing a 3,000 mile route.

Trails have become multi-user and multi-purpose concepts - covering a range of purposes, not just "simple" recreation. And the basic concept of a simple linear trail has changed. The 1980s saw the growing popularity of the circular trail, allowing users to return to their car or public transport. That concept was taken further by Tarka Trail in Devon, and Kingfisher Trail in Ireland to cover the Figure Eight Trail - able to link two trails at once in a unity. Trails that use multi-modes - part train, part foot for example - have emerged. And the specialty themed trail has become a common place. Throughout there has been the strong idea of using trails as a tool: one of those key tools has been for tourism development. And behind that idea is that trails should be economically productive if at all possible. Only then can the public sector back trails with resources and political good will.

Tourism is a key to the economic productivity of trails. Walking as a leisure activity was estimated to comprise no less than 850 million trips in UK in 1996, generating visitor expenditure in rural areas of £2 billion. Utilitarian walking is declining: leisure walking is increasing.

Cycling is also a fast rising activity newly in fashion, with cycle sales outstripping car sales in most northern European countries in the early 1990s.

Whole shelves full of new leisure activity magazines, specialty TV travel shows and travel channels, and bigger newspaper travel pages both reflect and spur this market.

Economic Benefits of Greenways: Summary of Findings-Economic Impacts of Protecting Rivers, Trails, and Greenway Corridors, *National Park Service, 1990. Adapted by The Conservation Fund's American Greenways Program.*

Real Property Values

Many studies demonstrate that parks, greenways and trails increase nearby property values, thus increasing local tax revenues. Such increased revenues often offset greenway acquisition costs.

A. California's Secretary for the State Resources Agency estimated that $100 million would be returned to local economies each year from an initial park bond investment of $330 million (Gilliam, 1980).

B. A greenbelt in Boulder, Colorado increased aggregate property values for one neighborhood by $5.4 million, resulting in $500,000 of additional annual property tax revenues. The tax alone could recover the initial cost of the $1-5 million greenbelt in three years (Cornell, Lillydahl, and Singel, 1978).

Expenditures by Residents

Spending by local residents on greenway related activities helps support recreation related business and employment, as well as businesses patronized by greenway and trail users.

A. Residents are increasingly spending vacations closer to home, thus spending increasing amounts of vacation dollars within the boundaries of the state (NPS 1990).

B. In 1988, recreation and leisure was the third largest industry in California. More than $30 billion is spent each year by Californians on recreation and leisure in their state. This amounts to 12 percent of total personal consumption (California Department of Parks and Recreation, 1988).

Commercial Uses

Greenways often provide business opportunities, locations and resources for commercial activities such as recreation equipment rentals and sales, lessons, and other related businesses.

A. Along the lower Colorado River in Arizona, 13 concessionaires under permit to the Bureau of Land Management generate more than $7.5 million annually, with a major spinoff effect in the local economy (Bureau of Land Management, 1987).

B. Golden Gate National Recreation Area has contracts with ten primary concessionaires. Total 1988 gross revenues for these concessionaires were over $16 million, over 25 percent of which was spent on payroll (NPS, 1990).

Tourism

Greenways are often major tourist attractions which generate expenditures on lodging, food, and recreation related services. Moreover, tourism is Maryland's second largest and most stable industry, and is projected to become its largest.

> *The San Antonio Riverwalk is considered the anchor of the $1.2 billion tourist industry in San Antonio, Texas. A user survey concluded that the Riverwalk is the second most important tourist attraction in the state of Texas (National Park Service, 1990).*

The Governor's Committee on the Environment reported in 1988 that the governors of five New England states officially recognized open space as a key element in the quality of life in their region. They credited that quality of life with bringing rapid economic growth and a multi-billion dollar tourism industry to the region (Governor's Committee on the Environment, 1988).

Agency Expenditures

The agency responsible for managing a river, trail or greenway can help support local businesses by purchasing supplies and services. Jobs created by the managing agency may also help increase local employment opportunities. Corporate Relocation Evidence shows that the quality of life of a community is an increasingly important factor in corporate relocation decisions.

Greenways are often cited as important contributors to quality of life. The quality of life in a community is an increasingly important factor in corporate relocation decisions; greenways are often cited as important contributors to quality of life and to the attractiveness of a community to which businesses are considering relocating.

A. *An annual survey of chief executive officers conducted by Cushman and Wakefield in 1989 found that quality of life for employees was the third most important factor in locating a business (NPS, 1990).*

B. **St. Mary's County, Maryland, has found over the last ten years that businesses which move to the county because of tax incentives tended to leave as soon as the incentives expire.** *However, businesses that move to the county because of its quality of life remain to become long term residents and taxpayers (NPS, 1990).*

C. *Site location teams for businesses considering San Antonio, Texas regularly visit the San Antonio Riverwalk.* **A location on the river-walk is considered very'desirable.** A regional grocer, the HEB Company, relocated its corporate headquarters to a historic building oriented towards the river (NPS, 1990).

D. **The Joint Economic Committee of the U.S. Congress reports that a city's quality of life is more important than purely business- related factors when it comes to attracting new businesses, particularly in the high-tech and service industries** *(Scenic America, 1987).*

St. Louis' All-America City Award Points the Way, St. Louis Today, Tuesday, June 24 2008) *Author, Neil Peirce. (Neil Peirce, "Citistates: How Urban America Can Prosper in a Competitive World (Seven Locks Press, 1993) Tuesday, June 24, 2008)*

Eleven Years ago, Washington Avenue in St. Louis was declining rapidly, the city's downtown prospects grim. And the rest of the St. Louis region didn't seem to care.

On June 6, the yearly competition for one of the National Civic Leagues coveted All-America City awards. St. Louis received its first All-America City award since 1956. And, what was the top talking point St. Louis used to win? Downtown redevelopment.

St. Louis, for decades bedeviled by deep population losses and widely scattered suburban sprawl, also won its award by pointing to a stunning regional advance: the new River Ring project, which will eventually be a 600-mile web of 45 biking trails and greenways designed to encircle and connect the entire region, a big "green" advance and also a way to help metro St. Louis compete with other areas in environmentally friendly outdoor life.

Just completed: a renovation of the historic McKinley Bridge across the Mississippi River, with a 6,600 foot bike and pedestrian way offering spectacular views of downtown St. Louis and its landmark Gateway Arch, to be connected in the next twelve months to a converted railway trestle going five more miles into the heart of the city.

Yet the greenway advance wouldn't have happened if both the Missouri and Illinois state legislatures – along with the voters of St. Louis, two adjacent Missouri counties and four in Illinois – had not agreed in 2000 to fund a bi-state regional park district to set up the interconnecting parks, trails, and greenways.

The Economic Benefits of Trails – American Hiking Society

In a study conducted in August 2001, of the visitors ot the Rio Grande National Forest (52% listed hiking as their primary activity, it was estimated that the amount of money each individual spent per visit within a 50 miles radius of the recreation site included $567.93 for lodging, $319.44 for food and drink, and $168.44 for transportation. It was also estimated in a typical year, these visitors individually spend $3,805.92 on all outdoor recreation activities.

A May 2001 study of visitor impact in Blaine County Idaho near the Salmon River, indicated the impact of visitor spending was the creation of 5,980 jobs and $120 million in income in a single county.

In 1998, outdoor enthusiasts contributed almost $132 million dollars to the economy while visiting the Everglades National Park and helped create over 5,000 new jobs. *(Business for Wilderness, The Bottom Line: Protecting the Value of America's Public Lands, 2001, p. 5.)*

> *The Washington State Trails Plan estimated that trail users in the state have an estimated equipment investment of over $3.4 billion which generates tax revenues of $13.8 to $27.6 million.*

Traffic Congestion Relief

Americans spend millions of dollar purchasing, operating and maintaining vehicles. The average car costs about $3,000 per year to operate plus up to $2,000 for gasoline (prior to gasoline inflation of the years between 2004 and 2008. *Yet, studies indicate that 50% of all car excursions are less than 3 miles – a distance that could easily be walked or biked.* **Using human-powered transportation could result in a savings of 17.9 billion motor vehicle miles, seven billion gallons of gas, and 9.5 million tons of exhaust emissions annually.** *(National Bicycle and Pedestrian Clearing House, Technical Assistance Series, Number 2: The Economic and Social Benefits of Off Road Bicycle and Pedestrian Facilities, Washington, D.C. 1995, p. 3.)*

Lower Cost Healthcare

Studies show that walking or hiking a few times per week can improve a person's health and lower healthcare costs. A National Park Service study compared people who lead sedentary lifestyles to those who exercise regularly. **The exercisers filed 14 percent fewer health claims, spent 30% fewer days in the hospital, and had 41% fewer claims greater than $5,000.** (Greenways, Incorporated, p. 14).

Trail Expenditures Shown to Reduce Health Care Costs – *A cost-benefit anaylsis of using bike/pedestrian trails in Lincoln, Nebraska to reduce health care costs associated with inactivity.*

> *Every $1 investment in trails for physical activity led to $2.94 in direct medical benefit.*

The Economic and Social Benefits of Trails, *Gary Sjoquist, Quality Bicycle Products*

During warm weather months in Minnesota, nearly 1.5 million cyclists, inline skaters, and walkers use our nationally-recognized city, county, and state trails. In fact, these trails are a quality of life issue for residents, as well as luring tourists from neighboring states who don't have access to the number and variety of trails we have in Minnesota. Other than a quality of life issue, our trails are an economic boon to the state as well.

"Generally, it's been found a trail can bring at least one million dollars annually to a community."

Lanesboro, on the Root River Trail in Southeastern Minnesota, is an often-cited example of the economic impact a trail can have. Pre- and post-trail Lanesboro, a town of about 800 residents, differ dramatically.

Post-trail Lanesboro boasts 12 B&Bs (with year-long waiting lists), 8 restaurants, an art gallery, a museum, and a thriving community theater well-off enough to offer housing to its actors. Economically speaking, the Root River **Trail has had more than a $5,000,000 a year economic impact for Lanesboro.**

A specific example from Lanesboro can provide further insight. The bike shop in Lanesboro, a small "mom and pop" kind of a place, sold 60 tandem bicycles in a single year (more than the Twin Cities largest multi-store bike retailer that same year). Now, few people would go to Lanesboro to specifically purchase a not-inexpensive tandem bicycle. Rather, this is an indication of people who are having a good time, want it to continue, and are willing to spend the money to spend quality time on the trail. This kind of "impulse" purchase bodes well for retailers along our trails.

Nationally, trail-related expenditures range from less than $1 per day to more than $75 per day, depending on mileage covered. *Generally, it's been found a trail can bring at least one million dollars annually to a community, depending on how well the town embraces the trail*. For a town like Lanesboro, a trail can mean an annual economic impact of more than five million dollars.

Furthermore, 70% of real estate agents use trails as a selling feature when selling homes near trails. 80.5% of them feel the trail would make it easier to sell. **Additionally, the U.S. National Parks Service notes that increases in property values range from 5 to 32% when adjacent to trails and greenways.**

With trail users relatively affluent, mobile, and interested in spending quality time with families, trails provide a perfect "getaway" adventure. Having access to trails has changed how families recreate, with people taking shorter but more frequent "vacations" closer to home and with a more family-oriented focus.

Economic Benefits of Off-Highway Vehicle Recreation to Arizona – Statewide Motorized and Nonmotorized Trails Plan, November 2004, Arizona State Parks

Whether one enjoys exploring Arizona's backcountry driving a truck, dirt bike or quad, or one prefers using their own muscle power to hike the trails, the following information may be of interest. Arizona State University conducted a yearlong economic study of recreational off-highway vehicle use in Arizona in 2002, completing 15,000 telephone surveys and 1,269 mail questionnaires from randomly selected Arizona households.

The study findings show the total economic impact (direct and indirect) to Arizona from recreational OHV use is more than $4 billion annually. OHV recreation activities provide an economic contribution to the State and its 15 counties mainly through direct expenditures for motorized vehicles, tow trailers, related equipment, accessories, insurance and maintenance costs.

Percent of Direct OHV Expenditures is $3.1 Billion:

* Trip Expenditures 28%
* Vehicle Expenditures 34%
* Equipment Expenditures 38%

Additionally, an economic benefit is generated when OHV recreationists spend money in local communities close to areas they recreate in for recreational trip items such as gasoline, food, lodging and souvenirs. These direct purchases provide indirect benefits by helping to pay for many people's salaries and wages, and contributing to local and State tax revenues.

In 2002, Off-Highway Vehicle Recreation in Arizona:

* **Created a statewide economic impact of $4.25 billion**

* Generated over $3 billion in retail sales (trip expenditures, $842.3 million; vehicle expenditures, $1,035.2 million; equipment expenditures, $1,178.2 million)

* **Added $187 million to annual State tax revenues**

* Created household income (salaries and wages) for Arizona residents totaling $1.1 billion

* Supported 36,591 jobs in Arizona

* Was participated in by 455,453 households or 1.1 million people, which accounts for 21% of Arizona's population

* Accounted for 12.2 million OHV Recreation Days in Arizona and an additional 1.8 million days in adjacent states and countries

RECENT ARTICLES

Fight, Fight, Fight!
More Trails are a Must – *Northwest Arkansas Times Editorial, Saturday, July 19, 2008*

"Mayor Coody touts the City's trail system as one of his top accomplishments during his first two terms in office. As he develops his campaign in his quest for a third term, it seems to us he needs to go beyond the rhetorical flourishes.

Lat year the city budget for trail s was hit hard – it dropped from $1.3 million to $500,000. At that rate, it is going to take a long, long time for the city to actually build all those scenic trails public officials and citizens alike enjoy bragging about.

Of course, the burden does not just land on the mayor's shoulders. He proposes a budget; ultimately the City Council must approve it. That 's where a lot of cuts are made. Ward 2 Alderman Kyle Cook, Chairman of the City's trails Task Force is ready to "fight like hell" on behalf of wiinning full funding of the trails program.

A key principle behind Fayetteville's trail construction program is to bring about approximately five miles worth of new trails annually – at least according to the city's website, that is. It is true that several miles of beautiful trails already exist, and we are grateful for them, every inch in fact. But the goal of trails supporters is to create a whopping 129 miles worth of trails connecting green space to neighborhoods all across the city. Reaching that admirable goal requires more construction, and more check writing, than anything the public has witnessed up to this point.

If you believe in this goal, if you believe in trails, if you believe in alternative transportation, if you believe in getting people out of their cars and into the great outdoors, if you believe that Fayetteville has the opportunity to lead the state in something significant by way of its trails – now is the time to pick up the telephone, call your council representatives, and make your thoughts know. Don't be afraid. Call Mayor Coody and tell him you believe the city's trails add up to a vision that is worth shooting for.

Making way for new trails will help Fayetteville stand out among cities in Northwest Arkansas and across the state and region. More trails means more options for residents trying to get around town. The city is already sprinkled with a number of trails. It's true. But the plain truth is that it is difficult to get from point A to point B when those trails don't connect or come anywhere close to the places we call home.

With gas prices not about to drop any time soon, trails can also play an important role in our efforts to lower our dependency on oil. Trails also provide safe routes for bicyclists, walkers, and runners. Trails also return us to nature, humble us, and act as a lasting credit to those souls thoughtful enough to ensure their birth and construction in the first place.

Do you get the feeling we are supportive of the city's trail program?
Much about these fine thoughts will fall short of becoming reality, at least in the near future) without more funding on the part of city government. headaches born of trying to bring city finances in under budget (again) will always be with us. The opportunity to create quality green space that can be used by us and future generations for years to come won't be.

So, let's do something about it.

Cycle sales are up as Drivers switch to save at the gas pump, *Jennifer Youssef, The Detroit News, June 10, 2008*

Ricky Cook was growing weary shelling out $60 every time he filled the tank of a Dodge Ram diesel pickup that got 18 miles per gallon – on a good day. When diesel reached $4.75 a gallon, he started looking for a cheaper way to get to work and zip around town.

He found it two months ago in the form of a 2006 Kawasaki motorcycle with its impressive 50 mpg and wallet-friendly $15 fill-up. And, the 22 year old towing and recovery driver couldn't be happier.

Cook is among thousands of drivers across Metro Detroit and the United States who are flocking to fuel-efficient two-wheeled vehicles – motorcycles, scooters, and bicycles – to find relief from $4.00 a gallon gas.

Arkansas Democrat- Gazette, July 27, 2008

Spring Creek Trail **. . . (Excerpts)**

The Walton Family Foundation grant (to Springdale) could be as much as $1 million dollars, but, for the foundation to disburse the funds, Springdale and private donors, each must match it in either cash or in-kind services. Thus far, Springdale has only managed to find $83,000 for the trail project.

Rogers, however, reached its challenge grant for trails offered by the Walton Foundation. From 2005 – 2007, Rogers raised $2 million in a combination of public money and private in-kind donations and in return received a $1 million grant from the foundation.

Rogers officials have built three miles of trails with the grant money so far and plan to build another eight. Their goal is linking the city through trails from north to south and providing pedestrian access to the Pinnacle Hills Promenade shopping center.

Fayetteville Free Weekly – July 17, 2008

Thrills and Spills . . . (Excerpts)

The 11th annual Eureka Springs Fat Tire Festival, the largest event of its kind in the central United States, lands in Eureka Springs on Friday for three jam-packed days.

Last year's event drew over 1,000 participants and spectators from all over the country. This year's festival will be "fatter" than ever, according to event organizer David Renko.

"Word keeps spreading about what a fantastic place Eureka is for mountain biking. We expect "Fatty '08 to be our biggest year yet," Renko said.

EDITORIAL: Trails, Bike Paths and Sidewalks are Infrastructure Tool - Trails offer a large return for a very small investment, *Robert Searns, The Urban Edge*.

"More creative solutions are needed, and bikes and walking shoes are part of this solution."

Just how many automobile bridges can you build with the penny or so of each Federal Transportation dollar spent on bicycling and walking facilities?

Of late, some have suggested that there is a causal tie between federal investment in non-motorized facilities and the growing problem of deteriorating roads and bridge infrastructure. Worse still there have been comments and political advertisements trivializing bicycle and walking facilities as somehow obsolete, frivolous and less than worthy.

While these improvements might seem to be a good scapegoat for our highway ills, the facts say this is simply not true.

> *The reality is that while nearly 10% of all trips to work, school and the store are by bike or foot, the amount of federal dollars invested nationwide for bike and pedestrian improvements has averaged around 1% over the past decade or so.*

It is also noteworthy that more than 40% of the trips made daily in our cities are two miles or less and 25% less than a mile. Many of these are by car but could be made by bike or on foot— with improved facilities.

We can visualize the part of each dollar spent as smaller than the number "1" on the corner of the bill. But, if you visualize what has been accomplished, catalyzed by this small investment, you would see hundreds of miles of bike paths and greenways that are transforming our cities, and countless barrels of oil not burned. **You would see millions of trail users, billions of private dollars invested in quality urban redevelopment in Denver, Chattanooga, and Pittsburgh stimulated by these amenities.**

Some have suggested that these investments are a throwback to the 1900s with cartoon-like figures on old-time bicycles. Perhaps it is these critics living in the past, though their past is the 1950s, a time of cheap oil, uncrowded roads and smaller populations. It's a nostalgic vision that does not take into account that today. ***according to the Texas Transportation Institute—***

> *The average commuter spends 88 extra hours a year in their car at a cost of $78 billion in lost time, burning 2.9 billion extra gallons of fuel spewing tons of contaminants.*
>
> *That vision also overlooks that in the 1950s a school kid had a longer life expectancy than today's child with nearly one in five clinically overweight due in large part to being driven rather than walking.*

How shortsighted to envision a transportation system epitomized by an SUV modeled after an assault vehicle that burns a gallon of gasoline to convey an overweight occupant eight miles down a crumbling road. Is this the pinnacle of American ingenuity and know-how? We can do better! The 2007 reality is that we need a diversity of solutions and each has its place.

While investment in alternative modes of transportation won't fully solve these daunting problems, simply building more roads and bridges won't either. More creative solutions are needed and bikes and walking shoes are part of this solution and they are a very apropos means of travel for these times. No one in the bicycle and trails community suggests that highways and bridges are not absolutely necessary infrastructure to be funded and maintained. We are saying, though, that bicycle and walking facilities are also part of the picture.

Even in trying times this kind of investment can and should be a part of the picture. In the depths of the depression, FDR dispatched tens of thousands of unemployed youth into the National Forests, building a legacy of over 100,000 miles of trails, instilling a sense of stewardship and a sense of pride. Some say that action may have helped save our Republic by engaging a restless populace and stimulating the economy. Surely we can similarly allocate a penny or so on the dollar to help solve today's daunting problems.

More importantly these improvements are something that the public— **the taxpayers who ultimately fund all of the programs— have said they desire and demand.** *Survey after survey shows that trails, walking and bicycle facilities rank in first priority for recreational activity, in deciding where to buy a home and where public funds should be spent.*

In Kansas City for example citizens ranked investing in trails over building a new football stadium! Indeed one of the engines transforming our inner cities and sustaining our economy is the rise of a class of creative workers and entrepreneurs who demand trails, greenways, bicycle and pedestrian amenities— an essential ingredient revitalizing urban areas from Denver to Detroit.

CONCLUSIONS & SUMMARY

From across America, city, state, and federal officials have studied the economic impact of comprehensive trail systems. Using sophisticated modeling to project and measure trail use impact on business growth and development, the prevailing opinion is

> *"The development of trails and trail systems make a profound economic impact on the regions and communities that surround them."*

Even healthcare is impacted economically by frequent trail use. Surveys indicate far fewer medical bills, lower insurance reimbursements, and fewer hospital stays by people who regularly use trails for transportation or recreation.

Numerous case studies have been illustrated to support the case statement premise, but, perhaps, one of the most important findings of all is that public opinion supports the development of trails and trail system;

> *Americans want their government to find alternatives to traffic congestion, greenhouse gases, and high fuel consumption. While not the only answer, trail development has become a key part of the balancing equation.*

As many studies indicate, taxpayers are willing to spend more to have these economic engines in their communities because they do more than impact growth and economics, trails also support quality of life by improving aesthetics (to be sure) but, also, by improving the economic and social health of the areas where they are located.

Regarding the dollar for dollar public transportation investment, it costs $100 million dollars to build one mile of one lane of interstate highway while it costs $250,000 to build one mile of 12-foot wide paved or concrete trail.

Considering the positive economic impact of trail systems on the public return on investment, and taking into consideration the current federal deficit spending and spiraling costs of gasoline, which is really the better investment?

The mayor of Rockport, Georgia (a rural town 35 miles outside Atlanta said it best.

***"Since the opening of the Silver Comet Trail, we've had more visitors in one year than in the 25 years prior.*" Atlanta Journal Constitution, 2002**

Appendix B-Cost Estimation for Additional Bike Lane at Time of Construction

"The typical roadway section for a secondary road in York or James City County is two 12-foot lanes plus an 8-foot shoulder. If the estimated traffic volume in the design year exceeds 2,000 vehicles per day, VDOT design standards require paving the first 3 feet of the 8-foot shoulder. Thus the shoulder consists of 3 feet of pavement and 5 feet of gravel. Therefore, the marginal (or additional) cost to a road construction project of adding a shoulder bike lane at the time of construction is the material and labor cost of an extra 1-2 feet of asphalt on each side of the road (the gravel shoulder is already a sufficient base). The marginal cost of a shared roadway is, in most cases, zero. However, if a wide outside lane is the chosen alternative, the labor and materials for 2 extra feet of pavement and gravel base on each side of the road would comprise the marginal cost of such a facility. It is very unlikely that this type of shared lane treatment would be constructed on a new or substantially reconstructed road. It is more likely to occur in a constricted right-of-way situation where curb and gutter are used or in retrofit projects. However, in order to produce a "worst case" cost example, it is used here.

Given the above assumptions, the costs from *A Cost Model for Bikeways* are as follows:

1. Shoulder Bike Lane—asphalt, 2 feet in width on both sides: $1.85/linear foot or $9,715 per mile.
2. Wide Outside Lane—asphalt plus aggregate base, 2 feet in width on both sides: $3.72/linear foot or $19, 642 per mile.

These figures come from the detailed analysis done by HRPDC and include the actual cost figures from the Old York-Hampton Highway and Centerville Road projects in York County and James City County respectively.

In order to understand the relative costs of bike lanes, it is important to compare them to two other figures:

1. Reconstructed Secondary Road—$ 1.2 - $1.9 million/mile
2. New Secondary Road on New location—$2.2 million/mile

As a percentage of total cost, bike lanes add approximately 1/2 of 1% to the cost of the road projects contained in the adopted six-year plan."

"VDOT spends a large amount of time and maintenance funds "grooming" gravel and dirt shoulders. Where shoulders are paved, this activity is unnecessary and will save maintenance money for use in improving the road surface instead of the shoulder. It appears that by the fourth time a shoulder is groomed, it would have been less expensive to have installed a shoulder bike lane."

(George Homewood, Bikeways and Bikeway Costs from The Virginia Cyclist, Vol. III, No.2, March - April 1997 at http://www.vabike.org/archive/ar97_2a2.htm)

Appendix C – Further Cost Estimates for Path Types and Maintenance Costs

Unit/Item Costs from "Trails For The 21st Century," published by Rails-To-Trails Conservancy, 2001

a) Surface Material/Cost Per Mile/Longevity (Table 3.3, page 74):

- soil cement, $ 60-100K, 5-7 years

- granular stone, $ 80-120K, 7-10 years

- asphalt, $ 200-300K, 7-15 years

- concrete, $ 300-500K, 20 years +

- boardwalk, $ 1.5-2.0 million, 7-15 years

- resin stabilized, cost varies depending on type of application, 7-15 years

- native soil, $ 50-70K, longevity depends on local use and conditions

- wood chips, $ 65-85K, short term, 1-3 years

- recycled materials, cost and life-cycles vary.

b) Typical Annual Maintenance Costs for A 1-Mile Paved Trail:

- drainage and storm channel maintenance $ 500

- sweeping/blowing debris off trail head $ 1,200

- pickup/removal of trash $ 1,200

- weed control and vegetation management $ 1,000

- mowing of 3-foot grass shoulder along trail $ 1,200

- minor repairs to trail furniture/safety features $ 500

- maintenance supplies for work crews $ 300

- equipment fuel and repairs $ 600

TOTAL $ 6,500

c) Total Cost of Resurfacing Trails (based on national averages; will vary):

- Asphalt, $ 10 per linear foot ($ 5 per linear foot to overlay with top coat)

- Concrete, $ 25 per linear foot

- Crushed Stone, $ 5 per linear foot

Florida Department of Transportation (1999)

Bike path per mile, 12 foot wide, railroad conversion: $128,000

Bike lanes per mile, 5 foot each side, pavement extension: $189,000

Paved shoulders per mile, 5 foot each side, rural: $102,000

Bike lockers (for 2 bikes): $1,000

Sidewalks, both sides, 5 feet width: $46,000 per mile

Sidewalks, both sides, 6 feet width: $54,000 per mile

Walk/Don't Walk Signal System, four corners: $3,700

Virginia Department of Transportation (2000)

Bike path per mile, 10 foot wide: $92,000

Bike lanes per mile, 4 foot each side w/curb and gutter: $270,300 (Includes total cost of road)

Bike lanes per mile 5 foot each side w/mountable curb: $281,100 (Includes total cost of road)

Bike lane stripe, four inch line: 60 cents per linear foot

Wide curb lane, 2 feet each side: $48,600

Paved shoulders per mile, 4 feet each side: $69,200

Bike locker (for 2 bikes): $670-$930

Bike rack (10-12 bikes): $325-$730

Wisconsin DOT Bicycle Transportation Plan

Wisconsin uses the "marginal cost" approach; the per-unit costs of bicycle improvements are those costs over and above the costs of the project without bicycle accommodation. Typically, right-of-way costs and the costs of relocating utilities are not included in this estimate for bicycle facilities.

Paved shoulder, 3 feet both sides; over gravel shoulder: $20,000 per mile

Paved shoulder, 5 feet both sides; over gravel shoulder: $33,000 per mile

Wide curb lane (one or two feet added, both sides): $15-50,000 per mile

Bike lane, five/six feet, both sides: $25-90,000 per mile

Bike path (final limestone surface): $10,000 per mile

Bike path (asphalt, 12 feet, landscaped etc): $200,000 per mile min.

The wide curb lane and bike lane figures have a range that depends on the use of asphalt versus concrete, width of lane as measured from curb face.

New York State DOT, Region 8 Cost Estimates, 1994

Sidewalk construction, 5 feet wide: $99,000 per mile, or $3.75 per sq. foot

Four-way pedestrian signal: $15,000 per unit

Striping, four inch stripes: $9,504 per mile, or $1.80 per linear foot

Vermont Agency of Transportation, 1996

Asphalt sidewalk, 4 feet, no curb: $1.50 per sq. foot

Concrete sidewalk, 6 feet: $3.33 per sq. foot

Striping, 12 inch strip: $1 per meter

The Iowa State Trails Plan has a detailed discussion of maintenance issues and costs and original construction costs at: http://www.iowadot.gov/iowabikes/trails/index.html.

Appendics D – ALTA Planning Cost Spreadsheet

Willamette Shoreline Rail with Trail Cost Data from Portland, Oregon

Inclusive system costs		2008					Inflation	
			Contingency	A&E Fees	Mobilization	Construction Management Construction Engineering	2008	Fully burdened
Trail Type		Raw cost with Profit and Overhead	40%	20%	15%	20%	4%	Total Unit Cost at Year of Construction
12' Trail Common condition	LF of trail	39.75	15.90	11.13	8.35	12.80	1.04	91.00
Add for Difficult soils	LF	23.00	9.20	6.44	4.83	7.41	1.04	53.00
Add for 4' Fill	LF of 4' fill	20.71	8.29	5.80	4.35	6.67	1.04	48.00
Add for 4' Cut	LF of 4' cut	37.68	15.07	10.55	7.91	12.13	1.04	87.00
Add for 6' retaining wall	LF	247.00	98.80	69.16	51.87	79.53	1.04	568.00
Add for Parallel to stream	LF	99.90	39.96	27.97	20.98	32.17	1.04	230.00
Add for Remove railroad/roadway	LF	10.65	4.26	2.98	2.24	3.43	1.04	25.00
Add for Wetland mitigation	LF	262.50	105.00	73.50	55.13	84.53	1.04	604.00
12' wide Boardwalk	LF	600.00	240.00	168.00	126.00	193.20	1.04	1,380.00
14' wide Bridge	LF	3,500.00	1,400.00	980.00	735.00	1,127.00	1.04	8,052.00
Add for:								
Intersection	EA	8,760.00	3,504.00	2,452.80	1,839.60	2,820.72	1.04	20,152.00
Signalized intersection	EA	131,760.00	52,704.00	36,892.80	27,669.60	42,426.72	1.04	303,111.00
Trailhead (20 cars)	EA	78,267.60	31,307.04	21,914.93	16,436.20	25,202.17	1.04	180,053.00
High Visibility CW	EA	3,000.00	1,200.00	840.00	630.00	966.00	1.04	6,901.00
Bank protection at Bridge	EA	3,966.67	1,586.67	1,110.67	833.00	1,277.27	1.04	9,125.00
Mid block crossing	EA	65,880.00	26,352.00	18,446.40	13,834.80	21,213.36	1.04	151,556.00

Inflation Table

Annual rate of inflation	4.0%	
Index Year	2007	100.00%
Year of construction	2008	104.00%
	2009	108.16%
	2010	112.49%
	2011	116.99%
	2012	121.67%
	2013	126.53%
	2014	131.59%
	2015	136.86%
	2016	142.33%
	2017	148.02%
	2018	153.95%
	2019	160.10%
	2020	166.51%
	2021	173.17%
	2022	180.09%
	2023	187.30%
	2024	194.79%
	2025	202.58%
	2026	210.68%
	2027	219.11%
	2028	227.88%
	2029	236.99%
	2030	246.47%
	2031	256.33%
	2032	266.58%
	2033	277.25%
	2034	288.34%
	2035	299.87%
	2036	311.87%
	2037	324.34%
	2038	337.31%
	2039	350.81%
	2040	364.84%

Alta Cost Guide

Trail Type		Raw Construction Cost
12' Trail Common condition	LF of trail	39.75
Add for Difficult soils	LF	23.00
Add for 4' Fill	LF of 4' fill	20.71
Add for 4' Cut	LF of 4' cut	37.68
Add for Parallel to stream	LF	99.90
Add for Remove railroad/roadway	LF	10.65
Add for Wetland mitigation	LF	262.50
12' wide Boardwalk	LF	600.00
14' wide Bridge	LF	3,500.00
Add for:		
Intersection	EA	8,760.00
Signalized intersection	EA	131,760.00
Trailhead (20 cars)	EA	78,267.60
High Visibility CW	EA	3,000.00
Add for 6' retaining wall	LF	247.00
Mid block crossing/Intersection		65,880.00

40 Mile Loop

			Smith/Bybee Wetland Gap		St Johns Gap		N Denver to Penin Drainage		Penin Drainage	
				1 18,600 ft		2 2,524 ft		3 11,000 ft		4 6,576 ft
12' Trail Common condition	39.75	LF	18,600	$ 739,438	2,524	$ 100,341	11,000	$ 437,302	6,576	$ 261,427
Add for Difficult soils	23.00	LF	2,000	$ 46,000		$ -		$ -		$ -
Add for 4' Fill	20.71	LF	6138	$ 127,134		$ -	1000	$ 20,713		$ -
Add for 4' Cut	37.68	LF		$ -		$ -		$ -		$ -
Add for Parallel to stream	99.90	LF		$ -		$ -	1000	$ 99,900	6500	$ 649,350
Add for Remove railroad/roadway	10.65	LF		$ -		$ -		$ -		$ -
Add for Wetland mitigation	262.50	LF	1500	$ 393,750		$ -		$ -		$ -
12' wide Boardwalk	600.00	LF		$ -		$ -		$ -		$ -
14' wide Bridge	3,500.00	LF	80	$ 280,000	600	$ 2,100,000	50	$ 175,000		$ -
Add for:										
Intersection	8,760.00	EA	1	$ 8,760		$ -		$ -		$ -
Signalized intersection	131,760.00	EA		$ -	1	$ 131,760	1	$ 131,760		$ -
Trailhead (20 cars)	78,267.60	EA	1	$ 78,268		$ -		$ -		$ -
Other	247									
Direct Construction Costs incl O&P				$ 1,673,349		$ 2,332,101		$ 864,675		$ 910,777
Contingency										
Concept Alignment	40%		40%	$ 669,340	40%	$ 932,840	40%	$ 345,870	40%	$ 364,311
Master Planned	35%		35%		35%		35%		35%	
Preliminary Design	30%		30%		30%		30%		30%	
Final Design	25%		25%		25%		25%		25%	
Under Contract	10%		10%		10%		10%		10%	
				$ 669,340		$ 932,840		$ 345,870		$ 364,311
Burdened Construction Value (w/o inflation)				$ 2,342,689		$ 3,264,941		$ 1,210,544		$ 1,275,088
Inflation										
Annual Inflation	4.0%		4.0%		Trail Type		4.0%		4.0%	
Enter Year of Construction	2008			2008		2008		2008		2008
Year of Construction Cost incl O&P				$ 2,436,397		$ 3,395,539		$ 1,258,966		$ 1,326,091
Multipliers										
Design & Engineering	20%		20%	$ 487,279	20%	$ 679,108	20%	$ 251,793	20%	$ 265,218
Mobilization	15%		15%	$ 365,460	15%	$ 509,331	15%	$ 188,845	15%	$ 198,914
Burdened and Inflated Construction Cost				$ 3,289,136		$ 4,583,978		$ 1,699,604		$ 1,790,223
Construction Management	20%		20%	$ 560,371	20%	$ 780,974	20%	$ 289,562	20%	$ 305,001
Cost Opinion for Built Project				$ 3,849,507		$ 5,364,952		$ 1,989,166		$ 2,095,224
Federal Administrative Costs	30%		30%	$ 1,154,852		$ 1,609,485		$ 596,750		$ 628,567
Cost Opinion for Federalized Built Project				$ 5,004,359		$ 6,974,437		$ 2,585,916		$ 2,723,792

	Bridgeton Gap		I205 Bridge Gap		Blue Lake Gap		Blue Lake	
		5 11,500 ft		6 3,821 ft		7 3,781 ft		8 4,700 ft
12' Trail Common condition	11,500	$ 457,179	3,821	$ 151,903	3,781	$ 150,313	4,700	$ 186,847
Add for Difficult soils		$ -		$ -		$ -		$ -
Add for 4' Fill	4000	$ 82,850		$ -	1500	$ 31,069		$ -
Add for 4' Cut	4000	$ 150,732		$ -	1500	$ 56,525		$ -
Add for Parallel to stream		$ -		$ -		$ -		$ -
Add for Remove railroad/roadway		$ -		$ -		$ -		$ -
Add for Wetland mitigation		$ -		$ -		$ -		$ -
12' wide Boardwalk		$ -		$ -		$ -		$ -
14' wide Bridge		$ -		$ -		$ -		$ -
Add for:								
Intersection		$ -		$ -		$ -		$ -
Signalized intersection		$ -		$ -		$ -		$ -
Trailhead (20 cars)		$ -		$ -		$ -		$ -
Other								
Direct Construction Costs incl O&P		$ 690,762		$ 151,903		$ 237,906		$ 186,847
Contingency								
Concept Alignment	40%	$ 276,305	40%	$ 60,761	40%	$ 95,162	40%	$ 74,739
Master Planned	35%		35%		35%		35%	
Preliminary Design	30%		30%		30%		30%	
Final Design	25%		25%		25%		25%	
Under Contract	10%		10%		10%		10%	
		$ 276,305		$ 60,761		$ 95,162		$ 74,739
Burdened Construction Value (w/o inflation)		$ 967,066		$ 212,664		$ 333,068		$ 261,586
Inflation								
Annual Inflation	4.0%		4.0%		4.0%		4.0%	
Enter Year of Construction		2008		2008		2008	er year>	2008
Year of Construction Cost incl O&P		$ 1,005,749		$ 221,170		$ 346,391		$ 272,050
Multipliers								
Design & Engineering	20%	$ 201,150	20%	$ 44,234	20%	$ 69,278	20%	$ 54,410
Mobilization	15%	$ 150,862	15%	$ 33,176	15%	$ 51,959	15%	$ 40,807
Burdened and Inflated Construction Cost		$ 1,357,761		$ 298,580		$ 467,628		$ 367,267
Construction Management	20%	$ 231,322	20%	$ 50,869	20%	$ 79,670	20%	$ 62,571
Cost Opinion for Built Project		$ 1,589,083		$ 349,449		$ 547,298		$ 429,838
Federal Administrative Costs		$ 476,725		$ 104,835		$ 164,189		$ 128,951
Cost Opinion for Federalized Built Project		$ 2,065,809		$ 454,284		$ 711,487		$ 558,790

40 Mile Loop

Item	Unit Cost	Unit	Ft James connector		Sundial		Sundial to Harlow	
			On existing dike		On dike crosses sundial road		Funded by Port and State	
				9		9		9
				4,900 ft		2,400 ft		9,700 ft
12' Trail Common condition	39.75	LF	4,900	$ 272,717	2,400	$ 133,576	9,700	$ 539,869
Add for Difficult soils	23.00	LF		$ -		$ -		$ -
Add for 4' Fill	20.71	LF		$ -		$ -		$ -
Add for 4' Cut	37.68	LF		$ -		$ -		$ -
Add for Parallel to stream	99.90	LF		$ -		$ -		$ -
Add for Remove railroad/roadway	10.65	LF		$ -		$ -		$ -
Add for Wetland mitigation	262.50	LF		$ -		$ -		$ -
12' wide Boardwalk	600.00	LF		$ -		$ -		$ -
14' wide Bridge	3,500.00	LF		$ -		$ -		$ -
				$ -		$ -		$ -
Add for:								
Intersection	8,760.00	EA		$ -		$ -		$ -
Signalized intersection	131,760.00	EA		$ -		$ -		$ -
Trailhead (20 cars)	78,267.60	EA		$ -		$ -		$ -
Other	247				1	$ 247		$ -
Direct Construction Costs incl O&P				**$ 272,717**		**$ 133,823**		**$ 539,869**
Contingency								
Concept Alignment	40%		40%	$ 109,087	40%	$ 53,529	40%	
Master Planned	35%		35%		35%		35%	
Preliminary Design	30%		30%		30%		30%	
Final Design	25%		25%		25%		25%	$ 134,967
Under Contract	10%		10%		10%		10%	
				$ 109,087		$ 53,529		$ 134,967
Burdened Construction Value (w/o inflation)				**$ 381,804**		**$ 187,352**		**$ 674,836**
Inflation								
Annual Inflation	4.0%		4.0%		4.0%		4.0%	
Enter Year of Construction	2008		nter year>	2008	nter year>	2008	nter year>	2008
Year of Construction Cost incl O&P				**$ 397,077**		**$ 194,846**		**$ 701,830**
Multipliers								
Design & Engineering	20%		20%	$ 79,415	20%	$ 38,969	20%	$ 140,366
Mobilization	15%		15%	$ 59,561	15%	$ 29,227	15%	$ 105,274
Burdened and Inflated Construction Cost				$ 536,053		$ 263,042		$ 947,470
Construction Management	20%		20%	$ 91,328	20%	$ 44,815	20%	$ 161,421
Cost Opinion for Built Project				**$ 627,381**		**$ 307,857**		**$ 1,108,891**
Federal Administrative Costs	30%			$ 188,214		$ 92,357		$ 332,667
Cost Opinion for Federalized Built Project				**$ 815,595**		**$ 400,214**		**$ 1,441,559**

Item	Unit Cost	Unit	I-84 undercrossing		Troutdale Waterfront		Beaver Creek 1	
			Under I-84 on bench under		Part of urban renewal district project			
				9		10		10
				1,745 ft		1,290 ft		770 ft
12' Trail Common condition	39.75	LF	1,745	$ 97,121	1,290	$ 71,797	770	$ 42,856
Add for Difficult soils	23.00	LF		$ -		$ -	400	$ 9,200
Add for 4' Fill	20.71	LF		$ -		$ -		$ -
Add for 4' Cut	37.68	LF		$ -		$ -		$ -
Add for Parallel to stream	99.90	LF		$ -		$ -		$ -
Add for Remove railroad/roadway	10.65	LF		$ -		$ -		$ -
Add for Wetland mitigation	262.50	LF		$ -		$ -	200	$ 52,500
12' wide Boardwalk	600.00	LF		$ -		$ -	100	$ 60,000
14' wide Bridge	3,500.00	LF		$ -		$ -		$ -
				$ -	500	$ -		$ -
Add for:								
Intersection	8,760.00	EA		$ -		$ -		$ -
Signalized intersection	131,760.00	EA		$ -		$ -		$ -
Trailhead (20 cars)	78,267.60	EA		$ -		$ -		$ -
Other	247			$ -		$ -	1	$ 247
Direct Construction Costs incl O&P				**$ 97,121**		**$ 71,797**		**$ 164,803**
Contingency								
Concept Alignment	40%		40%	$ 38,848	40%	$ 28,719	40%	$ 65,921
Master Planned	35%		35%		35%		35%	
Preliminary Design	30%		30%		30%		30%	
Final Design	25%		25%		25%		25%	
Under Contract	10%		10%		10%		10%	
				$ 38,848		$ 28,719		$ 65,921
Burdened Construction Value (w/o inflation)				**$ 135,969**		**$ 100,516**		**$ 230,724**
Inflation								
Annual Inflation	4.0%		4.0%		4.0%		4.0%	
Enter Year of Construction	2008		nter year>	2008	nter year>	2008	nter year>	2008
Year of Construction Cost incl O&P				**$ 141,408**		**$ 104,536**		**$ 239,953**
Multipliers								
Design & Engineering	20%		20%	$ 28,282	20%	$ 20,907	20%	$ 47,991
Mobilization	15%		15%	$ 21,211	15%	$ 15,680	15%	$ 35,993
Burdened and Inflated Construction Cost				$ 190,901		$ 141,124		$ 323,936
Construction Management	20%		20%	$ 32,524	20%	$ 24,043	20%	$ 55,189
Cost Opinion for Built Project				**$ 223,424**		**$ 165,168**		**$ 379,125**
Federal Administrative Costs	30%		$ -	$ 67,027		$ 49,550		$ 113,738
Cost Opinion for Federalized Built Project				**$ 290,452**		**$ 214,718**		**$ 492,863**

Item	Unit Cost	Unit	Beaver Creek 2		Umatilla to Harney		Harney to Clatsop	
				10		12		13
				1,420 ft		320 ft		550 ft
12' Trail Common condition	39.75	LF	1,420	$ 79,032	320	$ 12,722	550	$ 30,611
Add for Difficult soils	23.00	LF	800	$ 18,400		$ -	400	$ 9,200
Add for 4' Fill	20.71	LF		$ -		$ -		$ -
Add for 4' Cut	37.68	LF		$ -	150	$ 5,652	530	$ 19,972
Add for Parallel to stream	99.90	LF		$ -		$ -		$ -
Add for Remove railroad/roadway	10.65	LF		$ -	320	$ 3,408		$ -
Add for Wetland mitigation	262.50	LF	400	$ 105,000		$ -		$ -
12' wide Boardwalk	600.00	LF	500	$ 300,000		$ -		$ -
14' wide Bridge	3,500.00	LF		$ -		$ -		$ -
				$ -	160	$ -		
Add for:								
Intersection	8,760.00	EA		$ -	2	$ 17,520		$ -
Signalized intersection	131,760.00	EA	1	$ 131,760		$ -		$ -
Trailhead (20 cars)	78,267.60	EA		$ -		$ -		$ -
Other	247			$ -	fence/street ir	107,250	fence	13,500
Direct Construction Costs incl O&P				**$ 634,192**		$ 146,552		$ 73,283
Contingency								
Concept Alignment	40%		40%	$ 253,677	40%		40%	
Master Planned	35%		35%		35%	$ 51,293	35%	$ 25,649
Preliminary Design	30%		30%		30%		30%	
Final Design	25%		25%		25%		25%	
Under Contract	10%		10%		10%		10%	
				$ 253,677		$ 51,293		$ 25,649
Burdened Construction Value (w/o inflation)				**$ 887,869**		$ 197,845		$ 98,932
Inflation								
Annual Inflation	4.0%		4.0%		0.0%		4.0%	
Enter Year of Construction	2008		nter year>	2008	Enter year>	2008	Enter year>	2008
Year of Construction Cost incl O&P				**$ 923,384**		**$ 205,759**		**$ 102,890**
Multipliers								
Design & Engineering	20%		20%	$ 184,677	20%	$ 41,152	20%	$ 20,578
Mobilization	15%		15%	$ 138,508	15%	$ 30,864	15%	$ 15,433
Burdened and Inflated Construction Cost				$ 1,246,569		$ 277,775		$ 138,901
Construction Management	20%		20%	$ 212,378	20%	$ 47,325	20%	$ 23,665
Cost Opinion for Built Project				**$ 1,458,947**		**$ 325,099**		**$ 162,565**
Federal Administrative Costs	30%			$ 437,684	$ -	$ 97,530	$ -	$ 48,770
Cost Opinion for Federalized Built Project				**$ 1,896,631**		**$ 422,629**		**$ 211,335**

40 Mile Loop			Clatsop to Marion		Marion to Linn		Linn to 11th		11th to 13th		13th to Power Station		PS to SE 16th		16th to 17th	
				14 350 ft		15 410 ft		16 540 ft		17 540 ft		18 620 ft		19 390 ft		20 560 ft
12' Trail Common condition	39.75	LF	350	$ 19,480	410	$ 22,819	540	$ 30,055	540	$ 30,055	620	$ 34,507	390	$ 21,706	560	$ 31,168
Add for Difficult soils	23.00	LF		$ -		$ -	250	$ 5,750	250	$ 5,750		$ -	300	$ 6,900		$ -
Add for 4' Fill	20.71	LF		$ -		$ -		$ -		$ -		$ -		$ -		$ -
Add for 4' Cut	37.68	LF	280	$ 21,102		$ -		$ -		$ -	540	$ 20,349		$ -		$ -
Add for Parallel to stream	99.90	LF		$ -		$ -		$ -		$ -		$ -		$ -		$ -
Add for Remove railroad/roadway	10.65	LF		$ -		$ -		$ -		$ -		$ -		$ -		$ -
Add for Wetland mitigation	262.50	LF		$ -		$ -		$ -		$ -		$ -		$ -		$ -
12' wide Boardwalk	600.00	LF		$ -		$ -		$ -		$ -		$ -		$ -		$ -
14' wide Bridge	3,500.00	LF		$ -		$ -		$ -		$ -		$ -		$ -		$ -
											200	$ -	150	$ -	50	$ -
Add for:																
Intersection	8,760.00	EA		$ -	1	$ 8,760	2	$ 17,520		$ -	1	$ 8,760		$ -		$ -
Signalized intersection	131,760.00	EA		$ -		$ -		$ -		$ -		$ -		$ -		$ -
Trailhead (20 cars)	78,267.60	EA		$ -		$ -		$ -		$ -		$ -		$ -		$ -
Other	247		RR crossing Improv	53,500	Str Improve	133,750	pole/vault relo	42,050	pole reloc	49,750	fence	12,500	fence	13,325	Str Improv.fence	219,550
Direct Construction Costs incl O&P				$ 94,082		$ 165,329		$ 95,375		$ 85,555		$ 76,116		$ 41,931		$ 250,718
Contingency																
Concept Alignment	40%		40%		40%		40%		40%		40%		40%		40%	
Master Planned	35%		35%	$ 32,929	35%	$ 57,865	35%	$ 33,381	35%	$ 29,944	35%	$ 26,641	35%	$ 14,676	35%	$ 87,751
Preliminary Design	30%		30%		30%		30%		30%		30%		30%		30%	
Final Design	25%		25%		25%		25%		25%		25%		25%		25%	
Under Contract	10%		10%		10%		10%		10%		10%		10%		10%	
				$ 32,929		$ 57,865		$ 33,381		$ 29,944		$ 26,641		$ 14,676		$ 87,751
Burdened Construction Value (w/o inflation)				$ 127,011		$ 223,194		$ 128,756		$ 115,499		$ 102,756		$ 56,607		$ 338,469
Inflation																
Annual Inflation	4.0%		4.0%		4.0%		4.0%		4.0%		4.0%		4.0%		4.0%	
Enter Year of Construction	2008		Enter year>	2008	Enter year>	2008	Enter year>	2008	Enter year>	2008	Enter year>	2008	Enter year>	2008	Enter year>	2008
Year of Construction Cost incl O&P				**$ 132,092**		**$ 232,122**		**$ 133,906**		**$ 120,119**		**$ 106,867**		**$ 58,871**		**$ 352,008**
Multipliers																
Design & Engineering	20%		20%	$ 26,418	20%	$ 46,424	20%	$ 26,781	20%	$ 24,024	20%	$ 21,373	20%	$ 11,774	20%	$ 70,402
Mobilization	15%		15%	$ 19,814	15%	$ 34,818	15%	$ 20,086	15%	$ 18,018	15%	$ 16,030	15%	$ 8,831	15%	$ 52,801
Burdened and Inflated Construction Cost				$ 178,324		$ 313,365		$ 180,773		$ 162,160		$ 144,270		$ 79,476		$ 475,210
Construction Management	20%		20%	$ 30,381	20%	$ 53,388	20%	$ 30,798	20%	$ 27,627	20%	$ 24,579	20%	$ 13,540	20%	$ 80,962
Cost Opinion for Built Project				**$ 208,705**		**$ 366,753**		**$ 211,571**		**$ 189,787**		**$ 168,849**		**$ 93,017**		**$ 556,172**
Federal Administrative Costs	30%		$ -	$ 62,611	$ -	$ 110,026	$ -	$ 63,471	$ -	$ 56,936	$ -	$ 50,655	$ -	$ 27,905		$ 166,852
Cost Opinion for Federalized Built Project				**$ 271,316**		**$ 476,779**		**$ 275,043**		**$ 246,724**		**$ 219,504**		**$ 120,922**		**$ 723,024**

40 Mile Loop

			17 th Three Bridges		19th Linn to Ochoco		Wildwood Trail Bridge		
				21		22		23	
				470 ft					89,477 Feet
									16.95 Miles
12' Trail Common condition	39.75	LF	470	$ 26,159		$ -	-	$ -	$ 3,980,598
Add for Difficult soils	23.00	LF		$ -		$ -		$ -	$ 101,200
Add for 4' Fill	20.71	LF		$ -		$ -		$ -	$ 261,766
Add for 4' Cut	37.68	LF		$ -		$ -		$ -	$ 274,332
Add for Parallel to stream	99.90	LF		$ -		$ -		$ -	$ 749,250
Add for Remove railroad/roadway	10.65	LF	250	$ 2,663		$ -		$ -	$ 6,071
Add for Wetland mitigation	262.50	LF		$ -		$ -		$ -	$ 551,250
12' wide Boardwalk	600.00	LF		$ -		$ -		$ -	$ 360,000
14' wide Bridge	3,500.00	LF		$ -		$ -		$ -	$ 2,555,000
Add for:									
Intersection	8,760.00	EA	1	$ 8,760		$ -		$ -	$ 70,080
Signalized intersection	131,760.00	EA	1.5	$ 197,640		$ -		$ -	$ 592,920
Trailhead (20 cars)	78,267.60	EA		$ -		$ -		$ -	$ 78,268
Other	247		other	115,000	other	312,600	bridge	$200,000	$ 960,669
Direct Construction Costs incl O&P				$ 350,221		$ 312,600		$ 200,000	**$10,854,403**
Contingency									
Concept Alignment	40%		40%		40%		40%	$ 80,000	$ 3,449,109
Master Planned	35%		35%	$ 122,577	35%	$ 109,410	35%		$ 482,707
Preliminary Design	30%		30%		30%		30%		
Final Design	25%		25%		25%		25%		$ 134,967
Under Contract	10%		10%		10%		10%		
				$ 122,577		$ 109,410		$ 80,000	**$4,066,783**
Burdened Construction Value (w/o inflation)				$ 472,798		$ 422,010		$ 280,000	**$14,921,186**
Inflation									
Annual Inflation	4.0%		4.0%		4.0%		4.0%		
Enter Year of Construction	2008		Enter year>	2008	Enter year>	2008	er year>	2012	
Year of Construction Cost incl O&P				**$ 491,710**		**$ 438,890**		**$ 340,663**	**$16,681,283**
Multipliers									
Design & Engineering	20%		17%	$ 98,342	17%	$ 87,778	17%	$ 68,133	$3,048,478
Mobilization	15%		15%	$ 73,757	15%	$ 65,834	15%	$ 51,099	$2,286,359
Burdened and Inflated Construction Cost				$ 663,809		$ 592,502		$ 459,895	$20,577,230
Construction Management	20%		20%	$ 113,093	20%	$ 100,945	20%	$ 78,352	$ 3,593,529
Cost Opinion for Built Project				**$ 776,902**		**$ 693,447**		**$ 606,380**	**$ 24,844,559**
Federal Administrative Costs	30%			$ 233,071		$ 208,034			
Cost Opinion for Federalized Built Project				**$ 1,009,973**		**$ 901,481**		**$ 606,380**	**$ 32,116,013**

Columbia Slough Trail

Kelly Point Park Trail to Blue Lake

Kelly Point Park Trail to Blue Lake	Unit Cost	Unit	Smith/Bybee Wetland Gap 1 Qty	18,600 ft	N Denver to Penin Drainage 2 Qty	11,000 ft	Pen Drain to 82nd Ave 3 Qty	19,000 ft	East 205 Gap 4 Qty	14,861 ft	Blue Lake Connector 5 Qty	11,800 ft	75,261 Feet / 14.25 Miles
12' Trail Common condition	39.75	LF	18,600	$ 739,438	11,000	$ 437,302	19,000	$ 755,340	14,861	$ 590,795	11,800	$ 469,106	$ 2,991,980
Add for Difficult soils	23.00	LF	2,000	$ 46,000		$ -		$ -		$ -		$ -	$ 46,000
Add for 4' Fill	20.71	LF	6138	$ 127,134	1000	$ 20,713		$ -		$ -		$ -	$ 147,847
Add for 4' Cut	37.68	LF		$ -		$ -		$ -		$ -		$ -	-
Add for Parallel to stream	99.90	LF		$ -	1000	$ 99,900		$ -		$ -		$ -	$ 99,900
Add for Remove railroad/roadway	10.65	LF		$ -		$ -		$ -		$ -		$ -	-
Add for Wetland mitigation	262.50	LF	1500	$ 393,750		$ -		$ -		$ -	700	$ 183,750	$ 577,500
12' wide Boardwalk	600.00	LF		$ -		$ -		$ -		$ -		$ -	-
14' wide Bridge	3,500.00	LF	80	$ 280,000	50	$ 175,000		$ -		$ -	80	$ 280,000	$ 735,000
Add for:													-
Intersection	8,760.00	EA	1	$ 8,760		$ -		$ -	1	$ 8,760		$ -	$ 17,520
Signalized intersection	131,760.00	EA		$ -	1	$ 131,760	1	$ 131,760		$ -	2	$ 263,520	$ 527,040
Trailhead (20 cars)	78,267.60	EA	1	$ 78,268		$ -		$ -		$ -	1	$ 78,268	$ 156,535
Other							fence @ golf	$60,000					$ 60,000
Direct Construction Costs incl O&P				$ 1,673,349		$ 864,675		$ 947,100		$ 599,555		$ 1,274,643	$ 5,359,322
Contingency													
Concept Alignment	40%		40%	$ 669,340	40%	$ 345,870	40%	$ 378,840	40%	$ 239,822	40%	$ 509,857	$ 2,143,729
Master Planned	35%		35%		35%		35%		35%		35%		-
Preliminary Design	30%		30%		30%		30%		30%		30%		-
Final Design	25%		25%		25%		25%		25%		25%		-
Under Contract	10%		10%		10%		10%		10%		10%		-
				$ 669,340		$ 345,870		$ 378,840		$ 239,822		$ 509,857	$2,143,729
Burdened Construction Value (w/o inflation)				$ 2,342,689		$ 1,210,544		$ 1,325,940		$ 839,377		$ 1,784,501	$7,503,051
Inflation													
Annual Inflation	4.0%		4.0%		4.0%		4.0%		4.0%		4.0%		
Enter Year of Construction	2008			2008		2008		2008		2008		2008	
Year of Construction Cost incl O&P				$ 2,436,397		$ 1,258,966		$ 1,378,977		$ 872,952		$ 1,855,881	$7,803,173
Multipliers													
Design & Engineering	20%		20%	$ 487,279	20%	$ 251,793	20%	$ 275,795	20%	$ 174,590	20%	$ 371,176	$1,560,635
Mobilization	15%		15%	$ 365,460	15%	$ 188,845	15%	$ 206,847	15%	$ 130,943	15%	$ 278,382	$1,170,476
Burdened and Inflated Construction Cost				$ 3,289,136		$ 1,699,604		$ 1,861,619		$ 1,178,485		$ 2,505,439	$10,534,283
Construction Management	20%		20%	$ 560,371	20%	$ 289,562	20%	$ 317,165	20%	$ 200,779	20%	$ 426,853	$1,794,730
Cost Opinion for Built Project				$ 3,849,507		$ 1,989,166		$ 2,178,784		$ 1,379,264		$ 2,932,291	$ 12,329,013
Federal Administrative Costs	30%		30%	$ 1,154,852		$ 596,750		$ 653,635		$ 413,779		$ 879,687	$ 3,698,704
Cost Opinion for Federalized Built Project				$ 5,004,359		$ 2,585,916		$ 2,832,419		$ 1,793,043		$ 3,811,979	$ 16,027,717

East Buttes Loop

Connecting the Springwater Corridor

	Unit Cost	Unit	East Buttes Loop 1 (1) 6,735 ft		East Buttes Loop 2 (2) 11,809 ft		East Buttes Loop 3 (3) 11,386 ft		EB Powerline 1 (4) 8,805 ft		EB Powerline 2 (5) 8,974 ft		Scouter Mtn Extension (6) 16,815 ft		64,524 Feet 12.22 Miles
12' Trail Common condition	39.75	LF	6,735	$ 267,748	11,809	$ 469,464	11,386	$ 452,647	8,805	$ 350,040	8,974	$ 356,759	16,815	$ 668,476	$ 2,208,375
Add for Difficult soils	23.00	LF		$ -		$ -		$ -		$ -		$ -		$ -	$ -
Add for 4' Fill	20.71	LF	3000	$ 62,138	4500	$ 93,207	7000	$ 144,988	5000	$ 103,563	5000	$ 103,563		$ -	$ 403,896
Add for 4' Cut	37.68	LF	3000	$ 113,049	4500	$ 169,574	7000	$ 263,781	5000	$ 188,415	5000	$ 188,415		$ -	$ 734,819
Add for Parallel to stream	99.90	LF		$ -		$ -		$ -		$ -		$ -		$ -	$ -
Add for Remove railroad/roadway	10.65	LF		$ -		$ -		$ -		$ -		$ -		$ -	$ -
Add for Wetland mitigation	262.50	LF	1000	$ 262,500	1200	$ 315,000	3500	$ 918,750		$ -		$ -		$ -	$ 1,496,250
12' wide Boardwalk	600.00	LF		$ -		$ -		$ -		$ -		$ -		$ -	$ -
14' wide Bridge	3,500.00	LF		$ -		$ -		$ -		$ -		$ -		$ -	$ -
															$ -
Add for:															$ -
Intersection	8,760.00	EA		$ -	2	$ 17,520	1	$ 8,760	4	$ 35,040	3	$ 26,280	2	$ 17,520	$ 78,840
Signalized intersection	131,760.00	EA	2	$ 263,520	1	$ 131,760	1	$ 131,760	1	$ 131,760	1	$ 131,760	2	$ 263,520	$ 922,320
Trailhead (20 cars)	78,267.60	EA		$ -		$ -		$ -		$ -		$ -		$ -	$ -
Other															$ -
Direct Construction Costs incl O&P				$ 968,955		$ 1,196,524		$ 1,920,686		$ 808,818		$ 806,777		$ 949,516	**$5,844,499**
Contingency															
Concept Alignment	40%		40%	$ 387,582	40%	$ 478,609	40%	$ 768,275	40%	$ 323,527	40%	$ 322,711	40%	$ 379,806	$2,337,800
Master Planned	35%		35%		35%		35%		35%		35%		35%		
Preliminary Design	30%		30%		30%		30%		30%		30%		30%		
Final Design	25%		25%		25%		25%		25%		25%		25%		
Under Contract	10%		10%		10%		10%		10%		10%		10%		
				$ 387,582		$ 478,609		$ 768,275		$ 323,527		$ 322,711		$ 379,806	**$2,337,800**
Burdened Construction Value (w/o inflation)				$ 1,356,537		$ 1,675,133		$ 2,688,961		$ 1,132,346		$ 1,129,488		$ 1,329,322	**$8,182,299**
Inflation															
Annual Inflation	4.0%		4.0%		4.0%		4.0%		4.0%		4.0%		4.0%		
Enter Year of Construction	2008			2008		2008		2008		2008		2008		2008	
Year of Construction Cost incl O&P				**$ 1,410,798**		**$ 1,742,139**		**$ 2,796,519**		**$ 1,177,639**		**$ 1,174,667**		**$ 1,382,495**	**$8,509,591**
Multipliers															
Design & Engineering	20%		20%	$ 282,160	20%	$ 348,428	20%	$ 559,304	20%	$ 235,528	20%	$ 234,933	20%	$ 276,499	$558,659
Mobilization	15%		15%	$ 211,620	15%	$ 261,321	15%	$ 419,478	15%	$ 176,646	15%	$ 176,200	15%	$ 207,374	$418,994
Burdened and Inflated Construction Cost				$ 1,904,578		$ 2,351,887		$ 3,775,301		$ 1,589,813		$ 1,585,801		$ 1,866,368	$3,770,946
Construction Management	20%		20%	$ 324,484	20%	$ 400,692	20%	$ 643,199	20%	$ 270,857	20%	$ 270,173	20%	$ 317,974	$642,457
Cost Opinion for Built Project				$ 2,229,061		$ 2,752,579		$ 4,418,501		$ 1,860,670		$ 1,855,974		$ 2,184,342	**$15,301,127**
Federal Administrative Costs	30%		30%	$ 668,718		$ 825,774		$ 1,325,550		$ 558,201		$ 556,792		$ 655,303	$ 4,590,338
Cost Opinion for Federalized Built Project				$ 2,897,780		$ 3,578,353		$ 5,744,051		$ 2,418,871		$ 2,412,766		$ 2,839,644	**$ 19,891,465**

alta PLANNING + DESIGN

Fanno Creek Greenway Tualatin River to Willamette River			Southern Gap #1		Southern Gap #2		Main Street Park Gap		Bus Barn Gap		Allen Blvd Gap		Washington Co Gap	
				1 4,699 ft		2 4,330 ft		3 800 ft		4 3,482 ft		5 750 ft		6 5,300 ft
12' Trail Common condition	39.75	LF	4,699	$ 186,807	4,330	$ 172,138	800	$ 15,902	3,482	$ 138,426	750	$ 29,816	5,300	$ 210,700
Add for Difficult soils	23.00	LF		$ -		$ -		$ -		$ -		$ -		$ -
Add for 4' Fill	20.71	LF		$ -		$ -		$ -		$ -		$ -	2500	$ 51,782
Add for 4' Cut	37.68	LF		$ -		$ -		$ -		$ -		$ -	2500	$ 94,208
Add for Parallel to stream	99.90	LF		$ -	3500	$ 349,650	800	$ 79,920	1300	$ 129,870		$ -		$ -
Add for Remove railroad/roadway	10.65	LF		$ -		$ -		$ -		$ -		$ -		$ -
Add for Wetland mitigation	262.50	LF		$ -	3500	$ 918,750		$ -	2,500	$ 656,250		$ -		$ -
12' wide Boardwalk	600.00	LF		$ -		$ -		$ -	1,000	$ 600,000		$ -		$ -
14' wide Bridge	3,500.00	LF		$ -		$ -		$ -		$ -		$ -	1000	$ 3,500,000
Add for:														
Intersection	8,760.00	EA		$ -		$ -		$ -		$ -		$ -		$ -
Signalized intersection	131,760.00	EA	1	$ 131,760		$ -	1	$ 131,760		$ -		$ -	1	$ 131,760
Trailhead (20 cars)	78,267.60	EA		$ -		$ -		$ -		$ -		$ -		$ -
Other														
Direct Construction Costs incl O&P				$ 318,567		$ 1,440,538		$ 227,582		$ 1,524,546		$ 29,816		$ 3,988,449
Contingency														
Concept Alignment	40%		40%	$ 127,427	40%	$ 576,215	40%	$ 91,033	40%		40%	$ 11,926	40%	$ 1,595,380
Master Planned	35%		35%		35%		35%		35%		35%		35%	
Preliminary Design	30%		30%		30%		30%		30%	$ 457,364	30%		30%	
Final Design	25%		25%		25%		25%		25%		25%		25%	
Under Contract	10%		10%		10%		10%		10%		10%		10%	
				$ 127,427		$ 576,215		$ 91,033		$ 457,364		$ 11,926		$ 1,595,380
Burdened Construction Value (w/o inflation)				$ 445,994		$ 2,016,753		$ 318,615		$ 1,981,910		$ 41,742		$ 5,583,829
Inflation														
Annual Inflation	4.0%		4.0%		4.0%		4.0%		4.0%		4.0%		4.0%	
Enter Year of Construction	2008			2008		2008		2008		2008		2008		2008
Year of Construction Cost incl O&P				**$ 463,834**		**$ 2,097,423**		**$ 331,359**		**$ 2,061,186**		**$ 43,412**		**$ 5,807,182**
Multipliers														
Design & Engineering	20%		20%	$ 92,767	20%	$ 419,485	20%	$ 66,272	20%	$ 412,237	20%	$ 8,682	20%	$ 1,161,436
Mobilization	15%		15%	$ 69,575	15%	$ 314,613	15%	$ 49,704	15%	$ 309,178	15%	$ 6,512	15%	$ 871,077
Burdened and Inflated Construction Cost				$ 626,176		$ 2,831,521		$ 447,335		$ 2,782,601		$ 58,606		$ 7,839,695
Construction Management	20%		20%	$ 106,682	20%	$ 482,407	20%	$ 76,213	20%	$ 474,073	20%	$ 9,985	20%	$ 1,335,652
Cost Opinion for Built Project				$ 732,858		$ 3,313,929		$ 523,548		$ 3,256,674		$ 68,591		$ 9,175,347
Federal Administrative Costs	30%		30%	$ 219,857		$ 994,179		$ 157,064		$ 977,002		$ 20,577		$ 2,752,604
Cost Opinion for Federalized Built Project				$ 952,715		$ 4,308,107		$ 680,612		$ 4,233,676		$ 89,169		$ 11,927,951

Fanno Creek Greenway

Tualatin River to Willamette River			SW Portland (w)		SW Portland (center)		SW Portland (e)		George Himes Park		Fulton Park		Connector		
				7		8		9		10		11		12	
				6,243 ft		8,850 ft		7,600 ft		3,500 ft		5,960 ft		2,600 ft	54,114 Feet 10.25 Miles
12' Trail Common condition	39.75	LF	6,243	$ 248,189	8,850	$ 351,829	7,600	$ 302,136	3,500	$ 139,142	5,960	$ 236,938	2,600	$ 103,362	$ 1,596,311
Add for Difficult soils	23.00	LF		$ -		$ -		$ -		$ -		$ -		$ -	$ -
Add for 4' Fill	20.71	LF	3000	$ 62,138	4000	$ 82,850		$ -	3500	$ 72,494	2500	$ 51,782	2600	$ 53,853	$ 323,117
Add for 4' Cut	37.68	LF	3000	$ 113,049	4000	$ 150,732		$ -	3500	$ 131,891	2550	$ 96,092	2600	$ 97,976	$ 587,855
Add for Parallel to stream	99.90	LF	2,060	$ 205,813		$ -		$ -		$ -	500	$ 49,950		$ -	$ 765,253
Add for Remove railroad/roadway	10.65	LF		$ -		$ -		$ -		$ -		$ -		$ -	$ -
Add for Wetland mitigation	262.50	LF		$ -		$ -		$ -		$ -		$ -		$ -	$ 1,575,000
12' wide Boardwalk	600.00	LF		$ -		$ -		$ -		$ -		$ -		$ -	$ 600,000
14' wide Bridge	3,500.00	LF	1200	$ 4,200,000		$ -	1000	$ 3,500,000		$ -	450	$ 1,575,000		$ -	$ 7,700,000
															$ -
Add for:															$ -
Intersection	8,760.00	EA	1	$ 8,760	1	$ 8,760		$ -		$ -		$ -		$ -	$ 17,520
Signalized intersection	131,760.00	EA		$ -	1	$ 131,760		$ -		$ -	1	$ 131,760		$ -	$ 527,040
Trailhead (20 cars)	78,267.60	EA		$ -		$ -		$ -		$ -		$ -		$ -	$ -
Other									retaining wall	$197,600					$ 197,600
Direct Construction Costs incl O&P				$ 4,837,949		$ 725,932		$ 3,802,136		$ 541,126		$ 2,141,521		$ 255,191	**$19,833,353**
Contingency															
Concept Alignment	40%		40%		40%		40%		40%		40%		40%		$ 2,401,981
Master Planned	35%		35%	$ 1,693,282	35%	$ 254,076	35%	$ 1,330,748	35%	$ 189,394	35%	$ 749,532	35%	$ 89,317	$ 2,226,069
Preliminary Design	30%		30%		30%		30%		30%		30%		30%		$ 457,364
Final Design	25%		25%		25%		25%		25%		25%		25%		$ -
Under Contract	10%		10%		10%		10%		10%		10%		10%		$ -
				$ 1,693,282		$ 254,076		$ 1,330,748		$ 189,394		$ 749,532		$ 89,317	**$5,085,414**
Burdened Construction Value (w/o inflation)				$ 6,531,230		$ 980,008		$ 5,132,883		$ 730,520		$ 2,891,054		$ 344,508	**$18,975,109**
Inflation															
Annual Inflation	4.0%		4.0%		4.0%		4.0%		4.0%		4.0%		4.0%		
Enter Year of Construction	2008			2008		2008		2008		2008		2008		2008	
Year of Construction Cost incl O&P				**$ 6,792,480**		**$ 1,019,208**		**$ 5,338,199**		**$ 759,741**		**$ 3,006,696**		**$ 358,288**	**$28,079,008**
Multipliers															
Design & Engineering	20%		20%	$ 1,358,496	20%	$ 203,842	20%	$ 1,067,640	20%	$ 151,948	20%	$ 601,339	20%	$ 71,658	$3,946,823
Mobilization	15%		15%	$ 1,018,872	15%	$ 152,881	15%	$ 800,730	15%	$ 113,961	15%	$ 451,004	15%	$ 53,743	$2,960,117
Burdened and Inflated Construction Cost				$ 9,169,848		$ 1,375,931		$ 7,206,568		$ 1,025,650		$ 4,059,039		$ 483,689	$26,641,053
Construction Management	20%		20%	$ 1,562,270	20%	$ 234,418	20%	$ 1,227,786	20%	$ 174,740	20%	$ 691,540	20%	$ 82,406	$4,538,846
Cost Opinion for Built Project				$ 10,732,118		$ 1,610,349		$ 8,434,354		$ 1,200,391		$ 4,750,580		$ 566,095	**$44,364,833**
Federal Administrative Costs	30%			$ 3,219,635		$ 483,105		$ 2,530,306		$ 360,117		$ 1,425,174		$ 169,828	$ 13,309,450
Cost Opinion for Federalized Built Project				$ 13,951,753		$ 2,093,453		$ 10,964,660		$ 1,560,508		$ 6,175,753		$ 735,923	**$57,674,283**

Gresham/Fairview Trail

Springwater Corridor to Marine Drive/40 Mile Loop

				Phase 4 1		Phase 5 2	
				2,800 ft		8,710 ft	11,510 Feet 2.18 Miles
12' Trail Common condition	39.75	LF	2,800	$ 111,313	8,710	$ 346,264	$ 457,577
Add for Difficult soils	23.00	LF		$ -		$ -	$ -
Add for 4' Fill	20.71	LF	500	$ 10,356		$ -	$ 10,356
Add for 4' Cut	37.68	LF	500	$ 18,842		$ -	$ 18,842
Add for Parallel to stream	99.90	LF		$ -	1000	$ 99,900	$ 99,900
Add for Remove railroad/roadway	10.65	LF		$ -		$ -	$ -
Add for Wetland mitigation	262.50	LF		$ -		$ -	$ -
12' wide Boardwalk	600.00	LF		$ -		$ -	$ -
14' wide Bridge	3,500.00	LF		$ -	200	$ 700,000	$ 700,000
							$ -
Add for:							$ -
Intersection	8,760.00	LF		$ -		$ -	$ -
Signalized intersection	131,760.00	LF	1	$ 131,760	1	$ 131,760	$ 263,520
Trailhead (20 cars)	78,267.60	EA		$ -		$ -	$ -
Other					75' tunnel	$200,000	$ 200,000
Direct Construction Costs incl O&P				$ 272,271		$ 1,477,924	**$1,750,195**
Contingency							
Concept Alignment	40%		40%	$ 108,908	40%	$ 591,169	$ 700,078
Master Planned	35%		35%		35%		$ -
Preliminary Design	30%		30%		30%		$ -
Final Design	25%		25%		25%		$ -
Under Contract	10%		10%		10%		$ -
				$ 108,908		$ 591,169	**$700,078**
Burdened Construction Value (w/o inflation)				$ 381,179		$ 2,069,093	**$2,450,273**
Inflation							
Annual Inflation	4.0%		4.0%		4.0%		
Enter Year of Construction	2008		Enter year>	2008	Enter year>	2008	
Year of Construction Cost incl O&P				**$ 396,427**		**$ 2,151,857**	**$2,548,283**
Multipliers							
Design & Engineering	20%		20%	$ 79,285	20%	$ 430,371	$509,657
Mobilization	15%		15%	$ 59,464	15%	$ 322,779	$382,243
Burdened and Inflated Construction Cost				$ 535,176		$ 2,905,007	$3,440,183
Construction Management	20%		20%	$ 91,178	20%	$ 494,927	$586,105
Cost Opinion for Built Project				**$ 626,354**		**$ 3,399,934**	**$4,026,288**
Federal Administrative Costs	30%		30%	$ 187,906		$ 1,019,980	$ 1,207,886
Cost Opinion for Federalized Built Project				**$ 814,260**		**$ 4,419,914**	**$5,234,174**

Hillsdale to Lake Oswego Trail

Hillsdale Town Center to Downtown Lake Oswego

alta PLANNING + DESIGN

			Hillsdale - Marshall Park 1		Marshall Park to Tryon Creek Park 2 5,306 ft		5,306 Feet 1.00 Miles
12' Trail Common condition	39.75	LF	-	$ -	5,306	$ 210,939	$ 210,939
Add for Difficult soils	23.00	LF		$ -		$ -	$ -
Add for 4' Fill	20.71	LF		$ -		$ -	$ -
Add for 4' Cut	37.68	LF		$ -		$ -	$ -
Add for Parallel to stream	99.90	LF		$ -	2000	$ 199,800	$ 199,800
Add for Remove railroad/roadway	10.65	LF		$ -		$ -	$ -
Add for Wetland mitigation	262.50	LF		$ -		$ -	$ -
12' wide Boardwalk	600.00	LF		$ -		$ -	$ -
14' wide Bridge	3,500.00	LF	60	$ 210,000		$ -	$ 210,000
							$ -
Add for:							$ -
Intersection	8,760.00	EA		$ -		$ -	$ -
Mid-block crossing	65,880.00	EA		$ -	1	$ 65,880	$ 65,880
Trailhead (20 cars)	78,267.60	EA		$ -		$ -	$ -
Other					culvert bridge	$4,100,000	$ 4,100,000
Direct Construction Costs incl O&P				$ 210,000		$ 4,576,619	**$4,786,619**
Contingency							
Concept Alignment	40%		40%		40%		$ -
Master Planned	35%		35%		35%		$ -
Preliminary Design	30%		30%	$ 63,000	30%	$ 1,372,986	$ 1,435,986
Final Design	25%		25%		25%		$ -
Under Contract	10%		10%		10%		$ -
				$ 63,000		$ 1,372,986	**$1,435,986**
Burdened Construction Value (w/o inflation)				$ 273,000		$ 5,949,604	**$6,222,604**
Inflation							
Annual Inflation	4.0%		4.0%		4.0%		
Enter Year of Construction	2008			2008		2008	
Year of Construction Cost incl O&P				**$ 283,920**		**$ 6,187,588**	**$6,471,508**
Multipliers							
Design & Engineering	20%		20%	$ 56,784	20%	$ 1,237,518	$1,294,302
Mobilization	15%		15%	$ 42,588	15%	$ 928,138	$970,726
Burdened and Inflated Construction Cost				$ 383,292		$ 8,353,244	$8,736,536
Construction Management	20%		20%	$ 65,302	20%	$ 1,423,145	$1,488,447
Cost Opinion for Built Project				**$ 448,594**		**$ 9,776,389**	**$10,224,983**
Federal Administrative Costs	30%		30%	$ 134,578		$ 2,932,917	$ 3,067,495
Cost Opinion for Federalized Built Project				**$ 583,172**		**$ 12,709,306**	**$13,292,478**

Cazadero Trail

Springwater Trail to Barton Park

Item	Rate	Unit	Boring Gap	Boring Gap 1 (17,548 ft)	Deep Cr North Fork Gap	Deep Cr North Fork Gap 2 (16,992 ft)	34,540 Feet / 6.54 Miles
12' Trail Common condition	39.75	LF	17,548	$ 697,616	16,992	$ 675,512	$ 1,373,128
Add for Difficult soils	23.00	LF		$ -		$ -	$ -
Add for 4' Fill	20.71	LF		$ -		$ -	$ -
Add for 4' Cut	37.68	LF		$ -		$ -	$ -
Add for Parallel to stream	99.90	LF	7400	$ 739,260	11000	$ 1,098,900	$ 1,838,160
Add for Remove railroad/roadway	10.65	LF		$ -		$ -	$ -
Add for Wetland mitigation	262.50	LF		$ -		$ -	$ -
12' wide Boardwalk	600.00	LF		$ -		$ -	$ -
14' wide Bridge	3,500.00	LF		$ -	700	$ 2,450,000	$ 2,450,000
							$ -
Add for:							$ -
Intersection	8,760.00	EA	2	$ 17,520		$ -	$ 17,520
Signalized intersection	131,760.00	EA	1	$ 131,760	1	$ 131,760	$ 263,520
Trailhead (20 cars)	78,267.60	EA		$ -		$ -	$ -
Other							$ -
Direct Construction Costs incl O&P				$ 1,586,156		$ 4,356,172	$5,942,328
Contingency							
Concept Alignment	40%		40%	$ 634,462	40%	$ 1,742,469	$ 2,376,931
Master Planned	35%		35%		35%		$ -
Preliminary Design	30%		30%		30%		$ -
Final Design	25%		25%		25%		$ -
Under Contract	10%		10%		10%		$ -
				$ 634,462		$ 1,742,469	$2,376,931
Burdened Construction Value (w/o inflation)				$ 2,220,618		$ 6,098,641	$8,319,259
Inflation							
Annual Inflation	4.0%		4.0%		4.0%		
Enter Year of Construction	2008		Enter year>	2008	Enter year>	2008	
Year of Construction Cost incl O&P				$ 2,309,443		$ 6,342,587	$8,652,030
Multipliers							
Design & Engineering	20%		20%	$ 461,889	20%	$ 1,268,517	$ 1,730,406
Mobilization	15%		15%	$ 346,416	15%	$ 951,388	$ 1,297,804
Burdened and Inflated Construction Cost				$ 3,117,748		$ 8,562,492	$ 11,680,240
Construction Management	20%		20%	$ 531,172	20%	$ 1,458,795	$ 1,989,967
Cost Opinion for Built Project				$ 3,648,920		$ 10,021,287	13,670,207
Federal Administrative Costs	30%		30%	$ 1,094,676		$ 3,006,386	$ 4,101,062
Cost Opinion for Federalized Built Project				$ 4,743,596		$ 13,027,673	$17,771,269

Barton Park to Estacada

Gap 1

	Barton Park to Estacada				1 40,000 ft		40,000 Feet 7.58 Miles
12' Trail Common condition	39.75	LF	40,000	$	1,590,189	$	1,590,189
Add for Difficult soils	23.00	LF		$	-	$	-
Add for 4' Fill	20.71	LF		$	-	$	-
Add for 4' Cut	37.68	LF		$	-	$	-
Add for Parallel to stream	99.90	LF		$	-	$	-
Add for Remove railroad/roadway	10.65	LF		$	-	$	-
Add for Wetland mitigation	262.50	LF		$	-	$	-
12' wide Boardwalk	600.00	LF		$	-	$	-
14' wide Bridge	3,500.00	LF		$	-	$	-
						$	-
Add for:						$	-
Intersection	8,760.00	EA	3	$	26,280	$	26,280
Signalized intersection	131,760.00	EA	1	$	131,760	$	131,760
Trailhead (20 cars)	78,267.60	EA		$	-	$	-
Other						$	-
Direct Construction Costs incl O&P				$	1,748,229		$1,748,229
Contingency							
Concept Alignment	40%		40%	$	699,292	$	699,292
Master Planned	35%		35%			$	-
Preliminary Design	30%		30%			$	-
Final Design	25%		25%			$	-
Under Contract	10%		10%			$	-
				$	699,292		$699,292
Burdened Construction Value (w/o inflation)				$	2,447,520		$2,447,520
Inflation							
Annual Inflation	4.0%		4.0%				
Enter Year of Construction	2008		Enter year>		2008		
Year of Construction Cost incl O&P				$	2,545,421		$2,545,421
Multipliers							
Design & Engineering	20%		20%	$	509,084	$	509,084
Mobilization	15%		15%	$	381,813	$	381,813
Burdened and Inflated Construction Cost				$	3,436,319	$	3,436,319
Construction Management	20%		20%	$	585,447	$	585,447
Cost Opinion for Built Project				$	4,021,766		4,021,766
Federal Administrative Costs	30%		30%	$	1,206,530	$	1,206,530
Cost Opinion for Federalized Built Project				$	5,228,295		$5,228,295

Tickle Creek Trail

Cazadero Trail to Sandy				
				40,000 Feet
				7.58 Miles
12' Trail Common condition	39.75	LF	$	1,590,189
Add for Difficult soils	23.00	LF	$	-
Add for 4' Fill	20.71	LF	$	-
Add for 4' Cut	37.68	LF	$	-
Add for Parallel to stream	99.90	LF	$	2,997,000
Add for Remove railroad/roadway	10.65	LF	$	-
Add for Wetland mitigation	262.50	LF	$	-
12' wide Boardwalk	600.00	LF	$	-
14' wide Bridge	3,500.00	LF	$	-
			$	-
Add for:			$	-
Intersection	8,760.00	EA	$	-
Signalized intersection	131,760.00	EA	$	131,760
Trailhead (20 cars)	78,267.60	EA	$	-
Other			$	-
Direct Construction Costs incl O&P				**$4,718,949**
Contingency				
Concept Alignment	40%		$	1,887,580
Master Planned	35%		$	-
Preliminary Design	30%		$	-
Final Design	25%		$	-
Under Contract	10%		$	-
				$1,887,580
Burdened Construction Value (w/o inflation)				**$6,606,528**
Inflation				
Annual Inflation	4.0%			
Enter Year of Construction	2008			
Year of Construction Cost incl O&P				**$6,870,790**
Multipliers				
Design & Engineering	20%		$	1,374,158
Mobilization	15%		$	1,030,618
Burdened and Inflated Construction Cost			$	9,275,566
Construction Management	20%		$	1,580,282
Cost Opinion for Built Project				**12,230,005**

Oregon City Loop			99E Bike Ped Improv		River to McLoughlin ES		Oregon City Loop South McLoughlin ES to Wesley Lynn Park		Wesley Lynn Park to Beaver Lake Trail		Newell Creek Canyon Trail		Holcomb Blvd to Hwy 213		
				1 12,464 ft		2 10,244 ft		3 11,233 ft		4 13,732 ft		5 15,826 ft		6 7,375 ft	70,874 Feet 13.42 Miles
12' Trail Common condition	39.75	LF	12,464	$ 495,503	10,244	$ 407,247	11,233	$ 446,565	13,732	$ 545,912	15,826	$ 629,158	7,375	$ 293,191	$ 2,817,576
Add for Difficult soils	23.00	LF		$ -	5,000	$ 115,000		$ -		$ -		$ -		$ -	$ 115,000
Add for 4' Fill	20.71	LF		$ -	3000	$ 62,138		$ -	4500	$ 93,207	1500	$ 31,069		$ -	$ 186,413
Add for 4' Cut	37.68	LF		$ -	3000	$ 113,049		$ -	4500	$ 169,574	1500	$ 56,525		$ -	$ 339,147
Add for Parallel to stream	99.90	LF		$ -		$ -		$ -		$ -	2300	$ 229,770	4400	$ 439,560	$ 669,330
Add for Remove railroad/roadway	10.65	LF		$ -		$ -		$ -		$ -		$ -		$ -	-
Add for Wetland mitigation	262.50	LF		$ -		$ -		$ -		$ -	1000	$ 262,500		$ -	$ 262,500
12' wide Boardwalk	600.00	LF		$ -		$ -		$ -		$ -		$ -		$ -	-
14' wide Bridge	3,500.00	LF		$ -		$ -	300	$ 1,050,000		$ -		$ -	500	$ 1,750,000	$ 2,800,000
															-
Add for:															-
Intersection	8,760.00	EA		$ -		$ -		$ -	1	$ 8,760		$ -		$ -	$ 8,760
Signalized intersection	131,760.00	EA	1	$ 131,760		$ -		$ -	1	$ 131,760	1	$ 131,760	1	$ 131,760	$ 527,040
Trailhead (20 cars)	78,267.60	EA		$ -		$ -		$ -		$ -		$ -		$ -	-
Other															-
Direct Construction Costs incl O&P				$ 627,263		$ 697,434		$ 1,496,565		$ 949,212		$ 1,340,782		$ 2,614,511	$7,725,767
Contingency															
Concept Alignment	40%		40%	$ 250,905	40%	$ 278,974	40%	$ 598,626	40%	$ 379,685	40%	$ 536,313	40%	$ 1,045,804	$3,090,307
Master Planned	35%		35%		35%		35%		35%		35%		35%		-
Preliminary Design	30%		30%		30%		30%		30%		30%		30%		-
Final Design	25%		25%		25%		25%		25%		25%		25%		-
Under Contract	10%		10%		10%		10%		10%		10%		10%		-
				$ 250,905		$ 278,974		$ 598,626		$ 379,685		$ 536,313		$ 1,045,804	$3,090,307
Burdened Construction Value (w/o inflation)				$ 878,168		$ 976,408		$ 2,095,191		$ 1,328,897		$ 1,877,094		$ 3,660,316	$10,816,073
Inflation															
Annual Inflation	4.0%		4.0%		4.0%		4.0%		4.0%		4.0%		4.0%		
Enter Year of Construction	2008			2008		2008		2008		2008		2008		2008	
Year of Construction Cost incl O&P				$ 913,295		$ 1,015,464		$ 2,178,998		$ 1,382,053		$ 1,952,178		$ 3,806,728	$11,248,716
Multipliers															
Design & Engineering	20%		20%	$ 182,659	20%	$ 203,093	20%	$ 435,800	20%	$ 276,411	20%	$ 390,436	20%	$ 761,346	$2,249,743
Mobilization	15%		15%	$ 136,994	15%	$ 152,320	15%	$ 326,850	15%	$ 207,308	15%	$ 292,827	15%	$ 571,009	$1,687,307
Burdened and Inflated Construction Cost				$ 1,232,948		$ 1,370,877		$ 2,941,648		$ 1,865,771		$ 2,635,440		$ 5,139,083	$15,185,767
Construction Management	20%		20%	$ 210,058	20%	$ 233,557	20%	$ 501,170	20%	$ 317,872	20%	$ 449,001	20%	$ 875,547	$2,587,205
Cost Opinion for Built Project				$ 1,443,006		$ 1,604,433		$ 3,442,817		$ 2,183,643		$ 3,084,441		$ 6,014,630	17,772,971
Federal Administrative Costs	30%		30%	$ 432,902		$ 481,330		$ 1,032,845		$ 655,093		$ 925,332	$ -	$ 1,804,389	
Cost Opinion for Federalized Built Project				$ 1,875,907		$ 2,085,763		$ 4,475,663		$ 2,838,736		$ 4,009,774	$ -	$ 7,819,020	$23,104,863

Council Creek Trail

	Length (feet)		Banks to Forest Grove 5	36,246 ft	Forest Grove 4	17,857 ft	Cornelius 3	11,652 ft	County 2	9,944 ft	Hillsboro 1	2,850 ft	78,549 ft
12' Trail Common condition	39.75	LF	36,246	$ 1,440,950	17,857	$ 709,900	11,652	$ 463,222	9,944	$ 395,321	2,850	$ 113,331	$ 3,122,694
Add for Difficult soils	23.00	LF		$ -		$ -		$ -		$ -		$ -	
Add for 4' Fill	20.71	LF		$ -		$ -		$ -		$ -		$ -	
Add for 4' Cut	37.68	LF		$ -		$ -		$ -		$ -		$ -	
Add for Parallel to stream	99.90	LF	13000	$ 1,298,700	10000	$ 999,000	11000	$ 1,098,900	8100	$ 809,190		$ -	$4,205,790
Add for Remove railroad/roadway	10.65	LF		$ -		$ -		$ -		$ -		$ -	
Add for Wetland mitigation	262.50	LF	2700	$ 708,750	1000	$ 262,500	11000	$ 2,887,500	4000	$ 1,050,000		$ -	$4,908,750
12' wide Boardwalk	600.00	LF		$ -		$ -		$ -		$ -		$ -	
14' wide Bridge	3,500.00	LF	600	$ 2,100,000	300	$ 1,050,000		$ -		$ -		$ -	$3,150,000
Add for:													
Intersection	8,760.00	EA	3	$ 26,280	3	$ 26,280	3	$ 26,280	2	$ 17,520	2	$ 17,520	$113,880
Signalized intersection	131,760.00	EA	2	$ 263,520	1	$ 131,760		$ -		$ -		$ -	$395,280
Trailhead (20 cars)	78,267.60	EA		$ -		$ -		$ -		$ -		$ -	
Other													
Direct Construction Costs incl O&P				$ 5,838,200		$ 3,179,440		$ 4,475,902		$ 2,272,031		$ 130,821	**$15,896,394**
Contingency													
Concept Alignment	40%		40%	$ 2,335,280	40%	$ 1,271,776	40%	$ 1,790,361	40%	$ 908,812	40%	$ 52,328	$6,358,557
Master Planned	35%		35%		35%		35%		35%		35%		
Preliminary Design	30%		30%		30%		30%		30%		30%		
Final Design	25%		25%		25%		25%		25%		25%		
Under Contract	10%		10%		10%		10%		10%		10%		
				$ 2,335,280		$ 1,271,776		$ 1,790,361		$ 908,812		$ 52,328	$6,358,557
Burdened Construction Value (w/o inflation)				$ 8,173,480		$ 4,451,216		$ 6,266,263		$ 3,180,843		$ 183,149	**$22,254,951**
Inflation													
Annual Inflation	4.0%		4.0%		4.0%		4.0%		0.0%		4.0%		
Enter Year of Construction	2008		Enter year>	2008	Enter year>	2008	Enter year>	2008	er year>	2008	Enter year>	2008	
Year of Construction Cost incl O&P				$ 8,500,419		$ 4,629,265		$ 6,516,913		$ 3,308,077		$ 190,475	**$23,145,149**
Multipliers													
Design & Engineering	20%		20%	$ 1,700,084	20%	$ 925,853	20%	$ 1,303,383	20%	$ 661,615	20%	$ 38,095	$1,738,179
Mobilization	15%		15%	$ 1,275,063	15%	$ 694,390	15%	$ 977,537	15%	$ 496,212	15%	$ 28,571	$1,303,634
Burdened and Inflated Construction Cost				$ 11,475,565		$ 6,249,507		$ 8,797,833		$ 4,465,904		$ 257,142	$11,732,707
Construction Management	20%		20%	$ 1,955,096	20%	$ 1,064,731	20%	$ 1,498,890	20%	$ 780,858	20%	$ 43,809	$1,998,906
Cost Opinion for Built Project				$ 13,430,662		$ 7,314,238		$ 10,296,723		$ 5,226,762		$ 300,951	**$36,569,336**
Federal Administrative Costs	30%		30%	$ 4,029,198		$ 2,194,271		$ 3,089,017		$ 1,568,029		$ 90,285	
Cost Opinion for Federalized Built Project				$ 17,459,860		$ 9,508,610		$ 13,385,740		$ 6,794,790		$ 391,236	**$ 47,640,136**

Banks to Vernonia Trail

	Banks to Vernonia		Gap 1 Mile 16 - Mile 15	1 5,280 ft	Gap 2 Stub Stewart - Mile 7	2 15,840 ft	21,120 Feet 4.00 Miles
12' Trail Common condition	39.75	LF	5,280	$ 209,905	15,840	$ 629,715	$ 839,620
Add for Difficult soils	23.00	LF		$ -		$ -	$ -
Add for 4' Fill	20.71	LF		$ -		$ -	$ -
Add for 4' Cut	37.68	LF		$ -		$ -	$ -
Add for Parallel to stream	99.90	LF		$ -		$ -	$ -
Add for Remove railroad/roadway	10.65	LF		$ -		$ -	$ -
Add for Wetland mitigation	262.50	LF		$ -		$ -	$ -
12' wide Boardwalk	600.00	LF		$ -		$ -	$ -
14' wide Bridge	3,500.00	LF		$ -		$ -	$ -
							$ -
Add for:							$ -
Intersection	8,760.00	EA		$ -		$ -	$ -
Signalized intersection	131,760.00	EA		$ -		$ -	$ -
Trailhead (20 cars)	78,267.60	EA		$ -		$ -	$ -
Other							$ -
Direct Construction Costs incl O&P				$ 209,905		$ 629,715	$839,620
Contingency							
Concept Alignment	40%		40%	$ 83,962	40%	$ 251,886	$ 335,848
Master Planned	35%		35%		35%		$ -
Preliminary Design	30%		30%		30%		$ -
Final Design	25%		25%		25%		$ -
Under Contract	10%		10%		10%		$ -
				$ 83,962		$ 251,886	$335,848
Burdened Construction Value (w/o inflation)				$ 293,867		$ 881,601	$1,175,468
Inflation							
Annual Inflation	4.0%		4.0%		4.0%		
Enter Year of Construction	2008		Enter year>	2008	Enter year>	2008	
Year of Construction Cost incl O&P				$ 305,622		$ 916,865	$1,222,486
Multipliers							
Design & Engineering	20%		20%	$ 61,124	20%	$ 183,373	$ 244,497
Mobilization	15%		15%	$ 45,843	15%	$ 137,530	$ 183,373
Burdened and Inflated Construction Cost				$ 412,589		$ 1,237,767	$ 1,650,357
Construction Management	20%		20%	$ 70,293	20%	$ 210,879	$ 281,172
Cost Opinion for Built Project				$ 482,882		$ 1,448,646	1,931,528
Federal Administrative Costs	30%		30%	$ 144,865		$ 434,594	$ 579,459
Cost Opinion for Federalized Built Project				$ 627,747		$ 1,883,240	$2,510,987

Portland Maximum Mode Split

			NP Greenway 1	32,000 ft	Sullivans Gulch 2	31,000 ft	Barbur Blvd Cycle Track 3	34,000 ft	SW Willamette Greenway 4	19,000 ft
12' Trail Common condition	39.75	LF	32,000	$ 1,272,151	#####	$ 1,232,396	#####	$ 1,351,661	19,000	$ 755,340
Add for Difficult soils	23.00	LF	4,500	$ 103,500	2,000	$ 46,000		$ -		$ -
Add for 4' Fill	20.71	LF	2800	$ 57,995	9000	$ 186,413		$ -	3500	$ 72,494
Add for 4' Cut	37.68	LF	2800	$ 105,512	9000	$ 339,147		$ -	3500	$ 131,891
Add for Parallel to stream	99.90	LF	1000	$ 99,900		$ -		$ -		$ -
Add for Remove railroad/roadway	10.65	LF		$ -		$ -		$ -		$ -
Add for Wetland mitigation	262.50	LF	1250	$ 328,125		$ -		$ -		$ -
12' wide Boardwalk	600.00	LF	2000	$ 1,200,000	7500	$ 4,500,000		$ -		$ -
14' wide Bridge	3,500.00	LF	600	$ 2,100,000		$ -		$ -		$ -
Add for:										
Intersection	8,760.00	EA	8	$ 70,080	12	$ 105,120	6	$ 52,560		$ -
Signalized intersection	131,760.00	EA	1	$ 131,760	3	$ 395,280		$ -		$ -
Trailhead (20 cars)	78,267.60	EA		$ -		$ -		$ -		$ -
Other			Fence	$117,000						
Direct Construction Costs incl O&P				$ 5,586,024		$ 6,804,357		$ 1,404,221		$ 959,724
Contingency										
Concept Alignment	40%		40%	$ 2,234,410	40%	$ 2,721,743	40%	$ 561,688	40%	$ 383,890
Master Planned	35%		35%		35%		35%		35%	
Preliminary Design	30%		30%		30%		30%		30%	
Final Design	25%		25%		25%		25%		25%	
Under Contract	10%		10%		10%		10%		10%	
				$ 2,234,410		$ 2,721,743		$ 561,688		$ 383,890
Burdened Construction Value (w/o inflation)				$ 7,820,433		$ 9,526,099		$ 1,965,909		$ 1,343,614
Inflation										
Annual Inflation	4.0%		4.0%		4.0%		4.0%		4.0%	
Enter Year of Construction	2008			2008		2008		2008		2008
Year of Construction Cost incl O&P				$ 8,133,251		$ 9,907,143		$ 2,044,545		$ 1,397,359
Multipliers										
Design & Engineering	20%		20%	$ 1,626,650	20%	$ 1,981,429	20%	$ 408,909	20%	$ 279,472
Mobilization	15%		15%	$ 1,219,988	15%	$ 1,486,072	15%	$ 306,682	15%	$ 209,604
Burdened and Inflated Construction Cost				$ 10,979,888		$ 13,374,644		$ 2,760,136		$ 1,886,434
Construction Management	20%		20%	$ 1,870,648	20%	$ 2,278,643	20%	$ 470,245	20%	$ 321,392
Cost Opinion for Built Project				$ 12,850,536		$ 15,653,287		$ 3,230,381		$ 2,207,827
Federal Administrative Costs	30%		30%	$ 3,855,161		$ 4,695,986		$ 969,114		$ 662,348
Cost Opinion for Federalized Built Project				$ 16,705,697		$ 20,349,273		$ 4,199,496		$ 2,870,175

	Brooklyn Bridge 5		7th Avenue Bridge 6		Halsey St Overcrossing 7	
12' Trail Common condition	-	$ -	-	$ -	-	$ -
Add for Difficult soils		$ -		$ -		$ -
Add for 4' Fill		$ -		$ -		$ -
Add for 4' Cut		$ -		$ -		$ -
Add for Parallel to stream		$ -		$ -		$ -
Add for Remove railroad/roadway		$ -		$ -		$ -
Add for Wetland mitigation		$ -		$ -		$ -
12' wide Boardwalk		$ -		$ -		$ -
14' wide Bridge		$ -		$ -		$ -
Add for:						
Intersection		$ -		$ -		$ -
Signalized intersection		$ -		$ -		$ -
Trailhead (20 cars)		$ -		$ -		$ -
Other	Bridge	1,750,000	Bridge	1,750,000	Overcrossing	750,000
Direct Construction Costs incl O&P		$ 1,750,000		$ 1,750,000		$ 750,000
Contingency						
Concept Alignment	40%	$ 700,000	40%	$ 700,000	40%	$ 300,000
Master Planned	35%		35%		35%	
Preliminary Design	30%		30%		30%	
Final Design	25%		25%		25%	
Under Contract	10%		10%		10%	
		$ 700,000		$ 700,000		$ 300,000
Burdened Construction Value (w/o inflation)		$ 2,450,000		$ 2,450,000		$ 1,050,000
Inflation						
Annual Inflation	4.0%		4.0%		4.0%	
Enter Year of Construction		2008		2008		2008
Year of Construction Cost incl O&P		$ 2,548,000		$ 2,548,000		$ 1,092,000
Multipliers						
Design & Engineering	20%	$ 509,600	20%	$ 509,600	20%	$ 218,400
Mobilization	15%	$ 382,200	15%	$ 382,200	15%	$ 163,800
Burdened and Inflated Construction Cost		$ 3,439,800		$ 3,439,800		$ 1,474,200
Construction Management	20%	$ 586,040	20%	$ 586,040	20%	$ 251,160
Cost Opinion for Built Project		$ 4,025,840		$ 4,025,840		$ 1,725,360
Federal Administrative Costs		$ 1,207,752		$ 1,207,752		$ 517,608
Cost Opinion for Federalized Built Project		$ 5,233,592		$ 5,233,592		$ 2,242,968

Portland Maximum Mode Split

			SW Bikeways		Milwaukie LRT Path		I205 Bridge		Area Improvements		Safe Routes to School		SmartTrips		Sunday Parkways		
				8		9		10		10		11		12		13	
						34,320 ft											150,320 Feet 28.47 Miles
12' Trail Common condition	39.75	LF	-	$ -	#####	$ 1,364,382	-	$ -	-	$ -	-	$ -	-	$ -	-	$ -	$ 5,975,930
Add for Difficult soils	23.00	LF		$ -		$ -		$ -		$ -		$ -		$ -		$ -	$ 149,500
Add for 4' Fill	20.71	LF		$ -		$ -		$ -		$ -		$ -		$ -		$ -	$ 316,903
Add for 4' Cut	37.68	LF		$ -		$ -		$ -		$ -		$ -		$ -		$ -	$ 576,550
Add for Parallel to stream	99.90	LF		$ -		$ -		$ -		$ -		$ -		$ -		$ -	$ 99,900
Add for Remove railroad/roadway	10.65	LF		$ -		$ -		$ -		$ -		$ -		$ -		$ -	$ -
Add for Wetland mitigation	262.50	LF		$ -		$ -		$ -		$ -		$ -		$ -		$ -	$ 328,125
12' wide Boardwalk	600.00	LF		$ -		$ -		$ -		$ -		$ -		$ -		$ -	$ 5,700,000
14' wide Bridge	3,500.00	LF		$ -		$ -		$ -		$ -		$ -		$ -		$ -	$ 2,100,000
						$ -		$ -		$ -		$ -		$ -		$ -	$ -
Add for:																	$ -
Intersection	8,760.00	EA		$ -		$ -		$ -		$ -		$ -		$ -		$ -	$ 227,760
Signalized intersection	131,760.00	EA		$ -		$ -		$ -		$ -		$ -		$ -		$ -	$ 527,040
Trailhead (20 cars)	78,267.60	EA		$ -		$ -		$ -		$ -		$ -		$ -		$ -	$ -
Other			routes	1,250,000			Bridge	$ 1,750,000		$ 4,500,000		$ 10,500,000		$ 8,500,000		$ 1,750,000	$ 32,617,000
Direct Construction Costs incl O&P				$ 1,250,000		**$ 1,364,382**		**$ 1,750,000**		**$ 4,500,000**		**$ 10,500,000**		**$ 8,500,000**		**$ 1,750,000**	**$48,618,707**
Contingency																	
Concept Alignment	40%		40%	$ 500,000	40%	$ 545,753	40%	$ 700,000	40%		40%		40%		40%		$ 9,347,483
Master Planned	35%		35%		35%		35%		35%		35%		35%		35%		$ -
Preliminary Design	30%		30%		30%		30%		30%		30%		30%		30%		$ -
Final Design	25%		25%		25%		25%		25%	$ 1,125,000	25%		25%		25%		$ 1,125,000
Under Contract	10%		10%		10%		10%		10%		10%		10%		10%		$ -
				$ 500,000		$ 545,753		$ 700,000		$ 1,125,000		$ -		$ -		$ -	**$10,472,483**
Burdened Construction Value (w/o inflation)				$ 1,750,000		**$ 1,910,135**		**$ 2,450,000**		**$ 5,625,000**		**$ 10,500,000**		**$ 8,500,000**		**$ 1,750,000**	**$59,091,190**
Inflation																	
Annual Inflation	4.0%		4.0%		4.0%		4.0%		4.0%		4.0%		4.0%		4.0%		
Enter Year of Construction	2008			2008		2008		2008		2008		2008		2008		2008	
Year of Construction Cost incl O&P				**$ 1,820,000**		**$ 1,986,540**		**$ 2,548,000**		**$ 5,850,000**		**$ 10,920,000**		**$ 8,840,000**		**$ 1,820,000**	**$61,454,838**
Multipliers																	
Design & Engineering	20%		20%	$ 364,000	20%	$ 397,308	20%	$ 509,600	20%	$ 1,170,000	20%	$ 2,184,000	20%	$ 1,768,000	20%	$ 364,000	$12,290,968
Mobilization	15%		15%	$ 273,000	15%	$ 297,981	15%	$ 382,200	15%	$ 877,500	15%	$ 1,638,000	15%	$ 1,326,000	15%	$ 273,000	$9,218,226
Burdened and Inflated Construction Cost				$ 2,457,000		$ 2,681,829		$ 3,439,800		$ 7,897,500		$ 14,742,000		$ 11,934,000		$ 2,457,000	$82,964,031
Construction Management	20%		20%	$ 418,600	20%	$ 456,904	20%	$ 586,040	20%	$ 1,345,500	20%	$ 2,511,600	20%	$ 2,033,200	20%	$ 418,600	$14,134,613
Cost Opinion for Built Project				$ 2,875,600		$ 3,138,734		$ 4,025,840		$ 9,243,000		$ 17,253,600		$ 13,967,200		$ 2,875,600	97,098,644
Federal Administrative Costs	30%			$ 862,680		$ 941,620		$ 1,207,752		$ 2,772,900	$ -	$ 5,176,080		$ 4,190,160		$ 862,680	
Cost Opinion for Federalized Built Project				$ 3,738,280		$ 4,080,354		$ 5,233,592		$ 12,015,900		$ 22,429,680		$ 18,157,360		$ 3,738,280	126,228,237

Rock Creek Greenway

Orchard Park - Rood Bridge Park

			Orchard Park 1		Orenco Woods 2		Baseline 3		Noble Woods 4		Valley Memorial 5		
				2,767 ft		3,742 ft		1,517 ft		7,644 ft		5,100 ft	20,770 feet 3.93 miles
12' Trail Common condition	39.75	LF	2,767	$ 110,001	3,742	$ 148,762	1,517	$ 60,308	7,644	$ 303,885	5,100	$ 202,749	$ 825,706
Add for Difficult soils	23.00	LF		$ -		$ -		$ -		$ -		$ -	$ -
Add for 4' Fill	20.71	LF		$ -		$ -		$ -		$ -		$ -	$ -
Add for 4' Cut	37.68	LF		$ -		$ -		$ -		$ -		$ -	$ -
Add for Parallel to stream	99.90	LF	2767	$ 276,423	3700	$ 369,630	1500	$ 149,850	7600	$ 759,240	5100	$ 509,490	$ 2,064,633
Add for Remove railroad/roadway	10.65	LF		$ -		$ -		$ -		$ -		$ -	$ -
Add for Wetland mitigation	262.50	LF		$ -		$ -		$ -		$ -		$ -	$ -
12' wide Boardwalk	600.00	LF		$ -		$ -		$ -		$ -		$ -	$ -
14' wide Bridge	3,500.00	LF		$ -		$ -		$ -		$ -		$ -	$ -
													$ -
Add for:													$ -
Intersection	8,760.00	EA		$ -	1	$ 8,760		$ -	2	$ 17,520		$ -	$ 26,280
Signalized intersection	131,760.00	EA	1	$ 131,760		$ -	1	$ 131,760	1	$ 131,760		$ -	$ 395,280
Trailhead (20 cars)	78,267.60	EA		$ -		$ -		$ -		$ -		$ -	$ -
Other													$ -
Direct Construction Costs incl O&P				$ 518,185		$ 527,152		$ 341,918		$ 1,212,405		$ 712,239	**$3,311,899**
Contingency													
Concept Alignment	40%		40%	$ 207,274	40%	$ 210,861	40%	$ 136,767	40%	$ 484,962	40%	$ 284,896	$1,324,760
Master Planned	35%		35%		35%		35%		35%		35%		
Preliminary Design	30%		30%		30%		30%		30%		30%		
Final Design	25%		25%		25%		25%		25%		25%		
Under Contract	10%		10%		10%		10%		10%		10%		
				$ 207,274		$ 210,861		$ 136,767		$ 484,962		$ 284,896	**$1,324,760**
Burdened Construction Value (w/o inflation)				$ 725,458		$ 738,013		$ 478,685		$ 1,697,367		$ 997,135	**$4,636,658**
Inflation													
Annual Inflation	4.0%		4.0%		4.0%		4.0%		0.0%		4.0%		
Enter Year of Construction	2008		Enter year>	2008	Enter year>	2008	Enter year>	2008	er year>	2008	Enter year>	2008	
Year of Construction Cost incl O&P				**$ 754,477**		**$ 767,534**		**$ 497,832**		**$ 1,765,262**		**$ 1,037,020**	**$4,822,125**
Multipliers													
Design & Engineering	20%		20%	$ 150,895	20%	$ 153,507	20%	$ 99,566	20%	$ 353,052	20%	$ 207,404	$358,299
Mobilization	15%		15%	$ 113,172	15%	$ 115,130	15%	$ 74,675	15%	$ 264,789	15%	$ 155,553	$268,725
Burdened and Inflated Construction Cost				$ 1,018,544		$ 1,036,170		$ 672,074		$ 2,383,103		$ 1,399,977	$2,418,521
Construction Management	20%		20%	$ 173,530	20%	$ 176,533	20%	$ 114,501	20%	$ 406,010	20%	$ 238,515	$412,044
Cost Opinion for Built Project				**$ 1,192,073**		**$ 1,212,703**		**$ 786,575**		**$ 2,789,114**		**$ 1,638,492**	**$7,618,957**
Federal Administrative Costs	30%		30%	$ 357,622		$ 363,811		$ 235,973		$ 836,734		$ 491,548	
Cost Opinion for Federalized Built Project				**$ 1,549,695**		**$ 1,576,514**		**$ 1,022,548**		**$ 3,625,848**		**$ 2,130,039**	**$9,904,644**

Sandy River Connections

Blue Lake Park to Historic Columbia River Highway

			Blue Lake Connector		Ft James connector		Sundial		Sundial to Harlow	
			Adjacent to 223rd		On existing dike		On dike crosses sundial road		Funded by Port and State	
				1		2		3		4
				770 ft		4,900 ft		2,400 ft		9,700 ft
12' Trail Common condition	39.75	LF	770	$ 30,611	4,900	$ 272,717	2,400	$ 133,576	9,700	$ 539,869
Add for Difficult soils	23.00	LF		$ -		$ -		$ -		$ -
Add for 4' Fill	20.71	LF		$ -		$ -		$ -		$ -
Add for 4' Cut	37.68	LF		$ -		$ -		$ -		$ -
Add for Parallel to stream	99.90	LF		$ -		$ -		$ -		$ -
Add for Remove railroad/roadway	10.65	LF		$ -		$ -		$ -		$ -
Add for Wetland mitigation	262.50	LF		$ -		$ -		$ -		$ -
12' wide Boardwalk	600.00	LF		$ -		$ -		$ -		$ -
14' wide Bridge	3,500.00	LF		$ -		$ -		$ -		$ -
Add for 6' retaining wall		LF		$ -		$ -		$ -		$ -
Add for:										
Intersection	8,760.00	EA	1	$ 8,760		$ -		$ -		$ -
Signalized intersection	131,760.00	EA		$ -		$ -		$ -		$ -
Trailhead (20 cars)	78,267.60	EA		$ -		$ -		$ -		$ -
High Viz Crosswalk	3,000.00						1	$ 3,000		$ -
Direct Construction Costs incl O&P				**$ 39,371**		**$ 272,717**		**$ 136,576**		**$ 539,869**
Contingency										
Concept Alignment	40%		40%	$ 15,748	40%	$ 109,087	40%	$ 54,630	40%	
Master Planned	35%		35%		35%		35%		35%	
Preliminary Design	30%		30%		30%		30%		30%	
Final Design	25%		25%		25%		25%		25%	$ 134,967
Under Contract	10%		10%		10%		10%		10%	
				$ 15,748		$ 109,087		$ 54,630		$ 134,967
Construction Value (w/o inflation)				**$ 55,120**		**$ 381,804**		**$ 191,206**		**$ 674,836**
Inflation										
Annual Inflation	4.0%		4.0%		4.0%		4.0%		4.0%	
Enter Year of Construction	2008			2008	nter year>	2008	nter year>	2008	Enter year>	2008
Year of Construction Cost incl O&P				**$ 57,324**		**$ 397,077**		**$ 198,854**		**$ 701,830**
Multipliers										
Design & Engineering	20%		20%	$ 11,465	20%	$ 79,415	20%	$ 39,771	20%	$ 140,366
Mobilization	15%		15%	$ 8,599	15%	$ 59,561	15%	$ 29,828	15%	$ 105,274
Burdened and Inflated Construction Cost				$ 77,388		$ 536,053		$ 268,454		$ 947,470
Construction Management	20%		20%	$ 13,185	20%	$ 91,328	20%	$ 45,737	20%	$ 161,421
Cost Opinion for Built Project				**$ 90,573**		**$ 627,381**		**$ 314,190**		**$ 1,108,891**
Federal Administrative Costs	30%		30%	$ 27,172		$ 188,214		$ 94,257		$ 332,667
Cost Opinion for Federalized Built Project				**$ 117,744**		**$ 815,595**		**$ 408,447**		**$ 1,441,559**

	I-84 undercrossing		Sandy River Bike/Ped Bridge		Troutdale Waterfront		Beaver Creek 1		Beaver Creek 2		alta
	Under I-84 on bench under new bridges		Separate bridge parallel to Interstate-84		Part of urban renewal district project						
		5		6		7		8		9	
		1,745 ft		900 ft		1,290 ft		770 ft		1,420 ft	23,895 Feet 4.53 Miles
12' Trail Common condition	1,745	$ 97,121		$ -	1,290	$ 71,797	770	$ 42,856	1,420	$ 79,032	$ 1,267,579
Add for Difficult soils		$ -		$ -		$ -	400	$ 9,200	800	$ 18,400	$ 27,600
Add for 4' Fill		$ -		$ -		$ -		$ -		$ -	$ -
Add for 4' Cut		$ -		$ -		$ -		$ -		$ -	$ -
Add for Parallel to stream		$ -		$ -		$ -		$ -		$ -	$ -
Add for Remove railroad/roadway		$ -		$ -		$ -		$ -		$ -	$ -
Add for Wetland mitigation		$ -		$ -		$ -	200	$ 52,500	400	$ 105,000	$ 157,500
12' wide Boardwalk		$ -		$ -		$ -	100	$ 60,000	500	$ 300,000	$ 360,000
14' wide Bridge		$ -	800 ft	$ 2,900,000		$ -		$ -		$ -	$ 2,900,000
Add for 6' retaining wall		$ -		$ -	500	$ -		$ -		$ -	$ -
Add for:											
Intersection		$ -		$ -		$ -		$ -		$ -	$ 8,760
Signalized intersection		$ -		$ -		$ -		$ -	1	$ 131,760	$ 131,760
Trailhead (20 cars)		$ -		$ -		$ -		$ -		$ -	$ -
High Viz Crosswalk		$ -		$ -		$ -	1	$ 3,000		$ -	$ 6,000
Direct Construction Costs incl O&P		**$ 97,121**		**$ 2,900,000**		**$ 71,797**		**$ 167,556**		**$ 634,192**	**4,859,199**
Contingency											
Concept Alignment	40%	$ 38,848	40%	$ 1,160,000	40%	$ 28,719	40%	$ 67,022	40%	$ 253,677	$ 1,727,732
Master Planned	35%		35%		35%		35%		35%		$ -
Preliminary Design	30%		30%		30%		30%		30%		$ -
Final Design	25%		25%		25%		25%		25%		$ 134,967
Under Contract	10%		10%		10%		10%		10%		$ -
		$ 38,848		$ 1,160,000		$ 28,719		$ 67,022		$ 253,677	$ 1,862,699
Construction Value (w/o inflation)		**$ 135,969**		**$ 4,060,000**		**$ 100,516**		**$ 234,578**		**$ 887,869**	**$ 6,721,899**
Inflation											
Annual Inflation	4.0%		4.0%		4.0%		4.0%		4.0%		
Enter Year of Construction	nter year>	2008	Enter year>	2008	nter year>	2008	nter year>	2008	nter year>	2008	
Year of Construction Cost incl O&P		**$ 141,408**		**$ 4,222,400**		**$ 104,536**		**$ 243,961**		**$ 923,384**	**$ 6,990,775**
Multipliers											
Design & Engineering	20%	$ 28,282	20%	$ 844,480	20%	$ 20,907	20%	$ 48,792	20%	$ 184,677	$ 1,398,155
Mobilization	15%	$ 21,211	15%	$ 633,360	15%	$ 15,680	15%	$ 36,594	15%	$ 138,508	$ 1,048,616
Burdened and Inflated Construction Cost		$ 190,901		$ 5,700,240		$ 141,124		$ 329,347		$ 1,246,569	$ 9,437,546
Construction Management	20%	$ 32,524	20%	$ 971,152	20%	$ 24,043	20%	$ 56,111	20%	$ 212,378	$ 1,607,878
Cost Opinion for Built Project		**$ 223,424**		**$ 6,671,392**		**$ 165,168**		**$ 385,458**		**$ 1,458,947**	**11,045,424**
Federal Administrative Costs		$ 67,027		$ 2,001,418		$ 49,550		$ 115,637		$ 437,684	
Cost Opinion for Federalized Built Project		**$ 290,452**		**$ 8,672,810**		**$ 214,718**		**$ 501,096**		**$ 1,896,631**	**14,359,051**

Scouter Mt. & Mt.Scott Loop Trail

			SWC to Foster Rd		Foster - Clatsop		Clatsop - EB Powerline		EB Powerline - Golf course		Gold course - river		Foster - Cemetery	
				1		2		3		4		5		6
				1,100 ft		6,321 ft		7,000 ft		4,700 ft		11,000 ft		6,650 ft
12' Trail Common condition	39.75	LF	1,100	$ 43,730	6,321	$ 251,290	7,000	$ 139,142	4,700	$ 186,847	11,000	$ 437,302	6,650	$ 264,369
Add for Difficult soils	23.00	LF		$ -		$ -		$ -		$ -		$ -		$ -
Add for 4' Fill	20.71	LF		$ -	3600	$ 74,565	2500	$ 51,782	1100	$ 22,784		$ -	2000	$ 41,425
Add for 4' Cut	37.68	LF		$ -	3600	$ 135,659	2500	$ 94,208	1100	$ 41,451		$ -	2000	$ 75,366
Add for Parallel to stream	99.90	LF	200	$ 19,980		$ -		$ -		$ -	5500	$ 549,450	6650	$ 664,335
Add for Remove railroad/roadway	10.65	LF		$ -		$ -		$ -		$ -		$ -		$ -
Add for Wetland mitigation	262.50	LF		$ -		$ -		$ -		$ -		$ -		$ -
12' wide Boardwalk	600.00	LF		$ -		$ -		$ -		$ -		$ -		$ -
14' wide Bridge	3,500.00	LF		$ -	300	$ 1,050,000	400	$ 1,400,000	150	$ 525,000		$ -		$ -
Add for:														
Intersection	8,760.00	EA		$ -		$ -		$ -		$ -		$ -		$ -
Signalized intersection	131,760.00	EA	1	$ 131,760	1	$ 131,760		$ -		$ -	1	$ 131,760		$ -
Trailhead (20 cars)	78,267.60	EA		$ -		$ -		$ -		$ -		$ -		$ -
Other (retaining wall)	247	LF			6000	1,482,000	1760	434,720	2200	543,400			500	123,500
Direct Construction Costs incl O&P				$ 195,470		$ 3,125,274		$ 2,119,851		$ 1,319,482		$ 1,118,512		$ 1,168,995
Contingency														
Concept Alignment	40%		40%	$ 78,188	40%	$ 1,250,110	40%	$ 847,940	40%	$ 527,793	40%	$ 447,405	40%	$ 467,598
Master Planned	35%		35%		35%		35%		35%		35%		35%	
Preliminary Design	30%		30%		30%		30%		30%		30%		30%	
Final Design	25%		25%		25%		25%		25%		25%		25%	
Under Contract	10%		10%		10%		10%		10%		10%		10%	
				$ 78,188		$ 1,250,110		$ 847,940		$ 527,793		$ 447,405		$ 467,598
Burdened Construction Value (w/o inflation)				$ 273,658		$ 4,375,383		$ 2,967,791		$ 1,847,275		$ 1,565,917		$ 1,636,593
Inflation														
Annual Inflation	4.0%		4.0%		4.0%		4.0%		4.0%		4.0%		4.0%	
Enter Year of Construction	2008			2008	0%	2008	Enter year>	2008	Enter year>	2008	Enter year>	2008	Enter year>	2008
Year of Construction Cost incl O&P				$ 284,605		$ 4,550,399		$ 3,086,502		$ 1,921,166		$ 1,628,553		$ 1,702,057
Multipliers														
Design & Engineering	20%		20%	$ 56,921	20%	$ 910,080	20%	$ 617,300	20%	$ 384,233	20%	$ 325,711	20%	$ 340,411
Mobilization	15%		15%	$ 42,691	15%	$ 682,560	15%	$ 462,975	15%	$ 288,175	15%	$ 244,283	15%	$ 255,309
Burdened and Inflated Construction Cost				$ 384,216		$ 6,143,038		$ 4,166,778		$ 2,593,575		$ 2,198,547		$ 2,297,777
Construction Management	20%		20%	$ 65,459	20%	$ 1,046,592	20%	$ 709,896	20%	$ 441,868	20%	$ 374,567	20%	$ 391,473
Cost Opinion for Built Project				$ 449,675		$ 7,189,630		$ 4,876,674		$ 3,035,443		$ 2,573,114		$ 2,689,250
Federal Administrative Costs	30%		30%	$ 134,903		$ 2,156,889		$ 1,463,002		$ 910,633		$ 771,934		$ 806,775
Cost Opinion for Federalized Built Project				$ 584,578		$ 9,346,519		$ 6,339,676		$ 3,946,076		$ 3,345,049		$ 3,496,025

Scouter Mt. & Mt.Scott Loop Trail

alta

	Unit Cost	Unit	Cemetery - Mt Scott Blvd		Mt Scott - Mt Talbert		Mt talbert		Mather Rd - EB powerline		Bluffs - Sunnyside Rd		Monner Rd - Scouter Mt Trail		Total
				7 4,865 ft		8 9,900 ft		9 5,346 ft		10 10,000 ft		11 4,200 ft		12 2,900 ft	73,982 Feet 14.01 Miles
12' Trail Common condition	39.75	LF	4,865	$ 193,407	9,900	$ 393,572	5,346	$ 212,529	10,000	$ 397,547	4,200	$ 166,970	2,900	$ 115,289	$2,801,992
Add for Difficult soils	23.00	LF		$ -		$ -		$ -		$ -		$ -		$ -	
Add for 4' Fill	20.71	LF	2500	$ 51,782	4500	$ 93,207	2500	$ 51,782	5000	$ 103,563	2500	$ 51,782	1200	$ 24,855	$567,525
Add for 4' Cut	37.68	LF	2500	$ 94,208	4500	$ 169,574	2500	$ 94,208	5000	$ 188,415	2500	$ 94,208	1200	$ 45,220	$1,032,514
Add for Parallel to stream	99.90	LF		$ -		$ -		$ -		$ -		$ -		$ -	$1,233,765
Add for Remove railroad/roadway	10.65	LF		$ -		$ -		$ -		$ -		$ -		$ -	
Add for Wetland mitigation	262.50	LF		$ -		$ -		$ -		$ -		$ -		$ -	
12' wide Boardwalk	600.00	LF		$ -		$ -		$ -		$ -		$ -		$ -	
14' wide Bridge	3,500.00	LF		$ -	150	$ 525,000		$ -		$ -		$ -	150	$ 525,000	$4,025,000
Add for:															
Intersection	8,760.00	EA		$ -		$ -		$ -		$ -		$ -	1	$ 8,760	$8,760
Signalized intersection	131,760.00	EA	1	$ 131,760		$ -	1	$ 131,760	1	$ 131,760	1	$ 131,760		$ -	$922,320
Trailhead (20 cars)	78,267.60	EA		$ -		$ -		$ -		$ -		$ -		$ -	
Other (retaining wall)	247	LF	700	172,900	8000	1,976,000	1500	370,500	10000	2,470,000	2500	617,500	2000	494,000	$8,684,520
Direct Construction Costs incl O&P				$ 644,056		$ 3,157,352		$ 860,778		$ 3,291,285		$ 1,062,219		$ 1,213,123	$19,276,397
Contingency															
Concept Alignment	40%		40%	$ 257,622	40%	$ 1,262,941	40%	$ 344,311	40%	$ 1,316,514	40%	$ 424,888	40%	$ 485,249	$7,710,559
Master Planned	35%		35%		35%		35%		35%		35%		35%		
Preliminary Design	30%		30%		30%		30%		30%		30%		30%		
Final Design	25%		25%		25%		25%		25%		25%		25%		
Under Contract	10%		10%		10%		10%		10%		10%		10%		
				$ 257,622		$ 1,262,941		$ 344,311		$ 1,316,514		$ 424,888		$ 485,249	$7,710,559
Burdened Construction Value (w/o inflation)				$ 901,678		$ 4,420,293		$ 1,205,089		$ 4,607,799		$ 1,487,106		$ 1,698,373	$26,986,955
Inflation															
Annual Inflation	4.0%		4.0%		4.0%		4.0%		4.0%		4.0%		4.0%		
Enter Year of Construction	2008		Enter year>	2008	er year>	2008	Enter year>	2008	Enter year>	2008	Enter year>	2008	er year>	2008	
Year of Construction Cost incl O&P				$ 937,745		$ 4,597,104		$ 1,253,292		$ 4,792,111		$ 1,546,591		$ 1,766,308	$28,066,434
Multipliers															
Design & Engineering	20%		20%	$ 187,549	20%	$ 919,421	20%	$ 250,658	20%	$ 958,422	20%	$ 309,318	20%	$ 353,262	$5,613,287
Mobilization	15%		15%	$ 140,662	15%	$ 689,566	15%	$ 187,994	15%	$ 718,817	15%	$ 231,989	15%	$ 264,946	$4,209,965
Burdened and Inflated Construction Cost				$ 1,265,956		$ 6,206,091		$ 1,691,945		$ 6,469,350		$ 2,087,897		$ 2,384,515	$37,889,685
Construction Management	20%		20%	$ 215,681	20%	$ 1,057,334	20%	$ 288,257	20%	$ 1,102,186	20%	$ 355,716	20%	$ 406,251	$6,455,280
Cost Opinion for Built Project				$ 1,481,637		$ 7,263,425		$ 1,980,202		$ 7,571,536		$ 2,443,613		$ 2,790,766	$44,344,965
Federal Administrative Costs	30%			$ 444,491		$ 2,179,028		$ 594,061		$ 2,271,461		$ 733,084		$ 837,230	
Cost Opinion for Federalized Built Project				$ 1,926,128		$ 9,442,453		$ 2,574,263		$ 9,842,997		$ 3,176,697		$ 3,627,996	$57,648,455

Sullivans Gulch Trail

Willamette River to I-205

				1		2		3		4	
				5,746 ft		7,100 ft		9,415 ft		8,300 ft	30,561 feet 5.79 miles
12' Trail Common condition	39.75	LF	5,746	$ 228,431	7,100	$ 282,259	9,415	$ 374,291	8,300	$ 329,964	$ 1,214,944
Add for Difficult soils	23.00	LF	1,000	$ 23,000	1,000	$ 23,000		$ -		$ -	$46,000
Add for 4' Fill	20.71	LF	2500	$ 51,782	3500	$ 72,494	3000	$ 62,138		$ -	$186,413
Add for 4' Cut	37.68	LF	2500	$ 94,208	3500	$ 131,891	3000	$ 113,049		$ -	$339,147
Add for Parallel to stream	99.90	LF		$ -		$ -		$ -		$ -	$0
Add for Remove railroad/roadway	10.65	LF		$ -		$ -		$ -		$ -	$0
Add for Wetland mitigation	262.50	LF		$ -		$ -		$ -		$ -	$0
12' wide Boardwalk	600.00	LF	2500	$ 1,500,000	2500	$ 1,500,000	2500	$ 1,500,000		$ -	$4,500,000
14' wide Bridge	3,500.00	LF		$ -		$ -		$ -		$ -	$0
											$0
Add for:											$0
Intersection	8,760.00	EA	3	$ 26,280	3	$ 26,280	3	$ 26,280	3	$ 26,280	$105,120
Signalized intersection	131,760.00	EA	1	$ 131,760	1	$ 131,760	1	$ 131,760		$ -	$395,280
Trailhead (20 cars)	78,267.60	EA		$ -		$ -		$ -		$ -	$0
Other											$0
Direct Construction Costs incl O&P				$ 2,055,460		$ 2,167,683		$ 2,207,518		$ 356,244	**$6,786,904**
Contingency											
Concept Alignment	40%		40%	$ 822,184	40%	$ 867,073	40%	$ 883,007	40%	$ 142,498	$2,714,762
Master Planned	35%		35%		35%		35%		35%		
Preliminary Design	30%		30%		30%		30%		30%		
Final Design	25%		25%		25%		25%		25%		
Under Contract	10%		10%		10%		10%		10%		
				$ 822,184		$ 867,073		$ 883,007		$ 142,498	**$2,714,762**
Burdened Construction Value (w/o inflation)				$ 2,877,643		$ 3,034,756		$ 3,090,525		$ 498,742	**$9,501,666**
Inflation											
Annual Inflation	4.0%		4.0%		0.0%		0.0%		4.0%		
Enter Year of Construction	2008			2008		2008		2008		2008	
Year of Construction Cost incl O&P				**$ 2,992,749**		**$ 3,156,147**		**$ 3,214,145**		**$ 518,692**	**$9,881,733**
Multipliers											
Design & Engineering	20%		20%	$ 598,550	20%	$ 631,229	20%	$ 642,829	20%	$ 103,738	$1,976,347
Mobilization	15%		15%	$ 448,912	15%	$ 473,422	15%	$ 482,122	15%	$ 77,804	$1,482,260
Burdened and Inflated Construction Cost				$ 4,040,211		$ 4,260,798		$ 4,339,096		$ 700,234	$13,340,339
Construction Management	20%		20%	$ 688,332	20%	$ 725,914	20%	$ 739,253	20%	$ 119,299	$2,272,799
Cost Opinion for Built Project				$ 4,728,544		$ 4,986,712		$ 5,078,350		$ 819,533	**$15,613,138**
Federal Administrative Costs	30%		30%	$ 1,418,563		$ 1,496,014		$ 1,523,505		$ 245,860	
Cost Opinion for Federalized Built Project				$ 6,147,107		$ 6,482,725		$ 6,601,855		$ 1,065,392	**$20,297,079**

Tonquin Trail

Willamette River to Tualatin River

			Tualatin Community Park Gap		Ibach Park Gap A		Ibach Park Gap B		Ibach Park Gap C		TRNWR Gap (East) A		TRNWR Gap (East) B		TRNWR Gap (East) C	
			Tualatin River - SW Sagert		SW Sagert - SW Blake/Boones Ferry Rd		Boones Ferry Rd - Ibach St		Ibach St - SW Tonquin Rd		Tualatin River - Pacific Dr		Pacific Dr - Creek @ Cipole Rd		Cipole Rd - SW Tualatin-Sherwood Rd	
			1		2		3		4		5		6		7	
				6,440 ft		3,590 ft		4,010 ft (50% of new trail)		4,960 ft		2,376 ft		2,112 ft		6,020 ft
12' Trail Common condition	39.75	LF	6,440	$ 256,020	3,590	$ 142,719	4,010	$ 79,708	4,960	$ 197,183	2,376	$ 94,457	2,112	$ 83,962	6,020	$ 239,323
Add for Difficult soils	23.00	LF		$ -		$ -		$ -		$ -		$ -		$ -		$ -
Add for 4' Fill	20.71	LF		$ -		$ -		$ -		$ -		$ -		$ -		$ -
Add for 4' Cut	37.68	LF		$ -		$ -		$ -		$ -		$ -		$ -		$ -
Add for Parallel to stream	99.90	LF		$ -		$ -		$ -		$ -		$ -		$ -	1,987	$ 198,461
Add for Remove railroad/roadway	10.65	LF		$ -		$ -		$ -		$ -		$ -		$ -		$ -
Add for Wetland mitigation	262.50	LF		$ -		$ -		$ -	2,480	$ 651,000		$ -		$ -		$ -
12' wide Boardwalk	600.00	LF		$ -		$ -		$ -	2,480	$ 1,488,000		$ -		$ -		$ -
14' wide Bridge	3,500.00	LF	60	$ 210,000		$ -		$ -		$ -	100	$ 350,000		$ -	80	$ 280,000
Add for:																
Intersection	8,760.00	EA		$ -		$ -		$ -		$ -		$ -		$ -		$ -
Signalized intersection	131,760.00	EA	3	$ 395,280	1	$ 131,760		$ -		$ -		$ -	1	$ 131,760		$ -
Trailhead (20 cars)	78,267.60	EA	1	$ 78,268		$ -		$ -		$ -	1	$ 78,268		$ -		$ -
Other																
Direct Construction Costs incl O&P				$ 939,568		$ 274,479		$ 79,708		$ 2,336,183		$ 522,725		$ 215,722		$ 717,785
Contingency																
Concept Alignment	40%		40%	$ 375,827	40%	$ 109,792	40%	$ 31,883	40%	$ 934,473	40%	$ 209,090	40%	$ 86,289	40%	$ 287,114
Master Planned	35%		35%		35%		35%		35%		35%		35%		35%	
Preliminary Design	30%		30%		30%		30%		30%		30%		30%		30%	
Final Design	25%		25%		25%		25%		25%		25%		25%		25%	
Under Contract	10%		10%		10%		10%		10%		10%		10%		10%	
				$ 375,827		$ 109,792		$ 31,883		$ 934,473		$ 209,090		$ 86,289		$ 287,114
Burdened Construction Value (w/o inflation)				$ 1,315,395		$ 384,271		$ 111,592		$ 3,270,657		$ 731,815		$ 302,011		$ 1,004,899
Inflation																
Annual Inflation	4.0%		4.0%		4.0%		4.0%		4.0%		4.0%		4.0%		4.0%	
Enter Year of Construction	2008			2008	2008	2008	Enter year>	2008	Enter year>	2008	Enter year>	2008	Enter year>	2008	Enter year>	2008
Year of Construction Cost incl O&P				$ 1,368,011		$ 399,642		$ 116,055		$ 3,401,483		$ 761,087		$ 314,091		$ 1,045,095
Multipliers																
Design & Engineering	20%		20%	$ 273,602	20%	$ 79,928	20%	$ 23,211	20%	$ 680,297	20%	$ 152,217	20%	$ 62,818	20%	$ 209,019
Mobilization	15%		15%	$ 205,202	15%	$ 59,946	15%	$ 17,408	15%	$ 510,222	15%	$ 114,163	15%	$ 47,114	15%	$ 156,764
Burdened and Inflated Construction Cost				$ 1,846,815		$ 539,517		$ 156,674		$ 4,592,002		$ 1,027,468		$ 424,023		$ 1,410,878
Construction Management	20%		20%	$ 314,643	20%	$ 91,918	20%	$ 26,693	20%	$ 782,341	20%	$ 175,050	20%	$ 72,241	20%	$ 240,372
Cost Opinion for Built Project				$ 2,161,457		$ 631,434		$ 183,367		$ 5,374,343		$ 1,202,518		$ 496,264		$ 1,651,249
Federal Administrative Costs	30%		30%	$ 648,437		$ 189,430		$ 55,010		$ 1,612,303		$ 360,755		$ 148,879		$ 495,375
Cost Opinion for Federalized Built Project				$ 2,809,895		$ 820,865		$ 238,377		$ 6,986,646		$ 1,563,273		$ 645,143		$ 2,146,624

Tonquin Trail			TRNWR Gap (West) A		TRNWR Gap (West) B		TRNWR Gap (West) C		TRNWR Gap (West) D		Sherwood Gap A		Sherwood Gap B		Sherwood Gap C		Coffee Creek Wetlands Gap A	
Willamette River to Tualatin River			Tualatin River - BPA Powerline Corridor		Roy Rogers Rd - TRNWR		TRNWR - Lavender Place		Lavender Pl - SW Tualatin -Sherwood Rd		T-S Rd - Oregon St		T-S Rd - Oregon St		Oregon St - Tonquin Rd		Tonquin Rd - Grahams Ferry Rd	
			8		9		10		11		12		13		14		15	
			4,380 ft		1,640 ft		1,690 ft		4,590 ft		792 ft		4,490 ft		8,550 ft		6,080 ft	
				on street				on street										
12' Trail Common condition	39.75	LF	4,380	$ 174,126	1,640	$ 65,198	1,690	$ 67,185	4,590	$ 182,474	792	$ 31,486	4,490	$ 178,499	8,550	$ 339,903	6,080	$ 241,709
Add for Difficult soils	23.00	LF		$ -		$ -		$ -		$ -		$ -		$ -		$ -		$ -
Add for 4' Fill	20.71	LF		$ -		$ -		$ -		$ -		$ -		$ -		$ -		$ -
Add for 4' Cut	37.68	LF		$ -		$ -		$ -		$ -		$ -		$ -		$ -		$ -
Add for Parallel to stream	99.90	LF		$ -		$ -		$ -		$ -		$ -		$ -		$ -	3,040	$ 303,696
Add for Remove railroad/roadway	10.65	LF		$ -		$ -		$ -		$ -		$ -		$ -		$ -		$ -
Add for Wetland mitigation	262.50	LF		$ -		$ -		$ -		$ -		$ -		$ -	1000	$ 262,500		$ -
12' wide Boardwalk	600.00	LF		$ -		$ -		$ -		$ -		$ -		$ -		$ -		$ -
14' wide Bridge	3,500.00	LF		$ -	60	$ 210,000		$ -		$ -		$ -	80	$ 280,000		$ -		$ -
Add for:																		
Intersection	8,760.00	EA	1	$ 8,760		$ -		$ -	1	$ 8,760		$ -		$ -		$ -		$ -
Signalized intersection	131,760.00	EA		$ -		$ -		$ -		$ -	1	$ 131,760	1	$ 131,760		$ -	1	$ 131,760
Trailhead (20 cars)	78,267.60	EA	1	$ 78,268		$ -		$ -		$ -		$ -		$ -		$ -		$ -
Other																		
Direct Construction Costs incl O&P				$ 261,153		$ 275,198		$ 67,185		$ 191,234		$ 163,246		$ 590,259		$ 602,403		$ 677,165
Contingency																		
Concept Alignment	40%		40%	$ 104,461	40%	$ 110,079	40%	$ 26,874	40%	$ 76,494	40%	$ 65,298	40%	$ 236,103	40%	$ 240,961	40%	$ 270,866
Master Planned	35%		35%		35%		35%		35%		35%		35%		35%		35%	
Preliminary Design	30%		30%		30%		30%		30%		30%		30%		30%		30%	
Final Design	25%		25%		25%		25%		25%		25%		25%		25%		25%	
Under Contract	10%		10%		10%		10%		10%		10%		10%		10%		10%	
				$ 104,461		$ 110,079		$ 26,874		$ 76,494		$ 65,298		$ 236,103		$ 240,961		$ 270,866
Burdened Construction Value (w/o inflation)				$ 365,615		$ 385,277		$ 94,060		$ 267,728		$ 228,544		$ 826,362		$ 843,364		$ 948,031
Inflation																		
Annual Inflation	4.0%		4.0%		4.0%		4.0%		4.0%		4.0%		4.0%		4.0%		4.0%	
Enter Year of Construction	2008		er year>	2008	Enter year>	2008	er year>	2008	Enter year>	2008	er year>	2008	er year>	2008	er year>	2008	er year>	2008
Year of Construction Cost incl O&P				**$ 380,239**		**$ 400,688**		**$ 97,822**		**$ 278,437**		**$ 237,686**		**$ 859,417**		**$ 877,099**		**$ 985,952**
Multipliers																		
Design & Engineering	20%		20%	$ 76,048	20%	$ 80,138	20%	$ 19,564	20%	$ 55,687	20%	$ 47,537	20%	$ 171,883	20%	$ 175,420	20%	$ 197,190
Mobilization	15%		15%	$ 57,036	15%	$ 60,103	15%	$ 14,673	15%	$ 41,766	15%	$ 35,653	15%	$ 128,913	15%	$ 131,565	15%	$ 147,893
Burdened and Inflated Construction Cost				$ 513,323		$ 540,929		$ 132,060		$ 375,890		$ 320,876		$ 1,160,213		$ 1,184,083		$ 1,331,035
Construction Management	20%		20%	$ 87,455	20%	$ 92,158	20%	$ 22,499	20%	$ 64,040	20%	$ 54,668	20%	$ 197,666	20%	$ 201,733	20%	$ 226,769
Cost Opinion for Built Project				$ 600,778		$ 633,087		$ 154,559		$ 439,930		$ 375,544		$ 1,357,878		$ 1,385,816		$ 1,557,804
Federal Administrative Costs	30%			$ 180,233		$ 189,926		$ 46,368		$ 131,979		$ 112,663		$ 407,364		$ 415,745		$ 467,341
Cost Opinion for Federalized Built Project				$ 781,011		$ 823,013		$ 200,927		$ 571,910		$ 488,207		$ 1,765,242		$ 1,801,560		$ 2,025,145

Tonquin Trail

Willamette River to Tualatin River

			Coffee Creek Wetlands Gap B		Coffee Creek Wetlands Gap C		Villebois Gap		Graham Oaks Gap		
			Grahams Ferry Rd - Basalt Creek		Basalt Creek - Boeckman Rd		Boeckman Rd - Costa Circle		Costa Circle - Wilsonville Rd		
			16		17		18		19		
			4,860 ft		1,750 ft		7,600 ft		6,400 ft		82,330 Feet 15.59 Miles
12' Trail Common condition	39.75	LF	4,860	$ 193,208	1,750	$ 69,571	7,600	$ 302,136	6,400	$ 254,430	$3,193,298
Add for Difficult soils	23.00	LF		$ -		$ -		$ -		$ -	
Add for 4' Fill	20.71	LF		$ -		$ -		$ -		$ -	
Add for 4' Cut	37.68	LF		$ -		$ -		$ -		$ -	
Add for Parallel to stream	99.90	LF		$ -		$ -		$ -		$ -	$502,157
Add for Remove railroad/roadway	10.65	LF		$ -		$ -		$ -		$ -	
Add for Wetland mitigation	262.50	LF		$ -	700	$ 183,750		$ -	1000	$ 262,500	$1,359,750
12' wide Boardwalk	600.00	LF		$ -	700	$ 420,000		$ -	1500	$ 900,000	$2,808,000
14' wide Bridge	3,500.00	LF	60	$ 210,000		$ -		$ -		$ -	$1,540,000
Add for:											
Intersection	8,760.00	EA		$ -		$ -		$ -		$ -	$17,520
Signalized intersection	131,760.00	EA	1	$ 131,760		$ -		$ -		$ -	$1,185,840
Trailhead (20 cars)	78,267.60	EA		$ -		$ -	1	$ 78,268	2	$ 156,535	$469,606
Other									structure	$300,000	$300,000
Direct Construction Costs incl O&P				$ 534,968		$ 673,321		$ 380,403		$ 1,873,465	**$11,376,171**
Contingency											
Concept Alignment	40%		40%	$ 213,987	40%	$ 269,328	40%		40%		$3,648,921
Master Planned	35%		35%		35%		35%		35%		
Preliminary Design	30%		30%		30%		30%		30%		
Final Design	25%		25%		25%		25%		25%		
Under Contract	10%		10%		10%		10%	$ 38,040	10%	$ 187,347	$225,387
				$ 213,987		$ 269,328		$ 38,040		$ 187,347	**$3,874,308**
Burdened Construction Value (w/o inflation)				$ 748,955		$ 942,649		$ 418,444		$ 2,060,812	**$15,250,479**
Inflation											
Annual Inflation	4.0%		4.0%		4.0%		4.0%		4.0%		
Enter Year of Construction	2008		er year>	2012	er year>	2012	er year>	2008	er year>	2008	
Year of Construction Cost incl O&P				**$ 911,218**		**$ 1,146,877**		**$ 435,182**		**$ 2,143,244**	**$16,159,325**
Multipliers											
Design & Engineering	20%		20%	$ 182,244	20%	$ 229,375	20%	$ 87,036	20%	$ 428,649	**$3,231,865**
Mobilization	15%		15%	$ 136,683	15%	$ 172,032	15%	$ 65,277	15%	$ 321,487	**$2,423,899**
Burdened and Inflated Construction Cost				$ 1,230,145		$ 1,548,284		$ 587,495		$ 2,893,380	**$21,815,088**
Construction Management	20%		20%	$ 209,580	20%	$ 263,782	20%	$ 100,092	20%	$ 492,946	**$3,716,645**
Cost Opinion for Built Project				$ 1,439,725		$ 1,812,065		$ 687,587		$ 3,386,326	25,531,733
Federal Administrative Costs	30%			$ 431,918		$ 543,620		$ 206,276		$ 1,015,898	
Cost Opinion for Federalized Built Project				$ 1,871,643		$ 2,355,685		$ 893,863		$ 4,402,224	33,191,253

Trolley Trail / 17th Avenue

Springwater Corridor to Willamette River

Item	Unit Cost	Unit	17th Ave 1 (3,276 ft)		Washington - Trolley Trail 2 (1,114 ft)		4,390 ft
12' Trail Common condition	39.75	LF	3,276	$ 130,236	1,114	$ 44,287	$ 174,523
Add for Difficult soils	23.00	LF		$ -		$ -	$0
Add for 4' Fill	20.71	LF		$ -		$ -	$0
Add for 4' Cut	37.68	LF	1500	$ 56,525		$ -	$56,525
Add for Parallel to stream	99.90	LF		$ -		$ -	$0
Add for Remove railroad/roadway	10.65	LF		$ -		$ -	$0
Add for Wetland mitigation	262.50	LF		$ -		$ -	$0
12' wide Boardwalk	600.00	LF		$ -		$ -	$0
14' wide Bridge	3,500.00	LF		$ -	300	$ 1,050,000	$1,050,000
							$0
Add for:							$0
Intersection	8,760.00	EA		$ -		$ -	$0
Signalized intersection	131,760.00	EA	1	$ 131,760	1	$ 131,760	$263,520
Trailhead (20 cars)	78,267.60	EA		$ -		$ -	$0
Other							$0
Direct Construction Costs incl O&P				$ 318,521		$ 1,226,047	**$1,544,568**
Contingency							
Concept Alignment	40%		40%	$ 127,408	40%	$ 490,419	$617,827
Master Planned	35%		35%		35%		
Preliminary Design	30%		30%		30%		
Final Design	25%		25%		25%		
Under Contract	10%		10%		10%		
				$ 127,408		$ 490,419	**$617,827**
Burdened Construction Value (w/o inflation)				$ 445,929		$ 1,716,465	**$2,162,395**
Inflation							
Annual Inflation	4.0%		4.0%		4.0%		
Enter Year of Construction	2008			2008	Enter year>	2008	
Year of Construction Cost incl O&P				$ 463,767		$ 1,785,124	$2,248,891
Multipliers							
Design & Engineering	20%		20%	$ 92,753	20%	$ 357,025	$92,753
Mobilization	15%		15%	$ 69,565	15%	$ 267,769	$69,565
Burdened and Inflated Construction Cost				$ 626,085		$ 2,409,918	$626,085
Construction Management	20%		20%	$ 106,666	20%	$ 410,579	$106,666
Cost Opinion for Built Project				$ 732,751		$ 2,820,496	$3,553,247
Federal Administrative Costs	30%		30%	$ 219,825		$ 846,149	
Cost Opinion for Federalized Built Project				$ 952,576		$ 3,666,645	$4,619,221

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Tualatin River Greenway

Orchard Park to Rood Bridge Park

	Rate	Unit	Tonquin Trail - Hwy 99	1 5,777 ft	Hwy 99 - Jurgens Park	2 4,302 ft	Jurgens Park - Tualatin Community Park	3 7,107 ft	Tualatin Community Park - I-5	5 2,603 ft	I-5 - Brown's Ferry Park	6 2,394 ft	22,183 Feet 4.20 Miles
12' Trail Common condition	39.75	LF	5,777	$ 229,663	4,302	$ 171,025	7,107	$ 141,268	2,603	$ 103,482	2,394	$ 95,173	$740,611
Add for Difficult soils	23.00	LF		$ -		$ -		$ -		$ -		$ -	$0
Add for 4' Fill	20.71	LF		$ -		$ -		$ -		$ -		$ -	$0
Add for 4' Cut	37.68	LF		$ -		$ -		$ -		$ -		$ -	$0
Add for Parallel to stream	99.90	LF		$ -		$ -		$ -		$ -		$ -	$0
Add for Remove railroad/roadway	10.65	LF		$ -		$ -		$ -		$ -		$ -	$0
Add for Wetland mitigation	262.50	LF	953	$ 250,163	984	$ 258,300	2196	$ 576,450		$ -		$ -	$1,084,913
12' wide Boardwalk	600.00	LF		$ -		$ -		$ -		$ -		$ -	$0
14' wide Bridge	3,500.00	LF		$ -		$ -		$ -		$ -		$ -	$0
													$0
Add for:													$0
Intersection	8,760.00	EA		$ -		$ -		$ -		$ -		$ -	$0
Signalized intersection	131,760.00	EA		$ -		$ -		$ -	1	$ 131,760		$ -	$131,760
Trailhead (20 cars)	78,267.60	EA		$ -		$ -		$ -		$ -		$ -	$0
Other													$0
Direct Construction Costs incl O&P				$ 479,826		$ 429,325		$ 717,718		$ 235,242		$ 95,173	**$1,957,283**
Contingency													
Concept Alignment	40%		40%	$ 191,930	40%	$ 171,730	40%	$ 287,087	40%	$ 94,097	40%	$ 38,069	$782,913
Master Planned	35%		35%		35%		35%		35%		35%		
Preliminary Design	30%		30%		30%		30%		30%		30%		
Final Design	25%		25%		25%		25%		25%		25%		
Under Contract	10%		10%		10%		10%		10%		10%		
				$ 191,930		$ 171,730		$ 287,087		$ 94,097		$ 38,069	**$782,913**
Burdened Construction Value (w/o inflation)				$ 671,756		$ 601,055		$ 1,004,806		$ 329,338		$ 133,242	**$2,740,196**
Inflation													
Annual Inflation	4.0%		4.0%		4.0%		4.0%		4.0%		4.0%		
Enter Year of Construction	2008		Enter year>	2008	Enter year>	2008	Enter year>	2008	Enter year>	2008	Enter year>	2008	
Year of Construction Cost incl O&P				**$ 698,626**		**$ 625,097**		**$ 1,044,998**		**$ 342,512**		**$ 138,572**	**$2,849,804**
Multipliers													
Design & Engineering	20%		20%	$ 139,725	20%	$ 125,019	20%	$ 209,000	20%	$ 68,502	20%	$ 27,714	**$569,961**
Mobilization	15%		15%	$ 104,794	15%	$ 93,765	15%	$ 156,750	15%	$ 51,377	15%	$ 20,786	**$427,471**
Burdened and Inflated Construction Cost				$ 943,145		$ 843,881		$ 1,410,747		$ 462,391		$ 187,072	**$3,847,236**
Construction Management	20%		20%	$ 160,684	20%	$ 143,772	20%	$ 240,350	20%	$ 78,778	20%	$ 31,871	**$655,455**
Cost Opinion for Built Project				$ 1,103,829		$ 987,653		$ 1,651,097		$ 541,168		$ 218,943	**4,502,691**
Federal Administrative Costs	30%		30%	$ 331,149		$ 296,296		$ 495,329		$ 162,351		$ 65,683	
Cost Opinion for Federalized Built Project				$ 1,434,978		$ 1,283,949		$ 2,146,426		$ 703,519		$ 284,626	**5,853,498**

Westside Trail			Portland Gap		Mult Co Gap		THPRD Gap #1		THPRD Gap #4		THPRD Gap #5		THPRD Gap #6		THPRD Gap #7	
Tualatin River to the Willamette River				1		2		3		4		5		6		7
				10,138 ft		9,293 ft		9,557 ft		1,637 ft				4,910 ft		880 ft
												bridge crossing				
12' Trail Common condition	39.75	LF	10,138	$ 403,033	9,293	$ 369,441	9,557	$ 189,968	1,637	$ 65,078	-	$ -	4,910	$ 195,196	880	$ 34,984
Add for Difficult soils	23.00	LF		$ -		$ -		$ -		$ -		$ -		$ -		$ -
Add for 4' Fill	20.71	LF	5000	$ 103,563	4500	$ 93,207		$ -		$ -		$ -		$ -		$ -
Add for 4' Cut	37.68	LF	5000	$ 188,415	4500	$ 169,574		$ -		$ -		$ -		$ -		$ -
Add for Parallel to stream	99.90	LF		$ -		$ -		$ -		$ -	-	$ -		$ -		$ -
Add for Remove railroad/roadway	10.65	LF		$ -		$ -		$ -		$ -		$ -		$ -		$ -
Add for Wetland mitigation	262.50	LF		$ -		$ -	500	$ 131,250		$ -		$ -		$ -		$ -
12' wide Boardwalk	600.00	LF		$ -		$ -	300	$ 180,000		$ -		$ -		$ -		$ -
14' wide Bridge	3,500.00	LF		$ -		$ -	300	$ 1,050,000		$ -		$ -	150	$ 525,000		$ -
Add for:																
Intersection	8,760.00	EA	1	$ 8,760	1	$ 8,760	5	$ 43,800		$ -		$ -	1	$ 8,760		$ -
Signalized intersection	131,760.00	EA		$ -	1	$ 131,760	1	$ 131,760	1	$ 131,760		$ -	1	$ 131,760		$ -
Trailhead (20 cars)	78,267.60	EA		$ -		$ -		$ -		$ -		$ -		$ -		$ -
Other											Hwy 26 overcrossing	$10,000,000			walker Rd overcrossin(	$1,500,000
Direct Construction Costs incl O&P				$ 703,771		$ 772,741		$ 1,726,778		$ 196,838		$ 10,000,000		$ 860,716		$ 1,534,984
Contingency																
Concept Alignment	40%		40%	$ 281,509	40%	$ 309,096	40%	$ 690,711	40%	$ 78,735	40%	$ 4,000,000	40%	$ 344,286	40%	$ 613,994
Master Planned	35%		35%		35%		35%		35%		35%		35%		35%	
Preliminary Design	30%		30%		30%		30%		30%		30%		30%		30%	
Final Design	25%		25%		25%		25%		25%		25%		25%		25%	
Under Contract	10%		10%		10%		10%		10%		10%		10%		10%	
				$ 281,509		$ 309,096		$ 690,711		$ 78,735		$ 4,000,000		$ 344,286		$ 613,994
Burdened Construction Value (w/o inflation)				$ 985,280		$ 1,081,837		$ 2,417,489		$ 275,574		$ 14,000,000		$ 1,205,002		$ 2,148,978
Inflation																
Annual Inflation	4.0%		4.0%		4.0%		4.0%		4.0%		4.0%		4.0%		4.0%	
Enter Year of Construction	2008		Enter year>	2008	Enter year>	2008	Enter year>	2008	Enter year>	2008	Enter year>	2008	Enter year>	2008	Enter year>	2008
Year of Construction Cost incl O&P				$ 1,024,691		$ 1,125,111		$ 2,514,189		$ 286,597		$ 14,560,000		$ 1,253,202		$ 2,234,937
Multipliers																
Design & Engineering	20%		20%	$ 204,938	20%	$ 225,022	20%	$ 502,838	20%	$ 57,319	20%	$ 2,912,000	20%	$ 250,640	20%	$ 446,987
Mobilization	15%		15%	$ 153,704	15%	$ 168,767	15%	$ 377,128	15%	$ 42,990	15%	$ 2,184,000	15%	$ 187,980	15%	$ 335,241
Burdened and Inflated Construction Cost				$ 1,383,333		$ 1,518,899		$ 3,394,155		$ 386,906		$ 19,656,000		$ 1,691,823		$ 3,017,165
Construction Management	20%		20%	$ 235,679	20%	$ 258,775	20%	$ 578,263	20%	$ 65,917	20%	$ 3,348,800	20%	$ 288,236	20%	$ 514,035
Cost Opinion for Built Project				**$ 1,619,012**		**$ 1,777,675**		**$ 3,972,418**		**$ 452,823**		**$ 23,004,800**		**$ 1,980,059**		**$ 3,531,200**
Federal Administrative Costs	30%		30%	$ 485,704		$ 533,302		$ 1,191,725		$ 135,847		$ 6,901,440		$ 594,018		$ 1,059,360
Cost Opinion for Federalized Built Project				**$ 2,104,716**		**$ 2,310,977**		**$ 5,164,144**		**$ 588,670**		**$ 29,906,240**		**$ 2,574,077**		**$ 4,590,560**

Westside Trail

Tualatin River to the Willamette River

			THPRD Gap #8		THPRD Gap#9		THPRD Gap #10		THPRD Gap #11	
				8 1,531 ft		9 4,013 ft		10 3,010 ft		11 1,162 ft
12' Trail Common condition	39.75	LF	1,531	$ 60,864	4,013	$ 159,536	3,010	$ 119,662	1,162	$ 46,195
Add for Difficult soils	23.00	LF		$ -		$ -		$ -		$ -
Add for 4' Fill	20.71	LF		$ -		$ -		$ -		$ -
Add for 4' Cut	37.68	LF		$ -		$ -		$ -		$ -
Add for Parallel to stream	99.90	LF		$ -		$ -		$ -		$ -
Add for Remove railroad/roadway	10.65	LF		$ -		$ -		$ -		$ -
Add for Wetland mitigation	262.50	LF	550	$ 144,375	440	$ 115,500		$ -		$ -
12' wide Boardwalk	600.00	LF		$ -		$ -		$ -		$ -
14' wide Bridge	3,500.00	LF	100	$ 350,000	400	$ 1,400,000		$ -		$ -
Add for:										
Intersection	8,760.00	EA		$ -		$ -		$ -		$ -
Signalized intersection	131,760.00	EA		$ -		$ -		$ -		$ -
Trailhead (20 cars)	78,267.60	EA		$ -		$ -		$ -		$ -
Other										
Direct Construction Costs incl O&P				$ 555,239		$ 1,675,036		$ 119,662		$ 46,195
Contingency										
Concept Alignment	40%		40%	$ 222,096	40%	$ 670,014	40%	$ 47,865	40%	$ 18,478
Master Planned	35%		35%		35%		35%		35%	
Preliminary Design	30%		30%		30%		30%		30%	
Final Design	25%		25%		25%		25%		25%	
Under Contract	10%		10%		10%		10%		10%	
				$ 222,096		$ 670,014		$ 47,865		$ 18,478
Burdened Construction Value (w/o inflation)				$ 777,335		$ 2,345,050		$ 167,526		$ 64,673
Inflation										
Annual Inflation	4.0%		4.0%		4.0%		4.0%		4.0%	
Enter Year of Construction	2008		Enter year>	2008	Enter year>	2008	Enter year>	2008	Enter year>	2008
Year of Construction Cost incl O&P				$ 808,429		$ 2,438,852		$ 174,227		$ 67,260
Multipliers										
Design & Engineering	20%		20%	$ 161,686	20%	$ 487,770	20%	$ 34,845	20%	$ 13,452
Mobilization	15%		15%	$ 121,264	15%	$ 365,828	15%	$ 26,134	15%	$ 10,089
Burdened and Inflated Construction Cost				$ 1,091,379		$ 3,292,450		$ 235,207		$ 90,801
Construction Management	20%		20%	$ 185,939	20%	$ 560,936	20%	$ 40,072	20%	$ 15,470
Cost Opinion for Built Project				$ 1,277,317		$ 3,853,386		$ 275,279		$ 106,271
Federal Administrative Costs	30%			$ 383,195		$ 1,156,016		$ 82,584		$ 31,881
Cost Opinion for Federalized Built Project				$ 1,660,513		$ 5,009,402		$ 357,863		$ 138,152

			THPRD Gap#12		THPRD Gap#13		THPRD Gap #14	
				12 2,218 ft		13 2,059 ft		14 2,599 ft
12' Trail Common condition	39.75	LF	2,218	$ 88,176	2,059	$ 81,855	2,599	$ 103,323
Add for Difficult soils	23.00	LF		$ -		$ -		$ -
Add for 4' Fill	20.71	LF		$ -	1000	$ 20,713		$ -
Add for 4' Cut	37.68	LF		$ -	1000	$ 37,683		$ -
Add for Parallel to stream	99.90	LF		$ -		$ -		$ -
Add for Remove railroad/roadway	10.65	LF		$ -		$ -		$ -
Add for Wetland mitigation	262.50	LF		$ -		$ -		$ -
12' wide Boardwalk	600.00	LF		$ -		$ -		$ -
14' wide Bridge	3,500.00	LF		$ -		$ -		$ -
Add for:								
Intersection	8,760.00	EA		$ -		$ -	1	$ 8,760
Signalized intersection	131,760.00	EA		$ -		$ -		$ -
Trailhead (20 cars)	78,267.60	EA		$ -		$ -		$ -
Other								
Direct Construction Costs incl O&P				$ 88,176		$ 140,251		$ 112,083
Contingency								
Concept Alignment	40%		40%	$ 35,270	40%	$ 56,100	40%	$ 44,833
Master Planned	35%		35%		35%		35%	
Preliminary Design	30%		30%		30%		30%	
Final Design	25%		25%		25%		25%	
Under Contract	10%		10%		10%		10%	
				$ 35,270		$ 56,100		$ 44,833
Burdened Construction Value (w/o inflation)				$ 123,446		$ 196,351		$ 156,916
Inflation								
Annual Inflation	4.0%		4.0%		4.0%		4.0%	
Enter Year of Construction	2008		Enter year>	2008	Enter year>	2008	Enter year>	2012
Year of Construction Cost incl O&P				$ 128,384		$ 204,205		$ 190,912
Multipliers								
Design & Engineering	20%		20%	$ 25,677	20%	$ 40,841	20%	$ 38,182
Mobilization	15%		15%	$ 19,258	15%	$ 30,631	15%	$ 28,637
Burdened and Inflated Construction Cost				$ 173,319		$ 275,677		$ 257,731
Construction Management	20%		20%	$ 29,528	20%	$ 46,967	20%	$ 43,910
Cost Opinion for Built Project				$ 202,847		$ 322,644		$ 301,641
Federal Administrative Costs	30%			$ 60,854		$ 96,793		$ 90,492
Cost Opinion for Federalized Built Project				$ 263,701		$ 419,437		$ 392,133

Westside Trail

Tualatin River to the Willamette River

			THPRD Gap #15		Tigard Gap		Washington Co Gap #1		Washington Gap #2		
				15 2,059 ft		16 4,013 ft		17 6,125 ft		18 3,907 ft	69,111 Feet 13.09 Miles
12' Trail Common condition	39.75	LF	2,059	$ 81,855	4,013	$ 159,536	6,125	$ 243,498	3,907	$ 155,322	$2,557,521
Add for Difficult soils	23.00	LF		$ -		$ -		$ -		$ -	$0
Add for 4' Fill	20.71	LF		$ -	2000	$ 41,425	2800	$ 57,995		$ -	$316,903
Add for 4' Cut	37.68	LF		$ -	2000	$ 75,366	2800	$ 105,512		$ -	$576,550
Add for Parallel to stream	99.90	LF		$ -		$ -		$ -		$ -	$0
Add for Remove railroad/roadway	10.65	LF		$ -		$ -		$ -		$ -	$0
Add for Wetland mitigation	262.50	LF	400	$ 105,000		$ -		$ -		$ -	$496,125
12' wide Boardwalk	600.00	LF		$ -		$ -		$ -		$ -	$180,000
14' wide Bridge	3,500.00	LF		$ -		$ -	300	$ 1,050,000		$ -	$4,375,000
											$0
Add for:											$0
Intersection	8,760.00	EA		$ -		$ -	2	$ 17,520		$ -	$96,360
Signalized intersection	131,760.00	EA		$ -	1	$ 131,760		$ -	1	$ 131,760	$790,560
Trailhead (20 cars)	78,267.60	EA		$ -		$ -		$ -		$ -	$0
Other											$11,500,000
Direct Construction Costs incl O&P				$ 186,855		$ 408,087		$ 1,474,525		$ 287,082	**$20,889,018**
Contingency											
Concept Alignment	40%		40%	$ 74,742	40%		40%		40%		$7,487,730
Master Planned	35%		35%		35%		35%		35%		$0
Preliminary Design	30%		30%		30%		30%		30%		$0
Final Design	25%		25%		25%		25%		25%		$0
Under Contract	10%		10%		10%	$ 40,809	10%	$ 147,453	10%	$ 28,708	$216,969
				$ 74,742		$ 40,809		$ 147,453		$ 28,708	**$7,704,699**
Burdened Construction Value (w/o inflation)				$ 261,597		$ 448,896		$ 1,621,978		$ 315,790	**$28,593,717**
Inflation											
Annual Inflation	4.0%		4.0%		4.0%		4.0%		4.0%		
Enter Year of Construction	2008		Enter year>	2012	Enter year>	2008	Enter year>	2008	Enter year>	2008	
Year of Construction Cost incl O&P				**$ 318,273**		**$ 466,851**		**$ 1,686,857**		**$ 328,421**	**$29,811,398**
Multipliers											
Design & Engineering	20%		20%	$ 63,655	20%	$ 93,370	20%	$ 337,371	20%	$ 65,684	**$5,962,280**
Mobilization	15%		15%	$ 47,741	15%	$ 70,028	15%	$ 253,029	15%	$ 49,263	**$4,471,710**
Burdened and Inflated Construction Cost				$ 429,668		$ 630,249		$ 2,277,257		$ 443,369	**$40,245,387**
Construction Management	20%		20%	$ 73,203	20%	$ 107,376	20%	$ 387,977	20%	$ 75,537	**$6,856,621**
Cost Opinion for Built Project				**$ 502,871**		**$ 737,625**		**$ 2,665,234**		**$ 518,906**	**47,102,008**
Federal Administrative Costs	30%			$ 150,861		$ 221,288		$ 799,570		$ 155,672	
Cost Opinion for Federalized Built Project				**$ 653,732**		**$ 958,913**		**$ 3,464,804**		**$ 674,578**	**61,232,611**

North Portland Willamette Greenway

			St Johns Gap 1 2,524 ft		Lampros Steel Gap 2 1,270 ft		Willamette Cove Gap 3 3,540 ft		MacBaxter-Triangle Gap 4 5,180 ft		Waud Bluff Gap 5 2,800 ft	
12' Trail Common condition	39.75	LF	2,524	$ 100,341	1,270	$ 50,488	3,540	$ 140,732	5,180	$ 205,929	2,800	$ 111,313
Add for Difficult soils	23.00	LF		$ -		$ -	1,000	$ 23,000	2,500	$ 57,500	1,000	$ 23,000
Add for 4' Fill	20.71	LF		$ -		$ -	1500	$ 31,069		$ -	1300	$ 26,926
Add for 4' Cut	37.68	LF		$ -		$ -	1500	$ 56,525		$ -	1300	$ 48,988
Add for Parallel to stream	99.90	LF		$ -		$ -		$ -		$ -	1000	$ 99,900
Add for Remove railroad/roadway	10.65	LF		$ -		$ -		$ -		$ -		$ -
Add for Wetland mitigation	262.50	LF		$ -		$ -	500	$ 131,250		$ -	500	$ 131,250
12' wide Boardwalk	600.00	LF		$ -		$ -		$ -		$ -	2000	$ 1,200,000
14' wide Bridge	3,500.00	LF	600	$ 2,100,000		$ -		$ -		$ -		$ -
Add for:												
Intersection	8,760.00	EA		$ -	1	$ 8,760		$ -		$ -		$ -
Signalized intersection	131,760.00	EA	1	$ 131,760		$ -		$ -		$ -		$ -
Trailhead (20 cars)	78,267.60	EA		$ -		$ -		$ -		$ -		$ -
Other												
Direct Construction Costs incl O&P				$ 2,332,101		$ 59,248		$ 382,575		$ 263,429		$ 1,641,378
Contingency												
Concept Alignment	40%		40%	$ 932,840	40%	$ 23,699	40%	$ 153,030	40%	$ 105,372	40%	$ 656,551
Master Planned	35%		35%		35%		35%		35%		35%	
Preliminary Design	30%		30%		30%		30%		30%		30%	
Final Design	25%		25%		25%		25%		25%		25%	
Under Contract	10%		10%		10%		10%		10%		10%	
				$ 932,840		$ 23,699		$ 153,030		$ 105,372		$ 656,551
Burdened Construction Value (w/o inflation)				$ 3,264,941		$ 82,948		$ 535,605		$ 368,801		$ 2,297,929
Inflation												
Annual Inflation	4.0%		4.0%		4.0%		4.0%		4.0%		4.0%	
Enter Year of Construction	2008			2008		2008		2008		2008		2008
Year of Construction Cost incl O&P				**$ 3,395,539**		**$ 86,266**		**$ 557,029**		**$ 383,553**		**$ 2,389,846**
Multipliers												
Design & Engineering	20%		20%	$ 679,108	20%	$ 17,253	20%	$ 111,406	20%	$ 76,711	20%	$ 477,969
Mobilization	15%		15%	$ 509,331	15%	$ 12,940	15%	$ 83,554	15%	$ 57,533	15%	$ 358,477
Burdened and Inflated Construction Cost				$ 4,583,978		$ 116,459		$ 751,990		$ 517,797		$ 3,226,292
Construction Management	20%		20%	$ 780,974	20%	$ 19,841	20%	$ 128,117	20%	$ 88,217	20%	$ 549,664
Cost Opinion for Built Project				$ 5,364,952		$ 136,300		$ 880,106		$ 606,014		$ 3,775,956
Federal Administrative Costs	30%		30%	$ 1,609,485		$ 40,890		$ 264,032		$ 181,804		$ 1,132,787
Cost Opinion for Federalized Built Project				$ 6,974,437		$ 177,190		$ 1,144,138		$ 787,818		$ 4,908,743

North Portland Willamette Greenway

				Basin Ave Lagoon Gap		River to Lagoon Gap		Ports of Call Gap		Cement Road Gap		River Street	
				6		7		7		8		9	
				5,390 ft		2,745 ft		400 ft		4,650 ft		2,950 ft	31,449 Feet 5.96 Miles
12' Trail Common condition	39.75	LF	5,390	$ 214,278	2,745	$ 109,127	400	$ 15,902	4,650	$ 184,859	2,950	$ 117,276	$ 1,250,246
Add for Difficult soils	23.00	LF		$ -		$ -		$ -		$ -		$ -	$103,500
Add for 4' Fill	20.71	LF		$ -		$ -		$ -		$ -		$ -	$57,995
Add for 4' Cut	37.68	LF		$ -		$ -		$ -		$ -		$ -	$105,512
Add for Parallel to stream	99.90	LF		$ -		$ -		$ -		$ -		$ -	$99,900
Add for Remove railroad/roadway	10.65	LF		$ -		$ -		$ -		$ -		$ -	$0
Add for Wetland mitigation	262.50	LF		$ -		$ -	250	$ 65,625		$ -		$ -	$328,125
12' wide Boardwalk	600.00	LF		$ -		$ -		$ -		$ -		$ -	$1,200,000
14' wide Bridge	3,500.00	LF		$ -		$ -		$ -		$ -		$ -	$2,100,000
													$0
Add for:													$0
Intersection	8,760.00	EA	4	$ 35,040	3	$ 26,280		$ -		$ -		$ -	$70,080
Signalized intersection	131,760.00	EA		$ -		$ -		$ -		$ -		$ -	$131,760
Trailhead (20 cars)	78,267.60	EA		$ -		$ -		$ -		$ -		$ -	$0
Other									Fence	117,000			$117,000
Direct Construction Costs incl O&P				$ 249,318		$ 135,407		$ 81,527		$ 301,859		$ 117,276	**$5,564,119**
Contingency													
Concept Alignment	40%		40%	$ 99,727	40%	$ 54,163	40%	$ 32,611	40%	$ 120,744	40%	$ 46,911	$2,225,648
Master Planned	35%		35%		35%		35%		35%		35%		
Preliminary Design	30%		30%		30%		30%		30%		30%		
Final Design	25%		25%		25%		25%		25%		25%		
Under Contract	10%		10%		10%		10%		10%		10%		
				$ 99,727		$ 54,163		$ 32,611		$ 120,744		$ 46,911	**$2,225,648**
Burdened Construction Value (w/o inflation)				$ 349,045		$ 189,569		$ 114,138		$ 422,603		$ 164,187	**$7,789,766**
Inflation													
Annual Inflation	4.0%		4.0%		4.0%		4.0%		4.0%		4.0%		
Enter Year of Construction	2008			2008		2008		2008		2008		2008	
Year of Construction Cost incl O&P				**$ 363,007**		**$ 197,152**		**$ 118,703**		**$ 439,507**		**$ 170,754**	**$8,101,357**
Multipliers													
Design & Engineering	20%		20%	$ 72,601	20%	$ 39,430	20%	$ 23,741	20%	$ 87,901	20%	$ 34,151	$1,620,271
Mobilization	15%		15%	$ 54,451	15%	$ 29,573	15%	$ 17,805	15%	$ 65,926	15%	$ 25,613	$1,215,204
Burdened and Inflated Construction Cost				$ 490,059		$ 266,155		$ 160,249		$ 593,335		$ 230,519	$10,936,832
Construction Management	20%		20%	$ 83,492	20%	$ 45,345	20%	$ 27,302	20%	$ 101,087	20%	$ 39,274	$1,863,312
Cost Opinion for Built Project				**$ 573,551**		**$ 311,500**		**$ 187,551**		**$ 694,422**		**$ 269,792**	**$12,800,144**
Federal Administrative Costs	30%			$ 172,065		$ 93,450		$ 56,265		$ 208,326		$ 80,938	
Cost Opinion for Federalized Built Project				**$ 745,616**		**$ 404,951**		**$ 243,816**		**$ 902,748**		**$ 350,730**	**$16,640,188**

Northwest Willamette Trail

			Linnton Gap (Multnomah Channel - RR Bridge)		Guilds Lake Gap (RR Bridge - Fremont Bridge)		
			1	26,981 ft	2	30,413 ft	57,394 feet 10.87 miles
12' Trail Common condition	39.75	LF	26,981	$ 1,072,622	30,413	$ 1,209,080	$ 2,281,683
Add for Difficult soils	23.00	LF		$ -		$ -	$0
Add for 4' Fill	20.71	LF	13000	$ 269,264	15000	$ 310,889	$579,953
Add for 4' Cut	37.68	LF	13000	$ 489,879	15000	$ 565,245	$1,055,124
Add for Parallel to stream	99.90	LF		$ -		$ -	$0
Add for Remove railroad/roadway	10.65	LF		$ -		$ -	$0
Add for Wetland mitigation	262.50	LF		$ -		$ -	$0
12' wide Boardwalk	600.00	LF		$ -		$ -	$0
14' wide Bridge	3,500.00	LF		$ -		$ -	$0
							$0
Add for:							$0
Intersection	8,760.00	EA	6	$ 52,560	6	$ 52,560	$105,120
Signalized intersection	131,760.00	EA		$ -		$ -	$0
Trailhead (20 cars)	78,267.60	EA		$ -		$ -	$0
Other							$0
Direct Construction Costs incl O&P				$ 1,884,325		$ 2,137,554	$4,021,879
Contingency							
Concept Alignment	40%		40%		40%		
Master Planned	35%		35%		35%		
Preliminary Design	30%		30%	$ 565,297	30%	$ 641,266	$1,206,564
Final Design	25%		25%		25%		
Under Contract	10%		10%		10%		
				$ 565,297		$ 641,266	$1,206,564
Burdened Construction Value (w/o inflation)				$ 2,449,622		$ 2,778,821	$5,228,443
Inflation							
Annual Inflation	4.0%		4.0%		4.0%		
Enter Year of Construction	2008		Enter year>	2008	Enter year>	2008	
Year of Construction Cost incl O&P				$ 2,547,607		$ 2,889,973	$5,437,581
Multipliers							
Design & Engineering	20%		20%	$ 509,521	20%	$ 577,995	$509,521
Mobilization	15%		15%	$ 382,141	15%	$ 433,496	$382,141
Burdened and Inflated Construction Cost				$ 3,439,270		$ 3,901,464	$3,439,270
Construction Management	20%		20%	$ 585,950	20%	$ 664,694	$585,950
Cost Opinion for Built Project				$ 4,025,220		$ 4,566,158	$8,591,378
Federal Administrative Costs	30%		30%	$ 1,207,566		$ 1,369,847	
Cost Opinion for Federalized Built Project				$ 5,232,785		$ 5,936,006	$11,168,791

South Waterfront Greenway

				SW#1		SW#2		SW#3	
				1		2		3	
				2,746 ft		1,531 ft		1,637 ft	5,914 Feet
									1.12 Miles
12' Trail Common condition	39.75	LF	2,746	$ 109,166	1,531	$ 60,864	1,637	$ 65,078	$ 235,109
Add for Difficult soils	23.00	LF	2,746	$ 63,158	1,531	$ 35,213	1,637	$ 37,651	
Add for 4' Fill	20.71	LF	1500	$ 31,069	800	$ 16,570	800	$ 16,570	$64,209
Add for 4' Cut	37.68	LF	1500	$ 56,525	800	$ 30,146	800	$ 30,146	$116,817
Add for Parallel to stream	99.90	LF	2500	$ 249,750	1500	$ 149,850	1500	$ 149,850	$549,450
Add for Remove railroad/roadway	10.65	LF		$ -		$ -		$ -	
Add for Wetland mitigation	262.50	LF	2746	$ 720,825	1531	$ 401,888	1637	$ 429,713	$1,552,425
12' wide Boardwalk	600.00	LF	2746	$ 1,647,600	1531	$ 918,600	1637	$ 982,200	$3,548,400
14' wide Bridge	3,500.00	LF		$ -		$ -		$ -	
6' retaining wall		LF	2746	$ -	1531	$ -	1637	$ -	$0
Add for:									
Intersection	8,760.00	EA		$ -		$ -		$ -	
Signalized intersection	131,760.00	EA		$ -		$ -		$ -	
Trailhead (20 cars)	78,267.60	EA		$ -		$ -		$ -	
								0	
Direct Construction Costs incl O&P				$ 2,878,093		$ 1,613,131		$ 1,711,208	**$6,202,433**
Contingency									
Concept Alignment	40%		40%	$ 1,151,237	40%	$ 645,253	40%	$ 684,483	$2,480,973
Master Planned	35%		35%		35%		35%		
Preliminary Design	30%		30%		30%		30%		
Final Design	25%		25%		25%		25%		
Under Contract	10%		10%		10%		10%		
				$ 1,151,237		$ 645,253		$ 684,483	**$2,480,973**
Burdened Construction Value (w/o inflation)				$ 4,029,330		$ 2,258,384		$ 2,395,692	**$8,683,406**
Inflation									
Annual Inflation	4.0%		4.0%		0.0%		4.0%		
Enter Year of Construction	2008			2008	er year>	2008	er year>	2008	
Year of Construction Cost incl O&P				**$ 4,190,503**		**$ 2,348,719**		**$ 2,491,520**	**$9,030,742**
Multipliers									
Design & Engineering	20%		20%	$ 838,101	20%	$ 469,744	20%	$ 498,304	$1,806,148
Mobilization	15%		15%	$ 628,575	15%	$ 352,308	15%	$ 373,728	$1,354,611
Burdened and Inflated Construction Cost				$ 5,657,179		$ 3,170,771		$ 3,363,551	$12,191,502
Construction Management	20%		20%	$ 963,816	20%	$ 540,205	20%	$ 573,049	$2,077,071
Cost Opinion for Built Project				**$ 6,620,995**		**$ 3,710,977**		**$ 3,936,601**	**$14,268,573**
Federal Administrative Costs	30%		30%	$ 1,986,299		$ 1,113,293		$ 1,180,980	
Cost Opinion for Federalized Built Project				**$ 8,607,294**		**$ 4,824,270**		**$ 5,117,581**	**$18,549,144**

Springwater on the Willamette

					1 1,841 ft	1,841 Feet 0.35 Miles
12' Trail Common condition	39.75	LF	1,841	$	73,188	$ 73,188
Add for Difficult soils	23.00	LF	1,800	$	41,400	$ 41,400
Add for 4' Fill	20.71	LF	1300	$	26,926	$ 26,926
Add for 4' Cut	37.68	LF	1300	$	48,988	$ 48,988
Add for Parallel to stream	99.90	LF		$	-	$ -
Add for Remove railroad/roadway	10.65	LF		$	-	$ -
Add for Wetland mitigation	262.50	LF		$	-	$ -
12' wide Boardwalk	600.00	LF		$	-	$ -
14' wide Bridge	3,500.00	LF		$	-	$ -
						$ -
Add for:						$ -
Intersection	8,760.00	EA		$	-	$ -
Signalized intersection	131,760.00	EA		$	-	$ -
Trailhead (20 cars)	78,267.60	EA		$	-	$ -
Other						$ -
Direct Construction Costs incl O&P				$	190,503	**$190,503**
Contingency						
Concept Alignment	40%		40%	$	76,201	$76,201
Master Planned	35%		35%			
Preliminary Design	30%		30%			
Final Design	25%		25%			
Under Contract	10%		10%			
				$	76,201	**$76,201**
Burdened Construction Value (w/o inflation)				$	266,704	**$266,704**
Inflation						
Annual Inflation	4.0%					
Enter Year of Construction	2008				2008	
Year of Construction Cost incl O&P				**$**	**277,372**	**$277,372**
Multipliers						
Design & Engineering	20%		20%	$	55,474	**$55,474**
Mobilization	15%		15%	$	41,606	**$41,606**
Burdened and Inflated Construction Cost				$	374,452	**$374,452**
Construction Management	20%		20%	$	63,796	**$63,796**
Cost Opinion for Built Project				**$**	**438,248**	**438,248**
Federal Administrative Costs	30%		30%	$	131,474	
Cost Opinion for Federalized Built Project				**$**	**569,722**	**569,722**

Springwater Gap

Umatilla to Ochoco			Umatilla to Harney 1 320 ft		Harney to Clatsop 2 550 ft		Clatsop to Marion 3 350 ft		Marion to Linn 4 410 ft		Linn to 11th 5 540 ft		11th to 13th 6 540 ft		13th to Power Station 7 620 ft	
12' Trail Common condition	39.75	LF	320	$ 12,722	550	$ 30,611	350	$ 19,480	410	$ 22,819	540	$ 30,055	540	$ 30,055	620	$ 34,507
Add for Difficult soils	23.00	LF		$ -	400	$ 9,200		$ -		$ -	250	$ 5,750	250	$ 5,750		$ -
Add for 4' Fill	20.71	LF		$ -		$ -		$ -		$ -		$ -		$ -		$ -
Add for 4' Cut	37.68	LF	150	$ 5,652	530	$ 19,972	280	$ 21,102		$ -		$ -		$ -	540	$ 20,349
Add for Parallel to stream	99.90	LF		$ -		$ -		$ -		$ -		$ -		$ -		$ -
Add for Remove railroad/roadway	10.65	LF	320	$ 3,408		$ -		$ -		$ -		$ -		$ -		$ -
Add for Wetland mitigation	262.50	LF		$ -		$ -		$ -		$ -		$ -		$ -		$ -
12' wide Boardwalk	600.00	LF		$ -		$ -		$ -		$ -		$ -		$ -		$ -
14' wide Bridge	3,500.00	LF		$ -		$ -		$ -		$ -		$ -		$ -		$ -
Add for 6' retaining wall		LF	160	$											200	$ -
Add for:																
Intersection	8,760.00	LF	2	$ 17,520		$ -		$ -	1	$ 8,760	2	$ 17,520		$ -	1	$ 8,760
Signalized intersection	131,760.00	LF		$ -		$ -		$ -		$ -		$ -		$ -		$ -
Trailhead (20 cars)	78,267.60	EA		$ -		$ -		$ -		$ -		$ -		$ -		$ -
Other			fence/street improve	107,250	fence	13,500	RR crossing Improv	53,500	Str Improve	133,750	pole/vault relo	42,050	pole reloc	49,750	fence	12,500
Direct Construction Costs incl O&P				$ 146,552		$ 73,283		$ 94,082		$ 165,329		$ 95,375		$ 85,555		$ 76,116
Contingency																
Concept Alignment	40%		40%		40%		40%		40%		40%		40%		40%	
Master Planned	35%		35%	$ 51,293	35%	$ 25,649	35%	$ 32,929	35%	$ 57,865	35%	$ 33,381	35%	$ 29,944	35%	$ 26,641
Preliminary Design	30%		30%		30%		30%		30%		30%		30%		30%	
Final Design	25%		25%		25%		25%		25%		25%		25%		25%	
Under Contract	10%		10%		10%		10%		10%		10%		10%		10%	
				$ 51,293		$ 25,649		$ 32,929		$ 57,865		$ 33,381		$ 29,944		$ 26,641
Burdened Construction Value (w/o Inflation)				$ 197,845		$ 98,932		$ 127,011		$ 223,194		$ 128,756		$ 115,499		$ 102,756
Inflation																
Annual Inflation	4%		4.0%		4.0%		4.0%		4.0%		4.0%		4.0%		4.0%	
Enter Year of Construction	2008		Enter year>	2008	Enter year>	2008	Enter year>	2008	Enter year>	2008	Enter year>	2008	Enter year>	2008	Enter year>	2008
r of Construction Cost incl O&P				$ 205,759		$ 102,890		$ 132,092		$ 232,122		$ 133,906		$ 120,119		$ 106,867
Multipliers																
Design & Engineering	20%		20%	$ 41,152	20%	$ 20,578	20%	$ 26,418	20%	$ 46,424	20%	$ 26,781	20%	$ 24,024	20%	$ 21,373
Mobilization	15%		15%	$ 30,864	15%	$ 15,433	15%	$ 19,814	15%	$ 34,818	15%	$ 20,086	15%	$ 18,018	15%	$ 16,030
Burdened and Inflated Construction Cost				$ 277,775		$ 138,901		$ 178,324		$ 313,365		$ 180,773		$ 162,160		$ 144,270
Construction Management	20%		20%	$ 47,325	20%	$ 23,665	20%	$ 30,381	20%	$ 53,388	20%	$ 30,798	20%	$ 27,627	20%	$ 24,579
Cost Opinion for Built Project				$ 325,099		$ 162,565		$ 208,705		$ 366,753		$ 211,571		$ 189,787		$ 168,849
Federal Administrative Costs	30%		30%	$ 97,530		$ 48,770		$ 62,611		$ 110,026		$ 63,471		$ 56,936		$ 50,655
Cost Opinion for Federalized Built Project				$ 422,629		$ 211,335		$ 271,316		$ 476,779		$ 275,043		$ 246,724		$ 219,504

Springwater Gap

Umatilla to Ochoco				PS to SE 16th		16th to 17th		17 th Three Bridges		19th Linn to Ochoco	
				8		9		10		11	
				390 ft		560 ft		470 ft			4,750 Feet
											0.90 Miles
12' Trail Common condition	39.75	LF	390	$ 21,706	560	$ 31,168	470	$ 26,159		$ -	$ 259,280
Add for Difficult soils	23.00	LF	300	$ 6,900		$ -		$ -		$ -	$27,600
Add for 4' Fill	20.71	LF		$ -		$ -		$ -		$ -	
Add for 4' Cut	37.68	LF		$ -		$ -		$ -		$ -	$67,076
Add for Parallel to stream	99.90	LF		$ -		$ -		$ -		$ -	
Add for Remove railroad/roadway	10.65	LF		$ -		$ -	250	$ 2,663		$ -	$6,071
Add for Wetland mitigation	262.50	LF		$ -		$ -		$ -		$ -	
12' wide Boardwalk	600.00	LF		$ -		$ -		$ -		$ -	
14' wide Bridge	3,500.00	LF		$ -		$ -		$ -		$ -	
Add for 6' retaining wall		LF	150	$ -	50	$ -					$0
Add for:											
Intersection	8,760.00	LF		$ -		$ -	1	$ 8,760		$ -	$61,320
Signalized intersection	131,760.00	LF		$ -		$ -	1.5	$ 197,640		$ -	$197,640
Trailhead (20 cars)	78,267.60	EA		$ -		$ -		$ -		$ -	
Other			fence	13,325	Str Improv.fence	219,550	other	115,000	other	312,600	$1,072,775
Direct Construction Costs incl O&P				$ 41,931		$ 250,718		$ 350,221		$ 312,600	**$1,691,762**
Contingency											
Concept Alignment	40%		40%		40%		40%		40%		
Master Planned	35%		35%	$ 14,676	35%	$ 87,751	35%	$ 122,577	35%	$ 109,410	$592,117
Preliminary Design	30%		30%		30%		30%		30%		
Final Design	25%		25%		25%		25%		25%		
Under Contract	10%		10%		10%		10%		10%		
				$ 14,676		$ 87,751		$ 122,577		$ 109,410	**$592,117**
Burdened Construction Value (w/o inflation)				$ 56,607		$ 338,469		$ 472,798		$ 422,010	**$2,283,878**
Inflation											
Annual Inflation	4%		4.0%		4.0%		4.0%		4.0%		
Enter Year of Construction	2008		Enter year>	2008	Enter year>	2008	Enter year>	2008	Enter year>	2008	
ar of Construction Cost incl O&P				**$ 58,871**		**$ 352,008**		**$ 491,710**		**$ 438,890**	**$2,375,233**
Multipliers											
Design & Engineering	20%		20%	$ 11,774	20%	$ 70,402	20%	$ 98,342	20%	$ 87,778	$475,047
Mobilization	15%		15%	$ 8,831	15%	$ 52,801	15%	$ 73,757	15%	$ 65,834	$356,285
Burdened and Inflated Construction Cost				$ 79,476		$ 475,210		$ 663,809		$ 592,502	$3,206,565
Construction Management	20%		20%	$ 13,540	20%	$ 80,962	20%	$ 113,093	20%	$ 100,945	$546,304
Cost Opinion for Built Project				**$ 93,017**		**$ 556,172**		**$ 776,902**		**$ 693,447**	**$3,752,868**
Federal Administrative Costs	30%			$ 27,905		$ 166,852		$ 233,071		$ 208,034	
Cost Opinion for Federalized Built Project				**$ 120,922**		**$ 723,024**		**$ 1,009,973**		**$ 901,481**	**$4,878,729**

Willamette Shoreline Rail with Trail

	Unit Cost	Unit	1	4,745 ft	2	6,512 ft	3	1,378 ft	4	3,246 ft	5	2,863 ft	18,744 Feet / 3.55 Miles
12' Trail Common condition	39.75	LF	4,745	$ 188,636	6,512	$ 258,883	1,378	$ 54,782	3,246	$ 129,044	2,863	$ 113,818	$ 745,163
Add for Difficult soils	23.00	LF		$ -		$ -		$ -		$ -		$ -	$ -
Add for 4' Fill	20.71	LF	2000	$ 41,425	2000	$ 41,425		$ -		$ -		$ -	$ 82,850
Add for 4' Cut	37.68	LF	2000	$ 75,366	2000	$ 75,366		$ -		$ -		$ -	$ 150,732
Add for Parallel to stream	99.90	LF		$ -		$ -		$ -		$ -		$ -	$ -
Add for Remove railroad/roadway	10.65	LF		$ -		$ -		$ -		$ -		$ -	$ -
Add for Wetland mitigation	262.50	LF		$ -		$ -		$ -	3000	$ 787,500	2000	$ 525,000	$ 1,312,500
12' wide Boardwalk	600.00	LF		$ -	2500	$ 1,500,000		$ -	400	$ 240,000	1400	$ 840,000	$ 2,580,000
14' wide Bridge	3,500.00	LF		$ -		$ -	1200	$ 4,200,000		$ -		$ -	$ 4,200,000
													$ -
Add for:													$ -
Intersection	8,760.00	EA		$ -		$ -		$ -		$ -		$ -	$ -
Signalized intersection	131,760.00	EA		$ -	2	$ 263,520		$ -		$ -	1	$ 131,760	$ 395,280
Trailhead (20 cars)	78,267.60	EA		$ -		$ -		$ -		$ -		$ -	$ -
Other													$ -
Direct Construction Costs incl O&P				$ 305,427		$ 2,139,194		$ 4,254,782		$ 1,156,544		$ 1,610,578	**$9,466,525**
Contingency													
Concept Alignment	40%		40%	$ 122,171	40%	$ 855,678	40%	$ 1,701,913	40%	$ 462,618	40%	$ 644,231	$644,231
Master Planned	35%		35%		35%		35%		35%		35%		
Preliminary Design	30%		30%		30%		30%		30%		30%		
Final Design	25%		25%		25%		25%		25%		25%		
Under Contract	10%		10%		10%		10%		10%		10%		
				$ 122,171		$ 855,678		$ 1,701,913		$ 462,618		$ 644,231	**$644,231**
Burdened Construction Value (w/o inflation)				$ 427,598		$ 2,994,872		$ 5,956,695		$ 1,619,161		$ 2,254,809	**$10,110,756**
Inflation													
Annual Inflation	4.0%												
Enter Year of Construction				2008		2008		2008		2008		2008	
Year of Construction Cost incl O&P				**$ 444,702**		**$ 3,114,666**		**$ 6,194,963**		**$ 1,683,928**		**$ 2,345,001**	**$13,783,260**
Multipliers													
Design & Engineering	20%		20%	$ 88,940	20%	$ 622,933	20%	$ 1,238,993	20%	$ 336,786	20%	$ 469,000	**$469,000**
Mobilization	15%		15%	$ 66,705	15%	$ 467,200	15%	$ 929,244	15%	$ 252,589	15%	$ 351,750	**$351,750**
Burdened and Inflated Construction Cost				$ 600,348		$ 4,204,800		$ 8,363,200		$ 2,273,303		$ 3,165,752	**$3,165,752**
Construction Management	20%		20%	$ 102,282	20%	$ 716,373	20%	$ 1,424,841	20%	$ 387,303	20%	$ 539,350	**$539,350**
Cost Opinion for Built Project				$ 702,630		$ 4,921,173		$ 9,788,041		$ 2,660,606		$ 3,705,102	**21,777,551**
Federal Administrative Costs	30%		30%	$ 210,789	30%	$ 1,476,352	30%	$ 2,936,412	30%	$ 798,182	30%	$ 1,111,531	
Cost Opinion for Federalized Built Project				$ 913,418		$ 6,397,525		$ 12,724,453		$ 3,458,788		$ 4,816,633	**28,310,817**

Lake Oswego to Milwaukie

					Bridge 1	
12' Trail Common condition	39.75	LF	-	$	-	$ -
Add for Difficult soils	23.00	LF		$	-	$0
Add for 4' Fill	20.71	LF		$	-	$0
Add for 4' Cut	37.68	LF		$	-	$0
Add for Parallel to stream	99.90	LF		$	-	$0
Add for Remove railroad/roadway	10.65	LF		$	-	$0
Add for Wetland mitigation	262.50	LF		$	-	$0
12' wide Boardwalk	600.00	LF		$	-	$0
14' wide Bridge	3,500.00	LF		$	-	$0
				$	10,000,000	$10,000,000
Add for:						$0
Intersection	8,760.00	EA		$	-	$0
Signalized intersection	131,760.00	EA		$	-	$0
Trailhead (20 cars)	78,267.60	EA		$	-	$0
Other						$0
Direct Construction Costs incl O&P				$	10,000,000	**$10,000,000**
Contingency						
Concept Alignment	40%		40%	$	4,000,000	$4,000,000
Master Planned	35%		35%			
Preliminary Design	30%		30%			
Final Design	25%		25%			
Under Contract	10%		10%			
				$	4,000,000	**$4,000,000**
Burdened Construction Value (w/o inflation)				$	14,000,000	**$14,000,000**
Inflation						
Annual Inflation	4.0%		4.0%			
Enter Year of Construction	2008		Enter year>		2008	
Year of Construction Cost incl O&P				**$**	**14,560,000**	**$14,560,000**
Multipliers						
Design & Engineering	20%		20%	$	2,912,000	$2,912,000
Mobilization	15%		15%	$	2,184,000	$2,184,000
Burdened and Inflated Construction Cost				$	19,656,000	$19,656,000
Construction Management	20%		20%	$	3,348,800	$3,348,800
Cost Opinion for Built Project				**$**	**23,004,800**	**$23,004,800**
Federal Administrative Costs	30%		30%	$	6,901,440	
Cost Opinion for Federalized Built Project				**$**	**29,906,240**	**29,906,240**

WRG - Lake Oswego to West Linn (Downtown Lake Oswego to Willamette Park)			Downtown LO to George Rogers Park		George Rogers Park to Mary Young S.P.		Mary Young S.P. to Bridge		Bridge to Tanner Creek		Tanner Creek to Willamette Park		alta
				1 4,117 ft		2 14,110 ft		3 11,696 ft		4 5,746 ft		5 7,123 ft	42,792 Feet 8.10 Miles
12' Trail Common condition	39.75	LF	4,117	$ 163,670	14,110	$ 560,939	11,696	$ 464,971	5,746	$ 114,215	7,123	$ 283,173	$ 1,586,969
Add for Difficult soils	23.00	LF		$ -		$ -		$ -		$ -		$ -	-
Add for 4' Fill	20.71	LF		$ -		$ -		$ -	2800	$ 57,995		$ -	$ 57,995
Add for 4' Cut	37.68	LF		$ -		$ -		$ -	2800	$ 105,512		$ -	$ 105,512
Add for Parallel to stream	99.90	LF		$ -		$ -		$ -		$ -		$ -	-
Add for Remove railroad/roadway	10.65	LF		$ -		$ -		$ -		$ -		$ -	-
Add for Wetland mitigation	262.50	LF		$ -	1400	$ 367,500	1100	$ 288,750		$ -	3,100	$ 813,750	$ 1,470,000
12' wide Boardwalk	600.00	LF		$ -		$ -		$ -		$ -		$ -	-
14' wide Bridge	3,500.00	LF		$ -		$ -	450	$ 1,575,000	300	$ 1,050,000		$ -	$ 2,625,000
													-
Add for:													-
Intersection	8,760.00	EA		$ -	2	$ 17,520		$ -		$ -		$ -	$ 17,520
Signalized intersection	131,760.00	EA	1	$ 131,760		$ -		$ -		$ -		$ -	$ 131,760
Trailhead (20 cars)	78,267.60	EA		$ -		$ -		$ -		$ -		$ -	-
Other													-
Direct Construction Costs incl O&P				$ 295,430		$ 945,959		$ 2,328,721		$ 1,327,723		$ 1,096,923	**$5,994,756**
Contingency													
Concept Alignment	40%		40%	$ 118,172	40%	$ 378,384	40%	$ 931,488	40%	$ 531,089	40%	$ 438,769	$2,279,730
Master Planned	35%		35%		35%		35%		35%		35%		
Preliminary Design	30%		30%		30%		30%		30%		30%		
Final Design	25%		25%		25%		25%		25%		25%		
Under Contract	10%		10%		10%		10%		10%		10%		
				$ 118,172		$ 378,384		$ 931,488		$ 531,089		$ 438,769	**$2,397,903**
Burdened Construction Value (w/o inflation)				$ 413,602		$ 1,324,343		$ 3,260,210		$ 1,858,812		$ 1,535,692	**$8,392,659**
Inflation													
Annual Inflation	4.0%		4.0%		4.0%		4.0%		4.0%		4.0%		
Enter Year of Construction	2008			2008		2008		2008		2008		2008	
Year of Construction Cost incl O&P				**$ 430,146**		**$ 1,377,316**		**$ 3,390,618**		**$ 1,933,165**		**$ 1,597,120**	**$8,728,365**
Multipliers													
Design & Engineering	20%		20%	$ 86,029	20%	$ 275,463	20%	$ 678,124	20%	$ 386,633	20%	$ 319,424	**$1,659,644**
Mobilization	15%		15%	$ 64,522	15%	$ 206,597	15%	$ 508,593	15%	$ 289,975	15%	$ 239,568	**$1,244,733**
Burdened and Inflated Construction Cost				$ 580,698		$ 1,859,377		$ 4,577,334		$ 2,609,772		$ 2,156,112	**$11,202,596**
Construction Management	20%		20%	$ 98,934	20%	$ 316,783	20%	$ 779,842	20%	$ 444,628	20%	$ 367,338	**$1,908,590**
Cost Opinion for Built Project				**$ 679,631**		**$ 2,176,160**		**$ 5,357,177**		**$ 3,054,400**		**$ 2,523,449**	**13,790,817**
Federal Administrative Costs	30%		30%	$ 203,889		$ 652,848		$ 1,607,153		$ 916,320		$ 757,035	
Cost Opinion for Federalized Built Project				**$ 883,521**		**$ 2,829,008**		**$ 6,964,330**		**$ 3,970,720**		**$ 3,280,484**	**17,928,062**

WRG - West Linn to Wilsonville

(Tualatin River to Wilsonville Rd @ Wilsonville HS)			Clack Co Gap #1 (Tualatin River to Rock Island Landing)		Clack Gap #2 (Rock Island Landing to Stafford Trail)		Clack Co Gap #3 (Stafford Trail to Canby Ferry)		Clack Co Gap #4 (Canby Ferry to Wilsonville Rd)		
			1		2		3		4		
			12,580 ft		4,408 ft		2,232 ft		15,707 ft		34,927 Feet 6.61 Miles
				bridge							
12' Trail Common condition	39.75	LF	12,580	$ 500,114	4,408	$ 175,239	2,232	$ 88,733	15,707	$ 624,427	$ 1,388,513
Add for Difficult soils	23.00	LF		$ -		$ -		$ -		$ -	-
Add for 4' Fill	20.71	LF	6000	$ 124,276	2200	$ 45,568	1100	$ 22,784	1000	$ 20,713	$ 213,340
Add for 4' Cut	37.68	LF	6000	$ 226,098	2200	$ 82,903	1100	$ 41,451	1000	$ 37,683	$ 388,135
Add for Parallel to stream	99.90	LF		$ -		$ -		$ -		$ -	-
Add for Remove railroad/roadway	10.65	LF		$ -		$ -		$ -		$ -	-
Add for Wetland mitigation	262.50	LF		$ -		$ -		$ -	1300	$ 341,250	$ 341,250
12' wide Boardwalk	600.00	LF		$ -		$ -		$ -		$ -	-
14' wide Bridge	3,500.00	LF	450	$ 1,575,000		$ -		$ -	500	$ 1,750,000	$ 3,325,000
Add for:											-
Intersection	8,760.00	EA		$ -	1	$ 8,760		$ -	3	$ 26,280	$ 35,040
Signalized intersection	131,760.00	EA		$ -		$ -		$ -		$ -	-
Trailhead (20 cars)	78,267.60	EA		$ -		$ -		$ -		$ -	-
Other				$1,000,000							$ 1,000,000
Direct Construction Costs incl O&P				$ 3,425,488		$ 312,469		$ 152,968		$ 2,800,353	**$6,691,278**
Contingency											
Concept Alignment	40%		40%	$ 1,370,195	40%	$ 124,988	40%	$ 61,187	40%	$ 1,120,141	$2,676,511
Master Planned	35%		35%		35%		35%		35%		
Preliminary Design	30%		30%		30%		30%		30%		
Final Design	25%		25%		25%		25%		25%		
Under Contract	10%		10%		10%		10%		10%		
				$ 1,370,195		$ 124,988		$ 61,187		$ 1,120,141	**$2,676,511**
Burdened Construction Value (w/o inflation)				$ 4,795,683		$ 437,457		$ 214,155		$ 3,920,494	**$9,367,789**
Inflation											
Annual Inflation	4.0%		4.0%		4.0%		4.0%		4.0%		
Enter Year of Construction	2008		Enter year>	2008	Enter year>	2008	Enter year>	2008	Enter year>	2008	
Year of Construction Cost incl O&P				**$ 4,987,511**		**$ 454,955**		**$ 222,721**		**$ 4,077,314**	**$9,742,501**
Multipliers											
Design & Engineering	20%		20%	$ 997,502	20%	$ 90,991	20%	$ 44,544	20%	$ 815,463	**$1,948,500**
Mobilization	15%		15%	$ 748,127	15%	$ 68,243	15%	$ 33,408	15%	$ 611,597	**$1,461,375**
Burdened and Inflated Construction Cost				$ 6,733,139		$ 614,189		$ 300,673		$ 5,504,374	**$13,152,376**
Construction Management	20%		20%	$ 1,147,127	20%	$ 104,640	20%	$ 51,226	20%	$ 937,782	**$2,240,775**
Cost Opinion for Built Project				$ 7,880,267		$ 718,829		$ 351,899		$ 6,442,156	**15,393,151**
Federal Administrative Costs	30%		30%	$ 2,364,080		$ 215,649		$ 105,570		$ 1,932,647	
Cost Opinion for Federalized Built Project				$ 10,244,347		$ 934,478		$ 457,469		$ 8,374,803	**20,011,096**

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