City of Shoreline Environmental Sustainability Strategy

Contract Deliverable 1.B.:

Sustainability Measurement and Tracking

December 7, 2007

Prepared by:
AHBL, Inc.
O'Brien & Company

Sustainability Measurement and Tracking

Introduction

This memo builds on the sustainability program elements and profiles detailed in Memo 1.A by providing specific implementation recommendations for program measurement and tracking. Measurement and tracking of sustainability initiatives through indicators and assessments allows the City to effectively manage a wide range of sustainability actions, target specific objectives, identify community values and priorities, make informed decisions, gauge progress, and report on successes.

The memo is organized by the following major objectives:

1) Identify the City of Shoreline's specific sustainability objectives;
2) Review and analyze potential key benchmarking and assessment systems for possible use in the strategy; and
3) Identify and prioritize indicators and the development of performance targets.

We have identified potential specific objectives for the Environmental Sustainability Strategy based on a review of:

- On-going and recent activities that are included in the current sustainability program inventory prepared by City staff,
- Major regional or national initiatives that have recently been adopted through Council action, and
- Objectives which are included in the City's Comprehensive Plan or the Guiding Principles and High Level Goals identified in the previous Memo 1A, but are not currently fully implemented.

Based on this analysis, specific objectives for moving the sustainability strategy forward have been identified in four broad realms:

- Energy Conservation and Carbon Reduction,
- Waste Management and Resource Conservation,
- Sustainable Development and Green Infrastructure, and
- Ecosystem Conservation and Stewardship.

The specific objectives listed herein have been further refined and expanded based on feedback from City staff and community input from Community Conversation #1, which took place on October 11, 2007.

City of Shoreline Environmental Sustainability Strategy
Contract Deliverable 1.B.: Sustainability Measurement and Tracking

December 7, 2007   Prepared by AHBL, Inc. and O'Brien & Company   1

After the specific objectives of the Sustainability Strategy are finalized, benchmarking and assessment systems need to be selected and implemented to monitor performance. This memo contains a slate of recommended indicators that will need to be refined, amended and implemented by City staff.

As part of Task 1B, we have reviewed potential assessment systems for further consideration by the City, including the Resourceful Government Guidebook, PLACE³S, the Ecological Footprint, The Natural Step, Local Agenda 21, and carbon calculators. Detailed descriptions of these tools are included in Appendix A. A synopsis is included in this Memo for how these tools can be used in future Comprehensive and Master Planning, community engagement, and for guidance as the City implements and refines the Strategy. These tools can also assist in the development of a sustainability plan framework, planning green infrastructure, reducing energy consumption, calculating green house emissions, and comparing current versus sustainable practices.

We recommend a system of approximately 20-30 indicators to measure and monitor progress. Indicators must be closely tied to the specific objectives that are selected. Prioritizing and selection of program objectives, indicators and performance targets is driven by the potential **impact** or result of the initiative, where the City can exert the most **influence** towards achieving the identified objective, and **investment**, or where existing resources can be optimized, and multiple objectives can be achieved for the lowest relative cost.

Priority should be given to those indicators and measurements that best address the Guiding Principles and specific objectives, have the greatest City and community interest, are easy to implement, and lead to early program successes. This memo includes a list of key questions to ask when determining appropriate indicators. A list of preliminary draft indicators that are consistent with the City's Guiding Principles are provided in the body of the report for further review, refinement, and selection through an iterative, interactive and public process. These were chosen, refined and/or adapted from a larger list that was initially developed for City review (see Appendix C). Performance targets will be developed for the indicators that are ultimately selected. We have offered some potential targets to promote discussion of potential targets at the City of Shoreline and with stakeholders.

Why Measurement and Tracking?

Benchmarking and assessment programs allow municipalities to:

1. Obtain measurable results that can be used as internal management tools;
2. Engage the general public by tapping into values and attitudes and generate public investment in sustainability programs;
3. Enable a community to identify what it values and prioritize those values;
4. Hold individuals and specific groups accountable for achieving the results they want;
5. Build democracy and community through collaboration; and
6. Allow people to measure what is important and make decisions based on results.

Indicators are defined as standards of measurement (of performance) that illustrate the current condition or direction of change of environmental factors. Performance targets are thresholds established to measure progress within each indicator. Indicators should be selected that generate performance targets aligned with the City's objectives.

What are the City's Objectives?

The City's environmental sustainability objectives can be drawn from four sources:

- On-going activities promoting some act of environmental stewardship provide insights as to what the City cares about;
- Major regional and national initiatives the City has recently adopted include specific objectives;
- The City's Comprehensive Plan includes language promoting specific aspects of sustainability; and
- As part of this project, through the Community Conversations and City Team meetings, we will identify additional objectives.

Ongoing Activities

These current activities provide insights as to what the City has already committed to through program development and resource allocation. As part of this project, existing programs have been inventoried by City Staff in *Shoreline's Environmental Sustainability Inventory (Revised 8/29/07)*. The Inventory includes the following programs, projects, and regulations, organized by the Focus Areas of the Draft Guiding Principles:

Sustainability Program Inventory	
Status	**Activity Description**
Overarching Environmental Sustainability – not focus area specific	
2007 - Ongoing	Environmental Mini Grant Program

2003 - Ongoing	Earth Day Celebration – annual event
2007 - Ongoing	Neighborhood Environmental Stewardship Team
Sustainable Development and Green Infrastructure	
2007 - Development	Green Building and Low Impact Development Programs
2007 - Development	Green Streets Demonstration and Program
1995 - Ongoing	Solid & Hazardous Waste Management Program
2004 - Ongoing	Municipal Compost Facility
2007 - Development	Civic Center/City Hall - LEED Gold planned
Ongoing	City Building Operations Practices and Policies improvements
1998 - Ongoing	Business Access/Transit Lanes on Aurora
Energy Conservation and Carbon Reduction	
2006 - Development	Climate Protection Campaign
2006 - Ongoing	Promoting Alternatives to Driving
2005 - Ongoing	Green Fleet Vehicles Acquisition
Ecosystem Conservation and Stewardship	
2006 - Ongoing	Open Space Acquisition Bond
Ongoing	Habitat Restoration Projects - various
2001 - Ongoing	Water Resource Inventory Area 8 Salmon Habitat Conservation participation
2002 - Ongoing	Regional Roads Maintenance Endangered Species Act Forum participation
2005 - Ongoing	Critical Areas Ordinance Update and Implementation
2006 - 2008	Urban Forest Assessment – Hamlin Park, South Woods, Shoreview and Boeing Creek Parks
2005 - Ongoing	Ivy Out Volunteer Program
2003 - Ongoing	Clean & Green Car Wash Kits
2003 - Ongoing	Pesticide-Free Parks/No Spray in Richmond Beach
2001 - Ongoing	Adopt-a-Road and Adopt-a-Trail Programs
Waste Reduction and Resource Efficiency	
2006 - Ongoing	Sustainable Business Extension Service
1998 - Ongoing	Business Solid Waste Reduction, Recycling & Resource Conservation Program
Ongoing	Free Wood Chips at Hamlin Park
2002 - Ongoing	Household Battery Recycling
2007 - 2008	City of Shoreline Stormwater Standards Update
2007 - Development	Aurora Corridor Project Stormwater Solutions
1999 - Ongoing	Storm Drain Medallions & Stenciling

Major New Initiatives

Three major regional and national initiatives have been adopted: The Cascade Agenda[1], Cascade Land Conservancy Green Cities Program[2], and the US Conference of Mayors Climate Protection Agreement.[3] These three initiatives address a wide range of sustainability objectives. We have grouped the range of objectives into four main focus areas. These include: energy and carbon, waste management and resource conservation, sustainable development and green infrastructure, and ecosystem conservation and stewardship. These objectives apply both internally at the City of Shoreline and within the larger community.

Energy Conservation and Carbon Reduction objectives aim to reduce green house emissions, fossil fuel use, energy consumption and vehicle use, as well as increase in green power use and public awareness about global warming.

Waste Management and Resource Conservation objectives are focused on decreasing the amount of waste generated, adoption of a cradle to cradle perspective, increasing the recycling rate, reducing water consumption and increasing water reuse.

Sustainable Development and Green Infrastructure objectives provide a framework for compact growth, transit and walking supportive development, low impact development, green building, green streets, and recreation improvements.

Ecosystem Conservation and Stewardship objectives aim to protect habitat, water quality, urban forest, environmentally sensitive areas and open space and provide for long term conservation and enhancement of these areas.

City's Comprehensive Plan

A review of the City's Comprehensive Plan provides additional insight into the City's environmental stewardship priorities. A review and analysis of Comprehensive Plan policies entitled *Shoreline Sustainability Strategy: Existing Guidance and Potential Framework Goals and Objectives for Discussion* was provided to City staff and will be revised and included in the Sustainability Strategy at the City's direction. This document includes a discussion of the current policy direction provided in the Comprehensive Plan as well as a preliminary analysis of where more policy guidance may be

---

[1] http://www.cascadeagenda.com/, City of Shoreline has endorsed the principles of the Cascade Agenda and declared the City's intent to participate in the "Cascade Agenda City" and "Green City Partnership" by adoption of Resolution 260 on June 11, 2007

[2] http://www.cascadeland.org/stewardship/green-cities

[3] http://www.usmayors.org/climateprotection/agreement.htm. City of Shoreline authorized support of the US Conference of Mayors Climate Protection Agreement by adoption of Resolution 242 on April 24, 2006.

needed or useful. Based on this analysis, it is clear that the Comprehensive Plan currently addresses the following objectives at some level:

- Protect and enhance environmentally sensitive areas,
- Protect and enhance habitat and vegetation,
- Preserve and enhance open space,
- Promote native and drought tolerant landscaping,
- Encourage ecologically sensitive site design,
- Encourage a mix of land uses near transit,
- Promote and improve non-motorized transportation and transit,
- Encourage reduced energy and material use,
- Promote waste reduction and recycling,
- Protect and improve water quality,
- Develop and implement green streets programs, and
- Promote public awareness and stewardship.

Based on review of the Comprehensive Plan and comparison with the Sustainability Program Inventory, it is evident that there are programs that correspond to some aspect of the majority of the policies identified in the Comprehensive Plan. However, there are potential gaps, or areas where additional programs or program modifications may be needed to implement Comprehensive Plan policies. These include:

- Internal purchasing policies that do more to support sustainability
- Clear staff guidance, training and procedures for green practices
- A more complete and specific set of waste reduction and recycling objectives and programs for the City, but also for the Community (e.g. target construction and demolition waste),
- Specific objectives and an overall framework for public awareness and stewardship programs,
- Specific programs to promote or require ecologically sensitive site design, building and landscaping in private development (e.g. Low Impact Development and LEED),
- Specific programs to promote or require ecologically sensitive site design and landscaping in City projects, and
- A policy framework and strategy for implementation of the Green streets (program in its infancy and siting criteria and other guidance needed), and
- Additional areas that will be detailed in specific recommendations in the Environmental Sustainability Strategy.

Potential Gaps to Consider
While the City of Shoreline Comprehensive Plan provides general guidance for many components of sustainability, there are important aspects of sustainability that are not currently addressed in Shoreline's Comprehensive

Plan. City staff will update the Comprehensive Plan policies where necessary to reflect the policy direction and key recommendations of the Environmental Sustainability Strategy. The City should consider whether the Comprehensive Plan should include policies and more specific objectives for:

- Identifying and leveraging partners in achieving sustainability
- Interventions that improve public health
    - encouraging active lifestyles
    - eliminating use of toxic substances
    - encouraging use of non-hazardous materials
- Local and/or regional food production, sales and consumption
    - farmer's markets
    - p-patch program
    - public awareness campaigns
    - farm to school programs
- Water conservation
- Air quality

Identifying Quick Wins

Initial efforts in the Sustainability Strategy should be focused strategically on areas of greatest impact and "low-hanging fruit" – opportunities that will build on existing programs and lead to early successes. Three general areas of consideration include:

Impact
Where does the City have the greatest opportunity to benefit the economy, the environment and the community? It might be those areas that account for most resource use and costs. It might also be areas that have very acute impacts. For example, toxic substances can have tremendous impact even when used in small quantities.

Influence
The greatest opportunity to make a difference may be in those areas where the City can influence or support others in the community. Also, some otherwise lower impact projects have high potential for generating attention and employee interest.

Investment
The sustainability program should, above all, be sustainable – projects should be selected that contribute to the City financially, in terms of improved worker morale, safety or customer relations. The program should optimize existing resources and programs, and should build on previous work. As part of the Environmental Sustainability Strategy we will examine resources necessary to implement the recommendations, as well as administer the overall program of performance measures.

Going Forward – Draft Specific Objectives for Consideration

An important aspect of developing a strategy is to inventory and analyze existing policy direction and current programs and compare them with potential objectives that are built on the policy framework we have developed. Using this process, preliminary potential specific objectives for the Environmental Sustainability Strategy have been identified in four focus areas: **Energy and Carbon, Waste Management and Resource Conservation, Sustainable Development and Green Infrastructure, and Ecosystem Conservation and Stewardship**. Some of these potential objectives focus on internal action, some external, and some on both internal and external. Each objective also ties directly to several of the draft Guiding Principles and High Level Goals identified in Memo 1A.

Focus Area	Potential Objective	Emphasis
Energy and Carbon	Meet or beat the greenhouse gas emission reduction target suggested for the United States in the Kyoto Protocol	Internal and External
	Increase public awareness levels regarding the importance of reducing global warming within the public and private sectors of Shoreline Community.	External
	Establish and meet or beat greenhouse gas emission, conservation and alternative energy targets for the larger Shoreline community	External
	Reduce dependence on fossil fuels for City Operations	Internal
	Increase the use of green power (through green tags or on-site)	Internal and External
	Reduce energy consumption for City operations	Internal
	Reduce use of single occupancy vehicles	External and Internal
	Increase transit use and mode split	External and Internal
	Implement City procurement policies and standards to reduce energy and resource consumption (overlap with	Internal

Focus Area	Potential Objective	Emphasis
	Waste Management below)	
Waste Management and Resource Conservation	Reduce sources of waste through internal purchasing guidelines, training, reuse strategies and a comprehensive cradle to cradle approach.	Internal
	Target waste source reduction (e.g. through promotion of a cradle to cradle approach).	External
	Increase recycling in City operations	Internal
	Increase use of recycled content supplies	Internal
	Increase recycling participation in the community	External
	Reduce total waste generated and land-filled	Internal and External
	Reduce the volume of hazardous waste generated	Internal and External)
	Target reduction of organic waste land-filled	Internal and External
	Target reduction in construction waste land-filled	Internal and External
	Reduce water use in indoor and outdoor operations	Internal
	Reduce water use by businesses	External
	Reduce per capita water use	External
	Strengthen partnerships with water related utility providers	External and Internal
Sustainable Development and Green Infrastructure	Focus new growth in environmentally suitable areas served by adequate infrastructure, including transit	External
	Increase community's non-motorized transportation infrastructure to improve walkability	External
	Define and implement a green streets (complete streets) program	Internal
	Improve public access natural areas and features (e.g. the	Internal and External

Focus Area	Potential Objective	Emphasis
	Puget Sound shoreline) to enhance livability and provide more recreation opportunities locally	
	Implement and promote low impact development standards, including incentives and removal of current barriers	Internal and External
	Implement and promote a green building program, including incentives and removal of current barriers	Internal and External
	Reduce stormwater impacts from new development and improve overall basin water quality and quantity (e.g. reduce peak run-off rates and during, increase infiltration, etc.)	External and some Internal
	Provide additional developed recreation facilities (e.g. athletic fields) to help meet demand and maintain and enhance community livability	Internal with External input and potential partnerships
Ecosystem Conservation and Stewardship	Improve habitat quality of existing forested areas in parks	Internal and External
	Increase canopy coverage and habitat city-wide	External and some Internal
	Protect existing streams, wetlands and related riparian habitat	External and Internal
	Enhance and restore streams, wetland and related riparian habitat	External and some Internal
	Preserve and enhance existing natural open space	Primarily External Efforts but Internal Support Needed
	Increase amount of and access to open space	Internal Commitment and External Support and Input Needed
	Improve surface water quality	External and Internal Monitoring
	Increase volunteer and partner efforts in habitat improvement	External and some Internal needed to

Focus Area	Potential Objective	Emphasis
	projects	organize and support

This list of preliminary objectives has been further refined and modified. Revised objectives are included in the indicators table on page 16. Additional analysis will be done to assess potential gaps and overlaps and to make sure that a recommendation, target and indicator is provided for all key objectives. The list of objectives will be reviewed and amended in an iterative process as targets and indicators are refined and additional input is obtained from the community and the City Council. A revised list of objectives will be identified in the Draft Environmental Sustainability Strategy.

Benchmarking and Assessment Systems

Once objectives are identified, they can only be evaluated by determining baselines – current conditions – and measuring the effects of sustainability strategies in the future. Benchmarking and assessment systems can be used to monitor performance. There are a number of tools that may be used to develop Shoreline's unique benchmarking and assessment system.

For Task 1B, we have reviewed the *Resourceful Government Guidebook*, PLACE[3]S, the Ecological Footprint, The Natural Step, Local Agenda 21, and carbon calculators. Descriptions of the tools are included in Appendix A. A quick synopsis of the results of our analysis:

- The *Resourceful Government Guidebook* is a framework for development of a sustainability plan. The *Resourceful Government Guidebook* has proven effective in Portland and Fort Collins. Some of the worksheets from the Guidebook may be useful in prioritizing indicators and determining performance targets.
- PLACE[3]S is a software tool for evaluating planning alternatives. There is a free version of the PLACE[3]S software and it has been used with great success in regional and national projects. It could be useful for Shoreline, in particular as it addresses Guiding Principles relating to Green Infrastructure and Energy.
- Carbon calculators are quite useful for implementing climate change initiatives, both in terms of measurement and education. Within the PLACE[3]S system, a carbon calculator can be used to measure Green House emissions and serve as a rallying point for community engagement.

- Ecological Footprint Accounting is a widely recognized tool for calculating current versus sustainable resource use (energy, water, materials) for countries, regions, municipalities, businesses, and individuals. It can be a valuable tool, but it is proprietary and available only through contracting with Redefining Progress consultants based in California (and therefore a potentially significant expense). However, project team members have utilized the concept of ecological foot-printing to create graphic representations showing current vs. projected improved conditions of consumption. This approach may be useful in the future as an educational tool.

- The Natural Step (TNS) framework is the most holistic approach to sustainable development for municipalities and organizations, but is at a very high level. It takes a great deal of work to translate TNS to concrete actions an organization might take. However, it has been used with success in Whistler and elsewhere. Case studies indicate at least three years of lead time before indicator programs are implemented through the TNS framework. TNS does not appear to suit Shoreline's desire for a simple, timely process.

- Local Agenda 21 is the United Nations sustainability framework for local governments. Its precepts are global in scope. Unfortunately it has little guidance for local programs.

- The International Council of Governmental Initiatives (ICLEI) has developed software that the City will use to inventory green house gas emissions, analyze potential improvements and monitor progress towards specific emission reduction targets. City staff has received an initial orientation to the software and expect to receive additional training in its use in late 2007 or early 2008 to define the inventory data for collection.

In summary, the Environmental Sustainability Strategy will include recommendations for how PLACE^{3}S and other visualization and analysis tools can be integrated into future subarea, transportation and comprehensive planning efforts. We recommend use of a carbon calculator as a tool for community engagement and measuring progress towards reduction of green house gases. The City is currently gaining training using ICLEI and additional information about this tool will be included in the Environmental Sustainability Strategy. Finally Ecological Footprint Accounting will also be discussed further in the Environmental Sustainability Strategy and could be used as an education tool in the future. We recommend a system of indicators, as well as the City's use of ICLEI, as the primary focus of the benchmarking and assessment system.

Measurements of Progress

Prioritizing Indicators

There are more potential indicators than can be feasibly adopted at the outset. Indicators should be closely tied to the Guiding Principles and High Level Goals discussed in Memo 1A. Indicators must be also closely tied to specific objectives, as discussed on page 7. In addition, specific objectives are closely related to performance targets, which are used to gauge progress. More internal City discussion of performance targets is needed to finalize the draft targets presented in this Memo.

Indicators should measure the City's progress towards specific objectives and targets. In addition, recommendations (developed in Task 2) should be closely related to specific objectives for maximum strategic program integration and efficiency. Thus, there should be a clear relationship between:

Guiding Principles – Establish the basic direction and focus of the strategy
Specific Objectives – Identify clear goals
Targets – Refine goals into more specific statements
Recommendations – To help us reach our goals
Indicators – to measure progress towards our goals

Development of appropriate indicators will thus be an iterative process – as specific objectives, targets and recommendations are further refined, indicators will be adjusted accordingly.

Key Questions in Determining Appropriate Indicators

In addition to be aligned with the overall strategy, there are practical considerations for indicators as well. The following are some questions that should be considered when developing a list of potential indicators:

1. Is it informative? Does it tell us what we need to know?
2. How easy is it to analyze and track?
3. Does it rely on existing or readily available data?
4. Does it require new resources for measurement?
5. Is there a better option? Is it redundant?
6. How important/useful is the information?
7. How can the city influence this indicator and in what kind of timeframe?
8. Is it understandable to the public/city?
9. Does the public want to know? Is the indicator interesting/compelling?

Another method of sorting through objectives and indicators that may be useful is to use the applicable worksheets from the City of Portland's *Resourceful Government Guide*. Sample worksheets are provided in Appendix B. However, following discussion with the City it has been determined that the best path was to use the list of questions above rather than a formal assessment of indicators.

Performance Targets

Once general priorities are determined through development of a policy framework, the next step is to clarify specific objectives and performance targets, or metrics. Targets provide a specific description of the results you plan to achieve – it puts a number on your objective, making it measurable. A complete objective details how results will be quantified (performance measure), what part of the operation will be measured (scope), what the desired outcome is (performance goal) and when it will be achieved (completion date). In benchmarking lingo, it is known as a "performance target".

Note that in the sample below, energy use is measured on a per square foot basis. In other cases, results might be measured on a per-acre, per-employee, or per-work-output basis. These types of measures facilitate comparison. They also ensure that changes in levels of activity or output aren't mistaken for increases or decreases in efficiency.

Sample objective statement:

Decrease energy use

Sample measurable objective or performance target:

Decrease energy use per square foot in City Hall by 15% by 2004.
                   (measure)   (scope)   (goal)   (deadline)

Performance targets will be developed for the specific objectives and indicators that are ultimately selected by the City. We have recommended some potential targets for the City to consider in this Memo, starting on page 13. Both indicators and the related performance targets will be crafted through an iterative, interactive and public process. Public input on potential specific objectives, targets and indicators obtained during Community Conversation #2 will be reflected in the revised performance measurements presented in the Environmental Sustainability Strategy.

City of Shoreline Environmental Sustainability Strategy
Contract Deliverable 1.B.: Sustainability Measurement and Tracking

December 7, 2007   Prepared by AHBL, Inc. and O'Brien & Company   14

City of Shoreline's Indicators

Appendix C contains a list of the range of draft indicators that were initially considered by the Consultant and the City. Based on City feedback on that list, we have developed a preliminary set of specific objectives, targets and indicators.

The recommended slate of indicators and related objectives and targets below is much smaller than the range of indicators considered in Appendix C. Our recommendation to the City is to narrow the list down to a workable number of internal and external indicators for reporting and decision making purposes. We recommend actively monitoring no more than 20 to 30 indicators

With both internal and external indicators, it is important to address the guiding principles meaningfully. With internal indicators, it is vital to identify indicators that provide a long life and afford actions that can provide results within natural planning cycles. With external indicators, it is vital to capture the community's imagination and leverage and document community response.

The following is our list of preliminary objectives, targets and indicators for further consideration by the City and public input during Community Conversation #2. The specific targets and definitions of the indicators are still in DRAFT form and will be refined before the Draft Sustainability Strategy is completed.

Energy Conservation and Carbon Reduction	
Internal/Operations:	
1) Objective:	Reduce energy consumption in City facilities.
Target:	Reduce energy consumption in City facilities from baseline by 5% per year and 20% by 2012.
Indicator:	Percentage decrease in City's monthly electric and gas usage (measured in consumption unit/sf) -- obtainable from SCL and PSE.
Discussion:	2012 is both consistent with the US Mayors Climate Protection Agreement language and aligned with the City of Shoreline update to its Comprehensive Plan.
2) Objective:	Increase reliance on Green Power in City facilities, in order to reduce carbon emissions from facilities, consistent with US Mayors Climate Protection Agreement and Kyoto Protocol target of 7% reduction from 1990 levels by 2012.
Target:	Increase Green Power consumption as a proportion of total electricity consumption in City facilities by 10% per year, and 50% by 2012.

	Indicator:	Proportion of City Consumption supplied by alternative energy sources though Seattle City Light "Green Up" Program.
	Discussion:	Could also offset carbon emissions from natural gas and other sources through various initiatives.
3)	Objective:	Reduce carbon emissions from fleet vehicles and equipment, consistent with US Mayors Climate Protection Agreement and Kyoto Protocol target of 7% reduction from 1990 levels by 2012.
	Target:	Reduce carbon emissions from city fleet vehicles and equipment by increasing average miles/gallon of fleet 5% per year and 25% by 2012.
	Indicator:	Average fleet miles per gallon
4)	Objective:	Increase use of alternative fuel vehicles in City fleet.
	Target:	Reduce carbon emissions from city fleet vehicles and equipment by replacing 2% of petroleum-based-fuel vehicles per year with hybrid or alternative fuel vehicles.
	Indicator:	Percentage of fleet that is hybrid or alternative fuel
	Discussion:	This target is consistent with the existing vehicle purchase and replacement policy.

External/Public:

5)	Objective:	Reduce energy consumption
	Target:	Reduce per capita/per household energy consumption by 10% in the first year and an additional 3% per year through 2012
	Indicator:	Percentage decrease in consumption units of electric and gas annually (measured in % change per capita)
	Discussion:	Further discussion with PSE and SCL needed, but appears feasible. Could also potentially get at this through statistically valid survey.

Waste Management and Resource Conservation

Internal/Operations

6)	Objective:	Reduce solid waste land filled as a result of City operations
	Target:	Downward (positive) trend. Specific target TBD. E.g. Reduce by 10% per year total volume directed to landfills from City operations
	Indicator:	Volume of total waste generated (as compared to previous 4 years)
	Discussion:	Internal discussion necessary to establish target, but this appears to be plausible at least in the short to medium term.
7)	Objective:	Increase recycling in City operations
	Target:	Upward trend. Specific target TBD. E.g. Increase by 10% the percentage of materials sorted and recycled from City operations waste stream.

	Indicator:		Percentage of total waste recycled (as compared to previous 4 years)
	Discussion:		Internal discussion necessary to establish target, but this appears to be plausible at least in the short to medium term.
8)	Objective:		Increase purchasing of environmentally preferred products for City operations.
	Target:		Adopt a comprehensive Environmental Purchasing Policy (EPP) with specific targets in four key areas: Reduce consumption, reduce toxic materials, increase use of recycled-content materials, and increase use of recyclable materials.
	Indicator:		Percentage of purchases that meet top-tier EPP requirements.
	Discussion:		Shoreline can adapt policies already in place in Seattle, King County, and Washington State.
9)	Objective:		Reduce potable water use in City outdoor operations
	Target:		Downward (positive) trend. Specific target TBD. E.g. Reduce total potable water use for irrigation by 100% by 2012.
	Indicator:		Consumption units per year for outdoor operations based on utility billing.
	Discussion:		Data based on water bill. Potential strategies include stormwater storage and reuse, and Citywide moisture sensors, centrally controlled. Need to investigate how and if consumption units for irrigation are or can be separated.
10)	Objective:		Reduce potable water use in City indoor operations
	Target:		Downward (positive) trend. Specific target TBD. E.g. Reduce water use in City office facilities by 50% by 2012.
	Indicator:		Consumption units per year for indoor operations based on utility billing.
	Discussion:		Baseline will be established to include new City Hall/Civic Center facility. Need to investigate how and if consumption units for indoor operation are or can be separated. Probably want to calibrate this by units/per square foot of space or per employee.
External/Public			
11)	Objective:		Increase recycling rates in the community
	Target:		Upward trend. Specific target TBD. E.g. Divert an additional 10% per year of total volume from landfills.
	Indicator:		Percentage of total solid waste recycled by the Community (via CleanScapes)
	Discussion:		City to determine if this can be measured or monitored through existing waste contract.
12)	Objective:		Reduce residential potable water consumption

	Target:	Downward (positive) trend. Specific target TBD. E.g. Reduce water use in Shoreline households by 50% by 2012.
	Indicator:	Consumption units per year per residential customer
	Discussion:	Data would be gathered from water district billing data. Potential strategies include information outreach, changes to plumbing code interpretation, subsidization for the installation of low-flow and waterless fixtures, and grey water re-use for toilet flushing and irrigation. City will need to coordinate data collection with Shoreline Water District. Could broaden measure to include commercial customers, but size of business customers is more diverse. Could do measures of both units/per employee and units/per resident.
13)	Objective:	Promote sustainability among Shoreline businesses
	Target:	Upward trend. Specific target TBD. E.g. Increase by 10% each year the number of participating green businesses for the next five years.
	Indicator:	Number of participating (or certified) green businesses (per year as compared to previous 4 years)
	Discussion:	Requires establishment of green business program. Sustainable Business Extension program (contracted to ECOSS by the City) does not currently have a CERTIFICATION component. Could track number of businesses that participate in program based on criteria that they offer an environmentally preferable product or service alternative (similar to Chinook book criteria) and implement recommended changes to ECOSS.

Sustainable Development and Green Infrastructure

Transportation: Transit

14)	Objective:	Increase use of modes of transportation other than single occupant vehicles
	Target:	Upward trend (relative to increasing population), specific number TBD based on review of data
	Indicator:	Public transit rider-ship or number of transit boardings per year in Shoreline (as compared to previous 4 years)
	Discussion:	Obtain data from 3 transit agencies, could establish a specific target after baseline data collection. This indicator could also be combined with change in transit rider-ship compared with employment growth and/or park and ride usage (e.g. King County Benchmarks Program) when establishing a trend. Note: The City already conducts a statistically valid survey for "Strategic Objectives and we could get more directly at mode split by asking about it in the survey. Please see "potential future indicator" for additional suggestions.
15)	Objective:	Increase number of new households (density) near transit

	Target:	Upward trend, specific number could be established through housing strategy or in future comprehensive plan update
	Indicator:	Percentage of new residential units within 1/4 mile of transit stop with 30 minute minimum headway
	Discussion:	Requires integrating permit data with GIS analysis, could establish a specific target after baseline data collection and policy discussion.
Transportation: Non-motorized Facilities		
16)	Objective:	Increase pedestrian facility network length on major streets to make walking to destinations easier and safer
	Target:	Upward trend; specific target TBD
	Indicator:	Percentage of the total major street length (principal arterials, minor and neighborhood collector) citywide that has separated pedestrian facilities (sidewalk or paved off street trail) on at least one side of the street
	Discussion:	Target TBD by City based on analysis of GIS data, CIP and internal discussion. Future Transportation Plan update is an opportunity to set the target. May also want to consider establishing a target and indicator for trail improvements as well. Additional investigation of sidewalk connectivity measurements may also be needed - see Pedestrian LOS indicator.
17)	Objective:	Increase number of bicycle facilities throughout the city to encourage this mode and improve safety
	Target:	Upward trending number, specific target TBD
	Indicator:	Total miles of designated bicycle routes meeting minimum standard
	Discussion:	Bike lanes and interurban trail will be measured using GIS. City would need to define a minimum standard for other bike improvements that constitute a "bike route", map these and track year to year or change over 5 years.
Smart Growth		
18)	Objective:	Concentrate new growth in proximity of services and transit
	Target:	Upward trending number, specific numeric goal TBD
	Indicator:	Number of new residential units and total units (or average density) within a designated commercial center (and perhaps a 1/8 mile or other distance from boundary)
	Discussion:	Would need to define boundaries of designated commercial centers, 1/8 mile may be appropriate to the size of the centers themselves
19)	Objective:	Improve pedestrian/bicyclist access to open space and parks
	Target:	Upward trending number, specific numeric goal TBD

Indicator:		Percentage of households within a 1/4 mile of a neighborhood park or 1/2 mile of a community/regional park
Discussion:		Similar to measure currently identified in Parks Plan. An alternative measure could also try to get at accessibility through the presence of sidewalks/bicycle facilities on major streets within 1/4 and 1/2 mile of park boundary.

Green Building

20) Objective:		Promote efficient energy and material use in buildings
Target:		Upward trending number, Potential goal might be 3 projects in 2008
Indicator:		Number of certified LEED and 3+ star BuiltGreen projects within the City (by public and private).
Discussion:		Seems like an easy measure, but current permit system does not appear to track this.

Potential Future Indicator(s)

Objective:		Reduce the number of single occupant vehicle commuters (SOV)
Target:		TBD by City after collection and analysis of baseline data
Indicator:		Percent of commute trips taken by a mode other than SOV
Discussion:		More info needed to develop and apply this, but this is a more encompassing indicator than #1. The City collects Commute Trip Reduction (CTR) data from the City's largest employers and this data could be reported, however it would over estimate the number of workers who take alternative modes if extrapolated and it does not capture people who commute from Shoreline to jobs elsewhere. The City should consider using a statistically valid phone survey to get this data (e.g. expand the existing survey used to obtain the "strategic objectives" measurements). Census numbers can be compared with the phone survey every 10 years. Could also do this in conjunction with an expansion of the CTR program.
Objective:		Measure and improve the overall pedestrian "level of service"
Target:		TBD by City after collection of baseline data and refinement of the methodology to match local conditions and factors
Indicator:		Pedestrian LOS - combination of measuring continuity and directness of pedestrian network

Discussion:		More info needed to develop and apply this. Adapt Fort Collins Pedestrian LOS methodology, assigning a LOS of A,B,C,D,E, or F in terms of continuity, directness, street crossings, visual interest, and security. Concurrency requirements currently focus on cars and concurrency for other modes, especially pedestrians, is not currently measured in Shoreline. http://www.ci.fortcollins.co.us/transportationplanning/pdf/levelofservice.pdf

Ecosystem Conservation and Resource Stewardship

Stormwater and Water Quality

21)	Objective:	Decrease stormwater impacts through use of natural drainage techniques
	Target:	Upward trending number, specific target could be established
	Indicator:	Area (square feet) of new natural drainage constructed (by both private applicants and through public CIP projects) and total system area meeting defined minimum standard.
	Discussion:	Realistic goal can be set for public improvements following review of CIP. Target for private development will be harder to establish, should be modest at first, but should be attempted. Need to define a minimum standard, e.g. consistent with LID Manual and King County Surface Water Design Manual.
22)	Objective:	Reduce impervious surfaces in new development
	Target:	Downward trending number or possibly the goal of no net increase over existing baseline is more realistic given increasing population and density
	Indicator:	Median percentage of effective impervious surface in new projects (as compared to previous 4 years)
	Discussion:	Could also establish a defined numeric target, calculations derived from permitting data that is not currently tracked or aggregated. Current calculations do not identify "effective" impervious or distinguish between pervious and impervious paving systems.
23)	Objective:	Improve surface water quality
	Target:	Upward trend. Specific target could be established through trend analysis
	Indicator:	Washington Department of Ecology (DOE) Water Quality Index (WQI)

Discussion:		<u>The City has begun collecting data to use in the WQI and is determining whether or not it is appropriate as a reporting tool for the sustainability indicators.</u> The WQI is intended as a tool to summarize and report Ecology's Freshwater Monitoring Unit's routine stream monitoring data. The WQI is a unit less number ranging from 1 to 100; a higher number is indicative of better water quality. Scores are determined for temperature, pH, fecal coliform bacteria, dissolved oxygen, total suspended sediment, turbidity, total phosphorus, and total nitrogen. Constituent scores are then combined and results aggregated over time to produce a single yearly score for each sample station.
Potential Future Indicator(s)		
Objective:		Reduce impervious surfaces citywide
Target:		Downward trend or possibly the goal of no net increase from baseline is more realistic given increasing population and density. A specific goal could also be established.
Indicator:		Percentage of impervious surface citywide
Discussion:		LIDAR data can be interpreted to create an impervious data layer - research partnership, internship or thesis opportunity with UW. Given cost and rate of change considerations, data would be updated perhaps every 5 years.
Objective:		Improve surface water quality
Target:		Upward trending number for each stream reach and other surface water body as compared to previous 4 years or other study period, specifics TBD
Indicator:		Index of Benthic Invertebrate Diversity (IBID)
Discussion:		IBID was developed and used by UW - Derek Booth. There is an opportunity to partner with the Homewaters project and schools like Evergreen and Meridian Park that have done IBID sampling over the years in Thornton creek.
Vegetation and Habitat		
24) Objective:		Improve/restore habitat areas
Target:		Upward trending number, specific goal TBD based on City input
Indicator:		Acres of stream, wetland and related buffers that are enhanced and/or restored (as compared to previous 4 years).
Discussion:		City does not currently track and aggregate this data. Data should be broken out by voluntary/public projects and those done as permit requirements and mitigation. Invasive species removal could be tracked as a subset.
25) Objective:		Improve health of public forests
Target:		Upward trending number, specific acreage goal TBD based on City input

	Indicator:	Acres (and percentage) of public forests enhanced that year through removal of invasive species, replacement of dead or dying, thinning and other forest health management practices (as compared to previous 4 years).
	Discussion:	This is most actively occurring under Urban Forests Program and Ivy out efforts in parks. SF can be hard to track but should be measured. We will continue to study the Green Seattle program to look at ways to improve and refine this indicator.
26)	Objective:	Increase citywide tree canopy and natural vegetation through strategic use of the right of way
	Target:	Upward trending number, Specific target TBD following collection of baseline data and City review of existing, planned and possible CIP efforts.
	Indicator:	Number of street trees and square feet of landscaping planted in the right-of-way (ROW) per year by city services or programs (or private development in the ROW) as compared to previous 4 years
	Discussion:	Data from CIP projects, operations and DSG permit data related to right of way improvements would be combined. Might want to measure every 2 to 5 years to be more tangible and show change.

Potential Future Indicator(s)		
Objective:		Increase and maintain citywide tree canopy
Target:		Target to be established following collection of baseline data. E.g. 40% or potentially break down further by broad zoning category using American Forest's goals
Indicator:		Percentage of tree canopy coverage citywide
Discussion:		Establish baseline in medium term and update every 5 to 10 years based on remote sensing imagery. Consider use of CityGreen software.
Objective:		Measure and reduce the rate of tree canopy loss due to permitted development
Target:		Target to be established following collection of baseline data and further discussion. No net loss at least in single family areas may not be realistic given increasing density.
Indicator:		Median tree retention percentage achieved (better to use canopy coverage) and replacement trees planted on lots reviewed under the tree code.
Discussion:		Data could be tracked, but is tedious and replacement trees may not survive. More input from City needed to establish an appropriate indicator for private development. Overall City canopy coverage is a better potential future indicator and may be sufficient.

General		

27)	Objective:	Increase volunteer hours devoted to sustainability projects
	Target:	Upward trending number, based on current City "strategic objectives" program, target is 3,800 for all volunteer programs in 2008
	Indicator:	Number of volunteer hours and distinct individuals devoted to sustainability projects per year (as compared to previous 4 years)
	Discussion:	The City already gathers and tracks volunteer hours through "strategic objectives" program and could track hours in future years devoted to sustainability projects, e.g. habitat, recycling, right-of-way landscaping and other similar projects with a sustainability benefit.
28)	Objective:	Increase staff training on sustainability issues
	Target:	Upward trending number for next 5 years, than stabilize at appropriate level based on FTE, specific number TBD, including targets for certain positions.
	Indicator:	Number of staff hours devoted to sustainability training per year per full time employee equivalent (as compared to previous 4 years)
	Discussion:	The City already gathers and tracks training hours and establishes a training budget by department and by employee for some departments. A specific amount could be devoted to sustainability.

This list of potential indicators will be reviewed by the City and revised based on public input during Community Conversation #2. Additional consideration of target feasibility and goal setting by the City will be needed.

APPENDIX A - Assessment and Benchmarking Systems

Resourceful Government Guidebook

The Sustainable Development Commission's *Resourceful Government Guidebook* for City of Portland and Multnomah County is designed to help agencies put the concepts of sustainability into practice. The Guidebook helps agencies identify objectives and determine realistic performance targets given existing resources.

The *Resourceful Government Guidebook* includes:

- A step-by-step process that agencies can follow to create a sustainability initiative;
- Local policy requirements;
- Technical and financial resources; and
- A standardized reporting format which will allow the public, elected officials, and staff to review progress in a consistent manner.

The Guidebook has been used by other municipalities to create sustainability plans, most notably Fort Collins, Colorado (which was profiled in Task 1A memo).

The Guidebook contains a series of worksheets that support agencies through the steps of creating a sustainability plan. The steps outlined in the Guidebook are: Assessing Opportunities, Creating an Action Plan, Implementing the Action Plan, and Evaluating Results. Although the Shoreline Sustainability Planning Project is using different language for its process, we are currently at the equivalent of Step 2 as shown in the following graphic used in the Guide:

- **Assessing Opportunities**
  The worksheets in this section of the Guidebook help an agency conduct an initial assessment of opportunity areas commonly targeted by sustainability initiatives. Opportunities are presented in three categories:
  1. Building organizational support: Assessment of steps to incorporate sustainability into management and culture. What kind of leadership team is required? What policies and management systems are needed? How will the agency involve and educate employees?
  2. Modeling sustainable business practices: Review of areas where an agency can improve stewardship of resources in its internal operations. What does

the agency buy, build, or maintain? What resources are used and what waste is generated?

3. Promoting community development: This section helps an agency examine how its external programs and policies promote sustainability in the community. How is the agency changing behavior of citizens? How is it shaping the built and natural environment? Is the agency supporting the growth of sustainable business activity?

- **Creating an Action Plan**
  This section of the Guidebook contains a worksheet that helps set priorities and a simple template to organize goals, targets, and recommended actions.
- **Implementing the Action Plan**
  The *Resourceful Government Guidebook* does not provide information specific to implementation – rather, it lists available resources in Multnomah County. The City of Shoreline would need to develop lists of agencies and organizations that may partner in implementation efforts (see the Whistler2020 implementation scheme in the Task1A Memo). Note that the capacity assessment to be done as part of the Shoreline Sustainability Planning project will identify such resources.
- **Evaluating Results**
  The reporting template in this section of the Guidebook is used to evaluate and report results. The Guidebook then points the user back to Step 1 to identify new opportunities.

We found the Resourceful Government Guidebook useful as a source of ideas about indicator selection and in defining performance targets, and concepts related to these components were borrowed and adapted from this source. The City should consider this a good source for potential ideas and tools as the Sustainability Strategy is revised in the future.

PLACE³S

PLACE³S, an acronym for **PLA**nning for **C**ommunity **E**nergy, **E**conomic and **E**nvironmental **S**ustainability, is a free software-based planning method that focuses on public participation, community development and design, and computer-assisted quantification tools such as geographic information systems (GIS). Utilizing parcel-level land use data, PLACE³S is designed to estimate the community, environmental, economic, and transportation benefits associated with alternative development scenarios including existing land development patterns.

PLACE³S is unique because it employs energy as a yardstick to measure the sustainability of urban design and growth management plans. Using a Btu-based accounting system, PLACE³S can evaluate how efficiently a city or neighborhood uses land, provides housing and jobs, moves people and materials, operates buildings and public infrastructures, sites energy facilities, and uses other resources. PLACE³S integrates public participation, planning, design, and quantitative measurement into a five-step process appropriate for regional and neighborhood-scale assessments.

PLACE³S calculations rely on a community's own data to answer two key questions.
- How energy efficient is the neighborhood or region today?
- How much more or less energy efficient will it become in the future?

PLACE³S creates an information base that functions as a baseline and allows comparisons of actions and policies. The objective of the PLACE³S tool is for a community or municipality to build a Smart Growth plan by consensus that can be tracked and reported annually. A primary purpose for using the PLACE³S approach is to inform the public and decision-makers about quantitative differences among alternative development proposals. Because PLACE3S applies a common set of assumptions to all analyses, it compares alternatives objectively.

PLACE³S was applied in the Mid-City neighborhood of San Diego to help the community identify redevelopment options in conjunction with the completion of a freeway through the neighborhood. The model was used interactively in community workshops in order to help people understand the impacts of different zoning policies on redevelopment potential, energy use, vehicle travel, and other performance measures. The results helped shape a master plan for the neighborhood.

Data and Computer Needs
PLACE³S can be data-intensive. The method's reliance on energy measurements means that large communities or regions must use computers to assemble and interpret data, especially when evaluating multiple planning alternatives. In small community or neighborhood settings, however, a modest amount of data and hand calculations may support a PLACE³S study. Local priorities and resources will determine how many data are enough and how best to make computations.

If a community or region operates a GIS, it possesses a system it can adapt to make PLACE³S calculations. In locations without a GIS, a personal computer and spreadsheet software can tabulate data, which are then transferred to drawings. A CAD system can also automate this approach.

Software has been developed specifically for PLACE³S assessments. This software, called INDEX™, is available from Criterion, Inc. in Portland, Oregon for site or program-specific applications. Its use requires ArcView™ from ESRI, Inc. Aside from desired customization; its database must be populated before operation.[4]

For Shoreline, PLACE³S would be very useful for major comprehensive plan updates, master plans and significant redevelopment projects. The Environmental Sustainability Strategy will contain some recommendations related to the use of this tool in future planning efforts.

Ecological Footprint Accounting
The Ecological Footprint, a product of Redefining Progress, a public policy think tank (and consultancy), is a resource accounting and environmental education tool that inverts the traditional concept of carrying capacity (the population a given region could support) and instead seeks to determine what total area of land is required to sustain a population, organization or activity. For example, a nation's footprint is calculated by adding the footprint attributable to imports and subtracting the footprint of exports from domestic production: Total footprint = production footprint + imports footprint – exports footprint. This is computed for 72 product categories such as grains, timber, coal, oil, and cotton. A nation's footprint can be compared to the

---

[4] Contact Eliot Allen, Principal, Criterion Inc for details about INDEX, eliot@rain.com or 503-224-8606.

global average to provide perspective. A footprint can also be calculated, using different metrics, for municipalities.

The Footprint provides a graphic and poignant representation of sustainability. In 2001, the United States Ecological Footprint was 108 acres per capita, while the biocapacity (nature's supply) of the country was only 15 acres per capita. Each person in the country was using an average of more than seven times the amount of resources available to maintain current standards of living.

"Ecological Footprinting" targets the avoidance of ecological overshoot. Overshoot refers to a situation in which human demand for renewable resources exceeds nature's supply at a local, national or global scale. Once these limits have been exceeded, development can only occur through the liquidation of the planet's natural capital.

The Ecological Footprint measures human use of nature and aggregates human impact on the biosphere into one number – the bioproductive space occupied exclusively by a given human activity. This allows a comparison of biocapacity with humanity's demand (or consumption), and determines whether a defined region is moving into or avoiding overshoot.

Municipal Footprint Analysis
Redefining Progress has created a methodology to measure the amount of renewable and non-renewable ecologically productive land area required to support the resource demands and absorb the wastes of a city or region. Municipal Footprints are scientific, unbiased measurements that can be used to track progress towards sustainability goals.

Redefining Progress conducts three types of footprint analyses for municipalities, depending on the level of complexity needed. The Municipal Footprint options are:

▪ A "snapshot" of the city or region using readily available data about energy use, housing, consumption of goods and services, transportation, and recycling. The resulting spreadsheet allows the user to vary parameters in an urban planning framework.
▪ An analysis that incorporates local data compiled by Redefining Progress researchers on consumption, transportation, water use, and energy use patterns. Footprint calculations are generated over time to produce time-series data for use in policy analysis.
▪ Footprint analysis adapted to particular planning needs, in which a series of policy simulations is conducted over time, providing sustainability projections for different policy or planning options.

One drawback is that the Ecological Footprint is an expensive process – professional facilitation by Redefining Progress is required. However, project team members have utilized the concept of ecological footprinting to create graphic representations showing current vs. projected improved conditions of consumption as related to specific green building projects (see Figure 1). This graphic approach to showing the impact of human activities on biocapacity may be useful in the future as an educational tool. Improved footprint graphics could also be generated for the

shoreline strategy. In addition, this may be an opportunity to engage youths/students in collecting the (external) data needed to create the graphics.

Figure 1: Example of a graphic representation of a green building project (O'Brien & Company)

The Environmental Sustainability Strategy will contain additional guidance related to the use of ecological footprinting as a tool for community engagement. It may also be useful to use this tool as a way to show the impacts and benefits of new facilities (e.g. planned City Hall and Civic Center).

The Natural Step
The Natural Step (TNS) Framework is a science and systems-based approach to organizational planning for sustainability. It provides a set of design criteria that can be used to direct social, environmental, and economic actions. The Natural Step framework was developed in Sweden by Dr. Karl-Henrik Robèrt in 1989. Dr. Robèrt brought leading Swedish scientists together to develop a consensus on requirements for a sustainable society.

The Natural Step has four systems conditions:

1. In order for a society to be sustainable, nature's functions and diversity are not systematically subject to increasing concentrations of substances extracted from the earth's crust.
2. In order for a society to be sustainable, nature's functions and diversity are not systematically subject to increasing concentrations of substances produced by society.
3. In order for a society to be sustainable, nature's functions and diversity are not systematically impoverished by physical displacement, over-harvesting, or other forms of ecosystem manipulation.
4. In a sustainable society, people are not subject to conditions that systematically undermine their capacity to meet their needs.

Both the Whistler2020 and Santa Monica Sustainable City programs profiled in Task 1A memo used The Natural Step framework to guide development of their respective plans. Both cities cite the value of TNS in building consensus and creating tangible rallying points for the communities. Communities that embrace TNS have demonstrated remarkable results. The Whistler2020 program now includes more than 100 indicators managed by volunteer task forces. The UK used TNS to develop a nationwide program that includes 20 headline indicators that measure overall progress with a national set of 68 indicators which focus on specific issues and identify areas for action. Shoreline may decide to adopt this two-tiered approach to setting indicators. A simplification of TNS, such as the concept of living on "natural capital" can be useful in educational efforts.

> After reviewing the available information, it appears that this tool has limited immediate applicability for Shoreline. A "two-tiered" system of indicators may be useful and will be given further consideration. The concept of living on "natural capital" should be integrated into community education efforts.

Carbon Calculator

Carbon calculators are abundant – they can be found on Al Gore's "An Inconvenient Truth" website, via Bonneville Environmental Foundation's renewable energy program, and on the websites of a host of environmental organizations. Calculators vary according to complexity, but most are free. The calculator will estimate how many tons of carbon dioxide and other greenhouse gases a municipality's choices create each year.

> Carbon calculators are best considered as tools that are easily incorporated into broader sustainability plans. A specific sustainability objective, such as reducing carbon emissions or achieving carbon neutrality, can be simply calculated with readily available data. Calculators are accessible and applicable at many scales, and often provide tangible evidence of performance necessary to building consensus in sustainability plans. The City should use this tool for community engagement.

Local Agenda 21

Local Agenda 21 (LA21) provides the opportunity for Local Governments to work with communities to create ecologically sustainable development (ESD) agendas in concert with the United Nations Division for Sustainable Development Agenda 21. Agenda 21 is the action program adopted at the 1992 Earth Summit in Rio de Janeiro. 181 countries committed to work actively for sustainable development. Localities were requested to start local Agenda 21 processes that involve citizens in actively planning and creating projects that move the community toward sustainability.

LA21 is described as a process that involves local governments and communities working together to create a strategy which incorporates action plans based on environmental, economic, and social indicators. LA21 is best considered as a framework based on the high-level goals of Agenda 21. In fact, the chapter within Agenda 21 that addresses LA21 is remarkably short and lacking in detail – the implicit message being that local governments should use available resources to support the objectives of Agenda 21. However, there is no guidance and no specific

measurement system included. Some municipalities and local councils in Australia and England have developed LA21 indicator programs, but they are very unique to those locations and not replicable models. The best available research on LA21 efforts reveals that where local Agenda 21 efforts have been strong, such as in Sweden and the UK, they have included:

- A process orientation;
- A cross-sectoral approach;
- Grassroots participation;
- A holistic perspective including environmental, economic, and social considerations;
- A long-term perspective; and
- A search for innovative ideas.

After reviewing the available information, it appears that this tool has limited immediate applicability for Shoreline. It does not provide significant guidance for our efforts.

International Council of Governmental Initiatives (ICLEI)
The City also joined the International Council for Local Environmental Initiatives (ICLEI), the international leader for municipal implementation of climate protection, to obtain climate protection inventory software and training. Shoreline staff has received an initial software orientation. Staff expects to receive additional training in late 2007 or early 2008 to help define the inventory data for collection. The first step is to inventory the City's global warming emissions for 1990 and 2007, consistent with the timeframes in the recently adopted Mayor's Climate Protection Agreement. Toward this effort, City staff is researching how to accurately measure emission levels. City staff recently met with the City of Seattle to learn about and assess their method of completing a climate protection inventory. Additional information about ICLEI and related climate protection software is available at ***http://www.iclei.org/***.

ICLEI software will be used by City to inventory emissions and benchmark progress towards greenhouse gas reduction targets. This tool is recommended for inclusion in the Environmental Sustainability Strategy.

APPENDIX B – Alternative Forms of Prioritization and Selection

Resourceful Government Guidebook: Worksheet 4.1

Directions

1. In left-hand column, list the opportunity areas you identified in sections II and III of this guide.

2. Ask each team member to complete the worksheet on their own, rating the opportunities against the criteria shown. Rating system:

    2 = Significant opportunity   1 = Moderate opportunity   0 = Insignificant opportunity

3. Compare and discuss your scores.

4. Total the scores and discuss which areas are top priorities for action. *It may not be the items with the most points.*

5. Record your rationale for your choices. This will be important for future planning efforts.

Opportunities (see Worksheets 1.0 - 3.3)		Impact — Has benefits for . . .		
Opportunity areas	Description	Small/local business	Environment	Community
2.1 Sustainable purchasing				
2.1.1 **Automotive Vehicles and Equipment** Purchase biodiesel		2	2	2
2.2 Green building				
2.2.4 **Infrastructure** Roadside vegetation: requirements for landscaping focused on beautification, utility, and low resource use		1	2	1

Does this **really** have an impact?

A variety of resources help people assess the impact of their decisions.

"How many simple things do people need to do to save the planet?"

That's the question the Union of Concerned Scientists pose in their book The Consumers' Guide to Effective Environmental Choices. They weigh the impact of consumer choices and offer a list of priority actions which focus on transportation, food, and home energy use.

How many planets does it take to meet our needs?

The Ecological Footprint is an environmental accounting tool that calculates the acres required to meet our resource needs. According to its calculations, the average American uses 24 acres to support his or her current lifestyle. In comparison, the average Italian uses 9 acres. Find the Footprint online at www.redefiningprogress.org

What is our impact on global warming?

Human-caused greenhouse gasses are building up in the atmosphere, trapping heat and disrupting climate. To find out what you're doing to create this problem, and what you can do differently, use the global warming calculator at www.sustainableportland.org.

Influence		Investment				Summary	
Is visible	Supports community solutions	Saves/ makes money	Is easy to implement	Is timely	Benefits employees	Total score	Why selected or not
2	1	1	2	1	1	14	County currently conducting a pilot. Easy to implement right away.
2	1	2	1	1	1	12	High cost of maintaining roadside areas makes this a priority.

Setting goals & targets

Once your agency has identified its priorities, the next step is to clarify what you plan to achieve and how you will measure your progress. Use Worksheet 4.2 to record goals and targets for your priority areas.

Goals provide a broad statement of direction. Targets provide a specific description of the results you plan to achieve. A complete target details how results will be quantified (performance measure), what part of the operation will be measured (scope), what the desired outcome is (performance goal) and when it will be achieved (completion date). Note that in the sample below, energy use is measured on a per square foot basis. In other cases, results might be measured on a per acre, per employee, or per work output basis. These types of measures facilitate comparison with others. They also ensure that changes in levels of activity or output aren't mistaken for increases or decreases in efficiency.

Sample goal: **Decrease energy use**

Sample target: **Decrease energy use per square foot in City Hall**
performance measure   *scope*

by 15% by 2004.
performance *completion*
goal   *date*

Worksheet 4.2 A

Opportunity area	Goals	Targets
2.3 Healthy ecosystems		
2.3.1 Water use	*Increase water use efficiency by 25% by 2010.*	*At 10 largest sites, reduce gallons used per square foot by 2% by December 2002.*
2.5 Pollution and waste reduction		
2.5.2 Office waste reduction & recycling	*Reduce paper use*	*Reduce monthly copy paper use by 10% per employee by November 2002.*

Perspectives on performance measures

Compare with other communities:
These websites allow you to link to sustainability indicator programs established by other communities, or search for indicators by topic area. These examples can help you to identify good ways to measure progress and to compare your results with others.
www.sustainabilityindicators.org; www.sustainablemeasures.com

Workload or output measures
Organizations often use workload or output measures to put their sustainability performance measures in perspective. For example, a farm might track water used per acre. A manufacturing company might track energy used per product produced. For key workload measures for City agencies, refer to the *Service Efforts and Accomplishments Report* produced by the Auditor's Office.

www.ci.portland.or.us/auditor

City of Shoreline Environmental Sustainability Strategy
Contract Deliverable 1.B.: Sustainability Measurement and Tracking

December 7, 2007   Prepared by AHBL, Inc. and O'Brien & Company   34

Identifying specific actions

What will it take to meet your target? Part B of Worksheet 4.2 provides a basic format for recording the tasks required. Make sure that the tasks you identify are written into the appropriate agency workplans.

Charting a course

Backcasting

Should you reduce the amount of packaging for a product, switch to packaging that is completely recyclable, or do away with packaging altogether? Backcasting is a process that organizations use to envision a truly sustainable product or service, then focus on the actions needed to head that direction. For more information contact Oregon Natural Step Network 503-241-1140. For a case study using this approach, see *A Sustainability Vision for the Automotive Services Industry*, online at www.ortns.org/resources.htm

Quest for Performance -- training teams to solve problems

Quest for Performance is a training seminar that provides employees with the tools to analyze problems, identify root causes, develop solutions and manage for results. For example, Bureau of Licenses staff put their Quest training to use, slashing their annual printing costs by over $18,000 -- and saving a lot of paper in the process. Contact Laurel Butman at the Office of Management and Finance. 503-823-6806

Worksheet 4.2 B

What	Who	When
1. Complete water use audits at four sites.	Joe	by May 2001
2. Provide monthly water use data to facility staff.	Karen	by Dec 2001
3. Budget for water efficiency upgrades	Karen	by Jan 2002
1. Evaluate paper use from last year	Tom	by Jan 2003
2. Monitor monthly paper use; email usage trends to staff	Tom	Monthly, (starting Feb 03)
3. Purchase printer that prints 2-sided; multiple pages per sheet	Jane	by Feb 2003

When you've completed your draft plan, schedule an appointment to meet with the Sustainable Development Commission (SDC). SDC can identify technologies, expertise, partnerships and resources that will help you meet your targets. In addition, Matt Emlen 503-823-7224 and Amy Joslin 503-988-4092 are available for consultation as you develop your plan.

Potential Internal and External Indicators for Tracking Sustainability in the City of Shoreline

Below is a draft list of indicators that was initially developed for this task. These indicators were revised and a subset was selected for inclusion in the body of the Final Memo 1B. Please note that additional City input will be needed to define performance targets for the indicators that are ultimately selected. Each indicator addresses one or more of the Guiding Principals. Indicators are organized by focus areas (which also correspond to specific guiding principles).

Indicator	Method/Potential Measures	Source/ Reasoning/ Comment
Energy Conservation and Carbon Reduction		
Internal		
Annual energy consumption by City buildings	Electric and Gas Utility Bills	Common indicator
Annual greenhouse gas emissions from City fleet vehicles?	Based on Utility Bills, Utility energy sources, Motor Pool Logs and probably using an existing calculator application	Common indicator
Percentage of electricity use from renewable sources	Green Tags	Common indicator
Green Fleet – Percentage of fleet vehicles fueled by alternative sources Green Fleet – Average fuel efficiency Green Fleet - Number and percent of city motor pool VMT with natural gas, biodiesel, or hybrid vehicles	Motor Pool Log	Common indicator
External		
Annual per capita greenhouse gas emissions (by shoreline residents and businesses)	Not clear who would calculate this and what sources they would use. ICLEI is one source for doing this.	Common indicator
Annual per capita energy consumption (by shoreline	Not clear who would calculate this and	Common indicator

Indicator	Method/Potential Measures	Source/ Reasoning/ Comment
residents and businesses)	what sources they would use. ICLEI is one potential source for doing this. Could limit this to just natural gas and electricity consumption but that would only be part of the picture.	
Ratio of renewable to nonrenewable energy consumption for shoreline residents and businesses	PSE (gas), Seattle City Light (electric). E.g. Green tags program	Common indicator
Number of registered alternative fuel vehicles	Department of Licensing Records?	
City Operations and Purchasing		
Paper – recycled content and post-consumer waste recycled content as a percentage of total paper content purchased	City purchasing records	
Number of service providers and companies on a green vendors list that meet defined minimum requirements for environmentally friendly operations		Would need to develop and brand this program, probably as part of overall purchasing and outreach strategy
Transportation		
SOV and HOV Use		
Number of City residents that participate in Metro, Community, or Pierce Transit agency rideshare programs	Transit Agency Data and/or phone survey	
Number of employers/employees that have adopted voluntary or mandatory commute trip reduction programs	Survey and Transit Agency Data	
Transit		
Number of residential units within ¼ mile (network distance) of transit stop with 30 minute minimum peak headways.	GIS buffer analysis, land use data	Relates strongly to current LOS in City's Comp Plan. Also used in TND, LEED-

Indicator	Method/Potential Measures	Source/ Reasoning/ Comment
		ND
Number of transit boardings per year in Shoreline	Transit agency data	A way to measure transit use within the City of Shoreline. However improvements in this category limited by access to and convenience of service.
Total yearly and average daily park and ride usage by vehicles	Transit agency data	Provides additional information – suggested by City staff
Non-Motorized Facilities		
Total length and proportion of major streets (principal, minor, collector and neighborhood collector) citywide that have pedestrian facilities (sidewalk, off street path, or improved trail on at least one side of the street)		Sustainable Seattle, Richmond B.C. .
Total length and proportion of major streets citywide that have pedestrian facilities on at least one side of the street that are within: ¼ mile of Aurora, Ballinger Ave, 15th Ave, and 145th St ¼ mile of schools ¼ mile of parks ¼ mile of transit route/stop ¼ mile of commercial centers	Network distance would give a more accurate measure of directness. Criteria chosen based on suggestions from City staff on important transit streets, mixed use and multifamily development areas, and other areas where sidewalks are particularly desirable.	This measure gets at proximity of non-motorized facilities to key destinations/ facilities
Total number of "enhanced crosswalks" per mile of arterial roadway.	Will also establish a baseline, or establish a goal such as 2 per mile, This would give an overall citywide measure, but would	Similar to Fort Collins, CO *Pedestrian LOS,* walkinginfo.org An enhanced pedestrian crossing is a designated

Indicator	Method/Potential Measures	Source/ Reasoning/ Comment
	not address specific corridors where there is a known problem.	crossing that has curb ramps and standard signage and incorporates two or more of the following features: pedestrian-activated signal, overhead lighting, textured paving, illuminated overhead crosswalk sign, ladder crosswalk markings, curb extensions, median refuge area. City has concerns about cost, whether enhanced crosswalks are actually better in all cases and whether they are a measure of walkability.
Overall pedestrian level of service	Facilities - % of roadways with sidewalks on one or both sides of street meeting current city standards Directness - could compare buffer analyses based on a ¼ mile radius vs. network distance – changes between the two measures would indicate a trend towards or away from directness Crossings – changes in the year-to-year ratio of enhanced	This is likely a future effort that could be done during transportation master planning due to the time and data it will take. Fort Collins has an integrated Pedestrian LOS and other communities are developing LOS standards that encompass all modes.

Indicator	Method/Potential Measures	Source/ Reasoning/ Comment
	crossings would indicate a trend towards improved safety at crossings	
Number of miles of bike lanes, trails and routes citywide	6, 7, 10	Sustainable Seattle
Number of pedestrian injuries per year	Trending upward/downward based on previous year, we could make this per 1,000 population	Numbers of injuries is an indication of facility safety and are readily available.
Number of bicycle injuries per year	Police records, we could make this per 1,000 population and combine with peds.	Number of injuries is an indication of facility safety
Resource Protection and Management		
Stormwater Runoff		
Percentage of impervious surface citywide	King County data can provide baseline but it is very coarse. LIDAR data can be interpreted to create an impervious data layer. Measure trend based on previous year, update every 2-5 years.	Establishing baseline and tracking impervious would allow for establishing a stormwater utility.
Percentage of effective impervious surface in new projects	Permitting records, trending upward/ downward	This data would need to be collected via permits
Number of miles of swept roadway per month (or year)	Mile log of street sweeping equipment	Addresses suspended solids in stormwater
Lineal feet of existing or new natural drainage system meeting defined minimum standard.	Need to track from this point forward -does not appear to be part of their Utilities GIS data	Need to establish a minimum standard with City input.
Number of major drainage	It appears the City	measures water

Indicator	Method/Potential Measures	Source/ Reasoning/ Comment
incidents, flooding, landslides, significant erosion, etc.	tracks "drainage incidents" and incorporates into GIS	quantity. Could measure on a basin by basin basis and City-wide
Total estimated volume and number of sewer overflows to surface waters	Wastewater utilities are required to track this information.	
Amphibian count or benthic invertebrate count	Most likely beyond the capabilities of City, but could partner with researchers at UW, engage volunteers or find another source	Puget Sound Wetlands and Stormwater Research Program contributed to Sustainable Seattle for biodiversity as indicator of urban water quality
Water quality monitoring results	Existing City program, need recommendation on how to display this information in an indicator.	
Vegetation and Habitat		
Number of street trees planted per year by City Number of total documented trees planted in the community	In relation to an established goal, i.e. 500 trees per year, or a trend based on first recorded year City needs to establish goal and would need to begin tracking how many trees it plants each year, if it doesn't already	Many cities across the country have established tree planting goals, recognizing trees provide critical services such as stormwater uptake and evapotranspiration, reducing heat island effect, etc.
Square feet of native vegetation planted or restored in new projects on public land	Measured, plus trend upward/downward from previous year to year average	Will need to talk with the City about what data exists, how they update their inventory and what they are willing to collect.
Acres of critical areas (excluding	Based on permit data	Goal is to enhance

Indicator	Method/Potential Measures	Source/ Reasoning/ Comment
landslide and erosion hazard areas) enhanced/restored		City's tracking efforts for critical areas
Length and proportion in lineal feet of restored/enhanced streambank	Use permit data, need to set minimum definition trending upward/downward.	Will need to talk with the City about what data exists, how they update their inventory and what they are willing to collect.
Square feet of designated and permanently protected or restored/enhanced wetlands	Based on permit data, trending upward/downward	See previous comments and questions needing City input. Eventually could do both area and proportion, but wetland data is limited.
Acres of designated protected habitat	Based on City's open space inventory and records of native growth protection easements on private property.	Eventually could do a proportion when good data is established.
Percentage of lineal feet of major streets (primary, minor and collector arterials) with planting strips or street trees between sidewalk and street.	City would need to begin collecting data, if it doesn't exist already	Gets at urban landscaping and complete streets.
Percentage of canopy coverage citywide	Establish baseline using LANDSAT satellite imagery, track in relation to American Forest goals: • Average tree cover counting all zones 40% • Suburban residential zones 50% • Urban residential zones 25%	American Forests City would need to collect this data for any additional areas beyond what SUNP has analyzed. American Forests' City Green GIS software can be used to calculate benefits

Indicator	Method/Potential Measures	Source/ Reasoning/ Comment
	• Central business districts 15%	
Air Quality		
Number of complaints about air quality per year	Number of complaints from within City of Shoreline registered with the Puget Sound Clean Air Agency	**www.Sustainablemeasures.com**
Number of days key air pollutants (e.g. particulates) exceed healthful levels	Puget Sound Clean Air Agency trend graphing tool can provide data the two nearest monitoring stations (Lynnwood and Lake Forest Park) **http://www.pscleanair.org/airq/reports.aspx** , providing a clear upward or downward trend	**www.Sustainablemeasures.com**
Number and percent of city motor pool VMT with natural gas or hybrid vehicles	Motor pool log	More VMT by hybrid or natural gas = less CO2
Percentage of School District Busses that meet "clean diesel" standards		
Number of miles of swept roadway	Mile log of street sweeping equipment	Addresses particulates
Tons of waste landfilled annually both by City and total for the entire City	Rabanco, Waste Management and City records	
Recycling rate as a percentage of material generated both by City and total for the entire City.		
Number of sites within the City with known soil, surface water or ground water contamination		
Number of hazardous materials incidents		
Total volume of recycled motor oil		
Total for City, per capita and		

Indicator	Method/Potential Measures	Source/ Reasoning/ Comment
community total water consumption and water reuse		
Number of recycled products purchased by the City, or percentage of supplies budget spent on recycled products	City's financial records, procurement policy	
Gallons of water not used for city operations (reused water for toilet flushing and, irrigation, efficient water fixtures)	Utility bills	
Citizen Initiatives/Community Issues		
Total number of volunteer hours and hours per population dedicated to managing, monitoring, restoring and conserving biodiversity		
Number of volunteer events dedicated to environmental enhancement		
Number of "Growing Green" certified businesses	This is a potential program that could be established to promote green businesses and practices, similar to the "Chinook Book"	
Total acres and number of public agricultural gardens (could also do private gardens through survey)		
Land-use and development		
Number of certified LEED and 3+ star BuiltGreen projects within the City	Existing programs	
Number of ADUs, multifamily units permitted	Permit data	
Number or density of residential units within ¼ mile of the boundary of a designated commercial center, including:	GIS buffer analysis, land use data	Common measure taken from Traditional Neighborhood

Indicator	Method/Potential Measures	Source/ Reasoning/ Comment
• Aurora • North City • Paramount • Ballinger • Hillwood • Richmond Beach • Westminster/Highlands		Development (TND)
Percentage of households within a ¼ mile (radius or network distance) : • Transit stops • Schools • Parks	GIS analysis	¼ mile is a widely accepted measure for how far the average person is willing to walk to a destination, LEED-ND uses ¼ for its transportation efficiency credit
Parks and Open Space		
Percentage of households within a ½ mile of a neighborhood park amenity (either a neighborhood park or a designated school site that offers a neighborhood park amenity)	GIS buffer analysis, trending upward/downward	Neighborhood parks are intended to be within walking distance. The PROS plan has a service area of ½ mile (15 minute walk) for neighborhood parks, which results in substantial deficiency. The PROS plan cites an "amenity driven approach" in lieu of traditional service area, which would include schools as potential sites for developing neighborhood park amenities and addressing neighborhood park deficiencies. LEED-ND also uses a ½

Indicator	Method/Potential Measures	Source/ Reasoning/ Comment
		mile
Total miles of walking/biking trails (per capita)	Trending upward/downward in relation to standard.	Would show how city is meeting growing demand for trails. City of Edmonds, WA developed a formula for determining how many miles of trails would meet demand, based on a comparison of participation and trail systems in other communities and a community survey – the standard Edmonds uses is 0.17 miles per 1,000. Shoreline appears to not currently have a trails LOS standard
Percentage of parks within ¼ of a transit stop.	GIS buffer analysis, trending upward/downward	Measure of park accessibility, a key component of quality of system
Percentage of parks located adjacent to a designated bicycle route and/or green street *sidewalk measure under non-motorized transportation would measure how accessible parks are by walking	GIS buffer analysis, trending upward/downward	Measure of park accessibility, a key component of quality of system
Percentage of multi-family residential units within a ¼ mile of a park	GIS buffer analysis, trending upward/downward	Measure of park accessibility and how well city is meeting the greater need for parks near more densely developed areas, a key component of quality of system
Number of criminal incidents	Police data	Measures park

Indicator	Method/Potential Measures	Source/ Reasoning/ Comment
within parks and open spaces		safety, a key component of quality of system
Linear feet of publicly accessible shoreline		Shoreline access both on the sound and Echo Lake is cited in the PROS plan as an important community need.
Other		
Number or sustainability strategy recommendations adopted		
Percent of budget devoted to infrastructure and facility maintenance		