

Stewardship & Sustainability: Audit and Recommendations

Prepared for Metro Parks Tacoma
By Sustainable Business Consulting

October | 2008

Sustainable Business Consulting

4700 42nd Ave SW, Suite 552

Seattle WA, 98116

Office | 206.935.0210

Fax | 206.935.0341

www.sustainablebizconsulting.com

Table of Contents

Table of Contents..... 2

MPT *Guiding Goals*..... 3

Carbon Footprint Analysis *Year 2007*..... 4

S&S *Policy/Mandate Recommendations*..... 8

S&S *Recommended Actions* 10

S&S *Achievements To Date* 14

Benchmarking Stewardship & Sustainability Against Industry Leaders..... 16

Appendices..... 19

MPT *Guiding Goals*

1. *Greenhouse Gas Emissions: **Adopt and pursue the City of Tacoma's GHG goals.***
Measure gas, electricity, waste management, fleet use, commuting, and paper use.
2. *Water Conservation: **Reduce water use 50% from 2008 levels by 2020.***
Treat water like a precious resource.
3. *Waste Reduction: **Zero waste to landfill.***
Characterize waste and promote reduction, recycling, and reuse.
4. *Walkability: **Offer the most walkable park system in the US.***
Serve the community – promote health and wellness.
5. *Leadership: **Be a community leader and resource for learning sustainability.***
Share achievements & best practices, and teach practical skills that visitors can take home.

These Goals:

- Are “stretch” goals that are meant to guide short and long-term goal setting
- Support the stewardship & sustainability policy, as well as the MPT Strategic Plan
- Provide opportunities for cost savings through conservation measures
- Demonstrate leadership in the industry (Parks) and community (City of Tacoma)

Their Purpose:

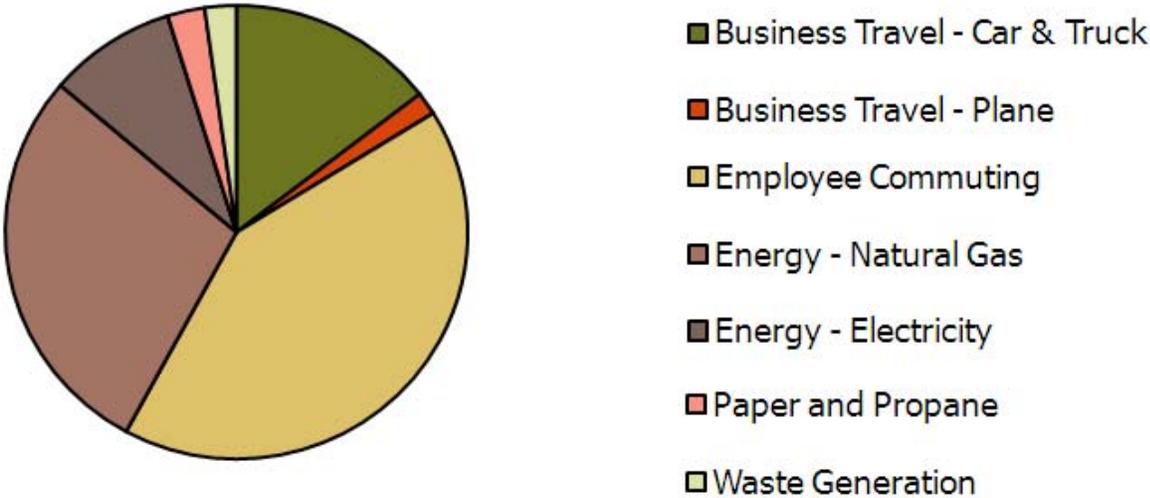
- Pull all Stewardship & Sustainability initiatives together under five simple headings – to create a clear vision and streamline communication
- Empower the Executive Cabinet to set goals for the Green Task Force
- Guide the development of annual Work Plans for the Green Task Force and Green Teams

Carbon Footprint Analysis *Year 2007*

Metro Parks Tacoma Estimated 2007 Carbon Footprint

Total emissions: 4,611 metric tons of CO₂e (MT CO₂) annually

5.0 metric tons of CO₂e/employee



Emissions Sources – 2007 Carbon Footprint Analysis

	B	C	D	E	F
8	Transportation				
9			Miles Traveled (Business & In-Town)	Miles Traveled (Commuting)	CO2 (Metric Tons)
10		Car & Truck	1,837,021	4,823,385	2,606.97
11		Airplane	427,738	-	77.08
12		Train	-	2,901	0.47
13		Bus	-	107,846	28.63
14		Scooter/Motorcycle	-	166,156	28.55
15		<i>Subtotal</i>	<i>2,264,759</i>	<i>5,100,289</i>	<i>2,741.70</i>
16					
17	Energy Use				
18			Quantity	Units	CO2 (Metric Tons)
19		Natural gas	252,497	therms	1,339.79
20		Electricity	9,354,775	kWh	420.96
21		Steam	-	thousand lbs	-
22		<i>Subtotal</i>			<i>1,760.75</i>

	B	C	D	E	F
24	Materials Purchased				
25			Quantity	Units	CO2 (Metric Tons)
26		Paper	3,790,000	sheets	19.23
27		Propane	13,411	pounds	77.01
28		<i>Subtotal</i>			<i>96.24</i>
29					
30	Waste Generation				
31			Quantity	Units	CO2 (Metric Tons)
32		Disposed	323	tons	135.70
33		Recycled	121	tons	(58.16)
34		Composted	325	tons	(65.0217)
35		<i>Subtotal</i>	<i>769</i>	<i>tons</i>	<i>12.52</i>

Summary

Transportation and Fleets (59%)

- 70% is from staff commuting
- 27% is from in-town travel and MPT fleets, which includes both vehicles and equipment
- 3% is from air travel

Natural Gas Consumption (30%)

- Second largest contributor to GHG emissions
- Pools and PDZA use the majority of this energy

Electricity Use (10%)

- PDZA, the Norpoint & Peoples centers are the 3 highest users

Waste and Paper Use (Minimal <1%)

- The US EPA calculates recycling and composting as “carbon-negative”; therefore, MPT’s recycling efforts offset much of its emissions from waste. However, emissions incurred by *hauling* are not included in this analysis, because technically these are usually assigned to the hauling company

Carbon Footprint Conclusions

The greatest opportunities to reduce GHG emissions are in **staff commuting, natural gas use and fleet use**. Focus on creating reduction strategies for these areas first to discover and capitalize on the easy wins.

To **track progress toward emissions reduction goals**, MPT's Carbon Footprint will have to be measured regularly in the future. To ease this process, MPT should consider:

- 1) Conducting a waste audit to characterize waste and measure it by volume & density.
- 2) Requiring all departments to track and report annual paper use.
- 3) Requiring the tracking and reporting of all flight connections, not just the destination.
- 4) Conducting additional employee commuting surveys and a maintenance driving audit to measure "windshield time."

To **match the City of Tacoma's GHG emissions reduction goals**, MPT's emissions reduction goals should be as follows:

15% below 1990 levels by 2012 -2% per year from 2005-2012.

40% below 1990 levels by 2020 -4% per year from 2013-2020 if 2012 goal is met.

80% below 1990 levels by 2050 -3.5% per year from 2021-2050 if 2020 goal is met.

A simple calculation was used to determine MPT's 1990 emissions relative to the City of Tacoma. **Assuming that MPT emissions currently account for an estimated 0.25% of the City of Tacoma's emissions**, MPT's 1990 emissions are estimated as follows:

City of Tacoma's 1990 emissions = ~**1,990,830 MT CO₂e**

Metro Parks Tacoma's 1990 emissions ~ **4,977 MT CO₂e**

S&S Policy/Mandate Recommendations

The following is a list of recommended policies and mandates that the MPT Executive Cabinet should consider enacting. S&S initiatives need this support and top-down cohesion in order to:

- Demonstrate to all MPT staff that the S&S initiatives are coming from the leadership level
- Implement simple, universally-applicable S&S activities throughout the entire MPT system

Policies and mandates enacted will serve as the foundation for recommended actions described in the next section.

Staff and Stakeholder Engagement

1. All purchasing and contracting policies will be updated by the Green Task Force to give priority to sustainable materials and services from suppliers, vendors and contractors.
2. MPT will provide a brief annual sustainability education and training program to all staff; this training may come from Green Teams, the Green Task Force, or another organization.
3. Each Green Team will create an annual sustainability action program for their department that aligns with the goals and objectives of the Green Task Force.

GHG

1. Measure MPT's carbon footprint annually (to inform actions and report progress).

Energy

1. Purchase Energy Star rated appliances, office equipment, and lighting whenever possible – and give preference items with the highest ratings (for example, 80Plus Program rating for new computers).
2. Set up computers to be shut off at night and to power down when inactive. Install software programs that enable downloads/updates at night. Install free CO2 Saver on all staff computers.
3. Monitor and calibrate thermostat levels in MPT facilities quarterly.

Travel

1. Create a comprehensive Green Fleets Program; follow the Puget Sound Green Fleets Guide (psgreenfleets.org).
2. Conduct a Maintenance Driving Audit to measure “windshield time” and determine the most efficient and cost effective driving and meeting patterns.
3. To reduce air miles traveled, determine how many miles each department is traveling and set an annual “total miles budget” to reduce air travel by 50%.
4. Utilize virtual meeting software to reduce business travel.

Paper

1. Require all printers to be set to default print double-sided.
2. Whenever possible, submit reports electronically (PARs for example).

WATER

1. Phase out single use disposable bottled water at offices and in programs by 2010.

WASTE

1. Set a 2:1 recycling bin to garbage bin ratio in all MPT buildings.
2. Make composting available at any MPT building that has a kitchen or food service.
3. Phase out disposable food service ware and transition to compostable options (to save on purchase and disposal costs, and reduces associated emissions).

S&S *Recommended Actions*

Three Priorities

1. Invest in communication efforts, both internally and externally.

- This includes merging, streamlining, and web communication of reports and audits.
- All Green Team members must gather more frequently to share best practices and celebrate accomplishments.
- Enhance the MPT website and include interpretive signs in visitor and staff areas-facing S&S initiatives to increase awareness.

2. Policies and mandates need to be enacted.

- Demonstrated support from leadership lends cohesion to efforts that are otherwise isolated.

3. Further address walkability.

- This was set during the goal-setting session with the Green Task Force, but few actions have yet been identified to pursue it.
- MPT has just broken ground on the Water Ditch Trail; consider what will be needed to support its use and build on this project.

Top 10 Sustainability Actions – for System-wide Implementation via the Green Task Force

1. Phase Out Bottled Water.

- Start by eliminating 12-20 oz. bottled water in all MPT offices and internal operations
- Look for alternatives to enable the phasing out bottled water sales at all metro parks

2. Execute High-Profile, Exciting Projects.

- Develop a "showcase park" for each planning area by implementing a diverse and innovative range of initiatives such as demonstration projects, low water-use landscaping, interpretive signs and education programs, and energy efficient facilities.
- Conduct "Eco Makeovers", carried out by the SMART Team with support from Green Teams: SMART team is currently conducting facility repair/renovation projects; train them to conduct "Eco Makeovers" as well. See the Benchmarking section on Toronto Parks for comparison

3. Install a Renewable Energy Demonstration Project at PDZA.

- PDZA has expressed tremendous interest in this. S&S efforts at PDZA are supported by an inspired Green Team that is enthusiastic about assisting with this endeavor. Potential social and educational returns are high

4. Reduce emissions from employee commuting, the largest contributor to MPT's carbon footprint.

- SBC's survey of MPT staff reveals strong interest in transportation incentives. PDZA's Green Team is successfully implementing this and can model for MPT as a whole
- Utilize a web-based e-carpooling program. PDZA has done this successfully by combining the tool at piercetransit.org with an internal campaign to connect carpoolers
- Take advantage of existing Pierce Transit commuter programs and incentives

5. Reduce Business Travel.

- Reduce staff air miles 50% by 2010
- Web conferencing and/or Ncomputing to limit in-person meetings between MPT staff, ex: between NW Trek and Metro Parks Headquarters

6. Make MPT landscapes and flower beds low water-use to reduce water and chemical use.

- Choose a strategic location each year for replacing existing plants and flowers with hardier plants that require less water, little or no chemical treatment, and are native when feasible. Highlight and replicate the project at Ruston Way
- Choose at least one strategic location each year to replace unused turf with low-maintenance, low-water landscaping; consider starting at HQ

7. Reduce Paper Use.

- Set all printing and copying machines to default duplex. 100% post-consumer recycled paper; for reports, print only the minimum required by law. Switch to electronic timecards and electronic PARs

8. Express MPT's values throughout the supply chain.

- Enact sustainable purchasing policies (for example, giving preference to Energy Star, locally made, certified organic/Forest Stewardship Council products) and include them in all RFPs, bids, contracts and purchasing protocols

9. Teach the Community about Sustainability.

- Offer recreation programs that teach sustainability skills (for example, Green Your Family, Green Your Yard)

10. Leverage the City of Tacoma and Tacoma Power's sustainability education programs and existing materials (ex. posters, free CFL light bulbs).

- Capitalize on resources and free materials developed by other agencies

Other Actions – for Green Teams to Consider

- Phase out 2-stroke engines in favor of using low-emissions alternative.
- Reusable/compostable food serviceware (silverware, plates, cups etc).
- Eliminate electric space heaters in office cubicles.
- Eliminate mini fridges.
- Turn off electronics at night.
- Sell MPT-branded stainless water bottles.
- Explore eliminating plug-in electric water coolers in MPT offices.
- Don't accept donations of used appliances unless Energy Star and in excellent condition.

S&S Achievements To Date

MPT has already accomplished many things that align with five goals identified in this report. It is important for everyone at MPT to recognize and understand the value of these achievements. They are inspiring, and it is critical that MPT communicate what has already been done in a way that dovetails with new initiatives. It needs to be understood that new activities are an exciting continuation of things already underway.

Toward GHG emissions measurement and reduction:

1. Overall, electricity and natural gas use at MPT have decreased from 2005 to 2007
2. MPT received grants for replacement of select 2-stroke equipment with 4-stroke
3. NW Trek increased its use of renewable energy, overhauled its trams to make them more efficient, and provides bicycles for staff to get from place to place

Toward Water Conservation:

1. Renovated turf to ensure water penetration, prevent runoff (Wright, Pt Defiance and sports complexes in 2008)
2. Installed computer-sensor irrigation clocks in South Park and flow meters at PDZA
3. Performed water audits on all PBS facilities in 2007
4. Upgraded to predominantly drought-tolerant landscaping. The 2007 project at Ruston Way is a highlight example

Toward Waste Reduction:

1. EnviroStars Certified at NW Trek and PDZA (5-star certified)
2. Pursuing Audubon Golf Course certification for Meadow Park
3. Started sustainable product use: ex. biodegradable hydraulic fluid in all new equipment

Toward Leadership in Sustainability:

Sustainability Initiatives:

1. NW Trek joined the NW Forest Sustainability Council certification in 2007
2. Developed an annual work plan and report on Stewardship & Sustainability Policy
3. Initiated a district-wide Green Team and established departmental Green Teams

Community Engagement:

1. Developed volunteer projects in MPT natural areas with the support of CHIP-In groups
2. Supported an initiative to assess the biological diversity of Pierce County
3. Established the ZEED outreach program to school districts in Pierce County

Natural Resource Conservation:

1. Helped guide the Green Tacoma Partnership, which started a newsletter and held 4 volunteer trainings and 4 meetings in 2007
2. Provided support for conservation efforts through the Zoo & Aquarium Alliance, Pierce Co. Biodiversity Alliance, the SPS Salmon Enhancement Group, and ZEED Cons. Committee
3. Participated in AZA conservation and science programs that support sustainable animal populations in zoological/aquarium settings and in the wild
4. Led successful Red Wolf, Clouded Leopard, Pygmy Rabbit, Bison, and Oregon Spotted Frog species conservation projects
5. NW Trek joined the NW Certified Forestry Group in 2007

Benchmarking Stewardship & Sustainability Against Industry Leaders

Benchmarking your actions against the best practices of industry leaders can help you measure your efforts – and acquire new ideas for doing even better.

Accomplishments of the following industry leaders are highlighted below:

- Toronto Parks, Forestry and Recreation
- Chicago Park District
- Denver Parks and Recreation
- Seattle Parks and Recreation
- Portland Parks and Recreation
- Ashland, OR Parks and Recreation
- Richmond, VA Parks and Recreation
- Michigan State Parks

GHG Emissions –Chicago, Richmond, Seattle, and Ashland

Fuel:

- Purchased eight propane-powered lawnmowers from EnviroGard. Propane is 30% less expensive than gas or diesel, and produces 80% less harmful emissions (Chicago)
- "Mind Your Idle" program supports cleaner air by requiring park staff and volunteers to turn their engines off when they are not needed (Seattle)

Electricity:

- LED exit signs: The lamps in nearly all emergency exit signs are equipped with these light features which use a fraction of the power of the traditional signs (Seattle)
- Push-button lights have been installed at four tennis courts and one baseball field. The department expects an approximate annual dollar savings of \$1,929 using the new push button lighting system (Richmond, VA)
- Motion-sensor lights at Hotchkiss Community Center, and plans for six other community centers (Richmond, VA)

Water Conservation: Seattle and Richmond

Irrigation:

- Maxicom is a computerized irrigation system installed in 45 parks, saving thousands of gallons of water per park each year (Seattle)
- Whenever practical, plants that require less water are planted, reducing the need for supplemental irrigation (Seattle)
- In accordance with the City of Toronto pesticide bylaw (which restricts the outdoor use of pesticides on all public and private properties), all Toronto parks are pesticide free
- Seattle Department of Parks and Recreation maintains a pesticide reduction program

Indoor Water Use:

- Tankless hot water systems are being installed to reduce natural gas costs at Hotchkiss, Powhatan, and Humphrey Calder community centers (Richmond, VA)
- All 10 pools now have Ecostar model washing machines that use up to 70% less electricity and 40% less water than previous models (Seattle)
- Waterless urinals are to be installed at Hotchkiss, Powhatan and Humphrey Calder community centers, saving an estimated 40,000 gallons of water per urinal annually (Richmond, VA)

Waste Reduction: Seattle and Richmond

- Seattle Parks creates its own "Clean Green" mulch, and reuses pier pilings and telephone poles for park structures (Seattle)
- "Pack It Out" program asks park visitors to take their garbage with them (Seattle)
- Outdoor Recycling Pilot Program: Bright blue bins with can-sized "mouths" in select parks (Seattle)
- Three "Big Belly" trash cans installed at Byrd Park Fountain Lake. These huge underground cans replace six regular-sized trash cans (Richmond, VA)

Community Leadership in Sustainability: Denver, Toronto, and Seattle

Walkability:

- “Walk in the park” program closes streets to thru-traffic on certain days, reducing carbon emissions by encouraging citizens to use alternative forms of transportation (Seattle)
- On select days, park streets are closed to vehicles for pedestrians and bicyclists as part of the city’s Climate Action Now program (Seattle)
- Offering a “carbon-free” guidebook showcasing ten walking and bicycling tours in and around downtown Denver (Denver)

Eco-Makeovers (Toronto):

In 2006, Toronto Parks launched Eco-Makeovers, an environmental improvement program structured around the following focus areas: reduce, reuse, recycle, rethink indoor air quality, water quality, water efficiency, sustainable transport, and education and outreach.

The Eco-Makeovers program has accomplished the following:

- Scarborough Centennial Recreation Center installed solar panels to help heat its pool
- Bob Abate Community Center installed a 10-ring bike rack
- Several recreation centers placed city transit maps and schedules in highly visible areas
- Several recreation centers received indoor air-cleaning plants
- Eco Makeover sites have posted "Switch Off" near light switches
- Compact fluorescent lights and water efficiency kits were distributed to staff at several sites
- Community centers received reusable dishware for their kitchens and lunchrooms
- 'Reusable Paper Here' stickers distributed to all participating centers
- Cloth bags, reusable stainless steel travel mugs, and refillable water bottles have been provided to many of the full-time, on-site staff at each Eco Makeover facility
- All Eco Makeover sites were provided with battery recycling and disposal information
- Eco Makeover sites received "Eco Info" display boards to help better inform staff and public users of the City’s waste diversion and environmental initiatives

Appendices

Appendix A: Carbon Footprint Analysis – assumptions and emissions factors

Assumptions and Notes

#Staff at MPT:

FTEs = 657

261 permanent full-time staff

585 revolving temporary/seasonal staff working at any time

Commuting:

919 people commuting to work at MPT each day on average

Paper Use:

No actual data; purchasing occurs at individual offices/depts, too difficult to measure as a whole.

The 585 temporary/seasonal staff use 80% less paper than full-time staff use.

Waste:

Waste and recycling hauling costs for MPT are combined and could not be separated. SBC had no actual data on how much MPT recycles.

20% of waste hauling costs are attributable to recycling.

Business Air Travel:

SBC was provided with only the destination name for each trip. Connection information was requested but apparently unavailable. For this reason, air travel emissions reported are likely lower than actual emissions.

Data Sources:

Waste, Fleet Fuel Use, Natural Gas and Electricity data sourced from Maggie Corbin's Utility Audit.

Staff commute data collected with an online Survey Monkey.

Staff business travel data sourced from MPT Accounting.

Emissions Factors

Transportation:

B20 8.11 kgCO₂/ga US Energy Information Administration <http://www.eia>.
Gasoline 8.87kgCO₂/gal Derived from Us GHG Inventory Annex 2
Diesel 11.15 kgCO₂/g Derived from Us GHG Inventory Annex 3

Air, short 0.24 kgCO₂/pn WRI
Air, medium 0.19 kgCO₂/pn WRI
Air, long 0.18 kgCO₂/pn WRI

Metro diesel consumption 0.018 gal/pm Federal Transit Administration & Metro data
Metro emission factor 0.22 kgCO₂/pn Seattle Climate Action Now
Sound Transit 0.22 kgCO₂/pn [Assumed same as Metro]

Scooter/Motorcycle 0.17 kgCO₂/mi <http://www.defra.gov.uk/environment/business/envrp>

Energy Use:

natural gas 5.30 kgCO₂/th U.S. GHG Inventory, Annex 2, Table A-29: Key Assumptio
Seattle City Light 0 kgCO₂/kWh Seattle City Light, includes offsets
Puget Sound Energy 0.39kgCO₂/kW Puget Sound Energy
SCL/PSE marginal emissions 0.6 kgCO₂/kW Seattle City Light
Tacoma Power 0.045 kgCO₂/k WA CTED

Waste:

Average cost for waste \$150 per ton Resource Venture www.resourceventure.org
Average cost for recycling \$100 per ton Resource Venture www.resourceventure.org
Average cost for organics \$125 per ton Resource Venture www.resourceventure.org
Waste 420 kgCO₂/ton EPA Life Cycle Assessment
Recycling (-)480 kgCO₂/ EPA Life Cycle Assessment
Yard/Food waste (-)200 kgCO₂/ EPA WARM

Appendix B: MPT Accomplishments To Date – raw list

GHG emissions reduction

- Implemented the Green Practices Checklist for capital projects.
- Baseline Year: 2007. All GHG emissions measured, same as City of Tacoma; opportunities for improved accuracy in measurement of waste management and paper use in particular.
- Electricity use has decreased since 2005.
- 4-cycle blowers and edgers arrived for testing at TNC in 2008.
- Monitored and reduced energy use in buildings using a utility use score card (since April 2008).
- Addressed energy efficiencies when planning all improvement projects (adopted a sustainable projects checklist in 2007, used on all bond projects)
- Providing utility use data for major facilities to help staff monitor and reduce building utility use and converting all fluorescent light fixtures from 32-watt to 25-watt.
- PDZA is partnering with TPU on a solar energy demonstration project including solar panels and interactive display element (cost constraints as a barrier).
- Increasing the portion of Trek's annual electricity purchases from green power sources.
- Rebuilt NW Trek's propane trams to achieve new efficiencies.
- Replaced select 2-stroke engine maintenance equipment by 4-stroke with granted funds. New purchases will be 4-stroke rather than 2-stroke if budget and specs allow.
- Carbon footprint of fleet has been analyzed.
- Purchased fuel efficient new vehicles (PBS and PDZA purchased a Prius hybrid car to replace older vehicles, purchased a low-emissions rated pickup, Planning purchased a Prius)

- Developed green fleet guidelines, with preference for hybrid vehicles, clean alternative fuel vehicles, low and ultra-low emission vehicles, and electric powered utility vehicles when practical.
- Installing a biodiesel B20 tank.
- Goal to reduce PBS fuel use by 5% in 2008.
- Converting diesel use to biodiesel (B20) and establishing centrally located fueling station(s).
- Refurbishing LPG trams at NW Trek to avoid diesel emissions.
- Encouraging alternative transportation for employees (participated in Relax Rewards in '06,'07, and '08; sponsored Carless Commute in 2007 and will again in 2008).
- Implementing a system to monitor fuel, electricity, natural gas, and water consumption.
- Developing conservation targets and implementing measures to reduce fuel, electricity, natural gas, and water consumption.
- Trek added bicycles for in-park staff transportation.
- Acquiring two new trams that are powered using clean burning fuels that are an alternative to gasoline.

Reduce water use 50% from 2008 levels by 2020.

- Install new irrigation systems that will include Cal-Sense computerized clocks to control water use.
- Focus on replacing inefficient toilets and urinals, per TPU water audit.
- Plans to audit and repair irrigation system leaks at Point Defiance in 2008.
- Renovate turf to ensure water penetration and prevent runoff (Wright, Pt. Defiance, and sports complexes in 2008).
- Performed water audits on all PBS facilities in 2007.
- Addressed water efficiencies when planning improvement projects using the sustainable projects checklist.

- Installed standardized computer-sensored irrigation clocks in South Park in 2007.
- Upgraded predominantly drought-tolerant landscaping (Ruston Way, 2006-2007: PDZA installed succulent plants display).
- Testing a lawn wetting agent to reduce runoff at Pt. Defiance in 2007, results of which were inconclusive and will continue testing.

Zero waste to landfill - waste is reduced, reused, recycled, or composted.

- Some facilities are purchasing post-consumer recycled paper, but not all.
- Purchased 100% recycled paper for all printers and copiers.
- Installed recycling at targeted community centers.
- Installed recycling containers along Ruston Way.
- Required all new workgroup printers to have 2-sided capability.
- Recycled green waste in all MPT operations.
- Composted most PBS and PDZA grass clippings and leaves on site. (In 2007, PBS analysis found in-house compost production not cost-effective).
- Composted carnivore waste at NW Trek.
- Providing recycling containers at Zoobilee, Zoo Cinemas, and other society sponsored events to capture plastic bottles and cans.
- Green Agenda goal set to require recycling at all public events at MPT sites, provide recycling at all facilities, increase public recycling in parks, and collect 100% of recyclable materials from MPT operations.
- Installed public recycling containers in all community centers and public rental facilities.
- Certified green cleaners for most cleaning is standard practice in all MPT operations.
- Used primarily organic fertilizers in all MPT operations.
- Used biodegradable hydraulic fluid in all new equipment beginning in 2007.
- Used less-toxic solvent & recycled antifreeze at NW Trek in 2007.

- Considered toxicity of materials during project design using the sustainable projects checklist adopted in 2007.
- Implemented chemical and waste handling recommendations from 2006 L&I audit of PBS operations.
- NW Trek Enviro Stars certified in 2007; PDZA certified in 2008.
- Writing a protocol for pesticide selection (Procedures developed in 2008).
- Pursuing Audubon Golf Course certification for Meadow Park.

Walkability

- TBD

Sustainability Leader and Resource

- Developed a strategy for employee and community education.
- NW Trek joined the NW Forest Sustainability Council certification in 2007.
- Promoted values of natural areas in a City Line segment (Aired 2007).
- Helped guide the Green Tacoma Partnership, started a newsletter and held 4 volunteer trainings and 4 meetings in 2007.
- Held a Point Defiance Trails Day work party (June 2007).
- Set and met environmental goals for all construction projects using the sustainable projects checklist adopted in 2007.
- Refined the Policy on Stewardship and Sustainability Policy with board advice and advanced its adoption.
- Organized an educational session for board, senior staff, and planning staff on the topic of LEED and developed a consensus on how to apply the program to the district's CIP.
- Implemented the Qwest for Life program that supports the fourth grade Structures of Life science curriculum (supported by PDZA).

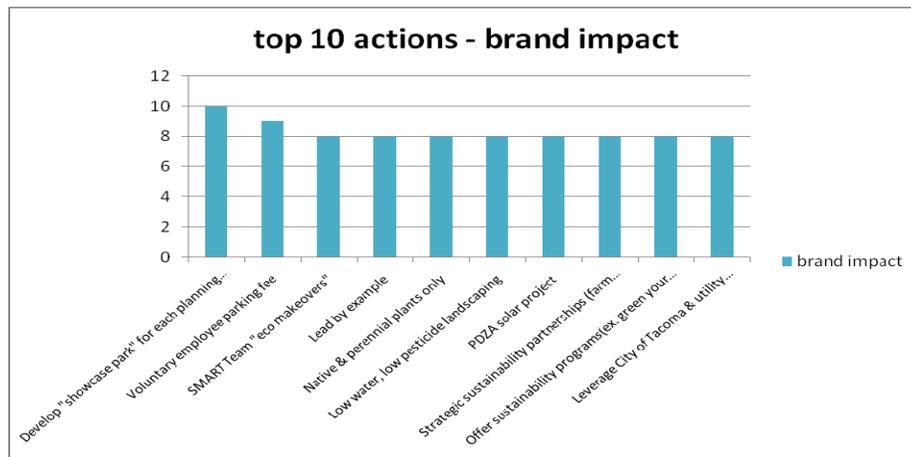
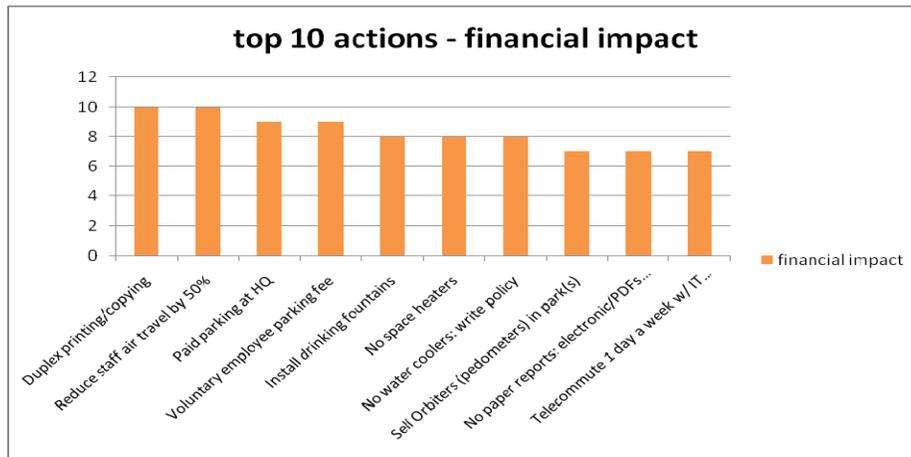
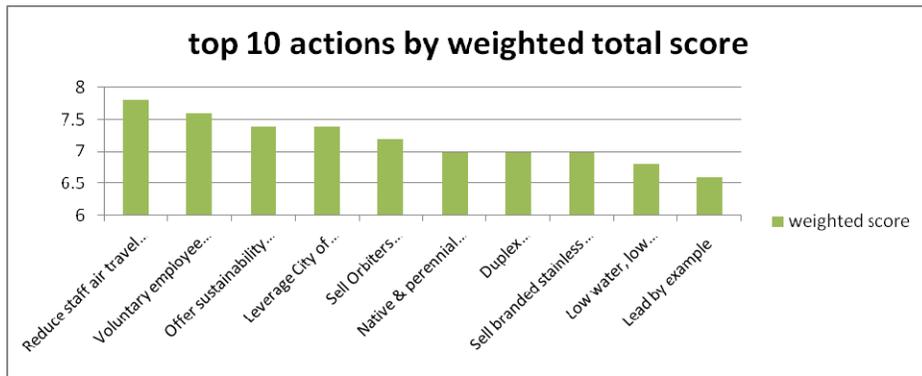
- Providing environmental tips in the Park Bench.
- Requiring recycling containers at all public events in parks.
- Holding a Focus Parks Appreciation Day on natural areas.
- Supporting volunteers working in MPT natural areas (5 active CHIP-In groups in natural areas).
- Providing an annual report to the board that describes the annual work plan and progress that is being made in the implementation of the district's Stewardship & Sustainability Policy.
- Retaining a district-wide Green Team and establish departmental Green Teams in every department of the district, focusing on natural resource conservation and stewardship in the workplace.
- Joining with the City of Tacoma in their efforts to reduce GHG pollution.
- Establishing an expanded outreach program that will include services for underserved communities in Tacoma (\$77,000/biennium).
- Supporting a biodiversity conservation initiative that will engage the community and schools in the assessment of biological diversity in Tacoma (\$36,000/biennium).
- Supporting the regional efforts of the Zoo & Aquarium Alliance focusing on promoting northwest conservation and has identified four pilot projects: backyard wildlife sanctuaries, encouraging the public to make smart pet choices, resource conservation within our institutions and alliances to promote species recovery efforts.
- Participating in AZA conservation and science programs that support sustainable animal populations in zoological/aquarium settings and in the wild through species in the collection or the allocation of resources to these efforts.
- Establishing a new outreach program that will provide environmental education services to school districts in Pierce County (\$25,000/biennium).
- Supporting a biodiversity conservation initiative to engage the community and schools in the assessment of the biological diversity in Pierce County.
- Supporting the community in the Oak Tree Partnership Project including both stewardship and guidance for bond program implementation.

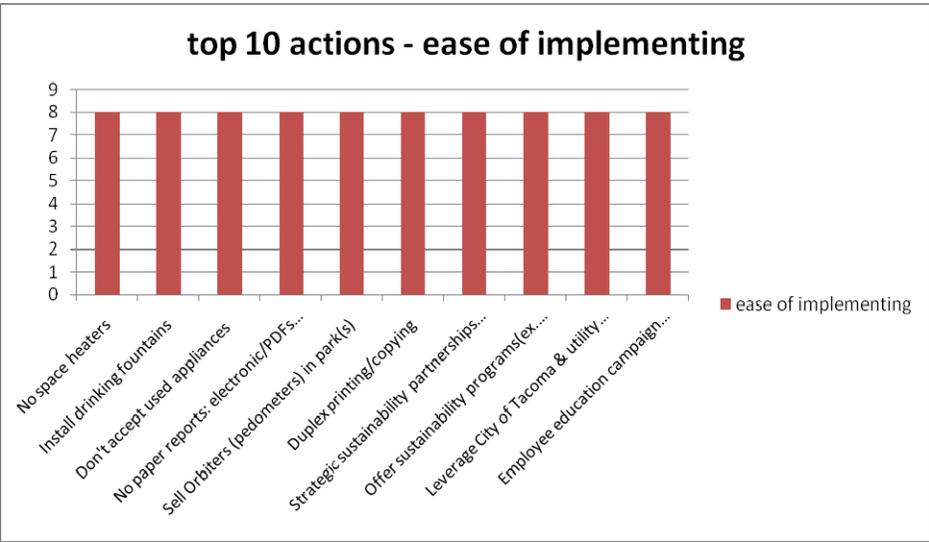
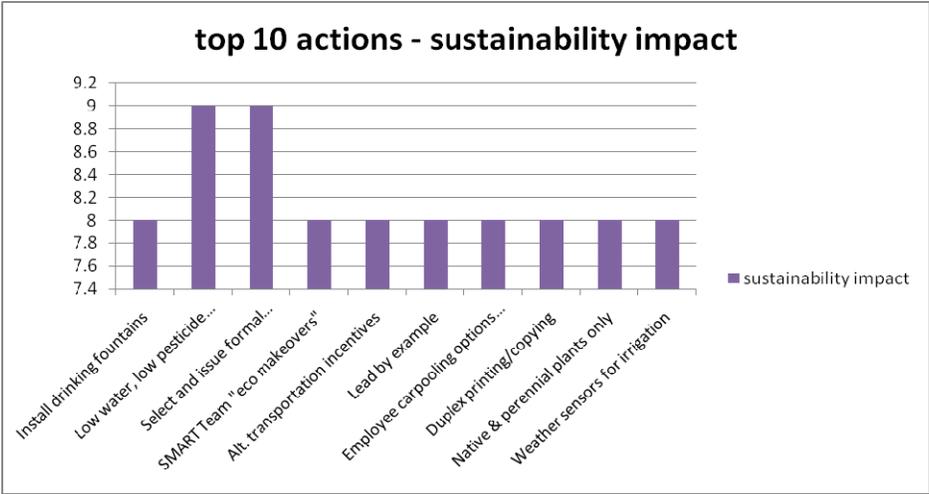
- Providing focused environmental education service for Tacoma Public Schools that includes support for SOTA's involvement at Oak Tree Park involving Arlington Elementary.
- Pursuing an inquiry based program based upon student engagement around community and environment with Hunt Middle School (lack of interest).
- Providing staff support for the Pierce County Biodiversity Alliance and its projects in Crescent Valley and the Lower White River.
- Provided staff support for the South Puget Sound Salmon Enhancement Group as they conduct a shoreline inventory from Point Defiance southward to the Nisqually Reach to identify areas with high potential for habitat enhancement and restoration.
- Provided private financial and human resources contributions to the conservation of animals in the wild and in the ZEED collection through the ZEED Conservation Committee.
- TNC provided invasive species control on the 13-acre addition that targets knapweed and tansy.
- Suggesting development of intranet based web page on S&S where dialogue about best practices can occur.
- Supporting the regional efforts of the Zoo & Aquarium Alliance focusing on promoting northwest conservation and has identified four pilot projects: backyard wildlife sanctuaries, encouraging the public to make smart pet choices, resource conservation within our institutions and alliances to promote species recovery efforts.
- Basing decisions on equipment purchases and CIP projects on lifetime costs.
- Seeking funding to relocate the red wolf breeding facility from Graham to protected lands adjacent to Northwest Trek.
- Providing leadership for the Clouded leopard project that includes: supporting the partnership between PDZA and its AAZK chapter to manage fundraising, education and research, providing staff and financial support for the Thailand breeding effort and PDZA's Southeast Asia Wild Cat Initiative and the Clouded leopard SSP advisor.
- Continuing to expand efforts in scientific research to enhance our understanding of biology and behavior in a zoological setting.

- Implementing an expanded stewardship plan for the 107-acre addition to Northwest Trek that is focused upon invasive species control and habitat restoration.
- Expanding involvement in the Pygmy rabbit captive breeding program.
- Continuing research and partnership with USDA in the bison contraception program.
- Completing the master plan update for Northwest Trek that includes opportunities for wetland restoration and species recovery efforts on the 107-acre addition.
- Initiating a master plan update to the TNC that recognizes the opportunity available for wetland mitigation and enhanced habitat for people and wildlife on the 13-acre addition.

Appendix C: Return on Sustainability – raw data and accompanying charts

Action Rankings	Total Score
Reduce staff air travel by 50%	7.8
Voluntary employee parking fee	7.6
Offer sustainability programs(ex. green your family, green your yard)	7.4
Leverage City of Tacoma & utility sustainability programs	7.4
Sell Orbiters (pedometers) in park(s)	7.2
Native & perennial plants only	7
Duplex printing/copying	7
Sell branded stainless steel bottles	7
Low water, low pesticide landscaping	6.8
Lead by example	6.6
SMART Team "eco makeovers"	6.6
PDZA solar project	6.6
Select and issue formal directives, policies	6.6
Ban bottled water, promote tap water	6.6
Telecommute 1 day a week w/ IT support	6.4
Create annual master book of all known courses "phone book style," post online	6.4
Strategic sustainability partnerships (farm tours)	6.2
Employee education campaign (emails, etc)	6.2
Alt. transportation incentives	6
No water coolers: write policy	6
Online info for one-time/seasonal events	6
Develop "showcase park" for each planning area	6
No paper reports: electronic/PDFs only	5.8
Paid parking at HQ	5.8
Trails: install mile markers	5.8
Switch to all-electronic PAR Reports: write policy	5.8
Compostable dog waste bags	5.8
Online PDF Playground Guide	5.6
Employee carpooling options (internal comm)	5.6
Switch to all-electronic timecards: write policy.	5.4
Weather sensors for irrigation	5.4
Reusable/compostable cookware (silverware, plates, cups etc.)	5.4
No soda machines	5.2
No 2-stroke engine equipment	5.2
Don't accept used appliances	5.2
Smart, same-day meetings scheduling	5.2
No mini fridges	5
No space heaters	5
Turn off electronics at night	5
Web conferencing	4.8
Virtual meetings: N-Computing	4.6
Limit and consolidate staff errands	4.6
Install drinking fountains	4.6
Showers and bike racks	3.6





Appendix D: Commuting Survey: results and responses to questions about incentives

	B	C	D	E	F	G
2	Metro Parks Tacoma Staff Commuting Data: Survey Results					
3						
4		#respondents		#staff at MPT*		
5	full time permanent	140		261	54%	FT staff responded
6	part-time/temporary	17		658	3%	PT staff responded
7	Total:	157		919	17%	Average response
8				*from K. Sutato 9.17.08 - number of staff working on avg. at any given time.		
9						
10	Survey Results %respondents: indicates the number of employees who use the given mode for at least a portion of their commute. Most employees use multiple modes, ex. dr			Estimated total miles per mode, extrapolated to 100% staff These totals were used in MTP's Carbon Footprint Analysis; data was entered on an interior Transportation worksheet and added to other Transportation for company		
11						
12	Total #miles single occupancy driving:		794,277 miles		4649303 miles	
13	Avg. fuel efficiency:		27 mpg			
14	Fuel Type:	100% unleaded gasoline				
15	%respondents who drive SOV to work:		98%			
16						
17	Total #miles carpooling:		73,952 miles		432878 miles	
18	Avg. fuel efficiency:		27 mpg			
19	Fuel Type:	94% unleaded; 6% biodiesel				
20	#passengers		2 per vehicle			
21	%respondents who carpool to work:		11%			
22						
23	Total #miles on bus:		18,586 miles		108793 miles	
24	on Pierce:		11,036 miles		64599 miles	
25	on King County:		200 miles		1171 miles	
26	on Sound Transit:		7,350 miles		43023 miles	
27	%respondents who bus to work:		4%			
28						
29	Total #miles by train:		500 miles		2927 miles	
30	%respondents who take the train:		1%			
31						
32	Total #miles on scooter:					
33			5,000 miles		29268 miles	
34	%respondents who ride a scooter:		1%			
35						
36						
37	Total #miles on motorcycle:		23,635 miles		138348 miles	
38	%respondents who ride a motorcycle:		3%			
39						
40						
41	Total #miles walked:		1,449 miles		8482 miles	
42	%respondents who walk to work:		4%			
43						
44						
45	Total #miles biked:		9,907 miles		57991 miles	
46	%respondents who bike to work:		6%			

What types of incentives would motivate you to change your commuting methods?

- Free tickets to events, green supplies, fuel gift cards

- Gift cards, passes to area attractions, trips
- Ability to work from home occasionally
- Bus pass
- Discounts on classes after carless commuting 20 times
- Movie tickets, gift cards
- Telecommuting, even if only one day per week
- Bonuses based on fuel consumption
- Free passes, bonus points, additional vacation days
- Gas cards, other gift cards, new bike!
- Outdoor hiking/biking equipment (backpacks, water bottles, etc.)
- Shared vehicle at work for important errands/meetings
- Vanpool to Olympia
- Place people at work sites closer to their homes
- Locate offices nearer a transit hub
- Switch to four 10 hour days

What can Metro Parks do to reduce our carbon emissions?

- Work with Pierce transit to help establish a bus line that goes out to Northwest Trek
- Solar panels on park buildings
- Turn down the air conditioning in buildings
- Have computers set automatically to print double-sided on paper
- Reassign fleet management to a professional
- Host meetings at the main office, so staff need not travel far
- Assign a designated copy person who does not waste paper by making errors
- Try some digital meetings, we waste a lot of time driving to meetings
- Mow the lawns less. During summer months they are mowed too often
- Turn off computers and lightings after work
- Eliminate use of personal space heaters in offices
- Eliminate sale of bottled water
- Get rid of pop and candy machines
- Stop buying bottled water for meetings
- Stop using blowers when a broom will do
- Get rid of grass except where needed for play

Appendix E: S & S Checklist *new version*

Project Sustainability Guidelines Checklist						
Goals	Categories	Strategies				
1. Greenhouse Gas Emissions Adopt and pursue the City of Tacoma's GHG emissions reduction goals			Yes	?	No	
Emissions	Improve air quality through reduction of air pollutants produced by vehicles	Minimize site improvements that would require the extended use of construction equipment				
	Ensure air quality by controlling project generated allergens	Enforce strict emissions control measures at the project site				
	Improve air quality by planting trees	Plant native trees, potential carbon offsets Improve water and air quality through use of varieties and numbers of trees				
Alternate Energy Consumption	Use clean renewable energy sources	Use on-site solar or wind power, if possible onsite wind or solar power				
		Install solar water heaters to reduce natural gas usage				
		Create initiatives to provide energy-efficient or renewable energy based projects and services, and reductions in energy requirements as a result of these initiatives				
Heat Islands	Reduce heat island effects to lower energy costs	Plan for deciduous shading of building roof and walls to reduce heat storage, especially on South and West sides				
		Specify roofing and wall cladding materials that have low heat storage capacity and high solar reflectance				
		Plant trees near buildings to reduce energy used in cooling the building				
		Reduce thermal gradient differences between developed and undeveloped areas				
Reduce Energy Consumption	Minimize energy usage	Design buildings, HVAC, lighting and other systems to maximize energy performance				
		Provide for natural ventilation to be used as the seasonal climate will allow				
		Provide for taking advantage of natural daylighting when conditions allow				
		Utilize new technologies that monitor energy and electricity consumption				
		Specify energy efficient (i.e. Energy Star, E-80 or Energy Star-compliant) fixtures/appliances				
		Specify variable speed motors for energy savings				
		Incorporate commissioning requirements for energy efficient HVAC, lighting and hot water systems				
Greenhouse Gases	Reduce pollution by minimizing other greenhouse gases	Select HVAC equipment with reduced refrigerant charge and increased equipment life				
		Use fire suppression systems that do not contain HCFCs or halons				
	Reduce light pollution	Reduce glare conditions and light trespass to improve night time visibility				

2. Water Conservation Reduce water use 50% from 2008 levels by 2020			Yes	?	No
Potable Water Use Reduction	Minimize energy use for water application	Provide efficient irrigation systems tailored to the microclimate, soil and plant material			
	Maximize the use of graywater	Use recaptured/graywater for irrigation purposes and toilet flushing			
	Conserve potable water	Use low-flow water fixtures and low water use appliances			
		Specify waterless urinals			
Living machines for Black water	Consider hiring machines for high use areas such as PDZA, NW Trek				
Landscape Efficiency	Reduce labor, water, and fertilizers to manage lawns and plantings	Design plantings to shade the soil surface and use mulch, to discourage weeds and conserve water			
		Plant natives and perennials, where possible to reduce water and fertilizer			
		Site plants where their preferred growing conditions can be met, to reduce pest problems			
		Consider replacing constructed surfaces with vegetated surfaces and open grid paving			
		Install lawns only in playfields, picnic areas and other appropriate locations and consider longer grass or naturalized areas where lawn will not be used			
	Minimize damage to soils	Minimize area accessible by construction equipment and preserve existing grades as much as possible			
		Ensure a minimum depth of 12 inches of good topsoil before installing lawns or other ornamental plantings			
		Work with MPT maintenance staff to create a maintenance/management plan for the site during the design process			
		Follow best management practices for temporary erosion control during construction			
Hydrology & Stormwater	Limit disruption & avoid pollution of natural hydrologic systems	Reduce stormwater runoff and increase infiltration on site			
		Minimize the area of impervious cover			
		Use watershed patterns and existing grades to provide drainage patterns			
		Exceed riparian & environmentally sensitive feature setbacks			
		Create vegetated swales or other areas that clean water as it infiltrates.			
		Coordinate with Environmental Services at Tacoma Public Works about water quality programs and incentives			

3. Waste Reduction Zero waste to landfill - waste is reduced, reused, recycled, or composted			Yes	?	No
Materials and Resources	Seek out Industrial Ecology opportunities	Divert construction waste from landfill and redirect recyclable resources back to the manufacturing process for financial and environmental benefit			
	Minimize hazardous waste	Hazardous waste management and accident reporting procedures			
	Increase the use of renewable materials in new construction	Specify salvaged and refurbished materials for at least 10% of the project to reduce the use of virgin materials			
	Reuse existing structures to conserve resources	Extend the life cycle of existing buildings to preserve cultural and natural resources, reduce environmental impacts, energy use and waste			
	Construct with materials that can be recycled	Use durable materials that can be recycled and diverted away from becoming waste in landfills			
Specify landscaping products that incorporate recycled content					
Local Materials	Specify the use of local materials and products to support the economy & minimize transportation impacts	Require a minimum of 20% materials and products that are use were or manufactured or produced within a 500-mile radius			
		Build with materials and products that are commonly available locally			
		Specify locally produced brand name products rather than using national brands			
Community	Community education and involvement	Encourage public composting and recycling			

4. Walkability Offer the most walking-friendly park system in the U.S.			Yes	?	No
Location and siting	Locate site facilities to encourage walkability	Orient facilities for easy public transportation access			
		Connectivity between recreation facilities to neighborhoods with paths that encourage walking and biking			
Physical Activity Promotion	Provide recreational functions that encourage physical activity	Incorporate walking and running within park facilities for adults			
		Incorporate facilities that generate active play functions such as spray parks			
Slow Fossil Fuel Depletion	Decrease the use of petroleum-powered vehicles	Design site to support integrated hierarchy of transportation systems for pedestrian activity, bicycles, alternative fuel vehicles			

5. Leadership Be a community leader and resource for learning sustainability			Yes	?	No
Wildlife	Protect native flora and fauna	Protect natural conditions whenever possible to preserve habitat			
		Create habitat for targeted species			
		Protect areas of high biodiversity value			
		Develop strategies, current actions, and future plans for managing impacts on biodiversity			
		Save trees that exist on the site for incorporation into the new landscape			
Community	Community benefit	Focus philanthropy in local communities, with evaluation & formal procedures for requests and find ways to lower operating costs by evaluating business & community benefits of corporate community investment			
		Ensure the nature, scope and effectiveness of any programs and practices assess and manage the impacts of operations on communities, including entering, operating and exiting			
		Ensure fair and adequate compensation for displacement of people during development projects			
		Create initiatives to mitigate environmental impacts of products and services			
	Bring diverse communities together	Location of project in areas of diverse communities			
Minimize environmental impact of product and services	Ensure programs adhere to laws, standards, and voluntary codes related to marketing communications, including advertising, promotion and sponsorship				
Safety	Minimize rates of injury, lost days, and absenteeism	Health & safety of workers listed as a top priority			
		Fair labor regulations & respect for the rights of employees to organize			
		Put education, training, counseling, prevention and risk-control programs in place to assist workforce members, their families, or community members			
		Specify materials with low volatile chemical content to reduce airborne irritants			
Supply Chain	Encourage suppliers to be environmentally responsible	Require suppliers to take climate change action and/or preference to those that do			

Appendix F: Carbon Cash Comparison

	A	B	C	D	E
1		Sustainable Business Consulting			
2		Carbon Cash Comparison			
3	IF YOU TYPICALLY:	YOU COULD:	CO2e SAVINGS, COST SAVINGS		
4	NW Trek Drive to Headquarters (70 miles round trip)	Replace half of meetings with video conferencing	Saving \$3,308/year - \$220 in first year (upfront cost of Nconference)		
5			Approx. 6 trees	1,386 lbs CO2e/year	1,575 miles
19	Fly round-trip Seattle to Indianapolis	Attend virtual or local meeting instead	\$400/trip		
21			Approx. 6 trees	1,488 lbs CO2e/trip	3,720 miles
22	Fly round-trip Seattle to San Diego	Attend virtual or local meeting instead	\$250/trip		
23			Approx. 3 trees	840 lbs CO2e/trip	2,100 miles
25	If you Typically:	You Could:	2		
26	Use paper in office settings	Cut paper use in half	\$5,685/year		
27			Approx. 42 trees per year	10,440 lbs CO2e per year	
29	Provide bottled water for meetings/events	Have people bring their own water	\$2,500/year		
30			Approx. 12 trees/year	3,060 lbs of CO2e/year	
32	Use natural gas water heating	Install a solar water heating system demonstration (56 sq. ft)	Implemented for educational/demonstration purposes	\$7,500 upfront cost	5-6 year payback
33					
35	Use Tacoma Power electricity	Install 1 kW Solar PV system	361 lbs CO2e/year	\$10,000 upfront cost	14-20 year payback period
36					
39	Yearly averages are based on an estimated 260 work days/year. Actual savings will vary by office location, local pricing, distances traveled, etc.				
40	CO2e = Carbon Dioxide Equivalents. All greenhouse gases have been converted to this common metric for ease of use				
41	1 car = 500 miles/800KM 1 tree = 250 lbs/112.5 Kg of CO2e				