

**Working with Local Business to Lower
Their Environmental Footprint**

Juliana Dixon

5-10-06

ENVS 410 Environmental Science Practicum

Dick Hansis

Table of Contents

Document

- 1.....Problem Background
- 2.....Project Background
- 3.....Goals and Objectives
- 5.....Weighing Alternatives
- 6.....Implementation Strategies
- 7.....Monitoring and Evaluation
- 8.....Results and Conclusion

Appendices

- Transportation Footprint Project
- 10.....Initial GIS Map
- 11-15.....GIS maps used for Analysis
- 16.....Transportation Footprint Results
- Hybrid Car Analysis
- 18.....Hybrid Car Data Gathering
- 22.....Hybrid Car Cost Benefit Analysis
- 24.....Hybrid Car Assumptions Explained
- Smaller Projects
- 25.....Fast Facts Sheet
- 28.....Poster Created for SLAM Fest
- 29.....Letter to City of Eureka
- Written Information about the Project / For W+K
- 30.....Service Learning Journal From Fall Semester
- 38.....Written Review of Michael Crooke's Speech

Lessening the Environmental Footprint for Local Business

Example: Winzler and Kelly

Problem Background:

Environmental Footprint is an all encompassing term used to refer to the specific impact upon our environment created by any particular action. For example, according to Library.thinkquest.org “Americans use 50 million tons of paper annually, consuming more than 850 million trees.” The “footprint” is the destruction of 850 million trees.

All of us have an environmental footprint, living in modern society and taking advantage of technology, almost precipitates the impossibility of not leaving a footprint. Whether or not it is feasible for us as a race to lessen our footprint ‘enough’ is a greater matter than the discussion of this project. However, we all can work to lessen our environmental impact in small ways frequently. These steps will not solve the problems around us, but will at least slow the degradation – a little bit more with each action.

Businesses in general are trapped within the supply and demand cycle. In order to be competitive and stay successful, they must continually keep costs slightly lower than their competitors, provide a better product that consumers are willing to pay more for, or provide a feeling to the customer that they are willing to purchase with dollars. This cycle does not lend itself to operating in an environmentally conscious manner. Thus the group of businesses in any one district has the power to create a larger positive impact on a region’s environmental footprint than individual citizens alone.

In Humboldt County’s bay region, our largest environmental issues include air quality, water quality, water quantity, illegal dumping, and landfill waste. Thus, logically, our local businesses could begin to affect our community positively if they analyzed and acted to improve their:

- Transportation footprint
 - Employee travel to and from work
 - Employee travel on the job

- Product shipping to and from the company
- Distance waste is shipped

- Effluent
 - Direct liquid discharge (when applicable)
 - Ground/street pollution – run off to water ways
 - Practices in the field (when applicable)
 - Minimize erosion
 - Minimize chemical additives to watersheds
 - Maximize watershed health

- Water usage
 - “In House” water usage practices
 - In the field water usage
 - Cosmetic uses – landscaping, fountains, etc.

- Waste Production
 - What is being thrown away?
 - What percentage of that waste could be avoided initially?
 - How much waste could be diverted to a recycling/composting program?

Humboldt County’s local businesses could have a dramatic positive effect on our environmental footprint if each one decided to implement steps to minimize the above mentioned problem areas. The initial problem to be overcome however, is awareness of the problem, and inertia in actively taking personal responsibility to make change.

Project Background

I was brought onto the Winzler and Kelly Consulting Engineers staff in September 2005 as a function of my ‘Sustainable Rural Economic Development’ class as

the 'Sustainability Intern'. Since that time I have been working with the firm to lessen their specific environmental footprint in as many ways as was feasible in a relatively short period of time. This particular company has many ways in which it can make a positive impact on their footprint. In an initial analysis of possible areas to lessen environmental impact, these problem areas surfaced immediately:

- They have a relatively high transportation footprint with 40+ employees driving to work daily from the greater Humboldt Bay area.
- Their energy usage could be reduced significantly.
- Their product choice could be improved.
- Their in-house waste could be reduced.
- Their recycling could be increased dramatically.
- Their employee awareness and habits could be improved

Winzler and Kelly already had an established 'Green Team' whose mandate was to try and lessen environmental impact of the company. However, this team had little direction, and low levels of experience in analysis and implementation of projects of this nature. As I began working with them, part of my experience was learning how to best benefit a structure already in place while not being confined to the limitations of those present.

Goals and Objectives:

There are many goals of a project seeking to become "better". In the business world, promoting environmentally conscious behavior is a tricky thing to create a concrete desired outcome. Corporate resistance to economic impact is great, and sometimes, just the seed of change being planted in the minds of those in power is quite the accomplishment. Any actual change in policy or behavior is a step in the right direction, and a step which may pave the way for all steps necessary in the future.

My goal for local business in general was to create a template with Winzler and Kelly to which other businesses may emulate. I would like the employees of Winzler and

Kelly to acclimate to an environmentally conscious workplace so much that as they move to new places of employment they bring expectations with them of what a responsible and conscientious workplace is like, and are able to apply pressure to a new environment to adapt accordingly. Another goal I have is for the competitors of Winzler and Kelly to feel pressure to live up to the socially responsible methods of their competition.

My goals for Winzler and Kelly are for them to lower their transportation footprint, lower their energy usage, improve their in-house and in-field product choices, lower their overall waste, improve their percentage of recycling, and improve their employee habits. My main objective is to influence the 'powers that be' in the corporate hierarchy to open their minds to the possibilities of thinking in a more environmentally conscious manner.

- My goals industry wide are:

- Greater, industry wide snowballing – all consulting firms in the region wanting to stay competitive with local preferences and thus changing their actions accordingly

- 'trickle-down' impact of green practices – i.e. as businesses choose to use fluorescent lighting, eventually the costs of this technology will lessen as demand increases.

- My goals company wide are:

- Greater, company wide snowballing – all 23 offices modeling after the Eureka office's actions

- Cost benefit analysis that promotes environmental consideration in business decisions

- For each office to have a template of steps that can be taken to lessen their environmental footprint

- My goals locally within Winzler and Kelly are:

- To lessen their transportation footprint

- To lessen their energy footprint

- To improve their recycling habits and lessen waste flow
- To improve their product choice
- To create employee awareness and improve habits
- Small-step impact effect. For example, five employees choosing to bicycle rather than drive twice a week

- My objectives industry wide are:
 - To create awareness of actions that can be taken
 - To create awareness of why action should be taken
 - To create an atmosphere in which actions must be taken to stay competitive

- My objectives company wide are:
 - Ease of implementation across business locations, as the path is paved locally
 - Corporate buy-in on a company-wide level

- My objectives within Winzler and Kelly are:
 - Corporate buy-in
 - Employee buy-in

Weighing Alternatives:

This section seems to have two places by which alternatives should be weighed. For myself, as the solution seeker, and for the administration of the company, who need to weigh the profit margin with the possible solutions.

For myself, for this project to be successful, I needed to find various solutions which I think will fit the company needs, create an effective impact, and be feasible enough monetarily to create buy-in. These solutions need to adequately work toward my overall goals for the company, and be a positive force for my overall objective.

From the perspective of the business, the lessening of footprint may correlate to the lessening of profit. For any for-profit business, cost is opportunity lost. If extra cost is involved in working to lessen environmental footprint, it must be weighed with the moral or advertising benefits of that action. The corporate administrators need to weigh solutions presented to them as per how beneficial they are to the company overall.

Winzler and Kelly is in the process of relocation or major retrofit of their current office. Various decisions are in the works as to the cost-benefit of various types of construction. Daylighting strategies, materials available, equipment purchase, etc. are all alternatives currently being weighed for the future.

Present alternatives weighed were:

Which type of printer to buy

What will be most effective to lessen the transportation footprint

Is a switch to CFL really cost effective if the office will be moving soon

Product choices – what is available, what is the cost

How can recycling best be improved in this office

How can awareness best be raised of the environmental Footprint of this office

Implementation Strategies:

To implement my goals and objectives, I will be doing various forms of analysis, background research, information distribution, and working with people. I intend to address the points below:

- Employee motivation
 - Will the company subsidize alternative transportation?
 - Are there adequate facilities for bike storage?
 - Is there education available for the employees
 - Alternatives available
 - Why alternatives should be used
- Action within company

- Purchasing choices
 - From where are products being shipped?
 - How were they produced?
 - What kind of packaging does it come in?
 - What type of labor was involved in the product's creation?
 - What is the 'grave' of that product?
 - Can it be recycled?
 - Can it be composted?
 - Can it be reused?

- Action in furthering company development
 - New building strategies -- LEED
 - Employee hiring with environmental awareness in mind
 - New product lines/projects developing in a more aware way

Monitoring and Evaluation:

At this time there has been no specific monitoring for Winzler and Kelly set in place, with the exception of the establishment of the "green team". As I have hope to become an employee of Winzler and Kelly post maternity break, I will have a vested interest in encouraging this aspect of our local business to keep up it's work toward a better future.

City-wide, the City Manager's office has an Environmental Programs division working to encourage local businesses to follow a similar path to that of Winzler and Kelly. Also, Assembly Bill 939 mandating lower city landfill mass is affecting everyone. This will encourage reduction of waste, recycling of what is recyclable, and the implementation of city-wide composting and better shipping practices.

My evaluation of Winzler and Kelly's success to date will be presented in a power point presentation at the conclusion of the semester. To evaluate industry-wide change,

time must be allowed to pass for the inter-dynamics of business relations to affect change.

Results and Conclusion

At the conclusion of my time as intern, I felt that I had accomplished quite a bit, although in the greater need of environmental action, such an amount of change is needed, that it is hard to find pride in the smaller steps. That said, I was able to work toward my goals and objectives with fairly steady progress, although there were many setbacks along the way.

The Green Team's accomplishments to date are as listed below:

Projects Completed

Review of Janitorial products for environmental impact
Cardboard collection and recycling
Re-usable cups to substitute for disposable
Lighting analysis -- compact florescent vs. incandescent
Researching transportation footprint of the company off jobsite
Paper -- recycled toilet paper, hand towels, tissues, etc.
Two-sided printing
Recycle bins in each office
Drafting paper recycling program
Cornstarch garbage bags
Less lighting usage during the day and at night
Initial analysis of Hybrid cars for fleet
Fast Facts accumulated to be sent out for employee awareness
Presence at SLAM fest

Projects in the works

Energy footprint -- paper towels vs. electric hand dryer

Transportation footprint of products in use

New printer

Carpooling organization + motivation

Bike rack next to building

Solid waste analysis

Change in other offices



Humboldt Bay

Arcata Bay

Eureka



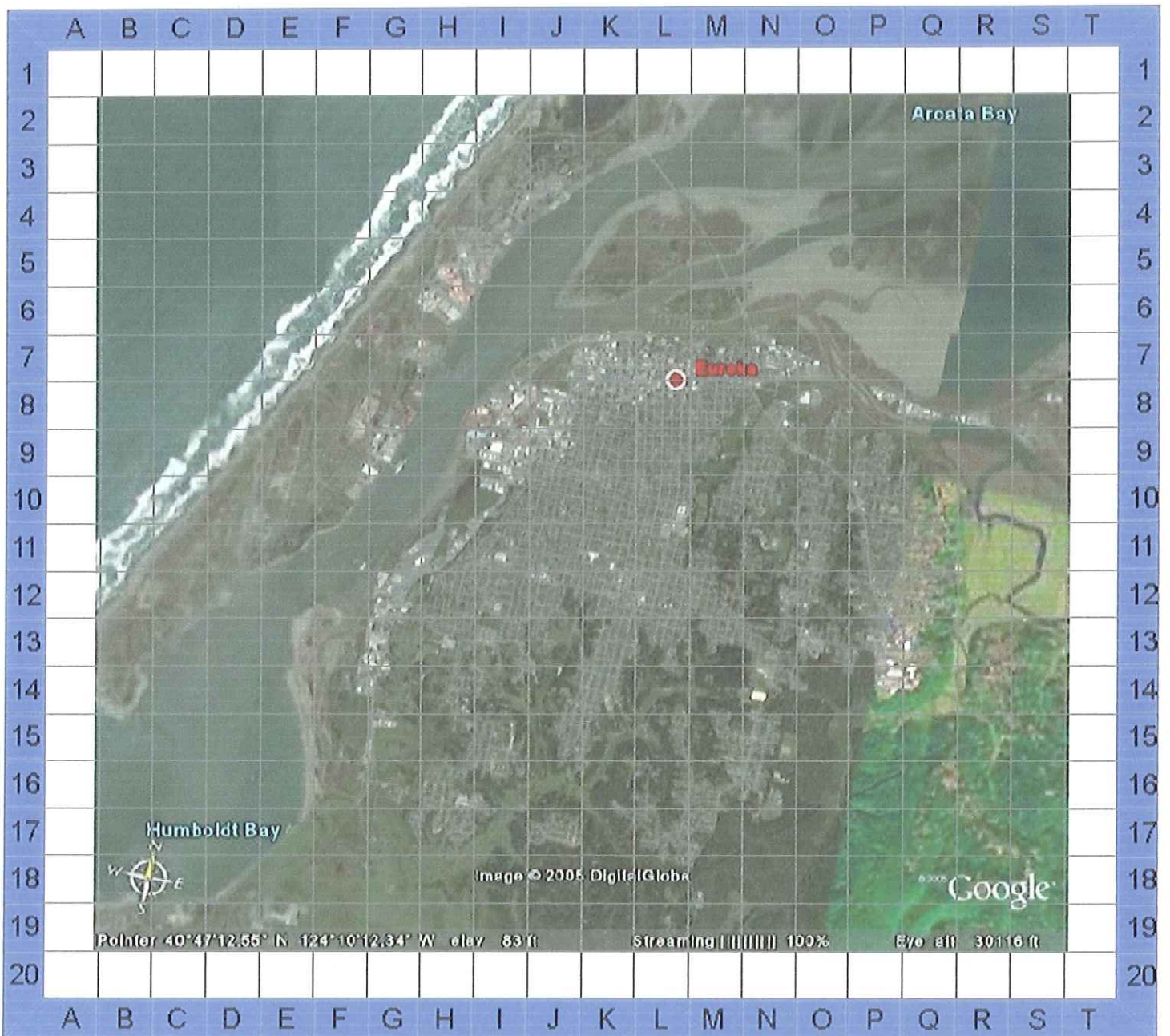
Pointer 40°47'12.55" N 124°10'12.34" W elev 83 ft

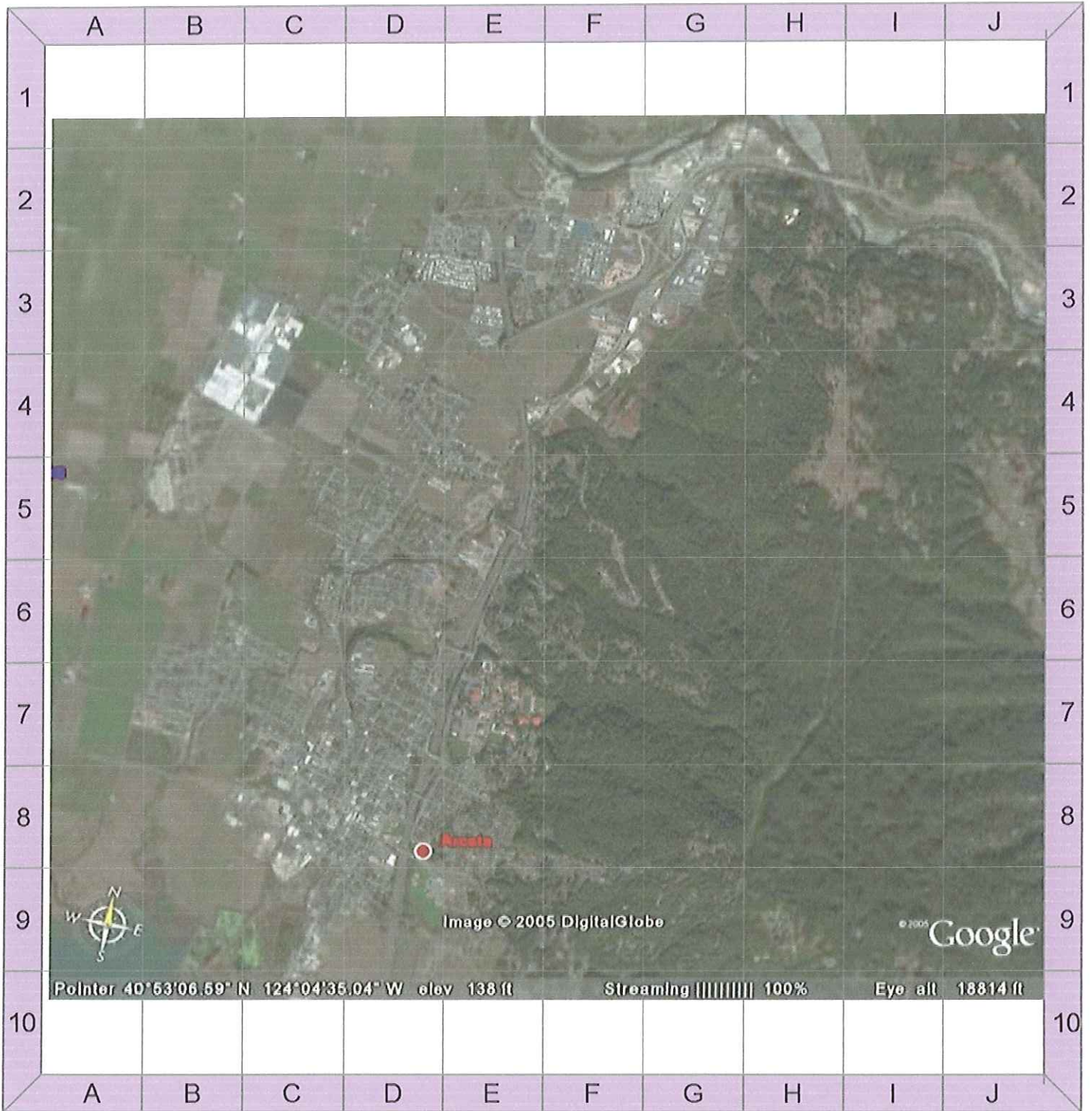
Image © 2005 DigitalGlobe

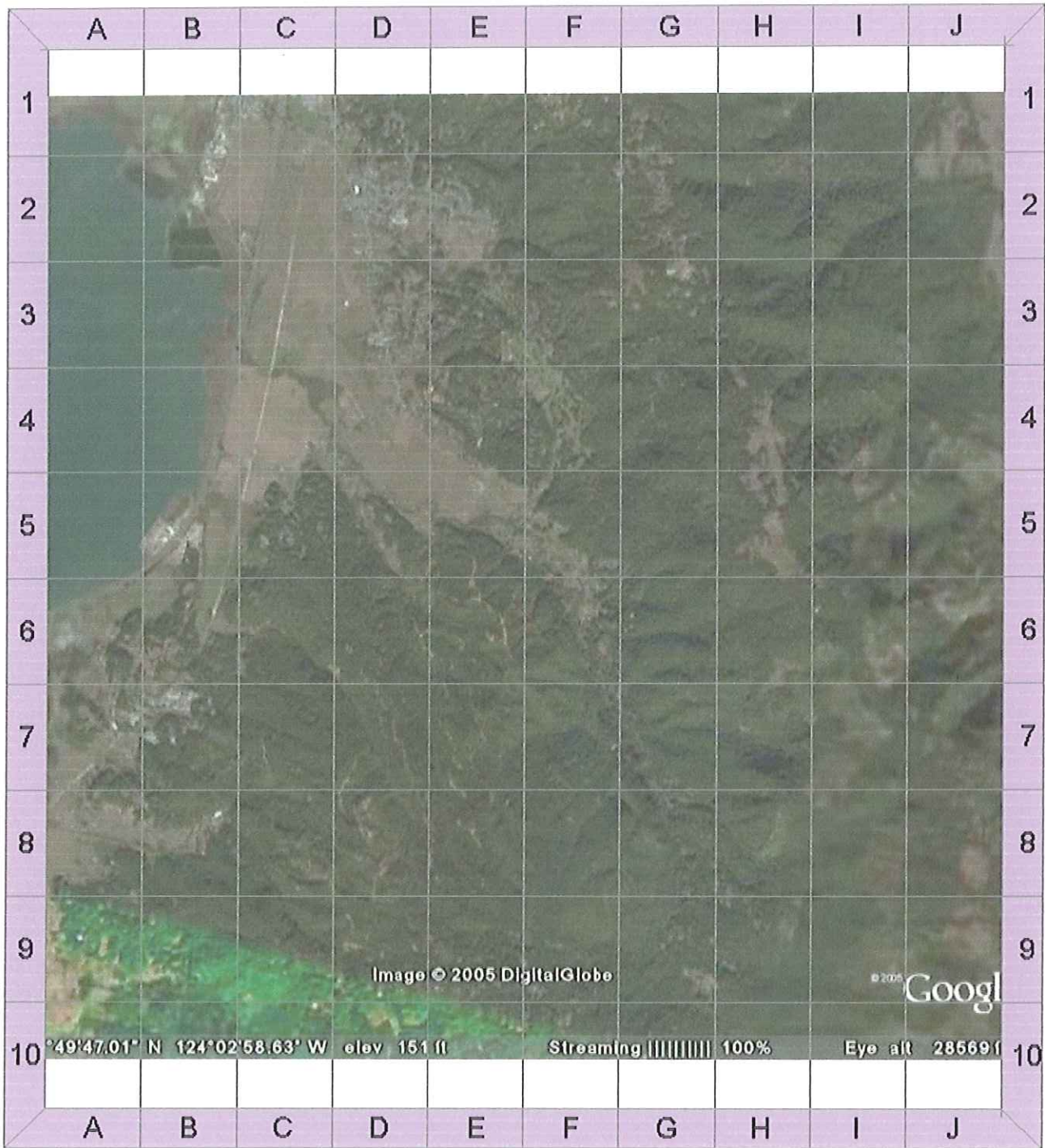
Streaming 100%

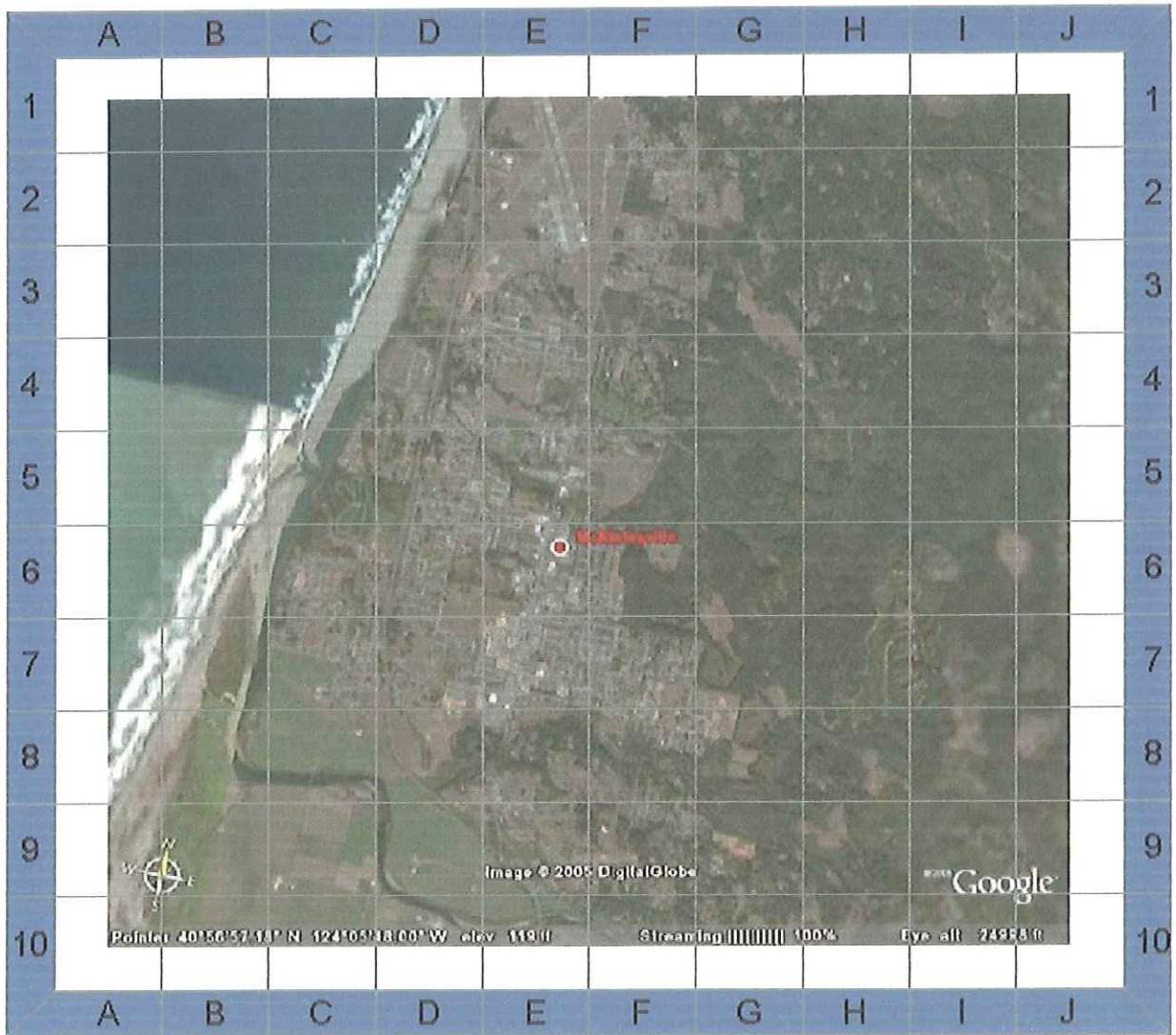
Google

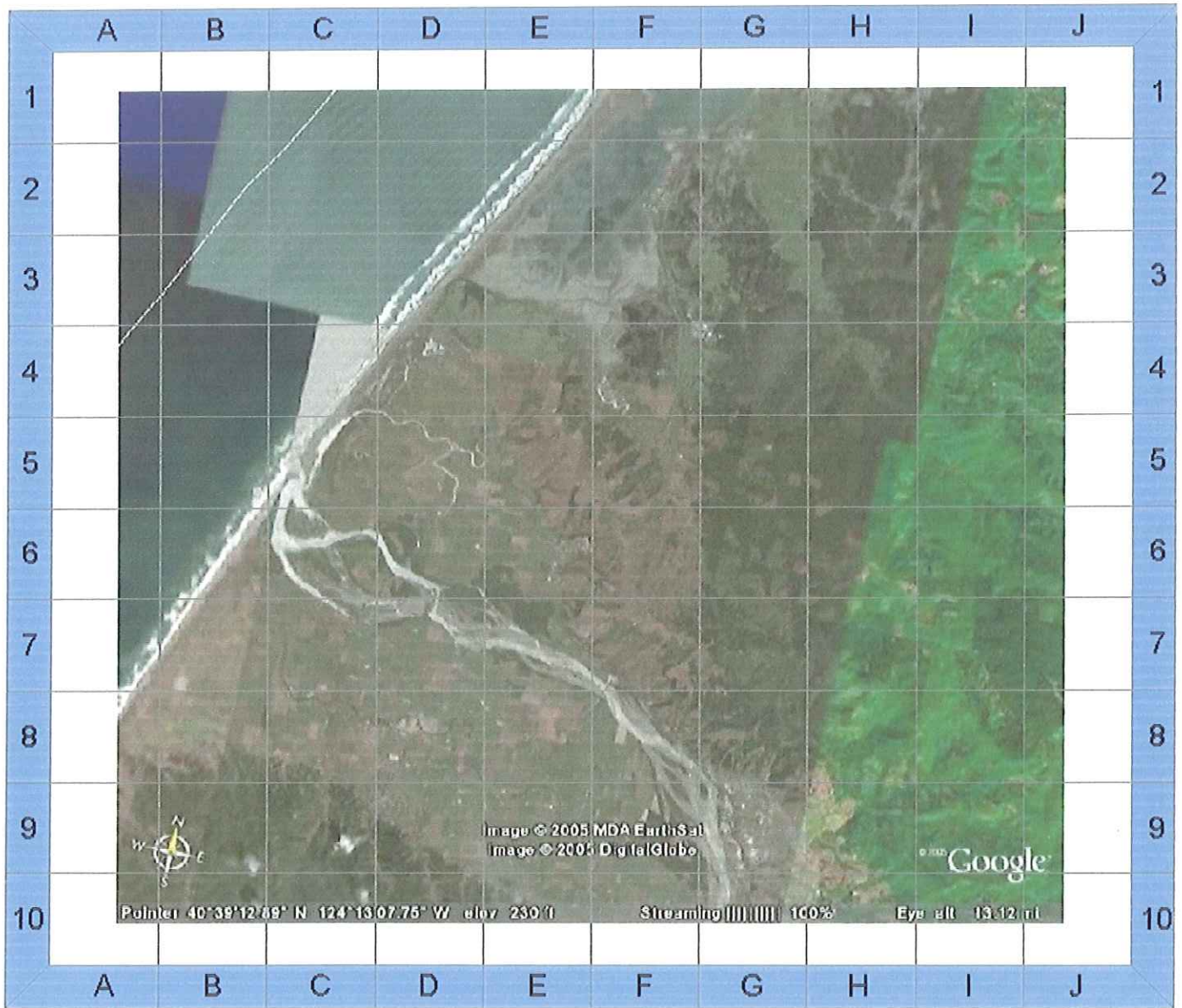
Eye alt 30116 ft











employee	map	x-coord	y-coord	mileage	Frequency	If not on Map, mileage to work	Already Carpooling
Ellis, Colleen	Arcata	F	3	30	5.00		
Davidson, Gary	none			26	5	20	
Lester, Gary	McKinleyville	G	10	25	5		
Thiessen, Ken	Eureka	H	18	25	3.5		
Bjorman, Holly	none			24	5	3	
Schilling, Jakob	Arcata	J	9	16	5		
Crow, Rebecca	Arcata	D	5	25	4		
Blackburn, Tom	McKinleyville	H	1	17	2		
Bainbridge, Jennifer	Eureka	P	13	20	5		
Jones, Paul	Eureka	N	9	18	4.75		
Webb, Lia	Arcata	H	2	16	4.75		
Carnam, Neal	none			20	5	17.5	
Mion, Ian	McKinleyville	C	7	15	5		
Kennedy, Matt	Eureka	J	11	17	3.5		
Pepke, Travis	Eureka	I	11	20	5		
Svehla, Jeremy	Arcata	D	7	18	5		
Salzman, Steve	Arcata	J	10	30	5		
Clark, Terry	Bayside	D	3	22	4		
Christensen, Tayler	Humboldt Hill	E	7	25	5		
Margler, Larry	none			25	5	16	
Holmlund, Robert	Arcata	E	7	25	4		
Davis, Scott	McKinleyville	E	6	30	5		
Teeters, Dee	McKinleyville	E	7	25	5		
Kaspari, Pat	Eureka	H	14	20	4.95		
Culick, Alex	Eureka	K	11	18	5		
McHaney, Steve	none			19	5	20	
Costa-Franklin, Linda	none			23	5	30	
O'Gorman, Susan	Arcata	D	7	33	5		
Borges, Shari	Eureka	H	13	12	5		y
Gomes, Shelly	none			30	5	10	
Ross, Suzanne	none			30	5	1	
Schwarz, Mishia	Arcata	J	4	24	5		
Jabbour, Tizah	none			25	5	5 y	
Schuler, Melissa	McKinleyville	D	3	22	5		
Shermock, Doug	Eureka	K	15	20	5		

Sullivan, Patrick	none			22	5	6	
Allen, Steve	Eureka	M	19	22	2		y
Ulbarri, Bob	Eureka	P	9	32	5		
Peacock, Steve	Eureka				0		walks
Larson, Nikki	Arcata	H	3	30	5		
Spivey, Linda							will not respond
Ayala, Michele	Eureka	K	11	10	5		y
Perry, Merritt	none			20	4	18	

HYBRID CARS:

Civic Hybrid (Automatic) 2006 4cyl

- MPG (city) = 49
- MPG (hwy) = 51
- Miles on tank = 554
- Tank Size = 12.3 gal

Honda Insight (Automatic) 2006 3cyl

- MPG (city) = 57
- MPG (hwy) = 56
- Miles on tank = 534
- Tank size = 10.6 gal

Honda Insight (Manual) 2006 3cyl

- MPG (city) = 60
- MPG (hwy) = 66
- Miles on tank = 601
- Tank Size = 10.6

Toyota Prius (automatic) 2006 4cyl

- MPG (city) = 60
- MPG (hwy) = 51
- Miles on tank = 589
- Tank Size = 11.9 gal

HYBRID TRUCKS:

Chevy Silverado (2WD) 2006 8cyl

- MPG (city) = 18
- MPG (hwy) = 21
- Miles on tank = 445 - 581
- Tank Size = 26 - 34 gal

Chevy Silverado (4WD) 2006 8cyl

- MPG (city) = 17
- MPG (hwy) = 19
- Miles on tank = 421 - 551
- Tank Size = 26 - 34 gal

GMC Sierra (2WD) 2006 8cyl

- MPG (city) = 18
- MPG (hwy) = 21
- Miles on tank = n/a
- Tank Size = n/a

GMC Sierra (4WD) 2006 8cyl

GAS CARS:

Civic (automatic) 2006 4cyl

- *MPG (city) = 30*
- *MPG (hwy) = 40*

Civic (manual) 2006 4cyl

- *MPG (city) = 30*
- *MPG (hwy) = 38*

GAS TRUCKS:

Chevy Silverado (2WD) 2005 8cyl

- MPG (city) = 16*
- MPG (hwy) = 20*

Chevy Silverado (4WD) 2005 8cyl

- MPG (city) - 14*
- MPG (hwy) - 16*

GMC Sierra (2WD) 2005 8cyl

- MPG (city) = 16*
- MPG (hwy) = 22*

GMC Sierra (4WD) 2004 8cyl

- MPG (city) = 17
- MPG (hwy) = 19
- Miles on tank = n/a
- Tank Size = n/a

MPG (city) = 15
MPG (hwy) = 18

HYBRID SUV'S:

GAS SUV'S

Ford Escape (2WD) 2006 4cyl

Ford Escape (2WD) 2005 4cyl

- MPG (city) = 36
- MPG (hwy) = 31
- Miles on tank = 446
- Tank Size = 15 gal

MPG (city) = 24
MPG (hwy) = 29

Ford Escape (4WD) 2006 4cyl

Ford Escape (4WD) 2005 6cyl only

- MPG (city) = 33
- MPG (hwy) = 29
- Miles on Tank = 419
- Tank Size = 15 gal

MPG (city) = 18
MPG (hwy) = 22

Lexus RS 400h (2WD) 2006 6cyl

Lexus RX 330 (2WD) 2004 6cyl

- MPG (city) = 33
- MPG (hwy) = 28
- Miles on tank = 464
- Tank Size = 17.2 gal
- Price \$49,060

MPG (city) = 20
MPG (hwy) = 26

Lexus RS 400h (4WD) 2006 6cyl

Lexus RX 330 (4WD) 2004 6cyl

- MPG (city) = 31
- MPG (hwy) = 27
- Miles on tank = 449
- Tank Size = 17.2 gal

MPG (city) = 18
MPG (hwy) = 24

Mazda Tribute (2WD) 2006 4cyl

Mazda Tribute (2WD) 2005 4cyl

- N/A

MPG (city) = 22

Mazda Tribute (4WD) 2006 4cyl

MPG (hwy) = 25

- MPG (city) = 33
- MPG (hwy) = 29
- Miles on tank = n/a
- Tank Size = n/a

Mazda Tribute (4WD) 2005 6cyl only

MPG (city) = 18

MPG (hwy) = 22

Mercury Mariner (2WD) 2006 4cyl

Mercury Mariner (2WD)

- N/A

N/A

Mercury Mariner (4WD) 2006 4cyl

Mercury Mariner (4WD)

- MPG (city) = 33
- MPG (hwy) = 29
- Miles on tank = n/a
- Tank Size = n/a

N/A

- Price \$29,840

Toyota Highlander (2WD) 2006 6cyl

- MPG (city) = 33
- MPG (hwy) = 28
- Miles on tank = 516
- Tank Size = 19.1 gal
- Price \$33,030

Toyota Highlander (2WD) 2005 6cyl

MPG (city) = 19
MPG (hwy) = 25
Price \$

Toyota Highlander (4WD) 2006 6cyl

- MPG (city) = 31
- MPG (hwy) = 27
- Miles on tank = 499
- Tank Size = 19.1 gal
- Price \$34,430

Toyota Highlander (4WD) 2005 6cyl

MPG (city) = 18
MPG (hwy) = 24

- (found @ http://www.fueleconomy.gov/feg/hybrid_sbs_cars.shtml)
www.fueleconomy.gov

-The real cost of owning a Hybrid

<http://www.edmunds.com/advice/specialreports/articles/103708/article.html>

-EPA workshop on sulfur levels

<http://www.epa.gov/oms/regs/ld-hwy/tier-2/chrysler.pdf>

-Green Vehicle Guide

<http://www.epa.gov/greenvehicles/>

Hybrid SUV'S:

Ford Escape (2WD) 2006 4cyl. - \$27,515 - no tax deduction

Ford Escape (4WD) 2006 4cyl. - \$29,140 - no tax deduction

Lexus RS 400h (2WD) 2006 6cyl. - \$45,355 - no tax deduction

Lexus RS 400h (4WD) 2006 6cyl. - \$46,755 - no tax deduction

Mazda Tribute (2WD) 2006 4cyl. – n/a

Mazda Tribute (4WD) 2006 4cyl. – n/a

Mercury Mariner Hybrid 2006 – \$29,840 - no tax deduction

Toyota Highlander (2WD) - \$33,030 no tax deduction

Toyota Highlander (4WD) - \$34,430 no tax deduction

GAS SUV'S:

Ford Escape (Manual) 2006 4cyl. – \$19,995 – no tax deduction

Ford Escape (Automatic) 2006 4cyl. – \$20,685 – no tax deduction

Lexus GX 2006 - \$47,230 – no tax deduction

Mazda Tribute (2WD) 2006 4cyl. – n/a

Mazda Tribute (4WD) 2006 6cyl. Only – n/a

Mercury Mariner 2006 – \$21,995 – no tax deduction

Toyota Highlander (2WD) 2006 6cyl. – \$25,590 no tax deduction

Toyota Highlander (4WD) 2006 6cyl. – \$27,840 no tax deduction

Toyota Highlander (2WD) 2006 4cyl. – \$24,530 no tax deduction

Toyota Highlander (4WD) 2006 4cyl. - \$25,930 no tax deduction

Make + Model	Price	MPG	Ave \$/gal	miles driven to break even	\$/100 mile savings w/ comparable vehicle	Tax Ded	money lost @ 100,000 miles
Cars w/ comparison							
civic hybrid	22,000	50	2.50	326,667	2.14	Y	\$4,857
civic (gas)	15,000	35	2.50			n	
Cars w/o comparison							
Insight auto.	22,000	56	2.50	261,333 @civic gas comparison		Y	\$4,321
insight man.	19,000	63	2.50	126,000 @civic gas comparison		Y	\$825
prius	22,000	56	2.50	261,333 @civic gas comparison		Y	\$4,321
Trucks w/ comparison							
Silverado 2WD (hybrid)	32,000	20	2.50	936,000	1.39	n	\$11,611
Silverado 2Wd (gas)	19,000	18	2.50			n	
Silverado 4WD (hybrid)	36,000	18	2.50	468,000	2.78	n	\$10,222
Silverado 4WD (gas)	23,000	15	2.50			n	
Sierra 2WD (hybrid)	n/a	n/a	2.50	n/a		n	
Sierra 2WD (gas)	19,000	19	2.50			n	
Sierra 4WD (hybrid)	n/a	18	2.50	n/a		n	
Sierra 4WD (gas)	24,000	16	2.50			n	
SUVs w/ comparison							
Escape 2WD (hybrid)	28,000	34	2.50	353,600	2.26	n	\$5,738
Escape 2WD (gas)	20,000	26	2.50			n	
Escape 4WD (hybrid)	30,000	31	2.50	202,909	4.44	n	\$4,565
Escape 4WD (gas)	21,000	20	2.50			n	
Lexus RS 400h 2WD (hybrid)	45,000	31	2.50	n/a		n	
Lexus RS. 2WD (gas)	n/a	24	2.50			n	
Lexus RS 400h 4WD	47,000	29	2.50	immediate	3.28	n	
Lexus RS. 4WD (gas)	47,000	21	2.50			n	

SUVs w/ comparison cont.

Tribute 4WD	n/a	31	2.50	n/a		n	
Tribute, 4WD (gas)	n/a	20	2.50			n	
Mariner 4WD	30,000	31	2.50			n	
Highlander 2WD	33,000	31	2.50	212,178	3.30	n	\$3,701
Highlander 2WD (gas)	26,000	22	2.50			n	
Highlander 4WD	34,000	29	2.50	182,700	3.28	n	\$2,716
Highlander 4WD (gas)	28,000	21	2.50			n	

Hybrid Analysis

Assumptions:

- As the price of gas is variable both over time and geographic/political location, the analysis was done at an assumed price of \$2.5 per gallon.
- There is currently insubstantial information about the cost and frequency of repair for hybrid vehicles, so costs are assumed to be comparable to conventional vehicles.
- Information is sparse as to the nature of tax deductions available. Benefits were not taken into consideration.

Calculations:

- Purchase costs were rounded for ease of analysis
- Miles per gallon were averaged between city and highway mileage
- Rate on Return was calculated assuming equal wear on vehicle

Cars:

The only direct comparison available was the Honda Civic, as this model is available both as a hybrid and gasoline engine. The \$7,000 initial cost is made up within 3,200 miles of use. After this point savings are \$2.14 per 100 miles driven.

Of the hybrid cars available, the Honda Insight (manual) has the lowest initial cost with the highest miles per gallon. With no information available as to durability over time, one would assume the Insight is comparable to other hybrids and thus the best deal.

Trucks:

All of the hybrid trucks also had gas models available for comparison, although GMC did not have enough information available for analysis.

The Chevrolet Silverado 4 wheel drive has the fastest rate on return as well as the highest per-mile savings after that. After 4,700 miles, the initial cost is paid and savings would continue at \$2.78 per 100 miles driven.

SUVs:

Of the information available, the Lexus RS 400h 4 wheel drive has an immediate rate on return, but a mid-range per-mile savings at \$3.28 per 100 miles. The Ford Escape 4 wheel drive has the highest per mile savings: \$4.44 per 100 miles, after the initial 2,000 mile return on investment.

Fast facts.

Lighting accounts for 29% of a typical office's energy use

-US department of Energy end Use Study 1995

Properly Designed and implemented day lighting strategies can save 50 to 80% of lighting energy

-Green Office Guide

Exit signs use an average of 960- 1920watts/day 7 days per week. Replacing these signs with cfl bulbs results in a savings of 50% or more

- Green Office Guide

The city of Portland Bureau of environmental services built a new water pollution control lab in 1997. Among its many energy saving features were electroluminescent exit signs. These exit sign draw only one watt each. There are 21 of them in the building and they are on all the time. Substituting electroluminescent for incandescent saves the Water Pollution Control Lab over \$350 per year on their electric bill.

- Water Pollution Control Lab, Portland OR

If you pay \$12 for a 25-watt CFL and install it in place of a 100-watt incandescent bulb that usually operates 8 hours/day, it will pay for itself in 2 years

- Portland Office of Sustainable Development

A Lawrence Berkeley Lab study from 1999 estimated that one workstation (one monitor and computer) left on after business hours is responsible for power plants emitting nearly one ton of CO₂ per year. That could be cut by 80% if the workstation is switched off at night and set to go to "sleep" during idle periods of the day. If every US computer and monitor were turned off at night, the nation could shut down 8 large power stations and avoid emitting 7 million tons of CO₂ every year.

- Portland. OSD

The first thing to know is that it's ok to turn off computers. There's a myth out there that says you shouldn't. That's not true. There's another myth that screen savers save energy. That's not true either. When you're not going to use a computer for more than 2 hours... the best thing you can do to save energy is just to turn it off.

-Portland OSD

Printers – "Energy Star" printers can cut a printer's electricity use by over 65% a printer with a duplex mode can also save around \$30 a month in paper costs

- Portland OSD

Unbleached Paper – paper manufacturers use chlorine to bleach paper bright white. This chlorine makes its way into the environment and creates dioxins,

which causes cancers, birth defects, immune system damage, and other health problems. Finding paper products which are not chlorine bleached are not difficult and comparable priced.

-Portland OSD

A ton of 100% recycled paper saves the equivalent of 4,100 K-watts of energy, 7,000 gallons of water, 60 lbs of air emissions, and three cubic yards of landfill space.

-Portland OSD

Unites States Residents use three time as much water a day – 1,300 gallons per person - as the average European

-greenfacts.org

The amount of solar radiation that reaches the earth's surface in three days equals roughly the total energy content of all known supplies of fossil fuels.

-greenfacts.org

A single dripping faucet can waste up to 20 gallons of water per day

-50 Simple Things You Can do to Save the Earth

Boosting the rush hour traffic from one to two people per vehicle would save 40 million gallons of gasoline per day –over 15% of US gasoline consumption

-Portland OSD

If just 25% of U.S. families used 10 fewer plastic_bags a month, we would save over 2.5 BILLION bags a year.

– library thinkquest

On the average, the 140 million cars in America are estimated to travel almost 4 billion miles in a day, and according to the Department of Transportation, they use over 200 million gallons of gasoline doing it.

Every year we throw away 24 million tons of leaves and grass. Leaves alone account for 75% of our solid waste in the fall.

- EPA

Over 100 pesticide ingredients are suspected to cause birth defects, cancer, and gene mutations.

Every ton of recycled office paper saves 380 gallons of oil.

- EPA

About 1% of U.S. landfill space is full of disposable diapers, which take 500 years to decompose.

-library thinkquest

Energy saved from one recycled aluminum can will operate a TV set for 3 hours, and is the equivalent to half a can of gasoline.-library thinkquest

Glass produced from recycled glass instead of raw materials reduces related air pollution by 20%, and water pollution by 50%. .-library thinkquest

Americans use 50 million tons of paper annually -- consuming more than 850 million trees. .-library thinkquest

Homeowners use up to 10 times more toxic chemicals per acre than farmers. .-library thinkquest

By turning down your central heating thermostat one degree, fuel consumption is cut by as much as 10%. -EPA

Insulating your attic reduces the amount of energy loss in most houses by up to 20%. .-library thinkquest

Enough glass was thrown away in 1990 to fill the Twin Towers (1,350 feet high) of New York's World Trade Center every two weeks. .-library thinkquest

One ton of carbon dioxide that is released in the air can be prevented by replacing every 75 watt light bulbs with energy efficient bulbs.

A three percent annual population growth rate will result in the doubling of consumption and production of food and other products in 25 short years. The amount of motor vehicles that are expected to be operated will increase 15 million a year until at least 2010.

The world's per capita grain production has been on the downfall since 1985 despite the use of fertilizers and pesticides.

Already a train system has been developed (back in 1987) which is based on magnetic levitation and causes minimal pollution. These versions of a train are already in use in several countries. .-library thinkquest

Every day 50 to 100 species of plants and animals become extinct as their habitat and human influences destroy them. .-library thinkquest

Winzler & Kelly's Green Team

Environmental Footprint

transportation

waste

Energy use

Product consumption

Employee habits

Product footprint

Company goals

- Winzler and Kelly is actively involved in the community through numerous charity involvements and volunteer efforts
- Now we are working to make this region a better place from within
- Join us in ecological awareness and personal change to bet-

Accomplishments

Initial analysis of Hybrid cars for fleet

Researching transportation footprint of the company off jobsite

Cardboard collection and recycling

Recycle bins in each office

Drafting paper recycling program



Re-usable cups to substitute for disposable

Cornstarch garbage bags

Two-sided printing

Paper – recycled toilet paper, hand towels, tissues, etc.

Less lighting usage during the day and at night

Lighting analysis – compact florescent vs. incandescent

Review of Janitorial products for environmental impact

Projects in the Works

Energy footprint – paper towels vs. electric hand dryer

Transportation footprint of products in use

New energy efficient printer

Carpooling organization + motivation

Bike rack next to building

Solid waste analysis

Juliana Dixon
Winzler and Kelly Consulting Engineers
633 3rd St.
Eureka, CA 955

Dan Moody
City of Eureka
Department of Engineering
531 K st
Eureka CA, 955

Dan Moody,

This letter is in regard to the installation of a bicycle rack in front of Winzler and Kelly Consulting Engineers. As per our conversation at the beginning of this month, I have received authorization to request a double bicycle rack in front of the 3rd street building.

If possible, the office would like the rack to be installed on the 3rd street face of the building, on the G st. side of the tree, approximately 2-3 feet from the tree closer to the corner. This would allow the front office attendant to keep an eye on bicycles locked there.

Thank you very much for making this available for our office. Please let me know if there are any questions or problems with this request. I can be contacted at: julianadixon@hotmail.com, or reached by phone at (707) 825-1053.

Thank you,

Juliana Dixon
Sustainability Intern at Winzler and Kelly Consulting Engineers

Service Learning Journal

- 1hr – meeting w/ Salzman, office + job clarification
- 1hr – meeting – initial meeting
- 1hr – reading binder on janitor chemical use
- 1hr – create transportation survey
- 3hrs – find facts for bottom of survey + validation
- 1hr – type meeting notes, read “green Business” paper
- 1hr – meeting 2 – job delegation, map etc.
- 2hr – create map of McKinnlyville, Eureka, Ferndale+ Fortuna
- 1hr – type meeting 2 notes + read “Green office guide”
- 1 hr – meeting three – recap before Salzman goes traveling
- 1 hr- type meeting three notes, and organize future meetings
- 2 hrs – redoing map w/ GIS program
- 4 hrs – finding info for Neal Carnam
- 2 hr – creating graph + presentation for him

Meeting w/ Salzman: 10-7-05

The meeting with Steve Salzman was exciting. He seemed to like my ideas, and had some of his own that I found interesting also. I am slightly hesitant of being on a sustainability team due to my experiences with Starbucks in Vermont. They hired me as a “green team” co-coordinator for the state, but gave me no power to actually change anything. Every idea I had had to be “pushed through corporate”, which meant Boston, and then Seattle. This also meant that whatever I wanted to do had to be implemented in my whole region, even though the stores in the region had different needs. One store, in a more rural area had a great demand for coffee grounds for people’s gardens and farms. The store in the middle of Burlington didn’t have a demand for this, they needed to lesser their waste output due to a lack of storage. However, I couldn’t tailor an environmental program for each store, it had to be the same everywhere. Also, we weren’t allowed to have any hand-made signs that customers could see, the only thing I could do was to put up signs in the break room encouraging employees to recycle and use less waste. It took me 9 months to get a recycling bin for the restaurant. Winzler and Kelly, however, seem to have buy-in from above. Steve Salzman speaks as though the owners themselves are very committed to making whatever changes necessary assuming the rate of return isn’t too far in the future. They already have a team looking into the “greening” of Winzler and Kelly. So hopefully this experience will be an improvement on my last one.

We spoke of various things that I could do for the company to try and lessen the environmental footprint: looking at their chemical products used for cleaning to see their toxicity, looking at the paper products to see their level of recycled material or recycleability (like to drafting paper), analyzing the transportation footprint of Winzler and Kelly – both on the job traveling to job sites, as well as employee footprint traveling to and from work, lighting analysis, and employee habits- do they take a new cup every time they get a drink of water, etc. After doing this I will be making a report for access by the greater community of steps that this company has taken to become more green, and steps that any local business could take for that end.

This ties into the coursework not so much as defined by the book – primarily an economic viewpoint – but as defined by the course title: Rural *Sustainable* Economic Development. While the rural economy needs to be developed, without environmentally sustainable design, rural economies will begin collapsing, as dependency on artificially cheap practices become too damaging to ignore. If this area were to have environmental eyes involved in the development of new businesses, and helping to change the old ones, this community will be able to survive, and be competitive in the greater economic market. Perhaps I will send my final report to Prosperity! To be an additional piece of information available for new businesses in the area.

The first meeting: 10-13-05

Wow. I attended a meeting of the “green team” for Winzler and Kelly this morning. I am a little dumbfounded. Steve Salzman seems so down to earth about the problems and practices which need analyzing, and his personal involvement in that. This meeting struck me that perhaps he’s the only one...

The meeting consisted of three women (Emily, Tirzah, and Taylor), one man (Doug) and myself. The first thing that I noticed was that I was the only one on time. The next two people in the room were Emily and Taylor. Both girls have big fake fingernails, various hair products on bleached and permed hair, lots of jewelry, and walked into the room talking about the new clothing deal at Target. I started having Starbucks flashbacks. This could be judgmental and stereotyping of me, but if a person has no concern about what chemicals go into their body, and no concern about the environmental or social consequences of the products they buy – how can they be serious about working to lessen the footprint of a company?

Then Tirzah and Doug showed up – these two looked fairly normal to me, except for Tirzah’s jewelry. Of course, being an Environmental Science major, I don’t see a pretty gold bracelet, I see 100 tons of earth being mined for enough gold for one ring. And of course she had several. Shortly after all five of us were in the room, Emily brought out bagels – not from Los Bagels (the local shop) but from Costco. She also had three types of cream cheese, with a plastic single-use knife for each of us. Taylor announced with pride that the plates we were eating on were 100% recycled material. I looked at the packaging. They had been shipped from the east coast.

Being new, and unsure how I was going to fit into their project yet, I sat quietly for the first half-hour of the meeting. During this time I was brought up to date on what the team had done so far. This included changing over to cornstarch garbage bags rather than plastic, changing to recycled paper products (at least to some percent) rather than virgin – tissue, toilet paper, and paper towels, they had also provided each employee with a steel mug for re-use for both hot and cold drinks to reduce the need for disposable cups. They then asked my perspective on their actions so far, and what we should do in the future. I thought for a minute – it’s never productive to make people feel negatively about their actions... So I asked if the goal of Winzler and Kelly was to improve the environment within their company for their employees, or to improve their footprint externally. They responded both, naturally. So I asked if they had looked into the transportation footprint of buying recycled products made on the east coast compared with a product of virgin

resources that didn't have to be shipped so far. No one had any information. Doug brought up that the steel mugs had been manufactured in China. I asked about using "house" plates and silverware instead of single-use products. They said that the company would never go for that because they have employees making \$120/hr – they didn't want any minute of that employee's day spent washing dishes. That task would only be worth it for interns. Hmm. Ok. I asked about CFL lighting, they said that the office would be moving soon, and it wouldn't be cost effective to replace them at this point. I asked about the purchasing of paper products from a more local distributor, but the company has a deal with Staples, and unless I find something cheaper than that, local(ish) and environmentally friendly, they wouldn't go for it. Ok. Homework for me.

For the rest of the meeting we discussed what I would be doing, and whom I would need to contact to be able to do those tasks. I felt excited about my work, but I also felt that I had burst the bubble of the girls who were really trying to do a good job, but just hadn't thought the problem all the way through. Am pondering the various ways of communication to contribute honestly and thoughtfully without blatantly criticizing another's work.

Reading the Binder on Janitorial Chemical Use:

10-16-05

So I went in and asked Emily how I would go about contacting the janitors for an interview about their practices, products, etc. She said, oh don't bother – we have the binder of every chemical they use here. I'll go get it for you. Ok, thank you.

Hmm, I was really hoping to be able to speak with them in person. What they use is only as helpful as knowledge about how much they use, how frequently, what precautions they take, what disposal methods they use, etc. But at least I have the binder.

Going through the binder was ridiculous. It is a massive amount of information useful only to a government agent checking to see that the proper literature is in place. The binder is roughly a three inch ring binder stuffed full of products, chemicals, and government regulations about said chemicals. Most pages were hard to read due to bad printing. Many were impossible to decipher what the numbers meant. None of the information told me what the products were used for. Nothing in the binder said how frequently they were used. Some of the chemicals were labeled as safe, some were very toxic. Most of the chemicals listed, I was concerned about the actual safety of such products in light of the government assurance – I mean, it was our government that used DDT as shampoo in WWII, as well as in several propaganda videos about its safety. Nothing in the binder said where the products were purchased, where they were manufactured, or how much they cost. How does one do an analysis of product usage and alternative products with so little information?

I later went in and asked Emily again for the contact info of the janitors, and tried to explain why I needed it. She didn't have the time to find it for me, but didn't tell me where to go to get it... I asked her to just e-mail the info to me when she gets a chance. She said she would, but something in her tone struck me as odd – like I was invading her space or something. She has yet to e-mail the information to me.

Meeting With Steve Salzman:

10-21-05

This meeting was fairly fast. Steve was wanting to check in with me and make sure that I was on track both for myself and for the company. We discussed economic vs. environmental concerns, and how those balance out in the corporate world. We spoke of “quality of life” and a company’s involvement in that, and thus the consequent ability for the company to market their contributions to the community in that way and thus be able to use sustainability to support economics.

Creating the Transportation Survey:

10-25-05

One of the tasks that has been given to me is to 1. Estimate the transportation footprint of Winzler and Kelly’s employees, 2. Find out the barriers to reducing it 3. Set up a system or interlacing systems to begin the reduction of this footprint. So I designed a transportation survey to be giving out to Winzler and Kelly employees seeking to determine various aspects of how they get to work, how far they have to go, why they choose that method, and what the barriers are to each employee to choosing another method of transportation. A couple of semesters ago I had to do a survey for a different class – a survey on local restaurants’ waste management actually. The professor recommended the website: ___ to model our surveys on for a “balanced”, representative survey technique. I went back to this website in the construction of my survey now. It’s rather interesting constructing a questionnaire for a group of people you don’t know, the vast majority of whom you’ve never met, and most of whom are professionals in their field who are rarely challenged in their opinions. I needed to do something that would be informative, but not prying, questioning, but not leading, laying groundwork for future possibility, but not accusing or pressuring. So I created the following survey, and asked my parents and my roommates to give me their opinions about the effectiveness and feeling of the survey. My roommates thought it was great. They had a few comments about sentence structure, and added some ideas about content, but were otherwise totally supportive. My mom felt like the survey didn’t open enough doors. For example, rather than asking why an employee chose not to use alternate transportation, she wanted to know specific barriers to biking, riding the bus, carpooling, and walking as an individual question each. Thus asking the reader to stop and think about each option on it’s own rather than just being able to say that nothing is as convenient as driving. My father was rather the opposite. He felt that the questions were a bit presumptuous. That he would have felt condescended upon having to answer for his actions in such a way.

Compiling these opinions was an interesting task. However, my father is the professional, and is of the age range of the average Winzler and Kelly employee, thus I tried to weigh his opinion more heavily. The resulting survey I e-mailed to my fellow green-team members asking their opinions, feedback, and criticisms. Everyone had pretty positive responses – a couple great ideas were given to add to the survey, and I set about making the final copy.

Finding facts for the bottom of the survey and to be sent out with weekly e-mails:

10-30-05

One of my projects is to find out facts to be sent out to the company which are informative/persuasive/environmentally and economically friendly/info proving the quality of life for employees. These facts need to be well founded, and ideally from a spread of informants. This project is fun to work on – I feel like I've spent three years at this school amassing nothing but random environmentally spiffy facts. The tricky part though, is making sure I can site all my sources. I have binders full of notes with quotes and info from professors, but I rarely noted where they got their info from. Sigh. So I went (and am still going) about finding facts from my textbooks, from the internet, from brochures etc. I have always found this kind of research really interesting, if nothing else, just for my personal knowledge. Of course, when you get personally interested in something, it's difficult to stay on track. I find myself running down paths that aren't specifically good for the economic slant that I need to be portraying. It is also difficult to maintain a spread of sources. A couple websites are super helpful, but I don't want to have everything coming from one place. Facts lose their validity when there aren't a multitude of reputable people saying the same thing.

Two things that have been particularly helpful here have been a couple of pamphlets that Steve Salzman gave to me. One was the green office guide produced by the city of Portland's Office of Sustainable Development. It is "A Guide to Greening Your Bottom Line Through a Resource-Efficient Office Environment". This guide has been fantastic. It is exactly what this service learning project is all about. Making the economic development of companies simultaneously environmentally friendly.

Type meeting notes and read "Green Business" paper

How to feel like a secretary 101. I have been entrusted with creating a binder of meeting minutes and creating the agenda for future meetings. Typing up the meeting was sort of a reminder of how frustrating the meeting had been. How can one move toward sustainable development if the people involved are so far from understanding the necessity of sustainability? How can one morally market one's strengths if they are achieved at the cost of other people's freedom to clean air and water? It is very hard to find compassion for the businessman when I am inundated daily with the harmful magnifying glass of effects that "economically successful" businesses do to a community. And I suppose trying to green the company is a form of trying to green the people within it.

The Second Meeting: 11-3-05

Whee! The second meeting was SO much better than the first. The other members of the green team who had not been able to be present at the first meeting were in attendance at the second. This included Steve Salzman and David Carter. Apparently the whole team and its purposes are a function of David Carter's drive. Having him there

was fabulous. We recapped the first meeting for Steve and David – they were both very supporting of my ideas, and had great ideas of their own. We delegated projects for people, and discussed the greater plan of the team. Doug has been delegated as the cardboard guy. Right now cardboard is not recycled, it is simply thrown in the dumpster. Doug had volunteered to collect it in his office, weigh it, and take it to the Arcata Recycle center. Emily is going to create a board for other Winzler and Kelly employees to be able to see what the team is doing. David Carter is going to continue to push the management to switch to CFL lighting. Steve Salzman is trying to get involved in the plans for the new building and making it Leed certified. Lastly, I will be analyzing the transportation footprint of the Winzler and Kelly employees. This meeting really felt to me like there was a positive motivation present, and

Creating the Map:

11-6-05

In order to do a survey of Winzler and Kelly employees' transportation footprint, I needed to get an idea of where each employee lives and what type of gas mileage they get. The addresses of the employees are not available to us from HR so we decided to have me make up a map w/ a co-ordinate system to send out to everyone and ask them to respond which coordinates they lived closest to and what kind of gas mileage they get. Then with that info I will do the distance calculations. So, I went about making a map. The first thing I tried to do was to play with GIS on the school computers and add layers of a co-ordinate system or a grid system. I found that while this program is really neat, and something that I would like to refresh myself on, I am not up-to date enough on it at the moment to really be efficient. So I tried another program called Google Earth. This is a really amazing program that I suggest anyone try. It is a system of satellites which allow you to focus clearly down to the level of your roof. So I spent some time cutting and pasting to get a good clear map of McKinnlyville, Arcata, Eureka and Ferndale. Then I tried adding a grid. This took a long time. Not being familiar with this program it took a fair amount of playing around to get something I could make work, I finally found the application to add a co-ordinate system, saved it, turned it into a useable Jpeg, and e-mailed it to my fellow green team members to see if they thought it was a good final product that we could send out.

It felt really good playing with the two types of software. One of the things that I have regretted about pursuing the Environmental Science degree was the lack of "hard science" that I had become accustomed to as a biology major at Cal Poly. I also realized that I was really glad I was doing this project as an intern and not as an employee. I really need to dig into those programs much further before I would feel comfortable claiming any kind of real proficiency. That said, as we were discussing the making of the map, I got the feeling that only about half the people there had any experience with GIS at all. Several of them had worked with AutoCAD, which I have not worked with at all (not being an engineer). I have a habit – perhaps women in general do this- of depreciating my skills, while I really am fairly competent. I took Cary Frazee's conflict resolution course a couple semesters ago and she showed a film that has stuck in my mind ever since. It was called "invisible rules" about the differences between men and women's communication in a business environment. One of the points it raised was that

stereotypically, women will say "I'll try", when men will say "I will" given the same amount of experience or knowledge. I recognize this tendency in myself. I frequently downplay my abilities as a protection in case I really do poorly. The reality though is that I am as qualified or more so than others of my experience. Working in manner in which I have for Winzler and Kelly has been very helpful for me to get a realistic view of my strengths and weaknesses in the business world.

Reading the "Green Office Guide"

11-11-05

This is a fabulous document. I had skimmed through it previously to find fast facts for the sheet, but now I went through and read it in depth for office ideas more specific to design and management rather than just employee habits, etc. I have found other information online about this but this document is a good hands-on guide for practical economic-return action. I would love to leave a copy of this with Prosperity! for their library. I am currently pondering contacting the Portland Office of Sustainable business to see if they offer internships. Actual application of many of the ideas addressed may be difficult from my position as an intern, but at least it is a great starting point for me to be able to present ideas to those in power here.

Redoing the Map: 11-15-05

Grrrrr. Ok, so I guess latitude and longitude aren't as easy as "I live at H,3", but seriously, this is an environmental engineering firm. Is Lat and Long too hard?

So anyway, this afternoon found me again in the computer lab down in Sci D wrestling with the GIS program. I do have fun with it, and I am glad that I'm getting the experience, but man this feels like Greek to me. I felt this way in the GIS class to. Making three maps is really like three separate projects since I have to work so hard to figure out each application, it's not a clear path how to do it for the next one. It's re-discovery all over again.

GIS is an amazing program, I am very curious to see where it will be in ten years when information is more readily available and its all in the same or compatible formats. I don't know how many times I would find exactly what I wanted but just couldn't get it to be in a format compatible with the other layers I am working with. Also of course, many of the websites want you to pay for the information. More and more is becoming available though, especially through government sites.

Meeting 3

11-17-05

Still feels positive, David Carter and Steve Salzman were totally supportive, although for varying vacations, everyone is disappearing for a while. We all have tasks to work on, and I was cleared for the last things I need to do to wrap up this semester. I feel like my work here has been positive, I look forward to continuing in the spring. It is interesting to ponder how my experience would be different if I were an actual employee. Would I

have more access to information? Would I have more sway to change policy? They had mentioned early on having me travel to different Winzler and Kelly offices to help implement these changes. Is that still a thought? What would I have to do to materialize that outcome?

Michael Crooke – Revolutionary Living
Monday, 4-5:30, Kate Buchanan Room, HSU
Watson Lecture Series in Business Ethics

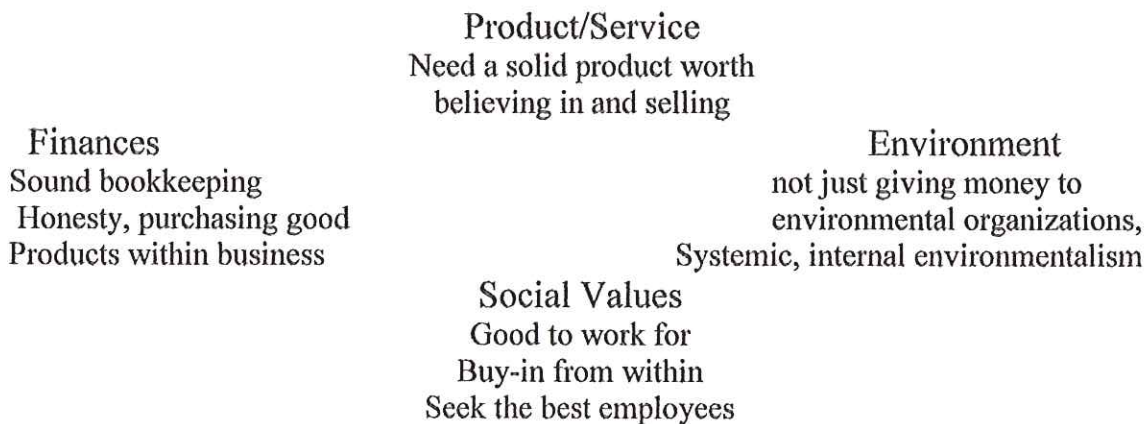
Summary:

The hour that Michael Crooke spoke was not so much about the details of how to make your business more sustainable, but about the necessity of following this path to survive in the immanent future.

Crooke gave examples of a sustainable business model, examples of businesses following this model, books to back up the necessity of becoming sustainable, and examples of “conscious consumerism” – the trend of the western market.

The Sustainable Business Model:

“Business is an ecosystem where resources are balanced”. Crooke made a case that quarterly profits are no longer the mark of a business that will be sustainable in the long term. It is now about socially and environmentally responsible companies. He presented the sustainable business model as seen below:



According to Crooke, marketing is now falling by the wayside in effectiveness as compared to word-of-mouth faith in the company. If a customer clicks on the website they have a lifelong value X for the company. If that customer walk in a store, and interacts with employees the value is 2X. If that same customer chooses your product over a competitor’s in another store their value quadruples, and they become your marketing.

Books Available:

Flow by Mihaly Cikszenimihaly

Speaks of buy-in from within, worker investment. “The state in which people are so involved in an activity that nothing else seems to matter, the experience itself is worth the effort”. Employees need to fully believe in the company. This can only be established with sound, sustainable practices

The Cultural Creatives by Paul Ray

If you want to market backpacking products, hire backpackers. Not just to sell the product, but to design it, test it, believe it, talk about it, and buy it.

Conscious Consumerism

“Conscious Consumerism is not just about pushing a product. You will make more money in the long term if you have that connection with customers”. *Any* business can start moving toward sustainability, but belief must be on all levels of the company. How do you move an environmental (sustainable) movement down the pyramid? Employees must believe the ethic themselves. It is through this that customers pick up on the energy of the company and begin to believe in the company also.

Be your own customer. How do you want to be treated? How do you want a company treating the world around you? Wellness and product must go hand-in-hand. All aspects of the company must be working toward the sustainable business model together, not just as a special interest group within the company.