

Appendix A: Initial Cost Analysis Calculations

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This appendix details the methodology, sources, and calculations for the initial cost estimates included in the Climate Action Plan. Only initial costs of the 42 supporting measures are calculated in order to create an even basis of comparison. While some measures include simple payback or rate of return data, these statistics are for information purposes only.

Initial cost analyses for the 21 reduction goals are based on the experience of City Staff and research conducted by PMC and ICLEI. City Staff from planning, public works, and building inspection gave estimates of time and materials to the City for implementing each measure. The initial costs of other measures were based on market research and the experience of similar cities.

The initial cost estimate for many reduction measures are represented as a range. This is due to the different hourly pay rates of staff, which are anywhere from \$50 - \$100 per hour once salary, insurance, and other costs to the City are taken into account.

Energy Use

1. Expand energy saving opportunities to businesses

1.1 Consider developing a tax rebate program for efficiency improvements in businesses.

Data Source	N/A
Interpretation	Updated Title 24 standards will not be released until 2009. The initial cost of a tax rebate program cannot be determined until a more specific scope is determined.
Total	Unknown

1.2. Expand energy saving opportunities for large and small commercial and industrial properties.

Data Source	City Staff and PMC
Interpretation	The cost of these two programs would be born by existing programs through PG&E and the State. The only cost to the city would be facilitation, which is estimated to be 50 hours of staff time per year. $50 \text{ hrs} * (\$50 - \$100 / \text{hr}) = \$2,500 - \$5,000 \text{ per year.}$
Total	\$2,500 - \$5,000 per year
Notes	There is a possibility for community group assistance.

2. Improve residential energy efficiency

2.1. Consider establishing energy efficiency standards for new construction and remodel projects that exceed the State's Title 24 energy standards.

Data Source	City Staff and PMC
Interpretation	It is estimated that writing energy efficiency standards for new construction and remodel projects would cost approximately 40 hours of Staff time, which equates to \$2,000 - \$4,000. There will be additional costs associated with staff time needed for plan checks, however this cost will be absorbed by the applicant.
Total	\$2,000 - \$4,000

2.2. Perform energy-efficient lighting retrofits and/or home energy audits.

Data Source	Acterra and PMC
Interpretation	The cost of this measure depends on whether the home energy audits are coordinated by a non-profit organization like Acterra or by community groups. Acterra estimates that a proposal for San Carlos would be similar to that for Menlo Park, which was \$35,000 for 250 home energy audits in one year. On the other hand, costs to the City for a home energy audit program run by community groups would be negligible. We therefore assume that this reduction measure will have costs anywhere from \$0 - \$35,000.
Total	\$0 - \$35,000.

2.3. Expand the distribution of free or subsidized energy and water saving devices and services to the mass market.

Data Source	PMC and Pacific Gas and Electric www.pge.com
Interpretation	The cost of distributing free or subsidized energy and water saving devices and services is minimal assuming that supplies are provided as they have been historically by utility providers and through promotions.
Total	Negligible

2.4. Expand and better integrate programs that increase energy efficiency in low-income households.

Data Source	PMC and Federal Low-Income Household Energy Assistance Program http://www.acf.hhs.gov/programs/ocs/liheap/
Interpretation	The Federal Low-Income Household Energy Assistance Program (LI-HEAP) distributes funding for low-income weatherization services as does the U.S. Department of Energy and PG&E. It is likely that some coordination time from City staff would be necessary to determine if applicant eligibility however this time is negligible and would most likely be covered by grants.
Total	Negligible

3. Adopt a green building standard for all new development and major remodels

3.1A. Enforce State Green Building requirements and provide information and support to developers on LEED and GreenPoint standards.

Data Source	City Staff and PMC
Interpretation	There are costs associated with training (\$1,000 for materials + [(40 hrs Staff time * \$50/hr) - (40 hrs Staff time * \$100/hr)] = \$3,000 - \$5,000) and additional Staff time for plan checks, however these costs are going to be required by the State with or without this reduction measure and are therefore negated. The cost of promoting LEED and GreenPoint standards would be equivalent to the current level of outreach.
Total	No additional cost

3.1B. Create a green building ordinance requiring a GreenPoint, LEED, or equivalent green building certification per development category.

Data Source	City Staff and PMC
Calculation	Additional training: \$1,000 for materials + [(40 hrs Staff time * \$50/hr) - (40 hrs Staff time * \$100/hr)] = \$3,000 - \$5,000 Plan Checks: 2 hrs additional time per plan check, however this cost

Total will be absorbed by the applicant.
\$3,000 - \$5,000

4. Create water and waste efficient landscapes

4.1. Formalize the City's water efficient landscaping practice by writing it into the Parks Master Plan.

Data Source City Staff and PMC
 Interpretation Implementing this goal would alter design standards in the Parks Master Plan, which is estimated to cost a one-time \$10,000 consultant fee. Further analysis would be necessary to determine the hard cost per plant as well as staff time per planting or total cost to hire additional contract landscapers.
 Total \$10,000

4.2. Expand the current landscaping ordinance to require efficient landscaping in conjunction with all residential and commercial property improvements.

Data Source City Staff and PMC
 Interpretation To update and enforce a more restrictive landscaping ordinance, approximately 40 hours of staff time or \$2,000-\$4,000 would be required. Additional review by plan-checkers is estimated to be an added half hour per application or \$3,750-\$7,500 assuming 150 qualifying plan checks per year, however this cost would be absorbed by the applicant.
 Total \$2,000-\$4,000

5. Identify opportunities for on-site renewable energy generation on City and privately-owned property

****Overall: \$10,000 Cost to the City for a feasibility study of on-site energy generation.**

Source: City Staff and PMC.

5.1. Identify opportunities for increasing solar system installations in the community and on City facilities.

Data Source PMC – also see footnotes
 Interpretation The average cost of PV installation per kW is \$9,000 without subsidies or financial assistance.¹ Keeping with our assumptions above, the gross cost to the City for installing an additional 100 kW of solar panels would be \$900,000 with a 50-year simple payback. Much of this cost would be paid back by the California Solar Initiative, which pays \$0.50 per kWh for solar power generation in the first five years. With an average of 4.5 hours of sunlight each day over the course of a year,² we can estimate that a 100 kW system would produce 164,250 kWh per year.³ This equates to \$410,625 over five years, or roughly half of the cost of installation.
 The remaining \$480,000 can be paid incrementally through loans, but for the purpose of this analysis we are assuming the initial cost will be paid up front.
 Total \$480,000

¹ Solar Buzz, "Fast solar energy facts," <http://www.solarbuzz.com/FastFactsIndustry.htm>, accessed November 1, 2008. Middle of \$8-10 per watt price range

² Rocky Grove Sun Company, "How many PV modules?" <http://www.rockygrove.com/design/howmany.html>, accessed November 3, 2008.

³ 100 kW of PV installed * 4.5 sun hours per day * 365 days = 164,250 kW-hours (kWh)

5.2. Identify opportunities for Wind energy generation.

Data Source PMC – also see Footnotes
Interpretation Small wind energy systems cost from \$3,000 - \$5,000 for every kilowatt of generating capacity, or about \$40,000 for a 10 kW installed system without taking into account rebates or incentives.⁴ For the purpose of analyzing the cost benefit of this measure, we will assume that the City installs ten small-scale wind turbines, which would equal \$30,000 - \$50,000 without assistance. The California Energy Commission Emerging Renewables Program provides rebates for wind turbines less than 50 kW. The American Wind Energy Association estimates that this program, along with other federal programs, will cover the cost of a wind turbine within 10 years, resulting in 20 years of relatively no-cost energy.⁵ For the purposes of this study, we will assume that half of the cost of the wind turbines will be born up-front in order to create consistency with other measures that also have a payback. Therefore, the initial cost of ten wind turbines is estimated to be \$15,000 - \$30,000 assuming most planning and coordination by Staff is completed as part of the initial feasibility study.

Total \$15,000 - \$30,000

5.3. Identify opportunities for Biomass energy opportunities.

Data Source PMC
Interpretation It is difficult to make an estimate of initial cost and greenhouse gas emissions reductions from biomass energy due to the different fuels that could be used. The only method of biomass energy production that is quantifiable is methane capture. However, since the landfills serving the City of San Carlos are all outside of City limits, it is unlikely that this biomass energy could be routed back into the City.

Total Unknown

6. Implement reduction strategies included in the energy audit of City facilities. Continue to monitor City facility performance.

Data Source City Staff and PMC
Interpretation Until the inventory is completed, the cost of modifying City facilities and their operations to increase efficiency is unknown. Additionally, the greenhouse gas benefits cannot be calculated until after the inventory is completed.

Total Unknown

7. Provide for increased albedo (reflectivity) of all urban surfaces including roads, driveways, sidewalks, and roofs in order to increase reflectivity and minimize the urban heat island effect

Data Source City Staff, PMC, US EPA (<http://www.epa.gov/heatisland/mitigation>)
Interpretation The US Environmental Protection Agency identifies multiple cool pavement technologies, many of which are similar if not lower in

⁴ American Wind Energy Association (AWEA), "Finding Incentives," <http://www.awea.org/smallwind/toolbox2/financing.html>, accessed November 3, 2008.
⁵ AWEA, "Finding Incentives"

cost to traditional asphalt. There would be some staff time for coordinating with public works and including the high albedo content requirements in the CIP, however these costs would be a component of the next CIP update associated with the General Plan. CalTrans would also need to be contacted regarding El Camino Real and the State's efforts to increase albedo on State highways.

Total Negligible

8. Encourage tree planting.

3.1. Provide for City assistance to community tree planting programs and efforts.

Data Source Case studies, PMC and CAPP
 Interpretation 200 tree estimation based on a 2-year program of 100 trees per year completed before 2015 in order to allow them to mature to a measurable carbon sequestration rate. Cost would be one hour of staff time per tree (\$50-\$100). In addition, twenty hours of staff time would be required for kickoff of the program and the preparation of a Council resolution (\$1,000-\$2,000 depending on staff wage). Assuming that 200 trees are planted by community tree planting programs, we can estimate costs to be \$11,000 - \$22,000 total. If this program is operated by a non-profit or other community organization, the cost of the program would be substantially less.

Total \$1,000 - \$22,000 total.

3.2. Require a specific tree coverage and tree replacement requirement for all new development.

and

3.3. Develop and implement a shading requirement for all City-owned parking lots.

Data Source City Staff
 Interpretation Staff estimates that updating the zoning code with shading requirements (including the shading requirement in the next measure) will cost 36 hours of Staff time, which is equivalent to \$1,800 -\$3,600, however this effort would likely be combined with other code updates following approval of the General Plan, so the costs could be substantially less than this figure.

Total \$1,800 -\$3,600

Transportation and Land Use

1. Encourage development that is mixed-use, infill, and higher density.

1.1. Revise municipal codes to encourage and allow for mixed-use, infill, and higher-density development.

Data Source City Staff and PMC
 Interpretation It is estimated that it would take approximately 90 hours staff time (\$50-\$100 pay range) = \$4,500 - \$9,000 to complete code revisions in this regard, however this effort would likely be combined with other code updates following approval of the General Plan, so the costs could be substantially less than this figure.

Total \$4,500 - \$9,000

2. Increase housing density near transit.

2.1. Revise municipal codes to encourage and allow for higher-density commercial and residential centers near transit corridors with the express intent of encouraging transit ridership and reducing the use of the personal automobile.

Data Source	City Staff and PMC
Interpretation	City staff has indicated an estimate of roughly \$22,500-\$45,000 in initial staff time for a planner to write TOD code revisions (equivalent to 450 hours dedicated) however this effort would likely be combined with other code updates following approval of the General Plan, so the costs could be substantially less than this figure.
Total	\$22,500-\$45,000

3. Provide for an education program and stepped up code enforcement to minimize vegetation that degrades access along public rights of way.

3.1. Provide for an education program to residents and businesses as well as increased code enforcement in order to minimize vegetation that degrades access along public rights of way.

Data Source	City Staff and PMC
Interpretation	A cost of \$9,000-\$18,000 from recurring staff time for Right of Way (ROW) management for approximately 10% of a full-time position for the year at an hourly rate range of \$50-\$100 an hour. An expected extra 300 hours of enforcement annually would take place at \$15,000-\$30,000 in staff costs ongoing per year. These costs could be substantially reduced if community organizations were involved in the program via ongoing education and enforcement.
Total	\$24,000 - \$48,000

4. Increase bike parking.

4.1. Increase the bicycle parking requirement for commercial projects in order to promote cyclist safety, security, and convenience.

4.2. Require large employers to provide facilities that encourage bicycle commuting, including shower facilities, and covered or indoor bicycle parking.

Data Source	City Staff and PMC
Interpretation	City Staff estimates approximately 18 hours of effort for planning staff to write bike parking code revisions. When assuming an hourly rate of \$50-\$100 per hour, this translates to \$900-\$1,800 in initial staff time.
Total	\$900-\$1,800

5. Actively promote walking and biking as safe modes of local travel, particularly for children attending local schools.

5.1. Promote traffic calming methods on City streets such as landscaped median barriers and traffic circles.

Data Source	City Staff and PMC
Interpretation	As previously described, traffic calming measures are the responsibility of the neighborhoods, however this information could be provided on water bills for greater outreach and public awareness of the opportunity.

Total Negligible

5.2. Establish clear and convenient pedestrian rights of way with shade and minimal tripping hazards.

Data Source City Staff and PMC

Interpretation The City already allocates \$50,000 a year to responding to complaints about pedestrian safety. City staff does not estimate that additional funds will be necessary to implement this reduction measure.

Total Negligible

5.3. Incorporate bicycle-friendly intersections and boulevards into street design as recommended by the Bicycle Transportation Plan currently under review.

Data Source City Staff, PMC and *Streets and Sidewalks, People and Cars: The Citizens' Guide to Traffic Calming* by Dan Burden

Interpretation Preparation of the Bicycle Transportation Plan has already been accounted for in the current budget. The installation of striping for bike intersections would cost approximately \$100 per striped lane, or for a typical intersection with 4 lanes, \$400. Assuming three additional miles of bike lanes are installed and ten bike intersections are striped, we can estimate that this measure will cost approximately \$157,000.

Total \$157,000

5.4. Promote "Walk pools" or "Walking buses" to increase the number of students that walk to school.

Data Source City Staff and PMC

Interpretation The cost of advertising and coordinating the routes for the program would be absorbed by parent groups and schools. The cost to the City for coordinating with these programs would be minimal and largely absorbed by the other measures under this goal and existing programs.

Total Negligible

6. Create travel routes that ensure that destinations may be reached conveniently by public transportation, bicycling, and walking.

6.1. Create a plan to identify and address barriers to safe or convenient walking, biking, and transit ridership from major residential areas to public areas of interest and see if the plan's implementation.

Data Source City Staff and PMC

Interpretation The initial cost of this measure would be negligible since the plan is already in the process of being updated. Some of the expected recommendations of the Bicycle Pedestrian Plan are largely encompassed in the initial cost estimations of other reduction measures in this Plan, yet the specific costs cannot be calculated until the Bicycle Pedestrian Plan is completed.

Total Negligible

6.2. Make it a condition for approval that new large-scale developments address transit, biking, and walking access to the location.

Data Source City Staff and PMC

Interpretation The only cost associated with this measure is plan review to ensure that new large-scale development applications address transit, biking, and walking access. It is estimated that this requirement will

cost an additional four hours per plan check, or \$200-\$400 dollars, however this cost would be absorbed by the applicant. As development leaned towards addressing these issues proactively, the time required to complete plan checks would be reduced.

Total Negligible

7. Provide for a shuttle service in order to increase transit ridership.

7.1. Establish a shuttle service within the City of San Carlos connecting areas not adequately served by public transit to Caltrain.

Data Source City Staff and PMC
 Interpretation Estimated \$2,000-\$4,000 in costs generated by 40 hours of staff admin/contract start up time. Operating costs would be covered by Measure A and local businesses.
 Total: \$2,000-\$4,000

8. Promote car sharing programs.

8.1. See to the establishment of a car sharing program

Data Source City Staff and PMC
 Interpretation It is estimated that initial setup and coordination between City staff and the Car Share organization will cost 36 hours, or \$1,800 to \$3,600 of staff time.
 Total \$1,800 to \$3,600

8.2. Provide for car share parking spaces in convenient locations

Data Source City Staff and PMC
 Interpretation The costs for signage and re-striping would be born by the car sharing company. Costs to the City would be minimal and largely encompassed under the existing permitting process.
 Total Negligible.

9. Convert more City vehicles to hybrid, electric, alternative fuel, or smaller vehicles.

9.1. Replace 15 traditional automobiles in the City's fleet with more efficient vehicles by 2020.

Data Source CAPP software
 Interpretation The initial cost for purchasing a Toyota Prius (as one example) for City use has a price range of \$21,430 for base model. This assumes fleet price is \$500 above invoice and includes destination charge with no additional options. Assuming that the City purchases 15 additional hybrid vehicles, the total charge to the City would be \$321,450. The replacement of three fleet vehicles (included in this cost) has already occurred.
 Total \$321,450 - \$345,540

10. Increase accommodation and promotion of alternatively fueled vehicles and hybrids.

10.1. Offer prioritized parking for hybrid or alternative fuel cars on City streets.

Data Source City Staff and PMC
 Interpretation This measure will consist of initial restriping for the selected priority

parking spaces, which also is considered an ongoing public works task with a cost of \$100 per parking space. Another \$400 per parking space relating to enforcement of the designated priority spaces by proper cars is estimated. Therefore, assuming that 20 spaces are converted, we can estimate that the cost of this measure is approximately \$10,000.

Total \$10,000.

10.2. Encourage alternative fueling stations within close proximity to potential customers.

Data Source City Staff and PMC

Interpretation The process of encouraging alternative fueling stations within San Carlos would largely be incorporated the zoning code update effort following adoption of the General Plan update in 2009.

Total Negligible

10.3. Encourage developers to dedicate parking lot spaces to electric vehicle recharging stations.

Data Source City Staff and PMC

Interpretation The cost to the City for encouraging electric vehicle recharging stations is negligible. Most likely it would be incorporated into existing incentives and concessions for project approval. As a point of information, the cost to the developer is estimated to be five thousand dollars per lot for recharging stations, including equipment & installation initial cost.

Total Negligible.

11. Price on-street parking in high-traffic areas in order to alleviate congestion, increase motorist convenience, reduce VMT, and create a revenue stream for commercial areas of the City

Data Source City Staff and PMC

Interpretation Costs to the City would include Staff time for writing and coordinating a parking pricing plan and costs for purchasing and installing the parking kiosks. Solar-powered, networked parking kiosks that accept bills, coins, and credit cards cost approximately \$11,000 each.⁶ There are approximately 170 non-handicapped parking spots along San Carlos Avenue and Laurel Street, necessitating approximately 19 parking kiosks (9 spots per kiosk). It is therefore estimated that the total cost for preparing a parking plan and installing the kiosks would be \$230,000.

Total \$230,000

Solid Waste

1. Support Zero Waste.

1.1. For municipal operations, establish a zero waste policy.

Data Source City Staff

Interpretation A zero waste policy would require approximately 200 hours of Staff time per year for training, purchasing of receptacles, and

⁶ \$11,000 per parking kiosk estimate obtained from several sources and companies, including the City of Dallas, TX (<http://www.dallascityhall.com/pdf/pio/WestEndParking.pdf>) and Baltimore (<http://articles.lancasteronline.com/local/4/232277>.)

coordinating with handlers, or approximately \$10,000 to \$20,000 depending on pay grade. City staff members are already spending this amount of time on coordination of recycling efforts, but this time would be shifted to the new zero waste policy and accompanying trainings. The startup of the program may require some additional time the first year.

Total Negligible

2. Increase recycling and composting at public events.

2.1. Require recycling and composting as a condition of approval for public events.

Data Source City Staff and PMC

Interpretation An additional two hours of staff time (\$100-\$200) per public event contract would be necessary under this reduction measure. This includes informing and monitoring recycling and composting opportunities at the applicants' events. The costs of recycling and composting would be incurred by the event holder, not the City. There would likely be a one-time start up cost for staff training, but since a similar practice is already in place, the new training would be minimal.

According to City records, approximately 25 public events occur annually in the City of San Carlos. Therefore, an estimated \$2,500 - \$5,000 is foreseeable to implement this measure.

Total Negligible

3. Establish an environmentally preferable purchasing program (EPP) for government operations.

Data Source City Staff and PMC

Interpretation City staff estimates that the initial cost for preparing an Environmentally Preferable Purchasing ordinance would be approximately \$5,000. There may be additional costs at the onset for quality control of new and unfamiliar products and their providers. There is also potential for higher material costs, although research is showing that the costs of environmentally preferable products are comparable with traditional products. There are also significant cost-saving opportunities in the future for EPPs. Entering into a regional purchasing cooperative may reduce costs by allowing neighboring cities to buy sustainable products in bulk. Organizations like the State Regional Purchasing Cooperatives and Joint Venture Silicon Valley may be able to facilitate or aid in a program such as this.

Total \$5,000

4. Increase overall waste diversion by at least 1% per year.

4.1. Increase required Construction and Demolition (C&D) diversion rate beyond the ~~60%~~ currently required.

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Data Source City Staff, PMC and NorCal Waste Contract

Interpretation The City of San Carlos is already well on its way to preparing for increased waste diversion. A consultant has been hired to address the C&D waste diversion ordinance and prepare a more stringent program. This extra effort for C&D recycling is currently funded

through garbage rates, but it may be funded in the future through C&D permit fee add-ons. The first year of counter work associated with the new C&D requirements is expected to cost approximately \$70,000, however this cost would be born by the applicants.

Total Negligible

4.2. Provide for expanded recycling outreach and services to multi-family residential buildings, including renter-occupied apartment buildings.

Data Source NorCal Waste Contract

Interpretation Expanded outreach to the residents of San Carlos is underway concerning recycling and composting services. In October 2008, City Council directed Staff to begin negotiations with NorCal Waste Systems of San Mateo County to become the new Solid Waste, Recycling and Organics Collection firm in San Carlos starting on January 1, 2011. As part the agreement, NorCal Waste will be providing a six month recycle publicity program to advertise their new programs. They will also do ongoing outreach and public education as part of their contract with the City. As a result, the initial cost to the City is expected to be negligible.

Total Negligible

4.3. Mandate commercial recycling

Data Source City Staff, PMC, and NorCal Waste Contract

Interpretation Costs to mandate commercial recycling would be minimal. The 2011 service contract with NorCal Waste is assumed to have capacity for increased commercial recycling.

Total Negligible