
Draft Trinidad Climate Action Plan

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Max Broderick, Meredith de
Roos, Janelle Lotzgesell, Ben
Madeo and Peter Rowland

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Executive Summary

This document provides a framework for the creation of a Climate Action Plan (CAP) for the City of Trinidad, California. It provides justification of the CAP process through international, state, and local policies based on curbing emissions of anthropogenic greenhouse gasses. An increasing amount of evidence supporting the theory of “climate change” and all of its implications is triggering multiple responses through activities and policies, such as the Climate Action Plan. This document is meant to serve as a template or framework to assist Trinidad in adopting its own Climate Action Plan and implementation measures. The overarching goal of this document is to provide support for greenhouse gas reducing measures by providing supporting policies and assembly bills which focus on the reduction of gasses, either indirectly such as through waste diversion or livability, or directly through energy efficiency and reduced vehicle miles traveled. The organization of the document is meant to provide a comprehensive framework and justification for the creation of a Climate Action Plan in Trinidad, as well as a cognitive mapping process for the reader. This Climate Action Plan provides tools and recommendations to increase community involvement, awareness, and implementation of emission reduction measures.

I. INTRODUCTION

1.1 Introduction to Trinidad Climate Action Plan

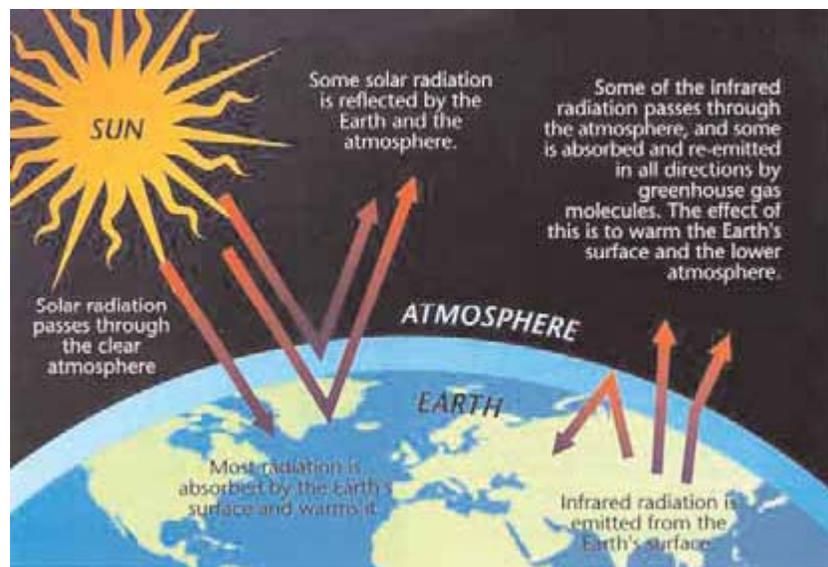
California is the fifteenth largest greenhouse gases emitter in the world. In an effort to help curb global warming, California passed new state laws regulating greenhouse gases in 2006 (Humboldt County General Plan, 2010). The Global Warming Solutions Act, Assembly Bill 32, require the state to implement a series of actions to reduce California’s greenhouse gas emissions to 1990 levels by 2020. Through AB 32, the statewide cap for 2020 greenhouse gases emissions

was set at 427 million metric tons of carbon dioxide equivalents. To reduce greenhouse gases emissions to this level a 30% reduction of business-as-usual emission levels was projected for 2020. That means reducing our annual emissions of 14 tons of carbon dioxide for every person in California down to about 10 tons per person by 2020 (Humboldt General Plan, 2010) This Climate Action Plan was created to identify opportunities and actions to reduce greenhouse gas emissions in the city of Trinidad.

1.2 Effects and Impacts of Climate Change

The Earth's atmosphere is composed of a number of gases that act like the glass panes of a greenhouse, retaining heat to keep the temperature of the Earth stable and hospitable for life. Carbon dioxide (CO₂) is the most abundant of these gases. Other contributing gases include methane (CH₄), nitrous oxide (NO₂), ozone (O₃) and halocarbons Earth has an average temperature of 60°F and without the natural warming effect of these gases the average surface temperature of the Earth would be around 14°F.

Figure 1: The Greenhouse Effect



Source: US Environmental Protection Agency, 2005

However, recently elevated concentrations of these gases in the atmosphere have had a de-stabilizing effect on the global climate, fueling the phenomenon commonly referred to as global warming. The global average surface temperature increased during the 20th century by about 1°F. The 2000s were the warmest decade on record according to analysis by NASA's Goddard Institute for Space Studies (Voiland, 2010). The Earth's climate has a number of feedback loops and tipping points that could accelerate global warming. For example, as CO₂ emissions have increased in recent human history, the oceans have been absorbing a significant portion of these gases, but as the oceans become more permeated with CO₂, scientists anticipate they will reach a saturation point, after which each ton of anthropogenically emitted CO₂ will have a more substantial impact. Another example of this compounding can be found in the polar ice caps. Ice is highly reflective and acts effectively like a giant mirror, reflecting the sun's rays back into space. As the planet warms and some of this ice melts away, a darker land or ocean surface is revealed. This darker surface tends to absorb more heat, accelerating the speed at which the planet warms with each ton of greenhouse gas emitted (IPCC, 2001).

1.2.1 Global Impacts

In addition to causing an increase in average global surface temperature, rising levels of greenhouse gases have a destabilizing effect on a number of different micro-climates, conditions and systems. According to the Intergovernmental Panel on Climate Change, surface temperatures are on course to increase by 2.5-10.5°F by the year 2100, with regions in the northern parts of North America and Asia heating by 40% above the mean increase. The increase in the temperature of the oceans is projected to accelerate the water cycle, thereby increasing the severity and rate of both storms and drought. These effects --along with decreased snow pack-- could disrupt ecosystems, agricultural systems and water supplies.

The current estimate for sea level rise is approximately 1.4 meters. This coastal encroachment on such a large scale could lead to not only significant environmental and ecosystem disturbances, but also major population displacement and economic disruption (IPCC, 2001).

1.2.2 Local Impacts

Over the past century, sea level has risen nearly eight inches along the California coast. Large sections of the Pacific coast are not vulnerable to flooding, like Trinidad, but are highly susceptible to erosion. Some studies estimate that a 1.4 meter sea-level rise will accelerate

erosion, resulting in a loss of 41 square miles (over 26,000 acres) of California's coast by 2100 (Hegerber et al, 2009).

1.3 Action being taken on Climate Change

1.3.1 International Actions

Several global efforts to address climate change have been made, beginning with the United Nations Framework Convention on Climate Change (UNFCCC) which is an international treaty created to reduce global warming and support institutions involved in the climate change process. This organization facilitated the Kyoto Protocol, which sets legally binding Greenhouse gas reduction targets for 37 industrialized countries. The Kyoto Protocol requires countries to primarily meet their target through national measures, but has also created three market based mechanisms to help them meet their targets. The Carbon Emission Trading scheme is the most

notable mechanism and allows countries to sell 'excess carbon credits' which are in excess of their assigned amount units.

A second mechanism is the Clean Development Mechanism (CDM), in which countries with an emission limitation under the Protocol can implement emission reduction projects in developing countries for a carbon credit. The purpose of this mechanism is to "stimulate sustainable development...while giving industrialized countries some flexibility in how they meet their emission limitation targets." (UNFCCC, 2010) One such CDM may include a rural electrification project through renewable energy sources within a developing country.

The final mechanism is the Joint Implementation (JI) mechanism which is similar to the CDMs. This allows protocol countries to invest in 'sharing' the responsibility with a third party, who in turn receives the benefits of economic investment and technological advancement. Each of these mechanisms, along with the entire Kyoto Protocol, are monitored by registry, reporting, and compliance systems created by the UNFCCC secretariat, and the collaboration of governments and national registries.

A separate climate change expert agency is the International Panel on Climate Change (IPCC) which was established by the United Nations Environmental Programme (UNEP) and the World Meteorological Organization (WMO) to provide scientific expertise on climate change as well as assess environmental and socio-economic consequences (IPCC, 2010). The IPCC is an intergovernmental scientific body created to provide scientific and technical data relevant to climate change to decision makers such as the Kyoto Protocol signers. As stated by the IPCC website, it is unique because it "is therefore policy-relevant yet policy-neutral, and never policy-prescriptive (IPCC)"

These international arrangements and mechanisms of greenhouse gas controls provide a framework for reducing greenhouse gas emissions at a global level. While the Trinidad CAP is a very locally focused document, it provides important policies and recommendations which can be done at the local level to reduce global levels of greenhouse gases.

II. EXISTING MEASURES AND POLICIES BY SECTOR

2.1 Transportation

There are a number of existing measures and policies that influence transportation in an effort to reduce its emission of greenhouse gases. It is important to address the existing measures and policies for they direct the manner in which local actions are taken. The already existing policies can be used to focus the City of Trinidad objective of reducing the greenhouse gases produced by transportation.

California's Existing Measures and Policies

- California's draft Climate Change Scoping Plan (June 2008) recommends local governments increase the carbon efficiency of government fleets and local transportation planning processes to increase the use of public transit, carpooling, biking, and walking. Population growth can be planned and distributed in a carbon-efficient way.
- AB 1493 Clean Car Standards by reinforcing California's commitment toward a nationwide program to reduce new passenger vehicle greenhouse gases from 2012 through 2016. The amendments will also prepare California to harmonize its rules with the federal rules for passenger vehicles.

Humboldt County's Existing Measure and Policies

- Humboldt General Plan E-P4. Revitalization and Reinvestment in Existing Resources by supporting the revitalization and infilling of Urban Development Areas to reduce long-term vehicle miles traveled as an energy conservation strategy.
- Humboldt General Plan AQ-P1. Reduce Length and Frequency of Vehicle Trips by reducing the length and frequency of vehicle trips through land use and transportation policies by encouraging mixed-use development, compact development patterns in areas served by public transit, and alternative modes of travel.
- Humboldt General Plan AQ-P2. Reduce Localized Concentrated Air Pollution. Reduce or minimize the creation of "hot spots" or localized places of concentrated automobile emissions.
- Humboldt General Plan E-G2. Increase Energy Efficiency and Conservation. Decrease energy consumption through increased energy conservation and efficiency in building, transportation, business, industry, government, water and waste management. (Humboldt General Plan)

Trinidad's Existing Measures and Policies

- Trinidad Circulation Element-22. The City shall provide safe and convenient pedestrian access to all areas of the City through routine maintenance and repair of sidewalks on the main arterial routes, so that pedestrians are encouraged to park vehicles in a centralized area and walk.
- Trinidad Circulation Element-19. The City should attempt to work with the Humboldt Transit Authority to encourage a more direct route into Eureka, with fewer stops in the McKinleyville area.

- Trinidad Recreation Element-9. The City Council shall develop ordinances and policies to ensure unobstructed public access to all Trinidad Trails. Vehicles, vegetation, or other obstructions shall not be allowed to block or hinder pedestrian access to trails.
- Trinidad Recreation Element-5. The public shall have unimpaired access to trails. A formal pedestrian trail system shall be marked out around Trinidad. The system shall include the beaches, the existing Trinidad Beach State Park trails, and ascend the bluff at Galindo Street to provide convenient pedestrian access from Edwards Street to the harbor, the Old Wagon Road from Wagner Street to Parker Creek Trail, the private road extending from Scenic Drive along the east branch of Parker Creek to the beach, and the beach extending southeasterly from Parker Creek to the City limits. (Refer to the Circulation Plan map for delineation of the trail system.) The system shall be advertised in visitor information and mapped at the visitor information center. Trail connections to the State Park should also be identified.
- Trinidad Circulation Element-4. Both Sides of Main Street and Trinity Street shall have continuous Sidewalks. Edwards Street should have a sidewalk on at least one side of the street, providing linkage to pedestrian trails.

2.2 Energy Efficiency

Policies to improve energy efficiency can reduce oil imports, improve the reliability of the U.S. electric grid, save consumers money, reduce air pollution, create jobs, and reduce prices (ACEEE, 2010). California has proved in past energy crisis's that it has the ability to reduce energy consumption, and in the face of climate change it should be able to again.

California's Existing Measures and Policies

- California's Appliance Efficiency Regulations California Code of Regulations, Title 20, sections 1601-1608: California was the first state in the country to adopt appliance and equipment efficiency standards, enacting these regulations in the late 70's. California's 2006 Appliance Efficiency Regulations became effective on December 30, 2005, replacing all previous versions of the regulations. Presently, California has standards for more than a dozen products that are not covered by federal standards.

2.3 Renewable Energy Policy

The International Energy Agency estimates that nearly 50% of global electricity supplies will need to come from renewable energy sources in order to halve carbon dioxide emissions by 2050 and minimize significant, irreversible climate change impacts (IEA, 2008) . The largest driver of today's rapid renewable energy growth is policy. Growth of renewables is strongest where and when the policy-makers have established favorable policy frameworks.

California's Existing Measures and Policies

- Senate Bill 1078, 2002 establishes a Renewable Portfolio Standard requiring electricity providers to increase purchases of renewable energy resources by 1% per year until they have attained a portfolio of 20% renewable resources.

Humboldt County's Existing Measures and Policies

- Humboldt County General Plan E-P3: Local Management and Ownership of Energy Supply. The County shall support projects consistent with this Plan that increase local management and ownership of energy supply and decrease expenditures for imported energy.

2.4 Waste Management

Waste management processes contribute a large amount of greenhouse gases through transportation of waste, combustion, and landfill. In order to combat the detrimental effects of solid waste, a plethora of policies have been enacted nationally and locally. While some of these laws are very specific and narrow in scope, they are an effective way of breaking the problem down to a manageable level. Setting and meeting objectives like these is necessary for reaching the goal of reducing greenhouse gas emissions within the waste sector. The City of Trinidad has several existing waste management programs which focus on waste diversion as a means of waste reduction. Waste diversions include recycling, composting, and other methods of diverting materials from landfills. *To see a full list of programs visit:*

<http://www.calrecycle.ca.gov/LGCentral/Tools/mars/jurdrsta.asp>)

Existing Federal Measures and Policies

- Resource Conservation and Recovery Act of 1976 (RCRA) is the primary national law which governs the disposal of solid and hazardous waste with four primary goals: to protect human health and the environment from the potential hazards of waste disposal, to conserve energy and natural resources, to reduce the amount of waste generated and to ensure the environmentally-sound management of waste (EPA, History of RCRA).
- Pollution Prevention Act of 1990: This act created a national policy that aims to reduce or prevent pollution wherever feasible. Focusing on source reduction pollution such as industrial emissions, this policy applies mostly to industrial activities, though not only to this sector. Federal agencies such as the EPA and the Toxic Release Inventory are responsible for monitoring of pollution levels.

California's Existing Measures and Policies

- California Waste Management Act of 1989 (CWMA): passed as AB 939 and established the California Integrated Waste Management Board (CIWMB) whose purpose is to oversee disposal reporting and planning of facilities and programs. Additionally, it mandates jurisdictional reduction of waste disposal as well as preparation of a Countywide Integrated Waste Management Plan (CIWMP). These CIWMPs must include elements that address siting, source reduction, recycling, non-disposal facilities and household hazardous waste.
- Pollution Prevention Act of 1990 was created as a national policy by United States Code Title 42. It aims to reduce or prevent pollution wherever feasible. Focusing on source reduction pollution such as industrial emissions, this policy applies mostly to industrial activities, though not only to this sector. Federal agencies such as the EPA and the Toxic Release Inventory are responsible for monitoring of pollution levels.
- Environmentally Preferable Purchasing Law: passed in 2002 as California AB 4981; this law involves the Department of General Services, the California Environmental Protection Agency, members of the public, of industry and public health and environmental organizations in providing state agencies with information and assistance regarding environmentally friendly purchasing.
- California Green Building Standards Code: The nation's first mandatory state-wide standards code to fight Climate Change. Requires every new building in California to meet certain requirements in energy and water efficiency. This code incorporates several aspects of 'green building' including requiring the diversion of fifty-percent of construction materials from landfills, twenty-percent reduction in indoor water use, among other required and voluntary measures.

- AB 1972: California state-wide ordinance of 2009 which requires that all biodegradable and compostable bags meet standards from the American Society for Testing and Materials Standard Specifications. This is to prevent false claims of biodegradable bags.
- AB 3035: California state-wide ordinance of 2009 requires a certain amount of recycled materials in expanded polystyrene (EPS), loose packaging peanuts, and will ultimately require EPS materials to be made only of recycled materials.

Trinidad's Existing Measures and Policies

- City of Trinidad Waste Diversion through Composting: Residential self-haul of greenwaste; Commercial self-haul of greenwaste; School composting programs; Backyard and On-Site Composting/Mulching.
- City of Trinidad Waste Diversion through Source Reduction: Business waste reduction programs and School source reduction programs.
- City of Trinidad Waste Diversion through Recycling: Government recycling programs; school recycling programs; Residential recycling drop off; Residential buy-back programs; Commercial On-site pickup; Commercial Self-Haul; Special Collection (Seasonal) program.

2.5 Stewardship and Livability

In the past polices for community participation for the reduction of greenhouse gases has been lacking. Some possible reasons include, Trinidad's out dated General Plan which during the time of its completion very little was known about climate change. Humboldt Countries General Plan is a little more recent. However it also lacks community involvement in its recommended

policies. Both documents do recognize the importance the importance of energy conservation with Humboldt's being a little stronger.

Humboldt County's Existing Measures and Policies

- E-IM6. Energy-conserving Landscaping: Consider the use of natural and drought-resistant planting materials and efficient irrigation systems and the siting of trees to reduce energy demand in the preparation of the County landscaping ordinance.
- AQ-P11. Forest Sequestration and Biomass Energy: Provide incentives for increased carbon sequestration on forestlands and encourage the use of forest biomass for sustainable energy generation.
- AQ-P15. Preservation and Replacement of On-site Trees: Projects requiring discretionary review should preserve large trees where possible and mitigate for carbon storage losses attributable to significant removal of trees

Trinidad's Existing Measures and Policies

- Trinidad Housing Element Draft Energy Conservation 8. Rehabilitated units will be encouraged to include retrofit weatherization improvements such as ceiling and floor insulation, caulking and weather stripping.
- Trinidad Housing Element Draft Energy Conservation 9. Energy conservation information for existing housing will be disseminated by publicizing available weatherization programs.
- Updated Circulation Element Circ- 21 The City shall provide for pedestrian and bicycle amenities such as benches and attractive, secure and accessible bike parking, where

feasible. This may include seeking grant funding, volunteer efforts, or a requirement for private development proposals.

- Encourage the use of sustainable forms of transport by providing bus facilities in the major commercial and mixed-use development areas. Location's could include the Harbor and along Trinity Street, outside town hall.

III. EMISSIONS INVENTORY (PLACEHOLDER)

3.1 Methodology & Reasoning

3.1.1 Inventory Sources and Data Collection Process

3.2 Inventory Results

3.2.1 Municipal Operations Emissions Inventory

IV. GREENHOUSE GAS EMISSIONS REDUCTION TARGET (PLACEHOLDER)

4.1 Transportation Emissions

4.2 Energy Related Emissions

V. PROPOSED MEASURES AND POLICIES

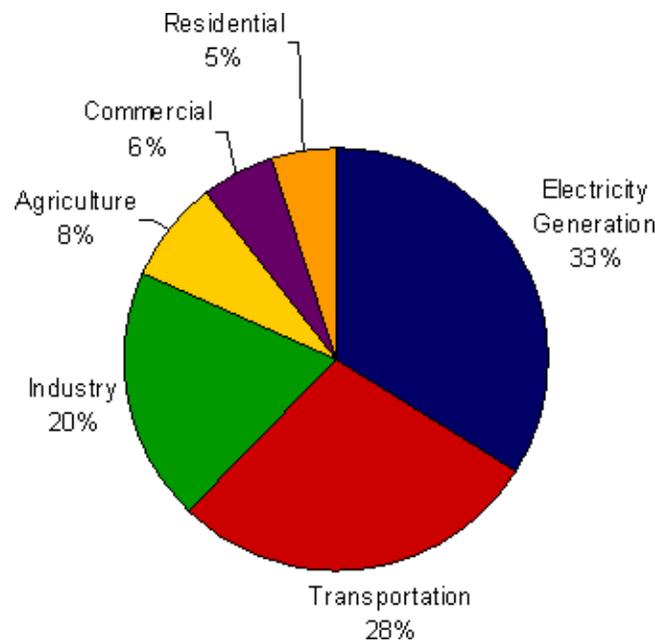
5.1 Transportation:

There are several different modes of transportation. The modes that are focused on in Trinidad's CAP plan are automobiles, bicycles, buses, and walking and the creation of the networks needed to support them. Transportation infrastructure plays an important role in the choices people have regarding what mode of transportation to use. Reducing individuals' reliance on passenger cars through improved transportation networks and education will have a

significant effect on greenhouse gas reduction within the transportation sector for the City of Trinidad is a bedroom community.

Since 1990, transportation has been one of the fastest-growing sources of greenhouse gases emissions in the U.S. The fuel consumed in international travel by aircraft and marine sources is not counted in national greenhouse gas inventories. Transportation is the largest end-use sector emitting the most prevalent greenhouse gas, CO₂. Nearly 97 percent of transportation greenhouse gas emissions came through direct combustion of fossil fuels, with the remaining 3 percent of emission coming from electricity used for trains and HFCs emitted from vehicle air conditioners and refrigerated transport. Transportation emits more greenhouse gases than any sector other than electricity generation. (U.S. Department of Transportation, 2010).

Figure 2: Percentage of U.S. Greenhouse Gas Emissions

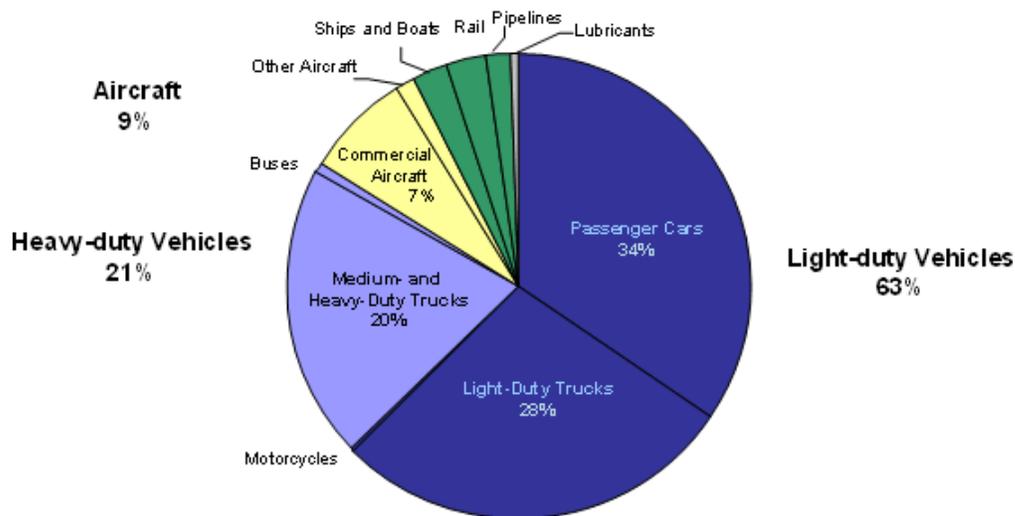


Source: U.S. Department of Transportation, 2006

Estimates of greenhouse gas emissions do not include emissions released due to the extraction and refining of fuel and the manufacture of vehicles. This is also a significant source

of domestic and international greenhouse gas emissions. International trade has been growing rapidly, thus increasing the role of transportation as a source of global emissions. Therefore, Transportation sector is even larger is even larger than reported. Since 1990, transportation emissions represent 48 percent of the increase in total U.S. greenhouse gases emissions in which passenger cars make up 36 percent of the increase (U.S. Department of Transportation, 2010).

Figure 3: U.S. Transportation Greenhouse Gas Emissions by Source
Other Non-Road
7%



Source: U.S. Department of Transportation, 2006

The transportation sector in Trinidad, which is made up primarily of passenger cars, may be accountable for more than half of the total CO₂ emissions in Trinidad (Martinez, 2009). The 2000 Census shows that 66.5% (206 people) of Trinidad drive alone to work (Martinez, 2009). One person in Trinidad drives an estimated average of 39.5 miles per day and an estimate of 14,417.5 miles a year (Martinez, 2009). The reduction of the uses of passenger cars will significantly reduce the amount of green house gases emitted by the City of Trinidad.

5.1.2 Emission Reductions

The City of Trinidad must have a comprehensive set of actions that can be implemented to reduce GHGs emitted by transportation. This section will discuss actions to be put in place to reduce GHGs emission while reducing air pollution. Reducing emissions produced by transportation is problematic for the reason that transportation networks are largely a regional issue, which requires coordination between different levels of government. A reduction in emission can be achieved by an increase in fuel efficiency standards, which can only be implemented at the state or federal level. Therefore, reducing the number of vehicle trips will be one of the main approaches to reducing emission from the transportation sector through the encouragement of using alternative modes of transportation by the residents of Trinidad.

Increasing the use of public transportation by increase the ridership of public transportation within Trinidad, while improving the mobility of residents, to decrease traffic congestion and improve air quality. Public transportation is an essential alternative to driving. To increase the ridership there needs to be an array of improvements to the current system such as: more routes, more stops, and increased dependability and access of public transportation. Increase bus services. Provide bus facilities in the major commercial and mixed-use development areas including the Harbor and along Trinity Street to encourage ridership. Increase the number of stops to these areas at peak times of the day. Expand bus service. Work with the City of Eureka and Arcata to increase the frequency of trips between the towns to allow more individuals to utilize the service. Inform public on bus services. Ensure information on bus times and services are provided at bus stops. Disperse pamphlets locally to encourage the use of the

bus system. Create a tourist shuttle system with a fixed route to the Trinidad Harbor for visitors. This would reduce individual vehicle use and would be easy for visitors to use.

To reduce average miles traveled, per trip, by residents of Trinidad. Through the planning for transportation networks one of the goals is to build networks that reduce the amount of miles of road that need to be traveled between destinations. Ridesharing is a substitute to driving alone and reduces overall miles driven. Trinidad can coordinate with the surrounding areas to in an effort to efficiently build roads to reduce trip lengths. The use of Smart Growth urban design and land use mixing. By creation of a Car Pooling Program for the residents of Trinidad to reduce individual miles traveled to work. Implement a School Ridesharing Program to reduce the number of cars being used to transport children to school. This measure could be effective for parents who do not feel comfortable allowing their children to bike or walk to school. Through promoting ridesharing through outreach and education will enable the residents of Trinidad to decrease their use of individual transport.

Increasing the use of alternative transportation will lessen the dependence of using individual owned motorized vehicles for transportation, while promoting the health benefits of walking and biking that emit no green house gases. Improved infrastructure for bike lanes and create disincentives for driving. Such measures can include charging for parking which would encourage alternative forms of transportation. Through identify opportunities, and possible support, to create a system of trails for non-motorized vehicles in and around Trinidad. This would facilitate walking and bicycling. Improve existing and future infrastructure by widening sidewalks and bike lanes, which would improve safety and encourage use. Require bike lanes for all new or improved streets. Provide more bike locks for increased convenience and to encourage the use of bicycles. Encourage the use of alternative transportation to residents and visitors

through outreach, education, and interpretive signs identifying trails. Explore possibilities of creating a community operated bicycle maintenance shop to encourage non-motorized transportation and community health. Charge a fee for public parking to encourage individuals to use alternative transportation.

5.1.3 Funding Sources

To implement the actions proposed will need adequate funding. One way to raise money to implement these actions would be by charging money for public parking. A number of grants are also available to assist in the funding of these actions.

Community Action for Renewed Environment (CARE) is a competitive grant program available through the Environment Protection Agency. It provides financial and technical assistance by offering an innovative way for a community to organize and take action to reduce toxic pollution in its local environment.

The Transportation Planning grant is available through the community transportation association of America. Provide grants to improve mobility and accessibility, increase safety, to enhance and protect the environment.

The Federal Highway Administration has a Recreational Trail Grant Program which is meant to provide funds for developing and maintaining recreational trails and trail-related facilities for both non-motorized and motorized recreational trail uses.

5.2 Energy Efficiency Measures

While regulating energy production at the source is a critical component of climate change mitigation, it is also important to educate the end users of the resource, the consumers. Encouraging energy efficiency in homes and businesses is imperative to the success of integrated

climate change policy. Increasing energy efficiency throughout the community has giant potential to both reduce greenhouse gas emissions and save people money. There are many resources that exist to assist people and local governments improve efficiency. ENERGY STAR, for example, offers local governments energy efficient products and tools for improving energy management. The California Energy Commission also maintains a database of efficient appliances, which can be used by the federal government, contractors, building officials, utilities and others. Trinidad is a small community without large industries, and residential energy use is a major contributor to greenhouse gas emissions. Residential energy efficiency retrofits are relatively inexpensive compared to large industrial retrofits, and they could significantly reduce Trinidad's greenhouse gas emissions.

5.2.2 Emissions Reductions

Trinidad can reduce its emissions in simple ways like replacing incandescent lighting with fluorescent. Energy efficient lighting requires at least 65 percent less energy than incandescent lighting, can reduce emissions by 450 pounds over its lifetime, and last up to 10 times longer. Residents can also save significant amounts of money and energy by installing efficient light bulbs, on average a more efficient light bulb can save up to \$50 in electricity costs annually. Lighting isn't the only way Trinidad residents can improve efficiency. The best appliances today consume about half as much energy and water as average 10-year-old products. Electrolux, a European appliance corporation, has estimates that some 188 million appliances used in European households are more than 10 years old and thus inefficient and energy thirsty. Replacing these appliances with new energy efficient products could cut CO2 emissions by as much as 18 million tons/year (Electrolux, 2010). These estimates are for Europe, but demonstrate how energy efficiency can have significant impacts.

To help Trinidad reach its goal of reducing greenhouse gas emissions, there are several simple actions which could have a significant impact on energy use within the community. To reduce greenhouse gas emissions from energy consumption, the city of Trinidad can set an emission reduction standard. Similar to other emission reduction goals, this would provide a target for the reduction in energy usage within the city of Trinidad. To meet the reduction goals energy retrofits on existing buildings, and energy efficiency standards for new buildings can be implemented and encouraged by the city. Community outreach workshops and engagement activities should also be facilitated through the city.

5.2.3 Funding Sources

Pacific Gas and Electric, Trinidad's electricity provider, offers energy efficiency rebates to cover costs of replacing appliances, lighting, and even improving insulation residential homes. These rebates make the immediate cost of retrofitting lower, and decrease the time it takes for the improvements to pay for themselves. Also, Local governments are able to apply for loans up to \$3 million to conduct energy retrofits through the CEC's Energy Efficiency Financing Program.

5.3 Renewable Energy Measures

Renewable energy sources offer the potential for clean energy that can significantly impact greenhouse gas emissions. Trinidad will work to integrate alternative energy into the community's power scheme. The majority of primary energy used in Humboldt County is imported, with the exception of biomass energy. There are sufficient supplies of biomass from lumber mill wood to accommodate approximately 10% of the county's electricity needs. It is estimated that using local renewable resources, there is the potential to generate six times the

county's current electricity consumption (HCGP). Trinidad can reach its goal of reducing greenhouse gas emissions by utilizing local renewable energy sources.

5.3.2 Emissions Reductions

For every kilowatt of installed capacity, Photovoltaic panels can generate approximately 2,000 kilowatt hours of electricity per year. For every kilowatt of photovoltaic generated electricity, 1.03 tons of Carbon Dioxide are prevented from entering the atmosphere. Arcata's 12.1 kilowatt photovoltaic energy system on city hall, and 2.3 kilowatt marsh interpretive energy system reduce 14.03 tons of CO₂ annually (Connors, 2004). Using these methods of renewable energy, Trinidad could reach its goal of utilizing renewable energy sources to reduce greenhouse gas emissions.

Installing solar panels or photovoltaic electricity generators in Trinidad on public buildings will reduce the amount of consumed energy. Requiring implementation of these renewable energy sources on every new building will ensure reductions in greenhouse gas emissions in the future. Community outreach programs and educational workshop will also be an important component of the plan. They could inform residents of the benefits and financial assistance options available.

5.3.3 Funding Sources

The State of California offers a rebate of \$2,800 per kW, or \$2.80/Watt, for systems under 30kW, which covers about 30% of the total system cost. PG&E's Self-Generation Incentive Program (PG&E, 2010) offers a rebate of \$2,800 per kW for systems larger than 30kW. The USDA has the Rural Energy for America Program that offers grants to cover up to 25 percent of the project cost (DSIRE, 2009).

5.4 Waste Management

This section investigates methods of waste reduction and diversion that fit within the demographics and abilities of the Trinidad community. As of now, Trinidad's waste is collected and then exported outside the municipal boundary by the Humboldt Waste Management Authority. The goal of this section is to introduce community wide actions as well as individual level actions to effectively reduce climate altering side effects of poor waste management. The goals and actions are recommendations meant to provide the City of Trinidad and its inhabitants with the necessary tools to accomplish responsible waste management.

Solid waste is a major contributor to the creation of greenhouse gasses, mostly in the form of methane, nitrous oxide, and carbon monoxide (EPA, Wastes Home). Greenhouse gasses released by solid waste amount to two percent of total emissions within the United States. Different stages of the waste cycle produce greenhouse gasses through various mechanisms such as waste decomposition in landfills resulting in the creation of methane, carbon dioxide as a by-product of waste incineration, combustion of fossil fuels used to transport waste results in carbon dioxide emissions and fossil fuels used in manufacturing of new goods to replace those which have been disposed of.

Many jurisdictional districts as well as municipal areas have adopted their own Integrated Waste Management Plans, which have policies and ordinances uniquely tailored to their area, and are therefore more effective. Trinidad would be a perfect candidate to adopt an Integrated Waste Management Plan because their current waste management regime is externalized. Due to Trinidad's small population, lack of large scale economic activity, and demographic data, waste

management and reduction should focus on any commercial, governmental, or business related activity. These are the sectors responsible for most of Trinidad's solid waste.

5.4.2 Emissions Reductions

Improper management of Municipal Solid Waste (MSW) can greatly influence greenhouse gas emissions. According to the EPA, in 2008 approximately 4.5 pounds of MSW was produced *per person* each day. Measures of waste diversion or prevention are the environmentally sensitive options of management and include source reduction, recycling, and compost. When these programs aren't available, waste proceeds to be disposed of either through landfill or combustion. The following goals are meant to guide Trinidad in the appropriate management of MSW.

The creation of an Integrated Waste Management Program (IWMP) for Trinidad can effectively address ineffective and inefficient waste problems for Trinidad. Using the existing framework of waste service providers, and encouraging collaboration and facilitation amongst different providers in the Humboldt area can help create the IWMP. Furthermore, the United Nations Environmental Program titled "Developing Integrated Solid Waste Management Plans, Training Manual," provides inside tips as to how to create the IWMP. This document is available at: http://www.unep.or.jp/ietc/Publications/spc/ISWMPlan_Vol2.pdf

A second measure which can be taken to reduce greenhouse gasses caused by waste is a community wide composting program. The city could provide incentives to businesses as well as composting bins, which would be incorporated into the existing waste service provisions. The creation of a local facility for composting is a great way to prevent greenhouse gas emissions

associated with transporting waste from entering the atmosphere. Finally, training workshops and educational programs which will explain composting techniques and benefits will be provided to further encourage community involvement.

Developing an effective and feasible Waste Reduction Ordinance for the city of Trinidad that limits or bans specified carbon-intensive consumer goods can cut down on greenhouse gas emission from solid waste. A preliminary feasibility study can be conducted to determine whether or not a Waste Reduction Ordinance is good for the city of Trinidad. Identification of carbon-intensive goods to be banned or limited within the city should be compiled.

Developing an outreach program to assist developers to comply with the 2010 California Green Building Standards Code will greatly reduce waste emissions from the development industry. By catering certain recycling programs to the development industry, developers will be more likely to comply with the waste reduction measures highlighted in the California Green Building Standards Code. Considering the development of a community 'materials exchange' system for leftover reusable materials to be re-distributed among developers will greatly reduce the amount of construction waste within Trinidad.

5.5.3 Funding

The Solid Waste Management Grant Program from the Rural Development Services department of United States Department of Agriculture provides federal funding for a variety of waste management programs. The objective of this grant program is to reduce or eliminate pollution of water resources in rural areas and improve planning and management of solid waste sites in rural areas. Trinidad may be applicable for a grant from this source.

Green School Grants are available through the Bureau of Waste Management and provide grant money for project related to solid waste planning, solid waste plan implementation,

household hazardous waste collection and disposal, agricultural pesticide collection and disposal, and small business waste collection and disposal. The Bureau of Waste Management provides a plethora of other grants related to waste management.

Solid Waste Assistance Grants are awarded by the Environmental Protection Agency. These grants are meant to provide assistance for projects addressing solid waste reduction and management and are awarded to applicants aiming to establish recycling and solid waste reduction projects that have a significant national environmental impact or that address a significant environmental issue.

Local funding can be generated through programs such as pay-as-you-throw and improving the economic profile of recycling. Pay-as-you-through programs work by charging residents for the collection of municipal solid waste based on the amount they throw away. Additionally, effective consideration of collection and processing costs associated with recycling could result in significant effects to the local economic profile.

5.5. Stewardship and Livability

The actions proposed in this section are meant to build on existing outreach, education, livability, and empowerment efforts in the community. It is the goal of this section to contribute to building a consensus of citizens and businesses to engage in achieving a reduction in greenhouse gas emissions through increased stewardship in sustainability and green practices.

Stewardship is an ethic that embodies cooperative planning and management of environmental resources by those whose actions affect the environment in the interest of long-term sustainability. The community of Trinidad will need to be stewards for the success of this Climate Action Plan. Residents of Trinidad already has a strong sense of community and takes

pride in being the smallest incorporated city in California. Through the analysis of multiple climate action plans, it's been noted that cities across the country have discovered the importance of involving the community in greenhouse gas reductions. Gaining the support of the community will lead to more understanding of new policies and foster a sense of pride in stewardship practices. In turn, this will encourage the City of Trinidad and its citizens to become better stewards of the land.

Trinidad is already a very livable place. It has a wide range of housing opportunities and offers pedestrian friendly streets. Trinidad has great access to recreation such as hiking, surfing, beachcombing, fishing and much more. This plan only recommends further enhancements to make Trinidad even more livable while reducing its carbon footprint. Ultimately, the goal of Trinidad's Climate Action Plan is to build on existing planning and implementation efforts and integrate them into the broader task of reducing the community's impact on climate change. There are already numerous policies in affect within Trinidad's General Plan which encourage better sustainable living, these include:

5.5.2 Urban forestry

Trees are important and play many roles in a community. When urban forests are healthy, they provide communities with many valuable services that can be measured in dollar amounts. Trees have value for storm water management by slowing runoff and reducing peak flows. Trees can reduce the heat island effect, enhance the aesthetics of neighborhoods, increase property values but most importantly for this Plan, trees can sequester carbon and reduce emission associated with household cooling/heating. Planting more trees in Trinidad can help offset emission created by Trinidad and its residents. It has also been found that trees reduce building energy use through cooling and shading in summer. However, emissions reductions associated

with carbon sequestration are relatively low. Sequestration from trees can range from 35 pounds CO₂e/year for small, slow-growing trees to 600 pounds CO₂e/year for larger trees growing at their maximum rate. When compared to the annual greenhouse gas emissions from one passenger vehicle at about 8,000 lbs CO₂e/year (3.6 metric tons CO₂e/year), it becomes clear that planting trees will make a much small contribution to greenhouse gas reductions. However, carbon sequestration is important because coupled with effective education, outreach, communication and the rest of this plan, it can help raise awareness about climate change science and encourage individuals to reduce their own ecological footprint. Urban forestry has a high cost. However, there are multiple creative ways to address the cost of urban forestry. The first method is for Trinidad to carry the burden of all costs. Other ways include passing the monetary burden to contractors as a form of mitigation for building within city limits. A third method links back to stewardship and have community involvement days or have schools out planting trees in designated locations.

The goal for Urban Forestry is to create a carbon sequestering environment, while improving the beauty of the area within Trinidad's Cities limits. There are seven actions that will lead up to the completion of this goal. The first action is to locate strategic places where trees can be planted. This can be done with GIS and onsite surveys. Following the locations the next step will be to initiate the planting of native trees that are streetscape friendly and are acclimated to the vicinity. The new streetscapes will be functional, safe, and visually appealing. Not only should trees act as landscaped medians, parkways, public art, and other amenities should be included in the streetscape. Street trees should be used in formal architectural fashion to reinforce, define, and connect the spaces and corridors created by buildings and other features along a street. An important action is the development an education campaign to raise awareness

among private property owners about the benefits of trees and the importance of selecting appropriate trees for planting. In order to implement the actions above it is necessary to seek out cost effective ways to forest Trinidad. As well as develop a current Trinidad Forestry Management Guide, which will better define polices and management goals of Trinidad's trees and shrubs.

5.5.3 Community Involvement

This Climate Action Plan will not be able to work to its full potential if the community of Trinidad is not involved, as they account for the majority of greenhouse gas emissions. A big piece of the climate protection puzzle lays within Trinidad's citizens or more precisely, the gas pedals, light switches and thermostats of individuals. To foster and build community involvement, Trinidad should support community wide public engagement campaigns to educate, inspire, and offer cost-effective, healthy, and easy solutions for energy efficiency. Trinidad should connect individuals and organizations to education, tools and resources, and celebrate positive changes and successes. Once again, an involved community is the key to successful Climate Action Plan. The Climate Action Plan Action Committee (CAPAC) will explore a range of approaches to community involvement in climate protection, including public information and outreach campaigns; incentive-based strategies; and, where appropriate, regulatory measures.

The goal for community involvement is to instill a sense of stewardship into Trinidad's citizens. Citizens should feel a personal responsibility for increasing livability and an increased appreciation in the community in which they live.

Actions that will lead to the completion of the goal are to set up workshops and events that

train and inform people about steps they can take to reduce greenhouse gas emissions. One way to inform Trinidad's citizens is to create a website that serves as one of the City's outreach tools. The site should contain areas dedicated to green building, all programs related to the climate action plan, and information about local green jobs and training. Other actions include the launching of a series of radio ads offering tips for reducing emissions to residents and businesses, as well as any important upcoming dates for events or workshops. The promotion climate friendly purchasing will also be important. Promotion can be done through the radio ads, public service announcements, or encouraging business to specially mark any products that are considered green. The last action is to request information based upon the sustainable practices of prospective companies when requesting proposals for construction projects.

5.5.4 Climate Action Plan Committee

The creation of this plan will be a new document for the city to implement. The task to oversee the accomplishment of this plan will be large. Currently there is no department or committee within the Trinidad's government with this sort of task. Oversight of the Climate Action Plan will require people committed to its effectiveness, which could be accomplished by establishing a Climate Action Plan Committee (CAPAC) for Trinidad. The CAPAC should have clearly defined long-term vision and direction, strong support from Trinidad officials, the CAPAC should be made up of respected heads of the city and community. A yearly evaluation report should be given to the city and made easily available to the public so that all can know how Trinidad is doing in meeting recommendations of this plan and how much the city has reduced its greenhouse gas emissions.

The goal for Climate Action Plan committee Establish an implementation framework that

enables the City to more efficiently and effectively distribute information and resources to a wide range of community partners and to report progress on achieving the goals outlined in this plan. The actions that need to be taken to complete the goal are to first is to create a Climate Action Plan Advisory Committee. This committee will oversee the carrying out of this document. The CAPAC should measure accomplishments and create new goals and objectives that can be met. The committee will be the organizing body for events that encourage stewardship and inform the public about climate change and greenhouse gases.

5.5.5 Funding Sources

To reach the goal of greenhouse gas reduction it will cost a significant amount of money. Because Trinidad is the smallest city in California funding is more complicated than larger cities. However, it is still possible to find funds to implement these recommendations. For example, in November 2006, Boulder voters passed the Climate Action Plan tax. This was the nation's first “carbon tax.” The tax provides funding for programs to reduce community-wide greenhouse gas emissions. City residents and businesses are taxed on their electricity use, per kilowatt-hour. Xcel Energy, Boulder Colorado’s energy provider, collects the tax for the city through its monthly customer utility billing. Other sources of funding can be found in the form of grant money. Some possible grants include: (Find and make bulleted list). Fundraising is an option although may not be suited for larger projects or the small size of Trinidad.

The funding sources goal is to find funding that will allow Trinidad to implement the Climate Action Plan to its full potential. To complete this goal, actively searching for funding opportunities through government, grants and community will be necessary. As well as

investigating the feasibility of Trinidad's tax revenue to incorporate funding for Trinidad's Climate Action Plan.

VI. STEPS FOR IMPLEMENTATION

6.1 Transportation

This section states the actions to be taken to reduce emissions produced by the transportation sector. However, reducing transportation emissions is going to be difficult. Therefore, there needs to be a wide range of options for alternative modes of transportation as well as education regarding the different services available to residents and visitors of Trinidad. Several actions are going to require coordination with regional and national transportation sectors and may require policy changes at these levels as well.

Goal: Increase use of Public Transportation

Encouraging a shift from driving to the use of public transportation is one of the most appropriate approaches to reduce emissions at the local level. Encouraging this transition requires an appealing alternative to driving.

Next Steps:

- Increase and improve bus service within Trinidad.
- Increase regional connectivity and service.
- Publicize public transportation to tourists.
- Promote public transportation through public outreach, including more available bus schedules.

Goals: Reduce Miles Traveled

Changes to road networks, Smart Growth, and mixed land use can reduce the number of miles traveled by residents. Additionally, encouraging residents to carpool is another way to reduce the number of miles traveled and greenhouse gas emissions. Residents will not take advantage of carpooling unless they are informed of their different options. Through outreach and education, residents will be able to understand the convenience of carpooling and the money they can save.

Next Steps:

- Decrease the number of miles of road between destinations through the collaboration with regional transportation planning.
- Require the use of Smart Growth and mixed land use for all new development and incorporate it into Trinidad's General Plan.
- Create a Car Pooling Program for the residents of Trinidad; use outreach such as site on the City's webpage and brochures to advertise the ease and convenience of carpooling to residents.
- School Ridesharing Program for parents to organize rides for their children to be dropped off and picked up from school; use brochure sent home with students as outreach.

Goal: Increase the Use of Alternative Transportation

Using alternative transportation, such as walking and bicycling, will increase community health along with reducing greenhouse gas emissions. Supporting the improvement of current trails and bike lanes and the creation of new trails and bike lanes are essential. These outlets will give residents options for travelling around town.

Next Steps:

- Community scoping meeting to identify the appropriate location to place new trails and create a trail system.
- Widening sidewalks and bike lanes for increased use.
- Outreach will be used, along with interpretative signs produced through Humboldt State University Natural Resources Interpretative students, to bring awareness of trail locations.
- Work with Green Wheels, a Humboldt State University club, to create a volunteer operated bicycle maintenance shop.
- Charging a fee for public parking. The money collected will be used towards improvement for alternative transportation.

6.2 Energy Efficiency

As of now carbon-based energy sources fuel the majority of societies energy needs. Before renewables can replace carbon-intensive energy sources, energy uses must become as efficient as possible. Using the available resources, Trinidad's city government and residents can do a lot to improve efficiency and reduce greenhouse gas emissions.

Next Steps:

- Set targets for reducing municipal energy consumption in buildings (e.g., 20 percent reduction in energy consumption by 2015)
- Conduct energy retrofits in municipal buildings
- Adopt an energy efficiency standard for any future municipal buildings

- Participate in community outreach to engage the community in energy efficiency retrofits.

6.3 Renewable Energy

AB 32 establishes goals such as using 20% renewable fuels by 2020 and returning to 1990 levels of greenhouse gas emissions by 2020 with an 80% reduction by 2050. The Legislature is also creating standards including setting a statewide cap on greenhouse gas emissions (ARB 2006). To meet these goals Trinidad will utilize renewable energy sources.

Next Steps:

- Install Photovoltaic Systems into Municipal Buildings
- Consider alternative energy generation options (e.g., solar) in any future municipal buildings
- Engage in community outreach to inform them of financial aid options and long-term benefits of using solar energy.

6.4 Waste Management

Goal: Creation of an Integrated Waste Management Plan

Per requirements of AB 939, the Integrated Waste Management Act of 1989, counties are required to prepare a Countywide Integrated Waste Management Plan (CIWMP). This rule can encompass a variety of jurisdictions; from cities to multiple cities to regions. As in the case of Trinidad, an Integrated Waste Management Plan (IWMP) would rely on the collaboration of waste providers within Humboldt County to create the IWMP. The goal of such a plan is to

reduce the amount of waste being disposed and to effectively monitor waste within a specific area.

Next Steps:

- Facilitate collaboration among current Humboldt County waste management providers.
- Consult existing waste management programs surrounding the City of Trinidad to develop an effective IWMP.
- Use the training manual from the United Nations Environment Programs which guides the development of an IWMP.

Goal: Community Composting Program

Trinidad's current waste diversion rate of 34% (HUMSAN) is indicative of the need to establish more efficient waste diversion programs. One such program would be focused on diverting waste to compost within the community. According to the EPA, 25.9% of non-hazardous waste production is from yard trimmings (13.2%) and food scraps (12.7%). A composting program which targets the diversion of these wastes would effectively reduce the amount of material transported to landfills which in turn would reduce methane production and the combustion of fossil fuels.

Next Steps:

- Increase participation through expanded outreach by using brochure, handouts and community meetings to educate the community about the benefits of composting.

- Promote composting through community training workshops.
- Establish an agreement with the existing solid waste collection provider to create a local composting facility.
- Evaluate possible incentives to encourage businesses to compost waste.

Goal: Creation of a Waste Reduction Ordinance

Creating a waste reduction ordinance is a measure that cities can take to regulate specific waste sources. Establishing a waste reduction ordinance for the city of Trinidad would effectively limit particular wastes disposed of within the City. This ordinance will focus on limiting or banning specific carbon-intensive consumer goods and directly relates to the Environmentally Friendly Purchasing law as well as practices pertaining to source reduction.

Next Steps:

- Conduct a citywide feasibility study for the effectiveness of a waste reduction ordinance.
- Hold community—including businesses—scoping projects to identify which carbon-intensive consumer goods to limit or ban without unfairly targeting certain community entities.
- Employ Streamline Planning and the Trinidad City Administration in creating the waste reduction ordinance.

Goal: Green Building Standards Code Outreach Program

According to the 2010 California Green Building Standards Code, construction projects are required to divert 50% of construction waste prior to being issued a building or demolition permit. To efficiently abide by this rule, Trinidad's outreach program would assist local

contractors in understanding and implementing the code. It could also include the development of recycling programs specifically for construction projects as well as development of a materials exchange system.

Next Steps:

- Conduct scoping project to identify potential participation in such a program
- Use results of scoping to aid in assessing the effectiveness of a materials exchange system. A web-based program that lists leftover or reusable building materials that can be recycled through the community could support this system.
- Identify what types of outreach efforts would be effectively received by Trinidad public (i.e. website, brochures, meetings, etc)
- Collaborate with existing recycling program administrator to develop construction-specific recycling options

6.5 Livability

6.5.1 Urban Forestry

Next Steps: Urban Forestry will be beneficial to Trinidad’s greenhouse gas goals. Urban Forestry will also compliment Trinidad aesthetic appeal. Research should be completed which looks into the diversity of native species which can be planted in Trinidad. Community involvement will be important in completing the Urban Forestry goal. A great way to begin working on the goal is to follow the recommendations of campaigning made in the 5.5.3 and 6.5.2 as they can be directly applied to be applied to Urban Forestry also.

Progress Indicators:

- Number of trees planted on public property

- Number of trees planted on private property
- Increase in percentage of canopy cover in Trinidad
- Ratio of trees removed compared to trees planted

6.5.2 Community Involvement

Next Steps: In order to engage the community in contributing to the commitment of greenhouse gas reductions the previously outlined actions in section 5.5.3 need to be taken. Some steps to implement the actions include, advertising of the climate action plan immediately and recommending the website which will tell them about Trinidad's commitment to greenhouse gas reductions on how citizens can help. Advertising will be the most crucial part in community involvement and campaigning for support needs to be started as soon as possible.

Progress Indicators:

- Turnout counts at greenhouse gas events or equivalent events hosted by Trinidad or related host
- Website counter
- Analysis of marketing and advertising to reach the public
- Survey of businesses on green products stocked and sold

6.5.3 CAP committee

Next Steps: In order for the CAPAC be productive it needs to be created as soon as possible. The Mayor should appoint willing and diverse group of citizens, business owners and City officials to the Committee. The first task carried out by CAPAC is a clearly defined mission and

goals. Next would be the implementation of the community involvement campaign. The committee should also decide on frequency of monitoring and also begin research on greenhouse gas emissions which were not able to be obtained by the time of this Plans creation.

Progress Indicators:

- City Council must hold the CAPAP accountable
- Compare current emissions to baseline to see if progress has been made
- Clearly defined goals of committee
- Strong community report
- All emissions data gathered

VII. CONCLUSION (Work in progress)

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Appendix