



MULTISTAKEHOLDER APPROACH TO CLIMATE CHANGE

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Presentation Outline

Pamela Gallares-Oppus
Regional Manager
Cities for Climate Protection™ Campaign, Southeast Asia
International Council for Local Environmental Initiatives

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Vehicular Reduction Strategy For Air Pollution Prevention and Climate Change Mitigation

A Case of Puerto Princesa City, Philippines¹
Cities for Climate Protection™ Campaign, Southeast Asia
International Council for Local Environmental Initiatives

Abstract

Air pollution, limited mobility options and poverty are intersecting transport concerns that confront small-to-medium-sized cities, particularly those who thrive on tourism and agriculture. Compounding these is the vulnerability of poorer local governments to the impacts of climate change, thereby challenging these local governments to clip greenhouse gas emissions while struggling to keep the community's welfare at the core of local decisions and actions.

This case attempts to usher us into the hurdles of legislating and enforcing a local transport policy on motorized vehicular reduction through scheduling to address congestion and reduce emissions. It pins down the actual and potential contributions of this measure to socioeconomic welfare, the local environment, and the global climate. The value of quantifying benefits aids in drumming up support to implement climate actions.

Climate change mitigating options are diverse and prove to be beneficial to developing countries, both in the immediate and long term. While these options may not yield huge reductions in GHG individually, the cumulative reductions of these options is worth considering.

Ultimately, the case captures the nuances of multistakeholdership as a rightful approach to implementing local climate change mitigation actions.

Profile of Puerto Princesa

- Capital and Chief Seaport and airport of the province of Palawan, the Philippines' Last Frontier
- 306 nautical miles from Manila (1 hour by air or 18 hours by sea).
- Population: 151,286 (as of 2001), urban dwellers account for 23 percent of the total population
- No. of barangays – 66 (44 rural, 24 urban)
- City's Income: 843 Million Php or 16.7 Million US\$ (as of 2002)
- Economic Activities: tourism, commerce and agriculture
- Land Area: 235,982 ha (comprising 17% of the total land area of the province)
- Access and Mobility
 - The main mode of public transport is tricycles, particularly among the urban barangays. Vans, buses and jeepneys serve inter-local government and the city's main corridors.
 - The annual growth rate of motor vehicles from 1994-1998 is registered at 14%.
 - As of 1998, 60% of the registered motor vehicles are motorcycles and tricycles. Because of this, the tricycle sector accounts for 30-60% of traffic congestion.
- Morbidity
 - Acute respiratory infection and malaria are among the top causes of morbidity for the last decade.
- GHG Emissions Profile
 - Transport accounts for 64% of GHG emissions (1998) and is forecasted to grow to 83% in 2010
- Vision

“A model community in sustainable development promoting cleanliness, peace and order, environmental protection, equal access to improved services, and people's participation and in progress”

¹ Puerto Princesa City is an ICLEI Member and a participant to the Cities for Climate Protection™ Campaign.

Presentation Outline

1. WHY TRICYCLES PROLIFERATE

Table 1: A List of Interrelated Factors

Local Economy:	<ul style="list-style-type: none"> Limited alternative to agriculture and related agro-business ventures as a quick provider of cash-based income-generating activities
Mobility:	<ul style="list-style-type: none"> Tricycles are preferred by commuters Higher passenger-occupancy modes carry between 15-40% of passengers along major corridors
Poverty Reduction/Equity:	<ul style="list-style-type: none"> Ability of the tricycle business to reach more individual families compared with higher passenger-occupancy transport units
Land-Use Planning:	<ul style="list-style-type: none"> The dispersed location of service access centers from residential communities demands more travel activities
Weather and road spacing:	<ul style="list-style-type: none"> Heat, rain, congestion, worsening local air pollution, and absence of spaces for pedestrians do not encourage pedestrianization and cycling, thereby increasing the demand for motorized transport
Prevailing Culture:	<ul style="list-style-type: none"> Walking and biking are still very much associated with poor economic status
Government Management:	<ul style="list-style-type: none"> Franchise fees are a source of income, about US\$35,000 annually (Php1.750 M) Least options to provide lucrative income-generating opportunities for the communities
Political leadership	<ul style="list-style-type: none"> Tricycle sector is a substantive source of votes

2. REASONS WHY THE CITY ENGAGES IN CLIMATE ACTIONS

- *City's inventory of GHG Emissions and Sources of Air Pollution*²
 - The highest source of GHG emissions in both the Community and Corporate Sectors is transport. Particularly, in the community emissions where the tricycles belong, transport contributes at least 64% to the total GHG emissions.
 - The city likewise projects that motorcycles and tricycles will be the largest consumers of fuel in the future. Thus, the future emission scenario (2010)³ of the Community sector shows that the transport sector will grow to as much as 83%.

Figure 1: 1998 Community Emissions Profile

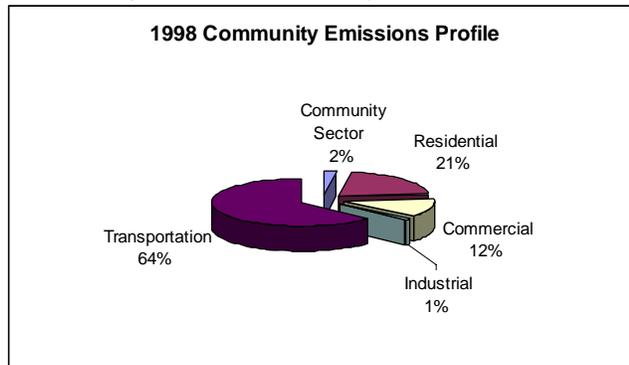
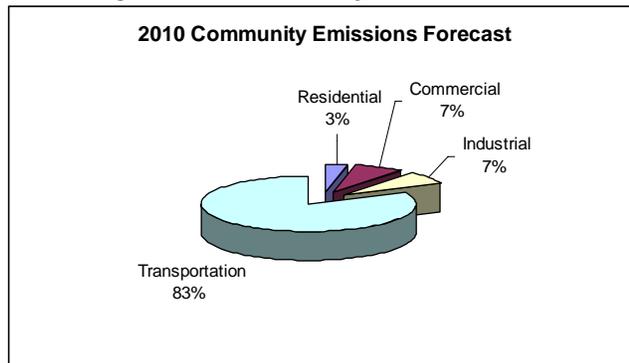


Figure 2: 2010 Community Emissions Forecast



- Because tricycles dominate the composition of motorized vehicles, they contribute between 30% and 60% to road traffic and congestion. This causes unnecessary acceleration and deceleration, thereby increasing burning of fuel resulting in increased pollutant emissions. The ratio of 2-stroke with 4-stroke engines is 45:55. The average age of the engine is 6-

² Source: GHG Emissions Profile of Puerto Princesa, ICLEI

³ assumed 2% annual growth

10 years. Added to this is the design and fuel efficiency of the tricycle engines, the emissions of which aggravate air pollution.⁴

- *Health*

Acute respiratory infection and malaria consistently emerged as the top leading cause of morbidity⁵. In addition, the city health office noted the increase in the incidence of common upper respiratory ailments (i.e., colds) in areas where there is more vehicular congestion.

- *The Worsening Local Environment*

Smoke is largely visible during daytime. Noise pollution accompanies air pollution.

- *A Rough Sketch of the City's Vulnerability to the Effects of Climate Change*

Table 2: Potential Adverse Effects of Climate Change on the City

	Social	Economic	Environment
Extreme weather events	Threat of food security	changes in crop production	Worsened local air pollution
		Increased investments for port and drainage facilities	Forest fires
	Increased incidence of malaria and other vector-borne diseases (dengue) ⁶	Increased investments on health services	
coral bleaching ⁷ and species migration	Threatened food security	threatened eco-tourism	Coastal biodiversity
Sea-level rise	Displacement of coastal communities	damage to infrastructure	

⁴ Since 4-stroke engine is more powerful, it is suitable for heavy load usage such as tricycles. In addition, 4-stroke engine is cleaner in terms of smoke emission. On the other hand, 2-stroke engines emit significant amount of smoke because of its design. It is also not suitable for heavier load like the side car. There is also an issue of oil and fuel mix, the incorrect formula of which influences the combustion process.⁴ (Helen Deian—In the two-stroke engines, unburned oil and gasoline, along with the residues of burned fuel and oil, end up being released through the engine exhaust. As much as 25% of the gas/oil mixture remains unburned and is dumped in the waters of lakes, rivers and bays. This mixture contains 100 elements, some proven to be carcinogens and other announced by USEPA as toxic.

⁵ (Source: City Health Office--data in two five-year periods from 1992-1996 and 1996-2000)

⁶ vector means carried of diseases and they thrive in warmer temperatures

⁷ based on mapping of vulnerability assessment on coral bleaching (NOOA 2002) and observations of fishermen

3. THE CITY GOVERNMENT'S RESPONSE TO THE GROWING TRICYCLE PROBLEM: AN OUTLOOK OF TRANSPORT POLICY INTERVENTIONS (1974 TO 2001)

Table 3: Profile of Local Policy Interventions for Tricycle and Air Pollution Management in Puerto Princesa

Period	Major Objective of the Policy	Policy Components
1974-1992	To address congestion and road safety	<ul style="list-style-type: none"> • Traffic rerouting and route assignments • Parking policies • Designating pedestrian lanes • Driving and parking practices and safety
1993 onwards	To address the unregulated growing number of franchises, volume of tricycles on the road, and unabated smoke emissions ⁸	<ul style="list-style-type: none"> • Regulating no. of tricycle franchises • Controlling emissions for pollution prevention through inspection and maintenance
1999 to present	Air Pollution Prevention and Global Warming	<ul style="list-style-type: none"> • Analysis of transport policies incorporating the dimension of GHG emissions reduction

4. THE GOVERNANCE MECHANISM AND VENUES FOR MULTISTAKEHOLDERSHIP

Table 4: Institutional Response to Address Tricycle Problem

Structures	Themes/Content Areas	Activities
Climate Action Team (executive, legislative, and department level)—City Planning Office as coordinator	Waste, Transport, Energy Efficiency, Urban Forestry	<ul style="list-style-type: none"> • Intersectoral planning, management and monitoring
Ad-hoc subsectors (Academe, associations, people's organizations)		<ul style="list-style-type: none"> • Validation, problem analysis and identifying options
Traffic Management Board	Transport	<ul style="list-style-type: none"> • Recommendatory body for local policy formulation and decisionmaking
Traffic Management Committee	Technical officers from special traffic and transport offices	<ul style="list-style-type: none"> • Committee Review
Drivers' Associations		<ul style="list-style-type: none"> • Consultation during committee reviews • Source of policy support legitimacy drawing consensus/position among members • Enforcement of policies disseminate information among members, • Improving enforcement mechanisms • Problem-Analysis and Problem-Solving

⁸ During this time, tricycle franchising was devolved to LGUs due to the Local Government Code. Furthermore, the former mayor introduced environmental management as central to his administration's thrust, and eco-tourism was beefed up during this time.

5. KEY FEATURES OF THE VEHICULAR REDUCTION STRATEGY: ONE DAY REST

- Introduced in 1998 as a section within a zoning and rerouting ordinance to reduce congestion and mitigate air pollution
- Intended to provide one day rest for tricycle drivers, prohibiting operations from 8 AM-6 PM (10 hours)
- Envisions to displace 500 units of tricycles daily through scheduled operations
- Reinforced in 1999 as a GHG emissions reduction measure in addition to improving local air quality and increasing income potentials of drivers
- Repealed in 2001 due to alleged claims of drivers that congestion and income were not significantly improved
- Based on an interview of 100 drivers in July 2002, drivers admitted that they complied with the policy, and noted an increase in income.
- They want this section on scheduling reinstated primarily because of the income potentials of the scheme. In so doing, the drivers' associations propose that they be part in devising and improving the implementation scheme. They also suggest that they be represented in the lobby group to reinstate this scheme. The councilor in-charge of transport and infrastructure is seeking legitimacy to reinstate this section.

6. ACTUAL AND POTENTIAL RESULTS OF THE 1-DAY REST SECTION OF THE ZONING ORDINANCE

Table 5: A Summary of Actual and Potential Benefits

Indicators	Financial	Air Pollutants and CO2	Social	Government Management
Cut in fuel consumption for 1 day (5-6 liters daily)	Php5184 (USD100)	Reduced 650 kg CO2 annually ⁹ (per unit) 16% cut in PM10, CO and NOx	<ul style="list-style-type: none"> ▪ Time with the family, leisure, etc. ▪ Rest for the driver ▪ Lesser incidence of morbidity ▪ Optimized social activities due to faster travel time 	<ul style="list-style-type: none"> ▪ Easier to apprehend unlicensed franchises ▪ Manageable investments for health services
Higher occupancy potentials	20% increase in weekly income ¹⁰			
Cut in fuel consumption due to reduced traffic congestion (VKT/hours)—speedier travel time	Unquantifiable due to no data recording/monitoring			
Cut in fuel use due to engine tune-up	<ul style="list-style-type: none"> ▪ Longevity of engine promotes longer operation ▪ at least 15% cut in fuel use 			

⁹ Carbon Dioxide emission of gasoline = 2.26 kg CO₂ per liter (computed for 288 liters a year)

¹⁰ Based on interview with drivers, their income before the policy was P1750 weekly. When the policy was implemented, P2100 with less days. The optimum passenger capacity is 4 per trike. From a load capacity perspective however, this is considered overload. With more trikes on the road, the income potential is lesser because then they take only 1 passenger per trip.

7. POTENTIAL PARTNERSHIP MECHANISMS TO ADDRESS THE TRICYCLE PROBLEM

Table 6: List of Multidimensional Options

Venues for Multistakeholdership	Policy and Programmatic Mechanisms	Pollution Prevention and Climate Mitigation Measures
National-Local Policy Synchronization, in partnership with the academe and manufacturers to draft and enforce local policies	<ul style="list-style-type: none"> • a limit to tricycle franchises based on a passenger-demand ratio 	Slowed down trend in the use of tricycles/motorized vehicles
	<ul style="list-style-type: none"> • issuing franchises only to units that have four-stroke engines, or other less pollutive engines (procurement options) 	Reduced emissions due to decreased 2-stroke engines
	<ul style="list-style-type: none"> • enforcement of smoke emissions control mechanisms to ensure fuel efficiency 	Reduced emissions from regular maintenance
Intersectoral Planning and Management to Improve Transport Policies, Plans and Enforcement	<ul style="list-style-type: none"> • comprehensive landuse planning that encourages mixed road use and zoning, improved mobility/access network, pedestrianization, bike lanes 	Less vehicular travel demand
Local Economic and Investment Planning with Community and Business Sectors	<ul style="list-style-type: none"> • alternative economic activities 	Communities engage less in tricycle business as a source of income
Multisectoral team for information and education campaign, training, capacity-building to improve procurement and driving practices, especially between manufacturers and operators	<ul style="list-style-type: none"> • Green Purchasing • Correcting drivers' habits (e.g., traffic rules compliance) 	Purchase and use of more fuel efficient technologies
Long-term---Global and National Institutions to look into long-term technological options using alternative fuels	<ul style="list-style-type: none"> • engine retrofits and transport unit design that will accommodate the use of natural gas and LPG 	Use of low emissions fuels
Regional/International Partnership Mechanism to Access Resources for Implementation	<ul style="list-style-type: none"> • Sustainable Transport Planning • Twinning and Inter-City Technical Exchanges • Access to CDM and CDM -like activities to include small-medium sized poor local governments 	

PROFILE OF ICLEI AND THE CITIES FOR CLIMATE PROTECTION™ CAMPAIGN

The International Council for Local Environmental Initiatives (ICLEI)

The International Council for Local Environmental Initiatives (ICLEI) was founded in the United States in 1990. It is a nonprofit, professional association of local governments worldwide committed to improving the local environment and to sustainable development. It runs Campaigns on the Local Agenda 21, Cities for Climate Protection, and Water.

ICLEI's CCP™ was introduced in the region in 1999, with the Philippines as the pilot country. It then expanded to Indonesia in 2001, and in Thailand in 2002.

The Cities for Climate Protection Campaign®

The Cities for Climate Protection™ (CCP) Campaign was established by ICLEI in 1993 at an international summit of municipal leaders held at the U.N. in New York. It grew out of ICLEI's Urban CO₂ Reduction Project (1991-1993), which brought together a select group of American, Canadian, and European cities to develop a municipal planning framework for greenhouse gas reduction. The experience of the Urban CO₂ Reduction Project led to the development of the five-milestone framework and a software product designed for local government use.

Over the past six years, the Campaign has engaged over 500 local governments in a worldwide effort to slow the earth's warming by reducing greenhouse gas emissions at the urban level. The campaign links the global issue of climate change with local air quality and other local issues such as traffic congestion, waste management and community livability. It is such links -- the adverse impact that rising local temperatures have on smog formation, for instance -- that primarily motivate local leaders to participate in a Campaign focused on climate protection. These links are especially important as the Campaign expands into developing countries where carbon emissions per capita are minimal and issues such as air quality, health and economic development are far higher priorities.

The Campaign seeks to reduce carbon dioxide (CO₂), methane (CH₄), and conventional air pollutants such as nitrogen oxides, carbon monoxide, and non-methane volatile organic compounds, compounds (SO_x, NO_x and PM₁₀) that are precursors of ground-level ozone and smog, as well as by-products of fossil fuel combustion.

For information about the Campaign in the region, you can write:

The Regional Manager
ICLEI-CCP in Southeast Asia
Manila Office, Philippines
Email: pgallares-oppus@iclei.org

The International Director
ICLEI-CCP International
US Berkeley Office, California
Email: nskinner@iclei.org

For information about Puerto Princesa City, Philippines, you can contact:

Mr. Angel Padon
City Planning and Development Office
Puerto Princesa City, Philippines
Fax No. +63 48 434 2523