Building America's 21st Century Transit Systems

Opportunities for driving transportation projects forward

by Tian A. Feng, FCSI, FAIA

Image courtesy Transbay Joint Power Authority

PUBLIC TRANSIT INFRASTRUCTURE CAN COMPRISE THE GREENEST OF EARTH-FRIENDLY, ENERGY-EFFICIENT TECHNOLOGIES, BUT IT DOES LITTLE GOOD IF PEOPLE KEEP CHOOSING THEIR CARS INSTEAD OF TAKING THE TRAIN. DESIGNING SUCCESSFUL TRANSPORTATION PROJECTS INVOLVES A NEW WAY OF THINKING.

5 key indicators of sustainable mobility

smart Land use and livable neighborhood
materials and construction/operations optimization
energy and resource efficiency
quality of ambient environment and health
emissions and pollution control

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for example, voters passed a $10 billion state bond toward building the nation's first high-speed rail connecting San Francisco to San Diego. Many other transit projects will be launched or continued over this and the next decade. The needs for implementing

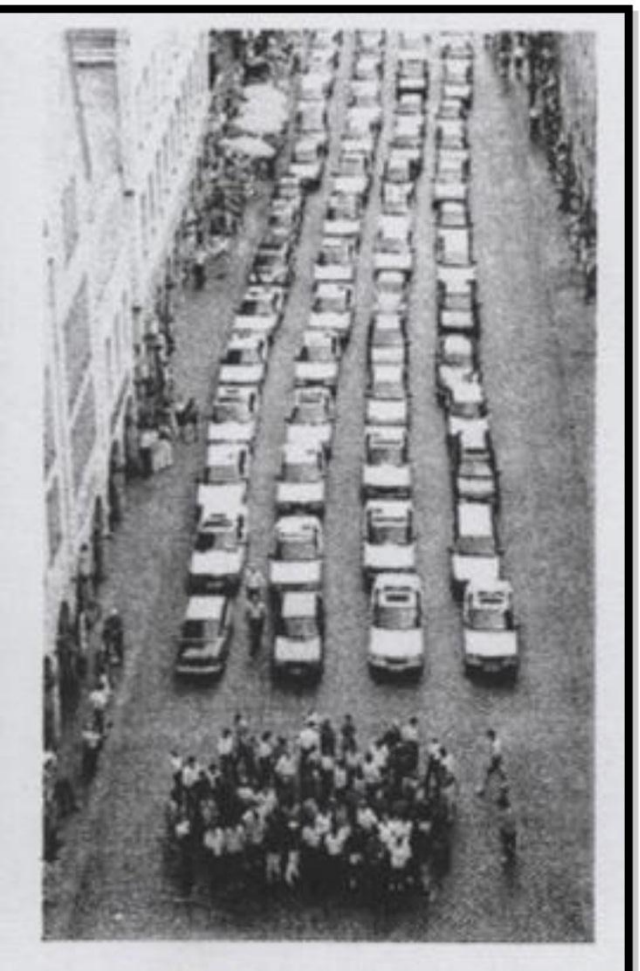
Sustainable Mobility

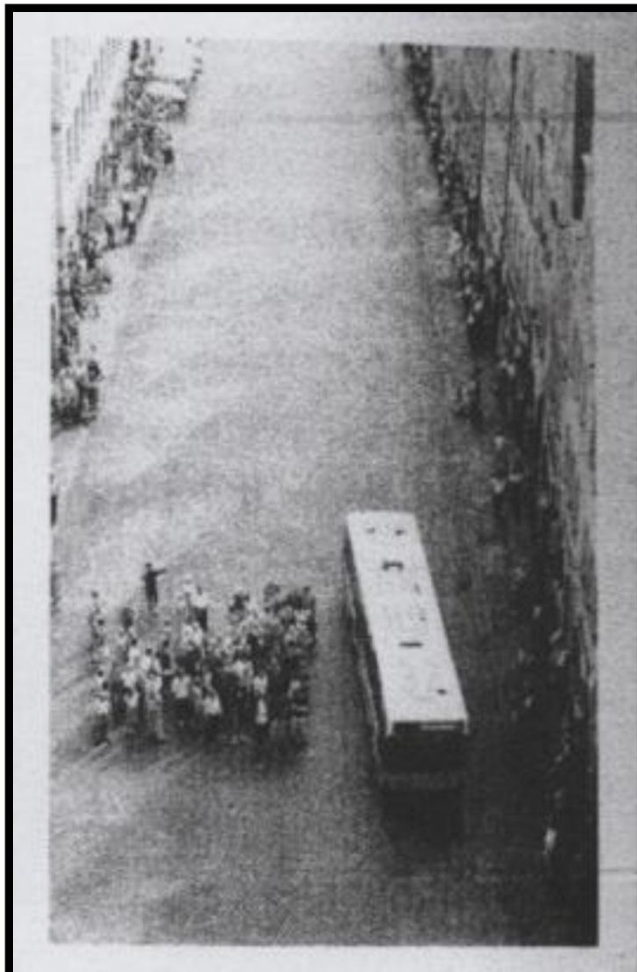
Material for infrastructure

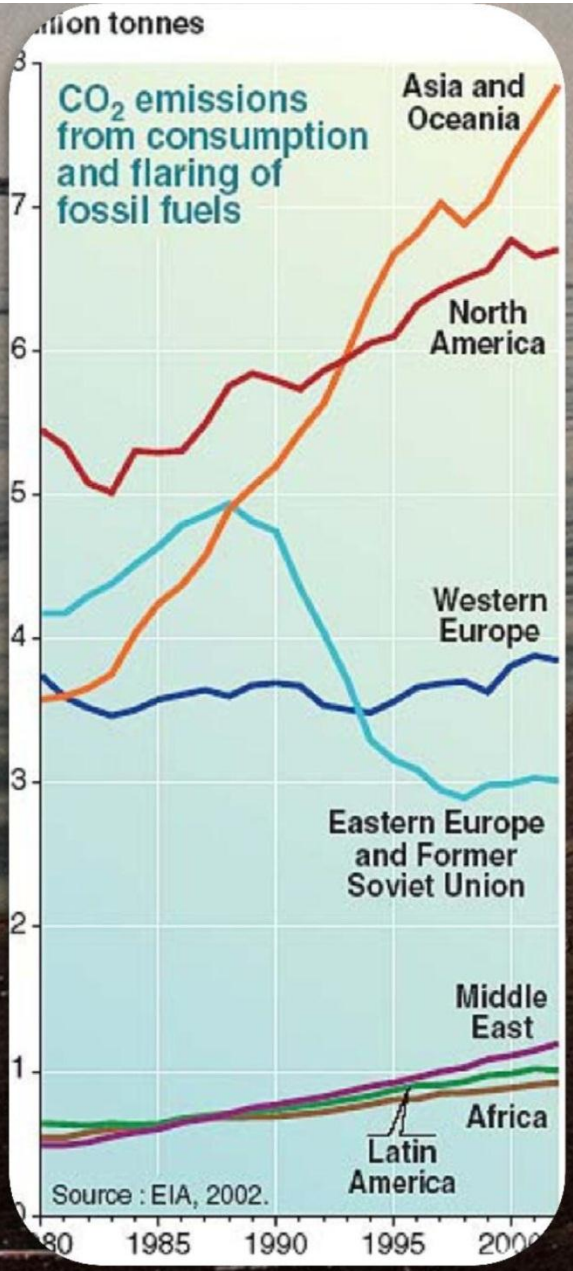
Demand for Space

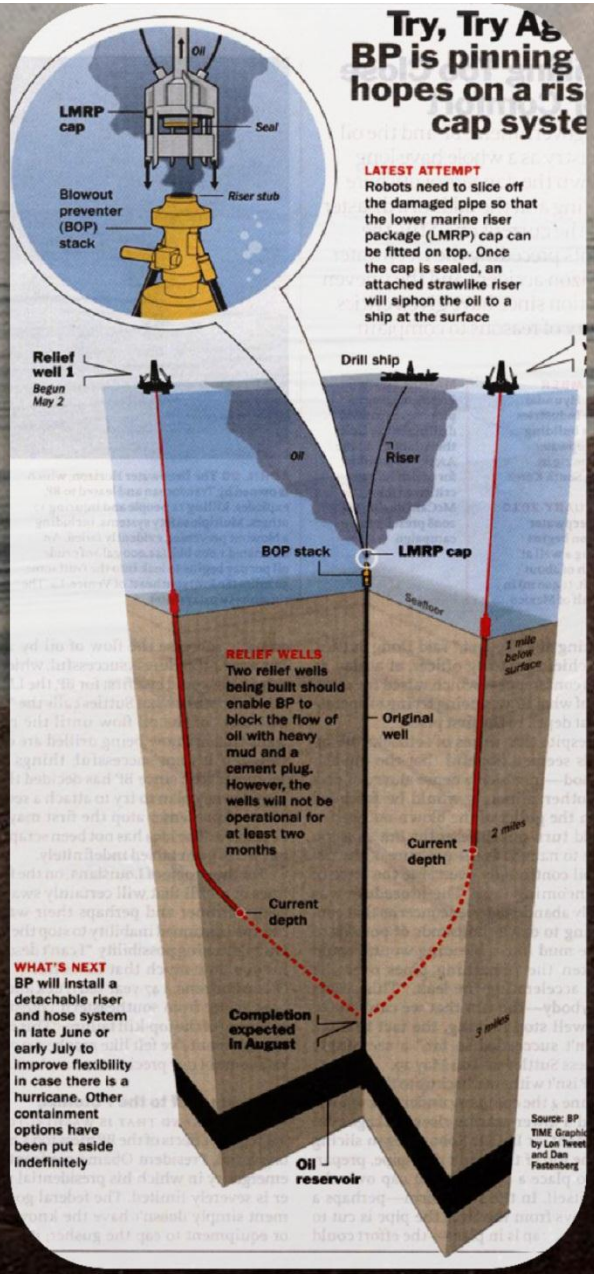
Impact to public health

Energy consumption





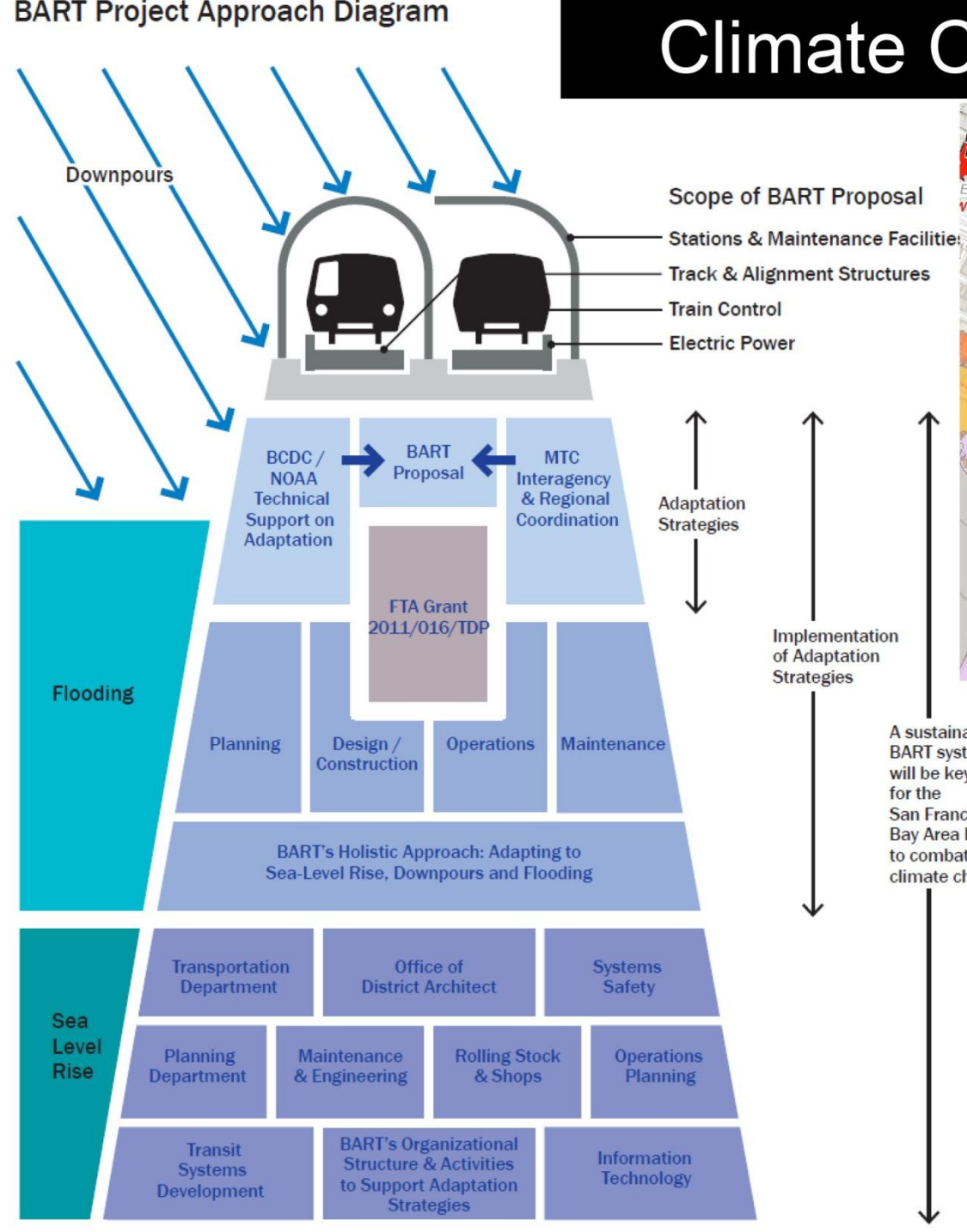




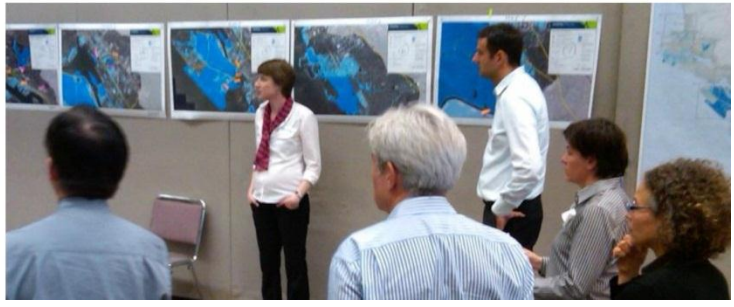
cost of automobile-based mobility

Source: Time and UN

Climate Change Adaptation

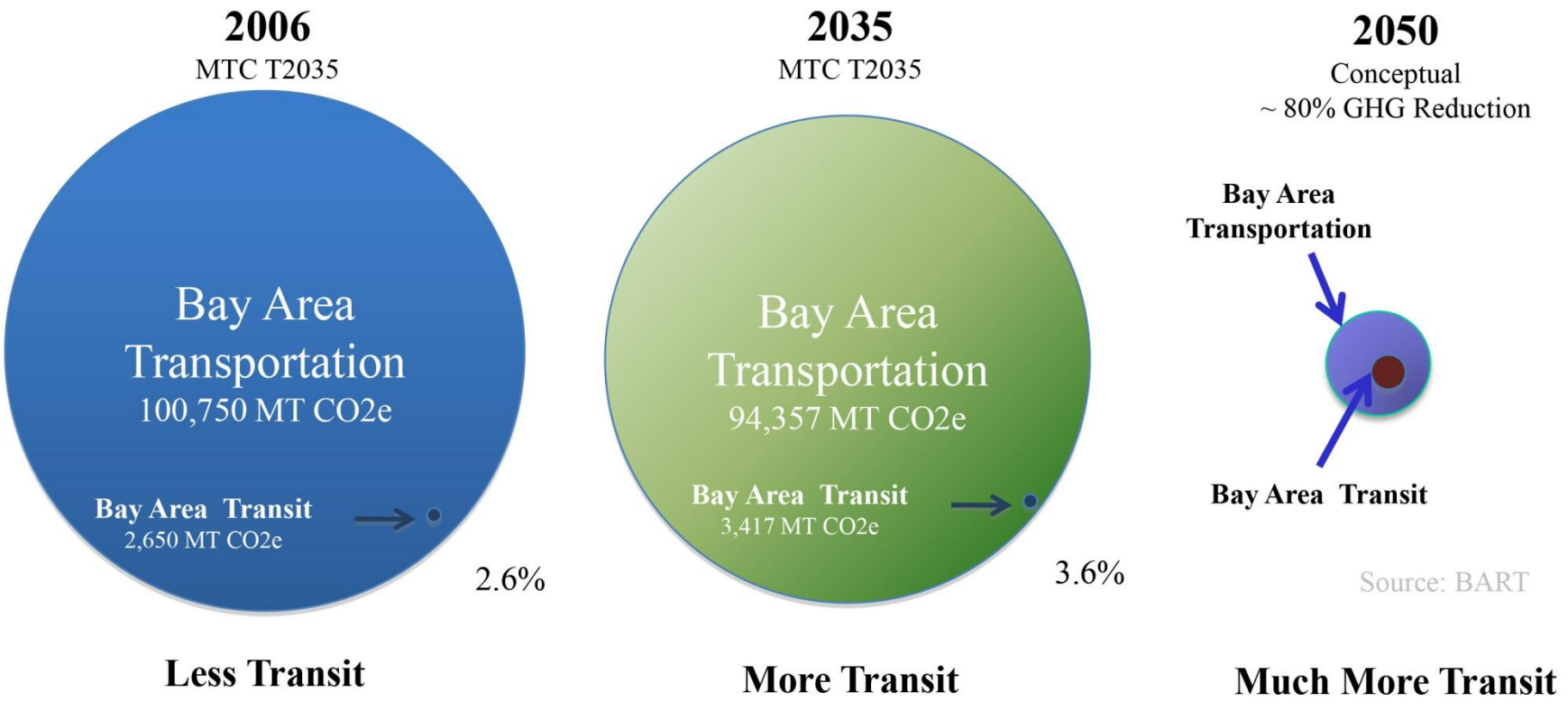


Lake Merrit 55" SLR (2100) 100 year storm plus wind waves



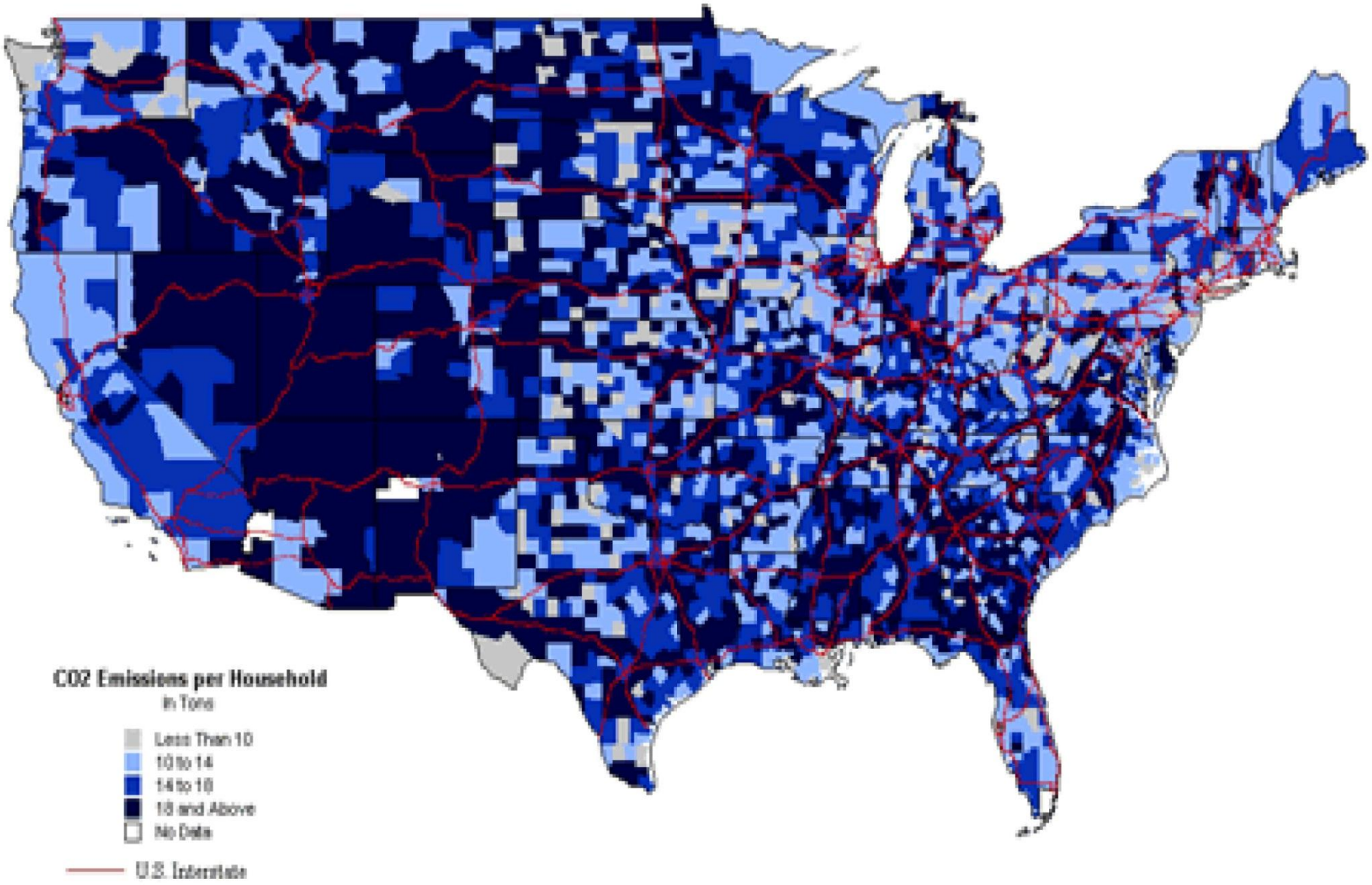
daily ghg emissions

transit role in reducing transportation ghg emissions



sources: bart, 2010; mtc t2035 plan deir, mtc t2035 travel forecasts data summary; fta national transit database 2008, ftapublic transportation's role in responding to climate change, 2010.

FIGURE 4: CARBON DIOXIDE EMISSIONS PER HOUSEHOLD WITHIN COUNTIES

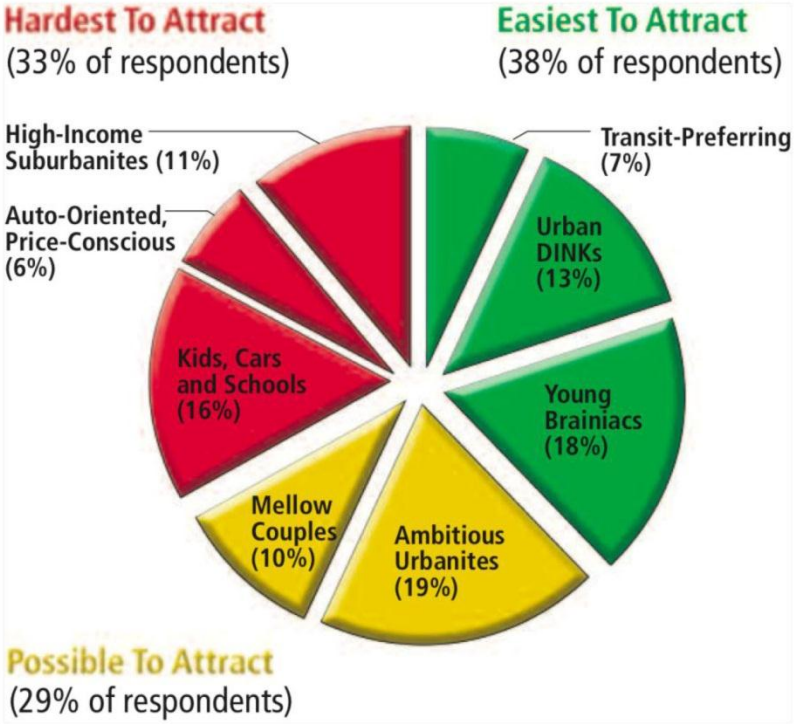


Average volume of CO2 emitted per household in each county. *Source of VMT Data: U.S. Federal Highway Authority, 1999*

Grouping the Market Segments

We then grouped the market segments into three categories based on how easily they could be attracted to living in a TOD. Each market segment is described on the following pages, with key attitudes and distinguishing characteristics.

- **Easiest to Attract.** Three segments — Transit-Preferring, Urban DINKs and Young Brainiacs — totaling 38 percent of respondents, were judged to be the most easily attracted to TODs based on their strong interest in transit and their low interest in driving relative to the rest of the groups.



- **Possible to Attract.** Two segments — Ambitious Urbanites and Mellow Couples — representing 29 percent of respondents, are possible to attract based on having certain interests that match TOD characteristics but are challenging due to other interests.

Source: MTC

Transit-Oriented Development around BART stations

APTA Adopts New Sustainability Guidelines for Public Transit

'Make American Public Transport Systems Work for Americans'

In the spirit of Earth Day, APTA released its most recently adopted standard: the Transit Sustainability Guidelines, derived from best practices at home and around the world.

Original funding for the initiative came from an Environmental Protection Agency (EPA) Innovations Grant to the San Francisco Bay Area Rapid Transit District (BART) in 2006.

"We have to make American public transport systems work for Americans, not just lecture people about the environmental benefits of transit," said Tian Feng, BART's chief architect, who was the founder of this initiative and editor of the document.

Noting that America's transit industry is at a critical juncture, Feng continued, "innovations in customer service and integration with community development are vital. The automobile industry succeeded in making cars a prime form of mobility in America, and government became the builder and operator of the automobile-based transportation infrastructure."

Feng concluded: "We believe the application and implementation of the guidelines will lead to a renaissance of American public transportation where more and more transit systems offer enjoyable, timely, and safer transportation solutions."

According to Timonie Hood, the EPA innovation project manager: "The guidelines represent a holistic approach to transit sustainability covering design through operations and maintenance. The combined environmental benefit of making American transit systems greener and more rider-friendly will make our communities more sustainable and dramatically reduce pollution, greenhouse gas emissions, and energy consumption."

Primary objectives of the sustainability guidelines include:

- Improving mobility and creating livable communities through facilitating more environmentally friendly forms of mobility, such as walking, biking, and public transit, and

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Sustainable Transit Guidelin

September 20, 2010

transit sustainability guidelines

Transit Sustainability Guidelines Working Group
Tian Feng, Chair and Editor
tfeng@bart.gov

Standards Development Committee
American Public Transportation Association

http://www.fta.dot.gov/documents/Transit_Sustainability_Guidelines.pdf

TABLE 1
Opportunity for Implementing Sustainability Measures

		Transit Element			
		System Route, Transit Mode and Node (Section 2)	Infrastructure and Facilities (Section 3)	Rolling Stock/Fleet (Section 4)	Operations and Maintenance (Section 5)
Sustainability Indicator	Smart land use and livable neighborhood	***	**	**	*
	Materials and construction/ operations optimization	*	***	***	***
	Energy and resource efficiency	**	**	**	**
	Quality of ambient environment and health	***	***	***	***
	Emissions and pollution control	*	**	**	***

Implementation opportunity: * Less, ** More, ***Most.

http://www.apta.com/resources/hottopics/sustainability/Documents/Transit-Sustainability-Practice-Compendium.pdf

introduction

The physical siting and alignment of public transportation routes have a profound impact on urban growth patterns and sustainability potential, more so than any other aspect of transit design. The following guidelines address transportation planning as community building through attention to context.

Introduction

Smart Land Use & Livable Neighborhoods

- Partner with local and regional planning agencies
- Promote partnerships for TOD
- Make Livable Neighborhoods a centerpiece for planning
- Scale transit appropriately
- Plan for Intermodal Connections
- Reduce long-term auto dependence
- Engage stakeholders early

Energy and Resources Efficiency

- Consider energy in mode choice
- Design alignment to optimize energy use
- Partnerships for renewable energy

Quality of Ambient Environment

- Promote healthy modes of transportation

Emissions & Pollution Control

- Evaluate long-term impact of modal choices
- Design to minimize noise & vibration

section 2 system route, mode, & transit node - case study

los angeles metro station at hollywood highlands

Image from wickpedia

make livable neighborhoods a centerpiece of system planning - make transit stations and associated infrastructure public destination points in their own right, by understanding user needs to ensure that transit architecture can act as a catalyst for the surrounding environment.

section 3 infrastructure & facilities – case study

partnerships for renewable energy

- TriMet partnering with Portland General Electric (PGE) to design and construct innovative renewable energy initiatives.
- Leverage Utility's expertise in energy production & transit agency's long term facility ownership.
- The Portland Mall Revitalization project will include both photovoltaic (PV) and vertical axis wind turbines (VAWT).
- Enough power to run site lighting, lights for illumination of the exterior screen wrap and buildings' electrical systems.
- TriMet and Portland State University will monitor the energy output and report on performance.

Section 4 Rolling Stock & Fleet
3.D Quality of Ambient Environment and Health

- Southern Nevada RTC in Las Vegas operates the only “specialized” Bus Rapid Transit (BRT) vehicle in the United States
- Key objectives
  - Visually attractive and aesthetically appealing, more “rail-like”
  - Branding an identity separate from other transit services
  - BRT can establish itself as a new and distinct transit mode
- Environmental benefits include:
  - Reduced auto use

Section 5 operations & maintenance – case study

san francisco bay area regional transit connectivity improvement

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Opportunities for driving transportation projects forward

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District Architect

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TRAIN. DESIGNING SUCCESSFUL TRANSPORTATION PROJECTS INVOLVES A NEW WAY OF THINKING.

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