Energy and the Environment

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Implications for Urban Transportation Policy and Planning

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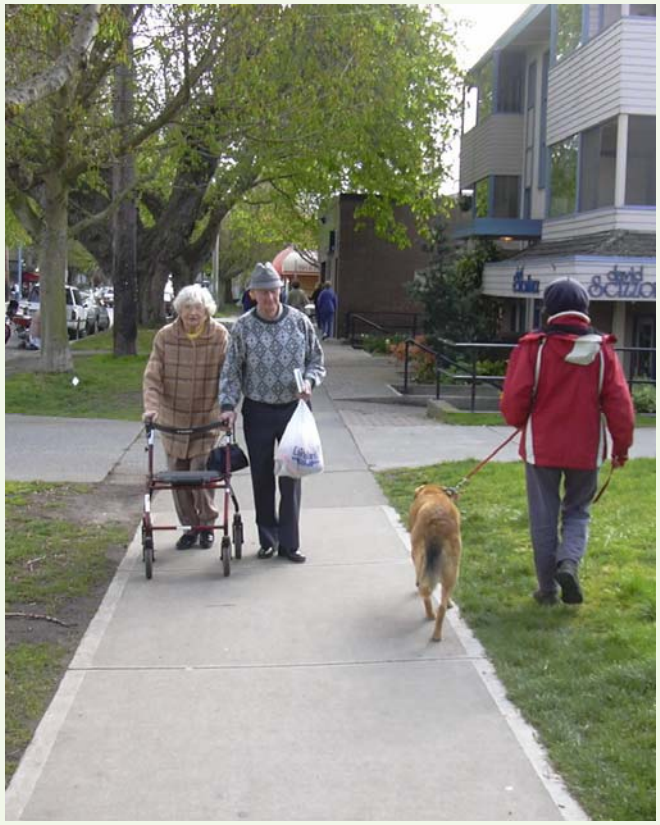
Earth In Balance

- Sustainability emphasizes the integrated nature of human activities and therefore the need for coordinated planning among different sectors, jurisdictions and groups.

- Sustainability planning is to development what preventive medicine is to health: it anticipates and manages problems rather than waiting for crises to develop.

Paradigm Shifts

- **Growth -** expanding, doing more.
- **Development** - improving, doing better.



- **Mobility** - physical movement.
- **Accessibility** - obtaining desired goods, services and activities.

What is "The" Transportation Problem?

- Traffic congestion?
- Road construction costs?
- Parking congestion or costs?
- Excessive costs to consumers?
- Government costs?
- Traffic crashes?
- Lack of mobility for non-drivers?
- Poor freight services?
- Environmental impacts?
- Inadequate physical activity?
- Others?

Current Transport Planning

Current planning tends to be reductionist: each problem is assigned to a single agency with narrowly defined responsibilities. For example:

- Transport agencies deal with congestion.
- Environmental agencies deal with pollution.
- Welfare agencies deal with the needs of disadvantaged people.
- Public health agencies are concerned with community fitness.
- Etc.

Reductionist Decision-Making

Reductionist planning can result in public agencies implementing solutions to one problem that exacerbate other problems facing society, and tends to undervalue strategies that provide multiple but modest benefits.

Win-Win Solutions

Put another way, more comprehensive planning helps identify "Win-Win" strategies: solutions to one problem that also help solve other problems facing society.

Ask:

"Which congestion-reduction strategy also reduces parking costs, saves consumers money, and improves mobility options for non-drivers."

Comparing Benefits

Planning Objectives	Shift Modes	Smart Growth	Efficient and Alt. Fuel Vehicles	Widen Roads
Congestion reduction	✓	✓/ ×	×	✓
Roadway cost savings	✓	✓/ ×	×	×
Parking cost savings	✓	✓	×	×
Consumer cost savings	✓	✓/×		
Better mobility options	✓	✓		
Improved traffic safety	✓	✓	×	
Reduced pollution	✓	✓	✓	×
Energy conservation	✓	✓	✓	×
Land use objectives	✓	✓	×	×
Public fitness & health	✓	✓		

✓ = Supports Objective × = Contradicts Objective

Issues

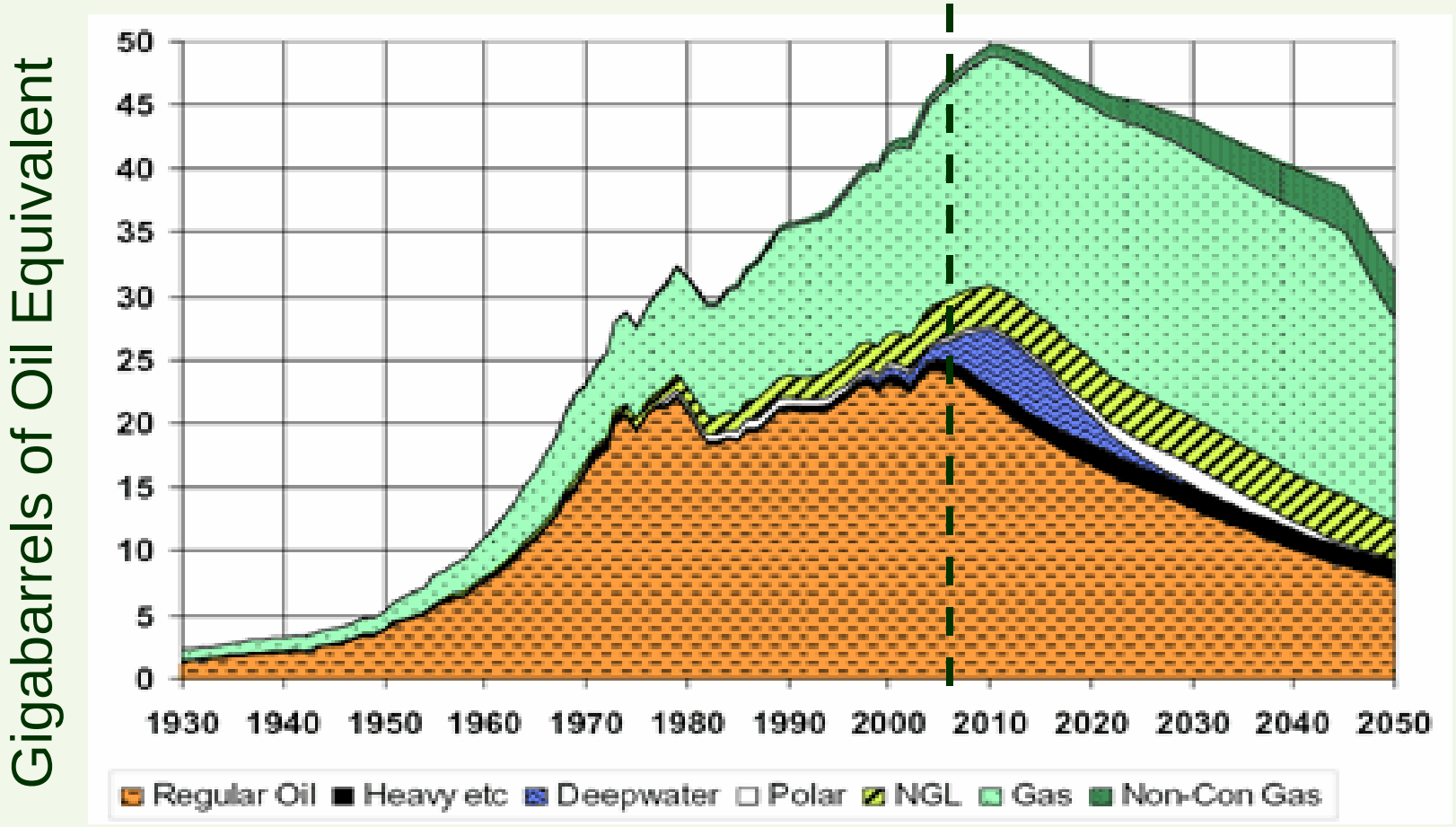
Energy

- Rising fuel prices
- Transport affordability
- Energy dependency
- Energy externalities
- Climate change impacts

Environment

- Air, noise and water pollution
- Sprawl and its costs
- Hazardous cargo & waste
- Community livability
- Equity and social inclusion
- Physical fitness and health

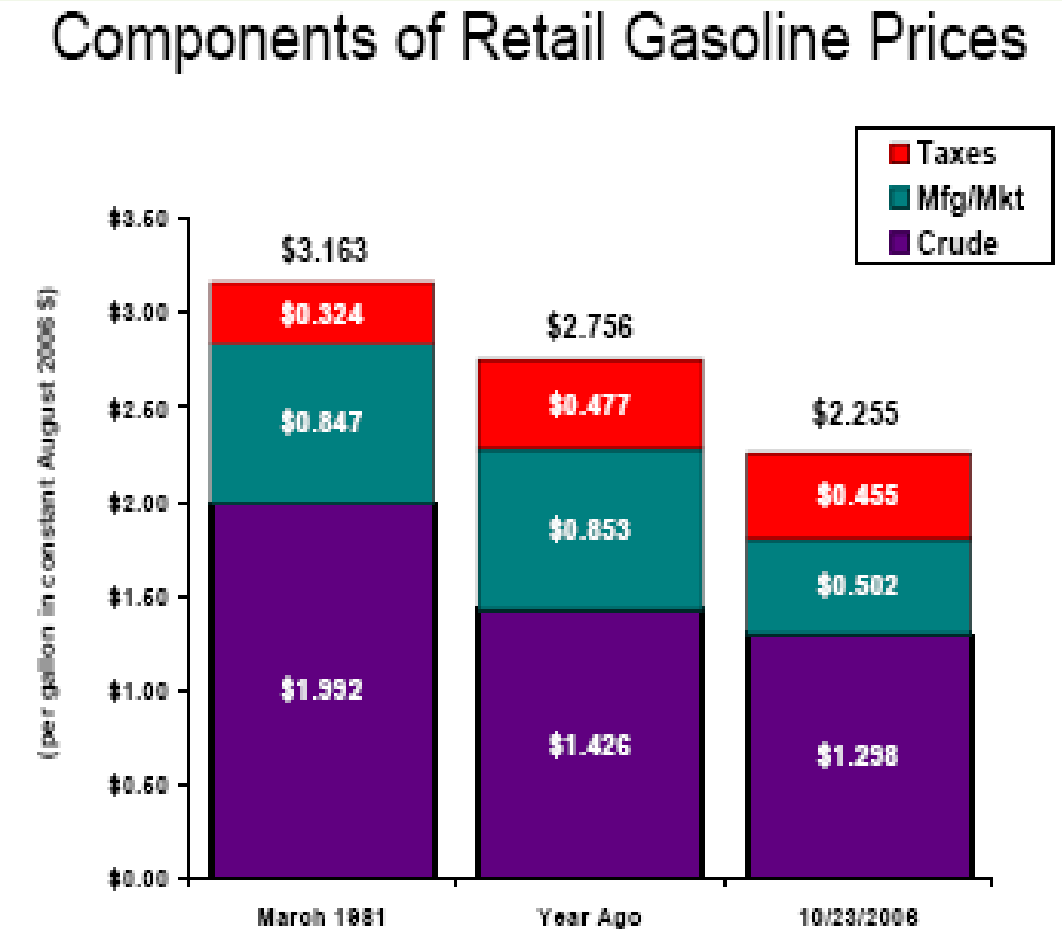
Peak Oil



Source: ASPO (Association For the Study of Peak Oil)

Crude Portion of Fuel Costs

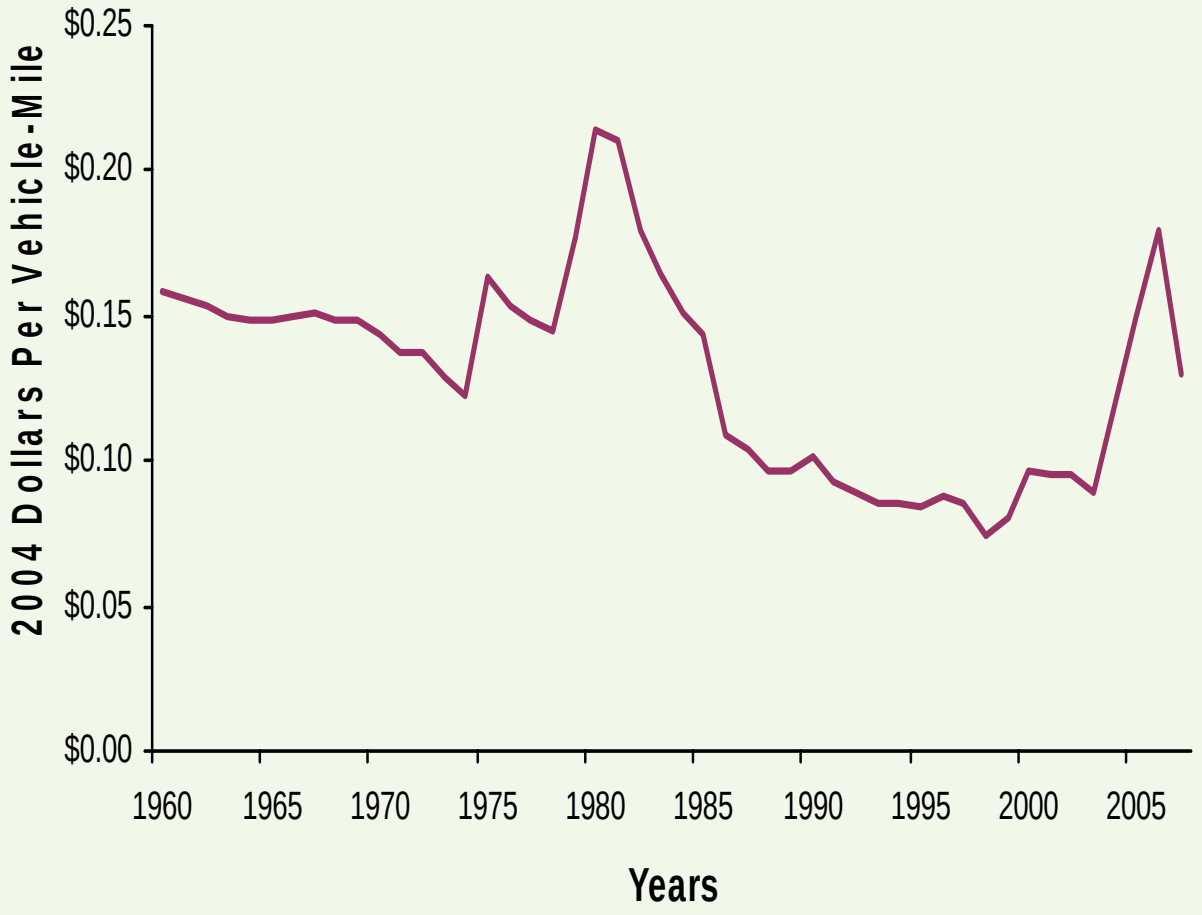
Crude oil represents about half of U.S. fuel prices, so doubling crude oil costs only increases retail prices 50-60%.



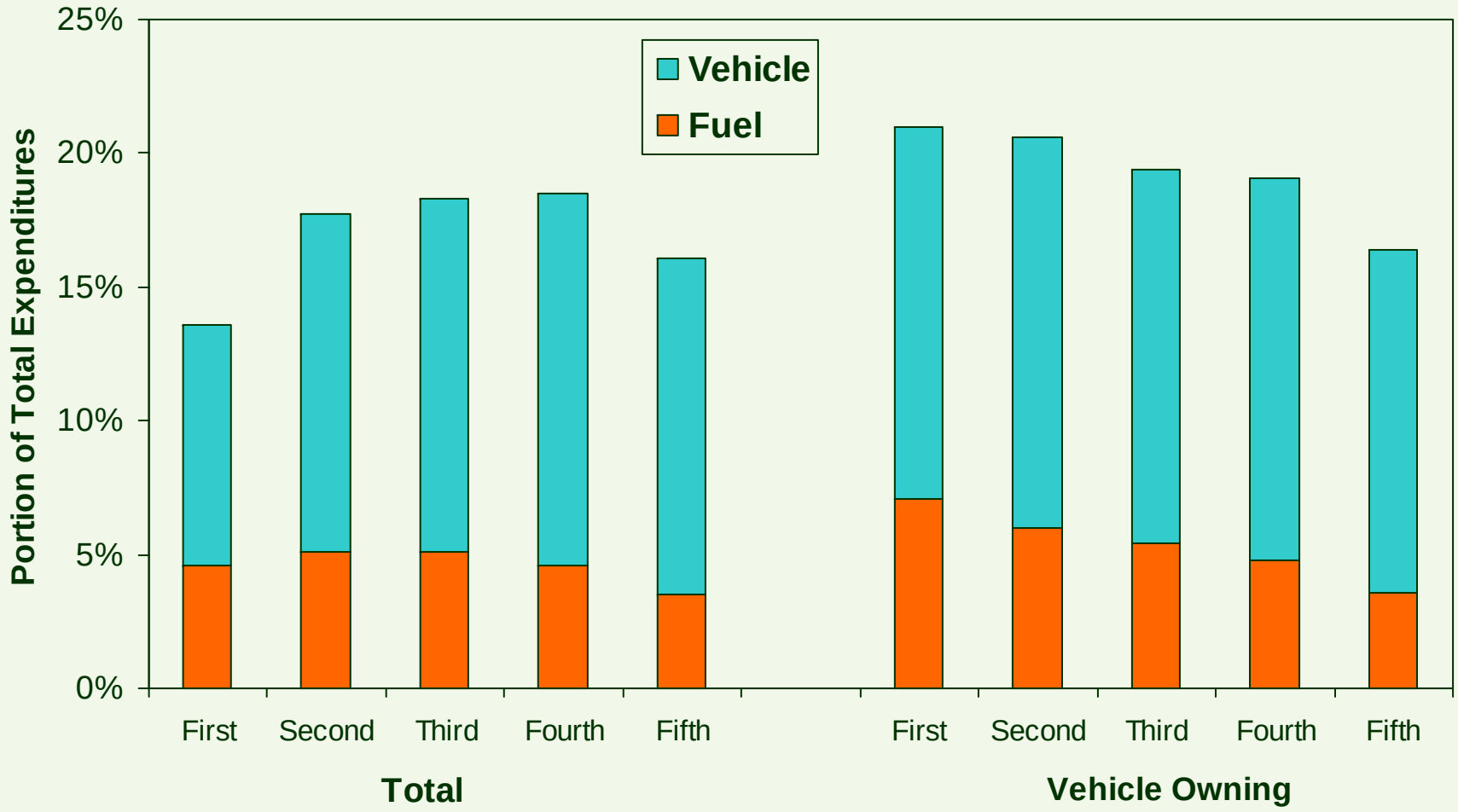
Sources: U.S. Dept of Energy, U.S. Dept of Labor, and API

Per Mile Fuel Costs

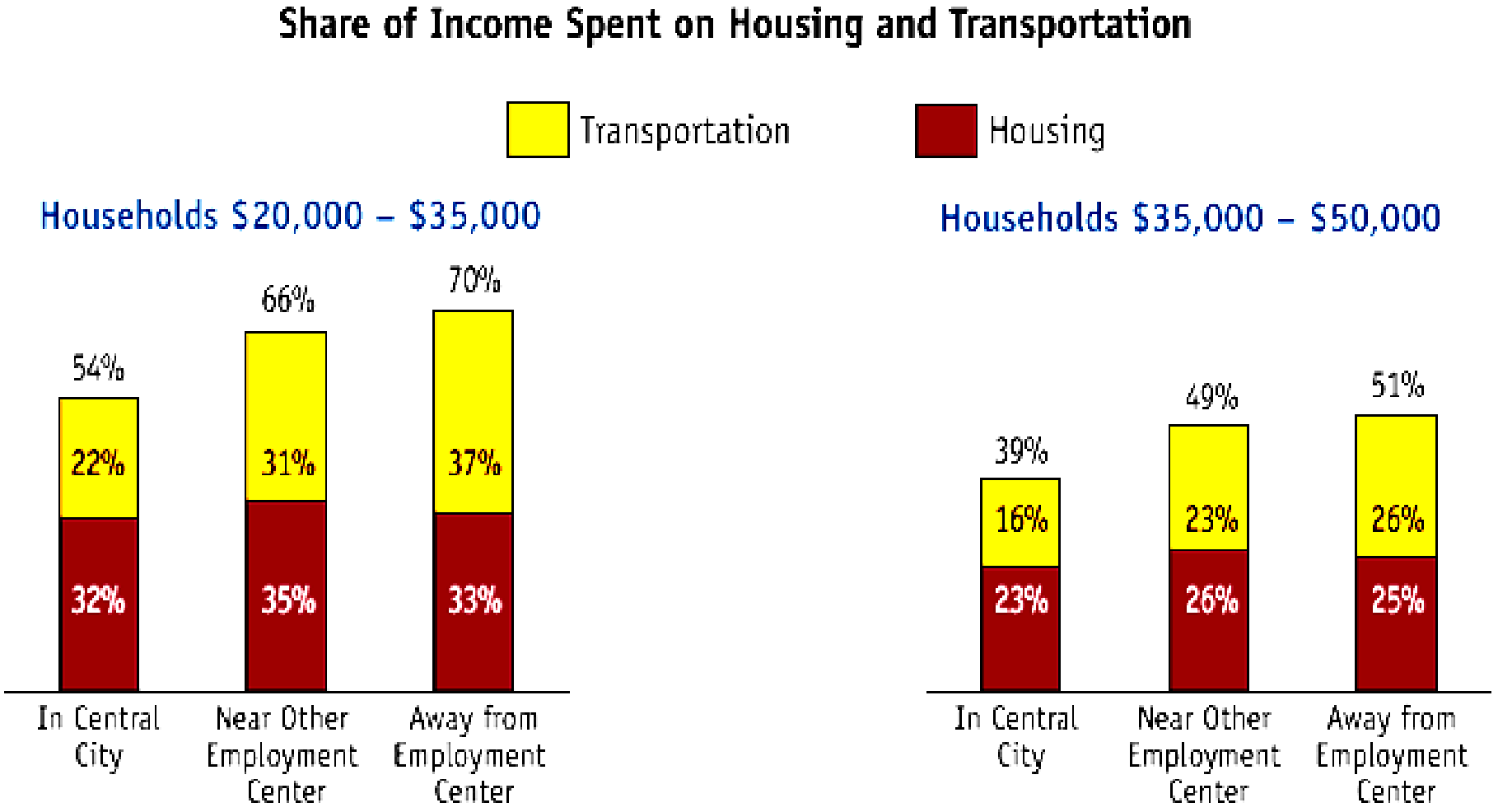
During most of the last century, per-mile fuel costs declined, but this trend is not expected to continue in the future.



Household Expenditures



"A Heavy Load" Report



Alternative Fuels

Available at $40-80 a barrel:

- Tar sands and oil shales.
- Coal gasification.
- Biofuels (ethanol and biodiesel).
- Nuclear- or coal-produced hydrogen.
- ???

More Fuel Efficient Vehicles

Commercially available vehicles that meet most travel needs have 2-3 times average vehicle fuel efficiency of the current fleet average.

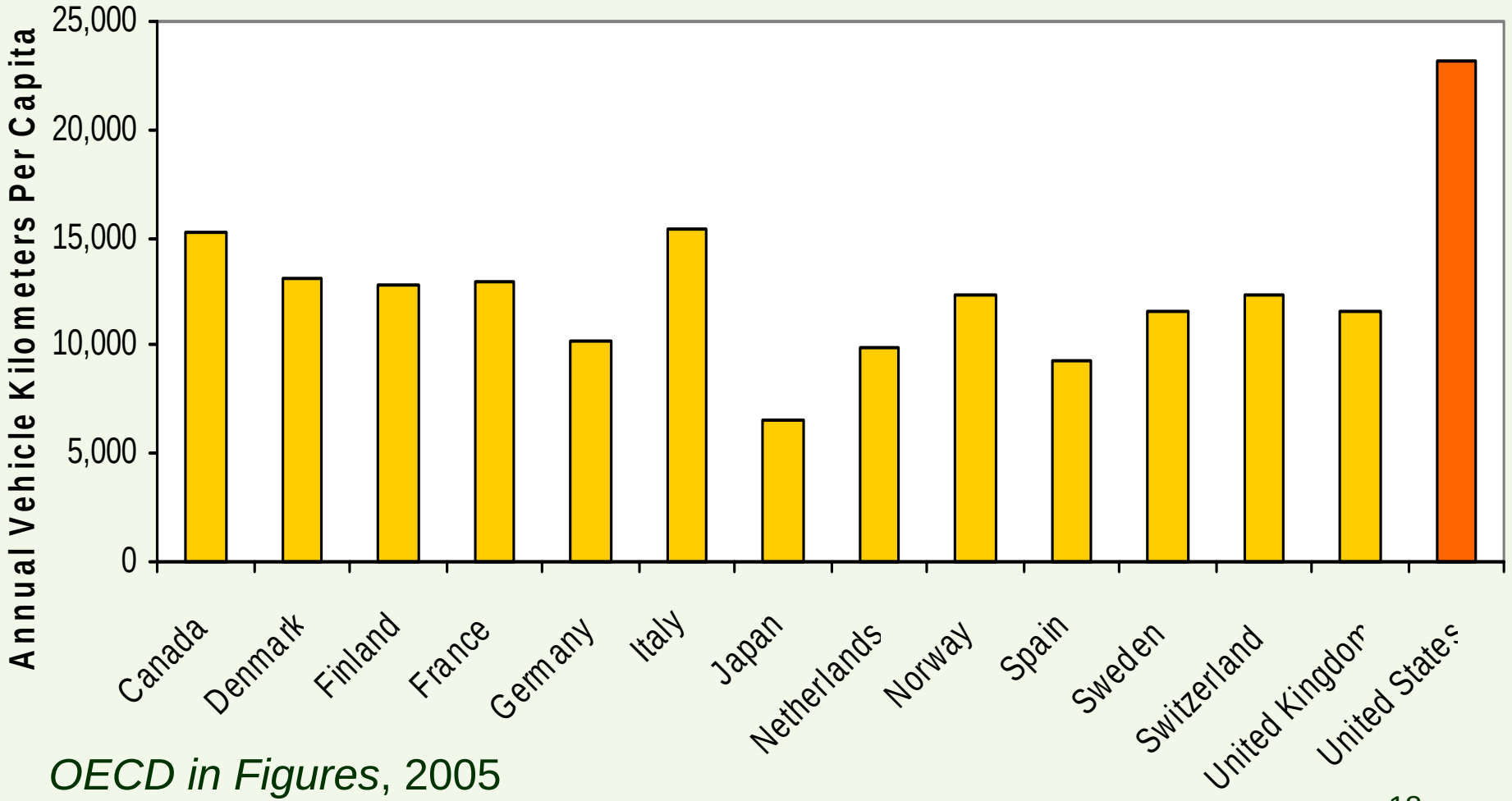
2005 Toyota Prius
Rated 60/51 mpg City/Highway

Defining The Problem

The age of cheap oil is over. The age of dirty, moderate-priced alternative fuels may begin.

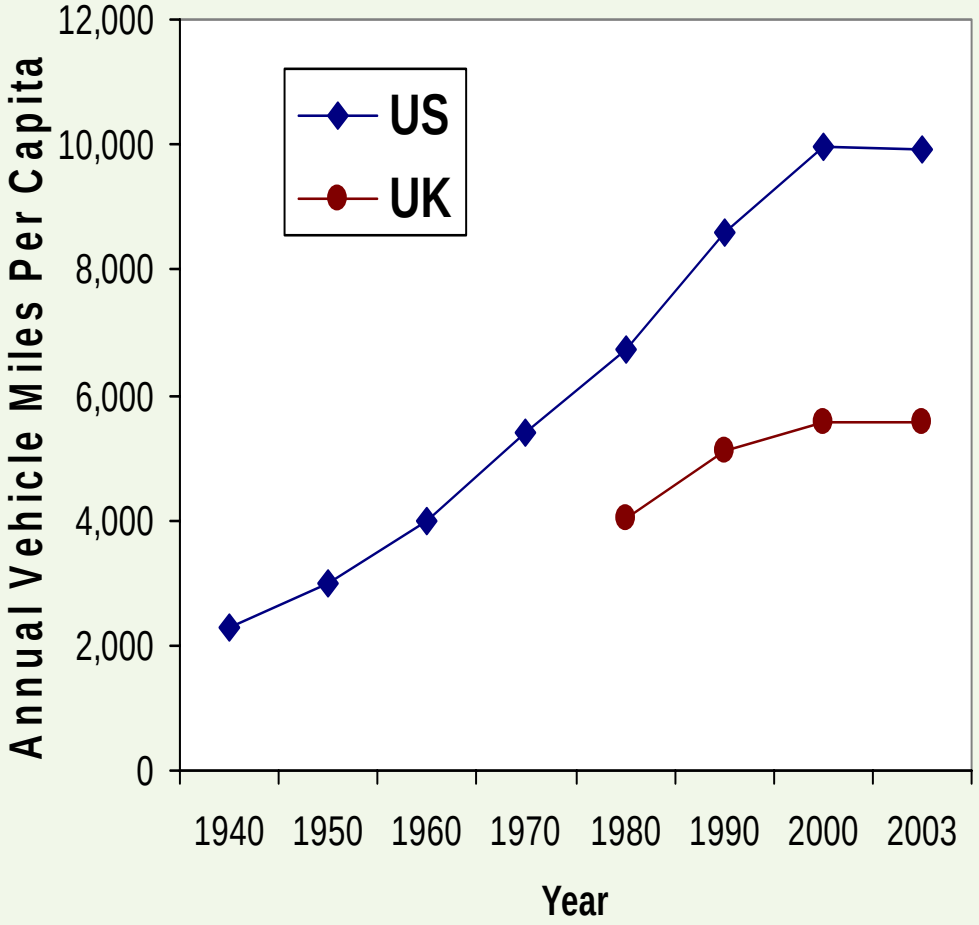
Defining the problem only as an energy shortage justifies costly and harmful energy subsidies.

Per Capita Vehicle Travel



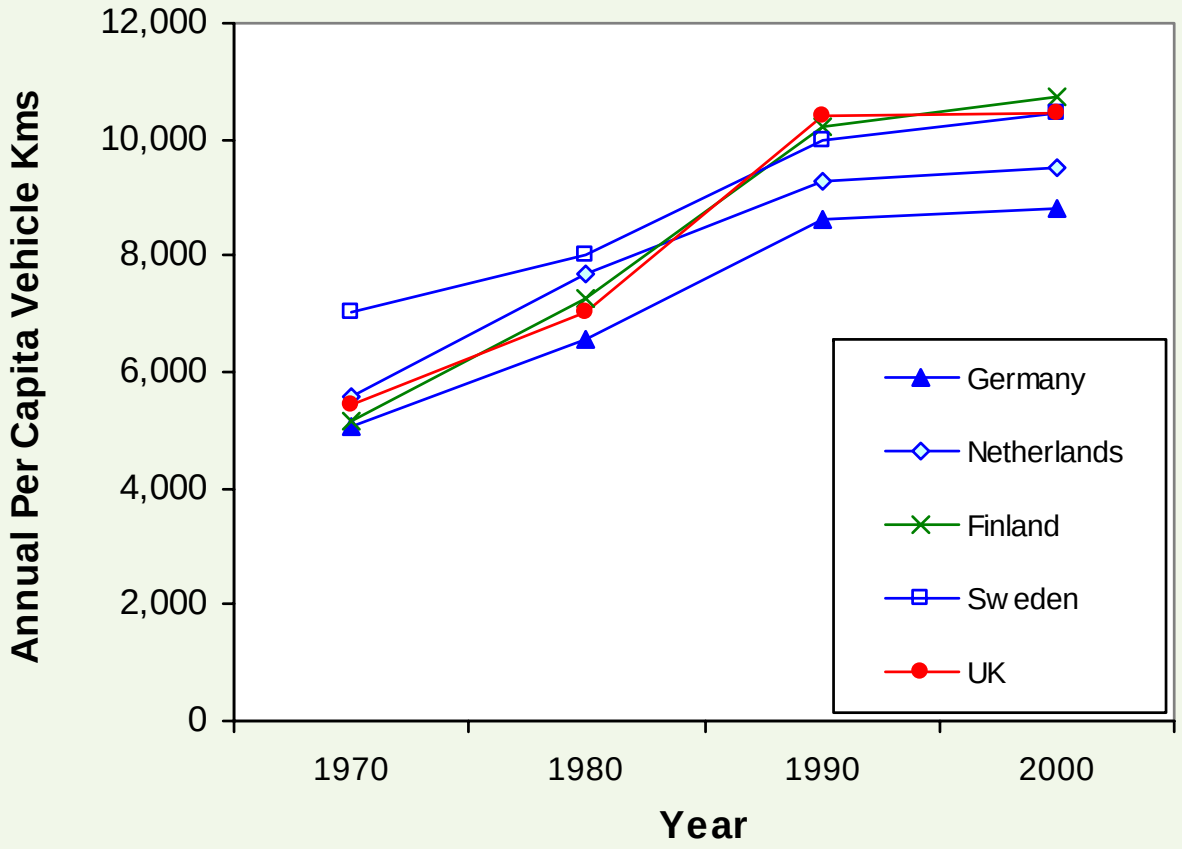
OECD in Figures, 2005

Vehicle Travel Trends



Per capita annual motor vehicle mileage also grew substantially during the last century but has since leveled off in the U.S.

International Travel Trends



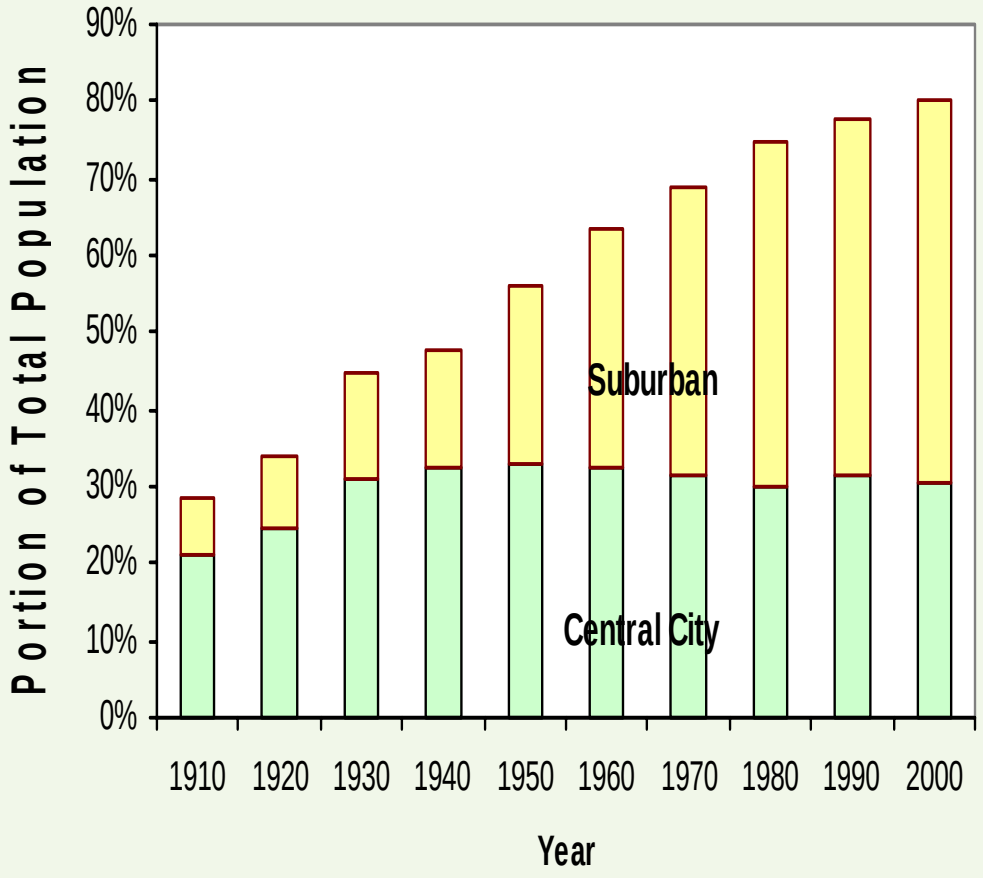
Similar patterns are occurring in other developed countries.

Effects of Technology

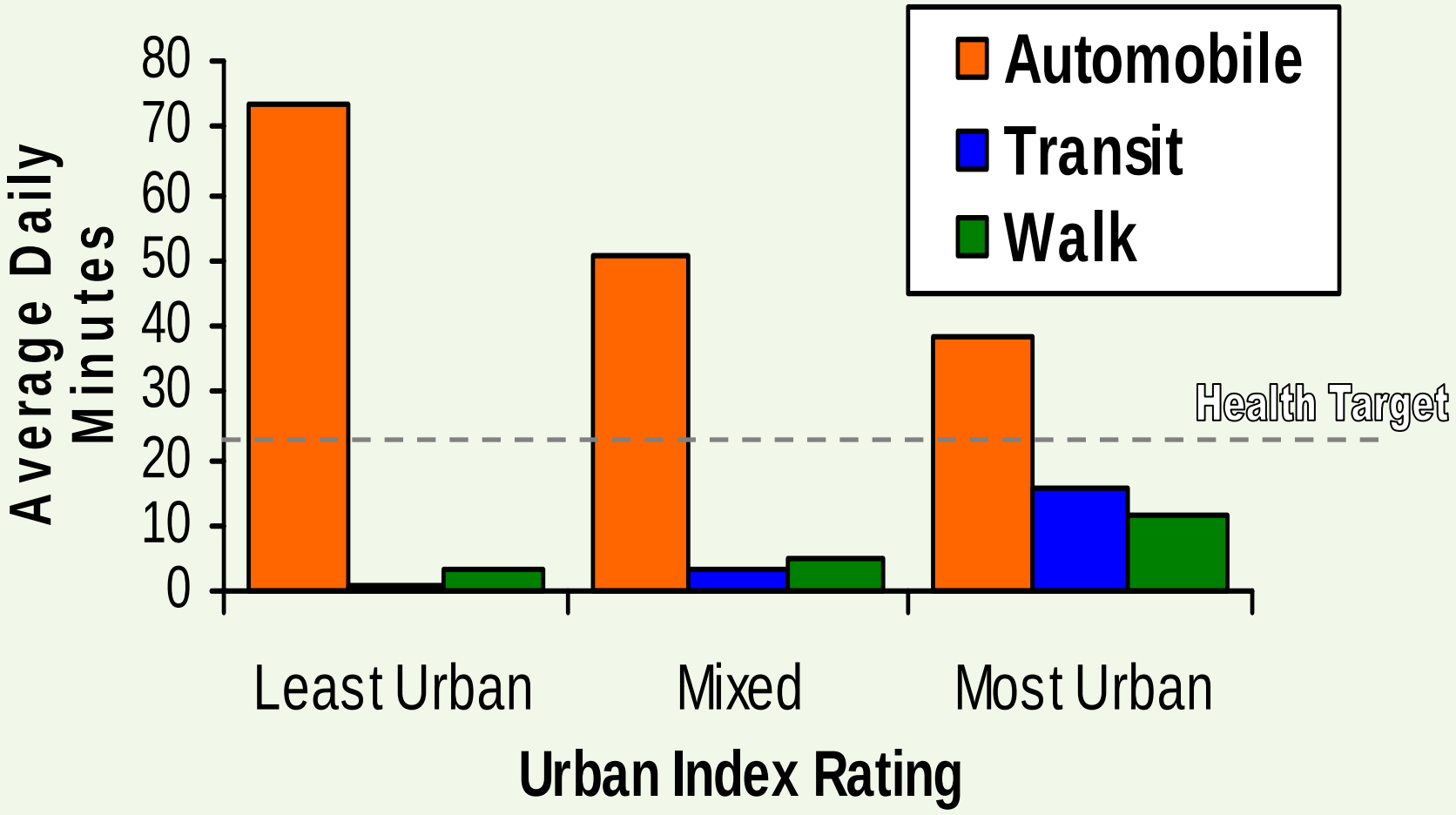
Increases Motorized Travel	Mixed Travel Impacts	Reduces Motorized Travel
Increased fuel efficiency.	Improved traffic signal control.	Telework.
Increased comfort.	Improved navigation.	Improved road and parking pricing.
Automated driving.		Transit service improvements.
		Rideshare matching.
		Delivery Services

Urbanization

Between the 1940s and 1980s the population became more suburbanized. Now, about half of North Americans live in suburbs.

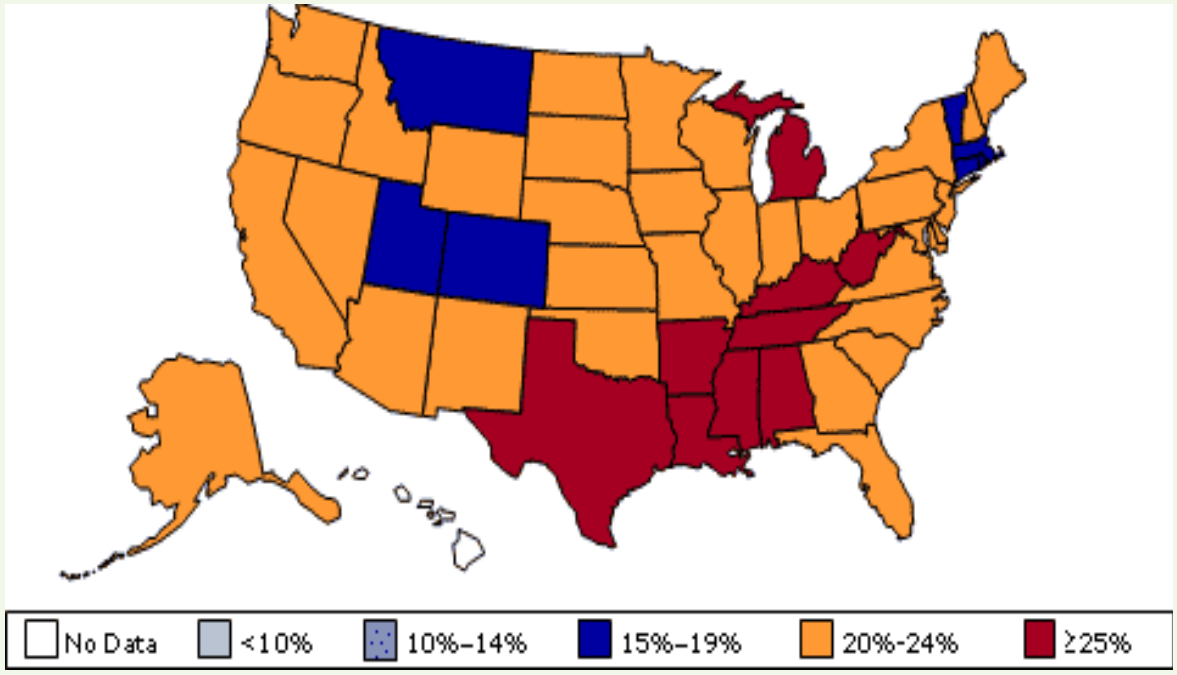


Land Use Impacts On Travel



Health Concerns

Obesity Rates (BMI > 30)



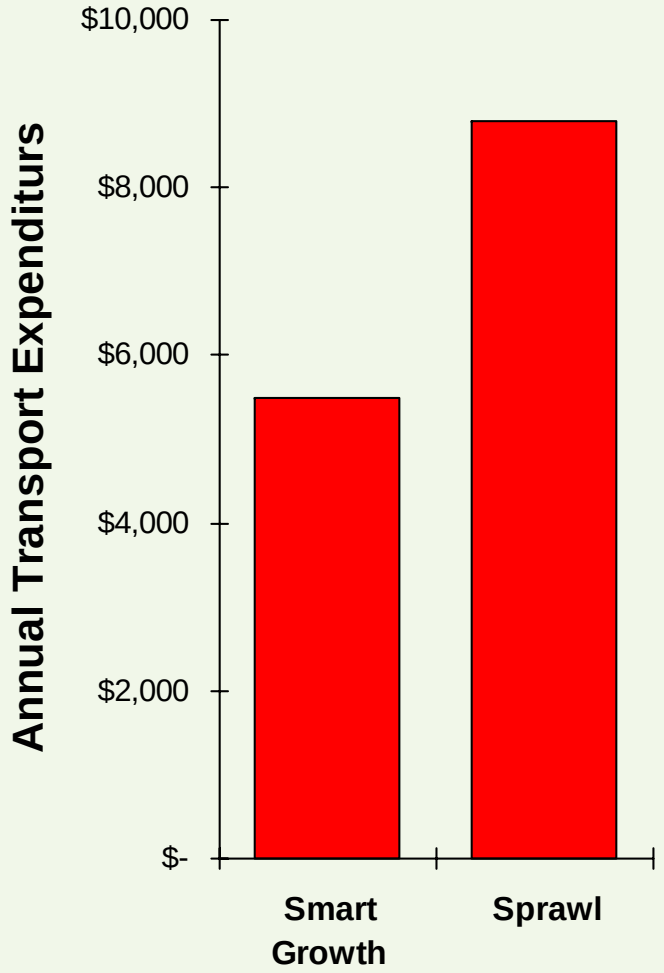
There is increasing concern about the health problems that result from reduced physical activity, and the value of transport systems that accommodate walking and cycling.

What Gets People Moving?

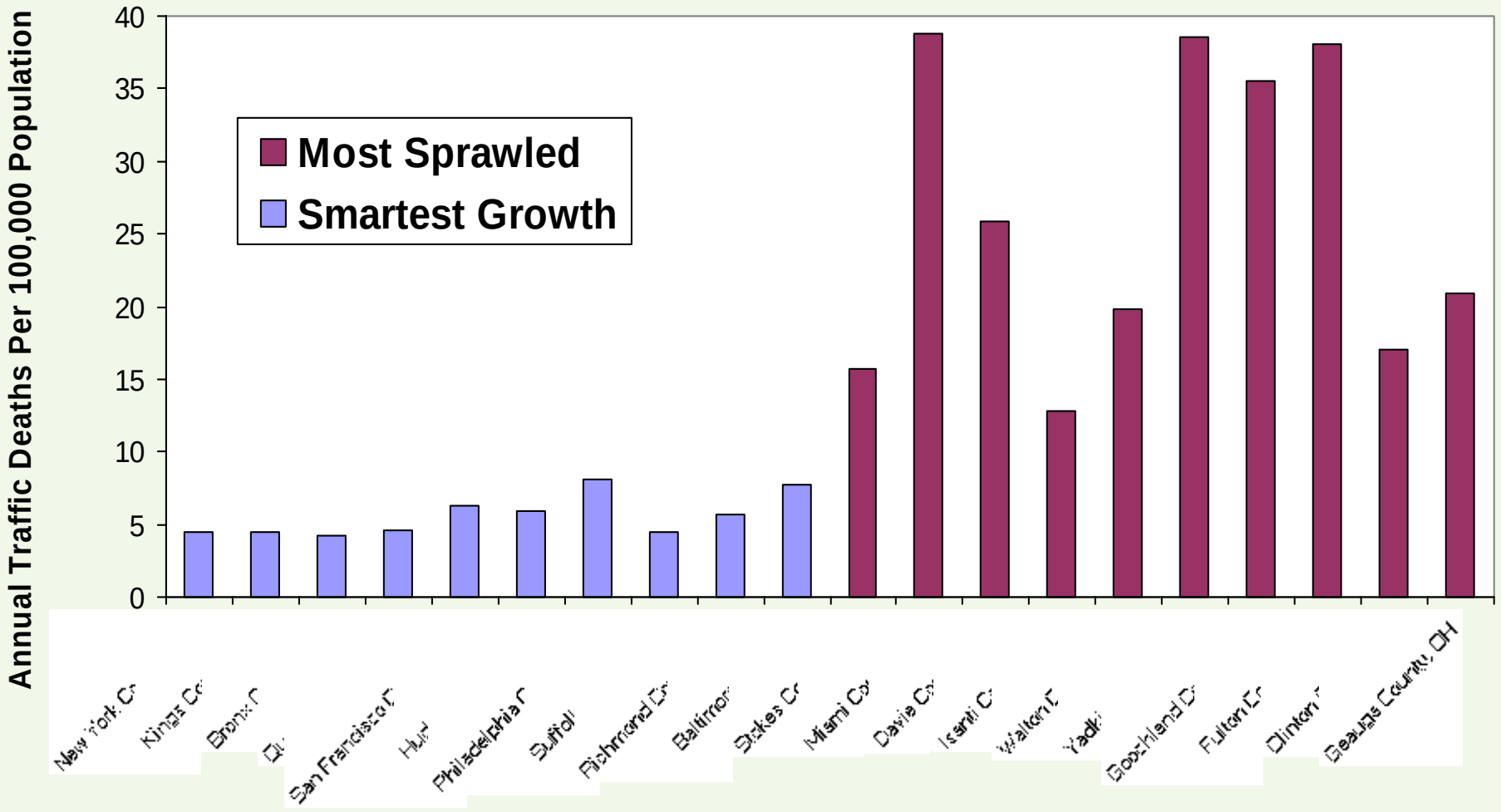
Walking is a natural and essential activity. If you ask sedentary people what physical activity they will most likely to stick with, walking usually ranks first.

Sprawl Is Costly

- Increases infrastructure and public service costs.
- Increases transportation costs and reduces travel options.
- Environmental costs (reduced greenspace and wildlife habitat).

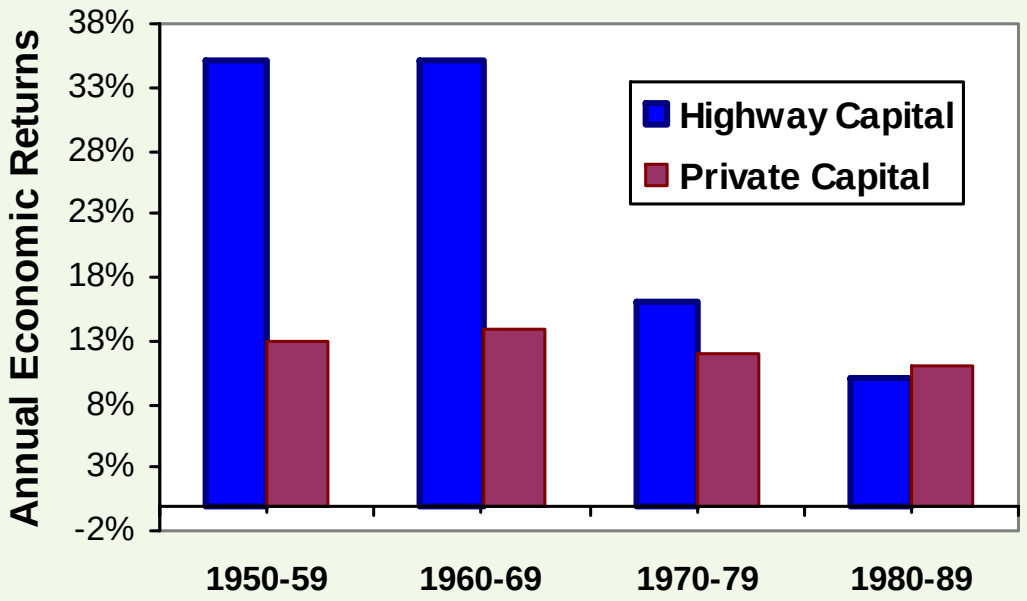


Smart Growth Safety Impacts



Value of Highway Expansion

When major highway systems were being developed in the 1950s and 60s they provided high returns on investment. Now that the system is more mature, economic returns have declined.



Community Livability

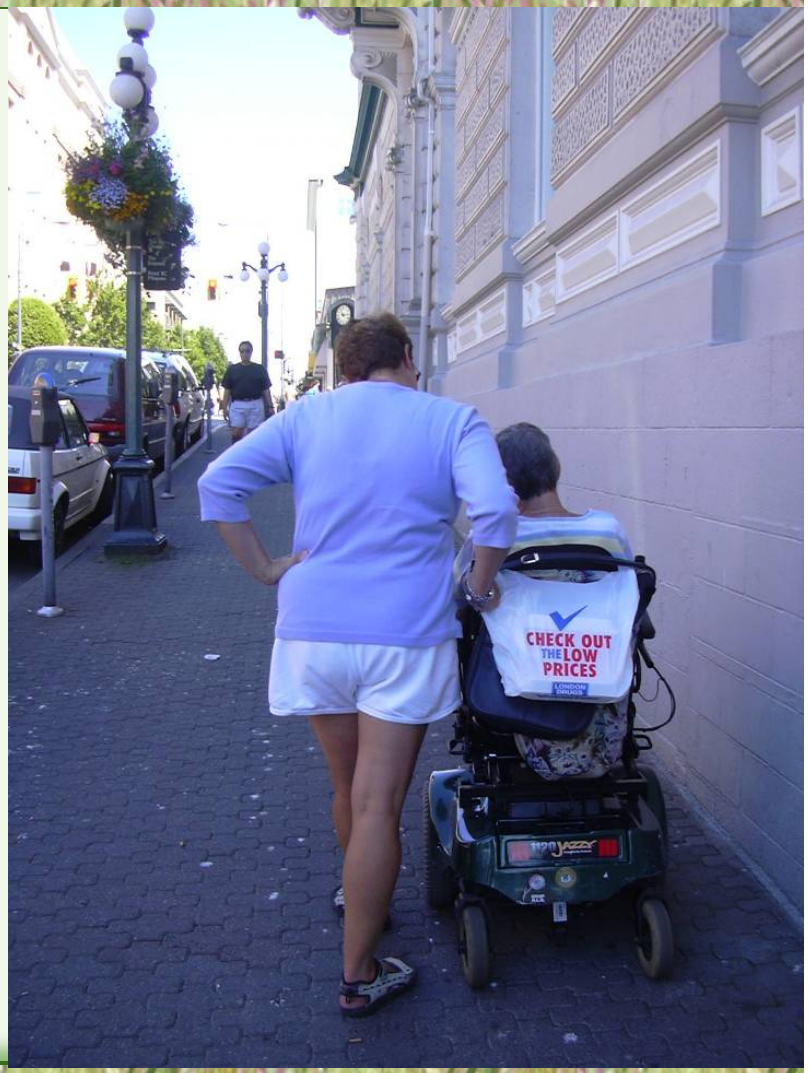
Community Livability refers to the environmental and social quality of an area as perceived by residents, employees, customers and visitors.

Streets that are attractive, safe and suitable for walking and cycling increase community livability.

Equity

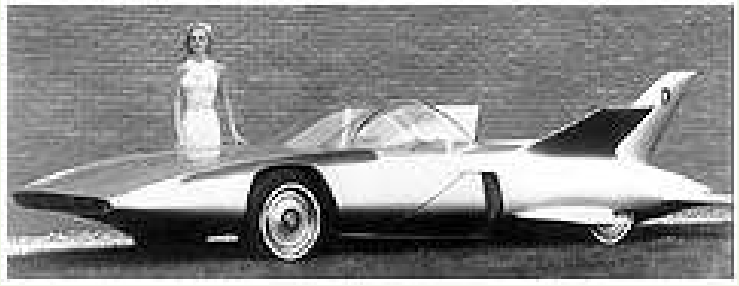
Transportation has significant equity impacts:

- Impacts one mode imposes on other modes.
- Basic mobility for physically, economically or socially disadvantaged people.
- Affordability.



Past Visions of Future Transport

1949 ConvAIRCAR Flying Car



1958 Firebird

Segways

Resource Sustainability

Would we have a sustainable transportation system if all automobiles were solar powered?

Wheeled Luggage

Win-Win Strategies

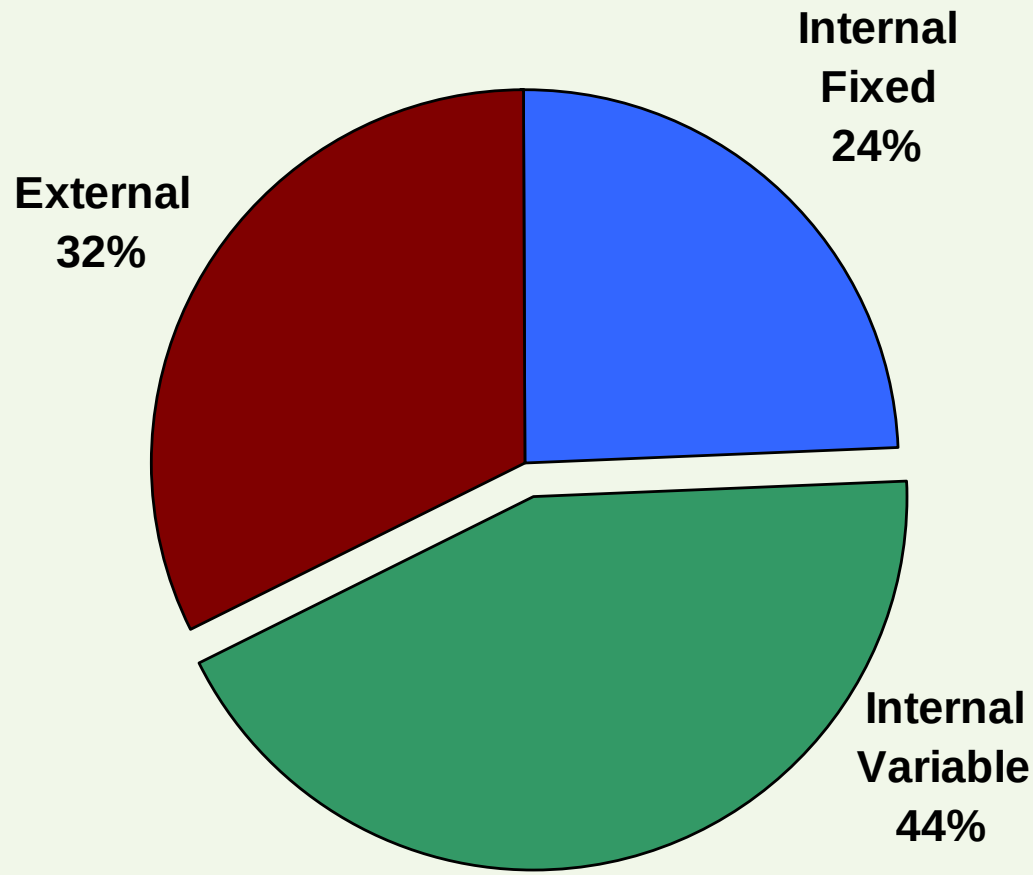
Market reforms justified on economic principles that help provide various economic, social and environmental benefits.

- Improved travel options.
- Incentives to use efficient modes.
- Accessible land use.
- Policy and market reforms.

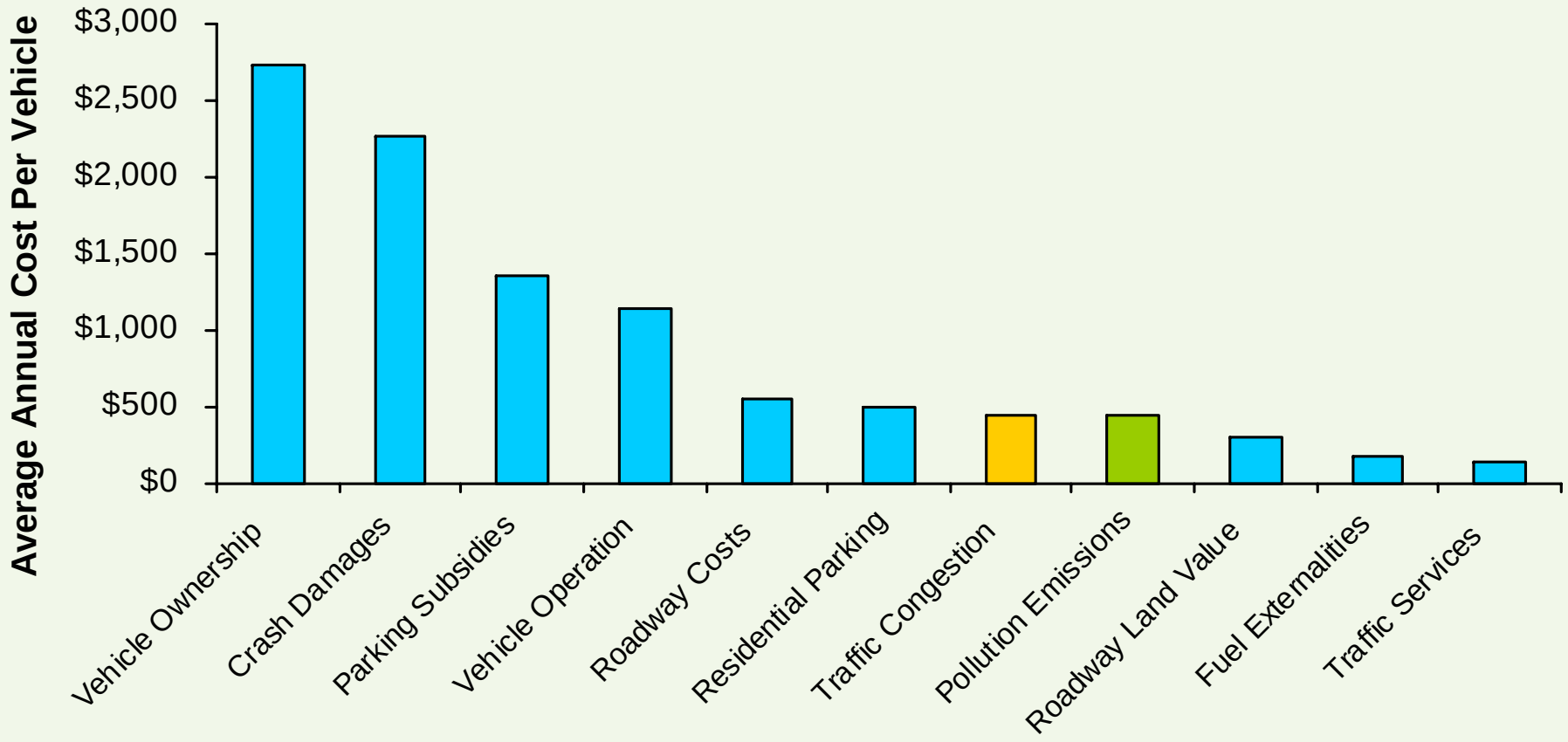
Market Distortions - Examples

- Roadway costs not borne directly by motorists.
- Free/underpriced parking.
- Fixed vehicle insurance and registration fees.
- Lack of congestion pricing (unpriced road “space”).
- Uncompensated environmental damages.
- Tax policies favoring car use (e.g., company cars).
- Land use policies that favor low-density, automobile-oriented development.
- Underinvestment in alternative modes.
- Others...

Automobile Costs



Comparing Costs



"Raise My Prices, Please!"

Of course, motorists do not like to pay more for driving and parking, but unpriced facilities are not really free, consumers ultimately pay through higher taxes and retail prices. The choice is actually between paying directly or indirectly.

Paying Directly Provides Savings

Paying directly is more equitable and efficient, since users pay in proportion to the costs they impose, and capture the savings that result when they drive less, providing a new opportunity to save money.

Motorist Reduces Mileage

⇩

Reduced Congestion, Road & Parking Facility Costs, Reduced Crashes, etc.

⇩

Economic Savings

Employee Trip Reduction Programs

Employers encourage employees to walk, bicycle, carpool and ride transit rather than drive to work. For example, offer a tax incentive for businesses that have effective commute trip reduction programs.

Walking and Cycling Improvements

- More investment in sidewalks, crosswalks, paths and bike lanes.
- More traffic calming.
- Bicycle parking and changing facilities.
- Programs to encourage safe walking and cycling.

School & Campus Transport Management

- Programs that encourage parents and students to use alternative modes to travel to schools, colleges and universities.
- Support alternative modes (e.g., bikeways, crosswalks and traffic calming around schools).

Mode Shifts

How do we convince people who drive luxury cars to shift mode?

Ridesharing: Puget Sound Example

The Puget Sound region has the most successful vanpool program in North America. About 7% of commute trips over 20 miles in length are by vanpooling. A marketing study suggests that this could double or triple. More than a third of suburban automobile commuters would consider vanpooling, if it had:

- More flexibility.
- High Occupant Vehicle priority lanes and parking.
- More financial incentives.
- Integration with public transit.
- Employer support.

Attracting Discretionary Riders

- Quality service (convenient, fast, comfortable).
- Low fares.
- Support (walkable communities, park & ride facilities, commute trip reduction programs).
- Convenient information.
- Parking pricing or “cash out”.
- Integrated with special events.
- Positive Image.

Distance-Based Pricing

Motorists pay insurance, registration and lease fees by the vehicle-mile, so a $600 annual fees become 5¢/mile and a $2,000 annual fees become 16¢/mile. This gives motorists a significant financial incentive to drive less, but is not a new fee at all, simply a different way to pay existing fees.

Carsharing

Automobile rental services intended to substitute for private vehicle ownership.

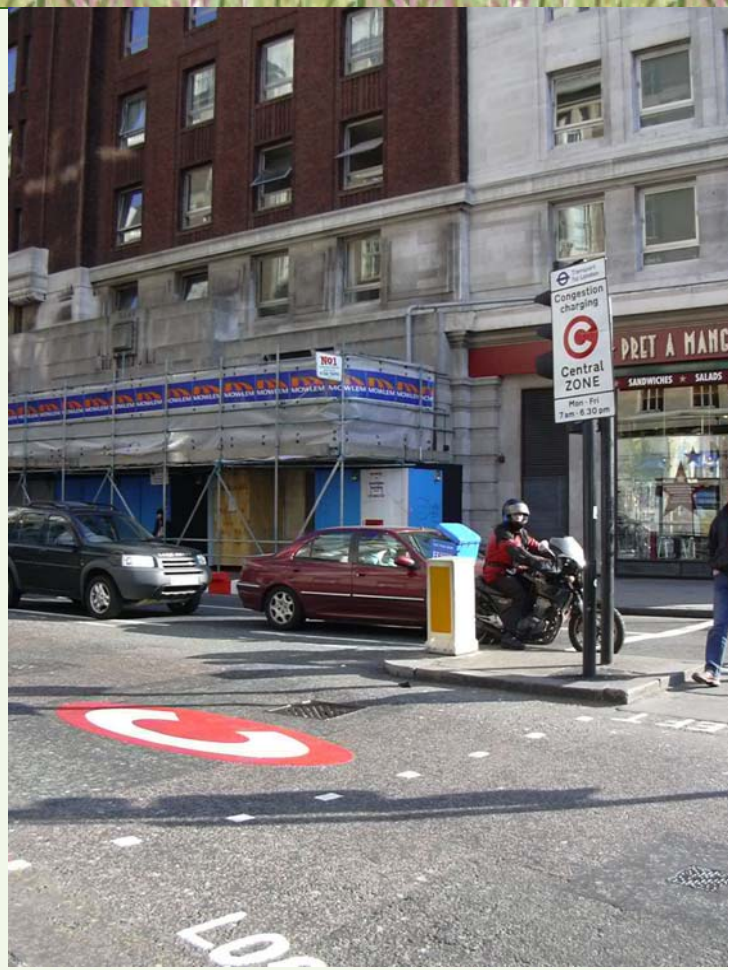
Parking Management

More efficient parking:

- More flexible parking requirements.
- Shared parking.
- Charge users directly for parking, rather than indirectly through taxes and rents.
- Parking Cash Out (Employees who current receive free parking are able to choose a cash benefit or transit subsidy instead.)

Road Pricing

- Charge motorists directly for using specific roads, based on use.
- Charge tolls, with higher rates during congested periods and lower rates during off-peak.
- Use electronic pricing systems that eliminate the need for tollbooths.
- Dedicate revenue to transport improvements (roads, transit and other services).



Raising Fuel Taxes

- Increase existing taxes to reflect inflation and cover roadway costs.
- Revenue neutral tax shifts.
- Increases should be gradual and predictable (e.g., 5% annual increase over inflation for a decade).
- Use revenues to address popular policy objectives. Emphasize to consumers that these additional taxes are “buying” benefits that people value.
- Emphasize fuel tax increases as part of a multi-faceted program to achieve economic and environmental objectives.

Reform Planning Practices

- *Multi-modal planning:* create a diverse and integrated transportation system.
- *Fix-It-First:* Major capacity expansion deferred until basic maintenance and operations needs are met.
- *Least-cost planning:* equal funding for mobility management solutions.
- *Context Sensitive Design:* Designing roadways to reflect local needs and preferences.

The Value of Mobility Management

Mobility Management provides multiple benefits. When all impacts are considered, integrated mobility management programs are often the most cost effective way to improve transportation.

Change Management

- “Be a change agent”
- “Think outside the box”
- “Turn problems into opportunities.”
- “Create the future you want to live in”
- “Build partnerships”
- “Think strategically”
- “We ***CAN*** do that!”

Motorists Benefit Too

Win-Win solutions create more balanced transport systems. It is no more “anti-car” than a healthy diet is anti-food. Motorists have every reason to support these reforms:

- Reduced traffic and parking congestion.
- Improved safety.
- Improved travel options.
- Reduced chauffeuring burden.
- Often the quickest and most cost effective way to improve driving conditions.

www.vtpi.org

"Win-Win Emission Reduction Strategies"
"Appropriate Response To Rising Fuel Prices"
"The Future Isn't What It Used To Be"
"Online TDM Encyclopedia"

Many Others…