



# Valuing Active Transport: Why and How to Improve Walking and Cycling

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*Victoria Transport Policy Institute*

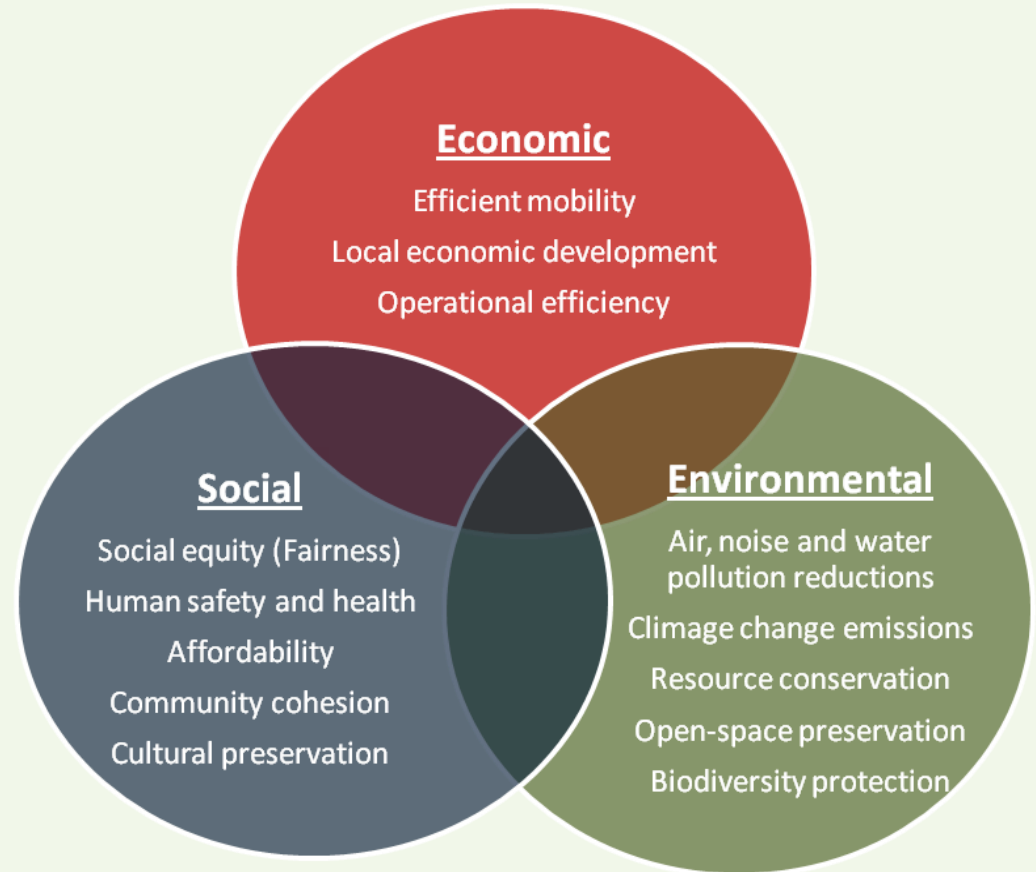
*Active Transportation Symposium*

Christchurch, New Zealand

13 May 2013

# *Sustainable Planning*

Sustainability emphasizes the integrated nature of human activities and therefore the need to coordinate planning among different sectors, jurisdictions and groups.



# *Preventing Problems*



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

# *Sustainable Transportation?*

Is a transport system sustainable if all vehicles are electric powered?



# *Electric Power Does Not:*

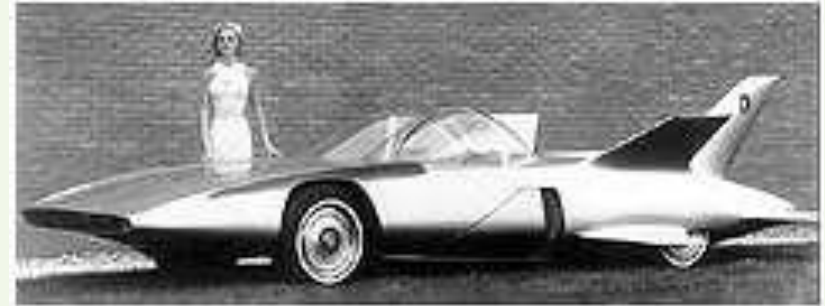
- Reduce traffic congestion
- Reduce accidents
- Reduce roadway costs
- Reduce parking facility costs
- Reduce vehicle purchase costs
- Improve mobility for non-drivers
- Improve social equity
- Improve public fitness and health
- Reduce sprawl
- Protect threatened habitat



# *Past Visions of Future Transport*



1949 ConvAIRCAR Flying Car



1958 Firebird



Segways



Supersonic Concorde

# *2001 A Space Odyssey*



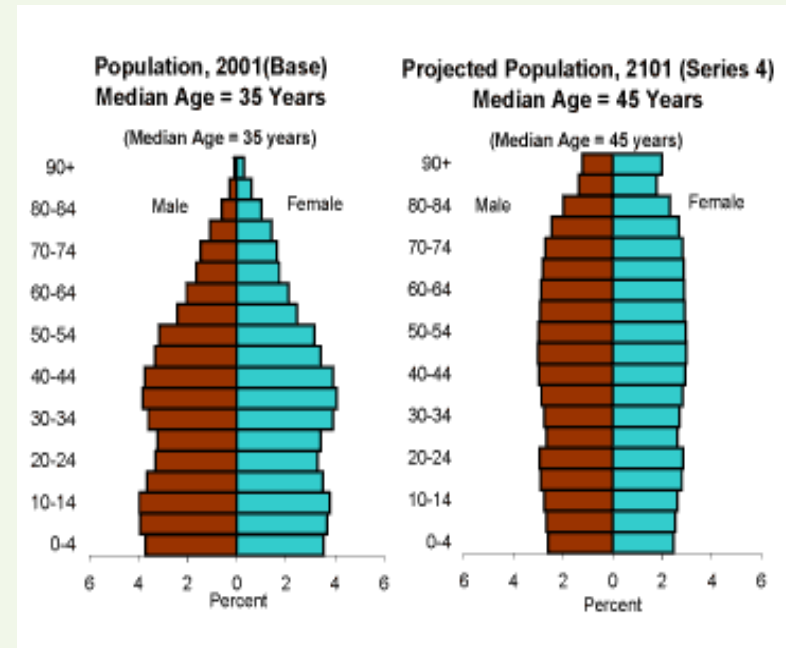
# *Wheeled Luggage*





# Who Benefits?

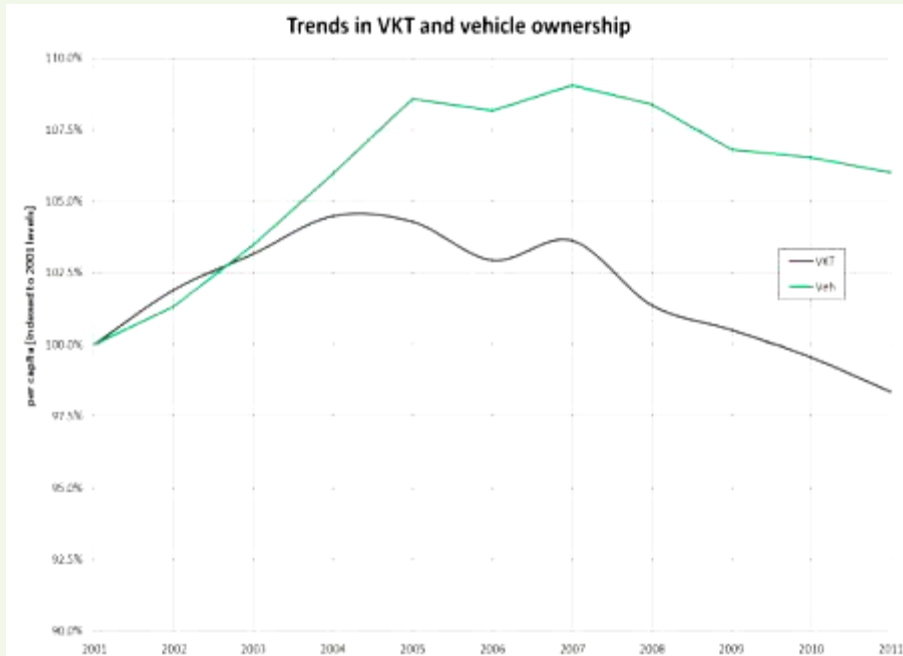
- Law-abiding drinkers
- Seniors, many of whom do not or should not drive (about 10% of total population and increasing)
- Youths 8-18 (about 20% of total population)
- People who cannot drive due to disability (3-5%)
- Households with low incomes that want to minimize automobile expenses
- People who walk or bike for enjoyment and health
- Pets who walk for enjoyment and health
- Residents who don't want vehicle pollution
- Motorists who want to avoid chauffeuring non-drivers
- Motorists who want convenient parking



# *Walking & Cycling Benefits*

Improved Active Transport Conditions	Increased Active Transport Activity	Walkable Community Design	Reduced Automobile Travel
<ul style="list-style-type: none"> <li>• Improved user convenience and comfort</li> <li>• Improved travel options, particularly for non-drivers</li> <li>• Improved local property values</li> </ul>	<ul style="list-style-type: none"> <li>• Improved public fitness and health</li> <li>• User enjoyment</li> <li>• Increased community cohesion (positive interactions among neighbors)</li> </ul>	<ul style="list-style-type: none"> <li>• More livable communities.</li> <li>• Reduced sprawl (more compact, mixed development) reduces land consumption, reduces costs of providing public services, preserves openspace.</li> <li>• Improved accessibility, particularly for non-drivers</li> <li>• Reduced vehicle ownership</li> </ul>	<ul style="list-style-type: none"> <li>• Reduced traffic congestion</li> <li>• Road and parking cost savings</li> <li>• Consumer cost savings</li> <li>• Reduced crash risk to others</li> <li>• Air and noise pollution reductions</li> <li>• Energy conservation</li> <li>• Economic development benefits</li> </ul>

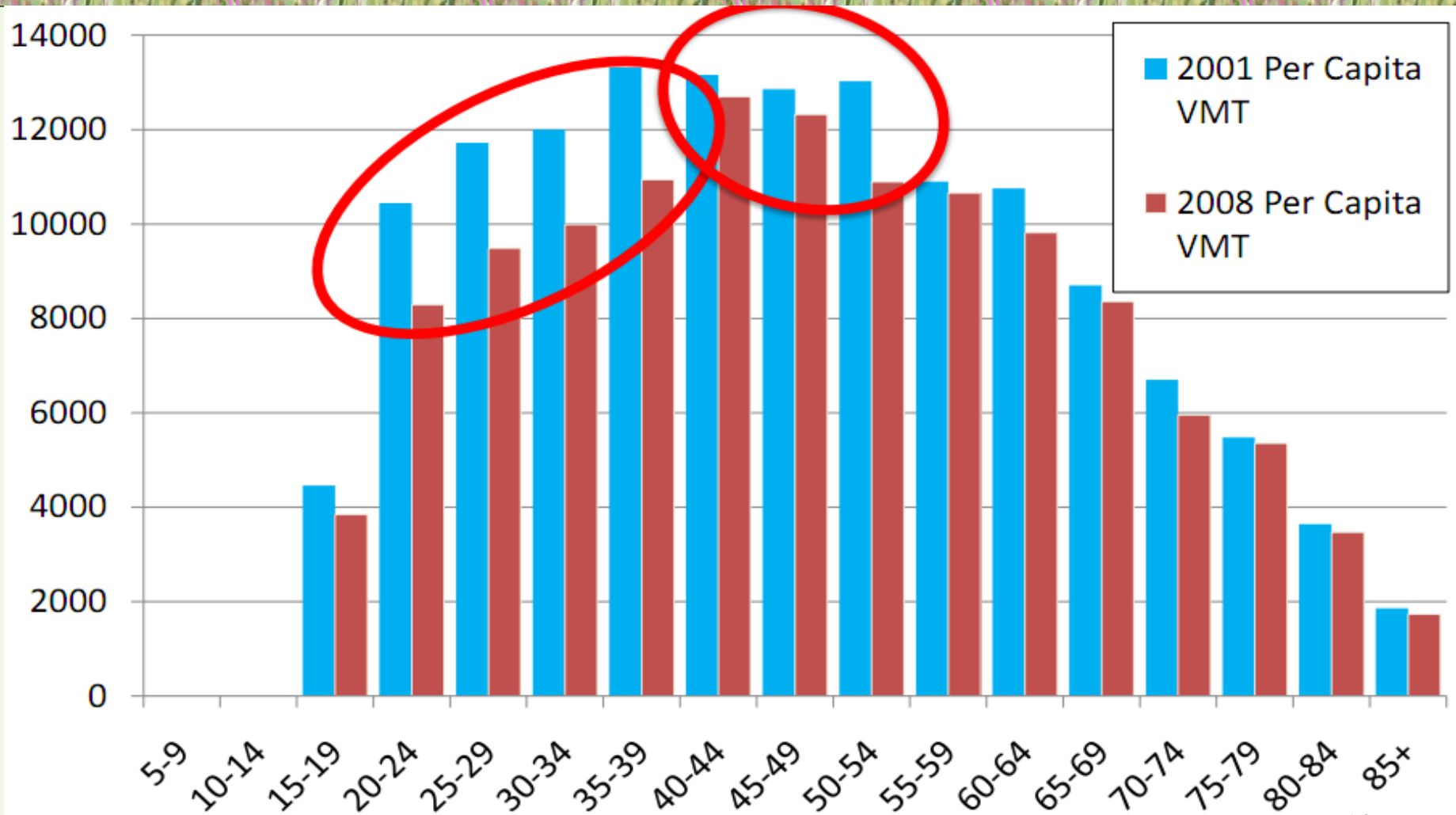
# *Trends Supporting Multi-Modalism*



Stuart Donovan, *Auckland Transport Blog*, 30 April 2013  
<http://transportblog.co.nz/2013/04/30/trends-in-vehicle-travel-in-nz>

- Motor vehicle saturation.
- Aging population.
- Rising fuel prices.
- Increased urbanization.
- Increased traffic and parking congestion.
- Rising roadway construction costs and declining economic return from increased roadway capacity.
- Environmental concerns.
- Health Concerns

# Average Annual Mileage by Age



(Polzin, Chu and McGuckin 2011)

# "The Economist"

22 Sept. 2012

"Governments may find that changes in driving habits force them to rethink infrastructure. Most forecasting models that governments employ assume that driving will continue to increase indefinitely. Urban planning, in particular, has for half a century focused on cars.

If policymakers are confident that car use is waning they can focus on improving lives and infrastructure in areas already blighted by traffic rather than catering for future growth.

By improving alternatives to driving, city authorities can try to lock in the benefits of declining car use.



## The future of driving

### Seeing the back of the car

In the rich world, people seem to be driving less than they used to

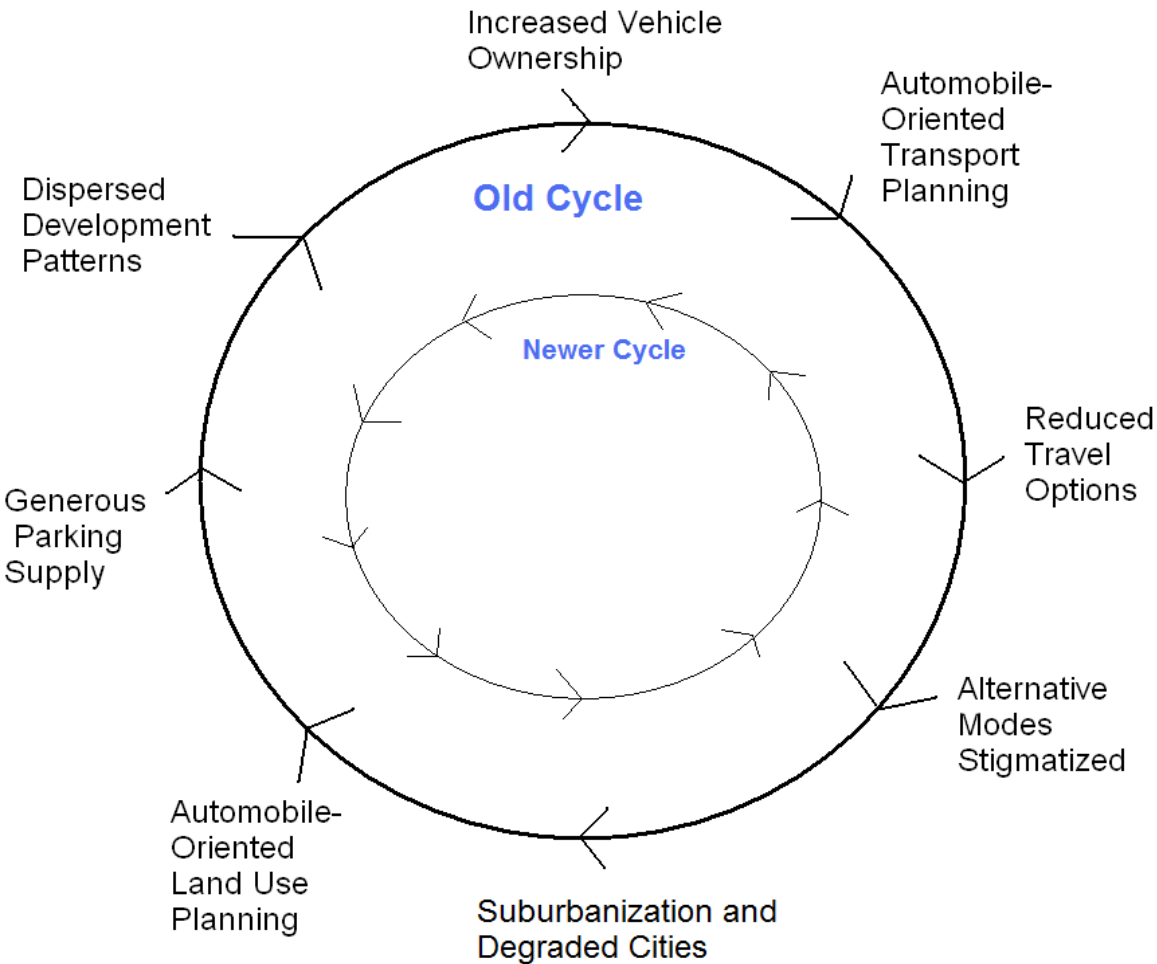
Sep 22nd 2012 | from the print edition

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"I'll love and protect this car until death do us part," says Toad, a 17-year-old loser whose life is briefly transformed by a "super fine" 1958 Chevy Impala in "American Graffiti". The film follows him, his friends and their vehicles through a late summer night in early 1960s California: cruising the main drag, racing on the back streets and necking in back seats of machines which embody not just speed, prosperity and freedom but also adulthood, status and sex.

# *Automobile Dependency and Sprawl*



During the last century many transport and land use development practices tended to favor automobile dependency and sprawl. Many of these trends are now reversing, resulting in a new cycle of growing demand for multi-modal transportation systems and more compact communities.

# *Paradigm Shift*

	<b>Old Paradigm</b>	<b>New Paradigm</b>
Definition of <i>Transportation</i>	<i>Mobility</i> (physical travel)	<i>Accessibility</i> (people's overall ability to reach services and activities)
Transport planning goals	Maximize travel speeds and minimize user costs	Optimize transport system efficiency and equity
Modes considered	Mainly automobile	Multi-modal: Walking, cycling, public transport, and automobile
Performance indicators	Vehicle traffic speeds, roadway Level-of-Service (LOS), distance-based crash and emission rates	Quality of transport options. Multi-modal LOS. Land use accessibility. Quality of accessibility for disadvantaged groups. Various costs to users and society.
Favored transport improvement strategies	Road and parking facility expansion.	Improve transport options. TDM. More accessible land development.
Health impacts considered	Per-kilometer traffic crash and pollution emission rates	Per capita crash, emission and physical activity rates, and basic access

# *Mobility Versus Accessibility*

## **Mobility (physical movement)**

- Favors faster modes and longer trips
- Ignores land use impacts
- Supports highway expansion and sprawl



## **Accessibility (ability to reach desired services and activities)**

- Favors multi-modalism. Recognizes the roles of non-motorized and public transport.
- Recognizes land use impacts on accessibility
- Supports comprehensive, integrated planning and smart growth development





# *What is "The" Transportation Problem?*

- Traffic congestion?
- Road construction costs?
- Parking congestion or costs?
- Excessive costs to consumers?
- 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.

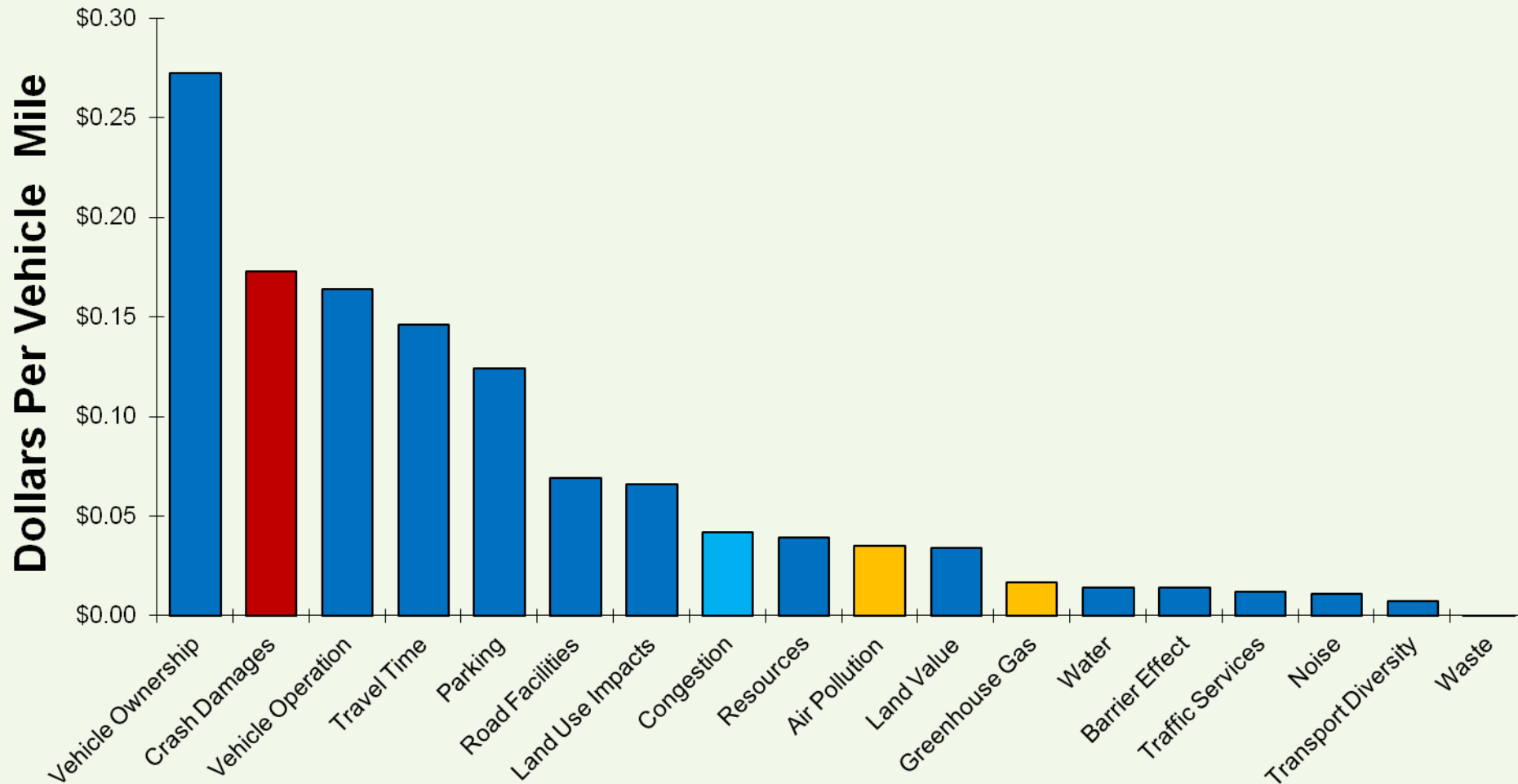
**Ask:**

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

# *Comparing Benefits*

<b>Planning Objectives</b>	<b>Expand Roadways</b>	<b>Efficient and Alt. Fuel Vehicles</b>	<b>Improve Alt. Modes and Smart Growth</b>
<i>Vehicle Travel Impacts</i>	<i>Increased VMT</i>	<i>Increased VMT</i>	<i>Reduced VMT</i>
Reduce traffic congestion	✓		✓
Improved travel experience	✓		✓
Roadway cost savings			✓
Parking cost savings			✓
Consumer cost savings			✓
Improve mobility options			✓
Improve traffic safety			✓
Energy conservation		✓	✓
Pollution reduction		✓	✓
Land use objectives			✓
Public fitness & health			✓

# *Comparing Costs*



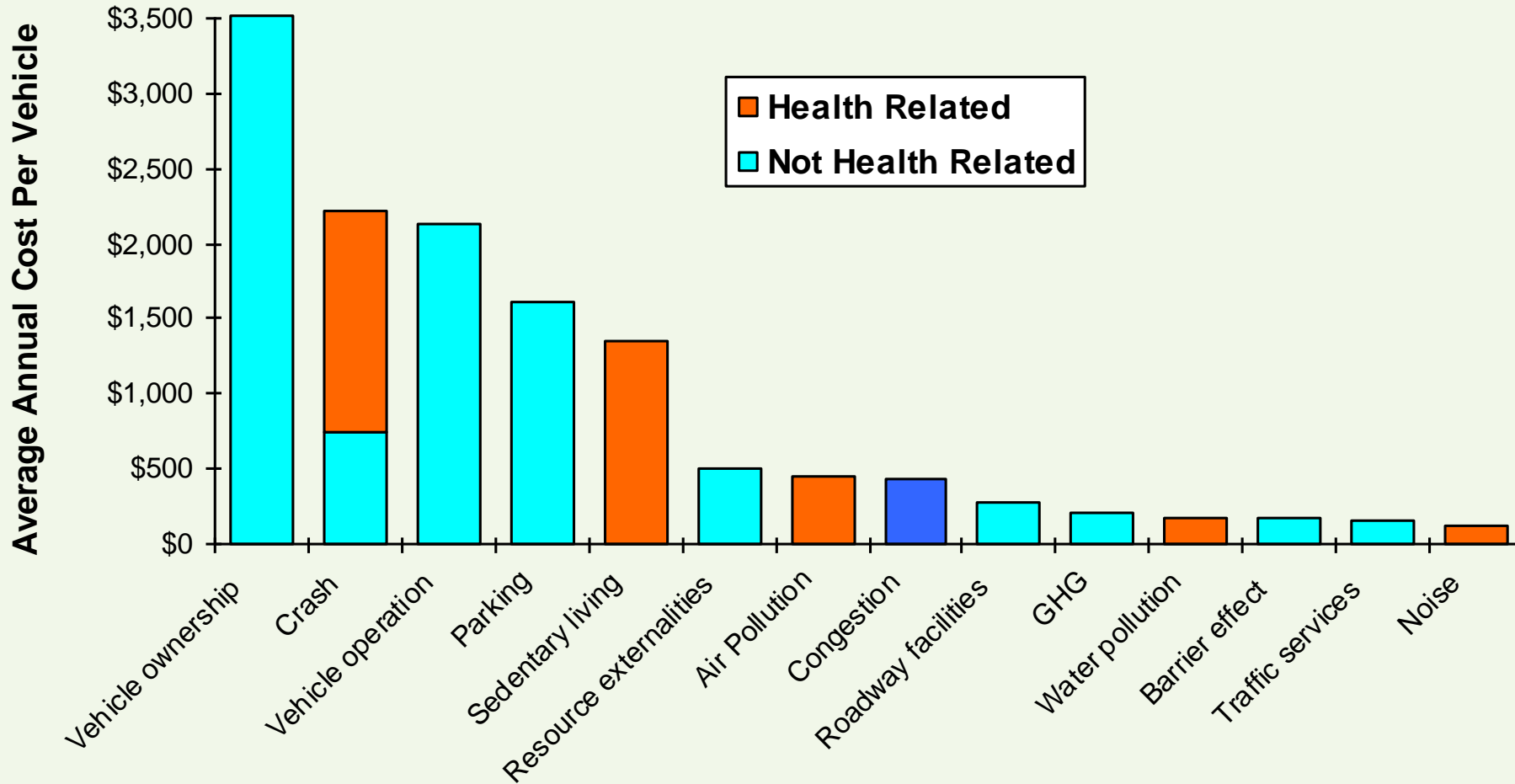
# *Narrow Car Congestion Solution*



“The Tango can fit in a 6-foot half-lane with more clearance than a truck has in a full 12-foot freeway lane. This virtual doubling of lane capacity can make the traffic jam a fading memory. It can also park perpendicularly to the curb like a motorcycle, allowing up to four Tangos in one parallel parking space.”



# Health-Related Costs





# *Valuing Multi-Modalism*

An efficient transportation system is diverse and has suitable incentives for users to choose the best mode for each trip, considering all impacts (benefits and costs). Current planning does a poor job of accounting for many of benefits of this diversity.

*"A developed country is not a place where the poor have cars. It's where the rich use public transportation."*

Gustavo Petro, Mayor of Bogota



# *Equity*

*In most communities, 20-30% of the population cannot drive due to constraints including age (teenagers and seniors), disability and poverty.*

A more diverse transportation systems helps achieve equity objectives:

- A fair share of public resources for non-drivers.
- Financial savings to lower-income people.
- Increased opportunity to people who are physically, socially or economically disadvantaged.



# *Community Livability & Cohesion*



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

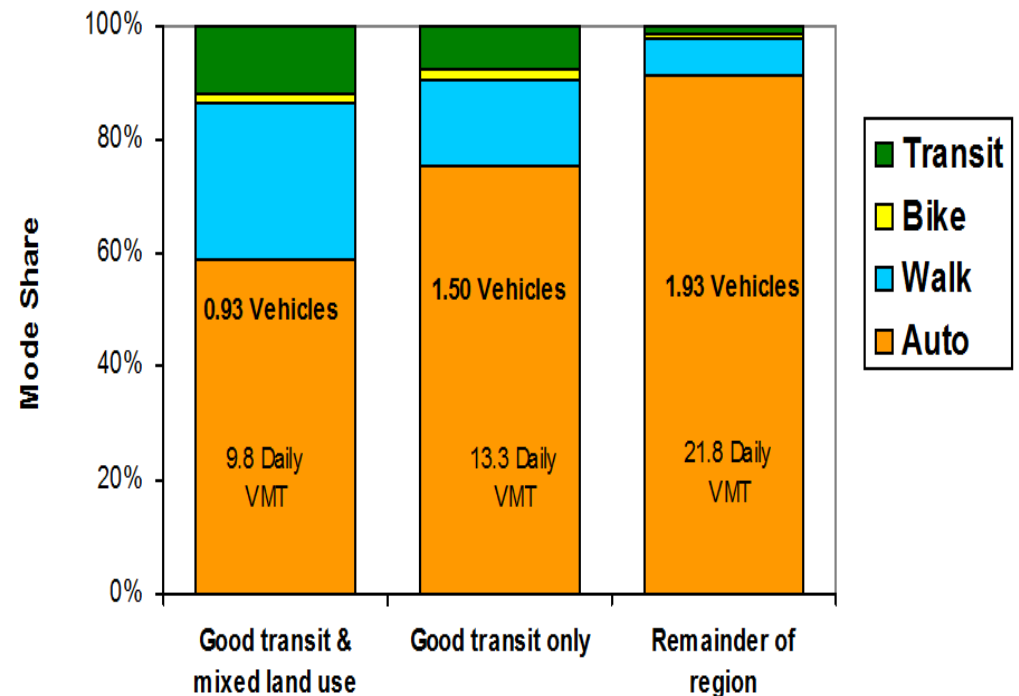
*Community Cohesion* refers to the quantity and quality of positive interactions among people in a community.

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

# *Transit-Oriented Development*

Transit-oriented development (TOD) residents tend to own fewer vehicles, drive about half as much per capita, and rely more on walking, cycling and public transit than they would in more automobile-oriented neighborhoods.

Only a minor portion of these differences are explained by self-selection.



# *Congestion Reduction*

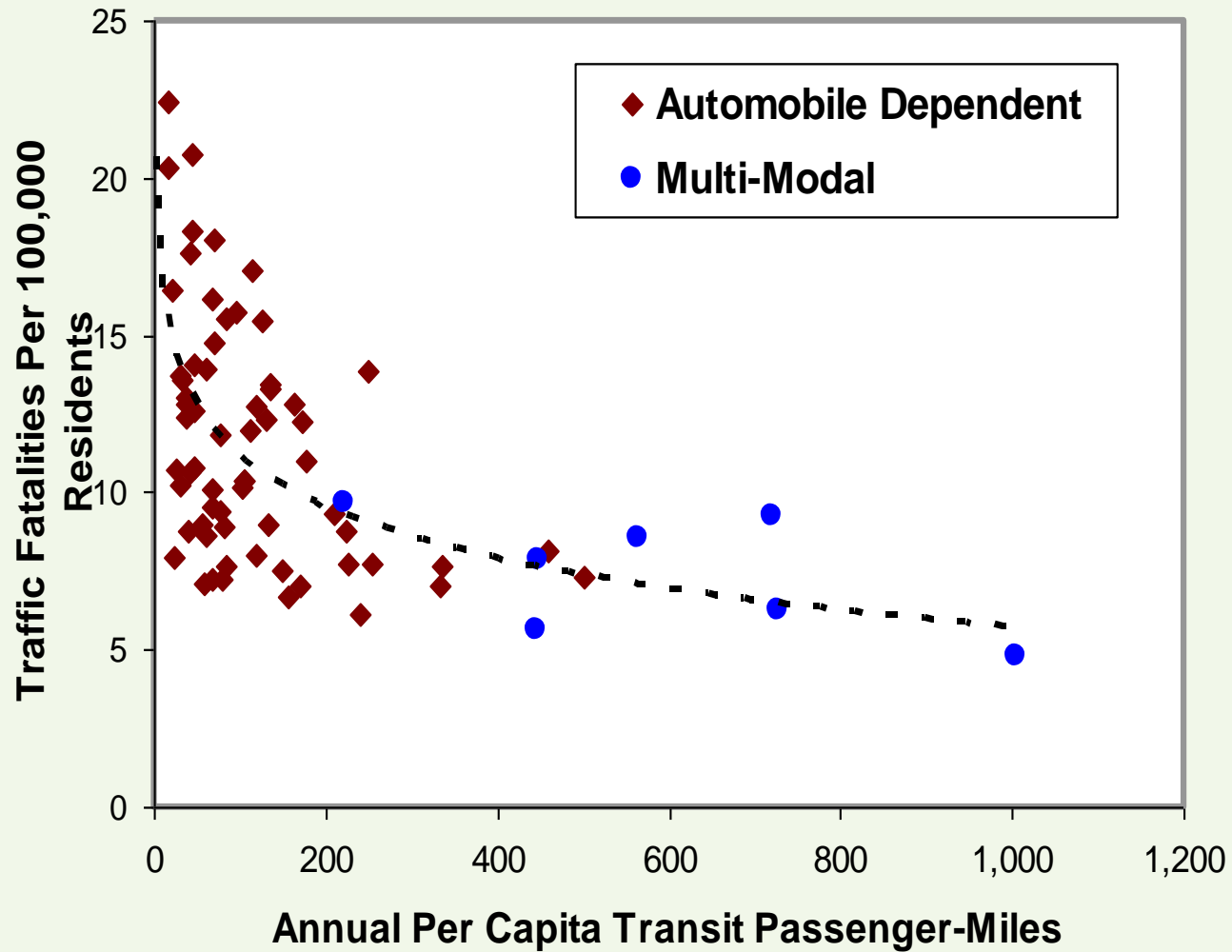


- Urban road congestion maintains equilibrium. It gets bad enough to discourage further vehicle trips.
- The quality of travel options affects this point of equilibrium: If alternatives are inferior, few motorists will shift mode and congestion will be severe. If alternatives are attractive, motorists are more likely to shift modes, reducing congestion equilibrium.
- Grade-separated transit tends to reduce congestion on parallel highways. When all impacts are considered it is often the most cost effective congestion reduction strategy.

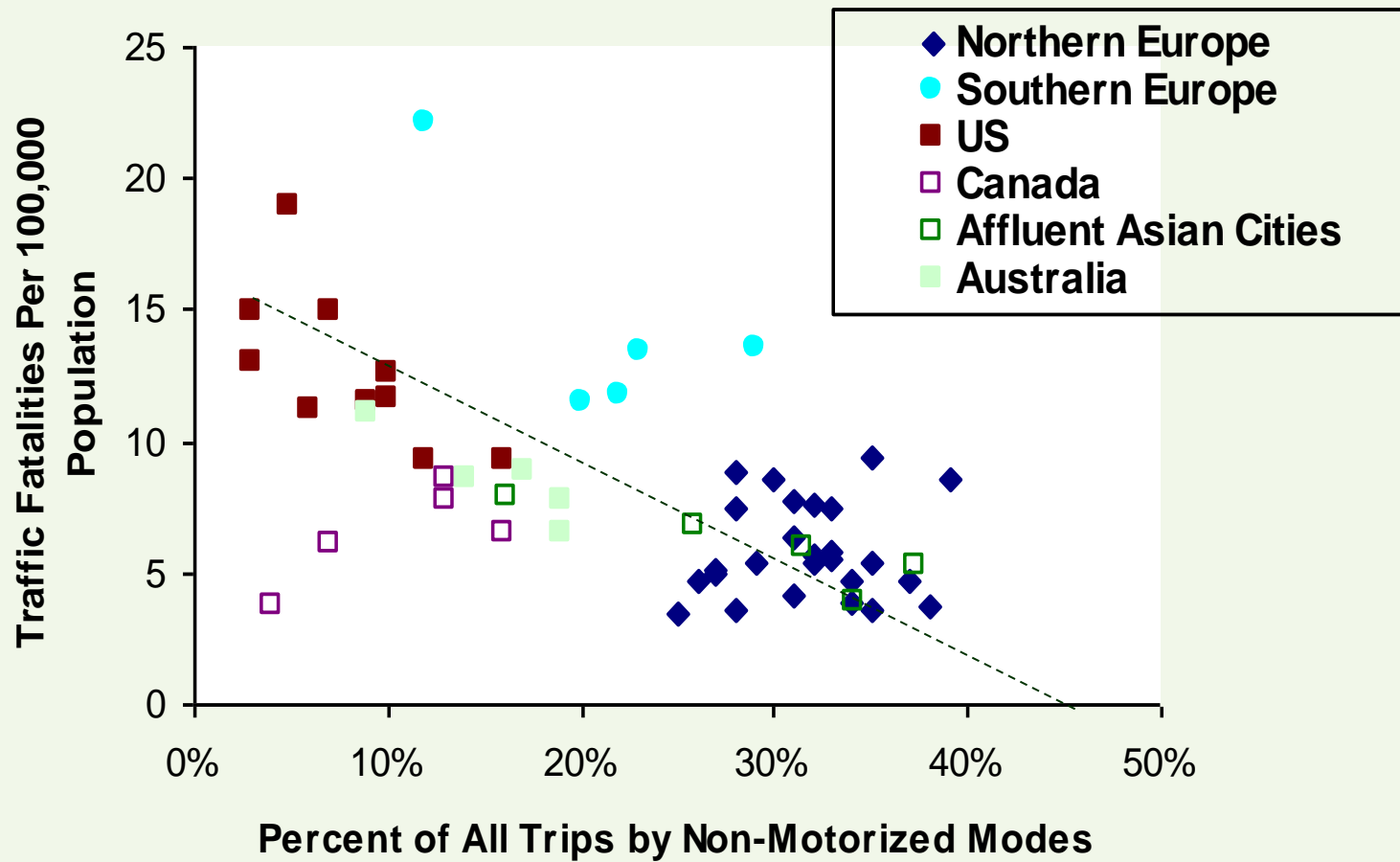
# *Road Space Requirements*



# Traffic Fatalities

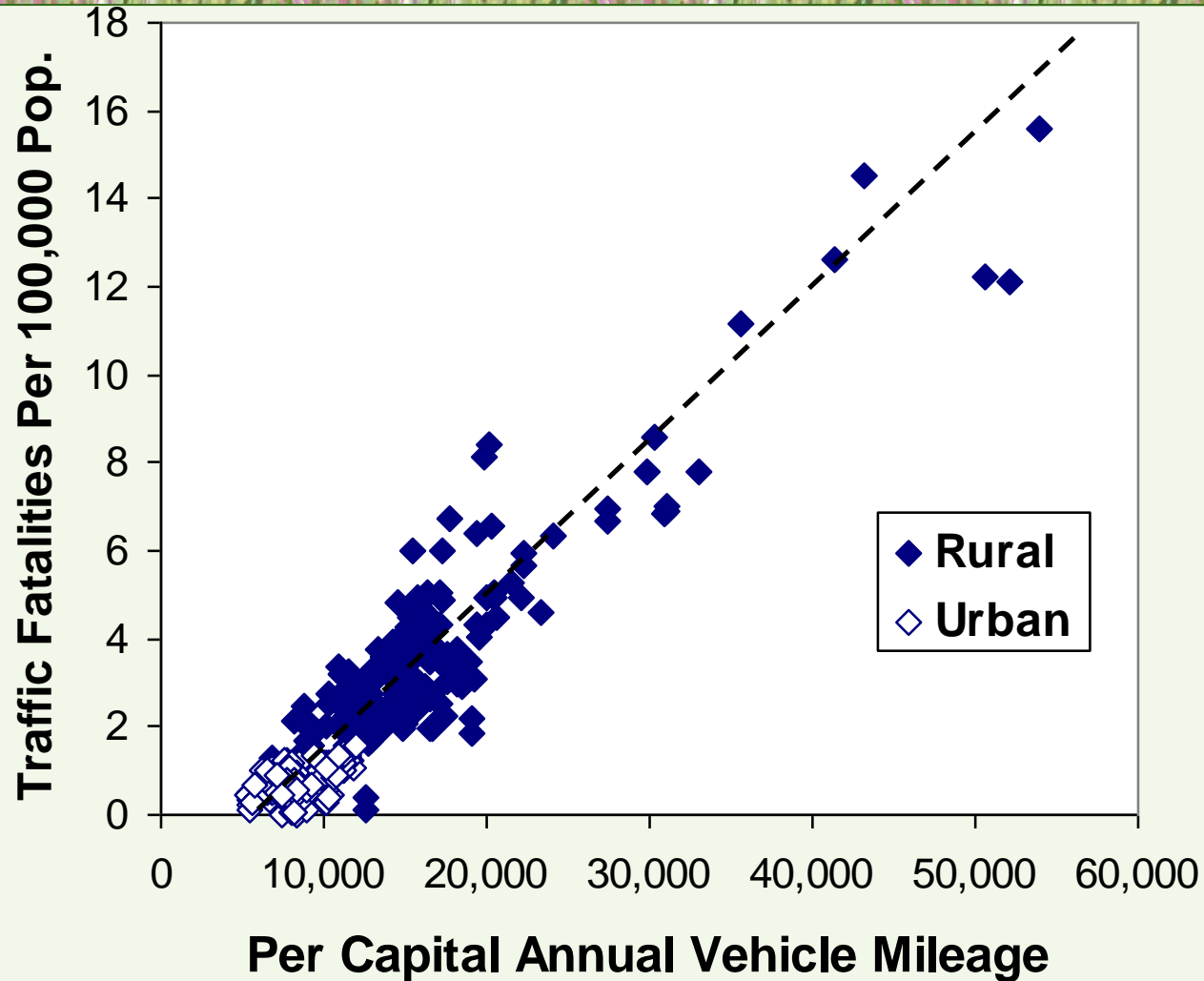


# *Safety Benefits*

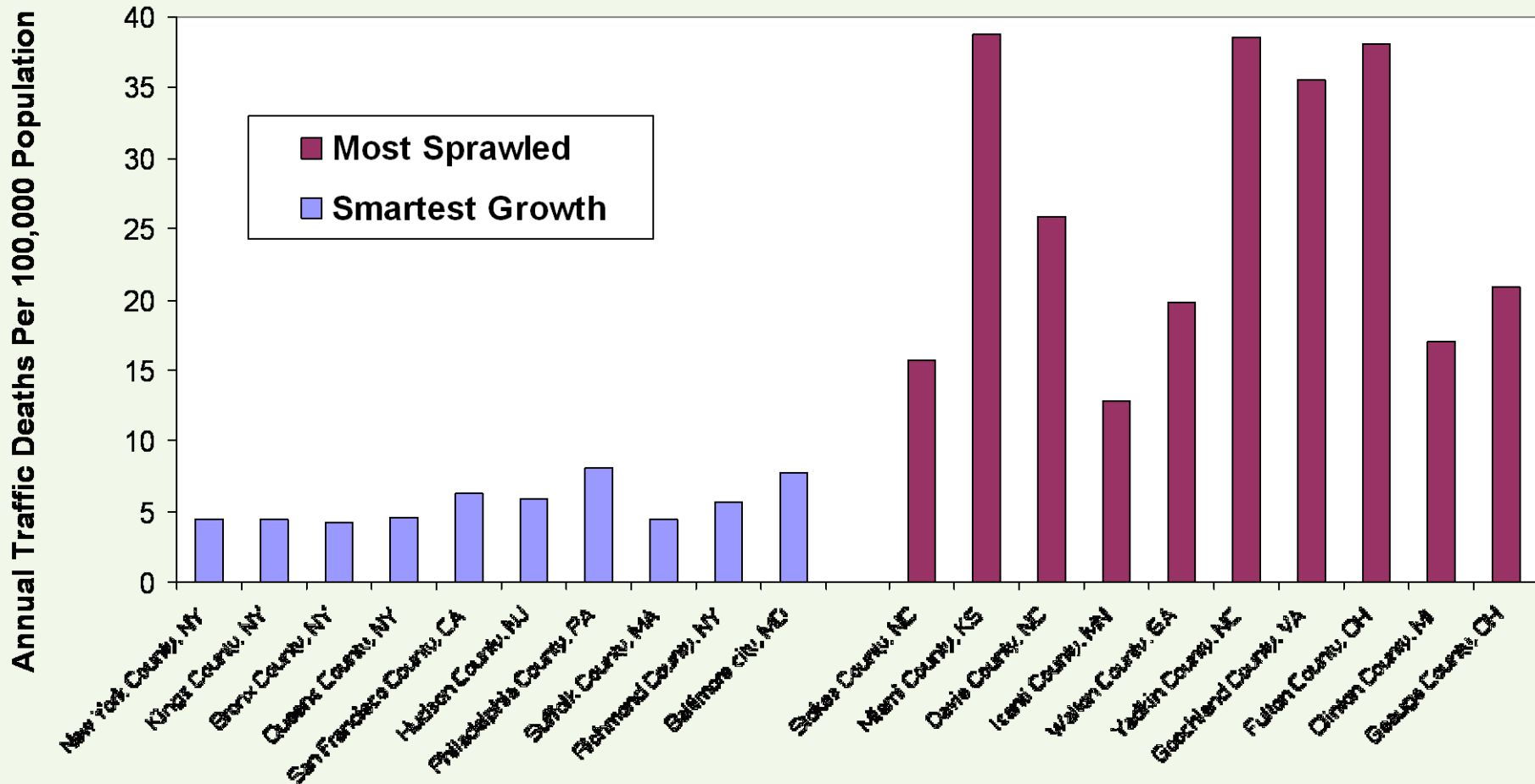




# *U.S. Crash Rates*

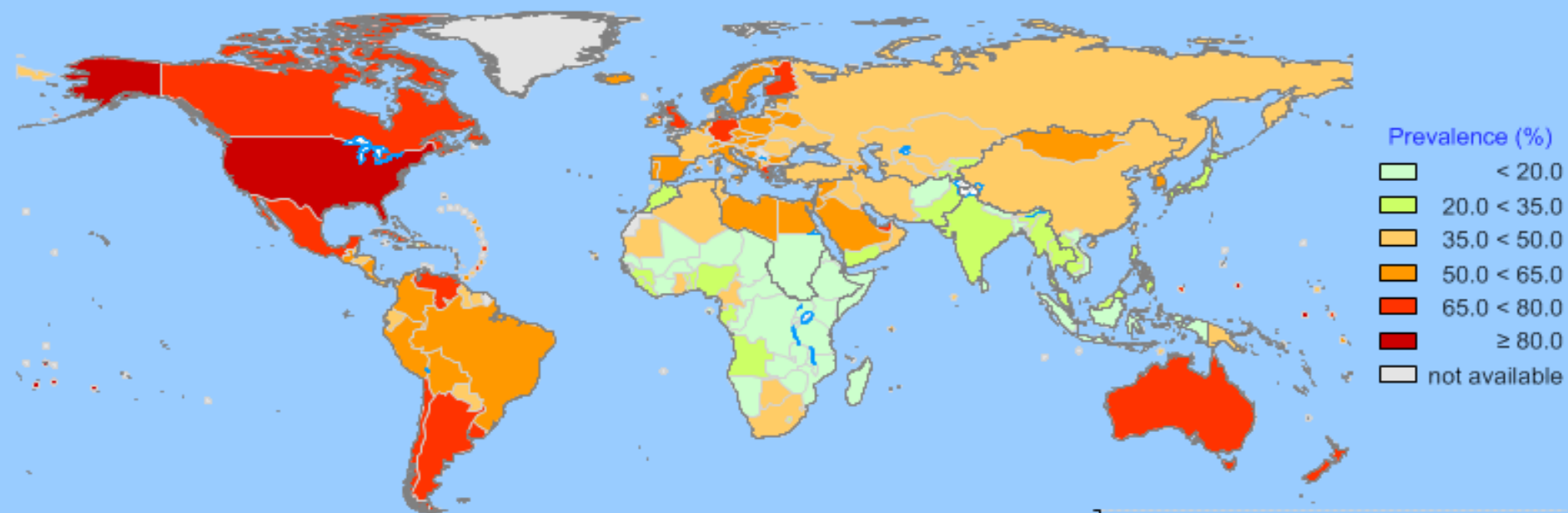


# Smart Growth Safety Impacts



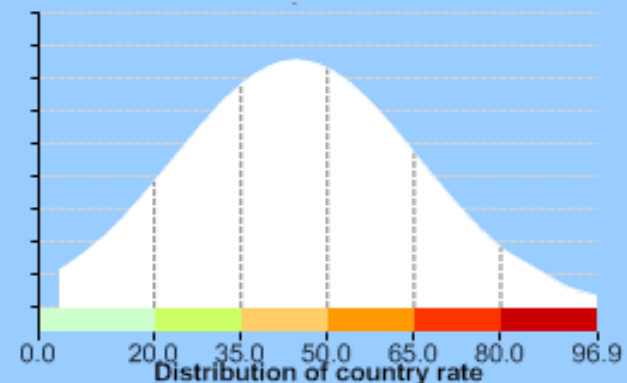
# Obesity Rates

Estimated Overweight & Obesity (BMI  $\geq 25$  kg/m<sup>2</sup>) Prevalence, Males, Aged 15+, 2010



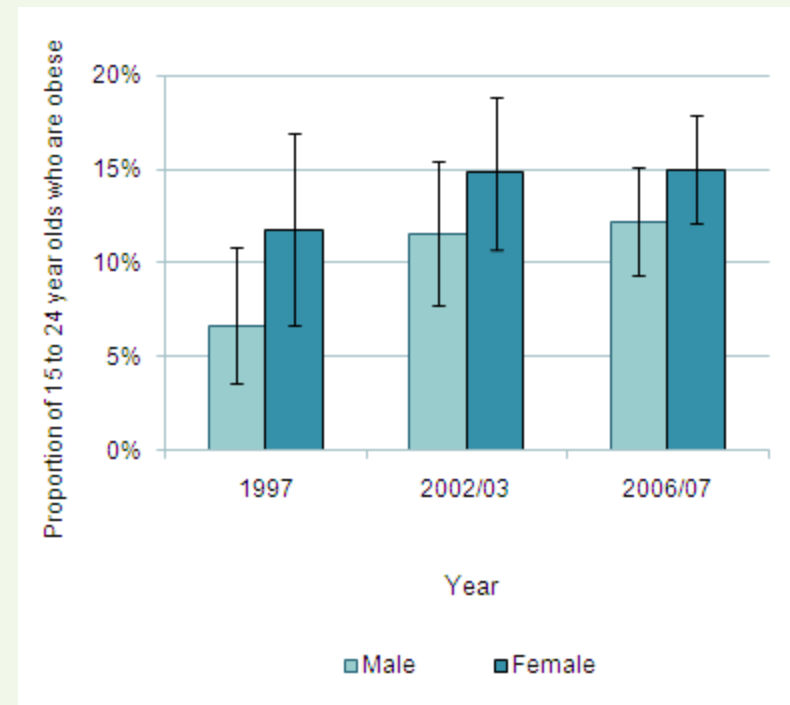
Source: Ono T, Guthold R, Strong K, WHO Global Comparable Estimates, 2005

The boundaries and names shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted lines on maps represent approximate border lines for which there may not yet be full agreement. © WHO 2010. All rights reserved



# *Youth Obesity Rates*

New Zealand youth obesity rates have increased significantly during the past two decades.

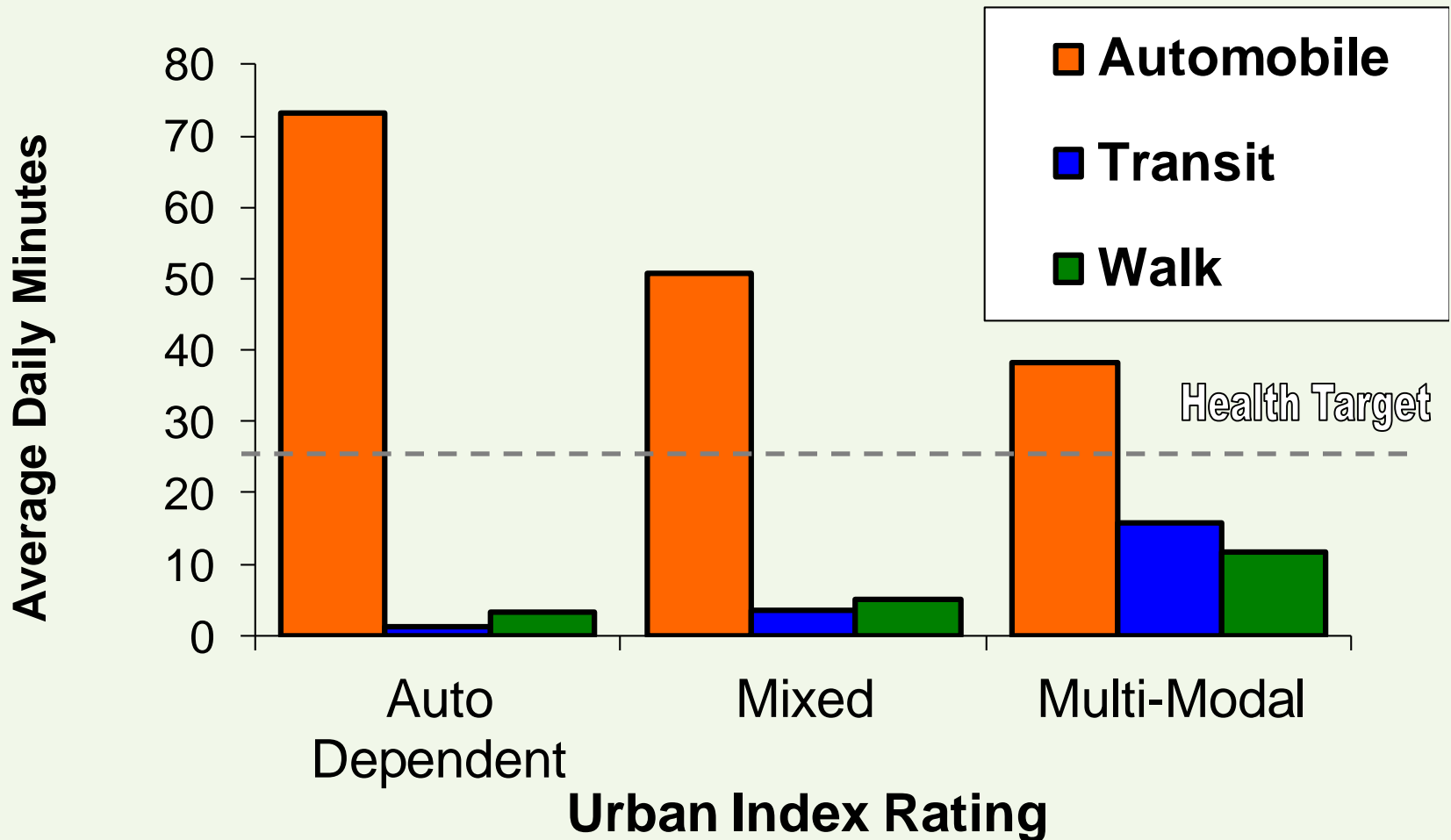


# *What Gets People Moving?*

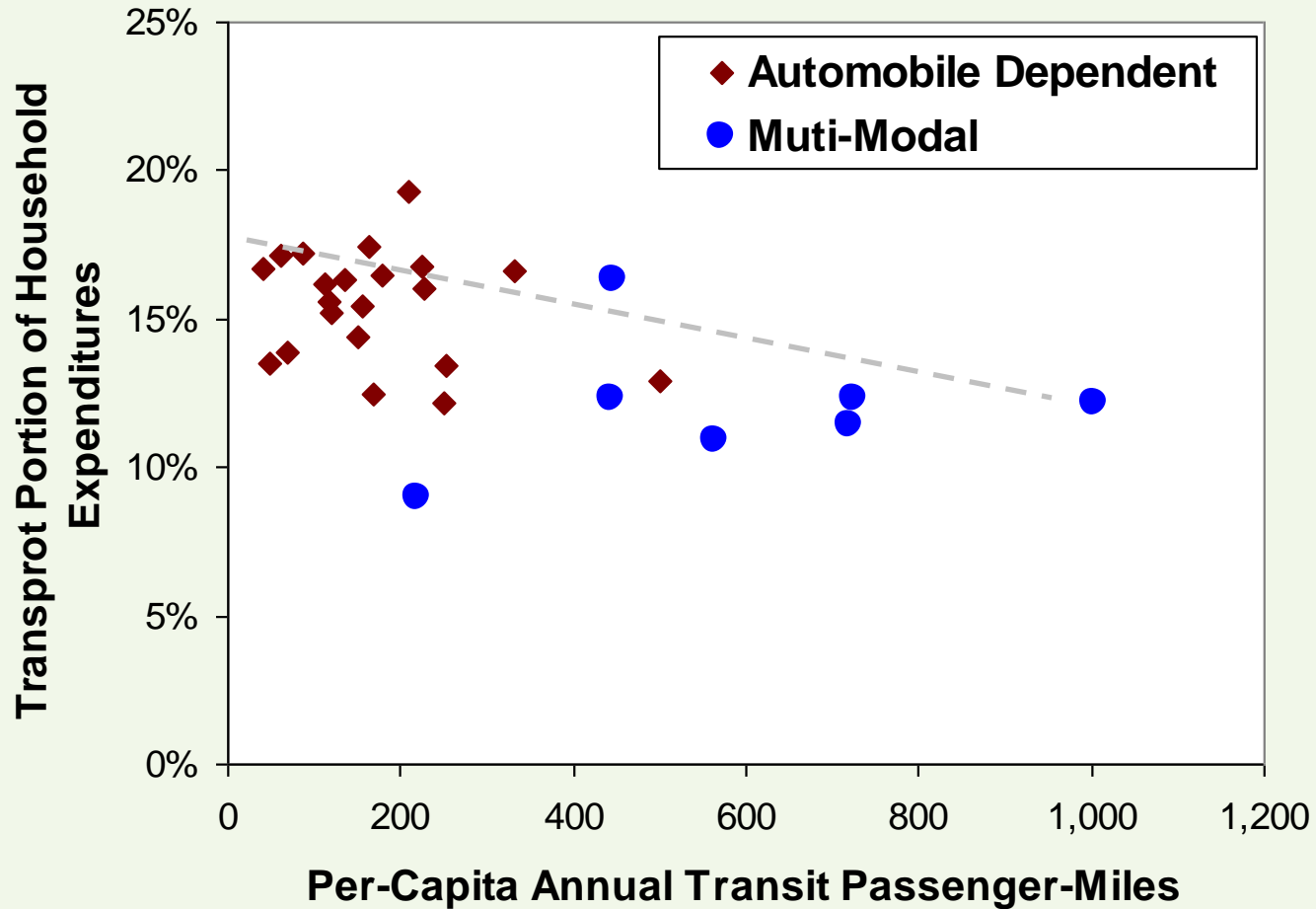
Walking is a natural and essential activity. If you ask sedentary people what physical activity they will most likely to stick with, walking usually ranks first.



# *Land Use Impacts On Travel*



# *Transportation Affordability*



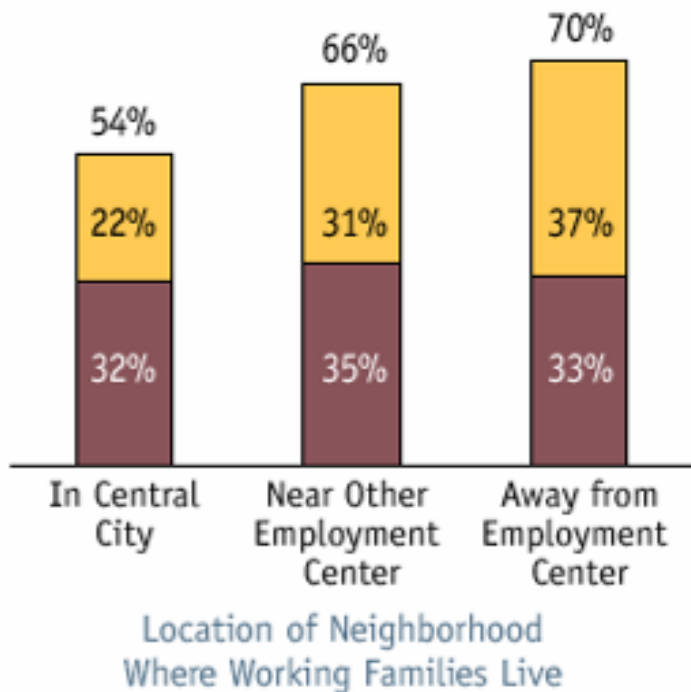
# "A Heavy Load" Report

## Share of Income Spent on Housing and Transportation

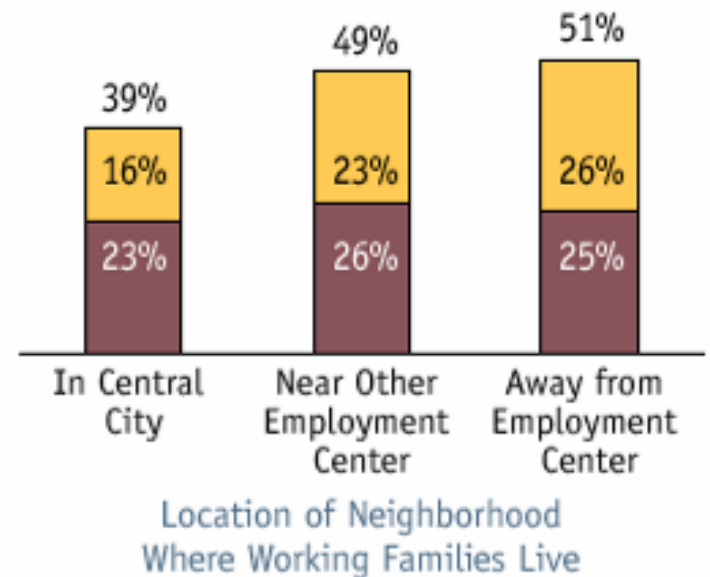
Transportation

Housing

### Households \$20,000 – \$35,000

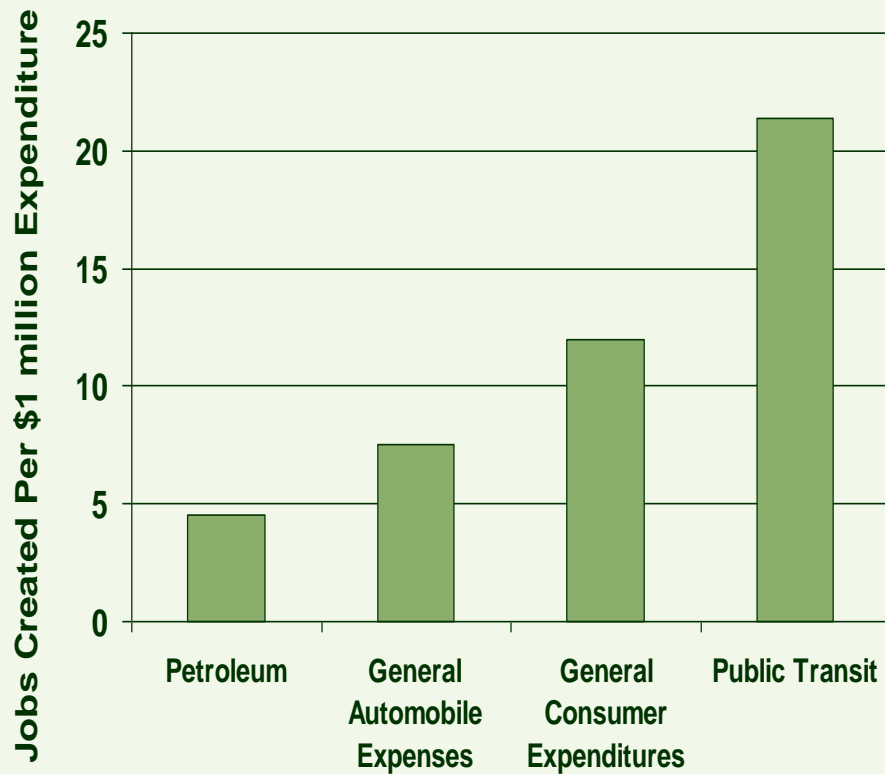


### Households \$35,000 – \$50,000



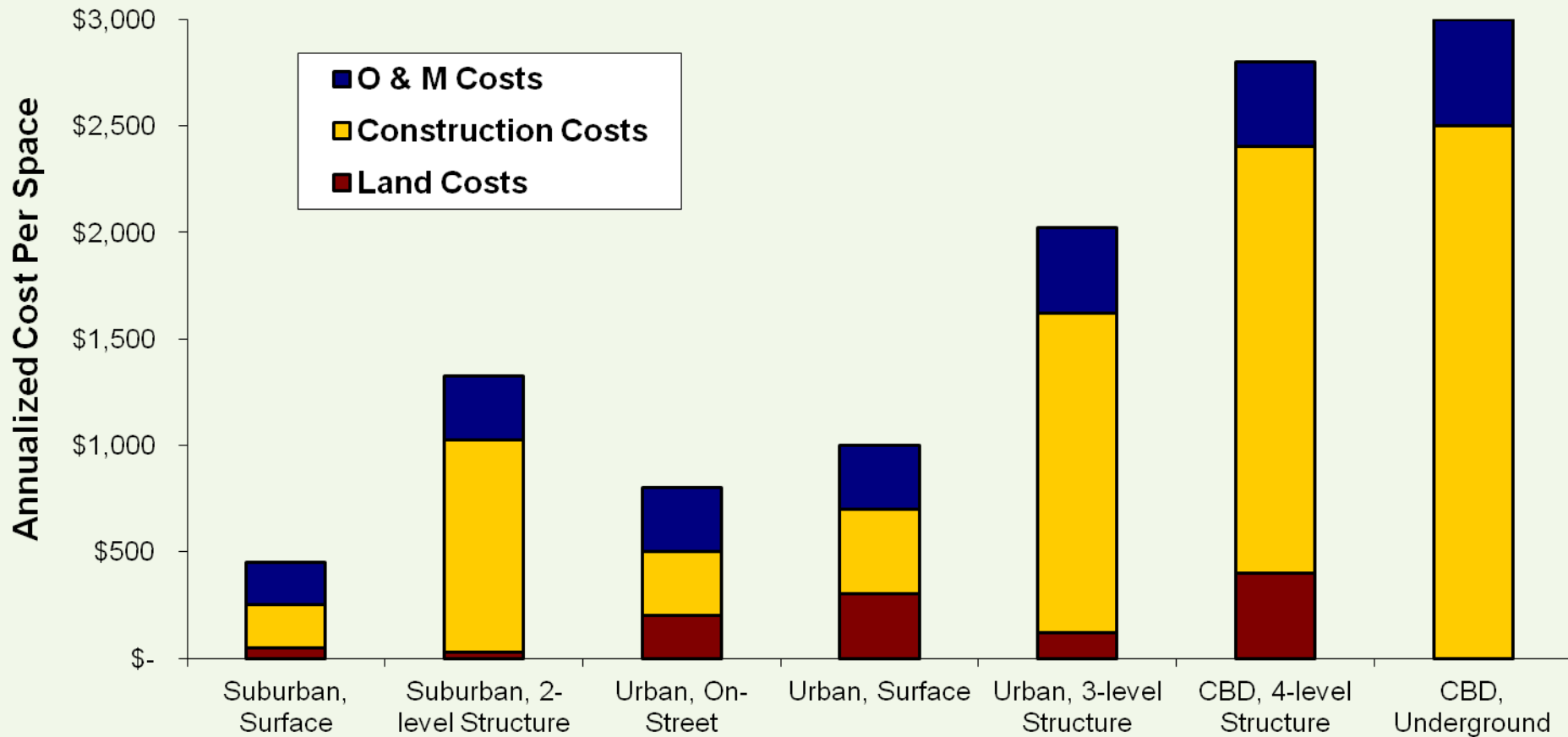


# Community Economic Impacts



- Transport savings and efficiencies (congestion, parking, taxes) increases productivity and competitiveness.
- Reducing vehicle expenditures and expanding transit service increases regional employment and business activity.
- Agglomeration efficiencies.
- Supports strategic land use development objectives.
- Increases affordability, allowing businesses to attract employees in areas with high living costs.
- Changes in household expenditures on vehicles and fuel.

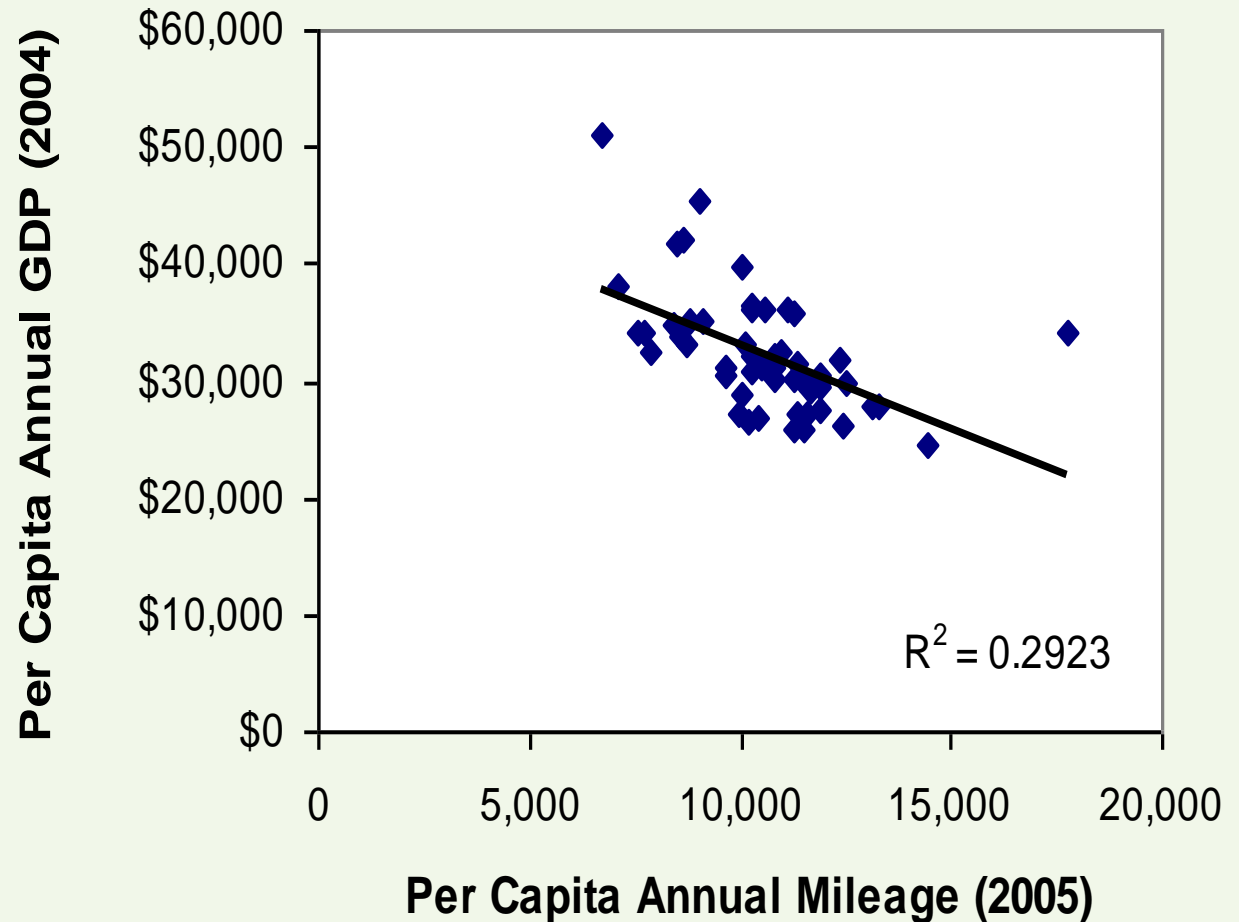
# *Parking Facility Costs*



# *Per Capita GDP and VMT*

Productivity tends to decline with increased mobility. (Each dot is a U.S. urban region.)

Bureau of Economic Analysis and FHWA data



# Memo From Future Self

Hope for the best but prepare for the worst:

- *Physical disability* – diverse and integrated transport with universal design (accommodates people with disabilities and other special needs).
- *Poverty and inflation* – affordable housing in accessible, multi-modal locations.
- *Higher energy prices* – improve efficient modes (walking, cycling and public transport).
- *Isolation and loneliness* – community cohesion (opportunities for neighbors to interact in positive ways).



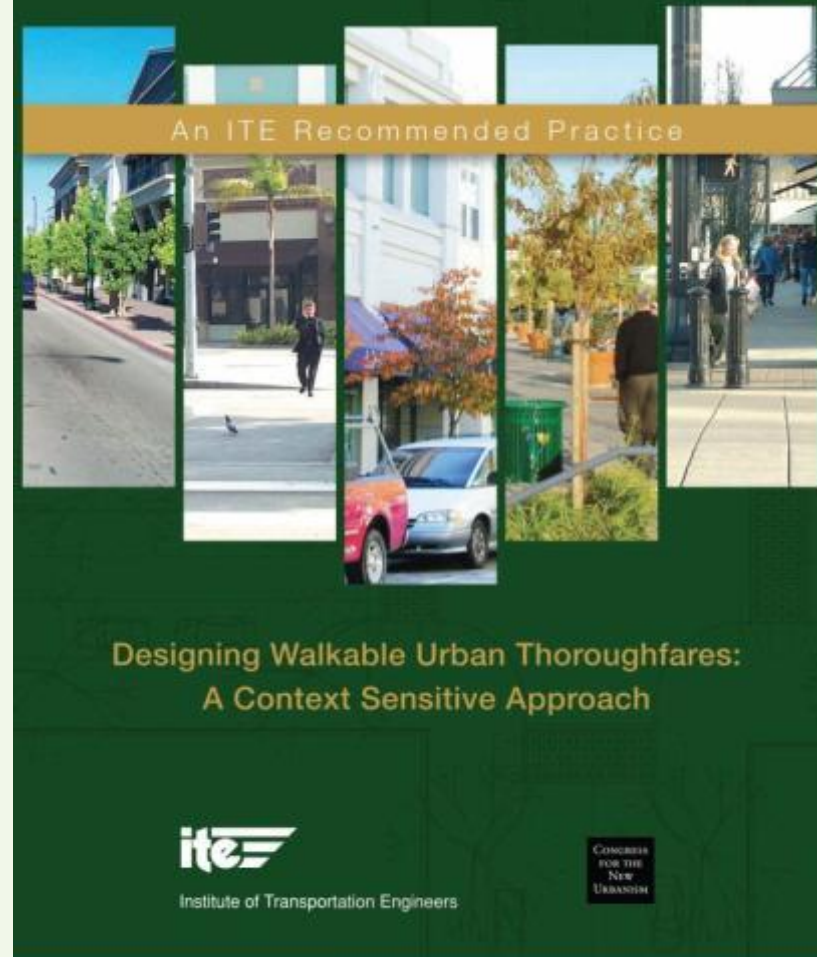
# *Sustainable Transport Hierarchy*

1. Walking
2. Cycling
3. Public Transit
4. Service & Freight
5. Taxi
6. HOV
7. Private Automobile



# *Innovative Transport Planning*

- Smart growth/New Urbanism
- Context oriented planning
- Complete streets
- Streetscaping
- Road diets
- Traffic calming
- Transportation Demand Management (TDM)
- Transit-Oriented development
- Parking management



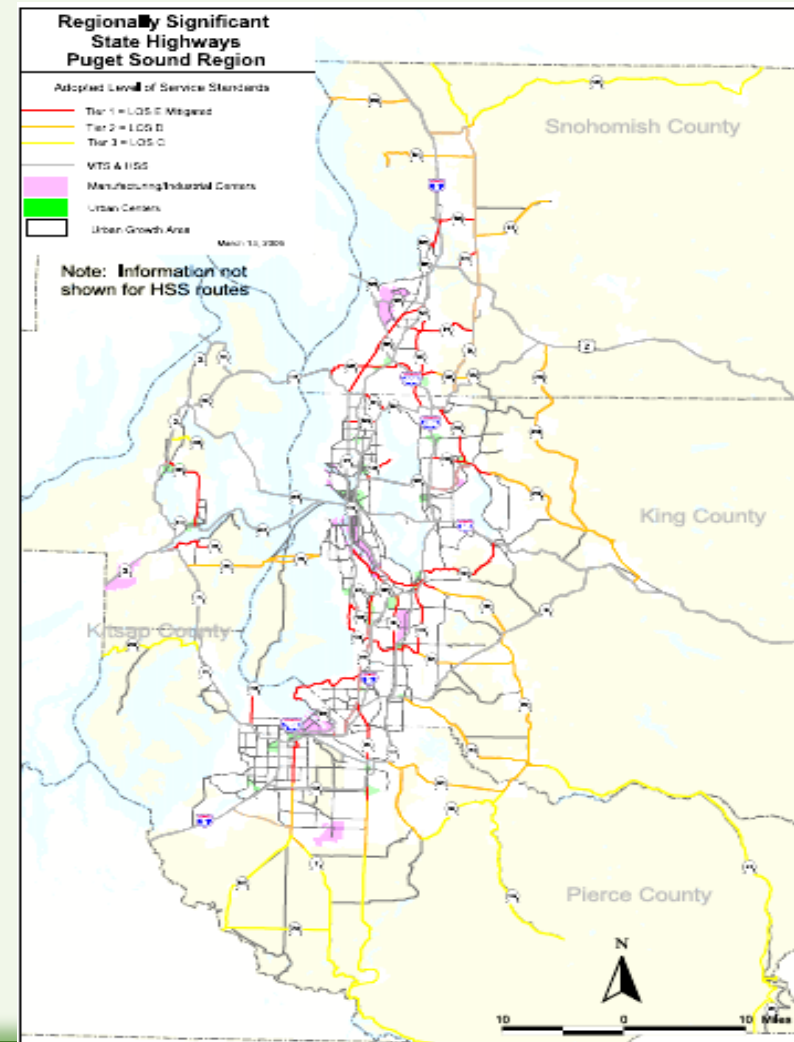
# *Comprehensive Multi-Modal Planning*

- Evaluation and planning based on *accessibility* instead of *mobility*.
- Consider all modes
- Consider all impacts and objectives
- Least-cost funding (invest in the most cost effective solution, considering all impacts and objectives)



# *Conventional Transport Indicators*

- Roadway Level-of-Service (LOS)
- Average traffic speeds.
- Per capita congestion delay.
- Parking occupancy rates.
- Traffic fatalities per billion vehicle-miles.
- Traffic fatalities per 100,000 population.





# Multi-Modal LOS (Jacksonville)

## Cycling LOS



## Pedestrian LOS



# Multi-Modal Prioritization

## Cycling Improvements



## Pedestrian Improvements



# *Rural Cycling Level-Of-Service*

- Presence and quality of roadway shoulders, particularly on busier roads. (The Oregon Department of Transportation has established road shoulder standards, which require additional width as motor vehicle traffic volumes increase).
- Motor vehicle traffic speeds (lower is better) and traffic law enforcement (higher is better).
- Quantity and quality of cycling trails, including surfaced (for road bikes) and rough (for mountain bikes).
- Presence of public transit services that connect rural communities and larger cities, particularly if they carry bicycles.
- Presence of a bicycle shop in the community.
- Quality of cycling maps and guides.
- Suitable camping and hostel facilities for bicycle tourists.
- Cycling education and encouragement programs.
- Quality of food and drink (cycling is just an excuse to eat).



# Smart Growth

- Compact (higher density)
- Mixed use
- Diverse housing types
- Connected roads
- Multi-modal
- Good walking and cycling conditions
- Good public transit services
- Efficient parking management
- Emphasis on the public realm (public places where people interact)



# Street Connectivity

## Comparing Distances

1.3 miles

vs.

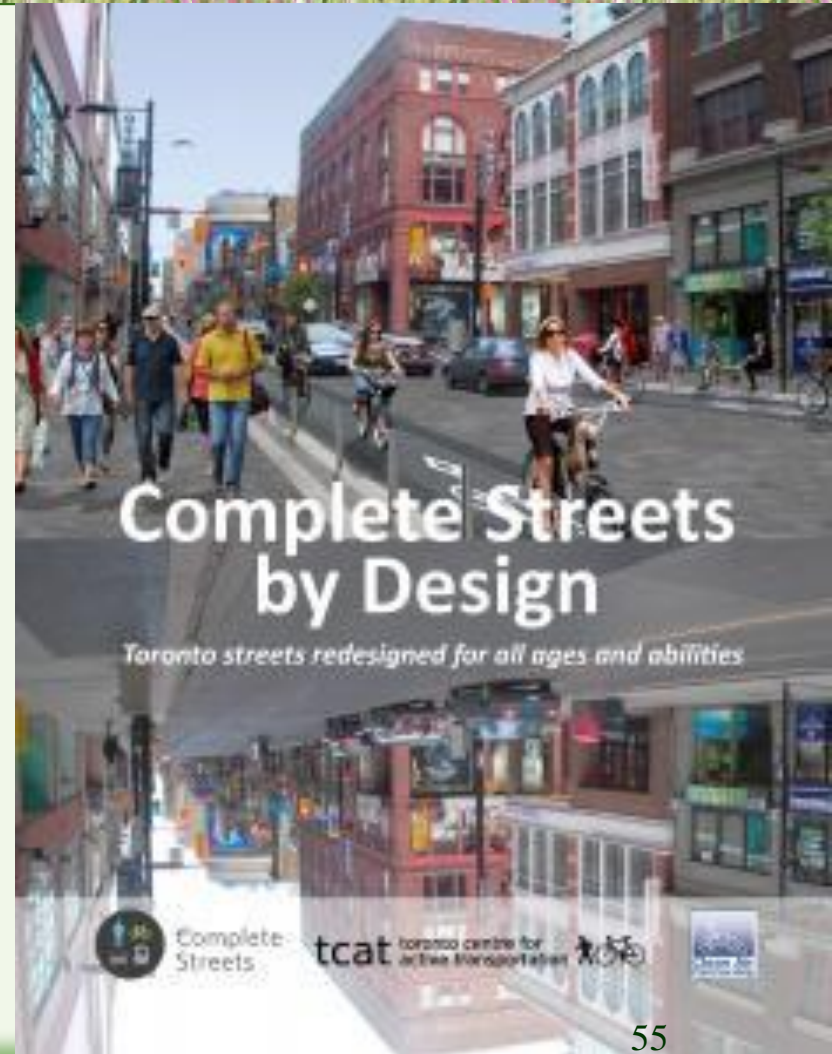
0.5 miles



Images are same scale, approximately 1 sq mi.

# *Complete Streets*

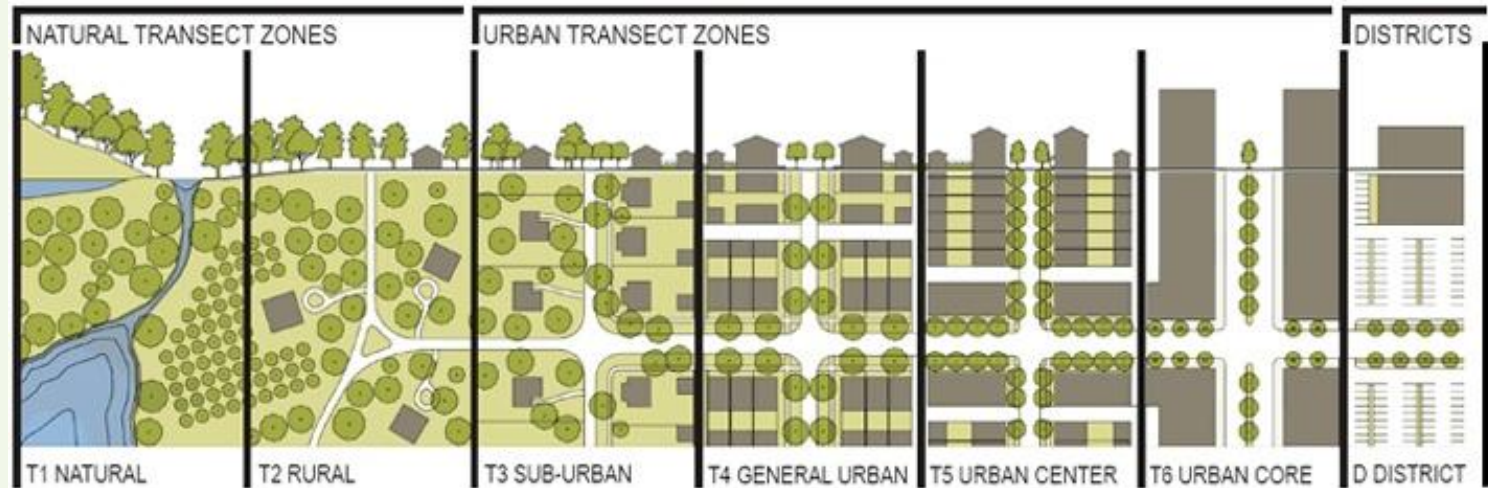
A Complete Street is designed for all activities, abilities, and travel modes. Complete Streets provide safe and comfortable access for pedestrians, cyclists, transit users and motorists, and a livable environment for visitors, customers, employees and residents in the area.



# Transect



RURAL ||||| TRANSECT ||||| URBAN



# *Retrofitting Suburbs*

Many smaller cities, towns and suburban strips are now being retrofitted based on smart growth principles to create compact, walkable and bikeable, mixed use neighborhoods, reflecting traditional development practices.





# *Linking the Centers across US29*

*by Dan Burden, Walkable & Livable Communities Institute*



*Ped/bike bridge from mall to transit stop/garage*



*Mixed-use redevelopment on mall parking lot*



# *Landscaping matures*



# *Additional redevelopment*



# *Landscaping matures over time*



# *Landscaping matures over time*



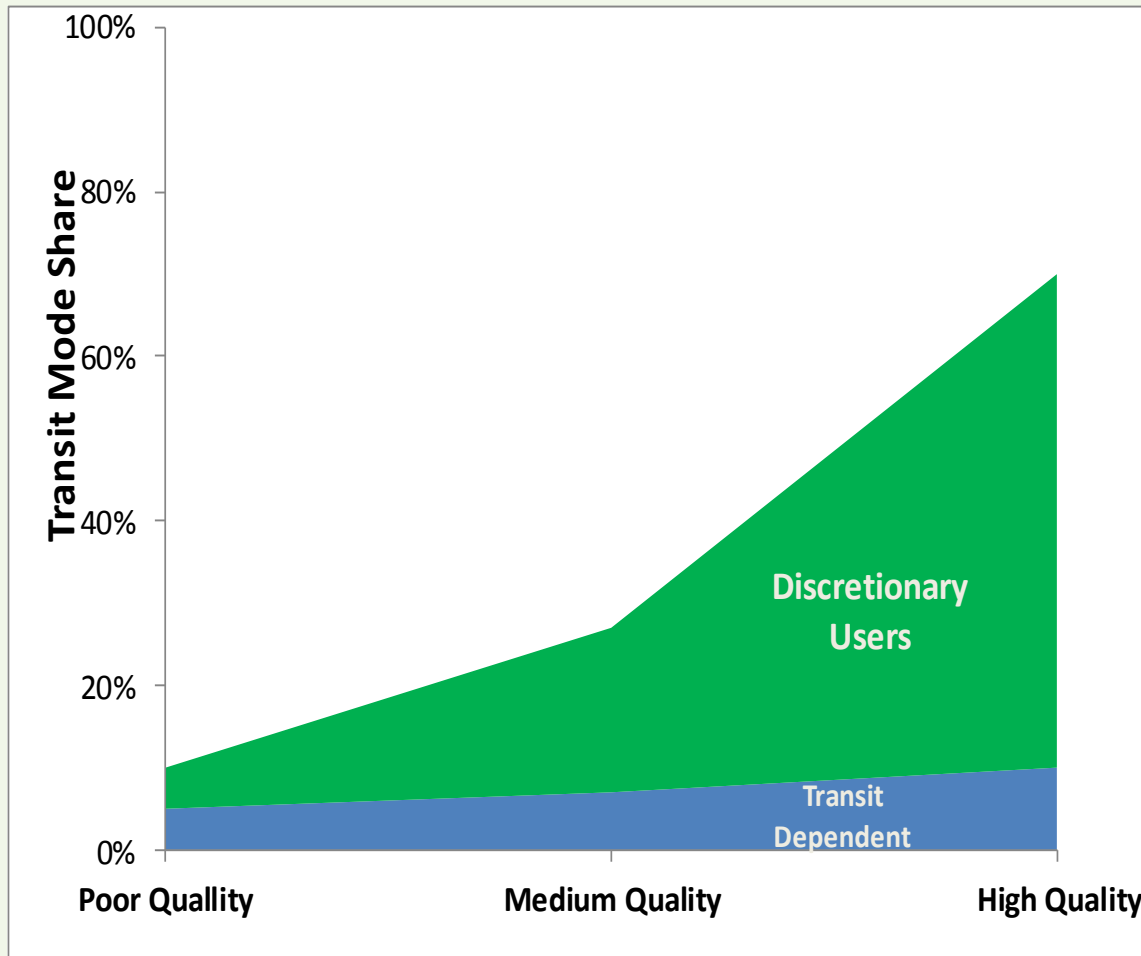
# *Mode Shifts*



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



# *Increasing Transit Mode Share*



A portion of the population is *transit dependent* and will use transit services even if poor quality.

As public transit service quality improves it will attract an increasing portion of *discretionary travelers* (people who can travel by automobile).

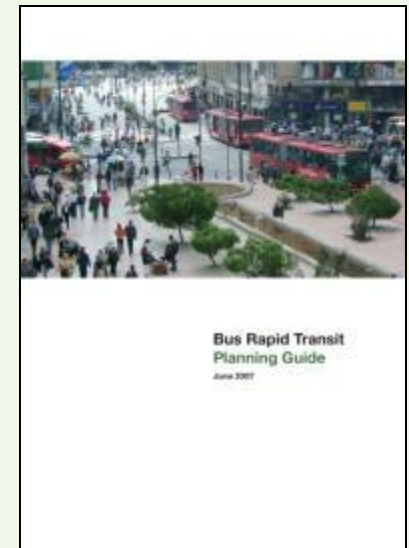
# *Attracting Discretionary Riders*

- Quality service (convenient, fast, comfortable)
- Affordable
- Support and incentives (commute trip reduction programs, parking cash out, etc.)
- Integrated (good connections, walking and cycling access to stops and stations, transit-oriented development)
- Convenient information
- Integrated with special events
- Positive Image



# *LRT and BRT*

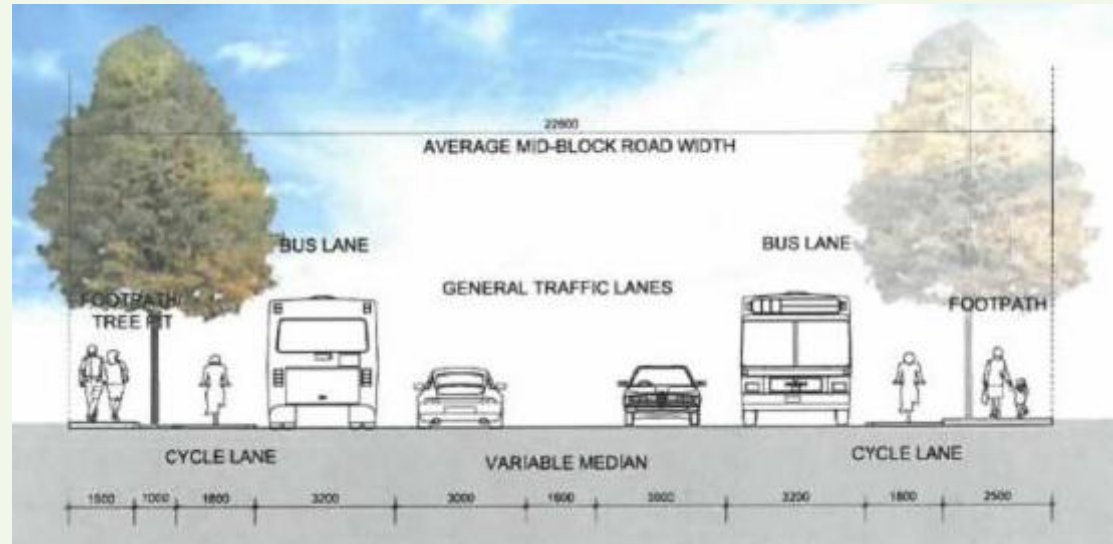
- Frequent service
- Grade separation
- Comfortable vehicles
- Integrated networks
- Fast loading
- Prepaid fares
- Integrated fares
- Branding and marketing
- Attractive stations
- Good station access
- Transit-oriented development



# *Transit Priority*

Transit travel requires less road space than automobile travel. A bus lane that carries 20 buses or more during peak hours carries more people than a general traffic lane.

It is therefore more efficient and fair to give buses priority in traffic with special lanes and signal controls. This reduces transit operating costs and attract discretionary travelers who would otherwise drive. As a result, overall congestion does not increase.



# *Transit Station Level-Of-Service*

- Clean
- Comfort (seating, temperature, quiet)
- Convenience (real-time user information, easy fare payment)
- Accessible (walkability, bike parking, nearby housing, employment, nearby shops)
- Services (refreshments, periodicals, etc.)
- Security



# User Information

Provide information when and where users need it:

- Transit route, schedule and fares
- Discounts and incentives.
- Real-time arrival.
- Navigation to bus stops, train stations and destinations.
- Travel times for various modes (e.g., transit vs. driving).
- Special problems (warnings of delays).
- On-board wifi services.
- Parking availability and price.

Delivering real-time public transit information when and where you need it.

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Wait times for connecting lines at stop 48th Ave & Point Lobos Ave:

38AX-Geary A Express Outbound	9 minute wait time
38L-Geary Limited Outbound	2 minute wait time

18-46th Avenue

San Francisco

Google



# *Public Transport Funding Options*

- Dedicated Property Taxes
- Land Value Capture (special property taxes)
- Dedicated Fuel Tax
- Commercial Parking Surtax
- Expand pricing of public parking
- Per-space Parking Levy
- Employee Levies
- Transportation Impact Fee

# *Ridesharing*

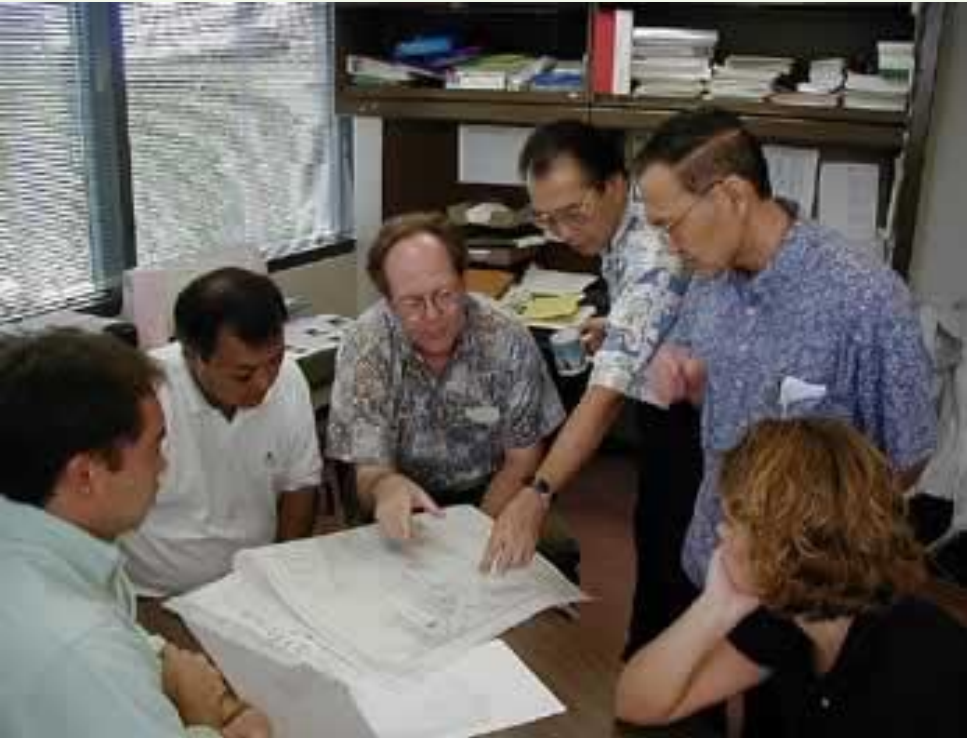
Market studies suggest that a third of suburban automobile commuters would consider vanpooling, if it had:

- Flexibility.
- High Occupant Vehicle priority lanes and parking.
- Financial incentives.
- Integration with public transit.
- Employer support.





# *Employee Trip Reduction Programs*



Employers encourage employees to walk, bicycle, carpool, ride transit and telework rather than drive to work.

# *Transportation Management Associations*



*Transportation Management Associations (TMAs) are private, non-profit, member-controlled organizations that provide transportation services in a particular area, such as a commercial district, mall, medical center or industrial park.*

*TMAs provide an institutional framework for implementing Mobility Management.*

# *School & Campus Transport Management*



Programs that encourage parents and students to use alternative modes to travel to schools, colleges and universities.

THERE IS TOO MUCH TRAFFIC  
FOR BILLY TO WALK TO SCHOOL ;  
SO WE DRIVE HIM.



Lockwood

**Traffic Inducing Traffic**

# *Walking and Cycling Improvements*

- More investment in sidewalks, crosswalks, paths and bike lanes.
- Improved roadway shoulders.
- More traffic calming.
- Bicycle parking and changing facilities.
- Encouragement, education and enforcement programs.



# *Attracting Discretionary Riders*

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# *Ridesharing*

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# *Location-Efficient Development*

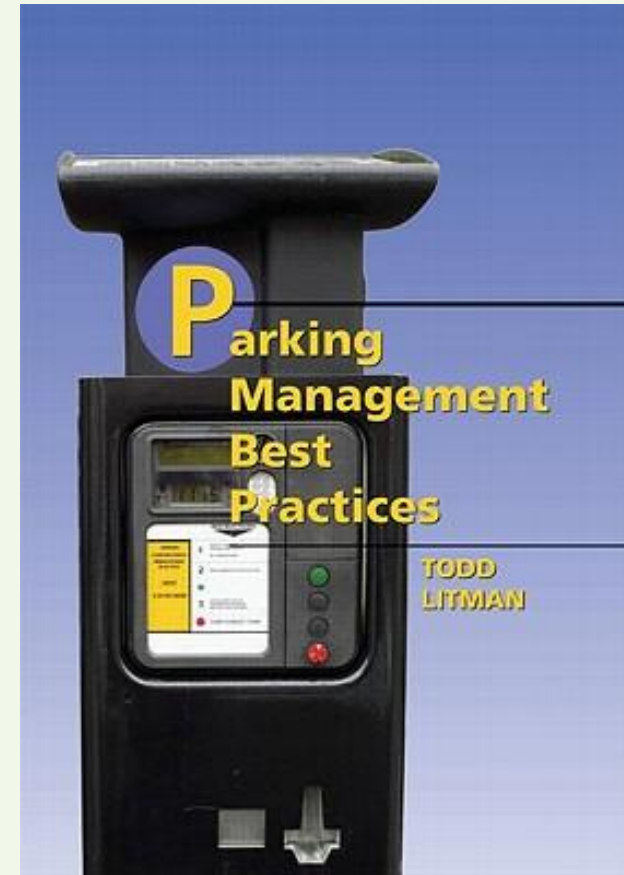


- Locate affordable housing in accessible areas (near services and jobs, walkable, public transit).
- Diverse, affordable housing options (secondary suites, rooms over shops, loft apartments).
- Reduced parking requirements and unbundle parking.
- Reduces property taxes and utility fees for clustered and infill housing.



# *Parking Management Strategies*

- Share spaces, within a parking lot and between destinations
- Use of off-site parking, particularly for occasional overflow
- Reduced and more flexible requirements
- Regulate and price to prioritize use of the most convenient spaces
- Encouraging use of alternative modes, particularly during peak periods
- Improved walking conditions, to allow more convenient use of off-site parking facilities
- Improved user information, so travelers can determine their travel and parking options.
- Improved design of existing parking facilities



# *Examples of Successful TDM Programs*

- London (congestion pricing; improve alternative modes)
- Seoul (reduce road space, improve alt. modes, parking pricing)
- Paris (improve alternative modes, public bike systems)
- New York (reallocate road space, improve alternative modes)
- Los Angeles (improving alternative modes)
- Stockholm (congestion pricing, improve alt. modes)
- Tokyo (parking pricing, improve alt. modes)
- Vancouver (improve alt. modes, encourage downtown housing)
- Singapore (restricting car ownership, improving alt. modes)
- Chinese cities (limiting car ownership, improving alt. modes, parking pricing)
- Various European cities (restricting driving and parking in central city neighborhoods, increasing parking pricing)

# *Significant Benefits*

Improved management typically reduces parking supply 20-60% compared with what conventional planning requires, without reducing user convenience or total costs.



# *Contingency-Based Planning*

*Contingency-Based Planning* deals with uncertainty by identifying specific responses to possible future conditions.

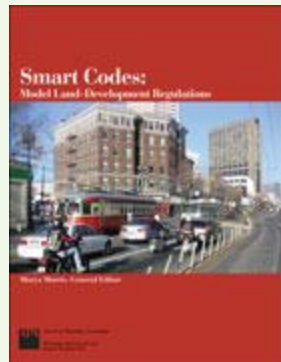
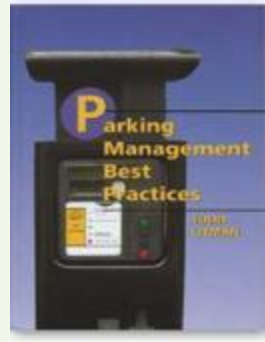


# *Integrated Implementation*

Implement transportation reforms as an integrated package, including improvements to alternative modes, incentives such as more efficient pricing, and programs such as employee trip reduction and transportation management associations.



# *Supported by Professional Organizations*



- Institute of Transportation Engineers
- Planning Institute
- Federal, provincial regional and local transport agencies
- World Health Organization
- And much more...

# *Motorists Benefit Too*

More balanced transport policy 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.



# *Key Messages*

- NMT is efficient and beneficial.
- User demands and social benefits of NMT are increasing.
- NMT tends to be undervalued in conventional transport planning.
- NMT activity is sensitive to policy and planning decisions: cities with supportive programs have far more walking and cycling activity.
- Improving walking and cycling conditions benefits physically, economically and socially disadvantaged people and so helps achieve equity objectives.
- Policies and programs that improve walking and cycling conditions can help support strategic planning objectives, such as more compact land use development.







**Victoria Transport Policy Institute**

**“If Health Matters: Integrating Public Health Objectives in Transportation Planning”**

**“Transportation Affordability: Evaluation and Improvement Strategies”**

**“Evaluating Non-Motorized Transportation Benefits and Costs”**

**“Transportation Cost and Benefit Analysis”**

**“Parking Management Best Practices”**

**“The Future Isn’t What It Used To Be”**

**“Evaluating Complete Streets”**

**“Online TDM Encyclopedia”**

**and more...**

**[www.vtppi.org](http://www.vtppi.org)**