Transportation Systems & Urban Development Patterns for a One Planet Region

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Anthropocene Community Conversations
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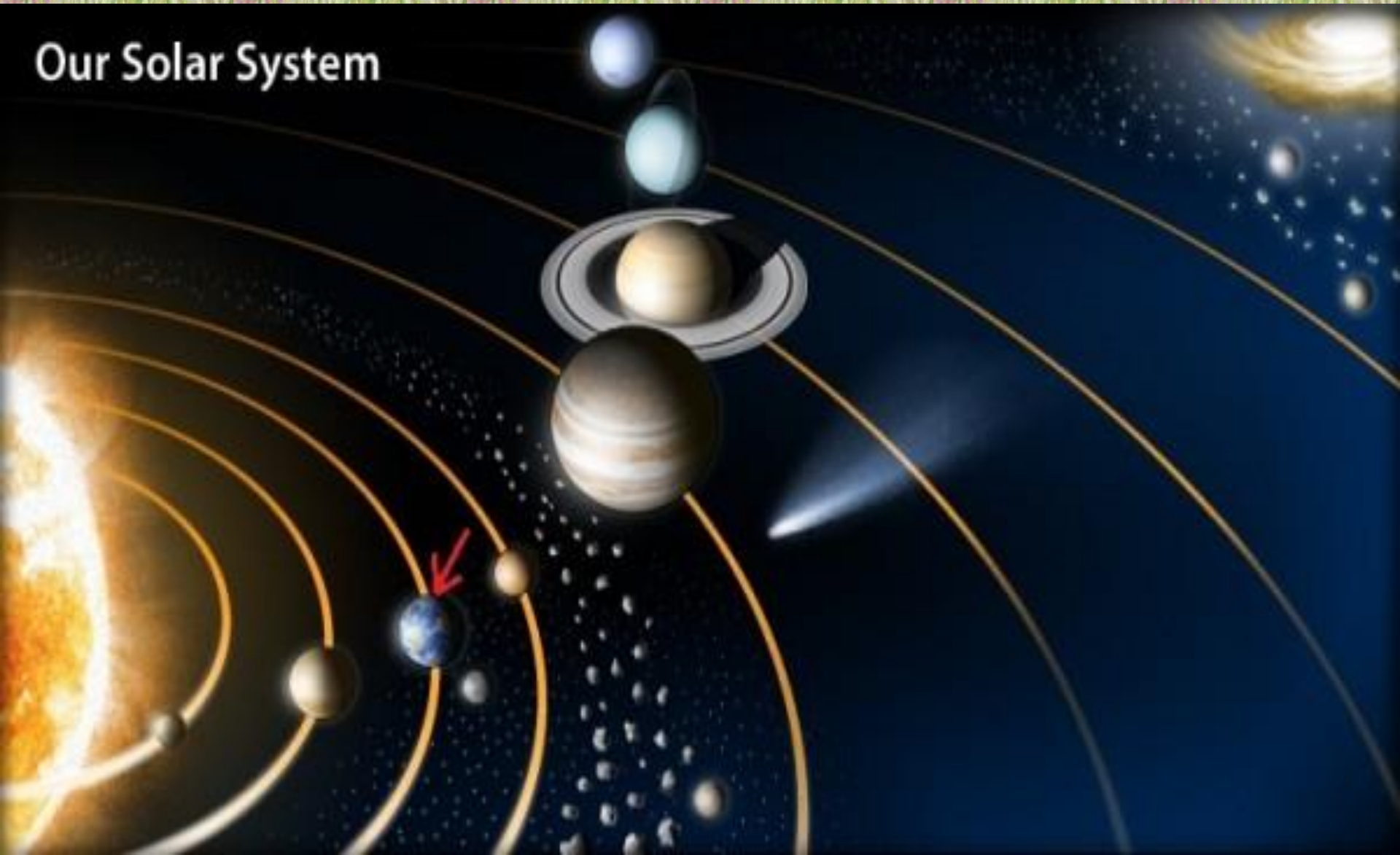
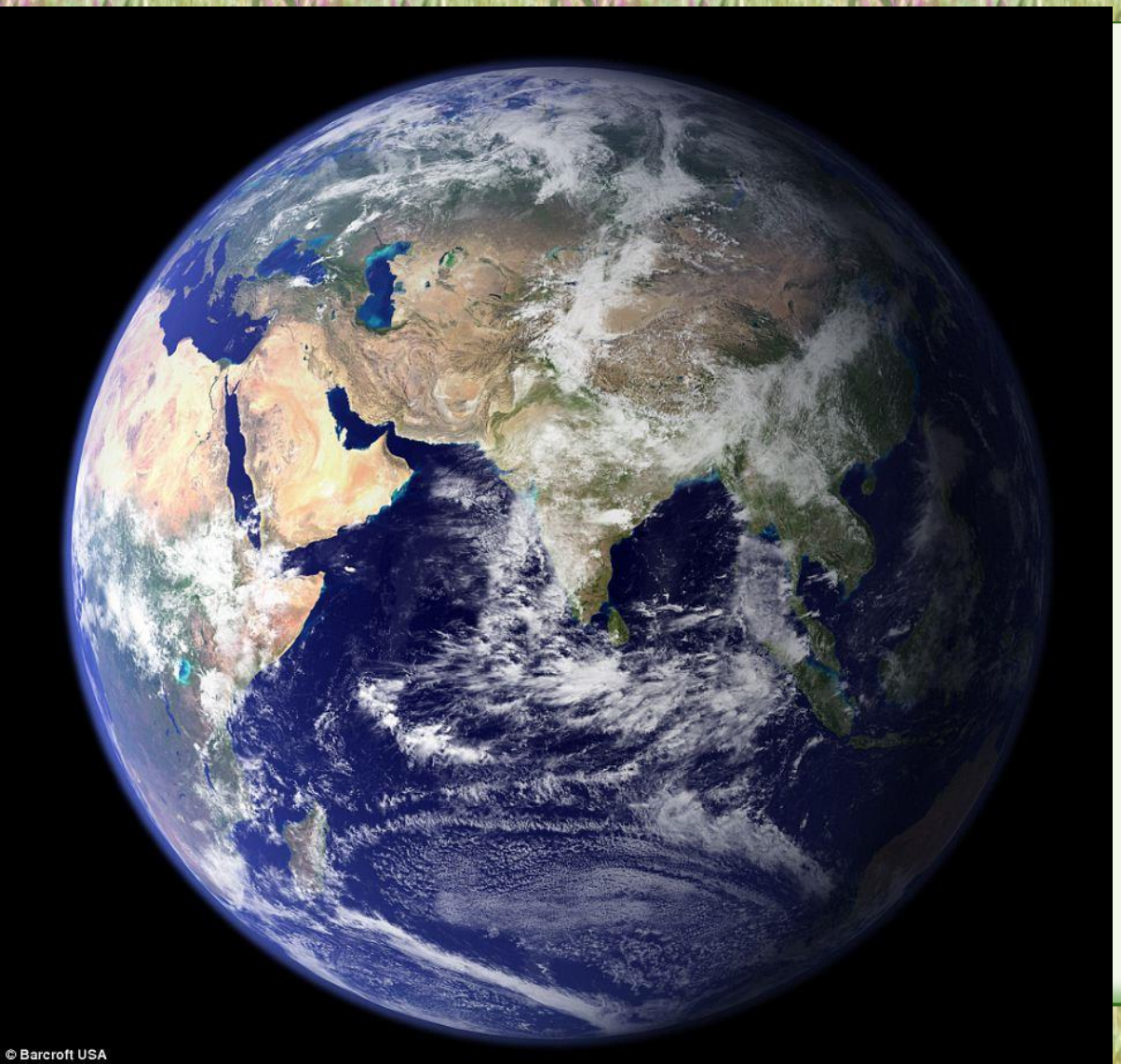
You Are Here



Our Home

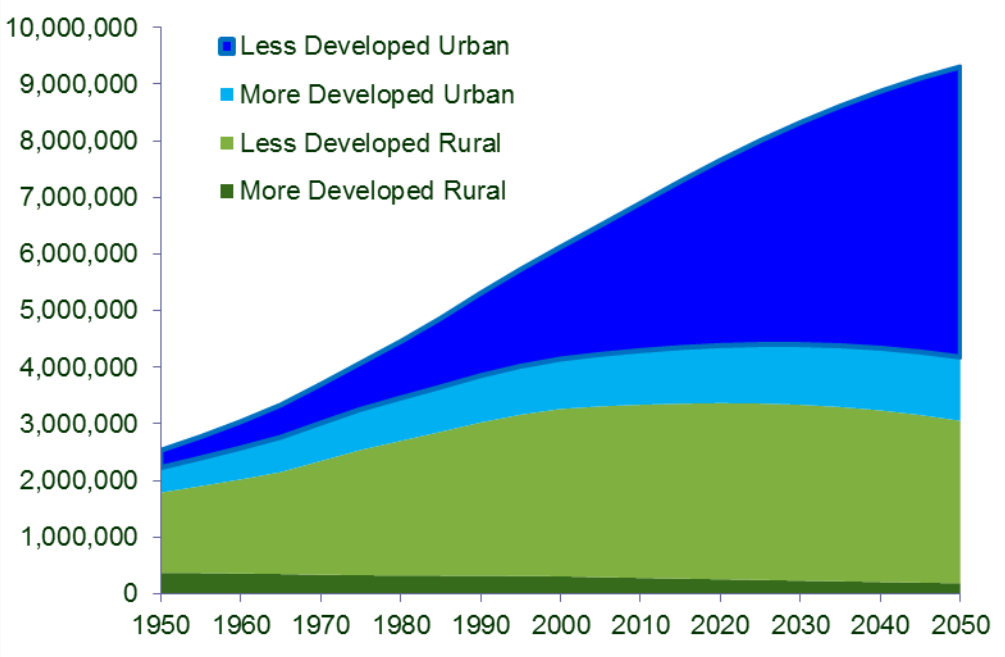


Good planets are difficult to find.

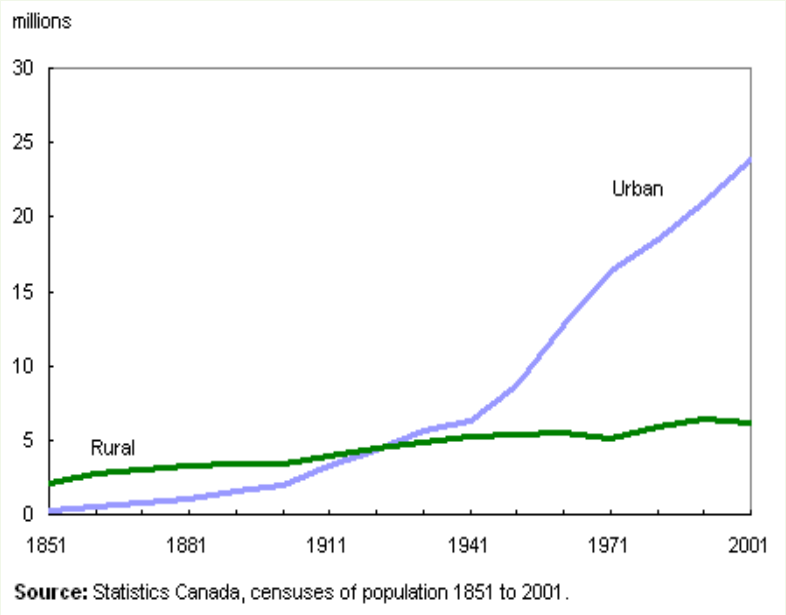
Let’s take good care of the one we have!

The World is Urbanizing

Global



Canada



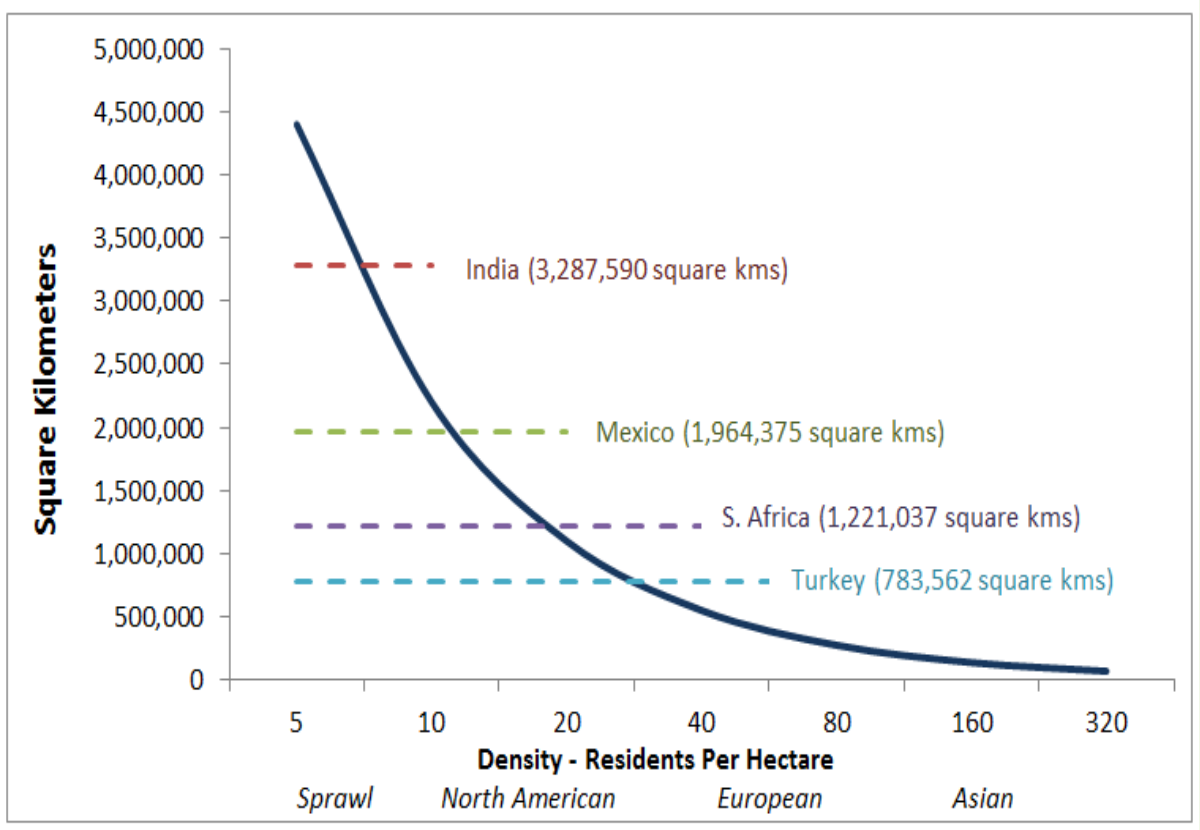
Humanity is shifting from about 80% rural in 1900 to about 80% urban in 2100.

How Much Land Will This Require?

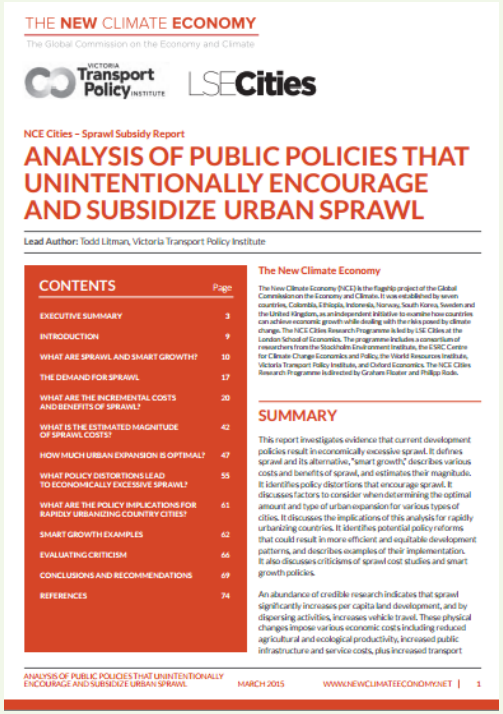
The density with which new urban residents live will significantly affect the total amount of openspace (farmland and natural habitat) that will be displaced by development.

More compact development (more than 20 residents per hectare) provides large savings and benefits.

Our challenge is to increase both density and residents' quality of life.



Costs of Sprawl Research


THE NEW CLIMATE ECONOMY
The Global Commission on the Economy and Climate

Victoria Transport Policy Institute | LSE Cities

NCE Cities – Sprawl Subsidy Report

ANALYSIS OF PUBLIC POLICIES THAT UNINTENTIONALLY ENCOURAGE AND SUBSIDIZE URBAN SPRAWL

Lead Author: Todd Litman, Victoria Transport Policy Institute

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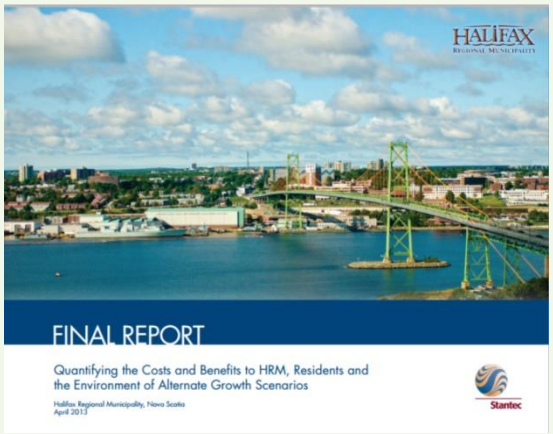
The New Climate Economy

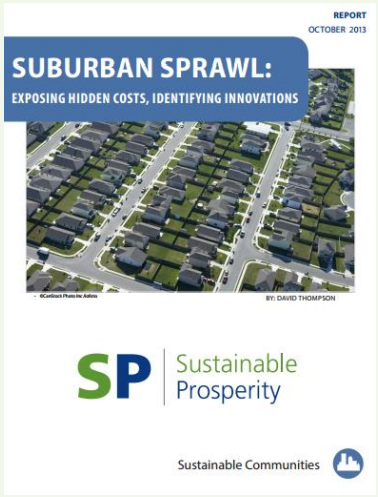
The New Climate Economy (NCE) is the flagship project of the Global Commission on the Economy and Climate. It was established by seven countries, Colombia, Ethiopia, Indonesia, Norway, South Korea, Sweden and the United Kingdom, as an independent initiative to examine how countries can achieve economic growth while dealing with the risks posed by climate change. The NCE Cities Research Programme is led by LSE Cities at the London School of Economics. The programme includes a consortium of researchers from the Stockholm Environment Institute, the ESRC Centre for Climate Change Economics and Policy, the World Resources Institute, Victoria Transport Policy Institute, and Oxford Economics. The NCE Cities Research Programme is directed by Graham Floater and Philipp Rode.

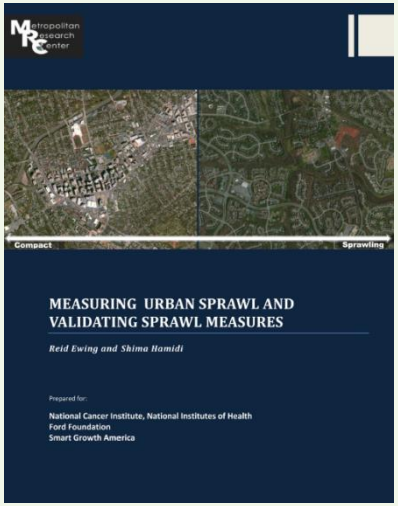
SUMMARY

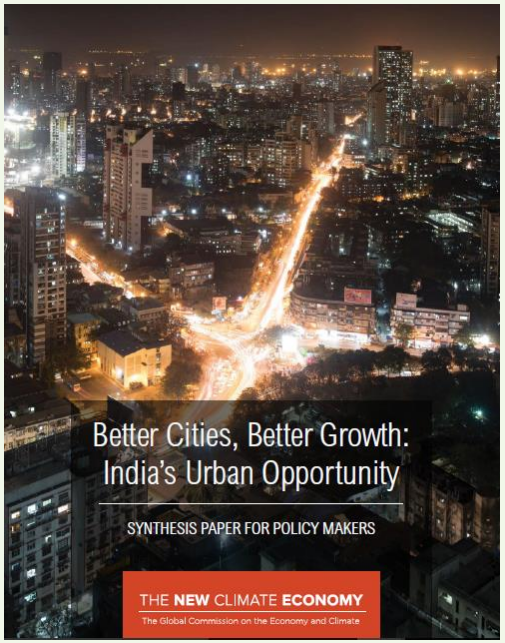
This report investigates evidence that current development policies result in economically excessive sprawl. It defines sprawl and its alternative, "smart growth," describes various costs and benefits of sprawl, and estimates their magnitude. It identifies policy distortions that encourage sprawl. It discusses factors to consider when determining the optimal amount and type of urban expansion for various types of cities. It discusses the implications of this analysis for rapidly urbanizing countries. It identifies potential policy reforms that could result in more efficient and equitable development patterns, and describes examples of their implementation. It also discusses criticisms of sprawl cost studies and smart growth policies.

An abundance of credible research indicates that sprawl significantly increases per capita land development, and by dispersing activities, increases vehicle travel. These physical changes impose various economic costs including reduced agricultural and ecological productivity, increased public infrastructure and service costs, plus increased transport



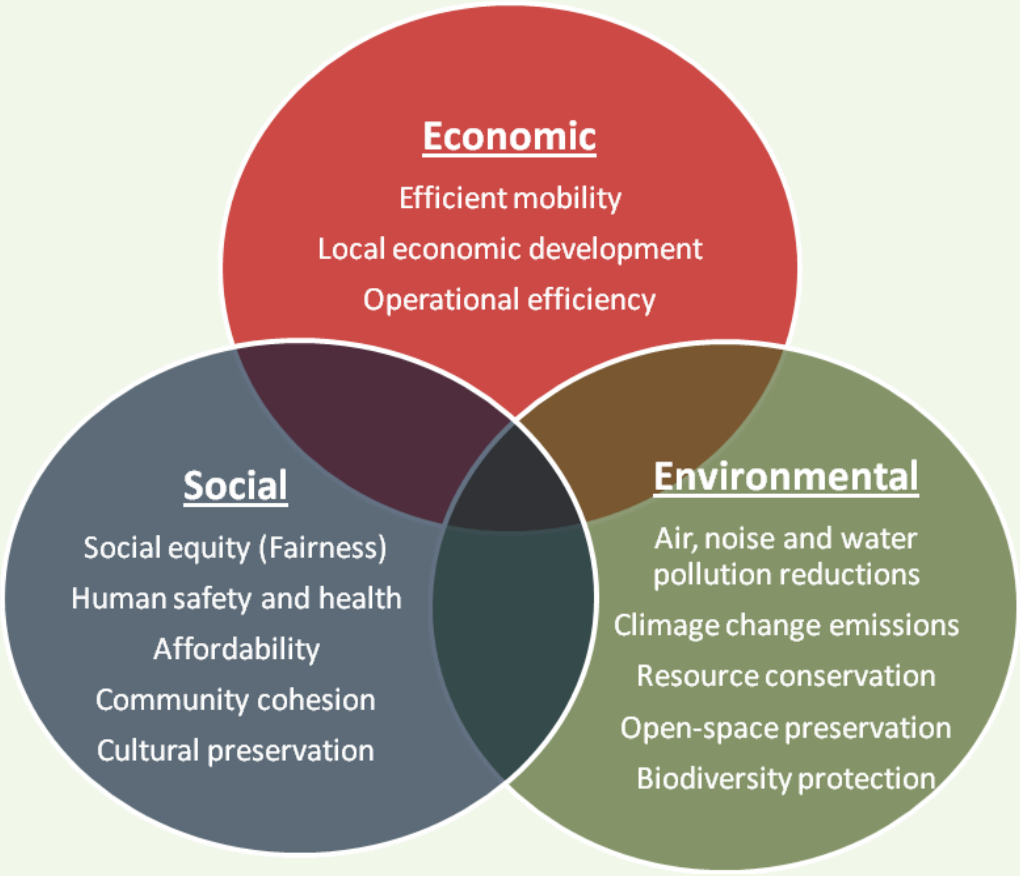






Sustainable Planning

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



Livability Versus Sustainability

Livability Objectives	Other Sustainability Objectives
Local economic development	
Affordability	
Equity / Fairness	
Human safety, security and health	
Community development	National and regional economic productivity
Cultural heritage preservation	Resource efficiency
Air, noise and water pollution prevention	Operational efficiency
Openspace preservation	Climate change prevention
Climate change mitigation	Biodiversity protection

Sustainabile 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

Win-Win Transport Solutions

Planning Objectives	Expand Roadways	Efficient and Alt. Fuel Vehicles	Shifts to Efficient Modes
Reduce traffic congestion	✓		✓
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			✓

Canadian Vehicle Travel Trends

Figure 4 — Vehicle-kilometres travelled by vehicle type, 2000 to 2009

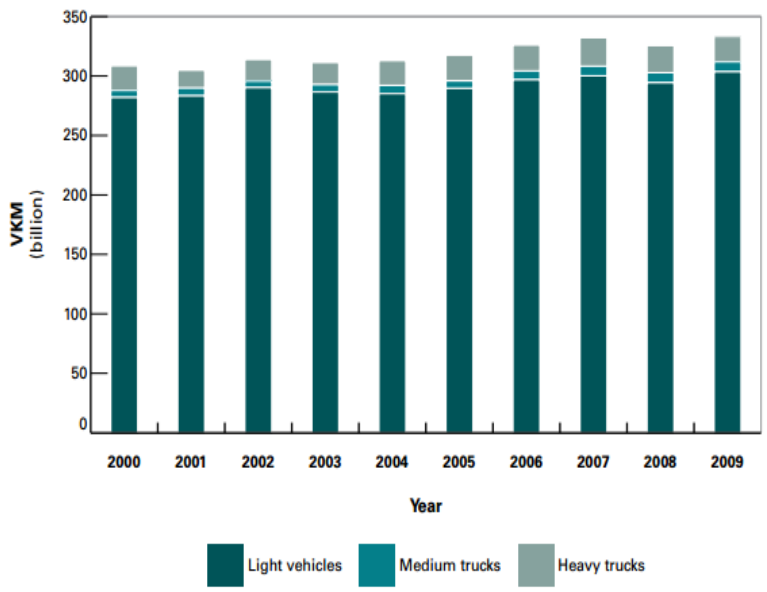
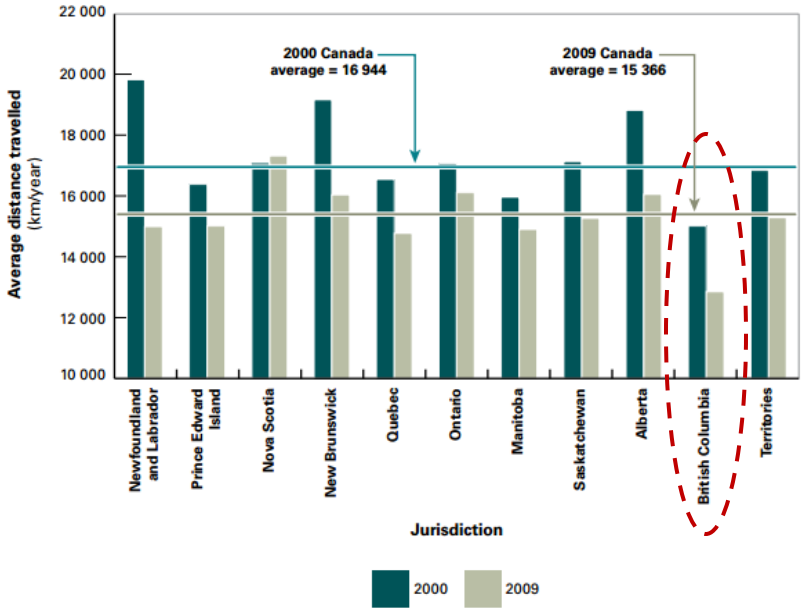


Figure 11 — Average distance travelled by light vehicles by jurisdiction, 2000 and 2009



Total vehicle-travel has approximately peaked, and annual vehicle travel per capita declined during the last decade, particularly in British Columbia.

2009 Canadian Vehicle Survey

"The Economist" 22 Sept. 2012

"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. Cars take up more space per person than any other form of transport—one lane of a freeway can transport 2,500 people per hour by car, versus 5,000 in a bus and 50,000 in a train."

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

"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.

Valuing Multi-Modalism

An efficient and equitable transportation system is diverse so users to choose the most efficient mode for each trip:

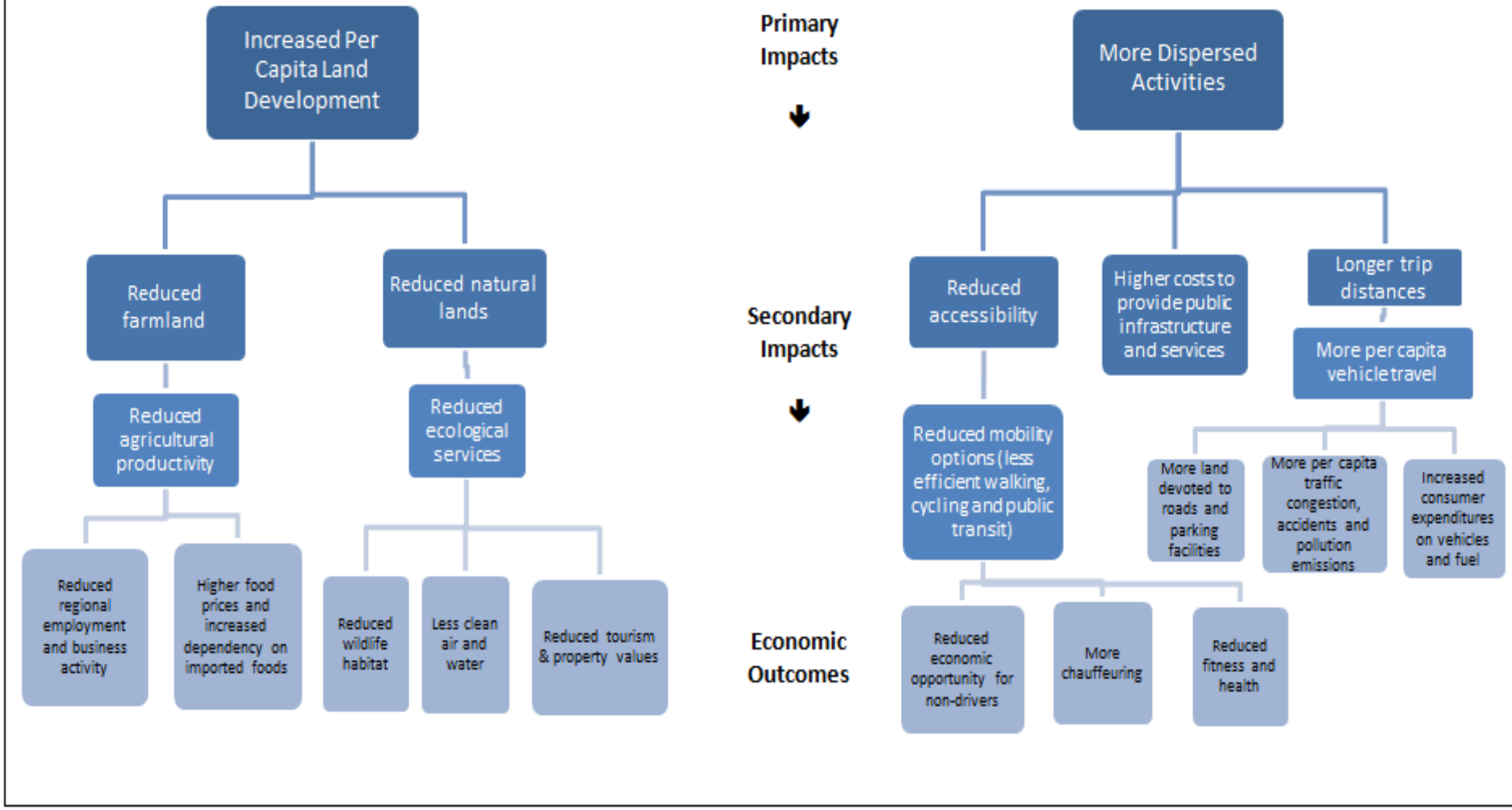
- Walking and cycling for local errands
- High quality public transit when travelling on busy corridors
- Automobile travel when it is truly most efficient, considering all impacts

Current planning does a poor job of valuing this diversity.

"A developed country is not where the poor drive cars, it is where the rich use public transportation"

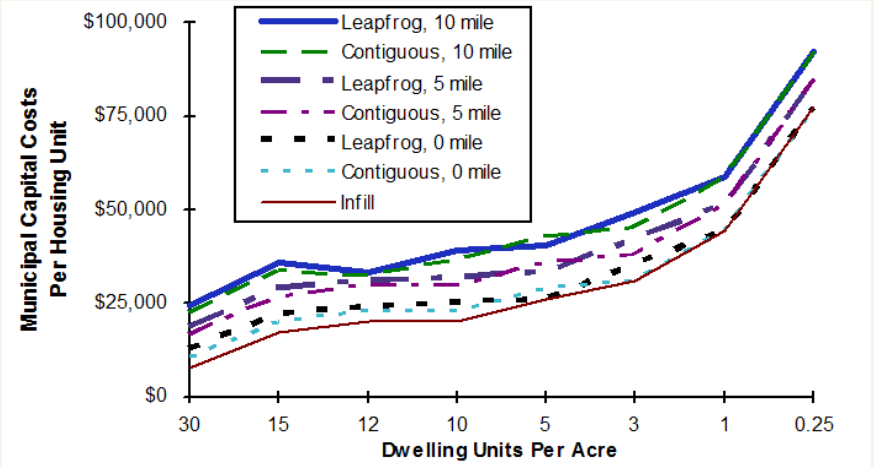
- Enrique Peñalosa, Bogota Mayor

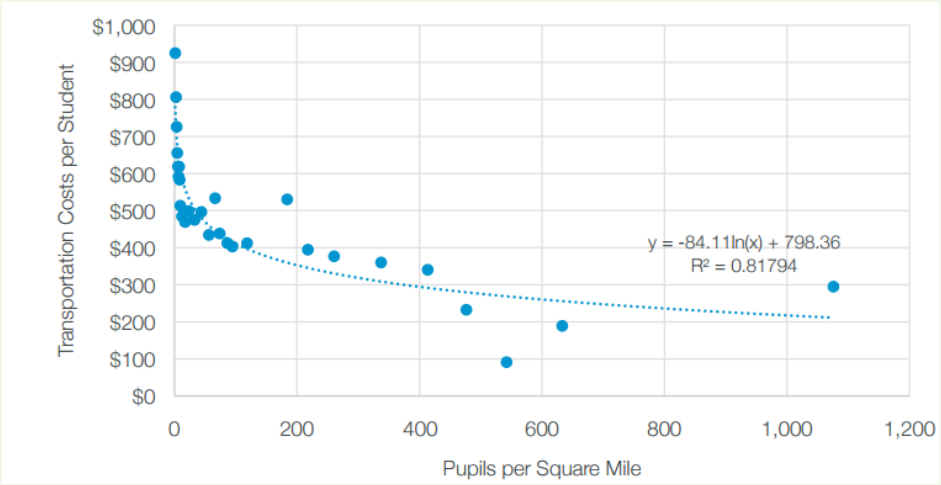
Urban Efficiency



Public Service Costs

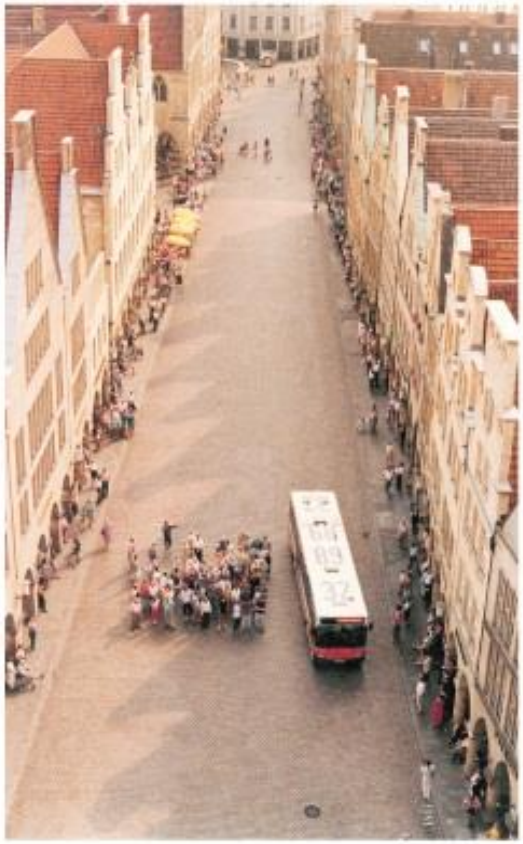
Lower-density, urban fringe development significantly increases the costs of providing public infrastructure and services such as school transportation, emergency response and healthcare.



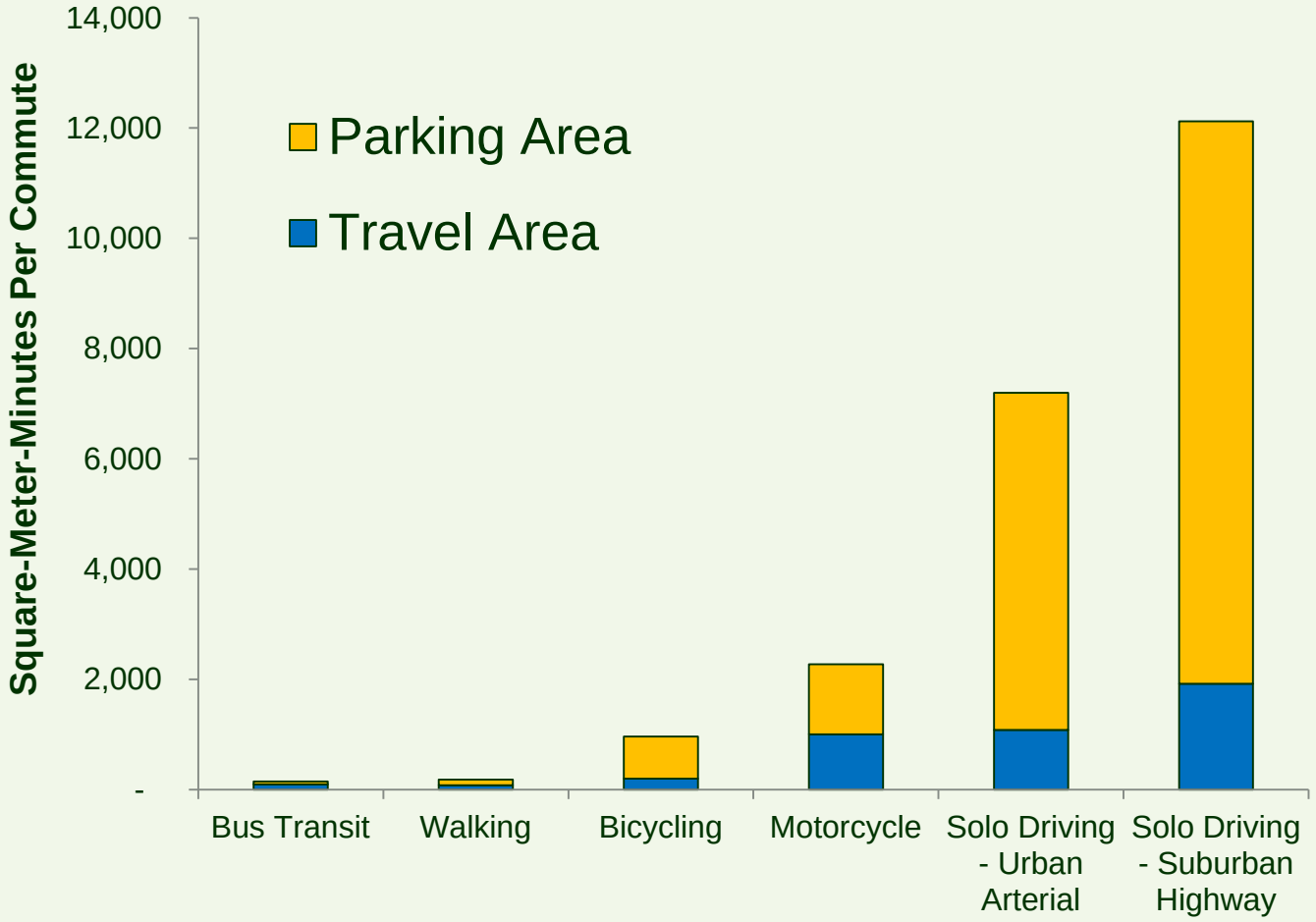


Road Space Requirements

space required to transport the same number of passengers by car, bus or bicycle. (Poster in city of Muenster Planning Office, August 2001)



Space Requirements



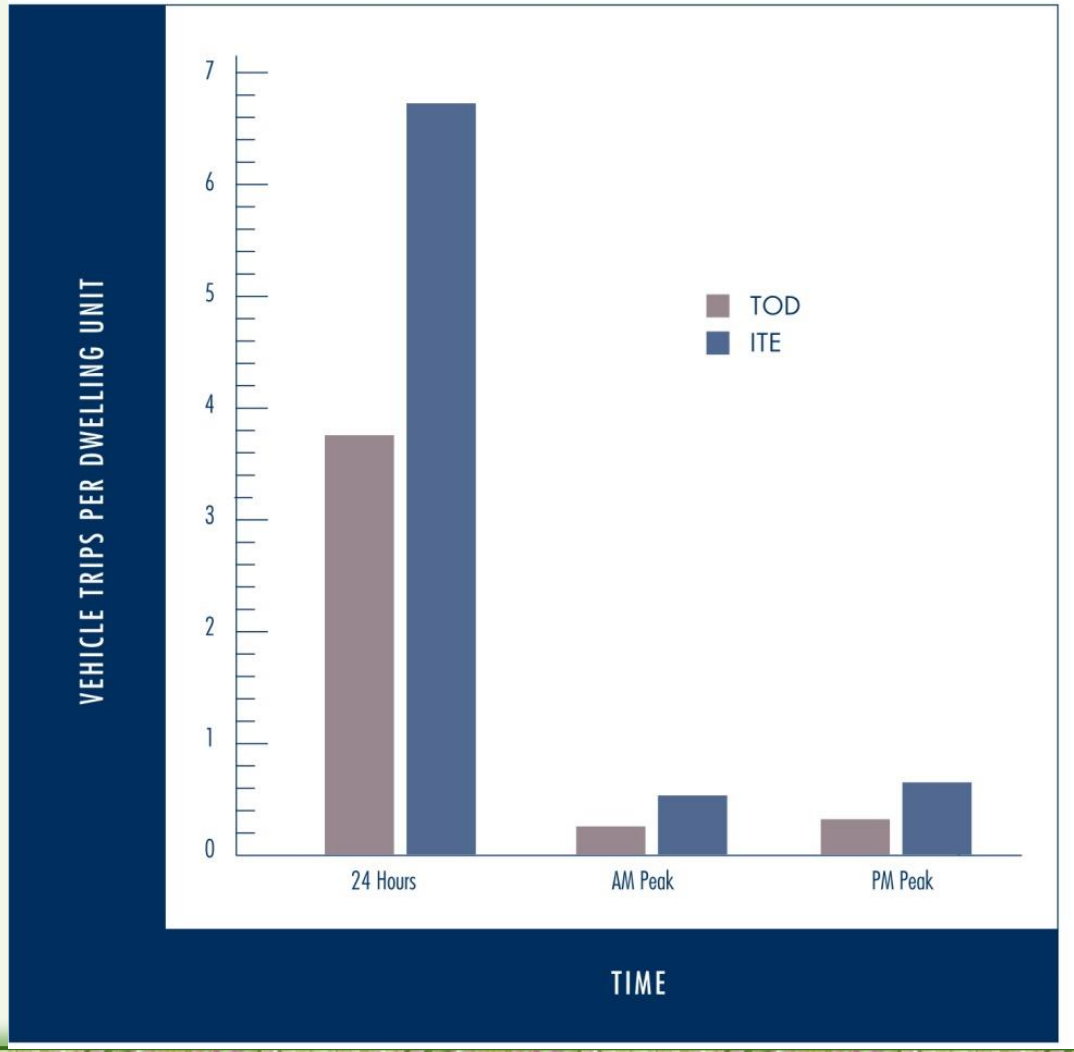
Since each car requires road space plus three to six parking spaces (at home, work and other destinations), a car uses more land than most urban residents' homes.

Walking, cycling and public transit require far less space.

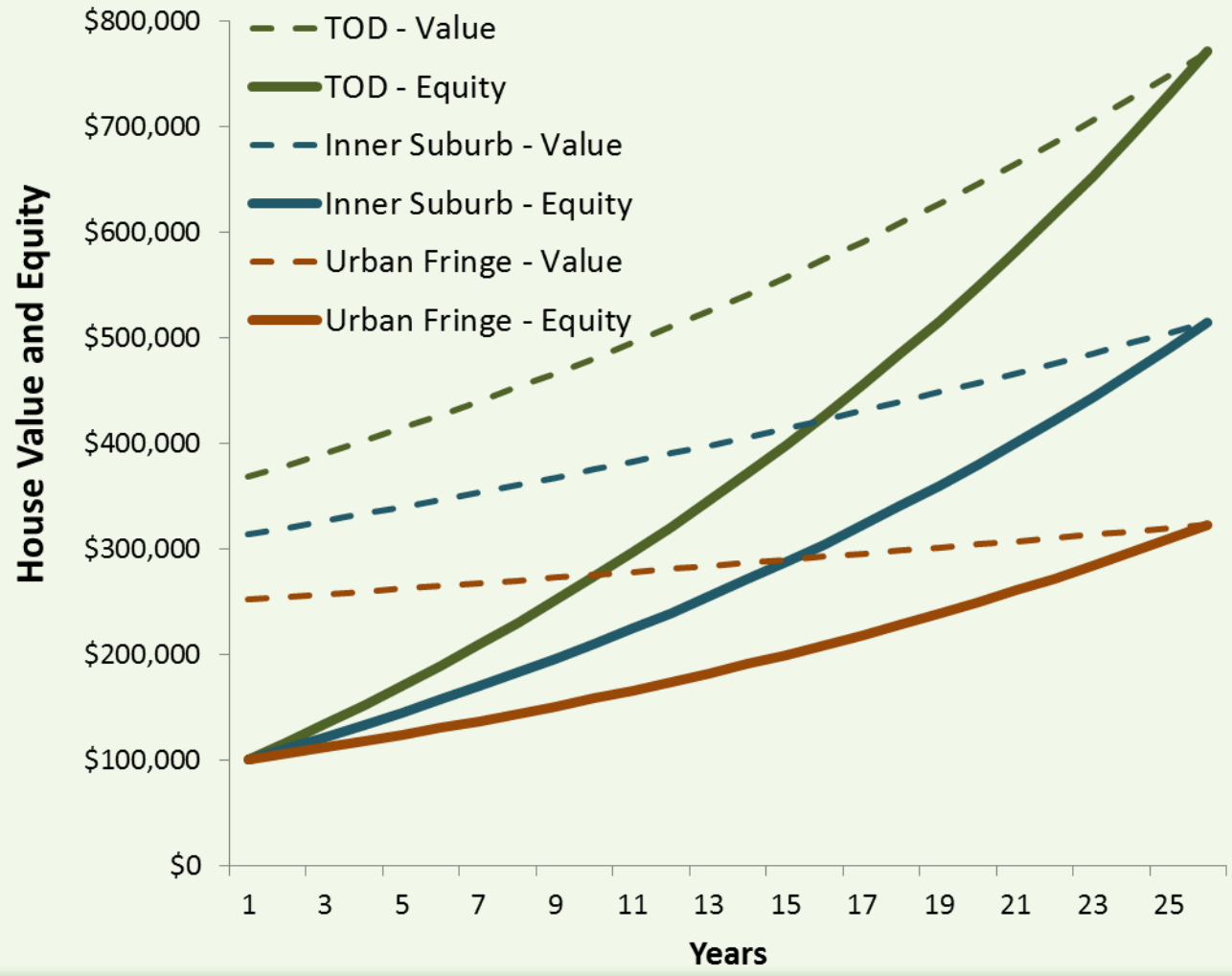
Improving Demand Analysis

Transit-oriented development trip and parking generation rates are about half as high as what conventional traffic models assume.

Although infill development may increase local traffic, it significantly reduces regional traffic problems.

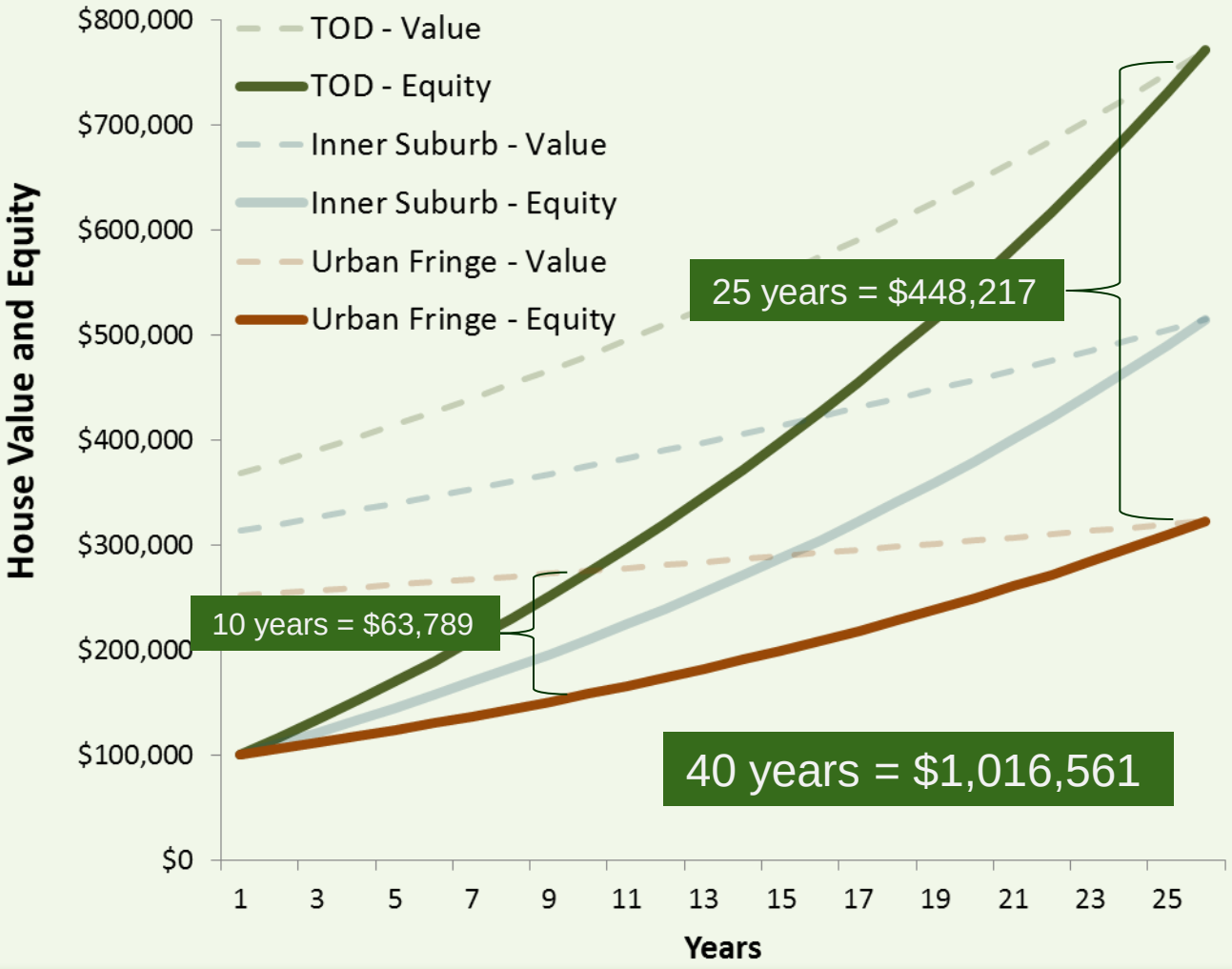


Housing Price Appreciation



With a total annual $27,000 housing and transportation budget and a $100,000 down payment, a household can afford to purchase a $251,975 urban fringe house, a $313,862 inner suburb house, or a $368,405 TOD house.

Housing Price Appreciation

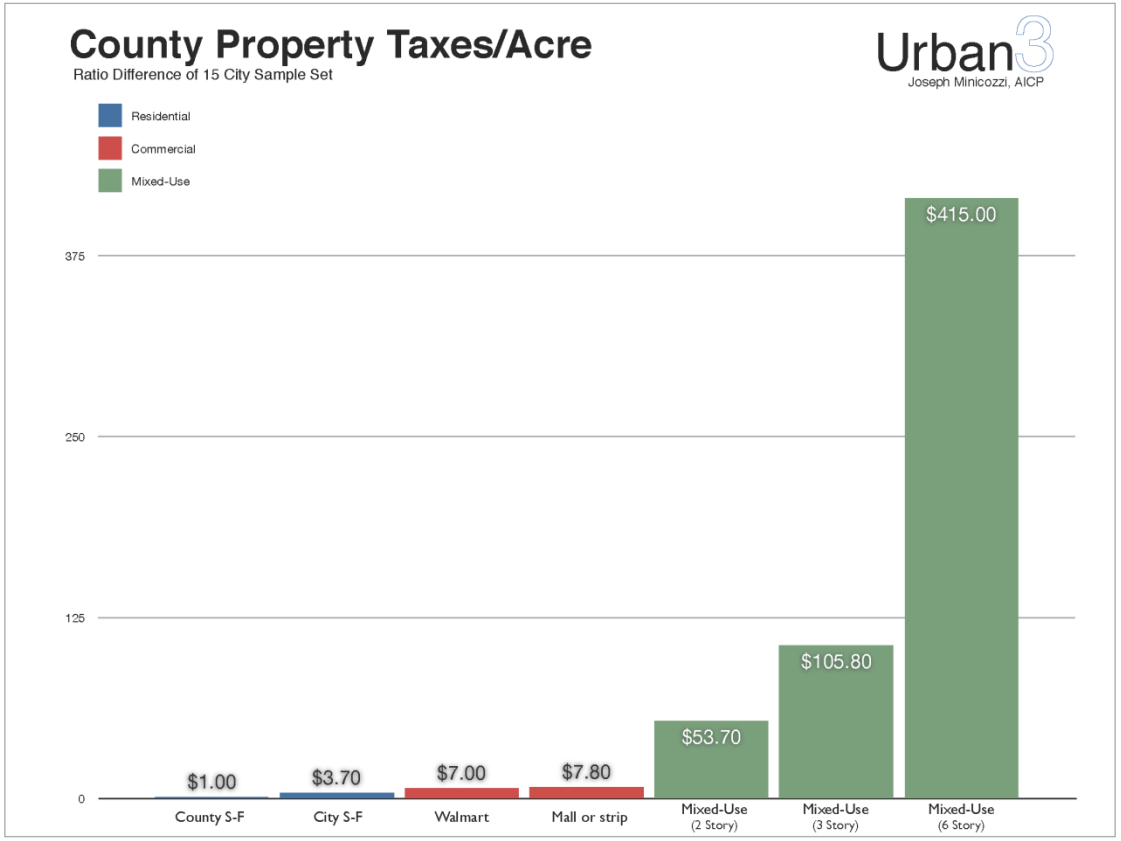


After ten years the TOD home builds **$63,789** more equity, and after 25 years **$448,217** more equity, than an urban fringe home.

If, starting at age 25, a household always chooses TOD homes and invests the transport savings in real estate, they can retire at age 65 with approximately $1.8 million in equity, **$1,016,561** more than if they purchased urban fringe houses with high transportation costs.

Economic Development

Smart growth tends to provide more economic activity and tax revenue per acre, resulting in more stable and higher quality jobs, and improves economic opportunity for disadvantaged people.

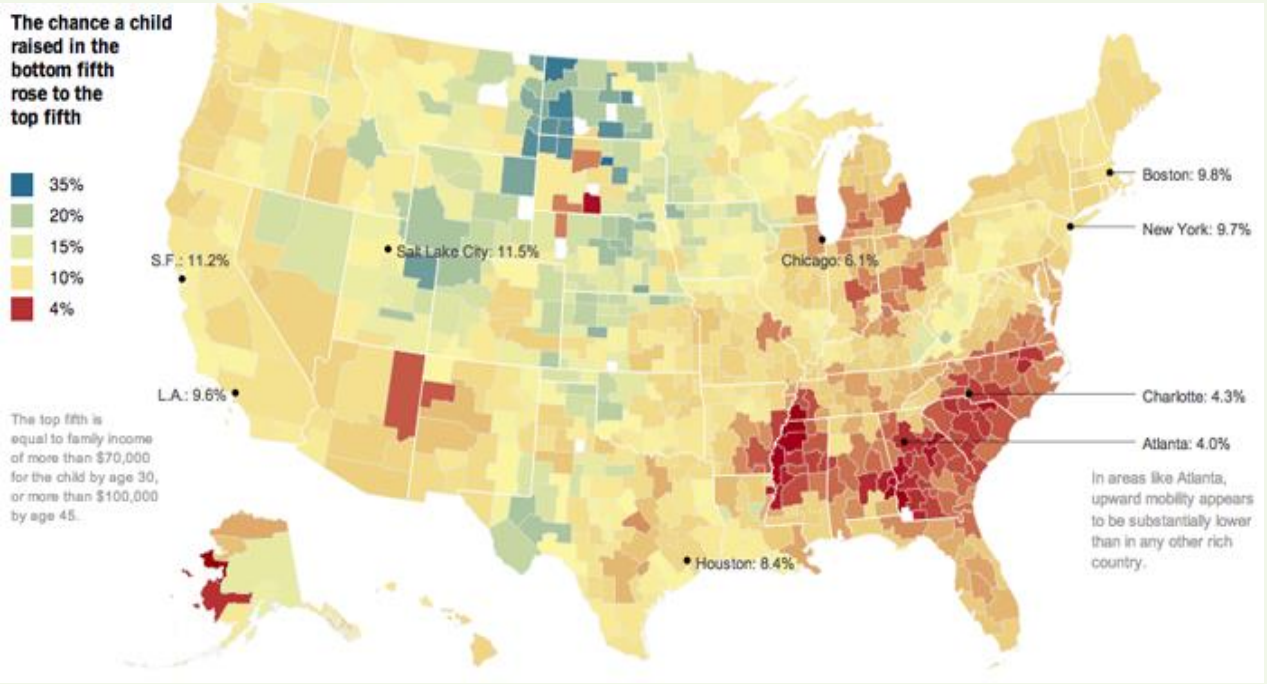


Social Equity Objectives

Walking, cycling and public transit help achieve social equity objectives:

- They provide basic mobility for people who are unable to drive an automobile due to low incomes and disabilities.
- They support economic opportunities (access to jobs and housing) for economically disadvantaged people.
- They ensure that people who don't drive receive a fair share of public resources such as road space and parking facilities.

Economic Opportunity and Mobility

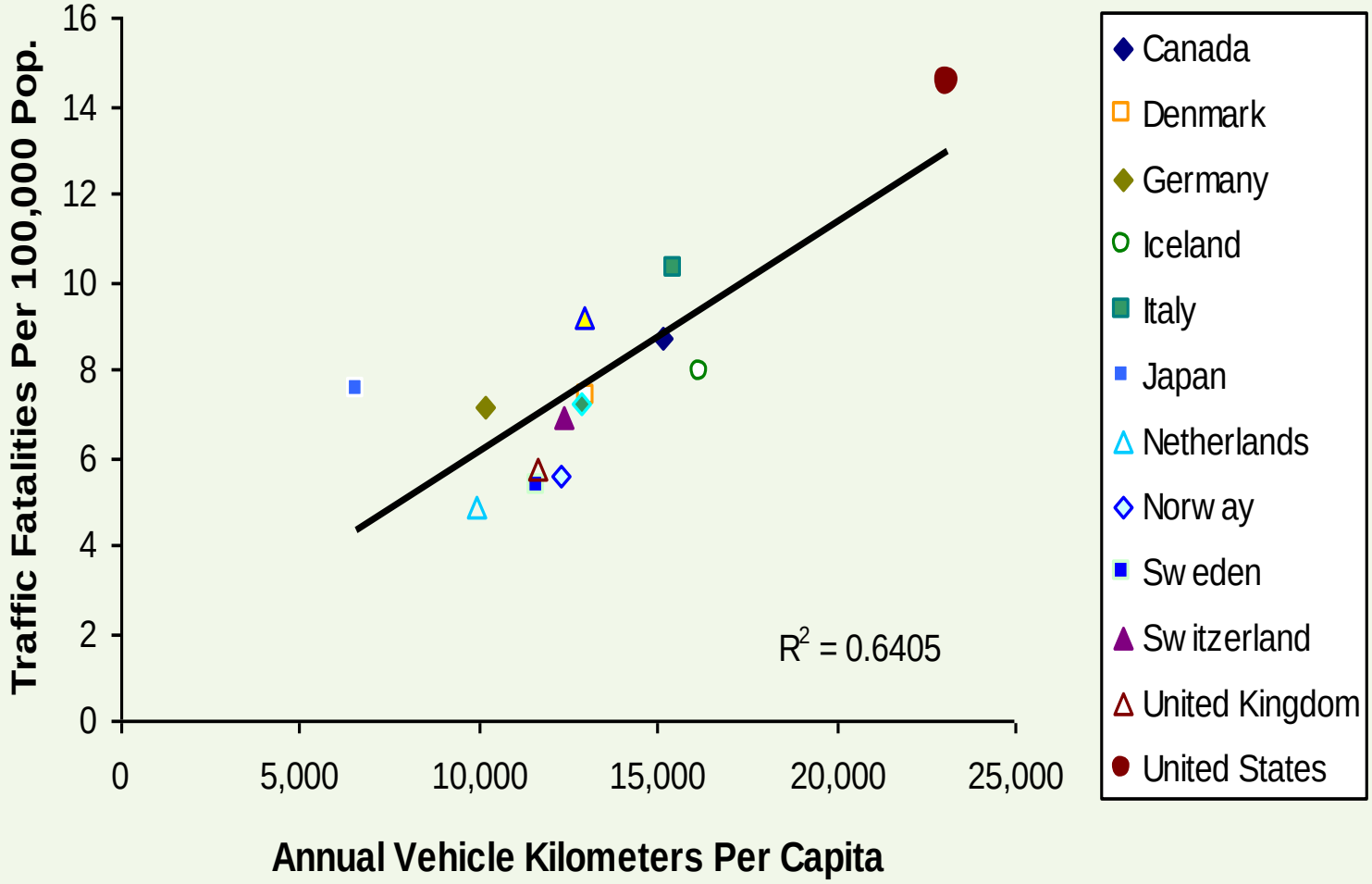


New research identifies factors that affect economic opportunity and mobility.

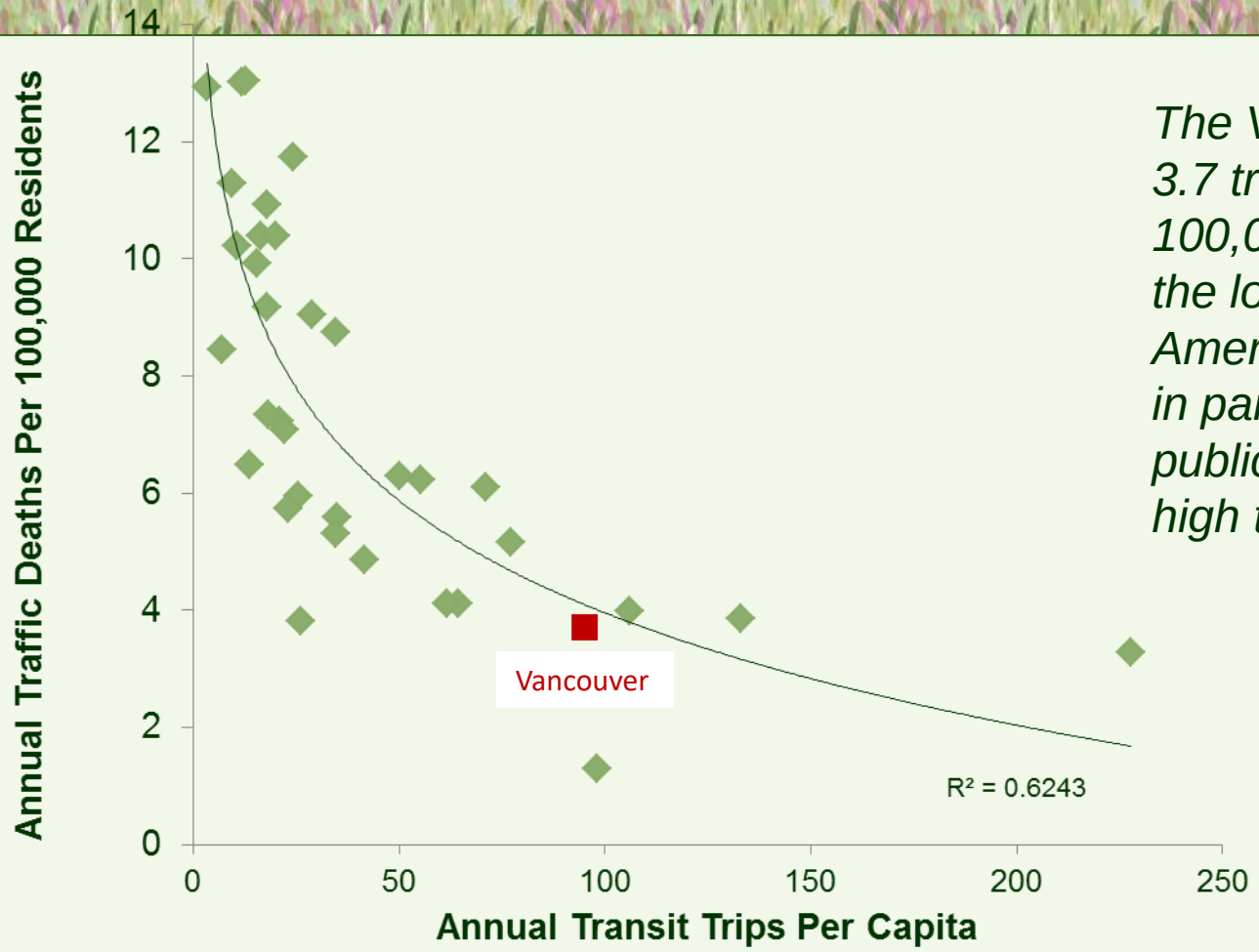
More compact, multi-modal development increases the number of jobs available to potential workers and the pool of workers available to businesses.

Mixed-income neighborhoods turn out to be a key indicator of a family's ability to rise out of poverty.

Transit Travel Vs. Traffic Deaths

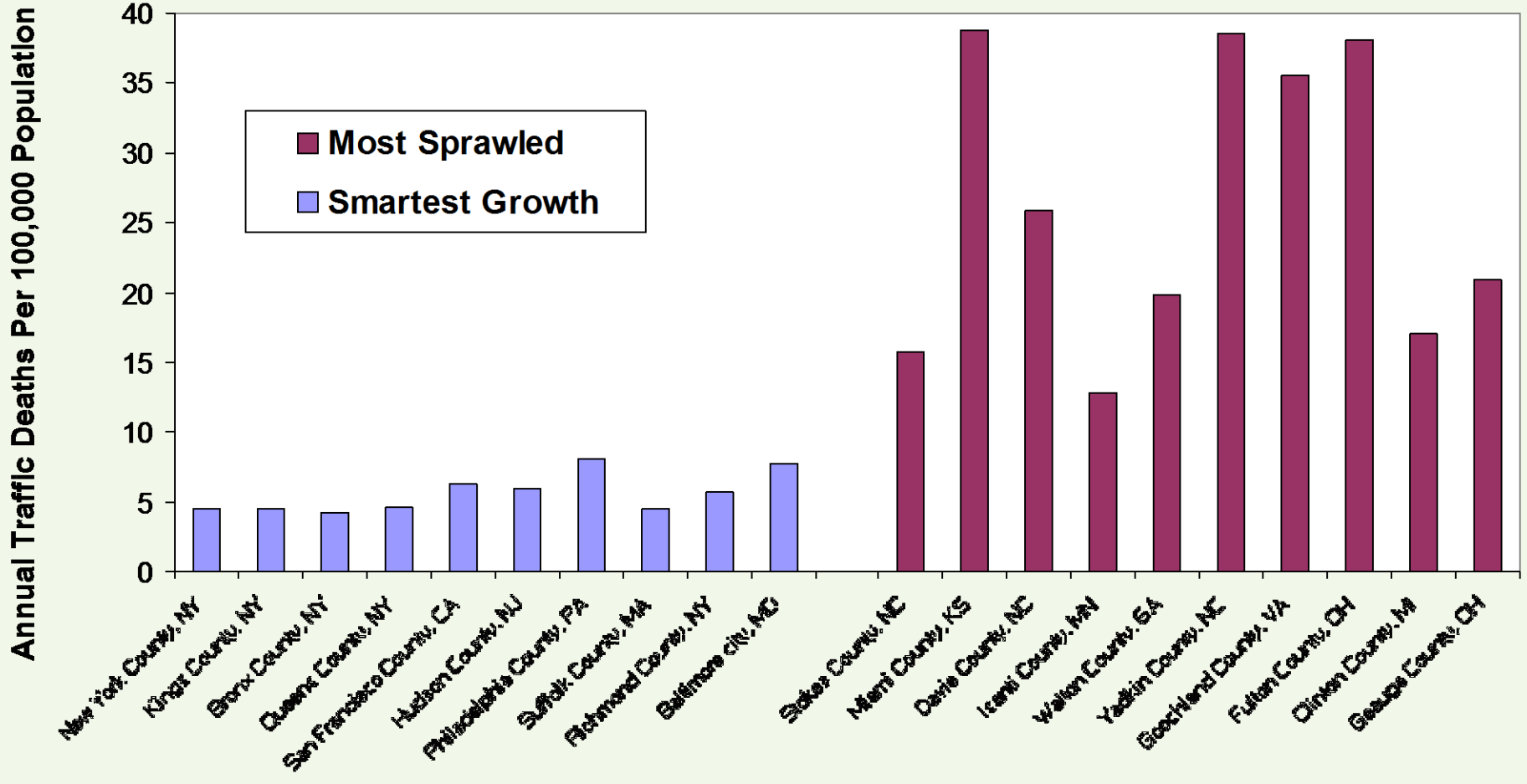


Increases Safety



The Vancouver region has 3.7 traffic deaths per 100,000 residents, one of the lowest among North American cities. This results, in part, from high quality public transit and associated high transit ridership.

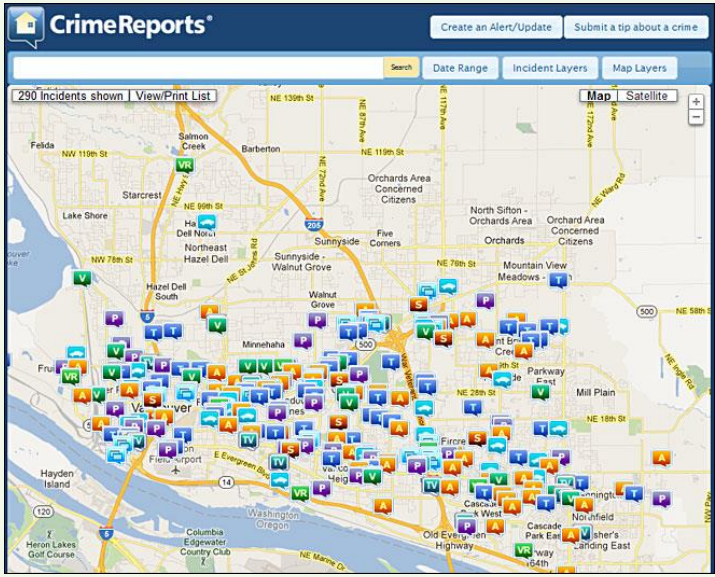
Smart Growth Safety Impacts



Personal Security

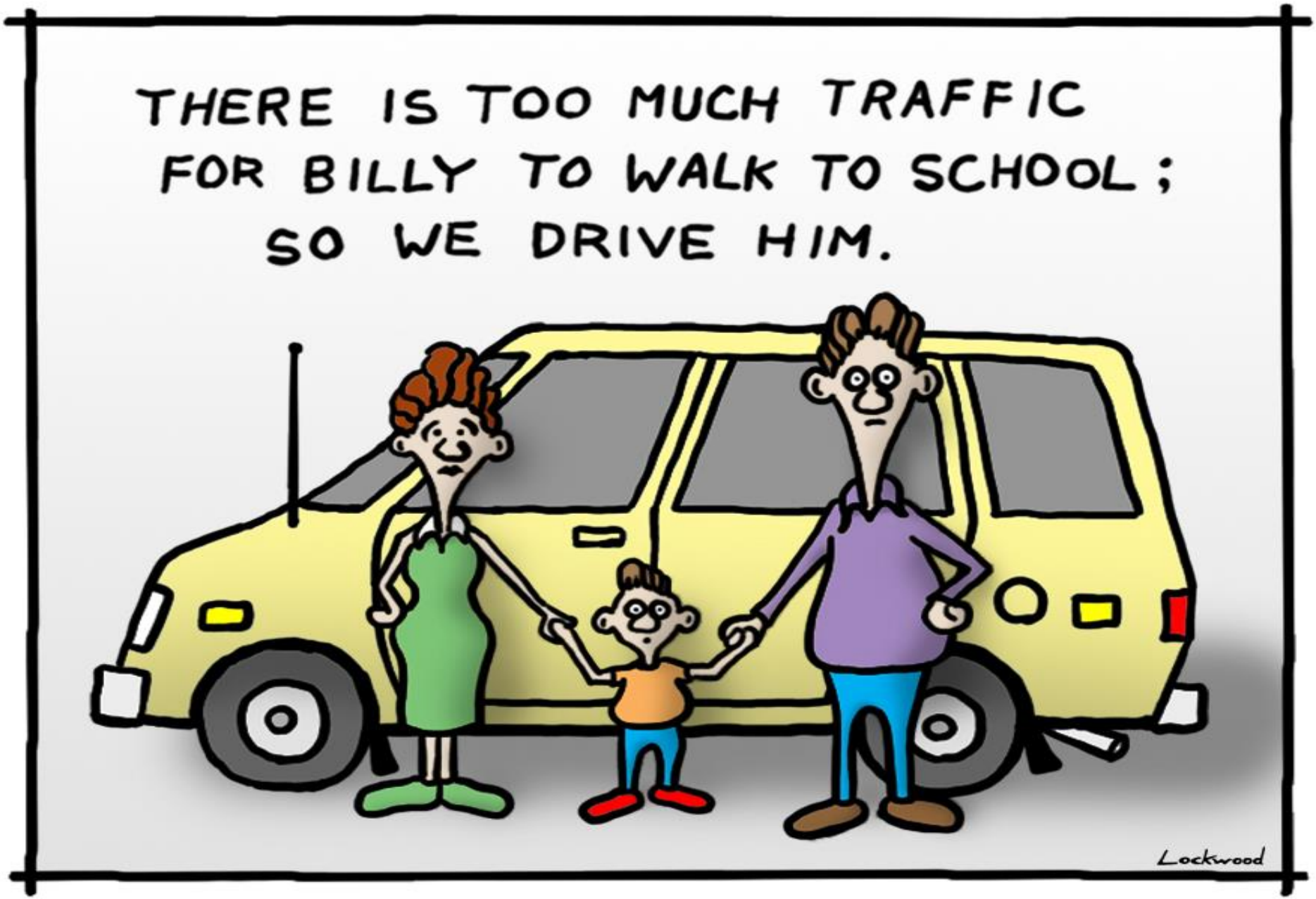
Many people assume that urban neighborhoods are dangerous. In fact, more compact, mixed communities tend to have lower per capita crime rates:

- **More Community Cohesion and Passive Surveillance.** *Community cohesion* refers to the quantity and quality of positive interactions among neighbors. Increasing community cohesion and more *passive surveillance* (also called *eyes on the street*) help reduce crime. Geographic crime analysis indicates that all else being equal, crime rates are negatively associated with development density and mix, and the number of pedestrians walking through an area.
- **Reduced Poverty Concentration.** Crime is strongly correlated to concentrated poverty. Development policies that improve poor residents' travel options, and therefore their economic opportunities, and create more mixed-income communities are likely to reduce concentrated poverty.
- **Reduced Motor Vehicle Crime.** Reduced vehicle ownership reduces vehicle crimes (vehicle assaults, thefts and vandalism), which are a major portion of total crimes, and far more common and costly than transit crimes.



What Gets People Moving?

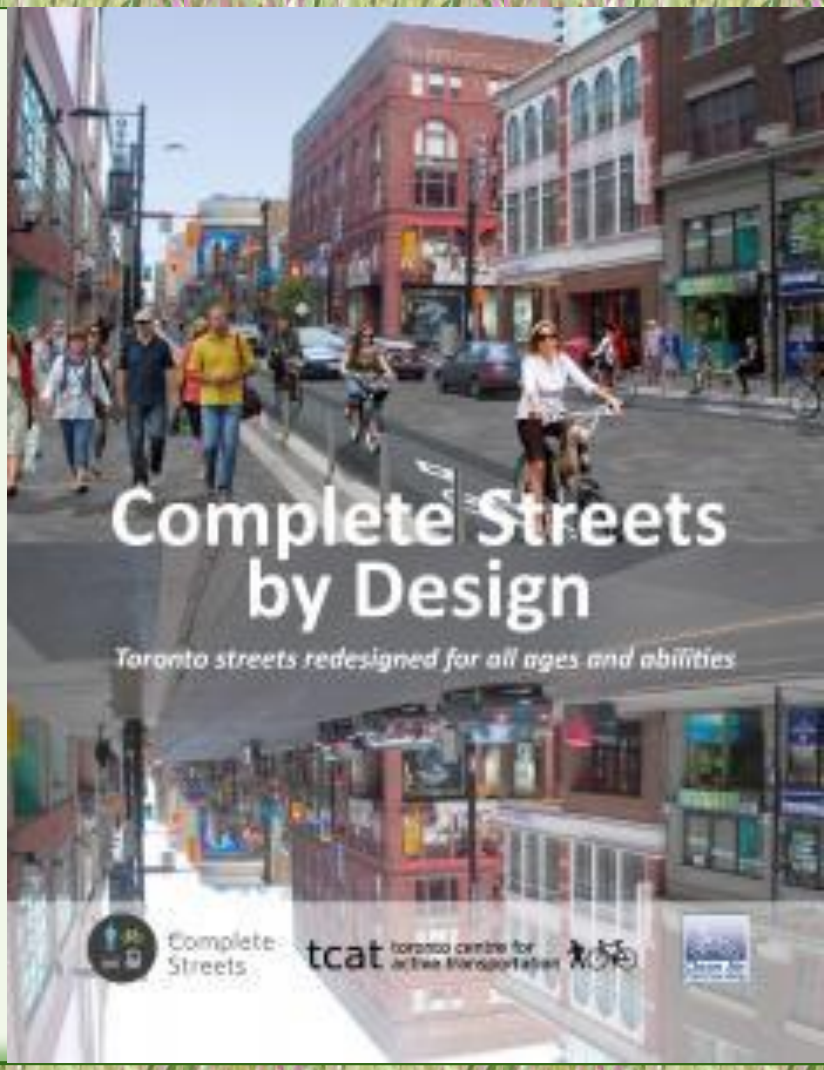
Walking is a natural and essential activity. If you ask sedentary people what physical activity they will most likely to stick with, walking usually ranks first.



Traffic Inducing Traffic

Complete Streets

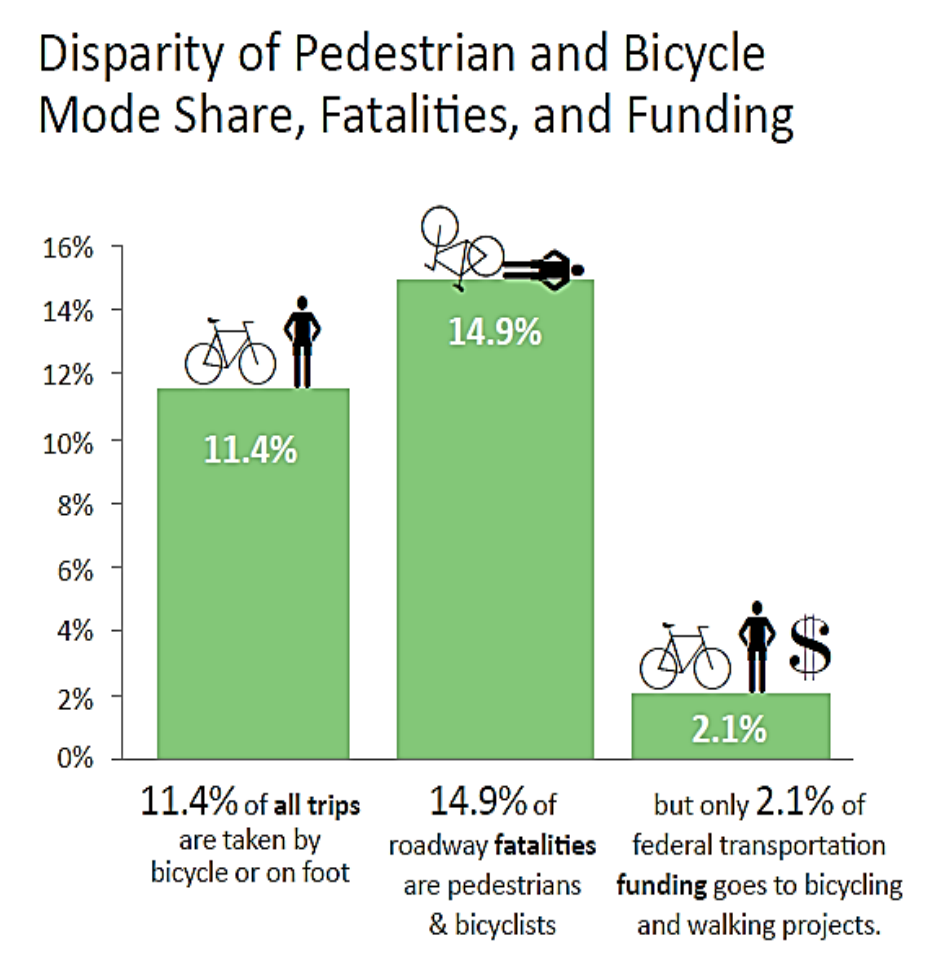
A Complete Street is designed for all activities, abilities, and travel modes. Complete Streets provide safe and comfortable access for pedestrians, cyclists, transit users and motorists, and a livable environment for visitors, customers, employees and residents in the area.



Affordable-Efficient Modes

Walking, cycling and public transport are resource efficient and affordable, and so tend to be most sustainable.

Yet, they often receive less than a fair share of public investment.



(US Data, ABW 2014)

Latent Demand for Active Transport

- The FHWA's *Nonmotorized Transportation Pilot Program* found substantial increases and continual growth in nonmotorized travel activities in each of the studied corridors and intersections.
- Community-wide increases of 22% for walking and 49% for bicycling between 2007 and 2010.
- Most of these increases consisted of utilitarian, plus increased recreational and exercise activity.

Mental Health

- *Affordability*. Improve affordable urban housing and transportation options (walking, cycling, public transit, taxi, etc.) to reduce residents' financial stress.
- *Independent mobility.* Provide independent mobility options for residents who are poor, have disabilities or impairments, adolescents or seniors.
- *Pro-social places*. Create public spaces (streets, parks, public buildings, etc.) that promote community and encourage positive interactions among residents.
- *Community safety*. Create communities that minimize urban dangers including traffic, crime and harassment, and pollution exposure.
- *Design for physical activity*. Integrate physical activity by providing good walking and cycling conditions, high quality public transit, and compact, walkable and mixed neighborhoods, and local parks and recreation facilities.
- *Pollution reductions.* Implement noise, air, light and toxic pollution reduction.
- *Greenspace*. Design cities with appropriate greenspaces. Dedicate 15-25% of urban land to public parks, and locate most homes within a five-minute walk of neighborhood parks or appropriate recreational facilities.

Smart Growth Benefits

Economic	Social	Environmental
• Preserving openspace increases agricultural productivity and recreational industries • More efficient public facilities and services, reduces government costs • Reduced road and parking demands, reduces costs to governments and businesses • Improved accessibility, reduced transportation costs (vehicle expenses, accident and pollution damages) • Reduces spending on imported vehicles and fuel, reducing export exchange burdens.	• Improved accessibility and economic opportunity for economically disadvantaged people. • Reduced traffic casualties (injuries and deaths). • Improved public fitness and health. • Increased community cohesion (positive interactions among neighbors). • Reduced chauffeuring burdens.	• Openspace preservation maintains wildlife habitat and other ecological functions. • Reduced hydrologic disruptions (surface and groundwater flows) and stormwater management costs. • Reduced per capita energy consumption and pollution emissions (although increases in residents' exposure to some local pollutants).

Memo From Future Self

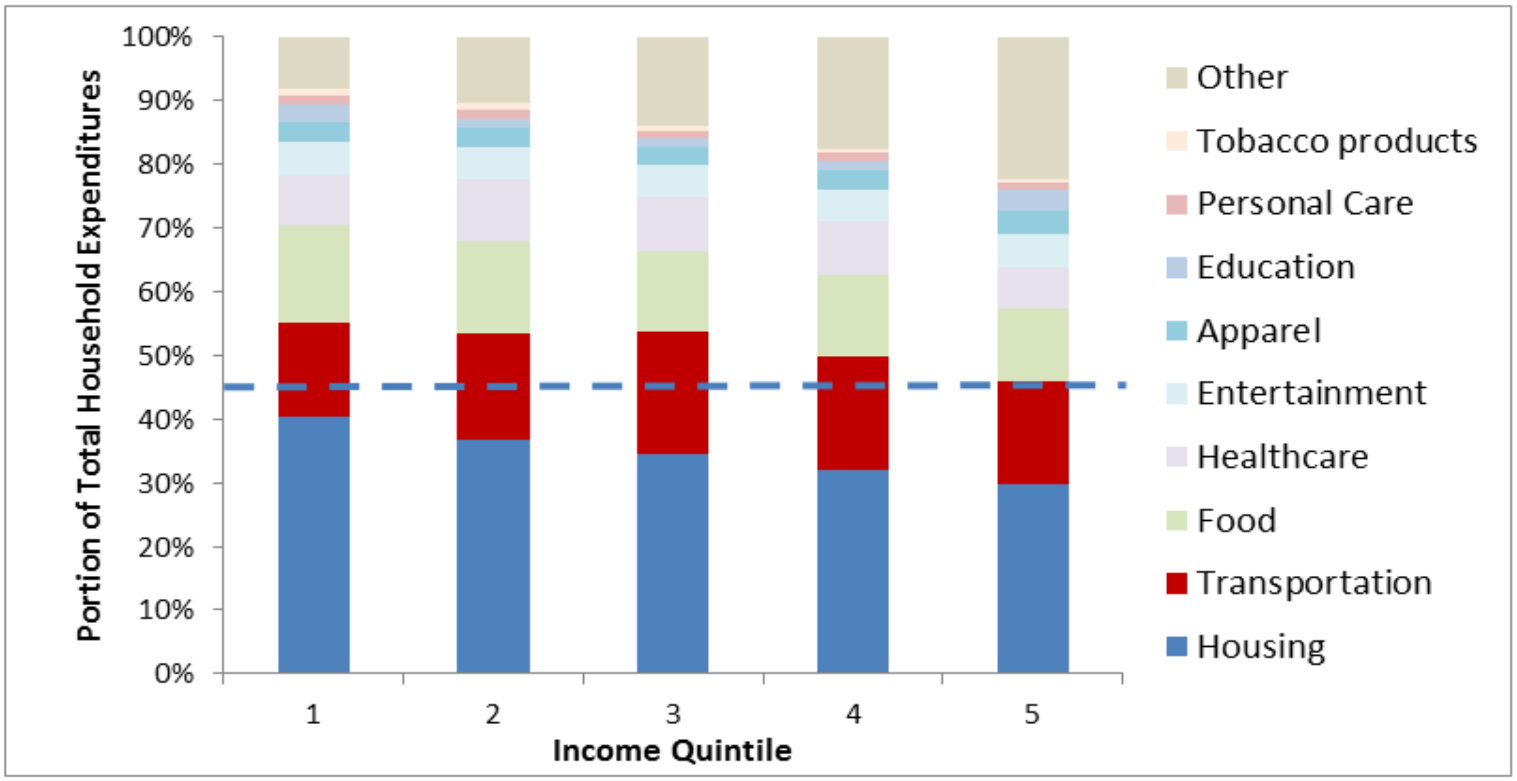
Hope for the best but prepare for the worst:

- *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).

Happily Poor

- What public policies help people be poor but happy?
  - Efficient public services for everybody
  - High quality affordable transport options (walking, cycling, public transport)
  - Affordable-accessible housing (affordable housing located in walkable urban neighborhoods)

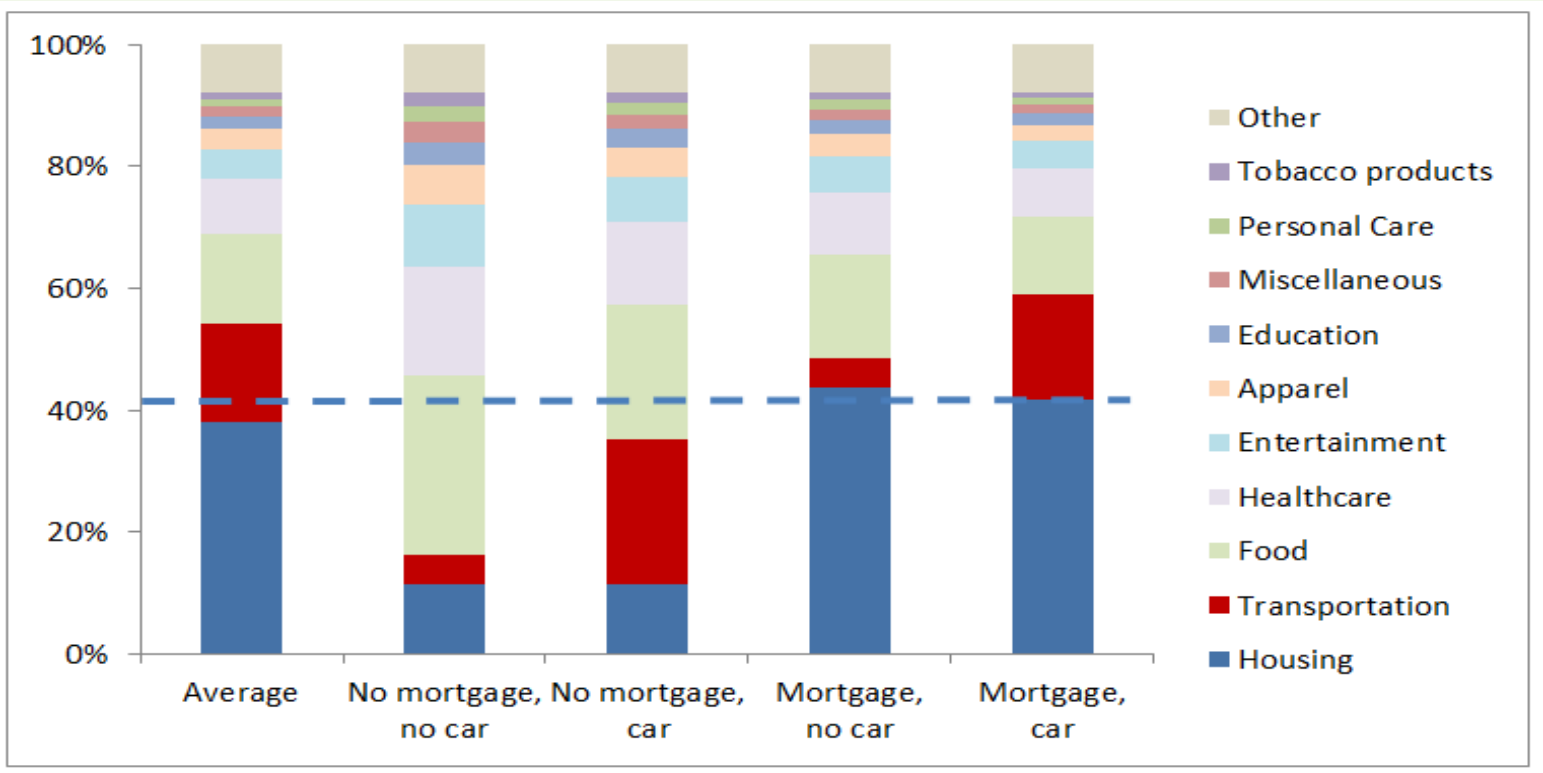
Household Expenditures by Income Quintile



2015 Consumer Expenditure Survey Data, US Bureau of Labor Statistics

Housing and transportation are the two largest household expenditure categories, representing more than half of all spending for all but the highest income quintile (fifth of all households). This is far more than is considered affordable (45%). These excessive cost burdens result, in part, from public policies that favor more expensive housing and transport over more affordable options.

Household Expenditures by Income Quintile

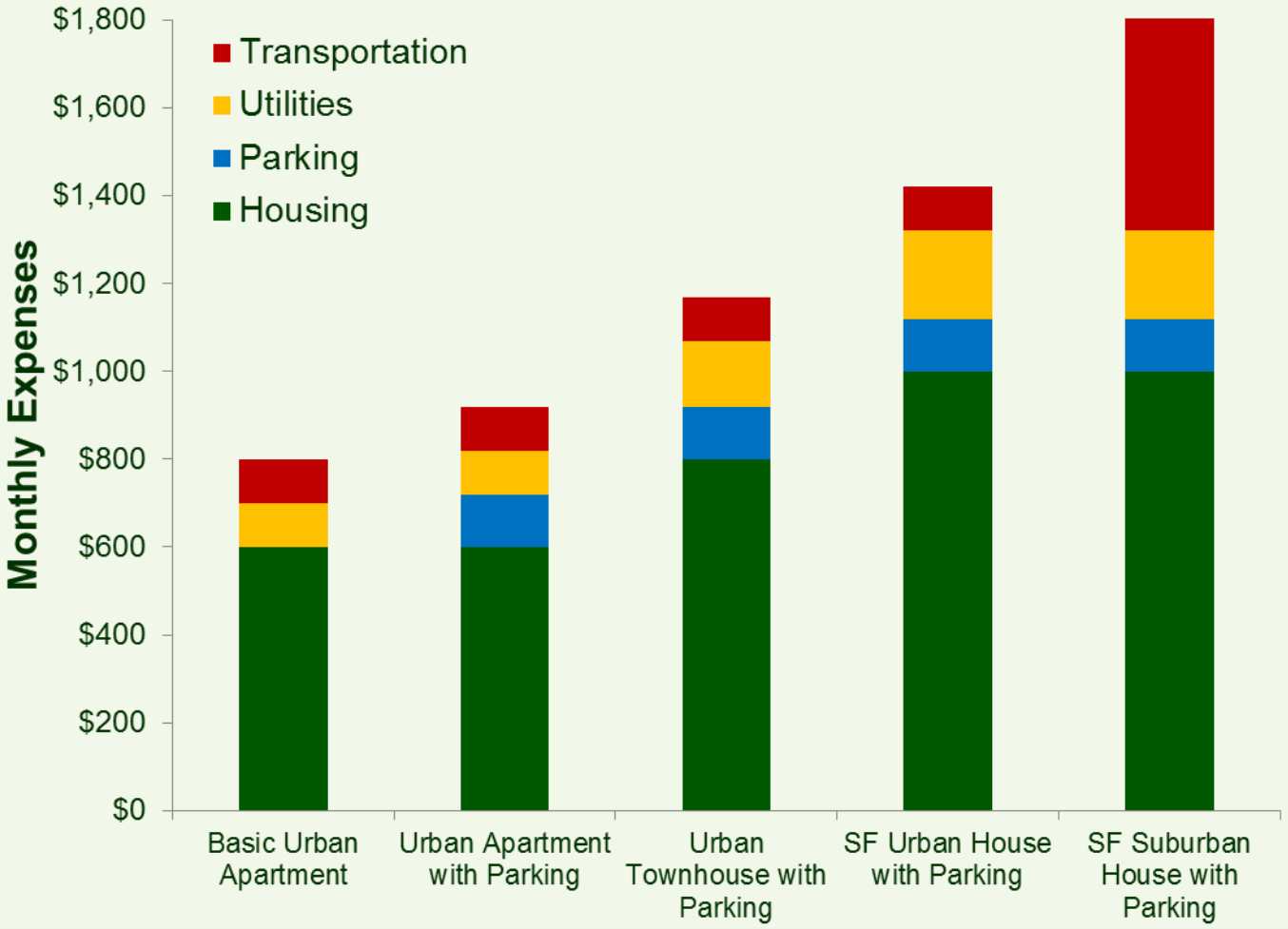


2015 Consumer Expenditure Survey Data, US Bureau of Labor Statistics

This figure adjusts reported expenditures by low-income households (the average of the First and Second income quintiles) to account for home and vehicle ownership. It indicates that lower-income households that pay rents or mortgages and own cars on average spend 59% of their total household budgets to housing and transportation, far more than considered affordable.

Housing & Transport Costs

A basic low-rise apartment in a walkable urban neighborhood can cost less than $800 in total housing and transport expenses. Add parking, less compact housing types, and locating in automobile-dependent suburban areas each add costs. Most jurisdictions have policies that impose these additional costs, which reduce affordability, and exclude lower-income households from urban neighborhoods.



Urban Affordable Benefits

More Affordable Housing	Reduced Vehicle Traffic	Reduced Sprawl
Improved housing options, particularly for disadvantaged households	Reduced total traffic and parking congestion	Reduced per capita land consumption
Household financial savings	Reduced road and parking infrastructure costs	Reduced costs of providing public infrastructure and services
Reduced homelessness and associated social problems such as crime	Reduced traffic crash costs	Improved accessibility and economic opportunity for disadvantaged residents
Creates more diverse neighborhoods, allowing “aging in place”	Reduced traffic accidents	Energy conservation and pollution emission reductions
Higher property values and tax revenues per urban acre	Reduced chauffeuring burdens	More local economic development
	More efficient public transit services	

Affordable Housing Approaches

Approach	Advantages	Disadvantages
"Slum" housing. Older houses and neighborhoods become undesirable, reducing rents.	Requires no public investment or policy initiatives.	Housing is inferior (inefficient and often dangerous), and poverty is concentrated which exacerbates social problems such as crime and social exclusion.
Urban expansion. Inexpensive houses built on cheap urban fringe greenfield land.	Allows lower-income households to have larger-lot housing, and avoids disruption of infill development.	Affordable housing is located in less accessible, automobile-dependent neighborhoods, which increases user costs (so the housing is not really affordable) and various external costs.
Subsidize housing. Government subsidies or developer mandates to provide housing below market price.	Provides a predictable amount of affordable housing.	Can generally only serve a small portion of affordable housing demands. Often reduces supply and increases costs of non-subsidized housing, which reduces total affordable housing supply.
Affordable infill. Policies encourage more compact	Affordable housing is located in accessible, multi-modal neighborhoods, which minimizes transport and other sprawl-related costs.	Infill construction tends to be disruptive, and existing residents often oppose affordable housing in their neighborhoods, which increases development costs.

Affordable-Accessible Housing Types

Small-lot single-family housing.

Accessory Units

Laneway houses

Duplex

Townhouses

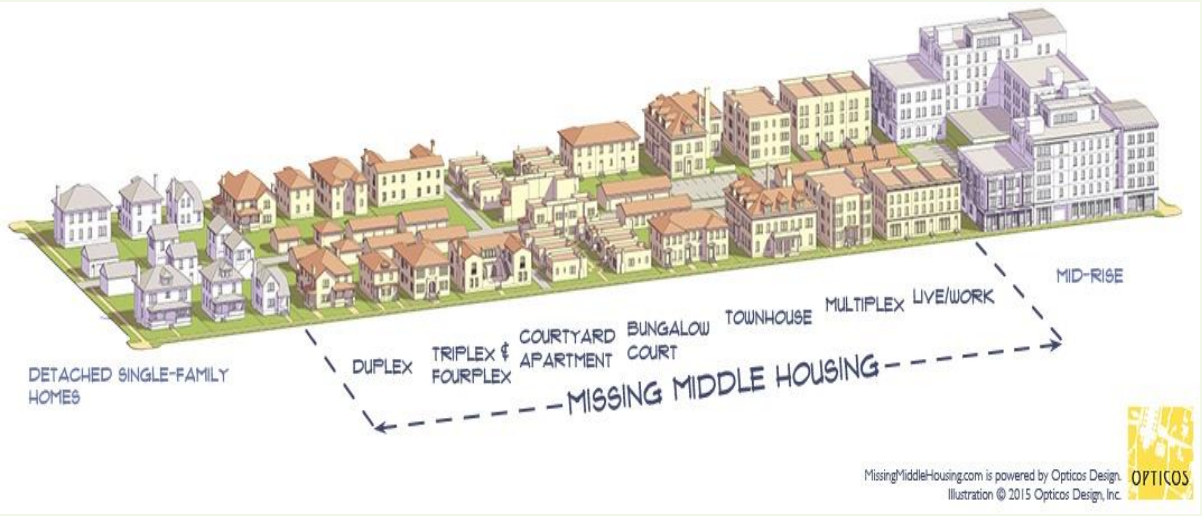
Residential over retail

Low-rise Apartment

Loft apartments

High-rise Apartment

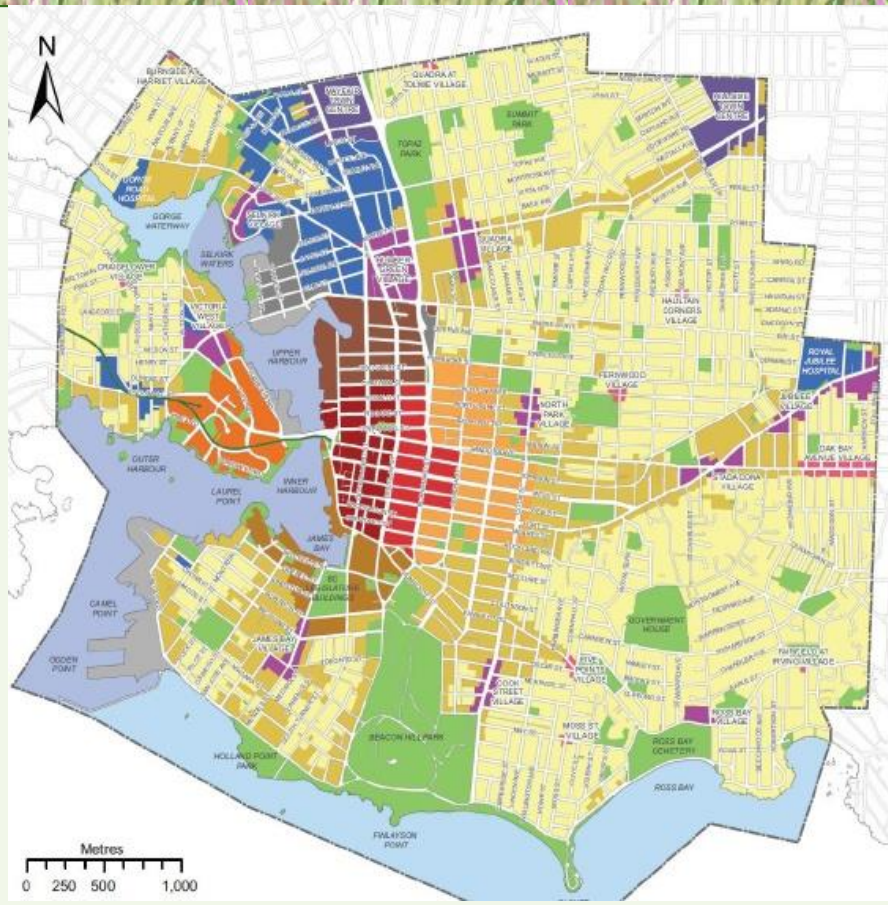
Missing Middle Housing (Parolek 2014)



The lowest-priced housing types include townhouses, multi-plexes (two to eight units) and low-rise apartments, called *missing middle* housing since they are denser than single-family housing but less dense than high-rise, and so are suitable for urban neighborhoods.

Welcome to Our Neighborhood

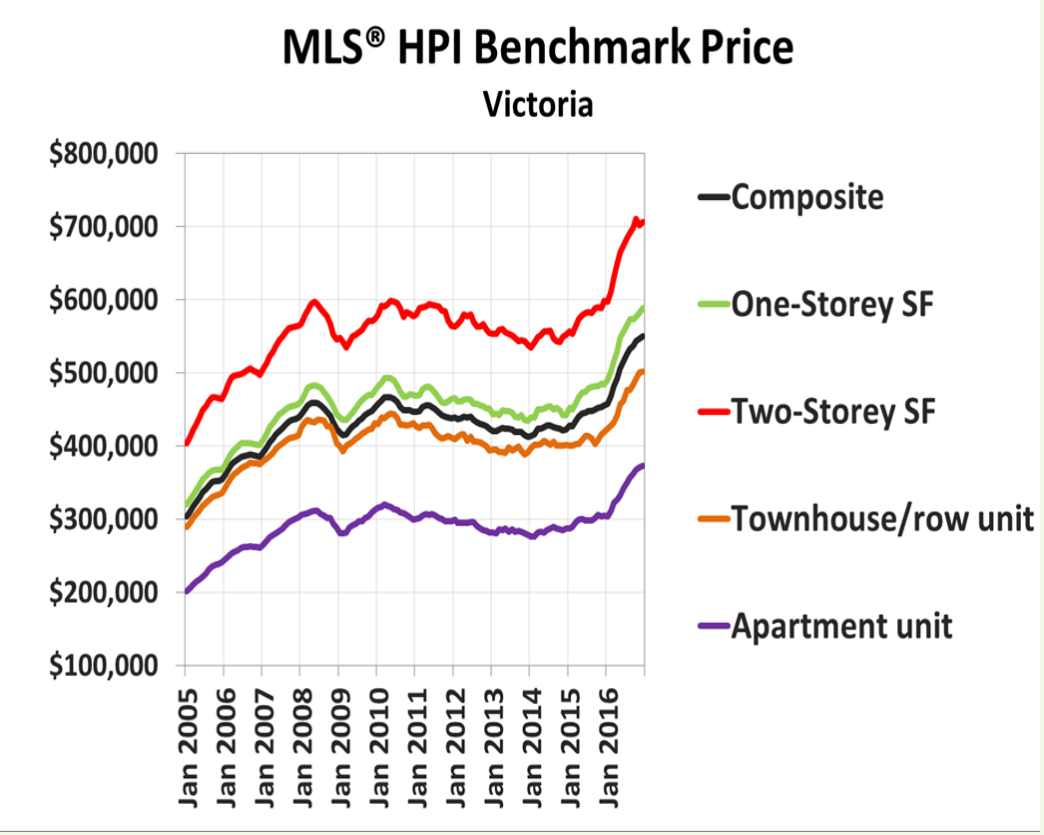
Current real estate markets respond effectively to demands for expensive homes and urban fringe development but fail to accommodate the growing demand for affordable housing in walkable urban neighborhoods, due to restrictions on the development of basic apartments in residential neighborhoods.



Most Victoria neighborhoods prohibit affordable multi-family housing (yellow).

Affordable Non-conforming

Housing Price Appreciation



Why Urban Housing Prices Appreciate:

- Current demographic and economic trends are increasing the portion of households that value urban amenities such as neighborhood walkability.
- Urban areas tend to be economically productive which increases household incomes.
- Most attractive and economically successful cities restrict affordable infill.

Resistance to Affordable Infill

The three-story Bohemia and four-story Castana mixed-use buildings were originally proposed to have 71 units, a third of which were to be moderate-priced rentals. The city council rejected the proposal due to local residents' objections to what they described as the project's excessive size, parking and traffic generation.

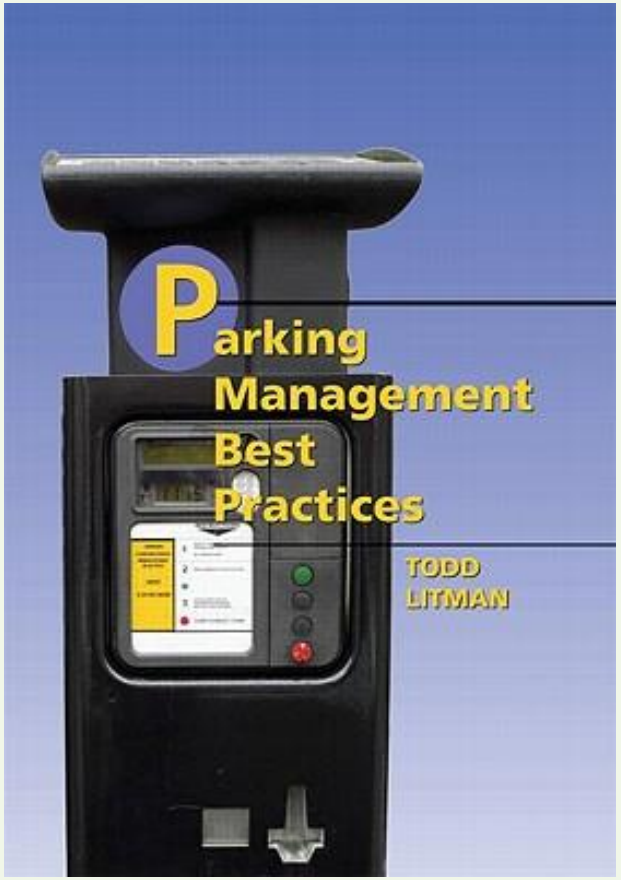
Council eventually approved a smaller three-story design with 51 larger, more expensive units, none of which are rentals.

When density is restricted, affordable housing is usually the first to be excluded.

A message to urban neighborhood associations: *"You got yours, now please give others a chance."*

Parking Management Strategies

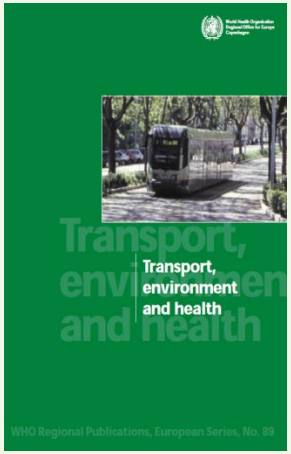
- Share spaces, within a parking lot and between destinations
- Use of off-site parking, particularly for occasional overflow
- Reduced and more flexible requirements
- Regulate and price to prioritize use of the most convenient spaces
- Encouraging use of alternative modes, particularly during peak 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

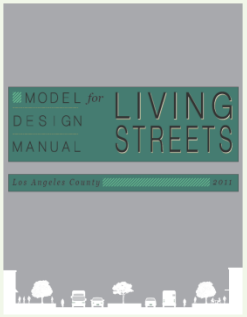


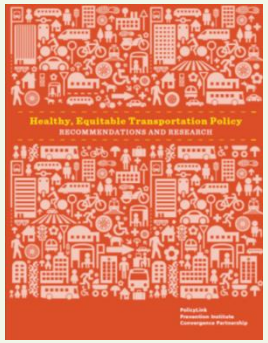
Parking Spaces Per Vehicle

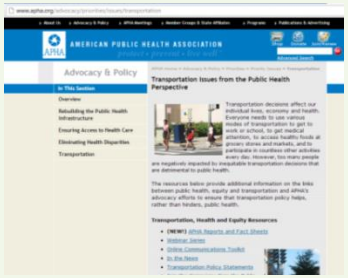
- **3-5** parking spaces per vehicle.
- Annualized cost per space:
  - Surface = **$500-1,500**
  - Structured = **$1,500-3,000**
- **$2,000 to $8,000** total annualized cost per vehicle
- May parking space are worth more than the vehicles they serve
- Most vehicles are worth less than the total value of parking spaces they use.
- For every dollar motorists spend on their vehicles, somebody spends more than a dollar to subsidize its parking.

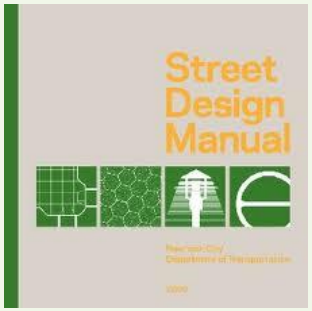
Supported by Professional Organizations

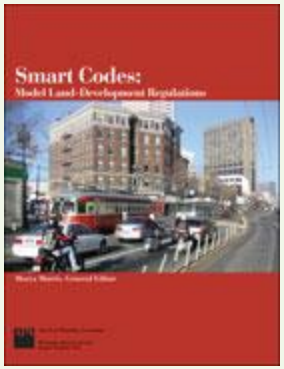


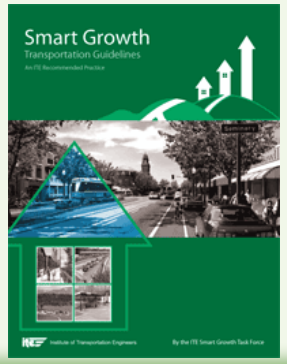


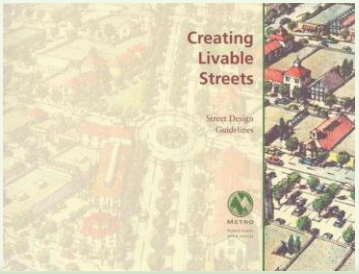












- International City/County Management Association
- Institute of Transportation Engineers
- American Planning Association
- American Public Health Assoc.
- Center for Disease Control
- Federal, state, regional and local planning agencies
- World Health Organization
- National Governor's Association
- And much more...

Example: Malahat Highway

Several options are being considered to address congestion problems on the Malahat highway north of Victoria, BC. Current proposals have $500 million to $1.5 billion capital costs, or about $30 to $60 million in annualized costs.

Multi-Modal Solution

- Bus frequency: 60-minute peak headways (18 daily trips).
- Bus fares: $3-$6 per trip, $120 monthly passes.
- Vanpool fares: 20% subsidy ($50-$100 per month)
- Commute trip reduction programs: 30% of commuters.
- HOV priority: saves 3-5 minutes per trip.
- General marketing along corridor: moderate.
- Pricing reforms: parking cash out and Pay-As-You-Drive insurance. No road pricing.
- User information services: moderate
- **Results: 5-15% shift**
- **Annualized Costs: $1-3 million**

Park & Ride P

Park & Ride lots offer direct routing along Hwy. 1 between Duncan and Victoria.

- Frayne Road Park & Ride: 70 parking spaces
- Valleyview Centre Park & Ride: 50 parking spaces

Park & Pool P&P

Park & Pool lot off Hwy. 1 offers space for carpoolers

- Hutchinson Road east of Hwy. 1

Contact Cowichan Valley Transit

Customer Information:	250-746-9899
Lost and Found:	250-746-9899
Web:	www.bctransit.com

Cowichan Valley Commuter Fares

Cash	$7.00
Tickets (10)	$63.00
Monthly Pass	$165.00 Zone A $200.00 Zone B

Zone A: Valid on Cowichan Valley Commuter and Cowichan Valley Transit

Zone B: Valid on the Cowichan Valley Commuter, Cowichan Valley Transit, and the Victoria Regional Transit systems

For Ticket and Passes outlets, visit www.bctransit.com

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Cowichan Valley Commuter

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CVRD BCTransit

Linking Communities, Businesses & Lifestyles

Local Agenda for Affordability

- Allow townhouses, apartments, and other compact, affordable housing types in existing residential neighborhoods.
- Allow secondary suites, such as laneway units, garage conversions and basement apartments, with minimal regulatory burdens.
- Allow existing parcels to be subdivided or converted to strata ownership (condominiums and cooperatives) with minimal regulatory burdens.
- Gradually raise allowable building density (e.g., floor area ratios) and heights in urban neighborhoods.
- Reduce or eliminate parking requirements, so developers can decide how much parking to provide; allow residential development on exiting, underused parking lots; and implement complementary parking regulations and management strategies to minimize spillover problems.
- Minimize development and traffic impact fees for infill, in recognition that such development tend to impose less infrastructure costs and generate less traffic per capita than sprawled, automobile-dependent development.
- Minimize regulatory burdens and fast-track development approval for affordable infill housing, particularly lower-priced rental units.
- Improve affordable transportation (walking, cycling, public transit, carsharing) and encourage mixed-use development in urban neighborhoods.

Vote For Affordability!

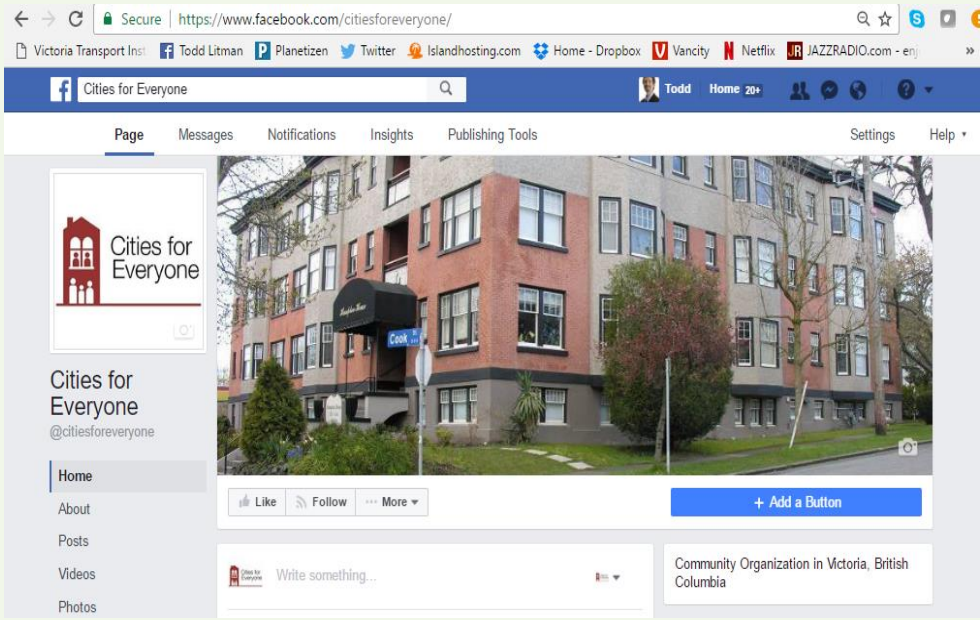
- Many low-income and young households spend far more on housing and transportation than is considered affordable (45% of total household budgets).
- This places financial stress and insecurity.
- Young and low-income citizens also vote at far lower rates than older and more affluent citizens.
- This helps explain why many public policies favor more costly housing and transport over more affordable options.
- Affordability can be an issue to motivate low-income and young citizens to vote more.

Cities for Everyone

Cities for Everyone is a community organization that supports more affordable housing and transportation, in order to provide security, freedom and opportunity for people with all incomes and abilities.

"Home, Sweet, Affordable Home"
Personal-Political Art Contest
$1,200 in Prizes

Challenges artists to explore links between personal experiences and politics regarding housing and transportation affordability, and to find new and unexpected perspectives in these issues.



Potential Advocacy Partners

Benefit	Potential Partners
Traffic congestion reduction	Transportation agencies, motorists
Parking congestion reductions	Local transport agencies, motorists, developers, businesses and economic development associations
Improved public safety and health	Transportation agencies, public health agencies and advocacy organizations
Basic mobility for non-drivers and increased affordability	Social service organizations, advocacy groups for seniors, low-income and people with disabilities
Local economic development and increased real estate values	Business and economic development organizations, developers and real estate industries
Energy conservation and emission reductions	Environmental and economic development organizations
Improved service	Current and potential transit users

“Safe Travels: Evaluating Mobility Management Traffic Safety Benefits”

“Safer Than You Think: Revising the Transit Safety Narrative”

“The Hidden Traffic Safety Solution: Public Transportation”

“Evaluating Active Transportation Benefits and Costs”

“Evaluating Public Transportation Health Benefits”

“Transportation Pricing for Traffic Safety”

“Selling Smart Growth”

“If Health Matters”

“Urban Sanity”

“Online TDM Encyclopedia”

and more...

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