



# Harmony Between Urban Growth and Transportation Accessibility

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Presented

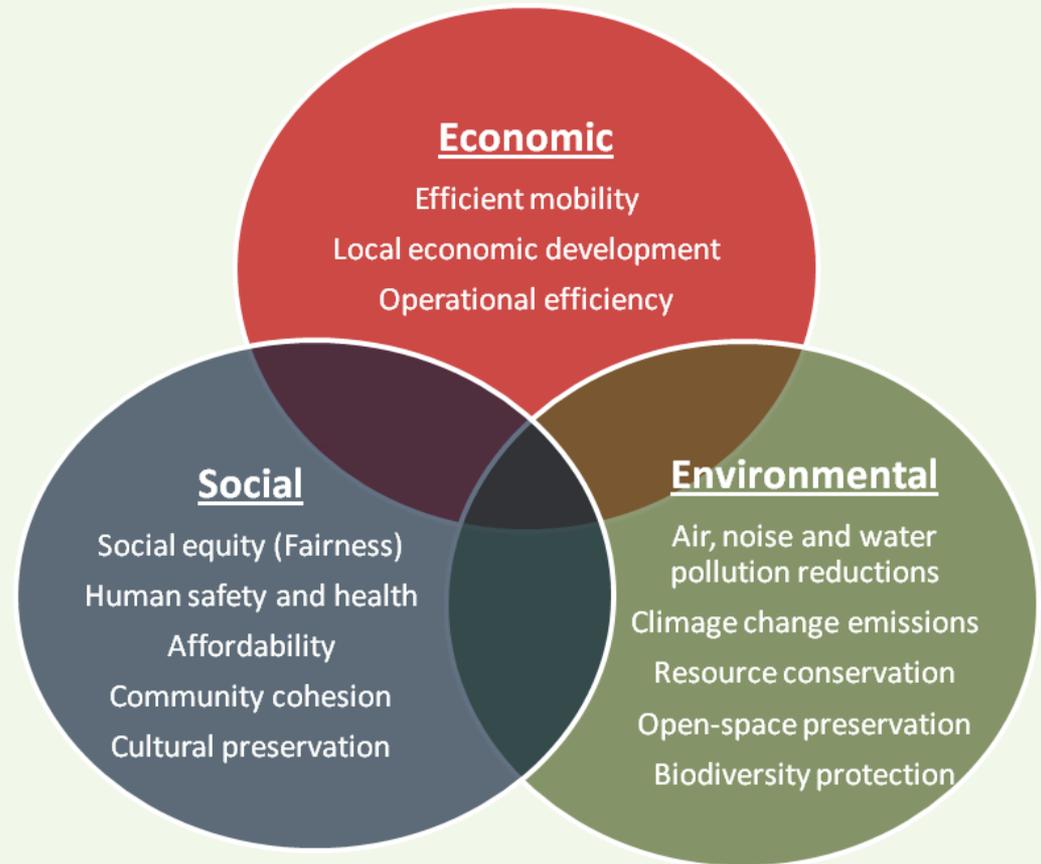
Smart & Healthy Transport in Cities

*Pilsen*

4 April 2017

# *Sustainable Planning*

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



# *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



# *Cities Provide Efficiency*

- Cities are places where many people and activities locate close together. This increases efficiency by reducing the distances that people and goods must travel to reach destinations.
- Space is always limited and valuable in cities. Efficient urban transport must favor higher value trips and space efficient modes over lower value trips and space intensive modes.



# *Economic Principles*

**Consumer sovereignty** means that, as much as possible, public policies respond to consumer demands. Current development policies support expensive housing and travel options, but often fail to respond to demand for affordable housing in accessible neighborhoods, and affordable travel modes.

**Cost-based pricing** means that prices that users pay to use facilities and services should reflect the full marginal costs of providing them, unless a subsidy is specifically justified. Current policies result in significant underpricing of sprawl and motor vehicle travel.

**Comprehensive planning** means that, as much as possible, individual, short-term decisions should support strategic, long-term goals. Current planning overlooks and undervalues many significant impacts.

# Sprawl Costs – Smart Growth Benefits

The report, *Analysis of Public Policies that Unintentionally Encourage and Subsidize Sprawl*, for the New Climate Economy, describes and quantifies the costs of sprawl and benefits of smart growth policies, and identifies specific policy reforms for more efficient development.

## THE NEW CLIMATE ECONOMY

The Global Commission on the Economy and Climate



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

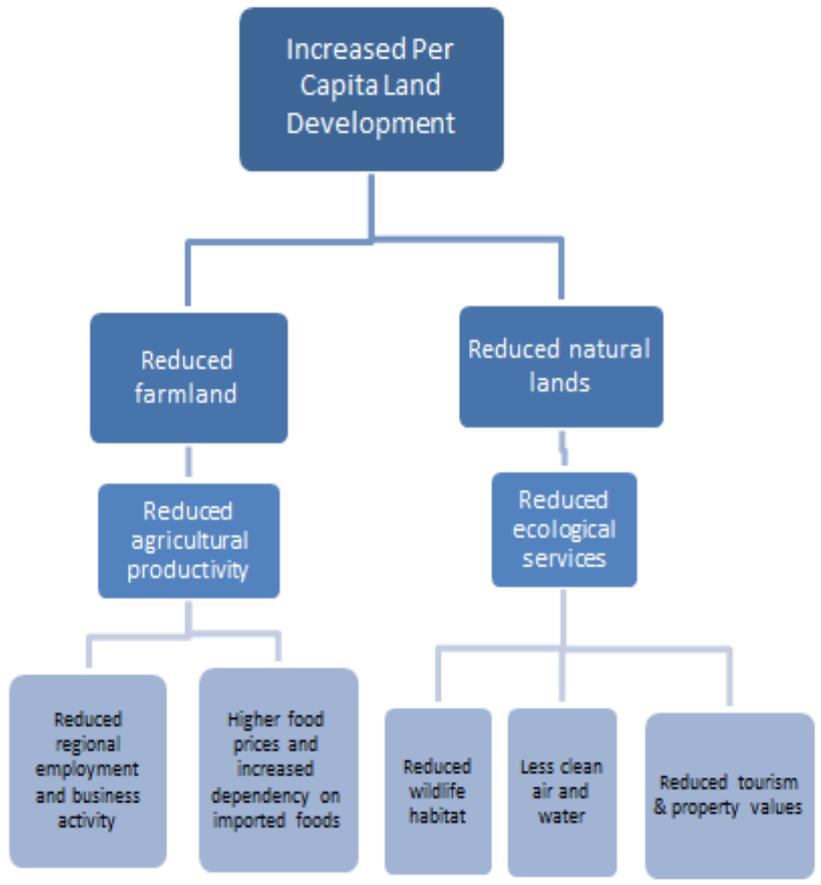
The New Climate Economy (NCE) is the flagship project of the Global Commission on the Economy and Climate. It was established by seven countries, Colombia, Ethiopia, Indonesia, Norway, South Korea, Sweden and the United Kingdom, as an independent initiative to examine how countries can achieve economic 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 Foster 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

# Urban Efficiency



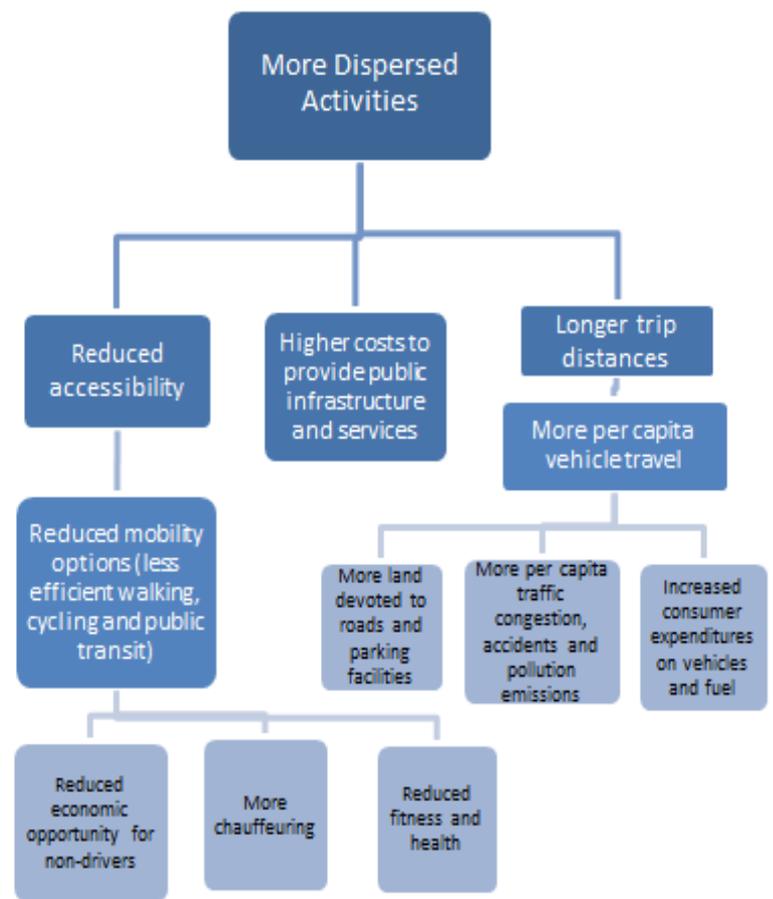
**Primary Impacts**



**Secondary Impacts**

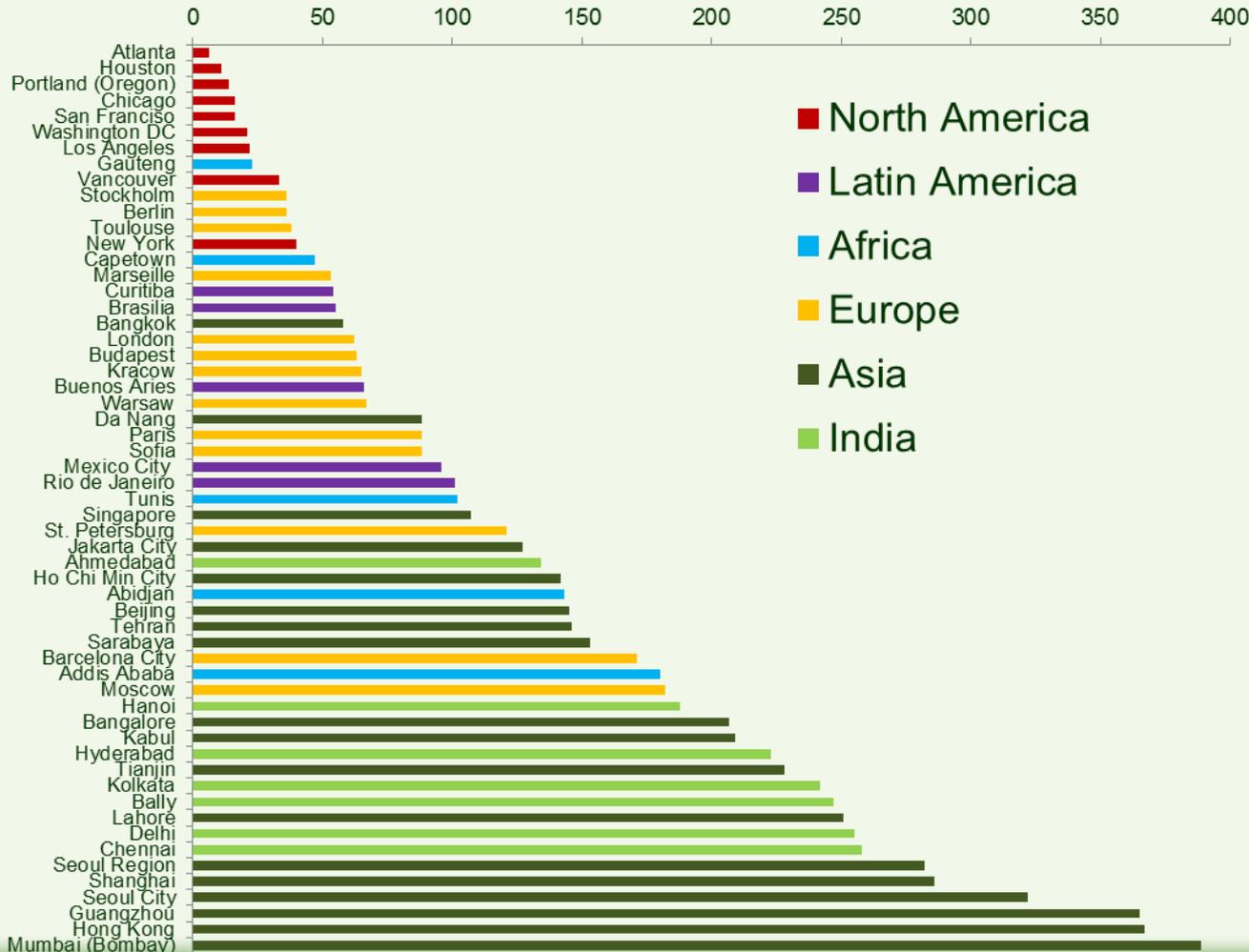


**Economic Outcomes**



# How Much Land Will This Require?

Residents Per Hectare



Urban densities vary significantly from less than 20 to more than 200 residents per hectare.

Density can be measured in many ways that result in very different results, so it is important to use consistent methods when comparing cities.

# *Limited Capacity*

- How much water can a one-litre bottle hold?
- How many vehicles can city streets accommodate?



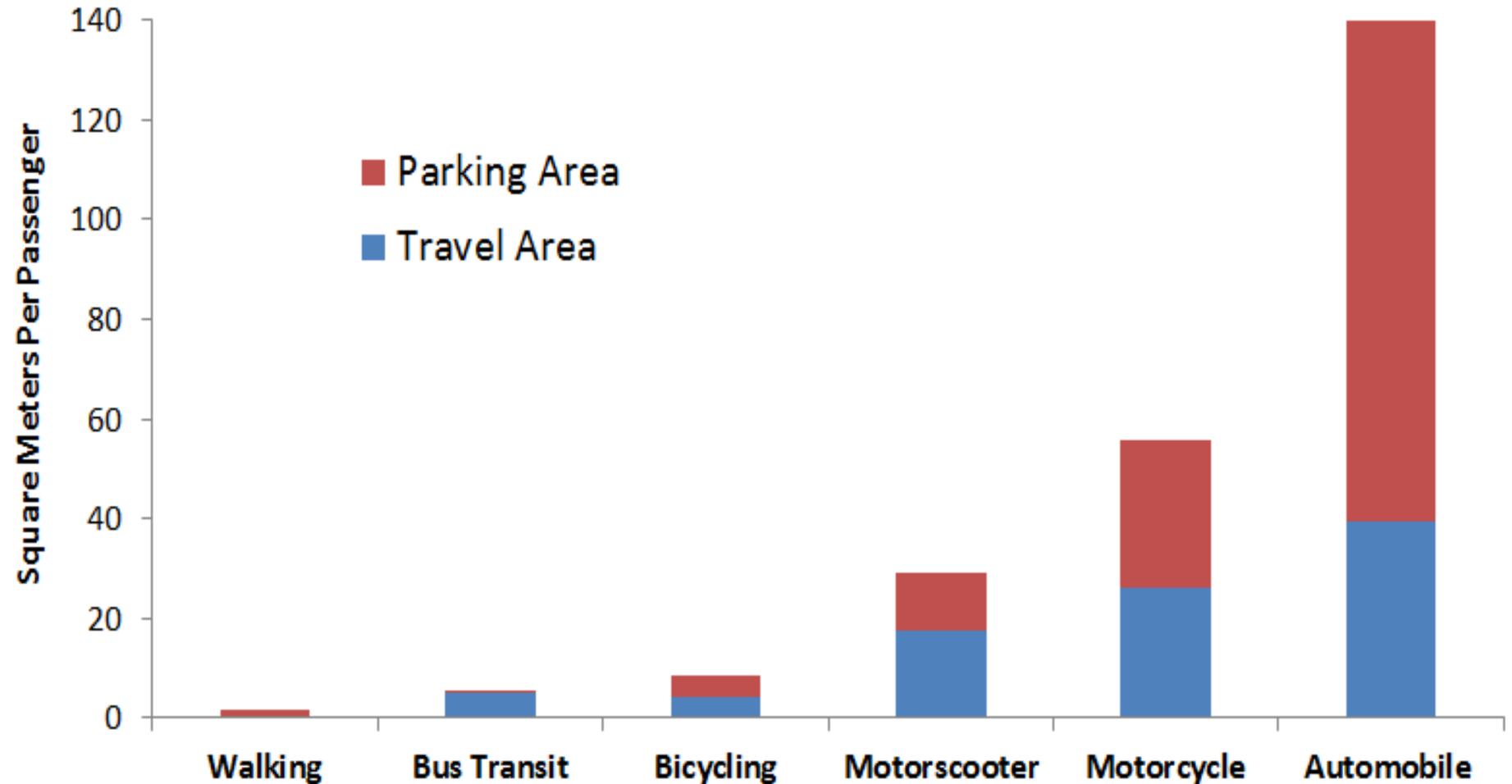
# *Road Space Requirements*

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

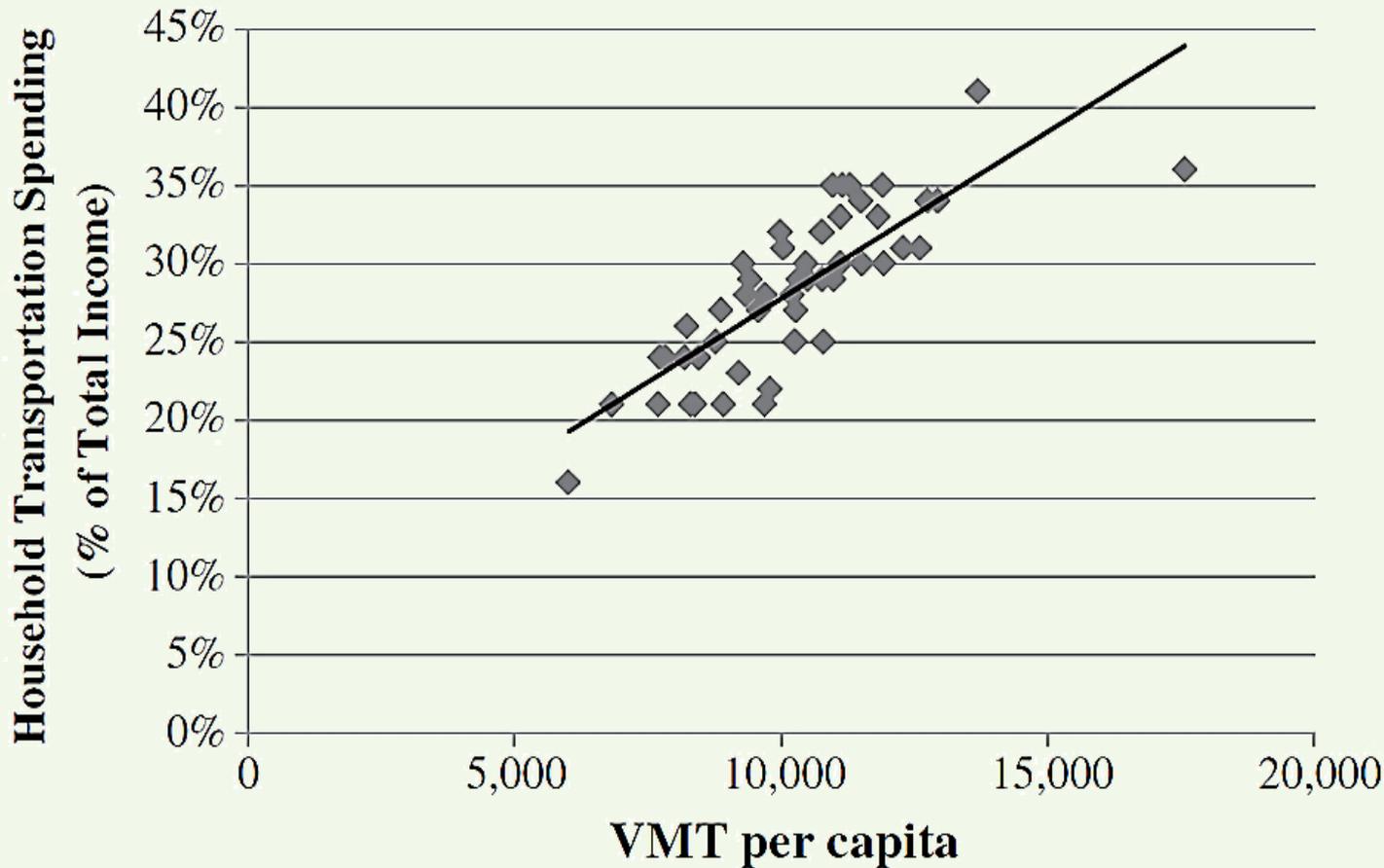


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# *Road and Parking Space Requirements*



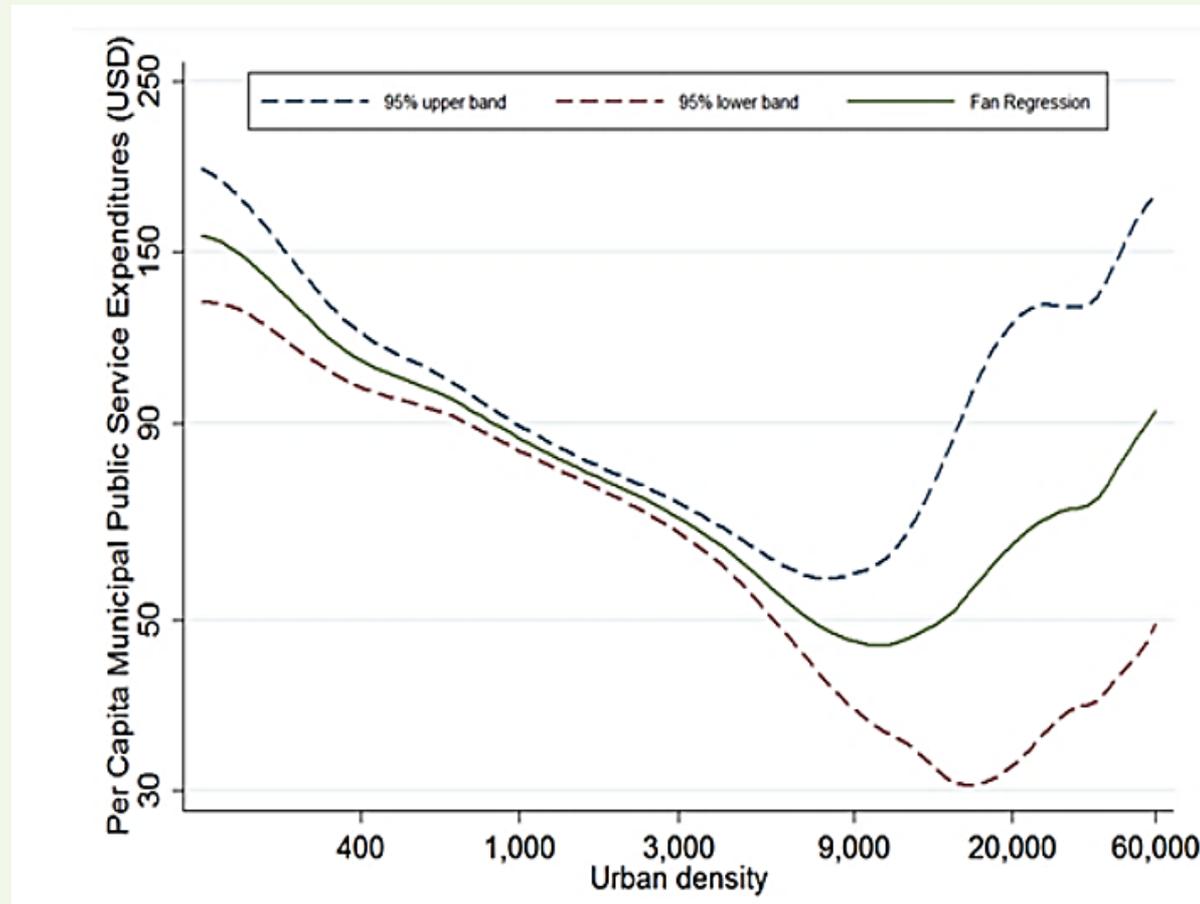
# Transportation Affordability



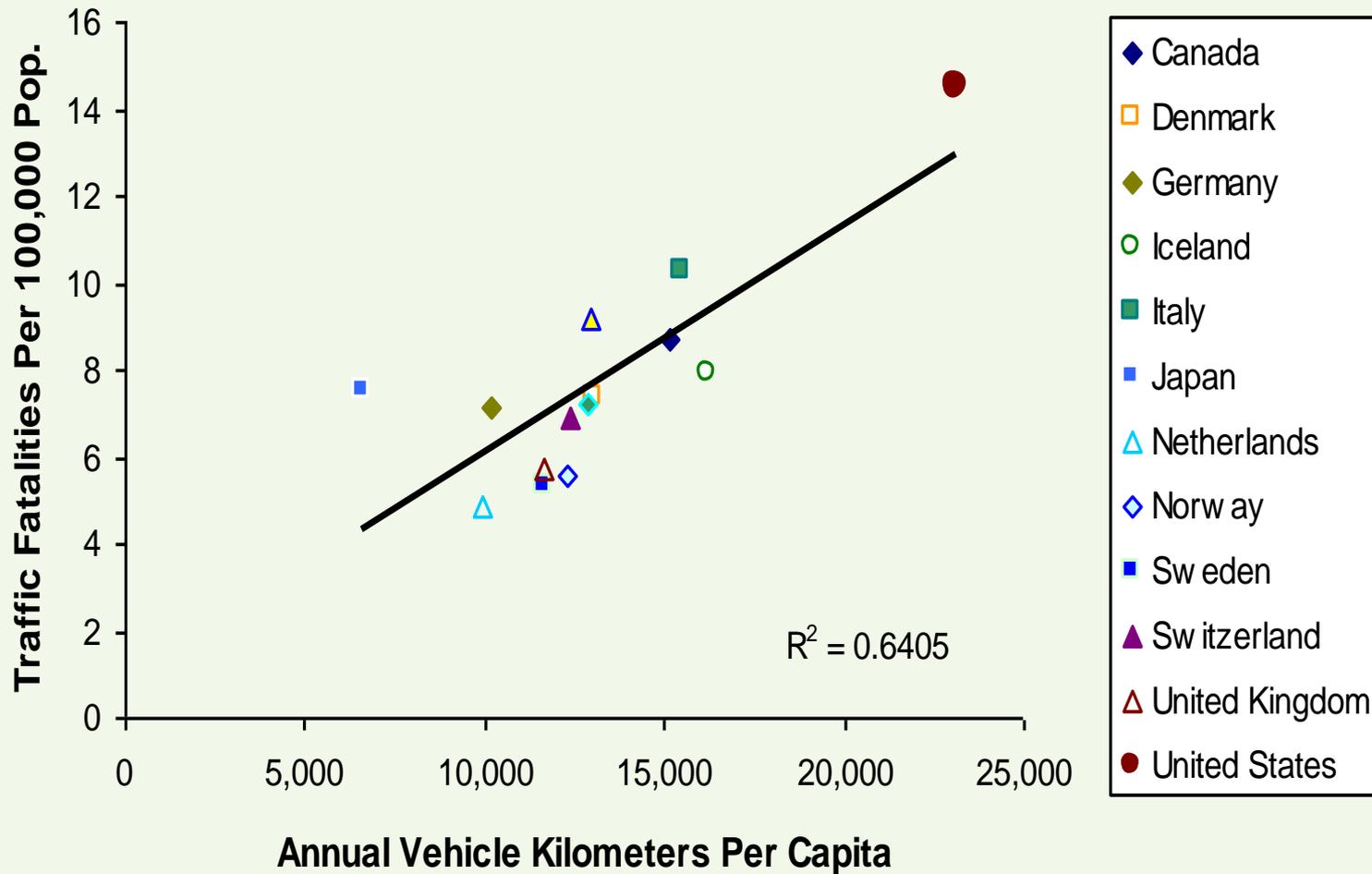
The portion of household income devoted to transport increases with per capita vehicle miles traveled (VMT). Each dot represents a U.S. state.

# Public Service Costs

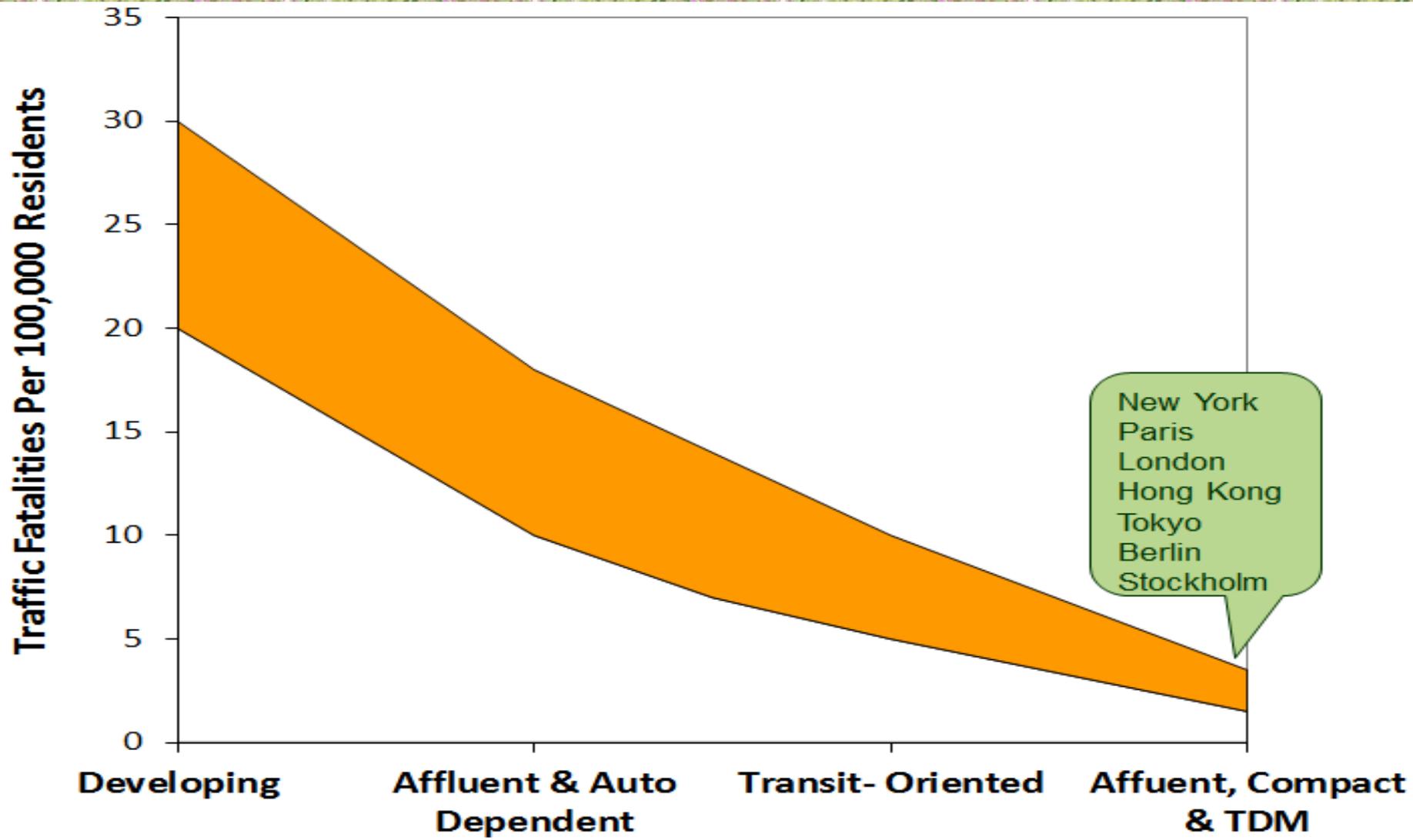
The costs of providing public infrastructure and services tends to be lowest at 40-100 residents per hectare.



# *Transit Travel Vs. Traffic Deaths*



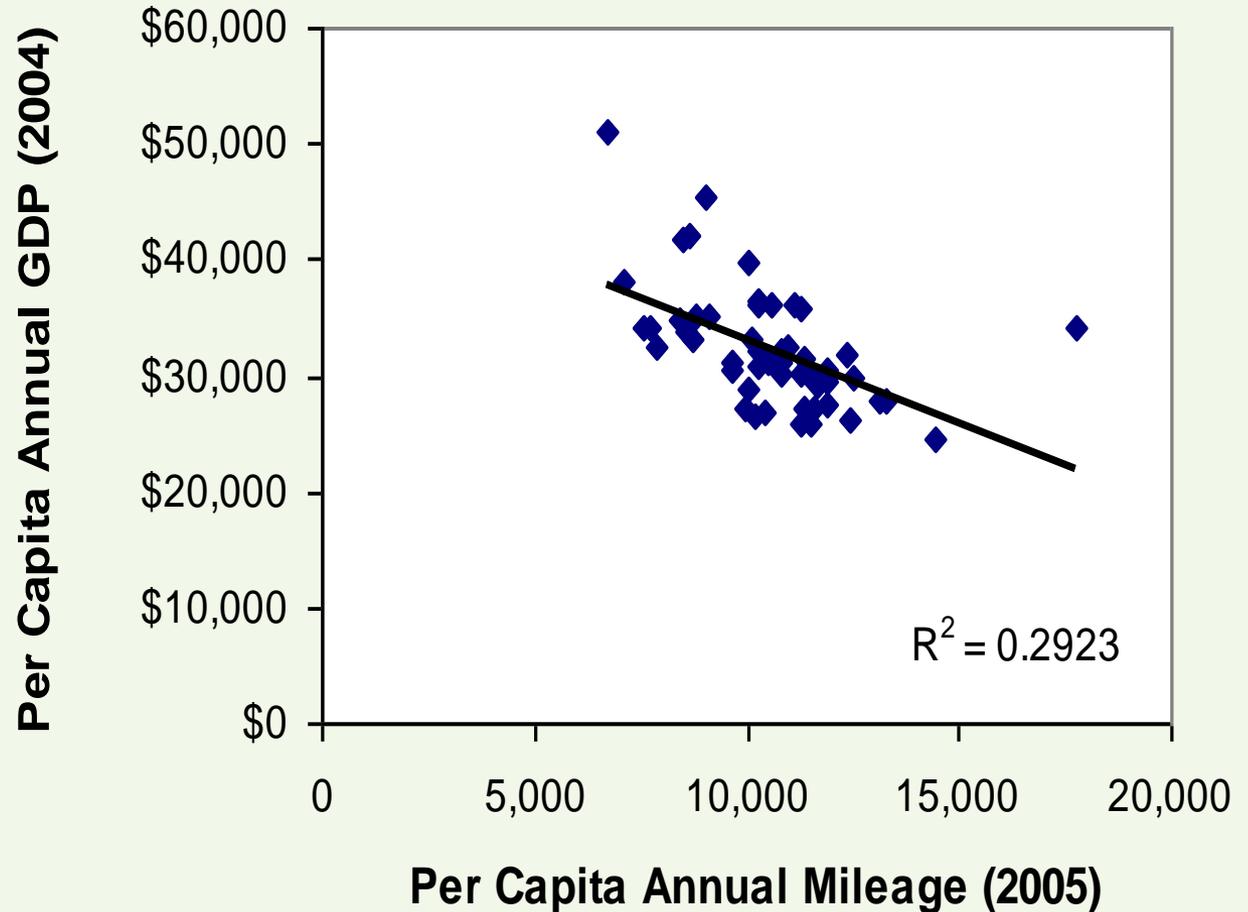
# Traffic Fatalities



# *Per Capita GDP and VMT*

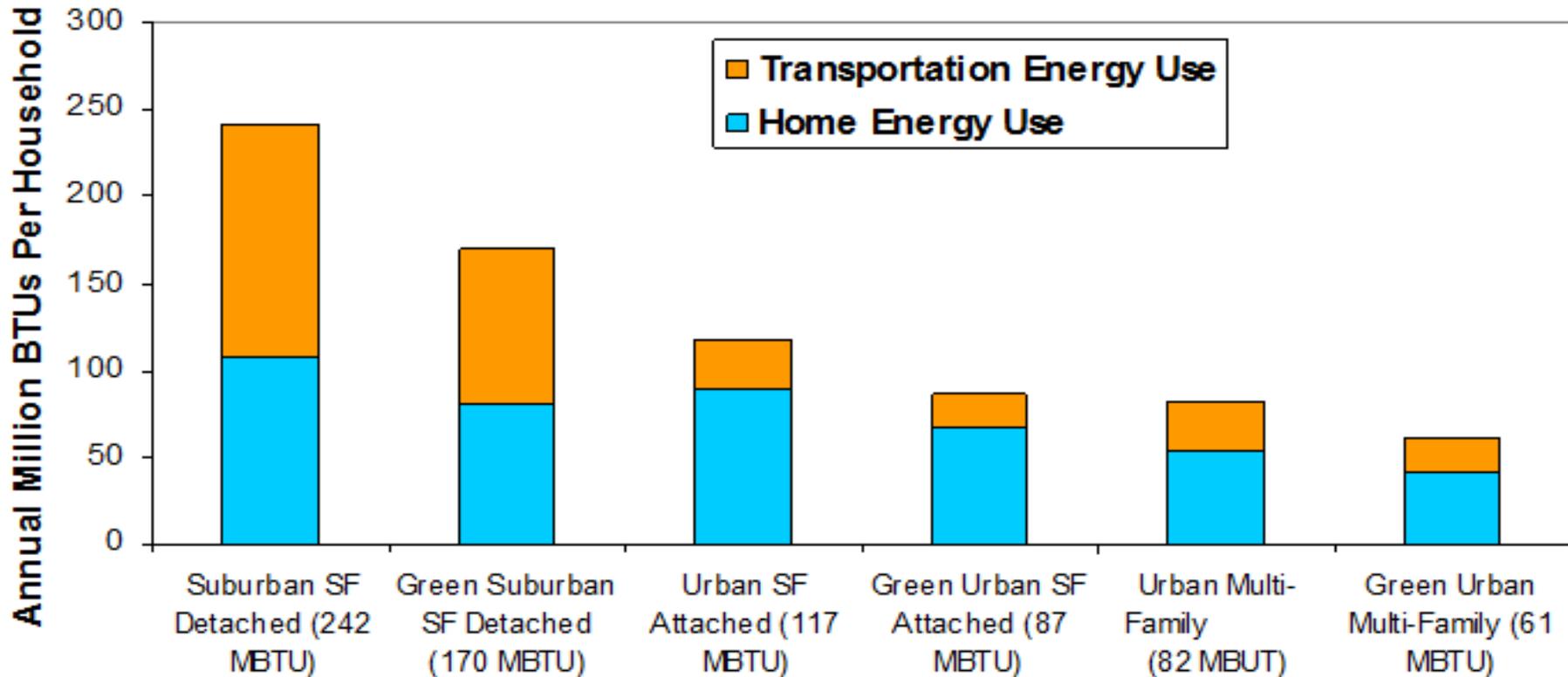
Productivity tends to decline with increased mobility. (Each dot is a U.S. urban region.)

Bureau of Economic Analysis and FHWA data



# Energy and Emissions

**Residents Transport and Home Energy Consumption (JRC 2009)**



*According to this analysis, compared with a typical detached single-family house in an auto-dependent suburb, an attached green (energy efficient) home in an urban location reduces energy consumption 64%, and a multifamily home reduces energy consumption 75%.*

# *Smart Growth Benefits*

<b>Economic</b>	<b>Social</b>	<b>Environmental</b>
<p>Infrastructure cost savings</p> <p>Public service cost savings</p> <p>Transportation efficiencies</p> <p>Economic resilience</p> <p>Agglomeration efficiencies</p> <p>Supports industries that depend on high quality environments (tourism, farming, etc.)</p>	<p>Improved transport options, particularly for non-drivers</p> <p>Increased housing options</p> <p>Community cohesion</p> <p>Cultural resource preservation (historic sites, traditional neighborhoods, etc.)</p> <p>Increased physical exercise and health</p>	<p>Greenspace &amp; habitat preservation</p> <p>Energy savings</p> <p>Air pollution reductions</p> <p>Water pollution reductions</p> <p>Reduced “heat island” effect.</p>

# *Valuing Multi-Modalism*

An efficient and equitable transportation system is diverse so users to choose the best 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”***

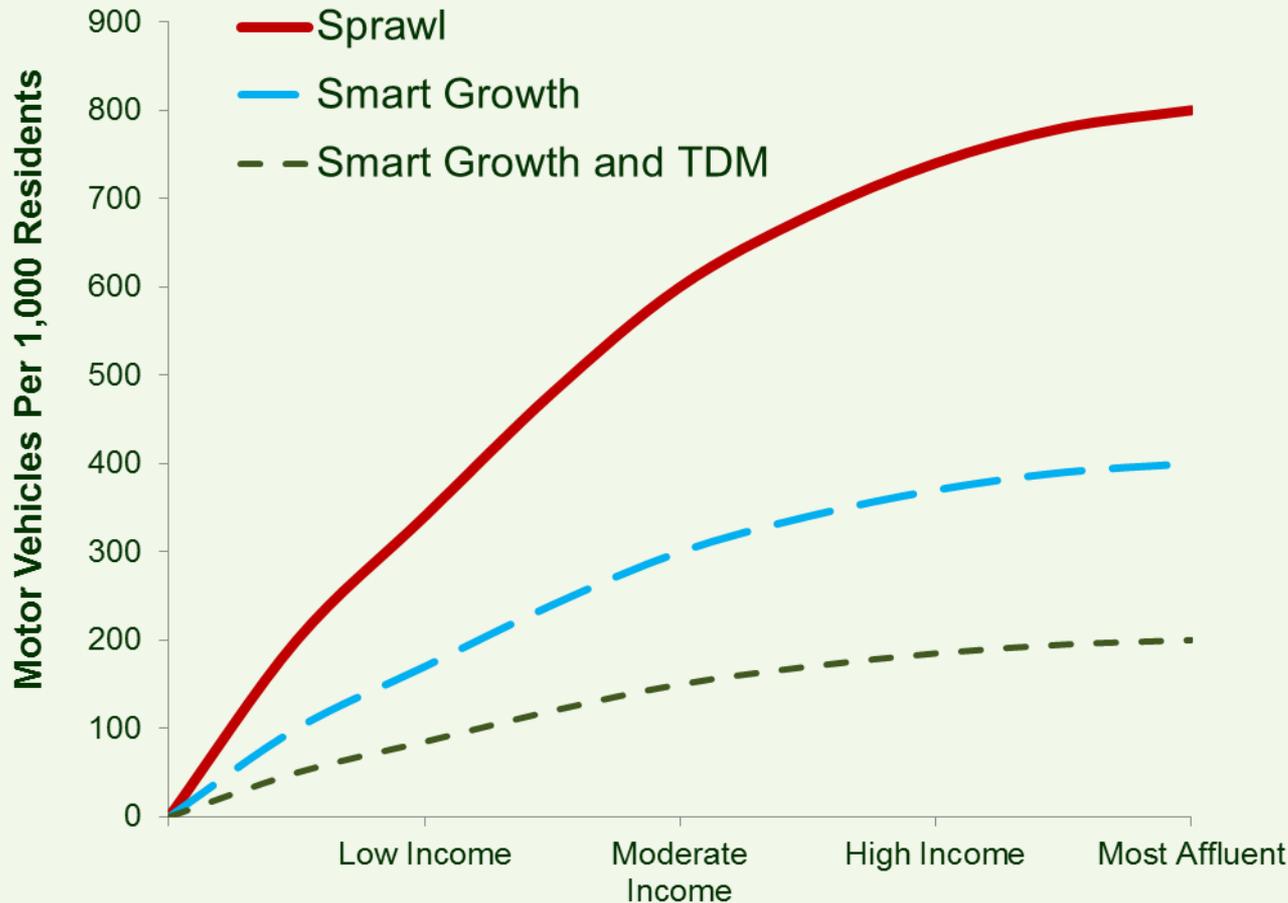
- Enrique Peñalosa, Bogota Mayor

# *Affordable Transportation Recipe*

- Good walking and cycling conditions, suitable for all users
- Good (comprehensive, fast, frequent, comfortable, etc.) public transit services
- Convenient bike parking and racks on buses
- Carsharing and vehicle rental services
- Convenient information on travel options
- Efficient delivery services
- Affordable housing in accessible, multi-modal neighborhoods, with unbundled parking



# *Optimal Automobile Mode Share*



As cities develop from poverty to affluence, vehicle ownership rates increase, but where they peak depends on land use and transport policies that affect density, mix and vehicle costs.

# *Optimal Urban Development*

Factor	Unconstrained	Semi-constrained	Constrained
<b>Growth pattern</b>	Expand as needed	Expand less than population growth	Minimal expansion
<b>Regional density (residents/ha)</b>	20-60	40-80	80 +
<b>Neighborhood density</b>	40-120	80-160	160 +
<b>Housing types</b>	A majority can be small-lot single-family or adjacent	Approximately equal portions single-family, adjacent, and multi-family	Mostly multi-family
<b>Vehicle ownership (per 1,000)</b>	300-400	200-300	< 200
<b>Private auto mode share</b>	20-50%	10-20%	Less than 10%
<b>Intersection density per sq. km.</b>	40+	60+	80+
<b>Portion of land in road ROW</b>	10-15%	15-20%	20-25%
<b>Recreational facilities</b>	Most houses located within a five-minute walk of local parks and recreational facilities, and 10% of urban land is devoted to parks		
<b>Examples</b>	Most African and American cities	Most European and Asian cities	Singapore, Hong Kong, Male

Excepting the most constrained cities, Smart Growth does not require most households to live in high-rise or forego automobile travel.

# *Key Conclusions*

- Many common development policies and planning practices are distorted in ways that result in economically-excessive sprawl and motor vehicle use.
- Smart Growth policies, that result in more compact and multi-modal communities, provide many economic, social and environmental benefits.
- Conventional planning evaluation tends to overlook or undervalue many of these benefits.
- Smart Growth is vulnerable to inaccurate criticisms and biases.
- Practitioners need better tools for evaluating and communicating Smart Growth benefits.
- Because of its diverse benefits, Smart Growth can attract diverse supporters, resulting in large coalition for support.



**“Analysis of Public Policies That Unintentionally Encourage and Subsidize Urban Sprawl”**

**“Toward More Comprehensive and Multimodal Evaluation”**

**“Healthy Community Transportation Planning”**

**“Transportation Cost and Benefit Analysis”**

**“Evaluating Smart Growth Benefits”**

**“Online TDM Encyclopedia”**

**and more...**

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