



Multi-Modal Rural Planning *Understanding Demands and Solutions*

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Rural Mobility Needs

1. Isolation and high transport costs
2. Relatively high portion of seniors, retirees, people with disabilities.
3. High poverty rates.
4. Increasing health and environmental concerns.
5. Special needs, such as commuter and tourist travel



Urban Versus Rural

	Urban	Rural
Development conditions	Dense, mixed, growing, expensive	Dispersed, low or negative growth
Development type	Commercial centers (downtowns), urban neighborhoods and suburbs	Villages, towns, farms and openspace
Transport conditions	Multi-modal	More automobile-dependent
Transport type	Sidewalks, paths, bikelanes, public transit, roads	Mainly roads.
Transport problems	Traffic and parking congestion, poverty	Inadequate mobility for non-drivers, poverty, unpaved and poorly-maintained roads
	Unaffordability, traffic risks, inadequate physical activity, etc	

Senior Population by Location

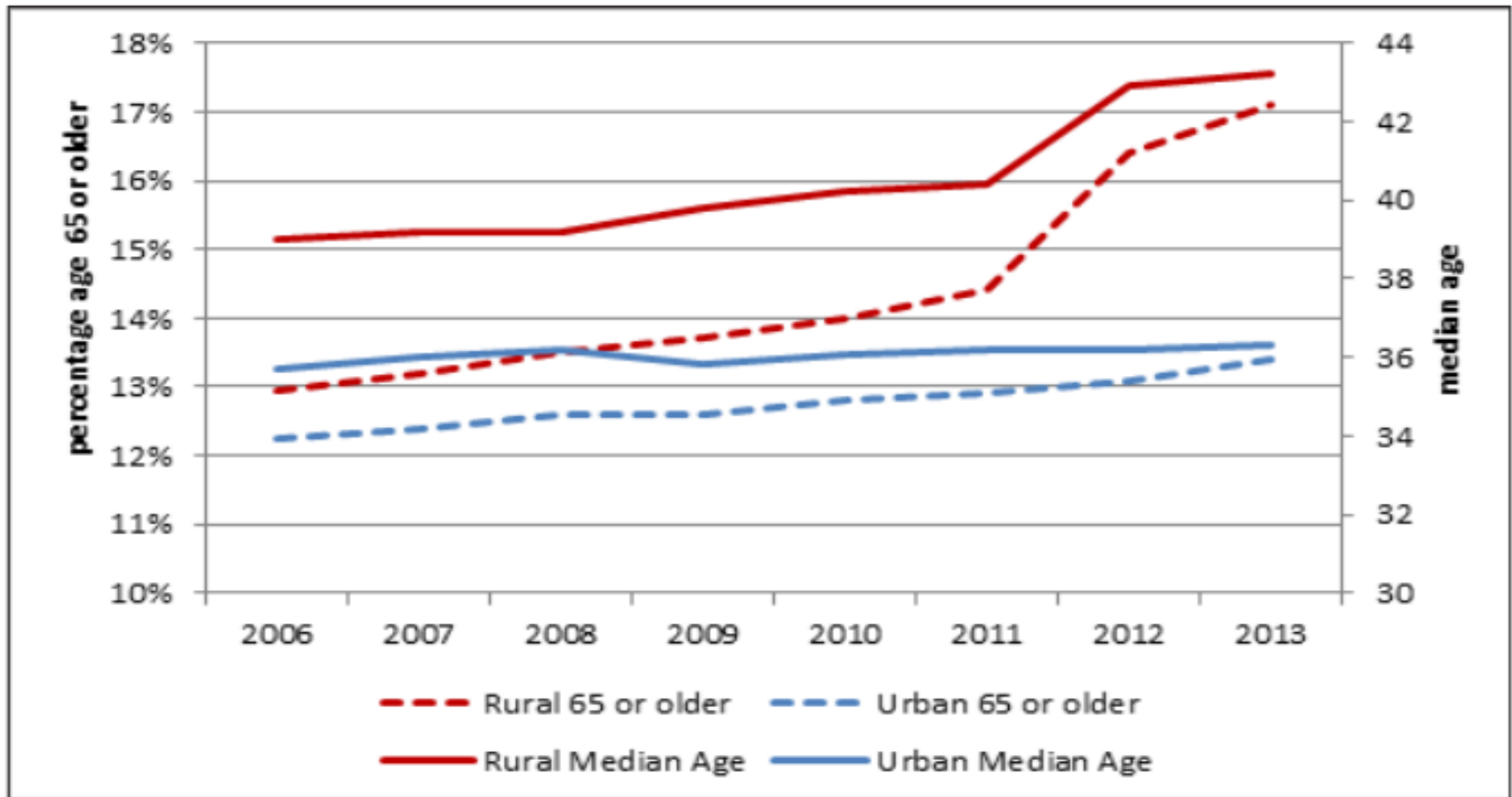
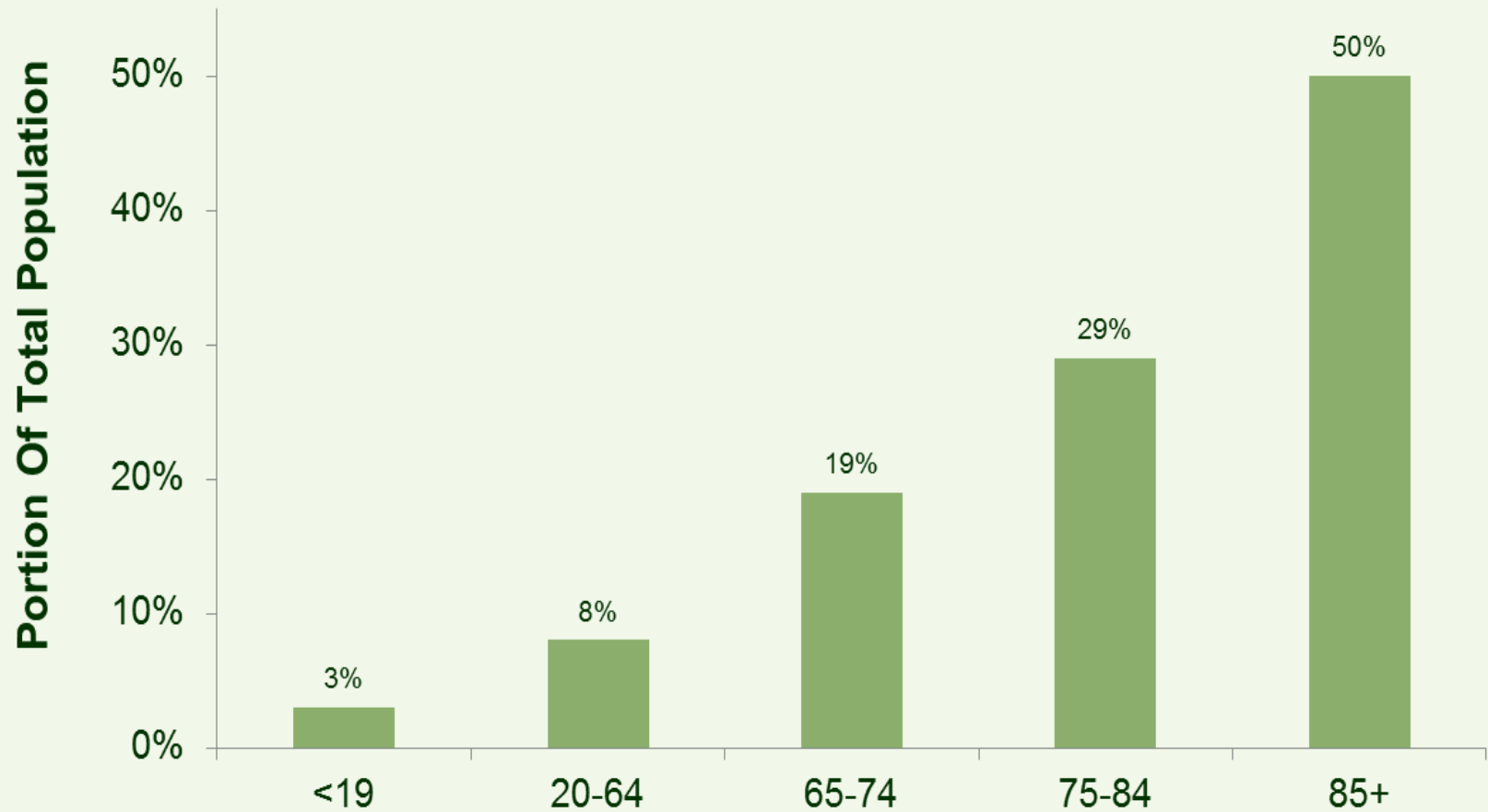


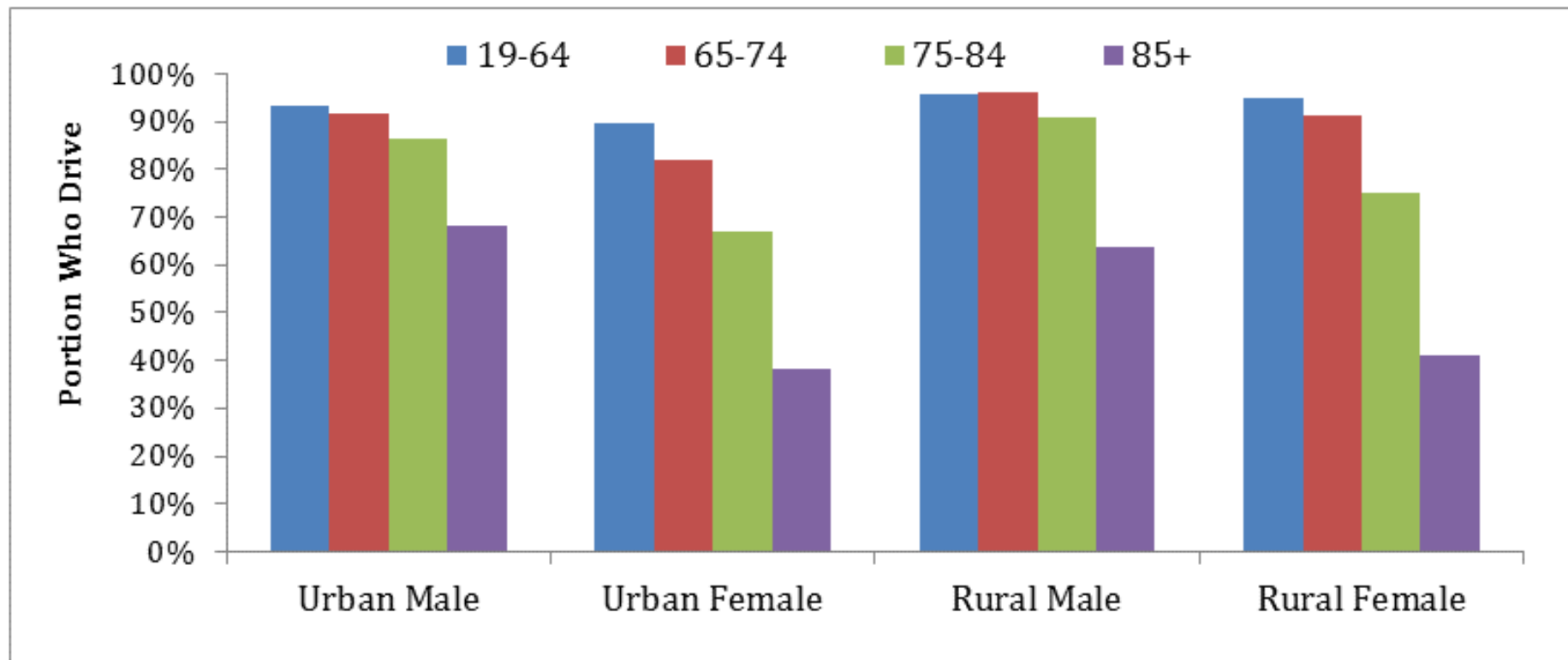
Figure 1. Median Age and Percentage of Population Aged 65 or Older, 2006-2013

Source: American Community Survey 1-Year Estimates, 2006-2013

Mobility Constraints by Age



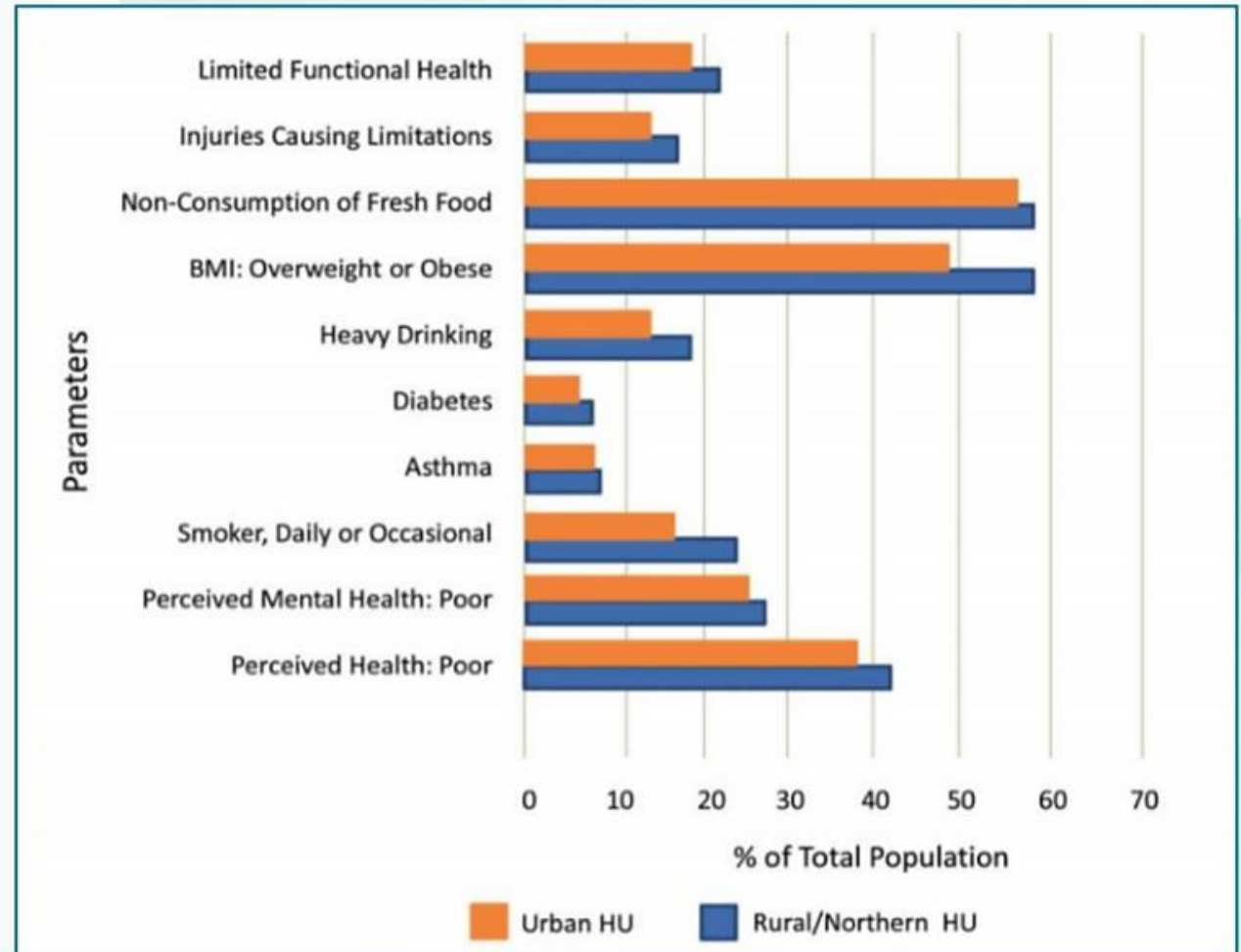
Ability to Drive by Age and Location



Healthy Disparities

Rural communities tend to have high rates of:

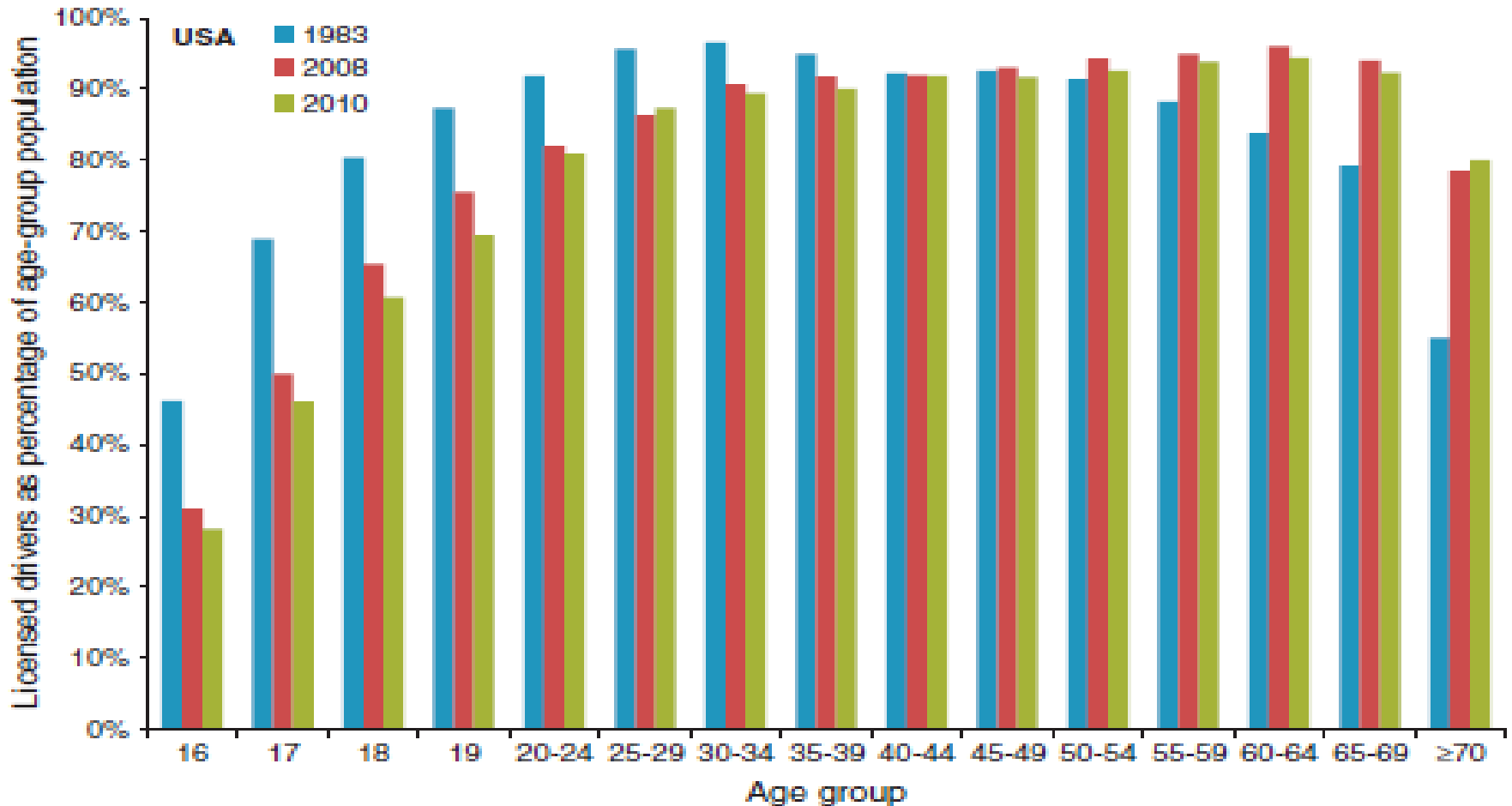
- Disabilities
- Poor nutrition
- Obesity,
- Alcoholism
- Poor mental health



*Healthy Rural Communities
Tool Kit A Guide for Rural
Municipalities*

Public Health Ontario

Youth Driver's Licensure



Valuing Transport Diversity

Diverse travel demands requires diverse travel options. An efficient and equitable transportation system is diverse so users can choose the best mode for each trip:

- Walking and cycling for local errands.
- Public transit for travel on major corridors and to serve non-drivers.
- Automobile travel when it is truly most efficient, considering all impacts.



Transit's Roles

Public transit plays various roles in an efficient and equitable transportation system:

- Basic mobility for non-drivers. A portion of community residents (typically 20-40%) cannot or should not drive and so depend on walking, cycling, public transit and ridesharing. Without public transit they either lack mobility or require chauffeuring. Transit therefore reduces chauffeuring burdens.
- Affordable mobility, including fuel savings for longer trips and allows some households to reduce their vehicle ownership.
- Reducing traffic congestion on major corridors, and reducing parking problems (e.g., downtown and at university).
- Supports certain industries, such as higher education (colleges and universities), tourism, retirement industries, and businesses that require numerous lower-wage employees.
- Can be a catalyst for compact urban development (transit-oriented development).



Types of Non-Drivers

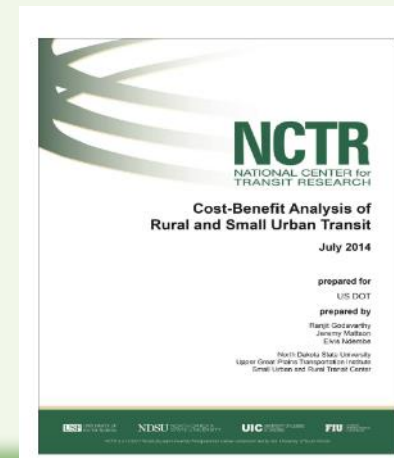
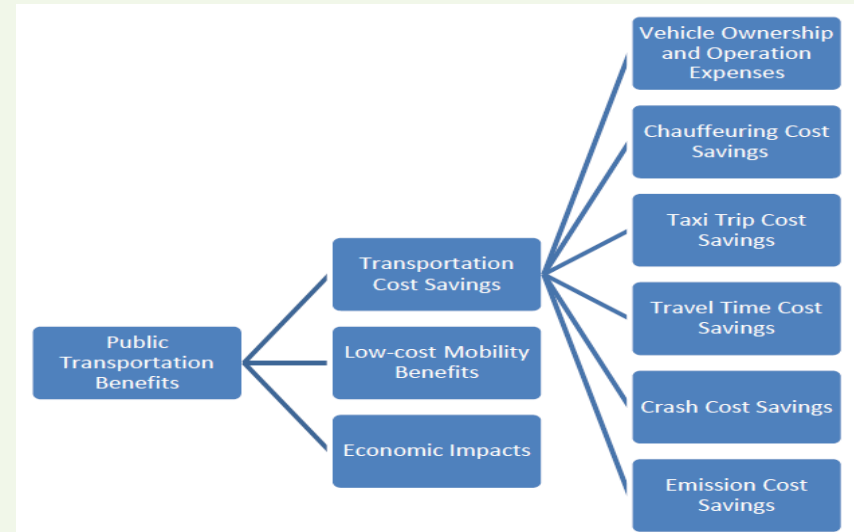
Transit User Types	Prevalence	Consequences if Transit is Unavailable
Seniors who do not or should not drive	10-20% of residents and increasing	Lack mobility, require chauffeuring (special vehicle travel to transport a non-driver), or move to another community with better transport options
People with disabilities	3-5% of residents	
Adolescents (12-20 years)	5-15% of residents	
Stay-at-home parents in single-vehicle household	Varies	
Low-income households	20-40% of households	Lack mobility or spend an excessive portion of budgets on transport
Drivers who temporarily lack a vehicle	Varies	Lack mobility, require chauffeuring or expensive taxis
Tourists and visitors	Varies	Lack mobility or visit other areas with better transport options
Law-abiding drinkers	Varies	Drive impaired, risking citations and crashes

Transport Diversity Benefits

Residents of communities with diverse transport systems:

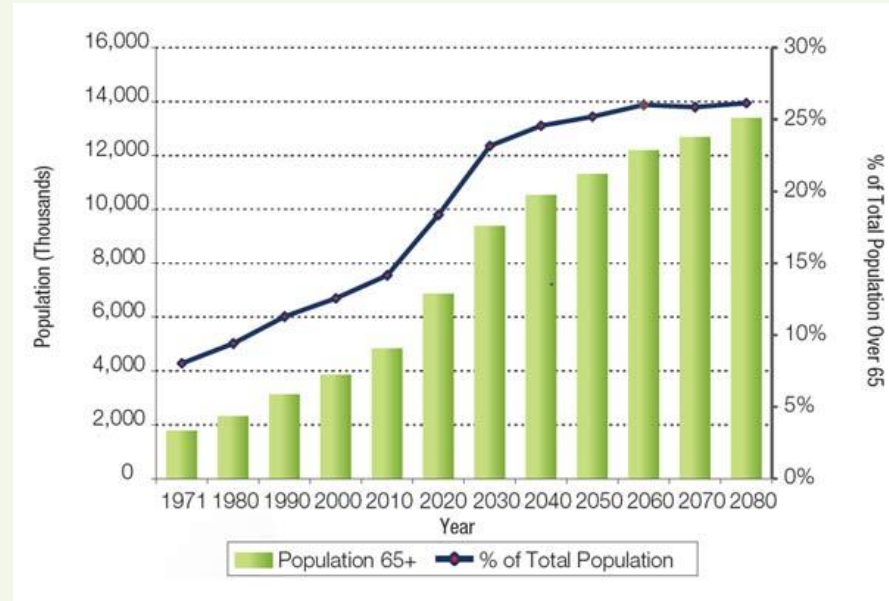
- Save money
- Spend less total time driving
- Have lower traffic fatality rates
- Are healthier

Even people who do not use these modes benefit from reduced traffic and parking congestion, reduced chauffeuring burdens, and increased traffic safety.



Who Values Improved Options?

- Youths 8-18 (about 20% of total population).
- Seniors who do not or should not drive (about 10% of total population and increasing).
- Adults with certain disabilities (3-5%).
- Law-abiding drinkers.
- Lower income households that want to minimize automobile expenses.
- People who walk or bike for enjoyment and health.
- Pets who walk or bike for enjoyment and health.
- Motorists who want to avoid chauffeuring non-drivers.



Rural areas tend to have high rates of:

- Seniors
- Poverty
- Isolation
- Ill health

Savings and Benefits

Users	Motorists	Local Economies
<ul style="list-style-type: none">• More independent mobility• Economic opportunity• Financial savings• Reduced accident and assault risk• Improved public fitness and health• Reduced impaired driving citation or accident risk	<ul style="list-style-type: none">• Reduced chauffeuring burdens• Reduced traffic risks (due to less higher-risk driving)• Reduced traffic and parking congestion• Improved mobility option for times when they cannot drive	<ul style="list-style-type: none">• Retains and attract more residents• Increases tourism by non-drivers• Helps attract major employers such as colleges and hospitals

Strategic Development Objectives

1. Supports growing economic sectors including education (colleges and university), tourism and retirement communities.
2. Is a catalyst for compact, downtown redevelopment – a popular trend.
3. Saves households money, particularly if they can reduce their vehicle ownership.
4. Improves disadvantaged residents' economic opportunity, and expands the pool of potential low-wage workers available to businesses.
5. Can help reduce road and parking facility cost, and traffic accident rates.
6. Supports public fitness and health.

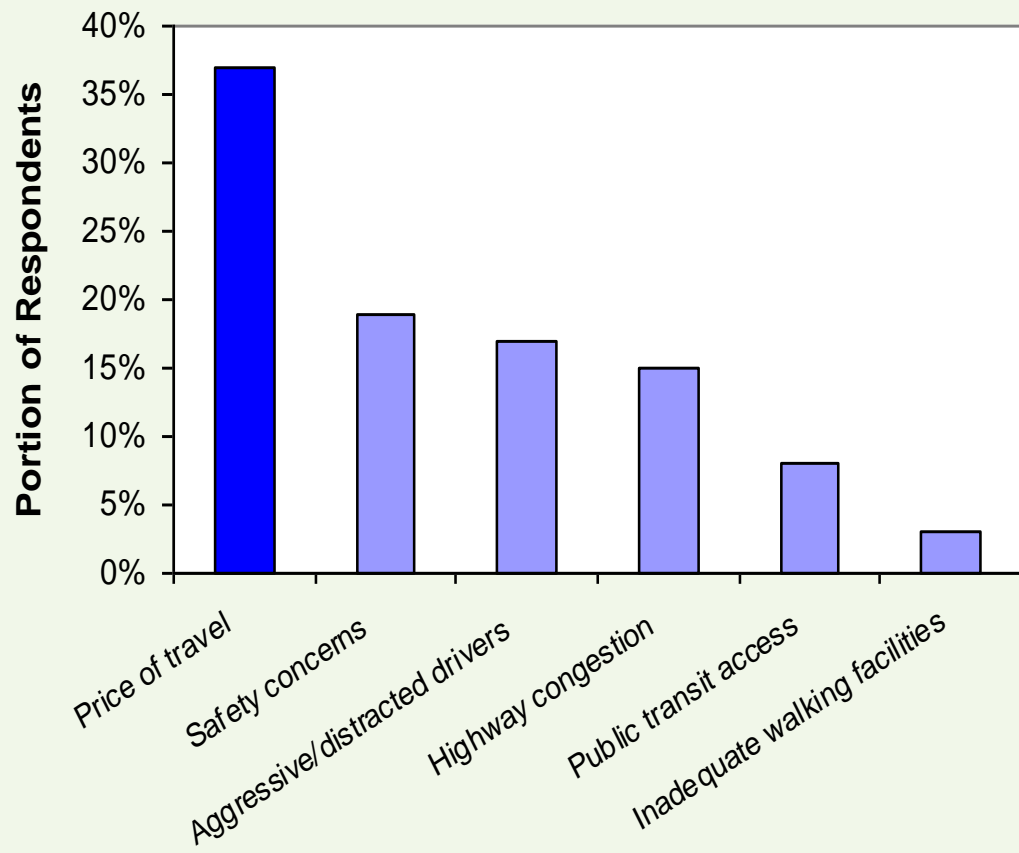


Social Services Perspective

- Every community includes people who for various reasons cannot or should not drive. Many of them rely on public transit for basic mobility: access to schools, jobs, healthcare shopping and services.
- Many people will at some point experience disabilities or other constraints that limit their ability to drive. Public transit is comparable to a lifeboat, available if it is ever needed.
- Without adequate mobility services, non-drivers are isolated or drivers must chauffeur non-drivers family members and friends.

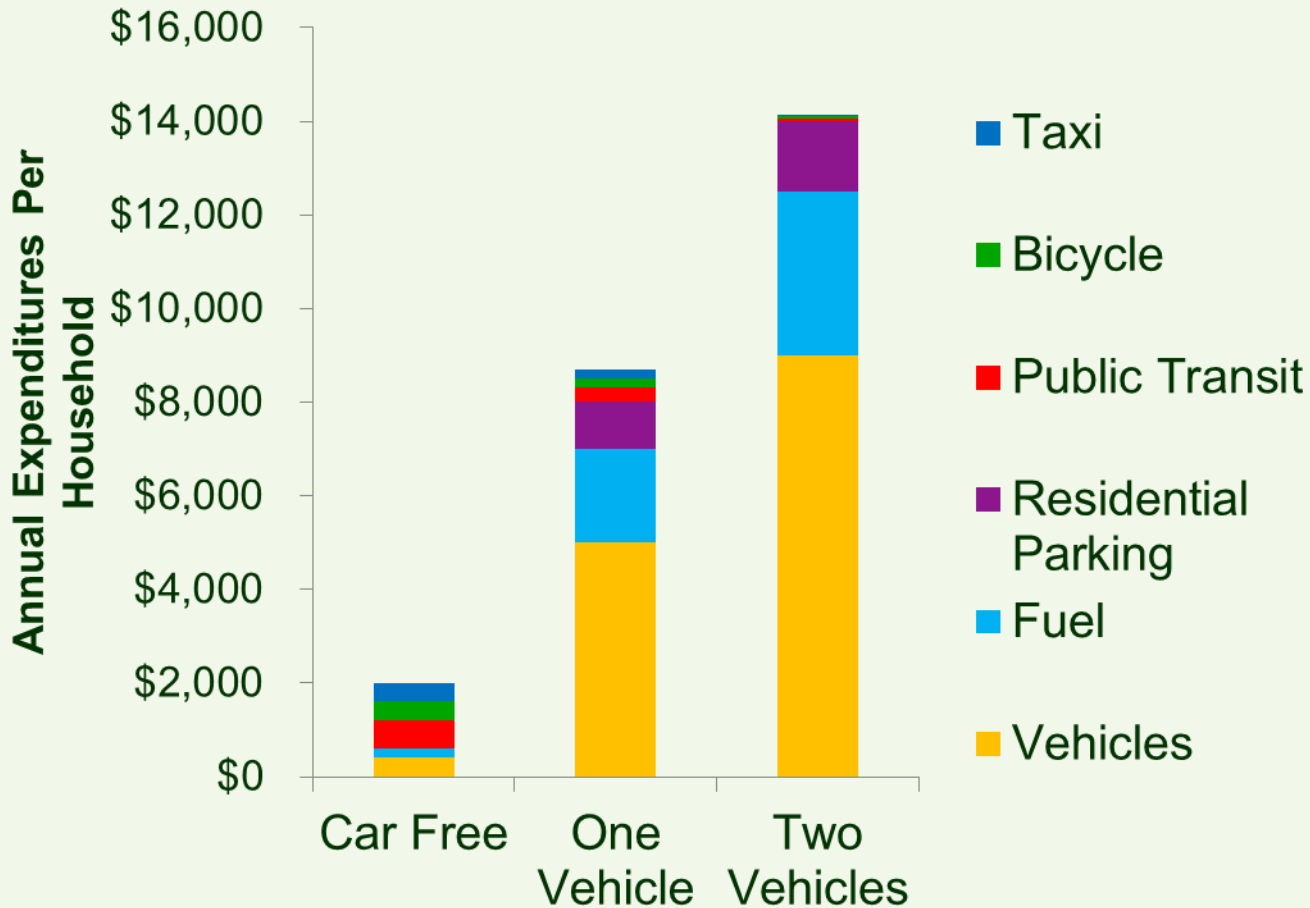


Affordability as a Planning Issue



2009 National Household Travel Survey respondents ranked the “Price of Travel” most important of the six transport issues considered.

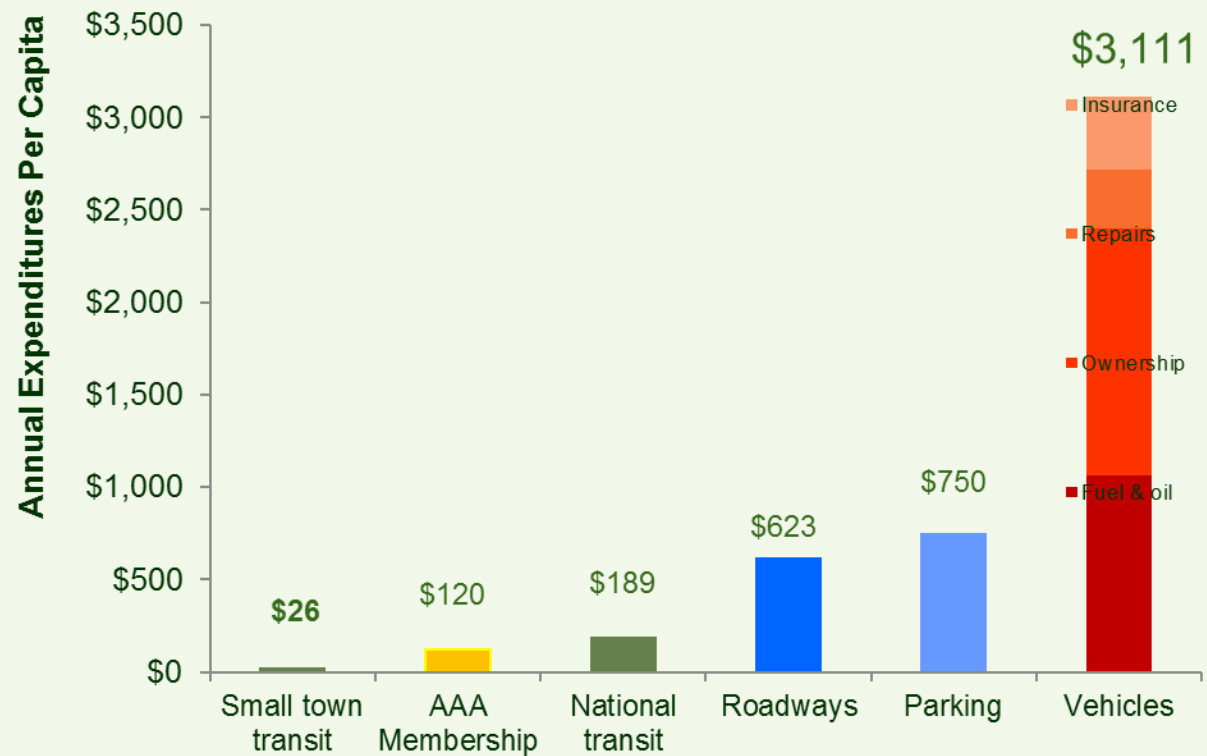
Affordability



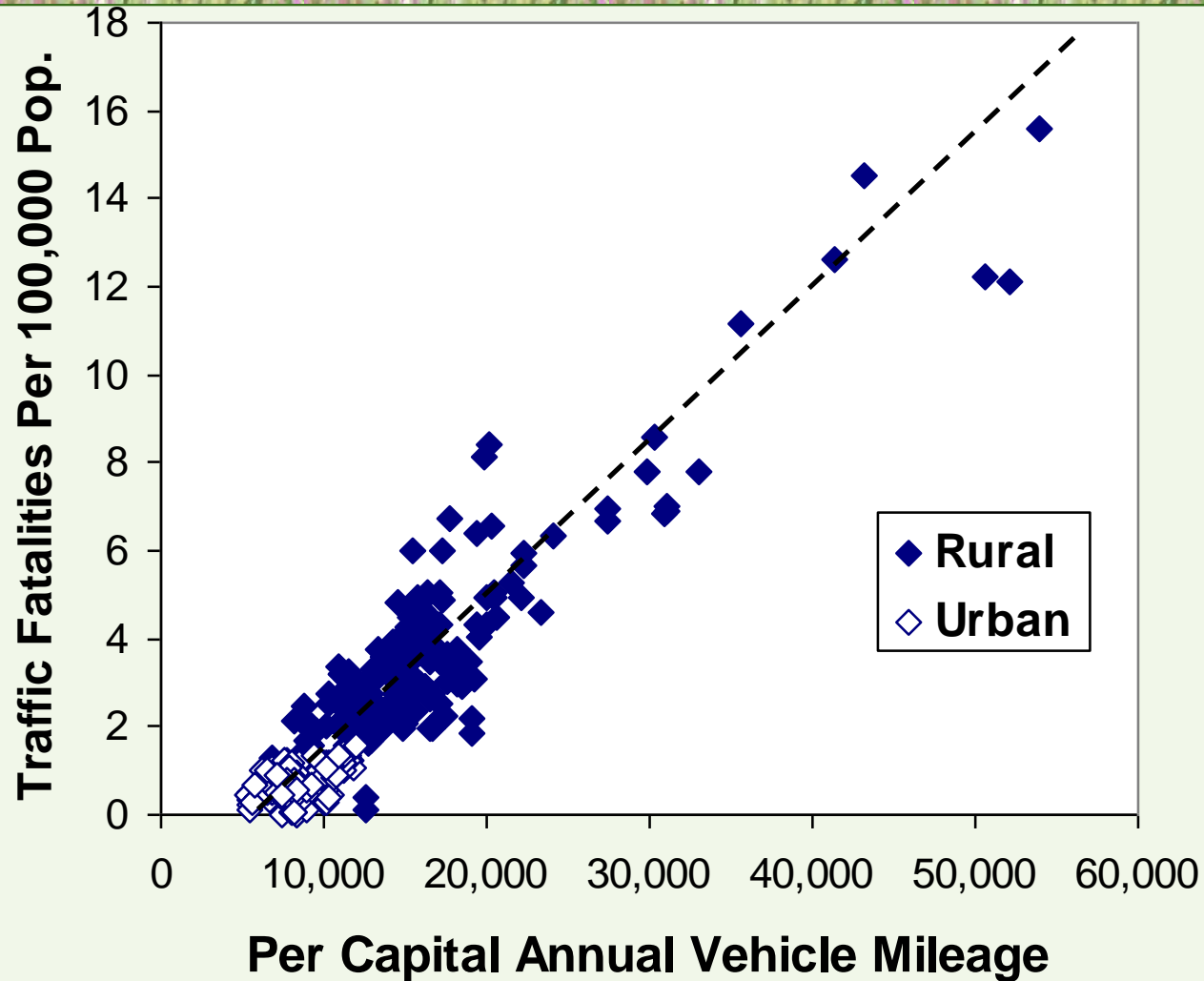
Households in multi-modal communities can save thousands of dollars annually in transportation costs.

Comparing Expenditures

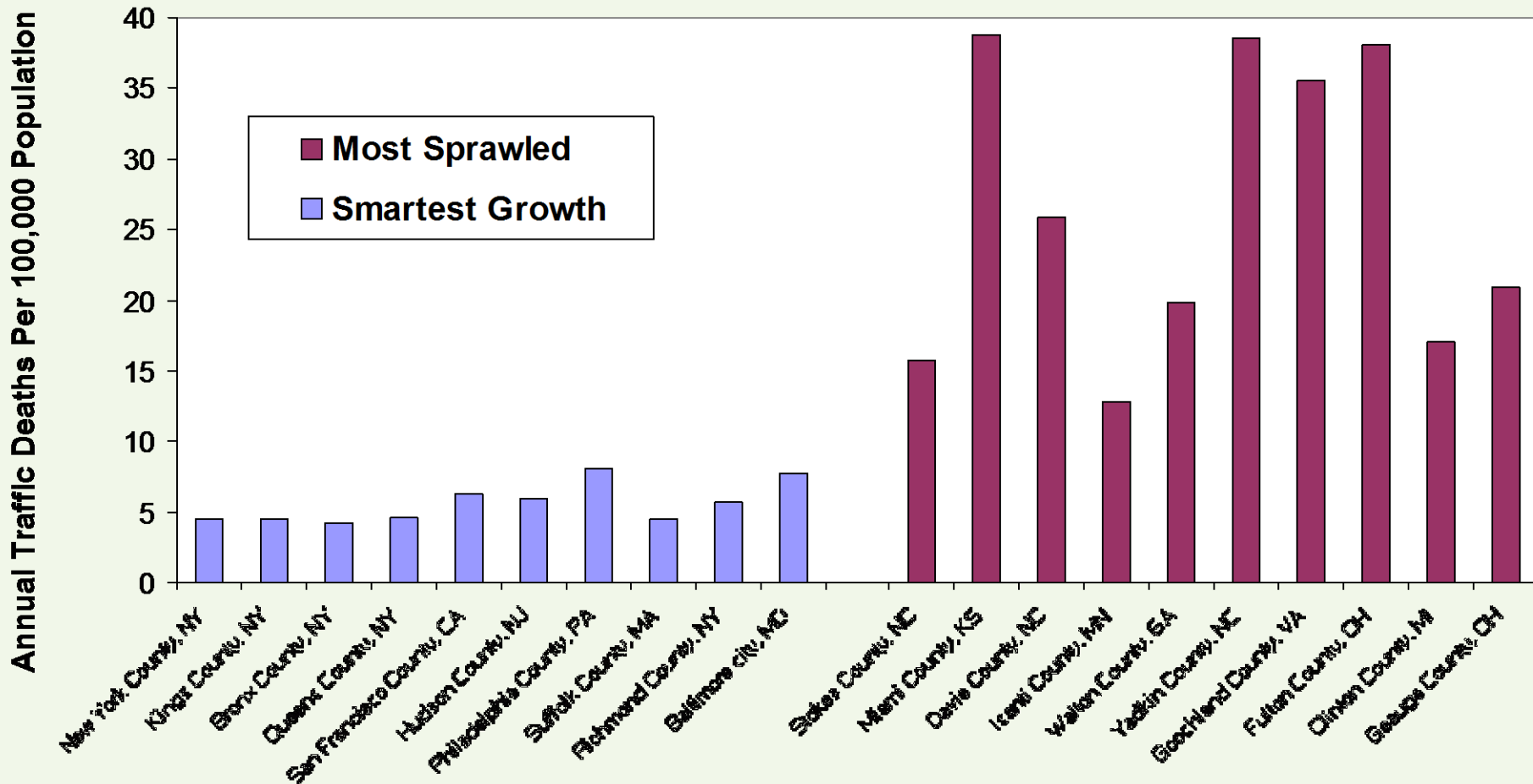
Public transit costs are small compared with total vehicle, road and parking costs for automobile travel.



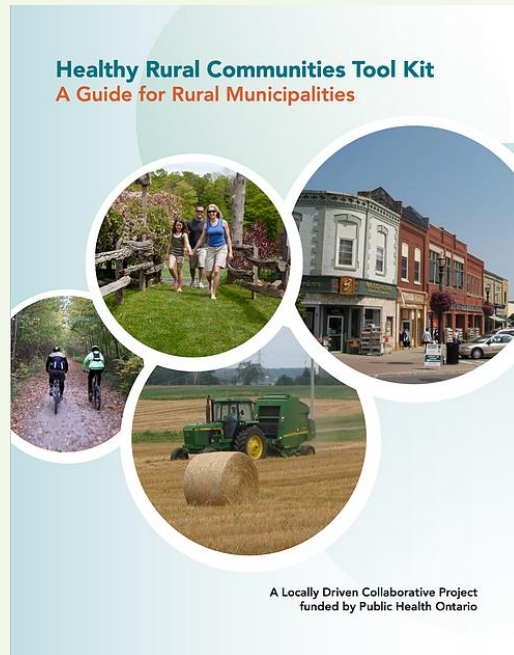
U.S. Crash Rates



Safety Impacts



Healthy Rural Communities



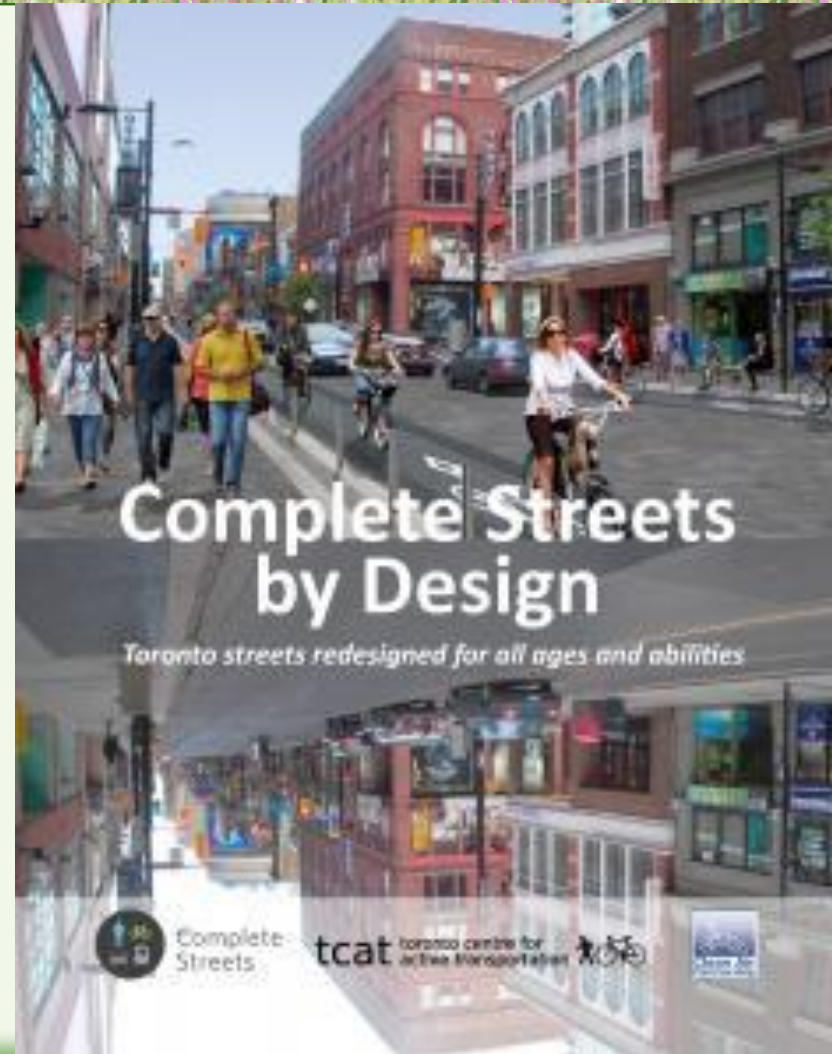
What Gets People Moving?

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.



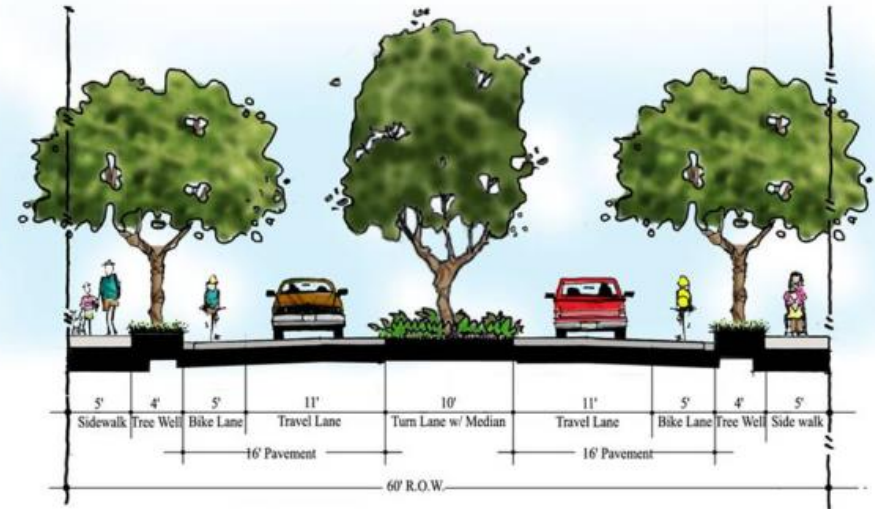
Complete Streets

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.



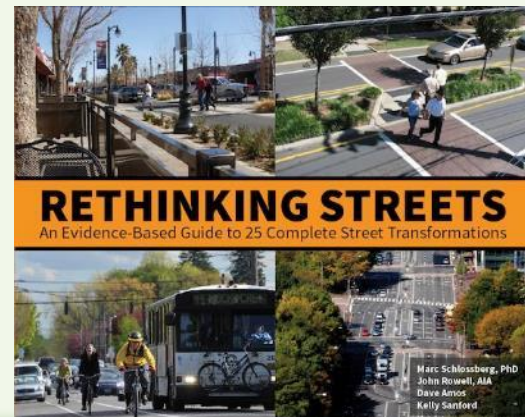
Complete Streets Design Features

- Sidewalks
- Cross walks
- Bike lanes
- Traffic speed reductions (traffic calming)
- Bus lanes
- Bus stops
- Traffic lanes
- Center turn lanes
- On-street parking
- Landscaping and street furniture



State Highways and Mainstreets


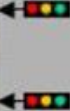

















Complete streets planning is particularly appropriate where highways pass through small towns and villages. This ensures that these roadways accommodate walking, cycling, driving, public transit, parking and commercial activities.



Multi-Modal LOS

New indicators can be used to evaluate multiple modes.

This is critical for creating more efficient and diverse transportation systems.

Level of Service	Automobile	Bicycle	Pedestrian	Bus
A/B	 			 <p>>4 buses/hour</p>
C/D	 			 <p>2 to 4 buses/hour</p>
E/F	 			 <p>< 1 bus/hour</p>
				

Source: FDOT Quality/Level of Service Handbook

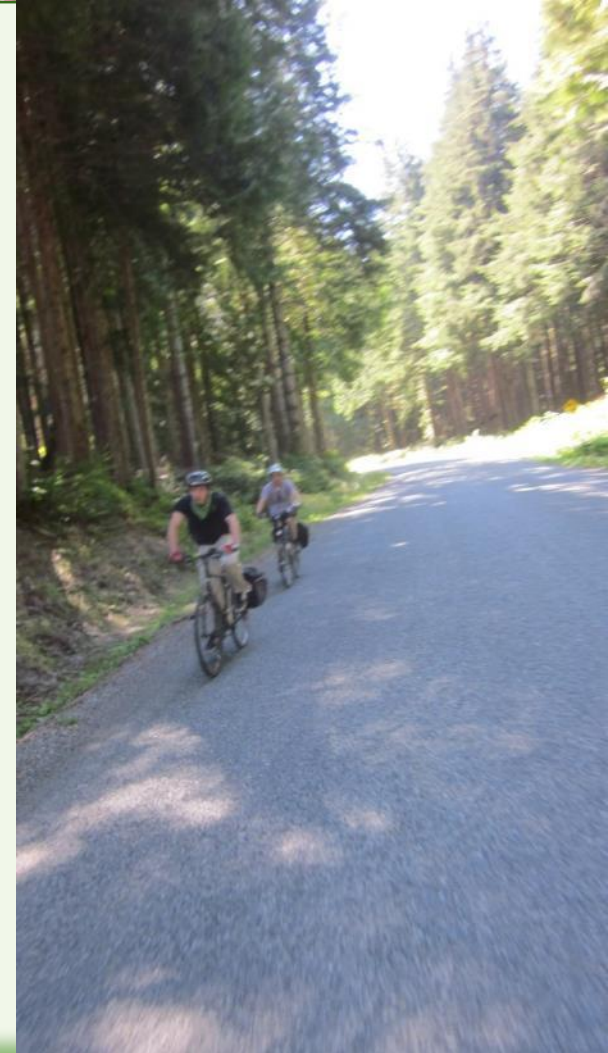
Walking and Cycling Improvements

- 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.



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).



Road Shoulder Standards

	ADT < 250	ADT 250-400	ADT 400- DHV 100	DHV 100-200	DHV 200-400	DHV >400
Rural Arterials	1.2	1.2	1.8	1.8	2.4	2.4
Rural Collectors	0.6	0.6	1.2	1.8	2.4	2.4
Rural Local Routes	0.6	0.6	1.2	1.8	1.8	2.4

ADT = Average Daily Traffic

DHV = Design Hour Volume (0.6 = 2 ft; 1.2 = 4 ft.; 1.8 = 6 ft; 2.4 = 8 ft.)

On rural roads, pedestrians and cyclists travel on roads. As traffic volumes increase so does the need for adequate road shoulders. The Oregon DOT developed these recommended road shoulder standards.

Types of Rural Public Transit

Name	Description	Service Quality	User Costs	Public Costs
Taxi Subsidies	Private taxis receive subsidies for certain types of trips. Users pay any additional fares.	Moderate to high, depending on local taxi service availability.	Varies depending on size of subsidy and length of trip.	Varies.
Volunteer Drivers – Own Vehicles	Non-profit organizations coordinate volunteer drivers who provide rides in their own vehicles.	Low. Limited to what volunteers can provide.	Users may be asked to help pay for gas.	Varies. May help reimburse drivers.
Community buses	Non-profit organizations use volunteer or paid drivers to offer subsidized van or bus rides.	Low to moderate, depending on resources.	Varies. Users may be asked to help pay expenses.	Low. Helps fund vehicles.
Paratransit (Demand Response)	Non-profit organizations or government agencies coordinate paid drivers using vans or small buses.	Moderate, depending on resources.	Varies. Generally requires a fare of several dollars.	High.
Vanpool services	A transportation agency or employer group helps organize commuter vanpools	Good for longer commute trips	Low compared with driving a private vehicle	Very low. Vanpools are generally self-supporting
Fixed Route Transit Bus Services	Government agencies or contractors operate buses on scheduled routes.	High in service area, depending on resources.	Generally requires moderate fares.	Moderate to high.
Integrated Regional Transit Services	Local and regional agencies coordinate transit services to connect communities.	High, depending on funding: more funding allows more service.	Generally requires moderate fares.	Moderate to high.

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



Public Transport Revenue 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

Rural Transportation Management

- Improve walking and cycling facilities for transport, recreation and exercise.
- Improve public transit services, including bus and rail stations and shelters.
- Integrate bus and bicycling.
- Improve user information concerning transport options.
- Use context sensitive roadway design to accommodate local needs.
- Manage tourist and special event transport.
- Redevelop downtowns and villages.



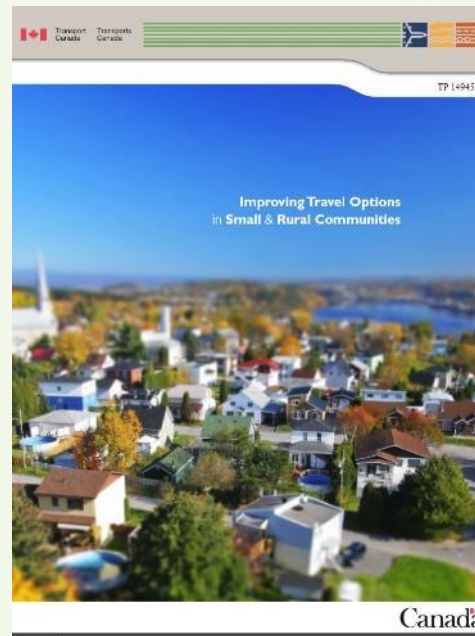
Ridesharing

Ridesharing (car- and van-pooling) can be very cost-effective, and is particularly appropriate in rural areas.



Rural Smart Growth

- Revitalize village and town centers.
- Meet diverse housing needs.
- Provide transportation options including walking, cycling, public transit, ridesharing and taxi.
- Improve public fitness and health.
- Protect natural habitats.
- Strengthen local economies.
- Support productive agriculture.
- Preserve historic and cultural resources.
- Create efficient public infrastructure.
- Efficient and renewable energy.

A banner with a house icon and the text "Smart Growth Canada Network WELCOME".

home	Welcome to the Smart Growth Canada Network website	news flash!
online courses	The Smart Growth Canada Network (SGCN) is a national advisory board organization founded in May 2001 to help advance the implementation of smart growth and sustainability principles across the country through education, research and capacity building strategies for the broad range of decision makers.	Launching Community Energy Planning Webpage
municipal executives' resource group		
steering committee		
community energy planning		
useful research	Smart Growth Canada Network Online Courses	
previous meetings	Please take the time to look at our online courses that is currently in production on the principles of smart growth. Currently, only a selected number of the online courses are available while others are under construction. Please tell us what you think at the end with a short online survey.	contact us
partner organisations		Ray Irsalidis, 616.647.5199, rirsalidis@smartgrowth.ca
EN FRANÇAIS	SGCN Learning Modules: A Primer on Smart Growth Principles	Don Alcott, (905) 251-3345 x 143961, donalco@smartgrowth.ca
Sign up for the SGCN Smart Growth Listserv	10 Principles of Smart Growth	
<input type="text" value="email address"/>	These are the principles that are being used to create the Smart Growth Canada Network Primer E-Course:	
Share Us!	1) Housing Choice Principle: Create a range of affordable, quality housing choices.	
	2) Vibrant, Walkable Complete Communities Principle: Foster development that creates vibrant, unique, walkable complete communities where uses like residential and commercial are mixed to create attractive places to live, work and	

Parking Management



Various strategies that result in more efficient use of parking supply

Affordable-Accessible Housing



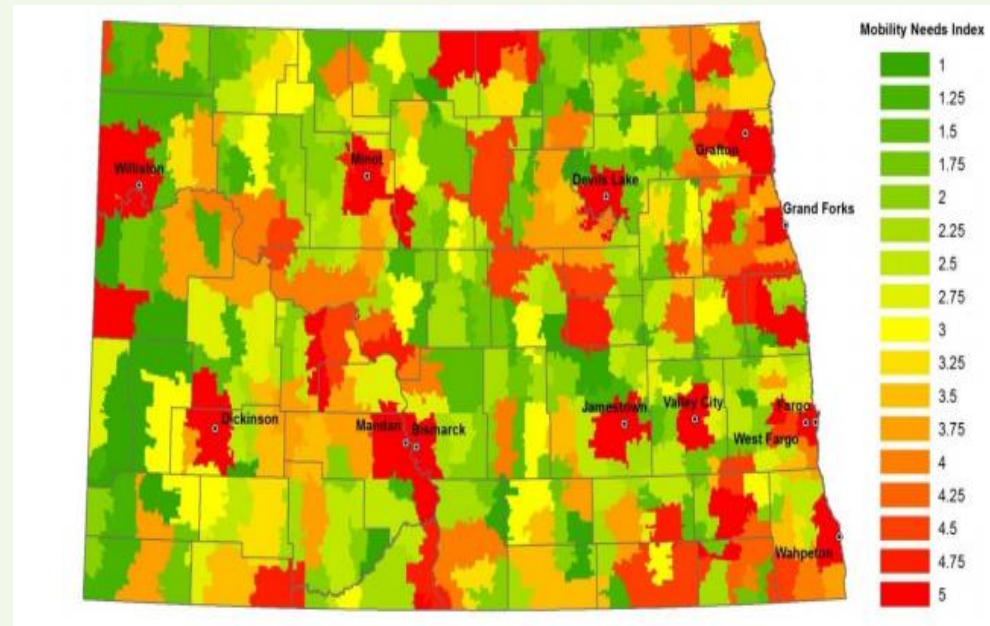
- Aging in place
- Inclusive communities
- Economic opportunity

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

Example: Mobility Needs Index

Identifying and Satisfying the Mobility Needs of North Dakota's Transit System (Mattson and Hough 2015) analyzed demographic and economic trends that affect transit demands to estimate future transit demands and funding needs.

They calculated a *Mobility Need Index* for each county.



Example: Travel Washington Intercity Bus

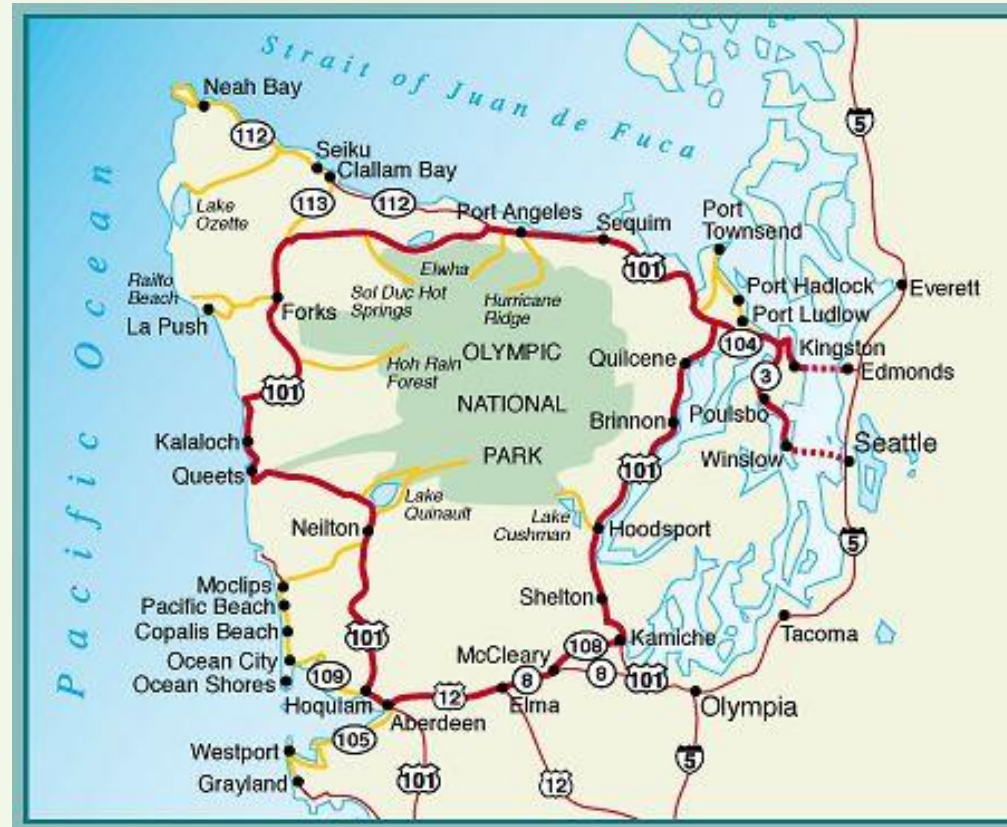
Washington State's Travel Washington Intercity Bus Program contracts with private companies to provide services to many rural communities. The State Department of Transportation works with communities to design the program and select service providers



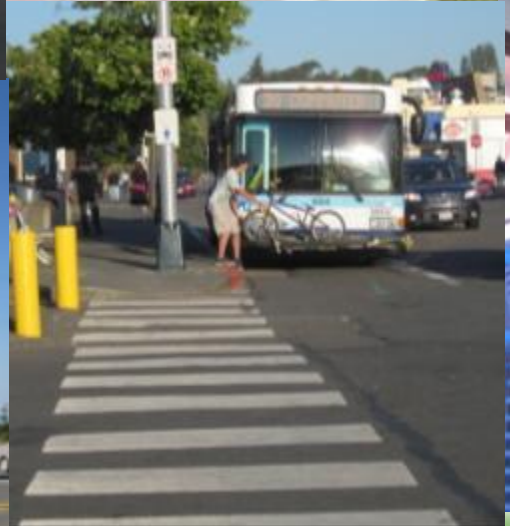
Example – Olympic Peninsula Transit

Washington State's Olympic Peninsula has numerous towns and villages located in six counties each with its own public transit system. It possible to travel between these communities by public transit.

- Terminals in each town.
- Convenient user information.
- Integrating schedules.
- Bike racks on all buses.
- Sidewalks and highway shoulders for cyclists.



Olympic Peninsula Transit Services



Example: Highway of Tears

The so-called *Highway of Tears* is a 724 kilometer stretch of northern British Columbia highway where numerous low-income, First Nations women have been assaulted, murdered or disappeared while hitchhiking between rural communities. To address this risk, a major symposium in 2006, and the federal Missing Women Commission in 2012, both of which recommended the establishment of transit services on the corridor, *but as of 2015 no service is planned.*

This is an example of the tendency of transport planning to undervalue non-drivers' needs. The BC Ministry of Transportation collects data on vehicle travel and traffic crashes, and invests significant resources to improve vehicle travel conditions and safety, but collects little data on non-drivers travel needs and risks, such as assaults while hitchhiking.



Numerous public studies have examined the Highway of Tears risks, but none have addressed it simply as a rural transport planning issue. The BC Ministry of Transportation has done little to evaluate or reduce this risk.

Example: Ride To Wellness

Rides to Wellness (R2W) is non-emergency medical transport program available to residents of Union County in rural Oregon.

The program provides 3,000-14,000 annual round trips in an area with an estimated 1,100-5,000 residents who lack transportation to medical services. This is estimated to provide benefits \$2.2-9.8m annual net benefits.



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 

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 

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

**BE PART OF THE SOLUTION...
REUSE YOUR RIDER'S GUIDE.**

Transit Info 250-746-9899
www.bctransit.com

 This bulletin is printed on environmentally responsible paper and is recyclable. 092-08

Rider's Bulletin
**Cowichan Valley
Commuter**

Effective September 27, 2010
Revised from September 7, 2010



Linking Communities, Businesses, & Lifestyles

Themes For Building Support

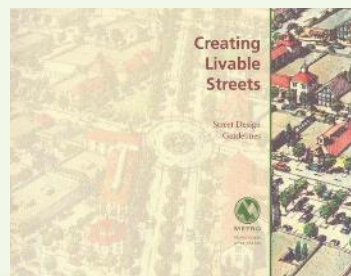
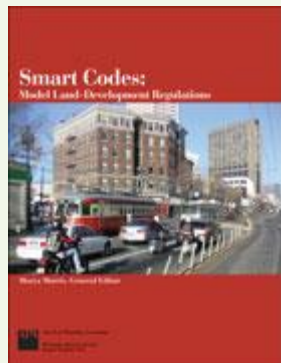
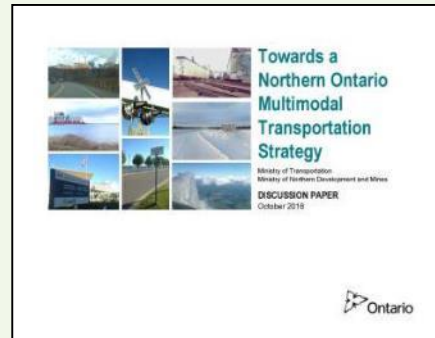
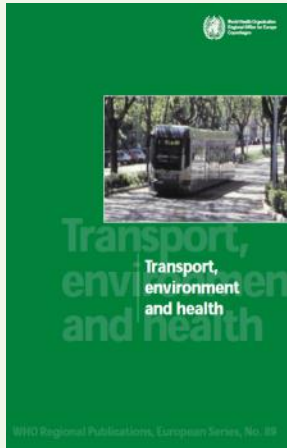
1. Identify demographic and economic trends that are increasing public transit demand.
2. Show ridership growth and latent demand (increased ridership with improved service).
3. Identify ways that public transit helps achieve regional development objectives (financial savings to governments and businesses, economic development, improved quality of life).
4. Demonstrate that public transit benefits non-users.
5. Demonstrate positive economic returns from public transit investments.
6. Demonstrate fiscal responsibility.



Potential Advocacy Partners

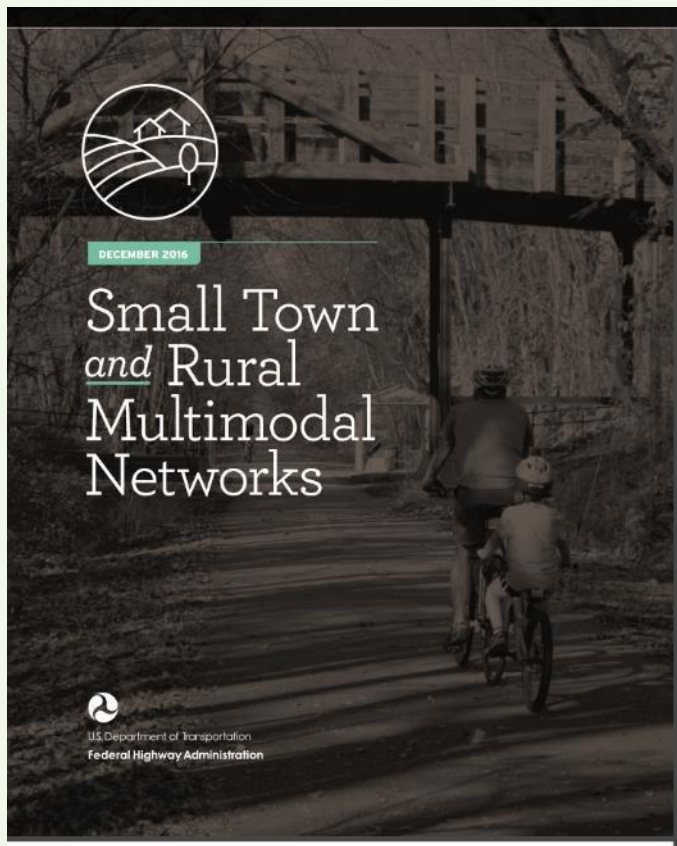
Benefit	Potential Partners
Traffic congestion reduction	Transportation agencies, motorists
Parking congestion reductions	Local transport agencies, motorists, developers, businesses and economic development associations
Improved public safety and health	Transportation agencies, public health agencies 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

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...

Small Town & Rural Multimodal Networks



Why a Rural and Small Town Focused Guide?

There is a need and desire to make travel safer and more active in small and rural communities.

While rural places vary considerably in geographic scale and character, there are common issues that prevail:



Longer Non-local Trip Distances

Rural trip distances have been increasing.⁽ⁱ⁾



Health Disparities

Rural areas have higher rates of physical inactivity and chronic disease than urbanized areas.⁽ⁱⁱ⁾



Higher Crash Rates

While only 19 percent of the population lives in rural areas, 58 percent of all fatal crashes and 60 percent of traffic fatalities were recorded in rural regions.⁽ⁱⁱⁱ⁾




Income Disparities

Urban households earn 32 percent more in yearly income than rural households.^(iv)



Rural Transit and Connectivity



NCTR
NATIONAL CENTER for
TRANSIT RESEARCH

**Cost-Benefit Analysis of
Rural and Small Urban Transit**

July 2014

prepared for
US DOT

prepared by
Ranjit Godavarthy
Jeremy Mattson
Elvis Ndembe

North Dakota State University
Upper Great Plains Transportation Institute
Small Urban and Rural Transit Center

USF UNIVERSITY OF SOUTH FLORIDA NDSU NORTH DAKOTA STATE UNIVERSITY UIC UNIVERSITY OF ILLINOIS AT CHICAGO FIU FLORIDA INTERNATIONAL UNIVERSITY

NCTR is a USDOT/Texas A&M University Transportation Center consortium led by the University of South Florida.



UTCM

Improving the Quality of Life
by Enhancing Mobility

University Transportation Center for Mobility

DOT Grant No. DTRT06-G-0044

Improving Intermodal Connectivity in Rural Areas to Enhance Transportation Efficiency: A Case Study

Final Report

**Stephen Fuller, John R. Robinson,
Francisco Fraire and Sharada Vadali**

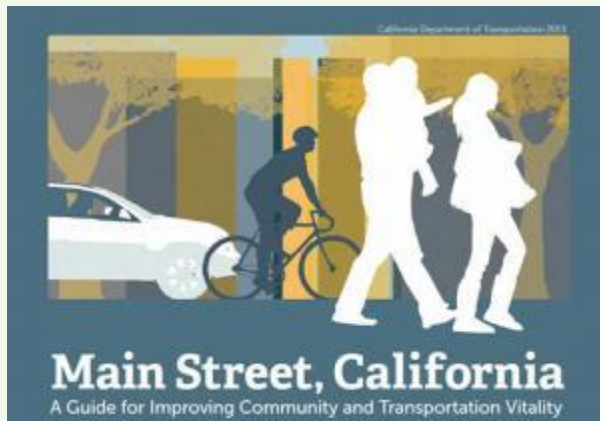
Performing Organization
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Sponsoring Agency
Department of Transportation
Research and Innovative Technology Administration
Washington, DC



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Main Street, California Guide



pedestrians, bicyclists, transit riders and drivers.



Main Streets and Communities of /

In cities, suburbs and small towns, freedom to choose the mode of transportation requirements.

In developed areas, streets comprising outdoor space, making it even more as special public places in their own as attractive shopping destinations and as venues for public gatherings.

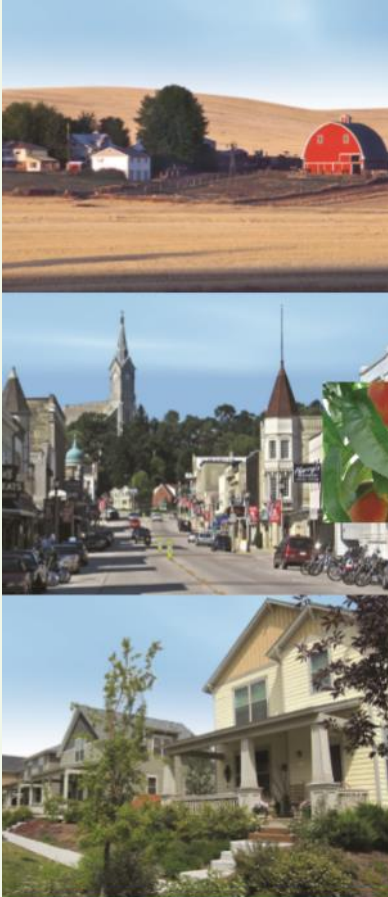
Creating favorable conditions for business to be a powerful engine for the local communities, main street businesses portion of a town's tax base and major employers.


The concepts discussed in this guide may be applied to a wide variety of main street environments.


Rural Smart Growth


Goals:

1. **Support the rural landscape** by creating an economic climate that enhances the viability of working lands and conserves natural lands;
2. **Help existing places thrive** by taking care of assets and investments such as downtowns, Main Streets, existing infrastructure, and places that the community values; and
3. **Create great new places** by building vibrant, enduring neighborhoods and communities that people, especially young people, don't want to leave.




SMART GROWTH
NETWORK

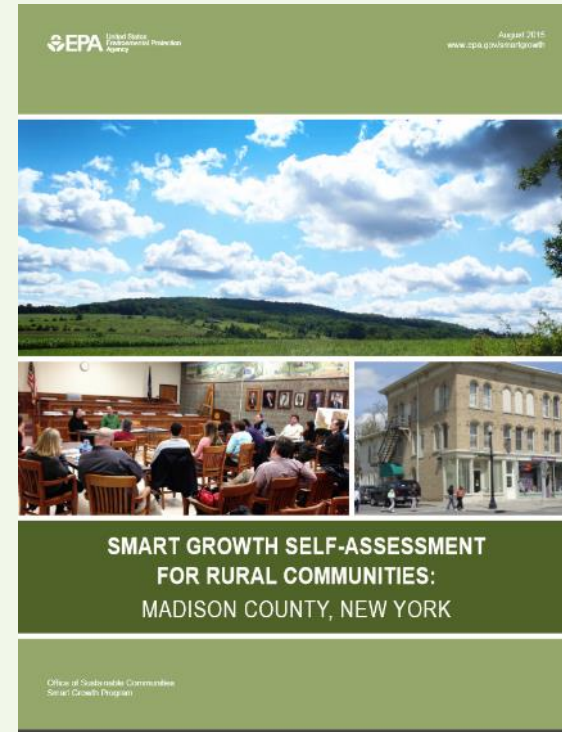

**Putting
Smart Growth
to Work
in Rural Communities**

 **ICMA** Leaders at the Core of Better Communities

Smart Growth Assessment

Rural smart growth self-assessment:

- Revitalize village and town centers.
- Strengthen the local economy.
- Engage and connect community members.
- Improve health and promote active living.
- Protect natural habitats and ecosystems.
- Support productive agriculture.
- Meet housing needs for different ages and incomes.
- Preserve historic and cultural resources.
- Provide transportation choices.
- Invest in efficient public infrastructure.
- Use energy efficiently and renewable energy.



Resources

David W. Eby, et al. (2012), *Recommendations For Meeting The Mobility Needs Of Older Adults In Rural Michigan*, University of Michigan Transportation Research Institute.

Elizabeth Ellis and Brian McCollom (2014), *Guidebook for Rural Demand-Response Transportation: Measuring, Assessing, and Improving Performance*, TCRP Report 136

Gerard Fitzgerald (2012), *The Social Impacts Of Poor Access To Transport In Rural New Zealand*, Research Report 484, NZ Transport Agency.

Ranjit Godavarthy and Jeremy Mattson (2016), *Exploring Transit's Contribution to Livability in Rural Communities: Case Study of Valley City, ND, and Dickinson, ND*, Upper Great Plains Transportation Institute, North Dakota State University, for the U.S. Department of Transportation.

Anush Yousefian Hansen and David Hartley (2015), *Promoting Active Living in Rural Communities*, Active Living Research, Robert Wood Johnson Foundation.

Kenneth I. Hosen and S. Bennett Powell (2014), *Innovative Rural Transit Services: A Synthesis of Transit Practice*, TCRP Synthesis 94, Transportation Research Board.

ICMA (2010), *Putting Smart Growth to Work in Rural Communities*, International City/County Management Association.

IPCS (2011), *Supporting Sustainable Rural Communities*, Interagency Partnership for Sustainable Communities, USDOT, USEPA.

ITF (2015), *International Experiences on Public Transport Provision in Rural Areas*, International Transport Forum.

Jeremy Mattson (2016), *Rural Transit Fact Books*, Small Urban and Rural Transit Center, Upper Great Plains Transportation Institute.

Jeremy Mattson and Jill Hough, (2015), *Identifying and Satisfying the Mobility Needs of North Dakota's Transit System*, Upper Great Plains Transportation Institute.

Sue Mitchell and Ben Hamilton-Baillie (2011), *Traffic in Villages – Safety and Civility for Rural Roads: A Toolkit for Communities*, Dorset AONB Partnership.

Resources - II

NSMM (2015), *Rural Transportation*, National Center for Mobility Management.

NRTAP (2015), *National Rural Transit Assistance Program Website*, Federal Transit Administration.

Kathleen Painter, et al. (2007), "Demand Forecasting for Rural Transit: Models Applied to Washington State," *Transportation Research Record* 1997, pp. 35-40.

Reconnecting America (2012), *Putting Transit to Work in Main Street America: How Smaller Cities and Rural Places Are Using Transit and Mobility Investments to Strengthen Their Economies and Communities*, Reconnecting America.

RTTC (2012), *Active Transportation Beyond Urban Centers: Walking and Bicycling in Small Towns and Rural America*" Rails-to-Trails Conservancy. *Rural Transportation Planning Clearinghouse*.

Rural Transportation Planning Website (wwwcf.fhwa.dot.gov/planning/rural) by the US Federal Highway Administration.

Small Urban & Rural Transit Center (www.surtc.org).

TGM (2013), *Transit in Small Cities: A Primer for Planning, Siting and Designing Transit Facilities in Oregon*, Oregon Department of Transportation and Growth Management.

TROUT (2015), *About The TROUT*, The Rural Overland Utility Transit.

Upper Great Plains Transportation Institute: Small Urban and Rural Transit Center (www.surtc.org).

Nagendra R. Velaga, et al. (2012), "Potential Role of Flexible Transport Services in Enhancing Rural Public Transport," *Journal of Public Transportation*, Vol. 15, No. 1.

Natalie Villwock-Witte and Karalyn Clouser (2016), *Mobility Mindset of Millennials in Small Urban and Rural Areas*, Small Urban and Rural Livability Center.

James P. Wood, et al. (2016), "Older Adult Transportation in Rural Communities: Results of an Agency Survey," *Journal of Public Transportation*, Vol. 19, No. 2, pp. 154-167.



“Safe Travels: Evaluating Mobility Management Traffic Safety Benefits”

“Evaluating Active Transportation Benefits and Costs”

“Evaluating Public Transportation Health Benefits”

“Transportation Pricing for Traffic Safety”

“Selling Smart Growth”

“If Health Matters”

“Online TDM Encyclopedia”

and more...

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