NAU NORTHERN ARIZONA UNIVERSITY
Economic Policy Institute

Transit's Return on Investment

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Economic Policy Institute
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NAU NORTHERN ARIZONA UNIVERSITY

EPI's Mission

NAU NORTHERN ARIZONA UNIVERSITY
Economic Policy Institute

To empower rural and tribal communities and small businesses with data driven research to aid in sustained economic growth. To promote financial literacy and equity through education opportunities for all grade levels.

- Research Unit
- Center for American Indian Economic Development
- Center for Economic Education
- Arizona Hospitality Research and Resource Center

Research

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2024 Research Projects

	Project Name	Project Type
COMPLETED	Quechan Tribal Planning Study Report	Supply Chain Optimization
	Round Rock Chapter: Convenience Store & Gas Station Planning Market Feasibility Study	Business Feasibility Studies
	Cost of Living (COLI) Survey in Sedona, Arizona	Primary Data Collection
	Indigenous Youth Media Workshop Survey	Program Evaluation
	Data Support for Northern Arizona Council of Governments (NACOG) Comprehensive Economic Development Strategy (CEDS)	Public Policy
	Navajo Industry Indicators (Partnered with local business incubator – Change Labs)	Entrepreneurship
	City of St. Johns Regional Energy and Education Tech Center (REETC) Financial Viability Analysis	Business Feasibility Studies
	Addressing CAFMA and Prescott Region Attainable Housing Challenges	Public Policy
	Coconino County 2025-2028 Local Workforce Development Plan	Public Policy
	Higher Minimum Wage Impact Study on Economic and Workforce Development in Coconino County	Public Policy
ON-GOING	Navajo Wool Processing - Market Study and Cost Analysis	Business Feasibility Studies
	NAU Economic Contribution Study	Economic Impact Analysis
	Native American Housing Needs in Border Towns (Tri-University)	Public Policy

What we talk about when we talk about transit's return on investment?

Most transit systems in the world lose money (except Hong Kong MTR's Rail + Property Model), none that operate purely on fare revenue

- High capital costs
  - Infrastructure like subways, buses, and trains require massive investment, and ongoing operations often don't break even through fares alone.
- Low fares by design
  - Keeping fares affordable is a policy goal in many places, leading to intentional subsidies.
- Public good
  - Provides mobility for those who can't drive or afford a car
  - Other benefits that extend beyond fare-paying riders

Case study: Mountain Line's Economic Contribution

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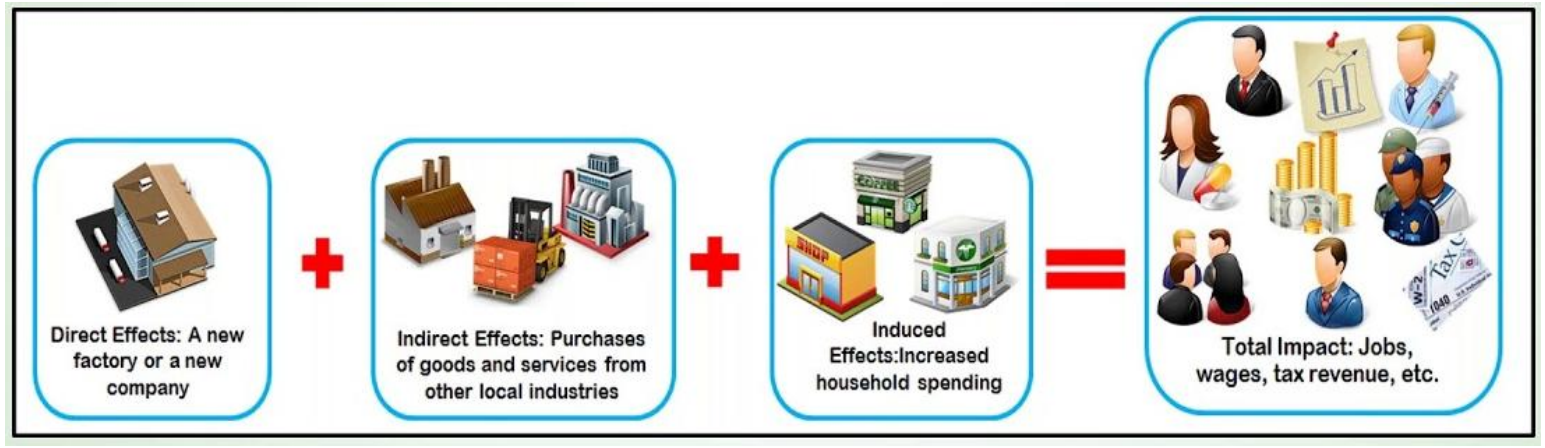
	inter-industry input-Ouput															Final Demand					
Industry	Agriculture	Mining	Manufacturing	Utilities	Construction	Wholesale and retail trade	Transportation and storage	Accomodation and food services	Telecommunications	IT and other information services	Financial activities	Public administration	Education	other service	**Total immediate use**	Consumption	Government	Investment	Exports	**Total Final Use**	**Total Output**
Agriculture	38	48	58	68	78	88	98	108	118	128	138	148	158	168	**1,442**	1,070	2,674	1,070	535	**5,348**	**6,790**
Mining	200	210	220	230	240	250	260	270	280	290	300	310	320	330	**3,710**	656	1,640	656	328	**3,280**	**6,990**
Manufacturing	150	160	170	180	190	200	210	220	230	240	250	260	270	280	**3,010**	836	2,090	836	418	**4,180**	**7,190**
Utilities	250	260	270	280	290	300	310	320	330	340	350	360	370	380	**4,410**	596	1,490	596	298	**2,980**	**7,390**
Construction	20	30	40	50	60	70	80	90	100	110	120	130	140	150	**1,190**	1,280	3,200	1,280	640	**6,400**	**7,590**
Wholesale and retail trade	50	60	70	80	90	100	110	120	130	140	150	160	170	180	**1,610**	1,236	3,090	1,236	618	**6,180**	**7,790**
Transportation and storage	80	90	100	110	120	130	140	150	160	170	180	190	200	210	**2,030**	1,192	2,980	1,192	596	**5,960**	**7,990**
Accomodation and food services	60	70	80	90	100	110	120	130	140	150	160	170	180	190	**1,750**	1,288	3,220	1,288	644	**6,440**	**8,190**
Telecommunications	85	95	105	115	125	135	145	155	165	175	185	195	205	215	**2,100**	1,258	3,145	1,258	629	**6,290**	**8,390**
IT and other information services	520	530	540	550	560	570	580	590	600	610	620	630	640	650	**8,190**	80	200	80	40	**400**	**8,590**
Financial activities	600	610	620	630	640	650	660	670	680	690	700	710	720	730	**9,310**	536	1,340	536	268	**2,680**	**11,990**
Public administration	500	510	520	530	540	550	560	570	580	590	600	610	620	630	**7,910**	856	2,140	856	428	**4,280**	**12,190**
Education	120	130	140	150	160	170	180	190	200	210	220	230	240	250	**2,590**	1,960	4,900	1,960	980	**9,800**	**12,390**
other service	340	350	360	370	380	390	400	410	420	430	440	450	460	470	**5,670**	1,384	3,460	1,384	692	**6,920**	**12,590**
Total immediate use	**3,013**	**3,153**	**3,293**	**3,433**	**3,573**	**3,713**	**3,853**	**3,993**	**4,133**	**4,273**	**4,413**	**4,553**	**4,693**	**4,833**	**54,922**	**14,228**	**35,569**	**14,228**	**7,114**	**71,138**	**126,060**
Taxes	477	497	517	537	557	577	597	617	637	657	677	697	717	737	**8,498**						
Compensation of employees	1,500	1,530	1,560	1,590	1,620	1,650	1,680	1,710	1,740	1,770	5,000	5,030	5,060	5,090	**36,530**						
Gross opearting surplus	1,800	1,810	1,820	1,830	1,840	1,850	1,860	1,870	1,880	1,890	1,900	1,910	1,920	1,930	**26,110**						
Gross value added	3,777	3,837	3,897	3,957	4,017	4,077	4,137	4,197	4,257	4,317	7,577	7,637	7,697	7,757	**71,138**						
Total output	**6,790**	**6,990**	**7,190**	**7,390**	**7,590**	**7,790**	**7,990**	**8,190**	**8,390**	**8,590**	**11,990**	**12,190**	**12,390**	**12,590**	**126,060**						



Case study: Mountain Line's Economic Contribution

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Economic Contribution from Operational Expense

Contribution	Employment	Labor Income	Value Added	Output
Direct	99.75	$6,864,677	$6,864,677	$9,881,201
Indirect	12.05	$553,731	$978,499	$1,738,171
Induced	25.10	$1,263,208	$2,282,403	$3,899,485
Total Operations	**136.89**	**$8,681,616**	**$10,125,579**	**$15,518,858**

	Capital Expenditure
2018	$4,932,814.89
2019	$751,216.21
2020	$626,349.53
2021	$937,356.84
2022	$604,641.30
Total	**$7,852,378.77**

Economic Contribution from Capital Expense

	Employment	Labor Income	Value Added	Output
2018	24.4	$1,198,816.8	$1,591,784.9	$2,952,522.1
2019	7.6	$395,139.2	$555,600.5	$1,088,736.2
2020	6.9	$342,041.7	$424,140.1	$894,096.8
2021	9.3	$474,461.9	$604,777.6	$1,220,118.0
2022	7.2	$379,140.7	$479,975.8	$904,762.6
Total	**55.4**	**$2,789,600.5**	**$3,656,278.9**	**$7,060,235.8**
Average	**11.1**	**$557,920.1**	**$731,255.8**	**$1,412,047.2**

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Total Economic Contribution

Contribution	Employment	Labor Income	Value Added	Output
Operational FY2022	136.89	$8,681,616	$10,125,579	$15,518,858
Average Capital FY2018-2022	11.1	$557,920.1	$731,255.8	$1,412,047.2
Total	**147.99**	**$9,239,536.1**	**$10,856,834.8**	**$16,930,905.2**

Total Tax Contribution

Impact	Sub County General	Sub County Special Districts	County	State	Federal	**Total**
Direct	$7,253	$9,876	$5,472	$125,612	$1,479,924	**$1,628,138**
Indirect	$85,145	$79,970	$58,132	$208,035	$15,485	**$446,767**
Induced	$51,657	$48,929	$35,339	$145,488	$223,574	**$504,988**
Total	**$144,056**	**$138,776**	**$98,943**	**$479,136**	**$1,718,984**	**$2,579,893**

Top 15 Supported Industries

	IMPLAN Code	Industry Description	Industry Total Output	Contribution Output	Estimated Growth Percentage
	532	Local government passenger transit		$9,881,201	-
1	449	Owner-occupied dwellings	$723,214,393	$662,185	.09%
2	402	Retail - Motor vehicle and parts dealers	$53,086,630	$460,378	.87%
3	490	Hospitals	$781,783,552	$414,583	.05%
4	512	Automotive repair and maintenance, except car washes	$89,380,217	$404,050	.45%
5	399	Wholesale - Petroleum and petroleum products	$18,609,067	$245,952	1.32%
6	447	Other real estate	$570,218,692	$222,620	.04%
7	60	Maintenance and repair construction of nonresidential structures	$65,578,248	$214,186	.33%
8	510	Limited-service restaurants	$342,695,970	$203,436	.06%
9	483	Office of physicians	$180,146,840	$167,331	.09%
10	534	Other local government enterprises	$499,368,564	$157,489	.03%
11	509	Full-service restaurants	$347,519,409	$147,824	.04%
12	462	Management consulting services	$22,540,612	$121,109	.54%
13	411	Retail - General merchandise stores	$126,993,331	$119,574	.09%
14	476	Services to buildings	$61,241,789	$118,503	.19%
15	465	Advertising, public relations, and related services	$88,028,404	$114,156	.13%

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Operational Revenue Sources FY2022

Source	Revenue
Federal Funding	$3,191,789
Local Funding	$5,315,476
Operating Revenues (Fares)	$1,407,285
Total	**$9,914,550**

Capital Revenue Sources FY2022

Source	Revenue
Federal Funding	$421,384
Local Funding	$183,257
Total	**$604,641**

Operational Revenue

- For every dollar raised from local taxes and fares for operations, an additional **$0.52** is leveraged from federal sources.

Capital Revenue

- 70% is derived from external federal dollars, while only 30% is locally funded.
- Every dollar of local capital funding leverages **$2.30** in non-local funding

Transit Agency Economic Contribution: Mountain Line

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Money Saved due to Trips Avoided

Adjusted annual passenger trips	1,298,624
Portion of riders with access to a vehicle	35%
Number of rides by passengers with vehicle access	454,518
Average length of trip (in miles)	3.81
Private vehicle miles avoided	1,731,714
Average cost per mile avoided	$0.28
Total Cost Avoided	**$484,880**

Cost-Benefit Analysis of Rural and Small Urban Transit

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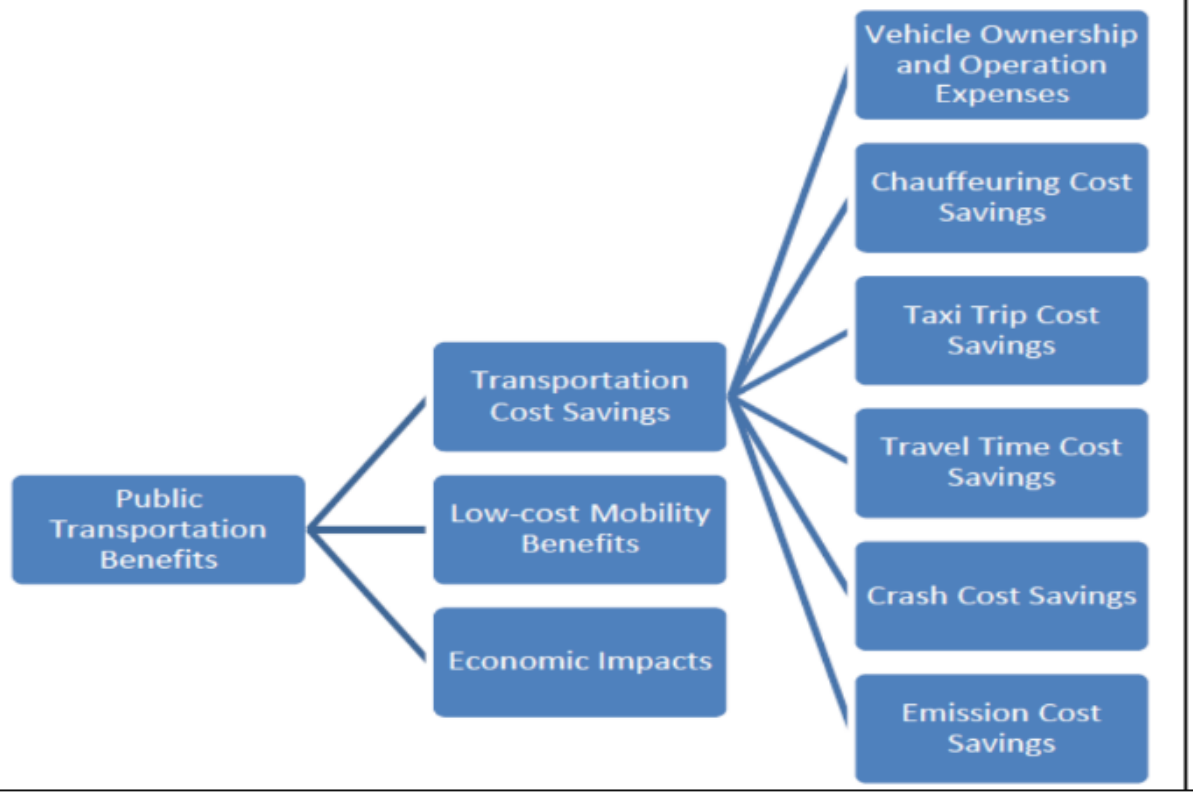
Benefit Categories



Benefit Estimates

Table 8.4 Benefit-Cost Ratios for US States/Regions in Rural Areas

Benefit-Cost Ratio of Public Transit in Rural Areas			
State	B/C Ratio	State	B/C Ratio
Alabama (AL)	1.46	Montana (MT)	1.93
Alaska (AK)	1.48	Nebraska (NE)	1.67
Arizona (AZ)	1.34	Nevada (NV)	1.26
Arkansas (AR)	0.82	New Hampshire (NH)	2.28
California (CA)	1.14	New Jersey (NJ)	0.72
Colorado (CO)	2.01	New Mexico (NM)	1.53
Connecticut (CT)	1.27	New York (NY)	1.17
Florida (FL)	0.37	North Carolina (NC)	0.46
Georgia (GA)	0.55	North Dakota (ND)	1.30
Hawaii (HI)	1.79	Ohio (OH)	0.84
Idaho (ID)	1.01	Oklahoma (OK)	1.05
Illinois (IL)	0.86	Oregon (OR)	1.50
Indiana (IN)	1.26	Pennsylvania (PA)	1.11
Iowa (IA)	1.87	South Carolina (SC)	1.48
Kansas (KS)	2.01	South Dakota (SD)	1.45
Kentucky (KY)	0.41	Tennessee (TN)	0.66
Louisiana (LA)	0.32	Texas (TX)	0.66
Maine (ME)	0.32	Utah (UT)	4.19
Maryland (MD)	2.57	Vermont (VT)	0.70
Massachusetts (MA)	1.79	Virginia (VA)	1.39
Michigan (MI)	0.61	Washington (WA)	1.48
Minnesota (MN)	1.77	West Virginia (WV)	1.16
Mississippi (MS)	1.60	Wisconsin (WI)	0.63
Missouri (MO)	1.29	Wyoming (WY)	3.00
		Total	1.12

Rural Transit Benefit Analysis (Godavarthy, Mattson and Ndembe 2014)

- Public transit investments generally provide positive economic returns
- Many benefits tend to be overlooked and undervalued

Impact Category	Description
Transit Service Costs	*Financial costs of providing transit services*
Fares	Direct payments by transit users.
Subsidies	Government expenses to provide transit services.
Existing User Impacts	*Incremental benefits and costs to existing transit users*
Various	Changes in fares, travel speed, comfort, safety, etc. to existing transit users.
Mobility Benefits	*Benefits from increased travel that would not otherwise occur.*
Direct User Benefits	Direct benefits to users from increased mobility.
Public Services	Support for public services and cost savings for government agencies.
Productivity	Increased productivity from improved access to education and jobs.
Equity	Improved mobility that makes people who are also economically, socially or physically disadvantaged relatively better off.
Option Value/ Emergency Response	Value of having mobility options available in case they are ever needed, including the ability to evacuate and deliver resources during emergencies.
Efficiency Benefits	*Benefits from reduced motor vehicle traffic.*
Vehicle Costs	Changes in vehicle ownership, operating and residential parking costs.
Chauffeuring	Reduced chauffeuring responsibilities by drivers for non-drivers.
Vehicle Delays	Reduced motor vehicle traffic congestion.
Pedestrian Delays	Reduced traffic delay to pedestrians.
Parking Costs	Reduced parking problems and non-residential parking facility costs.
Safety, Security and Health	Changes in crash costs, personal security and improved health and fitness due to increased walking and cycling.
Roadway Costs	Changes in roadway construction, maintenance and traffic service costs.
Energy and Emissions	Changes in energy consumption, air, noise and water pollution.
Travel Time Impacts	Changes in transit users' travel time costs.
Land Use	*Benefits from changes in land use patterns.*
Transportation Land	Changes in the amount of land needed for roads and parking facilities.
Land Use Objectives	Supports land use objectives such as infill, efficient public services, clustering, accessibility, land use mix, and preservation of ecological and social resources.
Economic Development	*Benefits from increased economic productivity and employment.*
Direct	Jobs and business activity created by transit expenditures.
Shifted expenditures	Increased regional economic activity due to shifts in consumer expenditures to goods with greater regional employment multipliers.
Agglomeration Economies	Productivity gains due to more clustered, accessible land use patterns.
Transportation Efficiencies	More efficient transport system due to economies of scale in transit service, more accessible land use patterns, and reduced automobile dependency.
Land Value Impacts	Higher property values in areas served by public transit.

Comprehensive Transit Evaluation Framework (Litman, 2024)

Two categories of transit benefits

- *equity-oriented*, result from the availability and use of transit by disadvantaged people
- *efficiency-oriented*, result from when transit substitutes for automobile travel

Maximizing the Return: Planning & Leveraging Dollars

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Smart Planning

- Plan transit alongside community needs.
- Prioritize projects that deliver on multiple goals – mobility, economic development, equity, and sustainability.

Measure & Communicate Benefits

- Use tools to measure benefits; build support for sustained transit investment

Leverage Every Dollar

- Coordinate funding streams and partnerships to amplify impact: be ready with local match to unlock state or federal funding.

Thank you!

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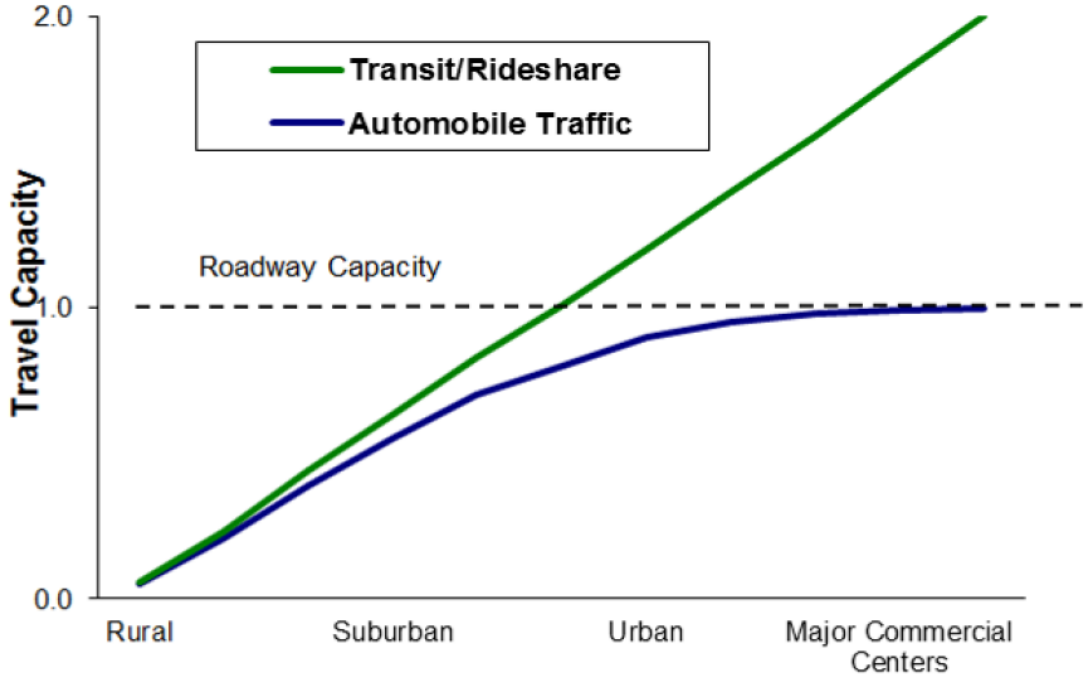
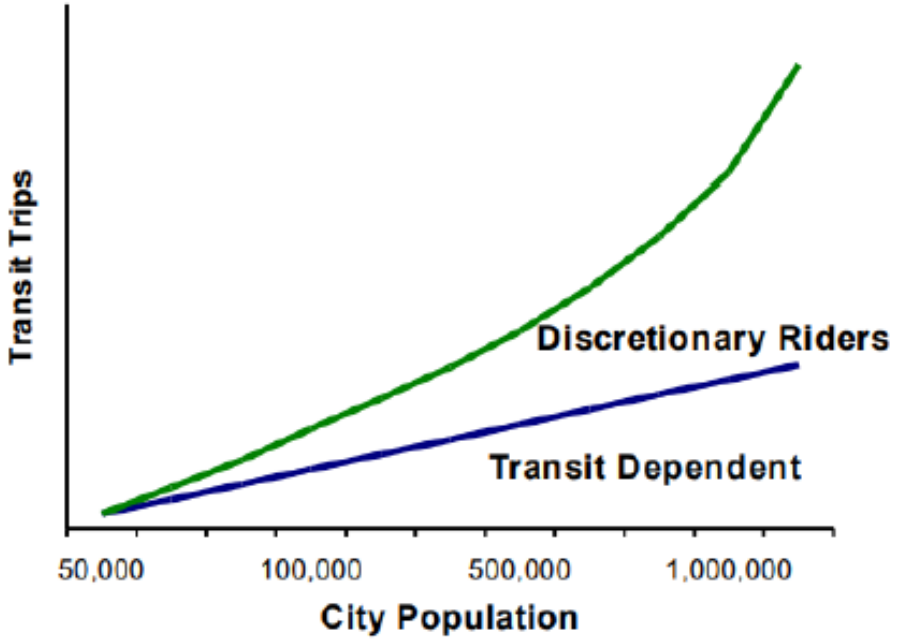
Questions?

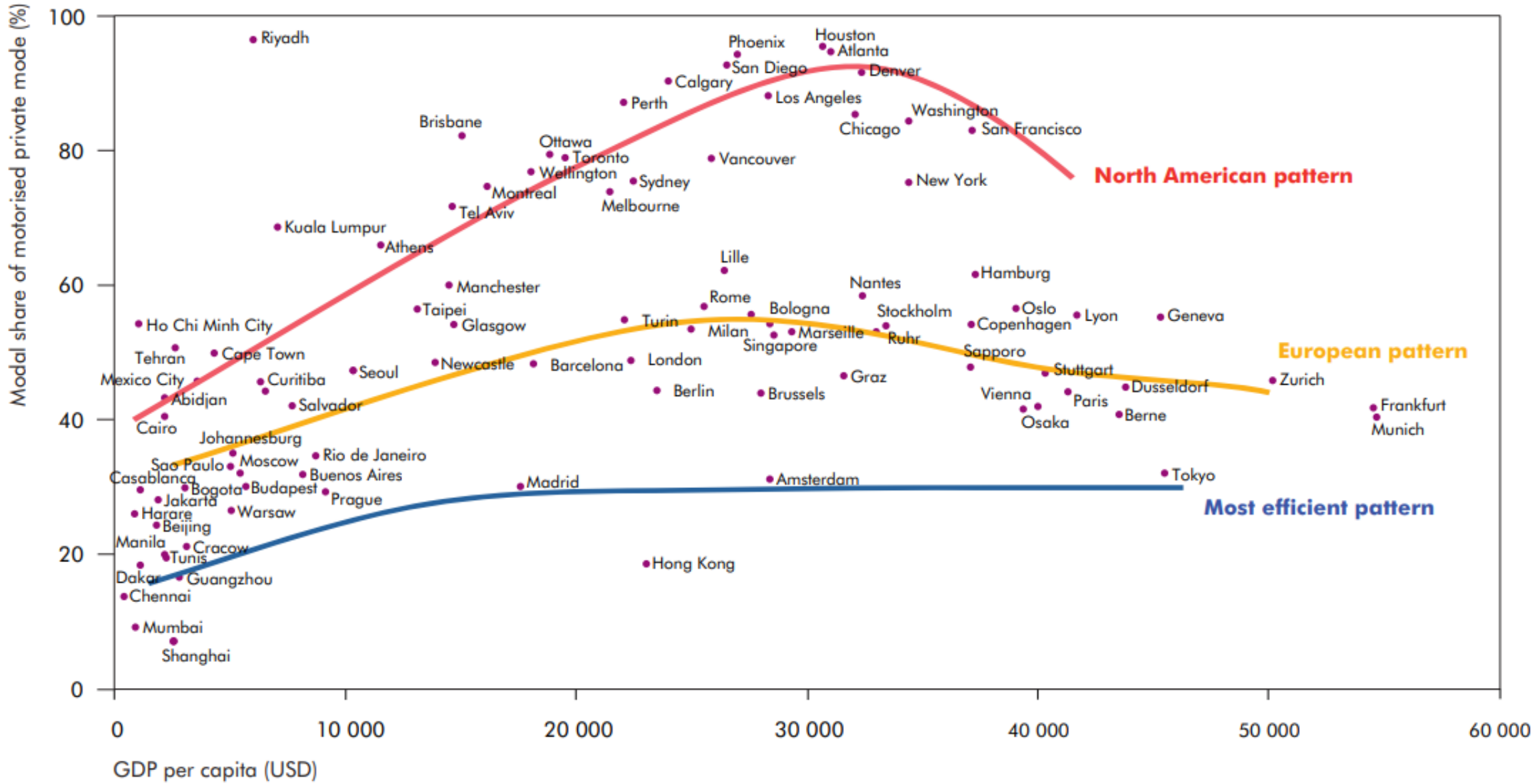


When roadways approach their maximum traffic capacity, transit and ridesharing carry an increasing portion of person-trips. In major commercial centers, a significant portion of peak-period travels use transit, vanpools or carpools.



As a city increases in size, transit ridership increases as more discretionary riders (people who have the option of traveling by automobile) use transit.

Relationship between GDP per capita and motorized modal share



Source: UITP, 2006 (Courtesy of SYSTRA).