Understanding Florida Transit Ridership Declines and How We Can Respond

CUTR Webinar

Thursday, November 8, 2018

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Context

- Research supported by FDOT
- Findings and observations are those of the project team and do not represent FDOT positions
- Builds on prior project deliverables and will be forthcoming in a final project report
- Builds on prior CUTR webinars: https://www.cutr.usf.edu/webcast/#tab-3
  - Trends in Travel Behavior and Transit Ridership, March 2018 https://cutr.adobeconnect.com/pk7ix2ehpu0c/
  - Understanding the Effects of Demographic and Socio-Economic Factors on Public Transit Ridership Trends, April 2018, https://cutr.adobeconnect.com/patulhcgam3n/

Outline

- Update on trends
- Some details on Florida trends and issues
- Thoughts on industry response

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Travel Trend Metrics

	2015 vs 2014	2016 vs 2015	2017 vs 2016	2018 YTD vs 2017	Months	Source
U.S. Population	0.8%	0.7%	0.7%	0.7%	8	Census
Total Employment	1.7%	1.7%	1.3%	1.3%	8	BLS
Real GDP	2.9%	1.6%	2.2%	2.9%	6	BEA
Gas Price	-29.3%	-14.8%	15.1%	18.2%	8	EIA
Registered Cars and Light Trucks	2.1%	2.4%	2.4%	2.1%	9	Hedges Co.
Light Vehicle Sales	5.8%	0.1%	-1.8%	-1.1%	8	BEA
Count of Zero-Vehicle households	-1.0%	-1.9%	-0.7%	-	-	Census
VMT	2.3%	2.4%	1.2%	0.4%	8	FHWA
Public Transit Ridership	-1.4% to -2.2%	-2.1% to -1.8%	-2.7% to -2.5%	-3.9% to -3.3%	3-7	APTA and NTD
Amtrak Ridership (FY)	-0.3%	1.9%	1.9%	-0.4%	7	Amtrak
Airline Passengers	5.3%	3.9%	3.5%	5.0%	6	USDOT, BTS

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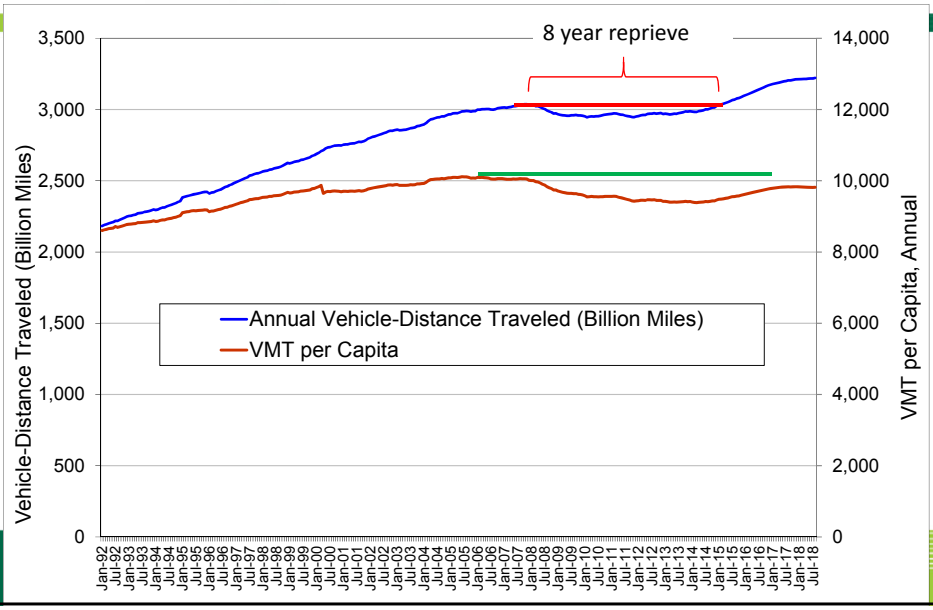
National VMT and VMT per Capita Trend,
Moving 12-Month Total, 1990–2018



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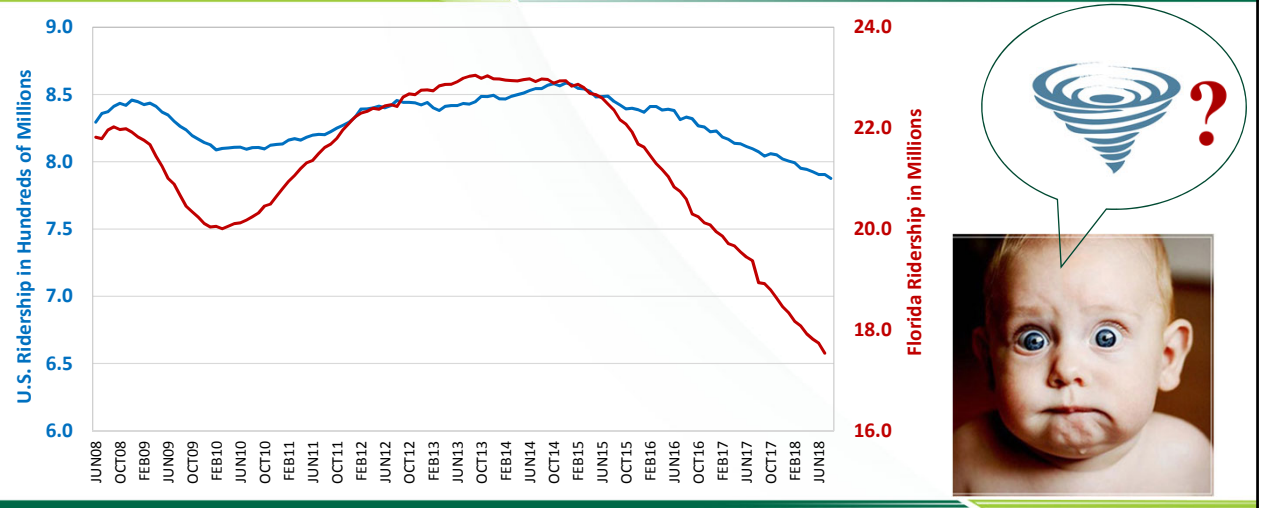
Transit Ridership, Fixed Route, 12-Month Rolling Average



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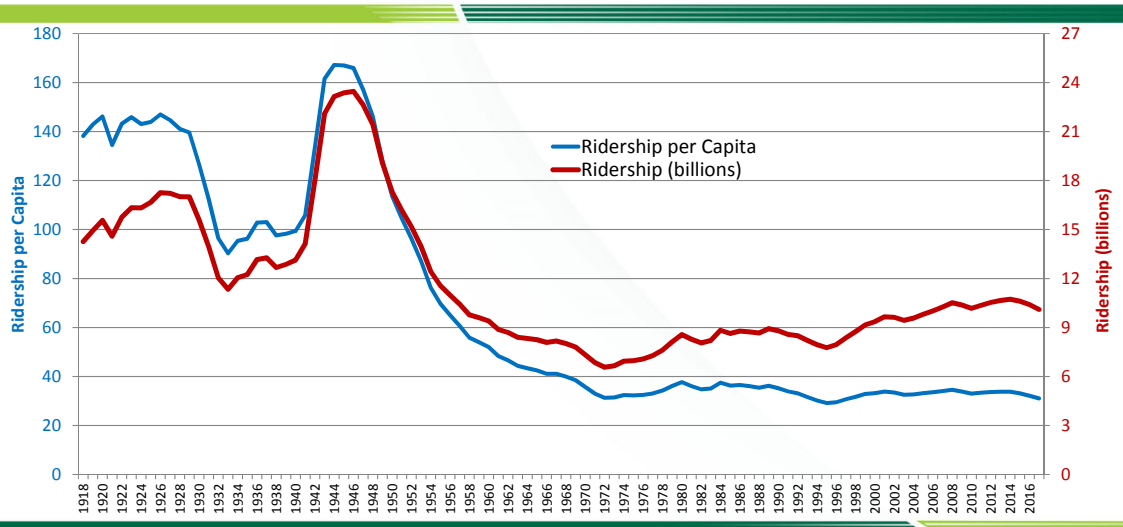
U.S. Transit Ridership and Ridership per Capita



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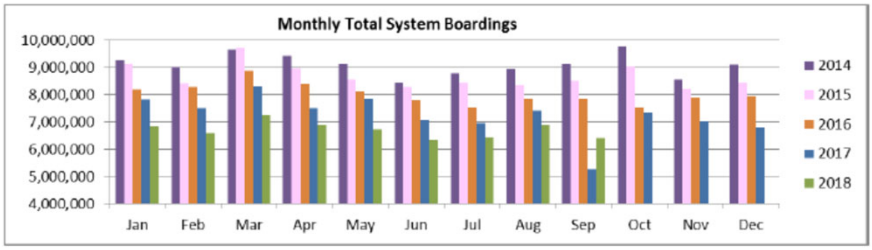
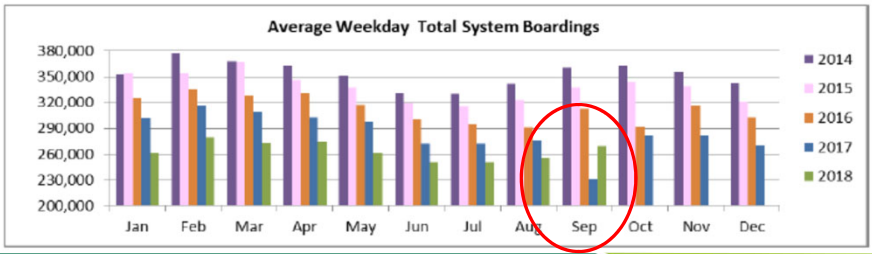
Have We Found a Bottom?

TOTAL MONTHLY AND AVERAGE WEEKDAY RIDERSHIP
YEAR OVER YEAR COMPARISON CHARTS – ALL MODES COMBINED



MDTA trend



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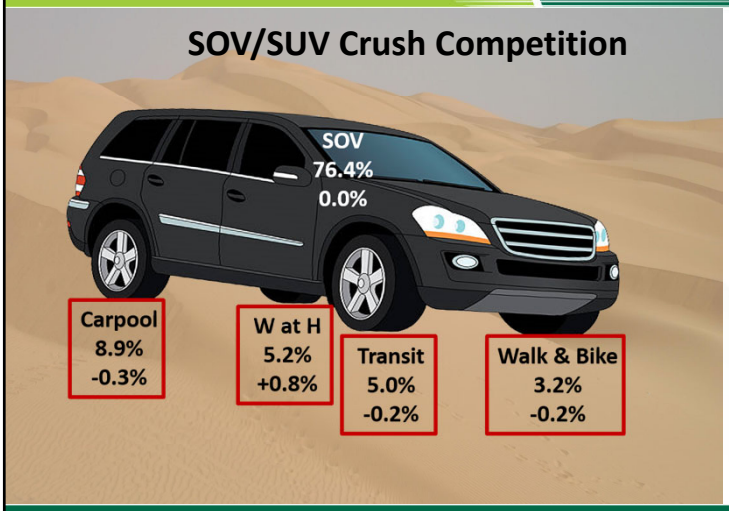
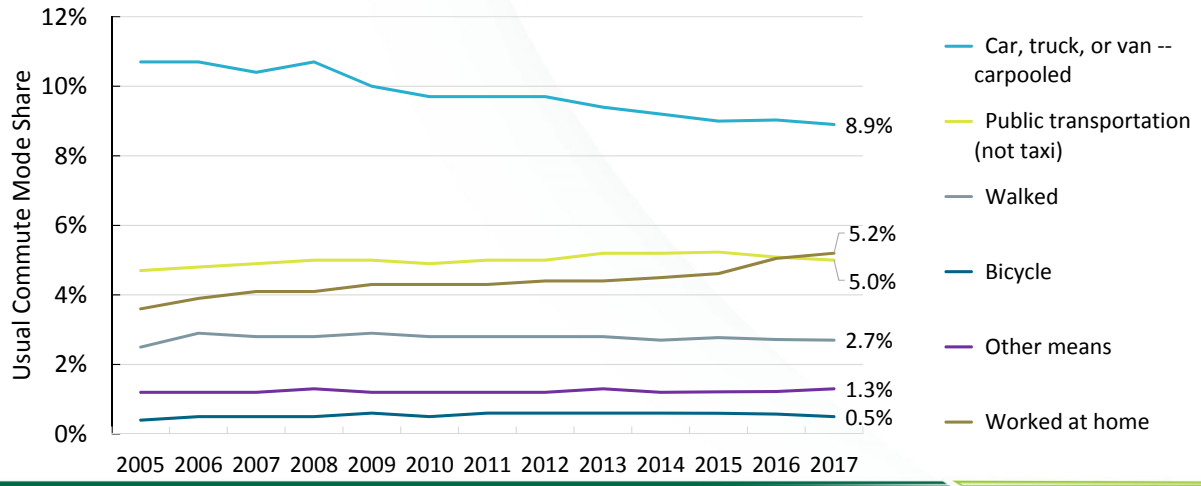
Commuting 2017 vs. 2013



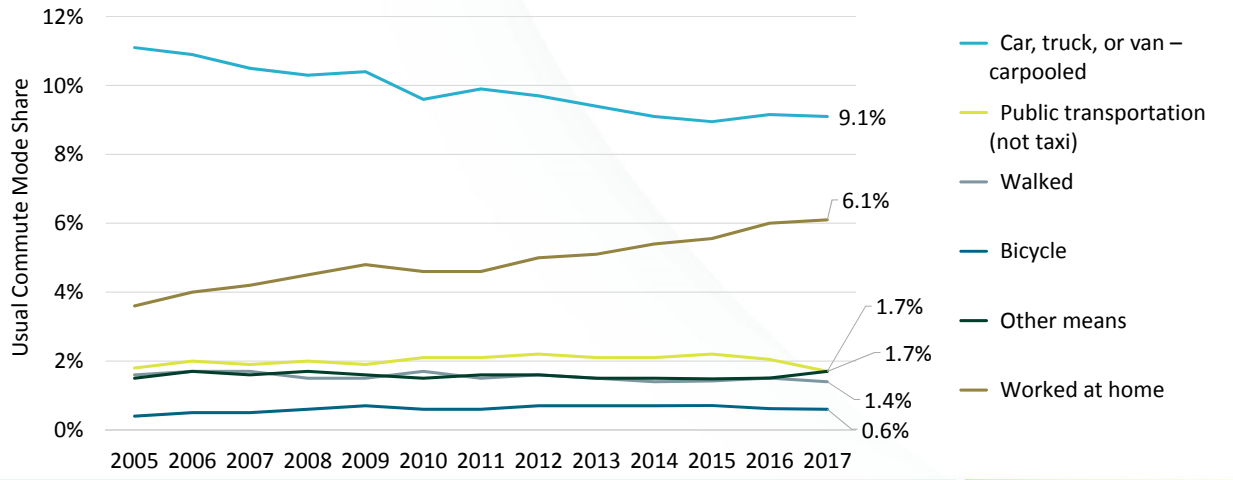
- 8.6% of US HH have zero vehicles, down 0.5% since 2013 (about 5.9% of population)
- 5.0% of US HH with workers have no cars
- In August 2018, < 30% of new vehicles were autos, (WSJ)

Sources: ACS, WSJ

Declining Carpooling and Growing Work-at-Home Dominate Trends, US



Declining Carpooling and Growing Work-at-Home Dominate Trends, FL



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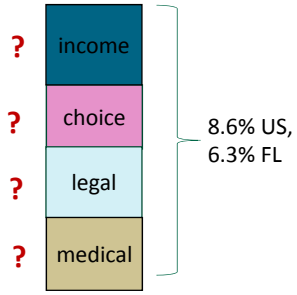
Zero-Vehicle Households are Declining

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
No vehicles available US	8.9%	8.8%	8.7%	8.8%	8.9%	9.1%	9.3%	9.2%	9.1%	9.1%	8.9%	8.7%	8.6%
No vehicles available FL	6.6%	6.6%	6.2%	6.6%	6.6%	7.0%	7.3%	7.4%	7.2%	6.9%	6.8%	6.6%	6.3%

- Nearly half of all transit trips are made by residents of zero-vehicle households – 44.6% in 2001 NHTS, 48.1% in 2009 NHTS, 43.0% in 2017 NHTS
- We do not know what share of zero-vehicle households are zero-vehicle by choice, law, physical/medical condition, or income
- The share of zero-vehicle households ranges from 4% in Utah to 12.6% in Massachusetts then 29% in New York and 37.3% in DC



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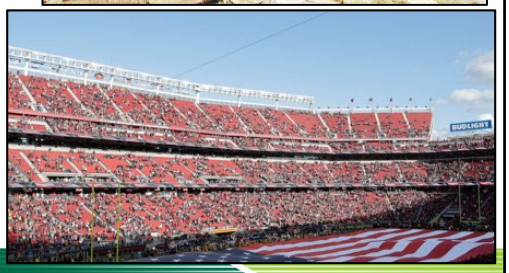
Real World Implications of Declining Trip Rates

- 9.6% of retail sales are via e-commerce (Q2 2018, +15.4% over 2017, Census)
- Homeschooling increased from 1.7% to 3.3% of children from 1999 to 2016 (National Center for Educational Statistics, 2017)
- Church attendance declined 3.7% between 2007 and 2014 (Pew Research Center)
- Banks have closed over 10,000 branches since financial crisis (S&P Global Market Intelligence)
- Movie Ticket sales in 2017 were the lowest in 20 years (https://www.the-numbers.com/market/)
- Major League Football and Baseball in multiyear attendance decline (http://www.espn.com/nfl/attendance)



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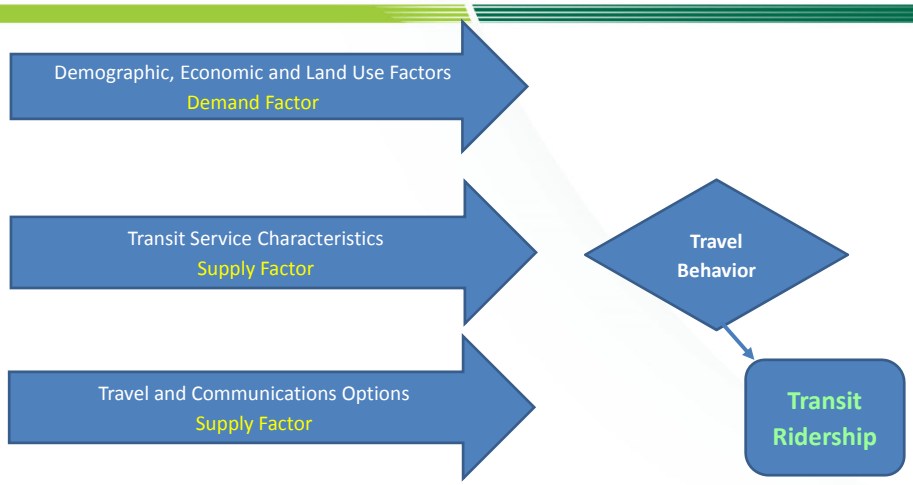
Framework for Organizing Analysis



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Demand Factors - Demographic, Economic and Land Use	
Land Use	Geographic distribution of population/activity with respect to transit service areas Urban, suburban or rural - low versus high service areas (regional scale).
	Geographic activity distribution within transit service areas Concentration near higher quality service locations (neighborhood/stop scale, TOD)
	Geographic activity patterns Clustering/concentration, origin-destination balancing
Demographics	Age, household composition/structure, employment status Factors that influence travel levels, preferences and available choices
	Income, wealth, home ownership status, vehicle ownership status Factors that influence travel levels and options/preferences
	Race, Ethnicity, gender, citizenship status Factors that may influence travel options and preferences
	Changes in core values (safety, reliability, flexibility, convenience, image, autonomy, etc.) Changes in culture or preferences (independent of socio-demographic changes) that influence choices
Economic Conditions	Economic activity Employment, disposable income, job security, consumer confidence – factors that affect activity levels
	Fuel prices Impacts mode choice and household disposable income
	Interest costs/availability Factors that affect home/vehicle ownership decisions and subsequently impact travel decisions

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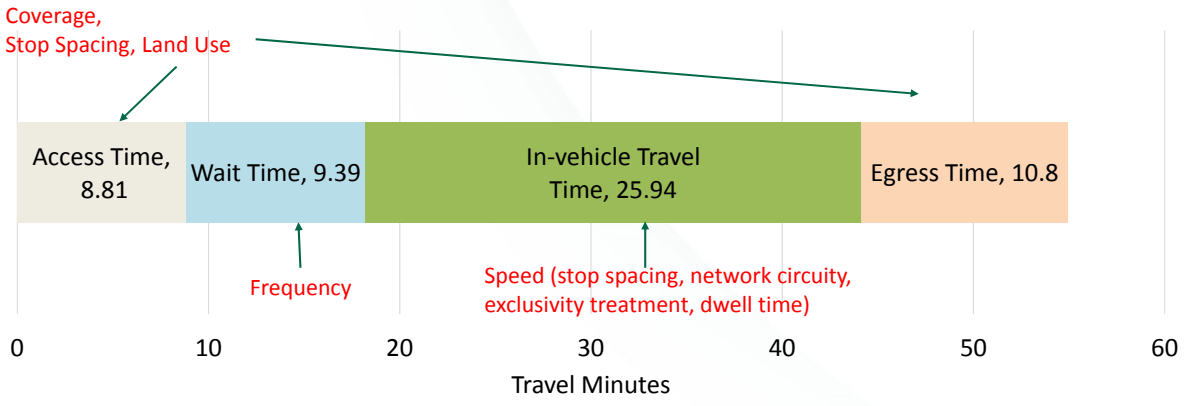
Supply Factors - Transit Service Characteristics	
Service Accessibility	Geographic coverage Coverage and density of network
	Frequency of services As it impacts wait and transfer times
	Temporal Span of service Availability of service by time of day and day of week
	Network configuration/connectivity Optimality of network in connecting origin-destination pairs
	Speed of in-vehicle travel Travel speed as impacted by operating speed and stop spacing
Service Features	Fare level and structure Traveler cost as impacted by fare levels and structure (time, distance, frequency, transferring, employer and tax treatment, etc.)
	Comfort, cleanliness, crowding
	Convenience as impacted by information Trip planning, real time information, payment ease, Wi-Fi availability,
	Reliability Arrival reliability, trip time reliability
	Safety and security Personal safety accessing and using transit, accident safety when using transit
	Awareness, image, visibility, etc. Knowledge of transit choice and characteristics, stigma/image of using transit (clean, modern, socially inclusive, environmentally friendly, etc.)
	Access/egress amenities bike, walk access; shelter, lighting, landscaping; first-mile/last-mile accommodations (parking, bike storage, TNC/taxi access; customer services; etc.

Supply Factors - Travel and Communication Options	
Communication Substitution for Travel	Telecommuting/work-at-home Changes in commuting travel levels
	E-Commerce Foregone travel via online shopping
	Electronic communications of video, audio, and document materials in lieu of travel E-learning, online banking, electronic document transfer, video and music streaming, etc.
	Social Networking Electronic interaction in lieu of in-person social interaction (text, tweet, skype, Facebook, Instagram, video gaming, etc.)
Auto Travel Competitiveness	Vehicle cost and availability New/used vehicle prices, interest cost and financing availability, vehicle reliability/maintenance cost
	Licensure/Insurance considerations Costs, government policies (age, immigration status, etc.)
	Parking cost and availability
	Travel time/speed and reliability Congestion, incident frequency, mechanical reliability
	Safety and security
	Change in features and amenities Comfort/convenience features (Wi-Fi, navigation, toll/parking payment connectivity, vehicle telematics, etc.)
	Fuel Cost
	Stigma, Image Perceptions of environmental impacts, social impacts, status, etc.
TNC/MaaS Services	TNC Availability Temporal and geographic availability, arrival time
	TNC Access Banking arrangement, smartphone availability, vehicle accessibility for mobility limited, etc.
	TNC Cost
	Bikeshare, scooter share, short term auto rental - availability, accessibility, and cost

Transit Competitiveness

Components of an Average Transit Trip



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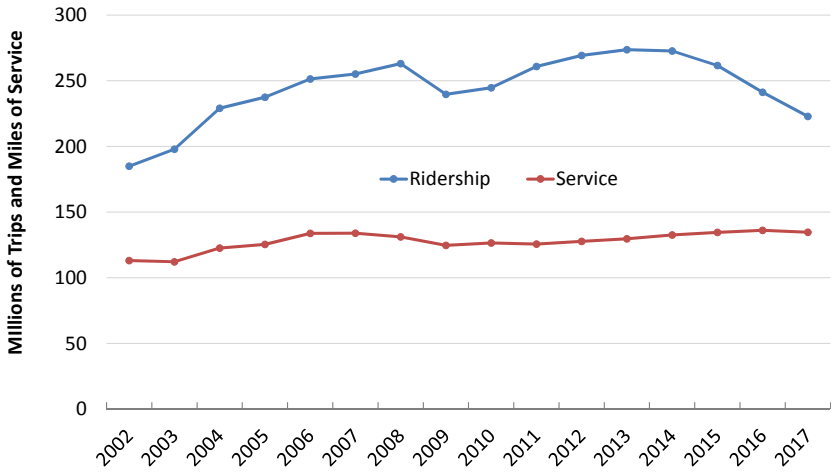
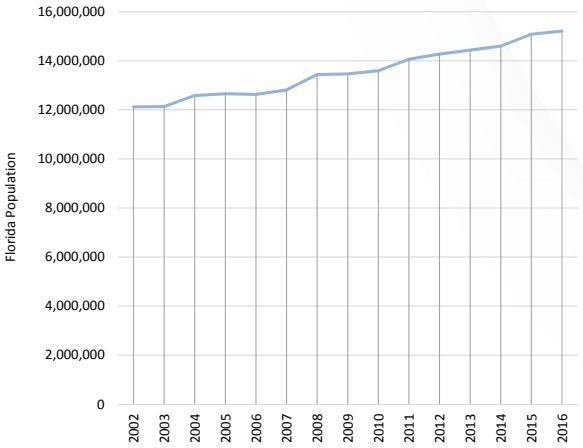
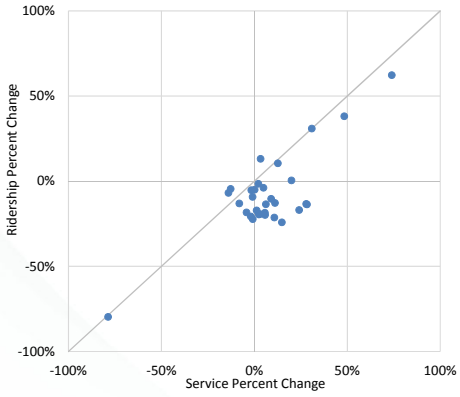
Florida Fixed Route Transit Ridership and Service Trend



Growing Population and Service are Not Driving Ridership



Trend in Florida Population Served by Transit (2002-2016)



Ridership vs. Service percent Change 2014-2017

Modestly Better Service but Slower Speed

Service Intensiveness (frequency and/or hours of operation) for All Florida Transit Agencies

	Vehicle Miles	Vehicle Rev Miles	Directional Route Miles	VRM/ VM	VRM/ DRM
2016	234,686,207	208,998,950	15,383	89.10%	13,586
2015	230,225,775	206,346,836	15,551	89.60%	13,269
2014	222,856,983	204,319,915	15,809	91.70%	12,924
2013	227,524,013	204,187,184	15,325	89.70%	13,324
2012	224,641,871	200,696,728	14,992	89.30%	13,387
2011	220,067,823	197,507,461	14,628	89.70%	13,502
2010	218,477,997	195,301,735	14,505	89.40%	13,464

Source: NTD annual data

Florida Fixed Route Agencies' Average Speed

Year	Average Speed
2016	13.83
2015	14.00
2014	13.99
2013	14.10
2012	14.20
2011	14.08
2010	14.31

Source: NTD Annual Data, passenger volume weighted

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Comparative Employment Accessibility, Auto vs Transit, 2017

Metro Rank by Jobs	Metro Area	Employment 2017	Jobs Accessible by Transit in 60 Mins (Access Across America: Transit 2017)	Metros Rank By Transit Accessibility	Jobs Accessibile by Auto in 60 Minutes (Access Across America Auto 2017)	Ratio of Transit Accessible Jobs to Auto Accessible Jobs
1	New York	8,654,470	1,287,186	1	5,165,184	24.9%
11	San Francisco	2,164,298	415,289	2	2,414,867	17.2%
7	Washington DC	2,776,148	357,510	4	2,555,148	14.0%
23	Portland	1,093,778	156,682	11	1,130,378	13.9%
45	Salt Lake City	576,320	144,560	14	1,044,810	13.8%
15	Seattle	1,709,920	185,318	8	1,421,132	13.0%
33	Las Vegas	897,183	110,821	23	856,257	12.9%
10	Boston	2,401,512	275,182	5	2,261,287	12.2%
47	Buffalo	529,252	70,219	24	582,827	12.0%
37	Milwaukee	771,322	139,321	12	1,172,274	11.9%
3	Chicago	4,389,339	342,635	3	3,012,464	11.4%
18	Denver	1,356,387	180,478	10	1,617,550	11.2%
32	San Jose	909,053	203,107	9	2,163,277	9.4%
27	San Antonio	986,091	86,468	26	949,332	9.1%
14	Minneapolis	1,794,806	146,905	13	1,754,122	8.4%
6	Philadelphia	2,793,982	205,692	7	2,542,247	8.1%
17	San Diego	1,363,986	113,058	18	1,433,964	7.9%
48	New Orleans	513,830	48,220	30	616,252	7.8%
29	Austin	917,901	81,826	22	1,051,765	7.8%
22	Pittsburgh	1,100,915	76,673	21	1,000,173	7.7%
2	Los Angeles	5,636,421	341,437	6	4,517,360	7.6%
40	Louisville	627,630	52,872	37	720,647	7.3%
30	Sacramento	915,759	72,932	28	1,063,577	6.9%
31	Columbus	911,367	74,521	25	1,093,480	6.8%
9	Miami	2,412,346	113,542	16	1,737,359	6.5%
13	Phoenix	1,865,829	109,972	19	1,739,291	6.3%
20	Baltimore	1,291,995	111,707	15	1,926,759	5.8%
46	Oklahoma City	574,561	35,139	44	619,587	5.7%
28	Cleveland	955,181	74,528	29	1,372,782	5.4%
19	St. Louis	1,310,349	64,119	33	1,200,988	5.3%
41	Jacksonville	626,060	32,651	48	634,122	5.1%
39	Virginia Beach	707,752	33,168	46	659,585	5.0%
35	Charlotte	877,360	55,578	34	1,137,958	4.9%
42	Richmond	617,617	33,016	42	697,915	4.7%
34	Indianapolis	886,380	52,705	35	1,115,194	4.7%
5	Houston	2,888,073	114,960	17	2,520,388	4.6%
43	Hartford	593,012	64,698	27	1,443,504	4.5%
25	Kansas city	1,023,563	47,330	40	1,087,996	4.4%
38	Povidence	757,913	53,339	31	1,279,767	4.2%
26	Cincinnati	1,018,914	48,793	39	1,197,690	4.1%
36	Nashville	801,589	34,390	43	847,287	4.1%
8	Atlanta	2,416,397	72,599	32	1,791,972	4.1%
21	Tampa	1,227,356	52,728	38	1,328,760	4.0%
24	Orlando	1,050,065	48,584	41	1,323,827	3.7%
4	Dallas	3,206,364	100,304	20	2,941,638	3.4%
44	Raleigh	583,916	36,321	47	1,070,759	3.4%
12	Detroit	1,869,538	64,677	36	1,975,248	3.3%
49	Birmingham	476,681	17,858	49	582,467	3.1%
16	Riverside	1,635,100	39,302	45	1,815,028	2.2%

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Recent Growth Population, Households, Employed Persons and Vehicles Coincident with Declining Ridership

Florida Demographic Trends

Year	Population	Employed Persons	Households	Household Vehicles Est.
2006	18,089,889	8,350,076	7,106,042	11,942,942
2007	18,251,243	8,371,485	7,088,960	11,977,849
2008	18,328,340	8,399,763	7,057,285	11,723,276
2009	18,537,969	7,994,791	6,987,647	11,509,305
2010	18,843,326	7,970,551	7,035,068	11,482,763
2011	19,057,542	8,099,212	7,106,283	11,473,800
2012	19,317,568	8,271,006	7,197,943	11,573,647
2013	19,552,860	8,462,255	7,211,584	11,700,291
2014	19,893,297	8,741,509	7,328,046	11,989,656
2015	20,271,272	8,985,706	7,463,184	12,303,027
2016	20,612,439	9,220,896	7,573,456	12,659,935
2016 vs. 2006	13.94%	10.43%	6.58%	6.00%
2016 vs. 2013	**5.42%**	**8.96%**	**5.02%**	**8.20%**

Fixed Route Ridership and Service Trends in Florida

Year	Fixed Route Ridership	Change from Previous Year	Service	Change from Previous Year
2002	191,355,730		169,289,376	
2003	204,925,565	7.1%	168,100,828	-0.7%
2004	235,975,856	15.2%	179,539,981	6.8%
2005	244,661,590	3.7%	187,608,846	4.5%
2006	259,660,356	6.1%	201,188,721	7.2%
2007	263,926,396	1.6%	201,589,977	0.2%
2008	271,492,158	2.9%	198,496,393	-1.5%
2009	250,902,392	-7.6%	194,890,561	-1.8%
2010	255,059,771	1.7%	194,018,644	-0.4%
2011	271,642,257	6.5%	195,575,780	0.8%
2012	280,313,492	3.2%	199,404,810	2.0%
2013	285,084,731	1.7%	203,551,956	2.1%
2014	283,630,356	-0.5%	205,243,261	0.8%
2015	271,256,168	-4.4%	206,492,950	0.6%
2016	249,653,837	-8.0%	209,670,618	1.5%
2017	231,493,278	-7.3%	211,281,350	0.8%

Source: NTD data

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The Car Availability Is the Single Biggest Factor Impacting Transit Ridership

Trips Per Person (5 and older) Per Year Using Transit

	Year, Data source	0 vehicles	1 vehicle	2+ vehicles
National	2008, 2009 NHTS	211.0	36.2	8.2
	2016, 2017 NHTS	226.5	39.7	10.7
Florida	2008, 2009 NHTS	130.9	17.9	3.7
	2016, 2017 NHTS	147.6	18.6	2.3

Florida Population by Household Vehicle Availability, 5 and Older

	0 vehicles	1 vehicle	2+ vehicles
2008	766,110	5,045,241	11,435,616
2013	913,141	5,498,887	11,987,214
2016	866,657	5,472,770	13,056,877

Source: CUTR analysis of ACS

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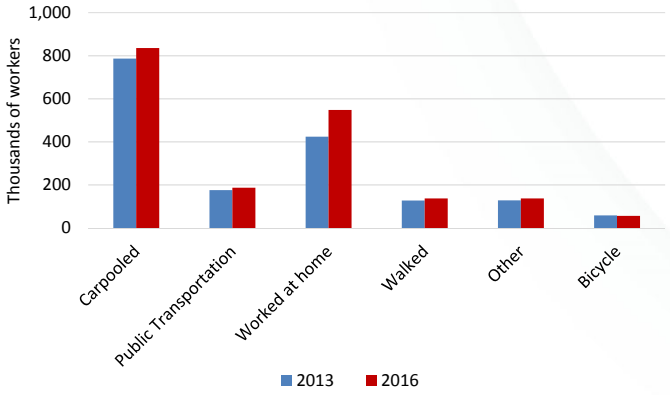
Possible Impact of Telecommuting



1,363,000 additional telecommuters in Florida

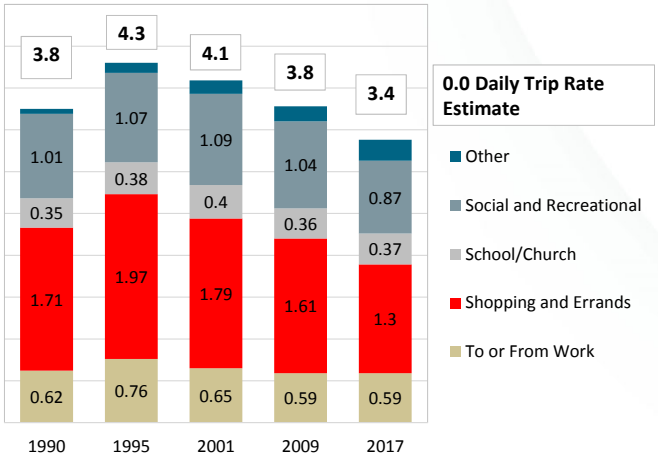
- If 2.15% would have been transit travelers previously
- If they would have commuted round trip 220 days per year
- If 30% would have had transfers

Then nearly 17 million annual transit trips would have been foregone

This is nearly 50% of the statewide decline in transit use over that period.

Commuting by U.S. Workers by Usual Commuting Mode, 2013, 2016, (000)

Possible Impact of Reduced Trip Making



If declining trip making occurred proportionally for transit

- Person trip rate declining .05 trips/day/per year
- 21.5 million Floridians over 5
- If 0.66% were transit trips

Over 3 years this would be ≈ 10,000,000 reduction in transit trips/year

Approximately 20% of the decline in transit use

Source: Nancy McGuckin analysis of NHTS data

TNC Impact on Transit

- TNCs have more than doubled the overall size of the for-hire ride services sector since 2012, making the for-hire sector a major provider of urban transportation services that is projected to surpass local bus ridership by the end of 2018.
  - TNCs transported 2.61 billion passengers in 2017, a **37 percent increase from 1.90 billion in 2016**.
  - Together with taxicabs, the for-hire sector is projected to grow to 4.74 billion trips (annual rate) by the end of 2018, a 241 percent increase over the last six years, **surpassing projected ridership on local bus services in the United States** (4.66 billion).
- TNC ridership is highly concentrated in large, densely populated metro areas. Riders are relatively young and mostly affluent and well-educated.
  - 70 percent of Uber and Lyft trips are in nine large, densely populated metropolitan areas (Boston, Chicago, Los Angeles, **Miami**, New York, Philadelphia, San Francisco, Seattle and Washington DC.)
    These same 9 cities carry ≈ 72% of US Transit ridership (Polzin)
  - People with a bachelor's degree, over $50,000 in household income, and age 25 to 34 use TNCs at least twice or even three times as often as less affluent, less educated and older persons.

Source: The New Automobility: Lyft, Uber and the Future of American Cities, July 25, 2018, SCHALLER CONSULTING

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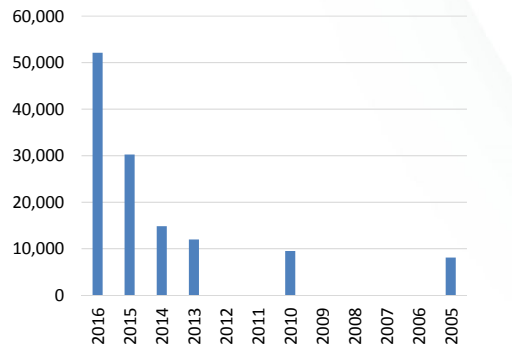
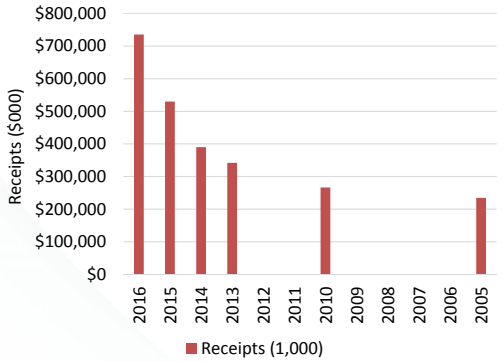
TNC Impact on Transit In Florida



Trend in Number of Non-employer Livery Operators in Florida
Source: Census, Non-employer Statistics 2016.



Trend in Number of Receipts of Livery Operators in Florida
Source: Census, Non-employer Statistics 2016.

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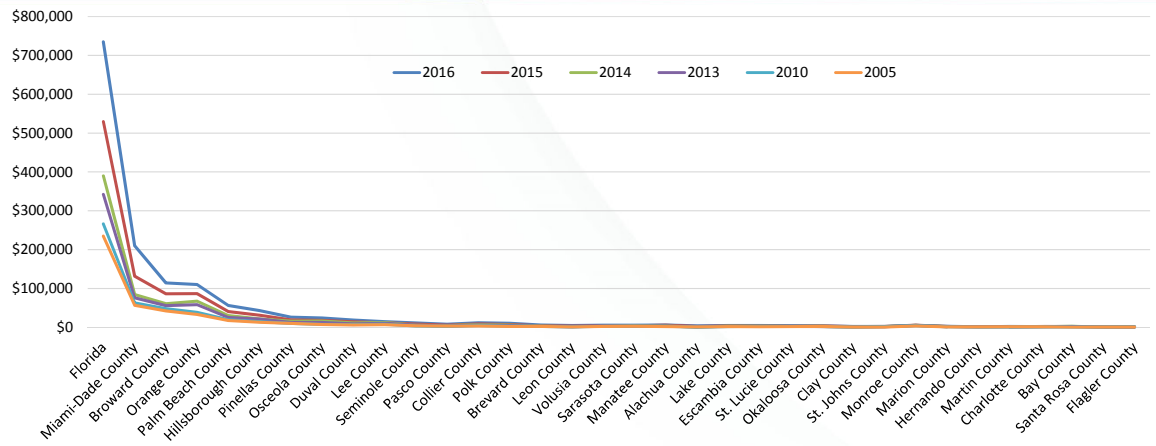
TNC Impact on Transit In Florida



TNC Impact on Transit In Florida

Reason for most recent TNC trip versus transit trips

	BART15	MARTA	NJ Transit	WMATA
TNC connecting to transit	16%	6%	8%	3%
TNC instead of transit	11%	16%	17%	39%
Transit not an option (reason)	32% (26% hour, 6% route)	16% (8% hour, 8% route)	19% (no data for reason)	13% (4% hour, 9% route)
Haven't used TNC in region	41%	62%	56%	45%

Source: TCRP RESEARCH REPORT 195, Broadening Understanding of the Interplay Among Public Transit, Shared Mobility.
and Personal Automobiles

TNC Impact on Transit In Florida

2015 Miami transit ridership	102,889,956
2016 Miami transit ridership	94,969,988
2016 – 2015 change	-7,919,968
2016 TNC operator receipts	$209,962,000
2015 TNC operator receipts	$131,519,000
2016 – 2015 change	$78,443,000
Guesstimated TNC trips assuming a $15 average fare of which $11.25 would be driver receipts	6,972,711
Number of transit trip equivalents assuming group size of 1.2 and 50% of trips would have required a transfer	12,550,880
Assuming 20% would have been made on transit	2,510,176
Share of transit ridership decline potentially explained by diversion to TNC travel	31.7%

Source: CUTR scenario

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TNC Impact on Transit In Florida

- **The impact of TNCs on transit ridership may be very different across time and across geography**. Early TNC growth appears to have targeted the off-peak/evening and weekend time periods and grown fastest amongst younger higher income individuals with smart phone and banking relationships, and higher awareness of emerging technology applications. As awareness of TNCs grew, the profile of TNC riders may have changed. Similarly, the relative availability of TNC travel options may have changed at different paces in different metropolitan areas.
- TNCs have expanded geographically quite dramatically over the past few years. The user profile of TNC users and the impact on transit, both as a complementary and competitive mode, is inevitably changing over time and across geography. It's entirely possible that **TNCs were not powerful in explaining changes in transit ridership in 2014 – 2015, but have become more significant factors in 2016 and 2017**.
- There may be a difference in the influence of TNCs dependence upon context factors. For example, the convenience and speed of TNCs might be particularly attractive in off-peak time periods for larger group sizes and in situations where the transit option requires a transfer. Similarly, shorter TNC trips might have a more acceptable cost comparison in situations where travel costs are shared across the group and fixed-price transit had a higher cost per mile as might be the case for a short trip on a fixed price system.
- TNC as an access mode to transit makes the most sense in situations where the total trip length is relatively long and TNC enables access to (or egress from) a high quality transit mode that offers an efficient and competitive means of travel for a longer distance commutes or access to an airport or special event. This is particularly true if parking costs at the destination are a deterrent to using auto travel for the whole trip (i.e. airport access, special event venue, etc.).

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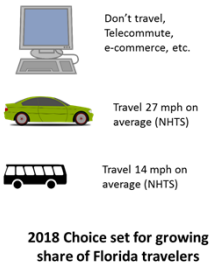
Summary Observations

- The magnitude, speed, and pervasiveness of changes in transit use are pronounced compared to recent history.
- The spectrum of travel choices is changing and travelers are making decisions to forgo public transportation.
- The performance characteristics of transit travel options is perceived by many travelers as inferior to the alternative mobility choices now available.
- The softness in ridership in Florida, relative to other transit markets, is attributable to the fact that transit ridership in Florida has been more dependent upon individuals who have not had other travel options.



2018 Choice set for growing share of Florida travelers

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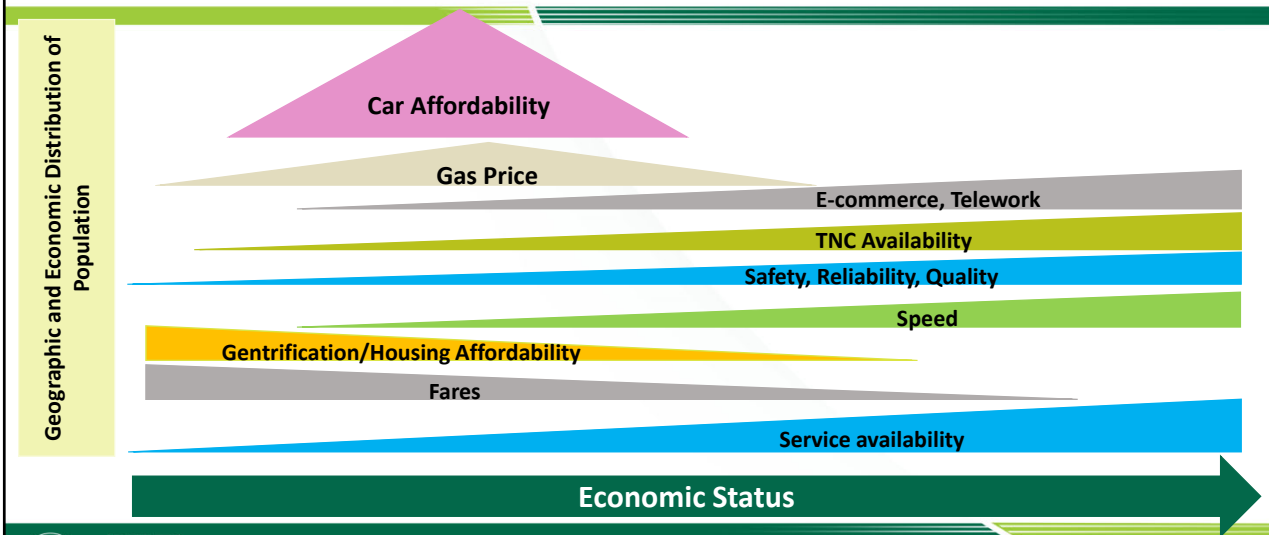
Influences on Transit Choice (Hypothesized)



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Responding to Declining Ridership

Stakeholder Responses to Ridership Declines:

1. **Mitigate the Decline in Ridership**
2. **Mitigate or Offset the Impacts of Declining Ridership**
3. **Position Public Transportation for the Evolving World of Personal Mobility**
4. **Modify Transportation Planning to Reflect Changing Ridership Propensity**

- The phenomenon surrounding declining ridership are multifaceted and the ability to comprehensively diagnose and attribute causality in a quantitative sense is challenged by data availability and the inherent complexity of multifactor decision-making.
- Research findings confirm that ridership declines are attributable to different factors in different markets.
- Many of the phenomenon that have contributed to changing ridership are factors that are beyond the control of transit agencies and other traditional stakeholders.
- One should seek out the most effective mechanisms for increasing ridership irrespective of their contribution to recent ridership declines.

Addressing ridership declines does not necessarily mean undoing the changes in conditions that contributed to those declines.

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Target Markets for the Service Improvements

Transit Dependent → → → → → → → → → → → → → → Transit Choice

Stabilize Transit Dependent Market
Improve hours, frequency, coverage, connectivity, and speed to discourage transit dependent from seeking alternatives (auto ownership, TNC use, etc.).

Induce Transit Dependent Trips
Improve hours, frequency, coverage, connectivity, and speed to induce greater use by transit dependent.

Target Transit Dependent in New Geographies
Improve coverage, hours, frequency, connectivity, and speed to target transit dependent in new areas where gentrification or dispersion has resulted in concentrations beyond traditionally strong core urban areas.

Target Choice Travelers to Special Generators
Target service improvements to areas where parking cost and availability, site congestion, or other features make transit potentially competitive. (Airports, convention centers, arenas, major intermodal facilities, etc.

Target Premium Services to Longer Distance Trips Where Transit Can Be Time Competitive
Longer distance trips allow travelers to amortize the access and egress times over a longer in-vehicle time where they may garner time savings.

Target High-Quality Services to Transit Friendly Areas Where High Activity Levels Enable Productive Service and an Opportunity for "captive by choice" Markets
Some communities have dense areas where high quality transit service could be operated productively and competitively enabling persons who favor an auto free or auto light lifestyle.

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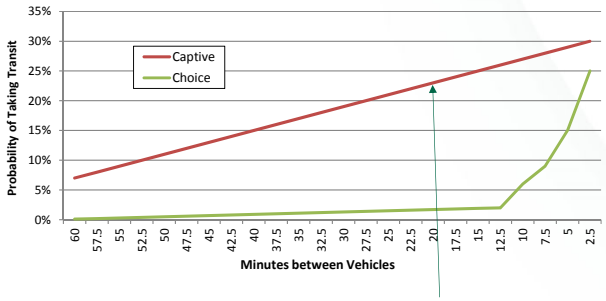
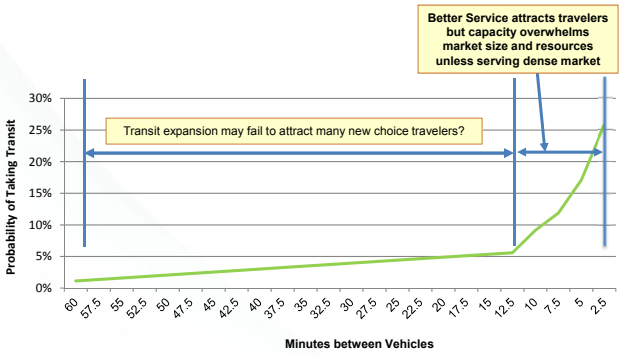
The Trend Toward Service Reconfiguration



Growing probability of transit use but a small share of population



Pricing Travel Choices

- Fuel Taxes, VMT fees, parking fees, congestion fees, pricing in the externalities of auto travel

- *About one in eight drivers on the road in 2015 was uninsured, according to the latest data from the Insurance Research Council (IRC). The nationwide uninsured motorist (UM) rate increased from 12.3 percent in 2010 to 13 percent in 2015. Uninsured motorist rates varied substantially among individual states, ranging from 4.5 percent in Maine to 26.7 percent in Florida.*
  - *Uninsured Motorists, 2017 Edition, Insurance Research Council (IRC)*

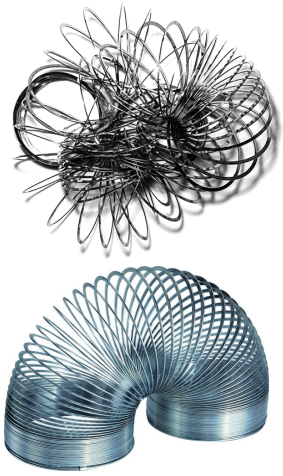
The Goals Remain the Same, The Strategies Will Change

Key goals → May be best addressed with multiple

1. *Mobility*
2. *Resource efficiency*
3. *Economic competitiveness*

1. *Technologies and services*
2. *Mixes of public and private providers*
3. *Different pricing and funding strategies*

Thank You!



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