

Open for Business:

THE BUSINESS CASE



AMERICAN
PUBLIC
TRANSPORTATION
ASSOCIATION

for **INVESTMENT**
in **Public Transportation**



INTRODUCTION

Mobility in the United States is undergoing an evolution, driving new partnerships and challenging the traditional boundary between public and private realms. In fact, much of the innovation in transportation is coming from private sector, venture capital-backed support of smarter cities through technology. Though viewed as a primarily public-sector function, public transportation is proving to be the backbone of the multimodal, on-demand economy that private sector innovation is driving today.

The arrival of Transportation Network Companies (TNCs), such as Uber and Lyft is one of the more prolific trends in recent years; their recent partnerships with public transportation agencies showcases the primacy of public transportation in America's most vibrant regions. By partnering with public transportation, TNCs are able to positively impact their bottom lines by closing the gap between the station and a user's end destination. The result is a consumer more willing to cut the cord of a personal automobile, just as they are cutting the cord of the cable company.

Disruptive change led by the smartphone is also calling for a shift to more user-friendly integrated fare payment systems that allow secure mobile transactions through Near Field Communication (NFC) and Radio-Frequency Identification (RFID). Transit agencies do not have innate capacity to properly make the shift and will therefore need to create mission-critical partnerships with the private sector.

These changes continue despite a public sector affected by regional factionalism and partisanship at the federal level. In fact, though federal spending for infrastructure has dropped 2.3 percent since 2007, federal support for public transportation went up 8.2 percent during the same period. Furthermore, passage of the new federal surface transportation authorization, known as the FAST Act, has created rare certainty during this era, increasing federal support for public transportation by 18 percent over the next five years.

However, demand for public transportation has outstripped the federal government's investments. The result is a funding regimen that includes, not only federal, but also state, local and private sector contributions. The substantial local contributions are often the result of the passage of local referenda. Public transit is so popular at the local level that 469 ballot measures have been introduced since 2003, and 75 percent of them have passed. For a nation that cannot agree on objective policy needs, such a high passage rate is notable.

In order to keep up with the pace of change, some transit agencies have decided to enlist the support of private sector partners to promote efficiencies and customer responsiveness. These include the use of private firms to operate transit systems. There are various models that can be utilized to promote efficiencies and they all have merit and have sparked healthy debate, proving that transit is an agile industry.

Furthermore, public transportation is buoyed by strong demographic fundamentals. The regions with the best mobility networks continue to grow and age, and ethnic groups most likely to utilize public transportation continue to increase. The introduction of additional grade-separated, high-frequency public transportation is bringing high quality public transportation to areas that have never experienced an alternative to the privately owned automobile. These factors ensure that public transportation will continue to be an attractive investment destination, even in down cycles.

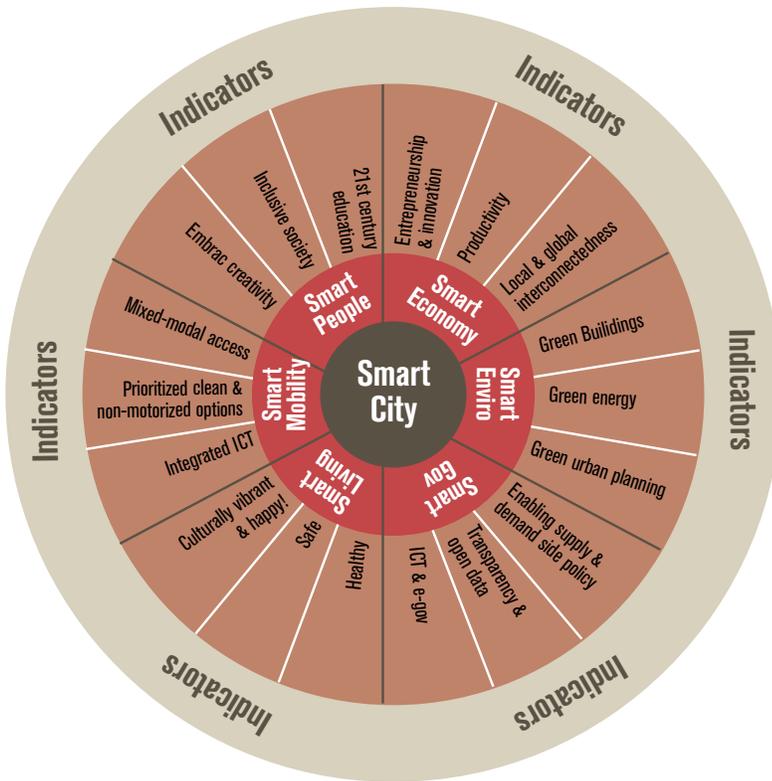


The Appeal of Smart Cities

What Are Smart Cities?

“Smart Cities” as a movement acknowledges the various components a city needs to be vibrant, have a healthy economy and educated populace. These components include: 1) smart mobility, 2) smart people, 3) smart government, 4) smart environment, 5) smart economy, 6) and smart living. The Smart City market is expected to hit \$1 trillion by 2019. Public transportation serves as an integral component or contributor to all components of a smart city and therefore will grow as an investment destination as entrepreneurs seek to leverage market growth in this emerging segment.

Smart Mobility—Public Transportation’s Strongest Contribution

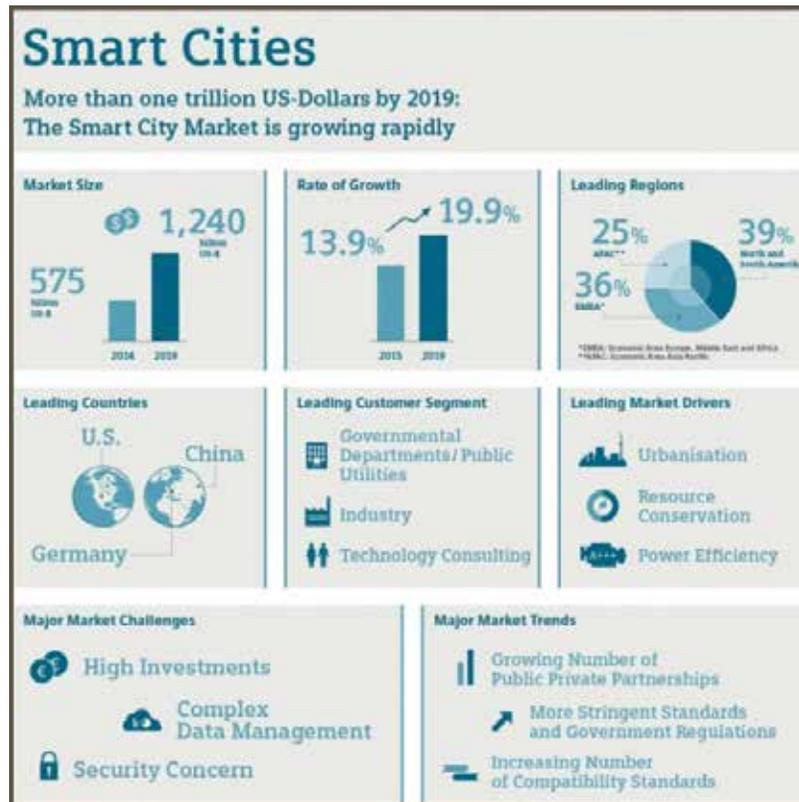


Smart mobility calls for development of seamless multimodal access, the development and deployment of clean mobility options and the development of integrated technologies that promote easy cross-modal fare payment and itinerary planning. The evolution of the public transportation industry as it deploys new technologies and experiences the attendant cultural change will further magnify public transit’s centrality in the nation’s most vibrant economies. Furthermore, smart fare payment and itinerary planning promotes smart government, another key tenant of smart cities.



The Market Opportunity

Fare Payment



Source: Siemens Market Analysis

Smart cards offer transit users the ability to pay for trips using a stored value card, offering greater versatility. Currently, 33.3 percent of U.S. agencies currently utilize smart cards on at least one mode. Of those agencies that operate rail, 52.3 percent of agencies provide smart cards. Although smart cards were once considered cutting edge and signaled a move towards greater versatility, emerging technology means that operators will have to provide additional ways to pay for service, necessitating greater investment in fare payment equipment and consultation engagement.

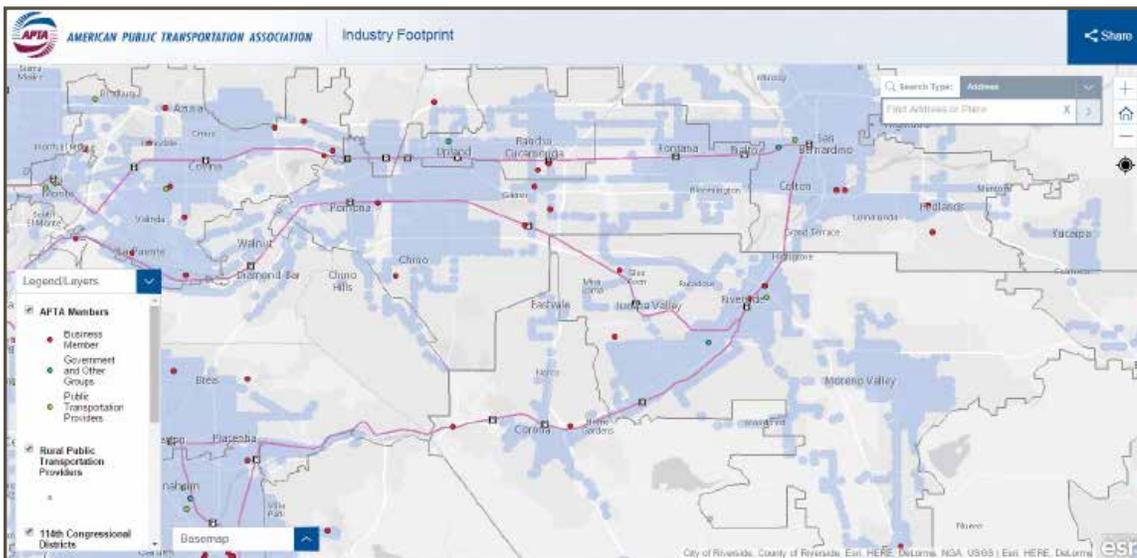
The payment technologies expected to be most prolific are Near Field Communication (NFC) and Radio-Frequency Identification (RFID). Both will allow consumers to pay for service using secure mobile payment platforms such as Apple Pay, Android Pay, Samsung Pay and contactless credit cards. Agencies are beginning to test the application of such payment platforms, and we anticipate usage to become more common in coming years. Some in the industry believe that offering a seamless fare experience between transportation network companies (TNCs) and public transportation providers will lead to an enhanced customer benefit.

Itinerary Planning

Big data figures prominently as a component of smart cities. In fact, without the availability of open data—making data publicly available—many of the cross-pollination efforts needed for a smart city could not occur. That is why effective data collection practices, combined with making data public, is so critical. A primary component of big data in the transit context is the location and arrival time of buses and trains and the availability of this data to the private sector and other governmental entities. APTA polls the industry every two years on its infrastructure development

and found that in 2014, 46.4 percent of agencies responding offer open data for their real-time data systems, allowing third party application developers the opportunity to utilize big data to enhance mobility. Fortunately, the industry has moved to a common language in which to share schedule data, known as General Transit Specification Feed (GTFS). This common language allows for the data to be interpreted with relative ease by third parties. A perfect example of the opportunities from shared data is APTA's Industry Footprint, which uses GTFS data to map bus stops and rail lines all over the country in one platform.

Example of APTA Industry Footprint



Smart Environment

While the attention of the media has been on new lithium battery breakthroughs in the consumer vehicle market, public transportation has tremendous potential with a proven track record as an early adopter of new clean fuel technologies. In fact, 21.7 percent of the U.S. bus fleet is Compressed Natural Gas (CNG), hybrids make up 16.8 percent, and biodiesel 7.6 percent. Deployment of hybrid technologies is up 140 percent since 2005. This investment shows that as transit continues to choose cleaner energy sources, the industry's contribution to a cleaner environment will still outpace improvements in the passenger vehicle fleet. Already, 46 percent of vehicles already use cleaner energy sources.

Future Technology Deployment

Autonomous, driverless automobiles have been a popular topic in the media and have been a source of debate among policy makers. However, long before these vehicles become a major component of the U.S. auto fleet, public transportation would have had an opportunity to deploy these technologies. Many of these technologies support bus operations and therefore public transit could become a major investment destination for companies developing the technology.



Forward Collision Avoidance Systems

Sensors mounted in the front of the vehicle will be able to detect and therefore mitigate a collision with an obstacle.

Pedestrian Detection & Avoidance

These systems use radar or camera sensors and alert the driver to pedestrians in front of the vehicle. The system will automatically apply brakes should the driver fail to take action.

Blind Spot Detection

These systems consist of sensors and cameras that will assist in changing lanes, thereby increasing safety and potentially reducing traffic delays associated with leaving bus stops.

Driver Fatigue & Inattention Alerts

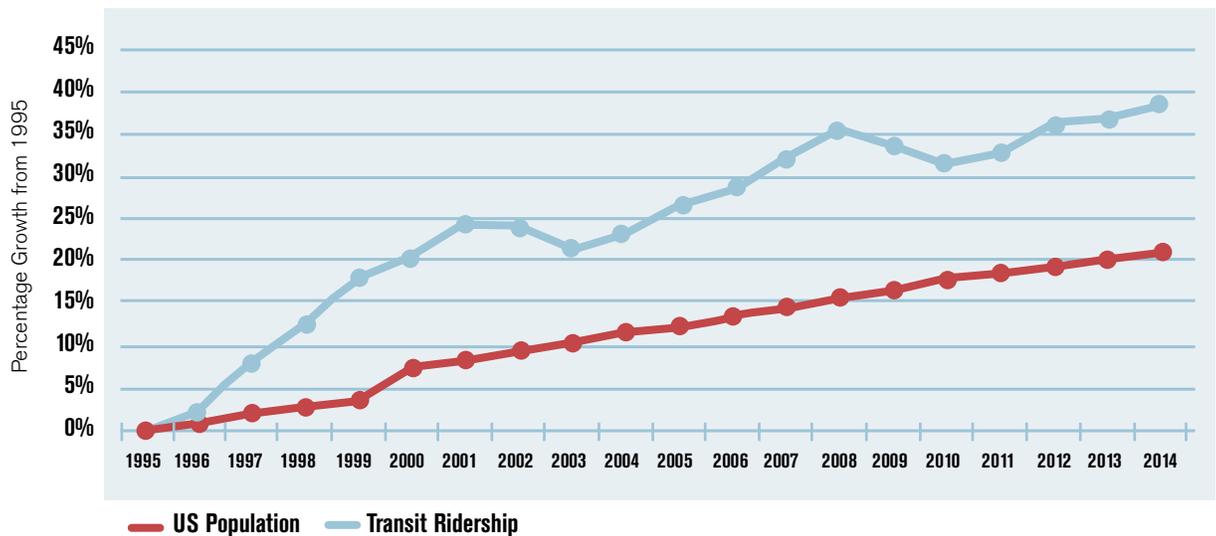
These systems will alert a driver who is likely not alert, based on lane and facial position, and steering patterns.

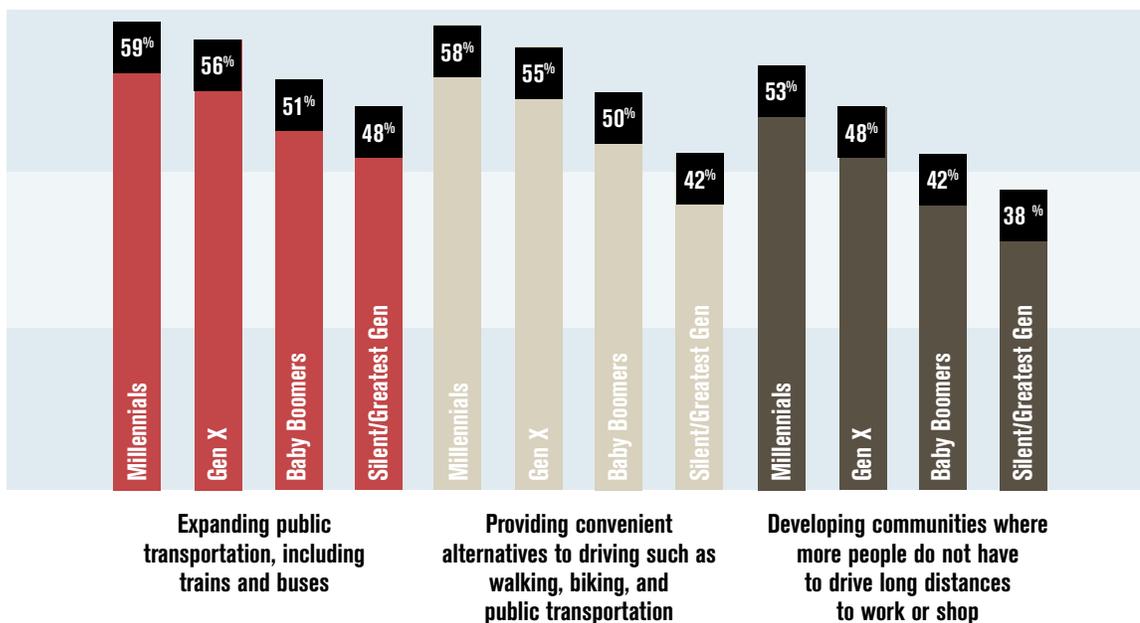
These are just a few of the systems that will offer public transportation operators greater safety and operational stability, perhaps long before heavy penetration into the consumer automobile market. The history of public transportation as an early adopter of new fuel technologies will carry into the autonomous vehicle sector, making the public transportation industry a prime investment target.

Strong Demographic Headwinds Growth Since 1995

FIGURE 1

Transit Ridership Has Grown Faster Than Population





Path Towards Improved Rail Service Continues

Improved passenger rail is critical to America’s economic future. Congestion on our nation’s highways and at our airports already costs more than \$130 billion a year. America’s population is expected to grow by another 100 million in the next 40 years, so investment in rail is critical to accommodate future growth.

In California, the legislature and governor agreed to plan to use a portion of funds from that state’s cap-and-trade program to secure continued development of California’s high-speed rail program. The ground breaking took place last year. Earlier this year, the authority decided to build the segment from Bakersfield to San Jose as an Initial Operating Segment. The decision is expected to bring high-speed rail service into operation much faster—potentially within the next 10 years. Furthermore, the segment is anticipated to create a substantial interest from the private sector, due to the lucrative nature of the route.

In Florida, work continues on a high-performance passenger rail link between Orlando and Miami, and is generating over four million square feet of transit-oriented development near train stations in South Florida. Service is expected to begin in 2017.

Passenger rail improvements are underway in a number of mega-regions, which together represent 65 percent of the U.S. population and stand to absorb the bulk of America’s future population growth. These densely populated regions will demand new, competitive transportation



choices as both highway congestion and the cost of air travel increase. At the same time, rural and small urban communities will benefit from the increased transfer points and feeder services connecting to new high-performance rail corridors.

With high-performance rail in place, travel choices will expand exponentially for most Americans. 67 percent of the public report interest in traveling by high-speed rail, the figure rises to 72 percent among suburban residents and 80 percent among Latinos, one of the nation's fastest growing demographics. Their reasons: faster trip times, lower cost, greater convenience, and a more environmentally friendly alternative to other transportation modes.

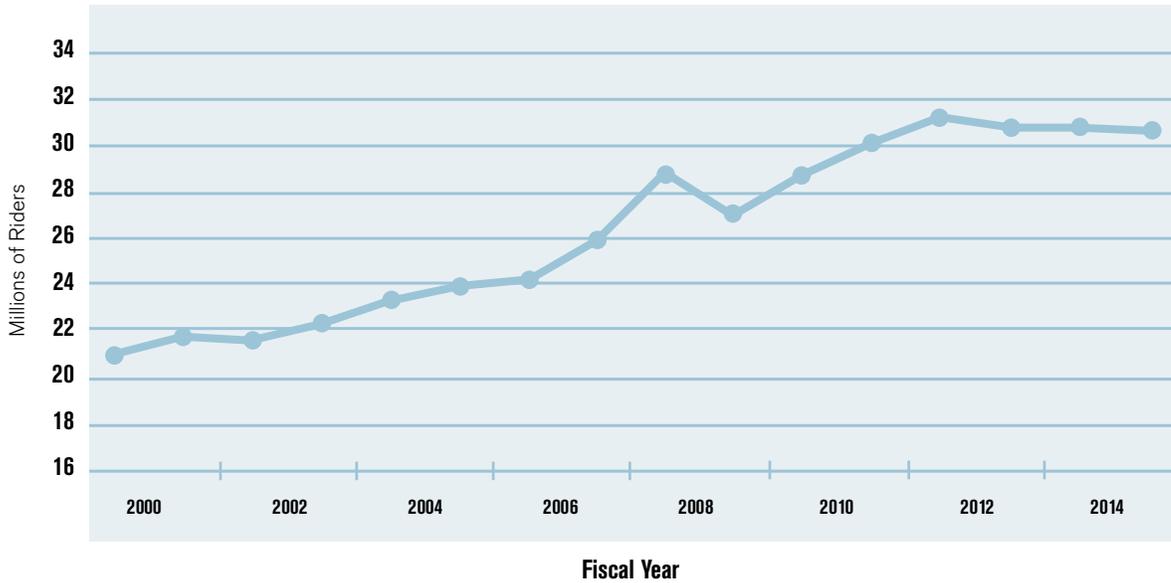
In spite of chronic underinvestment, annual passenger trips on Amtrak have increased from 21 million in 2000 to 30.8 million in 2015, or 47 percent.

An Expanding Fleet

Public transit vehicles are critical to the consumer experience and therefore are a source of major expenditures. The roadway vehicle fleet for the industry exceeds 150,000 with railcars bringing the total fleet to more than 181,000 passenger vehicles. Two out of three roadway vehicles operating in urbanized areas are buses, with vans representing the majority of the remainder. Among the bus fleet, two out of three buses are approximately 40 feet in length and represent the most significant part of the potential new vehicle market.

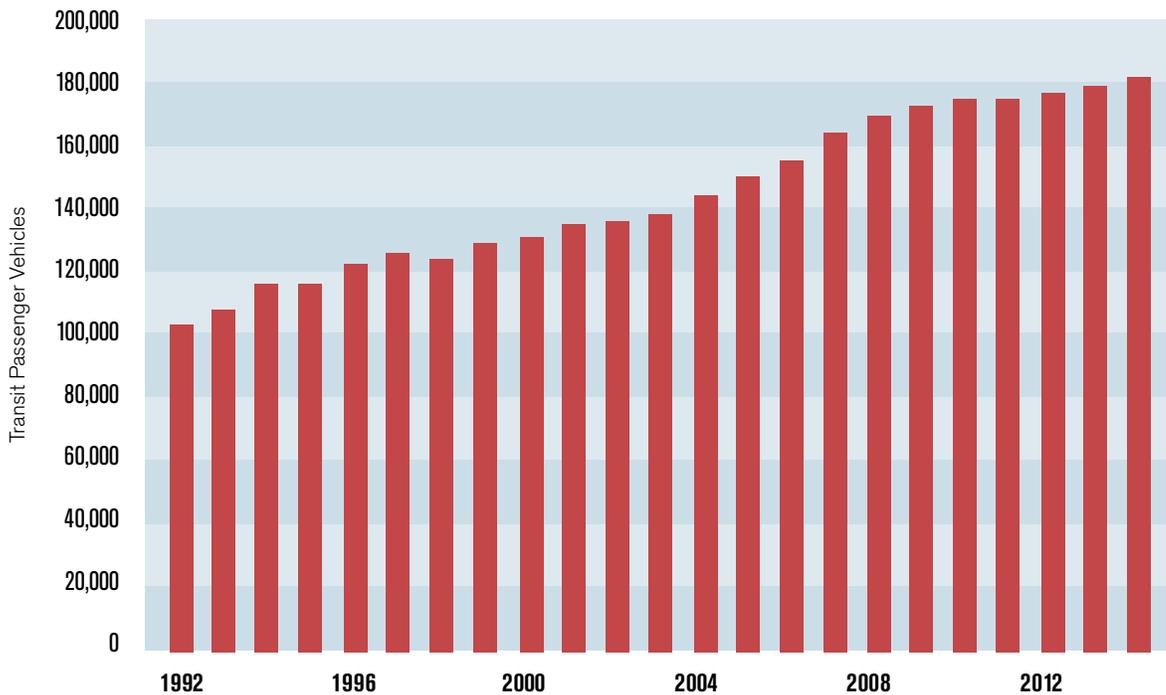
Amtrak Annual Ridership Trends

FIGURE 3



Public Transportation Vehicle Fleet Has Expanded

FIGURE 4

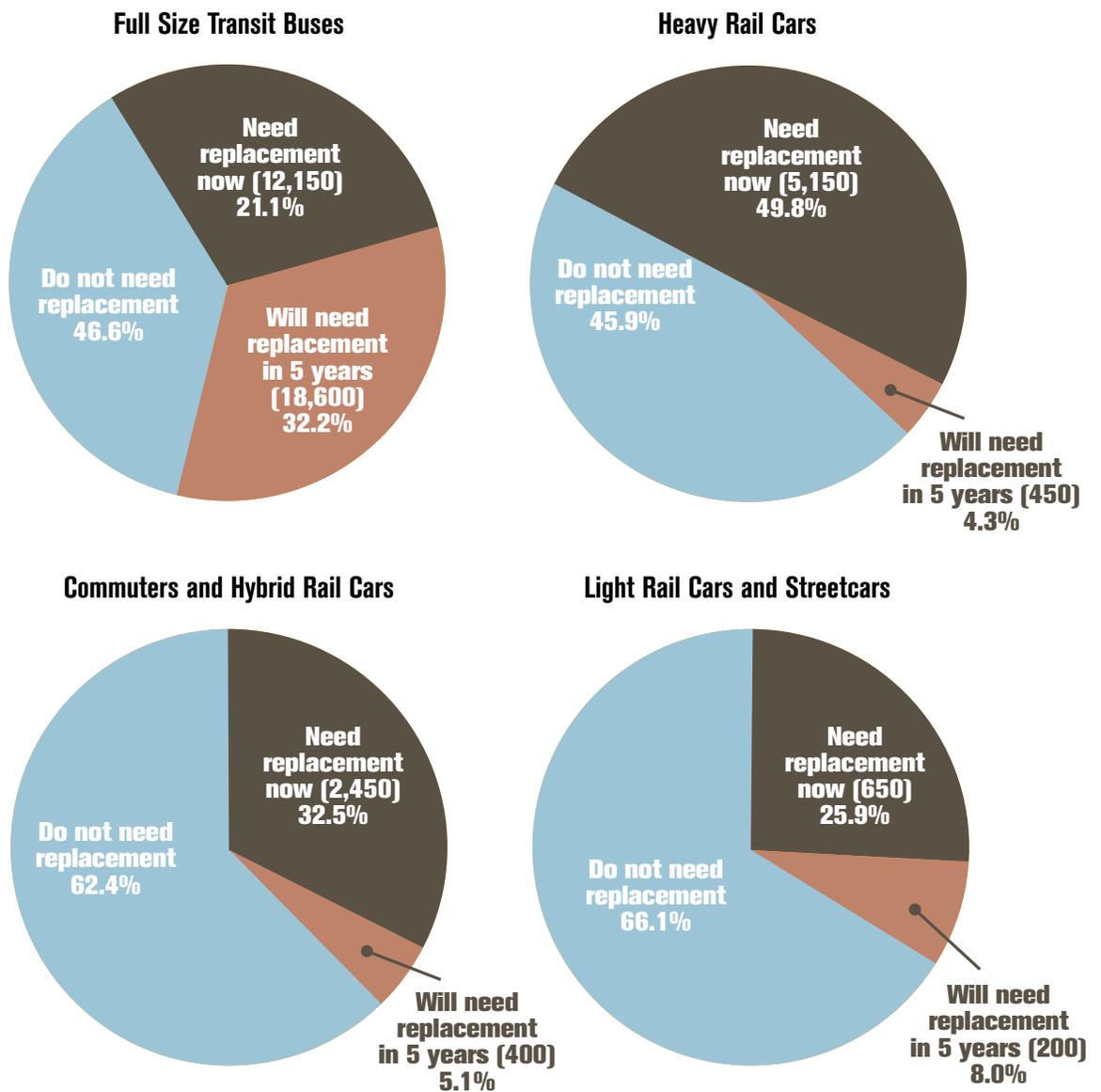




Significant Replacement Needs

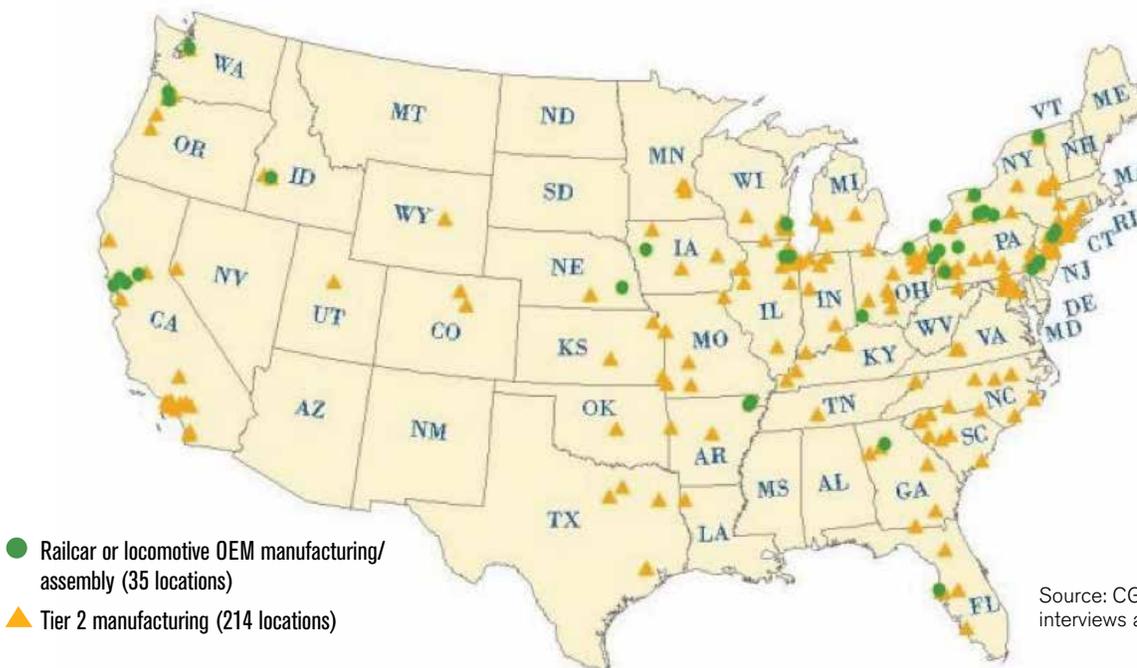
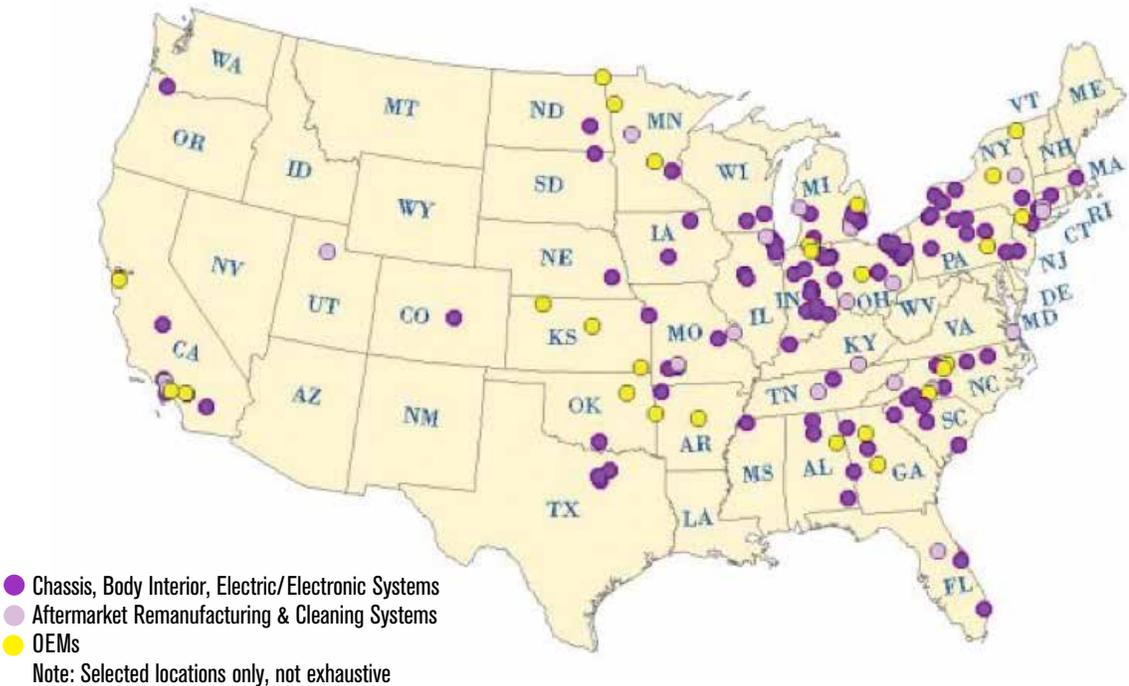
As the nation's growing transit fleet ages, there will be additional demand for new transit vehicles. Public transit agencies generally replace vehicles according to guidance provided by the Federal Transit Administration, which for typical 40-foot buses is every 12 years, and a rebuild at year six, but this varies by vehicle type, annual miles driven and climatic conditions. On average, 4,385 buses are delivered from the factory in a given year.

FIGURE 5 Vehicle Replacement Need



With Significant Manufacturing Employment, Coast to Coast

Recent supply-chain research by Duke University shows that investment in public transportation provides jobs throughout the country. Major manufacturers exist in states that are not widely known for having prolific public transportation systems and represent significant employment in those communities.



Source: CGGC, based on industry interviews and company websites.

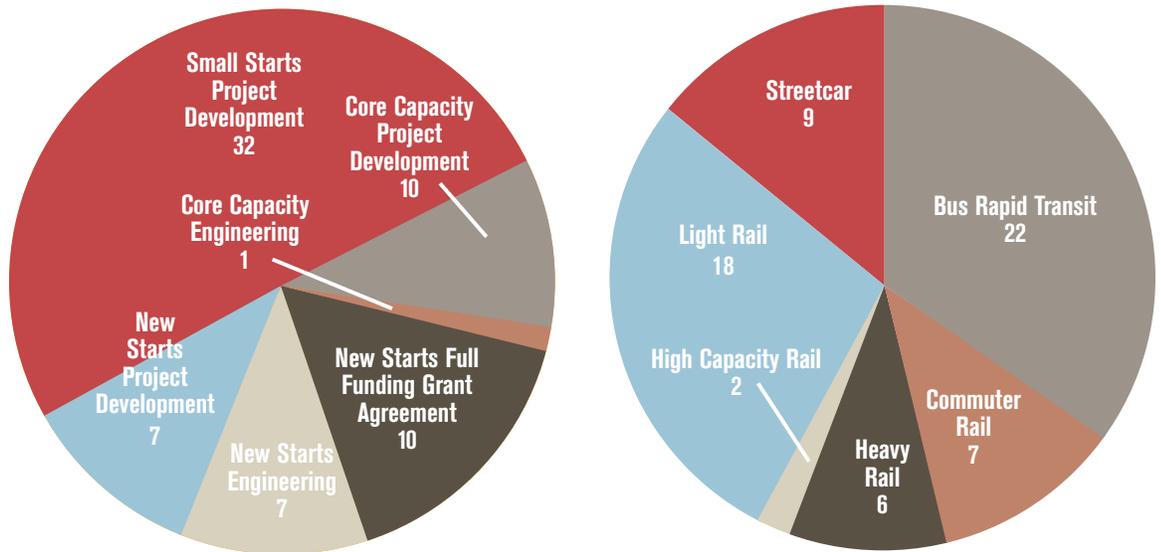


Major Capital Expansion is Underway

Major federal commitments for new projects have come in at an unprecedented rate over the past two years. Typically projects are matched with state and local funding for approximately one half of the total cost, although the proportion of matching funds varies by project. Projects move through various stages of planning, design and construction with a high degree of oversight from the federal government. The federal government’s Capital Improvement Grant Program, also known as “New Starts,” offers substantial support for new public transportation projects—ranging from heavy rail subway projects to bus rapid transit.

FIGURE 6 New Starts Proposed for FY 2017

Proposed FY ‘17 Federal Transit Administration Capital Investment Projects

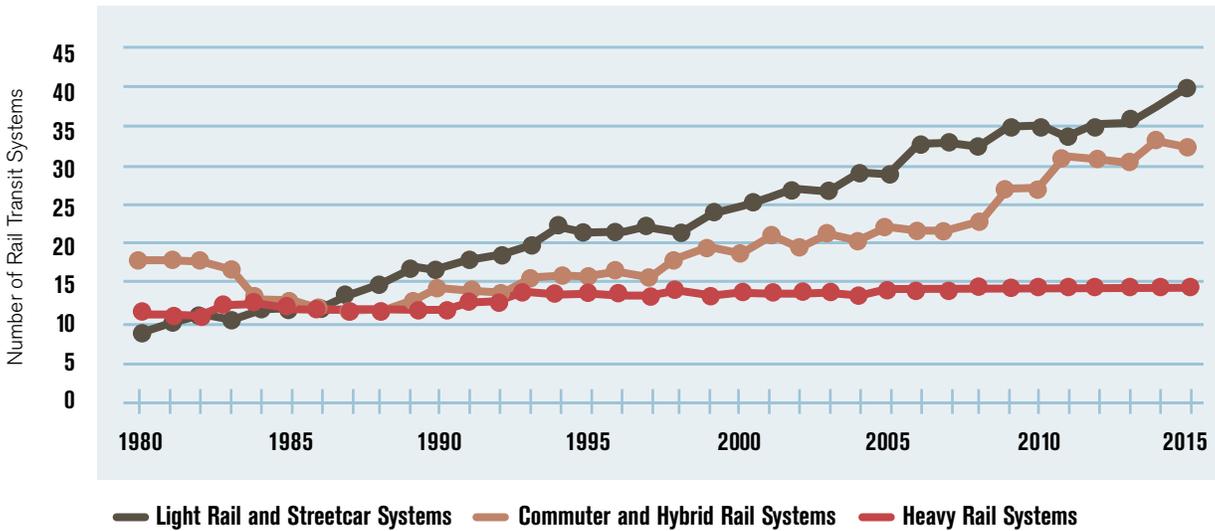


Number of Transit Systems Continues to Grow

Communities around the nation continue to enter the public transportation market, making investments to provide service that is more reliable, customer-facing, and just cool.

Number of Rail Transit Systems Has Increased Steadily Over Three Decades

FIGURE 7



Public Transportation Has Diverse and Stable Sources of Funding

Public transit funding is provided from a mix of government agencies, fares and private investment. Of the \$66.2 billion in direct industry revenue in 2014, \$48.3 billion was used for agency operations and \$17.9 billion for agency capital programs. This report focuses primarily on the capital programs.

Growth in Capital Revenue by Source, 1995-2013

FIGURE 8

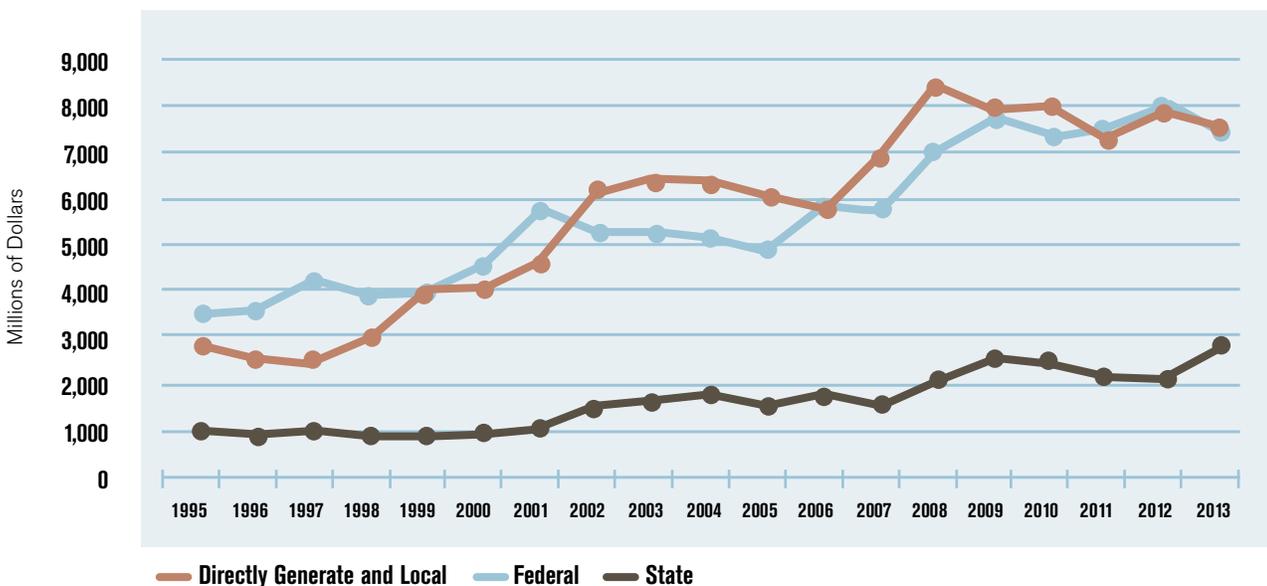
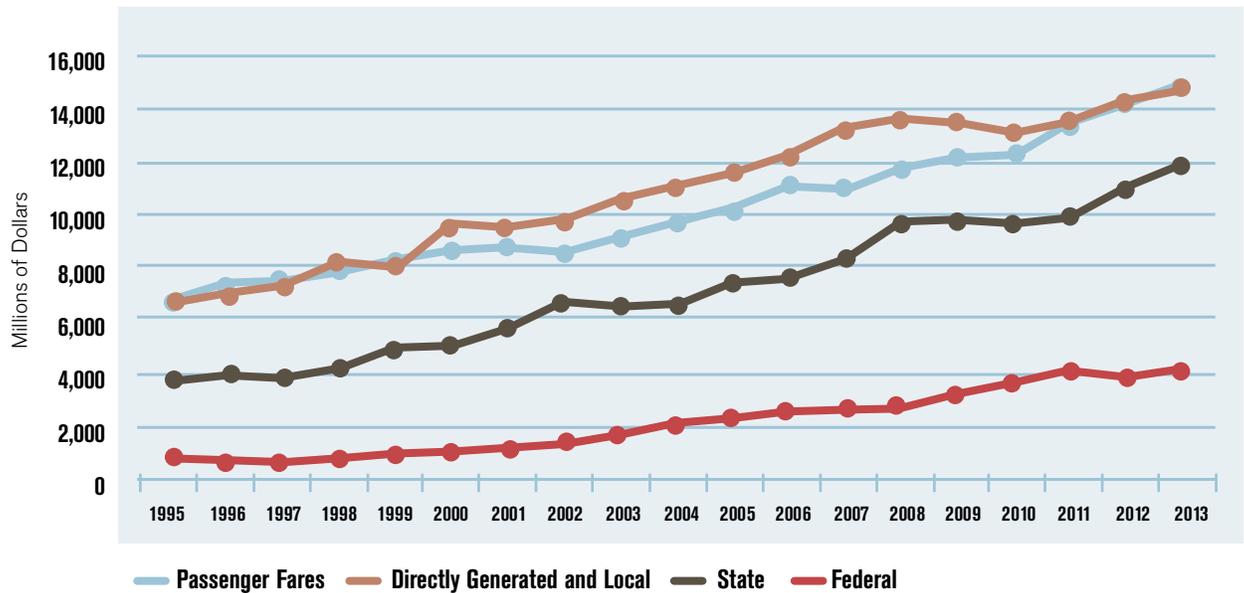




FIGURE 9

Growth in Operating Revenue by Source, 1995-2013

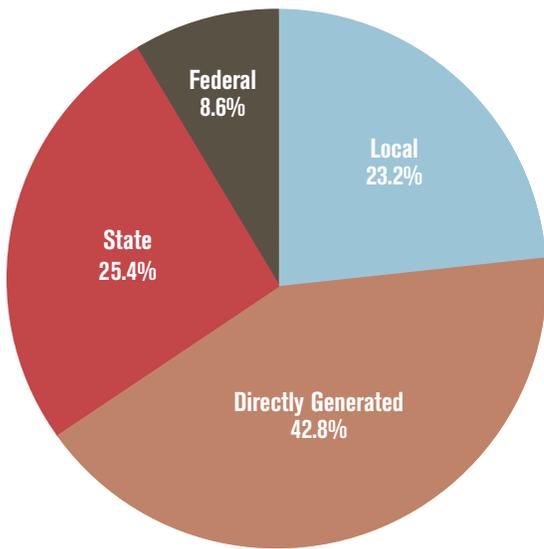


Source: APTA Public Transportation Fact Book, Annual

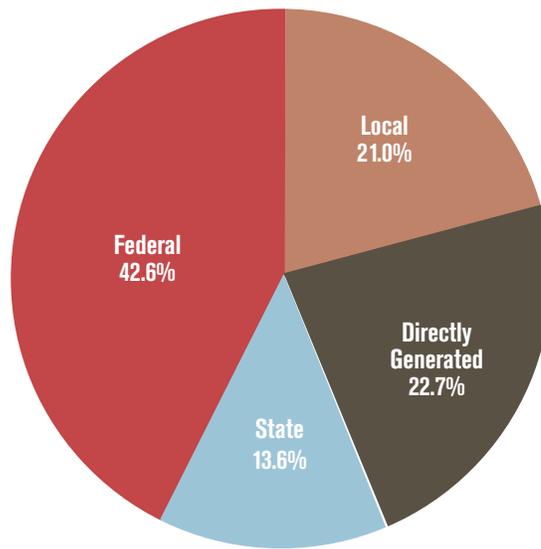
Directly generated revenues are acquired by the public transit agency by its own activities, including fares, taxes levied by the system, and other revenue, such as advertising, concessions, or parking revenues.

- Local revenues are taxes or fees generated by a local or regional government. Examples include a local sales tax or income tax, a property tax or other local taxes.
- State revenues are taxes or fees imposed by a state government.
- Private equity is represented by the up-front capital, risk-sharing, and management expertise and resources brought to the table by private companies or investors. Private companies can be involved in either the capital and/or the operating side of public transportation.
- Federal revenues originate from federal government funds.
- Enhanced federal loan programs, such as the Transportation Infrastructure Finance Innovation Act, provide the ability to expand and leverage available revenue streams. According to the Department of Transportation’s TIFIA program site, during Fiscal Years 2014 and 2015, over \$4.6 billion of TIFIA assistance had been provided to public transportation projects, almost a 700 percent increase over the preceding two fiscal years.

Sources of Operating Funds, 2014



Sources of Capital Funds, 2014



According to recent APTA data, most operating revenue is generated by the public transit agency (42.8 percent) or local tax revenue sources (23.2 percent), with a smaller percentage coming from state and federal sources (34 percent). Capital funds are generated from a more diverse range of sources with the federal government providing the largest share (44.4 percent).

A relatively large proportion of funding is generated from dedicated revenues, with the majority of these funds derived from sales taxes. Dedicated revenues are taxes levied with the express purpose of funding public transportation and, therefore, suitable for multi-year planning and multi-year project implementation. Dedicated funding provides a backbone from which other sources can be leveraged such as federal, state and private-sector partners.

Examples of Direct Private Investment

Just as federal loan assistance proves the credit-worthiness of transit projects around the nation, the public transportation industry continues to attract private-sector investment. Public transportation investment in the U.S. continues to be a multi-sector partnership between federal, state and local governments, along with the private and non-profit sectors.



EXAMPLES OF DIRECT PRIVATE INVESTMENT

DENVER EAGLE P3: A half-cent sales tax approved by regional voters in 2004 is helping fund a major public transit expansion initiative known as FasTracks. A consortium from the private sector was awarded a contract to build a commuter rail line to the Denver International Airport, a project known as Eagle P3. This is a design-build-finance-operate-maintain project.

ALL ABOARD FLORIDA: Florida East Coast Industries is developing a privately owned, operated and maintained intercity passenger rail service that will give business and leisure passengers a new, convenient, environmentally friendly and cost-effective way to travel between South Florida and Orlando.

CONTRACTED SERVICES: Since 1988, the Colorado legislature has required Denver RTD to contract with the private sector for portions of its operations. Many other regions have chosen to contract out. Suburban San Diego, New York City and Austin are recent examples.

PURPLE LINE: This \$2.5 billion suburban Washington, DC light-rail line will utilize the private sector to design, build, operate and maintain the system.

Transit Ballot Initiatives, An Important Component

Local and regional sales taxes dedicated to investment in public transportation have grown by over 275 percent in the past 15 years. The local referenda approved by voters in 2016 potentially could generate hundreds of billions in additional revenue over the course of their approved terms. These votes of citizens on projects deemed critical in their communities offers a critical third leg of the transit funding stool—federal, private and local & state initiatives.

Public transit ballot initiatives are often paired with other mobility improvements, such as highway safety projects and efforts to combat highway choke points.

Year	Measures on Ballots	Measures Approved	Percentage Approved
2003	17	12	71%
2004	50	40	80%
2005	25	21	84%
2006	45	34	76%
2007	18	12	67%
2008	47	35	74%
2009	11	8	73%
2010	56	43	77%
2011	28	22	79%
2012	62	49	79%
2013	15	11	73%
2014	61	42	69%
2015	34	24	71%

Fast Act Proves, Infrastructure Investment Remains Bipartisan

Recent passage of the FAST Act is proof that infrastructure investment in the U.S. is still a bipartisan priority. The bill increases public transit funding by 18 percent and secures the level of investment over a five year period. Efforts to fund the next infrastructure bill are already under way. Some experts point to a Vehicle Miles Traveled (VMT) charge as a sustainable path towards funding as the American auto fleet continues to become more fuel-efficient. A VMT charge scenario will require the extensive deployment of new technologies, creating yet another possible investment destination for interested firms.

Summary

Public transportation is a key investment destination for those seeking to create positions in smart cities segment. Thanks to the decades-long trend of increased and expanded service, public transportation enjoys bipartisan political support, has a strong ridership base in the nation's most dynamic regions, and is increasingly utilized among the fastest growing market segments.



References and Other Sources

An Inventory of HSR Criticisms with Suggested Responses: An inventory of responses to frequently used criticisms against developing U.S. high performance passenger rail.

Annual Report on Funding Recommendations (“New Starts Report”): FTA publishes an annual report outlining the status of various projects being considered for funding under the New Starts program.

APTA Primer on Transit Funding: The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users, and Other Related Laws, FY 2004 through FY 2011. The primer describes the amount of funds from federal transit programs, how they can be used, and how they are distributed among public transit agencies and states.

The Case for Business Investment in High-Speed Rail: Offers a compendium of compelling reasons why investment in high-speed rail can offer a good return on investment.

Center For Transportation Excellence: The CFTE maintains a complete, up-to-date listing and analysis of all transportation ballot measures that include a public transit component.

National Transit Database: A comprehensive source of data collected from public transit agencies in urbanized areas that operate 10 or more vehicles (produced by FTA). Data are typically released 12-18 months after the end of the reporting period. A less detailed report is also produced for rural area transit systems.

Public Transportation Fact Book: The APTA Fact Book is a summary of national data for the transit industry for a single year. Appendix A: Historical Data provides data for every year as far back as 1902. Appendix B: Transit Agency and Urbanized Area Operating Statistics ranks public transit agencies and urbanized areas by size for six operating statistics.

Public Transportation Infrastructure Database: This database produced by APTA lists major transit infrastructure in the U.S. and Canada and includes rail line data and stations, stop and parking data for all modes.

Public Transportation Investment Background Data: This APTA report is the source of the data included in this publication. It includes an extensive analysis of transit revenue sources and what transit funds are spent on with descriptions of the availability, quality and meaning of data from primary sources. Data in this report are updated whenever they are updated in primary sources.

Public Transportation Vehicle Database: The APTA Vehicle Database lists vehicles reported by participating transit agencies for the active fleet, under contract for purchase, and planned purchases.

Statistical Summaries: Annual FTA publication that reports how federal funding was used, including the types of equipment purchased.

The Role of Transit in Support of High Growth Business Clusters in the U.S.: December 2013. This study addresses issues of business productivity, market access and transit service for high-growth business clusters in the United States. The study draws on eight high-growth knowledge-oriented business clusters and their transportation conditions in six U.S. cities to provide an estimate of the total national income and employment consequences of congestion and how investment in public transportation can alleviate those consequences.

A New Partnership: Rail Transit and Convention Growth: November 2013. This joint report produced with the U.S. Travel Association and APTA examines how cities with rail stations connected directly to airport terminals can realize increases in hotel performance. The report compares six cities with direct access from their airport terminal to five cities without access. The analysis found that from 2006-2013, hotels in the cities with direct rail access brought in 10.9 percent more revenue per room than hotels in those cities without.

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