NYSERDA TRANSPORTATION PROGRAM MARKET CHARACTERIZATION REPORT

Volume 1: Executive Summary

Final

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1. Introduction

In 2014, New York State's transportation sector consumed more than 1,073 trillion Btus of energy, or 39 percent of net energy consumption in the state. In that same year, the transportation sector was responsible for 41 percent of the state's fuel-borne greenhouse gas emissions, largely due to the sector's reliance on petroleum fuel.[1]

Within this context, NYSERDA's Transportation Program has identified several objectives:

- To reduce and diversify the energy consumed by the transportation sector;
- To minimize greenhouse gas emissions; and
- To create economic development opportunities in New York State.[2]

The current Transportation Program, as implemented under NYSERDA's Clean Energy Fund (CEF), works toward these objectives by focusing on three areas: electric vehicles (EVs), public transportation, and mobility management. "Mobility management" encompasses a variety of strategies designed to reduce transportation demand and congestion, including intelligent and adaptive transportation systems and transportation demand management (TDM).

This Executive Summary is the first volume in a broad, five-volume market characterization analysis (MCA) of clean transportation in New York State. The MCA is designed to inform Transportation Program planning and strategy by assessing the current state of the clean transportation market in New York State and remaining barriers in key market segments. Specifically, the MCA:

1. Identifies the companies and organizations that comprise the current "clean transportation market" operating in New York State, with a focus on companies and organizations that could benefit from or partner with NYSERDA's Transportation Program.
2. Assesses the extent to which these companies and organizations already interact with the Transportation Program, or have adopted new technologies or products supported by the Transportation Program.
3. Identifies recent trends in the market adoption of key transportation-related technologies in New York State and more broadly, to inform subsequent evaluations of the Transportation Program's performance.
4. Characterizes the ways in which NYSERDA's Transportation Program interacts with different parts of the broader markets producing and adopting transportation goods and services.

[1] The remaining 59 percent of emissions from fuel consumption are associated with the residential (20 percent), commercial (12 percent), industrial (six percent), and electric generation (21 percent) sectors. NYSERDA. 2016. Patterns and Trends – New York State Energy Profiles: 2000-2014. October 2016. http://www.nyserda.ny.gov/About/Publications/EA-Reports-and-Studies/Patterns-and-Trends

[2] NYSERDA. 2015. Transportation Program: Product Development, Product Demonstration, and Product Deployment, Program Theory and Logic Model Report. August 2015. https://www.nyserda.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2015ContractorReports/2015-Transportation-LM-Report.pdf

5. Identifies areas of the transportation market where the Transportation Program is uniquely positioned to use its limited resources for greater impact.

The overall structure of the MCA includes five volumes:

- Volume 1: This executive summary.
- Volume 2: A central MCA that describes the size and design of New York State's market for transportation technologies and services, as well as NYSERDA's role in the market.
- Volume 3: A targeted study of EVs. EVs were identified as a key market segment for analysis because of the Transportation Program's focus on EVs under the CEF, as well as the emphasis on EV market adoption by New York State's Charge NY initiative, which aims to increase the deployment of EVs and EV charging stations statewide.
- Volume 4: A targeted study of TDM services. TDM was identified as a key market segment for analysis because of the Transportation Program's focus on mobility management under the CEF, as well as New York State Department of Transportation's (NYSDOT) focus on TDM through its statewide TDM framework.
- Volume 5: Supplemental appendices.

2. Summary of Findings

The results of this MCA are presented in three separate volumes, focusing on characterization of (1) the supply-side transportation market and the types of companies and organizations that may be important for NYSERDA to engage to increase market adoption; (2) progress to date and remaining barriers to market adoption of EVs; and (3) the market potential for TDM and areas of possible engagement for NYSERDA. The following three sections summarize the key findings from each of these volumes.

2.1 New York State Transportation Market

The New York State Transportation Market report (Volume 2 of the larger MCA) assesses the current state of the transportation industries operating in New York State, based primarily on a survey of transportation companies and organizations. Specifically, the study:

- Characterizes the size and design of the New York State supply-side transportation market;
- Assesses how the Transportation Program interacts with and influences different parts of the market; and
- Identifies areas where the Transportation Program is well-positioned to address market barriers.

To reach as many companies and organizations as possible with the survey, IEc employed a "snowball" survey method that began with companies directly connected to the Transportation Program (Stage 1) and expanded to include those companies' professional contacts (Stage 2).[3] In addition, this study validates and supplements the survey data with information from two NYSERDA databases:

- A recently-developed inventory of clean energy companies in New York State, which includes companies (primarily for-profit) focused on clean transportation; and
- NYSERDA's research and development (R&D) Metrics Database, which includes information on funded projects.

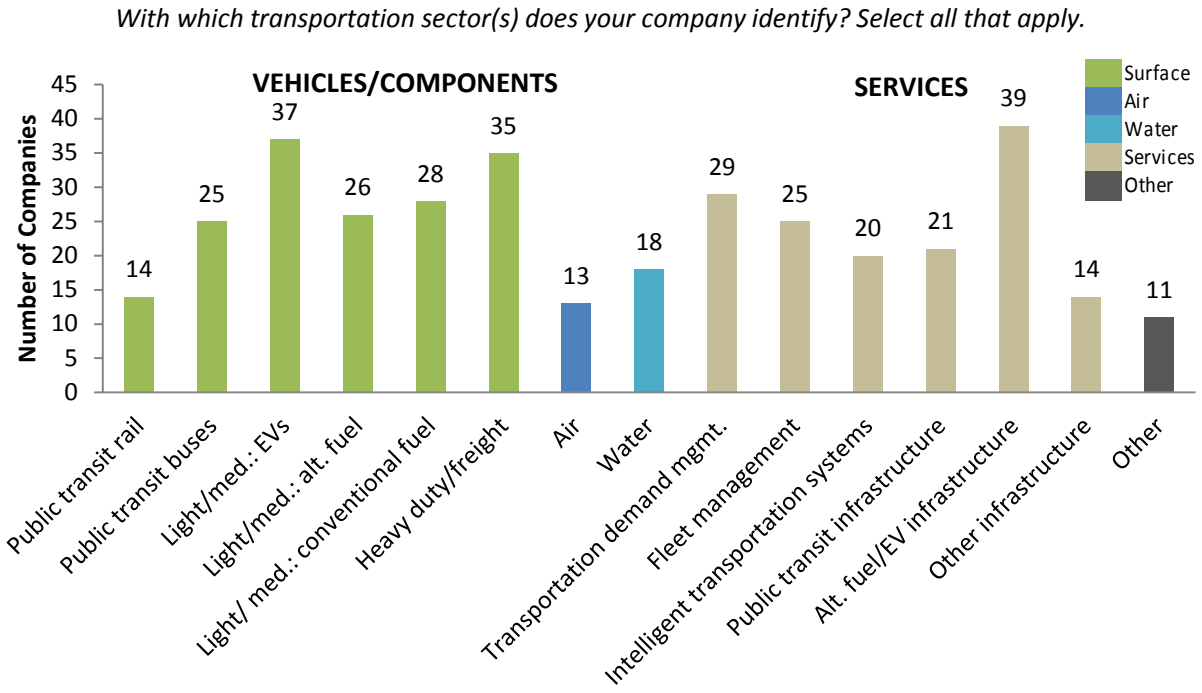
Integration of the data from these three sources demonstrates that the supply-side transportation market in New York State is large, both in terms of number of participating companies (more than 300) and annual revenues (more than $8 billion), although this represents a small share (less than one percent) of New York State's 2015 gross domestic product.[4] Based on the survey results, the companies that constitute the supply-side market span many sectors, with a relatively strong emphasis on alternative fuel and EV infrastructure. In contrast, four sectors – air, water, public transit rail, and non-public transit infrastructure – appear to encompass a small number of companies (see Figure 2-1). The companies active in the market are arrayed across the state, although they tend to cluster in more urban regions.

[3] A "snowball" survey is a survey conducted in at least two, and sometimes multiple, rounds, in which respondents in each round identify respondents for the subsequent round from among their professional acquaintances. If, after one or more rounds of snowball sampling, respondents are largely referring individuals that have already been surveyed, this indicates that the "market" (or network) is well characterized, and that additional sampling may not provide new information. Thus, for this market characterization, the Stage 1 and Stage 2 populations are assumed to be part of a single, interconnected market.

[4] U.S. Bureau of Economic Analysis (BEA). Regional Data: Gross domestic product (GDP) by state (millions of current dollars). New York State, 2015. https://www.bea.gov/iTable/index_regional.cfm

Survey respondents also identified the sectors they believe will be most important in the next five years. These responses suggested that alternative fuel/EV infrastructure and EVs are likely to remain important, while intelligent transportation systems (ITS) and non-public transit infrastructure will increase in importance.

Figure 2-1. Sectors Represented by Survey Respondents



The data also show that NYSERDA is interacting with a wide range of companies that vary by size (i.e., employment and revenues), age, type, and sector. Nearly all survey respondents had interacted with NYSERDA in the past, and indicated that NYSERDA was extremely or very influential in the success of funded projects. However, based on a comparison of survey and Inventory data, a number of companies remain unconnected to NYSERDA. This is particularly true in the Finger Lakes region and Western New York for analysis and services companies; the Finger Lakes and Southern Tier for manufacturers; and Central New York and Western New York for R&D companies.

Important market influences and barriers identified by survey respondents included:

- Access to financial capital,
- Physical infrastructure,
- Lack of supportive state policies and regulatory frameworks, and
- Poor market conditions in general.

To address these barriers and advance clean transportation overall, the Transportation Program could:

- **Consider additional outreach to engage program non-participants.** Non-participants are most likely to be for-profit companies focused on technology development and manufacturing, R&D, and analysis and testing, primarily located in the western half of the state. The Transportation Program may want to determine whether these companies represent technologies, regions, or other areas of future focus.

- **Continue providing, and consider expanding, business development support.** After funding, respondents found introductions, particularly to public sector officials, and business development support particularly valuable. Based on this feedback, NYSERDA should continue providing business development support, while considering whether there are new ways to facilitate connections among partners that will help address market barriers, particularly those related to policy and regulation.

- **Maintain focus on intelligent transportation systems (ITS) and EV sectors.** Respondents indicated that ITS is likely to grow in importance over the next five years, while the EV sector is likely to remain important. Both sectors align with the Transportation Program's focus under the CEF on mobility management and EVs. The Transportation Program should therefore continue to support R&D projects that advance the market in these areas.

2.2 Electric Vehicles

The primary goal of the EV baseline assessment in Volume 3 is to inform the Transportation Program's planning and strategy by characterizing progress and barriers to market adoption of EVs in New York State. Using a variety of quantitative and qualitative methods, including literature review, stakeholder interviews, and review of data from several recent surveys, this study:

- Assesses the extent to which consumers are aware of the value proposition of EVs;

- Identifies the most significant barriers to increasing EV adoption in New York State;

- Describes existing programs that attempt to increase consumer adoption of EVs;

- Characterizes the types of market actors working on or interested in EVs in New York State; and

- Compiles baseline data on the program's progress toward EV adoption goals.

Using the results of three recent surveys of likely car buyers, the assessment found that consumer awareness remains a significant barrier to EV adoption nationally as well as in New York State. One of these surveys, conducted by Edelman Intelligence in 2016, indicates that self-rated familiarity, knowledge, and interest in learning more about EVs appear to be higher in New York State than nationally. Compared to California, where EV adoption is substantially higher than in the rest of the U.S., New York State residents rated themselves lower in terms of familiarity and knowledge. Table 2-1 summarizes key results from the Edelman survey.[5]

[5] Edelman Intelligence. Survey results provided by NYSERDA via email on March 22, 2017.

Table 2-1. Consumer Awareness Benchmarking (Edelman Intelligence Survey)

Metric	New York State	California	National
Familiarity	• 72% consider themselves familiar with plug-in hybrid EVs (PHEVs) • 68% consider themselves familiar with battery EVs (BEVs)	• 79% consider themselves familiar with PHEVs • 78% consider themselves familiar with BEVs	• 64% consider themselves familiar with PHEVs • 59% consider themselves familiar with BEVs
Knowledge	• 57% say they are knowledgeable about EVs	• 61% say they are knowledgeable about EVs	• 43% say they are knowledgeable about EVs
Interest	• 84% are interested in learning more about EVs	• 82% are interested in learning more about EVs	• 73% are interested in learning more about EVs

Overall, the three surveys indicate that consumers are substantially less familiar with EVs and less comfortable making purchasing decisions about EVs compared to conventional vehicles. The surveys also show that consumers hold a number of negative perceptions of EVs (e.g., they do not perform well, are not fun to drive, are not stylish or luxurious) and are generally unfamiliar with and uncertain about the technology. At the same time, interest in learning more about EVs is high in New York State, which suggests that NYSERDA may be able to improve EV adoption rates by focusing on information campaigns among interested consumers. The Edelman survey also included questions about consumers' preferred information sources for EVs, which could inform Transportation Program strategy. Notably, these results illustrate the importance of ride-and-drives and peer influence in encouraging EV sales.

In addition to barriers associated with consumer awareness and familiarity, a number of other technical, economic, and policy barriers impede EV adoption in New York State. The most significant include:

- **Technical barriers:** vehicle choice (e.g., availability of SUV models, used vehicles), vehicle range, availability of EV repair and maintenance services, access to charging infrastructure
- **Economic barriers:** EV purchase price, charging station price, demand charges for charging station operation
- **Policy barriers:** building codes that do not proactively encourage EV charging infrastructure

While some of these barriers do not align closely with the Transportation Program's focus on R&D (i.e., vehicle choice, repair and maintenance) or are best addressed by other programs (i.e., vehicle range, which is one focus of the NY-BEST Battery and Energy Storage Technology Consortium, and building codes, which are addressed by NYSERDA's Building Energy Codes program), the remaining barriers are well-suited to Transportation Program involvement. To improve consumer awareness and address remaining barriers in the short term, the Transportation Program could:

- Strengthen and expand existing partnerships with dealerships and outreach organizations to educate dealers and consumers on the benefits of EVs and address consumers' anxieties.
- Support ride-and-drives or similar events that allow drivers to interact directly with EVs because of the weight consumers give these experiences in forming their preferences.

- Continue to support charging station deployments, particularly at highly visible locations such as workplaces and public parking lots.
- Support projects focused on reducing both initial and operating costs of EV charging stations.
- Work with utilities to explore solutions to peak demand impacts, including charging station owners' concerns over demand charges.

In the longer term, the Transportation Program may want to collaborate with NY-BEST and other research institutions to advance EV R&D, and well as with policymakers and other NYSERDA programs to integrate EV considerations into building codes.

To evaluate its progress toward EV adoption goals under the CEF, the Transportation Program is tracking EV-specific outputs, outcomes, and indicators, summarized in Table 2-2. The table shows the baseline values that will be reported in the forthcoming update to the Clean Transportation CEF Investment Plan and the corresponding current values assessed as part of this evaluation. A complete list of indicators can be found in Volume 3; this table is limited to those for which quantitative data are available.

Table 2-2. EV Outputs, Outcomes, and Indicators

Outputs/Outcomes	Indicators	Data Source	CEF Baseline (2017 Update)	Current Value
Fast-charge stations funded and installed	# of charging stations installed in New York	Alternative Fuels Data Center[6]	1,600	1,639 total; 160 fast (56 non-Tesla)*
Increased rate of EV sales	# of EVs registered in NY	NYSERDA (DMV data via contractor)[7]	16,000	16,131
Raised awareness of EVs	EV market share (EVs as a percentage of total number of car sales in New York State)	Auto Alliance[8]	0.58%	0.58%
Growth in consumer awareness and experience with EVs, including growth in consumer understanding of the value proposition of EVs	Consumer awareness and experience with EVs	Edelman Intelligence survey[9]	Not specified	72% familiar with PHEVs; 68% with BEVs
Reduction of installed cost of charging stations	Average installed cost of Level 2 charging station per port	NYSERDA (based on projects funded)	$9,000	$8,774
Geographic availability of charging stations, especially DC fast charging stations that enable greater intercity EV travel	Geographic availability of charging stations, especially DC fast charging stations that enable greater intercity EV travel	Alternative Fuels Data Center[10]	Not specified	Fast charging stations (non-Tesla) in 29 cities*
* Note: The Transportation Program is interested in tracking the coverage provided by stations that use standard charging technology (i.e., not Tesla fast charging stations, which use a proprietary connection not compatible with other vehicles).				

[6] Alternative Fuels Data Center (AFDC). Alternative Fueling Station Locator. Downloaded February 17, 2017. http://www.afdc.energy.gov/locator/stations/

[7] Energetics. NY DMV EV Analysis 2016-11-30. Data provided by NYSERDA on January 31, 2017.

[8] Auto Alliance. ZEV Sales Dashboard. Accessed April 25, 2017. https://autoalliance.org/energy-environment/zev-sales-dashboard/

[9] Edelman Intelligence. Survey results provided by NYSERDA via email on March 22, 2017.

[10] Alternative Fuels Data Center (AFDC). Alternative Fueling Station Locator. Downloaded February 17, 2017. http://www.afdc.energy.gov/locator/stations/

2.3 Transportation Demand Management

TDM is broadly defined as the use of strategies to increase transportation system efficiency, typically by reducing single-occupant vehicle (SOV) demand or redistributing that demand in space or time. The primary goal of the TDM baseline assessment in Volume 4 is to inform the Transportation Program's planning and strategy by characterizing the market potential for TDM in New York State and potential areas of engagement for NYSERDA. Using a variety of quantitative and qualitative methods, including literature review, stakeholder interviews, and geospatial analysis, this study:

- Identifies conditions that are necessary and sufficient for TDM adoption, and identifies locations in New York State where these conditions can be found (i.e., "priority areas" for TDM);
- Identifies the most significant barriers to increasing TDM adoption in New York State;
- Characterizes the types of market actors needed for successful TDM adoption; and
- Compiles baseline data on the program's progress toward TDM adoption goals.

To identify TDM priority areas in New York State, IEc conducted a geospatial analysis of factors necessary for a successful TDM program, as identified through literature review and in-depth interviews. These factors can be grouped into four categories: availability of transportation options beyond SOVs, population or employment density, populations with particular interest in TDM, and other logistical considerations. Although data were not readily available for all factors, IEc was able to incorporate at least one factor from each of these categories. Table 2-3 summarizes the factors included.[11]

Table 2-3. Data and Methods for Geospatial Analysis

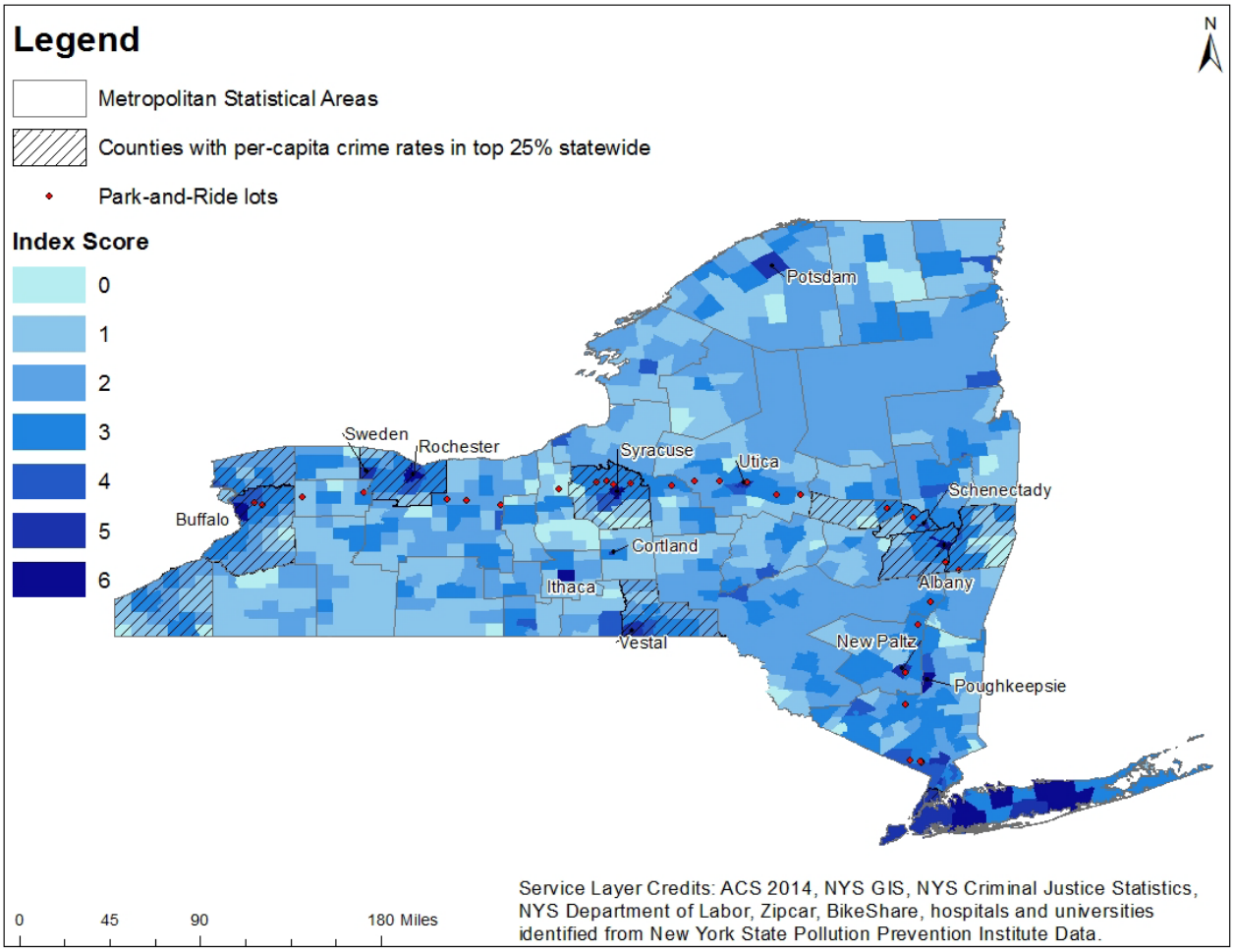
Factor		Data Source	Methods and Key Assumptions
Non-SOV Transportation Options	Public Transit	American Community Survey (ACS) 2014	Percent of all workers that take public transportation to work. Arrived at threshold of 11.9% after categorizing through "quantile" in GIS.
	Park-and-Ride Lots	NYS GIS	Locations shown for illustrative purposes only, given difficulty in mapping transit routes.
	Carshare or Bikeshare Program	Shared Mobility, Inc., Zipcar.com, Bikeshare.com	Areas where carshare or bikeshare is present or under development.
Population/ Employment Density	Population Density	ACS 2014	Arrived at threshold of 366 people/sq km after excluding NYC and categorizing through "quantile" in GIS.
	Large Employer	NYS Dept. of Labor, NYS Pollution Prevention Institute (NYSP2I)	Based on two combined data sets: 1. Largest private sector employers in each of 10 NYS regions from the NYS Dept. of Labor. Excluded companies likely to have multiple locations (e.g., grocery chains). Identified towns for the included companies using online searches. 2. Hospital locations and size (number of beds) from NYSP2I; excludes NYC. Arrived at threshold of 370 beds through "quantile" in GIS.

[11] Key factors that were *not* incorporated into the analysis due to lack of available data are: public transit affordability, non-SOV transportation options beyond carshare or bikeshare, non-SOV infrastructure, existence of municipal or employer-based transportation or environmental programs, and engagement of key market actors.

Factor		Data Source	Methods and Key Assumptions
Populations with TDM Interest	Large University	NYSP2I	Arrived at threshold of 5,666 students through "quantile" in GIS. Data set excludes NYC.
	Low-Income Population	ACS 2014	Percent of households below poverty level. Use federal poverty rate of 14.3% as threshold.
	Older Population	ACS 2014	Percent of population over 65. Arrived at 26.7% threshold using "natural breaks" in GIS.
Other Considerations	Public Safety and Security	NYS Division of Criminal Justice Services	County-level index (property plus violent) crime rate per 100,000 population. Flagged counties with crime rates in top 25% statewide. Locations shown for illustrative purposes only.

Based on an aggregation of these factors using the threshold values identified in Table 2-3, IEc calculated a TDM priority index score for each town, ranging from 0-6, where 6 represents the highest priority. The index shows that the highest priority areas for TDM include many areas downstate and large cities, including Albany, Buffalo, Ithaca, Rochester, and Syracuse. Of these places, Buffalo has already emerged as a TDM leader; Rochester and Albany have both demonstrated interest through carshare and bikeshare initiatives, and could be natural places to expand TDM demonstrations.

Figure 2-2. TDM Priority Index Score – All Towns



Despite the market potential, widespread adoption of TDM is hindered by remaining gaps and barriers. These barriers include low engagement of specific market actors, such as public transit agencies, developers, and employers; lack of integration of TDM strategies into land use planning; policy restrictions that limit non-SOV options such as local carsharing and electric assist bikes; and a lack of focus on offsetting VMT.

Although TDM initiatives in New York State are primarily managed by the New York State Department of Transportation (NYSDOT), NYSERDA works closely with NYSDOT to ensure that the two organizations' TDM initiatives complement each other. Typically, NYSERDA supports smaller demonstrations and education, while NYSDOT oversees larger, more comprehensive programs. To complement NYSDOT's role while addressing key barriers, NYSERDA's Transportation Program could in the short term:

- Leverage NYSDOT's existing relationships with transit agencies and NYSDOT's TDM employer partners in high priority areas to encourage adoption of TDM strategies.
- Leverage existing successful programs (e.g., carshare, bikeshare, workplace transportation or environmental programs) to identify local TDM champions and organizations that can assist with education and outreach.
- Consider whether public safety concerns are dampening local TDM adoption, and encourage local employers and developers to adapt their TDM strategies and messaging accordingly.
- Support R&D related to complementary technologies, such as intelligent transportation systems and real-time transportation data tracking.

Over the long term, the Transportation Program could continue working with policymakers and other NYSERDA programs (e.g., Clean Energy Communities) to encourage integration of TDM into long-term land use planning.

Although the Transportation Program has not yet filed a CEF Investment Plan for its mobility management program area, the Program proposes to assess its progress using the outputs, outcomes, and indicators summarized in Table 2-4. A complete list of indicators can be found in Volume 4; this table is limited to those for which quantitative data are available.

Table 2-4. TDM Outputs, Outcomes, and Indicators

Outputs/Outcomes	Indicators[1]	Data Source	Baseline Value (2016)
Employers proactively offer TDM opportunities	# of employer TDM programs (as approximated by # of NYSDOT 511NY Rideshare employer partners)	NYSDOT[12]	~1,000
People shift commuting modes away from SOVs	Commuter mode split (% using SOV)	U.S. Census Bureau, 2014[13]	53.6% of workers age16+
New carsharing and bikesharing programs launch	# of metro areas with carsharing or bike sharing	Zipcar.com, Bikeshare.com, and Shared Mobility, Inc.[14]	30 (29 carshare; 3 bikeshare)[2]
People participate in ride-matching programs	# of people signed up for NYS ride-matching programs (specifically, 511NY Rideshare)	NYSDOT[15]	69,665
More people use carsharing and bike sharing programs	# of carsharing and bikesharing program members in NYS (includes Reddy Bikeshare and SoBi Long Beach "riders," but only annual members for Citi Bike)	Citi Bike and Shared Mobility, Inc.[16]	127,845 bikeshare riders; carshare data not available
Increased demand for bikesharing programs in NYS	Fleet size of bikesharing programs in NYS	Citi Bike and Shared Mobility, Inc.[17]	8,463 bikes (7,993 in NYC)
Increased use of bikesharing programs in NYS	# of miles ridden through NYS bikesharing programs	Citi Bike and Shared Mobility, Inc.[18]	30.5 million (30.4 million in NYC)
Increased use of bikesharing programs in NYS	# of trips taken through NYS bikesharing programs	Citi Bike and Shared Mobility, Inc.[19]	13.9 million (13.8 million in NYC)

Notes:
1. Gray-shaded indicators denote additional indicators of TDM progress identified by IEc.
2. Two cities, Buffalo and New York City, had both carshare and bikeshare programs in 2016.

[12] NYSDOT. 2017. 511NY Rideshare Second Quarter Progress Report. February 2017. https://511nyrideshare.org/documents/11420/116339/2016-2017+Q2+Quarterly+Progress+Report+-+Final+Draft+-+2-27-17.pdf/9a28ef63-42ae-4d16-933c-ca6dd341edb9?version=1.0&previewFileIndex

[13] U.S. Census Bureau. 2017. Selected Economic Characteristics 2010-2014 American Community Survey 5-Year Estimates. 2017. https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=bkmk

[14] Zipcar. Where the Cars Are. Accessed February 9, 2017. http://www.zipcar.com/cities; and Bikeshare. Bikeshare Cities. Accessed February 9, 2017. http://bikeshare.com/map; and Shared Mobility, Inc. Results provided by Mike Galligano via email on February 9, 2017.

[15] NYSDOT. 2017. 511NY Rideshare Second Quarter Progress Report. February 2017. https://511nyrideshare.org/documents/11420/116339/2016-2017+Q2+Quarterly+Progress+Report+-+Final+Draft+-+2-27-17.pdf/9a28ef63-42ae-4d16-933c-ca6dd341edb9?version=1.0&previewFileIndex

[16] Citi Bike. December 2016 Monthly Report. https://www.citibikenyc.com/system-data/operating-reports; Shared Mobility, Inc. Results provided by Mike Galligano via email on April 14, 2017; and Buffalo Rising. The Reddy Bikeshare Results Are In…. January 4, 2017. https://www.buffalorising.com/2017/01/the-reddy-bikeshare-results-are-in/

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[19] Ibid.

3. Conclusions and Recommendations

Overall, this MCA demonstrates that the supply-side market for clean transportation technologies and services in New York State is large and encompasses a wide range of companies and organizations, in terms of size, age, type, and sector. A few key sectors are expected to emerge as particularly important to industry operations over the next five years; these include intelligent transportation systems, EVs and alternative fuel/EV infrastructure, and non-public transit infrastructure. These sectors align well with the Transportation Program's focus under the CEF on mobility management and EVs. The Program's third CEF focus area, public transportation, was identified by respondents as relatively less important to their companies' operations currently, although they expected the sector to increase slightly in importance over the next five years.

In addition, this MCA shows that NYSERDA is generally well-connected among the companies and organizations active in the supply-side transportation market. However, NYSERDA could strengthen its partnerships with some market actors, including:

- For R&D in general: Primarily in the western half of New York State, for-profit companies focused on technology development and manufacturing, R&D, and analysis and testing.
- For advancing the EV market specifically: Automobile dealerships, consumer outreach organizations, and utilities.
- For advancing the TDM market specifically: Public transit agencies, potential TDM hosts (e.g., developers, employers), and outreach organizations.

Both target market segments evaluated – EVs and TDM – show potential for increased technology/strategy adoption, although adoption is currently hindered by a few key market barriers. NYSERDA is well-positioned to address several of these barriers to ensure continuing progress toward New York State and Transportation Program goals. Specifically, the Transportation Program could:

- **Conduct additional outreach to engage the key market actors identified above.** For EVs, consumer outreach may benefit from a focus on ride-and-drives and similar events that allow drivers to interact directly with EVs. For TDM, NYSERDA should work closely with NYSDOT to leverage NYSDOT's existing relationships with transit agencies and employer partners.
- **Maintain R&D and deployment focus on technologies that will become increasingly important in the future or have the potential to reduce key barriers.** Specifically, NYSERDA should continue to support R&D and deployment of intelligent transportation systems, real-time transportation data tracking, EVs, and EV charging stations.
- **Continue providing, and consider expanding, business development and networking support.** A number of remaining gaps and barriers, such as a lack of supportive state policies and low engagement from key market actors, could be improved by facilitating connections among market actors. This type of business development support was cited as particularly valuable by survey respondents.

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