TRANSPORTATION PROGRAM: PRODUCT DEVELOPMENT, PRODUCT DEMONSTRATION, AND PRODUCT DEPLOYMENT

Program Theory and Logic Model Report

Final

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1 Program Context, Stakeholders, Intent, and Design

NYSERDA's Transportation Program focuses on reducing and diversifying the energy consumed by the transportation sector, minimizing emissions, and creating economic development opportunities in New York State.[1] The Transportation Program encompasses Product Development, Product Demonstration, and Product Deployment (hereafter, Development, Demonstration, and Deployment, respectively). Together, these areas support the development of surface transportation, including electric vehicle (EV) infrastructure, and emerging technologies to improve rail, marine, and air transportation system efficiency. The current program builds on decades of research conducted with statutory and Systems Benefits Charge (SBC) funding. In addition, NYSERDA's recent Clean Energy Fund (CEF) Proposal identifies the development of advanced sustainable transportation systems as one of its five strategic priorities.[2] Preliminary discussions about the transition to the CEF suggest that the Transportation Program is likely to focus on four key areas beginning in 2016, including: public transit (e.g., efficiency of the New York City subway system), transportation demand management (e.g., employer strategies to reduce single-occupancy vehicle use), smart mobility (e.g., adaptive traffic signal controls), and alternative fuels (e.g., electric vehicles). The finalization process of the CEF is an iterative process and, as such, these focus areas may evolve or change over time. The program logic and theory described in this report is consistent with preliminary plans for the CEF program.

As described in NYSERDA's Draft Final Transportation Group Strategic Plan, the program receives funding from multiple sources, including both state and federal funds. Federal funds have accounted for nearly half of total program funding in recent years. State funding sources include SBC IV (also referred to as Technology and Market Development, or T&MD, for the current funding cycle; this source is expected to be replaced by the CEF in 2016), among others. The amount of funding provided to the Transportation Program by each source varies from year to year.[3] Specific funding sources used by the program are described later in this report.

The purpose of this report is to describe the logic and theory underlying the structure and design of the Transportation Program. In particular, this report is intended to inform future evaluations of program effectiveness. The central objective of evaluation activities, which are undertaken regularly for NYSERDA programs, is to support program accountability and foster continuous program improvement. Evaluation may also provide actionable insights to support future funding decisions or interim modifications of active programs. This Logic Model Report considers the following key questions in the context of the Transportation Program:

[1] NYSERDA. 2013. Draft Final Transportation Group Strategic Plan. January 2013.

[2] NYSERDA. 2015. Case 14-M-0094, Proceeding on Motion of the Commission to Consider a Clean Energy Fund, Clean Energy Fund Information Supplement. June 25, 2015. Pages 142-145.

[3] NYSERDA. 2013. Draft Final Transportation Group Strategic Plan. January 2013.

- What are the desired outputs and short-, mid-, and long-term outcomes of this program?
- What indicator data could be used to analyze progress towards these outputs and outcomes?
- What are the logical relationships between program activities and the desired outputs and outcomes?

1.1 Targeted Problem

Although total transportation energy consumption in New York State has declined in recent years, the transportation sector remains the largest consumer of energy in New York State. In 2011, the transportation sector alone consumed more than 999 trillion Btus of energy, or 38 percent of the total energy consumed in the state. Approximately 92 percent of this energy came from petroleum products, such as motor gasoline and diesel.[4] As a result of its reliance on the combustion of petroleum products, the transportation sector was responsible for more than 72 million tons of CO_2 emissions (equivalent in 2011).[5]

Energy use by the transportation sector has both localized and widespread effects on human health, the environment, and the economy. Air emissions from a variety of pollutants contribute to local and regional air quality, and CO_2 emissions contribute to global climate change. In addition, statewide expenditures for transportation energy were nearly $27 billion in 2011. More than 98 percent of this figure was spent on petroleum products.[6] Approximately 45 percent of petroleum products consumed in all sectors in New York State were sourced from foreign countries. As a result, reducing fossil fuel consumption and diversifying the energy consumed by the transportation sector have important implications for local, regional, and global environmental quality, national security, and the New York State economy.[7]

Exhibit 1-1 shows the current barriers to reducing and diversifying the energy consumed by the transportation sector in New York.

[4] NYSERDA. 2013. *Patterns and Trends – New York State Energy Profiles: 1997–2011*. June 2013. Available at: https://www.nyserda.ny.gov/-/media/Files/Publications/Energy-Analysis/1997-2011-patterns-and-trends-report.pdf.

[5] Ibid.

[6] NYSERDA. 2013. Draft Final Transportation Group Strategic Plan. January 2013.

[7] Ibid.

Exhibit 1-1. Barriers to the Reduction and Diversification of Transportation Energy Consumption in New York State

Problem Area and Barrier Details	Stakeholders Impacted and/or Involved
TECHNICAL BARRIERS	
• Because the transportation sector encompasses a broad range of technologies (e.g., surface, marine, and air transportation), improving the efficiency of the sector requires specialized expertise in a wide range of products, technologies, and strategies. • Given the magnitude of transportation energy consumption relative to other sectors, achieving meaningful energy and emissions reductions is a considerable challenge. • New products and technologies must maintain compatibility with existing transportation infrastructure and technologies. • New products and technologies may have limited opportunities for demonstrations and/or replications.	Product developers, product manufacturers, research and development (R&D) organizations, private and public industry consortia, research universities, national laboratories, technology end-users
FINANCIAL BARRIERS	
• New energy-efficient transportation products and technologies often have high initial development costs that hamper private investment. • Emissions, including greenhouse gases, are generally not priced or are under-priced, and as a result, technologies to reduce emissions require public funding for development. • Available funding is typically directed towards specific purposes and programmatic areas, limiting the types of transportation projects that can be undertaken. • The level of currently available funding is insufficient given the magnitude of transportation energy consumption relative to other sectors.	Product developers, product manufacturers, private sector investors, R&D organizations, private and public industry consortia, research universities, national laboratories, regulatory agencies
INSTITUTIONAL BARRIERS	
• Collaboration is needed to leverage investments to solve critical problems that are common to multiple stakeholders. • Collaboration is needed to connect private technology developers to public agencies to promote public benefit projects. • As the transportation sector continues to change, research plans must be developed and implemented to address new issues and to adapt to changing conditions. • New products and technologies must maintain compatibility with current rules, regulations, standards, and rating systems in the short term. In the long term, those rules, regulations, standards, and rating systems may need to change to adapt to new technologies.	Private sector investors, R&D organizations, private and public industry consortia, research universities, national laboratories, Transportation and Climate Initiative, Regional Greenhouse Gas Initiative, regulatory agencies (e.g., New York State Department of Transportation), private and public rating organizations, product developers

Problem Area and Barrier Details	Stakeholders Impacted and/or Involved
INFORMATIONAL BARRIERS	
• Some types of transportation projects, such as alternative fuels R&D, are highly visible. Other types of projects, such as transportation planning and transportation demand management (TDM), are less visible and therefore attract less support. • End-users, suppliers, and investors may not be aware that certain types of technologies exist, or of the benefits of those technologies. • End-users, suppliers, and investors may also be risk-averse or resistant to the adoption of new technologies.	Private sector investors, R&D organizations, technology end-users, technology suppliers (wholesale and retailers)

1.2 Program Design

As described above, the Transportation Program encompasses the Development, Demonstration, and Deployment areas.

Exhibit 1-2 characterizes the key relationships among the three areas, which undertake the following activities:

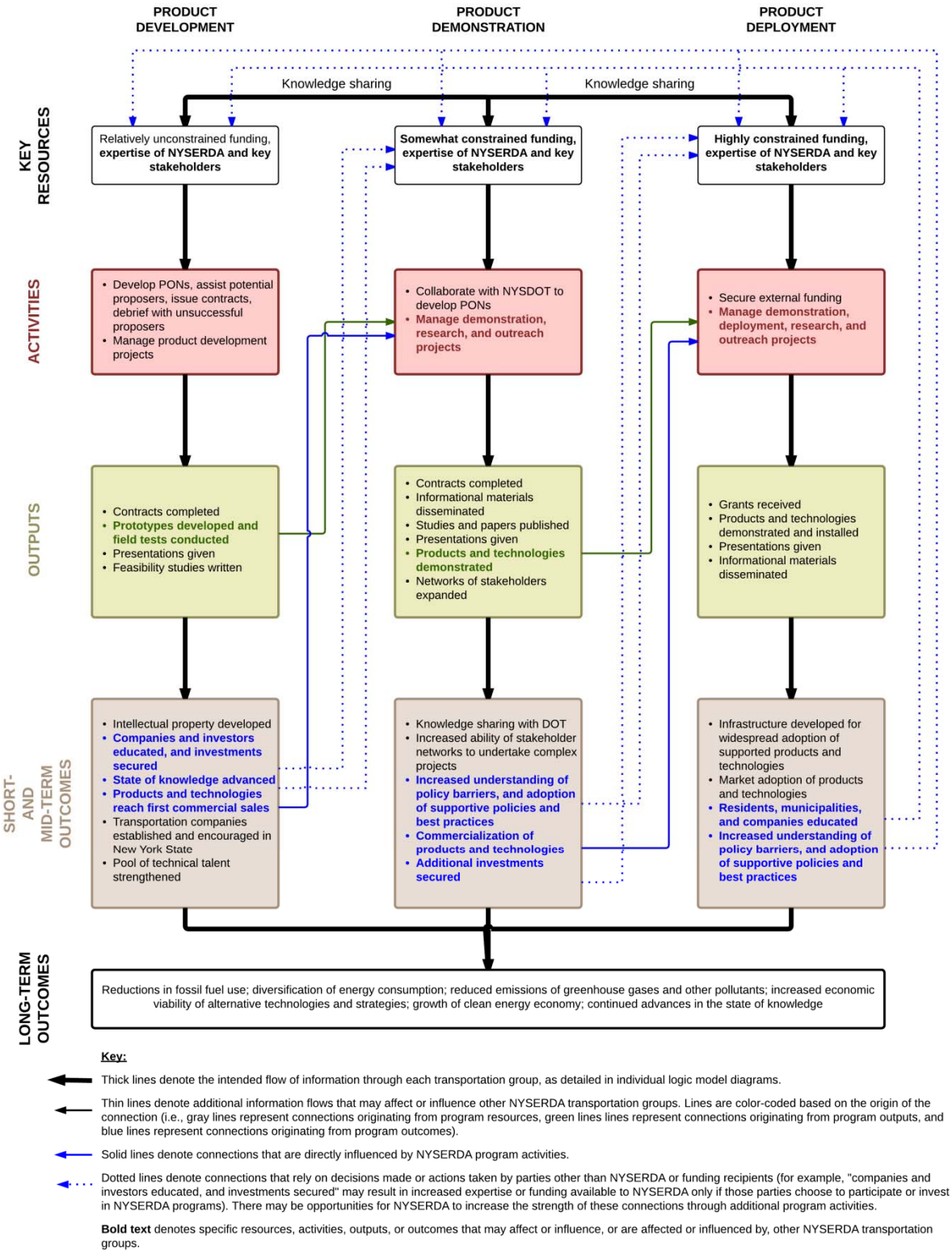
- **Research studies** aimed at exploring new policy, business, or regulatory models; advanced concepts; or innovative product or technology development opportunities.
- **Engineering studies** that assess the feasibility and effectiveness of demonstrating new or underutilized technologies at a New York site. The studies are intended to support product development activity, such as site assessment, economic analysis, technical compatibility, and permitting issues associated with potential demonstration projects.
- **New product development** and commercialization of products with the potential to improve the efficiency and environmental performance of the transportation sector (*Development*).
- **Demonstrations** of underutilized commercial technologies that have been successfully deployed elsewhere but not significantly adopted by the market in New York State (*Demonstration and Deployment*). Within the Demonstration area, a separate category of demonstration projects focuses on the implementation of projects that require collaboration among large groups of diverse stakeholders.
- **Installations** that increase the end-use of proven products and technologies that are commercially available but not yet widely adopted by the market (*Deployment*).
- **Outreach, education, and stakeholder engagement** to increase awareness of or provide technical assistance for supported products and technologies that improve the efficiency or environmental performance of the transportation sector.

The three areas work toward the common goal of improving transportation energy efficiency in New York State, although each is focused on a different stage of the R&D innovation chain.[8] As described in Section 3 below, each area has its own funding sources and constraints. The program structure gives rise to several implementation challenges and opportunities:

- Historically, R&D programs and deployment programs have been managed separately within NYSERDA. In contrast, the Transportation Program represents a first step towards more integrated, sector-based management. While this structure may increase opportunities for program coordination and the sharing of technical expertise, it also adds complexity to program management due to the larger number and greater diversity of activities, products, technologies, and strategies that must be managed within the context of a single program.
- Variation in the amount of funding available from year to year makes the planning and coordination of multi-year strategies difficult. The initiatives of the Transportation Program, particularly the Deployment area, require program staff to spend time identifying and pursuing external funding opportunities. Current staffing levels limit the program's ability to undertake these activities.
- The Transportation Program's reliance on highly constrained external funding sources, particularly within the Deployment area, suggests the need for highly visible projects that can attract funding. The low visibility of certain types of projects, such as transportation planning, may directly affect the ability of the program to raise sufficient funding to undertake those activities, even if those activities may have large impacts. As another example, product development funding has, in recent years, been focused primarily on electric transportation, restricting the ability of the Product Development area to support non-electric transportation projects.
- The initiatives of the Transportation Program require collaboration with multiple partnerships and external agencies, including the New York State Department of Transportation (NYSDOT), the Port Authority, the multi-state Transportation and Climate Initiative, and the multi-state Regional Greenhouse Gas Initiative. While the number and diversity of stakeholders offer opportunities for increased technical expertise and strategic support, they also create coordination challenges.

[8] The innovation chain is a broad concept used to describe the various stages of the research and development process. The innovation chain begins with product development and commercialization, and proceeds through successful demonstrations and deployment to full market adoption. In the context of the Transportation Program, the Development area represents the earliest stage of the innovation chain, followed by the Demonstration area and then by the Deployment area. A related concept used by many NYSERDA programs is the Technology Readiness Level (TRL) system. The TRL system characterizes the technical maturity of products and technologies using a numerical scale from 1 to 9. The scale corresponds to the following stages: basic technology research, research to prove feasibility, technology development, technology demonstration, system commissioning, and system operations. The TRL system does not cover the full range of the innovation chain because it excludes commercialization and market adoption, but the TRL system exemplifies the idea of trying to benchmark product progress in a quantitative framework to improve evaluation.

Exhibit 1-2. Relationships Among Product Development, Demonstration, and Deployment Areas



2 Program Objectives (High Level)

Through reviewing NYSERDA's Transportation Group Strategic Plan, the Operating Plan for Technology and Market Development Programs (2012-2016), and other materials, IEc has identified the following objectives for the Development, Demonstration, and Deployment areas:

2.1 Short-Term/Mid-Term (1-4 Years)

All areas:

- Secure investments (including grants, cost-share funding, and additional, external leveraged funding) for supported products and technologies.
- Receive an ample number of high quality Program Opportunity Notice (PON) proposals.
- Improve implementation of funded projects.
- Disseminate reports to be read by external audiences.
- Educate New York State residents, municipalities, companies, and investors about supported transportation products and technologies, available incentives, and investment opportunities.

Development:

- Encourage the establishment of transportation technology companies in New York State.
- Develop patents, trade secrets, other proof of concept, and business plans for supported products and technologies.
- Realize first commercial sales for supported products and technologies, and receive associated recoupment.
- Develop and strengthen the pool of technical talent in New York State.
- Advance the state of knowledge throughout the New York State market (e.g., through the development of new intellectual property and policymaker awareness).

Demonstration:

- Increase the level of knowledge sharing between NYSERDA and NYSDOT.
- Improve implementation of the project portfolio to ensure that NYSERDA, NYSDOT, and New York State priorities are represented.
- Increase policymakers' understanding of barriers and solutions to the adoption of underutilized commercial transportation technologies and strategies.
- Encourage the adoption of policies and best practices to support the market adoption of underutilized commercial transportation technologies and strategies.
- Increase awareness and knowledge of underutilized commercial transportation technologies and strategies by key stakeholders.
- Increase the production, sales, and market adoption of supported products and technologies.
- Increase the ability of stakeholder networks to undertake complex transportation projects.
- Complete complex transportation projects that overcome adoption barriers through coordinated action.

Deployment:

- Encourage the development of infrastructure necessary for widespread adoption of supported products and technologies.
- Realize sales of supported products and technologies in new markets.
- Increase sales of supported products and technologies, including increasing registrations of EVs in New York State.
- Encourage market adoption of supported products and technologies, including EVs, to the point that further incentives are not necessary.
- Increase understanding by policymakers of barriers and solutions to the adoption of advanced transportation technologies and strategies.
- Encourage the adoption of policies and best practices by governments and municipalities to support advanced transportation technologies and strategies.

2.2 Long-Term (5+ Years)

All areas, unless otherwise noted:

- Reduce fossil fuel use by the transportation sector.
- Diversify energy consumption in the transportation sector.
- Reduce emissions of greenhouse gases and other pollutants.
- Increase economic viability of alternative transportation technologies and strategies (*Demonstration and Deployment*).
- Grow the clean energy economy in New York State—for example, through job creation.
- Continue to advance the state of knowledge regarding transportation technologies.

3 Program Resources

As outlined in NYSERDA's Draft Final Transportation Group Strategic Plan, the program receives funding from multiple sources, including both state and federal funds. Federal funding sources accounted for nearly half of total program funding between 2009 and 2013. These funds are primarily associated with the Congestion Mitigation and Air Quality Improvement Program (CMAQ), which is administered jointly by the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA). In addition, the Transportation Program receives federal funds from the U.S. Environmental Protection Agency (EPA) and the U.S. Department of Energy (DOE). The remainder of the Transportation Program's funding comes from state sources, including appropriations, the New York State Urban Development Corporation (UDC), the System Benefits Charge (SBC, also referred to as Technology and Market Development, or T&MD, funding; this source is expected to be replaced by the CEF in 2016), settlement funds, NYSDOT State Planning and Research (SPR) funds, and the Clean Water/Clean Air Bond Act.[9]

On average, NYSERDA spends approximately $4 million per year on transportation activities managed by the Development area and approximately $6 million per year on activities managed by the Demonstration area.[10] The Demonstration area leverages significant funding from NYSDOT, which co-manages many projects with NYSERDA staff.

In addition, the Deployment area spends approximately $12 million per year on the deployment of advanced transportation technologies and products.[11] Funding for the Deployment area varies widely from year to year as a result of the area's reliance on external grants. Deployment funding has ranged from approximately $5 million to $25 million in recent years.[12] Because of this reliance on grant funding, available funding for the Deployment area tends to be directed towards specific purposes and programmatic areas, limiting the types of projects that can be undertaken. In contrast, funding received by the Development area is relatively unconstrained.

Exhibit 3-1 summarizes average annual funding amounts and sources for the Transportation Program.

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[9] Although the Transportation Program may use T&MD funds for a number of activities across the three areas, one significant, ongoing use of T&MD funds is for the Electric Vehicle Infrastructure initiative, which is implemented by the Deployment area. This initiative is outlined in NYSERDA's *Operating Plan for Technology and Market Development Programs (2012-2016)*. [See: NYSERDA. 2013. *NYSERDA Operating Plan for Technology and Market Development Programs (2012-2016).* System Benefits Charge, Second Revision February 15, 2013. Available at: https://www.nyserda.ny.gov/Energy-Data-and-Prices-Planning-and-Policy/Program-Planning/System-Benefits-Charge.aspx.]

[10] Personal communication with Transportation Program staff and NYSERDA evaluation staff on October 16, 20, and 22, 2014.

[11] Ibid.

[12] NYSERDA. 2013. Draft Final Transportation Group Strategic Plan. January 2013.

Exhibit 3-1. Approximate Average Annual Funding Allocated to the Transportation Program

Program Area	Funding by Source (million $)				
	T&MD	RGGI	NYSDOT	Other	Total
Development	$1.0	$1.5	$0	$1.25	**$3.75**
Demonstration	$2.5	$0	$2.0	$1.0	**$5.5**
Deployment	$0	$3.0	$0	$9.0	**$12.0**
Total (Percent)	**$3.5 (16%)**	**$4.5 (21%)**	**$2.0 (9%)**	**$11.25 (53%)**	**$21.25 (100%)**

Notes:
1. Average values were provided by Transportation Program staff.
2. The "Other" category includes all funding sources not otherwise listed, such as regulatory funding, grants, and legislative funding.

In comparison with the approximately $21 million allocated to the NYSERDA Transportation Program each year, statewide expenditures for transportation energy consumption were nearly $27 billion in 2011, 98 percent of which was spent on petroleum products.[13] As described in Section 1, the transportation sector was responsible for 38 percent of total energy consumed in New York State, and more than 72 million tons of CO_2-equivalent emissions, in 2011.[14]

Additionally, only T&MD, RGGI, and past SBC funds include dedicated program evaluation funds. Because the majority of the Transportation Program's funding comes from other sources, most program activities do not undergo evaluation. The inability to highlight the program's successes could limit NYSERDA's ability to effectively attract and target additional funds in the future.

The NYSERDA staff that manage and oversee the Transportation Program have been developing and managing transportation projects for over 20 years. Their expertise spans all stages of the innovation chain, from technology and product development to support for strategic business partnerships. Transportation Program staff regularly share knowledge among areas. In addition, program staff collaborate with other NYSERDA departments (e.g., NYSERDA Entrepreneurs-in-Residence), although interdepartmental relationships could be strengthened to fully utilize NYSERDA's expertise and resources. Transportation Program staff bring this background of program management experience, market knowledge, and technical expertise to the development and management of the Transportation Program.

Exhibit 3-2 shows the financial, staff, external, and intangible resources available to the program.

Exhibit 3-2. Program Resources

[13] NYSERDA. 2013. Draft Final Transportation Group Strategic Plan. January 2013.

[14] NYSERDA. 2013. *Patterns and Trends – New York State Energy Profiles: 1997–2011*. June 2013. Available at: https://www.nyserda.ny.gov/-/media/Files/Publications/Energy-Analysis/1997-2011-patterns-and-trends-report.pdf.

FUNDING
• Federal, state, and other funding, including statutory, T&MD, and Regional Greenhouse Gas Initiative (RGGI) funding
NYSERDA STAFF RESOURCES
• Staff knowledge and time • Expertise of the Technical Evaluation Panel (TEP) • Expertise of NYSERDA business development staff
EXTERNAL RESOURCES
• Experience of funding recipients • Expertise of NYSDOT project managers • Expertise of technical contractors • Expertise of multi-state organizations such as the Transportation and Climate Initiative, Regional Greenhouse Gas Initiative, and Zero Emission Vehicle Program Implementation Task Force
INTANGIBLE RESOURCES
• NYSERDA's relationship with market actors and stakeholders • NYSERDA's organizational reputation

4 Program Activities

This section provides a description of NYSERDA's activities under the Transportation Program. These activities fall into five major categories:

- ***General Project Management:*** The program awards funding to a wide range of projects, based on the recommendations of the TEP. Projects seek to: develop innovative products and technologies that will increase the efficiency or environmental performance of the transportation sector; support market adoption of such products and technologies; and/or disseminate information to end-users and industry stakeholders. The three transportation areas use a competitive solicitation process to identify and award funding to promising projects that seek to increase transportation efficiency and environmental performance in New York State. In addition, the Deployment area uses an open enrollment process, which provides funding to participants for the installation of proven products and technologies. Projects are generally funded through Program Opportunity Notices (PONs).[15] Since the initiation of the T&MD funding cycle in 2012, numerous PONs have been issued by the Transportation Program, including PONs 1896, 2301, 2584, 2618, 2755, 2781, and 2881. Funding for these PONs comes from both T&MD and other sources.

  The PON development and project management process is broadly similar across the three areas. This process is summarized in the text box below. However, the process differs among the areas in two key ways.

  First, the level of effort necessary to identify funding sources and the restrictiveness of various funding sources differs widely among sources and NYSERDA transportation areas. For example, the Development area generally receives relatively unconstrained funding, and as a result, can support a variety of technologies. The Demonstration area receives much of its funding from NYSDOT as part of their co-management agreement; as a result of this agreement, projects funded through the Demonstration area necessarily reflect NYSDOT, as well as NYSERDA, priorities. The Deployment area must identify or solicit funding (i.e., grants). Because grant conditions generally limit the scope of eligible activities, Deployment projects are restricted to a much narrower selection of technologies than the other two transportation areas. As a result, PONs generally become more focused when moving along the innovation chain from Development to Demonstration to Deployment.

  Additionally, because of the high level of investment risk inherent in product development efforts, the Development area may fund projects in phases through staged funding arrangements or offer specialized business and regulatory support. Staged funding arrangements, which may vary by project, require that program staff closely

[15] An exception to this is the New York Truck – Voucher Incentive Program, which is managed by the Deployment area and relies on a simplified purchase voucher application rather than a traditional PON proposal.

monitor projects during each phase to assess progress toward contractual milestones, issue "Go/No Go" decisions determining whether additional funding should be granted, and, when requested, debrief with funding recipients who do not continue to advance. Staged funding arrangements are designed to identify and mitigate investment risk. In particular, "Go/No Go" decisions occur only after significant product development milestones, such as the completion of a feasibility study or demonstration. In addition, to increase the likelihood of commercialization for new products and technologies, Development staff may work with funding recipients to minimize regulatory and legal barriers through coordination with policymakers, and to increase market readiness through market analysis and development of business plans.[16]

NYSERDA PROJECT MANAGEMENT PROCESS

For competitive solicitations, the NYSERDA project management process begins with development of a PON. At this stage, program staff must identify specific funding sources and amounts, and submit a Project Planning Request (PPR) to NYSERDA management. Once the PON has been posted publicly, program staff may spend a significant amount of time providing information to potential proposers. Information and feedback may address both technical and business development aspects and challenges related to specific projects. The aim of providing such input prior to the project review process is to ensure that proposals received are high quality and complete with regard to the resources and expertise needed for project success. In the context of the Transportation Program, all three areas provide this type of feedback. However, particular emphasis is placed on this activity by the Development area due to the risks inherent in product development efforts.

Once proposals have been submitted to NYSERDA, program staff create an ad hoc TEP with majority non-NYSERDA membership to review and rank proposals on their technical merit. Based on this review, the TEP recommends specific projects to receive funding. Program staff then form an interdepartmental team to develop, and obtain senior NYSERDA management approval for, detailed recommendations for funding amounts and contract provisions.

Following issuance of funding award letters, program staff work with contract specialists and legal staff to develop contracts specific to each project. The negotiation of these contracts can require substantial effort from program staff. For example, within the Transportation Program, the Development area routinely negotiates contract terms to set specific requirements for the product to be supported and to ensure that recipients have identified strategic business partners and other external technical expertise as needed. Occasionally, these negotiations may fail to produce a signed contract, but are generally assumed to increase the quality of funded projects. When requested, program staff also provide feedback to unsuccessful proposers following the issuance of funding non-award letters.

Finally, all three areas execute standard project close-out activities, including writing and filing final project reports, releasing retainage, drafting any necessary memos to file, and managing the disposition of equipment and patents. These activities differ by project but are common to all three areas.

[16] In particular, the Development area may help product designers identify regulations or permitting requirements that could hinder commercialization and market adoption of the new product, and will help product designers coordinate with policymakers to change these barriers. To assist with business development and market readiness, the Development area may help product designers create business plans or assess the potential market for their new products.

- ***Research and Engineering Studies:*** All three areas support research projects focused on addressing policy, market, or technical barriers to the adoption of transportation technologies and strategies. The type of research funded most frequently by each area reflects that area's position along the innovation chain. For example, the Development area tends to support feasibility research for new product development efforts, but does not generally conduct policy research. In contrast, the Demonstration and Deployment areas focus on policy and market research to encourage the adoption of supported products and technologies.
- ***New Product Development:*** New product development efforts are primarily supported by the Development area, which focuses on supporting new products and technologies to the point of first commercial sale. Subsequent validation of underutilized commercial products and technologies, which may include but are not limited to products and technologies supported by the Development area, is generally managed by the Demonstration area.[17] The Deployment area then works to encourage market adoption of underutilized products and technologies, which are also not limited to products and technologies previously supported by NYSERDA. In addition, because of New York State's current prioritization of increasing EV registrations under the "Charge NY" initiative, the Deployment area has also overseen a number of projects related to EV infrastructure.[18] To date, these projects have been considered part of the Deployment area for management purposes, but may include both product demonstrations and deployment efforts.
- ***Demonstration and Installation Projects:*** Validation of underutilized commercial products and technologies is generally managed by the Demonstration area. However, demonstration projects may be conducted by any of the three areas. Within the Development area, demonstrations most frequently take the form of field testing new products. Within the Deployment area, demonstrations focus on demonstrating a product or technology in a specific market context. In contrast, the installation projects managed by the Deployment area focus on rapidly increasing the market adoption of a proven technology, and are funded via open enrollment rather than competitive solicitations. As noted previously, the Demonstration area has a separate category of projects focused on demonstrating solutions to complex transportation projects that require collaboration among large areas of diverse stakeholders. For example, the Demonstration area recently supported the establishment and activities of a Transportation Management Association at Buffalo Niagara Medical Campus, which is a consortium of nine healthcare, research, and educational institutions in the City of Buffalo. This Association aims to reduce the

[17] As described in PON 2881, a commercial technology is defined as "a product, such as an item, material, component, subsystem, or system, applicable to transportation and sold or traded in reasonable quantities on the open market within the course of normal business operations at prices based on established catalog or market prices with industry-standard deliveries, terms, and warranties."

[18] "Governor Cuomo Announces the Installation of Hundreds of Electric Vehicle Charging Stations." Governor's Press Office. April 11, 2013. Available at: https://www.governor.ny.gov/press/04112013-hundreds-of-electric-vehicle-charging-stations.

use of single-occupant vehicles and promote the use of alternative transportation modes among employees at Buffalo Niagara Medical Campus.[19]

- ***Outreach, Education, and Stakeholder Engagement:*** Outreach, education, and stakeholder engagement are important to all three areas, although their specific activities differ. For example, because of the intellectual property concerns inherent in new product development, the Development area generally does not seek to publish or otherwise disseminate project findings, like the other two areas. However, the Development area may encourage funding recipients to prepare information for dissemination for high-interest products or technologies. Such dissemination could include presentations at conferences, workshops, or press events, or the distribution of press releases. In contrast, the Demonstration and Deployment areas frequently produce and disseminate research studies, white papers, final project reports, brochures, electronic information, training programs, and presentations. The Deployment area also works with industry organizations to recognize leading adopters of supported products and technologies. All three areas also focus on developing relationships with key stakeholders. These relationships may help to identify funding opportunities (e.g., grants from key stakeholders obtained by the Deployment area), increase the expertise available to NYSERDA (e.g., expertise of the multi-state Transportation and Climate Initiative), or encourage action by external partners outside of the NYSERDA PON process. These relationships are both an important resource for the Transportation Program and the outcome of staff efforts.

[19] NYSERDA. 2014. Advancing Transportation Demand Management Strategies at the Buffalo Niagara Medical Campus. Final Report. May 2014. Report Number 14-17.

5 Program Outputs

This section describes the anticipated short-term results (i.e., outputs) associated with the activities of the Development, Demonstration, and Deployment areas. Outputs are the direct and measurable results of specific program activities. Outputs tend to be easily identified and quantified, often by reviewing program records, and are typically prioritized for process evaluations.

Exhibit 5-1 identifies specific outputs associated with the activities of each area, as well as related indicators, data sources, and potential data collection approaches. To emphasize the unique focus of each program area, the logic model diagrams in Section 6 of this report do not include all applicable outputs for each area. For example, issuing PONs is an activity conducted by each area, but is only included in the diagrams for the Development and Deployment areas to emphasize the extent to which those areas undertake actions (e.g., assistance for potential proposers, identification of funding sources) prior to project initiation. **Exhibit 5-1** lists all relevant areas for each output, but uses italicized text to indicate areas for which that output is not included in the logic model diagram. For additional detail on the relationship between activities and outputs, see the logic model diagrams in Section 6 of this report.

Exhibit 5-1 also presents all relevant indicators that could be used to assess progress toward program outputs. The specific outputs and associated indicators that are a high priority for evaluation are denoted with bold text. For additional information on these indicators, see the Transportation Program Evaluation Readiness Review.[20]

[20] NYSERDA. 2015. Transportation Program: Product Development, Product Demonstration, and Product Deployment. Final Evaluation Readiness Review. Prepared by Industrial Economics, Inc. July 2015.

Exhibit 5-1. Outputs, Indicators, and Potential Data Sources for Transportation Program Activities

Outputs[1, 2]	Indicators[2]	Data Sources and Potential Collection Approaches	Associated Area[3]
OUTPUTS FROM GENERAL PROJECT MANAGEMENT			
PONs written and issued	Number of PONs issued	Review of NYSERDA website	Development, *Demonstration*, Deployment
Funding award and non-award letters issued	Number of proposals received Number of award letters issued Number and percentage of proposals selected for award Number and percentage of awards accepted	TEP packets	Development, *Demonstration*, *Deployment*
Contracts issued with requirements for product/technology development and potential business development activities	Number and description of contracts issued	Review of NYSERDA website; contract summaries from program staff	Development
"Go/No Go" decisions issued for efforts funded through stage-gate process	Number of "Go/No Go" decisions issued Number and percentage of projects that result in a "Go" versus a "No Go" decision	Program staff project management files	Development
Individual projects contracted and managed	**Number of projects initiated (signed contracts), in progress, completed, and terminated**	R&D Metrics Database; deployment tracking spreadsheets	*Development*, Demonstration, *Deployment*
Funding applications submitted	Number and dollar value of funding applications submitted	Program management files from program staff	Deployment
OUTPUTS FROM PRODUCT DEVELOPMENT, DEMONSTRATION, AND INSTALLATION ACTIVITIES			
Prototypes developed or field tests conducted for supported products and technologies	Number and description of prototypes developed Number and results of field tests conducted	R&D Metrics Database; program staff project management files	Development

Outputs[1, 2]	Indicators[2]	Data Sources and Potential Collection Approaches	Associated Area[3]
New or underutilized products, technologies, or business models demonstrated in specific applications that advance market readiness	**Number, description, and results of technology demonstrations**	R&D Metrics Database	Demonstration, Deployment
Proven products and technologies installed throughout New York State	**Number and locations of installations of a given product/technology, including EV charging stations** Customer usage counts for installations	R&D Metrics Database; deployment tracking spreadsheets; industry data, such as data from Clean Edge; case study interviews with funding recipients	Deployment
OUTPUTS FROM RESEARCH AND ENGINEERING STUDIES			
Research studies and white papers written, published, or disseminated to policymakers	**Number of research studies and white papers published** **Number of downloads or hard copy distributions of individual studies or papers** Number of research studies and white papers written by or submitted to NYSERDA Number of research studies and white papers disseminated to policymakers (number of unique studies and papers disseminated, and number of copies of each) Number of policymakers provided with research studies and white papers	R&D Metrics Database; review of NYSERDA website; case study interviews with program staff; NYSERDA web statistics	Demonstration, Deployment
Feasibility or market studies completed for supported products and technologies	Number of studies completed Number and percentage of products and technologies deemed feasible without substantial changes (i.e., feasibility studies that continue on to further product development)	R&D Metrics Database; program staff project management files	Development

Outputs[1, 2]	Indicators[2]	Data Sources and Potential Collection Approaches	Associated Area[3]
OUTPUTS FROM OUTREACH, EDUCATION, AND STAKEHOLDER ENGAGEMENT			
Products and technologies supported by NYSERDA, technical papers, or research findings presented at conferences, workshops, or press events, or in press releases	Number and summary of presentations, press releases, and other information dissemination sources/events Number and types of stakeholders reached through presentations, press releases, and other information dissemination sources/events	R&D Metrics Database; Program staff (event attendance, distribution lists)	Development, Demonstration, Deployment
Final project reports or policy memos written, filed, and disseminated	Number of reports and memos written and filed Number and summary of reports and memos published or disseminated externally	Final reports and memos from program staff; R&D Metrics Database; review of NYSERDA website	Development, Demonstration
Brochures and other print materials and electronic information developed and disseminated widely	Number and summary of print and electronic materials developed and disseminated Number and types of stakeholders reached through presentations, press releases, and other information dissemination sources/events	R&D Metrics Database; case study interviews with funding recipients or program staff	Demonstration, Deployment
Partnerships and networks of stakeholders expanded or created	**Number and types of partnerships and stakeholder networks supported**	Market survey and/or case study interviews with funding recipients; social network analysis	*Development*, Demonstration, Deployment

Notes:

1. Outputs may apply to more than one project category; however, this table assigns outputs to the most relevant category. For additional detail on the relationship between activities and outputs, see the logic model diagrams.
2. This exhibit presents all relevant indicators that could be used to assess progress toward program outputs. The specific outputs and associated indicators that are a high priority for evaluation are denoted with bold text.
3. To emphasize the unique focus areas of each area, the logic model diagrams in Section 6 of this report do not include all applicable outputs for each area. For example, issuing PONs is an activity conducted by each area, but is only included in the diagrams for the Development and Deployment areas to emphasize the extent to which those areas undertake actions (e.g., assistance for potential proposers, identification of funding sources) prior to project initiation. This table lists all relevant areas for each output, but uses italicized text to indicate areas for which that output is not included in the logic model diagram.

6 Program Outcomes and Logic Diagrams

This section contains the anticipated short-, mid-, and long-term outcomes of the Development, Demonstration, and Deployment areas. Outcomes are the expected effects of a program, which are often closely related to the program's goals and objectives. Outcomes include changes in awareness, behavior, or conditions. Compared to outputs, outcomes are less certain to occur and are typically prioritized as potential areas for investigation in market impact evaluations.

Exhibit 6-1 details the expected outcomes of the Transportation Program, as well as the observable indicators that would signify the presence of these outcomes. The table also shows data sources and potential data collection approaches that an evaluation might use. To emphasize the unique focus of each program area, the logic model diagrams at the end of this section do not include all applicable outcomes for each area. For example, all areas provide feedback to potential proposers, when requested, to increase the quality of proposals received. However, unlike the other two areas, the Development area places a high priority on this activity due to the particular risks and challenges faced by product developers. **Exhibit 6-1** lists all relevant areas for each outcome, but uses italicized text to indicate areas for which that outcome is not included in the logic model diagram.

Exhibit 6-1 also presents all relevant indicators that could be used to assess progress toward program outcomes. The specific outcomes and associated indicators that are a high priority for evaluation are denoted with bold text. For additional information on these indicators, see the Transportation Program Evaluation Readiness Review.[21]

[21] NYSERDA. 2015. Transportation Program: Product Development, Product Demonstration, and Product Deployment. Final Evaluation Readiness Review. Prepared by Industrial Economics, Inc. July 2015.

Exhibit 6-1. Outcomes, Indicators, and Potential Data Sources for Transportation Program Activities

Outcomes[1, 2]	Indicators[2]	Data Sources and Potential Collection Approaches	Associated Area[3]
SHORT-TERM AND MID-TERM OUTCOMES ASSOCIATED WITH GENERAL PROJECT MANAGEMENT			
Ample number of high-quality PON proposals received	**Number and percentage of unsuccessful proposers who indicate that NYSERDA's feedback was useful to their future business operations** Number and percentage of proposals received that are considered for funding, regardless of whether funding is awarded (i.e., proposals not eliminated during TEP review due to quality concerns) Number and percentage of proposers that successfully reapply for NYSERDA funding after initial rejection	TEP packets, process evaluation survey of key stakeholders	Development, *Demonstration*, *Deployment*
Improved implementation of funded projects	**Number and percentage of funding recipients that indicate the contract negotiations, work scope development (and requirements), or general management strengthened their projects** Change in number and percentage of projects reaching completion Change in average and maximum time to project completion Change in number and percentage of projects that adhere to proposed project timelines Change in number and percentage of projects that adhere to original project budgets Change in number of projects paying recoupment fees to NYSERDA Change in amount of recoupment paid to NYSERDA Number and percentage of NYSERDA staff that believe the contract negotiations, work scope development (and requirements), or general management strengthened their projects	R&D Metrics Database; program staff project management files; process evaluation survey of funding recipients; process evaluation interviews with program staff	Development, *Demonstration*, *Deployment*

Outcomes[1, 2]	Indicators[2]	Data Sources and Potential Collection Approaches	Associated Area[3]
Increased knowledge sharing between NYSERDA and NYSDOT	Number of co-managed projects Number and percentage of NYSERDA staff satisfied with co-management process Number and percentage of NYSDOT staff satisfied with co-management process Number and percentage of funding recipients satisfied with co-management process Descriptions from NYSERDA staff of knowledge gained from NYSDOT staff and how that knowledge was applied to other NYSERDA projects Descriptions from NYSDOT staff of knowledge gained from NYSERDA staff and how that knowledge was applied to other NYSDOT projects Descriptions from funding recipients of knowledge gained from NYSERDA/NYSDOT interactions and how that knowledge was applied	R&D Metrics Database; process evaluation interviews with program staff and NYSDOT staff; process evaluation survey of funding recipients	Demonstration
Improved implementation of project portfolio that represents NYSERDA, NYSDOT, and New York State priorities	Number and percentage of stated priorities of NYSERDA, NYSDOT, and New York State that are addressed by NYSERDA projects Number and percentage of projects that address stated priorities of: (1) NYSERDA, (2) NYSDOT, and (3) New York State Number and percentage of co-managed projects that are adopted by the market	CEF; NYSERDA program operating plan; planning documents for NYSDOT and New York State; R&D Metrics Database	Demonstration
Investments (including cost-share funding and external leveraged funding) secured for supported products and technologies	**Ratio of external leveraged funding to NYSERDA funding** Dollar value of cost-share funding required by project contracts Dollar value of cost-share funding invested Dollar value of external leveraged funding, broken out by private and public investment	R&D Metrics Database; program staff project management files	Development, *Demonstration*, *Deployment*

Outcomes[1, 2]	Indicators[2]	Data Sources and Potential Collection Approaches	Associated Area[3]
Transportation technology companies established and supported in New York State	Number of transportation technology companies in New York State directly supported by project contracts Number of new transportation technology companies established in New York State Change in number of employees at transportation technology companies directly supported by project contracts Number of transportation technology companies that chose to relocate outside of New York State Time spent by funding recipients with NYSERDA business development staff (number of meetings, length of meetings) Satisfaction of funding recipients with business development support provided	R&D Metrics Database; market survey of key stakeholders; records of meeting participation tracked by NYSERDA business development staff	Development
Funding secured (e.g., grants)	Dollar value and source(s) of grants received	Review of PONs; CEF and program operating plans; program management files from program staff	Deployment
SHORT-TERM AND MID-TERM OUTCOMES FROM PRODUCT DEVELOPMENT, DEMONSTRATION, AND INSTALLATION ACTIVITIES			
Patents, trade secrets, other proof of concept, or business plans developed for supported products and technologies	**Number and description of patents, trade secrets, other proof of concept, or business plans developed**	R&D Metrics Database; program staff project management files	Development
Supported products and technologies reach first commercial sales	**Number of products reaching commercial sales** **Number and dollar value of sales of supported products and technologies**	R&D Metrics Database	Development
Recoupment received by NYSERDA for sales of supported products and technologies	Dollar value of recoupment received Number of projects paying recoupment fees	R&D Metrics Database	Development

Outcomes[1, 2]	Indicators[2]	Data Sources and Potential Collection Approaches	Associated Area[3]
Infrastructure necessary for the widespread adoption of supported products and technologies developed	**Number and description of infrastructure projects (NYSERDA-funded or external) undertaken that are associated with supported products and technologies** Dollar value of external infrastructure investments associated with supported products and technologies	Market survey of key stakeholders	Deployment
Supported products and technologies realize sales in new markets	Number and dollar value of sales of supported products and technologies in new markets Number and description of market segments purchasing supported products and technologies	R&D Metrics Database; market survey of funding recipients	Deployment
Increased sales of supported products and technologies, including increased registrations of EVs in New York State	**Change in number of sales for supported products and technologies** **Change in dollar value of sales for supported products and technologies** **Change in number of EV registrations and EV charging stations in New York State**	R&D Metrics Database; industry data, such as data from Clean Edge; EV registration records from the New York State Department of Motor Vehicles (as compiled by the New York Power Authority)	*Demonstration*, Deployment
Supported products and technologies, including EVs, adopted by market without the need for further incentives	Number of sales of supported products and technologies Dollar value of sales of supported products and technologies Number of products and technologies adopted by the market Change in NYSERDA program offerings and statewide incentive levels for supported products and technologies	R&D Metrics Database; deployment tracking spreadsheets; review of data and documents from planning agencies, research organizations, or industry groups	Deployment
SHORT-TERM AND MID-TERM OUTCOMES FROM RESEARCH AND ENGINEERING STUDIES			
Increased understanding by policymakers of barriers and solutions to the adoption of underutilized transportation technologies and strategies	**Number of policy and planning decisions or documents that reflect the recommendations of NYSERDA studies/papers** Significance of policy and planning decisions to the transportation sector in New York State	Planning documents from regulatory agencies; market survey of key stakeholders	Development, Demonstration, Deployment
Adoption of policies and best practices by governments and municipalities to support the adoption of underutilized transportation technologies and strategies	**Number and description of policies and practices adopted** **Number of unique adopters of policies or practices**	Market survey of key stakeholders	Demonstration, Deployment

Outcomes[1, 2]	Indicators[2]	Data Sources and Potential Collection Approaches	Associated Area[3]
SHORT-TERM AND MID-TERM OUTCOMES FROM OUTREACH, EDUCATION, AND STAKEHOLDER ENGAGEMENT			
New York State residents, municipalities, companies, and investors educated about supported products, technologies, incentives, and investment opportunities	Number and types of audiences and stakeholders engaged Percentage of entities engaged within target audience	Program staff (contact lists, event attendance); market survey of funding recipients	Development, *Demonstration*, Deployment
Pool of technical talent in New York State developed and strengthened	Change in number of transportation technology companies in New York State Change in number of employees at transportation technology companies in New York State Time spent by funding recipients with NYSERDA business development staff (number of meetings, length of meetings) Satisfaction of funding recipients with business development support provided	Market survey of key stakeholders; process evaluation survey of funding recipients; records of meeting participation from NYSERDA business development staff	Development
Reports and memos read by external audiences, including policymakers	Number of reports and memos published externally Number and types of target audiences and stakeholders who read the reports and memos	R&D Metrics Database; review of NYSERDA website; market survey of key stakeholders	Development, *Demonstration*, *Deployment*
Knowledge advanced throughout New York State market (e.g., through development of new intellectual property)	Number and description of patents and other intellectual property developed for supported products and technologies	R&D Metrics Database	Development
Increased awareness and knowledge of underutilized commercial technologies and strategies by key stakeholders	**Change in number of companies and industry groups using supported technologies** Change in number of references to or use of supported technologies and strategies by companies and industry groups	Citation analysis; market survey of key stakeholders	Demonstration
Increased production and market adoption of supported products and technologies	**Change in number of sales and sales revenue of supported products and technologies** **Change in awareness of key stakeholders of supported products and technologies**	R&D Metrics Database; deployment tracking spreadsheets; market survey of key stakeholders	Demonstration

Outcomes[1, 2]	Indicators[2]	Data Sources and Potential Collection Approaches	Associated Area[3]
Additional investments secured for supported products and technologies	**Ratio of external leveraged funding to NYSERDA funding** Dollar value of cost-share funding Dollar value of external leveraged funding, broken out by private and public investment	R&D Metrics Database	*Development*, Demonstration, *Deployment*
Increased ability of stakeholder networks to undertake complex transportation projects in New York State	Change in the number of stakeholders in the network(s) Changes in flows of information and levels of collaboration among diverse stakeholders	Social network analysis	Demonstration
Completion of complex transportation projects that overcome adoption barriers through coordinated action	Number of large-scale, collaborative transportation projects completed Number and percentage of large-scale, collaborative transportation projects that result in the removal of one or more targeted barriers	R&D Metrics Database; case study interviews with funding recipients and program staff	Demonstration
LONG-TERM OUTCOMES			
Reductions in fossil fuel use by the transportation sector	**Change in the quantity of fossil fuel consumed by the transportation sector in New York State**	R&D Metrics Database; deployment tracking spreadsheets; NYSERDA Patterns and Trends reports; FHWA Highway Statistics Series; monitoring/measurement and verification (M&V)	Development, Demonstration, Deployment
Diversification of energy consumption in the transportation sector	**Change in the quantity and mix (percentages) of fuel sources used by the transportation sector in New York State**	R&D Metrics Database; deployment tracking spreadsheets; NYSERDA Patterns and Trends reports; M&V	Development, Demonstration, Deployment
Reduced emissions of greenhouse gases and other pollutants	**Change in emissions attributed to the transportation sector in New York State** Change in total emissions in New York State	R&D Metrics Database; deployment tracking spreadsheets; NYSERDA Patterns and Trends reports; FHWA Highway Statistics Series; M&V	Development, Demonstration, Deployment
Increased economic viability of alternative transportation technologies and strategies	Change in capital and operating costs of supported transportation technologies and strategies (e.g., costs of EV ownership)	Data and documents from planning agencies, research organizations, or industry groups	Demonstration, Deployment

Outcomes[1, 2]	Indicators[2]	Data Sources and Potential Collection Approaches	Associated Area[3]
Growth of clean energy economy in New York State	Change in the number of clean energy businesses in New York State Change in the quantity and share (percentage) of clean energy used by the transportation sector Change in sales revenue of clean energy companies in New York State Change in number and volume of clean energy venture investment deals in New York State	Data and documents from planning agencies, research organizations, or industry groups, including NYSERDA Patterns and Trends reports; market survey of key stakeholders	Development, Demonstration, Deployment
Continued advances in the state of knowledge regarding transportation technologies	Number of patents or other intellectual property developed for advanced transportation technologies	R&D Metrics Database	Development, Demonstration, Deployment

Notes:

1. Outcomes may apply to more than one project category; however, this table assigns outcomes to the most relevant category. For additional detail on the relationship between activities and outcomes, see the logic model diagrams.
2. This exhibit presents all relevant indicators that could be used to assess progress toward program outcomes. The specific outcomes and associated indicators that are a high priority for evaluation are denoted with bold text.
3. To emphasize the unique focus areas of each area, the logic model diagrams presented later in this report do not include all applicable outcomes for each area. For example, all areas provide feedback to potential proposers, when requested, to increase the quality of proposals received. However, unlike the other two areas, the Development area places a high priority on this activity due to the particular risks and challenges faced by product developers. This table lists all relevant areas for each outcome, but uses italicized text to indicate areas for which that outcome is not included in the logic model diagram.

Exhibits 6-2 through 6-4 present logic model diagrams for the three Transportation Program areas. The diagrams show causal linkages between activities, outputs, and anticipated short-, mid-, and long-term outcomes, as well as program resources and potential external influences.

Exhibit 6-2. Transportation Program Logic Diagram: Product Development

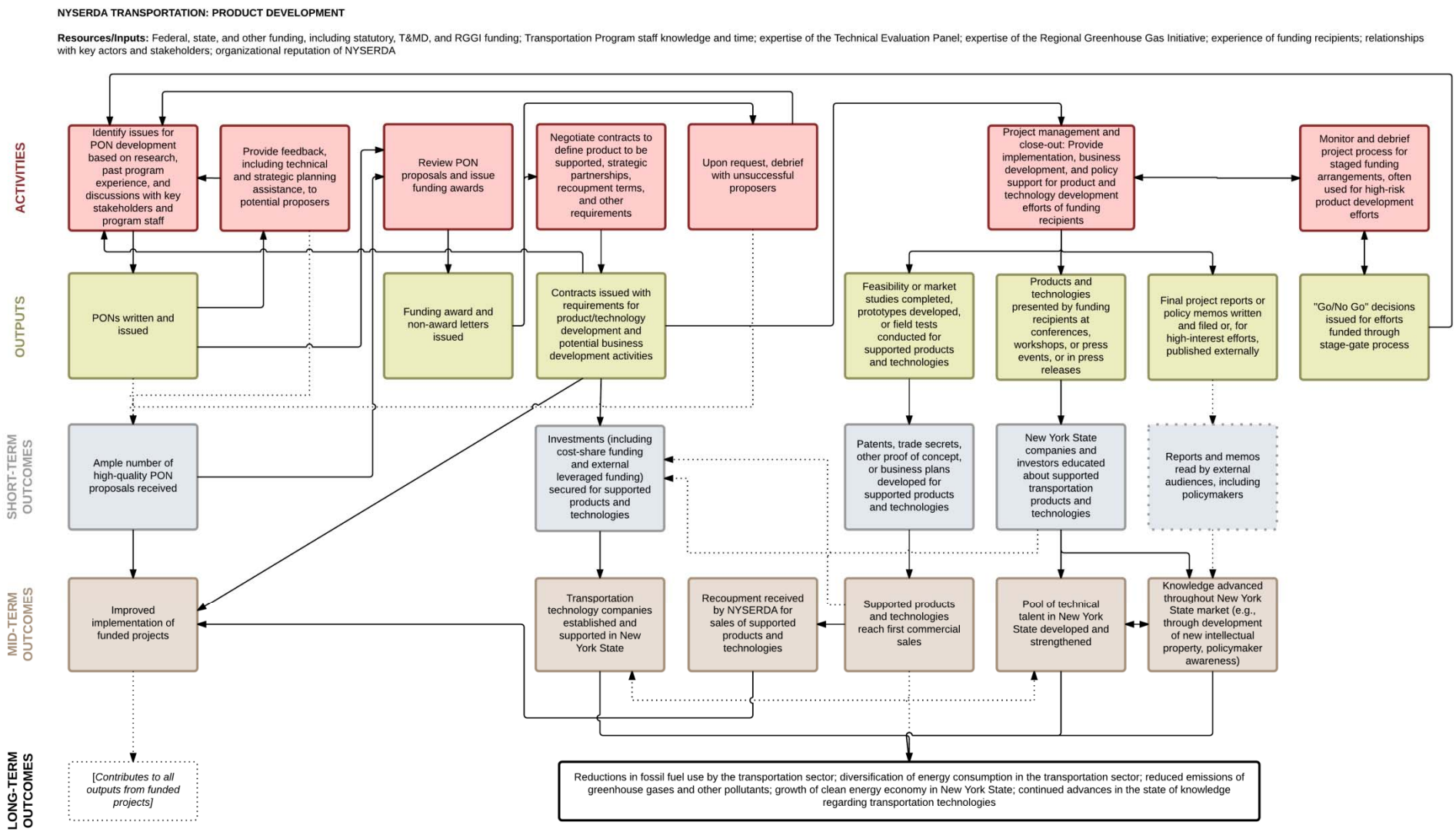


Exhibit 6-3. Transportation Program Logic Diagram: Product Demonstration

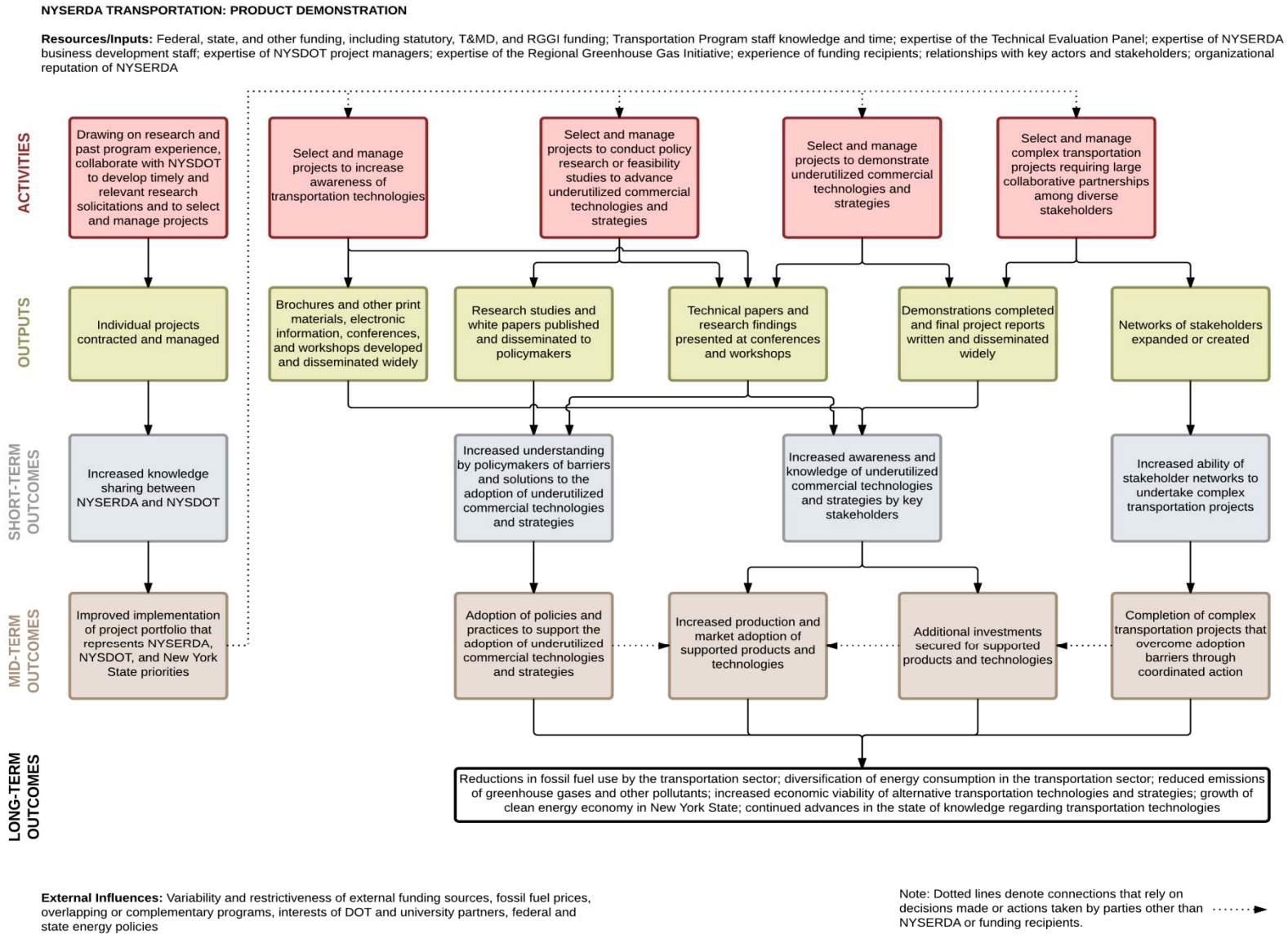
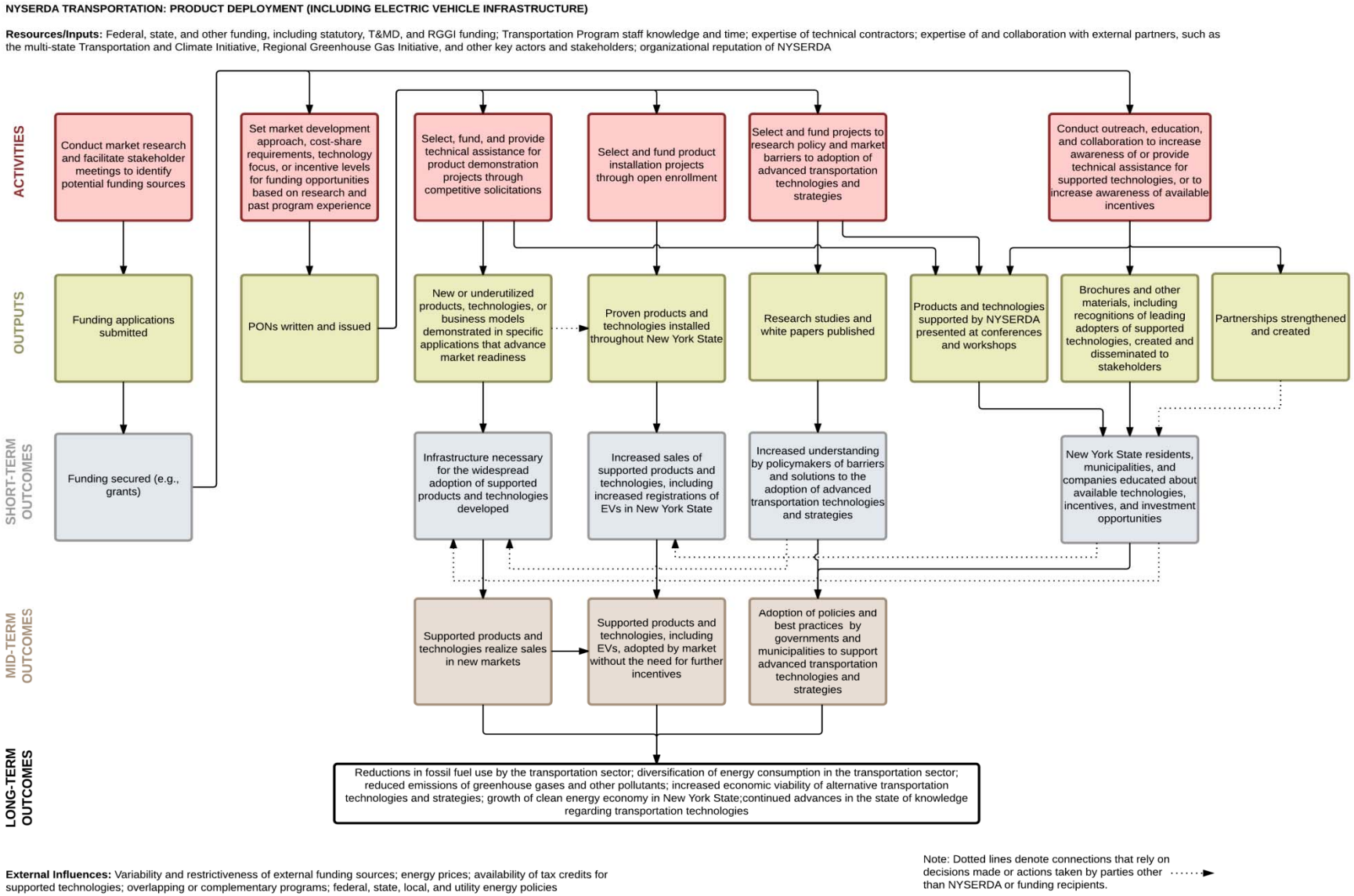


Exhibit 6-4. Transportation Program Logic Diagram: Product Deployment



7 Assumptions About Strategies

This section describes testable assumptions about the Transportation Program that may be explored in subsequent evaluations.

- Projects applying for NYSERDA funding are likely to be riskier investments than projects undertaken solely with private investment. As a result, the market adoption rate for supported products and technologies may be lower than that of the products and technologies developed without NYSERDA support.
- Information from program activities is successfully disseminated to and used by policymakers, municipalities, transportation companies, investors, end-users, and other key stakeholders.
- Information from program activities results in the adoption of advanced transportation technologies and strategies by the transportation industry and other end-users.
- Demonstrations of new and underutilized technologies inform and change behavior because key firms are involved and data is widely disseminated to influential stakeholders.
- Studies on policy and market issues lead to increased investment in transportation technologies because they are targeted at key barriers, disseminated to the appropriate market actors, and influence specific policies.
- Time spent advising and debriefing with potential and unsuccessful proposers results in higher-quality proposals in the future as a result of educating stakeholders about key considerations in transportation R&D. Alternatively, even if potential or unsuccessful proposers choose not to apply or reapply for NYSERDA funding, NYSERDA's feedback leads to continued advancements in transportation R&D through higher-quality private investments in companies that acted on NYSERDA's advice.

8 Non-Program Influences on Outcomes

This section describes the factors external to the Transportation Program that may affect program outcomes.

- ***Variability and restrictiveness of external funding sources***: As described previously, the amount and sources of funding received by the Transportation Program vary widely from year to year. In addition, funding becomes relatively more constrained in terms of technology focus for areas further along the innovation chain (i.e., Demonstration and Deployment). The variability and restrictiveness of external funding sources cannot be anticipated by NYSERDA, but affect the ability of the program to establish multi-year strategies.
- ***Fossil fuel and other energy prices***: The attractiveness of advanced transportation technologies depends in large part on the relative cost of fuel from various sources, including petroleum, natural gas, and electricity. For example, when petroleum prices drop, investment in the development of alternative transportation technologies may also decrease.
- ***Overlapping or complementary programs***: Other national, regional, and state-level programs seek to reduce or diversify transportation energy consumption or pursue other goals with potential implications for the transportation sector. These programs include research conducted by DOT (including both NYSDOT and U.S. DOT) and NYSERDA's university partners, as well as private sector initiatives. For example, because of the collaborative relationship between the Demonstration area and NYSDOT, changes in NYSDOT programs or priorities can affect the types of projects NYSERDA is able to support.
- ***Federal and state energy policies***: Investment in transportation products, technologies, and strategies can depend on existing federal and state energy policies, such as the availability of tax credits for supported technologies (e.g., EVs), fuel efficiency standards, renewable fuel standards, or state fleet efficiency requirements. The presence and stringency of such tax credits or standards can affect the willingness of stakeholders to invest in new transportation technologies. Uncertainties surrounding the duration of these policies create a high-risk climate for investors, who would not be able to engage in long-term planning or investment. One particularly relevant example of current policy influence is Governor Cuomo's "Charge NY" initiative, which established a goal of 3,000 EV charging stations and 40,000 EVs on the road in New York State by 2018.[22] This target for EV infrastructure and market adoption has directly affected the priorities of and resources available to the Deployment area.

[22] "Governor Cuomo Announces the Installation of Hundreds of Electric Vehicle Charging Stations." Governor's Press Office. April 11, 2013. Available at: https://www.governor.ny.gov/press/04112013-hundreds-of-electric-vehicle-charging-stations.

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