NYSERDA TRANSPORTATION PROGRAM MARKET CHARACTERIZATION REPORT

Volume 5: Appendices

Prepared For:

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APPENDIX A: MARKET MAP MEMO

IEc

TO Jennifer Phelps, NYSERDA

FROM Claire Santoro and Cynthia Manson, IEc

SUBJECT Conceptual Map of New York State Transportation Market

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INTRODUCTION The New York State Energy Research and Development Authority's (NYSERDA) Transportation Program focuses on reducing and diversifying the energy consumed by the state's transportation sector, with the goals of minimizing emissions and creating economic development opportunities.[1] The Transportation Program encompasses three program areas – Product Development, Product Demonstration, and Product Deployment – that target distinct phases of the innovation chain but are intertwined through staff, resources, and their long-term objectives. Beginning in 2016 with the transition to NYSERDA's Clean Energy Fund (CEF), the Transportation Program adopted three focus areas: vehicle electrification, public transportation, and mobility management.

To assist NYSERDA with program planning and design under the CEF, Industrial Economics, Inc. (IEc) is conducting a market characterization analysis (MCA) with the following objectives:

1. Identify the companies and organizations operating in New York State that could benefit from or partner with NYSERDA's Transportation Program.

2. Assess 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. Identify recent trends in the commercialization and 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. Characterize the ways in which NYSERDA's Transportation Program interacts with different parts of the transportation market.

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

The primary method employed in the MCA was a survey designed to elicit the above information from companies and organizations active in New York State's market for transportation technologies and services. To reach as many market actors as possible, IEc employed a "snowball" survey method that began with actors directly connected to the Transportation Program (Stage 1) and expanded to include actors operating in the same

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[1] NYSERDA. 2015. Transportation Program: Product Development, Product Demonstration, and Product Deployment, Program Theory and Logic Model Report. August 2015.

markets who have not yet had contact with the Transportation Program (Stage 2).[2] The Stage 1 survey was conducted between June and August 2016, and the Stage 2 survey was conducted during October 2016. The survey was administered online and over the phone.

This memorandum discusses a subset of the survey results, focusing on summarizing the design and priorities of the transportation market in New York State, as well as NYSERDA's involvement with particular market segments (objectives 1, 2, and 4). Specifically, this memorandum presents IEc's conceptual map of New York State's transportation market. Additional survey results will be discussed in IEc's market characterization report, which will address all five objectives.

CONCEPTUAL MARKET MAP

IEc developed an initial list of market elements prior to launching the MCA survey, and subsequently developed a conceptual market map based on survey results. The following sections describe IEc's preliminary list of market elements and final market map, highlighting the changes made to the list of elements based on survey results.

PRELIMINARY LIST OF MARKET ELEMENTS

IEc developed a preliminary list of market elements (sectors) based on consultative interviews with two academic experts in transportation systems, NYSERDA's concurrent effort to develop an inventory of clean energy companies in New York State, and communication with NYSERDA Transportation Program staff. The preliminary list first grouped companies by whether they focus on products (i.e., vehicles and components) or enabling infrastructure and services, and then by transportation mode or service type. The transportation sectors included in the preliminary list are as follows:

1) Vehicles and components

    a) Surface transportation

        i) Public transit

            (1) Rail or rapid transit

            (2) Buses

        ii) Light or medium duty

            (1) Electric vehicles (EVs), including hybrid EVs

            (2) Alternative fuel vehicles, other than EVs

            (3) Conventional fuel vehicles

        iii) Heavy duty or freight

            (1) Trucking or rail

    b) Air travel or transport

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[2] 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. For example, IEc began by surveying organizations known to Transportation Program staff, asked those organizations to identify others with whom they interact, and then surveyed those additional organizations.

    c) Shipping, ferrying, or other water transport

  2) Infrastructure and services

    a) Public transit infrastructure and services

    b) Alternative fuel and EV infrastructure

    c) Transportation demand management (e.g., car sharing, bike sharing, ridesourcing, behavior management)

    d) Fleet management

    e) Intelligent transportation systems (ITS; e.g., traffic and route management, lighting and signals)

    f) Infrastructure systems, excluding public transit (e.g., roads, highways, bridges, bike lanes)

FINAL MARKET MAP

IEc's market characterization survey, which was sent to 225 individuals and received 109 responses (a 48 percent response rate), asked respondents to identify all sectors from the list above with which their company or organization identifies.[3] The survey also asked for examples of products or services offered, thus enabling IEc to validate and refine the preliminary list of sectors.

As shown below in Exhibit 1, the largest number of respondents (39) identified as part of the alternative fuel/EV infrastructure sector, followed closely by light/medium duty EVs (37), and heavy duty/freight (35). Few respondents identified as part of the air transport, public transit rail/rapid transit, or other infrastructure (excluding public transit and alternative fuel/EV infrastructure) sectors. The small number of companies identifying with these sectors may reflect the relative size of the customer base for those products and services, rather than the expertise in New York State.

The distribution across sectors of survey respondents also generally mirrors the distribution of all NYSERDA-supported companies, as identified from project descriptions in NYSERDA's R&D Metrics Database. Exhibit 2 illustrates this similarity. As shown, the three sectors with the greatest number of *funded* companies also have the greatest number of survey respondents: heavy duty/freight (51 funded companies), alternative fuel/EV infrastructure (45), and light/medium duty EVs (39).

The survey also asked for information on how each company's priorities are likely to change over time; specifically, the survey asked respondents to identify the three sectors most important to their *current* operations and the three likely to be most important to operations *five years in the future*. As shown in Exhibit 3, respondents identified the same two sectors – alternative fuel/EV infrastructure and light/medium duty EVs – as the most important sectors currently *and* in five years. The largest areas of anticipated importance relative to current importance (e.g., the largest differences in the number of respondents listing a given sector as important in 2016 and five years in the future) are in the intelligent transportation systems (ITS) and infrastructure sectors.

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[3] The survey included an "Other" option for companies to specify a sector not listed.

EXHIBIT 1. SECTORS REPRESENTED BY SURVEY RESPONDENTS

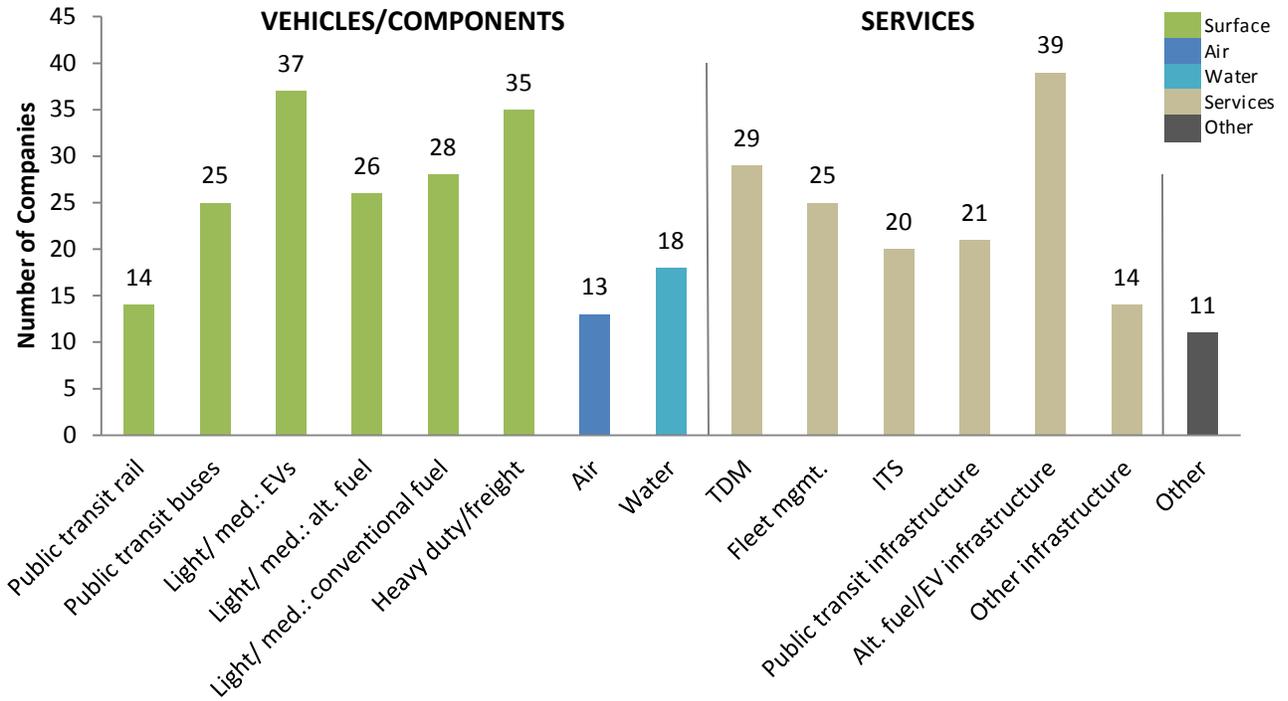*With which transportation sector(s) does your company identify? Select all that apply.*

EXHIBIT 2. SECTORS REPRESENTED BY FUNDED COMPANIES AND SURVEY RESPONDENTS
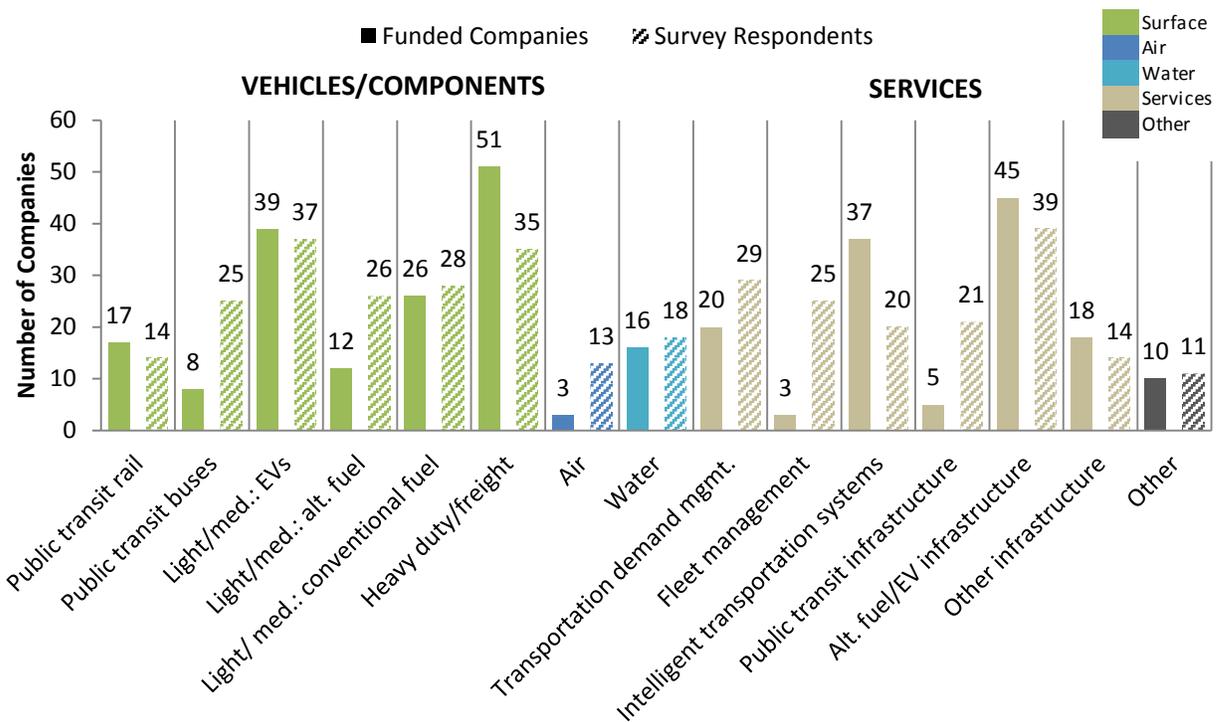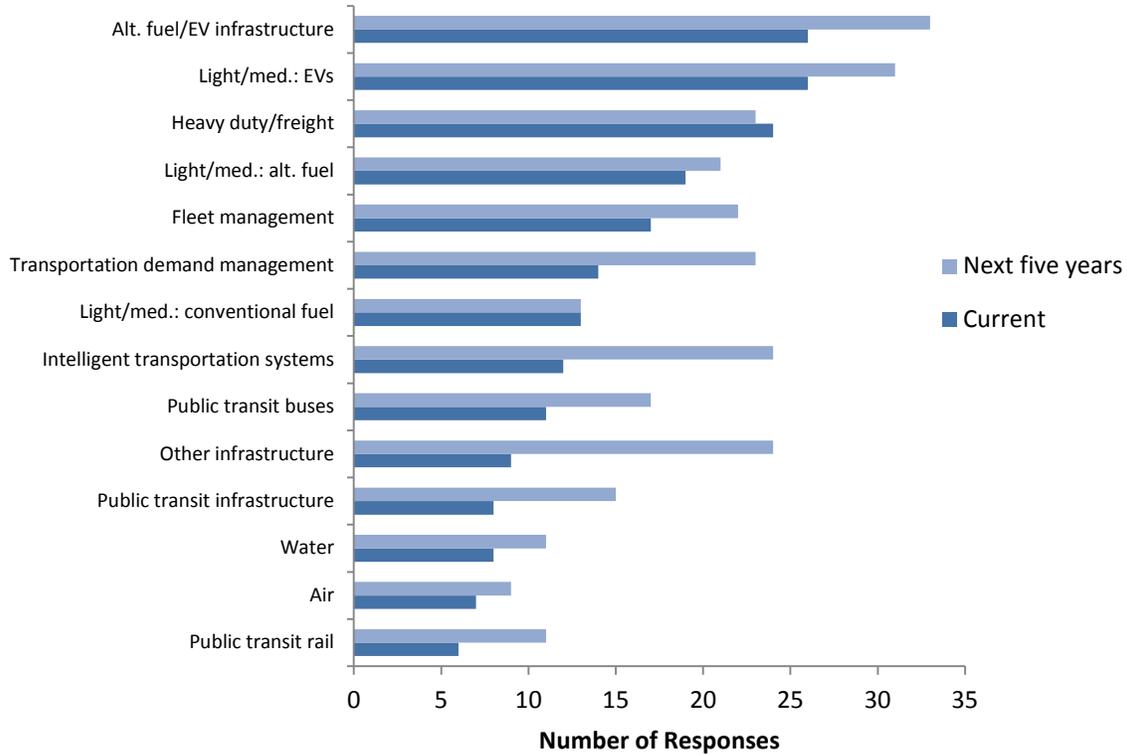
EXHIBIT 3.   CURRENT AND EMERGING IMPORTANT SECTORS

Which of the following sectors are most important to your company's revenues now and in the next five years? Select up to three.

Overall, the survey responses confirmed that the distinctions used in the preliminary list were appropriate and informative, with a few exceptions. These gaps, and the extent to which IEc addressed them in the final market map, are described below:

- **Consider potential overlap between ITS and other transportation services.** Although the survey characterized ITS as a separate transportation sector, expert reviewers noted that ITS is becoming increasingly integrated with a wide variety of services. For example, vehicle telematics is an important part of fleet management, smart charging is important for EV infrastructure, and vehicle detection is important for traffic management. For this reason, the experts recommended that ITS be considered a potential feature of other transportation services. For the final market map, IEc included traffic and route management as a separate service (it had previously been grouped with ITS), and added examples of ITS technologies into the descriptions of other services.

- **Add categories for market sectors not currently reflected in response options.** Although the survey offered respondents an "Other" option to capture all sectors not listed, a few additional sectors emerged as more distinct or potentially larger than anticipated. These include:

A-6

o **Materials** (e.g., lightweight plastics). Materials manufacturing represents an important input to vehicle production. In the final market map, IEc considers materials to be similar to vehicle components, and includes them in the sector for each vehicle type. Only one company wrote in "materials" in the survey, and based on IEc's review of survey responses, the total number of companies in this sector is likely to be small.

o **Fuels** (e.g., biofuels). Although only one company self-identified as a biofuel provider in the survey, an additional five non-respondents that were funded by the Transportation Program focused on developing alternative fuels. In the final market map, IEc considers fuels to be a product, and includes them in the sector for each vehicle type.

o **General research and development.** A small number of companies and organizations (e.g., universities) indicated that they work on transportation R&D broadly, and thus had difficulty selecting sectors with which they identify. IEc added a "general R&D" option to the final market map.

o **Electrification of various modes.** According to Transportation Program staff, electric transit buses are emerging as an area of particular interest in New York State; the preliminary market map asked about fuel type only for light/medium duty vehicles. IEc therefore added fuel type options to public transit and heavy duty/freight for the final market map.

IEc's final market map, which incorporates the changes to the sector list described above, is presented as Exhibit 4. Although the exhibit conceptualizes the design of the transportation market overall, without accounting for the focus of companies and organizations operating in New York State, the relative proportion of companies working in each sector in New York State is shown on the left. These percentages were developed using data from the survey and NYSERDA's R&D Metrics Database.[4]

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[4] IEc will also incorporate information from NYSERDA's Clean Energy Inventory into the full market characterization report. As is consistent with the Inventory's focus, the data from the Inventory appear not to substantially change the number of companies in the service sectors but do increase the number of companies working on vehicles, components, materials, and fuels.

EXHIBIT 4. CONCEPTUAL MAP OF SUPPLY-SIDE TRANSPORTATION MARKET
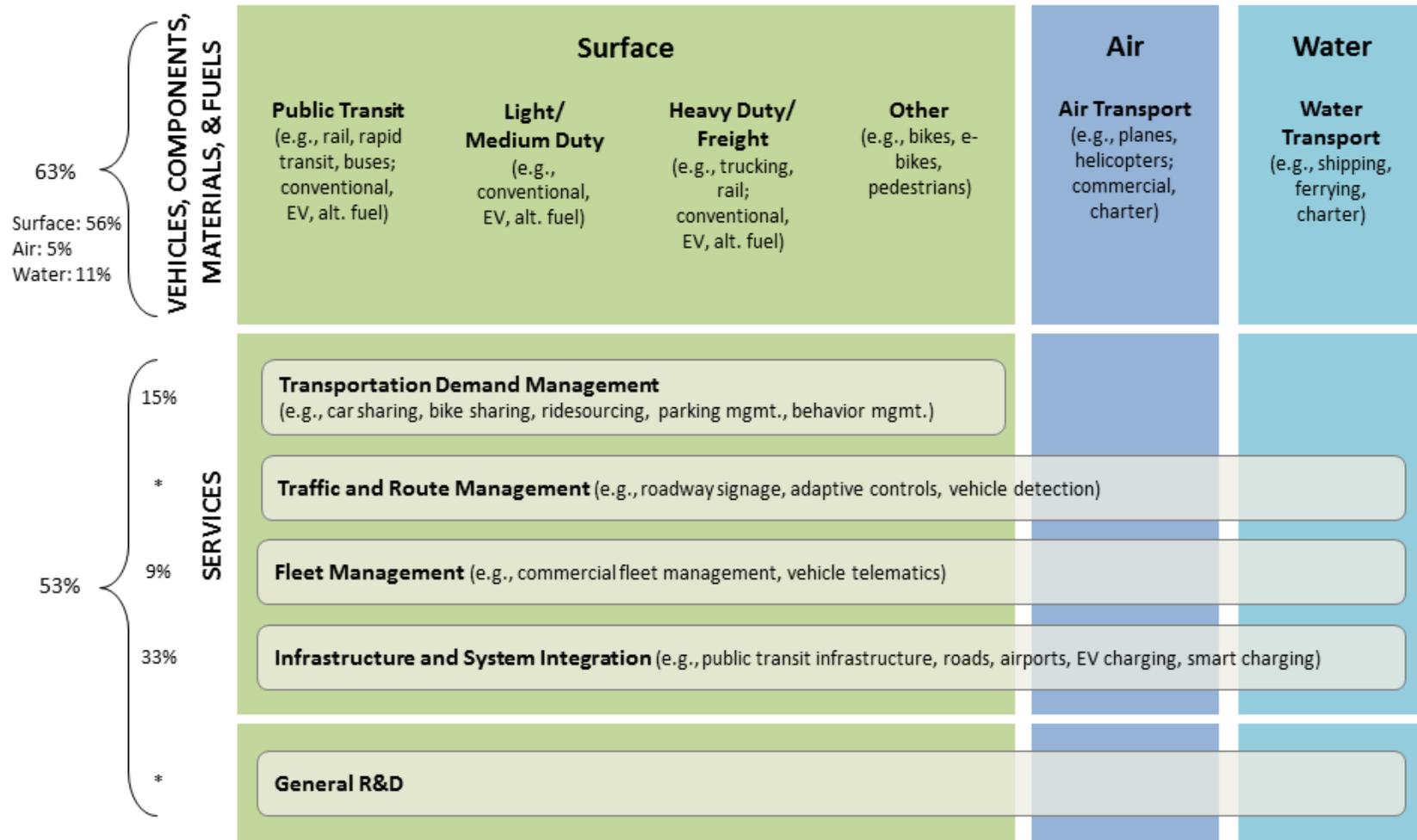
* Traffic and route management and general R&D were not included as separate options in the survey. Intelligent transportation systems (ITS) was included, but is not shown here because subsequent feedback indicated that ITS services should be considered a feature of other services. All percentages are out of total number of companies; because companies could select more than one sector, values do not sum to 100%.

A secondary focus of this memorandum is to assess NYSERDA's involvement with the state's transportation industry as a whole (as represented by survey respondents), and specific market sectors. Nearly all (104, or 95 percent) of survey respondents were aware of NYSERDA prior to taking the survey. Most of these respondents also indicated that they had interacted with NYSERDA in the past, in one or more ways:

- Received direct funding (86 respondents)

- Applied for, but did not receive, direct funding (23)[5]

- Attended events hosted by NYSERDA (65)

- Requested or reviewed general information, including materials published by NYSERDA (62)

- Received direct technical assistance (28)

- Other (e.g., PON reviewer) (9)

These respondents indicated that, of the services received from NYSERDA's Transportation Program, direct funding was the most useful (see Exhibit 5). After direct funding, respondents indicated that general information, introductions to public sector officials, and feedback on business plans were the most useful. Two respondents provided additional positive feedback emphasizing that the dedicated support of their NYSERDA project manager was particularly beneficial.

EXHIBIT 5.   MOST USEFUL NYSERDA SERVICES[6]

What are the three most useful services that you have received from the Transportation Program to help you achieve your business goals?

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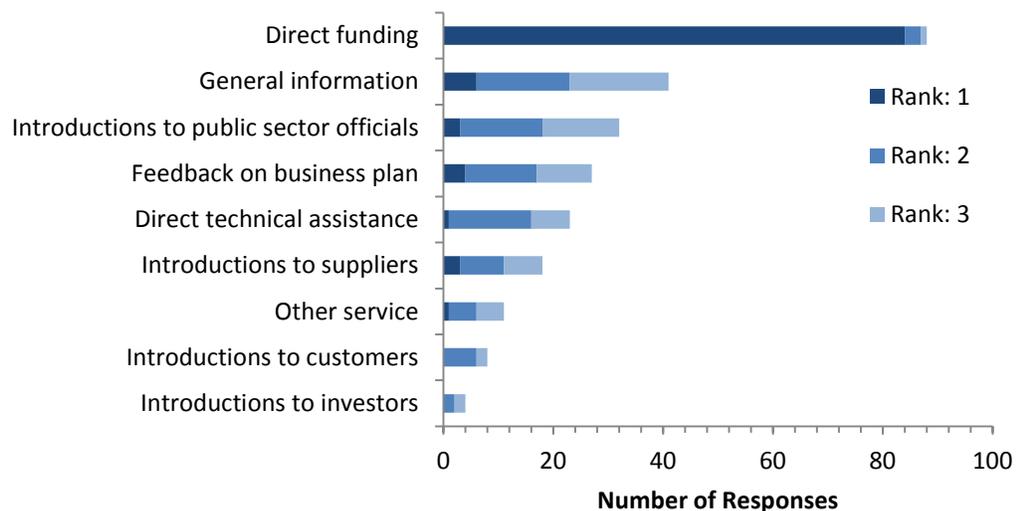
[5] Of the 23 respondents who indicated they had applied for but not received direct funding from NYSERDA, 17 indicated that they had also at some point received funding.

[6] "Other" includes marketing assistance, feedback on PON proposal, operating space within the Saratoga Technology + Energy Park (STEP), credibility, introductions to local industry partners, and dedicated project manager support.

Seven respondents, spanning all sectors except air and water transport, indicated that they either had not heard of NYSERDA or were not sure if their company or organization had interacted with NYSERDA's Transportation Program in the past.[7] The services these respondents were most interested in receiving were direct funding and introductions to public sector officials or regulators (4 respondents, or 57 percent, expressed interest in each). Additionally, two respondents expressed interest in each of the following categories: general information, direct technical assistance, introductions to new customers, and feedback on business plans and/or strategies. One respondent indicated that they were not interested in receiving any services from NYSERDA's Transportation Program (no reason given).

When asked to provide suggestions for additional services they would like to receive from NYSERDA, respondents mentioned several new services or improvements to existing services. Common suggestions included:

- **Business development and networking support**, including direct introductions to collaborators, customers, and business partners; industry networking events, including joint events with other state or federal agencies that may have funding available; a public database of transportation companies to support supply chain development; and public outreach materials. Specifically, one respondent recommended modeling industry networking events on those of the Suppliers Partnership for the Environment.[8] According to this respondent, "I have participated in federal grant sponsored events in which the granting agency invited technology scouts from different commercial sectors to [a] general grantee meeting. This was an excellent networking and vetting tool, since the event was very focused on partnerships."

- **Support for specific policy areas**, including:

    o Promotion of hybrid vehicles, plug-in EVs, and hydrogen fuel cells through incentives and changes to electricity rate structures;

    o Training for alternative fuel vehicle technicians; and

    o R&D efforts focused on electric bicycles and "complete streets" (i.e., streets designed to support active modes of transportation such as walking and biking).

- **Additional types of funding support**, including follow-on funding, referrals to or assistance with applications for other funding sources, changes to recoupment terms, and subsidies or financial incentives for end-users.

CONCLUSION Overall, preliminary analysis of the survey results suggests that NYSERDA may be well-connected among companies in the New York State transportation market. However, the two-stage survey failed to yield much information on program non-participants. IEc will attempt to fill this gap using information from NYSERDA's concurrent clean energy

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[7] After comparing these seven survey respondents' organizations to NYSERDA's Metrics Database, three of the organizations have in fact worked with NYSERDA's Transportation Program in the past. Most likely, the individuals responding to the survey were not involved in those efforts.

[8] See: http://www.supplierspartnership.org/

inventory, and will summarize those results in a subsequent market characterization report.

The companies that responded to this survey, as well as those that previously received funding from NYSERDA, are working in a wide range of product and service sectors; the largest of these sectors, by share of respondents participating, are associated with alternative fuel and electric vehicles. The New York State market does not appear to include many companies or organizations working on air transport, public transit rail/rapid transit, or infrastructure (excluding public transit and alternative fuel vehicle infrastructure).

Market actors have to date interacted with NYSERDA's Transportation Program in a variety of ways. Although most respondents indicated that direct funding was the most useful service they have received, others cited "intangible" services such as enhanced credibility, dedicated project manager support, and proposal feedback. Several respondents also requested additional services—most commonly, additional business development support, including the facilitation of business relationships through direct introductions, networking events, a public database, or public outreach materials.

Additional discussion of the transportation market in New York State, including market size and capacity, will be provided in IEc's subsequent market characterization report.

APPENDIX B: SURVEY INSTRUMENT

The New York State Energy Research and Development Authority (NYSERDA) is conducting a market study of transportation technology development in New York State. This important study will enable NYSERDA to understand and characterize the priorities, barriers, and performance of the State's advanced transportation sector. The survey results will enable NYSERDA to assess their program accomplishments and improve future programs that serve New York.

Most respondents will be able to complete this survey in 15-20 minutes. You should not need to conduct additional research or spend significant time querying company data to respond to this survey. The information you provide will be kept confidential to the extent permitted by law. We will report all responses in aggregate, and we will not attribute any answers to you as an individual.

Part I: Background

1. What is your name? *[short text box – first name; short text box – last name]*

2. What is the name of your company or organization? *[short text box]*

3. Did your current company or organization change its name in the last six years?

   a. Yes
   b. No

[If "yes," continue to Question 4. If "no," skip to Question 5.]

4. [ASK IF Q3=YES] What was the former name of your company or organization? *[short text box]*

5. Is your company or organization located in New York State? Select one.

   a. Yes, all operations are in New York.
   b. Yes, our headquarters are in New York, but some operations are elsewhere.
   c. Yes, some operations are in New York, but our headquarters are elsewhere.
   d. No, none of our operations are in New York.

[If "yes" (a, b, or c), continue to Question 6. Otherwise, skip to Question 7.]

6. [ASK IF Q5=A-C] In which New York State region is your company or organization located? Select all that apply.

   a. **Long Island:** Nassau and Suffolk counties
   b. **New York City:** Brooklyn, Bronx, Manhattan, Queens, and Staten Island
   c. **Mid-Hudson:** Dutchess, Orange, Putnam, Rockland, Sullivan, Ulster, and Westchester counties
   d. **Capital Region:** Albany, Columbia, Greene, Rensselaer, Saratoga, Schenectady, Warren, and Washington counties
   e. **Mohawk Valley:** Fulton, Herkimer, Montgomery, Oneida, Otsego, and Schoharie counties
   f. **North Country:** Clinton, Essex, Franklin, Hamilton, Jefferson, Lewis, and St. Lawrence counties

g. **Central New York:** Cayuga, Cortland, Madison, Onondaga, and Oswego counties
h. **Southern Tier:** Broome, Chemung, Chenango, Delaware, Schuyler, Steuben, Tioga, and Tompkins counties
i. **Finger Lakes:** Genesee, Livingston, Monroe, Ontario, Orleans, Seneca, Wayne, Wyoming, and Yates counties
j. **Western New York:** Allegany, Cattaraugus, Chautauqua, Erie, and Niagara counties

7. How many employees (full-time equivalents, or FTEs) are working at your company or organization <u>this fiscal year</u>? Select one.

   a. 1-4
   b. 5-9
   c. 10-19
   d. 20-49
   e. 50-99
   f. 100-499
   g. 500 employees or more

8. What were your company's or organization's approximate annual revenues for the <u>last fiscal year</u>? Select one.

   a. $1 - $49,999
   b. $50,000 - $249,999
   c. $250,000 - $999,999
   d. $1,000,000 - $4,999,999
   e. $5,000,000 - $24,999,999
   f. $25,000,000 - $49,999,999
   g. $50,000,000 or higher
   h. My company/organization does not have revenues

[If "h" skip to Question 10. Otherwise, continue to Question 9.]

9. [ASK OF Q8=A-G] Approximately what percentage of your company's or organization's revenues are for products or services sold in each of the following three areas? The total should add to 100%.
   a. In New York State: *[percentage]*
   b. Elsewhere in the U.S.: *[percentage]*
   c. Outside of the U.S.: *[percentage]*

10. When was your company or organization formally established? Select one.

    a. Prior to 1990
    b. 1990-1994
    c. 1995-1999
    d. 2000-2004
    e. 2005-2009
    f. 2010 to present

11. Which of the following terms best describe your company or organization? Select all that apply.

     a. Product designer/R&D
     b. Manufacturer
     c. Software developer
     d. Wholesaler
     e. Retailer
     f. Consultant (including engineering consultant)
     g. Fleet owner
     h. Fueling infrastructure owner or demonstration site
     i. Transportation service provider
     j. Public sector organization
     k. Nonprofit organization
     l. Academic or research organization
     m. Construction or installation company
     n. Other (please specify)

12. With which transportation sector(s) does your company or organization identify? Select all that apply.

     a. Public transit: rail or rapid transit (vehicles and components)
     b. Public transit: buses (vehicles and components)
     c. Public transit: infrastructure and services
     d. Light or medium duty: electric vehicles, including hybrid electric vehicles (vehicles and components)
     e. Light or medium duty: alternative fuel vehicles, other than electric vehicles (vehicles and components)
     f. Alternative fuel and electric vehicle infrastructure
     g. Light or medium duty: conventional fuel vehicles and components
     h. Heavy duty or freight: trucking or rail (vehicles and components)
     i. Air travel or transport (vehicles and components)
     j. Shipping, ferrying, or other water transport (vehicles and components)
     k. Transportation services: transportation demand management (e.g., car sharing, bike sharing, ridesourcing, behavior management)
     l. Transportation services: fleet management
     m. Transportation services: intelligent transportation systems (e.g., traffic and route management, lighting and signals)
     n. Transportation services: infrastructure systems, excluding public transit (e.g., roads, highways, bridges, bike lanes)
     o. Other (please specify)

13. [SKIP IF Q12 HAS ONLY 1 SELECTED (AUTOFILL AS TOP SECTOR)] Of the sectors your company identifies with, which are the most important to your company's or organization's operations in terms of operating revenues? Please select and rank *up to three (3)* sectors, where 1 means *most important of all to operating revenues* and 3 means *third most important to operating revenues*.

[Table with checkboxes: Program so that only options identified in Question 12 show up here.]

Sector	Rank: Check one sector for each		
	1	**2**	**3**
Public transit: rail or rapid transit (vehicles and components)	[checkbox]		
Public transit: buses (vehicles and components)			
Public transit: infrastructure and services			
Light or medium duty: electric vehicles, including hybrid electric vehicles (vehicles and components)			
Light or medium duty: alternative fuel vehicles, other than electric vehicles (vehicles and components)			
Alternative fuel and electric vehicle infrastructure			
Light or medium duty: conventional fuel vehicles and components			
Heavy duty or freight: trucking or rail (vehicles and components)			
Air travel or transport (vehicles and components)			
Shipping, ferrying, or other water transport (vehicles and components)			
Transportation services: transportation demand management (e.g., car sharing, bike sharing, ridesourcing, behavior management)			
Transportation services: fleet management			
Transportation services: intelligent transportation systems (e.g., traffic and route management, lighting and signals)			
Transportation services: infrastructure systems, excluding public transit (e.g., roads, highways, bridges, bike lanes)			
Other (please specify)			

14. Which of these sectors do you think will be the <u>most important</u> to your company's or organization's operations in terms of operating revenues <u>five years from now</u>? Please select and rank *up to three (3)* sectors, where 1 means *most important of all to future operating revenues* and 3 means *third most important to future operating revenues*.

[Table with checkboxes: Show all sectors.]

Sector	Rank: Check one sector for each		
	1	2	3
Public transit: rail or rapid transit (vehicles and components)	[checkbox]		
Public transit: buses (vehicles and components)			
Public transit: infrastructure and services			
Light or medium duty: electric vehicles, including hybrid electric vehicles (vehicles and components)			
Light or medium duty: alternative fuel vehicles, other than electric vehicles (vehicles and components)			
Alternative fuel and electric vehicle infrastructure			
Light or medium duty: conventional fuel vehicles and components			
Heavy duty or freight: trucking or rail (vehicles and components)			
Air travel or transport (vehicles and components)			
Shipping, ferrying, or other water transport (vehicles and components)			
Transportation services: transportation demand management (e.g., car sharing, bike sharing, ridesourcing, behavior management)			
Transportation services: fleet management			
Transportation services: intelligent transportation systems (e.g., traffic and route management, lighting and signals)			
Transportation services: infrastructure systems, excluding public transit (e.g., roads, highways, bridges, bike lanes)			
Other (please specify)			

15. Please provide at least one example of a product or service your company or organization provides or is working on developing in each of the following sectors.

[Short text fields: Program so that only options ranked in Question 13 (not 14) show up here.]

Sector	Example Product(s) or Service(s)
Public transit: rail or rapid transit (vehicles and components)	*[short text field]*
Public transit: buses (vehicles and components)	
Public transit: infrastructure and services	
Light or medium duty: electric vehicles, including hybrid electric vehicles (vehicles and components)	
Light or medium duty: alternative fuel vehicles, other than electric vehicles (vehicles and components)	
Alternative fuel and electric vehicle infrastructure	
Light or medium duty: conventional fuel vehicles and components	
Heavy duty or freight: trucking or rail (vehicles and components)	
Air travel or transport (vehicles and components)	
Shipping, ferrying, or other water transport (vehicles and components)	
Transportation services: transportation demand management (e.g., car sharing, bike sharing, ridesourcing, behavior management)	
Transportation services: fleet management	
Transportation services: intelligent transportation systems (e.g., traffic and route management, lighting and signals)	
Transportation services: infrastructure systems, excluding public transit (e.g., roads, highways, bridges, bike lanes)	
Other (please specify)	

16. Which of the following are part of your company's or organization's transportation-related goals and initiatives? Select all that apply.
    a. Increasing vehicle efficiency
    b. Reducing vehicle miles traveled
    c. Reducing transportation-related environmental impacts
    d. Advancing alternative fuel use
    e. Advancing multimodal transportation systems
    f. Improving the public's transportation experience
    g. Innovating new products or services
    h. Other (please specify)

Part II: Influence and Barriers

17. Of the following factors, which have the most influence on your company's or organization's transportation technology development efforts? Please select and rank *up to three (3)* factors, where 1 means *most influential* and 3 means *third most influential*.

[Limit the number of choices that each respondent can select to up to 3.]

       a. Supportive State regulatory framework
       b. Existence of supportive State policies
       c. Tax incentives and subsidies
       d. Availability of R&D
       e. Access to financial capital – equity, debt, or grants
       f. Access to human capital – talent and expertise
       g. Access to large customers in the State
       h. Networks of other transportation technology developers and service providers
       i. Proximity to large customer base
       j. Market demand
       k. Energy prices in the State
       l. Availability of business services to support entrepreneurial companies
       m. Success stories of energy entrepreneurs in the State
       n. Adequate supply of necessary materials/production inputs
       o. Physical infrastructure
       p. Other (please briefly describe – *limit number characters*)

18. You indicated that you consider [INSERT Q17 TOP RANKED] to be most influential. What, specifically, does your company or organization need to be successful in advancing transportation technology development? Please elaborate. *[short text box]*

19. Of the following factors, which currently present the greatest barriers to transportation technology development for your company or organization? Please select and rank *up to three (3)* factors, where 1 represents the *most significant barrier* and 3 represents the *third most significant barrier*.

[Limit the number of choices that each respondent can select to up to 3.]

       a. Unsupportive/difficult State regulatory framework
       b. Lack of supportive State policies
       c. Lack of tax incentives and subsidies
       d. Lack of R&D capabilities
       e. Lack of access to financial capital – equity, debt, or grants
       f. Lack of access to human capital – talent and expertise
       g. Lack of access to large customers in the State
       h. Small customer base
       i. Poor market conditions
       j. Energy prices in the State
       k. Gas prices
       l. Lack of access to business services to support entrepreneurial companies
       m. Lack of success stories of transportation technology developers in the State
       n. Inadequate supply of necessary materials/production inputs
       o. Physical infrastructure
       p. Other (please briefly describe – limit number characters)

20. You indicated that you consider [INSERT Q19 TOP RANKED] to be the most significant barrier. What, specifically, would be most helpful to your company or organization in overcoming this barrier to advancing transportation technology development? Please elaborate. *[short text box]*

Part III. Familiarity with NYSERDA

21. Had you heard of NYSERDA before taking this survey?
    a. Yes
    b. No

[If "no," skip to Question 28.]

22. [IF Q21=YES] How, if at all, has your company or organization interacted with NYSERDA in the past? Select all that apply.

    a. Requested or reviewed general information, including materials published by NYSERDA
    b. Attended events hosted by NYSERDA
    c. Received direct technical assistance
    d. Applied for, but did not receive, direct funding
    e. Received direct funding
    f. Other (please specify)
    g. My company/organization has not interacted with NYSERDA in the past.
    h. I don't know if my company/organization has interacted with NYSERDA.

[If "g" or "h," skip to Question 28. Otherwise, proceed to Question 23.]

23. [IF Q22=A-F] Were you working with *[program with the company name]* when it requested information or support from NYSERDA?

    a. Yes
    b. No
    c. I don't know

24. [IF Q22=A-F] What are the *three (3) most useful* services that you have received from NYSERDA's transportation program to help you achieve your business goals? Please select and rank *up to three (3)* services, where 1 means *most useful* and 3 means *third most useful*.

[Limit the number of choices that each respondent can select to up to 3.]

    a. General information, including information presented in materials published by NYSERDA or at events hosted by NYSERDA
    b. Direct technical assistance
    c. Direct funding
    d. Introductions to new customers
    e. Introductions to suppliers or manufacturers
    f. Introductions to investors
    g. Introductions to public sector officials or regulators
    h. Feedback on business plan and/or strategy
    i. Other service provided (please specify)

25. [IF Q22=A-F] You indicated that you consider [INSERT Q24 TOP RANKED] to be most useful. How, specifically, was this service helpful to your work? Please elaborate. *[short text box]*

26. [IF Q22=A-F] Are there any additional services that you wish NYSERDA's transportation program had provided or would provide?

    a. Yes
    b. No

[If "yes," continue to Question 27. If "no," skip to Question 29.]

27. [ASK IF Q26=YES] What additional services, beyond those currently provided, would you like or would you have liked to receive from NYSERDA's transportation program? *[short text box]*

 [Skip to Question 29.]

28. [ASK IF Q21=NO OR Q22=G OR H] Which of the following services would you most like to receive from NYSERDA's transportation program? Select all that apply.

    a. General information, including information presented in materials published by NYSERDA or at events hosted by NYSERDA
    b. Direct technical assistance
    c. Direct funding
    d. Introductions to new customers
    e. Introductions to suppliers or manufacturers
    f. Introductions to investors
    g. Introductions to public sector officials or regulators
    h. Feedback on business plan and/or strategy
    i. Other service (please specify)

[Note: No question 29 in final version.]

Part IV. Outcomes of Interest

[Applies only if answered "c" or "e" to Question 22. Otherwise, skip this section and proceed to Part V.]

The following questions ask you about the specific product(s) or service(s) for which your company or organization received technical or financial support from NYSERDA's transportation program.

30. Is your company or organization still selling, providing, or pursuing development of the product(s) or service(s) for which NYSERDA provided technical or financial support?

    a. Yes, we still sell or provide at least some of the product(s) or service(s)
    b. Yes, we are still pursuing development of at least some of the product(s) or service(s)
    c. No, we are not selling, providing, or pursuing development of any of the product(s) or service(s)
    d. I don't know

[If "a" continue to Question 31. If "c" continue to Question 32. Otherwise, skip to Question 33.]

31. [ASK IF Q30=A] Where does your company or organization sell or provide the product(s) or service(s) for which NYSERDA provided technical or financial support? Select all that apply.

    a. New York State
    b. Elsewhere in the U.S.
    c. Outside of the U.S.

[Skip to Question 33.]

32. [ASK IF Q30=C] Why is your company or organization no longer selling, providing, or pursuing development of the product(s) or service(s) for which NYSERDA provided technical or financial support? Select all that apply.

    a. Technical issues with the product
    b. Difficulty finding investors
    c. Difficulty finding suppliers/manufacturers
    d. Customer demand lower than expected
    e. New products/services made this one obsolete
    f. Too expensive to produce/provide
    g. Change in our company's or organization's priorities
    h. Other (please specify)

33. Have you filed for any patents based on the research conducted with NYSERDA's support?

    a. Yes, we filed for and received one or more patents.
    b. Yes, we have filed for one or more patents, but have not yet received them.
    c. No, but we expect to file for a patent in the future.
    d. No, and we do not expect to file for any patents.

[If "a" continue to Question 34. Otherwise, skip to Question 36.]

34. [ASK IF Q33=A] How many patents have you received in connection with research conducted with NYSERDA's support? *[enter number in numeric response field]*

35. [ASK IF Q33=A] What type(s) of patent(s) have you received in connection with research conducted with NYSERDA's support? Select all that apply.

    a. Design patent
    b. Utility patent
    c. Plant patent
    d. Reissue patent
    e. Statutory invention registration

36. How influential was NYSERDA's transportation program in helping you advance the product(s) or service(s) for which NYSERDA provided technical or financial support? Please answer on a scale from 1 to 5, where 1 means *not at all influential* and 5 means *extremely influential.*

    a. Not at all influential
    b. Slightly influential
    c. Somewhat influential
    d. Very influential
    e. Extremely influential

Part V. Technologies of Interest [ASK ALL]

37. This question asks about your company's or organization's interest in specific technologies and strategies supported by NYSERDA. For each technology or strategy, please characterize your company's or organization's level of interest using the drop-down menus.

Technology or Strategy	Level of Interest
Plug-in electric vehicles	MENU OPTIONS: • My company/organization currently uses, invests in, or otherwise participates in the market for this technology. • My company/organization has considered using, investing in, or otherwise participating in the market for this technology, and may be interested in doing so. • My company/organization has considered using, investing in, or otherwise participating in the market for this technology, but is unlikely to be interested in doing so. • My company/organization has not considered using, investing in, or otherwise participating in the market for this technology. • I have not heard of this technology.
Connected infrastructure (e.g., adaptive traffic signals)	
Rail car efficiency	
Airport management	
Transportation demand management	
Freight electrification	

Part VI: Market Information

SCREEN 1:

You are almost finished with this survey! Thank you again for your time.

For this final section, NYSERDA is interested in learning about other companies and organizations active in New York's advanced transportation sector. NYSERDA wants to use this information to deepen our understanding of the State's transportation market, and to potentially contact these organizations to participate in a similar survey about their experiences and priorities.

For each of the transportation sector(s) you identified as being most important to your company's or organization's operations, please identify the three (3) most important companies or organizations you interact with in the New York State market.

If you do not wish to provide any information, you can click "Skip" to proceed.

Sector	Company/Organization Name	Company/Organization Name	Company/Organization Name
[program with sector 1 name]	1 WRITE IN	2	3
[program with sector 2 name]	1	2	3
[program with sector 3 name]	1	2	3

CONTINUE TO SCREEN 2   SKIP [GOES TO CLOSING SCREEN]

SCREEN 2:

Please provide the name of the primary contact you or your organization interacts with at each company that you listed. We may use this information to reach out to these contacts for a similar survey about their experiences and priorities.

If you do not wish to provide any information, you can click "Skip" to proceed.

Contact Organization	Contact Name
[FILLED IN FROM SCREEN 1 TABLE]	

CONTINUE   SKIP [GOES TO CLOSING SCREEN]

CLOSING SCREEN:

You have completed the survey! Thank you for your time and participation. The information you provided will enable NYSERDA to assess their program accomplishments and improve future programs that serve New York.

Would you like to be notified by email of future NYSERDA opportunities in the New York State transportation market?

YES WITH TEXT BOX FOR EMAIL ADDRESS   NO

APPENDIX C: DETAILED SURVEY RESULTS

Part I: Background

Table 1. Company Location

Q: Is your company or organization located in New York State? Select one.

Response Option	N
Yes, all operations are in New York.	62
Yes, our headquarters are in New York, but some operations are elsewhere.	17
Yes, some operations are in New York, but our headquarters are elsewhere.	19
No, none of our operations are in New York.	11
Total	**109**

Table 2. Company Location within New York State

Q: In which New York State region is your company or organization located? Select all that apply.

Response Option	N[1]
Long Island: Nassau and Suffolk counties	18
New York City: Brooklyn, Bronx, Manhattan, Queens, and Staten Island	31
Mid-Hudson: Dutchess, Orange, Putnam, Rockland, Sullivan, Ulster, and Westchester counties	14
Capital Region: Albany, Columbia, Greene, Rensselaer, Saratoga, Schenectady, Warren, and Washington counties	23
Mohawk Valley: Fulton, Herkimer, Montgomery, Oneida, Otsego, and Schoharie counties	10
North Country: Clinton, Essex, Franklin, Hamilton, Jefferson, Lewis, and St. Lawrence counties	8
Central New York: Cayuga, Cortland, Madison, Onondaga, and Oswego counties	10
Southern Tier: Broome, Chemung, Chenango, Delaware, Schuyler, Steuben, Tioga, and Tompkins counties	12
Finger Lakes: Genesee, Livingston, Monroe, Ontario, Orleans, Seneca, Wayne, Wyoming, and Yates counties	23
Western New York: Allegany, Cattaraugus, Chautauqua, Erie, and Niagara counties	17
Notes: (1) Respondents could select more than one response option. (2) Question was asked only of respondents that indicated that their company has operations in New York State.	

Table 3. Company Employment

Q: How many employees (full-time equivalents, or FTEs) are working at your company or organization this fiscal year? Select one.

Response Option	N
1-4	30
5-9	9
10-19	10
20-49	14
50-99	9
100-499	13
500 employees or more	24
Total	**109**

Table 4. Company Revenues

Q: What were your company's or organization's approximate annual revenues for the last fiscal year? Select one.

Response Option	N
My company/organization does not have revenues	14
$1 - $49,999	11
$50,000 - $249,999	10
$250,000 - $999,999	15
$1,000,000 - $4,999,999	14
$5,000,000 - $24,999,999	21
$25,000,000 - $49,999,999	5
$50,000,000 or higher	19
Total	**109**

Table 5. Geographic Distribution of Sales

Q: Approximately what percentage of your company's or organization's revenues are for products or services sold in each of the following three areas? The total should add to 100%.

Response	In New York State	Elsewhere in the U.S.	Outside of the U.S.
<10%	24	34	74
10-24%	15	9	11
25-49%	9	7	5
50-74%	9	14	3
75-99%	7	26	1
100%	31	5	1
Not applicable[1]	14	14	14
Total	**109**	**109**	**109**

Notes:
   (1) Question was asked only of respondents that indicated that their company had non-zero revenues in the previous fiscal year.

Table 6. Year of Establishment

Q: When was your company or organization formally established? Select one.

Response Option	N
Prior to 1990	44
1990-1994	8
1995-1999	11
2000-2004	11
2005-2009	18
2010 to present	17
Total	**109**

Table 7. Company Types Represented

Q: Which of the following terms best describe your company or organization? Select all that apply.

Response Option	N[1]
Product designer/R&D	25
Manufacturer	21
Software developer	7
Wholesaler	5
Retailer	3
Consultant (including engineering consultant)	22
Fleet owner	8
Fueling infrastructure owner or demonstration site	8
Transportation service provider	20
Public sector organization	13
Nonprofit organization	24
Academic or research organization	20
Construction or installation company	6
Other (please specify)	
Investor	1
Electric utility	1
Port authority	1
Biofuel producer	1
Notes: (1) Respondents could select more than one response option.	

Table 8. Transportation Sectors Represented

Q: With which transportation sector(s) does your company or organization identify? Select all that apply.

Response Option	N[1]
Public transit: rail or rapid transit (vehicles and components)	14
Public transit: buses (vehicles and components)	25
Light or medium duty: electric vehicles, including hybrid electric vehicles (vehicles and components)	37
Light or medium duty: alternative fuel vehicles, other than electric vehicles (vehicles and components)	26
Light or medium duty: conventional fuel vehicles and components	28
Heavy duty or freight: trucking or rail (vehicles and components)	35
Air travel or transport (vehicles and components)	13
Shipping, ferrying, or other water transport (vehicles and components)	18
Transportation services: transportation demand management (e.g., car sharing, bike sharing, ridesourcing, behavior management)	29
Transportation services: fleet management	25
Transportation services: intelligent transportation systems (e.g., traffic and route management, lighting and signals)	20
Public transit: infrastructure and services	21
Alternative fuel and electric vehicle infrastructure	39
Transportation services: infrastructure systems, excluding public transit (e.g., roads, highways, bridges, bike lanes)	14
Other (please specify)	
R&D	7
Public outreach	2
Electricity generation	1
Materials	1
Notes:	
(1) Respondents could select more than one response option.	

Table 9. Most Important Sectors – Currently

Q: Of the sectors your company identifies with, which are the most important to your company's or organization's operations in terms of operating revenues? Please select and rank up to three (3) sectors, where 1 means most important of all to operating revenues and 3 means third most important to operating revenues.

Response Option	Rank: 1	Rank: 2	Rank: 3
Public transit: rail or rapid transit (vehicles and components)	3	3	0
Public transit: buses (vehicles and components)	2	5	4
Public transit: infrastructure and services	1	3	4
Light or medium duty: electric vehicles, including hybrid electric vehicles (vehicles and components)	14	9	3
Light or medium duty: alternative fuel vehicles, other than electric vehicles (vehicles and components)	7	5	7
Alternative fuel and electric vehicle infrastructure	19	4	3
Light or medium duty: conventional fuel vehicles and components	4	3	6
Heavy duty or freight: trucking or rail (vehicles and components)	10	10	4
Air travel or transport (vehicles and components)	2	1	4
Shipping, ferrying, or other water transport (vehicles and components)	5	2	1
Transportation services: transportation demand management (e.g., car sharing, bike sharing, ridesourcing, behavior management)	10	2	2
Transportation services: fleet management	6	7	4
Transportation services: intelligent transportation systems (e.g., traffic and route management, lighting and signals)	8	4	0
Transportation services: infrastructure systems, excluding public transit (e.g., roads, highways, bridges, bike lanes)	5	4	0
Other (please specify)			
R&D	6	0	1
Public outreach	2	0	0
Electricity generation	1	0	0
Materials	1	0	0
No answer/not applicable[1]	3	47	66
Total	**109**	**109**	**109**

Notes:
   (1) Question was asked only of respondents that identified with more than one transportation sector.

Table 10. Most Important Sectors – Five Years from Now

Q: Which of these sectors do you think will be the most important to your company's or organization's operations in terms of operating revenues five years from now? Please select and rank up to three (3) sectors, where 1 means most important of all to future operating revenues and 3 means third most important to future operating revenues.

Response Option	Rank: 1	Rank: 2	Rank: 3
Public transit: rail or rapid transit (vehicles and components)	5	5	1
Public transit: buses (vehicles and components)	3	8	6
Public transit: infrastructure and services	4	5	6
Light or medium duty: electric vehicles, including hybrid electric vehicles (vehicles and components)	11	13	7
Light or medium duty: alternative fuel vehicles, other than electric vehicles (vehicles and components)	6	8	7
Alternative fuel and electric vehicle infrastructure	20	7	6
Light or medium duty: conventional fuel vehicles and components	2	8	3
Heavy duty or freight: trucking or rail (vehicles and components)	11	4	8
Air travel or transport (vehicles and components)	3	1	5
Shipping, ferrying, or other water transport (vehicles and components)	7	2	2
Transportation services: transportation demand management (e.g., car sharing, bike sharing, ridesourcing, behavior management)	8	6	9
Transportation services: fleet management	6	10	6
Transportation services: intelligent transportation systems (e.g., traffic and route management, lighting and signals)	6	11	7
Transportation services: infrastructure systems, excluding public transit (e.g., roads, highways, bridges, bike lanes)	8	9	7
Other (please specify)			
Electricity generation	1	0	0
Transportation safety	1	0	1
Traffic analysis	1	0	0
Special needs transportation services	1	0	0
R&D	0	1	0
Public outreach	0	0	3
No answer	5	11	25
Total	**109**	**109**	**109**

Table 11. Example Products or Services by Sector

Q: Please provide at least one example of a product or service your company or organization provides or is working on developing in each of the following sectors.

Because of the large number of responses provided, and to preserve respondents' confidentiality, responses are summarized below for each sector.

Response Summary
Public transit: rail or rapid transit (vehicles and components)
- Rail car manufacturing   - Technologies and research related to rail car operations and maintenance, rail system monitoring and analytics, train control software, and energy harvesting and storage
Public transit: buses (vehicles and components)
- Technologies and research related to idle reduction, emissions reductions, hybrid buses, and propulsion systems   - Provision of bus service
Public transit: infrastructure and services
- Technologies and research related to road and rail maintenance, smart energy management, energy storage systems, vehicular communications (V2X), and transit signal priority systems   - Planning and financing services related to bus acquisition and transit-oriented development
Light/medium duty: electric vehicles, including hybrid electric vehicles (vehicles and components)
- EV manufacturing   - Technologies and research related to EV batteries, motors, heat recovery, hybrid truck components, propulsion systems, vehicle-to-grid communications, and wireless charging   - Planning and financing services related to EVs   - Standards related to EVs, vehicle-grid integration, and vehicle-to-grid communications   - EV-related outreach, education, and safety training
Light/medium duty: alternative fuel vehicles, other than electric vehicles (vehicles and components)
- Technologies and research related to alternative fuels (e.g., DME, CNG, diesel, natural gas, propane, E-85), composite materials, fuel cells, injectors, motors, and propulsion systems   - Planning and financing services related to alternative fuel vehicles   - Outreach, education, and safety training related to alternative fuel vehicles
Alternative fuel/EV infrastructure
- EV charging stations (EVSE) and alternative fuel stations (e.g., LNG, propane autogas)   - Technologies and research related to next generation EVSE, DC fast charging, fuel cells, compression, hydrogen infrastructure, wireless charging, EVSE data collection and analysis, and consumer acceptance   - Planning and financing services related to EV infrastructure   - Standards related to EVSE and vehicle-to-grid communications   - EV-related outreach, education, and safety training
Light/medium duty: conventional fuel vehicles and components
- Vehicle manufacturing   - Technologies and research related to fuel economy, idle reduction, emissions reductions, fuel delivery, refrigeration system motors, and heat recovery   - Provision of fleet vehicles, telematics, and fuel analytics

Heavy duty/freight: trucking or rail (vehicles and components)
• Technologies and research related to alternative fuel heavy duty vehicles, fuel economy, emissions reductions, regenerative braking, rail car operations and maintenance, railroad signaling, yard control systems, and truck stop electrification • Planning and financing services related to alternative fuel vehicles • Provision of heavy duty fleet services (e.g., waste disposal, hauling), telematics, vehicle health management, and fuel analytics
Air travel or transport (vehicles and components)
• Technologies and research related to fuel economy, lighting, flame retardant materials, torque measurement, landing systems, and helicopters • Standards for airfield visual guidance systems
Shipping, ferrying, or other water transport (vehicles and components)
• Technologies and research related to fuel economy, emissions reductions, docking, warehouse/storage capabilities, and repowering • Provision of water transport services (e.g., barge shipping)
Transportation services: transportation demand management
• Technologies and research related to queuing, asset utilization, and bicycle route mapping • Planning, management, and outreach for TDM programs • Provision of carshare, ridesourcing, and vanpooling services
Transportation services: fleet management
• Technologies and research related to fleet management software, vehicle telematics, fuel analytics, route optimization, night delivery, idling alternatives, and emissions reduction technologies • Operation and management of vehicle fleets, including driver coaching
Transportation services: intelligent transportation systems
• Technologies and research related to automated and connected vehicles, intelligent traffic controllers, integrated corridor management, traffic signal optimization, roadway lighting, and safety enforcement
Transportation services: infrastructure systems, excluding public transit
• Technologies and research related to traffic signals, corridor management, asset management, vehicle detection sensor systems, and roadway lighting • Construction, operation, and maintenance of highways and bridges
Other (please specify)
• General transportation R&D • Technical assistance, advocacy, education, outreach, and training services • Transportation planning, data collection, and analysis

Table 12. Transportation-Related Goals and Initiatives

Q: Which of the following are part of your company's or organization's transportation-related goals and initiatives? Select all that apply.

Response Option	N[1]
Increasing vehicle efficiency	63
Reducing vehicle miles traveled	40
Reducing transportation-related environmental impacts	86
Advancing alternative fuel use	55
Advancing multimodal transportation systems	37
Improving the public's transportation experience	36
Innovating new products or services	71
Other (please specify)	
Traffic safety	5
Infrastructure improvement	3
Building a sustainable regional transportation system	2
Notes:	
(1) Respondents could select more than one response option.	

Part II: Influence and Barriers

Table 13. Technology Development Influences

Q: Of the following factors, which have the most influence on your company's or organization's transportation technology development efforts? Please select and rank up to three (3) factors, where 1 means most influential and 3 means third most influential.

Response Option	Rank: 1	Rank: 2	Rank: 3
Supportive State regulatory framework	9	10	9
Existence of supportive State policies	7	18	10
Tax incentives and subsidies	6	6	6
Availability of R&D	9	10	5
Access to financial capital – equity, debt, or grants	28	11	8
Access to human capital – talent and expertise	6	7	7
Access to large customers in the State	4	4	2
Networks of other transportation technology developers and service providers	0	5	10
Proximity to large customer base	1	2	1
Market demand	20	14	13
Energy prices in the State	3	2	8
Availability of business services to support entrepreneurial companies	3	0	5
Success stories of energy entrepreneurs in the State	0	1	0
Adequate supply of necessary materials/production inputs	1	4	6
Physical infrastructure	7	8	11
Other (please briefly describe)[1]	2	0	0
No answer	3	7	8
Total	**109**	**109**	**109**

Notes:
  (1) "Other" includes the availability of proven technology advancements. In addition, one respondent did not appear to understand the question.

Table 14. Technology Development Influences – Elaboration

Q: You indicated that you consider [insert top ranked] to be most influential. What, specifically, does your company or organization need to be successful in advancing transportation technology development? Please elaborate.

Open-Ended Response	N[1]
Market Demand-Related Factors	
General increase in market demand	7
Government as a customer	6
Help identifying market/customer base	5
Support for customer outreach and education	3
Involvement of and access to large customers, e.g., large employers	3
Fuel or energy prices that will drive market demand	3
Funding-Related Factors	
General R&D funding	21
Subsidies/incentives for production or purchase	11
Funding for product development and demonstration	9
Funding for product deployment	7
Access to or funding for infrastructure improvements	7
Utility involvement, or utility rate changes	5
Other Factors	
Supportive state policies	21
Partners for knowledge sharing/ collaborative work	6
Highly qualified workforce/researchers	6
Availability of proven technological advancements	1
Notes: 　(1)　IEc coded respondents' open-ended responses into categories. Responses could be associated with more than one category.	

Table 15. Technology Development Barriers

Q: Of the following factors, which currently present the greatest barriers to transportation technology development for your company or organization? Please select and rank up to three (3) factors, where 1 represents the most significant barrier and 3 represents the third most significant barrier.

Response Option	Rank: 1	Rank: 2	Rank: 3
Unsupportive/difficult State regulatory framework	9	8	8
Lack of supportive State policies	7	5	16
Lack of tax incentives and subsidies	7	7	6
Lack of R&D capabilities	2	2	3
Lack of access to financial capital – equity, debt, or grants	29	12	8
Lack of access to human capital – talent and expertise	5	8	3
Lack of access to large customers in the State	2	3	5
Small customer base	2	7	7
Poor market conditions	12	9	3
Energy prices in the State	2	6	3
Gas prices	11	8	4
Lack of access to business services to support entrepreneurial companies	1	1	3
Lack of success stories of transportation technology developers in the State	1	1	1
Inadequate supply of necessary materials/ production inputs	0	2	0
Physical infrastructure	10	12	8
Other (please briefly describe)[1]	4	1	4
No answer	5	17	27
Total	**109**	**109**	**109**

Notes:
(1) "Other" includes the long timeframe for technology development and adoption, low customer awareness and other difficulties with customer engagement, challenges identifying appropriate products and strategies to implement, a short-term policy focus, and a lack of policy enforcement and evaluation.

Table 16. Technology Development Barriers – Elaboration

Q: You indicated that you consider [insert top ranked] to be the most significant barrier. What, specifically, would be most helpful to your company or organization in overcoming this barrier to advancing transportation technology development? Please elaborate.

Open-Ended Response	N[1]
Funding-Related	
Access to R&D funding (general)	14
Financial incentives for technology deployment	11
Customer-oriented financial or policy incentives	9
Funding for product development and demonstration	8
Support for product development testing hurdles	2
Business Development-Related	
Ability to hire and retain highly qualified human capital	9
Access or introductions to business partners	5
Outreach and education to increase customer awareness and engagement	4
Better knowledge of the industry and its needs	3
Other Factors	
Carbon credits, gas taxes, or other changes to fuel or energy prices	15
Supportive governmental policies, e.g., carsharing auto insurance requirements, focus on reducing VMT	11
Infrastructure improvements	10
General market expansion	7
Addressing inefficiencies in NYSERDA PON process	3
Notes:	
(1) IEc coded respondents' open-ended responses into categories. Responses could be associated with more than one category.	

Part III: Familiarity with NYSERDA

Table 17. Familiarity with NYSERDA

Q: Had you heard of NYSERDA before taking this survey?

Response Option	N
Yes	104
No	5
Total	**109**

Table 18. Interactions with NYSERDA

Q: How, if at all, has your company or organization interacted with NYSERDA in the past? Select all that apply.

Response Option	N[1]
Requested or reviewed general information, including materials published by NYSERDA	62
Attended events hosted by NYSERDA	65
Received direct technical assistance	28
Applied for, but did not receive, direct funding	23
Received direct funding	86
Other (please specify)	
NYSERDA funding/implementation partner	5
NYSERDA contractor	2
Met with NYSERDA to discuss transportation issues and priorities	1
NYSERDA PON reviewer	1
My company/organization has not interacted with NYSERDA in the past.	0
I don't know if my company/organization has interacted with NYSERDA.	2
Notes: (1) Respondents could select more than one response option. (2) Question was asked only of respondents that had heard of NYSERDA before taking this survey.	

Table 19. Respondent Relationship with NYSERDA

Q: Were you working with your company/organization when it requested information or support from NYSERDA?

Response Option	N
Yes	94
No	5
I don't know	3
Not applicable[1]	7
Total	**109**
Notes:	
(1) Question was *not* asked of respondents that had not heard of NYSERDA, said their company had not interacted with NYSERDA, or said they did not know if their company had interacted with NYSERDA.	

Table 20. Most Useful NYSERDA Services

Q: What are the three (3) most useful services that you have received from NYSERDA's transportation program to help you achieve your business goals? Please select and rank up to three (3) services, where 1 means most useful and 3 means third most useful.

Response Option	Rank: 1	Rank: 2	Rank: 3
General information, including information presented in materials published by NYSERDA or at events hosted by NYSERDA	6	17	18
Direct technical assistance	1	15	7
Direct funding	84	3	1
Introductions to new customers	0	6	2
Introductions to suppliers or manufacturers	3	8	7
Introductions to investors	0	2	2
Introductions to public sector officials or regulators	3	15	14
Feedback on business plan and/or strategy	4	13	10
Other service provided (please specify)[1]	1	5	5
No answer	0	18	36
Not applicable[2]	7	7	7
Total	**109**	**109**	**109**
Notes:			
(1) "Other" includes business development and marketing assistance, PON feedback, operating space, and credibility. In addition, several responses were not relevant to the question.			
(2) Question was *not* asked of respondents that had not heard of NYSERDA, said their company had not interacted with NYSERDA, or said they did not know if their company had interacted with NYSERDA.			

Table 21. Most Useful NYSERDA Services – Elaboration

You indicated that you consider [top ranked] to be most useful. How, specifically, was this service helpful to your work? Please elaborate.

Open-Ended Response	N[1]
Provided capacity for R&D (general)	30
Provided capacity for product development/feasibility research	23
Provided capacity for product deployment/implementation	18
Provided business development support (e.g., allowed company to hire staff or partners, provided seed funding for startup)	6
Enabled market research	6
Supported outreach and education	6
Provided useful general information or educational materials	6
Mitigated R&D risk	5
Provided introductions to key stakeholders	4
Provided insight into New York State governmental policies and priorities	3
Notes: (1) IEc coded respondents' open-ended responses into categories. Responses could be associated with more than one category.	

Table 22. Desire for Additional NYSERDA Services among Companies That Had Interacted with NYSERDA Previously

Q: Are there any additional services that you wish NYSERDA's transportation program had provided or would provide?

Response Option	N
Yes	31
No	71
Not applicable[1]	7
Total	**109**
Notes: (1) Question was *not* asked of respondents that had not heard of NYSERDA, said their company had not interacted with NYSERDA, or said they did not know if their company had interacted with NYSERDA.	

Table 23. Additional NYSERDA Services Requested by Companies That Had Interacted with NYSERDA Previously

Q: What additional services, beyond those currently provided, would you like or would you have liked to receive from NYSERDA's transportation program?

Open-Ended Response	N[1]
Follow-on funding, support for federal grant applications, or referrals to other potential funding sources	9
Changes to NYSERDA PON process or funding requirements	5
Subsidies or financial incentives for end-users	4
Industry networking events/introductions to key stakeholders	4
Funding for product demonstrations and deployment	4
Greater emphasis on specific policy issues and barriers	4
Support for customer acquisition	3
Funding for preliminary scoping or feasibility studies	2
Business development support (general)	1
Funding for workforce development	1
Notes:	
(1) IEc coded respondents' open-ended responses into categories. Responses could be associated with more than one category.	
(2) Question was asked only of respondents that said they would like additional services.	

Table 24. Desire for Services among Companies That Had Not Interacted with NYSERDA Previously

Q: Which of the following services would you most like to receive from NYSERDA's transportation program? Select all that apply.

Response Option	N[1]
General information, including information presented in materials published by NYSERDA or at events hosted by NYSERDA	2
Direct technical assistance	2
Direct funding	4
Introductions to new customers	2
Introductions to suppliers or manufacturers	1
Introductions to investors	1
Introductions to public sector officials or regulators	4
Feedback on business plan and/or strategy	2
Other service (please specify)	
No service	1
Notes:	
(1) Respondents could select more than one response option.	
(2) Question was asked only of respondents that had not heard of NYSERDA, said their company had not interacted with NYSERDA, or said they did not know if their company had interacted with NYSERDA.	

Part IV: Outcomes of Interest

Table 25. NYSERDA-Supported Product/Service Commercialization

Q: Is your company or organization still selling, providing, or pursuing development of the product(s) or service(s) for which NYSERDA provided technical or financial support?

Response Option	N
Yes, we still sell or provide at least some of the product(s) or service(s)	37
Yes, we are still pursuing development of at least some of the product(s) or service(s)	36
No, we are not selling, providing, or pursuing development of any of the product(s) or service(s)	11
I don't know	4
Not applicable[1]	21
Total	**109**
Notes: (1) Question was asked only of respondents that had received direct funding or direct technical assistance from NYSERDA.	

Table 26. Geographic Distribution of NYSERDA-Supported Product/Service Sales

Q: Where does your company or organization sell or provide the product(s) or service(s) for which NYSERDA provided technical or financial support? Select all that apply.

Response Option	N[1]
New York State	37
Elsewhere in the U.S.	22
Outside of the U.S.	12
Notes: (1) Respondents could select more than one response option. (2) Question was asked only of respondents that indicated they still sell or provide NYSERDA-supported products or services.	

Table 27. Reason for No Longer Selling, Providing, or Pursuing Development of NYSERDA-Supported Product/Service

Q: Why is your company or organization no longer selling, providing, or pursuing development of the product(s) or service(s) for which NYSERDA provided technical or financial support? Select all that apply.

Response Option	N[1]
Technical issues with the product	2
Difficulty finding investors	1
Difficulty finding suppliers/manufacturers	1
Customer demand lower than expected	4
New products/services made this one obsolete	1
Too expensive to produce/provide	2
Change in our company's or organization's priorities	2
Other (please specify)	
Product development/sales not part of mission	3
Market has since been saturated	1
Product delivered to independent contractor	1

Notes:
(1) Respondents could select more than one response option.
(2) Question was asked only of respondents that indicated they are not still selling, providing, or pursuing development of NYSERDA-supported products or services.

Table 28. Intention to File Patent

Q: Have you filed for any patents based on the research conducted with NYSERDA's support?

Response Option	N
Yes, we filed for and received one or more patents.	12
Yes, we have filed for one or more patents, but have not yet received them.	6
No, but we expect to file for a patent in the future.	10
No, and we do not expect to file for any patents.	60
Not applicable[1]	21
Total	**109**

Notes:
(1) Question was asked only of respondents that had received direct funding or direct technical assistance from NYSERDA.

Table 29. Number of Patents Received

Q: How many patents have you received in connection with research conducted with NYSERDA's support?

Numeric Response	N
1 patent	5
2 patents	4
3 patents	2
15 patents	1
Total	**12**

Notes:
  (1) Question was asked only of respondents that indicated they had received patents for NYSERDA-supported research.

Table 30. Types of Patents Received

Q: What type(s) of patent(s) have you received in connection with research conducted with NYSERDA's support? Select all that apply.

Response Option	N[1]
Design patent	6
Utility patent	8
Plant patent	0
Reissue patent	0
Statutory invention registration	0
Total	**14**

Notes:
  (1) Respondents could select more than one response option.
  (2) Question was asked only of respondents that indicated they had received patents for NYSERDA-supported research.

Table 31. Transportation Program Influence

Q: How influential was NYSERDA's transportation program in helping you advance the product(s) or service(s) for which NYSERDA provided technical or financial support? Please answer on a scale from 1 to 5, where 1 means not at all influential and 5 means extremely influential.

Response Option	N
Not at all influential	6
Slightly influential	4
Somewhat influential	21
Very influential	24
Extremely influential	33
Not applicable[1]	21
Total	**109**
Notes: (1) Question was asked only of respondents that had received direct funding or direct technical assistance from NYSERDA.	

Part V: Technologies of Interest

Table 32. Level of Interest in Specific NYSERDA-Supported Technologies

Q: This question asks about your company's or organization's interest in specific technologies and strategies supported by NYSERDA. For each technology or strategy, please characterize your company's or organization's level of interest using the drop-down menus.

Level of Interest	Plug-In Electric Vehicles	Connected Infrastructure (e.g., adaptive traffic signals)	Rail Car Efficiency	Airport Management	Transportation Demand Management	Freight Electrification
My company/organization currently uses, invests in, or otherwise participates in the market for this technology.	37	16	7	7	17	7
My company/organization has considered using, investing in, or otherwise participating in the market for this technology, and may be interested in doing so.	24	26	22	7	27	22
My company/organization has considered using, investing in, or otherwise participating in the market for this technology, but is unlikely to be interested in doing so.	21	14	11	12	11	14
My company/organization has not considered using, investing in, or otherwise participating in the market for this technology.	23	41	50	65	38	49
I have not heard of this technology.	1	10	13	11	9	11
No answer	3	2	6	7	7	6
Total	**109**	**109**	**109**	**109**	**109**	**109**

Additional Analyses

This section provides information on additional analyses that were conducted but not presented in the report. Table 33 summarizes the results of these analyses. The figures that follow provide additional detail on some of these analyses, as indicated in the table.

Table 33. Additional Analyses Conducted

Analysis Description	Conclusions
Are there differences in the types of companies that interact with NYSERDA in particular ways?	- See Figures 1-4. - No evident pattern with respect to employment. - Almost half of companies that applied for but did not receive funding are in mid-range of revenue distribution. - Wholesalers/retailers apply for/do not receive funding more often. - Construction/installation companies and fleet owners receive funding more often; public sector organizations less often. - Retailers, fueling infrastructure owners, and public sector organizations receive technical assistance more often; manufacturers and consultants less often.
Are there differences in the types of companies that identify with various sectors?	- See Figures 5-10. - Most companies are old (established prior to 1990), even in EV sectors. - No discernable differences by sector for employment, revenues, or product development outcomes. - Companies that had filed or planned to file patents most commonly identified as part of heavy duty/freight sector.
What is known about the companies in the survey that are located, or receive most revenues from, outside of New York State?	- See Figures 11-13. 10 companies have no operations or headquarters in New York State and receive more than half of their revenue from outside the state. - These companies tend to have fewer than 50 employees and work in a variety of sectors, most commonly EVs and fleet management.
Are there differences in the role or focus of nonprofit organizations in the survey?	- See Figures 14-16. - There are slightly more nonprofits in the EV sector, but overall these organizations are pretty well distributed across sectors; no evident pattern among sectors for nonprofits. - Access to capital is a top influential factor – similar to other company types. - Lack of supportive state policies is a top barrier.
How many program non-participants (i.e., companies that had not received NYSERDA funding) responded to the survey?	- See Figure 17. 7 Stage 1 respondents reported not receiving funding. - Only 11 respondents in Stage 2 had not received funding..

Analysis Description	Conclusions
Are there differences in the types of companies that interact with NYSERDA in particular ways?	• See Figures 1-4. • No evident pattern with respect to employment. • Almost half of companies that applied for but did not receive funding are in mid-range of revenue distribution. • Wholesalers/retailers apply for/do not receive funding more often. • Construction/installation companies and fleet owners receive funding more often; public sector organizations less often. • Retailers, fueling infrastructure owners, and public sector organizations receive technical assistance more often; manufacturers and consultants less often.
For transportation goals, how many companies choose multiple goals?	• See Figure 18. • Most companies selected more than one goal – 90 percent chose up to six. • Only 12 (11 percent) chose one goal.
Do respondents' top-ranked services differ by services received?	• Funding is most useful service overall, regardless of service received. • General information is the next most valuable service.
Do respondents' explanations of how their top-ranked service was useful differ by top-ranked service?	• Direct funding was most commonly useful because it provided capacity for R&D, product development, or product deployment; a smaller number of respondents mentioned supporting outreach and education, enabling market research, providing business development support, or mitigating R&D risk. • Otherwise, no evident pattern across the comparison. • Other explanations included providing introductions to key stakeholders, useful general information or educational materials, and insight into New York State governmental policies and priorities.

Which respondents selected market demand as a key need for success?	• The most common characteristics of the companies that selected market demand as a key need for success are:
	    o Companies with few employees
	    o Companies with higher revenues
	    o Manufacturers
	    o Companies in the EV sector

Does the distribution of company employment mirror state or national patterns?	• The distribution does not mirror overall state or national patterns in employment, which show very few companies with 500+ employees, and only slightly resembles the distribution for state and national Transportation Equipment Manufacturing Firms (data from U.S. Census Bureau and Small Business Administration). • The distribution is more similar to that of national Transportation Equipment Manufacturing Establishments.

Figure 1. Type of Interaction with NYSERDA by Company Employment (Full-Time Equivalents, or FTEs)
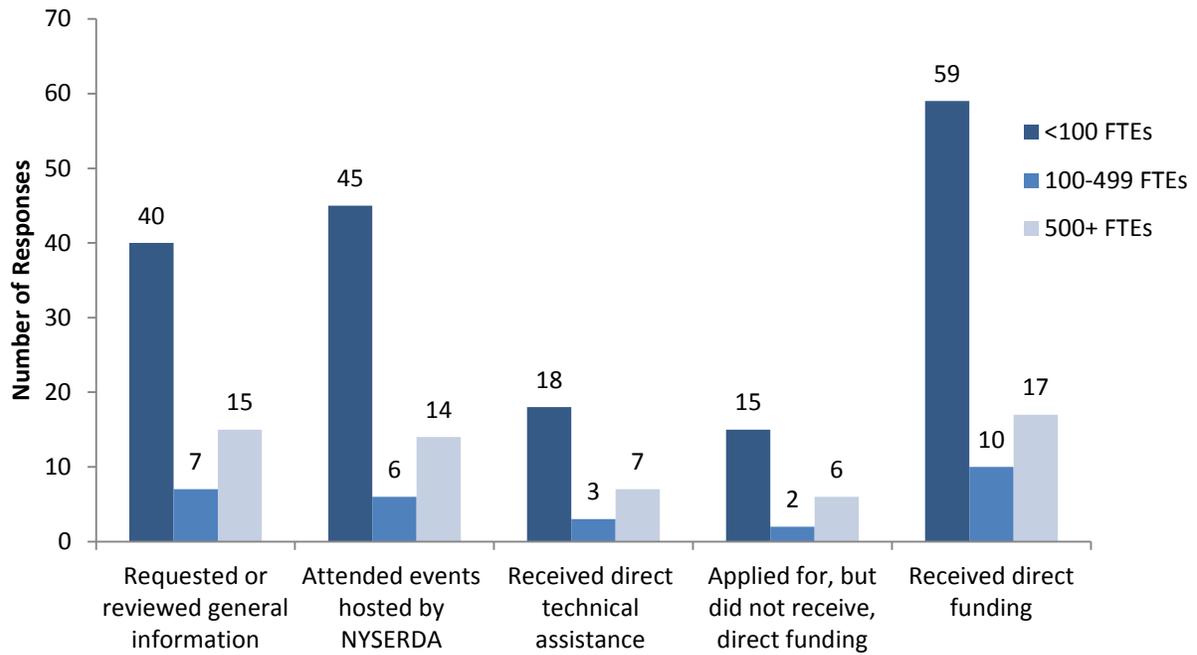
Figure 2. Type of Interaction with NYSERDA by Annual Revenues
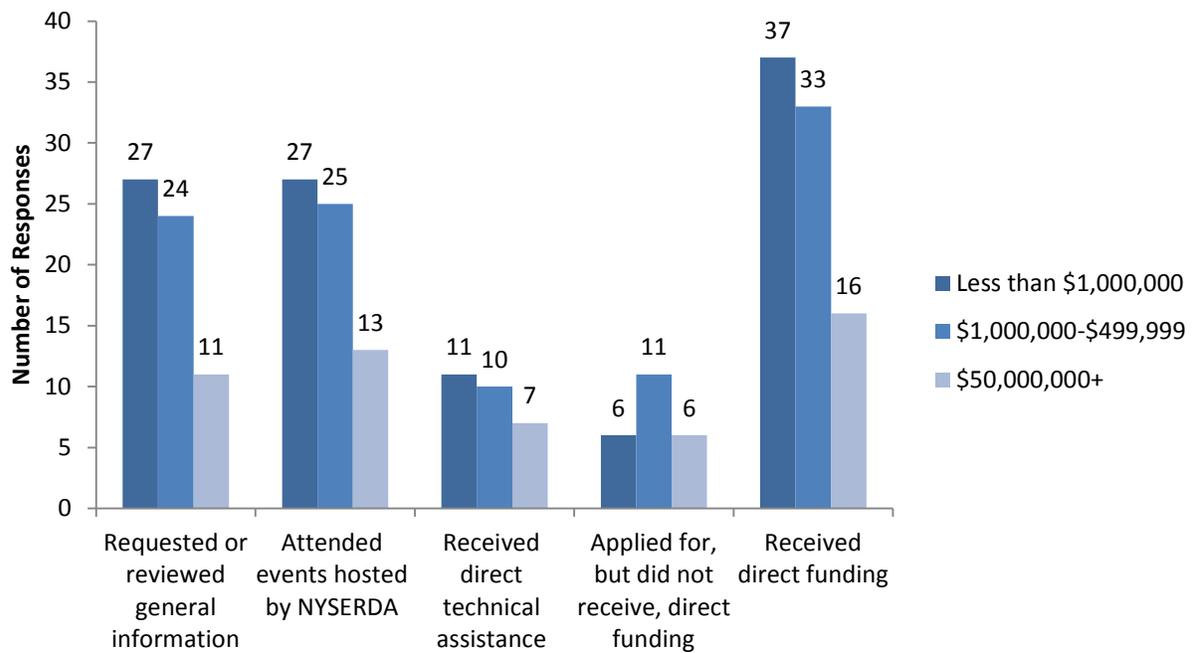
Figure 3. Type of Interaction with NYSERDA by Company Type

Legend:
- Requested or reviewed general information
- Attended events hosted by NYSERDA
- Received direct technical assistance
- Received direct funding
- Applied for, but did not receive, direct funding
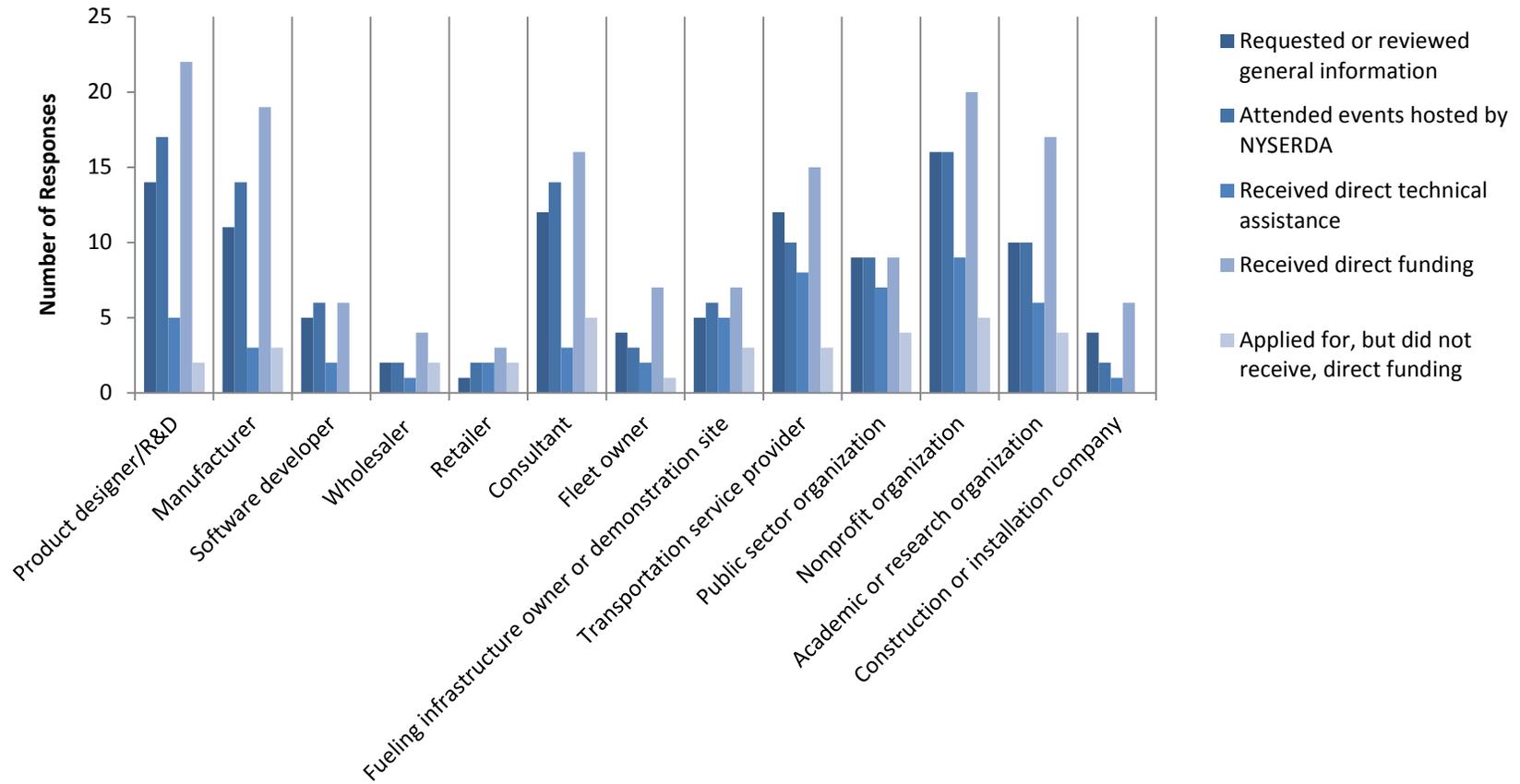
Figure 4. Company Type by Type of NYSERDA Interaction (Alternative Display of Figure 6)

Legend:
- Construction or installation company
- Academic or research organization
- Nonprofit organization
- Public sector organization
- Transportation service provider
- Fueling infrastructure owner or demonstration site
- Fleet owner
- Consultant
- Retailer
- Wholesaler
- Software developer
- Manufacturer
- Product designer/R&D

Categories (y-axis):
- Received direct funding
- Applied for, but did not receive, direct funding
- Received direct technical assistance
- Attended events hosted by NYSERDA
- Requested or reviewed general information

Number of Responses

Figure 5. Most Common Technology Areas (Sector Groupings)[1]

Technology Area	Number of Responses
Services	54
EV/alternative fuel vehicles	53
Public transit	36
Heavy duty/freight	35
Conventional fuel vehicles	28
Water	18
Air	13
Other	11

Note: Colors align with conceptual map by sector.
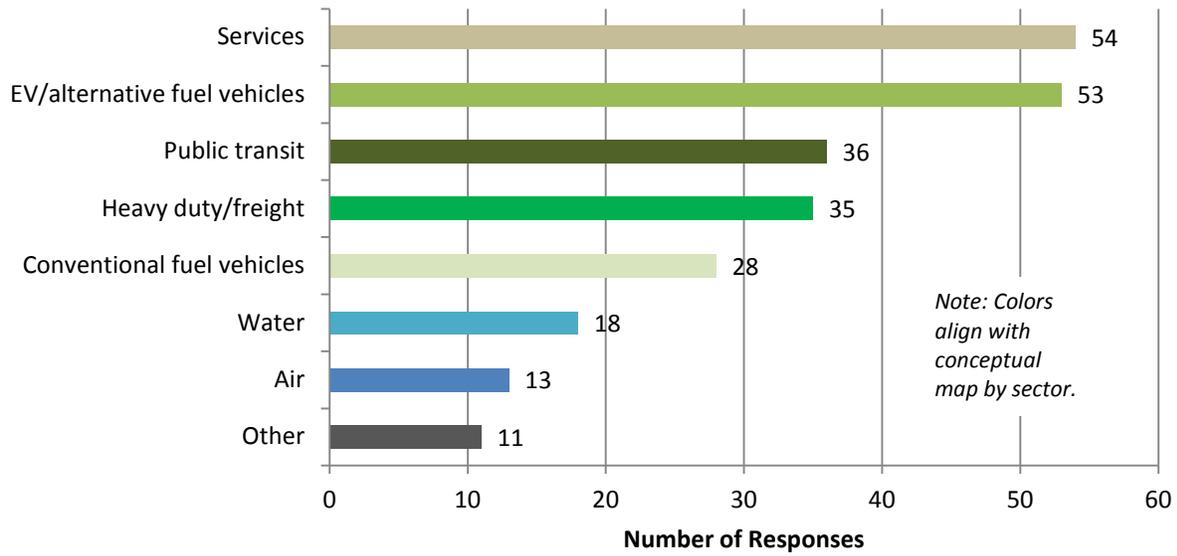
Figure 6. Year of Establishment by Technology Area (Sector Groupings)

Note: Colors align with conceptual map by sector.

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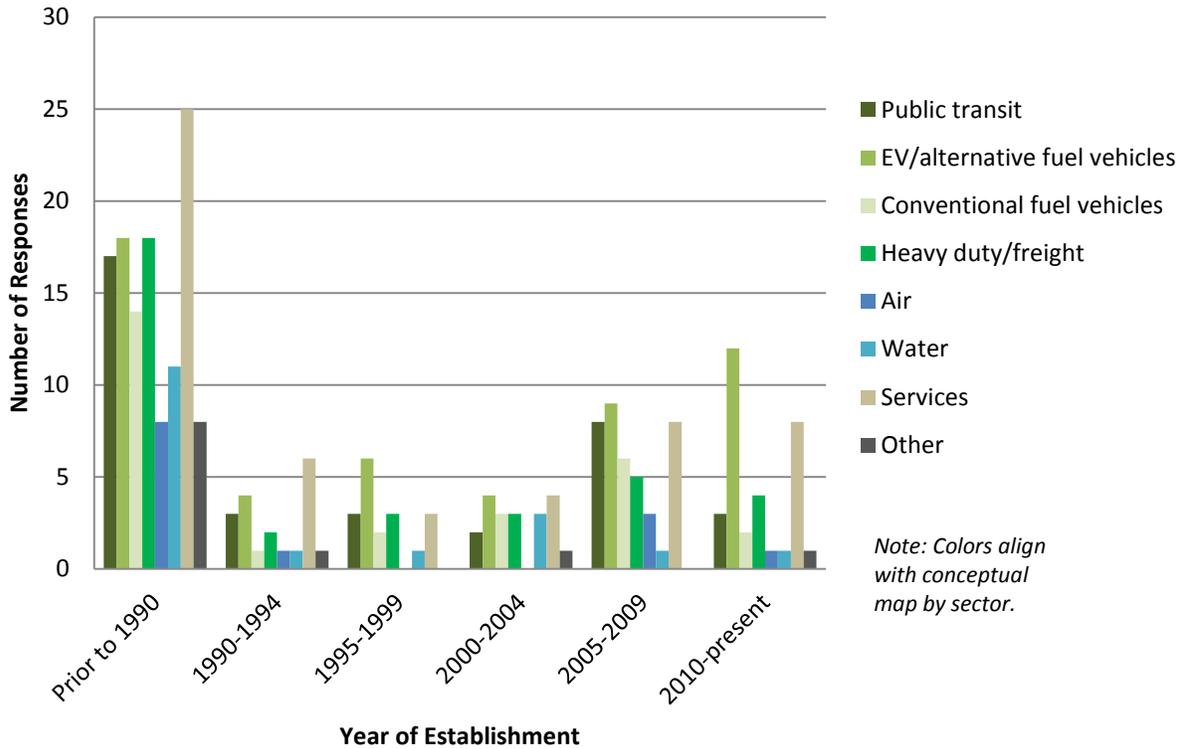
[1] Figures 5 through 14 combine multiple sectors into technology-specific groupings. For these charts, public transit includes public transit rail, buses, and infrastructure; EV/alternative fuel includes light/medium duty EVs, light/medium duty alternative fuel vehicles, and alternative fuel/EV infrastructure; and services includes all transportation services.

Figure 7. Company Employment by Technology Area (Sector Groupings)
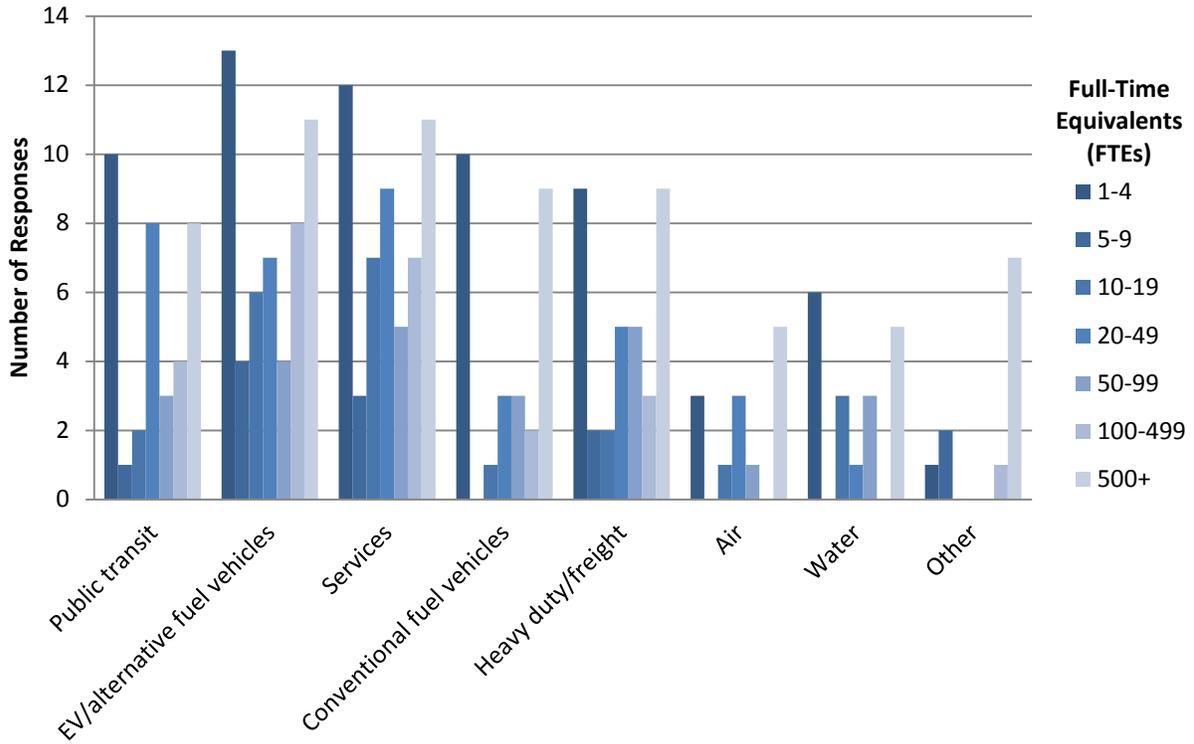
Figure 8. Company Revenues by Technology Area (Sector Groupings)
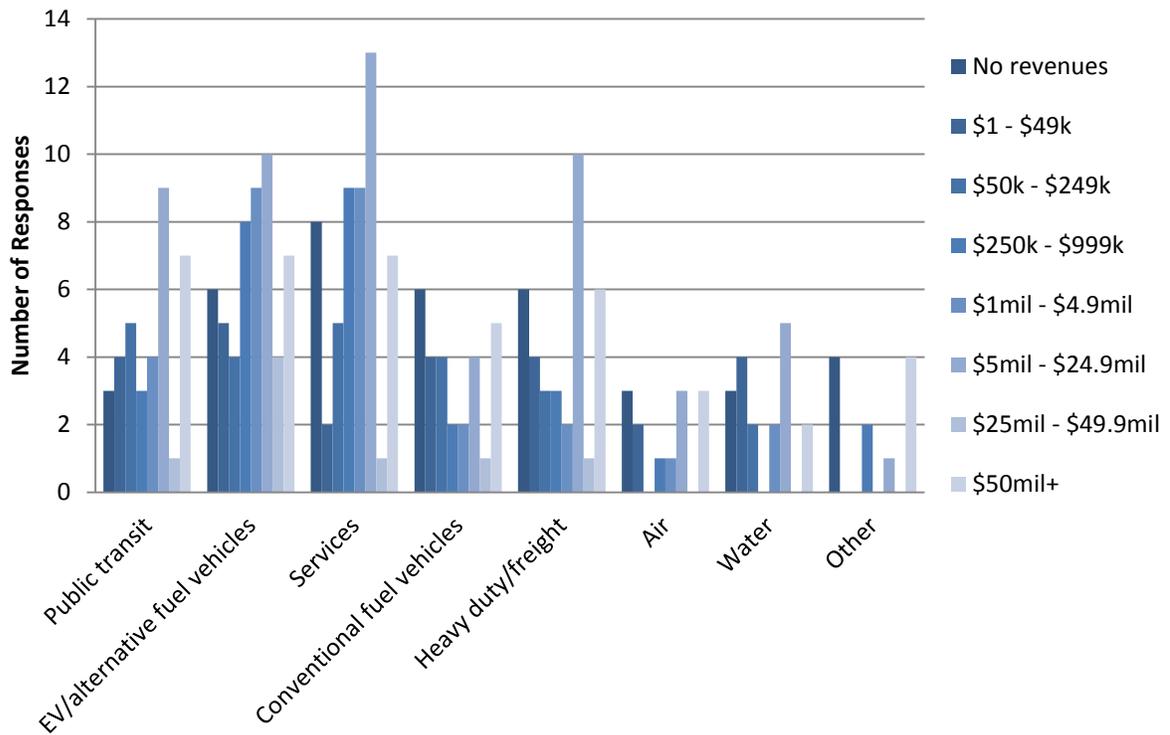
Figure 9. Product Development Outcomes by Technology Area (Sector Groupings)

Is your company still selling, providing, or pursuing development of the product(s) or service(s) for which NYSERDA provided technical or financial support?

Legend:
- No, not selling, providing, or pursuing development
- Yes, still pursuing development
- Yes, still sell or provide
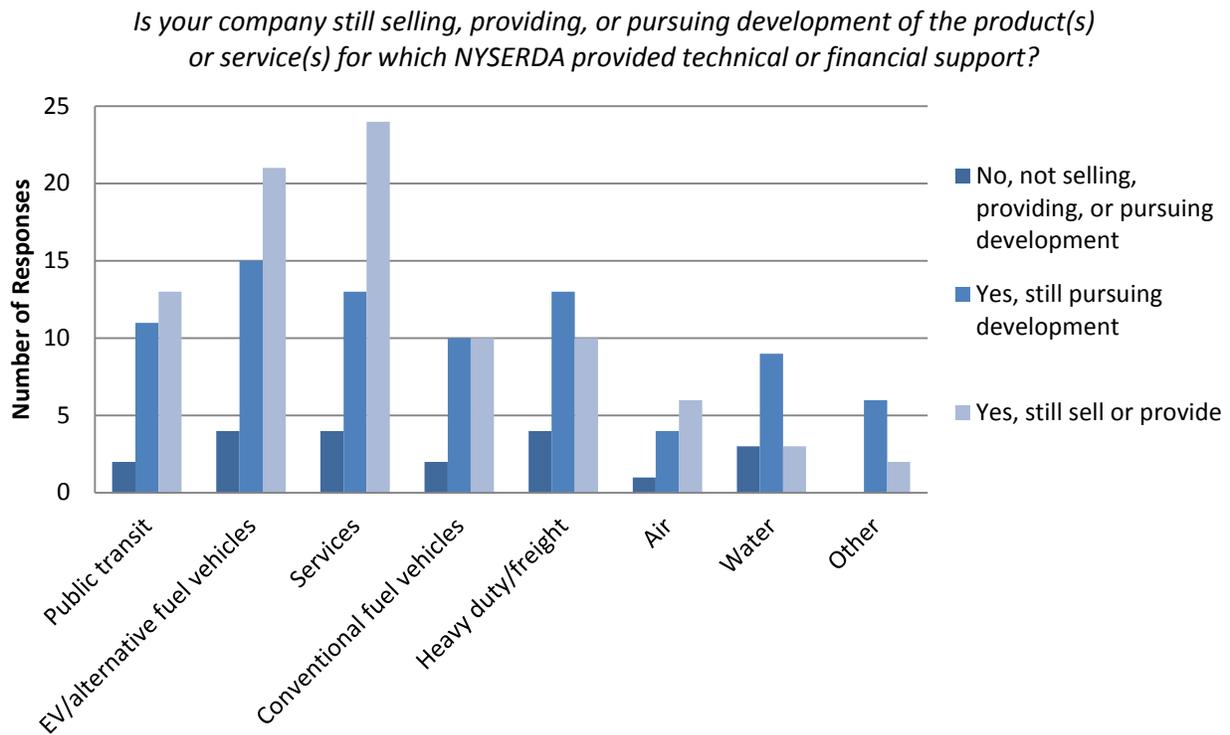
Figure 10. Patents Filed by Technology Area (Sector Groupings)

Have you filed for any patents based on the research conducted with NYSERDA's support?

Legend:
- No, and don't expect to file for patent
- No, but expect to file for patent
- Yes, filed for but have not received patents
- Yes, filed for and received patents
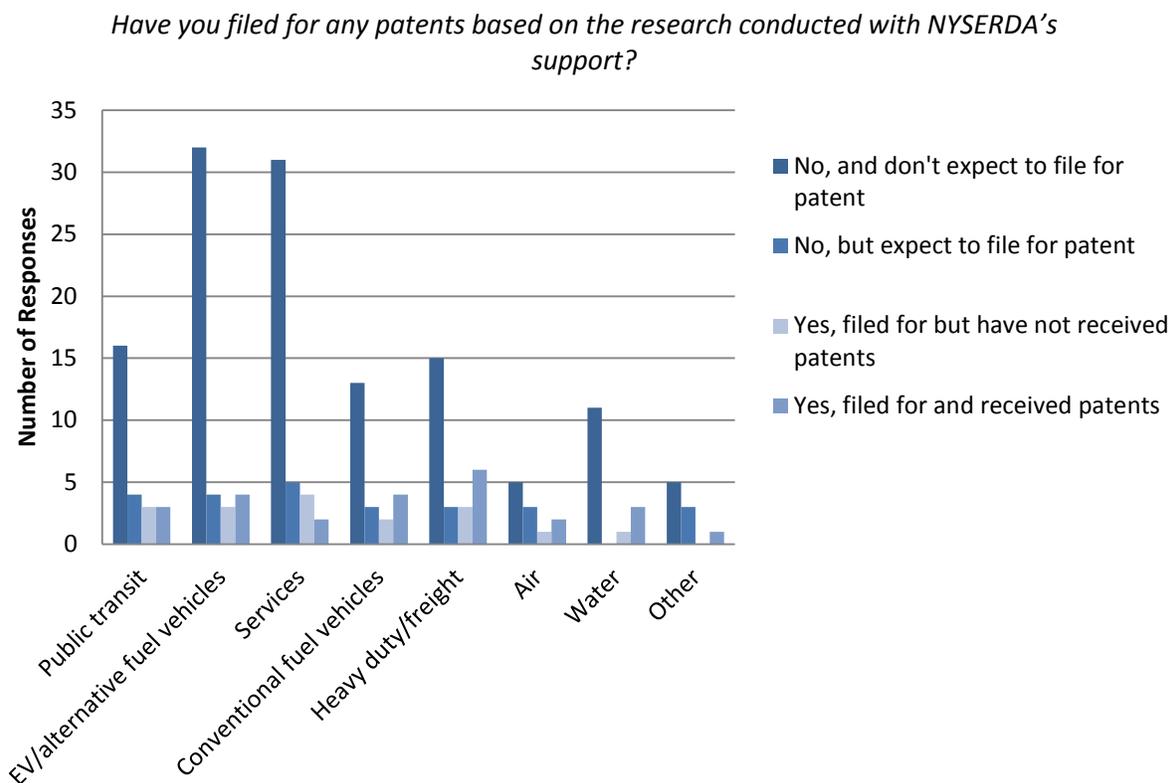
Figure 11. Location of Companies with >50 Percent of Revenues Outside New York State
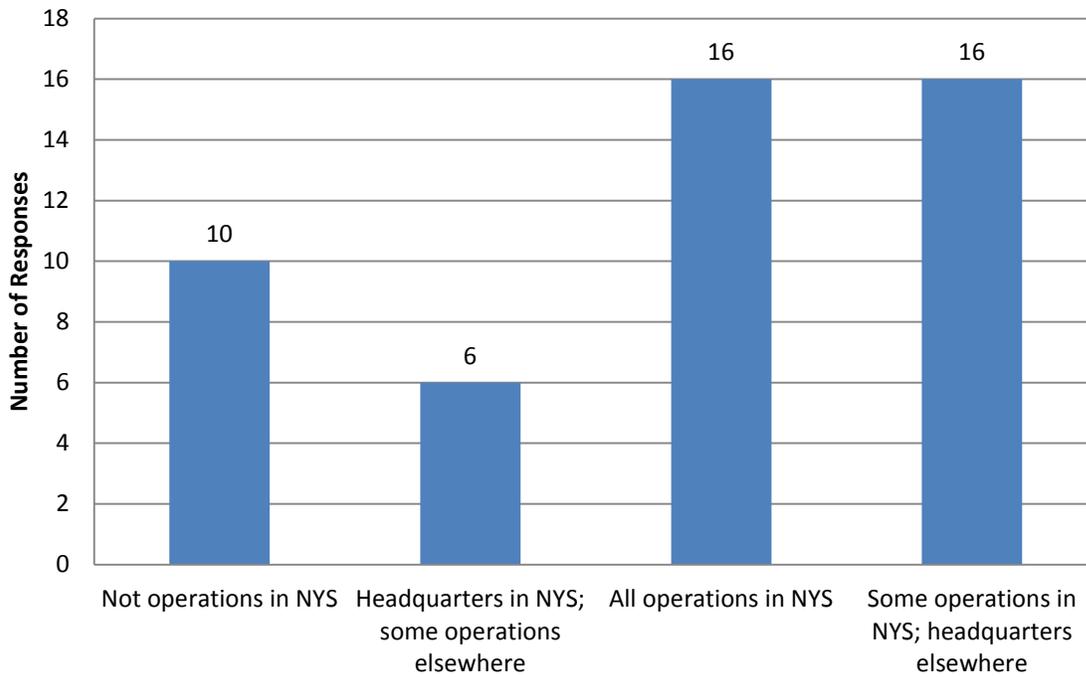
Figure 12. Technology Areas (Sector Groupings) Represented by Companies Located Outside of New York State
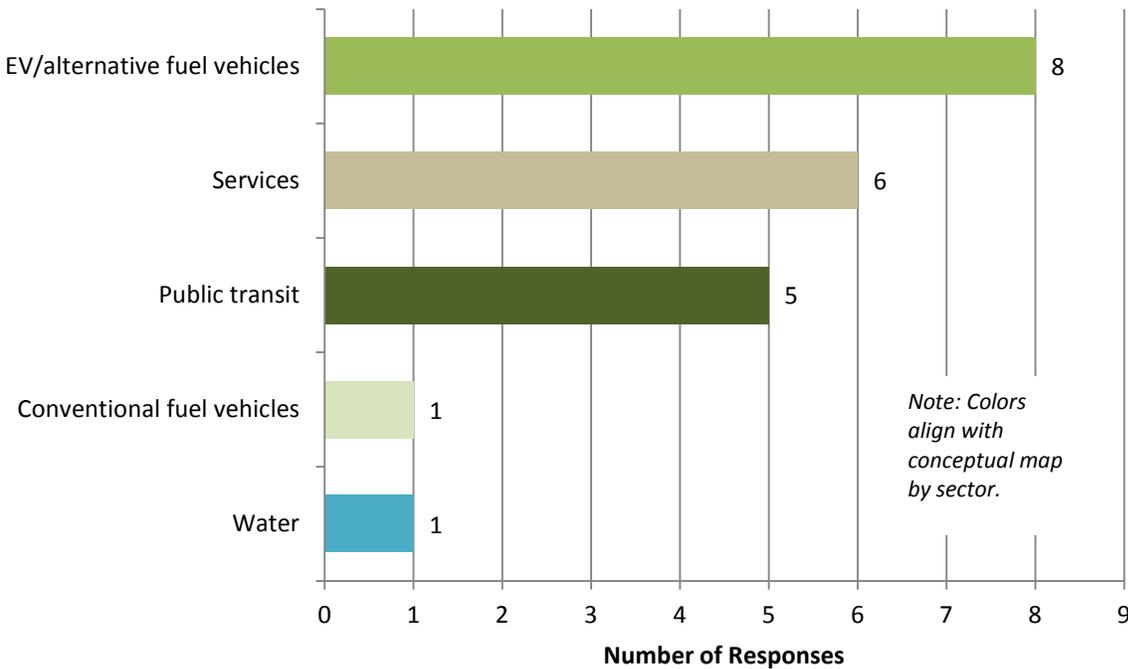
Figure 13. Employment of Companies Located Outside of New York State
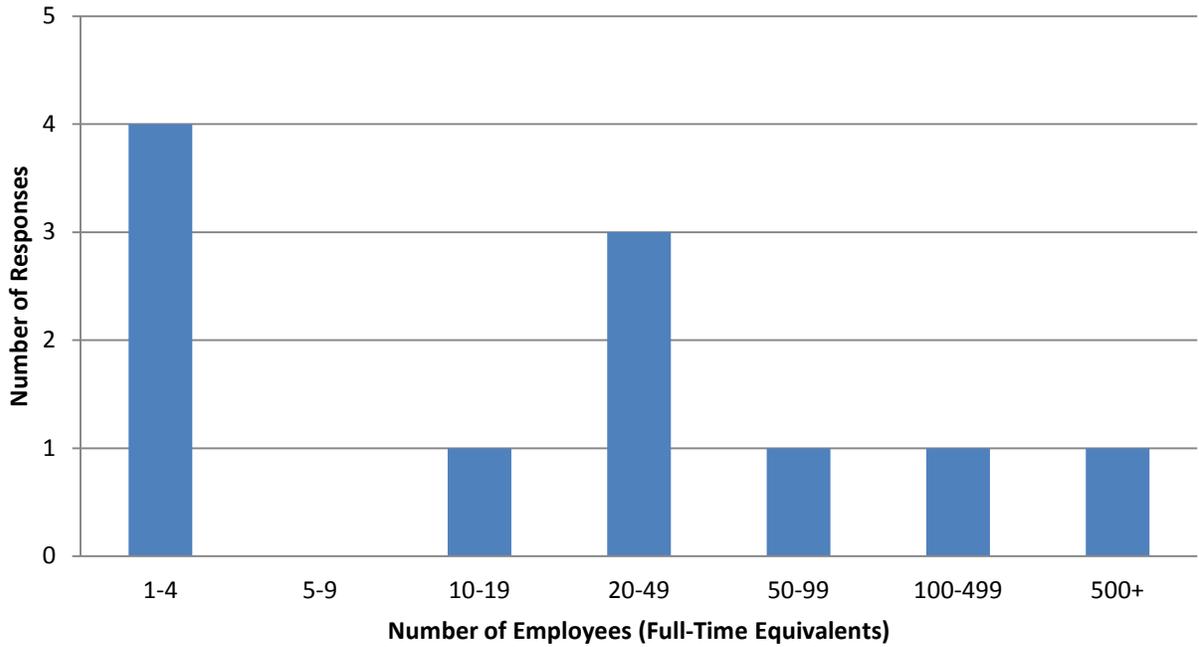
Figure 14. Technology Areas (Sector Groupings) of Nonprofit Organizations
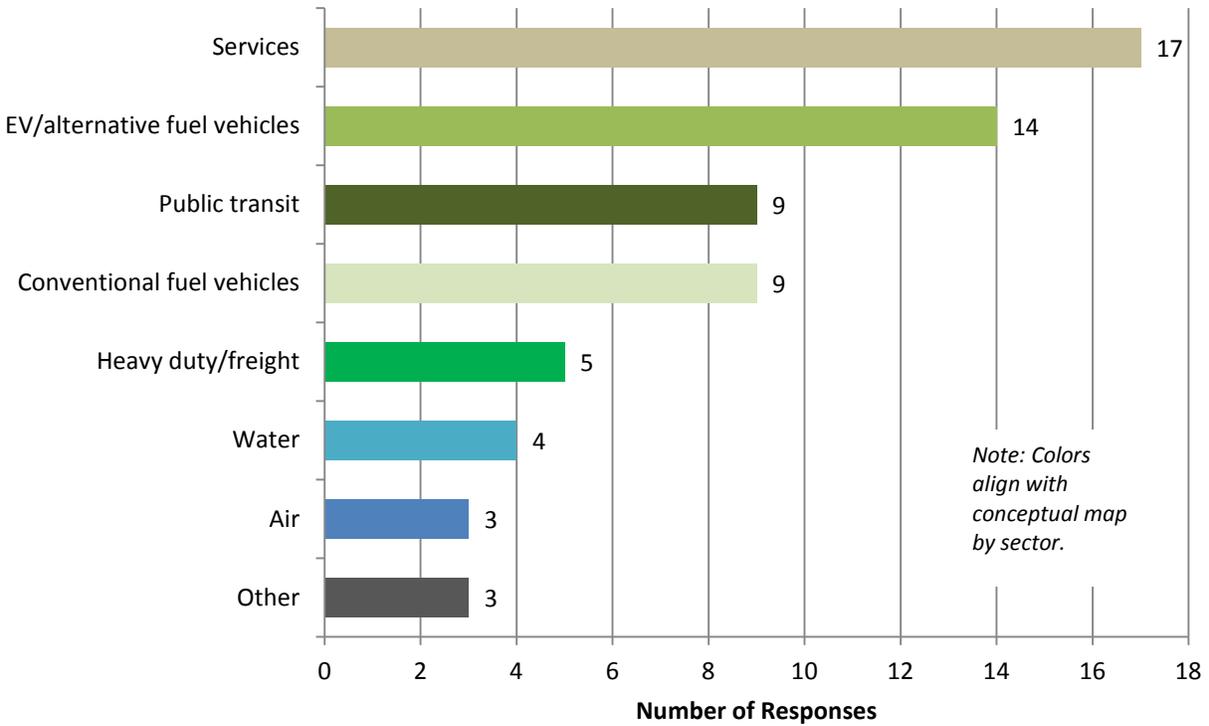
Figure 15. Most Influential Factors, According to Nonprofit Organizations

Factor	Number of Responses
Access to financial capital	7
Supportive state regulatory framework	3
Existence of supportive state policies	3
Physical infrastructure	3
Availability of R&D	2
Tax incentives and subsidies	1
Other	1
Energy prices in state	1
Availability of business services to entrepreneurial companies	1
Access to human capital	1
No answer	1

Number of Responses
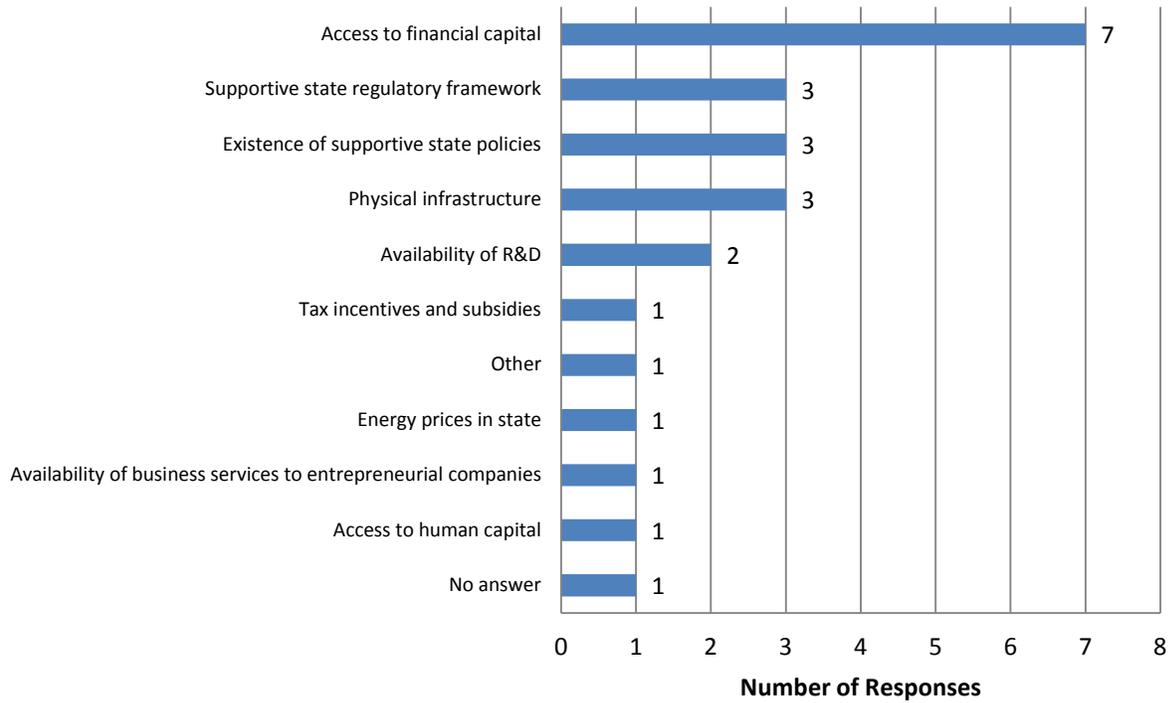
Figure 16. Greatest Barriers, According to Nonprofit Organizations

Barrier	Number of Responses
Lack of access to financial capital	5
Lack of supportive state policies	4
Unsupportive regulatory framework	3
Gas prices	3
Poor market conditions	2
Physical infrastructure	2
Lack of tax incentives and subsidies	2
Lack of R&D capabilities	1
Other	1

Number of Responses
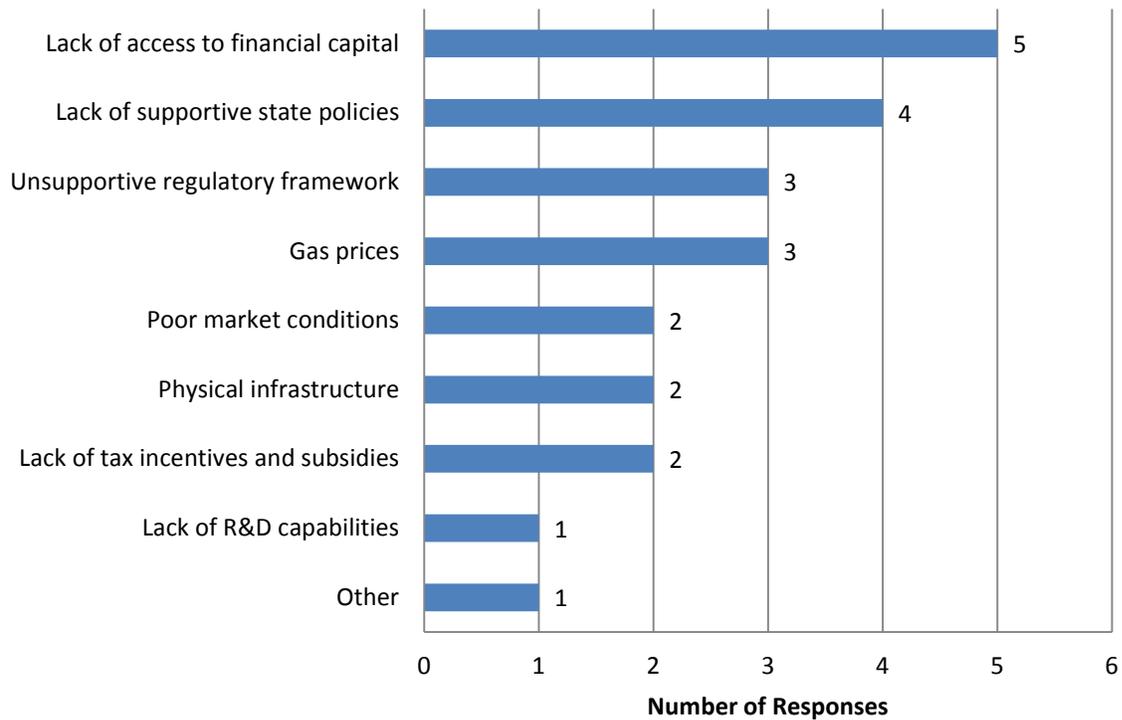
Figure 17. Receipt of NYSERDA Funding by Survey Stage[2]
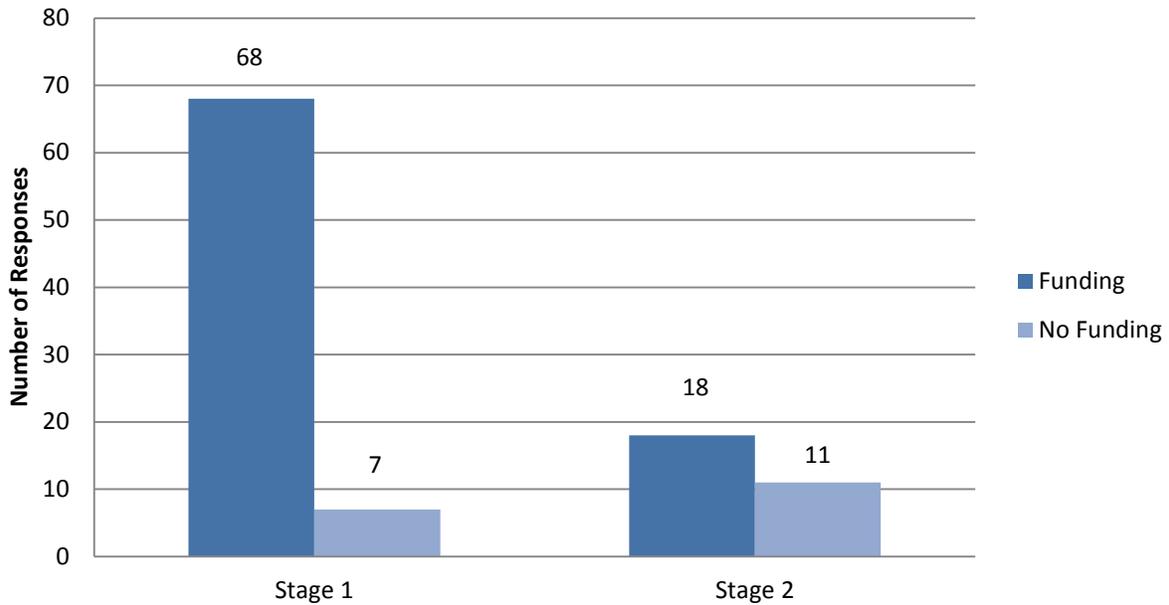
Figure 18. Number of Transportation-Related Goals Selected by Respondents

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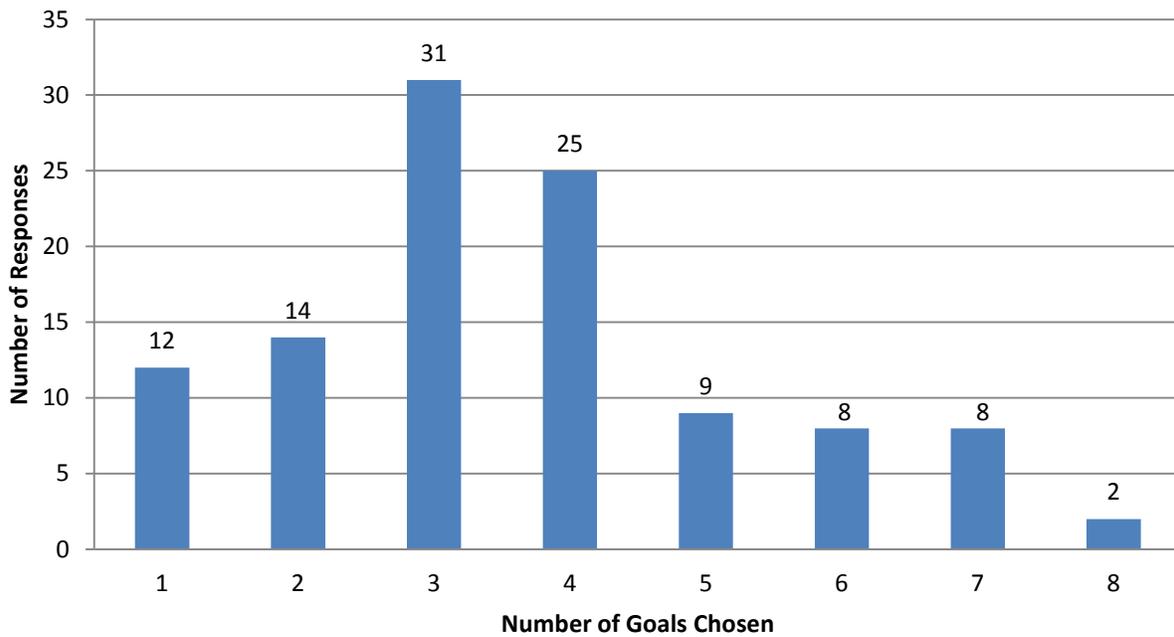
[2] This figure excludes respondents that indicated they had not heard of NYSERDA (n=5). All Stage 1 respondents had received NYSERDA funding by survey design; the seven respondents who indicated they had not were most likely not involved in those funded projects.

APPENDIX D: DETAILED METHODS FOR TRANSPORTATION DEMAND MANAGEMENT GEOSPATIAL ANALYSIS

The assessment of transportation demand management (TDM) priority areas relies on geospatial analysis as the primary method of evaluation. For this analysis, IEc identified publicly available GIS data sources to represent the factors necessary for successful TDM; for a couple factors, IEc supplemented publicly available data with information from stakeholder interviews. The factors considered in the analysis are:

- Public transit commuting rate,

- Presence of park-and-ride lots,

- Carshare and bikeshare availability,

- Population density,

- Presence of large employers,

- Presence of populations of interest, including universities, low-income populations, and older populations, and

- Public safety and security, as approximated by per-capita crime rates.

IEc first assessed the factors individually to determine suitable threshold values (i.e., low, medium, and high) and then combined the factors to create an index scoring system that allows for comparison across towns.[1] Table 1 and the following sections summarize each factor and the methods used in the index scoring system.

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[1] As noted in Table 1, park-and-ride lots were not included in the quantitative analysis because it was not feasible to map the destinations of transit routes from these lots.

Table 1. Data and Methods for Geospatial Analysis

Factor		Data Source	Geographic Resolution	Methods and Key Assumptions
Non-SOV Transit Options	Public Transit	American Community Survey (ACS) 2014	Block Group	Percent of all workers that take public transportation to work. Arrived at "high" threshold of 11.9% after categorizing through "quantile" in GIS.
	Park-and-Ride Lots	NYS GIS	Point	Locations shown for illustrative purposes only, given difficulty in mapping transit routes.
	Carshare or Bikeshare Program	Shared Mobility, Inc., Zipcar.com, Bikeshare.com	Town	Areas where carshare or bikeshare is present or under development.
Population/ Employment Density	Population Density	ACS 2014	Block Group	Arrived at "high" 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)	Town	Based on two combined datasets: 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. Arrived at "large" threshold of 370 beds through "quantile" in GIS.
Populations with TDM Interest	Large University	NYSP2I	Town	Arrived at "high" threshold of 5,666 students through "quantile" in GIS.
	Low-Income Population	ACS 2014	Block Group	Percent of households below poverty level. Use federal poverty rate of 14.3% as "high" threshold.
	Older Population	ACS 2014	Block Group	Percent of population over 65. Arrived at 26.7% "high" threshold using "natural breaks" in GIS.
Other Considerations	Public Safety and Security	NYS Division of Criminal Justice Services	County	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.

Public Transit

This metric is based on American Community Survey block group-level commuter data, published by the U.S. Census Bureau in 2014.[2] Public transit commuting rates were determined by dividing the number of workers ages 16 and over who commute by public transportation (field ID B08301e10) by the total number of workers 16 and over (field ID B08301e1).

Public transit commuting ranged from zero in some block groups to nearly 100 percent in others. To best represent the variation across New York State, IEc first eliminated block groups with zero public transit commuting and those in New York City, where public transit commuting was much higher than the rest

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[2] U.S. Census Bureau. 2014 TIGER/Line Shapefiles with Selected Demographic and Economic Data. Downloaded from https://www.census.gov/geo/maps-data/data/tiger-data.html on February 1, 2017.

of the state. IEc then categorized the remaining block groups into three bins using quantile breaks in GIS, resulting in the following categories:

- Low usage: 0-4 percent

- Medium usage: 4-11.9 percent

- High usage: 11.9-100 percent

Because interviewees indicated that public transit use and accessibility is vital to the success of TDM initiatives, IEc presented the results of the index score in two ways: first, considering all areas regardless of public transit usage, and second, considering only those towns that contained at least one block group with high public transit usage. Public transit commuting was otherwise not incorporated into the score.

Park-and-Ride Lots

New York State Thruway Park-and-Ride lot locations were downloaded from the New York State GIS Clearinghouse and included in the index score maps to provide context for potential TDM options.[3] Because it was not feasible to map the destinations of transit routes from these lots, they were not incorporated into the index score.

Carshare or Bikeshare Program

Using information collected from Zipcar, Bikeshare.com, and interviews with Shared Mobility, Inc., IEc compiled a list of towns that have carshare or bikeshare services available or under development.[4,5,6] Carshare and bikeshare presence was incorporated into the overall index score by assigning one point to any town with an existing or pending carshare or bikeshare program.

Population Density

This metric is based on the American Community Survey block group-level population data, published by the U.S. Census Bureau in 2014.[7] Density was determined by dividing the total population for each block group (field ID B01003e1) by the area of the block group, as calculated in GIS.

As with public transit commuting, population density is substantially higher in New York City than the rest of the state. IEc therefore excluded New York City block groups and categorized all other areas into three bins using quantile breaks in GIS:

- Low density: 0-365 people per km^2

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[3] New York State GIS. NYS Thruway Park and Ride Lots, Revised February 2015. Downloaded from https://gis.ny.gov/gisdata/inventories/details.cfm?DSID=1191 on February 10, 2017.

[4] Bikeshare.com. "Bike Share Cities." Accessed at http://bikeshare.com/map/ on February 20, 2017.

[5] Zipcar. "Where the cars are." Accessed at http://www.zipcar.com/cities on February 20, 2017.

[6] Shared Mobility, Inc. Data provided by Michael Galligano on February 9, 2017.

[7] U.S. Census Bureau. 2014 TIGER/Line Shapefiles with Selected Demographic and Economic Data. Downloaded from https://www.census.gov/geo/maps-data/data/tiger-data.html on February 1, 2017.

- Medium density: 366-1,857 people per km^2

- High density: 1,858-30,075 people per km^2

Population density was incorporated into the index score by assigning one point to any town that contained a block group with density in either the medium or high bins. Both categories were included in the score for this metric because the high bin included very few locations.

Large Employer

This metric is based on employer data compiled by the New York State Department of Labor and hospital data from the New York State Pollution Prevention Institute (NYSP2I). [8,9] The Department of Labor provides lists of the top 10 largest private sector employers in each of the 10 New York State regions. To narrow this list to employers that may be well-suited to TDM programs, IEc eliminated employers likely to have multiple, dispersed locations (e.g. supermarket chains, retail chains). Because the Department of Labor lists do not include addresses or other location information, IEc identified the associated town for each employer via internet research.

The hospital data was provided by NYSP2I, and contains estimates of hospital size in terms of number of beds and GIS coordinates for all hospitals outside of New York City. IEc categorized hospitals into three bins using quantile breaks in GIS:

- Small hospital: 0-224 beds

- Medium hospital: 225-368 beds

- Large hospital: 369-1,451 beds

Only large hospitals were considered large employers for purposes of this analysis. The large employer metric was incorporated into the overall index score by assigning one point to any town containing a large employer identified using the two methods above.

Large University

The university metric also relies on data provided by NYSP2I. These data contain estimates of university size in terms of student enrollment and GIS coordinates for all universities outside of New York City. [10] IEc categorized universities into three bins using quantile breaks in GIS:

- Small university: 0-2,673 students

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[8] New York State Department of Labor. 2016. New York's Largest Private Sector Employers. August 2016. Downloaded from https://labor.ny.gov/stats/nys/Largest-private-sector-employers-NYS.shtm on February 20, 2017.

[9] New York State Pollution Prevention Institute. 2016. Data provided by Ava Labuzetta on January 9, 2017, and summarized in: Ava Labuzetta, Melissa Hall, and Thomas Trabold. "Initial Roadmap for Food Scrap Recovery and Utilization in New York State." November 2016.

[10] New York State Pollution Prevention Institute. 2016. Data provided by Ava Labuzetta on January 9, 2017, and summarized in: Ava Labuzetta, Melissa Hall, and Thomas Trabold. "Initial Roadmap for Food Scrap Recovery and Utilization in New York State." November 2016.

- Medium university: 2,674-5,665 students

- Large university: 5,666-26,714 students

This metric was incorporated into the overall index score by assigning one point to any town with a large university.

Low-Income Population

This metric is based on the American Community Survey block group-level poverty data, published by the U.S. Census Bureau in 2014.[11] Poverty status was determined by dividing the total number of households with income below the poverty level (field ID B17017e2) by the total number of households (field ID B17017e1).

IEc set the threshold for high poverty populations at the national poverty rate of 14.3 percent. If a town included a block group where the poverty rate was equal to or higher than the national average, IEc assigned one point to the index score for that town.

Older Population

This metric is based on the American Community Survey block group-level population data, published by the U.S. Census Bureau in 2014.[12] IEc determined the percentage of the population comprised of older individuals by summing the total number of people aged 65 and over (field IDs B01001e20 through B01001e25 for males, plus B01001e44 through B01001e 49 for females) and dividing by the total population (field ID B01001e1) of each block group.

To determine thresholds for high priority populations for the index score, IEc categorized block groups into three bins using natural breaks in GIS, which provided a more reasonable division than quantile breaks. This resulted in the following bins:

- Low age distribution: 0-13.7 percent over 65

- Medium age distribution: 13.7-26.8 percent over 65

- High age distribution: 26.8-100 percent over 65

Presence of older populations was incorporated into the overall index score by assigning one point to any town that contained a block group in the high age bin.

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[11] U.S. Census Bureau. 2014 TIGER/Line Shapefiles with Selected Demographic and Economic Data. Downloaded from https://www.census.gov/geo/maps-data/data/tiger-data.html on February 1, 2017.

[12] U.S. Census Bureau. 2014 TIGER/Line Shapefiles with Selected Demographic and Economic Data. Downloaded from https://www.census.gov/geo/maps-data/data/tiger-data.html on February 1, 2017.

Public Safety and Security

This metric is approximated using crime rates. The finest scale for crime data that was available statewide was county-level index crime data from the New York State Division of Criminal Justice Services.[13] Index offenses include violent crime, such as murder, rape, robbery, and aggravated assault, as well as property crime, such as burglary, larceny, and motor vehicle theft. Because county-level crime data are likely not detailed enough to serve as a true indicator of TDM potential, these data were not incorporated into the overall town scores. Instead, the counties with crime rates in the top 25 percent statewide were flagged as having potential public safety and security concerns, to inform TDM strategy. This information can be considered alongside the index score when assessing the potential for TDM, but its effect may vary on a case-by-case basis due to localized conditions within each county.

Index Score

As indicated in the summaries above, IEc calculated a final index score ranging from 0-6 for each town by assigning one point for each of the following:

- At least one block group with medium or high population density;

- At least one block group with a high proportion of residents over age 65;

- At least one block group with more than 14.3 percent of households below the poverty level;

- Having a carshare or bikeshare program;

- Having a university with enrollment greater than 5,666 students; and

- Having a large employer.

Additional Methodological Notes

Town and city boundaries are based on New York State GIS Civil Boundary shapefiles.[14] IEc clipped these boundaries to the detailed shoreline county boundaries to eliminate open water from area calculations and create more precise maps.[15] In addition, IEc treated towns and cities with the same name and county as one unit – for example, although the city and town of Poughkeepsie are distinct municipalities for administrative purposes, for the purposes of this analysis, both are assumed to be part of a single metropolitan area and thus receive a single score.

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[13] Division of Criminal Justice Services, New York State. 2015 County Index Crime Counts and Rates Per 100,000 Population. Downloaded from http://www.criminaljustice.ny.gov/crimnet/ojsa/countycrimestats.htm on February 10, 2017.

[14] New York State GIS. NYS Civil Boundaries, City/Town. Downloaded from http://gis.ny.gov/gisdata/inventories/details.cfm?DSID=927 on February 10, 2017.

[15] New York State GIS. County Shoreline Boundary. Downloaded from http://gis.ny.gov/gisdata/inventories/details.cfm?DSID=927 on February 10, 2017.

APPENDIX E: DETAILED TRANSPORTATION DEMAND MANAGEMENT INDEX RESULTS

The following table presents the town-level results of the transportation demand management (TDM) priority index score analysis. In addition, for each town, the table reports the average public transit commuting rate across all block groups and whether the town is included in a county with above-average crime rates, as a proxy for potential public safety and security concerns, since these factors were not incorporated into the index. Towns are presented in descending order by score, with the highest-ranked towns (score of 6) shaded dark gray, and the next highest (score of 5) shaded light gray. Towns with a score of 0 are not included.

Town/City	County	Index Score	Public Transit Use	Potential Public Safety Concern?
Albany	Albany	6	14%	Yes
Brookhaven	Suffolk	6	5%	No
Buffalo	Erie	6	13%	Yes
Hempstead	Nassau	6	17%	No
Huntington	Suffolk	6	11%	No
Ithaca	Tompkins	6	10%	No
North Hempstead	Nassau	6	19%	No
Poughkeepsie	Dutchess	6	6%	No
Rochester	Monroe	6	8%	Yes
Syracuse	Onondaga	6	8%	Yes
Cortland	Cortland	5	1%	No
Eastchester	Westchester	5	26%	No
Islip	Suffolk	5	7%	No
Mount Pleasant	Westchester	5	18%	No
New Paltz	Ulster	5	3%	No
New York	New York, Bronx, Kings, Richmond, Queens	5	53%	Yes
Potsdam	St Lawrence	5	1%	No
Schenectady	Schenectady	5	8%	Yes
Sweden	Monroe	5	4%	Yes
Utica	Oneida, Herkimer	5	3%	No
Vestal	Broome	5	2%	Yes
Amherst	Erie	4	2%	Yes
Binghamton	Broome	4	6%	Yes
Brighton	Monroe	4	4%	Yes
Elmira	Chemung	4	3%	No
Geneva	Ontario	4	1%	No
Glen Cove	Nassau	4	8%	No
Glens Falls	Warren	4	1%	No
Greenburgh	Westchester	4	22%	No
Harrison	Westchester	4	22%	No
Henrietta	Monroe	4	3%	Yes
Hyde Park	Dutchess	4	2%	No
Irondequoit	Monroe	4	2%	Yes
Kingston	Ulster	4	2%	No
Long Beach	Nassau	4	20%	No
Milton	Saratoga	4	1%	No
New Hartford	Oneida	4	1%	No
New Rochelle	Westchester	4	22%	No

Town/City	County	Index Score	Public Transit Use	Potential Public Safety Concern?
Niagara Falls	Niagara	4	4%	Yes
Ogdensburg	St Lawrence	4	0%	No
Oneonta	Otsego	4	3%	No
Onondaga	Onondaga	4	4%	Yes
Orangetown	Rockland	4	10%	No
Oswego	Oswego	4	1%	No
Owego	Tioga	4	0%	No
Plattsburgh	Clinton	4	0%	No
Ramapo	Rockland	4	11%	No
Saratoga Springs	Saratoga	4	2%	No
Sidney	Delaware	4	0%	No
Ticonderoga	Essex	4	0%	No
Tonawanda	Erie	4	3%	Yes
Troy	Rensselaer	4	5%	Yes
Wallkill	Orange	4	4%	No
Watertown	Jefferson	4	1%	No
Yonkers	Westchester	4	26%	No
Albion	Orleans	3	0%	No
Amsterdam	Montgomery	3	1%	Yes
Arcadia	Wayne	3	2%	No
Athens	Greene	3	2%	No
Auburn	Cayuga	3	3%	No
Aurelius	Cayuga	3	1%	No
Babylon	Suffolk	3	9%	No
Bainbridge	Chenango	3	0%	No
Ballston	Saratoga	3	1%	No
Barrington	Yates	3	0%	No
Batavia	Genesee	3	0%	No
Bath	Steuben	3	1%	No
Bedford	Westchester	3	16%	No
Bethlehem	Albany	3	3%	Yes
Big Flats	Chemung	3	1%	No
Blooming Grove	Orange	3	7%	No
Brant	Erie	3	0%	Yes
Broadalbin	Fulton	3	0%	No
Brunswick	Rensselaer	3	1%	Yes
Busti	Chautauqua	3	1%	Yes
Camillus	Onondaga	3	1%	Yes
Canandaigua	Ontario	3	2%	No
Canton	St Lawrence	3	1%	No
Carmel	Putnam	3	7%	No
Castile	Wyoming	3	1%	No
Catskill	Greene	3	1%	No
Chautauqua	Chautauqua	3	1%	Yes
Cheektowaga	Erie	3	3%	Yes
Chenango	Broome	3	1%	Yes
Chesterfield	Essex	3	0%	No
Chili	Monroe	3	1%	Yes
Cicero	Onondaga	3	1%	Yes
Clarence	Erie	3	1%	Yes
Clarkson	Monroe	3	6%	Yes
Clarkstown	Rockland	3	9%	No
Clay	Onondaga	3	1%	Yes
Clifton Park	Saratoga	3	1%	No
Cobleskill	Schoharie	3	2%	No
Cohoes	Albany	3	2%	Yes
Colonie	Albany	3	3%	Yes

Town/City	County	Index Score	Public Transit Use	Potential Public Safety Concern?	Town/City	County	Index Score	Public Transit Use	Potential Public Safety Concern?
Conklin	Broome	3	0%	Yes	Kiantone	Chautauqua	3	0%	Yes
Corinth	Saratoga	3	1%	No	Kingsbury	Washington	3	1%	No
Cornwall	Orange	3	5%	No	Kirkland	Oneida	3	0%	No
Cortlandt	Westchester	3	14%	No	Kirkwood	Broome	3	0%	Yes
Cortlandville	Cortland	3	1%	No	Lackawanna	Erie	3	3%	Yes
Cuba	Allegany	3	1%	No	Lake George	Warren	3	0%	No
Dannemora	Clinton	3	1%	No	Lancaster	Erie	3	1%	Yes
De Witt	Onondaga	3	3%	Yes	Lansing	Tompkins	3	6%	No
Deerfield	Oneida	3	0%	No	Le Roy	Genesee	3	0%	No
Deerpark	Orange	3	1%	No	Leicester	Livingston	3	1%	No
Delhi	Delaware	3	2%	No	Lenox	Madison	3	0%	No
Dickinson	Broome	3	3%	Yes	Lewiston	Niagara	3	1%	Yes
Dix	Schuyler	3	1%	No	Liberty	Sullivan	3	1%	No
Dunkirk	Chautauqua	3	1%	Yes	Little Falls	Herkimer	3	1%	No
East Fishkill	Dutchess	3	4%	No	Lloyd	Ulster	3	4%	No
East Greenbush	Rensselaer	3	3%	Yes	Lockport	Niagara	3	0%	Yes
East Hampton	Suffolk	3	7%	No	Lowville	Lewis	3	0%	No
East Rochester	Monroe	3	1%	Yes	Lysander	Onondaga	3	0%	Yes
Eaton	Madison	3	0%	No	Madison	Madison	3	0%	No
Eden	Erie	3	0%	Yes	Malone	Franklin	3	1%	No
Ellicott	Chautauqua	3	0%	Yes	Mamaroneck	Westchester	3	30%	No
Esopus	Ulster	3	3%	No	Manlius	Onondaga	3	0%	Yes
Evans	Erie	3	0%	Yes	Marcy	Oneida	3	0%	No
Fayette	Seneca	3	0%	No	Massena	St Lawrence	3	0%	No
Fishkill	Dutchess	3	7%	No	Mechanicville	Saratoga	3	1%	No
Florida	Montgomery	3	1%	Yes	Middlefield	Otsego	3	1%	No
Frankfort	Herkimer	3	1%	No	Middletown	Orange	3	4%	No
Gaines	Orleans	3	0%	No	Milo	Yates	3	0%	No
Gates	Monroe	3	2%	Yes	Montour	Schuyler	3	1%	No
Geddes	Onondaga	3	2%	Yes	Moreau	Saratoga	3	1%	No
Geneseo	Livingston	3	1%	No	Mount Morris	Livingston	3	1%	No
German Flatts	Herkimer	3	1%	No	Mount Vernon	Westchester	3	27%	No
Glenville	Schenectady	3	2%	Yes	Nassau	Rensselaer	3	1%	Yes
Gloversville	Fulton	3	0%	No	New Scotland	Albany	3	1%	Yes
Goshen	Orange	3	4%	No	New Windsor	Orange	3	5%	No
Gouverneur	St Lawrence	3	0%	No	Newburgh	Orange	3	6%	No
Greece	Monroe	3	1%	Yes	Newstead	Erie	3	0%	Yes
Green Island	Albany	3	9%	Yes	Niagara	Niagara	3	3%	Yes
Greenfield	Saratoga	3	1%	No	Niskayuna	Schenectady	3	1%	Yes
Greenport	Columbia	3	3%	No	Norfolk	St Lawrence	3	0%	No
Guilderland	Albany	3	2%	Yes	North Dansville	Livingston	3	0%	No
Halfmoon	Saratoga	3	1%	No	North Elba	Essex	3	2%	No
Hamburg	Erie	3	1%	Yes	North Greenbush	Rensselaer	3	2%	Yes
Hamilton	Madison	3	0%	No	North Tonawanda	Niagara	3	1%	Yes
Harrietstown	Franklin	3	1%	No	Northeast	Dutchess	3	5%	No
Haverstraw	Rockland	3	7%	No	Norwich	Chenango	3	1%	No
Herkimer	Herkimer	3	1%	No	Ogden	Monroe	3	1%	Yes
Hoosick	Rensselaer	3	0%	Yes	Oneida	Madison	3	1%	No
Hopewell	Ontario	3	1%	No	Oswegatchie	St Lawrence	3	0%	No
Hornell	Steuben	3	1%	No	Otsego	Otsego	3	1%	No
Hornellsville	Steuben	3	0%	No	Oyster Bay	Nassau	3	12%	No
Horseheads	Chemung	3	0%	No	Peekskill	Westchester	3	15%	No
Hudson	Columbia	3	5%	No	Pelham	Westchester	3	21%	No
Hurley	Ulster	3	3%	No	Penfield	Monroe	3	1%	Yes
Jamestown	Chautauqua	3	1%	Yes	Perinton	Monroe	3	1%	Yes
Jerusalem	Yates	3	0%	No	Perry	Wyoming	3	0%	No
Johnstown	Fulton	3	0%	No	Philipstown	Putnam	3	11%	No

Town/City	County	Index Score	Public Transit Use	Potential Public Safety Concern?
Pittsford	Monroe	3	0%	Yes
Pomfret	Chautauqua	3	0%	Yes
Port Jervis	Orange	3	1%	No
Putnam Valley	Putnam	3	9%	No
Queensbury	Warren	3	1%	No
Red Hook	Dutchess	3	5%	No
Rhinebeck	Dutchess	3	3%	No
Ridgeway	Orleans	3	1%	No
Riga	Monroe	3	0%	Yes
Riverhead	Suffolk	3	2%	No
Rochester	Ulster	3	4%	No
Rome	Oneida	3	1%	No
Rotterdam	Schenectady	3	3%	Yes
Rye	Westchester	3	22%	No
Salina	Onondaga	3	2%	Yes
Saranac	Clinton	3	0%	No
Saugerties	Ulster	3	2%	No
Scarsdale	Westchester	3	32%	No
Schaghticoke	Rensselaer	3	1%	Yes
Schodack	Rensselaer	3	1%	Yes
Schuyler	Herkimer	3	0%	No
Seneca Falls	Seneca	3	0%	No
Sennett	Cayuga	3	1%	No
Shelby	Orleans	3	1%	No
Smithtown	Suffolk	3	7%	No
Somers	Westchester	3	10%	No
Southampton	Suffolk	3	6%	No
Southold	Suffolk	3	4%	No
Southport	Chemung	3	2%	No
Stony Point	Rockland	3	6%	No
Sullivan	Madison	3	0%	No
Thompson	Sullivan	3	2%	No
Throop	Cayuga	3	1%	No
Ulster	Ulster	3	1%	No
Ulysses	Tompkins	3	4%	No
Unadilla	Otsego	3	0%	No
Union	Broome	3	4%	Yes
Van Buren	Onondaga	3	1%	Yes
Victor	Ontario	3	1%	No
Walton	Delaware	3	2%	No
Warsaw	Wyoming	3	0%	No
Warwick	Orange	3	6%	No
Waterford	Saratoga	3	2%	No
Waterloo	Seneca	3	0%	No
Watervliet	Albany	3	7%	Yes
Wawarsing	Ulster	3	2%	No
Wawayanda	Orange	3	3%	No
Webster	Monroe	3	1%	Yes
West Seneca	Erie	3	1%	Yes
Westfield	Chautauqua	3	0%	Yes
Wheatfield	Niagara	3	1%	Yes
White Plains	Westchester	3	20%	No
Whitehall	Washington	3	0%	No
Whitestown	Oneida	3	1%	No
Wilton	Saratoga	3	1%	No
Windsor	Broome	3	0%	Yes
Adams	Jefferson	2	0%	No

Town/City	County	Index Score	Public Transit Use	Potential Public Safety Concern?
Afton	Chenango	2	1%	No
Alden	Erie	2	0%	Yes
Alexander	Genesee	2	0%	No
Alexandria	Jefferson	2	1%	No
Allegany	Cattaraugus	2	1%	No
Ancram	Columbia	2	4%	No
Andes	Delaware	2	4%	No
Arcade	Wyoming	2	0%	No
Arietta	Hamilton	2	0%	No
Arkwright	Chautauqua	2	0%	Yes
Ashland	Chemung	2	1%	No
Ashland	Greene	2	1%	No
Attica	Wyoming	2	0%	No
Augusta	Oneida	2	0%	No
Ausable	Clinton	2	0%	No
Austerlitz	Columbia	2	4%	No
Avon	Livingston	2	0%	No
Barton	Tioga	2	1%	No
Beacon	Dutchess	2	10%	No
Beekman	Dutchess	2	3%	No
Benton	Yates	2	1%	No
Bergen	Genesee	2	1%	No
Berne	Albany	2	1%	Yes
Bethel	Sullivan	2	2%	No
Bolton	Warren	2	0%	No
Bombay	Franklin	2	0%	No
Boston	Erie	2	0%	Yes
Bovina	Delaware	2	5%	No
Bradford	Steuben	2	1%	No
Brasher	St Lawrence	2	0%	No
Broome	Schoharie	2	1%	No
Butler	Wayne	2	0%	No
Butternuts	Otsego	2	1%	No
Cairo	Greene	2	1%	No
Caledonia	Livingston	2	0%	No
Callicoon	Sullivan	2	0%	No
Camden	Oneida	2	0%	No
Canadice	Ontario	2	0%	No
Caneadea	Allegany	2	1%	No
Canisteo	Steuben	2	2%	No
Cape Vincent	Jefferson	2	0%	No
Carlton	Orleans	2	0%	No
Catharine	Schuyler	2	1%	No
Catlin	Chemung	2	0%	No
Cazenovia	Madison	2	0%	No
Centerville	Allegany	2	1%	No
Champion	Jefferson	2	0%	No
Chatham	Columbia	2	2%	No
Chester	Warren	2	0%	No
Clarksville	Allegany	2	1%	No
Claverack	Columbia	2	4%	No
Clayton	Jefferson	2	1%	No
Clifton	St Lawrence	2	0%	No
Clinton	Dutchess	2	3%	No
Clinton	Clinton	2	2%	No
Coeymans	Albany	2	1%	Yes
Colchester	Delaware	2	1%	No

Town/City	County	Index Score	Public Transit Use	Potential Public Safety Concern?	Town/City	County	Index Score	Public Transit Use	Potential Public Safety Concern?
Colesville	Broome	2	0%	Yes	Groveland	Livingston	2	2%	No
Collins	Erie	2	0%	Yes	Guilford	Chenango	2	1%	No
Colton	St Lawrence	2	0%	No	Hadley	Saratoga	2	0%	No
Concord	Erie	2	0%	Yes	Hague	Warren	2	0%	No
Conesville	Schoharie	2	1%	No	Halcott	Greene	2	3%	No
Constantia	Oswego	2	0%	No	Hamden	Delaware	2	1%	No
Copake	Columbia	2	5%	No	Hampton	Washington	2	0%	No
Corning	Steuben	2	0%	No	Hamptonburgh	Orange	2	7%	No
Coventry	Chenango	2	1%	No	Hancock	Delaware	2	2%	No
Covert	Seneca	2	3%	No	Hanover	Chautauqua	2	0%	Yes
Coxsackie	Greene	2	1%	No	Harpersfield	Delaware	2	1%	No
Croghan	Lewis	2	0%	No	Hartland	Niagara	2	0%	Yes
Crown Point	Essex	2	0%	No	Hartsville	Steuben	2	0%	No
Day	Saratoga	2	1%	No	Hartwick	Otsego	2	1%	No
Delaware	Sullivan	2	1%	No	Hastings	Oswego	2	0%	No
Denmark	Lewis	2	0%	No	Hector	Schuyler	2	2%	No
Deposit	Delaware	2	1%	No	Henderson	Jefferson	2	0%	No
Diana	Lewis	2	0%	No	Highlands	Orange	2	5%	No
Dover	Dutchess	2	4%	No	Hillsdale	Columbia	2	5%	No
Dryden	Tompkins	2	3%	No	Hinsdale	Cattaraugus	2	1%	No
Durham	Greene	2	1%	No	Homer	Cortland	2	1%	No
East Bloomfield	Ontario	2	0%	No	Hope	Hamilton	2	1%	No
Edinburg	Saratoga	2	0%	No	Hopkinton	St Lawrence	2	0%	No
Elizabethtown	Essex	2	1%	No	Horicon	Warren	2	0%	No
Ellenburg	Clinton	2	1%	No	Hounsfield	Jefferson	2	0%	No
Ellery	Chautauqua	2	0%	Yes	Hunter	Greene	2	3%	No
Elma	Erie	2	1%	Yes	Indian Lake	Hamilton	2	0%	No
Erwin	Steuben	2	1%	No	Inlet	Hamilton	2	1%	No
Esperance	Schoharie	2	1%	No	Jay	Essex	2	1%	No
Essex	Essex	2	1%	No	Jefferson	Schoharie	2	1%	No
Fairfield	Herkimer	2	0%	No	Jewett	Greene	2	2%	No
Fallsburg	Sullivan	2	2%	No	Johnsburg	Warren	2	0%	No
Farmersville	Cattaraugus	2	1%	No	Keene	Essex	2	1%	No
Farmington	Ontario	2	1%	No	Kortright	Delaware	2	1%	No
Fenton	Broome	2	0%	Yes	La Grange	Dutchess	2	3%	No
Fine	St Lawrence	2	0%	No	Lake Luzerne	Warren	2	0%	No
Fleming	Cayuga	2	0%	No	Lake Pleasant	Hamilton	2	0%	No
Forestburgh	Sullivan	2	1%	No	Le Ray	Jefferson	2	0%	No
Forestport	Oneida	2	0%	No	Lebanon	Madison	2	0%	No
Fort Ann	Washington	2	0%	No	Lee	Oneida	2	1%	No
Fort Edward	Washington	2	1%	No	Lewis	Essex	2	1%	No
Franklin	Delaware	2	2%	No	Lewisboro	Westchester	2	13%	No
Freedom	Cattaraugus	2	0%	No	Lexington	Greene	2	3%	No
Fremont	Sullivan	2	1%	No	Lincoln	Madison	2	1%	No
Fremont	Steuben	2	0%	No	Lisbon	St Lawrence	2	0%	No
Fulton	Oswego	2	0%	No	Lisle	Broome	2	1%	Yes
Galen	Wayne	2	1%	No	Livingston	Columbia	2	3%	No
Gallatin	Columbia	2	2%	No	Livonia	Livingston	2	0%	No
Galway	Saratoga	2	0%	No	Long Lake	Hamilton	2	0%	No
Gardiner	Ulster	2	2%	No	Louisville	St Lawrence	2	0%	No
Ghent	Columbia	2	3%	No	Lyme	Jefferson	2	0%	No
Gorham	Ontario	2	1%	No	Lyons	Wayne	2	1%	No
Granby	Oswego	2	1%	No	Lyonsdale	Lewis	2	0%	No
Great Valley	Cattaraugus	2	0%	No	Machias	Cattaraugus	2	0%	No
Greene	Chenango	2	0%	No	Macomb	St Lawrence	2	1%	No
Greenville	Greene	2	1%	No	Maine	Broome	2	0%	Yes
Greig	Lewis	2	0%	No	Malta	Saratoga	2	1%	No

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Town/City	County	Index Score	Public Transit Use	Potential Public Safety Concern?	Town/City	County	Index Score	Public Transit Use	Potential Public Safety Concern?
Mamakating	Sullivan	2	2%	No	Pittsfield	Otsego	2	1%	No
Manchester	Ontario	2	1%	No	Plattekill	Ulster	2	2%	No
Manheim	Herkimer	2	0%	No	Pleasant Valley	Dutchess	2	1%	No
Marcellus	Onondaga	2	0%	Yes	Poland	Chautauqua	2	0%	Yes
Marlborough	Ulster	2	4%	No	Porter	Niagara	2	0%	Yes
Marshall	Oneida	2	0%	No	Portland	Chautauqua	2	1%	Yes
Masonville	Delaware	2	1%	No	Potter	Yates	2	0%	No
Mayfield	Fulton	2	0%	No	Prattsville	Greene	2	1%	No
Meredith	Delaware	2	1%	No	Preston	Chenango	2	0%	No
Middleburgh	Schoharie	2	1%	No	Providence	Saratoga	2	1%	No
Middlesex	Yates	2	1%	No	Pulteney	Steuben	2	1%	No
Middletown	Delaware	2	4%	No	Remsen	Oneida	2	0%	No
Milford	Otsego	2	1%	No	Rensselaer	Rensselaer	2	14%	Yes
Minerva	Essex	2	0%	No	Rensselaerville	Albany	2	1%	Yes
Minetto	Oswego	2	0%	No	Richland	Oswego	2	0%	No
Monroe	Orange	2	11%	No	Richmond	Ontario	2	0%	No
Montgomery	Orange	2	4%	No	Richmondville	Schoharie	2	1%	No
Morehouse	Hamilton	2	0%	No	Rockland	Sullivan	2	1%	No
Moriah	Essex	2	0%	No	Rossie	St Lawrence	2	0%	No
Morristown	St Lawrence	2	1%	No	Roxbury	Delaware	2	2%	No
Mount Hope	Orange	2	2%	No	Royalton	Niagara	2	0%	Yes
Mount Kisco	Westchester	2	18%	No	Rushford	Allegany	2	1%	No
Murray	Orleans	2	6%	No	Russia	Herkimer	2	0%	No
Naples	Ontario	2	0%	No	Salamanca	Cattaraugus	2	0%	No
Neversink	Sullivan	2	1%	No	Sandy Creek	Oswego	2	0%	No
New Baltimore	Greene	2	1%	No	Sanford	Broome	2	1%	Yes
New Berlin	Chenango	2	1%	No	Sangerfield	Oneida	2	0%	No
New Castle	Westchester	2	22%	No	Santa Clara	Franklin	2	1%	No
New Hudson	Allegany	2	1%	No	Saratoga	Saratoga	2	1%	No
Newcomb	Essex	2	0%	No	Sardinia	Erie	2	0%	Yes
Newfane	Niagara	2	0%	Yes	Schoharie	Schoharie	2	1%	No
Newport	Herkimer	2	0%	No	Schroeppel	Oswego	2	1%	No
North Castle	Westchester	2	14%	No	Schroon	Essex	2	0%	No
North Collins	Erie	2	0%	Yes	Scriba	Oswego	2	0%	No
North Harmony	Chautauqua	2	0%	Yes	Shandaken	Ulster	2	3%	No
North Hudson	Essex	2	0%	No	Shawangunk	Ulster	2	2%	No
Northampton	Fulton	2	1%	No	Sheridan	Chautauqua	2	0%	Yes
Oakfield	Genesee	2	0%	No	Sherrill	Oneida	2	0%	No
Ohio	Herkimer	2	0%	No	Smithville	Chenango	2	0%	No
Olean	Cattaraugus	2	1%	No	Sodus	Wayne	2	1%	No
Olive	Ulster	2	3%	No	Somerset	Niagara	2	0%	Yes
Oppenheim	Fulton	2	0%	No	South Bristol	Ontario	2	1%	No
Orange	Schuyler	2	0%	No	Southeast	Putnam	2	10%	No
Orchard Park	Erie	2	0%	Yes	Springfield	Otsego	2	0%	No
Ossining	Westchester	2	17%	No	Springwater	Livingston	2	0%	No
Otego	Otsego	2	1%	No	Stamford	Delaware	2	2%	No
Oxford	Chenango	2	0%	No	Starkey	Yates	2	0%	No
Palmyra	Wayne	2	0%	No	Stillwater	Saratoga	2	0%	No
Pamelia	Jefferson	2	1%	No	Stockbridge	Madison	2	0%	No
Paris	Oneida	2	0%	No	Stockholm	St Lawrence	2	0%	No
Parishville	St Lawrence	2	0%	No	Stockport	Columbia	2	2%	No
Parma	Monroe	2	0%	Yes	Stockton	Chautauqua	2	1%	Yes
Pendleton	Niagara	2	0%	Yes	Taghkanic	Columbia	2	3%	No
Perrysburg	Cattaraugus	2	1%	No	Thurman	Warren	2	0%	No
Persia	Cattaraugus	2	1%	No	Tioga	Tioga	2	1%	No
Perth	Fulton	2	0%	No	Tompkins	Delaware	2	1%	No
Phelps	Ontario	2	0%	No	Triangle	Broome	2	1%	Yes

Town/City	County	Index Score	Public Transit Use	Potential Public Safety Concern?	Town/City	County	Index Score	Public Transit Use	Potential Public Safety Concern?
Tupper Lake	Franklin	2	1%	No	Bethany	Genesee	1	0%	No
Tyrone	Schuyler	2	0%	No	Birdsall	Allegany	1	1%	No
Urbana	Steuben	2	1%	No	Black Brook	Clinton	1	0%	No
Vernon	Oneida	2	0%	No	Bleecker	Fulton	1	0%	No
Verona	Oneida	2	0%	No	Blenheim	Schoharie	1	0%	No
Veteran	Chemung	2	0%	No	Bolivar	Allegany	1	0%	No
Volney	Oswego	2	0%	No	Boonville	Oneida	1	0%	No
Wappinger	Dutchess	2	6%	No	Boylston	Oswego	1	0%	No
Warrensburg	Warren	2	0%	No	Brandon	Franklin	1	0%	No
Washington	Dutchess	2	3%	No	Bridgewater	Oneida	1	0%	No
Watson	Lewis	2	0%	No	Brighton	Franklin	1	0%	No
Wayne	Steuben	2	0%	No	Bristol	Ontario	1	0%	No
Webb	Herkimer	2	0%	No	Brookfield	Madison	1	0%	No
Wells	Hamilton	2	0%	No	Brownville	Jefferson	1	0%	No
West Monroe	Oswego	2	1%	No	Burke	Franklin	1	1%	No
Westerlo	Albany	2	1%	Yes	Burlington	Otsego	1	1%	No
Western	Oneida	2	0%	No	Burns	Allegany	1	1%	No
Westmoreland	Oneida	2	0%	No	Byron	Genesee	1	1%	No
Westport	Essex	2	1%	No	Cambria	Niagara	1	0%	Yes
Wheatland	Monroe	2	0%	Yes	Cambridge	Washington	1	0%	No
Willsboro	Essex	2	0%	No	Cameron	Steuben	1	1%	No
Wilna	Jefferson	2	0%	No	Campbell	Steuben	1	0%	No
Wilson	Niagara	2	0%	Yes	Canaan	Columbia	1	2%	No
Windham	Greene	2	1%	No	Canajoharie	Montgomery	1	0%	Yes
Wolcott	Wayne	2	0%	No	Candor	Tioga	1	1%	No
Woodstock	Ulster	2	4%	No	Carlisle	Schoharie	1	0%	No
Worcester	Otsego	2	0%	No	Caroga	Fulton	1	0%	No
Yates	Orleans	2	0%	No	Caroline	Tompkins	1	2%	No
Yorkshire	Cattaraugus	2	0%	No	Carrollton	Cattaraugus	1	0%	No
Yorktown	Westchester	2	9%	No	Cayuta	Schuyler	1	0%	No
Addison	Steuben	1	0%	No	Champlain	Clinton	1	0%	No
Alabama	Genesee	1	0%	No	Charlotte	Chautauqua	1	0%	Yes
Albion	Oswego	1	0%	No	Charlton	Saratoga	1	1%	No
Alfred	Allegany	1	0%	No	Chateaugay	Franklin	1	1%	No
Allen	Allegany	1	0%	No	Chazy	Clinton	1	0%	No
Alma	Allegany	1	0%	No	Chemung	Chemung	1	0%	No
Almond	Allegany	1	1%	No	Cherry Creek	Chautauqua	1	1%	Yes
Altona	Clinton	1	1%	No	Cherry Valley	Otsego	1	1%	No
Amboy	Oswego	1	0%	No	Chester	Orange	1	6%	No
Amenia	Dutchess	1	3%	No	Cincinnatus	Cortland	1	0%	No
Amity	Allegany	1	1%	No	Clarendon	Orleans	1	1%	No
Andover	Allegany	1	2%	No	Clymer	Chautauqua	1	1%	Yes
Angelica	Allegany	1	0%	No	Cochecton	Sullivan	1	2%	No
Annsville	Oneida	1	0%	No	Cohocton	Steuben	1	0%	No
Antwerp	Jefferson	1	0%	No	Cold Spring	Cattaraugus	1	1%	No
Aurora	Erie	1	1%	Yes	Colden	Erie	1	0%	Yes
Ava	Oneida	1	0%	No	Columbia	Herkimer	1	0%	No
Avoca	Steuben	1	1%	No	Columbus	Chenango	1	0%	No
Baldwin	Chemung	1	0%	No	Conesus	Livingston	1	0%	No
Bangor	Franklin	1	0%	No	Conewango	Cattaraugus	1	0%	No
Barker	Broome	1	1%	Yes	Conquest	Cayuga	1	0%	No
Barre	Orleans	1	0%	No	Constable	Franklin	1	1%	No
Beekmantown	Clinton	1	0%	No	Covington	Wyoming	1	1%	No
Belfast	Allegany	1	0%	No	Crawford	Orange	1	3%	No
Bellmont	Franklin	1	2%	No	Cuyler	Cortland	1	0%	No
Bennington	Wyoming	1	0%	No	Danby	Tompkins	1	3%	No
Benson	Hamilton	1	0%	No	Dansville	Steuben	1	0%	No

Town/City	County	Index Score	Public Transit Use	Potential Public Safety Concern?	Town/City	County	Index Score	Public Transit Use	Potential Public Safety Concern?
Danube	Herkimer	1	0%	No	Hermon	St Lawrence	1	0%	No
Darien	Genesee	1	0%	No	Highland	Sullivan	1	3%	No
Davenport	Delaware	1	1%	No	Holland	Erie	1	0%	Yes
Dayton	Cattaraugus	1	1%	No	Hornby	Steuben	1	1%	No
De Kalb	St Lawrence	1	0%	No	Howard	Steuben	1	1%	No
De Peyster	St Lawrence	1	0%	No	Hume	Allegany	1	0%	No
Denning	Ulster	1	2%	No	Humphrey	Cattaraugus	1	0%	No
DeRuyter	Madison	1	0%	No	Huron	Wayne	1	0%	No
Dickinson	Franklin	1	0%	No	Independence	Allegany	1	1%	No
Dresden	Washington	1	0%	No	Ira	Cayuga	1	1%	No
Duanesburg	Schenectady	1	1%	Yes	Ischua	Cattaraugus	1	0%	No
Eagle	Wyoming	1	1%	No	Italy	Yates	1	1%	No
Easton	Washington	1	0%	No	Jackson	Washington	1	0%	No
Edmeston	Otsego	1	1%	No	Jasper	Steuben	1	1%	No
Edwards	St Lawrence	1	0%	No	Java	Wyoming	1	0%	No
Ellicottville	Cattaraugus	1	0%	No	Kent	Putnam	1	7%	No
Ellington	Chautauqua	1	1%	Yes	Kinderhook	Columbia	1	1%	No
Ellisburg	Jefferson	1	0%	No	Knox	Albany	1	1%	Yes
Enfield	Tompkins	1	4%	No	La Fayette	Onondaga	1	8%	Yes
Ephratah	Fulton	1	1%	No	Lapeer	Cortland	1	1%	No
Erin	Chemung	1	0%	No	Laurens	Otsego	1	1%	No
Exeter	Otsego	1	0%	No	Lawrence	St Lawrence	1	0%	No
Florence	Oneida	1	0%	No	Leon	Cattaraugus	1	2%	No
Fort Covington	Franklin	1	0%	No	Lewis	Lewis	1	0%	No
Fowler	St Lawrence	1	0%	No	Leyden	Lewis	1	0%	No
Franklinville	Cattaraugus	1	0%	No	Lincklaen	Chenango	1	0%	No
Freetown	Cortland	1	0%	No	Lindley	Steuben	1	0%	No
Friendship	Allegany	1	0%	No	Little Valley	Cattaraugus	1	1%	No
Fulton	Schoharie	1	0%	No	Locke	Cayuga	1	1%	No
Gainesville	Wyoming	1	0%	No	Lodi	Seneca	1	1%	No
Genesee	Allegany	1	1%	No	Lorraine	Jefferson	1	0%	No
Genesee Falls	Wyoming	1	1%	No	Lumberland	Sullivan	1	2%	No
Genoa	Cayuga	1	1%	No	Lyndon	Cattaraugus	1	0%	No
Georgetown	Madison	1	0%	No	Macedon	Wayne	1	1%	No
German	Chenango	1	0%	No	Madrid	St Lawrence	1	0%	No
Germantown	Columbia	1	1%	No	Mansfield	Cattaraugus	1	0%	No
Gerry	Chautauqua	1	0%	Yes	Marathon	Cortland	1	0%	No
Gilboa	Schoharie	1	0%	No	Marbletown	Ulster	1	2%	No
Glen	Montgomery	1	1%	Yes	Marilla	Erie	1	0%	Yes
Grafton	Rensselaer	1	0%	Yes	Marion	Wayne	1	1%	No
Grand Island	Erie	1	2%	Yes	Martinsburg	Lewis	1	0%	No
Granger	Allegany	1	0%	No	Maryland	Otsego	1	0%	No
Granville	Washington	1	0%	No	McDonough	Chenango	1	0%	No
Greenville	Orange	1	1%	No	Mendon	Monroe	1	0%	Yes
Greenwich	Washington	1	0%	No	Mentz	Cayuga	1	0%	No
Greenwood	Steuben	1	1%	No	Mexico	Oswego	1	0%	No
Groton	Tompkins	1	1%	No	Middlebury	Wyoming	1	0%	No
Grove	Allegany	1	1%	No	Mina	Chautauqua	1	1%	Yes
Hamlin	Monroe	1	0%	Yes	Minden	Montgomery	1	1%	Yes
Hammond	St Lawrence	1	1%	No	Mohawk	Montgomery	1	0%	Yes
Hannibal	Oswego	1	1%	No	Moira	Franklin	1	0%	No
Hardenburgh	Ulster	1	4%	No	Montague	Lewis	1	0%	No
Harford	Cortland	1	4%	No	Montezuma	Cayuga	1	1%	No
Harmony	Chautauqua	1	1%	Yes	Mooers	Clinton	1	1%	No
Harrisburg	Lewis	1	0%	No	Morris	Otsego	1	1%	No
Hartford	Washington	1	0%	No	Nanticoke	Broome	1	1%	Yes
Hebron	Washington	1	0%	No	Napoli	Cattaraugus	1	2%	No

Town/City	County	Index Score	Public Transit Use	Potential Public Safety Concern?	Town/City	County	Index Score	Public Transit Use	Potential Public Safety Concern?
Nelson	Madison	1	0%	No	Rodman	Jefferson	1	0%	No
New Albion	Cattaraugus	1	2%	No	Romulus	Seneca	1	0%	No
New Bremen	Lewis	1	0%	No	Root	Montgomery	1	0%	Yes
New Haven	Oswego	1	0%	No	Rose	Wayne	1	0%	No
New Lebanon	Columbia	1	2%	No	Roseboom	Otsego	1	1%	No
New Lisbon	Otsego	1	2%	No	Rosendale	Ulster	1	2%	No
Newark Valley	Tioga	1	1%	No	Rush	Monroe	1	0%	Yes
Newfield	Tompkins	1	1%	No	Russell	St Lawrence	1	0%	No
Nichols	Tioga	1	1%	No	Rutland	Jefferson	1	0%	No
North Norwich	Chenango	1	1%	No	Salem	Washington	1	0%	No
North Salem	Westchester	1	11%	No	Salisbury	Herkimer	1	0%	No
Northumberland	Saratoga	1	1%	No	Sand Lake	Rensselaer	1	0%	Yes
Norway	Herkimer	1	0%	No	Schuyler Falls	Clinton	1	0%	No
Nunda	Livingston	1	2%	No	Scio	Allegany	1	1%	No
Ontario	Wayne	1	0%	No	Seneca	Ontario	1	1%	No
Orangeville	Wyoming	1	0%	No	Seward	Schoharie	1	1%	No
Orleans	Jefferson	1	1%	No	Sharon	Schoharie	1	1%	No
Orwell	Oswego	1	0%	No	Sheldon	Wyoming	1	0%	No
Ossian	Livingston	1	1%	No	Shelter Island	Suffolk	1	6%	No
Otselic	Chenango	1	0%	No	Sherburne	Chenango	1	0%	No
Ovid	Seneca	1	0%	No	Sherman	Chautauqua	1	1%	Yes
Owasco	Cayuga	1	0%	No	Skaneateles	Onondaga	1	0%	Yes
Palatine	Montgomery	1	1%	Yes	Smithfield	Madison	1	0%	No
Palermo	Oswego	1	0%	No	Smyrna	Chenango	1	0%	No
Parish	Oswego	1	0%	No	Solon	Cortland	1	0%	No
Patterson	Putnam	1	7%	No	South Valley	Cattaraugus	1	0%	No
Pavilion	Genesee	1	0%	No	Spafford	Onondaga	1	0%	Yes
Pawling	Dutchess	1	7%	No	Sparta	Livingston	1	0%	No
Pembroke	Genesee	1	0%	No	Spencer	Tioga	1	1%	No
Peru	Clinton	1	0%	No	Springport	Cayuga	1	0%	No
Petersburgh	Rensselaer	1	0%	Yes	St Armand	Essex	1	1%	No
Pharsalia	Chenango	1	0%	No	St Johnsville	Montgomery	1	0%	Yes
Philadelphia	Jefferson	1	0%	No	Stafford	Genesee	1	0%	No
Piercefield	St Lawrence	1	0%	No	Stanford	Dutchess	1	4%	No
Pierrepont	St Lawrence	1	0%	No	Stark	Herkimer	1	0%	No
Pike	Wyoming	1	0%	No	Sterling	Cayuga	1	1%	No
Pinckney	Lewis	1	0%	No	Steuben	Oneida	1	0%	No
Pitcairn	St Lawrence	1	0%	No	Stony Creek	Warren	1	0%	No
Pitcher	Chenango	1	0%	No	Stratford	Fulton	1	1%	No
Pittstown	Rensselaer	1	0%	Yes	Stuyvesant	Columbia	1	1%	No
Plainfield	Otsego	1	1%	No	Summit	Schoharie	1	1%	No
Plymouth	Chenango	1	1%	No	Taylor	Cortland	1	0%	No
Pompey	Onondaga	1	0%	Yes	Theresa	Jefferson	1	0%	No
Portage	Livingston	1	2%	No	Thurston	Steuben	1	0%	No
Portville	Cattaraugus	1	1%	No	Torrey	Yates	1	0%	No
Prattsburg	Steuben	1	1%	No	Trenton	Oneida	1	0%	No
Preble	Cortland	1	1%	No	Troupsburg	Steuben	1	1%	No
Princetown	Schenectady	1	0%	Yes	Truxton	Cortland	1	1%	No
Putnam	Washington	1	0%	No	Turin	Lewis	1	0%	No
Randolph	Cattaraugus	1	1%	No	Tuscarora	Steuben	1	0%	No
Rathbone	Steuben	1	1%	No	Tuxedo	Orange	1	8%	No
Reading	Schuyler	1	1%	No	Tyre	Seneca	1	1%	No
Red House	Cattaraugus	1	1%	No	Van Etten	Chemung	1	1%	No
Redfield	Oswego	1	0%	No	Varick	Seneca	1	0%	No
Richfield	Otsego	1	1%	No	Venice	Cayuga	1	1%	No
Richford	Tioga	1	2%	No	Vienna	Oneida	1	0%	No
Ripley	Chautauqua	1	0%	Yes	Villenova	Chautauqua	1	0%	Yes

Town/City	County	Index Score	Public Transit Use	Potential Public Safety Concern?
Virgil	Cortland	1	2%	No
Waddington	St Lawrence	1	0%	No
Walworth	Wayne	1	0%	No
Ward	Allegany	1	1%	No
Warren	Herkimer	1	1%	No
Waverly	Franklin	1	1%	No
Wayland	Steuben	1	0%	No
Wellsville	Allegany	1	1%	No
West Almond	Allegany	1	1%	No
West Sparta	Livingston	1	3%	No
West Turin	Lewis	1	0%	No
West Union	Steuben	1	0%	No
Westford	Otsego	1	0%	No
Westville	Franklin	1	1%	No
Wethersfield	Wyoming	1	1%	No
Wheeler	Steuben	1	1%	No
White Creek	Washington	1	0%	No
Willet	Cortland	1	0%	No
Williamson	Wayne	1	1%	No
Williamstown	Oswego	1	0%	No
Willing	Allegany	1	1%	No
Wilmington	Essex	1	1%	No
Winfield	Herkimer	1	0%	No
Wirt	Allegany	1	1%	No
Woodbury	Orange	1	6%	No
Woodhull	Steuben	1	1%	No
Worth	Jefferson	1	0%	No
York	Livingston	1	0%	No