# 5. Refined Long-List Alternatives Considered and Screened

## 5.1 Refined Long-List Alternatives

The eight Long-List Alternatives advanced from the fatal-flaw screening to the second, comparative-screening evaluation (see Section 4.4) were refined and developed in more detail for key characteristics, including:

- Travel time;
- Daily trips;
- Trips per track/lane mile;
- Trips per annual vehicle mile; and,
- Connections and activity centers served.

Each of the Refined Long-List Alternatives is described in the following sections, accompanied by a map of its route and tabulations of its characteristics relative to the factors listed above.

### 5.1.1 Refined Long-List Alternative 1

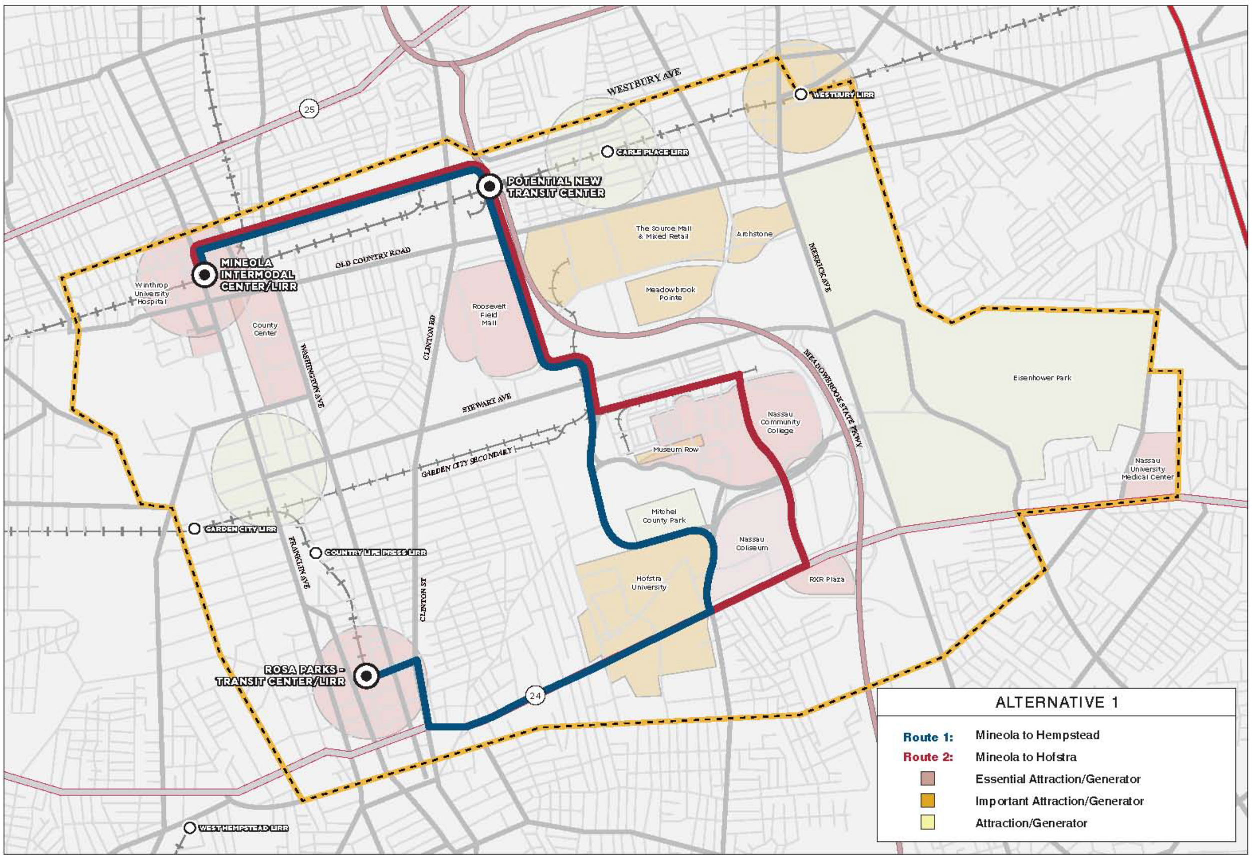
The primary alignment would generally travel east from the Mineola Intermodal Center utilizing 2nd Street and Voice Road to Glen Cove Road. The connection between 2nd Street and Voice Road may require a taking of property to establish a direct right-of-way to allow for a transit-only connection.[1] The route would then turn south and make a connection with the potential new transit center, located in the vicinity of the Macy's Furniture Store on Glen Gove Road. The proposed transit center would include a new station on the Long Island Rail Road (LIRR), which would supplement or replace the existing LIRR Carle Place Station. The LIRR has no current plans for constructing a new station at this location; therefore, any new facility would be part of the Nassau Hub transit alignment. The alignment would then continue south along the eastern edge of the Roosevelt Field property. (The exact routing of this Roosevelt Field connection was not determined at this phase of alternatives development.) The alignment would then travel south along South Street, which transitions to Quentin Roosevelt Boulevard/Charles Lindbergh Boulevard as it crosses Stewart Avenue. The alignment would diverge at the Garden City Secondary into two separate branch routes.

Route 1 would continue south and enter a one-way, counter-clockwise loop by following the flow of traffic along Quentin Roosevelt Boulevard/Charles Lindbergh Boulevard. It would then rejoin the primary alignment at the intersection of Quentin Roosevelt Boulevard/Charles Lindbergh Boulevard and Earle Ovington Boulevard. Route 1 southbound would rejoin the primary alignment by turning south on Earle Ovington Boulevard to Hempstead Turnpike. It would then turn west on Hempstead Turnpike toward downtown Village of Hempstead, make a slight right turn onto Fulton Avenue, right onto Clinton Street and finally left onto Jackson Street. The Route 1 alignment would terminate at the Rosa Parks–Hempstead Transit Center. The vehicle would then turn and operate eastbound and then northbound along the same alignment in the reverse direction except along the Quentin Roosevelt Boulevard/Charles Lindbergh Boulevard loop where it would again enter a one-way, counter-clockwise loop following the flow of traffic.

[1] This concept will require additional coordination with the Village of Mineola.

Route 2 would diverge from the main alignment at Quentin Roosevelt Boulevard/Charles Lindbergh Boulevard and the Garden City Secondary[2] and follow the rail alignment in an easterly direction to Endo Drive. It would then turn to the south and follow the southeastern boundary of Nassau Community College utilizing parking lot right-of-way. The Route 2 alignment would then rejoin the primary alignment at the intersection of Charles Lindbergh Boulevard and Earle Ovington Boulevard. From this point, the Route 2 alignment would continue south on Earle Ovington Boulevard and terminate at Hempstead Turnpike. The vehicle would then turn and operate northbound along the same alignment.

***Figure 5-1: Refined Long-List Alternative 1 Route***




*Source: Jacobs, 2011.*

[2] The alignment for this alternative uses part of the Garden City Secondary east of the section where there is active rail service; therefore, this alternative was not fatally flawed in the previous alternatives screening.

*Table 5-1: Key Characteristics of Refined Long-List Alternative 1*[1,2]

| | Hempstead to Roosevelt Field | | Mineola to Coliseum | | Potential Daily Trips 2035 | Trips per Track/Lane Mile | Trips per Annual Vehicle Mile |
|---|---|---|---|---|---|---|---|
| | Travel Time | Transfers | Travel Time | Transfers | | | |
| Mixed Flow[3] | 14:17 | 0 | 17:48 | 0 | 4,600 | 285 | 1.90 |
| Exclusive ROW[4] | 10:32 | 0 | 12:30 | 0 | 6,100 | 378 | 2.52 |

*Source: Jacobs, 2011.*

Notes1: Statistics reflect the shortest travel time/distance between locations using either Route 1 or 2.

Note 2: Preliminary forecasts of potential ridership in this phase of the alternatives screening process employed a standard planning-level model. This type of model provided the Study Team with order-of-magnitude ridership estimates that could be used to compare and contrast the Refined Long-List Alternatives under evaluation. The model used for this purpose is the Aggregate Rail Ridership Forecasting Model (ARRF), which is a travel demand modeling tool developed by the Federal Transit Administration (FTA) to estimate ridership for proposed new fixed-guideway transit projects in areas where there are no existing or similar transit services. Therefore, the ARRF model is appropriate for evaluating the potential travel market in the Study Area. Ridership projections were estimated using the ARRF model for the forecast year 2035 (see Section 9).

Note 3: Mixed-flow segments are those where the transit vehicle would operate within existing road right-of-way.

Note 4: Exclusive right-of-way segments would be used exclusively by transit vehicles.

*Table 5-2: Refined Long-List Alternative 1 Connections and Activity Centers Served*

| | |
|---|---|
| **Transit Connections** | Mineola Intermodal Center<br>Potential New Transit Center & LIRR Station Stop<br>Rosa Parks–Hempstead Transit Center |
| **Activity Centers Served** | Downtown Village of Mineola<br>Downtown Village of Hempstead<br>Roosevelt Field<br>Nassau Community College<br>Nassau Veterans Memorial Coliseum<br>Hofstra University |

*Source: Jacobs, 2011.*

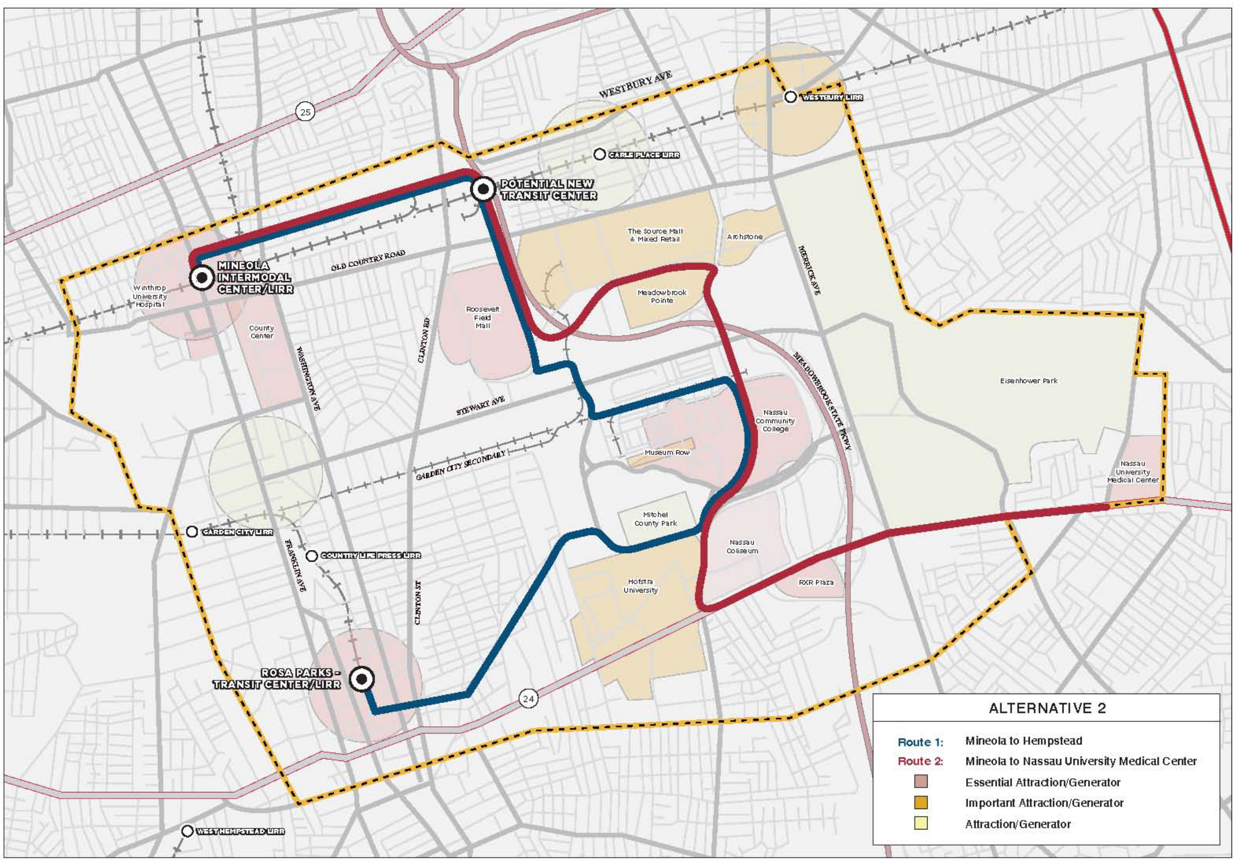
### 5.1.2 Refined Long-List Alternative 2

The first segment of this alternative is the same as Alternative 1. The alignments change at their respective divergence points. Alternative 2 would diverge into two separate branch routes near the southeastern corner of Roosevelt Field.

Route 1 would continue south from Roosevelt Field along South Street, which transitions to Quentin Roosevelt Boulevard/Charles Lindbergh Boulevard as it crosses Stewart Avenue. It would then turn east onto the Garden City Secondary and follow the rail alignment to Endo Drive. It would then rejoin the primary alignment by turning to the south and hugging the southeastern boundary of Nassau Community College, utilizing parking lot right-of-way to the intersection of Charles Lindbergh Boulevard and Earle Ovington Boulevard. It would then turn west onto Quentin Roosevelt Boulevard/Charles Lindbergh Boulevard and follow the counter-clockwise loop around as it turns to the south. The alignment would then turn right onto Meadow Street, cross Oak Street and continue west along Westbury Boulevard. Near downtown Village of Hempstead, the alignment would turn slightly to the right to Jackson Street and terminate at the Rosa Parks–Hempstead Transit Center. The vehicle would then turn and operate eastbound and then northbound along the same alignment in the reverse direction except along the Quentin Roosevelt Boulevard/Charles Lindbergh Boulevard loop. At this point, the northbound alignment would again enter a one-way, counter-clockwise loop following the flow of traffic back to the intersection of Charles Lindbergh Boulevard and Earle Ovington Boulevard where it would rejoin the main Route 1 alignment through the Nassau Community College parking lot right-of-way.

Route 2 would diverge from the primary alignment near the southeastern corner of Roosevelt Field and cross over the Meadowbrook State Parkway on an existing or newly constructed bridge. It would then follow Zeckendorf Boulevard/Corporate Drive past the Source Mall to Merchants Concourse. It then would turn south and run along Merchants Concourse and Endo Boulevard before rejoining the primary alignment at the Garden City Secondary. The primary alignment would hug the southeastern boundary of Nassau Community College, utilizing parking lot right-of-way to the intersection of Charles Lindbergh Boulevard and Earle Ovington Boulevard. From this point, the Route 2 alignment would continue south on Earle Ovington Boulevard and turn left onto Hempstead Turnpike. Traveling east, the alignment would pass RXR Plaza and Eisenhower Park before terminating at Nassau University Medical Center. The vehicle would then turn and operate westbound and then northbound along the same alignment in the reverse direction.

***Figure 5-2: Refined Long-List Alternative 2 Route***




*Source: Jacobs, 2011.*

*Table 5-3: Key Characteristics of Refined Long-List Alternative 2*

| | Hempstead to Roosevelt Field | | Mineola to Coliseum | | Potential Daily Trips 2035 | Trips per Track/Lane Mile | Trips per Annual Vehicle Mile |
|---|---|---|---|---|---|---|---|
| | Travel Time | Transfers | Travel Time | Transfers | | | |
| Mixed Flow | 14:04 | 0 | 17:43 | 0 | 6,200 | 283 | 1.89 |
| Exclusive ROW | 11:06 | 0 | 12:30 | 0 | 8,100 | 370 | 2.47 |

*Source: Jacobs, 2011.*

Note: Statistics reflect the shortest travel time/distance between locations using either Route 1 or 2.

*Table 5-4: Refined Long-List Alternative 2 Connections and Activity Centers*

| | |
|---|---|
| **Transit Connections** | Mineola Intermodal Center<br>Potential New Transit Center & LIRR Station Stop<br>Rosa Parks–Hempstead Transit Center |
| **Activity Centers Served** | Downtown Village of Mineola<br>Downtown Village of Hempstead<br>Roosevelt Field<br>Nassau Community College<br>Nassau Veterans Memorial Coliseum<br>RXR Plaza<br>Nassau University Medical Center<br>Hofstra University<br>Source Mall<br>Museum Row<br>Mitchel Field<br>Eisenhower Park |

*Source: Jacobs, 2011.*

### 5.1.3 Refined Long-List Alternative 3

The primary alignment would travel east from the Mineola Intermodal Center along 2nd Street and Voice Road to Glen Cove Road. The connection between 2nd Street and Voice Road may require a taking of property to establish a direct right-of-way.[3] The route would then turn south and make a connection with a potential new transit center and LIRR station stop. It would then continue south along the eastern edge of the Roosevelt Field property. (The exact routing of this connection was not determined at this phase of alternatives development.)

The alignment continues south from Roosevelt Field along South Street, which transitions to Quentin Roosevelt Boulevard/Charles Lindbergh Boulevard as it crosses Stewart Avenue. It would then make a short easterly jog onto Commercial Avenue and then turn south onto W Road. Turning left onto Davis Road, the alignment would pass Museum Row and then turn right past the Nassau Community College student union. Utilizing parking lot right-of-way, the route would travel south to the intersection of Charles Lindbergh Boulevard and Earle Ovington Boulevard and continue on Earle Ovington Boulevard to Hempstead Turnpike.

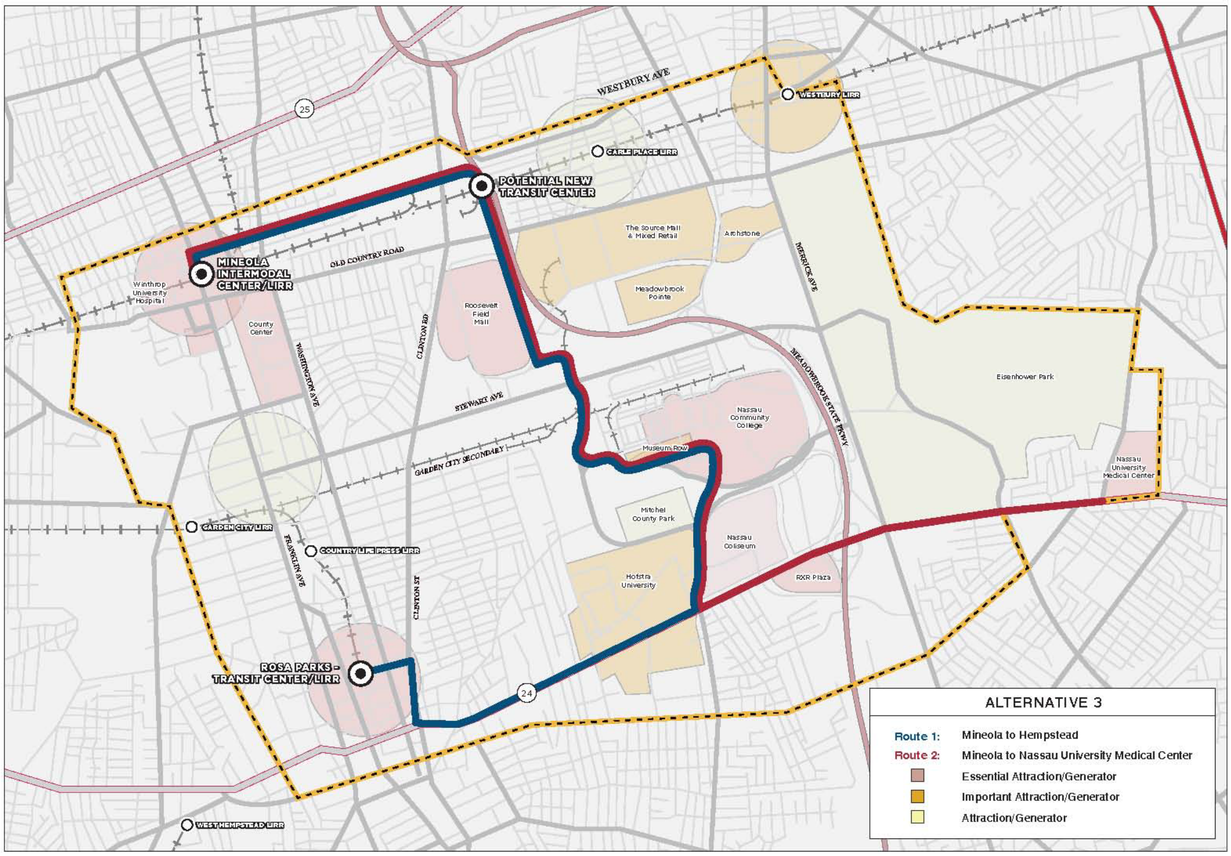
Route 1 would diverge from the primary alignment at Hempstead Turnpike and turn west toward downtown Village of Hempstead. The alignment would make a slight right turn onto Fulton Avenue, right

[3] This concept will require additional coordination with the Village of Mineola.

onto Clinton Street and finally left onto Jackson Street to terminate at the Rosa Parks–Hempstead Transit Center. The vehicle would then turn and operate eastbound and then northbound along the same alignment in the reverse direction.

Route 2 would diverge from the primary alignment at Hempstead Turnpike and turn east. The alignment would pass RXR Plaza and Eisenhower Park before terminating at Nassau University Medical Center. The vehicle would then turn and operate westbound and then northbound along the same alignment in the reverse direction.

***Figure 5-3: Refined Long-List Alternative 3 Route***




*Source: Jacobs, 2011.*

***Table 5-5: Key Characteristics of Refined Long-List Alternative 3***

| | Hempstead to Roosevelt Field | | Mineola to Coliseum | | Potential Daily Trips 2035 | Trips per Track/Lane Mile | Trips per Annual Vehicle Mile |
|---|---|---|---|---|---|---|---|
| | **Travel Time** | **Transfers** | **Travel Time** | **Transfers** | | | |
| Mixed Flow | 14:13 | 0 | 14:42 | 0 | 6,100 | 349 | 2.33 |
| Exclusive ROW | 10:19 | 0 | 10:18 | 0 | 8,000 | 458 | 3.05 |

*Source: Jacobs, 2011.*

Note: Statistics reflect the shortest travel time/distance between locations using either Route 1 or 2.

*Table 5-6: Refined Long-List Alternative 3 Connections and Activity Centers*

| | |
|---|---|
| **Transit Connections** | Mineola Intermodal Center<br>Potential New Transit Center & LIRR Station Stop<br>Rosa Parks–Hempstead Transit Center |
| **Activity Centers Served** | Downtown Village of Mineola<br>Downtown Village of Hempstead<br>Roosevelt Field<br>Nassau Community College<br>Nassau Veterans Memorial Coliseum<br>RXR Plaza<br>Nassau University Medical Center<br>Hofstra University<br>Museum Row<br>Eisenhower Park |

*Source: Jacobs, 2011.*

### 5.1.4 Refined Long-List Alternative 4

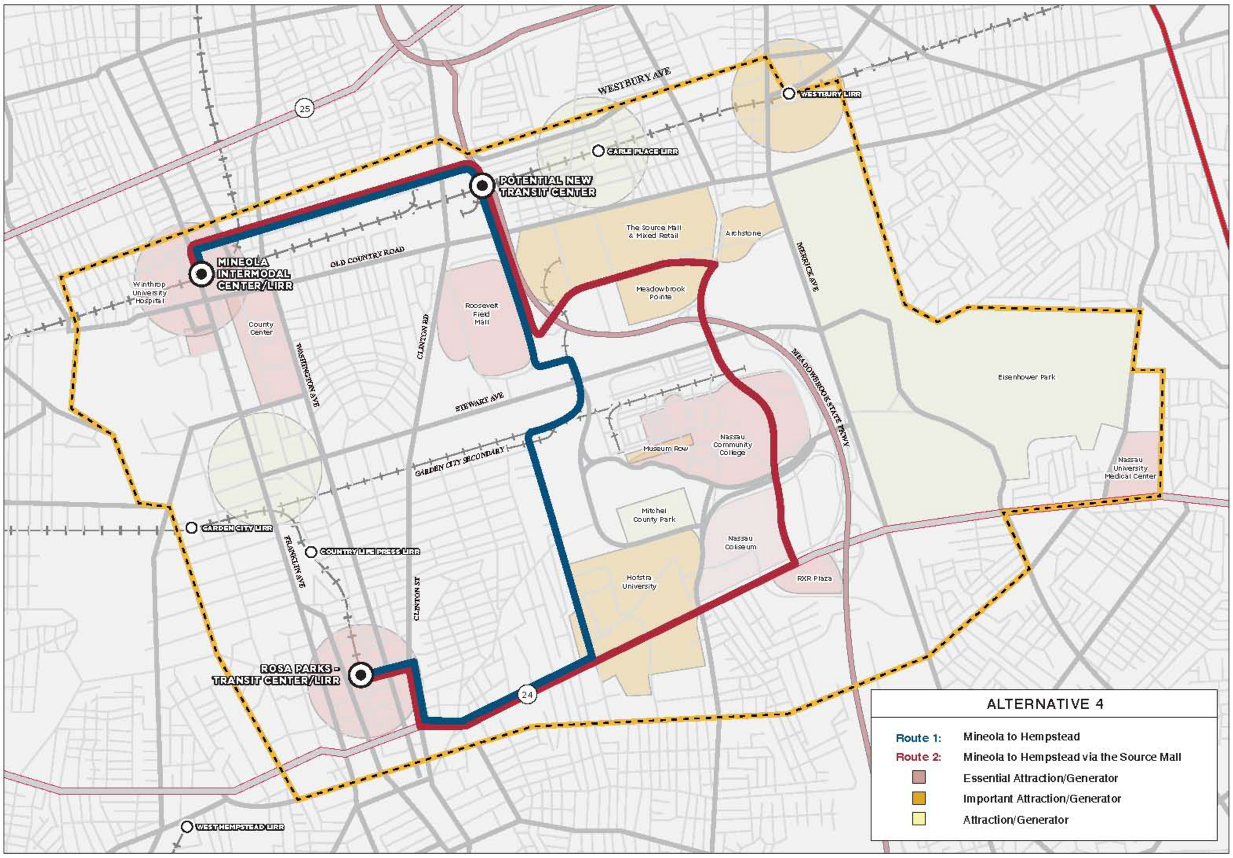
The primary alignment would travel east from the Mineola Intermodal Center along 2nd Street and Voice Road to Glen Cove Road. The connection between 2nd Street and Voice Road may require a taking of property to establish a direct right-of-way.[4] The route would then turn south and make a connection with a potential new transit center and LIRR station stop. It would then continue south along the eastern edge of the Roosevelt Field property. (The exact routing of this connection was not determined at this phase of alternatives development.) The alignment would diverge into two separate branch routes near the southeastern corner of Roosevelt Field.

Route 1 would continue south from Roosevelt Field along South Street, which transitions to Quentin Roosevelt Boulevard/Charles Lindbergh Boulevard as it crosses Stewart Avenue. It would turn right onto Commercial Avenue and then left onto Oak Street. Route 1 would rejoin the primary alignment at Hempstead Turnpike and turn west toward downtown Village of Hempstead. The alignment would make a slight right turn onto Fulton Avenue, right onto Clinton Street and finally left onto Jackson Street to terminate at the Rosa Parks–Hempstead Transit Center. The vehicle would then turn and operate eastbound and then northbound along the same alignment in the reverse direction.

Route 2 would diverge from the primary alignment near the southeastern corner of Roosevelt Field and cross over the Meadowbrook State Parkway on an existing or newly constructed bridge. It would then follow Zeckendorf Boulevard/Corporate Drive past the Source Mall to Merchants Concourse. It then would turn south and run along Merchants Concourse and Endo Boulevard and hug the southeastern boundary of Nassau Community College, utilizing parking lot right-of-way to the intersection of Charles Lindbergh Boulevard and Earle Ovington Boulevard. The alignment would then turn left and follow Charles Lindbergh Boulevard for a short distance and then turn to the south and travel through the Nassau Veterans Memorial Coliseum parking lot right-of-way to Hempstead Turnpike. It would then turn right and travel west toward downtown Village of Hempstead. The alignment would make a slight right turn onto Fulton Avenue, right onto Clinton Street and finally left onto Jackson Street to terminate at the Rosa Parks–Hempstead Transit Center. The vehicle would then turn and operate eastbound and then northbound along the same alignment in the reverse direction.

[4] This concept will require additional coordination with the Village of Mineola.

*Figure 5-4: Refined Long-List Alternative 4 Route*




*Source: Jacobs, 2011.*

*Table 5-7: Key Characteristics of Refined Long-List Alternative 4*

| | Hempstead to Roosevelt Field | | Mineola to Coliseum | | Potential Daily Trips 2035 | Trips per Track/Lane Mile | Trips per Annual Vehicle Mile |
|---|---|---|---|---|---|---|---|
| | Travel Time | Transfers | Travel Time | Transfers | | | |
| Mixed Flow | 11:09 | 0 | 17:26 | 0 | 4,700 | 258 | 1.72 |
| Exclusive ROW | 7:56 | 0 | 12:27 | 0 | 6,300 | 346 | 2.31 |

*Source: Jacobs, 2011.*

Note: Statistics reflect the shortest travel time/distance between locations using either Route 1 or 2.

*Table 5-8: Refined Long-List Alternative 4 Connections and Activity Centers*

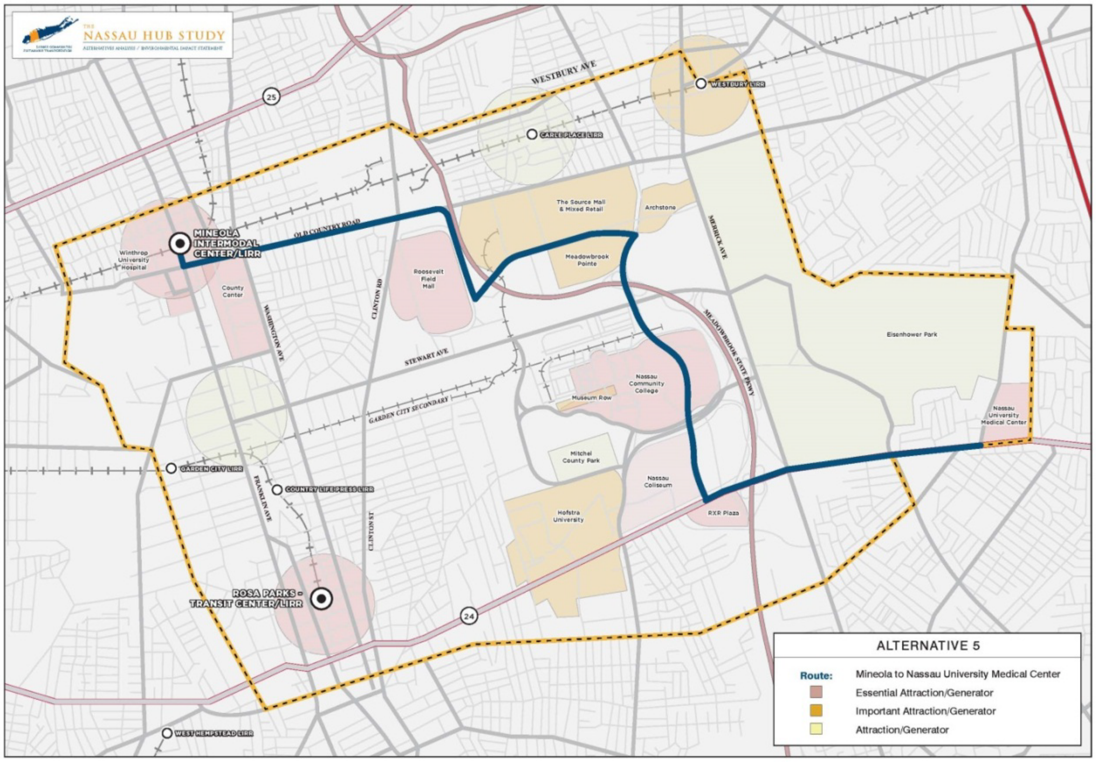
| | |
|---|---|
| **Transit Connections** | Mineola Intermodal Center<br>Potential New Transit Center & LIRR Station Stop<br>Rosa Parks–Hempstead Transit Center |
| **Activity Centers Served** | Downtown Village of Mineola<br>Downtown Village of Hempstead<br>Roosevelt Field<br>Nassau Community College<br>Nassau Veterans Memorial Coliseum<br>RXR Plaza<br>Hofstra University<br>Source Mall |

*Source: Jacobs, 2011.*

### 5.1.5 Refined Long-List Alternative 5

The primary alignment would travel south from the Mineola Intermodal Center along Mineola Boulevard. The route would then turn east and travel along Old Country Road. It would then continue south along the eastern edge of the Roosevelt Field property. (The exact routing of this connection was not determined at this phase of alternatives development.) The alignment would then cross over the Meadowbrook State Parkway on an existing or newly constructed bridge and follow Zeckendorf Boulevard/Corporate Drive past the Source Mall to Merchants Concourse. It then would turn south and run along Merchants Concourse and Endo Boulevard and hug the southeastern boundary of Nassau Community College, utilizing parking lot right-of-way to the intersection of Charles Lindbergh Boulevard and Earle Ovington Boulevard. The alignment would then turn left and follow Charles Lindbergh Boulevard for a short distance and then turn to the south and travel through the Nassau Veterans Memorial Coliseum parking lot right-of-way to Hempstead Turnpike. It would then turn left and travel east passing RXR Plaza and Eisenhower Park before terminating at Nassau University Medical Center. The vehicle would then turn and operate westbound and then northbound along the same alignment in the reverse direction.

*Figure 5-5: Refined Long-List Alternative 5 Route*




*Source: Jacobs, 2011.*

*Table 5-9: Key Characteristics of Refined Long-List Alternative 5*

| | Hempstead to Roosevelt Field | | Mineola to Coliseum | | Potential Daily Trips 2035 | Trips per Track/Lane Mile | Trips per Annual Vehicle Mile |
|---|---|---|---|---|---|---|---|
| | Travel Time | Transfers | Travel Time | Transfers | | | |
| Mixed Flow | - | - | 17:34 | 0 | 3,700 | 244 | 1.63 |
| Exclusive ROW | - | - | 12:33 | 0 | 4,800 | 316 | 2.11 |

*Source: Jacobs, 2011.*

*Table 5-10: Refined Long-List Alternative 5 Connections and Activity Centers*

| | |
|---|---|
| **Transit Connections** | Mineola Intermodal Center |
| **Activity Centers Served** | Downtown Village of Mineola<br>Roosevelt Field<br>Nassau Community College<br>Nassau University Medical Center<br>Nassau Veterans Memorial Coliseum<br>RXR Plaza<br>Source Mall<br>Eisenhower Park |

*Source: Jacobs, 2011.*

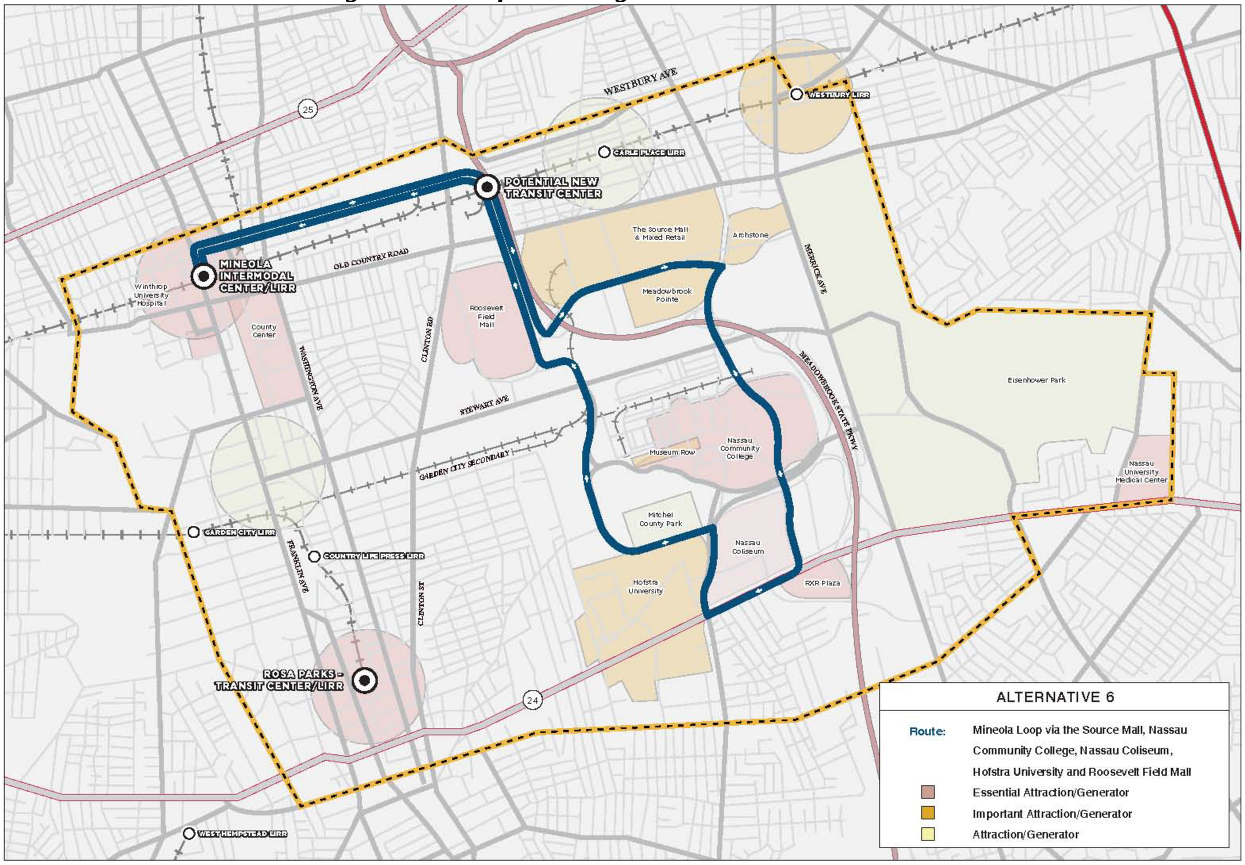
### 5.1.6 Refined Long-List Alternative 6

The primary alignment would travel east from the Mineola Intermodal Center along 2nd Street and Voice Road to Glen Cove Road. The connection between 2nd Street and Voice Road may require a taking of property to establish a direct right-of-way.[5] The route would then turn south and make a connection with a potential new transit center and LIRR station stop. It would then continue south along the eastern edge of the Roosevelt Field property. (The exact routing of this connection was not determined at this phase of alternatives development.)

The alignment would then enter one-way operation by crossing over the Meadowbrook State Parkway on an existing or newly constructed bridge and follow Zeckendorf Boulevard/Corporate Drive past the Source Mall to Merchants Concourse. It then would turn south and run along Merchants Concourse and Endo Boulevard and hug the southeastern boundary of Nassau Community College, utilizing parking lot right-of-way to the intersection of Charles Lindbergh Boulevard and Earle Ovington Boulevard. The alignment would then turn left and follow Charles Lindbergh Boulevard for a short distance and then turn to the south and travel through the Nassau Veterans Memorial Coliseum parking lot right-of-way to Hempstead Turnpike. It would then turn right and travel west past RXR Plaza to Earle Ovington Boulevard. Turning north onto Earle Ovington Boulevard, the alignment would then turn left onto Quentin Roosevelt Boulevard/Charles Lindbergh Boulevard and provide service to Museum Row and Mitchel Field. It would then continue north to Stewart Avenue. Quentin Roosevelt Boulevard/Charles Lindbergh Boulevard transitions to South Street as it crosses Stewart Avenue, and the alignment would continue north to rejoin the two-way alignment at Roosevelt Field and return to the Mineola Intermodal Center.

[5] This concept will require additional coordination with the Village of Mineola.

*Figure 5-6: Refined Long-List Alternative 6 Route*




*Source: Jacobs, 2011.*

*Table 5-11: Key Characteristics of Refined Long-List Alternative 6*

| | **Hempstead to Roosevelt Field** | | **Mineola to Coliseum** | | **Potential Daily Trips 2035** | **Trips per Track/Lane Mile** | **Trips per Annual Vehicle Mile** |
|---|---|---|---|---|---|---|---|
| | **Travel Time** | **Transfers** | **Travel Time** | **Transfers** | | | |
| Mixed Flow | - | - | 14:43 | 0 | 3,100 | 203 | 1.36 |
| Exclusive ROW | - | - | 10:59 | 0 | 4,100 | 269 | 1.80 |

*Source: Jacobs, 2011.*

*Table 5-12: Refined Long-List Alternative 6 Connections and Activity Centers*

| | |
|---|---|
| **Transit Connections** | Mineola Intermodal Center<br>Potential New Transit Center &LIRR Station Stop |
| **Activity Centers Served** | Downtown Village of Mineola<br>Roosevelt Field<br>Nassau Community College<br>Nassau Veterans Memorial Coliseum<br>RXR Plaza<br>Hofstra University<br>Source Mall<br>Mitchel Field |

*Source: Jacobs, 2011.*

### 5.1.7 Refined Long-List Alternative 7

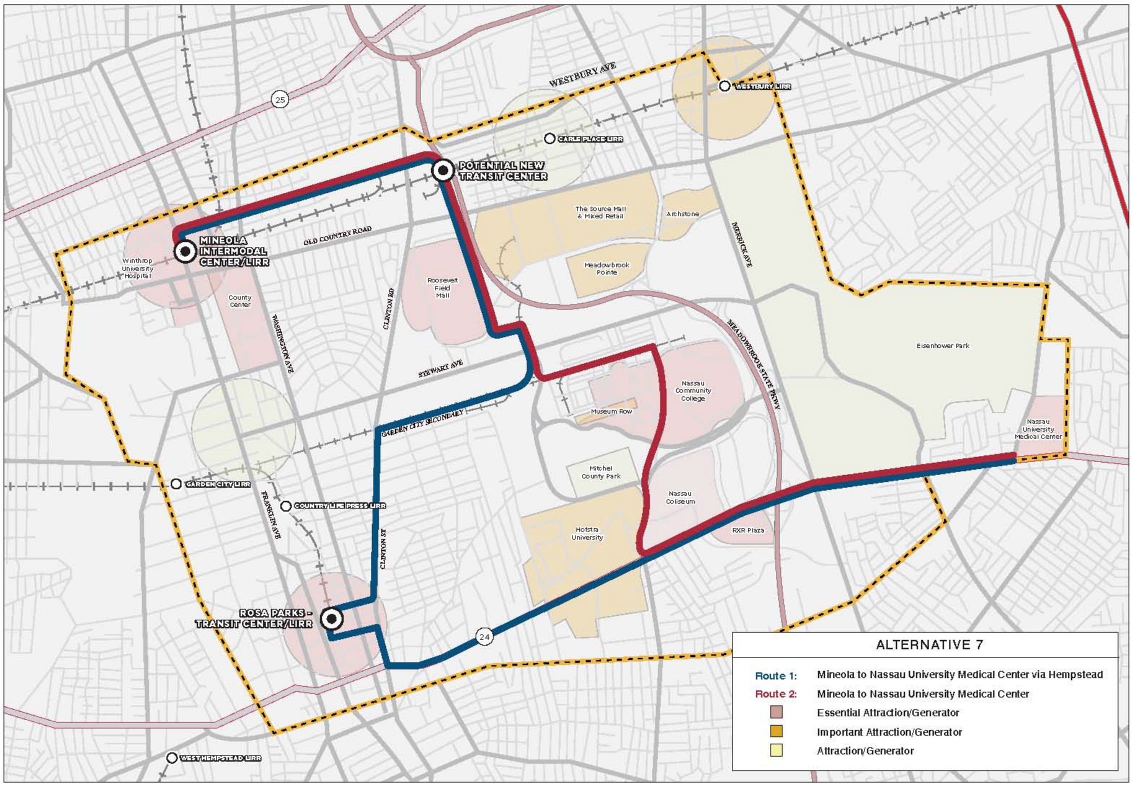
The primary alignment would travel east from the Mineola Intermodal Center along 2nd Street and Voice Road to Glen Cove Road. The connection between 2nd Street and Voice Road may require a taking of property to establish a direct right-of-way.[6] The route would then turn south and make a connection with a potential new transit center and LIRR station stop. It would then continue south along the eastern edge of the Roosevelt Field property. (The exact routing of this connection was not determined at this phase of alternatives development.) The alignment would continue south from Roosevelt Field along South Street, which transitions to Quentin Roosevelt Boulevard/Charles Lindbergh Boulevard as it crosses Stewart Avenue. The alignment would diverge into two separate branch routes at the Garden City Secondary.

Route 1 would turn right onto the Garden City Secondary and travel west along the rail right-of-way to Clinton Road. It would turn left and travel southwest toward downtown Village of Hempstead. The alignment would turn right onto Jackson Street and stop at the Rosa Parks–Hempstead Transit Center. The vehicle would then turn around and travel eastbound on Jackson Street back to Clinton Street where it would turn right. The alignment would then turn left onto Fulton Avenue and then merge slightly left onto Hempstead Turnpike and travel east to Earle Ovington Boulevard. The alignment would then rejoin the primary alignment and continue traveling eastbound along Hempstead Turnpike, past RXR Plaza and Eisenhower Park before terminating at Nassau University Medical Center. The vehicle would then turn and operate westbound and then northbound along the same alignment in the reverse direction.

Route 2 would turn left onto the Garden City Secondary and follow the rail alignment in an easterly direction to Endo Drive. It would then turn to the south and follow the southeastern boundary of Nassau Community College, utilizing parking lot right-of-way to the intersection of Charles Lindbergh Boulevard and Earle Ovington Boulevard. It would continue south on Earle Ovington Boulevard to Hempstead Turnpike where it would turn left and rejoin the primary alignment. It would travel east passing RXR Plaza and Eisenhower Park before terminating at Nassau University Medical Center. The vehicle would then turn and operate westbound and then northbound along the same alignment in the reverse direction.

[6] This concept will require additional coordination with the Village of Mineola.

***Figure 5-7: Refined Long-List Alternative 7 Route***




*Source: Jacobs, 2011.*

***Table 5-13: Key Characteristics of Refined Long-List Alternative 7***

| | **Hempstead to Roosevelt Field** | | **Mineola to Coliseum** | | **Potential Daily Trips 2035** | **Trips per Track/Lane Mile** | **Trips per Annual Vehicle Mile** |
|---|---|---|---|---|---|---|---|
| | **Travel Time** | **Transfers** | **Travel Time** | **Transfers** | | | |
| Mixed Flow | 8:17 | 0 | 15:46 | 0 | 6,200 | 279 | 1.86 |
| Exclusive ROW | 6:27 | 0 | 11:11 | 0 | 8,100 | 364 | 2.43 |

*Source: Jacobs, 2011.*

Note: Statistics reflect the shortest travel time/distance between locations using either Route 1 or 2.

***Table 5-14: Refined Long-List Alternative 7 Connections and Activity Centers***

| | |
|---|---|
| **Transit Connections** | Mineola Intermodal Center<br>Potential New Transit Center & LIRR Station Stop |
| **Activity Centers Served** | Downtown Village of Mineola<br>Roosevelt Field<br>Nassau Community College<br>Nassau Veterans Memorial Coliseum<br>RXR Plaza<br>Hofstra University<br>Source Mall<br>Mitchel Field |

*Source: Jacobs, 2011.*

### 5.1.8 Refined Long-List Alternative 8

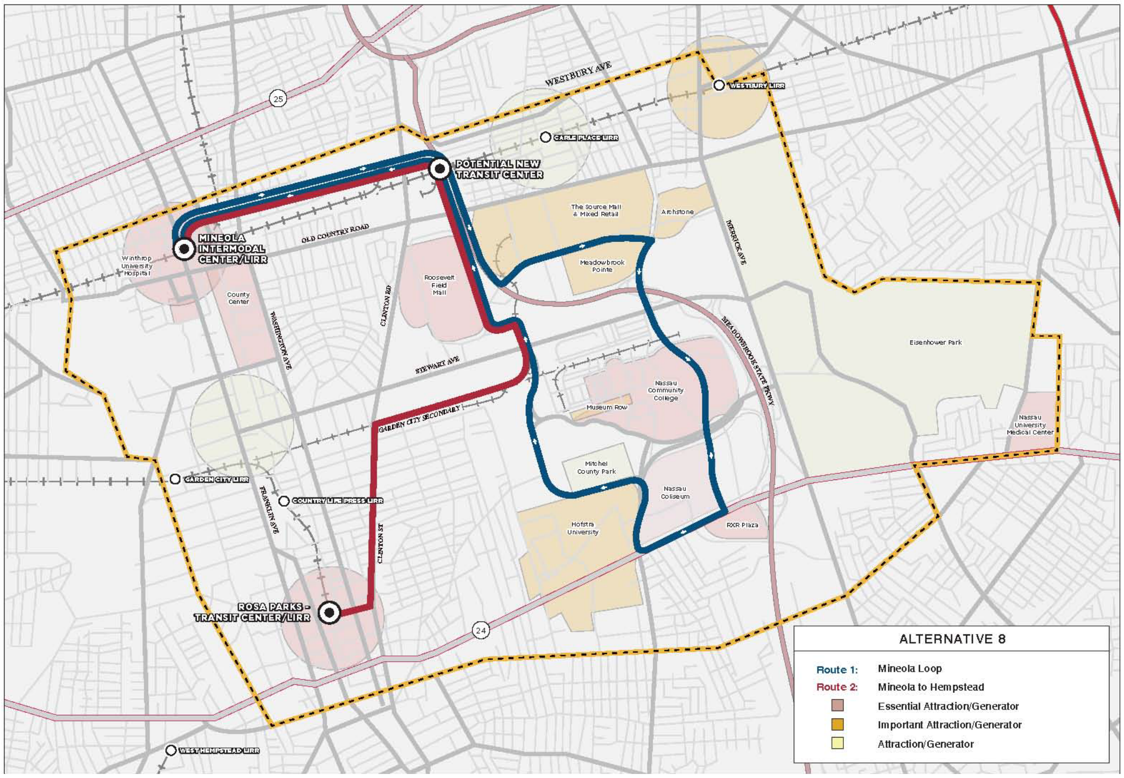
The primary alignment would travel east from the Mineola Intermodal Center along 2nd Street and Voice Road to Glen Cove Road. The connection between 2nd Street and Voice Road may require a taking of property to establish a direct right-of-way.[7] The route would then turn south and make a connection with a potential new transit center and LIRR station stop. It would then continue south along the eastern edge of the Roosevelt Field property. (The exact routing of this connection was not determined at this phase of alternatives development.) The alignment would continue south from Roosevelt Field along South Street, which transitions to Quentin Roosevelt Boulevard/Charles Lindbergh Boulevard as it crosses Stewart Avenue. The alignment would diverge into two separate branch routes at the Garden City Secondary.

Route 1 would turn right onto the Garden City Secondary and travel west along the rail right-of-way to Clinton Road. It would turn left and travel southwest toward downtown Village of Hempstead. The alignment would turn right onto Jackson Street and stop at the Rosa Parks–Hempstead Transit Center. The vehicle would then turn around and travel eastbound and then northbound along the same alignment in the reverse direction.

Route 2 would operate in one-way loop operation by diverging from the primary alignment near the southwest corner of Roosevelt Field by crossing over the Meadowbrook State Parkway on an existing or newly constructed bridge. It would then follow Zeckendorf Boulevard/Corporate Drive past the Source Mall to Merchants Concourse, turn south and run along Merchants Concourse and Endo Boulevard. The alignment would hug the southeastern boundary of Nassau Community College, utilizing parking lot right-of-way to the intersection of Charles Lindbergh Boulevard and Earle Ovington Boulevard. It would then turn left and follow Charles Lindbergh Boulevard for a short distance and then turn to the south and travel through the Nassau Veterans Memorial Coliseum parking lot right-of-way to Hempstead Turnpike. It would then turn right and travel west past RXR Plaza to Earle Ovington Boulevard. Turning north to Earle Ovington Boulevard, the alignment would then turn left onto Quentin Roosevelt Boulevard/Charles Lindbergh Boulevard and provide service to Museum Row and Mitchel Field. It would then continue north to rejoin the two-way primary alignment at the Garden City Secondary and return to the Mineola Intermodal Center.

[7] This concept will require additional coordination with the Village of Mineola.

*Figure 5-8: Refined Long-List Alternative 8 Route*




*Source: Jacobs, 2011.*

*Table 5-15: Key Characteristics of Refined Long-List Alternative 8*

| | Hempstead to Roosevelt Field Mall | | Mineola to Coliseum | | Potential Daily Trips 2035 | Trips per Track/Lane Mile | Trips per Annual Vehicle Mile |
|---|---|---|---|---|---|---|---|
| | Travel Time | Transfers | Travel Time | Transfers | | | |
| Mixed Flow | 8:17 | 0 | 15:05 | 0 | 4,600 | 235 | 1.57 |
| Exclusive ROW | 6:27 | 0 | 10:24 | 0 | 6,100 | 312 | 2.08 |

*Source: Jacobs, 2011.*

Note: Statistics reflect the shortest travel time/distance between locations using either Route 1 or 2.

*Table 5-16: Refined Long-List Alternative 8 Connections and Activity Centers*

| | |
|---|---|
| **Transit Connections** | Mineola Intermodal Center<br>Potential New Transit Center & LIRR Station Stop<br>Rosa Parks–Hempstead Transit Center |
| **Activity Centers Served** | Downtown Village of Mineola<br>Downtown Village of Hempstead<br>Roosevelt Field<br>Nassau Community College<br>Nassau Veterans Memorial Coliseum<br>RXR Plaza<br>Hofstra University<br>Source Mall<br>Mitchel Field |

*Source: Jacobs, 2011.*

## 5.2 Refined Long-List Alternatives Screening

The purpose of the second phase of the screening process was to broadly analyze the Refined Long-List Alternatives for their ability to address Study goals and, on that basis, identify the Short-List Alternatives. This phase of screening identified the alternatives that would best provide mobility and accessibility improvements. While this step incorporated the quantitative data developed at this stage of the AA, some of the evaluation measures remained qualitative in nature. Each of the alternatives received a ranking based upon its ability to meet each of the more rigorous screening criteria defined for the Study goals and objectives that were identified for use in this second phase of screening (see Table 5-17). Alternatives that did not perform well in their ability to meet the stated purpose, needs, goals and objectives, based on their comparative performance against the screening criteria, were eliminated from further consideration. The highest-performing alternatives were advanced as the Short-List Alternatives for the final screening phase.

***Table 5-17: Refined Long-List Alternatives Screening Evaluation Criteria and Measures***

| **Objective** | **Evaluation Criterion** | **Evaluation Measure** |
|---|---|---|
| ***GOAL: Develop transit improvements that will provide additional realistic and practical travel options to, from and within the Study Area and help to mitigate congestion on roadways.*** | | |
| Develop a public transportation alternative that will attract a maximum number of riders. | Total daily transit riders should be maximized. | Relative strength of ridership, utilizing preliminary outputs from a sketch planning model developed by the FTA |
| ***GOAL: Develop transit improvements that will enhance mobility to, from and within the Study Area in a cost-effective manner.*** | | |
| Develop an alternative that will have a capital cost that is consistent with anticipated financial resources for construction. | Projected capital costs should be minimized. | Trips per track/lane mile |
| Develop an alternative that will have an operating and maintenance cost that can feasibly be funded annually with state and local resources. | Annual operating and maintenance (O&M) costs should be minimized. | Trips per annual vehicle mile |
| ***GOAL: Develop transit improvements that encourage the development of sustainable, transit-friendly land use patterns and support economic development activities.*** | | |
| Develop a seamless, convenient and integrated regional transportation system. | The number of transfers between a standard set of activity centers should be minimized. | Number of transfers between activity centers (2 pairs – Village of Mineola to Nassau Veterans Memorial Coliseum, Village of Hempstead to Roosevelt Field) |

*Source: Jacobs, 2011.*

A series of three distinct screening matrices was developed to preclude bias in the screening process and determination of which Refined Long-List Alternatives should be advanced for further study. As described below, the three screening matrices used different weightings for the evaluation measures used with each matrix to assess how the alternatives performed against the Study goals and objectives. Ultimately, the results of the weighting in each matrix were evaluated and averaged for each matrix to determine the best performing alternatives to be advanced. The screening matrices were:

- Matrix 1 used five evaluation measures to screen the performance of the alternatives for the Study goals, objectives and evaluation criteria:
  - Potential daily trips (2035)

- – Trips per track/lane mile
- – Trips per annual vehicle mile
- – Travel time between the Village of Hempstead and Roosevelt Field and travel time between the Village of Mineola and Nassau Veterans Memorial Coliseum
- – Number of transfers between the Village of Hempstead and Roosevelt Field and number of transfers between the Village of Mineola and Nassau Veterans Memorial Coliseum.

Each evaluation measure used in Matrix 1 was given equal weight in the calculation of the ranking of the Refined Long-list Alternatives shown in the last column of this matrix. This places the most emphasis on the goal to "Develop transit improvements that will enhance mobility to, from and within the Study Area in a cost-effective manner" because three of the five evaluation measures address this goal. Less emphasis is placed on the other two goals, which have one evaluation measure each.

- Matrix 2 used six evaluation measures to screen the performance of the alternatives for the Study goals, objectives and evaluation criteria:
  - – Potential daily trips (2035)
  - – Trips per track/lane mile
  - – Trips per annual vehicle mile
  - – Travel time between the Village of Hempstead and Roosevelt Field and travel time between the Village of Mineola and Nassau Veterans Memorial Coliseum
  - – Number of transfers between the Village of Hempstead and Roosevelt Field and number of transfers between the Village of Mineola and Nassau Veterans Memorial Coliseum
  - – Number of essential activity centers served

Each evaluation measure used in Matrix 2 was given equal weight in the calculation of the Refined Long-list Alternatives ranking in the last column of the matrix. This places the most emphasis on the goal to "Develop transit improvements that will enhance mobility to, from and within the Study Area in a cost-effective manner" because three of the six evaluation measures address this goal. Some emphasis is placed on the goal to "Develop transit improvements that encourage the development of sustainable, transit-friendly land use patterns and support economic development activities," as there are two evaluation measures for this goal. The least emphasis is placed on the goal to "Develop transit improvements that will provide additional realistic and practical travel options to, from and within the Study Area and help to mitigate congestion on roadways," as there is only one evaluation measure for this goal.

- Matrix 3, similar to Matrix 2, also used six evaluation measures to screen the performance of the alternatives for the Study goals, objectives and evaluation criteria:
  - – Potential daily trips (2035)
  - – Trips per track/lane mile
  - – Trips per annual vehicle mile

- – Travel time between the Village of Hempstead and Roosevelt Field and travel time between the Village of Mineola and Nassau Veterans Memorial Coliseum
- – Number of transfers between the Village of Hempstead and Roosevelt Field and number of transfers between the Village of Mineola and Nassau Veterans Memorial Coliseum
- – Number of essential activity centers served

Matrix 3 averaged the ranking among the Refined Long-List Alternatives by goal rather than evaluation measure, as was done in Matrices 1 and 2. Equal weight was given to each of the three Study goals in the calculation of the ranking shown in the last column of this matrix. Matrix 3 places equal emphasis on each goal. This gives more weight to the evaluation measure "Potential daily trips" because it is the only measure for that goal. The least weight is given to the evaluation measures of "Trips per track/lane mile," "Trips per annual vehicle mile," and "Travel time between the Village of Hempstead and Roosevelt Field and travel time between the Village of Mineola and Nassau Veterans Memorial Coliseum" because these are all associated with the same goals; the evaluation measure ranks for these measures were averaged together to determine the individual rank for that goal.

The three matrices are presented in Tables 5-18, 5-19, and 5-20.

The following section describes the findings of the three-matrix analysis presented in Tables 5-18, 5-19, and 5-20.

### 5.2.1 Relative Strength of Ridership

The Study goal to "Develop transit improvements that will provide additional realistic and practical travel options to, from and within the Study Area and help to mitigate congestion on roadways" has an associated objective to "Develop a public transportation alternative that will attract a maximum number of riders." This objective is measured through relative strength of ridership. Relative strength of ridership utilizes preliminary outputs from the travel demand model used for this Study (see Table 5-1 Note 2 on page 5-3). Alternatives 2, 3, and 7 each received top ranking with potential daily ridership numbers in the 6,100 to 8,100 range.

### 5.2.2 Trips per Track/Lane Mile

This evaluation measure is related to the Study goal to "Develop transit improvements that will enhance mobility to, from and within the Study Area in a cost-effective manner." The evaluation criterion that "Projected capital costs should be minimized" measures order-of-magnitude relative costs by ranking the alternatives based on the trips per track/lane mile. Alternative 3 received the highest ranking, registering 349 trips per track/lane mile for a mixed-flow alignment and 458 trips per track/lane mile for an exclusive right-of-way alignment. Alternative 1 received the second highest ranking, with 285 trips per track/lane mile for a mixed-flow alignment and 378 trips per track/lane mile for an exclusive right-of-way alignment. Alternative 2 was the third highest ranked alternative, with 280 trips per track/lane mile for a mixed-flow alignment and 365 trips per track/lane mile for an exclusive right-of-way alignment.

*Table 5-18: Matrix 1—Five Evaluation Measures Equally Weighted*

| Alternative | GOAL: Develop transit improvements that will provide additional realistic and practical travel options to, from and within the Study Area and help to mitigate congestion on roadways. | | GOAL: Develop transit improvements that will enhance mobility to, from and within the Study Area in a cost-effective manner. | | | | | | | | | GOAL: Develop transit improvements that encourage the development of sustainable, transit-friendly land use patterns and support economic development activities. | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total daily transit riders should be maximized. | | Projected capital costs should be minimized | | Annual operating and maintenance (O&M) costs should be minimized. | | An alternative should shorten travel time between a standard set of Activity Centers. | | | | | The number of transfers between a standard set of Activity Centers should be minimized. | | | | | |
| | Relative Strength of Ridership | | Trips Per Track/Lane Mile | | Trips Per Annual Vehicle Mile | | Representative Travel Times | | | | | Number of Transfers Between Activity Centers | | | | | |
| | Potential Daily Trips 2035* | Evaluation Measure Rank | Trips Per Track/Lane Mile* | Evaluation Measure Rank | Trips Per Annual Vehicle Mile* | Evaluation Measure Rank | Travel Time, Hempstead to Roosevelt Field Mall* | Rank | Travel Time, Mineola to Coliseum* | Rank | Evaluation Measure Rank | Transfers, Hempstead to Roosevelt Field Mall | Rank | Transfers, Mineola to Coliseum | Rank | Evaluation Measure Rank | **REFINED LONG-LIST RANK** |
| 3 | 6,100 / 8,000 | 3 | 349 / 458 | 1 | 1.91 / 2.51 | 1 | 10:19 / 14:13 | 4 | 10:18-14:42 | 1 | 3 | 0 | 1 | 0 | 1 | 1 | **1.7** |
| 2 | 6,200 / 8,100 | 1 | 280 / 365 | 3 | 1.53 / 2.00 | 3 | 10:30 / 14:04 | 5 | 10:47-14:43 | 4 | 5 | 0 | 1 | 0 | 1 | 1 | **2.5** |
| 7 | 6,200 / 8,100 | 1 | 279 / 364 | 4 | 1.53 / 2.00 | 4 | 06:27 / 08:17 | 1 | 11:11-15:46 | 6 | 4 | 0 | 1 | 0 | 1 | 1 | **2.7** |
| 1 | 4,600 / 6,100 | 5 | 285 / 378 | 2 | 1.56 / 2.07 | 2 | 10:32 / 14:17 | 6 | 10:32-14:48 | 3 | 5 | 0 | 1 | 0 | 1 | 1 | **2.9** |
| 4 | 4,700 / 6,300 | 4 | 258 / 346 | 5 | 1.42 / 1.90 | 5 | 07:56 / 11:09 | 3 | 12:27-17:26 | 7 | 5 | 0 | 1 | 0 | 1 | 1 | **4.0** |
| 8 | 4,600 / 6,100 | 5 | 235 / 312 | 7 | 1.29 / 1.71 | 7 | 06:27 / 08:17 | 1 | 10:24-15:05 | 2 | 2 | 0 | 1 | 0 | 1 | 1 | **4.5** |
| 5 | 3,700 / 4,800 | 7 | 244 / 316 | 6 | 1.34 / 1.73 | 6 | -- | 8 | 12:33-17:34 | 8 | 8 | - | 8 | 0 | 1 | 5 | **6.3** |
| 6 | 3,100 / 4,100 | 8 | 203 / 269 | 8 | 1.12 / 1.48 | 8 | -- | 8 | 10:59-14:43 | 5 | 7 | - | 8 | 0 | 1 | 5 | **7.0** |

* Values for Relative Strength of Ridership, Trips per Track/Lane Mile, Trips per Annual Vehicle Mile and Representative Travel Times are displayed with the first reflecting mixed-flow operation and the second value reflecting operation within a dedicated right-of-way. Each alternative is comprised of both mixed-flow and dedicated ROW segments and the values for each measure would likely be within a range of the two numbers.

*Source: Jacobs, 2011.*

*Table 5-19: Matrix 2—Six Evaluation Measures Equally Weighted*

| Alternative | *GOAL: Develop transit improvements that will provide additional realistic and practical travel options to, from and within the Study Area and help to mitigate congestion on roadways.* | | *GOAL: Develop transit improvements that will enhance mobility to, from and within the Study Area in a cost-effective manner.* | | | | | | | | | *GOAL: Develop transit improvements that encourage the development of sustainable, transit-friendly land use patterns and support economic development activities.* | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total daily transit riders should be maximized. | | Projected capital costs should be minimized | | Annual operating and maintenance (O&M) costs should be minimized. | | An alternative should shorten travel time between a standard set of Activity Centers. | | | | | The number of transfers between a standard set of Activity Centers should be minimized. | | | | | Number of Essential Activity Centers Served | | |
| | Relative Strength of Ridership | | Trips Per Track/Lane Mile | | Trips Per Annual Vehicle Mile | | Representative Travel Times | | | | | Number of Transfers Between Activity Centers | | | | | Number of Essential Activity Centers Served | | |
| | Potential Daily Trips 2035* | Evaluation Measure Rank | Trips Per Track/Lane Mile* | Evaluation Measure Rank | Trips Per Annual Vehicle Mile* | Evaluation Measure Rank | Travel Time, Hempstead to Roosevelt Field Mall* | Rank | Travel Time, Mineola to Coliseum* | Rank | Evaluation Measure Rank | Transfers, Hempstead to Roosevelt Field Mall | Rank | Transfers, Mineola to Coliseum | Rank | Evaluation Measure Rank | Number of Essential Activity Centers Served | Evaluation Measure Rank | **REFINED LONG-LIST RANK** |
| 3 | 6,100 / 8,000 | 3 | 349 / 458 | 1 | 1.91 / 2.51 | 1 | 10:19/14:13 | 4 | 10:18/14:42 | 1 | 3 | 0 | 1 | 0 | 1 | 1 | 7 | 1 | **1.6** |
| 2 | 6,200 / 8,100 | 1 | 280 / 365 | 3 | 1.53 / 2.00 | 3 | 10:30/14:04 | 5 | 10:47/14:43 | 4 | 5 | 0 | 1 | 0 | 1 | 1 | 7 | 1 | **2.3** |
| 7 | 6,200 / 8,100 | 1 | 279 / 364 | 4 | 1.53 / 2.00 | 4 | 06:27/08:17 | 1 | 11:11/15:46 | 6 | 4 | 0 | 1 | 0 | 1 | 1 | 7 | 1 | **2.4** |
| 1 | 4,600 / 6,100 | 5 | 285 / 378 | 2 | 1.56 / 2.07 | 2 | 10:32/14:17 | 6 | 10:32/14:48 | 3 | 5 | 0 | 1 | 0 | 1 | 1 | 5 | 6 | **3.4** |
| 4 | 4,700 / 6,300 | 4 | 258 / 346 | 5 | 1.42 / 1.90 | 5 | 07:56/11:09 | 3 | 12:27/17:26 | 7 | 5 | 0 | 1 | 0 | 1 | 1 | 5 | 6 | **4.3** |
| 8 | 4,600 / 6,100 | 5 | 235 / 312 | 7 | 1.29 / 1.71 | 7 | 06:27/08:17 | 1 | 10:24/15:05 | 2 | 2 | 0 | 1 | 0 | 1 | 1 | 6 | 4 | **4.4** |
| 5 | 3,700 / 4,800 | 7 | 244 / 316 | 6 | 1.34 / 1.73 | 6 | -- | 8 | 12:33/17:34 | 8 | 8 | - | 8 | 0 | 1 | 5 | 6 | 4 | **5.9** |
| 6 | 3,100 / 4,100 | 8 | 203 / 269 | 8 | 1.12 / 1.48 | 8 | -- | 8 | 10:59/14:43 | 5 | 7 | - | 8 | 0 | 1 | 5 | 4 | 8 | **7.2** |

* Values for Relative Strength of Ridership, Trips per Track/Lane Mile, Trips per Annual Vehicle Mile and Representative Travel Times are displayed with the first reflecting mixed-flow operation and the second value reflecting operation within a dedicated right-of-way. Each alternative is comprised of both mixed-flow and dedicated ROW segments and the values for each measure would likely be within a range of the two numbers.

*Source: Jacobs, 2011.*

*Table 5-20: Matrix 3—Six Evaluation Measures Weighted by the Three Goals*

| Alternative | *GOAL: Develop transit improvements that will provide additional realistic and practical travel options to, from and within the Study Area and help to mitigate congestion on roadways.* | | *GOAL: Develop transit improvements that will enhance mobility to, from and within the Study Area in a cost-effective manner.* | | | | | | | | | *GOAL: Develop transit improvements that encourage the development of sustainable, transit-friendly land use patterns and support economic development activities.* | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total daily transit riders should be maximized. | | Projected capital costs should be minimized | | Annual operating and maintenance (O&M) costs should be minimized. | | An alternative should shorten travel time between a standard set of Activity Centers. | | | | | The number of transfers between a standard set of Activity Centers should be minimized. | | | | | Number of Essential Activity Centers Served | | |
| | Relative Strength of Ridership | | Trips Per Track/Lane Mile | | Trips Per Annual Vehicle Mile | | Representative Travel Times | | | | | Number of Transfers Between Activity Centers | | | | | Number of Essential Activity Centers Served | | |
| | Potential Daily Trips 2035* | Evaluation Measure Rank | Trips Per Track/Lane Mile* | Evaluation Measure Rank | Trips Per Annual Vehicle Mile* | Evaluation Measure Rank | Travel Time, Hempstead to Roosevelt Field Mall* | Rank | Travel Time, Mineola to Coliseum* | Rank | Evaluation Measure Rank | Transfers, Hempstead to Roosevelt Field Mall | Rank | Transfers, Mineola to Coliseum | Rank | Evaluation Measure Rank | Number of Essential Activity Centers Served | Evaluation Measure Rank | **REFINED LONG-LIST RANK** |
| 2 | 6,200/8,100 | 1 | 280 / 365 | 3 | 1.53 / 2.00 | 3 | 10:30/14:04 | 5 | 10:47/14:43 | 4 | 4 | 0 | 1 | 0 | 1 | 1 | 7 | 1 | **1.8** |
| 3 | 6,100/8,000 | 3 | 349 / 458 | 1 | 1.91 / 2.51 | 1 | 10:19/14:13 | 4 | 10:18/14:42 | 1 | 3 | 0 | 1 | 0 | 1 | 1 | 7 | 1 | **1.8** |
| 7 | 6,200/8,100 | 1 | 279 / 364 | 4 | 1.53 / 2.00 | 4 | 06:27/08:17 | 1 | 11:11/15:46 | 6 | 4 | 0 | 1 | 0 | 1 | 1 | 7 | 1 | **1.9** |
| 1 | 4,600/6,100 | 5 | 285 / 378 | 2 | 1.56 / 2.07 | 2 | 10:32/14:17 | 6 | 10:32/14:48 | 3 | 5 | 0 | 1 | 0 | 1 | 1 | 5 | 6 | **3.8** |
| 4 | 4,700/6,300 | 4 | 258 / 346 | 5 | 1.42 / 1.90 | 5 | 07:56/11:09 | 3 | 12:27/17:26 | 7 | 5 | 0 | 1 | 0 | 1 | 1 | 5 | 6 | **4.2** |
| 8 | 4,600/6,100 | 5 | 235 / 312 | 7 | 1.29 / 1.71 | 7 | 06:27/08:17 | 1 | 10:24/15:05 | 2 | 2 | 0 | 1 | 0 | 1 | 1 | 6 | 4 | **4.2** |
| 5 | 3,700/4,800 | 7 | 244 / 316 | 6 | 1.34 / 1.73 | 6 | -- | 8 | 12:33/17:34 | 8 | 8 | - | 12 | 0 | 1 | 7 | 6 | 4 | **6.3** |
| 6 | 3,100/4,100 | 8 | 203 / 269 | 8 | 1.12 / 1.48 | 8 | -- | 8 | 10:59/14:43 | 5 | 7 | - | 12 | 0 | 1 | 7 | 4 | 8 | **7.6** |

* Values for Relative Strength of Ridership, Trips per Track/Lane Mile, Trips per Annual Vehicle Mile and Representative Travel Times are displayed with the first reflecting mixed-flow operation and the second value reflecting operation within a dedicated right-of-way. Each alternative is comprised of both mixed-flow and dedicated ROW segments and the values for each measure would likely be within a range of the two numbers.

*Source: Jacobs, 2011.*

### 5.2.3 Trips per Annual Vehicle Mile

This evaluation measure is related to the Study goal to "Develop transit improvements that will enhance mobility to, from and within the Study Area in a cost-effective manner." The evaluation criterion that "Annual operating and maintenance (O&M) costs should be minimized" measures order-of-magnitude relative operating costs by ranking the alternatives based on the trips per annual vehicle miles traveled (VMT). Alternative 3 received the highest score, registering 1.91 trips per annual VMT for a mixed-flow alignment and 2.51 trips per annual VMT for an exclusive right-of-way alignment. Alternative 1 was the second highest ranked alternative, with 1.53 trips per annual VMT for a mixed-flow alignment and 2.07 trips per annual VMT for an exclusive right-of-way alignment. Alternative 2 was the third highest ranked alternative, with 1.53 trips per annual VMT for a mixed-flow alignment and 2.00 trips per annual VMT for an exclusive right-of-way alignment.

### 5.2.4 Number of Transfers Between Activity Centers

This evaluation measure is related to the Study goal to "Develop transit improvements that encourage the development of sustainable, transit-friendly land use patterns and support economic development activities." The evaluation criterion that "The number of transfers between a standard set of Activity Centers should be minimized" relates to the additional travel time and passenger inconvenience that would result from a required transfer in order to travel between the selected travel-destination pairs. While travel times will differ by mode and by alignment characteristics, the travel time between destination pairs should change at the same relative level based upon the travel distance and stopping patterns. Most of the alternatives received the highest possible ranking for this measure because the alternatives' alignments were designed to minimize transfers. Only Alternatives 5 and 6 received poor scores due to their lack of a connection to the Rosa Parks–Hempstead Transit Center.

### 5.2.5 Representative Travel Times

This evaluation measure is related to the Study goal to "Develop transit improvements that will enhance mobility to, from and within the Study Area in a cost-effective manner." The evaluation criterion that "An alternative should shorten travel time between a standard set of Activity Centers" measures the travel time for two sample trips, one between the Village of Hempstead and Roosevelt Field and the other between the Village of Mineola and the Nassau Veterans Memorial Coliseum. While travel times will differ by mode and by alignment characteristics, the travel time between destination pairs should change at the same relative level based upon the travel distance and stopping patterns. Alternative 8 received the highest combined score for travel time, with trips between the Village of Hempstead and Roosevelt Field projected to be 7:56 minutes for an exclusive right-of-way alignment and 11:06 minutes for a mixed-flow alignment. Trips between the Village of Mineola and the Nassau Veterans Memorial Coliseum were projected to be 10:24 minutes for an exclusive right-of-way alignment and 15:05 minutes for a mixed-flow alignment. Alternative 3 was the second highest ranked alternative for travel time, with trips between the Village of Hempstead and Roosevelt Field projected to be 10:19 minutes for an exclusive right-of-way alignment and 14:13 minutes for a mixed-flow alignment. Trips between the Village of Mineola and the Nassau Veterans Memorial Coliseum were projected to be 10:18 minutes for an exclusive right-of-way alignment and 14:42 minutes for a mixed-flow alignment. Finally, Alternative 7 placed third in the ranking for travel time, with trips between the Village of Hempstead and Roosevelt Field projected to be 6:27 minutes for an exclusive right-of-way alignment and 8:17 minutes for a mixed-flow alignment. Trips between the Village of Mineola and the Nassau Veterans Memorial Coliseum were projected to be 11:11 minutes for an exclusive right-of-way alignment and 15:46 minutes for a mixed-flow alignment.

### 5.2.6 Number of Essential Activity Centers Served

This evaluation measure is related to the Study goal to "Develop transit improvements that encourage the development of sustainable, transit-friendly land use patterns and support economic development activities." The objective to "Develop a seamless, convenient and integrated regional transportation system" relates to the value in providing high-quality and reliable connections between the essential activity centers within the Study Area. The evaluation criterion that "The number of transfers between a standard set of Activity Centers should be minimized" relates to the additional travel time and passenger inconvenience that would result from a required transfer in order to travel between the selected travel-destination pairs. Alternatives 2, 3 and 7 received the highest rankings for this measure because they would provide direct connectivity to seven essential activity centers. Alternatives 5 and 8 would provide direction connections between six essential activity centers, Alternatives 1 and 4 would connect five while Alternative 6 would connect only four essential activity centers.

## 5.3 Refined Long-List Alternatives Screening Results

Table 5-21 lists the alternatives based on their respective rankings from the results of each of the three screening matrices.

***Table 5-21: Refined Long-List Alternatives Screening Results***

| Matrix 1 | | Matrix 2 | | Matrix 3 | |
|---|---|---|---|---|---|
| Alt | Rank | Alt | Rank | Alt | Rank |
| 3 | **1.7** | 3 | **1.6** | 2 | **1.8** |
| 2 | **2.5** | 2 | **2.3** | 3 | **1.8** |
| 7 | **2.7** | 7 | **2.4** | 7 | **1.9** |
| 1 | **2.9** | 1 | **3.4** | 1 | **3.8** |
| 4 | **4.0** | 4 | **4.3** | 4 | **4.2** |
| 8 | **4.5** | 8 | **4.4** | 8 | **4.2** |
| 5 | **6.3** | 5 | **5.9** | 5 | **6.3** |
| 6 | **7.0** | 6 | **7.2** | 6 | **7.6** |

*Source: Jacobs, 2011.*

Note: Route 1 and Route 2 of individual alternatives are included if the alternative has two routes.

Based on the quantitative rankings summarized in the preceding sections, detailed in the three screening matrices (Tables 5-18, 5-19, and 5-20) and summarized in Table 5-21, Alternative 2 and Alternative 3 ranked the best cumulatively and, therefore, were advanced for further study as the Short-List Alternatives. Alternatives 1, 4, 5, 6, 7 and 8 were eliminated at this stage of the screening process.

## 5.4 Transit Technology Assessment

With Alternatives 2 and 3 advanced from the Refined Long-List screening, the next effort involved the consideration of transit technology along those alternatives' alignments. A series of transit technology evaluation measures, derived from the Study's goals and objectives, were developed. The technologies were rated based on performance against the measures and technologies were then recommended to be advanced for further Study with Alternatives 2 and 3.

### 5.4.1 Potential Transit Technologies

The consideration of transit technologies in the Nassau Hub Study AA/EIS builds upon the work of the Nassau Hub Major Investment Study. This section describes the universe of transit technologies that was considered in the development of the Short-List Alternatives and consistent with FTA guidelines.

The following review of transit technologies is provided as a means to inventory potential transit applications in the Study Area. A reference to use of a given technology in the New York metropolitan region is also given, if applicable. This review classifies the various modes in the following three categories based on the degree of grade separation that would be required: street transit, semi-separated transit, and separated transit.

#### 5.4.1.1 Street Transit

**Jitney**

Jitneys are passenger vans or smaller buses operating with fixed routes but no fixed schedules. They are generally privately owned and operated services that are typically free of government assistance, but are regulated through a public service commission, state or local government. Jitneys generally operate under franchise agreements; fares tend to be regulated and are subject to special insurance requirements. Vehicle capacity varies from eight to 30 people or more, and the vehicle may be owned or leased by the operator. Additionally, jitney services may also be operated as general public demand-responsive service (also known as "dial-a ride") or as deviated fixed-route service (also known as flex-routes).

**Circulator Bus**


A circulator bus or shuttle bus serves an area confined to a specific locale, such as a downtown area or suburban business district, with connections to other transit services. Circulator bus service is used to provide short localized trips, such as from home to a shopping center or between two nearby activity centers. Circulator bus services may employ smaller vehicles that are better able to provide service within neighborhoods, office complexes and shopping centers.

**Commuter Bus**

Commuter bus service operates along a fixed route, primarily in one direction during peak periods, with limited stops. The intent is to serve commuters traveling from an outlying area to the central business district or a connecting transit service. The service can be integrated with managed lanes for better performance. Commuter bus passengers generally tend to be peak hour-oriented, and many use multi-ride passes to pay for the service. Vehicles are typically motor coaches, which prioritize comfort over rapid boarding and alighting.

**Conventional Bus**


Fixed-route or conventional bus service involves a system of vehicles operated along prescribed routes and according to a fixed schedule. Fixed-route bus services can be operated as local, limited stop or express services such as provided by the Nassau Inter County Express (NICE) Bus system. Local bus service stops to allow passengers to board or alight at all stops along the route. Limited-stop service is typically operated in peak periods or along long corridors with high demand. Express bus service is a more restrictive form of limited-stop service in which the bus serves one to a few stops at the beginning of the route, and then operates directly to its destination. Fixed-route bus service is typically very effective in dense areas where there is nearly constant demand for services on the route. Less dense, suburban areas can also support effective fixed-route bus service and perform well in terms of ridership.

**Trolley Bus**


Trolley buses are rubber-tired, passenger vehicles that operate in mixed traffic on paved streets in much the same manner as conventional buses. However, unlike the diesel, hybrid or compressed natural gas (CNG) conventional buses, trolley buses are powered by overhead electric or catenary, which limits the flexibility to alter routes or pass other transit vehicles. Hybrid vehicles that permit trolley buses to detach from the catenary and operate on battery power are currently in service in a number of cities across the country.

**Modern Streetcar**


Modern streetcars are steel-wheeled passenger vehicles that generally operate along tracks laid in the street right-of-way and are typically powered by overhead electric catenary wires. Modern streetcars may operate in mixed-traffic or in a dedicated running-way and can be coupled together to form small trains. Modern streetcars are generally smaller than conventional light rail vehicles, have stops that are similarly spaced to bus routes and typically travel at lower speeds than other rail vehicles.

### 5.4.1.2 Semi-Separated Transit

**Bus Rapid Transit (BRT)/Premium Bus**

Bus rapid transit (BRT)/premium bus vehicles and related systems are intended to accommodate higher capacity, improve speed, provide greater passenger convenience and comfort, and improve reliability and predictability of service. BRT/premium bus routing may occur in exclusive rights-of-way, reserved lanes in streets, or lanes shared with other traffic. Treatments such as signal prioritization, distinctive stations and vehicles, and off-board fare collection have proven successful in speeding passengers around traffic congestion that would slow conventional buses. Collectively, BRT/premium bus services are designed to allow a quality of service that is close to that of light rail transit while still providing the cost savings associated with bus transit. In New York City, BRT/premium bus has been implemented with shared lanes as the Select Bus Service, while the Los Angeles Orange Line operates within a dedicated alignment placed within a former railroad right-of-way.

**Light Rail Transit (LRT)/Modern Streetcar**

Light Rail Transit (LRT) utilizes lightweight passenger vehicles to provide service with a lower capacity than heavy rail systems. Light rail may use shared or exclusive rights-of-way, high- or low-platform loading and single- or multi-vehicle trains. Due to their light weight and limited crash worthiness, the Federal Railroad Administration (FRA) safety regulations prohibit LRT from operating on railroad tracks at the same time as freight or commuter rail trains. This requirement would preclude the operation of a LRT alternative on LIRR tracks without strict temporal (time-based) separation. Light-rail vehicles are either electrically powered from overhead catenary wires (e.g., New Jersey Transit's Hudson-Bergen Light Rail) or utilize smaller, bus-like diesel engines (e.g., New Jersey Transit's RiverLine). Modern LRT vehicles offer high levels of performance (acceleration, braking, speed) and passenger comfort. Passenger capacity for each vehicle is generally 75 persons seated, with room for almost 150 standees. Multiple vehicles may be coupled together to increase passenger capacity.

#### 5.4.1.3 Separated Transit

**Aerial Tram**

Aerial tram systems consist of passenger vehicles suspended from a cable, which is supported by towers. The cable is pulled in a loop or back and forth by large motors at the terminus of the system. Most aerial tram systems are used to climb a steep grade or bridge a body of water. The largest vehicles can support up to 100 people. Generally, aerial trams are used over short distances to cross an obstruction, but can be used to cross larger distances and circulate commuters. Stations can be built freestanding or can be incorporated into existing or future structures.

**Automated Guideway Transit (AGT)**


Automated Guideway Transit (AGT) refers to a number of related technologies that operate on a fixed aerial or underground guideway and typically have no onboard operator present. These technologies include monorails, people movers, and personal rapid transit (PRT) systems. Computers are used to control vehicle speed, spacing and stopping. AGT systems are widely used in airports (e.g., JFK AirTrain) or other small collector areas, but have also been successfully implemented in a number of large urban locations such as Vancouver, British Columbia.

**Cable Drawn Systems (CDS)**

Cable drawn systems are similar to AGT systems, except that they utilize unpowered vehicles that are propelled along cables that run within the guideway. Modern cable drawn systems typically operate along dedicated, elevated or underground rights-of-way. This system allows for lightweight and inexpensive vehicles and smaller guideways. Many historic cable drawn systems were implemented to climb steep inclines, while modern cable drawn transit has typically been implemented in automated people-mover systems.

**Commuter Rail**

Commuter rail utilizes passenger trains, which generally operate between a central city, its suburbs and/or another central city. It may be propelled by electrified third rail (LIRR), overhead electric catenary wire (NJ Transit), or diesel locomotives (LIRR East-End services and the Oyster Bay Branch). Service is characterized by station-to-station or zone-based fares, conventional railroad crew employment practices, and usually only one or two stations in the central business district(s). Stations generally have attached parking lots and customer amenities. Commuter rail trains are built to FRA standards, and often share track or right-of-way with freight or intercity passenger trains.

**Heavy Rail Transit**

Heavy rail transit systems are high-volume passenger railways that are characterized by high-frequency and high-speed service, exclusive rights-of-way, third-rail electric propulsion, multi-vehicle trains, sophisticated signaling and high-platform stations. Trains are generally longer and stations are generally spaced further apart than with LRT systems. Heavy rail differs from commuter rail in that service is operated at much higher frequencies and stations are located closer together. Tracks may be placed at ground level, elevated on aerial structures, buried in tunnels, or all three, as is the case with New York City Transit's subway system.

### 5.4.2 Transit Technology Screening

#### 5.4.2.1 Methodology

The Refined Long-List Alternatives screening (see Section 5.3) identified alignment alternatives for advancement to the more detailed Short-List Alternatives phase of screening. The final step of the Refined Long-List Alternatives screening was a largely qualitative exercise in which the potential transit technologies were evaluated in terms of their basic attributes. That screening of transit technologies was used to select the most appropriate modes to be combined with Alternatives 2 and 3, which were advanced for further evaluation. The results of the alignment and technology screenings were combined to create the Short-List Alternatives for the final phase of the alternatives screening process.

A set of transit technology-related criteria and a qualitative rating system of "*Good*," "*Fair/Neutral*" and "*Poor*" were defined to screen the transit technologies and weight them using the following point system:

*Good (full circle) = 1*

*Neutral (half circle) = 3*

*Poor (empty circle) = 5*

The following criteria were defined to focus specifically on the performance of each transit mode and to reflect the Study goals and objectives:

- The preferred technology should be **flexible** for use in a variety of operating environments, while taking advantage of existing transportation infrastructure, where appropriate.
- The preferred technology should provide sufficient operating **capacity** for potential **ridership.**
- The preferred technology should be able to adapt to increasing passenger demands by increasing **service frequency or vehicle capacity**.
- The preferred technology should minimize impacts to existing traffic patterns and contribute to mitigation of traffic **congestion** in the Study Area.
- The preferred technology should **minimize costs** relative to the other technologies under consideration, based on generally accepted unit costs for each technology, and given the need to obtain capital and operating funding.
- The preferred technology should provide an adequately **accessible system** for passengers.
- The preferred technology should be **compatible** with existing and planned transportation systems and improvements and travel needs in the Study Area.
- The system should be reliable and based on **proven technology**.
- The preferred technology should be compatible with existing and planned **land uses,** development densities, neighborhood character and other factors that could affect the level of transit demand.
- The preferred technology should minimize **environmental impacts** to air, water, visual, and other environmental resources.

The ranking of technologies was a qualitative assessment based on typical characteristics of each technology and how it would be applied in the Study Area. Each technology was evaluated and ranked according to these criteria, as summarized below.

#### 5.4.1.2 Technology Screening Results

Table 5-22 summarizes the findings of the screening of transit technologies. To select the technologies that should be advanced as part of the Short-List Alternatives, each modal technology's performance against each criterion was rated as good, neutral or poor (Table 5-22).

*Table 5-22: Transit Technology Assessment Matrix*

| | Street Transit | | | | | | Semi-Separated Transit | | Separated Transit | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Jitney | Circulator Bus | Conventional Bus | Commuter Bus | Trolley Bus | Modern Streetcar | BRT/ Premium Bus | Light Rail/Modern Streetcar | Aerial Tram | Cable Drawn System | Automated Guideway Transit | Commuter Rail | Heavy Rail |
| The preferred technology should be **flexible** for use in a variety of operating environments, while taking advantage of existing transportation infrastructure, where appropriate. | ● | ● | ● | ● | ◖ | ◖ | ● | ◖ | ○ | ○ | ○ | ○ | ○ |
| The preferred technology should provide sufficient operating **capacity** for potential **ridership.** | ○ | ○ | ○ | ○ | ○ | ● | ● | ● | ◖ | ● | ● | ◖ | ● |
| The preferred technology should be able to adapt to increasing passenger demands by increasing **service frequency**. | ◖ | ◖ | ◖ | ◖ | ◖ | ● | ● | ● | ○ | ● | ● | ◖ | ● |
| The preferred technology should minimize impacts to existing traffic patterns and contribute to mitigation of traffic **congestion** in the Study Area. | ◖ | ◖ | ○ | ○ | ○ | ◖ | ◖ | ◖ | ● | ● | ● | ◖ | ● |
| The preferred technology should **minimize costs** relative to the other technologies under consideration, based on generally accepted unit costs for each technology, and given the need to obtain capital and operating funding. | ◖ | ● | ● | ● | ● | ◖ | ● | ◖ | ○ | ○ | ○ | ◖ | ○ |
| The preferred technology should provide the most **accessible system** for passengers. | ● | ● | ● | ● | ● | ● | ● | ● | ○ | ◖ | ◖ | ○ | ○ |
| The preferred technology should be **compatible** with existing and planned transportation systems and improvements and travel needs in the Study Area. | ◖ | ● | ● | ● | ● | ◖ | ● | ◖ | ○ | ◖ | ◖ | ○ | ◖ |
| The system should be reliable and based on **proven technology**. | ● | ● | ● | ● | ◖ | ● | ● | ● | ◖ | ◖ | ◖ | ● | ● |
| The preferred technology should be compatible with existing and planned **land uses,** development densities, neighborhood character and other factors that could affect the level of transit demand. | ◖ | ◖ | ◖ | ◖ | ◖ | ● | ◖ | ● | ○ | ○ | ○ | ● | ● |
| The preferred technology should minimize **environmental impacts** to air, water, visual, and other environmental resources. | ◖ | ◖ | ◖ | ◖ | ● | ● | ◖ | ● | ○ | ○ | ○ | ○ | ◖ |
| | 26 | 22 | 24 | 24 | 26 | 18 | 18 | 18 | 42 | 32 | 32 | 34 | 26 |

*Source: Jacobs, 2011.*

#### 5.4.1.3 Recommended Technologies

Based on the results shown in Table 5-22, the following transit technologies were advanced to the Short-List Alternatives:

- BRT/premium bus
- Modern streetcar

***BRT/premium bus*** technology was recommended for advancement based on the following findings:

- *System Flexibility rating is Good (●):* BRT/premium bus services can offer frequent stops, providing a high degree of accessibility to most potential passengers. BRT/premium bus can operate on a busway, in dedicated lanes or in mixed traffic with preferential treatments.
- *Ridership/Capacity rating is Good (●):* BRT/premium bus vehicles and fleets can be sized to meet demand and can be operated efficiently because they are given preferential treatment. Therefore, they are not limited by traffic congestion and other factors that affect operating speeds for traditional bus service.
- *Service Frequency rating is Good (●):* BRT/premium bus services can be adapted to increasing passenger demand by increasing bus frequency. Buses operating every few minutes on a single route in a congested corridor can be cost-effective, often comparable to similar rail transit services.
- *Congestion Mitigation rating is Neutral (◖):* BRT/premium bus vehicles that operate within a dedicated right-of-way do not contribute to traffic congestion. BRT/premium bus services that utilize the current street network require use of existing roadway capacity; however, there is a neutral or net positive effect on traffic congestion if the service attracts existing automobile drivers and removes those vehicles from the roadway.
- *Relative Cost rating is Good (●):* BRT/premium bus improvements are generally less expensive than are new rail systems. While high-quality, distinctive vehicles are often a component of BRT/premium bus service, a new system would not necessarily require procurement of a new vehicle type or new maintenance facilities.
- *System Accessibility rating is Good (●):* Feeder bus services can provide system access, but passengers could have direct (walk) access to the BRT/premium bus system depending on the alignment and station locations that are selected.
- *System Compatibility rating is Good (●):* BRT/premium bus would be compatible with the existing NICE Bus fleet and operations and maintenance facilities.
- *Proven Technology rating is Good (●):* Buses for BRT/premium bus service are manufactured by numerous vendors in North America and are operated in a wide variety of services, environments, and conditions.
- *Land Use Compatibility rating is Neutral (◖):* BRT/premium bus systems in North America have not been shown to have had a noticeable impact on transit-oriented development or transit-related land uses in either a positive or negative sense.
- *Environmental Impact rating is Neutral (◖):* Emissions can be mitigated through use of alternative fuels, but noise from internal combustion buses can impact residential areas. In most respects, bus-

based services do not affect their operating environments any more significantly than does other traffic.

***Modern streetcar*** technology was recommended for advancement based on the following findings:

- *System Flexibility rating is Neutral (◖):* Expansion of the system would require construction of additional guideway and purchase of new vehicles. Modern streetcar tracks can be extended at grade in many corridors and cross roadways at grade. These extensions can be cost-effective, particularly in areas where grade separation is unnecessary.
- *Ridership/Capacity rating is Good (●):* Modern streetcars generally range from one to two vehicles in length and can accommodate more than twice the number of passengers than can a BRT/premium bus with one operator, resulting in lower operating cost per passenger.
- *Service Frequency rating is Good (●):* Modern streetcar systems have the ability to operate very frequent services of every few minutes on a double-tracked alignment.
- *Congestion Mitigation rating is Neutral (◖):* Modern streetcars typically operate in mixed traffic and within existing traffic congestion. Modern streetcars operate along tracks laid in the street; therefore, they can be delayed if there is an obstruction such as a stalled vehicle in its path. Modern streetcars can have a neutral or net positive effect on traffic congestion if the service attracts existing automobile drivers and removes those vehicles from the roadway.
- *Relative Cost rating is Neutral (◖):* Although rail technologies are often more cost-effective in terms of operating costs than are comparable BRT/premium bus services, modern streetcars have a higher initial capital cost than do buses, requiring a more costly investment in tracks, electrification, and modifications to streets and traffic control.
- *System Accessibility rating is Good (●):* Access to modern streetcar service would be from on-street stops, park-and-ride facilities, or stops in activity centers or at intermodal transit centers.
- *System Compatibility rating is Neutral (◖):* Streetcars would be a new technology in Nassau County, requiring a new vehicle type, guideway, and operating and maintenance facilities.
- *Proven Technology rating is Good (●):* Streetcars are widely used around the world. Modern streetcars are manufactured in both mass production and custom configurations by a number of manufacturers worldwide.
- *Land Use Compatibility rating is Good (●):* Modern streetcar systems have many well-documented examples of encouraging transit-oriented development, allowing new land development around stations that supports economic development and generating additional ridership while reducing automobile usage.
- *Environmental Impact rating is Good (●):* Electrically powered modern streetcars can reduce emissions where ridership is substantial. Modern streetcars are generally quiet and typically have few negative impacts on compatible land uses.

## 5.5 Recommendations

As a result of the screening of the Refined Long-List Alternatives and potential transit technologies, the following alternatives, including their modal variations, were advanced as Short-List Alternatives for further detailed development and evaluation:

- **Alternative 2 as Modern Streetcar**
- **Alternative 2A as BRT/Premium Bus**
- **Alternative 3 as Modern Streetcar**
- **Alternative 3A as BRT/Premium Bus**

With completion of the Refined Long-List Alternatives screening, the Study undertook a more comprehensive and detailed evaluation of each of the four Short-List Alternatives. The evaluations are discussed in Sections 6 through 12.