4. Long-List Alternatives Considered and Screened

4.1 Preliminary Long-List Alternatives

Following definition of the Study's purpose and need and associated goals and objectives, preliminary transit-improvement alternatives that appeared to have the potential to address them were identified and conceptually defined. For each preliminary alternative, the primary routing of its alignment and connections between activity centers (i.e., uses and locations that generate and/or attract trip-making) in the Study Area were defined to provide a potentially viable circulation and distribution pattern. The alternatives were developed through discussions with stakeholders and the public, Study Team review of previous transportation improvements considered for the Study Area, and preliminary analysis of trip attractors and generators.

The Preliminary Long-List of Alternatives was identified based on the following considerations, focused on the defined Nassau Hub Study Area:

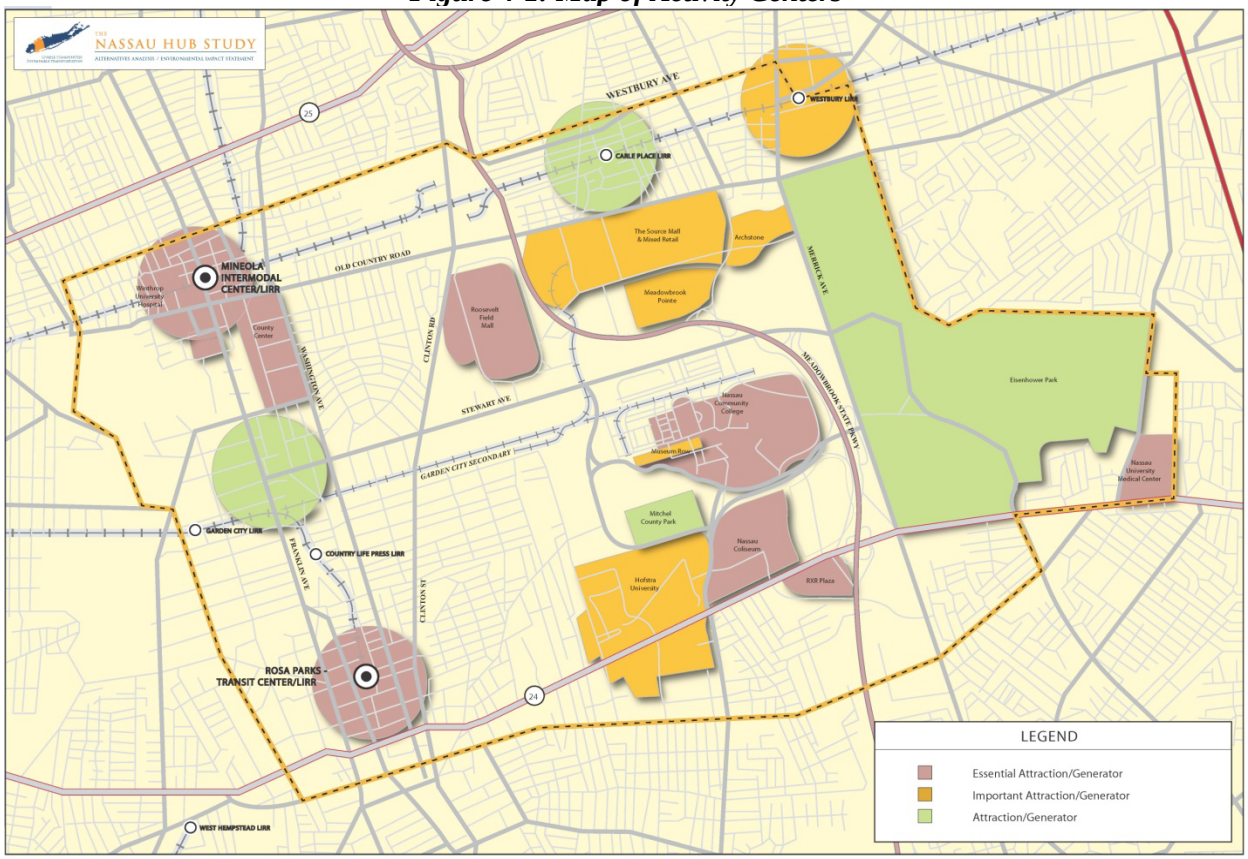
- The existing transportation network and services;
- Existing travel patterns;
- Capacity of existing transportation infrastructure, and operating conditions;
- Existing land use patterns and proposed major development;
- Linkages between existing and proposed activity centers; and
- Input received from stakeholders and the general public.

4.1.1 Activity Centers

As a precursor to conceptually defining each alternative's alignment, activity centers in the Study Area (Figure 4-1) were identified based on work completed for the Nassau Hub Major Investment Study (MIS) (2006) and on this Study's initial consideration of opportunities to support improved transit access and increased transit use to, from, through and within the Study Area. A key consideration in developing the Preliminary Long-List of Alternatives was to provide viable service to as many activity centers in the Study Area as possible. Once identified, the activity centers were categorized based on their relative significance as trip attractors/generators and which, as a result, would likely generate the greatest transit ridership and realize the greatest benefit from improved transit service. The priority of types of activity centers to be served by a given alternative was defined as follows:

- Essential attractors/generators – activity centers that would be crucial locations to serve by any new transit improvements;
- Important attractors/generators – activity centers that should be served by any new transit improvements wherever possible; and
- Attractors/generators – activity centers that are not vital to be connected by new transit service, but doing so would provide additional transit coverage within the Study Area.

Figure 4-1: Map of Activity Centers



Source: Jacobs, 2011.

There were 11 essential attractors/generators, five important attractors/generators, and five additional attractors/generators identified in the Study Area:

1) *Essential Attractors/Generators*

- Downtown Village of Mineola
- Mineola Intermodal Center
- Downtown Village of Hempstead
- Rosa Parks - Hempstead Transit Center
- Roosevelt Field
- Roosevelt Field Bus Facility
- Nassau Community College
- Nassau Veterans Memorial Coliseum
- RXR Plaza
- Nassau County Government Complex
- Nassau University Medical Center (NuHealth)

2) *Important Attractors/Generators*

- Hofstra University
- Source Mall
- Museum Row
- Downtown Village of Westbury
- Westbury Long Island Rail Road (LIRR) Station

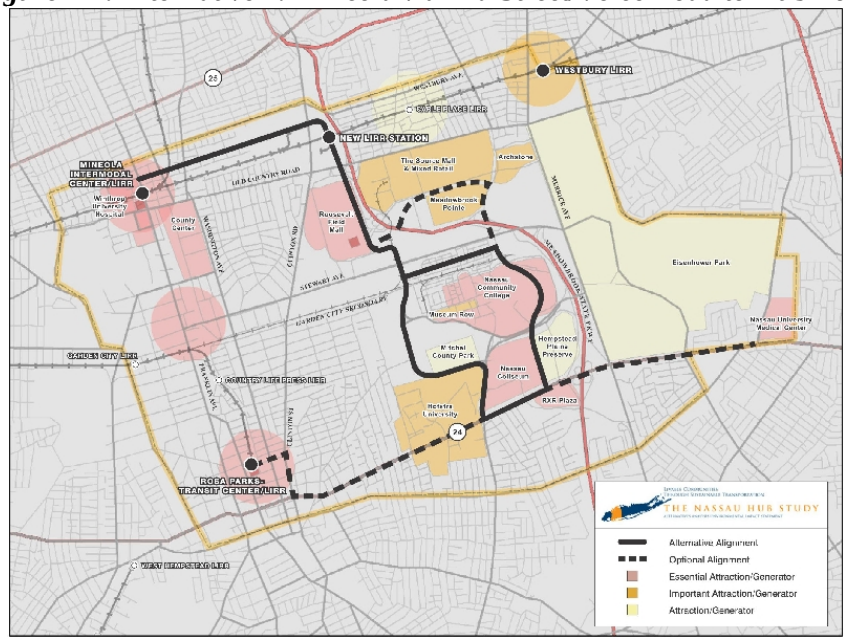
3) *Attractors/Generators*

- Garden City LIRR Station
- Eisenhower Park
- Country Life Press LIRR Station
- Carle Place LIRR Station
- Downtown Village of Garden City

4.1.2 Primary Alignment Alternatives

Fourteen alternative alignments were identified for consideration through discussion with the Study's Technical Advisory Committee (TAC), Stakeholder Committee and the general public regarding the purpose of and need for transit improvements in the Study Area, review of previously considered transit-improvement options, and preliminary analysis of trip attractors and generators. For each alternative, primary routing and connections between one or more of the LIRR stations to a number of activity centers within the Study Area were defined. The alternatives' alignments were conceptual in nature and a specific transit technology, related infrastructure and operational details were not associated with the alternatives at this stage of the screening process. The maps in Figures 4-2 through 4-15 show the general alignment for each of the preliminary alignment alternatives. A number of optional alignments, depicted on the maps with dotted lines, were also identified, along with certain additional features, as potential improvements that may be phased in over time, creating the potential for short- and long-term implementation of elements of the alternatives.

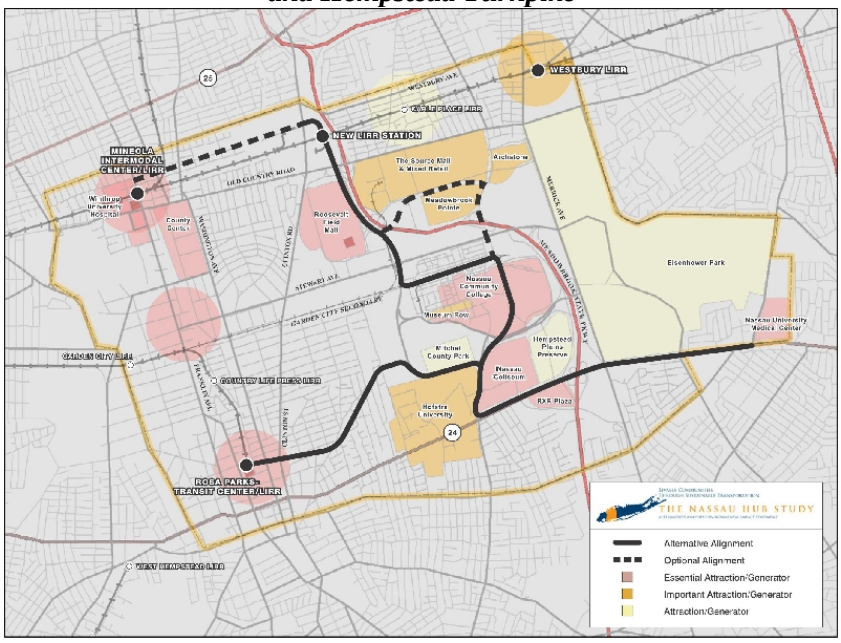
Figure 4-2: Alternative 1: Mineola via 2nd Street/Voice Road to Hub Loop



Source: Jacobs, 2011.

Includes alignment options to the Source Mall area and from downtown Village of Hempstead to NuHealth via Hempstead Turnpike.

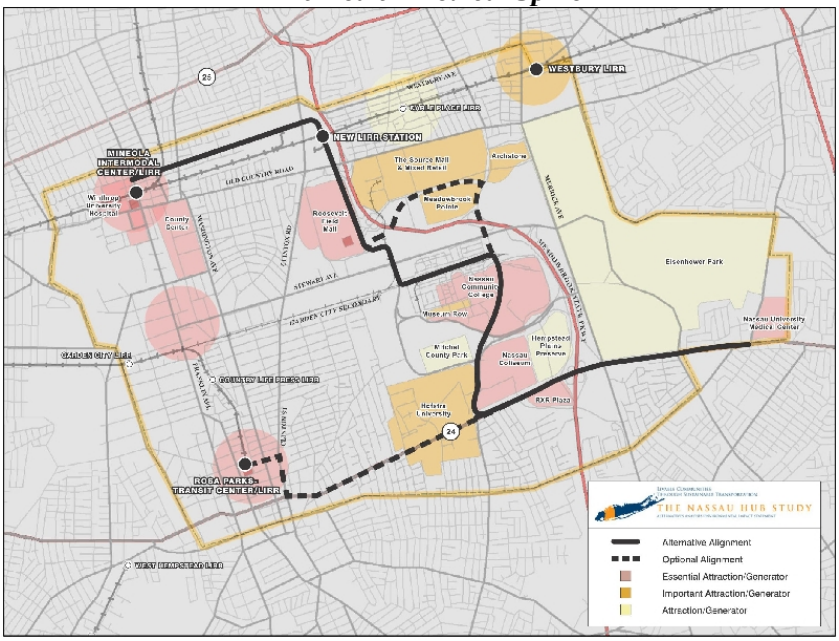
Figure 4-3: Alternative 2: New Port Jefferson Branch Station to Hub Area and Hempstead to NuHealth via Jackson Street, Westbury Boulevard, Roosevelt Boulevard, Earle Ovington Boulevard, and Hempstead Turnpike



Source: Jacobs, 2011.

Includes alignment options to Nassau County Government Center and the Source Mall area.

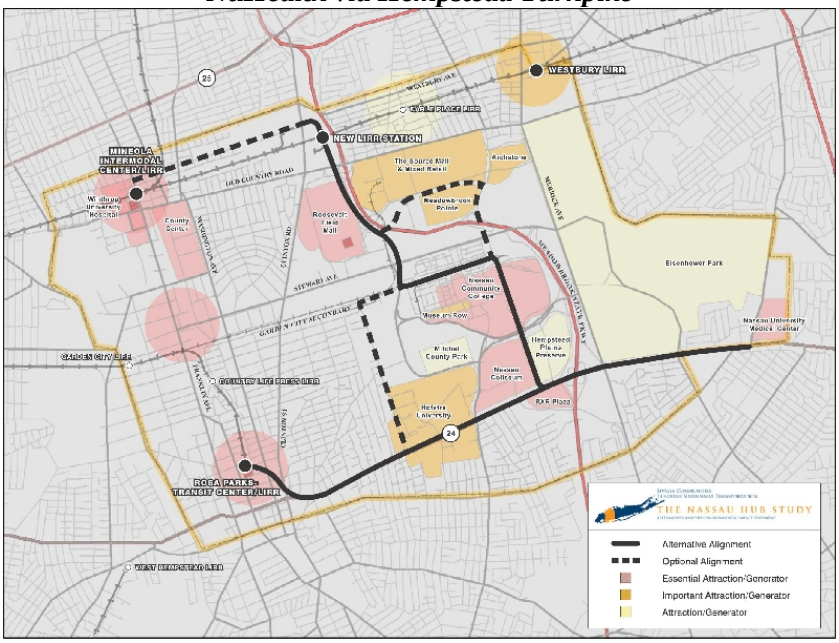
Figure 4-4: Alternative 3: Mineola via 2nd Street/Voice Road/Garden City Secondary to Hub Area and NuHealth Medical Spine



Source: Jacobs, 2011.

Includes alignment options to the Source Mall area and from downtown Village of Hempstead to Nassau Veterans Memorial Coliseum / RXR Plaza area via Hempstead Turnpike.

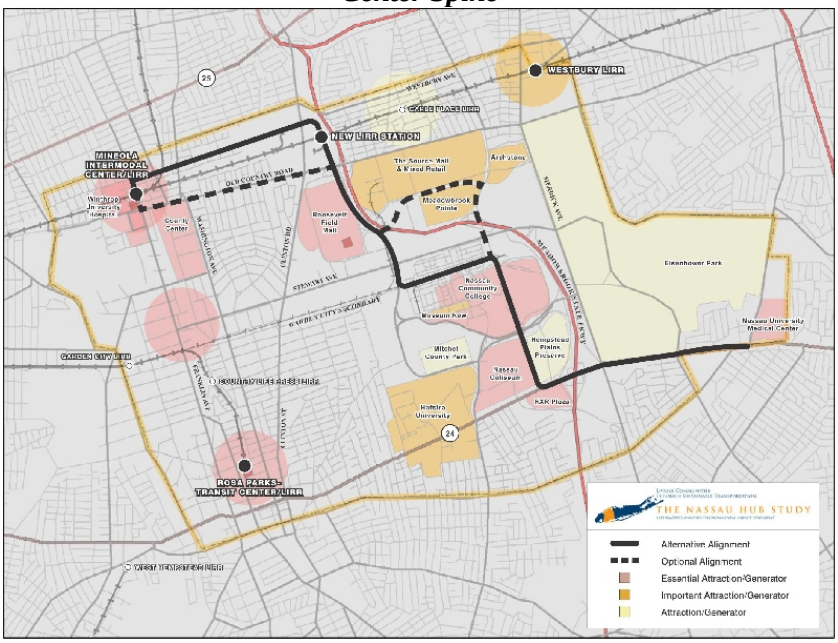
Figure 4-5: Alternative 4: New Port Jefferson Branch Station to Hub Area and Hempstead to NuHealth via Hempstead Turnpike



Source: Jacobs, 2011.

Includes alignment options to Nassau County Government Center, the Source Mall area and Oak Street to Hempstead Turnpike.

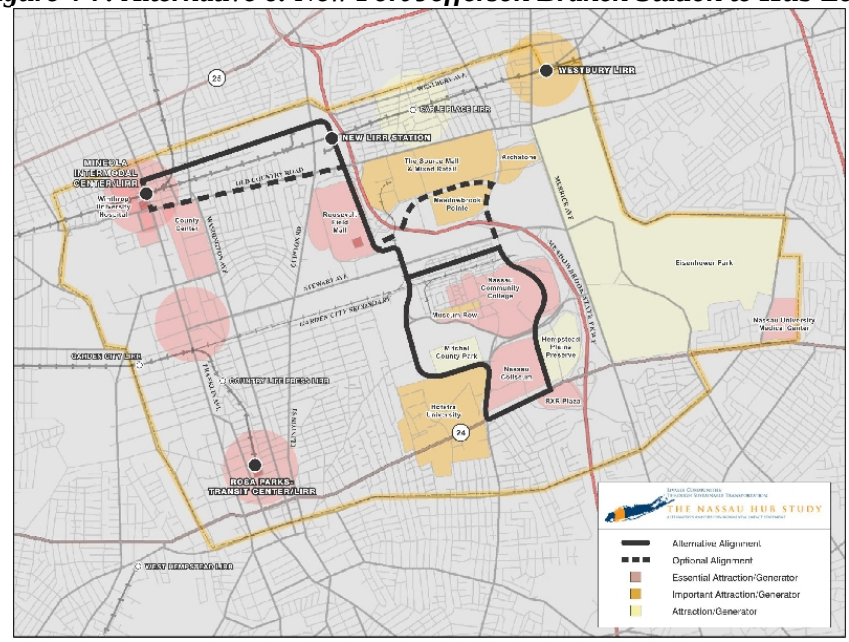
Figure 4-6: Alternative 5: New Port Jefferson Branch Station to Hub Area and NuHealth Medical Center Spine



Source: Jacobs, 2011.

Includes alignment options to Nassau County Government Center and the Source Mall area.

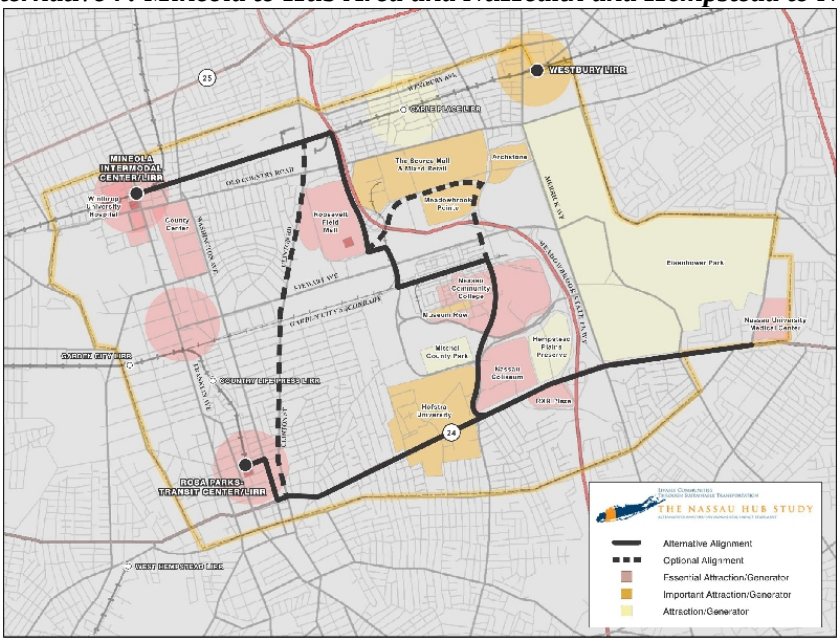
Figure 4-7: Alternative 6: New Port Jefferson Branch Station to Hub Loop



Source: Jacobs, 2011.

Includes alignment options to Nassau County Government Center and the Source Mall area.

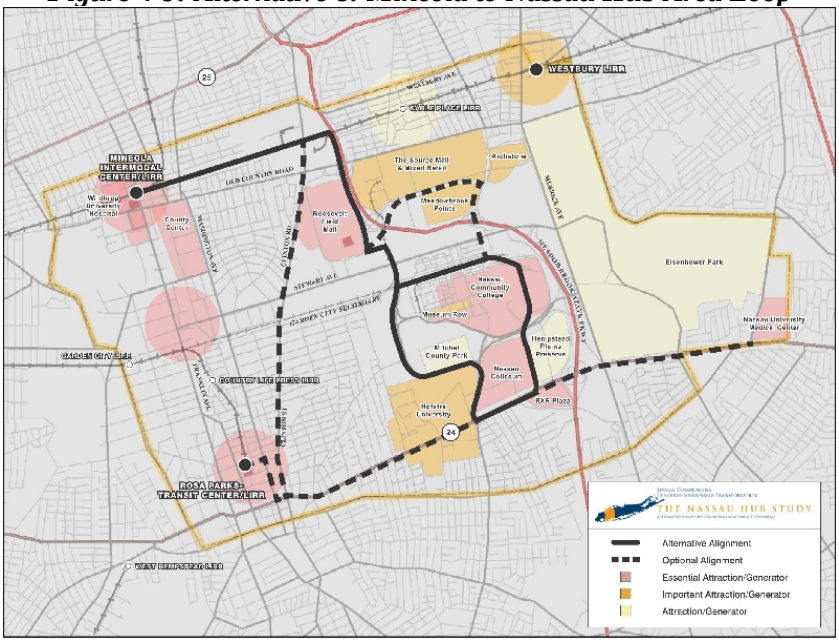
Figure 4-8: Alternative 7: Mineola to Hub Area and NuHealth and Hempstead to NuHealth Spine



Source: Jacobs, 2011.

Includes alignment options from Nassau County Government Center to downtown Village of Hempstead via Clinton Road/Clinton Street and the Source Mall area.

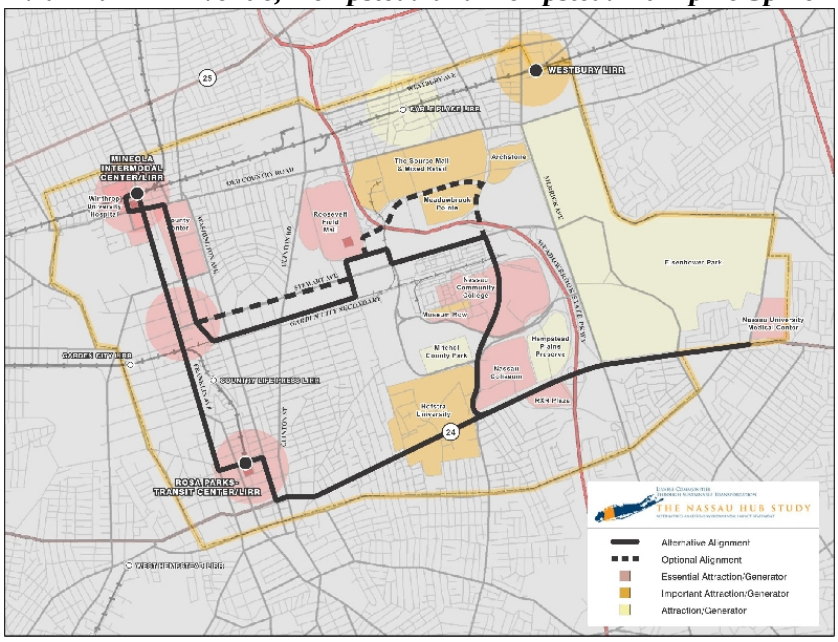
Figure 4-9: Alternative 8: Mineola to Nassau Hub Area Loop



Source: Jacobs, 2011.

Includes alignment options to downtown Village of Hempstead and NuHealth via Clinton Road /Clinton Street and Hempstead Turnpike and to the Source Mall area.

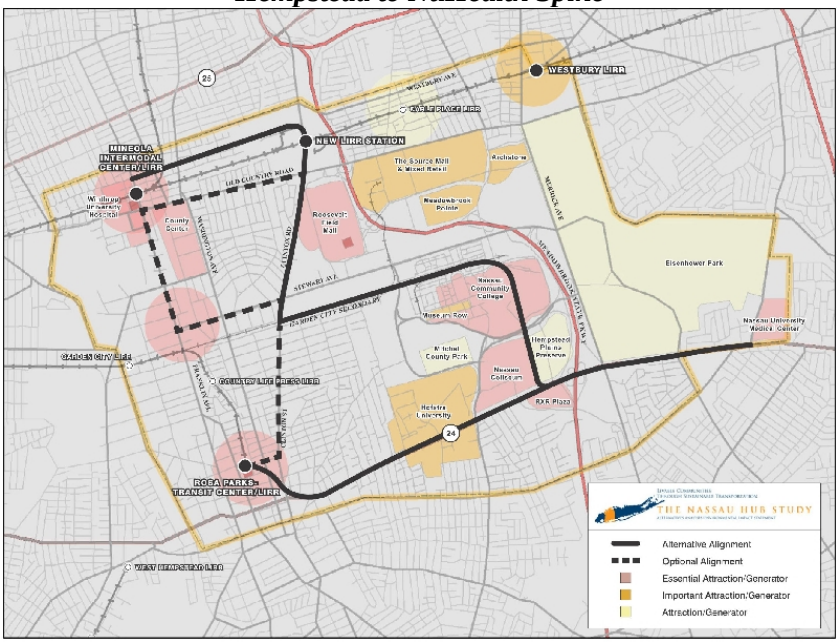
Figure 4-10: Alternative 9: Mineola to Hub Area via Garden City Secondary and Mineola to NuHealth via Franklin Avenue, Hempstead and Hempstead Turnpike Spine



Source: Jacobs, 2011.

Includes alignment options via Stewart Avenue and to the Source Mall area.

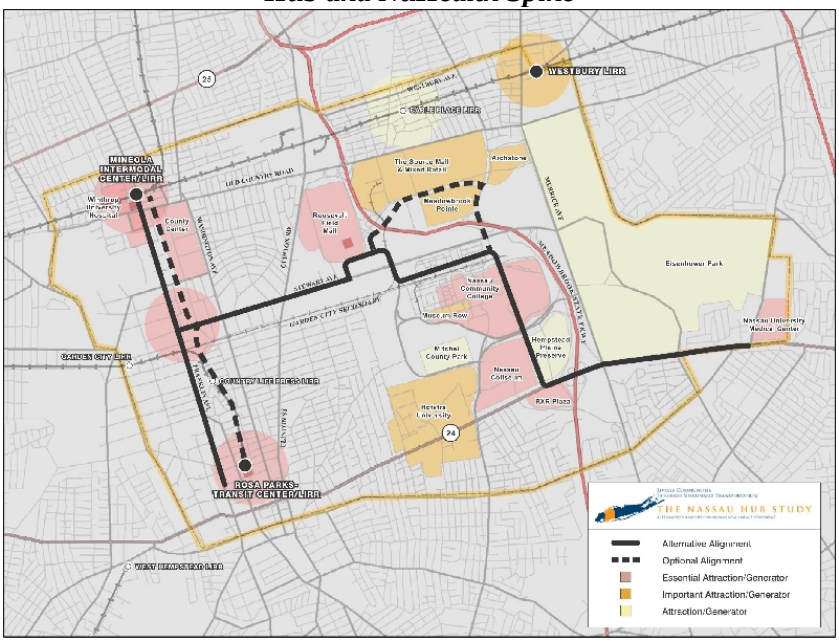
Figure 4-11: Alternative 10: Mineola to Hub Area via Clinton Road/Garden City Secondary and Hempstead to NuHealth Spine



Source: Jacobs, 2011.

Includes alignment options to Nassau County Government Center / downtown Village of Garden City / downtown Village of Hempstead.

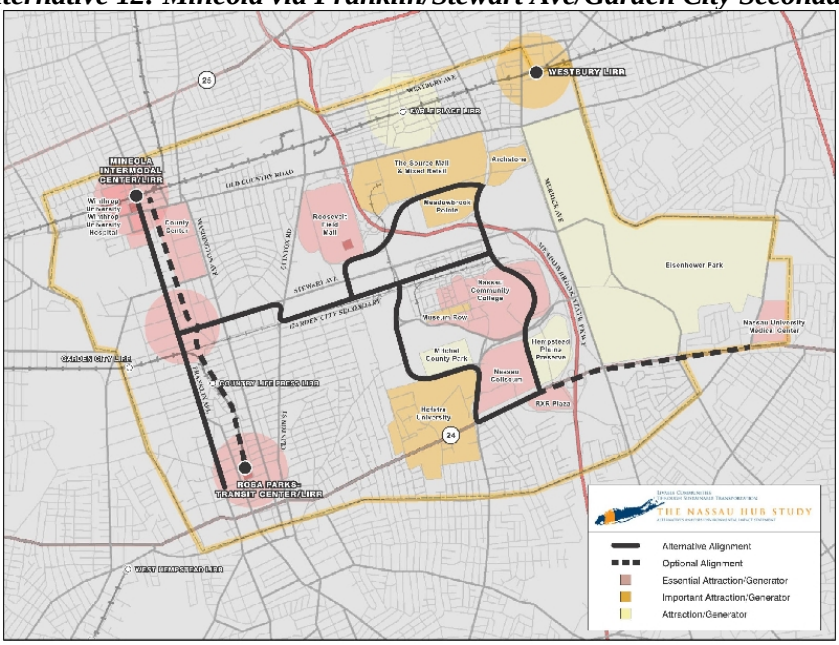
Figure 4-12: Alternative 11: Mineola via Franklin Avenue/Stewart Avenue/Garden City Secondary to Hub and NuHealth Spine



Source: Jacobs, 2011

Includes alignment options to the Source Mall area and Nassau County Government Center to downtown Village of Hempstead.

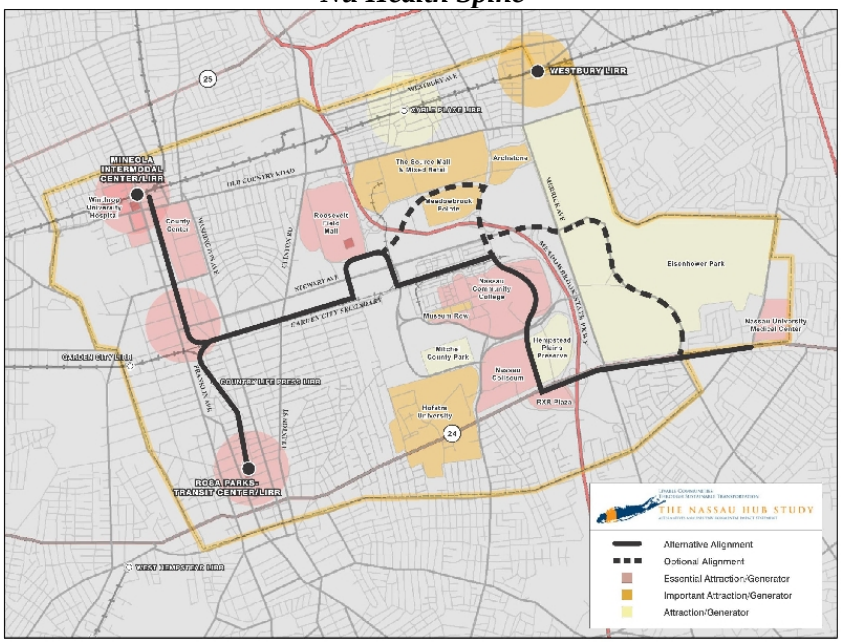
Figure 4-13: Alternative 12: Mineola via Franklin/Stewart Ave/Garden City Secondary to Hub Loop



Source: Jacobs, 2011.

Includes alignment options to NuHealth and Nassau County Government Center to downtown Village of Hempstead.

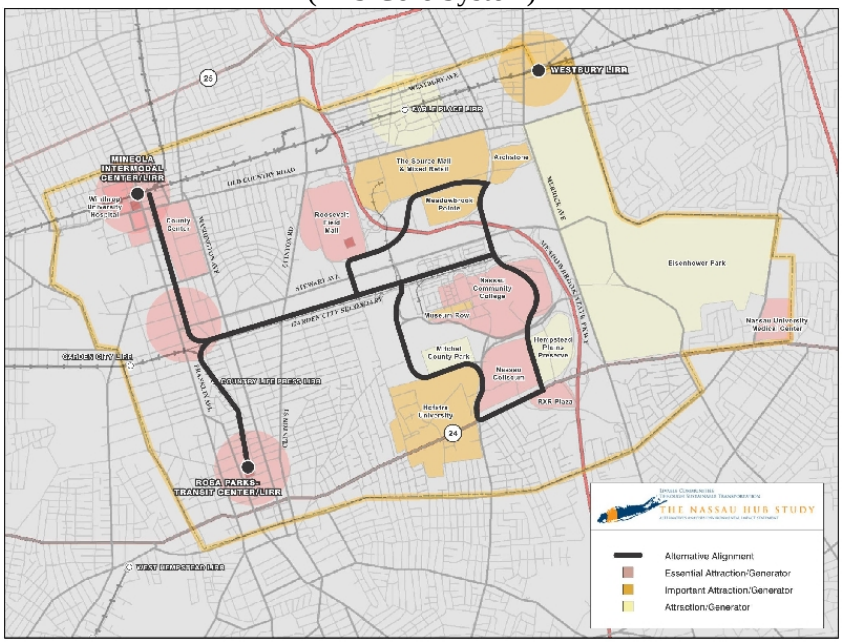
Figure 4-14: Alternative 13: Mineola/Hempstead via Garden City Secondary to Hub and Nu Health Spine



Source: Jacobs, 2011.

Includes alignment options to the Source Mall area and Eisenhower Park.

Figure 4-15: Alternative 14: Mineola/Hempstead via Garden City Secondary to Hub Loop
(MIS Core System)



Source: Jacobs, 2011.

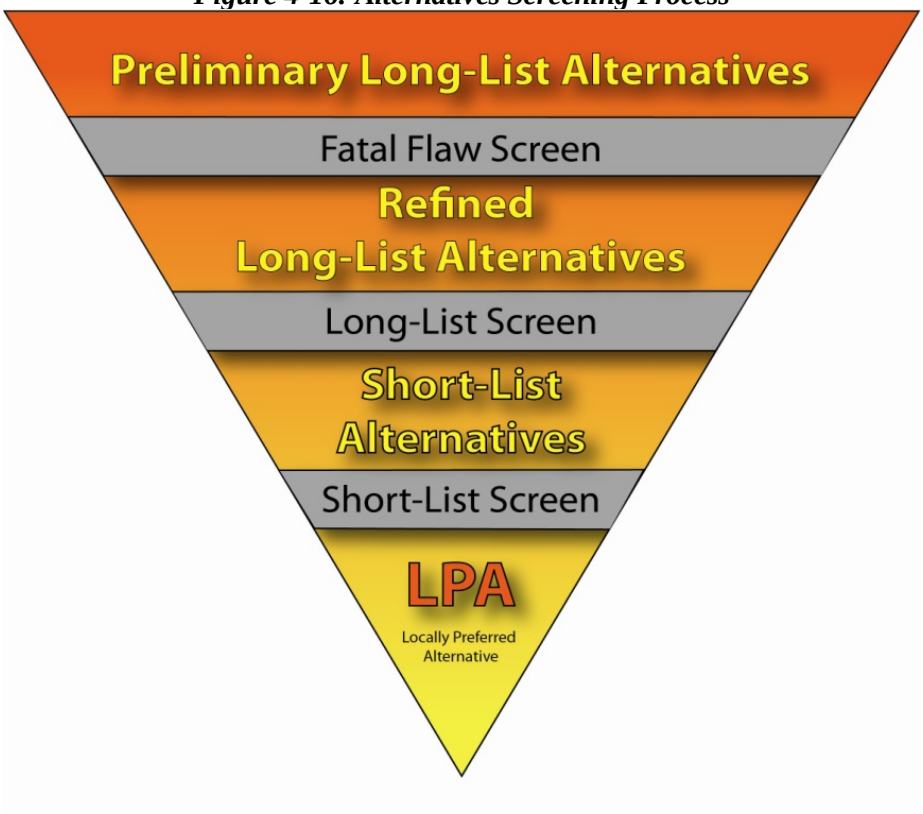
Selected as the preferred alternative at the conclusion of the Nassau Hub MIS (2006).

4.2 Screening Process Overview

A three-phase screening evaluation process was established for the Nassau Hub Study Alternatives Analysis (AA). This process was designed to initially eliminate any alternatives with fatal flaws, highlight the comparative strengths and weaknesses of potentially feasible and reasonable alternatives and, finally, identify one or more alternative(s) that should be recommended for further evaluation in the subsequent Study stage of detailed environmental analysis per the National Environmental Policy Act (NEPA). The screening criteria are progressively more quantitative and detailed with each successive screening phase. Figure 4-1 illustrates the screening evaluation process and milestones. The three phases are:

1. Fatal-flaw screening to eliminate alternatives found to be infeasible early in the evaluation process and refine the Preliminary Long-List Alternatives to a Refined Long-List;
2. Refined Long-List Alternatives screening to broadly analyze the Refined Long-List Alternatives for their ability to address Study goals and, on that basis, identify the Short-List Alternatives; and
3. Short-List Alternatives screening to analyze the Short-List Alternatives in greater detail to ultimately lead to the selection of the Locally Preferred Alternative (LPA).

Figure 4-16: Alternatives Screening Process



Source: Jacobs, 2011.

4.3 Fatal-Flaw Screening

The purpose of the fatal-flaw screening was to identify any Preliminary Long-List Alternative that was deemed infeasible, based on consideration of the alternatives against a set of fatal-flaw screening criteria. The screening evaluation was qualitative and considered the Preliminary Long-List Alternatives in terms of their alignments and basic attributes. Four project objectives were taken into consideration in this initial phase of alternatives screening. These objectives were used to develop the evaluation criteria and evaluation measures utilized in conducting the fatal-flaw screening (Table 4-1).

Each of the Preliminary Long-List Alternatives was screened using the fatal-flaw evaluation criteria listed in Table 4-1. The related evaluation measure was applied and a qualitative assessment performed in order to identify the presence of any fatal flaw for the alternative relative to that measure.

Table 4-1: Fatal-Flaw Screening Criteria

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 in a cost-effective manner.		
Develop a transit alternative that takes advantage of existing transportation infrastructure, where appropriate.	An alternative must be capable of being implemented in a location where there is potential physical and operational capacity to accommodate the route alignment.	Does the alternative's alignment contain physical, institutional, or operational restrictions that would not permit its realistic implementation or operation?
GOAL: Develop transit improvements that will enhance mobility to, from and within the Study Area in a cost-effective manner.		
Provide improved transit access to, from and within the Study Area.	An alternative must serve mobility needs efficiently.	Does the alternative's alignment provide service to areas that have low demand for transit as identified in the origin-destination survey?
GOAL: Develop transit improvements that encourage the development of sustainable, transit-friendly land use patterns and support economic development activities.		
Use transit to better serve existing activity centers.	An alternative must serve most of the essential attractors and generators in the Study Area.	Does the alternative's alignment lack connections to most of the identified essential attractors and trip generators located within the Study Area?
GOAL: Develop transit improvements that enhance quality of life and minimize adverse environmental impact.		
Coordinate transit infrastructure and services with land use to promote sustainability and livability and enhance quality of life.	An alternative must have physical attributes that will conceptually permit integration with the community.	Does the alternative's alignment lack physical attributes that will conceptually permit integration within the community?

Source: Jacobs, 2011.

The findings and results of the fatal-flaw screening are discussed in the following section.

4.3.1 Physical and Operational Capacity to Accommodate Route Alignment

Evaluation Measure: *Does the alternative's alignment contain physical, institutional, or operational restrictions that would not permit its realistic implementation or operation?*

A qualitative analysis of potential physical, institutional, or operational flaws of the alignment segments comprising each alternative was conducted. Based on the analysis, the following alignment segments were identified as fatally flawed due to institutional or physical restrictions that would not permit realistic implementation or operation of any alternative that contains one or more of the fatally flawed segments:

- LIRR Garden City Secondary between Franklin Avenue and Clinton Road: This alignment segment was identified as being fatally flawed because of the generally single-family, low-density residential land use patterns in the vicinity of this segment of the alignment, which are not consistent with transit operations. Also, by agreement, the LIRR Garden City Secondary alignment is currently limited to

use by the once yearly circus train operations and storage, thereby further complicating potential future transit operations.

- LIRR Hempstead Branch between the Garden City Station and Rosa Parks–Hempstead Transit Center: This alignment segment was identified as being fatally flawed because it is an active LIRR commuter line; only Federal Railroad Administration (FRA)-compliant rail vehicles could be jointly operated within the same alignment. As other segments would not be located within exclusive rights-of-way, the use of an FRA-compliant vehicle would not be possible along the entire alignment. Therefore, it would not be compatible with transit services proposed for the alignments.
- The former LIRR rail right-of-way between the Village of Mineola and the Garden City Secondary paralleling Franklin Avenue: This alignment segment has been acquired by various adjoining property owners and is no longer available for use as a dedicated transit corridor.

Alternative 13 and Alternative 14 were determined to be fatally flawed because they would use the Garden City Secondary between Franklin Avenue and Clinton Road, the LIRR Hempstead Branch and the abandoned right-of-way between the Village of Mineola and the Garden City Secondary.

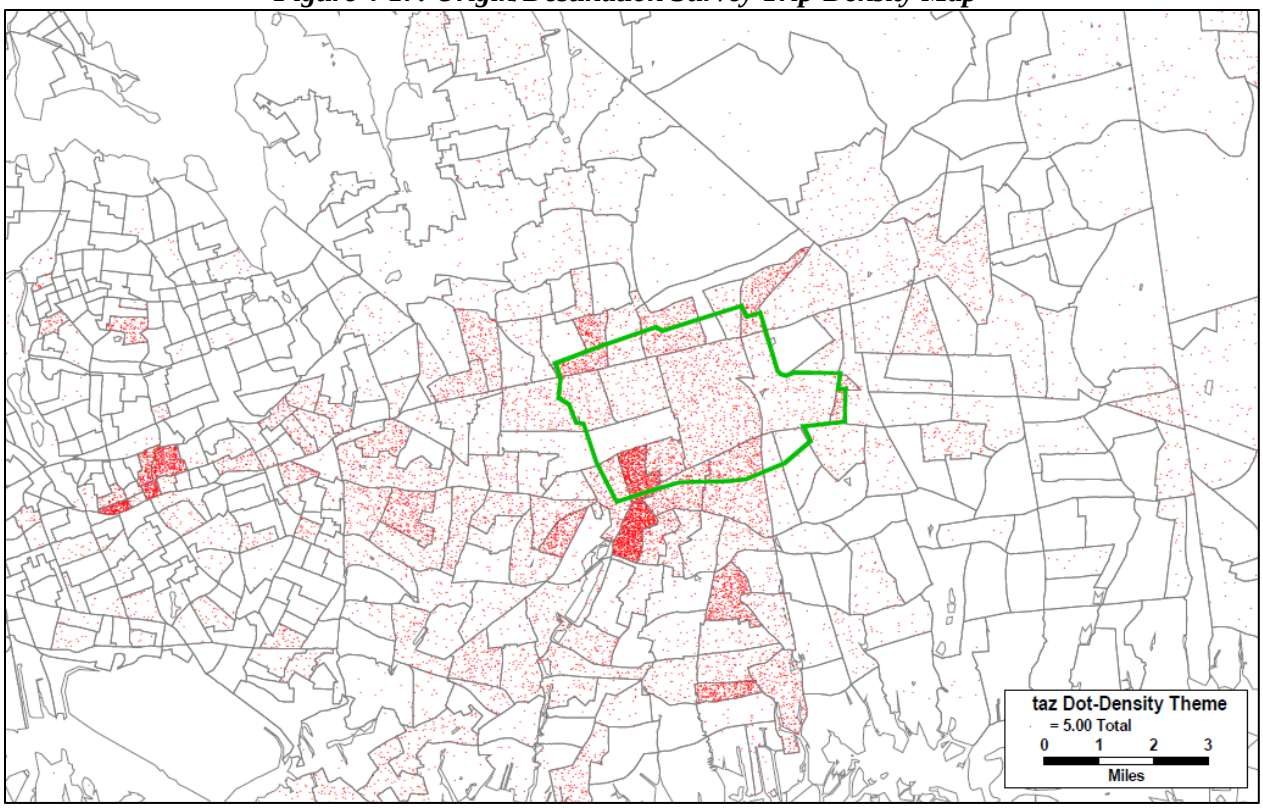
4.3.2 Serving Mobility Needs Efficiently

Evaluation Measure: *Does the alternative's alignment provide service to areas that have low demand for transit as identified in the origin-destination survey?*

An origin/destination (O/D) survey was conducted on the then Long Island Bus (currently Nassau Inter County [NICE] Bus) system in 2010 as part of the Study to obtain information about existing transit travel patterns to, from and within the Study Area. The Preliminary Long-List Alternatives' alignments were compared against the O/D survey results pertaining to the distribution and density of origins and destinations in the Study Area (Figure 4-17), which, in turn, are related to where trip generators and attractors are located. Some alignment segments traverse areas in the Village of Garden City for which the O/D survey results show very low demand. Upon further review of these areas, it was noted that transit trips originating in these areas are primarily Manhattan-focused rather than trips made within the Study Area.

Alternatives 9, 10 11, 12, 13 and 14 were identified as fatally flawed because their alignments traverse areas that currently have low demand for transit, based on the O/D survey results, as well as have land use policies and plans that do not contemplate significant changes that would result in potentially increased transit ridership.

Figure 4-17: Origin/Destination Survey Trip-Density Map



Source: Jacobs, 2011.

4.3.3 Serving Essential Attractors and Generators

Evaluation Measure: *Does the alternative's alignment lack connections to most of the identified essential attractors and trip generators located within the Study Area?*

Major activity centers in the Study Area were identified and categorized as either essential attractors/generators, important attractors/generators or attractors/generators (see Figure 4-1). The alignment of each alternative was reviewed relative to the locations of the essential attractors/generators to determine whether the alignment provides connections to them. None of the alternatives is fatally flawed for this evaluation measure as it was determined that each would provide a connection to the essential attractors/generators.

4.3.4 Integration with the Community

Evaluation Measure: *Does the alternative's alignment lack physical attributes that will conceptually permit integration within the community?*

Primary land use (see Section 2.3) along each of the alternatives' alignments was examined to determine if the character of uses (type, density, levels of activity) would be consistent with transit service. Portions of the Study Area where the primary land use is large-lot, single-family, low-density residential were not found to have the characteristics needed to support transit. Review of current zoning and master plans indicates that these conditions will continue in the future. Alternatives in these locations were found to be fatally flawed.

Alternatives 9, 10, 11, 12, 13 and 14 were identified as fatally flawed because they traverse areas with land use and densities that are not transit-supportive and are limited from becoming so in the future due to existing zoning and planning guidelines.

4.4 Fatal-Flaw Screening Results

The following table summarizes the results of the fatal-flaw screening. Alternatives found to have one or more fatal flaws for the screening criteria are indicated as "yes." Alternatives 9 through 14 were found to have one or more fatal flaws and were not recommended for advancement to the next phase of screening. Alternatives 1 through 8 were found to have no fatal flaws and were advanced as the Revised Long-List Alternatives for further screening evaluation (see Section 5).

Table 4-2: Fatal-Flaw Screening Results

Alt #	Screening Status	Fatal-Flaw Screening Criteria			
		Does the alternative's alignment contain physical, institutional or operational restrictions that would not permit its realistic implementation or operation?	**Does the alternative's alignment provide service to areas that have low demand for transit as identified in the origin-destination survey?**	**Does the alternative's alignment lack connections to the identified essential attractors and trip generators located within the Study Area?**	**Does the alternative's alignment lack physical attributes that will conceptually permit integration within the community?**
1	Advanced	No	No	No	No
2	Advanced	No	No	No	No
3	Advanced	No	No	No	No
4	Advanced	No	No	No	No
5	Advanced	No	No	No	No
6	Advanced	No	No	No	No
7	Advanced	No	No	No	No
8	Advanced	No	No	No	No
9	Flawed	No	Yes	No	Yes
10	Flawed	No	Yes	No	Yes
11	Flawed	No	Yes	No	Yes
12	Flawed	No	Yes	No	Yes
13	Flawed	Yes	Yes	No	Yes
14	Flawed	Yes	Yes	No	Yes

Source: Jacobs, 2011.

The alternatives with no identified fatal flaws were advanced for further detail and evaluation in a second round of screening. Based upon the screening performed, Alternatives 1 through 8 were advanced to the next level of evaluation.