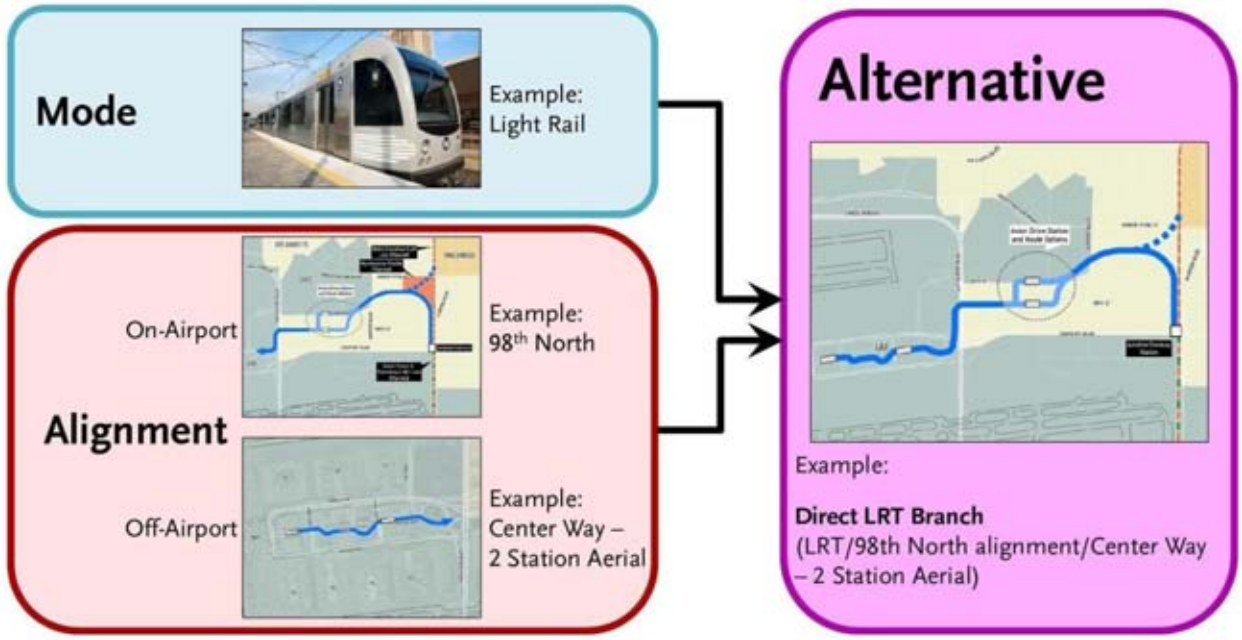
would likely be 5,000-10,000 additional riders per day traveling between the CTA and airport related functions in the vicinity of stations in the Airport District outside of the terminals.

4. SCREENING OF ALTERNATIVES

The screening process is divided into two stages. Stage I matches modes to alternative connection types and evaluates the feasibility of alignment options for each of the connection types. Stage II evaluates the performance of each Build alternative. See Figure 4.1 for the composition of a Build Alternative. The focus of Stage I screening that will support the development of the packaged alternatives to be carried forward into Stage II. Options that would result in significant issues (fatal flaws) will not advance to the Stage II screening evaluation.

The Stage II evaluation consists of a comparative analysis of trade-offs between alternatives to identify alternatives that will be carried forward into the Draft EIS/EIR. The criteria were developed to reflect the project objectives as defined in the Purpose and Need section.

Figure 4.1. Alternative Components



Source: ConnectLAX, 2011

4.1. STAGE I SCREENING PROCESS

The first step in the screening analysis is to match the transit mode(s) appropriate for each connection type. Listed below are the objectives, and transit modes, associated with each connection type. The evaluation criteria for Stage I screening include:

- **Direct LRT Branch Alternative** – a light rail transit (LRT) branch of the Metro Green Line (and possibly Crenshaw/LAX line) west from Aviation Boulevard to the LAX terminal area. Provides a direct connection for Metro Rail passengers to LAX.

- **Circulator Alternative** – a separate, independent transit system (APM or BRT) suited to the airport's unique travel demands/operating environment. System would connect the airport to the Metro Rail station at Aviation and Century Boulevards.
- **Intermediate LRT and Circulator Alternative** – a LRT branch of the Metro Green Line (and possibly Crenshaw/LAX line) west from Aviation Boulevard to an intermediate transfer station located east of Sepulveda Boulevard. A Circulator system (APM or BRT) would provide service between the intermediate station and the LAX terminal area.
- **Modified LRT Trunk Alternative** – shifts the main line of the Metro LRT system west of Aviation Boulevard to provide more direct service to the LAX terminal area for the Metro Green and Crenshaw/LAX lines.

The Stage I evaluation criteria include:

- **Physical fit and constructability** – Developing an alternative that will reduce conflicts with the existing infrastructure in the Project Study Area is important to reduce the project's potential construction and operational impacts. Physical fit and constructability includes impacts to the approved Metro Crenshaw/LAX light rail extension, existing structures, utilities and other major infrastructure.
- **Conflicts with Runway Protection Zone (RPZ)** – The dedicated guideway or stations for a transit system are subject to regulations and policies established by FAA to protect the safety of runway operations and minimize interference with air traffic control systems. In particular, off-airport routing options that encroach into areas designated as RPZs may result in significant issues.
- **Compatibility with Other Plans/Facilities** – It is important to have flexibility to integrate with future transit and airport plans and to serve potential airport facilities, such as ground transportation improvements in the LAX Master Plan and intermodal transportation facilities and Rent-a-Car facilities which are explored in LAWA's Specific Plan Amendment Study (SPAS). Future transit facilities include the Crenshaw/LAX line (with completed environmental review), the South Bay Metro Green Line Extension and the Coastal Corridor Study (in the unfunded Strategic Element of Metro's LRTP). Incorporating this sensibility ensures that the project is compatible with future Metro and LAWA goals.
- **Average Travel Time** – The initial screening considers average travel times as one component in the determination of the most appropriate on-airport route and station option. This criterion considers number of stations, and walking distance between the station(s) and the airport terminals, station dwell times, and vehicle operating speeds.
- **Cost** – The initial screening considers capital and construction cost as a component in determining the most appropriate on-airport route and station option(s). The cost includes the construction of the guideway, stations, vehicles and supporting facilities. Since the Metro Green Line to LAX project only has approximately $200 million allocated as part of Measure R, any costs in excess of this amount will need to be funded by other sources.

Cost and travel time are used to evaluate the large set of on-airport alternatives with the purpose of narrowing down the number of configurations for each connection type. Cost and travel time for off-airport alignments are considered in the context of the entire alternative in Stage II.

4.2. STAGE II SCREENING PROCESS

Several performance measures were developed to assess the pros and cons of each alternative. These performance measures are described below and the components of each are provided in Table 4.1.

- **Daily Ridership** – System-wide ridership (Metro Rail) will be examined to determine the impact the Alternatives may have on increasing the transit share of trips to and from the airport.
- **Travel Time** – System-wide travel times (Metro Rail) will be examined to determine the Alternative(s) that provide the best travel times to the airport and balances travel time impacts to non-airport bound Metro passengers.
- **Passenger Convenience** – Walking distance, vertical level changes, luggage accommodations, and fare collection will all be considered in determining which alternative(s) provides the highest quality experience for Metro passengers.
- **Cost** – Capital construction costs for each alternative, which will include the construction of the guideway, stations, vehicles, and supporting facilities, determine the potential fiscal impacts and cost effectiveness of each alternative. As noted previously, the Metro Green Line to LAX project only has approximately $200 million allocated as part of Measure R, any costs in excess of this amount will need to be funded by other sources.
- **Constructability** – The physical constructability of each alternative will be determined to ensure that alternatives fit within acceptable parameters for utility and construction disruption, and airport constraints.
- **Potential Environmental Impacts** – alternatives may impacts to specific environmental resources, especially traffic, visual and cultural resources. Traffic and transportation access are critical to some local businesses and the airport terminal area. Visual impacts, especially to landscaping and culturally significant structures such as the Theme Building, the original airport control tower and public art may also be affected by various alternatives.

The Stage II screening criteria provides a more quantitative comparison of alternatives. However, this information, by itself, is not intended to inform which of the alternatives should move forward to be studied in the Draft EIS/EIR. For example, an alternative may score high for one or two of the criteria, but does not score well for other criteria. Because all criteria are treated equally in this analysis (i.e., one criteria is not weighted more heavily than another), there are no clear winners or losers.

For this reason, another level of analysis is necessary to complete the Stage II screening – a trade-off analysis. This approach was used because it allows for a more nuanced method to revealing the preferences of project stakeholders and the public.

The four trade-off analyses explore:

- **Passenger Convenience by Connection Type** - How passenger experience variables (transfers, level changes, and travel time savings) vary by major connection type as well as ridership and cost;
- **Direct LRT Branch v. Through LAX** - How the two LRT connection alternatives compare to each other;
- **Alignments in the Airport Terminal Area (on-airport options)** - How the alignments within the CTA compare; and
- **Century Blvd v. 98th St.** - How Century Boulevard and 98th Streets compare to each other as alignments for the Direct LRT Branch and Circulator connection types.

Table 4.1. Stage II Evaluation Criteria & Performance Measures

Evaluation Criteria	Performance Measures
Daily Ridership	• System-wide ridership (Metro Rail) • Base ridership on system • Base ridership on Crenshaw/Green Line/South Bay System • Additional passengers on Circulator System • Additional Passengers on Crenshaw/Green Line/South Bay System • Travel markets ridership
Travel Time	• Regional travel time to LAX (from Metro Center, Exposition, Redondo Beach, Norwalk) • Travel time to LAX from/within Project Study Area (from Airport Blvd./98th St., Aviation/Century) • Additional travel time to Tom Bradley International Terminal (TBIT) • Other Regional Travel Times (Exposition to Redondo Beach) • Average walk distance to terminals
Passenger Convenience	• Number of transfers (from Metro Center, Exposition, Redondo Beach, Norwalk, TBIT) • Number of vertical level changes (i.e. the number of times that a passenger would need to use stairs, elevators or escalators to make their trip. This affects passengers with luggage)
Cost	• Total cost of stand-alone system (APM and bus only) • Total cost of light rail infrastructure • Parking structure demolition and replacement • Property acquisition (private) • Property acquisition (LAWA-owned)
Compatibility with Other Plans/Facilities	• Consistency with LAWA Plans • Security • Capacity • Operational scalability for future passenger loads • Would not preclude future extension of Metro Rail
Constructability	• RPZ encroachment • Utility disruption • Construction disruption • Airport constraints on construction

In addition to the performance measures described above, community acceptability was also considered based on comments received at the public meetings held in February/March 2012. Finally, Stage II culminates in a trade-offs analysis intended to highlight key differences in performance between options.

4.3. STAGE I EVALUATION

This section evaluates each modal, and on- and off-airport routing option for each Build Alternative based on the criteria presented in Section 4.1. A complete description of the options is provided in the Preliminary Definition of Alternatives Report. Once each modal and routing option has been analyzed, those that advance to Stage II will be combined to form "packaged alternatives."

4.3.1. Direct LRT Branch

4.3.1.1. Mode

Since the Direct LRT Branch Alternative is an extension of the existing Metro light rail system, the mode option is limited to LRT (the APM and BRT modes would require a transfer).

4.3.1.2. Off-Airport Options

The screening analysis of off-airport options for the Direct LRT Branch Alternative is shown in Table 4.2, and the significant issues are shown in bold. The evaluation is based on the physical fit and constructability and encroachment into the RPZ as discussed in Section 4.1.

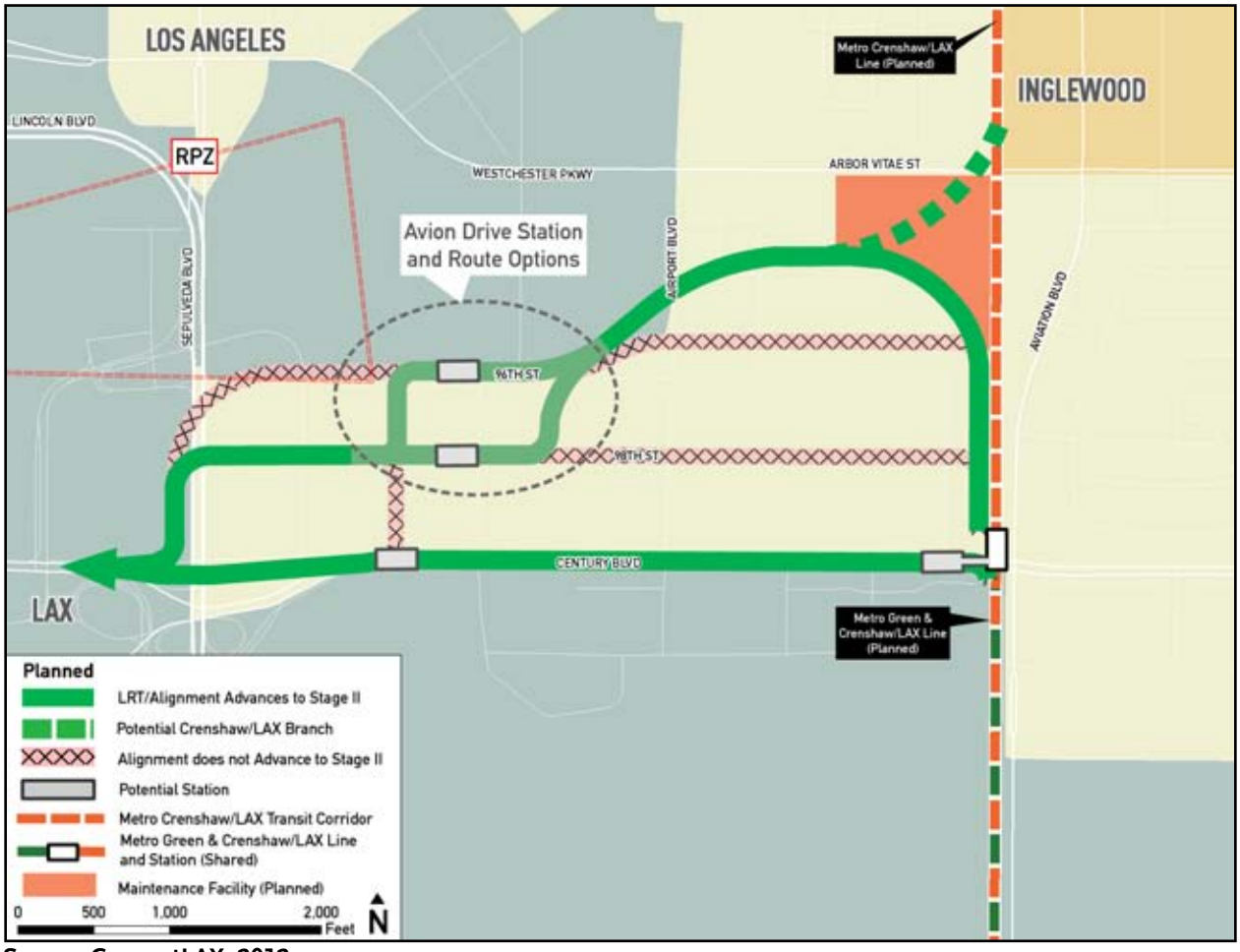
Table 4.2. Stage I Evaluation of Direct LRT Branch – Off-Airport Options

Off-Airport Options	Performance	Advance to Stage II
Century Blvd	• No transfer required for Metro Green Line passengers to the airport • Alignment could be designed with minimal physical fit and constructability issues • Alignment would not encroach into the RPZ • Alignment would serve potential airport facilities near Parking Lot C and/or near Aviation/Century • Transfers possible with Crenshaw/LAX line with second station at Aviation/Century • Future extension to Coastal Corridor from Aviation/Century is not precluded	✓
1994 SEIR Alternative	• **Alignment would require a transfer from Metro Rail to an airport circulator system to reach the CTA and therefore does not meet the objective of the connection type** • Alignment could be designed with minimal physical fit and constructability issues • Alignment would not encroach into the RPZ • Alignment would serve potential airport facilities near Parking Lot C and/or near Aviation/Century • Transfers possible with Crenshaw/LAX line with second station at Aviation/Century • Future extension to Coastal Corridor from Aviation/Century is not precluded	X
98th Street	• No transfer required for Metro Green Line passengers to the airport • **Alignment would require the planned Aviation/Century Station to be shifted to the south to allow for a turn onto 98th St; therefore, this reconfiguration would result in constructability issues with the track gradient south of the station, making this option infeasible** • **Potential impacts to parking garages and existing uses, involving potentially expensive property acquisitions.** • Alignment would not encroach into the RPZ • Alignment issues make service to Aviation/Century difficult	X

Off-Airport Options	Performance	Advance to Stage II
98th Street North	• No transfer required for Metro Green Line passengers to the airport • Alignment could be designed with minimal physical fit and constructability issues • Alignment would not encroach into with RPZ • Alignment would serve potential airport facilities near Parking Lot C and/or near Aviation/Century • Transfers with Crenshaw/LAX line possible with cross-platform transfer	✓
96th Street	• No transfer required for Metro Green Line passengers to the airport • **Potential impacts to parking garages and existing uses, involving potentially expensive property acquisitions.** • **Alignment would encroach into the RPZ, which would trigger significant regulatory constraints and would likely necessitate a less cost-effective below-grade configuration** • Alignment issues make service to Aviation/Century difficult	X
96th Street North	• No transfer required for Metro Green Line passengers to the airport • Alignment could be designed with minimal physical fit and constructability issues • **Alignment would encroach into the RPZ, which would trigger significant regulatory constraints and would likely necessitate a less cost-effective below-grade configuration** • Alignment would serve potential airport facilities near Parking Lot C and/or near Aviation/Century • Transfers with Crenshaw/LAX line possible with cross-platform transfer	X

Significant issues were identified for four of the nine off-airport options for the Direct LRT Branch Alternative based on the screening criteria. No significant issues for the 98th Street North or Century Boulevard options were found, and therefore, they will be carried forward as the off-airport options for the Direct LRT Branch Alternative. The routes to be carried forward are shown in Figure 4.2.

Figure 4.2. Off-Airport Routes to Advance to Stage II – Direct LRT Branch



Source: ConnectLAX, 2012
Note: Route and station location for the 98th North option are dependent on future LAX plans

4.3.1.3. On-Airport Options

The comparative analysis of on-airport options for the Direct LRT Alternative is shown in Table 4.3, with significant issues indicated in bold. The evaluation is based on average travel times between the Aviation/Century Station and terminal door (including in-vehicle and walking times)[4] and capital cost relative to the least expensive option (Center Way – 1 Station Aerial) at approximately $440 million. Cost estimate includes aerial off-airport configuration between Aviation and Sepulveda boulevards. Similarly, the travel time analysis assumes a given off-airport alignment with fixed travel time for the purposes of this comparison.

[4] Assumes an equal travel time for the off-airport portion of the trip.

Table 4.3. Stage I Evaluation of Rail Alignments – On-Airport Options

On-Airport Options	Performance	Advance to Stage II
Center Way – 1 Station Aerial	• Average Travel Time = 12.4 minutes between Aviation/Century and Terminals • Relative Cost = 1.0x (baseline) • **Longest average travel time of all options = poor passenger experience**	X
Center Way – 1 Station Tunnel	• Average Travel Time = 12.1 minutes between Aviation/Century and Terminals • Relative Cost = approx. 1.5x baseline estimate • **Travel times are slightly less than the Center Way – 1 Station Aerial, but costs 1.5x as much; therefore, the added cost would not result in substantial travel time benefits**	X
Through LAX – 1 Station Tunnel	• This option advances to Stage II for the Modified Trunk Alternative (see Section 4.3.4), as that alternative is designed to capture the benefits of this option	N/A
Center Way – 2 Station Aerial	• Average Travel Time = 11.1 minutes between Aviation/Century and Terminals • Relative Cost = approx. 1.2x baseline estimate • Option provides a 1.3 min travel time improvement while only increasing costs by 1.1x over the baseline option (Center Way – 1 Station Aerial)	✓
Center Way – 2 Station Tunnel	• Average Travel Time = 10.1 minutes between Aviation/Century and Terminals • Relative Cost = approx. 2.4x baseline estimate • Option offers the best average travel time for all on-airport options	✓
Loop – 3 Station Aerial	• Average Travel Time = 10.2 minutes between Aviation/Century and Terminals • Relative Cost = approx. 2.4x baseline estimate • Option is a good mix of cost (fourth least expensive) and average travel time (second fastest); therefore, it performs well across all measures • Potential impacts to parking structures, including demolition	✓
Loop – 3 Station Tunnel	• Average Travel Time = 10.2 minutes between Aviation/Century and Terminals • Relative Cost = approx. 2.7x baseline estimate • **Travel times are equal to the Loop – 3 Station Aerial, but costs are 2.4x the baseline option (Center Way – 1 Station Aerial); therefore, the added cost would not result in any travel time benefit**	X
Loop – 4 Station Aerial	• Average Travel Time = 10.4 minutes between Aviation/Century and Terminals • Relative Cost = approx. 2.6x baseline estimate • Average travel times and relative cost are more than the Loop – 3 **Station Aerial; therefore, the added cost would not result in any travel time benefit** • Potential impacts to parking structures, including demolition	X
Loop – 5 Station Aerial	• Average Travel Time = 10.7 minutes between Aviation/Century and Terminals • Relative Cost = approx. 2.7x baseline estimate • **Average travel times and relative cost are more than the Loop – 3 Station Aerial; therefore, the added cost would not result in any travel time benefit** • Potential impacts to parking structures, including demolition	X

On-Airport Options	Performance	Advance to Stage II
Loop – 8 Station Aerial	• Average Travel Time = 10.5 minutes between Aviation/Century and Terminals • Relative Cost = approx. 3.2x baseline estimate • **Average travel times and relative cost are more than the Loop – 3 Station Aerial; therefore, the added cost would not result in any travel time benefit** • Potential impacts to parking structures, including demolition	**X**

Due to the relatively long average travel times (in-vehicle and walk time) associated with the one-station options, and the higher relative cost and average travel times of the four, five and eight station options, they have been screened and will not be evaluated further. No significant issues for the two (aerial and tunnel) and three station options were found. They are carried forward into Stage II as on-airport options for the Direct LRT Branch Alternative. The routes to be carried forward are shown on Figure 4.3.

Figure 4.3. On-Airport Routes to Advance to Stage II – Direct LRT Branch

Source: ConnectLAX, 2012

4.3.1.4. Packaged Alternatives

The packaged alternatives for the Direct LRT Branch Alternative contain the following three components: mode, off-airport option and on-airport option. Table 4.4 lists the six Direct LRT Branch Alternatives that will be carried forward into Stage II for further consideration.

Table 4.4. Packaged Alternative – Direct LRT Branch

ID	Mode	Off-Airport Option	On-Airport Option
B-1	LRT	98th Street North	Center Way – 2 Station Aerial
B-2			Center Way – 2 Station Tunnel
B-3			Loop – 3 Station Aerial
B-4		Century Blvd	Center Way – 2 Station Aerial
B-5			Center Way – 2 Station Tunnel
B-6			Loop – 3 Station Aerial

4.3.2. Circulator

4.3.2.1. Mode

A separate, independent APM or BRT system suited to the airport's unique travel demands/operating environment. System would connect the airport to the Metro Rail station at Aviation and Century Boulevards.

4.3.2.2. Off-Airport Options

The screening analysis of off-airport options for the Circulator Alternative is shown in Table 4.5, and the significant issues are indicated in bold. The evaluation is based on the fulfillment of the goals of the alternative, physical fit and constructability, and encroachment into the RPZ as discussed in Section 4.1.

Table 4.5. Stage I Evaluation of Circulator Connection – Off-Airport Options

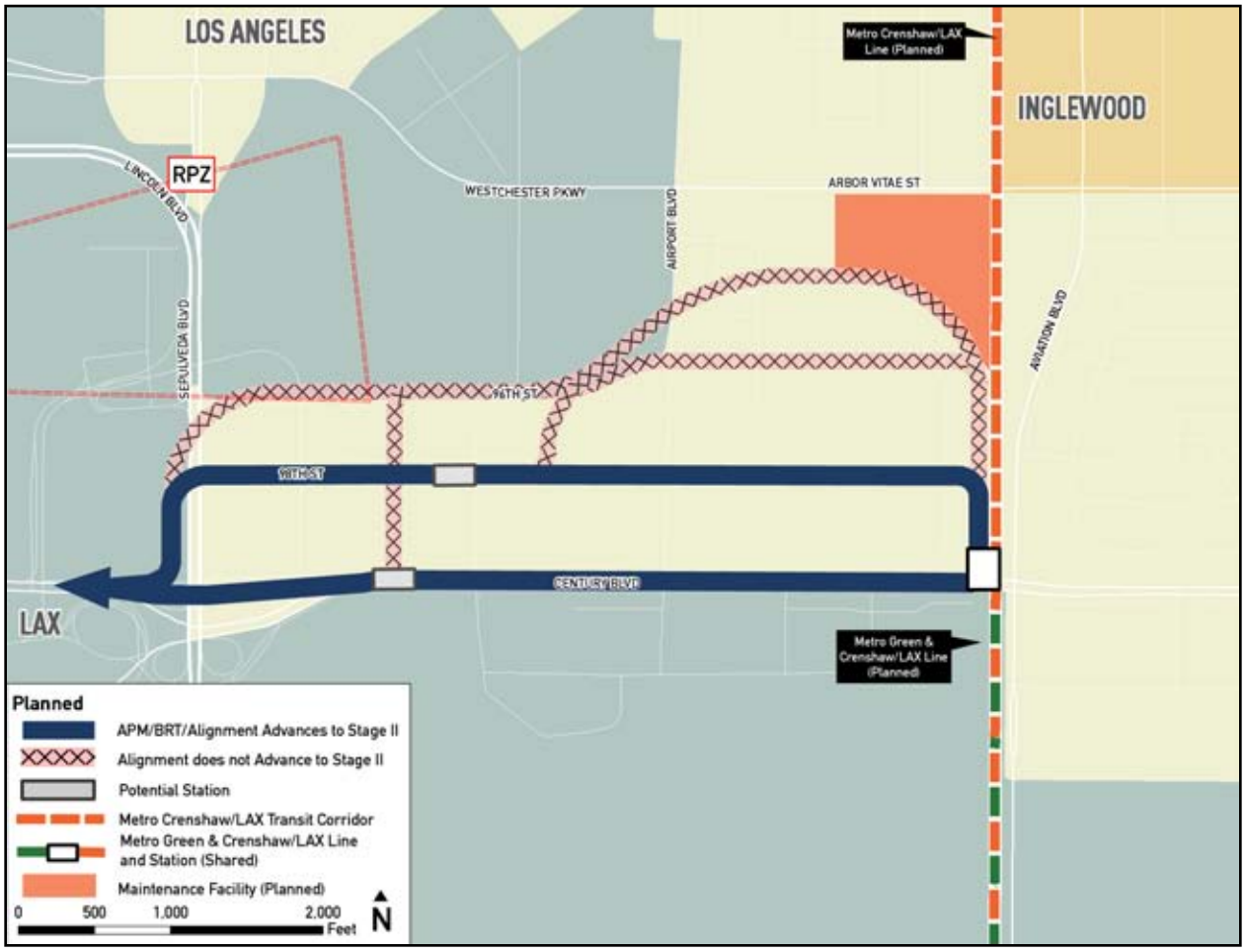
Off-Airport Options	Performance	Advance to Stage II
Century Blvd	• Option would support a transfer from the Metro Green Line and Metro Crenshaw/LAX rail corridor to an airport circulator system at the Aviation/ Century Station • Alignment could be designed with minimal physical fit and constructability issues • Alignment would not encroach into the RPZ • Alignment would serve potential airport facilities near Parking Lot C but requires a transfer to facilities near Aviation/Century • Alignment could straddle the LRT station at Aviation/Century to provide a transfer connection • Future LRT extension to Coastal Corridor from Aviation/Century is not precluded	✓

Off-Airport Options	Performance	Advance to Stage II
98th Street	• Option would support a transfer from the Metro Green Line and Metro Crenshaw/LAX rail corridor to an airport circulator system at the Aviation/ Century Station • Alignment could be designed with minimal physical fit and constructability issues • Alignment would not encroach into the RPZ • Alignment would serve potential airport facilities near Parking Lot C but requires a transfer to facilities near Aviation/Century • Alignment could straddle the LRT station at Aviation/Century to allow a transfer connection	✓
98th Street North	• Option would support a transfer from the Metro Green Line and Metro Crenshaw/LAX rail corridor to an airport circulator system at the Aviation/ Century Station • **Potential impacts to parking garages and existing uses with potentially expensive property acquisition** • Alignment would not encroach into the RPZ • Alignment would serve potential airport facilities near Parking Lot C but requires a transfer to facilities near Aviation/Century • Alignment may limit the ability to extend LRT to the north as part of a strategic, unfunded project	X
96th Street	• Option would support a transfer from the Metro Green Line and Metro Crenshaw/LAX rail corridor to an airport circulator system at the Aviation/ Century Station • **Potential impacts to parking garages and existing uses with potentially expensive property acquisition** • **Alignment would encroach into the RPZ, which would trigger significant regulatory constraints and would likely necessitate a less cost-effective below-grade configuration** • Alignment would serve potential airport facilities near Parking Lot C but requires a transfer to facilities near Aviation/Century • Alignment may limit the ability to extend LRT to the north as part of a strategic, unfunded project	X
96th Street North	• Option would support a transfer from the Metro Green Line and Metro Crenshaw/LAX rail corridor to an airport circulator system at the Aviation/ Century Station • **Potential impacts to parking garages and existing uses with potentially expensive property acquisition** • **Alignment would encroach into the RPZ, which would trigger significant regulatory constraints and would likely necessitate a less cost-effective below-grade configuration** • Alignment would serve potential airport facilities near Parking Lot C but requires a transfer to facilities near Aviation/Century • Alignment may limit the ability to extend LRT to the north as part of a strategic, unfunded project	X

Significant issues were identified for all but two of the nine off-airport options for the Circulator Alternative based on the analysis criteria. The benefits of the Airport Boulevard and Through LAX options are better captured in the Direct Trunk Alternative, and are not analyzed

as part of the Circulator Alternative. No significant issues for the 98th Street and Century Boulevard options were found. They are carried forward as the off-airport options for the Circulator Alternative. The routes to be carried forward are shown in Figure 4.4.

Figure 4.4. Off-Airport Routes to Advance to Stage II – Circulator



Source: ConnectLAX, 2012

4.3.2.3. On-Airport Options

The comparative analysis of on-airport options for the Circulator Alternative is the same as the analysis provided for the Direct LRT Branch Alternative in Section 4.3.1.3. Center Way – 2 Station Aerial, Center Way – 2 Station Tunnel, and Loop – 3 Station Aerial will be carried forward to Stage II for further evaluation as on-airport options for the Circulator Alternative.

4.3.2.4. Packaged Alternatives

The packaged alternatives for the Circulator Alternative contain the following three components: mode, off-airport option and on-airport option. BRT was not previously included in the on-airport screening options because it is assumed that buses would operate

on surface streets in mixed traffic inside the CTA with stops in front of each of the eight terminals. Table 4.6 lists the eight Circulator Alternatives that will be carried forward into Stage II for further consideration.

Table 4.6. Packaged Alternative – Circulator

ID	Mode	Off-Airport Option	On-Airport Option
C-1	APM	98th Street	Center Way – 2 Station Aerial
C-2			Center Way – 2 Station Tunnel
C-3			Loop – 3 Station Aerial
C-4	BRT		Loop – 8 Station At-Grade
C-5	APM	Century Blvd	Center Way – 2 Station Aerial
C-6			Center Way – 2 Station Tunnel
C-7			Loop – 3 Station Aerial
C-8	BRT		Loop – 8 Station At-Grade

4.3.3. Intermediate LRT and Circulator

4.3.3.1. Mode

The Intermediate LRT and Circulator Alternative would consist of an extension of the existing Metro light rail system to an intermediate location between the Aviation/Century Station and the airport; therefore, the mode option is limited to LRT for the initial segment. APM and BRT modes would both be suitable to complete the trip between the intermediate station and the CTA.

4.3.3.2. Off-Airport Options

The screening analysis of off-airport options for the Intermediate LRT and Circulator Alternative is shown in Table 4.7 with significant issues indicated in bold. The evaluation is based on the fulfillment of the goals of the alternative, physical fit and constructability, and encroachment into the RPZ as discussed in Section 4.1.

Table 4.7. Stage I Evaluation of Intermediate LRT and Circulator – Off-Airport Options

Off-Airport Option	Performance	Advance to Stage II
Century Blvd	• **Option would not support an intermediate station near future LAX off-airport operations as no airport development is planned along Century Blvd** • Alignment could be designed with minimal physical fit and constructability issues • Alignment would not encroach into the RPZ • Transfers to Crenshaw/LAX line possible with second station at Aviation/Century • A future extension to Coastal Corridor from Aviation/Century is not precluded	X
1994 SEIR Alternative	• Option would support an intermediate station near future LAX off-airport operations in the vicinity of Lot C • Alignment could be designed with minimal physical fit and constructability issues • Alignment would not encroach into the RPZ • Transfers to Crenshaw/LAX line possible with second station at Aviation/Century • A future extension to Coastal Corridor from Aviation/Century is not precluded	✓
98th Street	• Option would support an intermediate station near future LAX off-airport operations in the vicinity of Lot C • **Alignment would require the planned Aviation/Century Station to be shifted to the south to allow for a turn onto 98th St, resulting in constructability issues with the track gradient south of the station, making this option infeasible** • Alignment would not encroach into the RPZ	X
98th Street North	• Option would support an intermediate station near future LAX off-airport operations in the vicinity of Lot C • Alignment could be designed with minimal physical fit and constructability issues • Alignment would not encroach into the RPZ • Transfers with Crenshaw/LAX line possible with a cross-platform transfer • A future extension to Coastal Corridor from Aviation/Century is not precluded, but alignment may be less direct	✓
96th Street	• Option would support an intermediate station near future LAX off-airport operations in the vicinity of Lot C • **Potential impact to parking garages and existing uses with potentially expensive property acquisition** • **Alignment would encroach into the RPZ, which would trigger significant regulatory constraints and would likely necessitate a less cost-effective below-grade configuration**	X

Off-Airport Option	Performance	Advance to Stage II
96th Street North	• Option would support an intermediate station near future LAX off-airport operations in the vicinity of Lot C • Alignment could be designed with minimal physical fit and constructability issues • **Alignment would encroach into the RPZ, which would trigger significant regulatory constraints and would likely necessitate a less cost-effective below-grade configuration** • Transfers with Crenshaw/LAX line possible with a cross-platform transfer • A future extension to Coastal Corridor from Aviation/Century is not precluded, but alignment may be less direct	X

Significant issues were identified for all but two of the eight off-airport options for the Intermediate LRT and Circulator Alternative based on the analysis criteria. No significant issues for the 1994 SEIR Alternative or 98th Street North options were found. They are carried forward for further evaluation in Stage II. The benefits of the Airport Boulevard and Through LAX options are better captured in the Modified LRT Trunk Alternative, and are not analyzed as part of this alternative. The routes to be carried forward are shown in Figure 4.5.

Figure 4.5. Off-Airport Routes to Advance to Stage II – Intermediate LRT & Circulator

Source: ConnectLAX, 2012
Note: Route and station location for the 98th North option are dependent on future LAX plans

4.3.3.3. On-Airport Options

The comparative analysis of on-airport options for the Intermediate LRT and Circulator Alternative is the same as the analysis provided for the Direct LRT Branch Alternative in Section 4.3.1.3. Center Way – 2 Station Aerial, Center Way – 2 Station Tunnel, and Loop – 3 Station Aerial will be carried forward to Stage II for further evaluation as on-airport options for the Circulator Alternative.

4.3.3.4. Packaged Alternatives

The packaged alternatives for the Intermediate LRT and Circulator Alternative contain three components: mode, off-airport option and on-airport option. BRT was not previously included in the on-airport screening options because it is assumed that buses would operate on surface streets in mixed traffic inside the CTA with stops in front of each of the eight terminals. Table 4.8 lists the eight Intermediate LRT and Circulator Alternatives that will be carried forward into Stage II for further evaluation.

Table 4.8. Packaged Alternative – Intermediate LRT and Circulator

ID	Mode	Off-CTA Option	On-CTA Option
I-1	LRT/APM	98th Street North	Center Way – 2 Station Aerial
I-2			Center Way – 2 Station Tunnel
I-3			Loop – 3 Station Aerial
I-4	LRT/BRT		Loop – 8 Station At-Grade
I-5	LRT/APM	1994 SEIR Alt	Center Way – 2 Station Aerial
I-6			Center Way – 2 Station Tunnel
I-7			Loop – 3 Station Aerial
I-8	LRT/BRT		Loop – 8 Station At-Grade

4.3.4. Modified LRT Trunk

4.3.4.1. Mode

This connection type involves shifting the main line of the Metro LRT system west of Aviation Boulevard to provide more direct service to the LAX terminal area for the Metro Green and Crenshaw/LAX lines.

4.3.4.2. Off-Airport Options

The screening analysis of off-airport options for the Modified LRT Trunk Alternative is shown in Table 4.9, with significant issues indicated in bold. The evaluation is based on the fulfillment of the goals of the alternative, physical fit and constructability, and encroachment into the RPZ as discussed in Section 4.1.

Table 4.9. Stage I Evaluation of Modified LRT Trunk – Off-Airport Options

Off-Airport Option	Performance	Advance to Stage II
Century Blvd	• **Would not support the addition of a new alignment of the approved Metro Crenshaw/LAX line underneath the CTA** • Alignment could be designed with minimal physical fit and constructability issues • Alignment would not encroach into the RPZ	X
1994 SEIR Alternative	• **Would not support the addition of a new alignment of the approved Metro Crenshaw/LAX line underneath the CTA** • Alignment could be designed with minimal physical fit and constructability issues • Alignment would not encroach into the RPZ	X
98th Street	• **Would not support the addition of a new alignment of the approved Metro Crenshaw/LAX line underneath the CTA** • **Alignment would require the planned Aviation/Century Station to be shifted to the south to allow for a turn onto 98th St, resulting in constructability issues with the track gradient south of the station, making this option infeasible** • Alignment would not encroach into the RPZ	X

98th Street North	• **Would not support the addition of a new alignment of the approved Metro Crenshaw/LAX line underneath the CTA** • The alignment would avoid direct impacts to local businesses • Alignment would not encroach into the RPZ	X
96th Street	• **Would not support the addition of a new alignment of the approved Metro Crenshaw/LAX line underneath the CTA** • Alignment could be designed with minimal physical fit and constructability issues • Alignment would not encroach into the RPZ	X
96th Street North	• **Would not support the addition of a new alignment of the approved Metro Crenshaw/LAX line underneath the CTA** • Alignment could be designed with minimal physical fit and constructability issues • **Alignment would encroach into the RPZ, which would trigger significant regulatory constraints and would likely necessitate a below-grade configuration**	X
Airport Blvd	• Would support the addition of a new alignment of the approved Metro Crenshaw/LAX line, but would require an APM or BRT circulator to reach the CTA • Alignment could be designed with minimal physical fit and constructability issues • Alignment would not encroach into the RPZ • Alignment would serve potential airports facilities near Parking Lot C and/or near Aviation/Century • Alignment connects with service from the Crenshaw/LAX corridor • Future extension to Coastal Corridor from Airport Boulevard is not precluded	✓
Through LAX	• Would support the addition of a new alignment of the approved Metro Crenshaw/LAX line underneath the CTA • Alignment could be designed with minimal physical fit and constructability issues • Alignment would not encroach into the RPZ as it run in a tunnel under the North and South Runways • Alignment would serve potential airports facilities near Parking Lot C and/or near Aviation/Century • Alignment would serve potential airports facilities near Parking Lot C and/or near Aviation/Century • Alignment connects with service from the Crenshaw/LAX corridor • Future extension to Coastal Corridor from Airport Boulevard is not precluded	✓

Significant issues were identified for seven of the nine off-airport options based on the analysis criteria. The Airport Boulevard and Through LAX off-airport options will be the only ones carried forward into Stage II for further consideration, as shown in Figure 4.6.

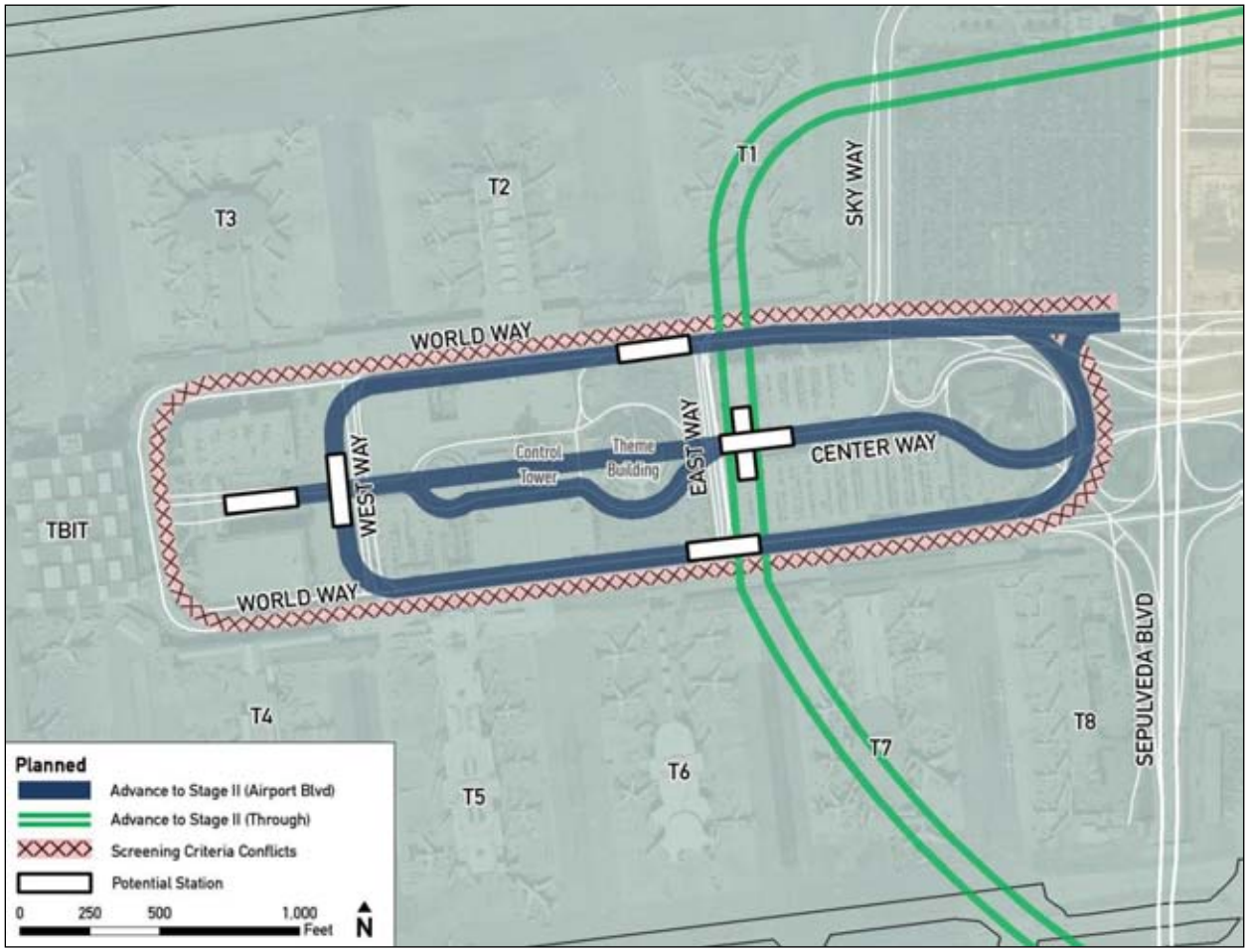
Figure 4.6. Off-Airport Route to Advance to Stage II – Modified LRT Trunk

Source: ConnectLAX, 2012

4.3.4.3. On-Airport Options

The screening analysis of on-airport options for the Modified LRT Trunk is the same as the analysis provided for the Direct LRT Branch Alternative in Section 4.3.1.3. The only substantial difference is that the configuration of the off-airport Through LAX option would only be compatible with the Through LAX – 1 Station Tunnel on-airport option. Therefore, the one station tunnel (Through LAX) two station (aerial and tunnel) and three station options will be carried forward to Stage II for further evaluation as on-airport options for the Modified LRT Trunk Alternative. The routes to be carried forward are shown on Figure 4.7.

Figure 4.7. On-Airport Routes to Advance to Stage II – Modified LRT Trunk



Source: ConnectLAX, 2012

4.3.4.4. Packaged Options

The packaged alternatives for the Modified LRT Trunk contain three main components: mode, off-airport, and on-airport options. BRT was not previously included in the on-airport screening options because it is assumed that buses would operate on surface streets in mixed traffic inside the CTA with stops in front of each of the eight terminals. Table 4.10 lists the five Modified LRT Trunk Alternatives that will be carried forward into Stage II for further evaluation.

Table 4.10. Packaged Alternative – Modified LRT Trunk

ID	Mode	Off-Airport Option	On-Airport Option
T-1	LRT	Through LAX	Through LAX – 1 Station Tunnel
T-2	LRT/APM	Airport Blvd	Center Way – 2 Station Aerial
T-3			Center Way – 2 Station Tunnel
T-4			Loop – 3 Station Aerial
T-5	LRT/BRT		Loop – 8 Station At-Grade

4.3.5. Stage I Screening Results

Based on the results of the Stage I screening, 27 packaged alternatives were carried forward to be evaluated further in Stage II. The 27 packaged alternatives were selected based on the Stage I screening criteria, which emphasizes feasibility of the modes and routes for the options within each of the four connection type described in Section 3.3.

4.4. STAGE II EVALUATION

Several performance measures were developed to assess the pros and cons of each alternative. These measures include ridership, capital cost, travel time, passenger convenience, compatibility with other plans/facilities, and constructability. In addition to these performance measures, community acceptability was also considered based on comments received at the public meetings held in February/March 2012.

The performance of each of the 27 packaged alternatives, as characterized by the Stage II quantitative performance measures, is provided below in Table 4.11.

Table 4.11. Stage II Performance Summary

Class	Alternative	Mode	Off-Airport Route	On-Airport Stations	Average Transfers	Average Vertical Level Changes	Average Travel Time (min)	Ridership	Cost (millions)	
									Low	High
Direct LRT Branch	B-1	LRT	98th N	2 Aerial	0.7	2.0	29.7	5,300	$540	$650
	B-2	LRT	98th N	2 Tunnel	0.7	2.0	29.0	5,300	$970	$1,160
	B-3	LRT	98th N	3 Aerial	0.7	2.0	28.7	5,400	$970	$1,160
	B-4	LRT	Century	2 Aerial	0.7	3.3	31.8	4,900	$470	$560
	B-5	LRT	Century	2 Tunnel	0.7	3.3	31.1	5,000	$900	$1,080
	B-6	LRT	Century	3 Aerial	0.7	3.3	30.8	5,100	$900	$1,080
Circulator	C-1	APM	98th	2 Aerial	1.0	4.0	32.2	4,600	$620	$740
	C-2	APM	98th	2 Tunnel	1.0	4.0	31.5	4,600	$1,040	$1,250
	C-3	APM	98th	3 Aerial	1.0	4.0	31.2	4,700	$1,060	$1,270
	C-4	BRT	98th	8 At-Grade	1.0	1.0	34.3	5,000	$110	$130
	C-5	APM	Century	2 Aerial	1.0	4.0	30.0	4,900	$600	$720
	C-6	APM	Century	2 Tunnel	1.0	4.0	29.5	4,900	$1,020	$1,220
	C-7	APM	Century	3 Aerial	1.0	4.0	29.2	5,000	$1,030	$1,240
	C-8	BRT	Century	8 At-Grade	1.0	1.0	33.6	5,100	$120	$140
Intermediate LRT and Circulator	I-1	LRT/APM	98th N	2 Aerial	1.7	4.0	33.7	3,900	$680	$820
	I-2	LRT/APM	98th N	2 Tunnel	1.7	4.0	33.0	4,000	$1,140	$1,370
	I-3	LRT/APM	98th N	3 Aerial	1.7	4.0	32.7	4,000	$1,110	$1,330
	I-4	LRT/BRT	98th N	8 At-Grade	1.7	1.0	35.5	4,300	$320	$380
	I-5	LRT/APM	1994 SEIR	2 Aerial	1.7	5.3	36.3	3,600	$640	$770
	I-6	LRT/APM	1994 SEIR	2 Tunnel	1.7	5.3	35.6	3,700	$1,090	$1,310
	I-7	LRT/APM	1994 SEIR	3 Aerial	1.7	5.3	35.2	3,700	$1,070	$1,280
	I-8	LRT/BRT	1994 SEIR	8 At-Grade	1.7	2.3	38.1	4,000	$280	$340
Modified LRT Trunk	T-1	LRT	Through LAX	1 Tunnel	0.5	2.0	24.9	6,100	$940	$1,130
	T-2	LRT/APM	Airport Bl	2 Aerial	1.0	4.0	31.1	4,700	$1,020	$1,220
	T-3	LRT/APM	Airport Bl	2 Tunnel	1.0	4.0	30.4	4,700	$1,220	$1,460
	T-4	LRT/APM	Airport Bl	3 Aerial	1.0	4.0	30.1	4,800	$1,170	$1,400
	T-5	LRT/BRT	Airport Bl	8 At-Grade	1.0	1.0	33.1	5,100	$480	$580

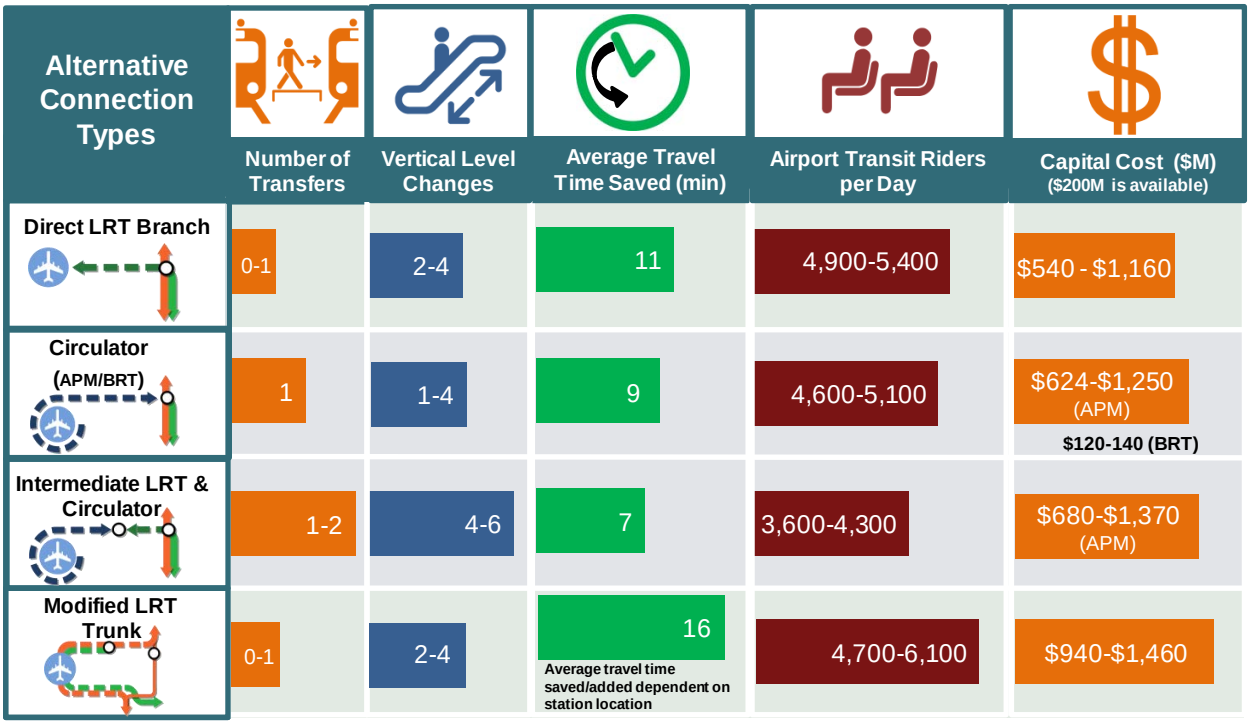
Table 4.11 alone, however, is not intended to inform which of the 27 alternatives should move forward to the Draft EIS/EIR phase. Therefore, another level of analysis is necessary to complete Stage II screening. This other analysis focuses on four main trade-off categories:

- Passenger convenience
- Direct LRT Branch vs. Modified LRT Trunk
- On-airport configuration
- Off-airport configuration

4.4.1. Passenger Convenience (by Alternative and Alternative Class)

The trade-off analysis for passenger convenience is provided below. This analysis provides a comparison of the four alternative classes (i.e., Direct LRT Branch, Circulator, Intermediate LRT and Circulator, and Modified LRT Trunk) in terms of the overall experience for passengers traveling to/from the airport. The performance measures used to evaluate passenger convenience are: the average number of transfers, the average number of vertical level changes, the average travel time, and ridership. Figure 4.8 shows the trade-off analysis graphically.

Figure 4.8. Passenger Convenience Trade-Off Analysis



Source: ConnectLAX, 2012

The five primary conclusions of this trade-off analysis are:

- Ridership for air passengers and employees increases as travel times and number of transfers decrease
- Direct LRT Branch and Modified LRT Trunk have fewest transfers, shortest travel times and highest ridership for airport passengers

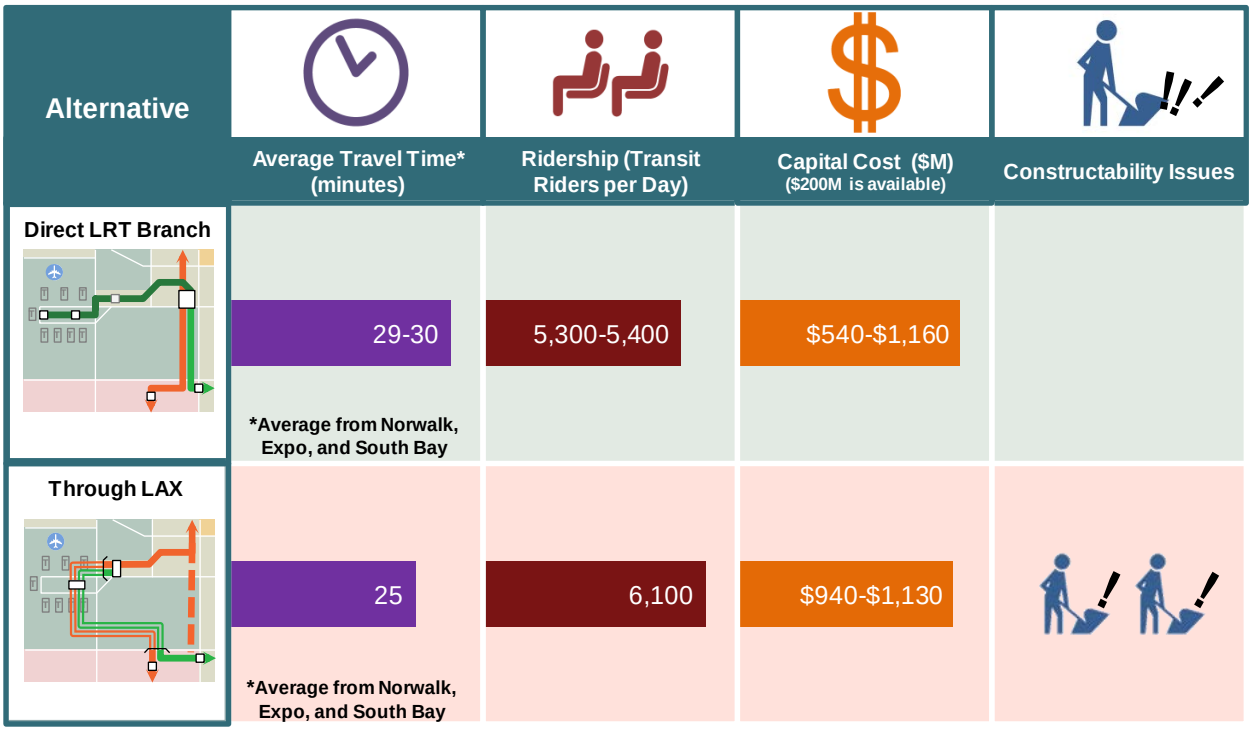
Metro

- Circulator (APM/BRT) ridership is slightly lower, since all Metro Rail passengers transfer
- Intermediate LRT and Circulator Alternative has most transfers and level changes, and the lowest ridership
- All alternatives, except the BRT Circulator, would require funding in excess of the $200 million available from Metro

4.4.2. Direct LRT Branch vs. Modified LRT Trunk Alternatives

With the highest travel time savings and ridership potential, the second trade-off scenario compares the Direct LRT Branch vs. Modified LRT Trunk alternative classes. The performance measures used to compare these two alternative classes against each other are: the average travel time, ridership, capital cost, and constructability issues where the project would interface with existing and planned Metro facilities. Figure 4.9 shows the trade-off analysis graphically.

Figure 4.9. Direct vs. Modified LRT Trunk Alternative Trade-Off Analysis



Source: ConnectLAX, 2012

The five primary conclusions of this trade-off analysis are:

- Because the Modified LRT Trunk Alternative (Through LAX) has a shorter travel time, ridership is higher than the Direct LRT Branch Alternative for airport passengers
- The Modified LRT Trunk Alternative increases travel time by 2 minutes for non-airport bound passengers between Expo (Crenshaw/LAX Corridor) and South Bay (Redondo Beach)

- The single station for the Modified LRT Trunk Alternative in the terminal area requires a long walk (0.3 to 0.4 miles) or transfer to a circulator (e.g., bus, moving walkway, shuttle) to reach western terminals (T3, T4, TBIT)
- Constructability issues:
  - Parallels portion of Crenshaw/LAX Line that is scheduled for construction (in 2013)
  - Requires a complex connection to existing Metro Green Line in El Segundo that would have operations impacts during construction
- Both alternatives would require funding in excess of the $200 million available from Metro

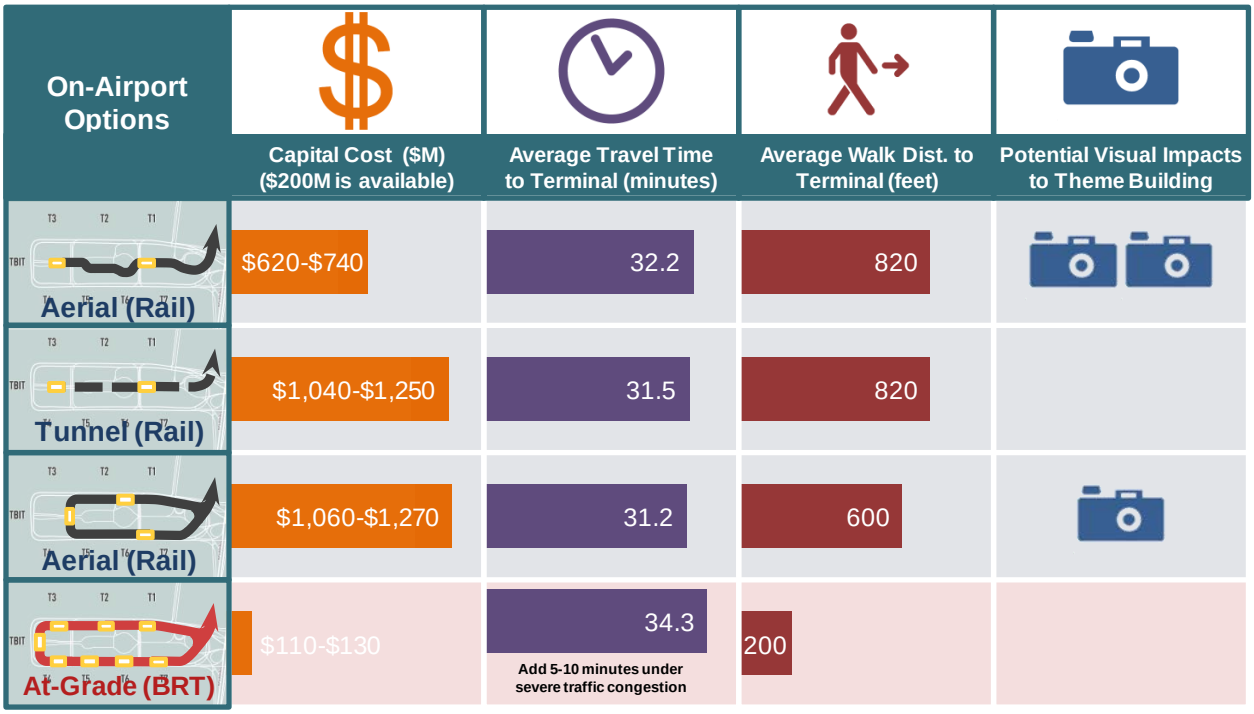
4.4.3. On-Airport Configuration

The trade-off analysis for the configuration within the CTA is provided below. This analysis compares four on-airport options that vary by number of stations, vertical alignment, and mode of access. The performance measures used to evaluate these on-airport options against one another are:

- Capital cost
- Average travel time to terminal
- Average walk distance to terminal
- Potential visual impacts to the Theme Building (a historic and cultural building in the center of the airport often cites as an icon of modern architecture and representative of LAX)

Figure 4.10 shows the trade-off analysis graphically.

Figure 4.10. On-Airport Trade-Off Analysis



Source: ConnectLAX, 2012
NOTE: (Rail) refers to LRT or APM

The three primary conclusions of this trade-off analysis are:

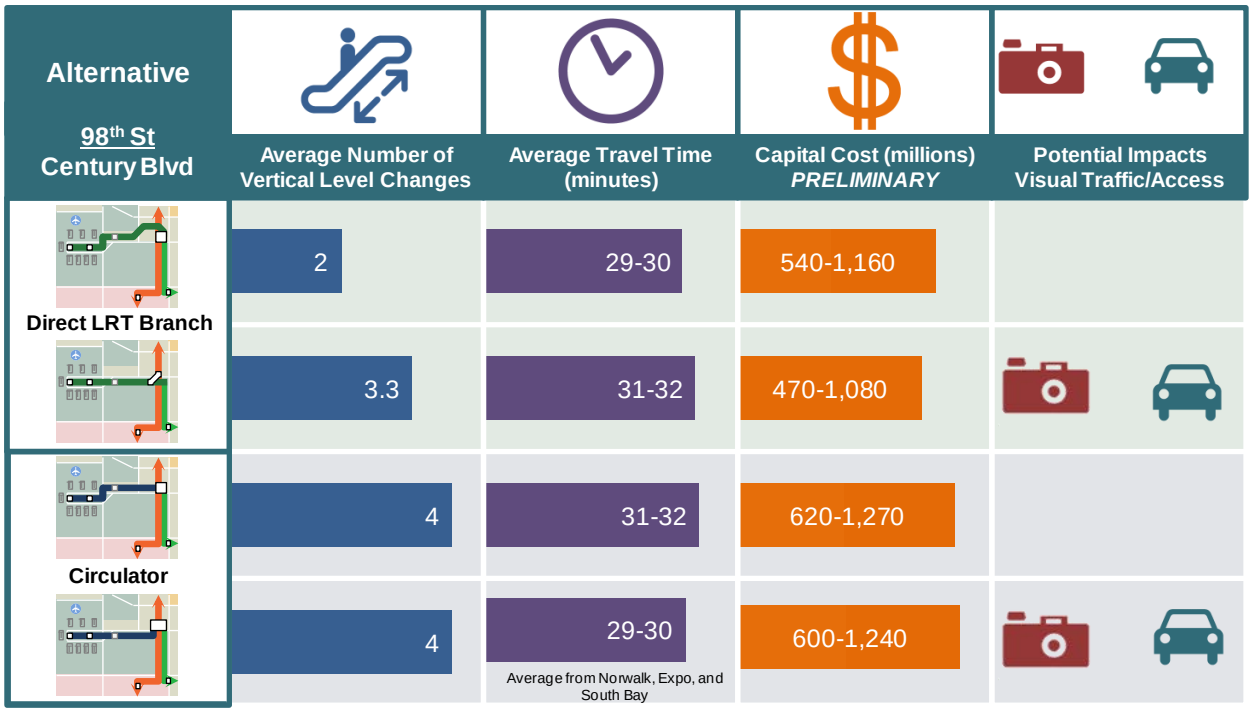
- For LRT and APM, the 2 station aerial option
  - Costs approximately $450 million less than the 2 station subway and 3 station aerial options
  - Runs adjacent to the Theme Building, leading to potential visual impacts
- The 3 station aerial loop option provides the shortest walk distances to terminals among the rail alignments, but extra time to travel around the loop leads to comparable total travel times (walk + ride) to terminals
- BRT is the least costly (the only on-airport option that would not require funding in excess of the $200 million available from Metro) and has shorter walking distances than the rail (LRT and APM) configurations, but...
  - Involves the longest total travel times (walk + ride) to airport terminals
  - Is subject to airport roadway congestion

4.4.4. Off-Airport Configuration

The trade-off analysis for the configuration outside of the CTA is provided below. This analysis compares four off-airport options that vary by mode of access (i.e., LRT or Circulator) and alignment (i.e., 98th Street, 98th Street North, or Century Boulevard). The performance measures used to evaluate these off-airport options against one another are: the average

number of vertical level changes, the average travel time, the capital cost, and potential visual impacts to landscaping, art treatments and businesses. Figure 4.11 shows the trade-off analysis graphically.

Figure 4.11. Off-Airport Trade-Off Analysis



Source: ConnectLAX, 2012

The three primary conclusions of this trade-off analysis are:

- Century Boulevard LRT
  - Requires a second station at Aviation/Century
  - Results in transfers, additional level changes, longer walks and longer travel times
- For both LRT and APM, the aerial structure along Century Boulevard may result in:
  - Visual impacts to landscaping (tree-lined medians) and art treatments (light pylons) by structures associated with light rail, APM or an elevated busway.
  - Potential impacts to traffic circulation and access to businesses
- All alternatives would require funding in excess of the $200 million available from Metro