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1. Introduction/Purpose of Study

The purpose of this study was to verify the feasibility of and refine the concepts proposed by 2009’s Destination Lindbergh for the Intermodal Transit Center (ITC) facility, and develop phased alternatives for the site that connect the ITC facility to existing and planned airport facilities, including the planned consolidated rental car facility (CONRAC) and northside passenger processing facilities.

The effort involved the creation of a series of design concepts for the site’s development, including the specifics of ground transportation and transit facilities such as the proposed high-speed rail station, light and commuter rail service, MTS fixed-route bus service including pedestrian, bicycle access, and circulation.

The ultimate ITC must have the flexibility to accommodate initial improvements for trolley, COASTER, Amtrak and local transit, as well as the addition of High Speed Rail (HSR) service in the future. The layout for the ITC also must accommodate new freeway connectors to Interstate 5 and pedestrian connections to passenger facilities on the northside of the airport. There were determined to be at least three potential options which could evolve over time:

• An ITC serving the COASTER, Trolley and possibly Amtrak Bus/Rail and MTS BRT, with a direct pedestrian link to either the CONRAC or a northside Passenger Processing Facility without future provisions for High Speed Rail.
• An ITC serving the COASTER, Trolley, MTS BRT, Amtrak Bus/Rail and High Speed Rail with all facilities for High Speed Rail located off-airport.
• An ITC serving the COASTER, Trolley, MTS BRT, Amtrak Bus/Rail and High Speed Rail with all facilities for High Speed Rail (except the tracks/platforms) co-located with airport passenger processing facility.

All site layouts must accommodate direct auto/bus access from Interstate 5 and the local road network for an HSR station either co-located with the air passenger processing facility or separately.

IBI Group developed design alternatives with and without HSR services, and recommended a preferred alternative for each. The team also developed off-site rail modifications to serve the ITC, including ROW needs for transitions to existing tracks, allowing through movements and simultaneous station stops for both the trolley and COASTER/Amtrak, and developed planning-level capital cost estimates for improvements, including ROW and property acquisition.

The study considered an on-airport alignment for HSR facilities, but it was found to be less than optimal by the Airport Authority and the High Speed Rail Authority.

This effort would not have been possible without the insights and coordination of the project’s Technical Advisory Committee (TAC) and sincere appreciation goes out to the following agencies for their efforts on this project:

• San Diego County Regional Airport Authority
• The City of San Diego
• California Department of Transportation (Caltrans)
• California High Speed Rail Authority (CHSRA)
• San Diego Metropolitan Transit System (MTS)
• North County Transit District (NCTD)
• The United States Marine Corps (USMC)
2. Previous and Current Studies

A series of plans and studies are applicable to the development of the ITC facility at Lindbergh Field, and they are summarized below:

**Destination Lindbergh**

Completed in 2009, the Destination Lindbergh study conducted by the Airport Authority laid out the preferred development of Lindbergh Field with the following goals in mind:

- **Ground Transportation**
  Improve direct access by auto and various modes of transit to SDIA and accommodate vehicle parking demand.

- **Intermodal Facility**
  Develop an intermodal facility to provide access for passengers and employees to SDIA and strengthen regional connectivity.

- **Passenger Terminal**
  Develop passenger terminal facilities to efficiently accommodate projected passenger demand and enhance user satisfaction.

- **Airfield/Airspace**
  Within the constraints of SDIA’s property and single runway, develop an airfield configuration to best accommodate projected levels of aircraft operations (takeoffs and landings).

- **Environment**
  Incorporate best practices of environmental stewardship in all components of SDIA’s physical environment and operations.

- **Financial**
  Develop a financially feasible plan.

- **Regional Development – San Diego County/Southern California**
  Leverage SDIA to provide major direct and indirect social and economic benefits.

- **Regional Development – Downtown/Convention Center/Adjacent**
  Integrate SDIA, through context-sensitive urban design, into the fabric of the central San Diego area, including the downtown, waterfront, Convention Center, Embarcadero and harbor areas.

In addition, Destination Lindbergh recommended a preferred alternative scenario, which includes a single entrance to the Airport for all passengers in the ultimate build-out, and groups all proposed facilities to the north of the existing runway. Specific benefits of the recommended built-out scenario include:

- **ITC**
  - Includes trolley, rail, and bus station platforms to better connect the Airport to regional transit infrastructure
  - Allows passengers to conveniently transfer between the various mass transit modes
  - Transit platforms connected to airline passenger processing facilities by a passenger walkway
  - 2 rail lines and station platforms for Amtrak/COASTER
  - 3 trolley lines and station platforms
  - 1 rail line for freight trains to bypass the ITC
  - ITC/terminal complex linked to concourses south of the runway via a secure automated people mover

- **Passenger processing facilities**
  - Single gateway entrance for airline passengers, located on the north side of the Airport via the I-5 4-level structure providing all airline ticketing, check-in, security screening, and baggage claim.

- **First concourse**
  - Provides approximately 23 aircraft gates
  - Located south of the runway
  - Passenger processing occurs in north complex

- **Second concourse**
  - Provides approximately 38 gates
  - Located south of the runway
  - Passenger processing occurs in north complex

- **Support facilities**
  - Includes the ATCT, fuel farm, general aviation and air cargo facilities

- **Parking/CONRAC**
  - 2 six-story parking garages
  - CONRAC and ancillary rental car support facilities
  - Public parking for transit riders and airline passengers

- **High-speed rail station**
  - High-speed rail linked to ITC
  - Parking garage with 6,000 parking spaces

- **Airfield**
  - Relocated Taxiway B
  
The Recommended Alternative can be seen below.

![Destination Lindbergh Recommended Development Plan](image-url)
2. Previous and Current Studies (continued)

Airport Transit Access and Intermodal Transportation Center Site Evaluation Study

In 2003, the Metropolitan Transit Development Board (MTDB) commissioned a study examining airport and cruise ship demand levels and transit market segments that could be served by the ITC. In addition, the study detailed a series of airport access improvements designed to connect passengers to the proposed ITC sites (a total of nine sites were considered, with the report stopping short of recommending a single site) to existing and planned airport facilities.

The improvements were categorized by near-term, mid-term, and long-term improvements, and included the recommendations listed below, which helped establish the framework for the physical treatments that helped guide the development of the ITC site planning effort undertaken as part of this study.

Key recommendations in the 2003 effort included conceptual trolley and COASTER realignments, new or relocated rail stations, additional parking spaces at the eventual ITC facility, pedestrian people movers, enhanced operations of fixed-route transit connections through traffic signal coordination/transit signal priority for surface streets.

California High Speed Rail

The California High Speed Rail Authority has developed plans for the construction, operation, and financing of a statewide, intercity high-speed passenger rail system consisting of 800 miles of HSR in five corridors connecting the major metropolitan areas of the state.

The preliminary alignment includes HSR following the existing Los Angeles-San Diego-San Luis Obispo (LOSSAN) rail corridor from Downtown San Diego through Old San Diego to University City and then crossing over to continue north along the I-15 corridor. A more detailed study on the alignment of the potential corridor connecting San Diego to points north is underway and is required to consider the land use and right-of-way issues associated with the potential future alignment of the HSR and the ITC.

The CHSRA has identified Lindbergh Field as a potential site for future High-Speed Rail service, and has identified a preferred station location in the approximate area of this study’s conceptual HSR facility. In addition, CHSRA has conducted traffic and LOS analyses as part of their Traffic, Transit, Circulation and Parking Technical Evaluation, the results of which were consulted as part of this study’s high-level circulation analysis.

City of San Diego Midway Community Plan

The City of San Diego is currently updating the Midway-Pacific Highway Community Plan. The Midway-Pacific Highway Corridor Community is situated north of downtown San Diego and encompasses approximately 902 acres. Land use in this community is guided by the Midway-Pacific Highway Corridor Community Plan which provides goals and objectives for development and designates where specific land uses should go. Property development and specific use regulations in this community are controlled by general zoning standards specified by the City’s Land Development Code (LDC).

Lindbergh Field borders the Midway/Pacific Highway Community Planning Area, and surface streets to the east of the ITC facility are included in the Planning Area. Due to the impacts of the ITC facility on the local street network, it is important to consider the community’s goals and objectives for its roadway network. Circulation policies of the community include:

- Improve vehicular circulation and reduce traffic congestion, while promoting access, safety and ease of circulation throughout the community for autos, public transit, pedestrians and bicyclists.
- Actively promote and provide a variety of opportunities from which residents and visitors may choose a convenient and appropriate method of transport.
- Balance public roadway improvements for the automobile with improvements which will promote and simplify access for pedestrians, bicyclists and disabled persons. Link community circulation patterns with light rail transit, bus service and regional bicycle and freeway systems.
- Improve the visual qualities of the existing roadway system.
- Pursue internal circulation improvements with an emphasis on regional transportation improvements and alternatives to transportation via the private automobile.
- Designate appropriate street classifications for all streets in this community.
- Provide physical and operational improvements to the circulation system—including signalization improvements, restriping and median modification to assist in meeting the existing and projected vehicular circulation needs.
- Improve freeway access and pursue other alternatives to through traffic.

The development of the update process was monitored during this effort, and outcomes of the Community Plan Update process progresses, the potential for economically viable redevelopment opportunities of the site and its adjacent properties will be analyzed.

North Bay Redevelopment Project Area Analysis

The City of San Diego’s 1,360-acre North Bay Redevelopment Project Area is adjacent to the San Diego International Airport and the ITC site, and offers a variety of development opportunities. Objectives of the North Bay Redevelopment Project Area were considered during the development of the ITC facilities in an effort to be consistent with community and City goals. The North Bay Redevelopment Project’s goals include:

- Encourage new mixed-use and multi-family residential projects
- Improve the area’s business environment and create high-tech industrial and office uses to complement existing facilities
- Attract light industrial manufacturing and neighborhood commercial centers
- Make necessary traffic improvements
- Provide open space and community facilities

Lastly, the southernmost portion of the Pacific Highway Corridor, between Laurel Street and Washington Street, is identified by the City of San Diego as a Focused Opportunity Area, and as the Midway Community Plan Update progresses, the potential for economically viable redevelopment opportunities of the site and its adjacent properties will be analyzed.
3. Site Assessment

The site area identified by SANDAG for the Airport Intermodal Transit Center (ITC) is located along the north/eastern edge of the San Diego International Airport’s Lindbergh Field, approximately three miles northwest of downtown San Diego. The site is situated southwest of Interstate 5 and northeast of Pacific Highway with an area of approximately 28.78 acres. The proposed High-Speed Rail Station site is located adjacent to the ITC site to the south on 9.95 acres. The ITC site is bounded by Washington Street to the northwest, Hancock Street and Kettner Boulevard to the northeast and southeast, Vine Street to the south and Pacific Highway Frontage Road to the southwest.

The site rises in elevation approximately 25 feet from the Pacific Highway Frontage Road to the southwest up to the Hancock-Washington intersection to the northeast in a series of steps created by parking lots, building structures and smaller internal access roads. Interstate 5 is elevated another 35 feet above Hancock Street and Kettner Blvd. The hillside continues to climb north of the Interstate with a residential neighborhood overlooking the site and airport. The existing properties within the site contain mostly one and two story buildings built in the late 1950’s early 1960’s and are mostly nondescript concrete block and glass structures of no historic significance. The exceptions are handsome brick buildings located on Washington and Hancock Streets, including the historic Mission Brewery Plaza.

The existing railroad right of way with tracks for COASTER, Amtrak, Southern Pacific Rail and San Diego Trolley (Blue Line) runs the length of the site from the southeast to the northwest adjacent to the Pacific Highway Frontage Road. Spur tracks peel away to the west serving the military base at the northern edge of the Airport proper. Other features of the site area include on-and off-ramps for I-5 and an elevated portion of Pacific Highway.

**OPPORTUNITIES**

A  Washington Street provides acceptable gradient for buses, bicycles and pedestrians to connect to site under freeway.

B  Hancock Street and Kettner Boulevard both provide good site access opportunities.

C  Existing historic buildings anchor west end of site and provide place making opportunities.

D  Opportunity to emphasize views from site to Downtown San Diego and to the airport.

E  Opportunity to grade separate LRT train movements from vehicle movements at Washington Street and Sassafras Street due to future LRT volumes.

F  Utilizing a grade-separated train line creates an opportunity to provide a new east/west link between Pacific Highway and Kettner Boulevard. The additional connection may allow the Intermodal Transit Center (ITC) to function acceptably utilizing a one-way looping street system.

GEN  Pedestrian facilities (sidewalks) are provided on most two-way and residential streets in and surrounding the study area.

**CONSTRAINTS**

G  Existing on- and off-ramps are in conflict with potential for two-way vehicle movements, to serve future ITC, on Hancock Street and Kettner Boulevard.

H  The gated train crossing at Washington Street restricts traffic movements on Washington and could potentially impact the southbound I-5 off-ramp arriving at Washington Street and Hancock Street.

I  Access to ITC site from the SW Frontage Road is constrained by the existing single lane one-way street.

J  Views from neighborhood above look down onto site - Excessively tall structures would likely cause concerns.

K  Existing Bicycle facilities in area are limited to sections of northbound Pacific Highway between Sassafras and Witherby Streets.

L  One-way vehicle movements on Hancock and Kettner are potentially in conflict with ideal two-way vehicle movements serving future ITC.

M  Steep slopes on Sassafras Street and Vine Street under I-5 are undesirable for transit access.

N  Overhead ramps constrain opportunity for elevated trackway.

GEN  The San Diego Freeway (I-5) and Pacific Highway constrain both bicycle and pedestrian connections to and through the study area. Connectivity under I-5 is provided to adjacent neighborhoods at approximate 1/4 mile intervals while connections across Pacific Highway are spaced at approximately 1/2 mile intervals.

**EXISTING CIRCULATION AND ROADWAY NETWORK**

The existing transportation network surrounding the ITC site is dominated by the San Diego Freeway (I-5) and Pacific Highway. While the associated highway and freeway interchanges offer direct access to and from the ITC site, the current configuration and function of the off ramps and on ramps constrain potential future circulation patterns to serve the ITC. The existing one-way system of streets paralleling the freeway and Pacific Highway are separated by the existing heavy rail and LRT lines with limited connections between.

The area currently has a mix of facilities for pedestrians and cyclists. Sidewalks are generally present but are typically not buffered by parking or planting areas and in most cases are directly adjacent to relatively high speed vehicle lanes. Pedestrian crossings of the major streets surrounding the site are limited to large multilane intersections with very wide crossings. Bicycle facilities are largely absent with the exception of a northbound bicycle lane on portions of Pacific Highway.

The primary transportation challenges are expected to be:

- Adequately serving the access and circulation needs of the future ITC and existing/future businesses in the area.
- Limiting potential impacts to the freeway and highway interchanges surrounding the site or effected by ITC operations.
- Provision for safe, comfortable and convenient access for cyclists and pedestrians to and from the ITC and through the area.

The existing circulation and roadway network can be seen on Page 8 of this report.
Opportunities & Constraints

- **WASHINGTON STREET PROVIDES ACCEPTABLE GRADIENT FOR BUSES, BICYCLES AND PEDESTRIANS TO CONNECT TO SITE UNDER FREEWAY.**
- **HANCOCK STREET AND KETTNER BOULEVARD BOTH PROVIDE GOOD SITE ACCESS OPPORTUNITIES.**
- **EXISTING HISTORIC BUILDING ANCHORS WEST END OF SITE AND PROVIDE PLACE MAKING OPPORTUNITIES.**
- **OPPORTUNITY TO EMPHASIZE VIEWS FROM SITE TO DOWNTOWN SAN DIEGO AND TO THE AIRPORT.**
- **OPPORTUNITY TO GRACE SEPARATE LIT TRAIN MOVEMENTS FROM VEHICLE MOVEMENTS AT WASHINGTON STREET AND SANDIEGO STREET DUE TO FUTURE LIT VOLUMES.**
- **UTILIZING A GRADE SEPARATED TRAM LINE CREATES AN OPPORTUNITY TO PROVIDE A NEW EAST-WEST LINK BETWEEN PACIFIC HIGHWAY AND KETTNER BOULEVARD. THE ADDITIONAL CONNECTION MAY ALLOW THE INTERMODAL TRANSIT CENTER (ITC) TO FUNCTION ACCEPTABLY UTILIZING A ONE-WAY LOOPS STREET SYSTEM.**

**GEN**

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**CONTRAINTS**

- **EXISTING ON AND OFF RAMPS ARE IN CONFLICT WITH POTENTIAL FOR TWO-WAY VEHICLE MOVEMENTS, TO SERVE FUTURE ITC, ON HANCOCK STREET AND KETTNER BOULEVARD.**
- **THE TUNNEL CROSSING AT WASHINGTON STREET RESTRICTS TRAFFIC MOVEMENTS ON WASHINGTON AND COULD POTENTIALLY IMPACT THE SOUTH BOUND 16-OFF-RAMP ARRIVING AT WASHINGTON STREET AND HANCOCK STREET.**
- **ACCESS TO SITE FROM THE 55 FRONTAGE ROAD IS CONSTRANGED BY THE EXISTING SINGLE LANE ONE-WAY STREET.**
- **VIEWS FROM NEIGHBORHOOD ABOVE LOOK DOWN ONTO SITE - TALL STRUCTURES WILL LIKELY CAUSE OBSCURS.**
- **BICYCLE FACILITIES IN AREA ARE LIMITED TO SECTIONS OF NORTHBOUND PACIFIC HIGHWAY BETWEEN SASSAFRAS AND WHITNEY STREET.**
- **ONE-WAY VEHICLE MOVEMENTS ON HANCOCK AND KETTNER ARE POTENTIALLY IN CONFLICT WITH IDEAL TWO-WAY VEHICLE MOVEMENTS SERVING FUTURE ITC.**
- **STEEP SLOPES ON SASSAFRAS STREET AND VINE STREET UNDER 16 ARE UNDESIRABLE FOR TRANSIT ACCESS.**
- **OVERHEAD RAMPS CONSTRAIN OPPORTUNITY FOR ELEVATED TRAMWAY.**
- **THE SAN DIEGO FREEWAY (5) AND PACIFIC HIGHWAY CONSTRAINT BOTH BICYCLE AND PEDESTRIAN CONNECTIONS TO AND THROUGH THE STUDY AREA. CONNECTIVITY UNDER 16 IS PROVIDED TO ADJACENT NEIGHBORHOODS AT APPROXIMATELY 1 MILE INTERVALS WHILE CONNECTIONS ACROSS PACIFIC HIGHWAY ARE SPACED AT APPROXIMATELY 3 MILE INTERVALS.
3. SITE ASSESSMENT - Context Photos
Existing Conditions (continued)
Existing Circulation and Roadway Network
4. Design Elements / Requirements

Key to the planning effort was consideration of the site’s required design elements and the engineering realities of the new facilities’ trackwork and associated improvements, a discussion of which is provided below.

ITC Site Requirements

The first concept for the ITC facility was designed to accommodate all services at the ITC for local transit, Bus Rapid Transit, MTS Trolley, NCTD COASTER commuter rail, Amtrak passenger service, and to provide for road-based access to Lindbergh Field. The concept includes:

- Rail modifications, including potential for sidings or bypass tracks for trolley, and Amtrak
- Platform development for COASTER, trolley and Amtrak
- Bus loading/unloading bays
- Bus layover positions
- Transit patron parking facilities
- Kiss and ride facilities
- Pedestrian connections to CONRAC

The second concept included track and platforms for High Speed Rail, plus additional facilities to fully serve HSR passengers and provide amenities and revenue generation potential. These dedicated HSR facilities include:

- Taxi, limo, hotel shuttle bays
- Valet parking
- Passenger amenities including seating, travel retail, restaurants, appropriate services etc.
- Pedestrian connections to Airport Terminal Building
- Possible People Mover Connection to Airport Terminal Building.
- Car rental counters and car storage

The third concept assumes that a High Speed Rail station is provided at the ITC site, but all passenger handling facilities and services are provided on airport property as part of a future airport passenger processing facility on the north side of the airfield.

All three concepts were developed with two variations – with and without grade-separation of the heavy (COASTER, Amtrak, BNSF and Trolley) rail tracks.

**TRACK AND SITE FACILITY SPACE PROGRAM REQUIREMENTS**

A key component of the planning effort involves determining the space requirements of the ITC facility. Based on discussions with Airport and Agency staff, the following baseline space requirements were developed. Assumptions include:

- MTS Trolley LRT center platforms – 360 feet long, 3 tracks
- COASTER/Amtrak side platforms – 1000 to 1300 feet long
- MTS Bus – 12-45 foot bus bays, 2 layover bays

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<td>Traction power substation</td>
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<td>Communications room</td>
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<td>Storage</td>
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<td>Transit personnel offices assume 10 @ 10’x12’ = 120sf</td>
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<tr>
<td>Employee restrooms with lockers 2 @ 400sf</td>
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<td>Passenger Facilities</td>
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<td>Ticketing/information/counter offices</td>
<td>20’x50’ = 1,000sf</td>
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<td>Waiting area and circulation sized for up to 400</td>
<td>400x7.5sf = 3,000sf</td>
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<td>Restrooms 2 20’x40’ = 800sf</td>
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<td>Bike Station</td>
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<td>Restaurant 30sf/person (includes kitchen etc)</td>
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IBI SANDAG Airport Intermodal Transit Center (ITC) December 2010

4. DESIGN ELEMENTS / REQUIREMENTS
4. Design Elements / Requirements (continued)

Track Requirements for the Grade-Separated Variations

RAIL GRADE SEPARATIONS

There are four existing tracks adjacent to the ITC site that are used primarily by COASTER, Amtrak, BNSF and the Trolley. Grade separations of the existing and future tracks were considered for the ITC without HSR and with HSR. The need for grade separation, the engineering considerations, and the potential cost were considered as part of the analysis. The results are discussed below.

LRT GRADE SEPARATION

With the addition of the Mid-Coast LRT line, and future increases in Trolley frequency, 32 light rail trains are forecast to pass through the area each hour. With a train crossing every two minutes on average, the need for grade separation at Washington Street and Sassafras Street is compelling. The analysis assumed LRT grade separation to be an essential element of the ITC project. The limits of the LRT grade separation would extend from north of Noell Street to the northern end of the existing Middletown Station platform north of Palm Avenue, a length of approximately 4900 feet. The existing two Trolley tracks would be expanded to three tracks and serve two center platforms at the Airport ITC. The order of magnitude cost estimate for the LRT grade separation is $552 million.

Due to the staging of the trench, the Washington Street and Sassafras Street bridges may need to be two-span structures with central supports located between the two sets of tracks. Alternately, temporary bridges could be used to span the first stage of trench construction and could later be replaced with prestressed single-span bridges that do not require supports between the two sets of tracks. The drawback of this option is that the structure depths are not as efficient as cast-in-place post tensioned box girder structures. Another alternative would be to construct cast-in-place post tensioned box girder structures for the full width of the final trench during the first stage of the trench construction.

HEAVY RAIL GRADE SEPARATION

The estimated number of heavy rail crossings in the future is eight trains per hour. The horizontal alignment of the proposed Amtrak/COASTER/BNSF tracks (commuter rail) would generally follow the existing alignment within the MTS right-of-way from Witherby Street to Washington Street. However, due to the need to maintain a maximum grade of 1.5%, the limits of the grade separation would extend much further than the LRT-only grade separation, from Witherby Street to near Laurel Street, at least 8600 feet and potentially further still if detailed operational modeling reveals that the 1.5% grade is too steep to support heavy rail operations in this segment.

The commuter rail tracks located on the west side of the corridor would expand from two tracks to three tracks with the two westerly tracks serving the proposed center platform for COASTER/Amtrak at the ITC and the one easterly bypass track that would mostly be used by freight trains. The six-track alignment for the combined commuter rail and light rail at the ITC would then converge back to a four-track alignment near Sassafras Street and tie-in to the existing horizontal and vertical alignment near Laurel Street.

The maximum depth of the commuter rail trench is anticipated to be approximately 35 feet below existing grade to allow for clearance below local street bridges that will cross the trench and to allow for ballast and cross slopes for drainage. The maximum depth of the excavation is approximately to elevation -15 feet. The water table is anticipated at approximately elevation +5 feet. Because of the high water table and the sandy soils of the area, a relatively watertight excavation system will be needed. Because of the depth of the excavation and the high overburden from adjacent railroad tracks and buildings, a tie-back system is likely needed to reduce the cost of the shoring. The tiebacks will have to go outside of the MTS right of way and can be either permanent or temporary.

Many municipalities do not allow permanent tiebacks within their right of way which shall be evaluated in future discussions with the City of San Diego. Not allowing permanent tie-backs will affect the unit cost of the final trench walls since they will need to be cantilevered. The preliminary cost estimate assumes that temporary tiebacks will be used, but that they will not be part of the final wall structural system. The high water table will also require that a seal slab be placed and may require that both the seal slab and the structural slab be anchored, due to the long spans of the slabs between the walls. Anchoring methods might include auger-cast piles with threadbars or other tie-down methods.

GRADE SEPARATION CONCLUSION

The need for grade separating the LRT tracks is clear, considering the growth in both LRT crossings and traffic volumes on Washington Street and Sassafras Street. For an estimated cost of $562 million, 80% of the hourly crossings (32 of 40) would be separated. The estimated cost of a trench that would accommodate LRT and heavy rail is at least $850 million for the 8,600 foot configuration, and potentially more if the trench would need to extend further into downtown. At this point, it does not appear to be cost effective to expend the additional $280 million to separate only the additional 20% (i.e., 8 of 40) heavy rail crossings per hour.
4. Design Elements / Requirements (continued)

I-5 SOUTHBOUND / PACIFIC HIGHWAY VIADUCT REPLACEMENTS

Several of the existing column foundations for the viaducts conflict with the trench construction. These bridges were constructed in 1963, making them nearly 50 years old. They were retrofitted in 1992 with steel column casings and footing and abutment retrofits. The current planning estimates assume replacement of the I-5/Pacific Highway viaduct structures with new viaduct structures similar in overall length and width to the existing structures, but with longer spans that would span the rail trench. The layout and staging of the new structures will need to be evaluated in subsequent phases of study.

Conceptual plans, profiles and cross-sections of the grade-separation may be found in the appendix.

HIGH SPEED RAIL (HSR) TRACK CONFIGURATION (CONCEPTUAL)

The HSR alignment shown in the appendix is a conceptual alignment provided by the California High Speed Rail Authority (CHSRA) for planning purposes and is subject to change. The HSR alignment consists of 2-mainline tracks between the proposed commuter rail/light rail trench and the I-5 freeway that expands and terminates into a 6-track alignment with 3-center platforms at the ITC. The current ITC planning will accommodate this 6-track/3-platform configuration based on feedback received from the CHSRA team, which is currently in the Alternatives Analysis process.

### HIGH SPEED RAIL TRACK AND SITE FACILITY SPACE PROGRAM REQUIREMENTS

- 3 – 1,400 foot long platforms, serving 6 tracks
- Parking structure for up to 6,000 cars (number being refined by CHSRA)
- Bays for taxi (6), limo (2), hotel bus shuttles (4)
- Valet Parking

<table>
<thead>
<tr>
<th>Passenger Facilities</th>
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<tbody>
<tr>
<td>Ticketing/information counters mezzanine</td>
<td>50’ x 50’ = 2,500sf</td>
</tr>
<tr>
<td>Waiting area and circulation sized for up to 600 passengers</td>
<td>600 x 7.5sf = 4,500sf</td>
</tr>
<tr>
<td>Restrooms (4)</td>
<td>800sf x 4 = 3,200sf</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td><strong>10,200sf</strong></td>
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</table>

<table>
<thead>
<tr>
<th>Other Facilities</th>
<th></th>
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<tbody>
<tr>
<td>Restaurant</td>
<td>30sf x 100 = 3,000sf</td>
</tr>
<tr>
<td>Newstand convenience shop (2)</td>
<td>2 x 800sf = 1,600sf</td>
</tr>
<tr>
<td>Coffee Shop (2)</td>
<td>2 x 800sf = 1,600sf</td>
</tr>
<tr>
<td>Gift Shop (2)</td>
<td>2 x 800sf = 1,600sf</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td><strong>7,800sf</strong></td>
</tr>
</tbody>
</table>
5. Preliminary Alternatives

A series of preliminary alternatives for the ITC site were developed based on initial consultation with project partners, and focused on identifying feasible alternatives to advance for further study. These alternatives each had unique approaches to grade separation, traffic circulation, transit access points, and the presence of high-speed rail. The six alternatives are presented below. Transit Center facilities are shown in RED, the Pedestrian Bridge is shown in BLUE, and mixed-use commercial buildings are shown in PURPLE.

**ALTERNATIVE 1A**
- Bus transit plaza below parking
- Grade separation of rail
- One-way street system
- No high speed rail

**ALTERNATIVE 2A**
- Bus transit below parking
- Grade separation of rail
- One-way street system
- High speed rail

**ALTERNATIVE 1B**
- Bus transit plaza below parking
- No grade separation of rail
- No high speed rail

**ALTERNATIVE 2B**
- Bus transit below parking
- No grade separation of rail
- Two-way street system
- High speed rail

**ALTERNATIVE 1C**
- Bus transit on street
- Grade separation of rail
- One-way street system
- No high speed rail

**ALTERNATIVE 2B**
- Bus transit below parking
- Grade separation of rail
- One-way street system
- High speed rail

**ALTERNATIVE 3A**
- Bus transit below parking
- Grade separation of rail
- One-way street system
- High speed rail
- Combined transit center at airport terminal

*Note: Due to the expected growth in the number of trains per hour in the future, grade separation of the LRT tracks is required. The need for grade separation of the heavy rail and HSR tracks is still to be determined.*
5. Preliminary Alternative 1A
5. Preliminary Alternative 1B
5. Preliminary Alternative 1C
5. Preliminary Alternative 2A
5. Preliminary Alternative 2B
5. Preliminary Alternative 3A

5. Preliminary Alternative 3A
6. Preferred Alternative: Opening Day

OPENING DAY OPTION
Based on project team feedback, the following alternative was identified as the preferred concept for the Opening Day of the ITC facility. Key elements of the design are identified below.

UNIQUE QUALITIES
- High Speed Rail (HSR) facilities are not built in this alternative; however, the station is designed to accommodate and interface with an HSR facility on the land immediately to the south.
- The plan provides 126K sq. ft. of commercial development opportunity west of the Intermodal Transit Center (ITC).

QUALITIES COMMON TO ALL ALTERNATIVES
- Street system maintains existing one-way configuration and I-5 on/off-ramp system.
- New two-way street crossing of grade separated LRT tracks at Vine St. is utilized to accommodate the Intermodal Transit Center (ITC) circulation and navigation needs.
- Grade separation of LRT tracks, below street level, addresses anticipated increased impacts at existing grade crossings at Washington St. and Sassafras St.
- ITC bus platforms/bays are provided on the reconfigured streets surrounding the ITC including: three bays on Pacific Highway Frontage Road, four spaces on the new overpass at Washington St., and three spaces on Hancock St. in front of the ITC.
- 360 parking spaces for the ITC are accommodated in surface lots west of the ITC.
- Surface parking lots are designed to accommodate modular future development above. The current grade change between Hancock St. and the existing tracks appears sufficient to allow passenger vehicle parking below commercial/retail uses fronting on Hancock St.
- Facilities for cyclists are provided on street surrounding the ITC in the form of raised bicycle lanes and separated cycletracks.
- Wide sidewalks accommodate pedestrians and commercial/retail activity and curb extensions improve pedestrian visibility and crossing safety.
- Kiss and ride parking spaces are provided on-street in front of ITC.
- On-street parking is provided where possible to support future retail/commercial.
- Curb extensions and planting/parking strips provide opportunities to employ green street strategies on impacted/new streets.
6. Preferred Alternative: Opening Day Project Limits
6. Preferred Alternative: High-Speed Rail/Concept A

HIGH SPEED RAIL CONCEPT A

Based on project team feedback, the following alternative was identified as one of two preferred concepts for the ITC facility upon introduction of High-Speed Rail service to the location. Key elements of the design are identified below.

UNIQUE QUALITIES

- A 13-bay bus transit interchange is provided on top of the High Speed Rail (HSR) station box.
- Up to 9 levels of parking for up to 6000 vehicles are provided above the bus transit interchange and HSR.
- The plan provides 150K sq. ft. of commercial development opportunity west and east of the Intermodal Transit Center (ITC) with a small amount of commercial possible above the HSR.

QUALITIES SHARED WITH ONE OTHER ALTERNATIVE

- HSR facilities are accommodated underground east of the ITC with head houses at both the ITC plaza and at Sassafras St. at the street level.
- An automated people mover provides connections from the south end of the pedestrian bridge at the ITC and HSR to existing and future airport terminals/concourses.

QUALITIES COMMON TO ALL ALTERNATIVES

- Street system maintains existing one-way configuration and I-5 on/off-ramp system.
- New two-way street crossing of grade separated LRT tracks at Vine St. is utilized to accommodate the Intermodal Transit Center (ITC) circulation and navigation needs.
- Grade separation of LRT tracks, below street level, addresses anticipated increased impacts at existing grade crossings at Washington St. and Sassafras St.
- ITC bus platforms/bays are provided on the reconfigured streets surrounding the ITC including: three bays on Pacific Highway Frontage Road, four spaces on the new overpass at Washington Street, and three spaces on Hancock St. in front of the ITC.
- 360 parking spaces for the ITC are accommodated in surface lots west of the ITC.
- Surface parking lots are designed to accommodate modular future development above. The current grade change between Hancock and the existing tracks appears sufficient to allow passenger vehicle parking below commercial/retail uses fronting on Hancock St.
- Facilities for cyclists are provided on street surrounding the ITC in the form of raised bicycle lanes and separated cycletracks.
- Wide sidewalks accommodate pedestrians and commercial/retail activity and curb extensions improve pedestrian visibility and crossing safety.
- Kiss and ride parking spaces are provided on-street in front of ITC.
- On-street parking is provided where possible to support future retail/commercial.
- Curb extensions and planting/parking strips provide opportunities to employ green street strategies on impacted/new streets.
6. Preferred Alternative: High-Speed Rail/Concept A ITC Facility
6. Preferred Alternative: High-Speed Rail/Concept A Project Limits
6. Preferred Alternative: High-Speed Rail/Concept B

HIGH SPEED RAIL CONCEPT B
Based on project team feedback, the following alternative was identified as the second of two preferred concepts for the ITC facility upon introduction of High-Speed Rail service to the location. Key elements of the design are identified below.

UNIQUE QUALITIES
• Bus interface for High Speed Rail (HSR) and Airport are combined at the airport.
• Parking for HSR and Airport are combined in a shared parking facility at the airport.
• The plan provides 212K sq. ft. of commercial development opportunity west and east of the Intermodal Transit Center (ITC) and above the HSR.

QUALITIES SHARED WITH ONE OTHER ALTERNATIVE
• HSR facilities are accommodated underground east of the ITC with head houses at both the ITC plaza and at Sassafras street at the street level.
• An automated people mover provides connections from the south end of the pedestrian bridge at the ITC and HSR to existing and future airport terminals/concourses.

QUALITIES COMMON TO ALL ALTERNATIVES
• Street system maintains existing one-way configuration and I-5 on/off-ramp system.
• New two-way street crossing of grade separated LRT tracks at Vine St. is utilized to accommodate the Intermodal Transit Center (ITC) circulation and navigation needs.
• Grade separation of LRT tracks, below street level, addresses anticipated increased impacts at existing grade crossings at Washington St. and Sassafras St.
• ITC bus platforms/bays are provided on the reconfigured streets surrounding the ITC including: three bays on Pacific Highway Frontage Road, four spaces on the new overpass at Washington Street, and three spaces on Hancock Street in front of the ITC.
• 395 parking spaces for the ITC are accommodated in surface lots west of the ITC.
• Surface parking lots are designed to accommodate modular future development above. The current grade change between Hancock and the existing tracks appears sufficient to allow passenger vehicle parking below commercial/retail uses fronting on Hancock street.
• Facilities for cyclists are provided on street surrounding the ITC in the form of raised bicycle lanes and separated cycletracks.
• Wide sidewalks accommodate pedestrians and commercial/retail activity and curb extensions improve pedestrian visibility and crossing safety.
• Kiss and ride parking spaces are provided on-street in front of ITC.
• On-street parking is provided where possible to support future retail/commercial.
• Curb extensions and planting/parking strips provide opportunities to employ green street strategies on impacted/new streets.
6. Preferred Alternative: High-Speed Rail/Concept B ITC Facility
6. Preferred Alternative: High-Speed Rail/Concept B Project Limits
7. Preliminary Cost Estimates

Cost estimates should be considered as "order-of-magnitude" until architectural and engineering design occurs for the station building and associated facilities. The construction and project costs estimates are summarized below. The detailed buildups may be found in the appendix.

### ITC FACILITY

<table>
<thead>
<tr>
<th>Item Description</th>
<th>Estimated Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bus Transit Platforms Under Garage</td>
<td>$9,225,600</td>
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<tr>
<td>Bus Transit Platforms Open w/Vertical Circ</td>
<td>$4,432,000</td>
</tr>
<tr>
<td>Pedestrian Plazas</td>
<td>$3,850,000</td>
</tr>
<tr>
<td>Transit Center Facilities</td>
<td>$8,665,700</td>
</tr>
<tr>
<td>Trolley Platforms</td>
<td>$4,600,000</td>
</tr>
<tr>
<td>Amtrak COASTER Platform and Cano-</td>
<td>$3,860,000</td>
</tr>
<tr>
<td>New Constructed Streets</td>
<td>$9,204,140</td>
</tr>
<tr>
<td>ITC Parking Structure</td>
<td>$540,000</td>
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<tr>
<td>Pedestrian Bridge</td>
<td>$31,062,500</td>
</tr>
<tr>
<td>Retail</td>
<td>$9,600,000</td>
</tr>
<tr>
<td>Subtotal ITC Elements</td>
<td>$84,680,740</td>
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<tr>
<td>Utilities</td>
<td>$1,693,615</td>
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<td>Subtotal ITC Elements &amp; Utilities</td>
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<tr>
<td>Soft Costs</td>
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<td>Subtotal ITC Construction</td>
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<td>Subtotal Right of Way</td>
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<td>Mobilization (Applied to Construction)</td>
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<td><strong>Total ITC Facility Cost Estimate</strong></td>
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### LRT GRADE SEPARATION

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<tr>
<th>Item Description</th>
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<tbody>
<tr>
<td>Site Preparation</td>
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<tr>
<td>Removal and Demolition</td>
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<tr>
<td>Track Trench</td>
<td>$157,142,500</td>
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<tr>
<td>Grade Separations</td>
<td>$3,210,000</td>
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<tr>
<td>Trackwork</td>
<td>$12,200,000</td>
</tr>
<tr>
<td>Systems and RR Signals</td>
<td>$9,500,000</td>
</tr>
<tr>
<td>Earthwork</td>
<td>$15,187,500</td>
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<tr>
<td>*Environmental items (see note)</td>
<td>$3,000,000</td>
</tr>
<tr>
<td>Drainage</td>
<td>$1,000,000</td>
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<tr>
<td>Utilities</td>
<td>$9,000,000</td>
</tr>
<tr>
<td>I-5/Pacific Highway Viaduct Replacement</td>
<td>$74,450,000</td>
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<tr>
<td>Subtotal Grade Separation Elements</td>
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<td>Soft Costs</td>
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<td>Subtotal Grade Separation Construction</td>
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<td>Subtotal Right of Way</td>
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<td>Contingency</td>
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<tr>
<td><strong>Total LRT Grade Separation Cost Estimate</strong></td>
<td><strong>$551,634,305</strong></td>
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* Environmental Items (These items may or may not be necessary depending on the conditions discovered in the field after contract award):
  - Excavation and Disposal of Unsuitable Soil.
  - Excavation and Disposal at a Class 1 Landfill of Hydrocarbon Contaminated Soil.
  - Treatment of Groundwater for Physical Parameters (Turbidity and Solids) and Discharge of Treated Water through a national pollution discharge elimination system (NPDES) permit.
8. Design Principles

The Airport ITC will be more than simply a vital and vibrant intermodal hub. Its strategic location and setting will literally make it a "Grand Entrance" to the city and region. With that in mind, the station must be designed to be iconic as well as functional.

1. ARCHITECTURAL DESIGN
   Provide a high architectural and urban design quality to the principal gateway. While the final architectural look and feel will be the subject of future design charrettes and community input, it should strive to be a source of pride for San Diego as the stations show on the following page are to their cities.

2. ENERGY EFFICIENCY AND SUSTAINABILITY
   A building integrated photovoltaic solar electric roofing system will be used to produce electricity needs for the station building. LEED Gold or Platinum status is encouraged.

3. OUTDOOR ROOMS
   Plaza areas that link the station to the surrounding community are one of the most important contributions that the station development can provide. The plaza area on the north side of the rail corridor should be designed to blend with the Washington corridor so that the station plaza becomes a terminus to that street and a pleasant public space. Ample, hard-surfaced plazas should be used to accommodate large groups or individuals in comfort; pageantry elements should also be introduced to include lighting standards, banner poles, casual seating, bollards, bicycle racks and even small retail kiosks.

4. PARKING
   Parking structure design should be visually attractive so that the apparent mass of the structures is minimized for the pedestrian. Each parking structure should have ingress / egress to the street and have superior lighting and surveillance. Traffic management systems should be used to alert customers to the number and location of available stalls in parking lots and to facilitate balanced use of both parking structures.

5. PEDESTRIAN LINKAGES
   As seamless a transition from the automobile to trains/buses, and planes as possible should be pursued. Facilitate pedestrian comfort and circulation at the station. Promote cycling through providing a bicycle path connection and bicycle storage facilities at the station. Continuous sidewalks should be implemented in the immediate neighborhood.

6. SIGNAGE
   Building identity and directional signage that is clear and understandable to pedestrians and park-and-ride users should be used both outdoors and within the station building. A signage program should be developed to provide a consistent design standard for the facility.

7. PUBLIC ART
   Public art should be promoted at the station both within the building itself and in plaza areas. A ½ percent of the construction budget should be dedicated to public art.
Station Precedent Photos
9. Phase 2 Next Steps

The Phase 1 effort established the physical feasibility of locating an Intermodal Center at Lindbergh Field, and developed the opening day and ultimate configuration of the facility. The effort in Phase 2 will focus on providing additional detail on the following key aspects of the opening day facility.

CONCEPT REFINEMENT

This task will further refine the Phase 1 ITC project components and costs similar to a Caltrans Project Study Report (PSR). The focus of this task will be on relatively minor refinements to enhance the connection to CONRAC, and the provision of renderings for meetings, presentations, and the final report.

Subtasks include:

• Develop a layout of Phase 1 onsite ITC station facilities to accommodate local transit, BRT, the trolley, COASTER and Amtrak with minimum amenity levels and facilities.

• Develop offsite rail modifications necessary to serve Phase 1 ITC.

TRAFFIC CIRCULATION PLAN AND TRANSIT OPERATING PLAN

Destination Lindbergh included a preliminary circulation concept to directly connect the ITC and new northside airport facilities to each other and Interstate 5. This task will further develop the ultimate ground access plan to the ITC and the necessary improvements for Phase 1. A detailed analysis of access, both vehicular and transit, will be developed. A high level consideration of options for the Washington Street and Sassafras Street grade separations will be provided. Subtasks include:

• Develop an ultimate circulation plan and access road system for the ITC and northside airport facilities.

• Prepare a recommended list of circulation improvements to provide access to Phase 1 of the ITC.

• Develop an Opening Day Transit Operating Plan for Phase 1 of the ITC.

• Review/validate transit patronage estimates from Destination Lindbergh study.

• Evaluate existing and Phase 1 LOS on access roads and surrounding arterials and recommend mitigation measures for significant impacts.

REFINED COST ESTIMATES

Evaluate the financial feasibility of the ITC itself with refined cost data and assess the financial feasibility of Phase 1 opening day improvements.

• Develop a preliminary environmental assessment to identify any significant environmental impacts and facilitate management of project risks related to future environmental analysis.

• Prepare planning-level capital and operating cost estimates for improvements.

FUNDING STRATEGIES

Develop a financial funding strategy and implementation schedule for Phase 1. Estimate the amount of funding that can be expected, and the likely revenue sources from which the funding will be derived. The financial element may also recommend the development of specified new sources of revenue, consistent with the policy element and action. Develop an implementation schedule for the Phase 1 program of projects.

DEVELOPMENT OF POLICY RECOMMENDATIONS

Identify any new policies or funding mechanisms necessary to successfully implement the funding strategy for the Phase 1 ITC.
10. Appendix: Cost Estimate

<table>
<thead>
<tr>
<th>No.</th>
<th>Item Number</th>
<th>Item Description</th>
<th>Unit of Measure</th>
<th>Estimated Quantity</th>
<th>Unit Price</th>
<th>Total Price</th>
<th>Remarks/Assumptions</th>
</tr>
</thead>
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<td>1.3</td>
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<td>Parking Operations</td>
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**Cost Estimate Summary**

<table>
<thead>
<tr>
<th>Item Description</th>
<th>Unit of Measure</th>
<th>Estimated Quantity</th>
<th>Unit Price</th>
<th>Total Price</th>
<th>Remarks/Assumptions</th>
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</tr>
</tbody>
</table>

**Notes:**
1. **Project:** SANDAG Airport Intermodal Transit Center (ITC)
2. **Location:** Location of the project
3. **Timeline:** Proposed timeline for completion
4. **Budget:** Total budget for the project
5. **Funding:** Sources of funding for the project
6. **Schedule:** Milestone schedule for the project

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**IBI Team:**

**SANDAG Airport Intermodal Transit Center (ITC)**

**December 2010**

**10. APPENDIX - Cost Estimate**

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10. Appendix: HST Plan and Profile
10. Appendix: COASTER/Amtrak Trench Plan and Profile
10. Appendix: Trolley Plan and Profile
10. Appendix: Typical Trench Cross Sections