

2.0 Executive Summary

Introduction

This Milestone Report, the second in a series of eleven, is the System Concepts and Evaluation Criteria Milestone. Milestone 2 sets the focus of the technical work for the balance of the study through the development of a list of system requirements and goals; project criteria for evaluating alternatives; identification of a range of general system concepts that meet the requirements of the project; the development of the preliminary opportunities and constraints analysis of the study area and approach to base mapping.

The purpose of Milestone 2 is to provide the source document for the fundamental reasoning behind the study. Milestone 2 shapes the development of the project alternatives and defines a set of measurement standards that can be used to evaluate the alternatives. Further, Milestone 2 identifies system concepts that satisfy the project goals and objectives. Milestone 2 forms the foundation for subsequent phases of the study.

Milestone 2, Systems Concepts and Evaluation Criteria, is composed of five sections as detailed in Sections 2.1 through 2.5 following this Executive Summary. The key components of Milestone 2 are:

- 2.1 System Goals and Requirements
- 2.2 Project Evaluation Criteria
- 2.3 System Concepts
- 2.4 Opportunities and Constraints
- 2.5 Base Mapping

System Goals and Requirements

System Goals and Requirements, Section 2.1 in Milestone 2, presents the goals, objectives, roles, guiding principles and preliminary functional requirements that are intended to serve as a starting point for the project. These points are used to stimulate discussion on the major issues that must be addressed over the course of this study. The ensuing vision will define the key features and characteristics of the system, and define the range and types of system elements being considered in the project.

The primary goals of the system are to:

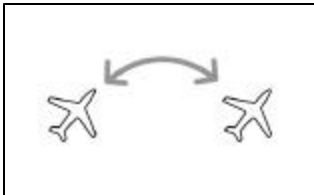
- Provide for improved ground connections for both air passenger and cargo demand to and between major regional airports;
- Provide an alternative transportation choice to avoid traffic congestion in this major travel corridor;
- Improve travel access and efficiency in this high-density, fast-growing corridor;
- Enhance regional connections by providing more ways to move people and goods;
- Improve transportation safety by providing a safe mode of travel that is physically separated from other ground modes;
- Provide for an expandable high-speed transit system in the region and statewide;

- Foster an expanded employment base by connecting jobs with more lifestyle options;
- Reduce costly and environmentally disruptive expansion of freeways in the corridor;
- Improve regional air quality by reducing vehicle emissions;
- Support local and regional economic and land development goals at all stations and facilities;
- Provide selected freight shipments as a commercial enterprise.

A set of guiding principles is applied in the development of system alternatives. Guiding principles are ideals that should be kept in mind when planning the system and developing the system alternatives. Guiding principals that should form the foundation in the planning of the project include:

- Plan For The Future, Not The Present
- Make It Pay Its Own Way
- Make It Affordable And Buildable
- Make It Easy To Live With
- Keep the Community Informed

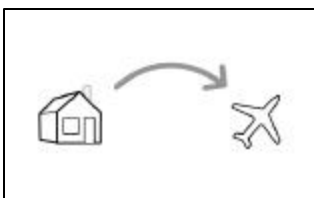
To meet the goals of the project, the system, or at least certain segments of the system would need to fulfill five identified major roles:



1. Airport Connector. Under this role, the system would act as a quick, limited-access shuttle connection linking LAX to VNY and PMD. The intent of this connection is to relieve ground and air congestion at LAX by using a "networked airport" whereby passengers and baggage would, for example, arrive on an international flight at LAX, board the system to PMD, and board a connecting regional flight there.

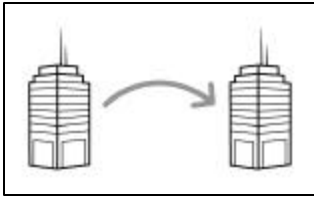


2. Congestion and Air Quality Reliever. This role is aimed at reducing non-airport related congestion by providing high-speed access between population and employment centers. Commuters would access the system, by their own cars, taxi or bus service, for a congestion-free ride to their places of employment. Although primarily aimed at providing congestion relief, this role provides an alternative mode of travel for many trips in West Los Angeles County, including education, shopping, personal business and tourism.

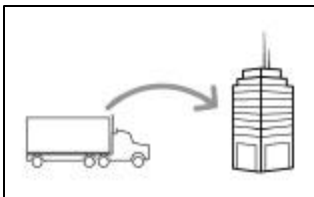


3. Airport Feeder. In this role, the system would relieve ground access congestion at LAX by providing a quick and convenient connection to LAX and PMD from population and employment centers in West Los Angeles County. Similar to the current Flyaway service offered at Van Nuys,

passengers could check in at a station, then ride to their selected airport.



- 4. Intra-regional Connector.** This is a longer-term goal, which begins to recognize the intimate relationship between access to transportation and the arrangement of land uses. By providing a high-speed connection, places that many consider to be “outside” the urban area, such as Palmdale and Lancaster, begin to be seen as seamlessly connected to the rest of the urbanized area, promoting more corrective and comprehensive land-use planning.



- 5. Freight Carrier.** The system can be designed to have the capacity and ability to carry specifically designed cars that use freight containers for easy handling and boarding. It is anticipated that freight would be containerized and prepared before a train arrives. Containers could be loaded concurrent with passenger boarding.

The functional requirements of each role are discussed in detail in Section 2.1 of the Milestone 2 Report. Based on the discussions of issues in Section 2.1, the following Table 2.0-1 summarizes the preliminary functional requirements for four major roles of the system (the Freight Carrier role concluded that no special provisions should be made for that role – any freight will be handled as part of the general baggage handling functions of the Airport Connector and Airport Feeder roles).

Table 2.0-1
SUMMARY OF PRELIMINARY FUNCTIONAL REQUIREMENTS

System Element	System Roles			
	Airport Connector	Congestion Reliever	Airport Feeder	Regional Connector
Span of Service	24/7	6am - 8 pm	24/7	5 am - 12 pm
Fares	"Invisible" to user - part of airline ticket	Competitive with driving and parking	Competitive with shuttles and parking	Low, to attract spontaneous travel
Frequency	Frequent; scheduled or unscheduled	As required for high-capacity and low travel time	Frequent; scheduled or unscheduled	Frequent; unscheduled
Travel Time/Cruising Speed	<90 minutes terminal-to-terminal minimum - About 100 mph <60 minutes terminal-to-terminal desirable - About 250 mph	25-50% faster than congested auto - About 160 mph	25-50% faster than congested auto - About 160 mph	<1 hour PMD to Union Station - About 200 mph
Capacity	TBD	50,000+ passengers per hour	TBD	50,000+ passengers per hour
Station Spacing	At airports only	20-30 miles	20-30 miles	10-15 miles
Offline Stations	Not required	Desirable	Desirable	Highly Desirable
Station Amenities	<ul style="list-style-type: none"> Airline check-in facilities Dedicated baggage platforms 	<ul style="list-style-type: none"> Capacity to accommodate flows of 3,000 - 12,000 peak-period passengers 1,000 - 4,000 park-and-ride spaces Adequate bus, shuttle and taxi areas Restrooms, kiosks 	<ul style="list-style-type: none"> Airline check-in facilities Dedicated baggage platforms 	<ul style="list-style-type: none"> Capacity to accommodate flows of 3,000 - 12,000 peak-period passengers 1,000 - 4,000 park-and-ride spaces Adequate bus, shuttle and taxi areas Restrooms, kiosks
Vehicle Amenities	<ul style="list-style-type: none"> 100% Seated capacity Overhead luggage bins Luggage Racks Dedicated baggage section/car 	<ul style="list-style-type: none"> 100% Seated capacity Overhead luggage bins 	<ul style="list-style-type: none"> 100% Seated capacity Overhead luggage bins Luggage Racks Dedicated baggage section 	<ul style="list-style-type: none"> 100% Seated capacity Overhead luggage bins
Connections	Direct terminal access from station; or access to people-mover or other high-quality shuttle	Direct transfers to Metro, Metrolink, bus and taxi	Direct terminal access from station; or access to people-mover or other high-quality shuttle	Direct transfers to Metro, Metrolink, bus and taxi
Transfers	Not tolerable	Tolerable, if competitive travel time maintained	Undesirable	Tolerable, if competitive travel time maintained
Passenger Information	Critical - high number of infrequent users	Important	Critical - high number of infrequent users	Important

Project Evaluation Criteria

The project evaluation criteria are a set of measurement standards that can be used to gauge the effectiveness and viability of alternative transit system configurations in Northwestern Los Angeles County. The screening of project alternatives will be conducted in two phases, Long-List Evaluation Criteria and Short-List Evaluation Criteria.

Long-List Evaluation Criteria

The Long-List Evaluation Criteria are used to screen the range of all potential alternatives down to a short-list of three alternatives that will be subjected to more detailed engineering and environmental studies. The broader evaluation criteria are as follows:

- Ridership Potential
- Operational Impacts
- Engineering/Capital and Operations & Maintenance Costs
- Cost-Effectiveness
- Environmental Impacts
- Public and Agency Comments
- System Continuity

Short-List Evaluation Criteria

The Short-List Evaluation Criteria subjects the three short-list alternatives to a more rigorous evaluation in a process to reveal the potential benefits and shortcomings of each alternative. Short-List Evaluations will be conducted in the subsequent milestones that cover Ridership Forecasts, Environmental Evaluations and Engineering/Cost Estimates. The evaluation criteria follows specific criteria derived from federal guidelines. They are as follows:

- Safety
- Ridership and Travel
- Regulatory/Permitting
- Construction
- Environmental/Physical
- Connectivity
- Community Acceptance/Economic Potential
- Personal Traveler Criteria
- Job Creation/Project Benefits
- Implementation
- Financial and Partnering

Because of the relationship of this project to the Phase 1 Maglev Deployment Project, additional Federal Railroad Administration (FRA) relevant guidelines for the national maglev competition will also be considered. The criteria are as follows:

- Maximization of Partnering Potential
- Developed Cost Forecasts

- Private Operations and Maintenance Plan
- Positive Benefit/Cost Ratio
- Financable with Available Funds
- Technology Transfer
- Satisfaction with Statewide/Regional Planning Requirements
- Approvable by FRA
- Maximizing Use of US Materials
- Nationally Significant Project
- Attractiveness to Travelers
- Maximization of Congestion Relief
- Ability to Operate in Varying Conditions

System Concepts

The Systems Concepts, Section 2.3 in Milestone 2, presents the results of an initial review of technologies and routings that will form the basis of developing a long-list of potential alternatives for the project. First, possible modes and technologies (and to an extent products that might be used in one or more technology alignment alternatives), are assessed. This technology assessment is then used to examine and screen general routing and technology alternatives. The surviving alternatives will be examined in more detail in Milestone 3 (Route Alignment and Technology Alternatives).

Information about potential technologies and related suppliers, projects and operating systems is provided in Section 2.3. This is a representative list with the major suppliers, but does not include every possible supplier, technology, or project. Information is organized by the following categories:

1. Technologies initially considered but not carried forward.
2. High-speed, quality bus.
3. Conventional rail.
4. High-speed rail.
5. High-speed maglev.

Further, technology evaluation criteria are also introduced. The criteria include:

- System Performance
- Technology Applicability
- Project Fit
- Supplier/Team Qualifications

The purpose of the system concept is to develop a base and systematic approach to identifying the range of potential system alternatives and background related projects. This is formulated by examining in the roles of the system and considering constraints such as available rights-of-way and impact from related projects in the region. The approach identifies possible destination points and examines potential connection options to reach the destinations. Exhibit 2.0-1 presents a summary diagram of the 3 x 3 matrix of potential alternatives. Of this matrix, an initial high-level screening results in identifying eight technology/alignment alternatives that should be carried forward to more detailed evaluations. Exhibit 2.0-2 summarizes the eight alternatives that remain from the screening.

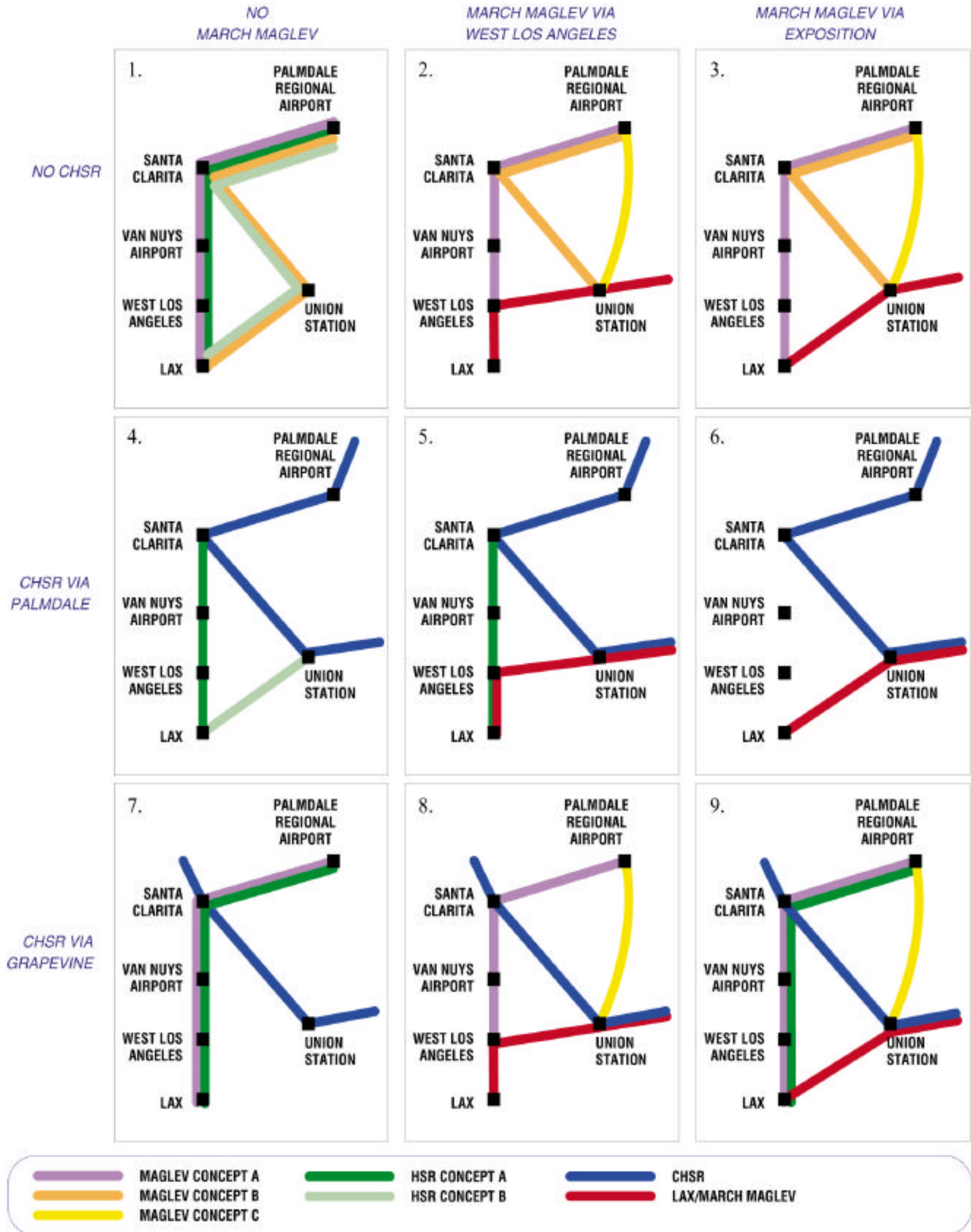
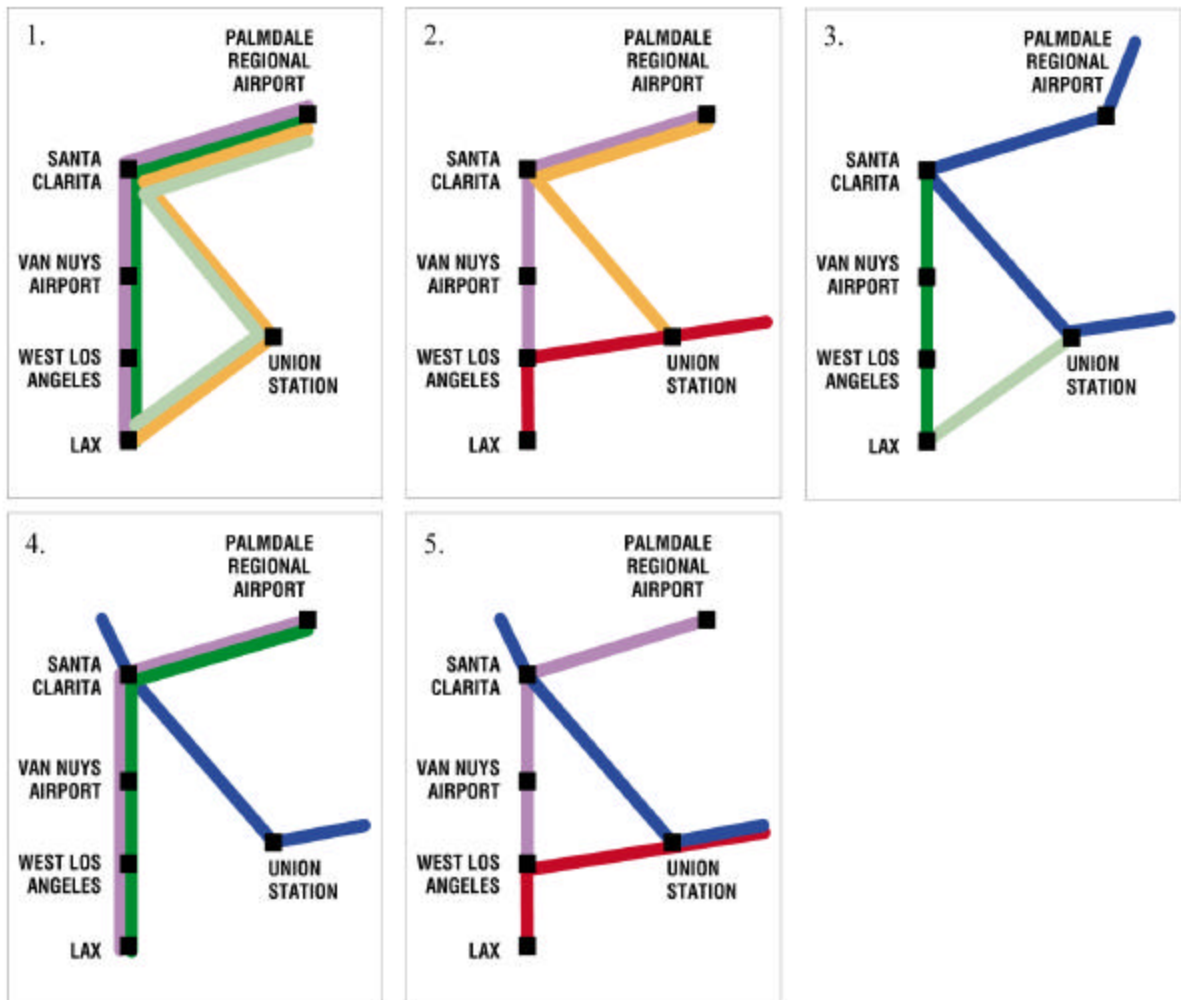
Exhibit 2.0-1
POTENTIAL SYSTEM CONCEPTS

Exhibit 2.0-2
PROPOSED SYSTEM CONCEPTS

 MAGLEV CONCEPT A	 HSR CONCEPT A	 CHSR
 MAGLEV CONCEPT B	 HSR CONCEPT B	 LAX/MARCH MAGLEV

Opportunities and Constraints

Opportunities and Constraints, Section 2.4, discusses key market opportunities for the system, and identifies potential constraints in general terms, with the intent of providing a framework for more detailed assessment once a long-list of alternatives has been generated in Milestone 3.

Market opportunities are identified based on the five major roles of the system which results in two broad groups, namely those that are comprised of opportunities in air travel markets, and those comprised of opportunities stemming from demographic and employment-related factors in the region.

Air Travel-Driven Markets

Airport connectivity, primarily between Los Angeles International Airport (LAX) and Palmdale Regional Airport (PMD), is one of the primary bases of the system.

Projected shortfalls in capacity to accommodate growths in both passenger and cargo demands are significant for the five counties served by LAX. Planning for increased airport capacity has centered around the regional context, recognizing that while LAX will remain the dominant facility, other regional airports will be relied upon to absorb demand through future expansion *and* future connectivity with LAX.

Airport connectivity within the SCAG region is critical in enabling regional airports to remain competitive with other west coast airports. Connectivity is important to the creation of a 'single' regional airport, and capturing the significant air travel demand within the area. A reliable, high-speed connection between LAX and Palmdale could capitalize on the requirement for this connectivity by forming a significant ground-based travel component of the future southern California airport system. Key opportunity areas within the air travel market are as follows:

- Regional airport systems development and enhancement: LAX – Palmdale connection;
- Airport feeder from employment and population catchment areas.

Population and Employment-Driven Markets

Between 1997 and 2020, the population in the regional statistical areas which comprise the project study area is expected to increase by more than 1.8 million people, to reach over 7.5 million. Significant employment growth of nearly 1 million jobs is also projected for this period. In the regional context, increasing labor specialization, demographic shifts, increased labor mobility and the pursuit of affordable housing are expected to continue the expansion of home to work journeys among the counties. The increasing need to reduce the length of home-work journeys on a regional basis creates a rationale for the development of a high-speed, reliable transportation mode.

Increases in population and employment, and locational disparities between jobs and homes, are projected to have a significant adverse effect on freeway

congestion levels by 2020. The majority of key freeways in the region, including the I-5, I-405 and SR-14, are expected to operate at unacceptable levels of congestion and travel speeds. Loss of productivity, vehicle emissions, and other negative factors attributable to travel congestion create the opportunity for an alternative, high-speed travel mode which will promote congestion relief and improve air quality in the region. Market opportunities related to population and employment are summarized as follows:

- Population growth corridors and centers;
- Employment growth areas;
- The regional development context – employment/population locational disparities;
- Travel congestion reduction - maintaining mobility.

Potential constraints to the development of the system identified at this stage would be expanded and developed to provide a finer-grained set of analytical criteria in the assessment of alternatives in Milestone 3, and during later stages of project evaluation. Due to the consideration of new technology in the LAX – Palmdale high-speed ground access system project, particularly in the case of a maglev system, and the inclusion of airport operations into the equation, the identification and careful evaluation of constraints will be essential to a successful project. Therefore, the preliminary constraints outlined in Section 2.4 reflect the unique attributes of this project in addition to factors which would typically be considered.

Based on the alignment alternatives at this stage, major roles for the ground access system, and the technology alternatives under consideration, the following constraint categories have been identified:

- Vertical and Horizontal Alignment;
- Clearances;
- Airport Operations;
- Geotechnical Factors;
- Environmental and Community Impacts and their Mitigation;
- Climate; and
- Local, Regional, County and State Policies.

Base Mapping

The base mapping for the project will be compiled on digital orthographic-corrected color aerial photographs. A series of base map aerial photographs will be prepared for up to three routes. These maps will be in digital format and will include color digital aerial photographs at an approximate scale of up to 1"=400'. The photographs will be orthographically corrected and tied into the California State Plane Coordinate System. Four types of base mapping will be conducted. They are as follows:

1. **Study Area Map.** The entire Study Area will be mapped on one image at an approximate scale of 1"=4000'.

2. **Corridor Maps.** Up to three corridors will be mapped for their entire length at a scale of approximately 1"=2000' and up to 1"=400'. The aerials at 1"=2000' scale will provide an overview of the area that is being studied for a possible route.
3. **Focus Area Maps.** Focus Area Maps will be prepared for each of the three airport vicinities and up to four other station locations, at an approximate scale of 1"=400'.
4. **Alignment Maps.** Alignment Sheets showing the routes for the three short-listed alternatives will be produced at a scale of 1"=400'.

Next Steps

The next step will be the preparation of the Milestone 3 Route Alignment and Technology Alternatives. Milestone 3 will identify the range of potential alignment and technology alternatives available to be studied. Using the alternatives development and screening process identified in this Milestone, System Concepts and Criteria, Milestone 3 will culminate with a short-list of three potential alternatives to be taken into further into the environmental and engineering studies in subsequent milestones.