OFFICE OF THE CITY MANAGER

August 14, 2006

TO: CITY COUNCIL

FROM: CITY MANAGER

SUBJECT: PRESENTATION AND DISCUSSION OF "ROUTE 710 TUNNEL TECHNICAL FEASIBILITY ASSESSMENT"

The Los Angeles County Metropolitan Transportation Authority (MTA) awarded a contract to Parsons Brinckerhoff for a study to assess the technical feasibility of a tunnel alternative for completion of the 710 Freeway. Staff from the nearby cities and regional agencies met on a monthly basis over the past year as a working group to monitor the progress of the project's technical studies performed by the consultant.

MTA announced the completion of the "Route 710 Tunnel Technical Feasibility Assessment" in June 2006. MTA Staff, along with the consultant team, held a general public meeting on June 22, 2006 at 6:00 p.m. at the Lake Avenue Church in Pasadena to share the findings with the public. Representatives from MTA and California Department of Transportation (Caltrans) will attend the City Council meeting on August 14, 2006 to make a presentation regarding the findings of the study. Attached is the Executive Summary of the "Route 710 Tunnel Technical Feasibility Assessment Report."

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City Manager

CJK:bj

Attachment

08/14/2006
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Route 710 Tunnel Technical Feasibility Assessment – Executive Summary

Submitted to:

Metro

Los Angeles County Metropolitan Transportation Authority
One Gateway Plaza
Los Angeles, CA 90012
MS 99-22-8

Submitted by:

PB PARSONS BRINCKERHOFF
100 YEARS

June 7, 2006

ES 1.0 Executive Summary

ES 1.1 Project Background

The Interstate 710 (I-710) "Long Beach" freeway serves as a major north-south link in the Los Angeles County transportation network. The freeway is an extensively traveled facility and its level of service has deteriorated as congestion and demand grow within the corridor. This facility currently extends from its southern terminus in the City of Long Beach to Valley Boulevard, just north of the Interstate 10 (I-10) "San Bernardino" freeway near the boundary between Cities of Los Angeles and Alhambra. Beyond this northern terminus is a 4.5 mile gap in the Route 710 until the freeway resumes at Del Mar Boulevard, in the City of Pasadena, where it extends 0.6 miles to the north --- to its junction with the Interstate 210 (I-210) "Foothill" freeway.

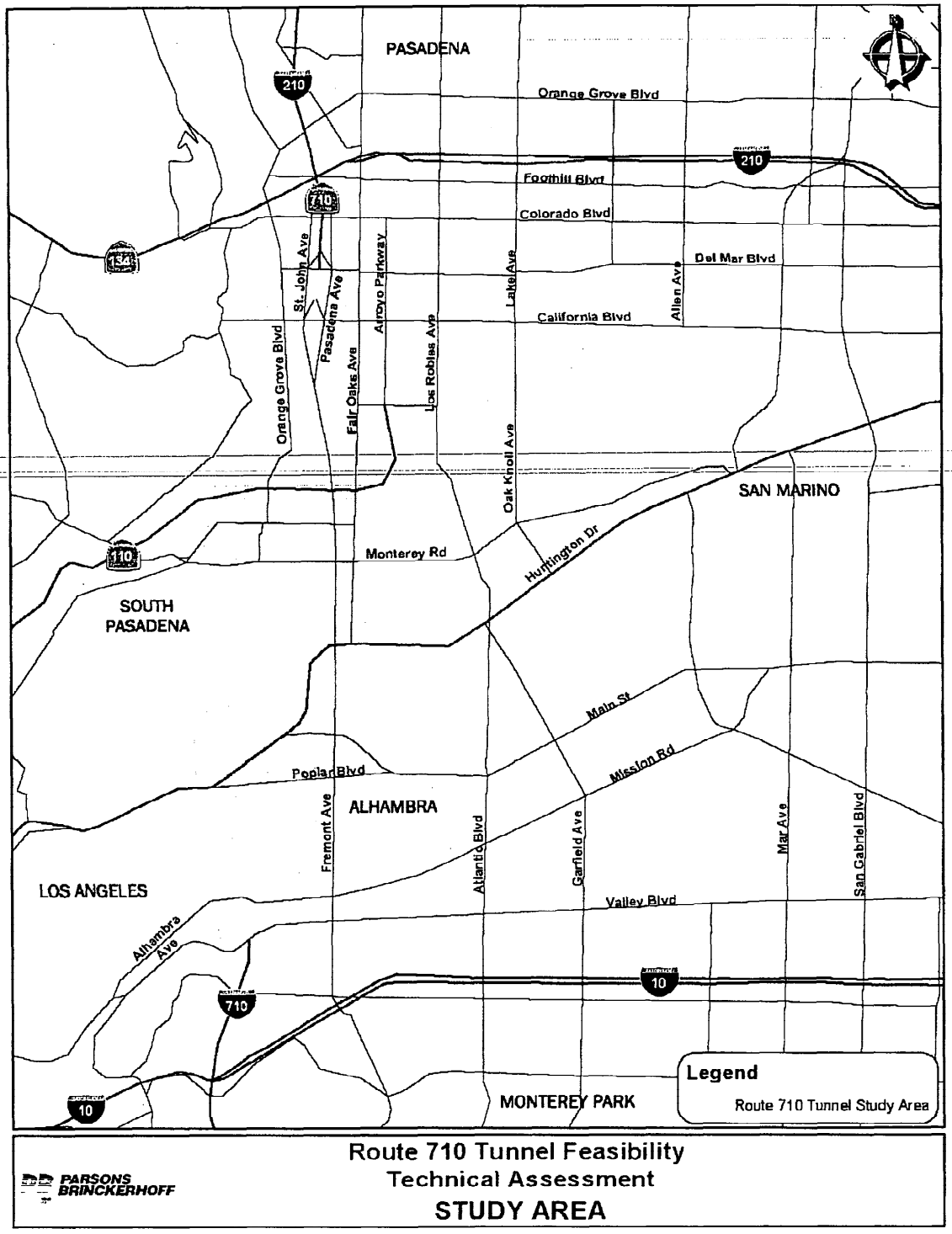
The California Department of Transportation (Caltrans), Federal Highway Administration (FHWA), the Southern California Association of Governments (SCAG) and the Los Angeles County Metropolitan Transportation Authority (MTA) support the completion of Route 710 to relieve regional and local traffic congestion and to enhance regional air quality. Consequently, SCAG has included this project in its Regional Transportation Plan (RTP) since 1989 and in its Regional Transportation Improvement Plan (RTIP) since 1991.

Over the past forty years, alternative concepts have been proposed and evaluated to complete the I-710 freeway and close the 4.5 mile gap in the corridor. To date, none of the previously proposed and evaluated alternatives has been successful in satisfying the regional mobility needs and community/ environmental concerns. These alternatives were traditional "surface" freeway alternatives through the communities of Los Angeles, South Pasadena and Pasadena. All alternatives considered traversed through highly developed urbanized neighborhoods and required a substantial volume of right-of-way along the alignments. Many members of the community were concerned with the impact of these "right-of-way" intensive "surface" alternatives and consequently, opposed to the extension of the Route 710 freeway. In response to this reaction and to lessen the potential impact of completing the Route 710 freeway, a tunnel concept was proposed for assessment as a potential option to the surface alternatives.

ES 1.2 Tunnel Technical Feasibility Assessment

The MTA, in conjunction with Caltrans, has taken the initiative to conduct this technical assessment to evaluate the feasibility of constructing a tunnel to complete Route 710 freeway between Valley Boulevard and Del Mar Boulevard. Recent advances in tunnel construction technologies appear to give merit to completing the Route 710 corridor using a tunnel. This technical feasibility assessment is intended to ascertain whether the tunnel concept is physically, environmentally and financially viable, as well as resulting in congestion relief, and worthy of more comprehensive evaluation and technical consideration. A map of the Route 710 Tunnel Study Area is shown in Figure ES-1.

Figure ES 1Study Area Map



The intent of the assessment is to determine the feasibility of completing this freeway gap by tunneling underground. Specifically, this evaluation is principally focused on deep subterranean bored or mined tunnel construction methods instead of the more environmentally intrusive shallow trench excavation or "cut-and-cover" tunnel methods. The purposes of this feasibility study were to:

- Determine if a tunnel is technically, operationally and financially feasible;
- Identify preliminary potential physical, environmental, and financial impacts to neighboring communities;
- Validate the concept of a bored tunnel(s); and
- Develop a preliminary project scope and cost estimates.

Although this assessment has examined a variety of issues related to a tunnel, it was by no means intended to be comprehensive nor exhaustive in scope. The purpose of this assessment is to serve as a technical foundation to allow decision-makers sufficient information to determine what appropriate actions should be initiated regarding the tunnel option.

ES 1.3 Tunnel Technical Feasibility Assessment – Findings

Based upon the technical feasibility assessment, the tunnel concept appears physically and environmentally feasible. The technical feasibility assessment considered a range of tunnel alternatives and features with the construction cost ranging from approximately $2.3 billion to $3.6 billion (2006 dollars). As part of financial strategies, a number of potential fund sources including federal, state, local and toll revenues were explored. Based on these preliminary findings, it is determined that the tunnel concept is technically viable and warranted to be advanced for more comprehensive and detailed evaluations to validate the findings of this assessment.

ES 1.4 Physical Feasibility

One of the primary purposes of this assessment was to evaluate the viability and suitability of implementing a tunnel through the Route 710 Gap based on current engineering and construction practices. This assessment was performed in consideration of the suitability of the geotechnical, geologic, hydrological, seismic conditions and the ability of the tunnel concept to satisfy traffic demand, highway standards, ventilation requirements, and other safety criteria.

The subsections below provide a brief discussion of some of the major physical elements that led to the conclusion that the tunnel option is physically feasible.

ES 1.4.1 Tunneling Technologies

Over the past thirty years, significant advancements have been made in the field of tunnel construction. Current tunnel construction practices and methods have seen tunnels constructed with interior dimensions approaching the fifty-foot threshold. The traffic modeling and forecasting results of this technical assessment indicate that tunnels of this magnitude will be necessary to accommodate the anticipated traffic demand along the Route 710 corridor.

This technical assessment focused on deep tunneling as the primary construction method for the tunnel scenario. The two types of excavation methods were examined including the Tunnel Boring Machine (TBM) method and the Sequential Excavation Method (SEM) technique. The TBM method uses a large mechanized excavator to bore the full diameter opening while the SEM technique uses smaller equipment to excavate several small diameter shafts or drifts to construct the full tunnel opening. See Figures ES 2 and ES 3 and Section 4 of this report for further descriptions of these techniques. Both of these construction methods are routinely used in the tunneling industry depending on the geologic conditions, length of the tunnel, cross-sections, project schedule, and various other considerations. It is anticipated that the use of surface trenching or "cut-and-cover" tunnel construction method will be limited to the shallower transition areas near the tunnel portals.

For the Route 710 tunnel concept, both the TBM and SEM construction techniques are considered valid for the anticipated conditions along the corridor and the size needed to accommodate the anticipated traffic demand.

Figure ES-2 Tunnel Boring Machine – Madrid, Spain

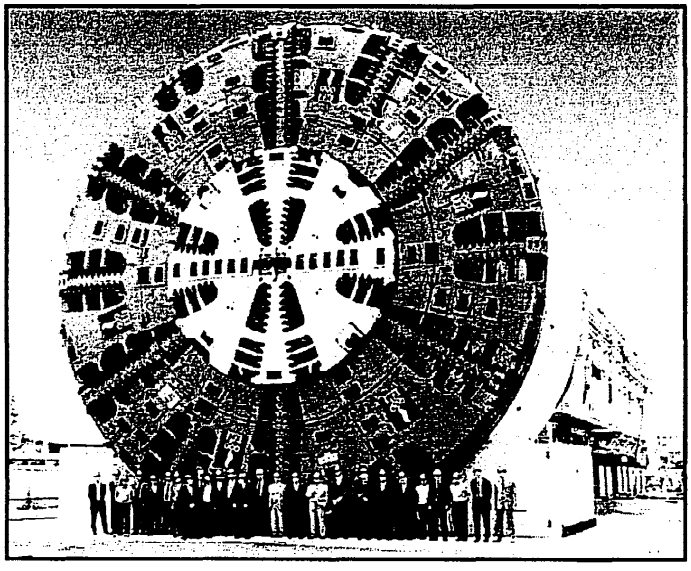
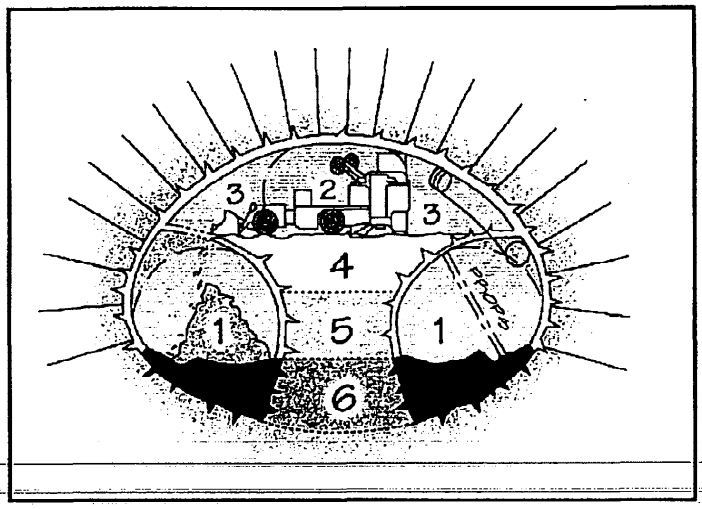


Figure ES-3 Sequential Excavation Method of Construction



ES 1.4.2 Physical Characteristics

Based upon the limited existing geologic and geotechnical information and the exploratory drilling program conducted for this feasibility assessment, the physical ground properties are considered to be suitable for tunneling in the study area. Although the conditions appear favorable for tunneling, there are several subsurface challenges that need to be quantified including location of the seismic faults and depth of the groundwater. Consequently, significant additional subsurface investigation is needed to more fully characterize the subsurface conditions.

ES 1.4.3 Traffic Demand

As a result of the traffic modeling and analysis, it was determined that the 2030 forecast demand along this proposed section of the Route 710 freeway would require four lanes of traffic in each direction to provide an acceptable level of service. As described above in Section ES 1.4.1, current tunneling technologies are capable of constructing tunnels of the size warranted to accommodate the anticipated traffic demand. Consequently, it will be necessary to construct a minimum of two tunnels to meet the anticipated two-way demand along the corridor.

In general, the traffic modeling revealed that the completion of the Route 710 would result in a re-distribution of traffic within the regional area surrounding the gap. Many trips that now use local arterials will use the Route 710 tunnel and some trips on adjacent freeways will transfer to the Route 710 freeway. Except for freeway segments at the two ends of the tunnel, the re-distribution of trips throughout the study area has generally positive impacts on arterial network and the surrounding freeways.

ES 1.5 Environmental Feasibility

The focus of the preliminary environmental assessment was to identify and address the potential tunnel issues and impacts -- impacts associated with both the construction and operation of a major highway tunnel -- to the adjacent and surrounding communities and the local environment within the study area. And, finally to determine if any of these issues or constraints will preclude additional consideration of the tunnel concept to complete the Route 710 freeway.

From the environmental perspective, the tunnel concept appears to be viable and feasible. Environmental impacts to the following resources may occur: noise, air quality, historic properties, aesthetics, archaeology, hazardous waste, soil disposal, and storm water. However the impacts or the severity of the impacts can be minimized, eliminated or mitigated using proven measures and techniques. Based upon this preliminary environmental assessment, no insurmountable environmental issues have been identified that would preclude further consideration of the tunnel alternative.

If a decision is made to advance the tunnel concept, more comprehensive consideration would be needed to further identify and quantify the potential environmental impacts of this concept within the Study Area and in close regional proximity of the corridor.

ES 1.6 Financial Feasibility

The funding sources and financial scenarios considered in this report provide a starting point for development of a financial plan for the project, should the tunnel concept be advanced. The Route 710 gap closure is a project of regional significance. This technical assessment examined a myriad of tunnel alternatives that would provide four-lanes of traffic per direction. The construction cost estimates for these alternatives were prepared with the estimates ranging from approximately $2.3 billion to $3.6 billion (2006 dollars). A cost estimate of $3 billion (2006 dollars) was used for the purposes of identifying potential funding sources and developing financial strategies to reflect the range of tunnel alternatives considered.

As part of this technical assessment, several potential financial strategies were developed that considered various federal, state, regional, and local funding sources. These sources included traditional funding sources and non-traditional sources such as bonds leveraged from anticipated toll revenues. Using these revenue sources and assumptions on the level of contribution from each source, seven preliminary financial scenarios were developed -- including four scenarios that contained toll based financing.

ES 1.7 Conclusion

It is the conclusion of this technical feasibility assessment that the tunnel concept to complete the Route 710 freeway is feasible from the physical perspective. Further, since the anticipated environmental issues or impacts can be eliminated, minimized or mitigated by proven methods, the concept also appears to be environmentally feasible. Although, the determination of the

financial feasibility is dependent on several external factors, it is warranted that the tunnel concept be advanced to the next more detailed stage to further validate the findings of this assessment and to determine whether the tunnel concept can ultimately serve as the alternative to complete the Route 710 freeway.