CHAPTER 5
THE CONSTRUCTION PROCESS

CHAPTER 5 - CONSTRUCTION IMPACTS

5-1 THE CONSTRUCTION PROCESS

5-1.1 Pre-Construction Activities

A number of activities must occur before construction activities can begin. Once ~~the corridor has been approved for implementation, a~~ Preliminary Engineering ~~and final design~~ has been completed, a Design/Build period will occur in which the final details of the corridor improvements will be developed. Included in this activity will be specification of various construction details that will become part of the Design/Build ~~or contractor bid~~ packages. Once the design details are available in the form of design drawings, precise right-of-way limits will be known and right-of-way acquisition can begin. This will include both the acquisition of privately owned parcels of real property and also the termination of lease agreements with a variety of tenants ~~within~~ along the corridor. Section 4-2 provides a detailed description of both types of property affected by the corridor. For the acquisition of privately owned property, appraisals will be conducted and the results communicated to the property owners, followed by negotiations and completion of purchase agreements. For the leasehold properties, tenants will be given sufficient advance notice by the MTA of its intent to occupy the corridor for its own use, and any needed agreements will be completed with the affected tenants. Completion of this step will secure the corridor and make it available for construction. The construction contractor(s) will be selected through ~~either a standard procurement process involving the issuing of bid packages, receipt and evaluation of bids, selection of the contractor(s) to perform the work, and award of the contract(s) or~~ a Design-Build process, which combines ~~these separate~~ a number of standard steps typically involving design, specifications, bidding, and construction into one.

5-1.2 Construction Scenario

No construction would be associated with the No Build Alternative other than that connected with typical capital improvements projects planned as part of normal municipal program planning. Construction involved in the TSM Alternative would consist of typical street construction activities (such as site-specific intersection improvements) and upgrades to the traffic signal system (such as integrated signal operation). These activities would be similar to those described in the following subsections, at Steps 6 and 8, and they would occur at a variety of currently undetermined locations.

For the Bus Rapid Transit Alternative, conversion of the existing MTA-owned railroad right-of-way into an at-grade busway is proposed. An overall construction schedule of 24 months is estimated to complete the busway, with several major construction steps involved, as illustrated on Figure 5-1 and described as a prototypical construction scenario below. It should be understood that the construction scenario described in the following pages is an illustration; the actual construction process will be governed by the provisions and procedures of the

	Construction Step [2]	Months From Start [1]																								
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
1	Utility Relocation / Site Clearing	■	■	■	■	■	■																			
2	Grading & Structural Section			■	■	■	■	■	■	■	■	■														
3	Soundwalls					■	■	■	■	■	■	■	■													
4	Stations / Park-and-Ride Lots					■	■	■	■	■	■	■	■	■												
5	Structures								■	■	■	■	■	■	■	■	■									
6	Paving & Surfacing												■	■	■	■	■	■	■	■	■					
7	Landscaping & Finish Work																					■	■	■	■	
8	Traffic Signal Improvements																				■	■	■	■		
	Street Intersection Reconstruction																					■	■	■		
	Construction Traffic Management			■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■		
9	Systems Installation & Testing																						■	■	■	
10	O & M Facilities [3]																	■	■	■	■	■	■	■	■	
	Revenue Operation																									■

Notes:
1. The schedule shown in this table is an illustration of the construction process and is not intended to reflect the precise scheduling of work to be governed by construction contracts. This schedule assumes that all right-of-way acquisition (including any needed construction easements) will have already occurred.
2. It is assumed for purposes of this schedule that three construction contracts (covering approximately 5 miles each) would be issued and that work therefore would be ongoing at three locations simultaneously.
3. Reflects additions of equipment and work areas at existing MTA Divisions 8 and 15. No additional operations and maintenance facilities would be constructed.

Source: Parsons Transportation Group, 2000; Myra Frank & Associates, 2000.

Figure 5-1: San Fernando Valley East-West Transit Corridor – Estimated Construction Sequence

construction contract. These provisions and procedures may vary significantly from the illustration.

5-1.2.1 Step 1: Utility Relocation and Site Clearing

This first step in the construction process would require an estimated 6 months and would clear the corridor and prepare it for construction of the busway. Four steps would be involved, as described below.

Site Clearing: Once the right-of-way acquisition process has been completed, the corridor would be cleared of above ground structures and improvements. In the case of right-of-way that was formerly private property, the construction contractor would remove the improvements. In the case of former lease property, the tenants would be required in most instances to remove their improvements, with some remainder to be removed by the construction contractor. Where necessary, construction sites would be fenced at this point for public safety.

Track and Ballast Removal: The remaining vestiges of the railroad would first be removed. Some portions of the removed material would be recycled. Track sections, railroad ties and fasteners, and the underlying ballast material would all be removed and the corridor would be rough-graded.

Bridge Demolition: There are several existing bridges along the corridor, including one located over the Tujunga Wash (just east of Coldwater Canyon Avenue) and another over the Los Angeles River in the Sepulveda Basin. These bridges would require demolition and reconstruction as part of the proposed corridor improvements. The crossing over the Los Angeles River would require the most extensive construction. Since the corridor does not currently carry railroad traffic, all bridges can be completely demolished, leaving open construction sites for their later replacement. It is estimated that approximately 6 months would be needed for this step in the construction process, and work would be restricted to the dry season (mid-April to mid-October). Depending upon information to be developed in final design, it may or may not be necessary to construct new foundations for the piers in the Los Angeles River channel. Should this be required, the bridge construction in this vicinity could be extended into a second dry season. For all the remaining water crossings, the bridges would completely span the crossings, and therefore seasonal construction issues should not be a constraint. Activities included in this step would consist of removing rail and track structures, walkways, guard railing and superstructures, followed by removal of bridge supports and foundations. Again, where possible, reusable materials would be recycled.

Utility Relocation: Existing utilities that would interfere with construction of the corridor improvements would be removed and relocated for continuing service. Also, utilities crossing the corridor may need to be removed and relocated to either temporary (requiring final relocation at an appropriate point later in the construction process) or permanent locations at the outset, the latter being more desirable. Based upon investigations conducted to date, it is not expected that any major utilities will require relocation. Where existing railroad bridges are replaced, it may be necessary in some instances to also replace utilities that have been connected to them.

Relocation or reconstruction of existing utilities will need to take into account service required at the station locations and parking lots (i.e. electricity for platform and parking lot lighting, telephone for communications, water for landscape maintenance) and also any additional feeds to reconstructed traffic signals.

5-1.2.2 Step 2: Surface Grading and Structural Section Installation

This second step in the construction process would require an estimated 9 months and would prepare the corridor for the busway paving and subsequent elements. Two activities would be involved, as described below.

<u>Excavation</u>: Only shallow excavation (estimated for purposes of this EIS/EIR to a depth of approximately 1.75 feet [0.53 meters]) is anticipated since the busway would be an essentially at-grade facility. In addition, minor amounts of shallow excavation would occur where the busway crosses city streets. It is estimated that over the length of the entire corridor (70,200 feet [21,400 meters]) an estimated 140,400 cubic yards (107,400 cubic meters) of excavated material would be required. For the Lankershim/Oxnard On-Street Alignment (total length of 53,720 feet [16,400 meters]), this would reduce the total quantity of excavated material to an estimated 107,440 cubic yards [82,200 cubic meters]). For the Minimum Operable Segment (MOS) (23,900 feet [7,300 meters] long), the quantity of material to be excavated would be approximately 47,800 cubic yards (36,600 cubic meters). Excavated material would be collected in haul trucks and carried away from the construction area to either become fill material for berms on this project or for some other project or, if either not desired as fill or containing contaminants, for disposal at an approved disposal site. Haul routes have not been specified at the present time; these will be determined in consultation with the City of Los Angeles Department of Transportation, Bureau of Engineering, and Bureau of Street Services. A minimum of contamination is expected (although some hazardous materials deposited during the period of railroad use may still be present); however, the actual amount will not be determined until pre-testing is conducted prior to the initiation of excavation activities. If contaminated materials are found, then characterization, treatment and disposal will be conducted in accordance with applicable regulations. Some of the non-contaminated excavation will be used to build berms along parts of the route. All of the crossings of the existing street system along the corridor will require reconstruction, as well. This will be timed to coincide with traffic control improvements (see step 8).

<u>Drainage Facilities</u>: It may be necessary to install subsurface drainage facilities, including catch basins, drainage pipe and connections to the local storm drain system, in conjunction with the corridor. There may be sections of the corridor requiring substantial lengths of longitudinal drainage pipe, depending upon the amount of runoff to be expected, the capacity of the local storm drain system and the location of appropriate connection points. The extent of this necessity and such specifications as size, length and connection points, will be determined in preliminary and final design. It will also be necessary to manage drainage during the construction period such that project-related drainage does not overflow onto adjacent properties or public streets. Due to the width of the right-of-way, the use of swales, retention areas, and other natural drainage to encourage percolation will be considered.

Compaction of Subgrade: Once the excavation process has been completed, then the corridor can be compacted to appropriate geotechnical standards, thereby providing the subgrade needed for installation of the structural roadway section. It may be necessary to over-excavate and recompact the subgrade to ensure a sufficient base for the BRT facility.

5-1.2.3 Step 3: Soundwall Construction

This third step in the construction process would require an estimated 8 months and would provide noise attenuation where appropriate along the corridor. It is desirable to install soundwalls as early in the construction process as practicable, thereby providing attenuation for construction noise as well as project operational noise, although in some locations this may not be possible in order to allow for the movement of construction vehicle and equipment within the construction zone. For purposes of illustration, standard concrete block wall construction is described below. Other methods that could also be used would include poured-in-place walls and fixed panel walls. For standard block walls, activities occurring during this step would be as described below.

Install Footings: Continuous footings would be excavated (either at grade or in conjunction with berm sections), to an appropriate structural depth, along the lengths where soundwalls are proposed. Reinforcing steel would be placed and concrete would be poured to complete the footing.

Construct Walls: Once the foundation is in place, walls would be constructed using masonry blocks, poured-in-place concrete, or some other suitable material. Based upon the noise impact analysis (see section 4-9), it is estimated that between approximately 12,100 and 23,400 lineal feet (3,700 to 7,100 meters) -- 2.3 to 4.4 miles (3.7 to 7.1 kilometers) -- would be needed for the Full BRT Alternative. For the Lankershim/Oxnard On-Street variation, an estimated 8,900 to 16,600 feet (2,700 to 5,100 meters) -- 1.7 to 3.1 miles (2.7 to 5.0 kilometers) -- would be needed. For the Minimum Operable Segment (MOS), an estimated 600 to 2,400 feet (180 to 700 meters) – 0.1 to 0.5 miles (0.16 to 0.80 kilometers) – would be needed.

Depending upon the area in which the soundwall is located, its proximity to residential land uses, and its visual prominence, it may be necessary or desirable to also provide some form of aesthetic treatment. Landscaping may be used to soften the appearance. Surface treatment of the wall may be used to create visual interest. MTA's Metro Art program may also be employed to enhance the visual appearance of the walls. Whatever approach is used, it will also be necessary to construct the soundwalls such that graffiti is prevented or easily removed (the latter can be done using special coatings on the wall surface).

5-1.2.4 Step 4: Station and Park-and-Ride Lot Construction

A total of 11 to 12 new stations are to be constructed along the corridor (depending upon the terminus selected at North Hollywood), at an approximate spacing of one mile. It is estimated that 9 months would be required for this construction step. Each of these stations would be constructed in the following steps:

Clearing and Grubbing: Each station location would be cleared of obstructions and rough-graded to permit subsequent activities to occur.

Platform Construction: Once the station areas are cleared, footings would be excavated to a depth necessary for the canopies, lighting, and other above ground elements. It will be necessary at this point to install utility feeds for power, water, ticket vending machines, telephones, etc. as part of the footing and platform construction. The footings would receive reinforcing steel and concrete would be poured. With the footings in place, at-grade platforms would be formed and the concrete platforms poured and finished.

Install Canopy and Other Platform Amenities: With the platforms in place, the above-platform features can be installed. Included among these features would be canopies, stairs and railings.

Parking Lots and Park-and-Ride Areas: These areas would be graded and subsequently paved and striped for a prescribed number of parking spaces. Entrance and exit driveways would be constructed.

5-1.2.5 Step 5: Structures Installation

This fifth step in the construction process would require an estimated 12 months and would result in finished above-grade structures, including bridges, to accompany the at-grade portions of the corridor. Construction of the Los Angeles River bridge would likely occur over two dry seasons. Several activities would occur during this step, as described below.

Foundation Excavation: If necessary, below-grade foundations would be constructed at bridge locations. Excavation would be conducted to establish the appropriate width, length and depth for each foundation. Excavated material would be used for backfill, which is described below. Any remaining excavated material would be removed and hauled away using the same procedures as for the main excavation.

Pile Setting: Where additional structural support is needed at the LA River bridge in the Sepulveda Basin, the Tujunga Wash bridge, and the retaining walls for retaining the I-405 abutments, piles would be placed. They would either be driven by means of a pile driver or placed in pre-drilled holes using a crane, depending upon the condition of the soils in the immediate vicinity and other factors. Proximity to noise sensitive areas will be a major factor in selecting the method pile setting.

Pile Cap Installation: With the foundations and piles in place, pile caps would then be constructed to support the remainder of the above-grade structure. Reinforcing steel would be placed in the excavated area, the perimeter would be formed, and concrete would be poured to form the pile cap.

Column Installation: Once the pile caps are in place, vertical columns, to support the bridge superstructures, would be constructed. Cages of reinforcing steel would be brought to the site on trucks, erected using cranes, and connected to the pile caps. Then, the exterior surfaces of the columns would be established with forming, and concrete would be poured to form the columns.

Abutment and Retaining Wall Installation: At this stage in the structures construction process, the balance of the structural support would be installed. In particular, abutment structures, constructed of reinforced concrete, would be built, using reinforcing steel and forming. Included among the structures to be built during this stage would be the retaining walls needed under the elevated I-405 freeway to provide space for the busway to pass beneath.

Bridge Superstructures: With all the foundations, pile caps, columns and structural retaining walls in place, it would then be possible to construct the superstructures upon which the above-grade roadway surfaces would reside. Falsework would be constructed using steel I-beam girders, which would be brought in on trucks and lifted onto the vertical falsework supports, where they would be attached. With all of the I-beam girders spanning the vertical supports in place, the falsework installation would be completed by installing formwork on top of the girders, forming the entire volume contained between vertical supports, the reinforcement would be placed and concrete poured, thereby completing the superstructure. The formed superstructures would be supported from below with wooden falsework, similar in appearance to above-grade freeway construction.

Bridge Decking: Once the entire bridge superstructure is in place, the decking can then be placed. This would involve another pour of concrete over a shallow formed area with reinforcing steel between the sides of the structures, to become the roadway decking portion of the structure. A space in the deck would be provided for the installation of lighting and communications equipment. All of the work would be done from above at this point.

Backfill: With all of the above-grade structures in place, the open excavated areas would then be backfilled and compacted, including the area behind the retaining walls beneath the I-405 freeway. With this step completed, falsework would be removed.

5-1.2.6 Step 6: Paving and Surfacing

This sixth step in the construction process would require an estimated 9 months and would result in a finished roadway surface over the entire length of the corridor, including locations where the busway would cross city streets. Activities occurring during this step would be as described below.

Install Base Material: At the completion of Step 2, the at-grade portions of the corridor were made ready for the installation of base material. Following the installation of utilities, including conduits, for communications and lighting, the sub-grade was compacted to a sufficient density and graded appropriately for drainage. At this new step, base material, consisting of aggregate, would be brought to the site in trucks and placed on top of the sub-grade. It is estimated that approximately 63,200 cubic yards (50,160 cubic meters) would be needed for the entire corridor. If the Lankershim/Oxnard On-Street Alignment is used instead of the Chandler portion, this quantity would be reduced to 48,350 cubic yards (34,400 cubic meters). For the MOS, the quantity would be an estimated 21,510 cubic yards (17,070 cubic meters). The material would then be graded and compacted to a prescribed density.

Construct Curbs and Gutters: One of the next steps needed to complete the roadway work would consist of forming and pouring curbs and gutters where needed along the entire length of the corridor. Runoff from the curbs and gutters would be channeled into drainage facilities leading to the existing storm drain system.

Place Portland Cement Concrete or Asphalt: ~~With all of the at-grade and above-grade roadway sub-surfaces in place, t~~The entire corridor would be paved with Portland cement concrete or asphalt. The process is similar to that used on the freeways. An estimated 48,440 cubic yards (38,440 cubic meters) would be needed for the entire corridor; 37,070 cubic yards (29,420 cubic meters) for the Lankershim / Oxnard On-Street Alignment. The MOS would require an estimated 16,490 cubic yards (13,090 cubic meters).

~~Construct Curbs and Gutters: The last steps needed to complete the roadway work would consist of forming and pouring curbs and gutters where needed along the entire length of the corridor. Runoff from the curbs and gutters would be channeled into drainage facilities leading to the existing storm drain system.~~

5-1.2.7 Step 7: Landscaping and Finish Work

This construction step would require an estimated 13 months. The following steps would occur.

Install Irrigation System and Landscaping: Prior to installing planting material, irrigation systems would be installed where required. Planting materials, including ground cover, shrubs and trees, would be brought to each planting location by truck, and planted.

Complete Finish Work: A variety of finish work tasks would need to be completed. At each station, final platform features would be installed, including benches, ticket machines, trash receptacles, lighting and signage, as determined in preliminary engineering. Also to be completed would be parking lot paving, striping, and landscaping. Along the corridor, installation of electrical equipment, signage (as determined in preliminary engineering) and final clean-up would occur.

5-1.2.8 Step 8: Traffic Control Systems Installation

This construction step would require an estimated 4 months; construction traffic management would occur throughout the entire project construction period. The following steps would occur.

Install/Upgrade Traffic Signals: It may be necessary to upgrade the local arterial traffic control system throughout the corridor, to permit the interaction between local traffic and busway movements. New signal controllers will need to be installed at a variety of locations along the corridor. It may also be necessary to upgrade intersection street lighting along the corridor. Reconstruction of street intersections crossing the BRT corridor would be accomplished along with the traffic signalization work. For the Full BRT, approximately 31 street crossings would be reconstructed or resurfaced. For the Lankershim/Oxnard On-Street alignment, approximately 20 street crossings would be involved, and for the MOS, approximately 10 street crossings would require reconstruction or resurfacing. It may be necessary, depending upon traffic conditions, to stage the reconstruction of some individual street crossings, and also preclude the simultaneous reconstruction of adjacent crossings in some areas.

Striping: Where necessary, intersection approaches may require restriping to allow for additional turning lanes, alterations in street lane geometry, and pedestrian crosswalks.

Signs: New signage will be needed along the corridor, for busway users, motorists, pedestrians and bicyclists.

5-1.2.9 Step 9: Systems Installation and Testing

Once the entire corridor has been completed, its operation would be tested, including the interactive traffic signal system, communications equipment, and station and park-and-ride facilities and equipment. Completion of this testing would then permit the corridor to be opened for service.

5-1.2.10 Step 10: Operations and Maintenance Facilities

No new maintenance facilities would be required for the corridor. Existing maintenance facilities at Divisions 8 (on Canoga Avenue in Chatsworth) and 15 (on Branford Street in Sun Valley) would be used to service buses operating on the corridor. It may be necessary to make some improvements internal to these two facilities to handle longer articulated buses, but their existing service capacity would be sufficient for the added number of buses added to the system.

5-2 TRANSPORTATION AND PARKING

5-2.1 Setting

Because the San Fernando Valley East-West Corridor BRT will be routed through urban areas, motorists and pedestrians will at times be delayed and inconvenienced during the construction period. These impacts will be felt most acutely in areas of station construction since the majority of the project construction will be taking place within the abandoned railroad right-of-way, which is separated from the main arterial circulation system.

5-2.2 Impacts

The degree of traffic disruption during construction of the San Fernando Valley Corridor will depend on how large the construction activity area is and how long the construction phase will last. In some locations, streets may be closed temporarily during nighttime hours or lanes may be closed temporarily. In addition to construction impacts due to changes in existing street geometrics, the traffic generated by construction workers and trucks hauling excavated material or construction supplies may also cause traffic impacts.

Throughout the corridor, in the segments where the project will be constructed within the existing abandoned railroad right-of-way, it is not expected that construction and construction-generated traffic will cause disruptions to local traffic and circulation patterns. The construction vehicles will enter the right-of-way at the arterial crossing points and will operate within the exclusive busway facility causing little disruption to parallel or crossing arterials.

Potential impacts to arterial traffic may occur during construction and paving of the at-grade crossings. The at-grade crossings will be graded, old tracks will be removed and the crossings will be re-paved for smooth operation of the buses across the intersecting streets. This construction activity is similar to street re-paving projects and will most likely be very short in duration and can be accomplished by half-street closures. If any full closures are necessary it should be done during the off-peak and/or night hours to minimize congestion and loss of significant cross street capacity. At one location, it may be necessary to close the entire intersection, this is the diagonal BRT crossing at the Fulton/Burbank intersection. At this location, two new legs will be constructed at this four-legged intersection and new intersection approaches will be put in place along with a realignment and re-paving of the diagonal busway crossing. Once paving is complete, the traffic signal modifications will be installed at the crossings and nearby intersections, but will not cause substantial traffic impacts.

5-2.2.1 Temporary Lane and Night-time Street Closures

No permanent street closures are anticipated; temporary lane and night-time street closures may be required. These are listed in Table 5-1. Duration of these would typically range from 3-7 months.

It is not anticipated that any cross streets will be closed entirely at any time.

During final design, site and street specific Worksite Traffic Control Plans will be developed in cooperation with the City of Los Angeles Department of Transportation (LADOT) to accommodate required pedestrian and traffic movements.

Table 5-1: Temporary (Weekend and Nighttime) Partial Lane and Street Closures for Resurfacing and Paving

De Soto Ave.	Sylmar Ave.
Mason Ave.	Tyrone Ave.
Victory Blvd.	Hazeltine Ave.
Corbin Ave.	Woodman Ave
Tampa Ave.	Oxnard St.
Wilbur Ave.	Fulton St. at Burbank Blvd.
Reseda Blvd.	Ethel Avenue
Lindley Ave.	Westbound Chandler
White Oak Ave.	Coldwater Canyon Ave.
Balboa Blvd.	Bellaire Ave.
Woodley Ave.	Whitsett Ave.
Sepulveda Blvd.	Corteen Pl.
Kester Ave.	Laurel Canyon Blvd.
Cedros Ave.	Colfax Ave.
Vesper Ave.	Tujunga Ave.
Van Nuys Blvd.	
Note: *All locations are at the BRT Crossing points	

Source: Meyer Mohaddes Associates, Inc., 2000.

Temporary reductions in roadway capacity would occur where busway construction would cross city streets, resulting in partial closures of some crossings. The only case where a complete closure of the street may be necessary is at the intersection of Fulton Avenue and Burbank Boulevard where the busway will be crossing in a diagonal orientation. Also westbound Chandler east of Ethel Avenue where the Busway will be transitioning from the center of Chandler Boulevard to the railroad right-of-way, may require a partial street closure. This crossing will most likely be built in two phases so that half the street can remain open to accommodate a single westbound lane on Chandler.

Other construction activity including placement of new signal equipment for the Busway and modifications to existing signals may require temporary minor lane closures, but will not result in street closures.

The on-street segments of the BRT system in Warner Center and the on-street segments of the BRT MOS, where the BRT will be operating in mixed-flow traffic will include on-street bus stops and will not involve any reconstruction of the streets. Therefore, it is not expected that street or lane closures will be required for this activity. Bus pads may be constructed in some locations, resulting in some on-street construction. All necessary signal modifications for transit priority in the on-street segments will be implemented by LADOT and will mostly involve software and equipment modifications. The traffic impacts of constructing the on-street portions will not be substantial.

5-2.2.2 Trucks Removing Excavated Material

Trucks removing excavated materials from the stations and park-and-ride lots have the potential to cause traffic impacts, if the number of trucks on a particular route causes congestion or if the routes utilized by the trucks are inappropriate (e.g., primarily residential in nature).

5-2.2.3 Cumulative Impacts

There are two types of cumulative construction impacts that could occur if the construction contracts are not well coordinated with one another or with other major construction projects in the vicinity of this project.

The construction schedule and the packaging of contracts will be defined during preliminary engineering or final design. In order to avoid cumulative construction impacts, the MTA should seek to package the other construction contracts under MTA control so that multiple excavation efforts are not happening in close proximity to one another with trucks from more than one excavation project attempting to use the same haul route at the same time. The area is traversed by three freeways making it relatively easy to design haul routes from each station to a freeway via different arterial streets, and the amount of excavated material will not be substantial, thus minimizing the potential for cumulative impacts on any arterial street.

Since the precise construction scheduling and construction packages are not known at this time, it is not possible to comprehensively identify other specific development projects or public infrastructure improvement projects that might be under construction at the same time. MTA will continue to work with the City of Los Angeles and other entities (e.g., utility companies or Caltrans) to identify other major construction projects in the vicinity and coordinate construction activities, particularly haul routes (to be coordinated with LADOT and the Bureaus of Engineering and Street Services), during the period of the construction contracts.

5-2.2.4 Parking

Due to the nature of the BRT project, it is unlikely that the elimination of spaces during construction would cause an overall parking shortfall. However, localized impacts and parking shortages or shortages of convenient parking may occur in the area immediately surrounding one or more proposed stations.

5-2.3 Mitigation Measures

The following measures are identified to mitigate the potential impacts of station construction on traffic circulation in the San Fernando Valley Corridor study area.

T&P-C1 Before the start of construction, Worksite Traffic Control Plans (WTCP) and Traffic Circulation Plans, including identification of detour requirements, will be formulated in cooperation with the City of Los Angeles and other affected jurisdictions (County, State). The WTCPs would be based on lane requirements and other special requirements defined by the Los Angeles City Department of Transportation (LADOT) for construction within the city and from other appropriate agencies for construction in those jurisdictions. LADOT will provide the contractor with the latest copy of the *Requirements of the Contractor* and *Signs and Legends*, to be incorporated into the Worksite Traffic Control Plans (WTCPs). The excavation, grading construction, and re-paving of arterial streets crossing the BRT alignment will be phased so that the capacity of these streets is not reduced unnecessarily. During construction, contractors will be required to follow the WTCP for each site as approved by LADOT. LADOT traffic control officers will be utilized as part of the WTCP at intersections affected by lengthy construction. Contractor-proposed variations to the WTCP will be subject to approval by LADOT.

T&P-C2 Unless determined to be impracticable, no designated major or secondary highway will be closed to vehicular or pedestrian traffic except at night or on weekends. No collector or local street or alley will be completely closed, allowing continued local vehicular or pedestrian access to residences, businesses and other establishments. Comprehensive bus rerouting and detour plans will be adopted, if necessary.

T&P-C3 The MTA and the Design/Build contractor will develop preferred haul route plans for ~~each construction package that entails~~ the removal of excavated material. The haul route plans shall prohibit the use of local residential streets, and avoid utilizing streets on which schools are located. If it is necessary for a potential haul route to pass a a school, trucks shall be prohibited from hauling past the school during normal school hours. The truck haul route plan will distribute the trucks over more than one arterial street route to/from the freeways, but avoid the use of any local residential streets. Hauling operations may occur over more than one shift (not concentrated in an 8-hour period). Haul routes, which must be approved by the City of Los Angeles, will be developed in consultation with and must be approved by the Los Angeles Department of Transportation and the Bureaus of Engineering and Street Services.

Example haul routes for carrying out excavated material are summarized below.

- De Soto Avenue Station: De Soto Avenue south to 101 Freeway.
- Mason Avenue Station: ~~Mason Avenue~~ Victory Boulevard east to Winnetka Avenue south to 101 Freeway.
- Tampa Avenue Station: Tampa Avenue south to 101 Freeway.
- Balboa Avenue Station: Balboa Avenue south to 101 Freeway.
- Woodley Avenue Station: Victory Boulevard east to I-405 Freeway

- Sepulveda Station: Using the railroad right-of-way directly to Victory Boulevard to I-405 Freeway.
- Van Nuys Station: Van Nuys Boulevard south to Burbank Boulevard west to I-405 Freeway.
- Woodman Avenue Station: Woodman Avenue south to 101 Freeway.
- Fulton/Burbank Station: Burbank Boulevard west to Woodman Avenue south to 101 Freeway.
- Laurel Canyon Boulevard Station: Laurel Canyon Boulevard south to Magnolia Boulevard east to 170 Freeway.
- North Hollywood Station: Tujunga Avenue south to Magnolia Boulevard west to 170 Freeway.

T&P-C4 The MTA will coordinate with other major construction projects within a 1-mile radius of the construction site to avoid, to the maximum extent practicable, overlapping haul routes with other public or private construction projects.

T&P-C5 Prior to initiating construction ~~on~~ of each station, the MTA will develop and adopt a site-specific parking plan ~~which~~ that identifies construction worker parking restrictions and replacement parking for any substantial quantity of on-street parking lost during construction, subject to consultation with LADOT.

T&P-C6 The City of Los Angeles will provide to the contractor the latest versions of *Requirements of the Contractor* and *Signs and Legends*, which will be incorporated into the construction contract and used in developing all work site “traffic control plans.”

5-3 ACQUISITIONS AND DISPLACEMENTS

5-3.1 Setting

A limited number of temporary easements may be required in order to construct the proposed San Fernando East-West Corridor. These construction easements may affect lease agreements between the MTA and local business, residences, and nonprofit organizations and/or private property located outside the MTA right-of-way. Temporary easements would most likely be required for construction staging, including equipment and materials storage, construction offices, employee parking, and other related construction uses.

5-3.2 Impact Analysis Methodology and Evaluation Criteria

The conditions for evaluating the effects of the temporary construction easements (i.e., acquisitions and displacements for both MTA lease agreements and private property) are similar to those discussed under Section 4-2 for project operations.

5-3.3 Impacts

5-3.3.1 No Build Alternative

The proposed No Build Alternative would not require any temporary construction easements. Therefore, businesses, residences, and/or nonprofit organizations would not be affected and displacements would not occur.

5-3.3.2 Transportation Systems Management (TSM) Alternative

The proposed TSM Alternative would not require any temporary construction easements. Therefore, businesses, residences, and/or nonprofit organizations would not be affected and displacements would not occur.

5-3.3.3 Bus Rapid Transit (BRT) Alternative

The majority of all construction staging activities associated with the BRT Alternative, including all three alignments (Full BRT, Minimum Operable Segment, and Lankershim/Oxnard On-Street Alignments), would occur within the existing MTA right-of-way. As a result, project construction would generally not affect any additional MTA lease agreements or private property beyond the acquisitions and displacements associate with project operations. However, in some areas, a limited number of temporary construction easements may be required. Therefore, a limited number of lease agreements and private property may be affected. It is anticipated that these easements would be located outside of residential areas, would not require large amounts of property, and would be limited in duration. However, minor encroachments may be required in some back yards to construct fences or walls at the right-of-way line. Therefore, full property acquisitions and associated displacements are not anticipated. However, information on the exact number and location of construction easements will not be available under further engineering is completed.

5-3.4 Mitigation

5-3.4.1 No Build Alternative

The proposed No Build Alternative would not require any temporary construction easements and would not affect MTA lease agreements or private property outside the right-of-way; therefore, mitigation is not proposed.

5-3.4.2 Transportation Management Systems (TSM) Alternative

The proposed TSM Alternative would not require any temporary construction easements and would not affect MTA lease agreements or private property outside the right-of-way; therefore, mitigation is not proposed.

5-3.4.3 Bus Rapid Transit (BRT) Alternative

All three of the proposed BRT alignments may require temporary construction easements that could affect residences or businesses. The following mitigation measure is proposed if any of the easements require any property acquisition and displacements.

A&D-1: The potential effects of property acquisitions and the displacement of persons and businesses will be substantially alleviated through compliance with applicable federal and state laws governing relocation assistance and property acquisition procedures, including the *Uniform Relocation Assistance and Real Properties Acquisition Policies Act of 1970* (Uniform Act), as amended, and the *California Relocation Act* (California Act). Please refer to Section 4-2 for more detailed information regarding both the Uniform Act and the California Act.

Construction-related displacements associated with existing MTA lease agreements may be entitled to relocation assistance. The qualification for assistance is subject to the eligibility requirements of the acts and is dependent upon the specific lease agreement. In many instances, the agreement with the MTA contains a provision wherein the tenant acknowledges that he is not entitled to relocation benefits if the lease is terminated. Many of the businesses, residences, and nonprofit organizations displaced by temporary construction acquisitions of private property may be eligible for relocation assistance under both the Uniform Act and California Act.

5-4 DEMOGRAPHICS AND NEIGHBORHOODS

5-4.1 Impact Analysis and Methodology

Construction activities would have an adverse effect under NEPA (significant effect under CEQA) on demographics and neighborhoods if they result in the alteration of the demographic patterns in the study area, or significantly disrupt neighborhood life or lifestyle along the project corridor.

5-4.2 Impacts

The No Build and TSM Alternatives would have no construction effects on demographics or communities because no construction would occur.

Construction of the BRT Alternative would have some effects on neighborhoods related to air quality, noise, vibration, traffic, public services, safety risks, aesthetics, and accessibility.

Construction of the proposed build alternatives, the BRT (including both the On-Street Alignment and MOS) Alternatives, would affect the populations and neighborhoods in the study area described in Section 4-3 (Demographics and Neighborhoods). Construction is expected to last a total of 24 months, or two years, with any particular potion of the corridor area affected for periods of a few weeks to two years. The construction scenarios anticipated for each alternative, including construction duration, sequencing, techniques, and equipment are described more fully in Section 5-1 (Pre-Construction Activities and Construction Methods).

The types of effects associated with construction would be essentially the same for all the build options. The local population could expect to experience temporary, localized, intermittent impacts from construction-related changes in air quality, noise, vibration, light, and glare that could be annoying to persons living, working in, or visiting the corridor area. Certain aspects of corridor construction, if they were not mitigated, could also involve some safety risks to persons in the area from the close proximity of construction equipment. Additionally, during some periods of construction along the corridor, access to neighborhoods and homes by residents, visitors, and emergency services personnel would be affected by street closures or detours. More detailed analyses of these localized construction effects can be found in the following sections of this document: 5-2 (Transportation and Parking), 5-5 (Community Facilities and Services), 5-7 (Visual and Aesthetic Conditions), 5-8 (Air Quality), 5-10 (Noise and Vibration), and 5-14 (Safety and Security). These various individual impacts would produce a collective nuisance, which is the impact consideration described in this section.

Under the BRT Alternative, all areas around the proposed alignment would be subject to the collective nuisance normally associated with a public works construction project. The Lankershim/Oxnard On-Street Alignment would avoid the impacts associated with construction in the areas surrounding the ~~SP~~ MTA ROW between Lankershim Boulevard and Woodman

Avenue. The MOS would limit the collective nuisance to the areas along the ~~SP~~ MTA ROW between Balboa Boulevard and Woodman Avenue.

In addition, construction activities are anticipated to generate some additional employment in the project study area. This is not expected to significantly affect the local demographic or housing patterns, however, because of the large regional economy of which the San Fernando Valley is a part. The additional workers brought to the area as a result of construction activities would most likely commute from surrounding areas, and thus would not affect the study area population or housing market. Therefore, no adverse effect under NEPA (significant effect under CEQA) is expected.

5-4.3 Mitigation

Mitigation measures to address the potential effects of construction on demographics and neighborhoods (which are related to transportation and parking), community facilities and services, visual and esthetic conditions, air quality, noise and vibration, and safety and security can be found in the following sections of this document: 5-2 (Transportation and Parking), 5-5 (Community Facilities and Services), 5-7 (Visual and Aesthetic Conditions), 5-8 (Air Quality), 5-10 (Noise and Vibration), and 5-14 (Safety and Security).

5-5 COMMUNITY FACILITIES AND SERVICES

5-5.1 Impact Analysis Methodology and Evaluation Criteria

Construction activities were analyzed in the context of adjacent facilities and services to the proposed alternatives and alignments. Adverse impacts under NEPA (significant impacts under CEQA) would include impaired access and physical intrusions such as noise and reduced air quality (e.g., dust). If access to facilities or services were substantially impaired for an extended period of time, that would constitute an adverse impact under NEPA (significant impact under CEQA). Overall exposure to combined impacts (noise, dust, etc.) for an extended period of time would also constitute an adverse impact under NEPA (significant impact under CEQA).

Community facilities and services adjacent to each alternative were identified during field surveys using conceptual engineering plans. The locations and types of facilities adjacent to the proposed alternatives were mapped and tabulated, and a qualitative assessment of the impacts to each facility during the construction of the project was made. The potential impacts resulting from the project would vary depending upon the characteristics (e.g. type of construction) an proximity of the alternative selected. Impaired accessibility and construction noise and dust could have an adverse impact under NEPA (significant impact under CEQA) upon public services.

It is assumed that there would be no construction associated with the TSM Alternative and therefore no analysis has been conducted.

5-5.2 Impacts

5-5.2.1 Fire and Police Protection Services

Increased traffic on local streets, particularly at intersections, may have an adverse effect under NEPA (significant effect under CEQA) on emergency response times. Street and lane closures would likely increase traffic congestion. To minimize the effect of these closures, staging/detour plans during construction would be reviewed with emergency personnel prior to construction. Notification of road or lane closures would be distributed to ensure no disruption of service. Furthermore, emergency vehicle access shall be included in construction specifications. At all street closures, an attempt would be made for one lane in each direction for emergency vehicle use to be maintained at all times.

5-5.2.2 Schools and Libraries

During construction, schools located adjacent to the proposed alternatives and alignments may be subject to adverse impacts under NEPA (significant impact under CEQA) requiring mitigation. Potential noise impacts and air quality impacts could occur at schools located adjacent to corridor construction. Noise impacts can be mitigated by adhering to City of Los

Angeles noise ordinances and operating within established LAUSD noise standards (see Section 5-9). Air quality impacts would also be minimized by adhering to the California ambient air quality standards (CAAQS) and following mitigation measures for construction activities to ensure that emissions do not exceed Southern California Air Quality Management District (SCAQMD) significance threshold levels (see Section 5-7).

Student safety during the construction period (see Section 5-13) could be a concern at schools located adjacent to construction sites, if not mitigated. Construction specifications are written to reduce potential construction hazards. Construction crews are trained in safety requirements and procedures and California Occupational Health and Safety requirements must be met by the contractor. The contractor would also be required to secure unsafe construction sites (fences and signage) to avoid creating an "attractive nuisance" and to prohibit unauthorized entry. At some locations, crossing guards may be needed

There are no libraries located adjacent to the proposed alternatives, and so libraries would not be affected by the construction of the project.

5-5.2.3 Religious Institutions

Religious facilities may experience short-term disruptions due to construction activities. Under the BRT, MOS, or the Lankershim/Oxnard On-Street alternatives and alignments, the following religious institutions would be adjacent to construction areas:

- St. John's Lutheran Church at 6220 Corbin Avenue
- Jehovah's Witnesses at 5440 Troost Avenue
- Shaarey Zedek Congregation at 12800 Chandler Boulevard
- Ohel Rachel Synagogue at 18750 Oxnard Street
- Iranian Synagogue at 18356 Oxnard Street
- Aish Hatorah at Wilkenson Avenue and Chandler Boulevard
- Chabad of North Hollywood at 13079 Chandler Boulevard

Construction of the proposed dedicated bus corridor may cause temporary noise and air quality impacts (see Sections 5-7 and 5-9). Noise and air quality impacts can be mitigated by adhering to City of Los Angeles noise ordinances (see Section 5-9), California ambient air quality standards (CAAQS) and establishing construction activities to ensure that emissions do not exceed Southern California Air Quality Management District (SCAQMD) significance threshold levels (see Section 5-7). Temporary closures of intersections would be spaced throughout the corridor to ensure that an alternative means of pedestrian activity would be available in proximity to the closed streets.

5-5.2.4 Health Care Facilities

The bus corridor for the BRT Alternative and the Lankershim/Oxnard On-Street Alignment would be constructed in proximity to the H.E.L.P. Group (a facility for disadvantaged children), Chandler Convalescent Hospital, and the Tarzana Treatment Center. These facilities could be inconvenienced by noise and dust. Noise and air quality impacts can be mitigated by adhering to City of Los Angeles noise ordinances (see Section 5-9), California ambient air quality standards (CAAQS) and establishing construction activities to ensure that emissions do not exceed Southern California Air Quality Management District (SCAQMD) significance threshold levels (see Section 5-7).

5-5.2.5 Parks and Recreational Facilities

Construction activities would result in temporary, periodic noise, vibration, air, visual, and access impacts that may indirectly affect parks and recreational facilities. Patrons and employees could expect limited and temporary impairment of their use and enjoyment of these facilities, but no adverse impact under NEPA (significant impact under CEQA) is expected since construction activities will be limited in duration and contractor specifications will be included in the project to minimize disruptions. Adherence to applicable construction standards would also tend to diminish potentially adverse impacts under NEPA (potentially significant impacts under CEQA) of construction activities.

5-5.3 Mitigation Measures

CF-C1 To reduce the potential for restricting access to community facilities and services during construction of the proposed alternatives or alignments, the MTA and the construction contractor ~~would~~ will adhere to local and state ordinances for areas under construction, and conduct construction under an approved traffic management plan.

5-5.3.1 Fire and Police Protection

CF-C2 Coordination will be conducted with City of Los Angeles Fire and Police Department personnel to provide adequate advance notice of construction activities and identify, as necessary, any special arrangements that may be needed to facilitate the delivery of emergency services.

5-5.3.2 Schools and Libraries

To further minimize impacts to schools and students, one or more of the following will be implemented:

CF-C3 School officials will be consulted regarding the construction process ~~to provide for~~ in order to develop the least intrusive construction process feasible;

CF-C4 School officials will be consulted in order to ensure maintenance of safe student walk routes and access for passenger vehicles and school buses;

CF-C5 Crossing guards or flag men will be provided at active construction sites in proximity to schools and where school pedestrian routes cross construction areas.

CF-C6 Construction scheduling and haul routes will be sequenced, to the extent practicable, to minimize conflicts with pedestrians, school buses and vehicular traffic during arrivals and dismissals of the school day.

For specific mitigation for noise and air quality impacts please refer to Sections ~~5-7~~ 5-8 and 5-9 respectively.

5-5.3.3 Religious Institutions

For specific mitigation for noise and air quality impacts please refer to Sections ~~5-7~~ 5-8 and 5-9 respectively.

5-5.3.4 Health Care Facilities

For specific mitigation for noise and air quality impacts please refer to Sections ~~5-7~~ 5-8 and 5-9 respectively.

5-5.3.5 Parks and Recreational Facilities

For specific mitigation for noise and air quality impacts please refer to Sections ~~5-7~~ 5-8 and 5-9 respectively.

5-6 FISCAL AND ECONOMIC CONDITIONS

5-6.1 Impact Analysis Methodology and Evaluation Criteria

The effects of construction on fiscal and economic conditions are analyzed in two areas: effects on business activity, and effects on regional output and employment. An adverse effect under NEPA (significant effect under CEQA) on business activity would result if construction prevents or severely inhibits businesses' ability to provide services or attract customers, thus threatening their economic viability. An adverse effect under NEPA (significant effect under CEQA) on regional output and employment would result if construction activities result in the loss of more than one percent of area employment or output.

5-6.2 Impacts

The No Build Alternative would have no construction effects on fiscal or economic conditions because no construction would occur.

The effects associated with construction under the BRT Alternative include effects on business activity and on regional output and employment. These effects are described in more detail below.

5-6.2.1 Business Activity

Construction activities would involve certain effects on business activity in the study area. In most instances, the precise nature of these effects and the particular businesses that might be affected cannot be known with certainty until final construction plans are prepared. In general, however, the potential effects on business activity in the corridor area would be expected to include the following:

a. Indirect Impacts

Indirect effects on business activity would potentially result from temporary, intermittent, localized construction-related changes in air quality, noise, vibration, safety risks, and aesthetics in the corridor area, if not mitigated. For example, construction activities and equipment would be likely to cause short-term, sporadic, site-specific air emissions, dust, noise, vibration, light and glare that could be annoying to the employees and patrons of corridor area businesses, if not mitigated. Some elements of construction might also involve temporary public safety risks to persons and businesses in the area, given the close proximity of heavy equipment and construction sites to public thoroughfares and structures, if not mitigated. More detailed analyses of these types of indirect construction effects can be found in the following sections of this document: 5-7 (Visual and Aesthetic Conditions), 5-8 (Air Quality), 5-10 (Noise and Vibration), and 5-14 (Safety and Security). These individual impacts would produce a collective nuisance affecting business activity, if not mitigated.

To the extent that these indirect effects of construction would temporarily make certain commercial areas along the MTA right-of-way (or along Oxnard Street and Lankershim Boulevard in the case of the Lankershim/Oxnard On-Street Alignment) less attractive locations in which to visit, work, and conduct business, they would be considered to have short-term adverse economic effects under NEPA (short-term significant economic effects under CEQA) on business activity. Specifically, the retail sales and restaurant patronage components of overall business activity could be temporarily affected in the corridor area, with related effects on revenues from business taxes and sales and use taxes. These economic effects occurring during the construction period cannot be quantitatively estimated with certainty, and such estimates would be speculative, at best, considering the multitude of other factors which influence the economy. However, since the effects would be temporary, intermittent, and localized, and most construction activities would be contained within the ~~SP~~ MTA ROW, the indirect adverse effects under NEPA (indirect significant effects under CEQA) on business activity associated with construction activities would not be substantial. In addition, mitigation measures are proposed to lessen the impacts.

b. Impacts on Accessibility

Business activity in the corridor area would also be potentially affected by temporary, intermittent, localized disruptions to accessibility during the construction period. During various phases of construction and for varying lengths of time, employees', patrons', and business suppliers' access to businesses and parking areas in some locations along the corridor would be disrupted by construction activities. Additionally, directional signs, commercial signs, and advertising could be periodically obscured. More detailed analysis of these types of effects can be found in the following sections of this document: 5-2 (Transportation and Parking), 5-7 (Visual and Aesthetic Conditions), and 5-14 (Safety and Security).

Similar to the indirect effects of construction activities described above, disruptions to accessibility resulting from construction activities would have short-term adverse economic effects under NEPA (short-term significant economic effects under CEQA) on business activity insofar as some commercial areas along the proposed corridor would temporarily be less appealing locations in which to visit, work, and conduct business. The specific economic effects on business activity in the corridor area from disrupted access would be similar to those already identified above. For the same reasons noted above, these effects cannot be accurately quantified. However, it should be noted that most of the staging activities and construction would occur entirely within the MTA right-of-way, and therefore the impacts on accessibility would not only be temporary, intermittent, and localized, but would also be limited in scope. In addition, mitigation measures are proposed to lessen the impacts.

c. Temporary Acquisitions

Some businesses may be subject to temporary acquisitions during construction in order to provide adequate space for construction activities and staging (see Section 5-3, Acquisitions and Displacements). However, as noted above, the effects would be temporary, intermittent, and localized, and the adverse effects under NEPA (significant effects under CEQA) on business activity associated with such possible temporary acquisitions would not be substantial.

5-6.2.2 Output and Employment

Construction of the build alternatives would have beneficial effects on the economy related to regional output and employment. These effects have been calculated using regional construction sector multipliers provided by the American Public Transit Association (APTA) using the Regional Industrial Modeling System (RIMS) II model, and the Southern California Association of Governments (SCAG) using the 66-Sector I/O model.

a. Direct Employment

Based on the Regional Industrial Modeling System (RIMS) II model, transit capital investments have been shown to result in a direct regional employment benefit. Using the RIMS II model, the American Public Transit Association (APTA) has determined that for each $100 million[1] invested in new rail projects, it is estimated to directly increase employment by 3,380 full time-equivalent (FTE) jobs. (One FTE is equivalent to one person employed full-time for one year.) The same amount invested in bus and bus facilities would directly create 3,149 jobs. Of the total jobs generated by new rail starts, over half are typically construction-related or business and professional services. For bus and bus facility investments, the jobs created are more equally divided among various employment sectors with a fairly large percentage in motor vehicle manufacturing. The higher employment impacts of new start projects are attributable to the higher labor-intensity of new transit construction work and related professional services. Bus projects generate somewhat fewer jobs per unit of investment since a larger proportion of these costs are expended on manufacture and assembly of motor vehicles, which is a more capital-intensive activity.

Because Bus Rapid Transit (BRT) is a relatively new form of transportation improvement, and has not yet been included in any regional economic modeling system, there is no multiplier designed specifically to calculate the direct effects of a BRT system on job creation. Therefore, for the purposes of this analysis, the regional multiplier for new rail projects (33.8 jobs/$1 million) was used as representative of an exclusive busway form of transit project. This is because a high percentage of the construction costs of the full BRT and On-Street alignment would be used for either construction or professional services, while a minimal percentage of construction costs would be used for the purchasing of vehicles. For the MOS, however, a much higher percentage of the construction cost would be devoted to the purchasing of vehicles; therefore, for the MOS, the regional multiplier for new bus projects (31.49 jobs/$1 million) was used.

The direct employment created by the full BRT, Lankershim/Oxnard On-Street alignment, and MOS is summarized in Table 5-2, below. The full BRT and Lankershim/Oxnard On-street alignment would generate the most FTE jobs, approximately ~~9,610~~ 9,065 to 9,450 and 8,280 respectively. The MOS would generate approximately 4,770 FTE jobs.

The effect on direct employment from construction of the proposed project would be considered a beneficial effect.

[1] Does not include right-of-way costs.

Table 5-2: Direct and Indirect Construction Employment				
Alignment		**Estimated Cost of Construction**[1]	**Direct FTE Employment Generated**[2]	**Indirect FTE Employment Generated**[3]
Full BRT	1999	$284,280,000	9,610	13,120
	2001	268,199,666-279,543,416[4]	9,065-9,450[4]	12,374-12,899[4]
Lankershim/Oxnard On-Street Alignment		$245,030,000	8,280	11,310
MOS		$151,403,000	4,770	6,510

Notes:
(1) Cost measured in 1999 dollars, and does not include right-of-way costs.
(2) Number of direct FTE jobs generated by the full BRT and Lankershim/Oxnard On-street Alignment based on a multiplier of 33.8 FTE jobs per $1 million of construction cost, as estimated by APTA (1983) for new start rail projects using the RIMS II model. Number of direct FTE jobs generated by the MOS based on a multiplier of 31.49 FTE jobs per $1 million of construction cost, also provided by APTA, but for new start bus projects.
(3) Indirect FTE is equivalent to the total direct FTE multiplied by a regional multiplier of 1.365 that was provided by APTA.
(4) Cost measured in 2001 dollars. Reflects a range of upper and lower bound capital cost estimates. See Chapter 6 for greater detail.
FTE = Full time-equivalent employment

Source: Myra L. Frank & Associates, Inc., 2000; Parsons Transportation Group, 2000.

b. Indirect Employment

The new construction employment that would be a direct result of construction of the proposed project would also have indirect effects on total employment in the San Fernando Valley area. Indirect employment effects have been calculated using a multiplier of 1.365 provided by ~~SCAG~~ APTA to estimate the number of indirect FTE jobs that would be generated by the construction of the proposed project. This means that for every one FTE job generated by construction, 1.365 additional indirect FTE jobs would also be generated. The indirect employment created by the full BRT, Lankershim/Oxnard On-Street alignment, and MOS is summarized in Table 5-2, above. The full BRT and Lankershim/Oxnard On-street alignment would generate the most indirect FTE jobs, approximately ~~13,120~~ 12,374 to 12,899 and 11,310 respectively. The MOS would generate approximately 6,510 indirect FTE jobs.

The effect on indirect employment from construction of the proposed project would be considered a beneficial effect.

c. Regional Output

Construction of the proposed project would result in increased regional output. In other words, this increase in regional output would represent the increase in total economic activity in the San Fernando Valley region precipitated by the initial capital construction expenditure for the BRT. The increase would be created by the demand for goods and services across a range of economic sectors which results from the direct, indirect, and induced economic multiplier effects of construction sector spending. The related economic sectors most likely to see the effects on regional output form the proposed project would be: business services, new construction, maintenance and repair construction, transportation, real estate, and motor vehicles.

The effects of new construction on regional output have been calculated using a multiplier factor for regional output of 1.74 that has been provided by the Southern California Association of Governments (SCAG). A factor of 1.74 means that for every one dollar change in activity by the construction sector, total economic activity in the San Fernando Valley region increases by $1.74. Depending on whether the full BRT, Lankershim/Oxnard On-Street Alignment, or MOS is adopted, the amount of increased regional output resulting from construction of the proposed project would range from about $280,841,220 to ~~$426,352,200~~ $486,405,544. This effect on the economy from construction of the proposed project would be considered a beneficial effect. Table 5-3 summarizes the multiplier effect of capital construction expenditures on regional output.

Table 5-3: Changes in Regional Output Due to Construction

Alignment		Estimated Cost of Construction[1]	Increase in Regional Output[2]
Full BRT	1999	$284,280,000	$494,647,200
	2001	$268,199,666- $279,543,416[3]	$466,667,419- $486,405,544[3]
Lankershim/Oxnard On-Street Alignment		$245,030,000	$426,352,200
MOS		$151,403,000	$280,841,220

Notes:
(1) Cost measured in 1999 dollars, and does not include previously acquired right-of-way costs.
(2) Multiplier effect based on a multiplier of 1.74, drawn from the 1991 SCAG 66-Sector I/O Model.
(3) Cost measured in 2001 dollars. Reflects a range of upper and lower bound capital cost estimates. See Chapter 6 for greater detail.

Source: Myra L. Frank & Associates, Inc., 2000; Parsons Transportation Group, 2000.

5-6.3 Mitigation Measures

Mitigation measures that address the potential adverse construction effects under NEPA (potential significant construction effects under CEQA) on business activity which are related to transportation, parking, aesthetics, air quality, noise, vibration, and safety risks can be found in the following sections of this document: 5-2 (Transportation and Parking), 5-7 (Visual and Aesthetic Conditions), 5-8 (Air Quality), 5-10 (Noise and Vibration), and 5-14 (Safety and Security).

Mitigation measures that address the potential adverse effects under NEPA (potential significant effects under CEQA) of construction on business activity which are related to temporary business acquisitions can be found in Section 5-3 (Acquisitions and Displacements).

No mitigation is required for employment and economic output since the potential effects of corridor construction on the economy which are related to regional output and employment would be beneficial.

5-7 VISUAL AND AESTHETIC CONDITIONS

5-7.1 Impact Analysis Methodology and Evaluation Criteria

Construction of the proposed BRT Alternatives would result in temporary disruptions to the visual character of the study area. Such disruptions could include blockage of key views, visual intrusion, shade and shadow, increases in ambient light levels, and glare. The same impact methodology and significance criteria used in Section 4-6, Visual and Aesthetic Conditions, were used to conduct this analysis. Because the TSM Alternative would not involve fixed facility construction, it is assumed that no impacts of significance would occur. The following is a description of the potential impacts associated with construction of each of the proposed BRT Alternatives.

5-7.1.1 Full BRT Alternative

This Alternative features an at-grade profile, and assumes a 2-year construction period. The existing ~~SP~~ MTA ROW would be cleared of existing tracks and buildings and graded. New paving, sound walls, station structures, bridges, traffic control equipment, curbs and gutters, and landscaping would be installed along the length of the right-of-way.

Medium sized earth-moving equipment such as earth loaders or scrapers, grading equipment such as dozers, and forklifts may be used. Cranes may be used for larger construction needs such as the bridges over the Tujunga Wash at Coldwater Canyon Avenue and over the Los Angeles River in the Sepulveda Dam Recreation Area. Construction areas may be surrounded by temporary fencing. Views of these fences would be visible to sensitive viewers along Chandler Boulevard, and potentially over rear yard fences in residential areas adjacent to the right-of-way. Views of construction activities could potentially be visible from second story windows in residential areas along the right-of-way. However, these views would be intermittent and short-term. Once soundwalls are built, they would serve to block views of construction in the right-of-way. In selected locations, MTA Metro Art, working cooperatively with adjacent communities, will commission artists to install temporary murals or banners on the soundwalls to enhance the walls and deter graffiti, thus mitigating the impact of the blank soundwalls. Because views of construction would be temporary and intermittent, and no other visual impacts such as changes to lighting or blockage of key views would occur, the visual impacts of construction for this alternative would not be adverse under NEPA (significant under CEQA).

5-7.1.2 Lankershim/Oxnard On-Street Alignment

This Alternative features an at-grade, on-street profile, and would require minimal construction in the on-street portion. Portions of traffic lanes along Lankershim Boulevard and Oxnard Street may be re-striped, and bus shelters would be constructed at the two station areas along Oxnard Street. Some roadway resurfacing at the station sites and some sidewalk reconstruction around the bus shelter could be necessary. Construction areas would not be fenced off from view, due to ongoing high levels of use in the area. Construction equipment would be visible to high and medium sensitivity viewers along Lankershim Boulevard and Oxnard Street, however these views would be intermittent and short-term. Existing street trees would be maintained and replaced if damaged during construction. Visual impacts such as shadow or glare or blockage of key views would not occur. Visual impacts of construction would not be adverse under NEPA (significant under CEQA) along this alignment.

5-7.1.3 Minimum Operable Segment (MOS)

The visual impacts of construction along the MOS would be identical to those described above for the full BRT Alternative. West of Balboa Boulevard, this Alternative would be an on-street alignment along Victory Boulevard and the impacts would be similar to those along the Lankershim/Oxnard On-Street Alignment. Visual impacts would not be adverse under NEPA (significant under CEQA).

5-7.2 Station Construction

Station construction is expected to take nine months, including clearing and grubbing the site, constructing the platforms, and installing the canopies and other platform amenities. The visual impacts of station construction would vary depending on the planned intensity of station development; specifically, whether or not a park-and-ride lot is planned on the station site. The visual impacts of station construction are described below, with the station sites grouped according to whether or not a parking lot is being constructed.

5-7.2.1 Stations With New Parking: Van Nuys, Sepulveda, Balboa, Reseda, Pierce College (Winnetka)

These stations may feature park-and-ride lots of varying size. As described above in Section 5-6.1.1, fences would be provided where required for safety considerations. Viewers near these stations are typically of low sensitivity, with the exception of the single family residences along the north edge of the proposed park-and-ride lot at the Sepulveda and Pierce College (Winnetka) stations (see Section 4-6.1.5). These residences would be more than 50 feet from any construction activity. Due to the predominantly commercial, ~~and~~ industrial, or institutional character of areas adjacent to construction, and the temporary nature of this construction, visual impacts would not be adverse under NEPA (significant under CEQA).

5-7.2.2 Stations Without New Parking: North Hollywood, Laurel Canyon, Valley College, Woodman, Woodley, Tampa, Pierce College (Mason) & De Soto

Platform construction areas may be fenced off from surrounding view, blocking sensitive viewers' sight of construction activities and equipment. Views of construction fences are screened by existing fences and vegetation. Because construction would be temporary and views of construction activity would be blocked, visual impacts would not be adverse under NEPA (significant under CEQA).

5-7.2.3 On-Street Stations: Warner Center Transit Hub, Laurel Canyon at Oxnard, Valley College at Oxnard

Station construction along the proposed on-street alignments would involve the construction of bus shelters and some altering of street and sidewalk pavement, as described above in Section 5-6.1.2. Fences would not be used in these areas due to ongoing high-intensity use of the area by transit users and pedestrians. However, these views of construction would be temporary and impacts would not be adverse under NEPA (significant under CEQA).

5-7.3 Mitigation Measures

Because visual impacts during the 2-year construction phase would be temporary and not adverse under NEPA (not significant under CEQA), additional mitigation measures other than fencing would not be required.

5-8 AIR QUALITY

5-8.1 Impact Analysis Methodology and Evaluation Criteria

Daily emissions were derived using applicable emission factors and formulas found in the South Coast Air Quality Management District (SCAQMD) California Environmental Quality Act (CEQA) Handbook, Appendix 9 (1993 edition).

The project would have an adverse impact under NEPA (significant impact under CEQA) if its daily construction emissions were to exceed significance thresholds for carbon monoxide (CO), reactive organic gas (ROG), nitrogen oxides (NO_X), sulfur oxides (SO_X), or particulates (PM_{10}) as established by the SCAQMD. Significance thresholds appear in Table 5-4.

Table 5-4: South Coast Air Quality Management District Daily Emissions Thresholds (pounds per day)

Criteria Pollutant	Construction
Carbon Monoxide	550
Reactive Organic Gas	75
Nitrogen Oxides	100
Sulfur Oxides	150
Particulates	150

Source: South Coast Air Quality Management District, 2000.

The proposed project does not contain lead, hydrogen sulfide, or sulfate emission sources. Therefore, emissions and concentrations related to these pollutants have not been analyzed.

5-8.2 Impacts

5-8.2.1 No Build Alternative

Under the No Build Alternative, no construction would occur, and no impacts are anticipated.

5-8.2.2 Transportation System Management (TSM) Alternative

Under the TSM Alternative, no construction would occur, and no impacts are anticipated.

5-8.2.3 Bus Rapid Transit (BRT) Alternative

Each of the three alignments (Full BRT, On-Street Alignment, and MOS) would generate pollutant emissions from the following construction activities: (1) removal of existing track and ballast, (2) excavation, (3) mobile emissions related to construction worker travel to and from the project sites, (4) mobile emissions related to the delivery and hauling of construction supplies and debris to and from project sites, and (5) stationary emissions related to fuel consumption by on-site construction equipment. Construction would occur in several steps, lasting for a total of approximately 24 months, and could be placed into two categories. The first category would include the excavation of existing ballast and placement of aggregate base material. The second category would include the construction of berms and the paving of curbs, gutters, drain inlets, and the BRT right-of-way. Construction of Sstations and bridges would include an excavation phase and new construction. Construction impacts for the three alignments are discussed below.

a. Full BRT

Sensitive receptors adjoining the construction area would be most affected by construction emissions. Adjacent sensitive receptors that are located along the construction area for the Full BRT include:

- North Hollywood Park,
- North Hollywood High School,
- Los Angeles Valley College,
- Birmingham High School,
- Van Nuys Golf Course,
- Sepulveda Dam Recreation Center,
- Pierce College, and
- Residential areas.

Table 5-5 shows the estimated daily emissions associated with each construction phase for the Full BRT Alignment.

Table 5-5: Daily Construction Emissions (pounds per day) – Full BRT Alignment

Construction Phase	CO	ROG	NO_X	SO_X	PM_{10}
Excavation/Aggregate Base Placement	203.79	26.7	82.35	2.97	1,224.27
Foundation/Finishing[1]	209.13	21.93	43.32	1.74	4.44
Maximum	209.13	26.7	82.35	2.97	1,224.27
SCAQMD Threshold	550	75	100	150	150
Potential Threshold Violation	No	No	No	No	Yes

Note: (1)[1]Foundation/finishing phase includes construction of PCC pavement, berms, curb and gutter concrete, and drain inlets concrete.

Source: Terry A. Hayes Associates, 2000.

As shown above, CO, ROG, NO_X, and SO_X are not anticipated to exceed the SCAQMD significance thresholds. Overlapping of construction phases would not increase these four criteria pollutants to a significant level. However, PM_{10} emissions would exceed the SCAQMD significance threshold of 150 pounds per day (ppd), which would result in a short-term adverse impact under NEPA (short-term significant impact under CEQA). Implementation of mitigation measures would reduce PM_{10} emissions to 235.26 ppd during the excavation/aggregate base placement phase of construction. However, the Full BRT would still exceed the SCAQMD threshold for PM_{10} during the excavation/aggregate base placement phase. This is considered a significant short-term impact under CEQA (adverse under NEPA).

It should be noted that, although the SCAB is in serious non-attainment for PM_{10}, the attainment status is based on whether the National Ambient Air Quality Standards (NAAQS) have been achieved. The NAAQS measures air pollutants based on pollutant concentrations, rather than pollutant emissions. Air pollutants generated during construction are typically measured by the amount of pollutants emitted in the air, rather than the concentration of pollutants. Since the NAAQS does not have standards based on pollutant emissions, the SCAQMD emissions thresholds were used for construction. Although pollutant emissions during the excavation/aggregate base placement phase for the Full BRT exceeds the SCAQMD construction thresholds, construction of the Full BRT may not necessarily result in pollutant concentrations that violate the NAAQS. Section 4-7 discusses the impacts that the Full BRT would have on pollutant concentrations.

b. Lankershim/Oxnard On-Street Alignment

Sensitive receptors that adjoin the construction area for the On-Street Alignment would be most affected by construction emissions. Adjacent sensitive receptors that are located along the construction area include:

- Birmingham High School,
- Van Nuys Golf Course,
- Sepulveda Dam Recreation Center,
- Pierce College, and
- Residential areas.

Table 5-6 shows the estimated daily emissions associated with each construction phase for the Lankershim/Oxnard On-Street Alignment.

As shown in the table, CO, ROG, NO_X, and SO_X are not anticipated to exceed the SCAQMD significance thresholds. Overlapping of construction phases would not increase these four criteria pollutants to a significant level. However, PM_{10} emissions would exceed the SCAQMD significance threshold of 150 ppd, which would result in a short-term adverse impact under NEPA (short-term significant impact under CEQA). Implementation of ~~M~~mitigation measures would reduce PM_{10} emissions to ~~80.1 ppd, below the significance threshold established by the SCAQMD~~ 180.33 ppd. However, the SCAQMD threshold for PM_{10} would still be exceeded during the excavation/aggregate base placement phase of construction. This is considered a significant short-term impact under CEQA (adverse under NEPA).

Table 5-6: Daily Construction Emissions (pounds per day) – Lankershim/Oxnard On-Street Alignment

Construction Phase	CO	ROG	NO_X	SO_X	PM_{10}
Excavation/Aggregate Base Placement	155.94	20.43	63	2.13	936.87
Foundation/Finishing[1]	153.96	16.05	31.08	1.26	3.15
Maximum	155.94	20.43	63	2.13	936.87
SCAQMD Threshold	550	75	100	150	150
Potential Threshold Violation	No	No	No	No	Yes

Note: [1]Foundation/finishing phase includes construction of PCC pavement, berms, curb and gutter concrete, and drain inlets concrete.

Source: Terry A. Hayes Associates, 2000.

It should be noted that, although the SCAB is in serious non-attainment for PM_{10}, the attainment status is based on whether the NAAQS has been achieved. The NAAQS measures air pollutants based on pollutant concentrations, rather than pollutant emissions. Air pollutants generated during construction are typically measured by the amount of pollutants emitted in the air, rather than concentrations of pollutants. Since the NAAQS does not have standards based on pollutant emissions, the SCAQMD emissions thresholds were used for construction. Although pollutant emissions during the excavation/aggregate base placement phase for the On-Street Alignment exceeds the SCAQMD construction thresholds, construction of the On-Street Alignment may not necessarily result in pollutant concentrations that violate in the NAAQS. Section 4-7 discusses the impacts that the On-Street Alignment would have on pollutant concentrations.

c. Minimum Operable Segment (MOS)

Sensitive receptors that adjoin the construction area for the MOS would be most affected by construction emissions, particularly PM_{10}. Adjacent sensitive receptors that are located along the construction area include:

- Birmingham High School,
- Van Nuys Golf Course,
- Sepulveda Dam Recreation Center, and
- Residential areas.

Table 5-7 shows the estimated daily emissions associated with each construction phase for the MOS. As ~~shown above~~ the table shows, CO, ROG, NO_X, and SO_X are not anticipated to exceed the SCAQMD significance thresholds. Overlapping of construction phases would not increase these four criteria pollutants to a significant level. However, PM_{10} emissions would exceed the SCAQMD significance threshold of 150 ppd~~, which would result in a short-term adverse impact under NEPA (short-term significant impact under CEQA)~~. Implementation of mitigation measures would reduce PM_{10} emissions to 180.03 ppd, and a less-than-significant impact under CEQA (adverse under NEPA) is anticipated.

Table 5-7: Daily Construction Emissions (pounds per day) – Minimum Operable Segment

Construction Phase	CO	ROG	NO_X	SO_X	PM_{10}
Excavation/ Aggregate Base Placement	69.39	9.09	28.02	0.96	416.82
Foundation/Finishing[1]	59.88	6.09	10.89	0.45	1.05
Maximum	69.39	9.09	28.02	0.96	416.82
SCAQMD Threshold	550	75	100	150	150
Potential Threshold Violation	No	No	No	No	Yes
Note: (1) Foundation/finishing phase includes construction of PCC pavement, berms, curb and gutter concrete, and drain inlets concrete.					

Source: Terry A. Hayes Associates, 2000.

5-8.3 Mitigation Measures

5-8.3.1 No Build Alternative

No mitigation measures are required.

5-8.3.2 Transportation System Management (TSM) Alternative

No mitigation measures are required.

5-8.3.3 Bus Rapid Transit (BRT) Alternative

a. Full BRT

The following mitigation measures ~~are proposed~~ will be implemented to lessen the adverse air quality impacts under NEPA (significant air quality impacts under CEQA) associated with construction.

AQ-C1 ~~Minimize use of on-site diesel construction equipment, particularly unnecessary idling. Where feasible, replace diesel equipment with electrically powered machinery. Construction equipment will be shut off to reduce idling when not in direct use. Diesel engines, motors, or equipment shall be located as far away as possible from existing residential areas.~~ Low sulfur fuel ~~should~~ shall be used for construction equipment. Consistent with the CARB's diesel-fuel regulations (Title 13, California Code of Regulations, Section 2281 and 2282), the fuel's sulfur content shall be less than 0.05 percent. Construction contracts ~~should~~ shall explicitly stipulate that all diesel powered equipment ~~should~~ shall be properly tuned and maintained.

AQ-C2 ~~If required, h~~Haul truck staging areas shall be approved by the City of Los Angeles Department of Transportation. Haul trucks shall be staged in non-residential areas away from school buildings and playgrounds.

AQ-C3 Site wetting shall occur often enough to maintain a ten percent surface soil moisture content during construction, particularly during ~~throughout~~ any site grading or excavation activity. Additionally, watering shall occur often enough such that visible emissions would not extend to more than 100 feet beyond the active construction area. All unpaved parking or staging areas shall be watered at least ~~four times daily,~~ once every 2 hours of active operations.~~and a~~ All on-site stockpiles of debris, dirt, or rusty material shall be covered or watered at least twice ~~daily~~ per hour of operation.

AQ-C4 ~~Require a~~All trucks hauling dirt, sand, soil, or other loose substances and building materials ~~to~~ shall be covered, ~~or to~~ and shall maintain a minimum freeboard of two feet between the top of the load and the top of the truck bed sides.

AQ-C5 ~~Utilize street~~ Within thirty minutes of visible dirt deposition (tracked-out debris), street sweeping equipment shall be used at all site access points and all adjacent streets used by haul trucks or vehicles that have been ~~onsite within thirty minutes of visible dirt deposition (track-out debris)~~ in the construction area.

AQ-C6 ~~Maintain a~~A fugitive dust control program consistent with the provisions of SCAQMD Rule 403 ~~for any~~ shall be maintained during construction, particularly construction that involves grading ~~or~~ and ~~earthwork~~ earthmoving ~~activity~~ activities ~~that may be required~~.

AQ-C7 ~~Suspend grading operations~~ Construction activities on any unpaved surfaces shall be suspended during first and second stage smog alerts, and during high winds, i.e., greater than 25 miles per hour.

AQ-C8 Water shall be applied to all disturbed surface areas on the last day of active operations prior to a weekend, holiday, or any other period when construction operations will not occur for more than four consecutive days. The water shall be treated with a mixture of chemical stabilizer diluted to no less than 1/20 of the concentration required to maintain a stabilized surface for a period of six months.

AQ-C9 Chemical stabilizers shall be applied to all disturbed surface areas within five working days of grading completion.

AQ-C10 Water shall be applied to all unpaved roads at least once every 2 hours of construction operation.

AQ-C11 Vehicular speeds on unpaved roads shall be restricted to 15 miles per hour.

b. Lankershim/Oxnard On-Street Alignment

Mitigation measures for the Full BRT Alignment are also applicable to the Lankershim/Oxnard On-Street Alignment (see Section 5-8.3.3a).

c. Minimum Operable Segment (MOS)

Mitigation measures for the Full BRT Alignment are also applicable to the MOS (see Section 5-8.3.3a).

5-9 NOISE AND VIBRATION

Construction noise and vibration are temporary impacts. However, without special mitigation measures, BRT construction has the potential to cause substantial short-term noise and vibration impacts when it takes place close to residences and other noise-sensitive land use. It is standard practice to leave specific decisions about construction procedures and equipment to the contractors' discretion, allowing them to meet the required standards via the most cost-effective approach. This means that only preliminary estimates of construction noise and vibration can be made at the present stage of project development.

While it is reasonable to expect the potential for construction noise impact to be substantial, the potential for impact from construction vibration is much more limited. The most likely impacts would result from short-term activities such as demolition, pile driving (if used) and vibratory compaction. While vibration from such activities may be perceptible at times, it will not be sufficient to cause even minor cosmetic building damage.

5-9.1 Construction Noise Impact

Construction noise varies greatly depending on the construction process, type and condition of equipment used, and layout of the construction site. Many of these factors are traditionally left to the contractor's discretion, provided all applicable codes are met. Overall construction noise levels are governed primarily by the noisiest pieces of equipment. For most construction equipment, the engine, which is usually diesel-fueled, is the dominant noise source. This is particularly true of engines without sufficient muffling. For special activities such as impact pile driving and pavement breaking, noise generated by the actual process dominates.

5-9.1.1 Assessment Approach

Table 5-8 summarizes some of the available data on noise emissions of construction equipment from the FTA Guidance Manual. Shown are representative maximum noise level (Lmax) values at a distance of 50 feet. The noise levels in Table 5-8 represent averages for the category of equipment; within each category, there can be wide fluctuations in noise emissions. For example, the sound level for a relatively new derrick crane that has very effective mufflers can be as low as 75 dBA, substantially lower than the 88 dBA value shown in Table 5-8. Correspondingly, an older derrick crane in need of new mufflers might cause noise levels substantially higher than the 88 dBA shown in Table 5-8.

Construction noise at a given location depends on the magnitude of noise during each construction phase, the duration of the noise, and the distance from the construction activities. Projecting construction noise requires a construction scenario of the equipment likely to be used and the average utilization factors or duty cycles (i.e. the percentage of time during operating hours that the equipment operates under full power during each phase). Using the typical sound emission characteristics, as given in Table 5-8, it is then possible to estimate Leq or Ldn at various distances from the construction site. Although projections during the environmental assessment phase of a project are very preliminary, they can provide an indication of the extent of noise mitigation that will be required.

Table 5-8: Typical Construction Equipment Noise Levels

Equipment Type	Typical Sound level at 50 ft (dBA)
Backhoe	80
Bulldozer	85
Compactor	82
Compressor	81
Concrete Mixer	85
Concrete Pump	82
Crane, Derrick	88
Crane, Mobile	83
Loader	85
Pavement Breaker	88
Paver	89
Pile Driver, Impact	101
Pump	76
Roller	74
Truck	88
Source: FTA, 1995	

Table 5-9 is an example noise projection for equipment typically used for roadway and transit station construction. In the calculation it is assumed that all the equipment is located at the geometric center of the construction work site. Based on this scenario, an 8-hour Leq at a distance of 50 feet from the geometric center of the work site would be 85 dBA. This calculation assumes no noise mitigation measures and no limits on how much noise can be made. The value at 50 feet can be scaled to other distances using the relationship:

$$\text{Leq(Dist)} = \text{Leq(50 ft)} - 20\ log_{10}(\text{Dist}/50)$$

Based on this relationship and a typical separation distance of 100 feet from construction areas to the closest residences, the projected Leq at the closest residences would be about 80 dBA, substantially higher than existing ambient noise levels in any part of the project corridor. The actual levels of construction noise will vary greatly depending on the equipment used, how the site is laid out, and the specific construction activities during each shift.

Table 5-9: Typical Equipment for Roadway/Transit Costruction			
Equipment Item	**Typical Maximum Sound Level at 50 ft (dBA)**	**Equipment Utilization Factor (%)***	**Leq (dBA)**
Air Compressor	83	20%	76
Backhoe	80	15%	72
Crane, Mobile	83	10%	73
Dozer	85	15%	77
Generator	81	50%	78
Loader	85	15%	78
Shovel	80	10%	70
Dump Truck	88	15%	80
Total workday Leq at 50 feet (8-hour workday)			85
Note: *Equipment utilization factor is estimated percentage of an 8-hour shift that the equipment will be operating at maximum power.			

Source: HMMH, 2000.

5-9.1.2 Construction Noise Criteria

Impact from construction noise usually requires that the noise be substantially higher than existing ambient noise levels and the impact criteria for construction noise are almost always substantially higher than the impact criteria for permanent noise sources. For example, the construction noise impact criteria for residential areas included in the FTA Manual are an 8-hour Leq of 80 dBA during daytime hours and 70 dBA during nighttime hours. The equivalent limits for operational noise would be at least 10 dBA lower. The higher limits are considered appropriate for construction activities because: (1) the noise impact is not permanent (although it can go on for an extended period of time for a large project), and (2) projections of construction noise tend to be for the worst case; averaged over the duration of construction, noise exposure is typically about 5 dBA lower than the projections.

The following noise impact limits have been used to develop estimates of the degree of impact from construction noise:

Daytime (7 a.m. to 10 p.m.): The higher of Leq 70 dBA and existing Leq + 5 dBA

Nighttime (10 p.m. to 7 a.m.): Existing Leq + 5 dBA

The Leq's are for an 8-hour shift. These limits are applicable to all residences, schools, and places of worship along the corridor. They are based on the requirements of the City of Los Angeles Municipal Code and the existing ambient noise levels in the communities that would be affected by construction noise.

Construction of the BRT would need to be in compliance with the requirements of Sections 112.03 and 41.40 of the City of Los Angeles Municipal Code and any variances to the Code issued by the City. The City regulations basically prohibit construction between 9 p.m. and 7 a.m. without a variance. The regulations do not include specific daytime noise limits, although they do state construction or repair work shall not be performed "... in such a manner that the noise created thereby is loud, unnecessary and unusual and substantially exceeds the noise customarily and necessarily attendant to the reasonable and efficient performance of such work."

Table 5-10 summarizes the noise impact thresholds for the different community areas within the project corridor, which are shown on Figure 5-2. The limits are based on the noise monitoring summarized in Section 4-9.1 and the construction impact limits given above. The daytime limits range from 70 dBA to 76 dBA, but the nighttime limits that are based on existing ambient noise range from 51 to 70 dBA.

Table 5-10: Construction Noise Impact Thresholds

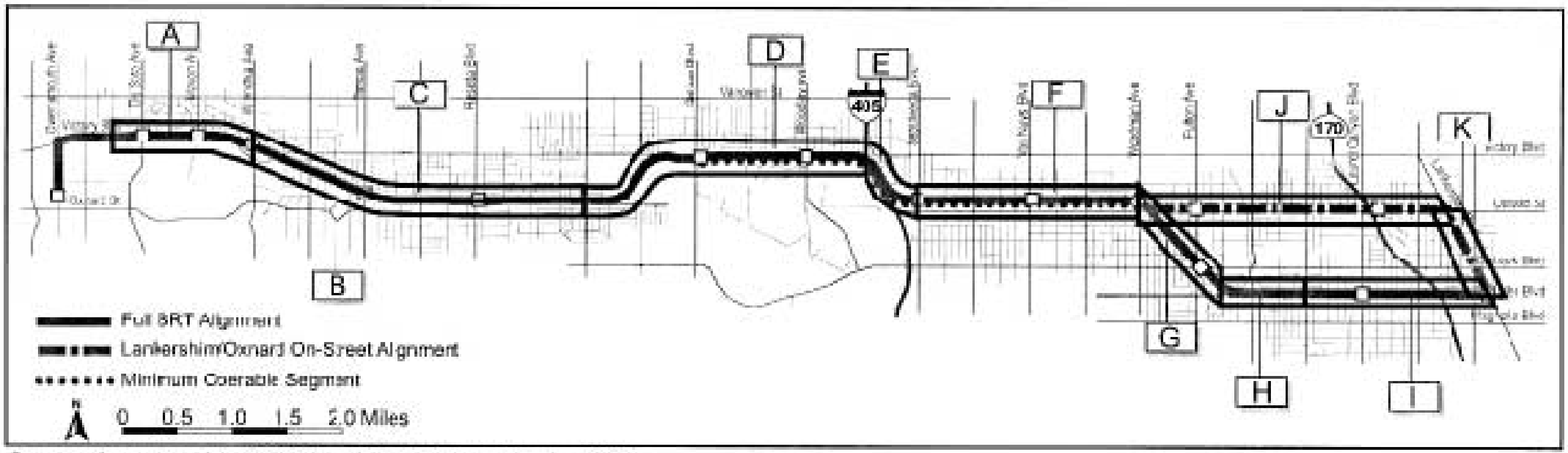
Area		Impact Threshold, 8-hour Leq (dBA)	
		Daytime (7am to 9 pm)	Nighttime (9 pm to 7 am)
WEST VALLEY			
A	Victory Boulevard from Variel Avenue to Winnetka Avenue.	70	59
B	South Side of Topham/Oxnard Streets from Winnetka Avenue to White Oak Avenue.	72	62
C	North Side of Topham/Oxnard Streets from Winnetka Avenue to White Oak Avenue.	70	53
D	Victory Boulevard from Balboa Boulevard to the San Diego Freeway.	76	70
EAST VALLEY			
E	Blucher Avenue along the San Diego Freeway.	70	~~65~~ 55
F	Oxnard Street from Sepulveda Boulevard to Woodman Avenue.	70	51
G	Diagonal section of the ~~SP~~ MTA ROW between Oxnard Street and Chandler Boulevard.	70	52
H	Chandler Boulevard from Ethel Avenue to Whitsett Avenue.	70	59
I	Chandler Boulevard from Whitsett Avenue to Lankershim Boulevard.	70	59

Note: (1) The study area for the on-street alignment would not be subject to construction activity and is therefore not shown in this table.

Source: HMMH, 2000.

5-9.1.3 Construction Noise Impact Assessment

The estimates of 8-hour Leq for typical at-grade transit construction and the noise impact thresholds for different parts of the corridor have been used to estimate the noise impact zone around construction sites in different areas. These are summarized in Table 5-11. It is clear from the preliminary noise impact distances given in Table 5-11 that, without mitigation, there could be substantial impacts from construction noise throughout the corridor. This is particularly true for any construction that would need to be performed during nighttime hours.



Sources: Gruen Associates, 2000; Myra L. Frank & Associates, Inc., 2000.

Figure 5-2: Community Areas Employed in Noise Monitoring Study

Table 5-11: Approximate Construction Noise Impact Distances

Area		Approximate Impact Distances (feet)	
		Daytime (7am to 9 pm)	Nighttime (9 pm to 7 am)
WEST VALLEY			
A	Victory Boulevard from Variel Avenue to Winnetka Avenue.	280	1000
B	South Side of Topham/Oxnard Streets from Winnetka Avenue to White Oak Avenue.	225	700
C	North Side of Topham/Oxnard Streets from Winnetka Avenue to White Oak Avenue.	280	2000
D	Victory Boulevard from Balboa Boulevard to the San Diego Freeway.	140	280
EAST VALLEY			
E	Blucher Avenue along the San Diego Freeway.	280	~~500~~ 1500
F	Oxnard Street from Sepulveda Boulevard to Woodman Avenue.	280	2500
G	Diagonal section of the ~~SP~~ MTA ROW between Oxnard Street and Chandler Boulevard.	280	2250
H	Chandler Boulevard from Ethel Avenue to Whitsett Avenue.	280	1000
I	Chandler Boulevard from Whitsett Avenue to Lankershim Boulevard.	280	1000

Source: HMMH, 2000.

The distances in Table 5-11 are approximate and will vary considerably depending on the specific construction activities. Also, impact out to distances of 2,500 ft is extremely unlikely because of acoustic shielding that would be provided by intervening buildings. However, the distances show that impact from construction activities will be difficult to avoid if there is to be any nighttime construction.

Impacts from construction noise are likely whenever a construction site would be located within about 300 feet of residences, schools, or places of worship. The impact distances increase substantially for any construction that must be performed during nighttime hours. As discussed above, nighttime construction will require that the City of Los Angeles issue a variance.

5-9.1.4 Construction Noise Mitigation Measures

~~One or more of t~~The following general mitigation measures ~~are provided~~ will be implemented:

N&V-C1: Two of the primary steps in controlling the noise impacts from construction are: (1) requirements for specific noise mitigation measures, such as sound walls around construction sites, in the contract documents, and (2) residential property line noise limits in the construction specifications that the contractor cannot exceed. One or more of the following ~~A~~approaches will be used as necessary to ensure that construction is performed in compliance with property line noise limits~~ include~~:

- Perform~~ing~~ noise monitoring (by MTA or its contractors). Regular noise monitoring should be done in areas where it is expected that the contractor will have trouble meeting the property line noise limits. The contractor can perform this type of monitoring, although communities may put more credence in monitoring performed by, or under the direction of, the MTA. The monitoring can be weekly spot checks supplemented with monitoring to respond to complaints. Continuous monitoring using automated, unattended monitors is sometimes justified in particularly sensitive areas.

- Require~~ing~~ contractors to prepare noise control plans. The goal of the noise control plan is to ensure that contractors consider community noise when designing construction sites, selecting construction procedures and equipment, and determining work schedules.

- Limit~~ing the~~ noisy construction activities, particularly during nighttime hours. Example restrictions are: requiring pre-drilled piles, limiting pile driving to mid-day hours, limiting the use of jackhammers and other pneumatic and impact devices, and restricting construction in residential areas to daytime hours.

- Require~~ing~~ contractors to have temporary barriers or sound blankets readily available stockpiled that can be used at the Resident Engineer's discretion to immediately address any noise complaints or noise limit violations. An effective temporary barrier can be constructed of plywood at least on inch thick, appropriately placed and extending to a height sufficient to break the lines of sight between the noise source and receptor.

N&V-C2: General procedures that the contractor ~~should~~ will be required to employ to minimize noise impacts are:

- Perform all construction in a manner to minimize noise. The contractor ~~should~~ will be required to select construction processes and techniques that create the lowest practicable noise levels. Examples are using predrilled piles in place of pile driving, mixing concrete off site instead of on site, and using hydraulic tools instead of pneumatic tools.

- Use equipment with effective mufflers. Diesel engines are often the major source of noise on construction sites. All equipment ~~should~~ will be required to have the most effective commercially available mufflers installed.

- Minimize the use of backup alarms. Because of the particularly intrusive nature of backup alarms, they are often the primary source of complaints about construction noise even though they are not the loudest noise. Approaches that will be ~~considered~~ used, as appropriate, to reducing annoyance caused by backup alarms are: lay out construction sites to minimize the need for backup alarms (if permitted by safety regulatory agencies); use strobe lights in place of backup alarms at night (subject to OSHA approval); use flagmen to keep the area behind maneuvering vehicles clear; and use self-adjusting, ambient-controlled backup alarms. Ambient-controlled backup alarms adjust the alarm loudness up and down depending on ambient noise. The safety implications of any procedure for reducing backup alarm noise must be carefully reviewed before the procedure is implemented.

- Select haul routes and schedules that minimize intrusion to residential areas.
- Lay out construction sites such that the noisiest activities are as separate as possible from noise sensitive receptors. Sometimes it is even possible to gain acoustical benefits by locating temporary construction offices or other barriers between construction activities and residential areas. There are even examples of locating material storage piles so they act as sound barriers.

5-9.2 Construction Vibration

It is expected that ground-borne vibration from construction activities would cause only intermittent, localized intrusion along the corridor. The construction activities most likely to cause vibration impacts are:

- Heavy construction equipment. Although all heavy, mobile construction equipment has the potential of causing at least some perceptible vibration when operating close to buildings, the vibration is usually short term and is not of sufficient magnitude to cause building damage. It is not expected that heavy equipment such as bulldozers, front end loaders or cranes would operate close enough to any residences to cause vibration impact.
- Jackhammers and vibratory compaction equipment. This type of equipment would be used for relatively short periods of time during the demolition phase, preparation of the subgrade, and during final site restoration. If residents complain about intrusive vibration, the contractor will be required to modify the procedure or arrange to complete the task in a manner that will cause the minimum amount of hardship for the affected residents.
- Impact pile driving. If possible, impact pile driving should be avoided at distances less than 250 feet from any residence. If no other approach is acceptable, the contractor will be required to monitor vibration levels at the residence and modify the procedures if the vibration exceeds a threshold of 0.04 in/sec (peak particle velocity).
- Trucks. Trucks hauling excavated material from construction sites can be sources of vibration intrusion if the haul routes pass through residential neighborhoods on streets with bumps or potholes. Fixing the bumps and potholes can almost always eliminate the problem.

5-9.2.1 Construction Vibration Mitigation Measures

The following mitigation measure is proposed:

N&V-C3: Impacts from construction vibration will be controlled by: (1) including specific vibration limits in contract documents, (2) limiting where and when high vibration activities such as pile driving can take place, and (3) requiring vibration monitoring for any construction process that could cause intrusive or damaging vibration.

5-10 GEOTECHNICAL CONSIDERATIONS

5-10.1 Impact analysis Methodology and Evaluation Criteria

Potential geotechnical impacts resulting from construction have been identified by reviewing available published and unpublished geotechnical literature pertinent to the proposed project. These include, but are not limited to, the safety elements of the general plans for the city and county of Los Angeles, available recent and historical aerial photographs, Alquist-Priolo Earthquake Fault Zone Maps, geologic and topographic maps and other publications by the California Division of Mines and Geology and the U.S. Geological Survey, pertinent maps by the California Division of Oil and Gas, Wildcat Oil and Gas Maps, and available geotechnical reports. Additionally, an updated environmental records search has been performed to identify sites along the proposed alignment that have known soil and/or groundwater contamination or a potential to have contamination. Based on the review of available information, the effects of the proposed construction on the existing topography, geology, soils, seismicity, and hazardous materials have been evaluated. Likewise, the effects of the existing topographic, geologic, and seismic conditions, and existing hazardous materials on the construction of the proposed project have been evaluated.

The criteria for determining if potential geotechnical construction impacts would be adverse under NEPA (significant under CEQA) are as follows:

- disruption of a unique geologic feature of unusual scientific value;
- potential for known mineral resources to be rendered inaccessible by construction;
- surface settlement related to tunneling or construction dewatering;
- potential for failure of construction excavations due to the presence of loose saturated sand or soft clay;
- handling and disposal of contaminated soils and groundwater encountered during construction; and
- handling and disposal of hazardous materials resulting from building demolition.

5-10.2 Impacts

The following impact discussions refer to the BRT Alternative, including the Full BRT, Lankershim/Oxnard On-Street Alignment, and MOS. No construction would occur under either the No Build or TSM Alternative.

5-10.2.1 Slope Stability

The construction of an underpass under Interstate 405 will require excavation into sloped embankments underneath the freeway, resulting in potentially unstable slopes. Design slopes will be approved by a geotechnical engineer, and therefore adverse effects under NEPA (significant effects under CEQA) on slope stability are not anticipated.

5-10.2.2 Hazardous Materials

The potential for encountering hazardous materials is present during any construction project, particularly within an urban area. Hazardous waste impacts would occur if project activities expose humans and/or wildlife to hazardous wastes. There is also the possibility of hazardous waste migration by uncovering hazardous materials, mistakenly depositing hazardous materials in a landfill or storage site, or otherwise handling such materials improperly. Impacts of construction could include the accidental release of contaminated soil or groundwater into river channels as well as the exposure of workers and pedestrians to contaminated materials.

Hazardous materials will also be present onsite during construction. Typical hazardous materials commonly stored on construction sites include: detergents, petroleum products for the operation and maintenance of construction equipment, paving coating materials, concrete curing materials, acids, glues, paints, and solvents. Storage of these products onsite could result in the exposure of workers or the public to these hazardous materials, contamination of the soil and/or groundwater, and contamination of runoff. The presence of these hazardous materials would not result in an adverse impact under NEPA (significant impact under CEQA) as long as best management practices are employed in their transportation, storage, and handling.

5-10.3 Mitigation Measures

The following mitigation measures are proposed to lessen adverse construction impacts under NEPA (significant construction impacts under CEQA) associated with the BRT Alternative (including its variations). No mitigation is necessary for the No Build and TSM alternative.

5-10.3.1 Slope Stability

No mitigation measures are necessary.

5-10.3.2 Hazardous Materials

GEO-C1: Federal and state regulations require that certain levels of soil or groundwater contamination be remediated prior to or during construction of the project. Cleanup activities will be conducted in accordance with all applicable regulations and guidelines governing the removal and disposal of hazardous materials. The application of standard construction practices would result in no adverse impact under NEPA (significant impact under CEQA) from exposure to hazardous materials. These practices include:

- exploration for hazardous materials in the soil;
- monitoring for hazardous materials during construction;
- excavation, segregation, and remediation of hazardous materials;
- use of drip pans under heavy equipment to minimize leakage of fluids into the soil;
- storage of chemicals in compliance with local hazardous and flammable material storage regulations; and
- hazardous materials training for employees.

5-11 BIOLOGICAL RESOURCES

5-11.1 Impact Analysis Methodology and Impact Criteria

Two types of potential impacts occurring during the construction period were considered: direct impacts and indirect impacts. Direct impacts are long-term adverse effects under NEPA (long-term significant effects under CEQA) from directly removing a resource such as trees or breeding habitat for wildlife species. Mortality (killing) of an animal that could result from such activities would also be considered a direct impact. Indirect impacts would include the potential loss of habitat used for foraging by some wildlife species, or high noise levels and project lighting that may negatively affect wildlife populations in the project vicinity.

5-11.2 Impacts

Vegetation: Project construction would remove primarily non-native landscaping and ruderal vegetation; thus, no adverse direct or indirect impacts under NEPA (significant direct or indirect impacts under CEQA) on vegetation would occur due to construction of the San Fernando Valley East-West Transit Corridor.

Wildlife: Project construction would result in conversion and disturbance of existing highly disturbed wildlife habitat. Direct mortality of individuals of some reptiles and small mammals that inhabit the project site may occur during project construction. However, none of these would be species that are rare in the project vicinity or in Los Angeles County. More mobile species such as birds may also be affected by project construction, but indirectly. Removal or destruction of one or more active nests of birds listed by the Migratory Bird Treaty Act (MBTA), whether nest damage was due to tree removal or to other construction activities, would be considered a violation of the MBTA, as in Section 4-11, and would be considered an adverse direct impact under NEPA (significant direct impact under CEQA).

Construction dust, noise and vibration from construction and increased human presence (construction workers) during construction would result in indirect effects on the limited diversity of wildlife in the project vicinity, which may result in temporary avoidance of the area by wildlife species. However, because the wildlife species in the area, including raptors, are species found in or adjacent to other residential habitats in Los Angeles County, no adverse indirect impacts under NEPA (significant indirect impacts under CEQA) on wildlife due to the San Fernando Valley East-West Transit Corridor project are anticipated.

Wildlife Dispersion Corridors: Construction of the San Fernando Valley East-West Transit Corridor would not result in any direct or indirect impacts on wildlife dispersion.

Sensitive Species: No sensitive species are known or expected to occupy the San Fernando Valley East-West Transit Corridor project area, as it provides no habitat essential for any sensitive species; thus, no direct or indirect impacts on sensitive species would occur due to construction of the San Fernando Valley East-West Transit Corridor.

5-11.3 Mitigation Measures

5-11.3.1 Vegetation

No mitigation is required.

5-11.3.2 Wildlife

The following mitigation measures are proposed:

BIO-C1: The MTA will retain the services of a qualified ornithologist to provide guidance with regard to preconstruction procedures and practices (including the removal of trees outside the nesting season) to be carried out consistent with the Migratory Bird Treaty Act, and to conduct a survey of the construction zone, if construction activities (grubbing, grading, tree trimming or removal) are to occur during the breeding season for native birds (approximately March 1 through July 31). The timing of the ornithological survey will be coordinated with the scheduling of construction activities such that both avoidance of occupied nests and a straightforward construction process can be maintained. If the ornithologist detects occupied nests of native birds within the construction zone, the MTA will conspicuously flag off the area(s) supporting bird nests, providing a minimum buffer of at least 100 feet between the nest and limits of construction. The construction crew will be instructed to avoid any activities in this zone until the bird nest(s) is/are no longer occupied, per a subsequent survey by the qualified ornithologist. Alternatively, the MTA will consult as appropriate with the United States Fish and Wildlife Service (USFWS) to discuss the potential loss of nests of native birds covered by the MBTA to obtain, if necessary per the USFWS, a permit authorizing activities that may otherwise result in MBTA violations.

BIO-C2: The MTA will comply with Section 404 of the Clean Water Act and Section 1600 of the California Fish and Game Code to ensure that construction of corridor crossings over the Los Angeles River and other drainages do not violate these laws.

5-11.3.3 Wildlife Dispersion Corridors

No mitigation is required.

5-11.3.4 Sensitive Species

No mitigation is required.

5-12 WATER RESOURCES

5-12.1 Impact Analysis Methodology and Evaluation Criteria

The reader is referred to Section 4-12 for a discussion of the methodology used to determine hydrology and water quality impacts. Project alternatives would have adverse impacts under NEPA (significant impacts under CEQA) during construction if the project would result in any of the following conditions:

- deplete or contaminate a groundwater aquifer;
- contaminate a surface water resource;
- place new development in areas susceptible to 100-year flooding; or
- create pollution, contamination, or nuisance as defined in Section 13050 of the California Water Code.

5-12.2 Impacts

The following impact discussions refer to the BRT Alternative and its Lankershim/Oxnard On-Street Alignment and MOS Variations. No construction would occur under either the No Build or TSM Alternative.

5-12.2.1 Surface Water Resources

Potential water quality impacts resulting from construction would primarily be associated with sediment loading on or contamination of runoff to the storm water and/or surface water systems. This would be a particular concern in the vicinity of the Sepulveda Flood Control Basin because of the biological resources located within the basin. Potential sediment sources include unstabilized, exposed soil at excavation sites and drainage from stockpiles of excavated materials. Potential adverse impacts under NEPA (significant impacts under CEQA) would exist prior to mitigation.

5-12.2.2 Groundwater

Because of the lateral and vertical nonuniformity of soils in the San Fernando Valley, spills of contaminants to the ground are unlikely to be able to penetrate deeply enough into the soil to affect the quality of water within the San Fernando Basin (see Section 4-12). However, the presence of hazardous materials onsite during construction creates the potential for the accidental release of contaminants to local bodies of perched groundwater. Typical hazardous materials commonly stored on construction sites include: detergents, petroleum products for the operation and maintenance of construction equipment, paving coating materials, concrete curing materials, acids, glues, paints, and solvents. The presence of hazardous materials at the construction site would not result in an adverse impact under NEPA (significant impact under CEQA) as long as best management practices are employed in their transportation, storage, and handling. These practices include:

- monitoring the soil for hazardous materials during construction;
- use of drip pans under heavy equipment to minimize leakage of fluids into the soil;
- storage of chemicals in compliance with local hazardous and flammable material storage
- regulations; and
- hazardous materials training for employees.

5-12.2.3 Floodplains

Construction activities within the five channels along the corridor and the Sepulveda Flood Control Basin would be scheduled to occur during the dry season (April 15 to October 15) to comply with Flood Control Agency requirements and to avoid potential hazards to workers in the event of a storm.

False work support columns may be placed within the river channels, particularly the Los Angeles River, during construction of the overhead structure. Typically, false work consists of a number of timber or steel columns supported on temporary foundations and stabilized with cross braces and beams. The area occupied by the false work columns, cross bracing, and beams would be minor compared to the overall area of a cross section taken through the Los Angeles River bottom. However, there is potential for the false work columns, cross bracing, and beams to catch debris during a flood event. Cooperation with the U. S. Army Corps of Engineers and the Los Angeles County Department of Public Works during planning of the construction phase of the five bridges will result in there being no adverse impact under NEPA (significant impact under CEQA) due to flooding of the channels.

5-12.3 Mitigation Measures

The following mitigation measures are proposed to address lessen adverse construction impacts under NEPA (significant construction impacts under CEQA) associated with the BRT Alternative. No mitigation is necessary for the No Build and TSM alternative.

5-12.3.1 Surface Water Resources

WR-C1: Construction will be conducted to comply with building codes, permit conditions, and other regulatory requirements to ensure that discharge of surface water runoff from construction sites will not result in increased erosion or siltation discharge to existing drainage facilities and would mitigate impacts to surface waters.

WR-C2: In compliance with the National Pollutant Discharge Elimination System (NPDES) General Construction Permit, implementation of pollution control methods associated with construction activities will be required. As a component of the General Construction Permit, a Storm Water Pollution Prevention Plan (SWPPP) will specifically identify best management practices to mitigate water quality impacts on receiving waters due to surface water runoff from the project site. These practices may include the placement of sandbags around basins, construction of a berm to keep runoff from flowing into the construction site, and covering or stabilizing topsoil stockpiles. Construction industry standard storm water best management practices can be found in the *State of California Storm Water Best Management Practice Handbook, Construction Activity*.

5-12.3.2 Groundwater

No mitigation measures are necessary.

5-12.3.3 Floodplains

No mitigation measures are necessary.

5-13 SAFETY AND SECURITY

5-13.1 Impact Analysis Methodology and Evaluation Criteria

A qualitative assessment was made of potential safety and security impacts. The Full BRT, BRT with Lankershim/Oxnard On-Street Alignment and the MOS alignment would involve intersection improvements and traffic signal system upgrades, and construction of the exclusive busway. The No Build and TSM alternatives would not require construction, and therefore, these options are not analyzed in this section.

5-13.2 Impacts

5-13.2.1 BRT, Lankershim/Oxnard On-Street Alignment, and MOS

Construction of the proposed exclusive busway would require fencing of potentially unsafe construction sites to protect the public and children. Construction specifications will be written to reduce potential construction hazards. Construction crews will be trained in safety requirements and procedures and California Occupational Health and Safety requirements and LADOT safety standards must be met by the contractor. The contractor would also be required to secure potentially unsafe construction sites (fences and signage) to avoid creating an “attractive nuisance” and to prohibit unauthorized entry. Modification of traffic lights and intersection configuration could potentially impair traffic circulation.

Utility lines running within and along the corridor would be removed and relocated for continuing service. Those utilities crossing the corridor would be relocated to temporary or permanent locations. Park-and-ride lots and stations located near residential areas will also be fenced during construction where children may be present to avoid creating an “attractive nuisance” and to prohibit unauthorized entry. Fencing and law enforcement surveillance would also deter criminal acts of graffiti, theft, or vandalism.

Given the temporary and localized nature of the construction, as well as LADOT and contractor standard safety measures to be taken during construction, adverse impacts under NEPA (significant impacts under CEQA) are not expected.

5-13.2.2 Emergency Response

The potential for adverse effects under NEPA (significant effects under CEQA) on emergency response during construction relates to detours, street closures, and increased traffic at intersections. To avoid disruption of emergency service during construction, emergency facilities will be consulted regarding the construction process to provide for the least intrusive construction process feasible. Proper communication with emergency facilities will inform them of exact construction area locations and schedules. Therefore, the proposed project would have no construction related impacts on emergency services.

5-13.3 Mitigation Measures

S&S-C1: To further minimize impacts to schools, students, and active pedestrian communities, ~~one or more of~~ the following will be implemented:

- Emergency services providers and school officials will be consulted regarding the construction process to reduce the intrusiveness of the construction process and provide for continuing two-way communication throughout the construction period;
- School officials will be consulted in order to ensure maintenance of safe student walk routes and access for passenger vehicles and school buses;
- Flag men will be provided during intersection modifications in active pedestrian communities. Crossing guards or flag men will also be provided at construction sites in proximity to schools and where school pedestrian routes cross construction areas.
- Construction scheduling and haul routes ~~should~~ will be sequenced to minimize conflicts with pedestrians, school buses and vehicular traffic during arrivals and dismissals of the school day.

5-14 CULTURAL RESOURCES

5-14.1 Impact Analysis Methodology and Evaluation Criteria

The criteria for determining impacts on historic properties under Section 106 of the National Historic Preservation Act are found in 36 CFR §800.5(a) and the criteria used under the California Environmental Quality Act are found in PRC §15064.5. A project is typically found to have an adverse effect under NEPA (significant effect under CEQA) if it causes a change in an otherwise eligible property that would prevent its inclusion in the National Register of Historic Places. Examples of changes include, but are not limited to, physical damage to or alteration of the property, moving the property, introducing visual or audible elements that jeopardize the characteristic for which the property is deemed eligible for listing, and causing neglect and deterioration of the property.

5-14.2 Impacts

5-14.2.1 No Build Alternative

The No Build Alternative would have no impact on cultural resources.

5-14.2.2 Transportation System Management (TSM) Alternative

The Transportation System Management Alternative would have no impact on cultural resources.

5-14.2.3 Bus Rapid Transit (BRT) Alternative

a. Full BRT

- **Archaeological Resources**

Excavation activities are proposed for the BRT Alternative as needed for the construction of the roadbed, platform foundations, and footings. Although background studies and an intensive Phase I archaeological survey/Class III inventory found no evidence of archaeological resources, the ground surface within the study corridor has been heavily disturbed and it is unlikely that any such remains (if any exist) would be visible. Moreover, the identification of period residential structures adjacent to the right-of-way increase the likelihood that extant remains may be present within the study area. Thus, any ground-disturbing activity has the potential to unearth previously unidentified archaeological resources, and mitigation measures should be implemented (see below).

❑ **Historical and Architectural Resources**

All construction activities proposed for the BRT Alternative would occur within an existing rail right-of-way. Construction of the BRT would not directly affect any of the historical resources within the proposed project's APE. Any indirect impacts of construction, such as noise, vibration, or visual elements (e.g., dust particles, machinery), would be temporary and would not affect the characteristics that makes the four historical resources eligible for listing in the National Register. Further, access to the resources would not be restricted during construction activities. Thus, construction of the BRT Alternative would have no impact on historical and architectural resources.

b. Lankershim/Oxnard On-Street Alignment

No identified resources exist along the Lankershim/Oxnard On-Street Alignment; therefore, it would have no impact on historical and architectural resources.

c. Minimum Operable Segment (MOS)

❑ **Archaeological Resources**

Construction impacts to archaeological resources resulting from implementation of the MOS would be identical to those described for construction of the Full BRT.

❑ **Historical and Architectural Resources**

One identified resource is located within the MOS: the Department of Water and Power Building at 14601 Aetna Street. Construction impacts to historical and architectural resources resulting from implementation of the MOS would be identical to those described for the construction of the Full BRT.

5-14.3 Mitigation Measures

5-14.3.1 No Build Alternative

No mitigation measures are required for cultural resources.

5-14.3.2 Transportation System Management (TSM) Alternative

No mitigation measures are required for cultural resources.

5-14.3.3 Bus Rapid Transit (BRT) Alternative

a. Full BRT

- **Archaeological Resources**

CR-C1: If buried cultural remains are encountered during construction activities, ~~it is recommended that~~ the activities will cease until a qualified archaeologist has evaluated the significance of the site and made a determination of eligibility for listing in the National Register.

CR-C2: If human remains are exposed during construction, pursuant to State Health and Safety Code Section 7050.5, ~~states that~~ no further disturbance shall occur until the County Coroner has made the necessary findings as to origin and disposition, pursuant to Public Resources Code 5097.98.

- **Historical and Architectural Resources**

No mitigation measures are required for historical and architectural resources.

b. Minimum Operable Segment (MOS)

- **Archaeological Resources**

Recommended mitigation measures for the MOS are identical to those described for the construction of the Full BRT.

- **Historical and Architectural Resources**

No mitigation measures are required for historical and architectural resources.

c. On-Street Alignment

No mitigation measures are required for cultural resources.