

would mark where the train emerges from the tunnel. Located in a landscaped embankment, this portal should not negatively affect the visual surroundings, which include retaining walls and abutments for the railroad overpass. The new train station on the site of the city maintenance yard should be a significant visual improvement over the present litter, stored material, trucks, and metal sheds currently present. The new train station would provide landscaped parking and buffer areas, walks, and a new small scale structure.

3.8.4 Mitigation Measures

The subway alignment would require few mitigation measures to improve its visual effect. Retaining walls defining the portals where the line enters or emerges from the ground can be screened with landscaping or treated with relief and color to make them aesthetically pleasing. The proposed Norwalk Transportation Center would provide the opportunity to design a handsome structure.

The aerial alignment presents a greater challenge. To mitigate the presence of this large and long structure would require careful and sensitive design. Landscaping the center strip down Imperial Highway between the columns supporting the guideway would be a great help. Colorful scrubs and decorative trees would scale down the route and obscure opposing traffic, making the road seem smaller. Sensitively placed trees would reduce the prominence of the overhead guideway and partially obscure its appearance from a distance. The columns of the guideway could be designed to obscure their presence or highlight their form. Columns could be covered with vine arbors and turned into green and flowered posts. Columns could be treated as sculptural forms with the base, shafts and capitals articulated. They could be striated and lined into smaller segments and surfaces. The columns of the aerial route create an opportunity for public art. They could be designed to scale down the guideway above, making it seem less prominent, or they could be designed to make the guideway more monumental and impressive. Street lighting along the guideway would also present another opportunity to either diminish the structure or highlight its presence. Night lighting can be used to obscure the guideway in dark shadow or to dramatize its interesting elements. A number of approaches, including landscaping, form manipulation, decoration, color, and lighting would probably be needed to mitigate the appearance of the aerial alignment.

3.9 CULTURAL RESOURCES

3.9.1 Applicable Legislation

The following section identifies cultural resources, including both archaeological and historic/cultural resources, and describes the potential effects of the proposed project alternatives on these resources. The purpose of this discussion is to comply with the California Environmental Quality Act (CEQA) regulations in regard to cultural resources.

The project does not involve federal funding sources. Federal documentation would include an identification and assessment of potential effects on cultural resources that would vary significantly from the methodology used for this section. Since the Metro Green Line Easterly Extension project is not a federal, federally-assisted, or federally licensed undertaking, only compliance with CEQA regulations is necessary in regard to cultural resources. CEQA states that "A project will normally have a significant effect on the environment if it will:... (j) Disrupt or affect a prehistoric or historic archaeological site or a property of historic or cultural significance to a community or ethnic or social group; or a paleontological site except as a part of a scientific study." [CEQA, Appendix G]

CEQA Compliance-Archaeological Resources

"For the purposes of CEQA, an 'important archaeological resource' is one which:

- A. Is associated with an event or person of:
 - 1. Recognized significance in California or American history, or
 - 2. Recognized scientific importance in prehistory;
- B. Can provide useful information which is both of demonstrable public interest and useful in addressing scientifically consequential and reasonable or archaeological research questions;
- C. Has a special or particular quality such as oldest, best example, largest, or last surviving example of its kind;
- D. Is at least 100 years old and possesses substantial stratigraphic integrity; or
- E. Involves important research questions that historical research has shown can be answered only with archaeological methods." [CEQA, Appendix K]

Avoidance of archaeological resources is preferred. If it is found to be an important archaeological resource and avoidance is not feasible, CEQA requires the lead agency to include an excavation plan for mitigating the effect of the project on the qualities which make the resource important. Depending on the extent of the resource, execution of the excavation plan may cause some temporary schedule delays.

If an identified archaeological resource is not an important archaeological resource CEQA requires that both the resource and the effect on it be noted in the EIR but not be considered further in the process.

CEQA Compliance-Historic/Architectural/ Cultural Resources

While CEQA is quite explicit in regards to what constitutes an important archaeological site, it is not as clear as to what constitutes "a property of historic or cultural significance to a community or ethnic or social group." Architectural resources are not specifically governed under CEQA but are generally identified as exhibiting cultural significance on behalf of the surrounding community. Acceptable CEQA documentation for historic or cultural resources generally may be limited to a documentation search of properties already having some national, state, or local landmark designation. Generally what may constitute a disruption or adverse effect on a historic resource includes such effects as significant visual obstruction to or from the resource, increase of noise levels, increase of vibration, settlement of ground under or near a structure, alteration of a structure, acquisition of property, or demolition of a structure. The level of significance for an effect is dependent upon the existing integrity and nature of contributing

elements to its historic or cultural significance, and the sensitivity of the current or historic use of the resource. Once the nature of the potential effect is established, mitigation measures should be incorporated as part of the project to minimize disruption or adverse effect on these resources.

Historic/Architectural/Cultural Resources Impact Criteria

Impacts on historic, architectural, or cultural resources could occur during the construction and/or operational phases of the project. During the construction phase, effects such as demolition, complete or partial right-of-way acquisition, temporary loss of access, vibration, and settlement may be considered. Construction impacts not resulting in demolition, settlement or which produce a temporary loss of access are considered temporary and therefore negligible. For the operational phase, permanent loss of access, vibration, noise, visual, alteration, and disruption of the integrity of setting may be considered. In order to establish criteria for these potential effects, technical reports and criteria were examined for right-of-way acquisition, land use sensitivity, noise, vibration, and visual obstruction.

The significance of right-of-way acquisition was based on the "partial" or "full" acquisition determinations used in the land acquisition section of this document (Section 3.4). In addition, the right-of-way plans and profiles for the project alternatives were examined to better interpret the effects of acquisition on a site specific basis. Should the right-of-way acquisition result in the demolition of all or part of the architecturally significant portion of a structure, or result in isolation of the structure from significant viewpoints, it would be considered an adverse effect. If the acquisition is limited to a portion of the resource property, and not the structure, the determination of effect is subjective and is dependent upon the historical association of the property to the significance of the resource, and the nature of the resulting loss of integrity of setting.

Impact due to loss of access was also based on the land acquisition analysis completed for this project. Site specific determinations were based on project plans in the immediate vicinity of a resource. Loss of access which results in isolation of the property, loss of significant viewpoints to the building, or which diminishes its operational capacity to such a degree that it may force a change of use or cause the property to be vacated would be considered an adverse effect.

The potential for visual impact was established as that area encompassed by the next adjacent parcel or the area within 5 feet per every 1 foot of elevated structure introduced by the project. If the significant resource is located beyond this distance from the project alignment, a finding of "no effect" for this impact category would be determined. The degree of potential impact is directly related to the proximity of the project improvements to significant portions of the cultural resource. Below grade project improvements are not considered to create significant visual effects.

Noise and vibration impact criteria are dependent upon the sensitivity of the use of the structure. If a particular resource does not contain residential or other similar occupancy which would be sensitive to noise, it is not considered subject to noise impact. Noise impact criteria is presented for airborne noise, ground-borne vibration and ground-borne noise below.

Airborne noise impact for this project was evaluated using existing Federal Transit Administration (FTA) criteria. Table 3-14 summarizes the existing FTA impact criteria as defined in "Guidelines for Preparing Environmental Impact Assessments," FTA Circular FTA C 5620.1. The impact identified using the existing FTA criteria is consistent with the guidelines included in the noise and vibration sections of the American Public Transit Association (APTA) noise and vibration guidelines and the design goals used for the Los Angeles-Long Beach Blue Line.

Table 3-14: FTA Airborne Noise Impact Criteria

IMPACT CATEGORY	CONDITIONS
Generally Not Significant	1. No noise-sensitive sites in project area.
	2. Increase of 3 dBA or less at noise sensitive sites and project does not result in violations of noise ordinances or standards.
Possibly Significant	Increases in noise levels no greater than 5 dBA.
Generally Significant	1. Project would cause noise standards or ordinances to be exceeded.
	2. Project would cause 6 to 10 dBA increase in noise levels in built-up areas.
	3. Project would cause increase in noise levels of 10 dBA or more.

Source: Harris Miller Miller & Hanson, Inc., July 1992.

There are no existing FTA criteria for acceptable levels of ground-borne vibration or ground-borne noise; however, proposed FTA criteria have been developed and are used to evaluate ground-borne vibration and noise impacts for this project. These criteria are based on previous standards, criteria, and design goals, including ANSI Section 3.29, the noise and vibration guidelines of the American Public Transit Association, and design goals used for previous LACTC rail projects (see Table 3-15).

Potential settlement criteria were based on proximity of the structure to excavation proposed by the project. The depth of the excavation for the subway structure relative to the closest point of the structure was analyzed. If historic structures were considered seismically unsound, they would be particularly susceptible to damage by potential settlement. A determination of adverse

Table 3-15: Impact Criteria for Ground-Borne Vibration and Noise

LAND USE CATEGORY	RMS GROUND-BORNE VIBRATION		GROUND-BORNE NOISE
	DECIBELS RELATIVE TO 1 μ in./sec	in./sec	
Category 1: Buildings where low ambient vibration is essential for interior operations. The limits are based on acceptable vibration for moderately vibration sensitive equipment such as optical microscopes or electron microscopes with vibration isolation bases.	65 dB	0.0018	--
Category 2: Residences and buildings where people normally sleep.	72 dB	0.004	35 dBA
Category 3: Institutional such as schools and offices with primarily daytime use.	75 dB	0.0056	40 dBA

Source: Harris Miller Miller & Hanson Inc., July 1992.

effect would be made for the structure if it were in extremely close proximity to an excavation site.

Disruption of integrity of setting is a more subjective area of evaluation and was analyzed in terms of the historic or existing use of the resource, proximity to elevated structures, and the absence or presence of intervening structures. For example, introduction of an elevated structure alongside a resource where there had previously been none would be a disruption of the integrity of setting. Replacement of a front yard with a relocated roadway would also be a significant disruption of integrity of setting.

Effects on historical, architectural or cultural resources may be categorized as beneficial, no adverse effect, and adverse effect. A beneficial effect is defined as an improvement of the condition of the resource as a direct or indirect result of implementation of the project. No adverse effect is defined as a perceptible change to the environment of the resource or its setting, but no diminution of its significant qualities. An adverse effect is defined as an effect which would result in a significant loss of integrity of the property's location, design, setting, materials, workmanship, feeling, or association.

3.9.2 Environmental Setting

Archaeological Resources

In order to identify previously recorded archaeological resources, an archival-background search was conducted for an area located within a one-mile radius of the project area by the University of California at Los Angeles (UCLA) Archaeological Information Center on July 15, 1992.

No prehistoric archaeological sites, prehistoric or historic isolates, historic archaeological sites, or pending historic archaeological sites have been identified within a one mile radius of the project. Two surveys have been conducted within one mile of the project area. One of those surveys (Rosenthal, 1991), which was performed for the proposed Norwalk Transportation Center, encompasses a portion of the eastern terminus of the project area, but no cultural resources were encountered. No additional systematic surveys have been conducted within the limits of the project area. Over ninety-nine percent of the project area has never undergone a systematic archaeological reconnaissance.

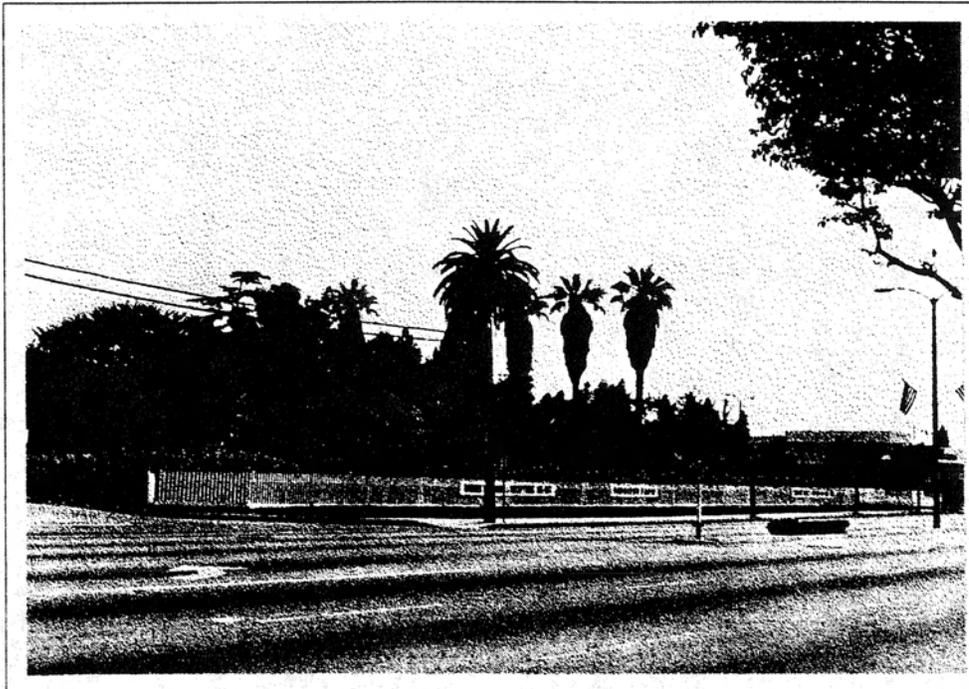
Based on the results of the background research phase, there is a slight to moderate degree of sensitivity to potential cultural resource remains of a prehistoric nature in the form of isolates; processing or hunting sites; or, seasonal base camps within the project area which may be significant under CEQA. Therefore, a Phase 1 Archaeological Study is recommended for the project area.

Historical/Architectural/Cultural Resources

In order to identify potentially significant historic, architectural, or cultural resources, previously documented resources for the cities of Norwalk and Santa Fe Springs were reviewed and compiled from a variety of sources. Historic resource lists, designations or organizations consulted included the National Register of Historic Places, California Historical Landmarks, State Office of Historic Preservation Statewide Database, Los Angeles County Points of Historic Interest, and "Architecture in Los Angeles: A Compleat [Sic] Guide" [Gebhard & Winter, 1988]. The cities of Norwalk and Santa Fe Springs do not have a local landmark ordinances, however, the planning departments were contacted for a list of historic resources. The area of inquiry for the documentation was limited to one parcel width along either side of the proposed subway and aerial alignments running the full length of the project limits.

Within the study area, one individual resource, the Paddison Ranch, was identified as having been previously documented on the National Register of Historic Places. This resource would be considered significant under CEQA as a property "of historic or cultural significance to a community or ethnic or social group." The "windshield" field survey indicated no other resources appearing to have architectural or historic significance within the project study corridor.

The Paddison Ranch is located adjacent to the north side of Imperial Highway between Zeus and Paddison avenues at 11951 Imperial Highway in the City of Norwalk. The location of the Paddison Ranch is mapped on Figure 3-19. The ranch represents an excellent example of the Victorian Stick/Eastlake style of architecture as exhibited in the main residence, and as an agricultural ranch complex. The grounds include a one and a half story residence set back

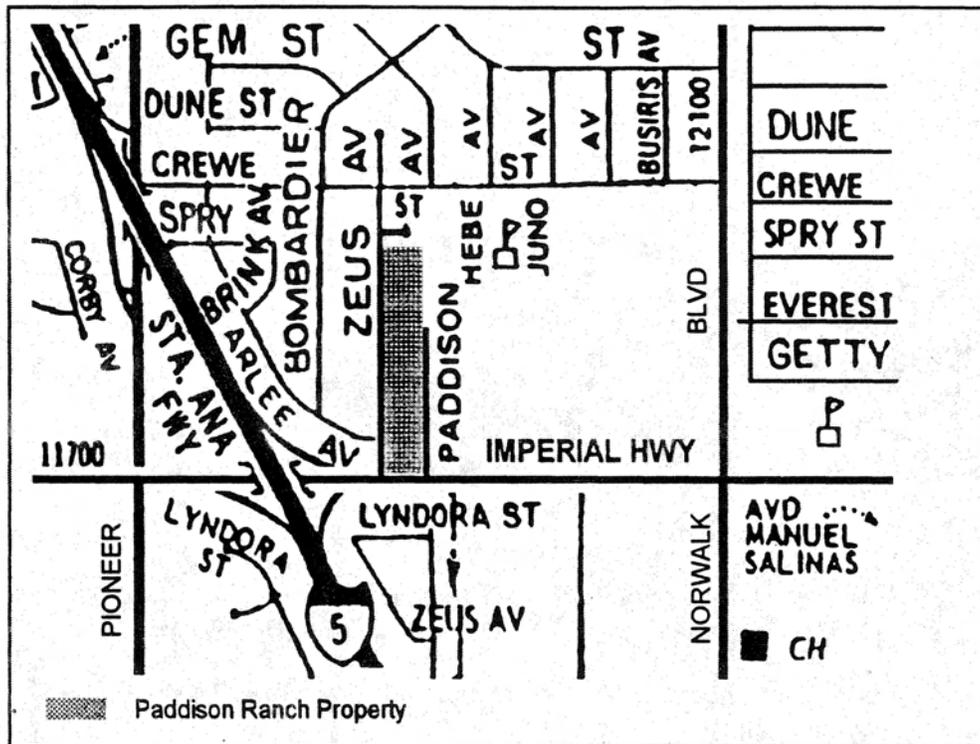


Looking northeast from the south side of Imperial Highway at the southern boundary of the Paddison Ranch property.

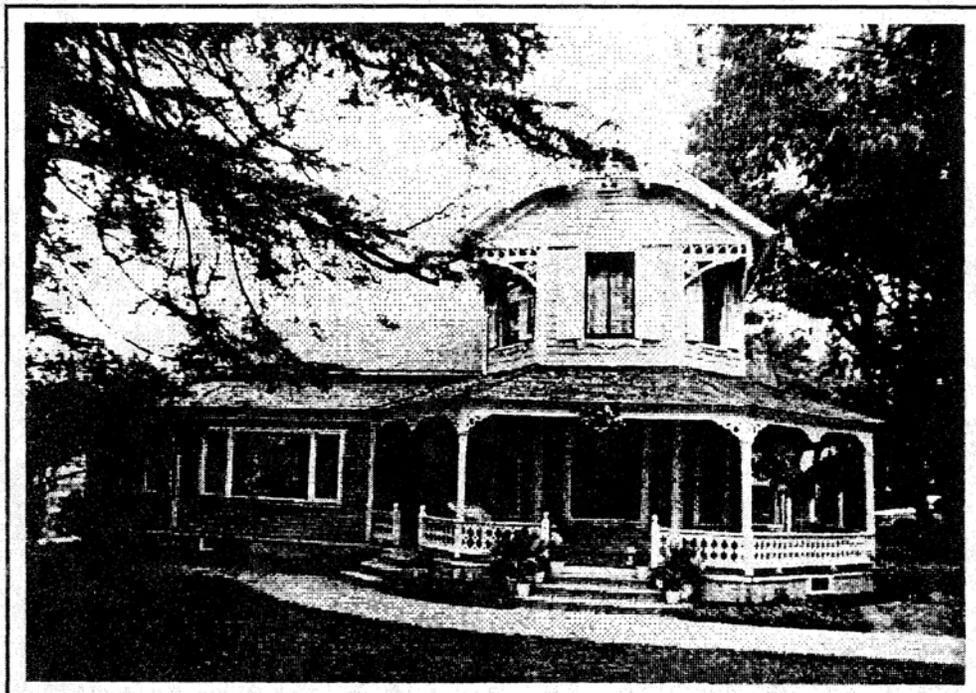


Looking east from the northwest corner of Zeus Avenue at the southern boundary of the Paddison Ranch property.

Figure 3-19: Southern boundary of Paddison Ranch



Paddison Ranch Property Location



Looking north from inside property boundary at Paddison Ranch Residence

Figure 3-19: Paddison Ranch Property

approximately 180 feet from Imperial Highway. The Victorian Stick/Eastlake design features of the residence include decorative stickwork in the gable roof, decorative window sills and porch support braces, overhanging eaves, clapboard siding, and a one-story wrap around porch with spindlework porch detailing. A two-story octagonal section dominates the porch area. A series of one-story agricultural/utilitarian buildings located behind the residence feature low-pitched gable roofs and board and batten siding. These buildings are surrounded by a white-picket fence extending along the south side and a portion of the east and west sides of the property. A modern era block wall extends along the perimeter of the remainder of the east and west sides of the property. A corn field extends along the west and south sides of the property. The residence and buildings are partially secluded from the surrounding streets by the corn fields and by mature trees planted throughout the grounds. Vehicular access to the property is provided from the eastern corner of the southern boundary and from the east side of the property. The structures were built in 1880 and have survived in very good condition and with few significant modifications. The historic use of the property is agriculture/subsistence. The site was listed on the National Register on June 23, 1978.

3.9.3 Impacts on Archaeological Resources

Since there is a slight to moderate degree of sensitivity to potential cultural resource remains of a prehistoric nature, the possibility does exist that remains may be encountered during construction. The potential effects are regarded as not significant, but appropriate mitigation measures should nonetheless be followed.

3.9.4 Impacts on Historical/Architectural/Cultural Resources

One historical resource, Paddison Ranch, located at 11951 Imperial Highway, would potentially be affected by the project.

Aerial alignment

The aerial alignment would be fully within the center of Imperial Highway right-of-way by the time it reaches the Paddison Ranch with the centerline of the structure located 50 feet from the southern boundary of the property and 180 feet from the main residence. The structure would be at its highest elevation of 67 feet as it crosses over the I-5 Freeway, 580 feet west of the southwest corner of the ranch. The aerial guideway would be descending after crossing over the I-5 Freeway so that by the time it reaches the southwest corner of the property at Zeus Avenue/Imperial Highway the top-of-rail would be 55.5 feet above the existing grade, with a 49.5 foot clearance between the bottom of the guideway and the street. The top-of-rail would be 45.5 feet above the existing grade, with a 39.5 foot clearance between the bottom of the guideway and the street by the time it reaches the southeast corner of the property at Paddison Avenue/Imperial Highway.

Three columns measuring seven feet in diameter and spaced 75 feet apart would be located in the centerline of the guideway between Zeus and Paddison avenues. A fourth column would be located 110 feet east of the property, also in the centerline of the guideway.

Cross bent structures would be placed west of the property beginning 75 feet west of southwest corner of the ranch. The cross-bent structure would extend 110 feet in a southeast diagonal direction across Imperial Highway to line up approximately with the western portion of the ranch.

- **Construction Effects**

Since the columns would be located at a distance of more than 175 feet from the main residence, and because the wood frame residence is not typically considered a fragile construction type, no effects are anticipated due to potential settlement.

Construction of the aerial alignment could result in temporary loss of vehicular access to the property via the entrances at the southern boundary and the west side. Trucks hauling construction material could impede traffic flow near the southern entrance. A drill rig would be set up either in the street or on private property for the drilling of the cross-bents which would affect traffic in the area. Constructing the transverse section of the cross-bent beams would also disrupt traffic in the area of Paddison Ranch and could impair access to the property. This disruption, however, is temporary and should be considered negligible. Construction noise and vibration would also be temporary and may be considered negligible.

- **Operational Effects**

- Noise and Vibration

According to the noise and vibration technical report prepared for this project, historic buildings in the Paddison Ranch complex are located outside any reasonable area of effects which would be caused by project-related noise and vibration.

- Visual

The height of the aerial guideway at top-of-rail would range from 55.5 feet at the western edge to 45.5 at the eastern edge of the Paddison Ranch. Based on the criteria used to determine whether the elevated structure would cause a visual impact to the ranch, the property would need to be located on the adjacent property or within 275 feet of the guideway. Since the Paddison Ranch meets both criteria (the centerline of the guideway would be located 50 feet from the southern property boundary and 180 feet from the main residence), the aerial alignment would have a significant visual impact on the property. Although the property, particularly the main residence, is largely concealed by mature trees and seasonal corn fields, there is a large open area in the southwest quadrant which would leave the property exposed to the aerial guideway.

The aerial alignment would not obstruct views of significant resources from the Paddison Ranch itself, only from the public right-of-way looking toward Paddison Ranch.

- Disruption of Integrity of Setting

The aerial alignment would introduce an elevated structure and three concrete columns, each measuring seven feet in diameter, to within 50 feet of the property. In addition, columns and cross-bents would be located to the east and west, respectively, of the property.

The earlier agricultural setting surrounding the Paddison Ranch property has been erased over time. Still, although today the ranch sits in an urban setting, the aerial alignment would introduce a structure of a magnitude significantly unlike the existing environment, defined by a major but at-grade highway and low-rise commercial and residential development. The introduction of the aerial guideway would, therefore, significantly disrupt the integrity of the agricultural setting.

Right-of-way Acquisition

Construction of the aerial alignment would result in the partial taking of the entire length of the southern boundary of the Paddison Ranch property. Right-of-way acquisition between Zeus and Paddison avenues would involve taking an 8-foot wide strip of property north of the public right-of-way to accommodate the placement of the columns in Imperial Highway. The taking would affect the grassy area of the ranch property located between the picket fence and the sidewalk. The grassy area extends from the southwest corner of the property at Zeus Avenue/Imperial Highway to the driveway at the south entrance gate. The grassy area measures 10 feet 11 inches in width, except at the western edge where it measures 12 feet 2 inches. The grassy area ends west of the south entrance gate. East of the driveway entrance the unlandscaped property measures 10 feet 5 inches between the public right-of-way and the fence.

The partial right-of-way taking would move the sidewalk to within 2 feet 11 inches of the picket fence, except at the western and eastern edges where the clearance would be 4 feet 2 inches and 2 feet 5 inches, respectively. The partial property acquisition at the Paddison Ranch is significant because it diminishes the overall size of the property and removes a buffer between the fence line and sidewalk. Although construction of the aerial alignment would move the sidewalk to within a short distance of the picket fence, the change would not result in disruption of the fence which is considered to be an integral part of the ranch complex.

Subway alignment

The subway alignment would be approximately 50 feet below the existing ground level and completely within the public right-of-way of Imperial Highway upon reaching the Paddison Ranch. Since the subway alignment would be constructed by tunnel and not cut and cover, there would be no effects caused by the construction or operation of the proposed project in this configuration.

3.9.5 Mitigation for Archaeological Resources

It is recommended that a Phase 1 Archaeological Study be conducted prior to subsurface excavation under the aerial alignment, since the potential for prehistoric remains exists and the majority of the project area has never undergone a systematic archaeological reconnaissance.

In the event the subway alignment is selected, a professional archaeologist would be promptly brought in for consultation and a Phase I Archaeological Study would be conducted prior to excavation since the potential for prehistoric remains exists and the majority of the project area has never undergone a systematic archaeological reconnaissance.

The archaeologist would be empowered to stop construction if any cultural resource remains are encountered in order to evaluate the materials. Procedural recommendations would be made following the evaluation of the remains.

Should burials be encountered, construction must halt and procedures according to Appendix K of the California Environmental Quality Act must be followed, beginning with the immediate contact of the County Coroner. These procedures and additional guidelines will be made a part of the project's construction specifications.

Since there is a further possibility of encountering buried prehistoric and/or historic archaeological resources within the overall project boundaries, it is recommended that a SOPA qualified archaeologist be contacted immediately should such unanticipated cultural resources remains be encountered during development or construction related activities within the limits of the proposed project.

3.9.6 Mitigation for Historic and Architectural Resources

Substantial landscaping features could alleviate the visual impacts and disruption of setting on the Paddison Ranch caused by the aerial alignment. It is recommended that plant and tree material similar to that found on the ranch be planted in the southwest quadrant of the property to provide additional shielding from the guideway structure. Although this mitigation measure would reduce exposure of the grounds to the guideway structure and to further signs of encroaching urbanization, it may create the unwanted effect of blocking sunlight from the corn fields, thus further disrupting the integrity of setting and jeopardizing potential income to the property. Consultation with the property owner should be undertaken to determine if this mitigation is appropriate for future plans of the property.

3.10 TRANSPORTATION AND CIRCULATION

3.10.1 Environmental Setting

Regional Transportation Facilities and Circulation

The primary regional access to the study area is provided by the Santa Ana Freeway (I-5), which provides service to northbound and southbound traffic in the vicinity of the study area. It passes through the study area between the two station locations on the proposed Easterly Extension and has interchanges with many other freeways in the area. Several I-5 on/off-ramps are provided near the study area. The relevant northbound on-ramps are presently located at Bloomfield Avenue, Norwalk Boulevard, Imperial Highway and Pioneer Boulevard, whereas the southbound on-ramps are located at Imperial Highway, Norwalk Boulevard, and Firestone Boulevard. The northbound off-ramps are presently located at Firestone Boulevard, Norwalk Boulevard, and Imperial Highway, whereas the southbound off-ramps are located at Pioneer Boulevard and San Antonio Drive. I-5 currently carries approximately 180,000 vehicles per day (VPD) in the vicinity of the study area.

In addition to I-5, the study area is surrounded by and has close access to the following freeways: San Gabriel River Freeway (I-605) to the west with a north-south orientation, Century Freeway (I-105) to the west with an east-west orientation (currently under construction), and Artesia Freeway (SR-91) to the south with an east-west orientation. There are several additional on-/off-ramps from these freeways which provide alternate freeway access points via city streets to the study area. Figure 3-20 shows the regional vicinity of the study area.

The section of the Santa Ana Freeway near the study area has interchanges with other major freeways in Los Angeles and Orange counties and serves as a major inter-county commute corridor and interstate commerce route, leading to significant freeway congestion. It stems from the inadequate capacity of the freeway system to serve the peak period travel demands at the present time. This lack of capacity has resulted in poor levels of service, characterized by severe congestion and low travel speeds during peak periods.

Arterial highways are intended to handle the bulk of intra-regional traffic and complement the freeway system and the local street network. As congestion continues to increase on the freeway system, those arterials parallel to freeways or those arterials serving the same trip destination as the freeways suffer from increased traffic volumes. Consequently, arterials in the vicinity of the study area, such as Imperial Highway and Firestone Boulevard, are becoming increasingly congested.

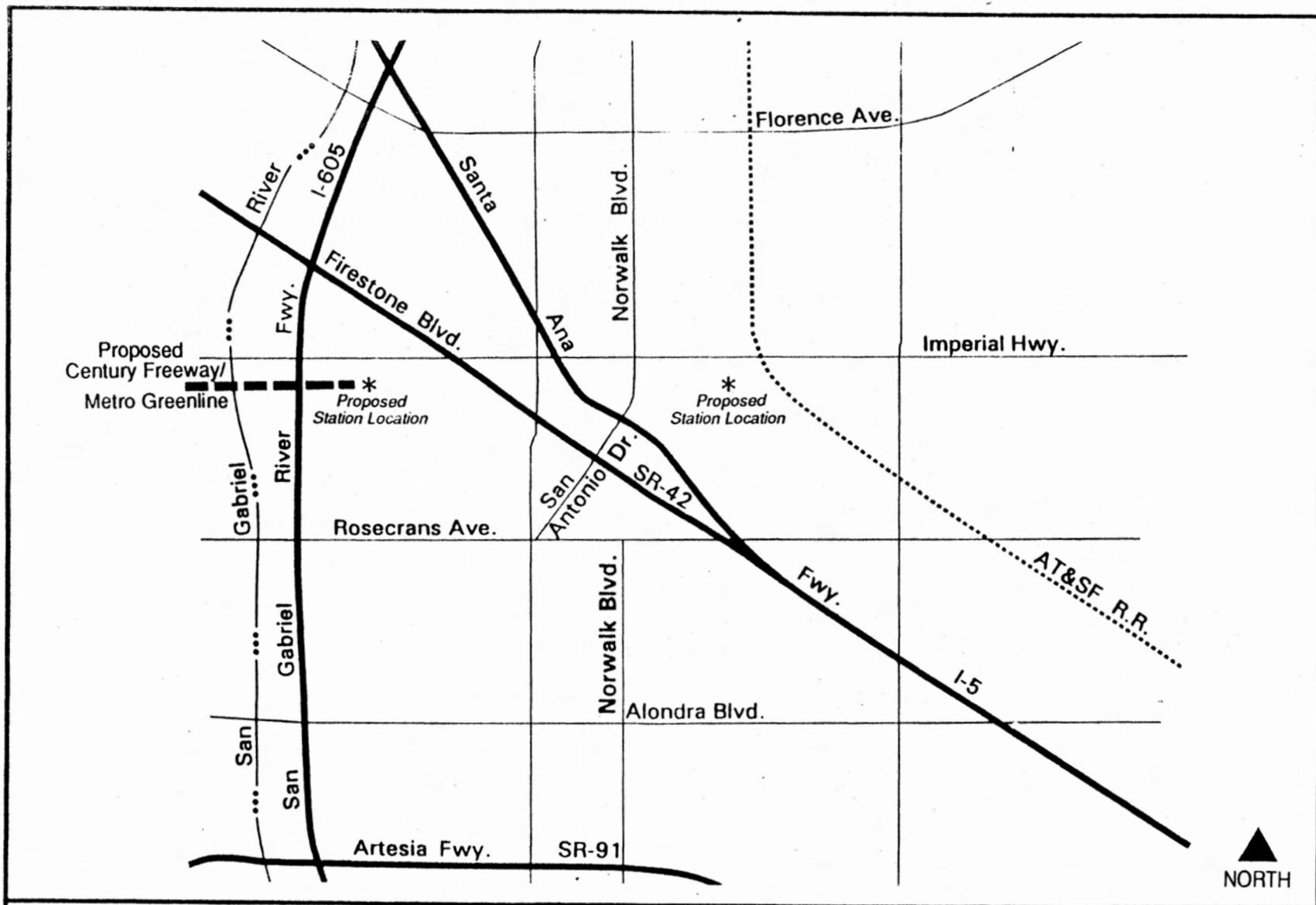
Local Transportation Facilities and Circulation

Although not served by a standard grid system of streets, study area sites can currently be accessed via major and secondary highways. Imperial Highway provides immediate access to the Santa Ana Freeway and is also the principal east-west access corridor along with Rosecrans Avenue. Pioneer Boulevard and San Antonio Drive/Norwalk Boulevard provide primary access in the north-south corridor.

The roadways which serve the study area are Imperial Highway, Firestone Boulevard (SR-42), San Antonio Drive/Norwalk Boulevard, Pioneer Boulevard, Studebaker Road, Rosecrans Avenue, Foster Road, Bloomfield Avenue, Civic Center Drive, and Orr & Day Road. Existing daily traffic volumes on city streets within the study area were obtained through traffic counts conducted at selected locations in February, 1992; from traffic counts conducted by Los Angeles County Department of Public Works; and estimates based on PM peak hour traffic volumes (assuming that PM peak hour traffic is approximately 10 percent of daily traffic). Freeway traffic volumes were obtained from Traffic Volumes on State Highways, published by Caltrans, 1989. The following paragraphs describe the general geometric conditions of key roadways.

Imperial Highway is classified as a Major Arterial traveling east-west. The roadway generally has three travel lanes in each direction west of Shoemaker Avenue and two lanes in each direction east of it. It generally carries a one-lane wide median that is raised (median island) in some stretches. Parking is prohibited all day on Imperial Highway near the study area. The posted speed limit varies from 40 to 45 miles per hour (mph). The daily traffic volume ranges from 35,000 to 40,000 vehicles per day.¹

¹Source: Traffic counts conducted in February 1992.



Firestone Boulevard is classified as a Major Arterial. It travels northwest-southeast in the study area. North of Imperial Highway, it generally has two travel lanes in each direction with a raised median, however, it has three travel lanes in the southbound direction in some stretches. South of Imperial Highway, it has two travel lanes in each direction separated by a median. Parking is prohibited on Firestone Boulevard all day north of Imperial Highway, and permitted with a two-hour limit in some stretches south of Imperial Highway. The posted speed limit on Firestone Boulevard is 40 mph. Presently Firestone Boulevard carries approximately 20,000 vehicles per day south of Imperial Highway.²

Norwalk Boulevard is a discontinuous street which travels north-south north of the I-5 Freeway and south of Rosecrans Avenue. San Antonio Drive provides the necessary connection between the two segments of Norwalk Boulevard, but is located west of the south segment of Norwalk Boulevard. San Antonio Drive exists between its intersection with Rosecrans Avenue/Pioneer Boulevard and the I-5 Freeway and continues as Norwalk Boulevard north of the freeway. San Antonio Drive/Norwalk Boulevard is classified as a Major Arterial. San Antonio Drive/Norwalk Boulevard has two travel lanes in each direction with a raised median in certain stretches. Parking is generally permitted on both sides of San Antonio Drive/Norwalk Boulevard. The posted speed limit is 35 mph. Presently, San Antonio Drive/Norwalk Boulevard carries approximately 25,000 vehicles per day near Imperial Highway and approximately 12,000 vehicles per day near Rosecrans Avenue.²

Pioneer Boulevard is classified as a Major Arterial in the study area. It travels north-south and generally carries two travel lanes in each direction with a raised median. Parking is generally permitted all day on Pioneer Boulevard. The posted speed limit is 35 mph. The street carries approximately 17,000 to 20,000 vehicles per day.¹

Studebaker Road is classified as a Major Arterial. It travels north-south. It has two lanes in each direction with a raised median. Parking is generally permitted on both sides of Studebaker Road all day. The posted speed limit is 40 mph. The street carries approximately 26,700 vehicles per day.¹

Rosecrans Avenue is classified as a Major Arterial traveling east-west. It has two travel lanes in each direction with a raised median. Parking is generally permitted on both sides of Rosecrans Avenue. The posted speed limit varies from 35 mph to 40 mph. This street carries approximately 22,000 vehicles per day east of Pioneer Boulevard and 29,000 vehicles per day west of it.³

Bloomfield Avenue is classified as a Major Arterial traveling north-south with two travel lanes in each direction and a median north of Imperial Highway. Bloomfield Avenue is discontinuous at I-5 Freeway/Rosecrans Avenue with off-set intersections on Rosecrans Avenue, which causes inconvenience for through traffic. Parking is allowed on both sides of the street north of Imperial Highway and at some stretches south of Imperial Highway. The posted speed limit varies from 40 mph to 45 mph. The street carries approximately 15,100 vehicles per day.¹

²Source: ADT was estimated based on PM peak hour traffic volumes.

³Source: Traffic counts conducted by Los Angeles County in January 1992.

Foster Road is classified as a Secondary Arterial. It travels east-west west of Pioneer Boulevard and northwest-south east of Pioneer Boulevard. Foster Road continues as Norwalk Boulevard south of Rosecrans Avenue. It has two travel lanes in each direction. Parking is generally permitted on both sides of Foster Road. The posted speed limit varies from 30 mph to 35 mph. The street carries approximately 5,800 vehicles per day.¹

Civic Center Drive is classified as a Collector Street. It travels east-west and has two travel lanes in each direction. East of Volunteer Avenue, it is referred to as Leffingwell Road. Leffingwell Road, which ends west of the AT&SF rail line, does not exist between the AT&SF rail line and Imperial Highway but it does continue north of Imperial Highway. Parking is generally permitted in the eastbound direction. The posted speed limit is 35 mph. The street carries approximately 2,000 vehicles per day.²

Orr & Day Road is classified as a Collector Street traveling north-south north of Firestone Boulevard and south of Imperial Highway. It does not continue between Imperial Highway and Firestone Boulevard as a continuous stretch, however, there is a spur from Orr & Day Road that connects Firestone Boulevard and Imperial Highway just west of the north-south Orr & Day Road. It carries one travel lane in each direction and parking is generally permitted on both sides of the street. The posted speed limit is 30 mph. The street carries approximately 1,000 vehicles per day south of Imperial Highway and approximately 3,000 vehicles per day north of Firestone Boulevard.²

Shoemaker Avenue is classified as a Secondary Arterial traveling in a north-south direction north of Imperial Highway and south of the AT&SF rail line. North of Imperial Highway, it has two travel lanes in each direction. Presently it does not exist between Imperial Highway and AT&SF rail line. Parking is generally permitted on both sides of the street. The posted speed limit is 40 mph. The street carries approximately 9,000 vehicles per day north of Imperial Highway.² Figure 3-21 shows the study area roadway network and existing daily traffic volumes.

Intersection Level of Service Analysis

A total of 16 key intersections were chosen for analysis in conjunction with the Los Angeles County Transportation Commission (LACTC) staff and City of Norwalk Public Works staff. The 16 intersections were chosen because they represent the locations that might potentially experience increases in traffic due to the Green Line Easterly Extension alignment along Studebaker Road and Imperial Highway. The 16 study intersection locations and the existing type of traffic control are listed below:

<u>Intersection #</u>	<u>Intersection Name</u>	<u>Type of Traffic Control</u>
1.	Studebaker Road at Imperial Highway	Signalized
2.	Studebaker Road at Foster Road	Signalized
3.	Studebaker Road at Rosecrans Avenue	Signalized
4.	Firestone Boulevard at Imperial Highway	Signalized
5.	Orr & Day Road (E) at Imperial Highway	Signalized
6.	Orr & Day Road (W) at Imperial Highway	Unsignalized
7.	Pioneer Boulevard at Imperial Highway	Signalized
8.	I-5 Fwy NB on/off-ramps at Imperial Highway	Unsignalized

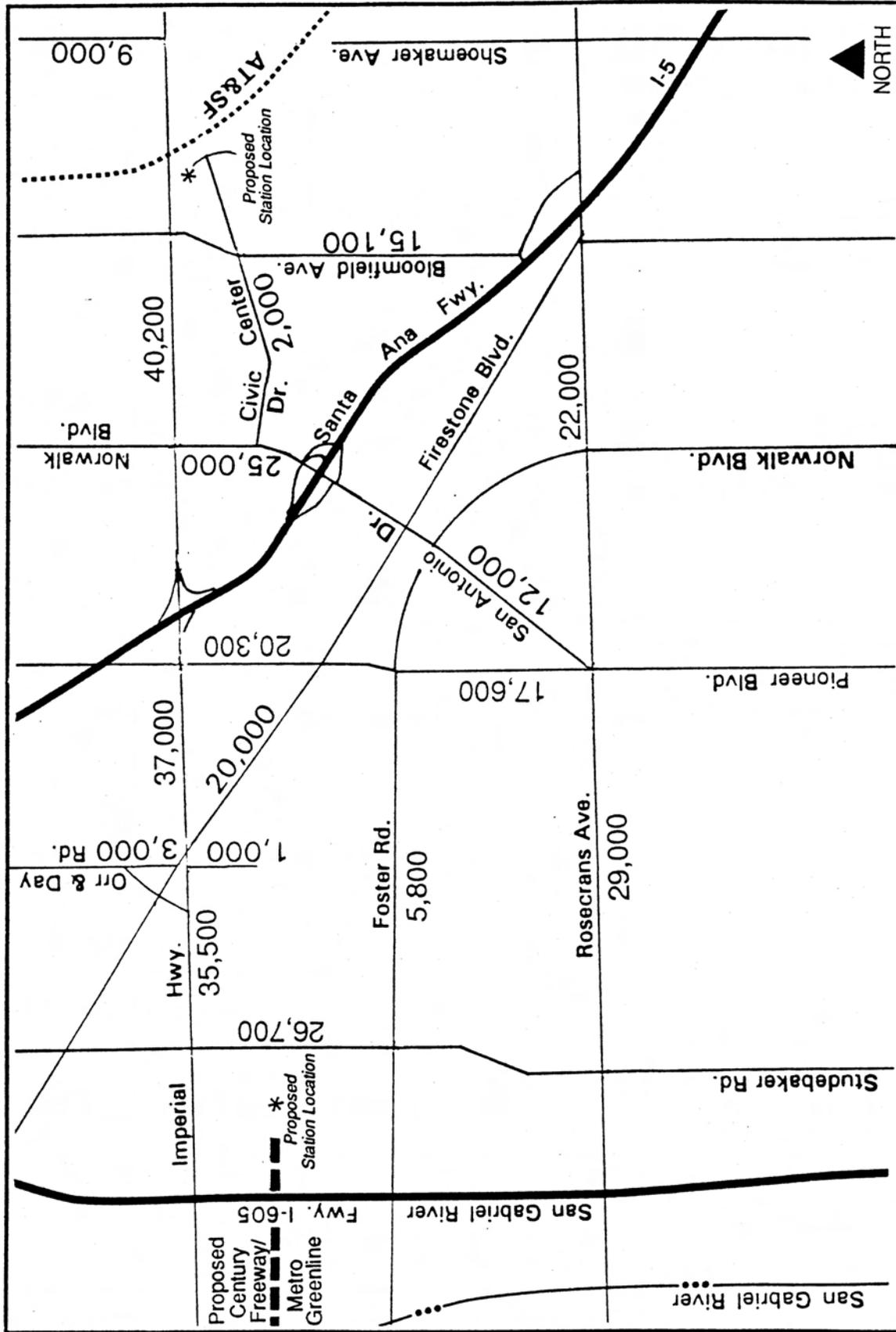


FIGURE 3-21

Existing ADT Volumes in Study Area
 Metro Greenline Easterly Expansion RRS/EIR

Meyer, Mohaddes Associates, Inc.



9.	I-5 Fwy SB on-ramp at Imperial Highway	Unsignalized
10.	Norwalk Boulevard at Imperial Highway	Signalized
11.	Bloomfield Avenue at Imperial Highway	Signalized
12.	Shoemaker Avenue at Imperial Highway	Signalized
13.	Bloomfield Avenue at Civic Center Drive	Signalized
14.	Norwalk Boulevard at Civic Center Drive	Signalized
15.	Norwalk Boulevard at I-5 NB on/off-ramps	Signalized
16.	Norwalk Boulevard at I-5 SB on-ramp	Signalized

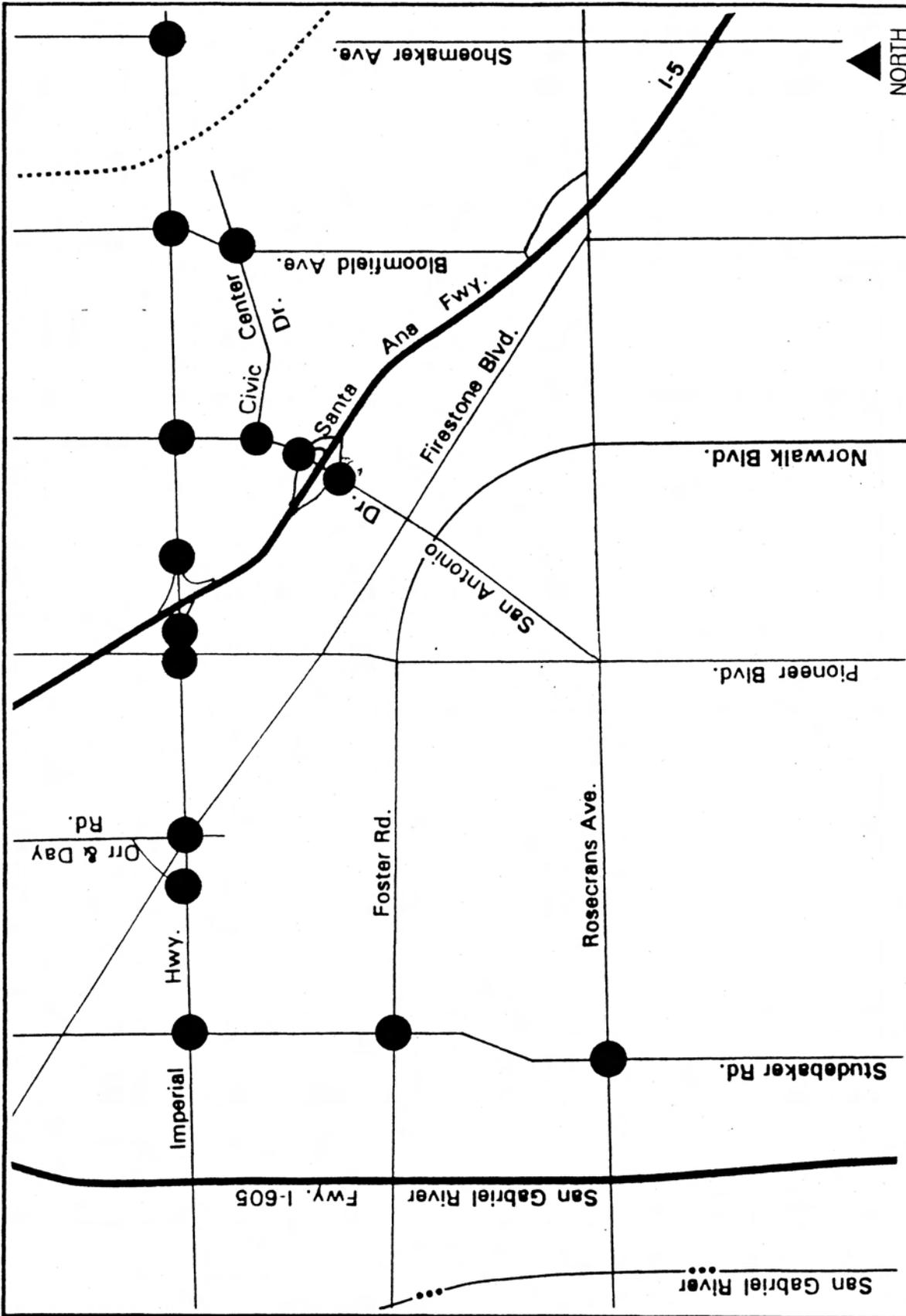
These locations are illustrated in Figure 3-22. Existing turning movement counts were obtained from counts conducted for AM and PM peak hours during February 1992. Figure 3-23 displays the lane configuration at the study intersections. Figure 3-24 and Figure 3-25 display the existing AM and PM peak hour turning movement volumes, respectively.

Based upon the intersection turning movements, MMA has analyzed AM and PM peak hour levels of service (LOS) for each study intersection. Signalized intersections were analyzed using the Circular 212 Planning methodology as per Los Angeles County guidelines. The unsignalized intersections with no control or intersections controlled by stop signs and/or yield signs on the minor street approach only (intersections of Imperial Highway at the I-5 Freeway ramps and Imperial Highway at Orr & Day Road-west) were analyzed using the method described in the 1985 Highway Capacity Manual. The result is expressed in terms of level of service, which is a qualitative concept used to describe the quality of traffic flow.

The unsignalized intersections were also analyzed using the Circular 212 Planning methodology for the purposes of capacity analysis. The Circular 212 Planning methodology is primarily designed for signalized intersections. The capacity analysis of unsignalized intersections using Circular 212 Planning methodology facilitates assessment of the impact of cumulative projects and the proposed development, as compared to the existing level of service, but this does not necessarily mean that these intersections should be signalized.

Level of service is a subjective description of traffic performance at intersections. The level of service concept indicates a measure of average operating conditions at intersections during an hour. Service levels range from A through F with each level defined by a range of volume/capacity ratios. Table 3-16 summarizes the level of service concept. Conditions A, B, and C are considered excellent to good operating conditions with V/C ratios ranging up to 0.79 for LOS C. Level of service D (V/C 0.80 to 0.89) is a generally acceptable standard for planning and design of urban transportation facilities. At level of service E (V/C 0.90 to 0.99), poor intersection operations occur as traffic volume approaches capacity, and LOS F represents extremely congested conditions.

Table 3-17 displays existing V/C ratios and level of service analyses for AM and PM peak hours, including level of service at unsignalized intersections by both methods. First considering the analysis of all intersections by signalized methodology, during the AM peak hour, two study intersections (Norwalk Boulevard at Imperial Highway and Shoemaker Avenue at Imperial Highway) are operating at LOS E or worse and all other intersections are operating at LOS D or better. Based on field observations, at the intersection of Shoemaker Avenue/Imperial Highway, the westbound approach could be restriped to accommodate an additional lane within the existing right-of-way, which would result in an improved level of service. With the signalized



NORTH

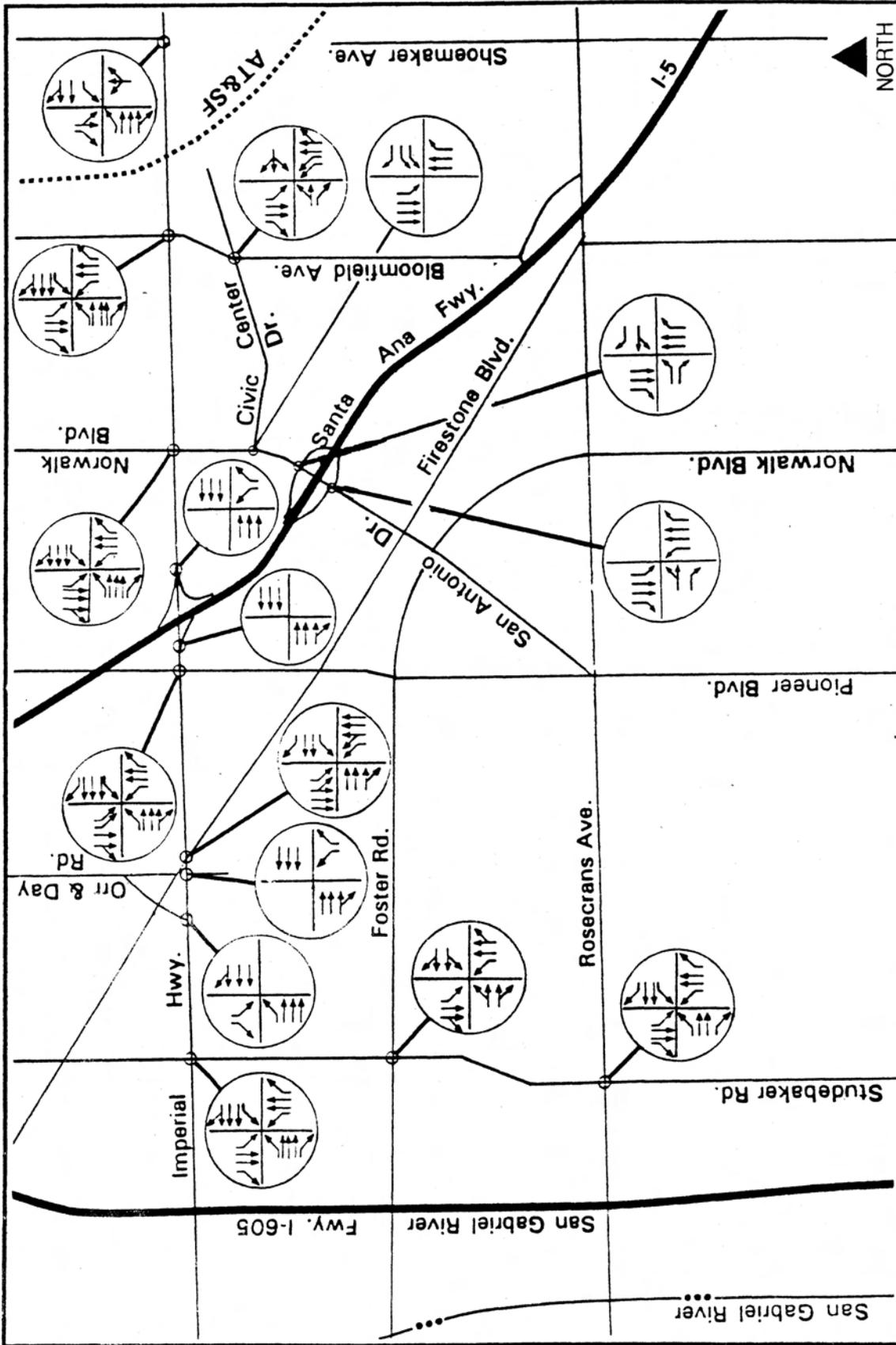
FIGURE

3-22

Study Intersections
Metro Greenline Easterly Expansion RRS/EIR

Meyer, Mohaddes Associates, Inc.





Existing Lane Configurations at Study Intersections
Metro Greenline Easterly Expansion RRS/EIR

Meyer, Mohaddes Associates, Inc.

FIGURE 3-23

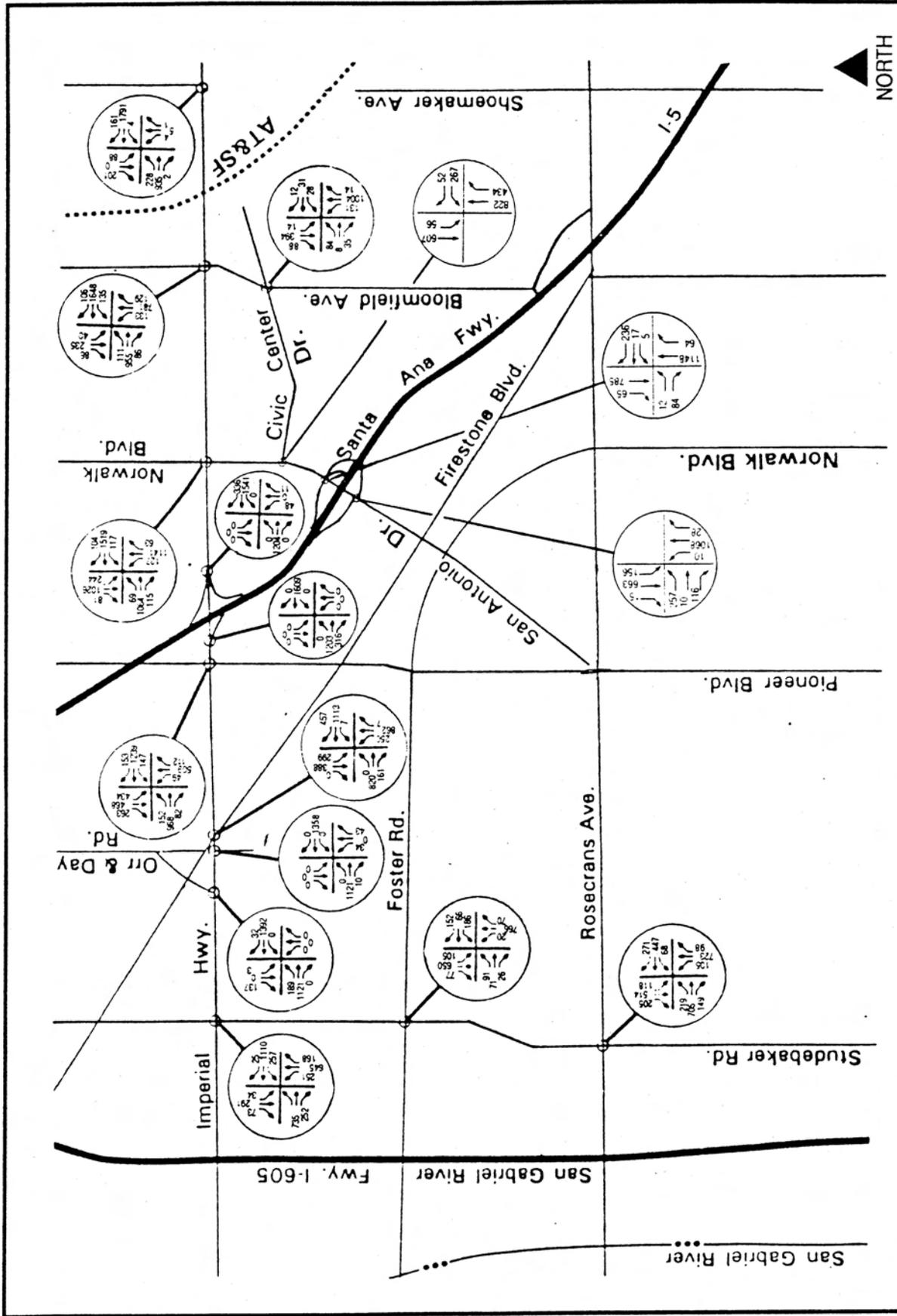


FIGURE
3-24

*AM Peak Hour Turning Movements
at Study Intersections*
Metro Greenline Easterly Expansion RRS/EIR

Meyer, Mohaddes Associates, Inc.



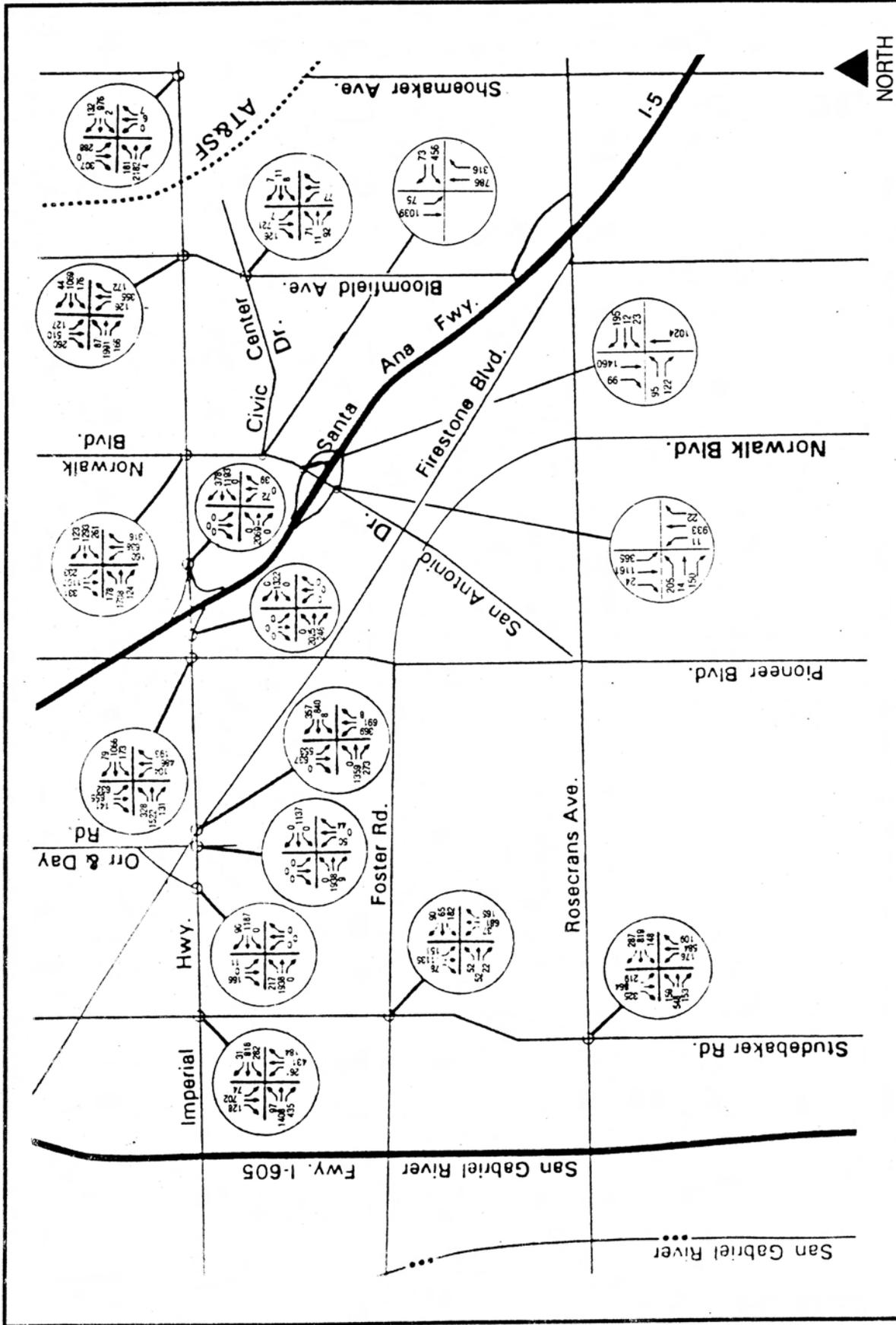


FIGURE 3-25

PM Peak Hour Turning Movements at Study Intersections
Metro Greenline Easterly Expansion RRS/EIR

Meyer, Mohaddes Associates, Inc.



Table 3-16: Level of Service Interpretation

Level of Service	Description	Volume to Capacity Ratio
A	Excellent operation. All approaches to the intersection appear quite open, turning movements are easily made, and nearly all drivers find freedom of operation.	≤0.60
B	Very good operation. Many drivers begin to feel somewhat restricted within platoons of vehicles. This represents stable flow. An approach to an intersection may occasionally be fully utilized and traffic queues start to form.	0.61-0.70
C	Good operation. Occasionally drivers may have to wait more than 60 seconds, and back-ups may develop behind turning vehicles. Most drivers feel somewhat restricted.	0.71-0.80
D	Fair operation. Cars are sometimes required to wait more than 60 seconds during short peaks. There are no long-standing traffic queues. <u>This level is typically associated with design practice for peak periods.</u>	0.81-0.90
E	Poor operation. Some long-standing vehicular queues develop on critical approaches to intersections. Delays may be up to several minutes.	0.91-1.00
F	Forced flow. Represents jammed conditions. Backups form locations downstream or on the cross street may restrict or prevent movement of vehicles out of the intersection approach lanes; therefore, volumes carried are not predictable. Potential for stop and go type traffic flow.	> 1.00

Source: *Highway Capacity Manual*, Special Report 209, Transportation Research Board, Washington, D.C., 1985 and *Interim Materials on Highway Capacity*, NCHRP Circular 212, 1982.

Table 3-17: Existing Conditions Level of Service Analysis

INT.#	INTERSECTION	AM		PM	
		V/C	LOS	V/C	LOS
1	Studebaker Road/Imperial Highway	0.66	B	0.99	E
2	Studebaker Road/Foster Road	0.55	A	0.60	B
3	Studebaker Road/Rosecrans Avenue	0.70	C	0.86	D
4	Firestone Boulevard/Imperial Highway	0.72	C	0.80	D
5	Orr & Day Road (E)/Imperial Highway	0.33	A	0.47	A
6	Orr & Day Road (W)/Imperial Highway ¹ Orr & Day Road (W)/Imperial Highway ²	---	---	---	---
		0.47	A	0.54	A
7	Pioneer Boulevard/Imperial Highway	0.77	C	0.96	E
8	I-5 Fwy NB on/off-ramps/Imperial Highway ¹ I-5 Fwy NB on/off-ramps/Imperial Highway ²	---	---	---	---
		0.45	A	0.51	A
9	I-5 Fwy SB on-ramp/Imperial Highway ³	0.00	A	0.00	A
10	Norwalk Boulevard/Imperial Highway	1.04	F	1.07	F
11	Bloomfield Avenue/Imperial Highway	0.82	D	0.89	D
12	Shoemaker Avenue/Imperial Highway	0.99	E	0.73	C
13	Bloomfield Avenue/Civic Center Drive	0.49	A	0.37	A
14	Norwalk Boulevard/Civic Center Drive	0.45	A	0.50	A
15	Norwalk Boulevard/I-5 NB on/off-ramps	0.55	A	0.68	B
16	Norwalk Boulevard/I-5 SB on-ramp	0.67	B	0.74	C

Notes:

- ¹ 2-way stop sign on minor street (see below for unsignalized intersection analysis results).
- ² Unsignalized intersection analysis using Circular 212 Planning methodology.
- ³ Uncontrolled intersection.

Source: Meyer, Mohaddes Associates, 1992.

analysis, during the PM peak hour, three study intersections (Studebaker Road at Imperial Highway, Pioneer Boulevard at Imperial Highway, and Norwalk Boulevard at Imperial Highway) are operating at LOS E or worse, and all other intersections are operating at LOS D or better. At the intersection of Studebaker Road/Imperial Highway, it is observed that the heavy left-turn traffic volumes on the westbound and northbound approaches contribute to the significant delay at the intersection. At the Pioneer Boulevard/Imperial Highway intersection, the very heavy southbound left-turn traffic volume is contributing to the significant delay at the intersection. At the Norwalk Boulevard/Imperial Highway intersection, the lack of an exclusive right-turn lane on the southbound approach to accommodate the heavy right-turn traffic volume is contributing to a significant delay at this intersection.

Using the unsignalized methodology, it was determined that both unsignalized intersections (Imperial Highway at the I-5 Freeway NB ramps and Imperial Highway at Orr & Day Road-west) are operating at LOS E or worse during AM and PM peak hours. At the Imperial Highway/I-5 Freeway NB ramps intersection, the minor street traffic delay is primarily contributing to a poor level of service, whereas at the intersection of Imperial Highway/Orr & Day Road-west, both minor street and major street left-turn traffic is contributing to the poor level of service.

Transit Services

The study area is served by the Southern California Rapid Transit District (SCRTD), local buses, commuter rail service between Los Angeles and San Juan Capistrano and taxi service throughout the study area.

SCRTD operates a number of bus routes throughout the study area, including routes 115, 120, 125, 270, 460, 462, and 466. SCRTD route No. 120 currently operates along Imperial Highway, and there are no plans to have buses stop at the Transportation Center. The nearest existing stop is at the corner of Imperial Highway and Bloomfield Avenue. Possible route changes to directly service the station would be dependent upon patronage realization. Route 270 is the route with closest access to the Studebaker station.

The City of Norwalk currently operates three bus routes, all of which travel along some stretch of Imperial Highway between Studebaker Road and Shoemaker Avenue. These buses could be used in conjunction with SCRTD buses to access the proposed stations.

The City of Norwalk's bus system would incorporate a new route to directly serve the Metro Green Line Station. This would be a loop route with potential stops at IBM, Bechtel, the Sheraton Hotel and City Hall, among others. As ridership increases on this route, extra buses would be added to serve these stops at more frequent intervals.

Amtrak presently operates commuter rail service between Los Angeles and San Juan Capistrano for the Orange County Transportation Authority. Currently there is one northbound train in the AM and one southbound train in the PM and this service is proposed to be expanded to a total of eight trains in each direction per day. Currently, Amtrak's trains between San Diego and Los Angeles/other destinations north use this corridor, however, they do not presently stop at Norwalk.

3.10.2 Construction Impacts

Prior to analyzing impacts due to operation of the proposed project on cumulative traffic conditions (Future No Project), potential traffic impacts during construction of the Green Line extension were qualitatively evaluated. Impacts during construction of the Green Line extension differ for each of the two alignments and are summarized below.

Aerial Alignment

An aerial guideway would be constructed for the entire alignment to accommodate Green Line rail operations under this alignment. The alignment under consideration (Studebaker Road/Imperial Highway) is an elevated alignment approximately two miles long which would be supported by concrete columns. The columns would be about seven to ten feet in diameter, depending upon the height of the structure, and spaced, on average, 130 feet apart. Several elements of construction activity of the guideway along Imperial Highway are anticipated to be undertaken simultaneously and the construction is estimated to take approximately two to three years to complete. The primary impact caused by the construction of the aerial guideway would be from potential lane closures and the impact of construction equipment on traffic. During construction of columns in the median of Imperial Highway, one lane of Imperial Highway in each direction would be closed to traffic and barriers would be placed marking the closure of lanes. Lane closures would be 24-hour lane closures, potentially lasting for the entire two-year construction period.

The closure of lanes on Imperial Highway during construction would directly affect traffic conditions on Imperial Highway and indirectly affect traffic circulation in the study area. Traffic circulation is affected because of a potential diversion of traffic from Imperial Highway to adjacent streets. The potential diversion would be, at most, 33 percent of traffic along Imperial Highway, since one of the three through lanes would be closed. In actuality the diversion would likely be closer to 25 percent, since many drivers prefer to use their first-choice (familiar) route rather than divert to an alternative. This would leave 75 percent of the volume in 66.7 percent of the capacity, thereby increasing the level of congestion on Imperial Highway during the construction period. The east-west through traffic diverted from Imperial Highway would likely use one of the following alternate routes: Rosecrans Avenue and Florence Avenue/Telegraph Road. Based on roadway capacity and existing daily traffic volumes, it is anticipated that approximately 60 percent of the diverted traffic would use Rosecrans Avenue and 40 percent of the diverted traffic would use Florence Avenue/Telegraph Road alternatives, respectively. Rosecrans Avenue is likely to receive a greater proportion of the diverted traffic because it is more directly parallel to Imperial Highway and has full service interchanges on both I-5 and I-605. Some north-south streets would also experience traffic volume increases as traffic transitions from the Imperial Highway corridor to the alternate parallel routes. The north-south streets affected could include Bellflower Boulevard and Studebaker Road, west of the construction zone, Pioneer Boulevard, San Antonio Drive-Norwalk Boulevard, Bloomfield Avenue, within the construction zone, and Carmenita Road and Valley View Avenue east of the construction zone.

The level of service on streets with diverted traffic would most likely worsen compared to traffic conditions prior to the addition of diverted traffic. The diversion of 25 to 33 percent of Imperial Highway traffic to alternate routes would alter the travel pattern of 10,000 to 12,000 vehicles per day. This would increase the ADT on Rosecrans Avenue by 6,000 to 7,200, from an average of

26,000 ADT to 32,000 or 33,000, about a 25 percent increase. This would result in a significant traffic impact on Rosecrans Avenue requiring mitigation. The increase in ADT on the Telegraph-Florence route would be about 4,000 to 4,800 vehicles per day. This would increase the average ADT from approximately 40,000 to 44,000 or 44,800, about an 11 percent increase. This would cause a significant impact on Florence Avenue, requiring mitigation. It is not anticipated that the diversion of traffic to the north-south streets would cause a significant impact to any of the roadways because of the numerous alternate north-south routes.

The traffic on minor side streets with access to Imperial Highway would be diverted to the closest alternative access routes. This would cause inconvenience to local residents and employees or patrons of commercial land uses along Imperial Highway and result in an increase in U-turns at signalized intersections, but this is not anticipated to cause a significant impact requiring mitigation other than a traffic control plan. Traffic at major intersections is anticipated to be excluded from significant disruption due to construction, except for certain turn movement restrictions, since bent structures rather than center columns would be utilized at major intersections and no lane closures are proposed.

Regional access to trucks/equipment used for construction of the aerial rail line is provided by I-5, I-605, and I-105. Depending on the location of activity, the nearest freeway access should be utilized; trucks and equipment should be limited to major arterials such as Imperial Highway, Studebaker Road, and Pioneer Boulevard to minimize their impact on traffic. In addition to closure of traffic lanes on Imperial Highway during construction, I-5 at Imperial Highway could potentially be briefly closed during the construction of an aerial guideway over I-5. The construction of a guideway at this location and simultaneous closure of I-5 would preferably be limited to nighttime and weekends because of the significance of the I-5 Freeway as a travel corridor. An actual plan for traffic circulation during construction of the Green Line needs to be developed during the final design stages.

Subway Alignment

For the subway alignment, the primary impact would be from trucks used for the construction process; more specifically, dirt haul trucks removing dirt excavated from the subway tunnel. There would be no other disruption to traffic along the alignment due to the subway alignment. The access/portal to the tunnel is anticipated to be located near the Pecos Avenue cul-de-sac, which is located west of Studebaker Road, south of Imperial Highway and north of Adoree Street. Trucks would potentially use Lyndora Street to access the tunnel portal. The estimated number of trucks to be used during the construction process is approximately 30, and each truck is assumed to make about four round trips during a typical eight-hour shift. This is equivalent to 120 truck round trips during a typical day shift, which is the time period under evaluation for this traffic study.

If the east end staging area is selected, construction-related traffic would shift to that locale.

Regional access to trucks used for subway construction is provided by I-105 and I-605. Figure 3-26 illustrates the general circulation pattern for trucks in the construction area. Access to I-105 is available from Studebaker Road just south of Lyndora Street; outbound trucks from the tunnel portal would travel south on Studebaker Road to the on-ramp and inbound trucks would travel northbound on Studebaker Road to reach the tunnel portal. The closest access to

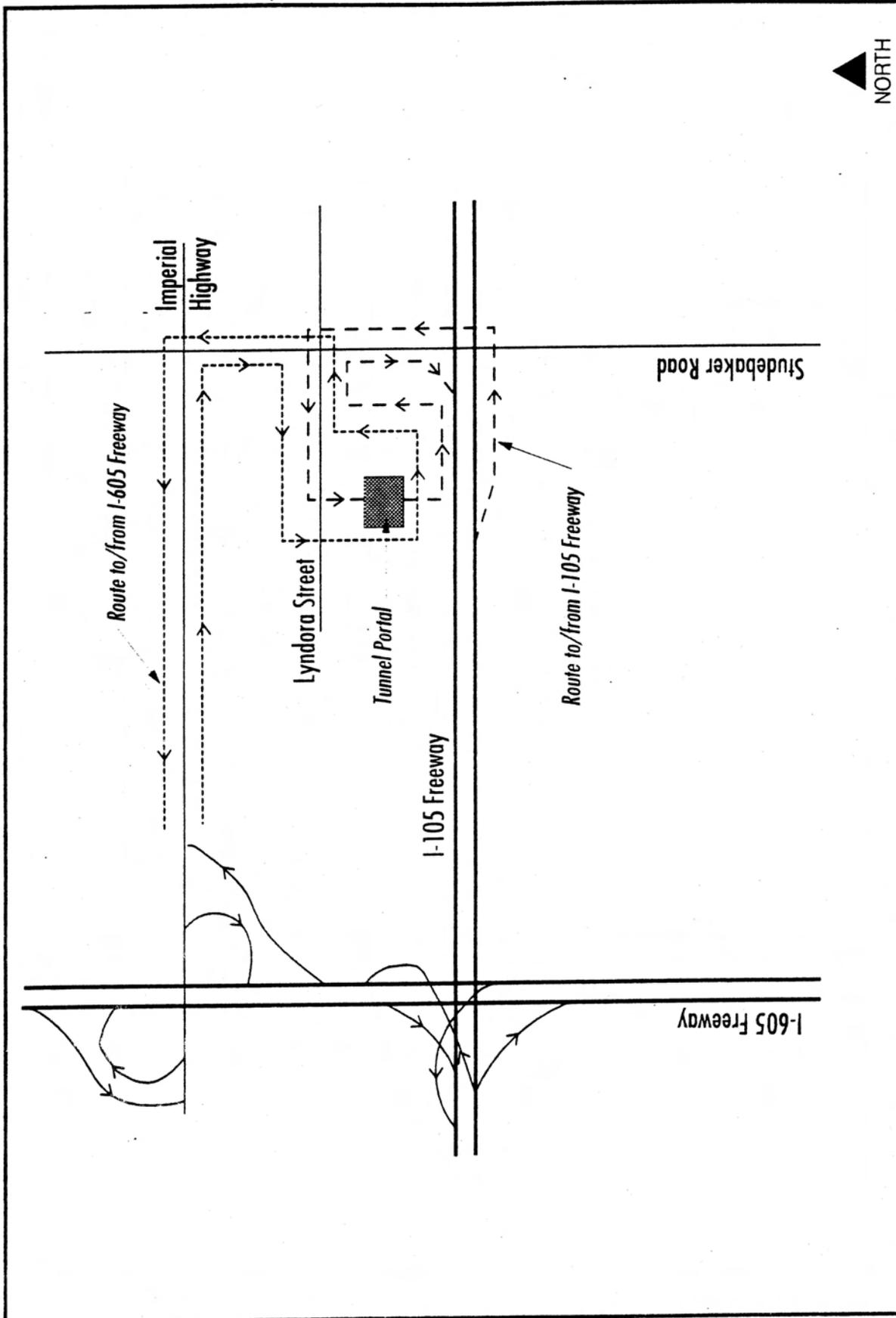


FIGURE 3-26

Subway Construction Truck Traffic Circulation
Metro Greenline Easterly Expansion RRS/EIR

Meyer, Mohaddes Associates, Inc.

the San Gabriel Freeway (both northbound and southbound) is available at Imperial Highway; outbound trucks from the tunnel portal would travel north on Studebaker Road and west on Imperial Highway, and inbound trucks would travel eastbound on Imperial Highway and south on Studebaker Road to reach the tunnel portal. These trucks would travel through one study intersection--Studebaker Road at Imperial Highway. It is anticipated that these trucks would potentially worsen level of service at this intersection only during the AM and PM peak hours and are therefore recommended to be restricted during peak hours.

As described above, truck traffic would potentially add traffic to Studebaker Road and Imperial Highway. Assuming an even split between I-105 and I-605, the daily truck traffic to be added to each freeway is 120 trips, assuming one shift per day. This would change the volumes on city streets by approximately 0.90 percent on Studebaker Road and 0.34 percent on Imperial Highway daily traffic. This would not cause a significant traffic impact requiring mitigation. A traffic control plan at the access points to the construction area, where trucks would turn onto/off of city streets, should be prepared as a mitigation measure to reduce localized impacts at the project access points.

3.10.3 Operational Impacts

Overview of Approach

The first step in the traffic impact analysis is to forecast traffic conditions based on existing conditions. The next step is an analysis of project-related impacts (extension of rail line) for the two alignments (aerial and subway) of the preferred Studebaker Road/Imperial Highway Alignment.

Future Traffic Conditions without the Project

Intersection levels of service have been forecast without the project for both AM and PM peak hour periods. Future forecasts were developed in accordance with the methodology described below.

- **Cumulative Traffic Increases**

The first element of the future no-project analysis was the application of an ambient traffic growth rate to expand existing traffic volumes. The purpose of the ambient traffic growth rate is to reflect background (ambient) increases in the traffic volumes which would occur as a result of projects that would be constructed before the rail line extension is completed. The ambient growth rate used in this study is 1.0 percent per year compounded for 18 years to 2010 (a total growth rate of 20 percent). No other related development projects were included in the analysis.

- **Trips between Century Freeway and Santa Ana Freeway**

I-105 is currently being constructed by Caltrans. It extends from the Los Angeles International Airport (LAX) in the west to its eastern terminus near I-605 and provides significant regional connections through its interchanges with many freeways, including the San Diego Freeway (I-405), the Harbor Freeway (I-110), the Long Beach Freeway (I-710), and I-605. I-105 does not connect with the Santa Ana Freeway (I-5), an important transportation corridor in the vicinity of

the study area. A portion of potential trips between these two facilities (eastern terminus of I-105 and southbound I-5) would add traffic to roadways in the study area.

The anticipated daily traffic volumes of freeway-oriented trips that would use study area roads were estimated based on the Los Angeles Regional Transportation Study (LARTS) model output provided by Caltrans. Based on model output and study area roadway network, it was assumed that the primary non-freeway route for these transfer trips would be via Studebaker Road and Imperial Highway. Based on model output, the potential daily traffic added to this non-freeway route was approximately 7,500 vehicles in 2010. The ratios of AM and PM peak hour traffic to daily traffic were based on existing 24-hour counts along Imperial Highway. These ratios were utilized in determining AM and PM peak hour transfer trips, which were estimated to be 500 and 550, respectively. These are trips that would travel between the two freeways via city streets.

- Commuter Rail Trips

Currently commuter rail service between Los Angeles and San Juan Capistrano is operated by Amtrak on its Los Angeles to San Diego route (LOSSAN corridor), with one round trip per day. This route passes the proposed Norwalk Transportation Center, the eastern terminus for the Green Line Easterly Extension. In the near future, expanded commuter rail service between Orange and Riverside counties to Los Angeles would also travel along this corridor. Two additional round trip commuter trains are proposed to start service between San Juan Capistrano and Los Angeles in December 1993, and an additional six trains are proposed to start service between Oceanside and Los Angeles by 1995. The present commuter rail service does not stop in Norwalk; however, with the implementation of the Green Line Easterly Extension, it is anticipated that commuter rail trains would stop at the proposed Norwalk Transportation Center.

The proposed commuter rail service, with a stop at the Norwalk Transportation Center, would add vehicular trips to the local roadway network. Information related to proposed service level descriptions and peak period patronage forecasts for commuter rail were obtained from the report, "Southern California Commuter Rail 1991 Regional System Plan," prepared by the Southern California Commuter Rail Coordinating Council. The anticipated daily and peak hour boardings and alightings were estimated based on assumed service parameters and peak period patronage forecasts. Estimates were made separately for the Oceanside to Los Angeles and the Riverside to Los Angeles routes.

Based on the total peak hour boardings/alightings and assumptions related to mode split, vehicle trips to/from the Norwalk Transportation Center were determined, as illustrated in Table 3-18 and Table 3-19. It was assumed that during the AM peak period, approximately 80 percent of commuter rail trips would be outbound (primarily towards Los Angeles) and 20 percent of the trips would be inbound (from Orange and Riverside/San Bernardino counties) to destinations in the vicinity of the Norwalk Station. During the PM peak period, approximately 80 percent of trips would be inbound to the Norwalk Station and 20 percent would be outbound trips.

Commuter rail trips were distributed as follows: 35 percent from the east via Imperial Highway, 35 percent from the south via the Santa Ana Freeway, 20 percent from the west via Imperial Highway, and 10 percent from the north via Norwalk Boulevard/Bloomfield Avenue. The

Table 3-18: Forecasted Commuter Rail Vehicular Trips

Mode	Mode Split %	AM		PM		Daily
		In	Out	In	Out	
Drive Alone	60	126	0	0	126	546
Car Pool	15	16	0	0	16	68
Van Pool	5	2	0	0	2	9
Kiss N Ride	5	11	11	11	11	46
Transit	8	3	3	3	3	14
Shuttles	5	6	6	6	6	26
Walk/Bike	2	0	0	0	0	0
Total	100	163	19	19	163	709

Source: Meyer, Mohaddes Associates, 1992.

Table 3-19: Forecasted Green Line Vehicular Trips

Mode	Mode Split %	AM		PM		Daily
		In	Out	In	Out	
Drive Alone	55	124	14	14	124	825
Car Pool	10	11	1	1	11	75
Van Pool	5	2	0	0	2	15
Kiss N Ride	10	25	25	25	25	150
Transit	13	3	3	3	3	20
Shuttles	5	2	2	2	2	11
Walk/Bike	2	0	0	0	0	0
Total	100	167	45	45	167	1095

Source: Meyer, Mohaddes Associates, 1992.

distribution of commuter rail trips remains the same with or without the Green Line Easterly Extension.

- Green Line Trips without Extension to Norwalk Transportation Center

The existing eastern terminus of the Metro Green Line is at the Studebaker station, located west of Studebaker Road and south of Imperial Highway. The vehicular trips related to the Studebaker station park-and-ride lot would add traffic to the study area roadway network. Green Line trips related to the Studebaker station in the "No Project" scenario would be a combination of primary trips at the Studebaker station in addition to other trips that would use the Norwalk Transportation Center Station if the Green Line were extended. Without the proposed extension of the Green Line trips related to the Norwalk Transportation Center would use the Studebaker station, since it is the nearest alternative access to the Green Line.

There are no current patronage forecasts available for the Green Line Easterly Extension. A set of assumptions were developed in conjunction with LACTC staff regarding potential ridership and potential demand at the Studebaker station. Projected Green Line ridership for the Year 2010 is approximately 50,000 passengers per day, including transfers from the commuter rail and the proposed Orange County fixed guideway. The base line patronage of the Green Line is assumed to be approximately 25,000 passengers per day in 2010.

Trips generated at the Studebaker station are assumed to be approximately 5-10 percent of the base line Green Line patronage, resulting in an estimated 1,250 to 2,500 daily passengers. For purposes of this study, a daily demand of 1,500 passengers was assumed at the Studebaker station. It was also assumed that approximately 33 percent of these trips would occur during each of the following time periods: AM peak period, PM peak period, and off-peak period. Assuming that half of the peak period travel would occur during peak hour, that accounts for approximately 16.7 percent of daily passengers. Estimated AM or PM peak hour demand would be 250 passengers.

In addition to primary trips at the Studebaker station there would be other trips. These potential trips, which would result from the diversion of riders from the proposed Norwalk Transportation Center, would produce about 250 passengers in the peak hour. However, because of additional travel from the vicinity of the Norwalk Transportation Center to the Studebaker station, it is assumed that only about 80 percent of these passengers (or demand) would utilize the Studebaker station. This demand (200, i.e., 80 percent of 250) is in addition to the primary demand at the Studebaker station. Therefore the total demand estimated at the Studebaker station for the "No Project" condition is 450 passengers during the peak hour. It should be noted that even though it has been assumed that up to 80 percent of the locally generated trips might shift to the Studebaker station if the Green Line extension is not completed, virtually none of the transfers between the Green Line and the commuter rail or Orange County Urban Rail would be expected to occur without the extension because too many transfers would be required of most riders. Therefore, total ridership on the Green Line could be significantly reduced without the extension to the Norwalk Transportation Center.

From the estimated peak hour demand, vehicle trips were derived using assumptions related to mode split. Assumptions related to mode split percentages were primarily based on passenger survey data collected for the existing Metro Blue Line in 1991. Data used for this study relates

to stations with similar park-and-ride lots, such as Del Amo station and Artesia station, and was obtained from the Southern California Rapid Transit District (SCRTD).

Trip distribution for Green Line trips is different for primary trips and other trips. For primary trips the following distribution was used: 35 percent from the south via Studebaker Road and I-605, 25 percent from the west via Imperial Highway/Rosecrans Avenue/I-105 and 40 percent from the north via Studebaker Road and I-605. The following distribution was used for other trips: 35 percent from the east via Imperial Highway, 50 percent from the south via I-5 and 15 percent from the northeast of the Studebaker station via Norwalk Boulevard/Bloomfield Avenue.

- **Future No Project Traffic Conditions**

The base 1992 traffic volumes were adjusted for the ambient growth and traffic volumes from I-105. The commuter rail and the Green Line were added to obtain the future cumulative traffic volumes. The Circular 212 Planning methodology for signalized intersections was used in analyzing the level of service at the study intersections for all future condition alternatives. Based on the 2010 peak hour, traffic volumes were developed and the "No Project" intersection levels of service were derived. Six study intersections were projected to operate with an estimated LOS E or worse during the AM peak hour. During the PM peak hour, seven of the study intersections (including the six in the AM peak hour) were projected to operate at LOS E or worse. These intersections are listed below:

AM Peak Hour

- Studebaker Road/Imperial Highway
- Firestone Boulevard/Imperial Highway
- Pioneer Boulevard/Imperial Highway
- Norwalk Boulevard/Imperial Highway
- Bloomfield Avenue/Imperial Highway
- Shoemaker Avenue/Imperial Highway

PM Peak Hour

- All intersections listed under AM peak hour
- Studebaker Road/Rosecrans Avenue

Impact Analysis (Future with Project Conditions)

The traffic impact analysis under "With Project" conditions considers impacts due to the proposed project at study intersections as well as along the entire stretch of roadway along the alignment. Impacts at study intersections could be in terms of level of service due to traffic generated by the Norwalk Transportation Center Station and any other impacts due to actual construction of the rail line. Impacts on level of service at study intersections is anticipated to be the same for either of the alignments (aerial or subway) because the vehicular trip characteristics to/from the station are the same for either alignment.

The estimation of level of service at study intersections involved two steps. The first step was the removal of "Green Line other trips" at the Studebaker station and the second step was the

addition of vehicular traffic to the study area roadway network due to the Green Line at the Norwalk Transportation Center. Using patronage and mode split assumptions described earlier for the Studebaker station, the number of passengers at the Norwalk Transportation Center is estimated to be approximately 250 during the peak hour. These passenger trips were converted to vehicular trips, based on mode split assumptions described earlier.

The trip distribution for Green Line trips to be added at the Norwalk Transportation Center is as follows: 40 percent from the east via Imperial Highway, 40 percent from the south via the Santa Ana Freeway and 20 percent from the north via Norwalk Boulevard/Bloomfield Avenue.

The redistribution of some Green Line trips from the Studebaker station to the Norwalk Transportation Center would result in a better level of service at some study intersections with the extension of the Green Line. This is due to the fact that Green Line riders from the I-5 corridor and east of I-5 would orient their trips toward the Norwalk Transportation Center rather than traveling west across the freeway to the Studebaker station. Table 3-20 and Table 3-21 illustrate the level of service at study intersections under "No Project" and "With Project" conditions for the AM and PM peak hours.

A significant impact at a study intersection due to the proposed project is defined as a change in volume to capacity ratio of at least 0.02 at an intersection, with a result of LOS E or worse. From the table it can be observed that during the AM peak hour, there were no significant project impacts, while in the PM peak hour, only the intersection of Norwalk Boulevard at the I-5 SB on-ramp was significantly affected. This is due to traffic utilizing the Norwalk Boulevard ramps to access the Norwalk Transportation Center via Civic Center Drive. Traffic impacts related to the two alignments are described below.

- Aerial alignment

In addition to impacts on level of service, the aerial alignment would affect several related elements such as roadway geometry (transitions required to provide a wider median to accommodate aerial guideway) and sight distance, among others. Where possible, columns would be placed in the median to support the aerial structure. In some locations, due to roadway geometry, placement of "bent" structures (on either side of a roadway) would be required. The placement of columns supporting the aerial structure on the Imperial Highway median or placement of bents on either side of the roadway would require additional right-of-way and/or narrowing of the vehicular lanes at some locations. The project would not reduce the number of lanes available along any segment or at any intersection in comparison to the "No Project" alternative. For the aerial alignment, column placement required to support the grade separation of the alignment could affect the roadway capacity and sight distance. Those impacts would have to be evaluated in detail during the design phase of the project if the aerial alignment is pursued.

- Subway Alignment

The subway alignment would have minimal impacts on street traffic, compared to the aerial alignment. This alignment involves building a subway for the entire alignment. Potential impacts due to an aerial alignment such as sight distance, roadway capacity, additional right-of-way and turn restrictions are eliminated with an subway alignment.

Table 3-20: Future AM Peak Hour Intersection Levels of Service

INTERSECTION	WITHOUT PROJECT		WITH PROJECT		IMPACT
	V/C	LOS	V/C	LOS	
Studebaker Road/Imperial Hwy	1.18	F	1.06	F	NI
Studebaker Road/Foster Road	0.68	B	0.68	B	NC
Studebaker Road/Rosecrans Ave	0.87	D	0.87	D	NC
Firestone Blvd/Imperial Hwy	0.99	E	0.94	E	NI
Orr & Day Road(E)/Imperial Hwy	0.47	A	0.44	A	NI
Orr & Day Road(W)/Imperial Hwy	0.64	B	0.61	B	NI
Pioneer Blvd/Imperial Hwy	1.01	F	0.98	E	NI
I-5 NB on/off-ramps/Imperial Hwy	0.78	C	0.72	C	NI
I-5 SB on-ramp/Imperial Hwy	0.50	A	0.48	A	NI
Norwalk Blvd/Imperial Hwy	1.26	F	1.26	F	NC
Bloomfield Ave/Imperial Hwy	1.00	E	1.00	E	NC
Shoemaker Ave/Imperial Hwy	1.23	F	1.24	F	+ & NSI
Bloomfield Ave/Civic Center Dr	0.63	B	0.70	B	+ & NSI
Norwalk Blvd/Civic Center Dr	0.58	A	0.63	B	+ & NSI
Norwalk Blvd/I-5 NB ramps	0.70	B	0.74	C	+ & NSI
Norwalk Blvd/I-5 SB on-ramp	0.81	D	0.82	D	+ & NSI
Key to Symbols: NI = No Impact, V/C ratio improves NC = No Change + & NSI = No Significant Impact					

Source: Meyer, Mohaddes Associates, 1992.

Table 3-21: Future PM Peak Hour Intersection Levels of Service

INTERSECTION	WITHOUT PROJECT		WITH PROJECT		IMPACT	W/MITIGATION	
	V/C	LOS	V/C	LOS		V/C	LOS
Studebaker Road/Imperial Hwy	1.51	F	1.49	F	NI		
Studebaker Road/Foster Road	0.73	C	0.73	C	NC		
Studebaker Road/Rosecrans Ave	1.04	F	1.04	F	NC		
Firestone Blvd/Imperial Hwy	1.05	F	1.02	F	NI		
Orr & Day Road(E)/Imperial Hwy	0.65	B	0.62	B	NI		
Orr & Day Road(W)/Imperial Hwy	0.74	C	0.72	C	NI		
Pioneer Blvd/Imperial Hwy	1.24	F	1.21	F	NI		
I-5 NB on/off-ramps/Imperial Hwy	0.88	D	0.86	D	NI		
I-5 SB on-ramp/Imperial Hwy	0.69	B	0.66	B	NI		
Norwalk Blvd/Imperial Hwy	1.30	F	1.28	F	NI		
Bloomfield Ave/Imperial Hwy	1.08	F	1.07	F	NI		
Shoemaker Ave/Imperial Hwy	0.90	D	0.90	D	NC		
Bloomfield Ave/Civic Center Dr	0.49	A	0.56	A	+ & NSI		
Norwalk Blvd/Civic Center Dr	0.63	B	0.65	B	+ & NSI		
Norwalk Blvd/I-5 NB ramps	0.84	D	0.87	D	+ & NSI		
Norwalk Blvd/I-5 SB on-ramp	0.93	E	0.97	E	+ & SI	0.79 ¹	C
Key to Symbols: NI = No Impact, V/C ratio improves NC = No Change + & NSI = No Significant Impact + & SI = Significant Impact							
Note: ¹ Mitigation - add a southbound left-turn pocket.							

Source: Meyer, Mohaddes Associates, 1992.

3.10.4 Parking Impacts

An analysis of parking requirements was conducted for the Norwalk Transportation Center Station with the proposed Green Line Easterly Extension. The parking requirements at this Station with the proposed extension are from two primary sources--the Commuter Rail and the Green Line. The parking demand would be the same with either of the alignments (aerial or subway). The estimation of parking demand at the Norwalk Transportation Center Station involves data related to patronage and mode split for both the Commuter Rail and the Green Line which were discussed in earlier sections. Based on those assumptions, peak hour and daily vehicular trips were estimated.

Parking demand was estimated by hour of the day between 6:00 AM and 7:00 PM and the results for the time period between 7:00 PM and 6:00 AM were combined. Parking demand is derived from vehicles related to the drive alone and car pool/van pool modes only. Other modes of travel do not generate parking demand. Based on proposed service descriptions, assumptions were made regarding direction of travel (inbound versus outbound) which affects the number of spaces occupied. The analysis resulted in information on the number of vehicles entering/leaving the proposed parking lot and the number of spaces occupied during each hour. This information was estimated for the Commuter Rail and the Green Line separately. Based on the analysis, a combined (Commuter Rail & Green Line) maximum parking demand of approximately 680 spaces was forecast, as shown in Figure 3-27. Of these, approximately 315 spaces would be required for Commuter Rail and approximately 365 spaces would be required for Green Line. As per LACTC staff, provision of an additional 10 percent parking spaces is recommended to attract additional riders to rail service. Therefore, a total of approximately 750 parking spaces would be required to meet parking demands on site at the Norwalk Transportation Center with the proposed extension of the Green Line.

If the estimated number of parking spaces required to meet the demand are not provided on-site, two primary impacts are likely. One is a potential spill over of parking, affecting on-street parking in the vicinity of Norwalk Transportation Center Station site, including parking on Bloomfield Avenue and on residential streets to the south of the station. The other impact of a parking shortfall would be reduced ridership on the Green Line or a potential increase in the demand for carpool/shuttle service.

3.10.5 Mitigation Measures

No Project Conditions

Two of the study intersections, Firestone Boulevard/Imperial Highway and Norwalk Boulevard/Imperial Highway, are designated as arterial monitoring locations in the Congestion Management Program (CMP) and are thus required to be maintained at no worse than level of service E or the existing level of service by the City of Norwalk. Currently, Firestone Boulevard/Imperial Highway operates at better than LOS E and Norwalk Boulevard/Imperial Highway operates at LOS F. The City of Norwalk would have to develop a deficiency plan to keep the Norwalk Boulevard/Imperial Highway intersection from degrading any further into LOS F. LACTC staff has recommended that the proposed project not preclude any potential mitigations that may be pursued by the city to mitigate the CMP intersections and other major study intersections along the alignment.

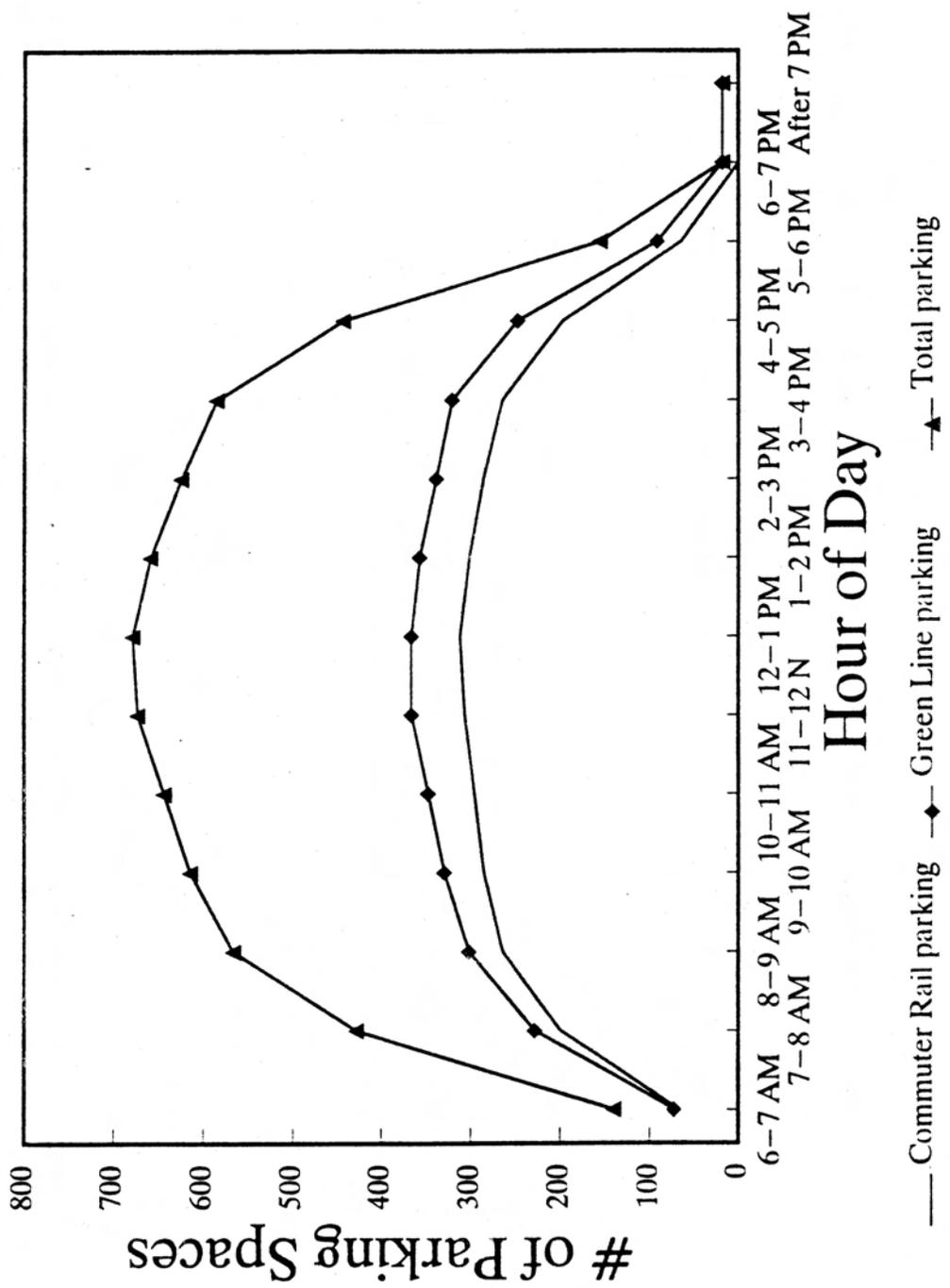


FIGURE 3-27

Hourly Parking Demand
Metro Greenline Easterly Expansion RRS/EIR

Meyer, Mohaddes Associates, Inc.

Potential mitigation measures to mitigate significant impacts under cumulative ("No Project") conditions were identified (e.g., double left-turn lanes). These are potential mitigation measures that the City would probably include in its deficiency plan. These potential CMP-related mitigations were considered during the selection of column/bent locations by providing proper setbacks to account for these mitigations.

With Project Conditions

- Construction

Prior to the construction of the chosen alternative, the contractor should develop a traffic management plan to control traffic during the construction period. The traffic management plan should be reviewed with relevant public agency staff. The traffic management plan should identify both auto and pedestrian detours, ensure a smooth traffic flow, and consider safety of motorists and workers related to construction activity. Adequate advance notice should be given to potential motorists through a public relations campaign. Adequate construction signage should be provided. For the aerial alignment, construction of the aerial guideway over I-5 and the potential closure of I-5 would preferably be limited to nighttime and weekends because of the significance of I-5 as a travel corridor. Also, at least two travel lanes in each direction should be maintained on Imperial Highway, and construction related truck/equipment movement should be limited to off-peak hours to reduce traffic impacts on the two remaining lanes.

With the aerial alignment, some traffic from Imperial Highway is anticipated to be diverted to Rosecrans Avenue and Florence Avenue-Telegraph Road for the duration of the construction period, as described earlier in the report, and mitigation measures need to be implemented on these alternate routes to accommodate additional traffic. On Rosecrans Avenue, the Los Angeles County Department of Public Works staff has recommended the restriction of parking during peak hours to provide an additional travel lane as part of the signal coordination project. However, the City of Norwalk is not accepting the county staff recommendation at this time. The peak period parking restrictions should be implemented as a temporary measure during the Green Line construction period to provide an additional travel lane on Rosecrans Avenue. The third travel lane on Rosecrans Avenue would mitigate the impacts of traffic diverted from Imperial Highway. The Los Angeles County staff has also recommended peak hours parking restriction on Florence Avenue to provide for an additional travel lane as part of a corridor study. According to the staff of City of Santa Fe Springs (the relevant stretch of Florence Avenue is located in the City of Santa Fe Springs), the City may be willing to implement this recommendation, at least temporarily, for the construction period of the Green Line extension. The additional travel lane on Florence Avenue would mitigate the impacts of traffic diverted from Imperial Highway. Without any mitigation measures to accommodate diverted traffic, there would be significant traffic congestion on these alternate routes.

- Traffic

Mitigation measures to mitigate potential significant impacts due to the proposed extension are again dealt with separately for study intersections and mid-block sections. The only study intersection significantly affected by the proposed project is the intersection of Norwalk Boulevard at the I-5 SB on-ramp. The proposed mitigation would be the addition of a southbound left-turn pocket resulting in a dual left turn for that approach. For the mid-block sections, mitigations

would be required only for the aerial alignment. For the aerial alignment, in order to accommodate the aerial guideway, the roadway would need to be widened at several locations along Imperial Highway in order to maintain the existing number of travel lanes.

- **Parking**

Based on the estimated parking demand, a total of 750 parking spaces should be provided on-site at the Norwalk Transportation Center to prevent spill over of parking onto adjacent streets. If the 750 spaces are not provided, a preferential parking plan should be established in the vicinity of the Norwalk Transportation Center station to eliminate spill over parking on residential streets, if the residents of the area perceive a significant problem with the availability of on-street parking.

3.11 NOISE AND VIBRATION

3.11.1 Environmental Setting

Existing Noise Environment

The existing noise levels in the project corridor have been documented through a noise survey. Measurements were performed at four locations shown in Figure 3-28. At each location, community noise levels were continuously monitored for a 24-hour period. Table 3-22 summarizes the measurement locations and overall results. The hourly measurement results and plots of the hourly L_{eq} 's are given for each site in Appendix A of the Noise and Vibration Study.

Each of the noise measurement locations are generally representative of other similar community areas in the study area. The measurements are important since they have been generalized to apply to all noise sensitive receptors in the corridor for estimating the change in CNEL that would be caused by the trains and determining impact. Following is a brief discussion of each site:

Site 1: End of Le Floss near start of extension. Somewhat removed from heavy traffic on Imperial Highway and Studebaker, this site is considered representative of the western and eastern ends where the track is not in the median of Imperial Highway.

Site 2: Lyndora Street in backyard facing Imperial. Six foot wall along Imperial. This site is typical of many residences along Imperial Highway that have some sort of obstruction that acts as at least a partial acoustical barrier.

Site 3. Jersey and Imperial Highway, direct view of Imperial Highway. This site represents the residences and commercial establishments that are somewhat set back from Imperial but without any acoustical protection from traffic noise on Imperial.

Site 4. Volunteer and Imperial across street from library. Direct view of Imperial Highway. This site is similar to Site 3 but closer to Imperial Highway. It is representative of buildings right on Imperial Highway.