



APPENDIX I. ENVIRONMENTAL JUSTICE TECHNICAL MEMORANDUM

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MEMO



To: Robert Forrest
From: HDR
Date: August 2018
Re: **Northwest Phase II Light Rail Extension**
Environmental Justice Technical Memorandum

1.0 INTRODUCTION

This memorandum evaluates the potential impacts on low-income and minority populations resulting from the Build and No-Build Alternatives for the proposed Northwest Phase II Light Rail Extension. For a full description of the alternatives considered, refer to Chapter 2.0 of the Northwest Phase II Light Rail Extension Environmental Assessment (EA).

2.0 REGULATORY SETTING

Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, requires that federal agencies consider and address disproportionately high and adverse environmental effects of proposed federal projects on the health and environment of minority and low-income populations to the greatest extent practicable by law. Following the direction of EO 12898, federal agencies developed guidelines for implementing environmental justice (EJ). U.S. Department of Transportation (USDOT) Order 5610.2(a) defines the fundamental principles of EJ as follows:

- Avoid, minimize or mitigate disproportionately high and adverse human health or environmental effects, including social and economic effects, on minority and low-income populations.
- Ensure the full and fair participation by all potentially affected communities in the transportation decision-making process.
- Prevent the denial of, reduction in or significant delay in the receipt of benefits by minority and low-income populations.

USDOT Order 5610.2(a) requires the following:

- Identifying and evaluating environmental, public health and interrelated social and economic effects of USDOT programs, policies and activities.
- Proposing measures to avoid, minimize and/or mitigate disproportionately high and adverse environmental and public health effects and interrelated social and economic effects and providing offsetting benefits and opportunities to enhance communities, neighborhoods and individuals affected by USDOT programs, policies and activities, where permitted by law and consistent with EO 12898.

- Considering alternatives to proposed programs, policies and activities where such alternatives would result in avoiding and/or minimizing disproportionately high and adverse human health or environmental impacts, consistent with EO 12898.
- Eliciting public involvement opportunities and considering the results thereof, including soliciting input from affected minority and low-income populations in considering alternatives.

3.0 EVALUATION METHODOLOGY

Federal Transit Administration (FTA) Circular 4703.1 defines “minority” as any individual who is a member of any of the following populations groups: American Indian, Alaska Native, Asian, Native Hawaiian and other Pacific Islander, Black or African American or Hispanic or Latino. Low-income is defined as a person whose median household income is at or below 150 percent of the poverty level, as determined by the U.S. Department of Health and Human Services. Below 150 percent of the poverty level was used as the basis for evaluating low-income populations to be more inclusive of the population at large that may have fewer mobility options. At 150 percent below the poverty level, a single individual’s annual salary is calculated to be just over \$17,000, which is lower than the State of Arizona’s minimum wage of \$10.00 per hour, or \$20,800 per year for a full-time employed individual. The methodology for analyzing the effects of the Build Alternative on EJ populations (any identifiable population group meeting the requirements for minority or low-income) consisted of the following steps:

- Define the unit of geographic analysis affected by the Build Alternative. The boundaries of the geographic unit should be large enough to include the area likely to experience adverse effects, but not so large as to artificially dilute the minority and/or low-income population.
- Gather relevant demographic data from a reliable source such as U.S. Census data or American Community Survey data at the census tract (CT) or block group level.
- Analyze impacts associated with the Build Alternative.
- Identify mitigation to avoid or minimize the impacts.
- Identify benefits of the Build Alternative.
- Determine disproportionately high adverse impacts (if any).

Typically, the study area identified for these analyses is an area within a one-half (½) mile buffer of the Build Alternative alignment and other facilities associated with the light rail extension. However, given the short distance of the project, the presence of the I-17 freeway and other built environment barriers (that is, Arizona Canal and ACDC) and the existing LRT station at 19th and Dunlap Avenues, the EJ analysis area for the Build Alternative was refined to four CTs that adequately cover the Build Alternative. The selected CTs do not dilute adverse impacts because they are the only CTs that would directly contain the Build Alternative construction activities and project features. Likewise, the selected CTs do not exaggerate benefits because they represent the only CTs where the population can directly access the additional transit services provided through the Build Alternative. The study area for this analysis was identified with concurrence from

FTA. Additionally, the Census data were cross-referenced with local data resources to specify impacts on adjacent populations, helping to refine and focus the analysis. This effort is described further in EA Section 3.14.1.3. Maricopa County has been selected as the unit of geographic analysis for comparison to the study area level in accordance with FTA Circular 4703.1.

The county was selected as the unit of comparison because it includes Valley Metro's transit service area, which is one of the geographic units the FTA circular recommends for comparison. With a majority of the County's total population living within 0.5 mile of transit service, this unit is not expected to artificially dilute the EJ populations that should be considered for comparison purposes.

Data used to evaluate both minority and low-income populations within the Build Alternative corridor were based on 2010 to 2014 American Community Survey 5-year estimates and were aggregated at the CT level because this was the smallest geographic level at which data for both groups were available. Four CTs fall within the study area and are evaluated in greater detail below.

3.1 DETERMINATION OF DISPROPORTIONATELY HIGH AND ADVERSE ENVIRONMENTAL EFFECTS

USDOT Order 5610.2(a) defines a disproportionately high and adverse effect on minority and low-income populations as an adverse effect that:

- Is predominantly borne by a minority population and/or a low-income population, or
- Will be suffered by the minority population and/or low-income population and is appreciably more severe or greater in magnitude than the adverse effect that will be suffered by the nonminority population and/or non-low-income population.

Identifying whether a project will have disproportionately high and adverse environmental effects on minority and low-income populations, and avoiding such effects, depends on a number of factors including: (1) identifying and evaluating environmental, public health and interrelated social and economic effects; (2) proposing measures to avoid, minimize and/or mitigate the adverse effects and provide offsetting benefits and opportunities to enhance communities, neighborhoods and individuals affected; (3) evaluating the alternatives considered and (4) considering the public involvement process. Potential adverse impacts, as identified in this EA, were examined in these critical areas: (1) displacements and relocations, (2) transportation, (3) noise and vibration, (4) community facilities/parklands and (5) construction impacts.

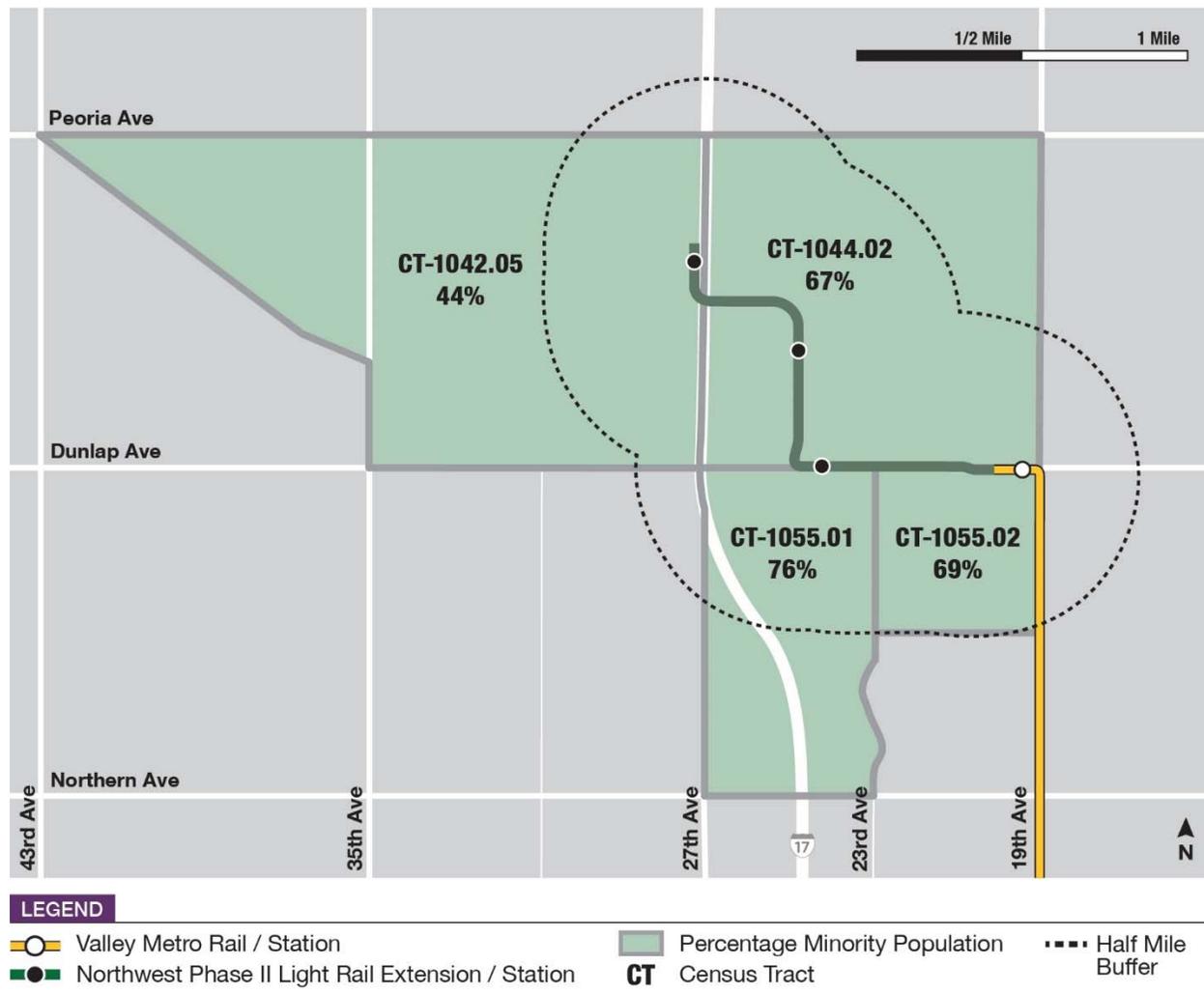
Environmental justice areas were identified as those CTs where minority and/or low-income populations exceeded county averages of minority and/or low-income populations, or where more than 50 percent of the total population of the CT was minority and/or low-income.

4.0 EVALUATION RESULTS

4.1 DO ANY AREAS ALONG THE BUILD ALTERNATIVE INCLUDE CONCENTRATIONS OF MINORITIES OR LOW-INCOME POPULATIONS?

Yes. The Build Alternative study area features a high concentration of both minority and low-income populations as well as non-minority and non-low income populations. In general, minority and low-income populations are found throughout the study area and are not concentrated in specific locations (Figures 1 and 2).

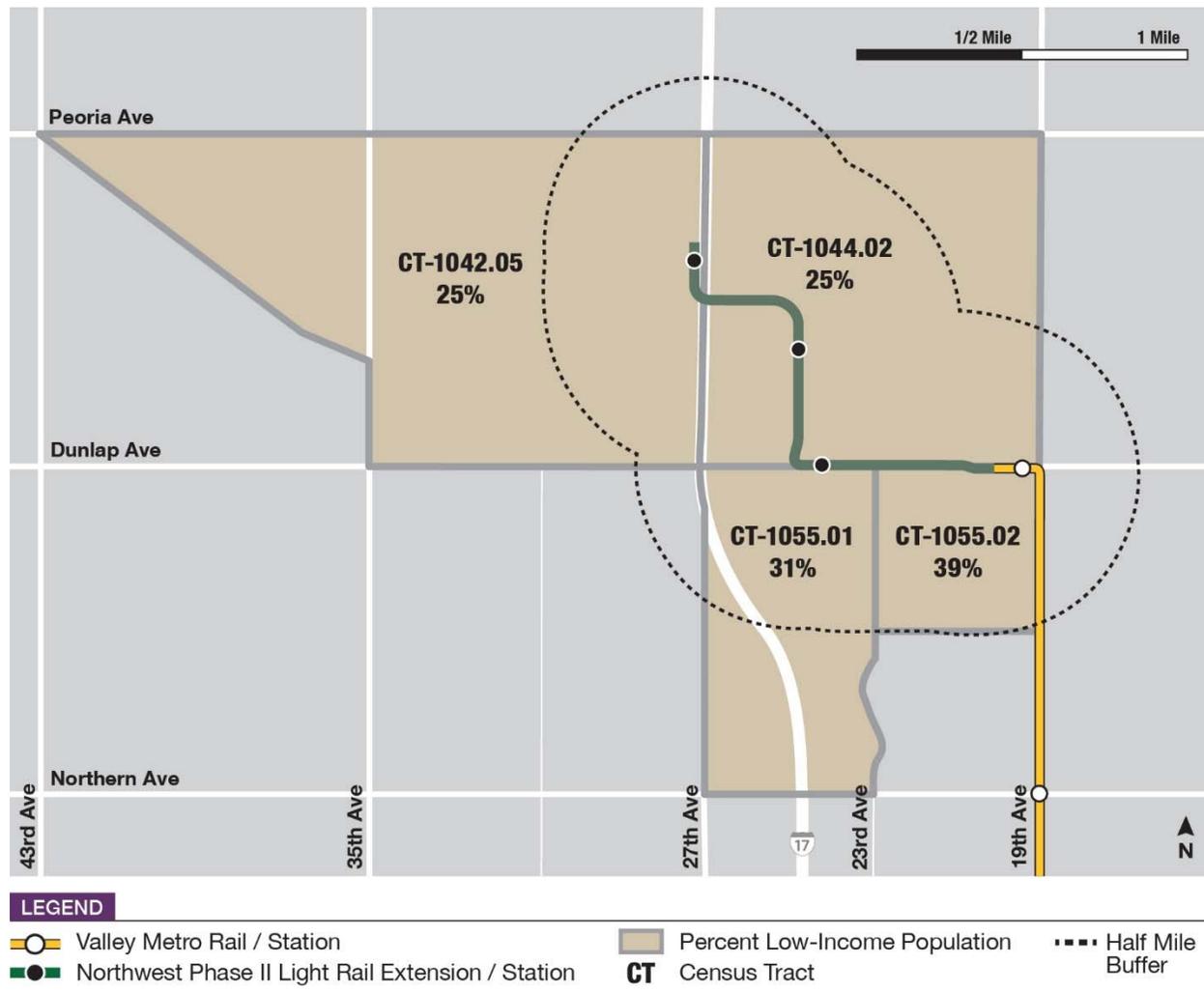
FIGURE 1: STUDY AREA PERCENTAGE MINORITY POPULATION COMPARISON



All four of the CTs in the study area feature minority populations that exceed the 42 percent average for Maricopa County. The percentage minority population in the study area CTs ranges from 44 to 76 percent, with three of the four CTs having minority populations greater than 50 percent (Figure 1 and Table 1).

Similarly, all four of the study area CTs contain low-income populations that exceed the 21 percent average for Maricopa County. The percentage of the total population with incomes at or below 150 percent of the U.S. Department of Health and Human Services poverty level in these CTs ranges from 25 to 39 percent (Figure 2 and Table 1).

FIGURE 2: STUDY AREA PERCENTAGE LOW-INCOME POPULATION COMPARISON



Maricopa County Low-Income Population Average = 21%

Eleven alternatives consistent with the project’s purpose and need were evaluated in a prior study completed in 2015 (*Northwest Phase II Project Definition Study*). See Chapter 2.0 of the EA for more information on alternatives. All alternatives, excluding the No-Build Alternative, would extend the region’s light rail system by approximately 1.5 to 2 miles. When considering that all CTs within approximately 5 miles of the Build

Alternative’s alignment are predominantly populated with minority or low-income persons, all feasible alternatives would affect EJ designated communities.

The Northwest Phase II Light Rail Extension would travel through predominantly minority and low-income areas, but both EJ and non-EJ populations are present within the project’s effective service area. Therefore, a comparison of mitigation and environmental enhancement actions that affect predominantly low-income and minority areas with mitigation previously implemented in predominately non-minority or non-low-income areas is included in this EJ analysis.

Valley Metro’s Central Mesa Light Rail Extension (CME), which opened for revenue service in August 2015, was used for the comparison. As defined in the CME Final Environmental Assessment (May 2011), the overall project area was determined to be predominantly populated by minority and low-income persons; however, unlike the Northwest Phase II Light Rail Extension, the CME service area included CTs that were predominately non-minority (three CTs) or non-low-income (three CTs). Using the CME project as the basis of comparison for mitigation and environmental enhancement actions is more appropriate than the other light rail extensions currently underway in the region, including South Central Extension (design phase) and Gilbert Road Extension (construction phase), which have no or only one CT classified as non-minority or non-low-income. For comparison of impacts borne by EJ and non-EJ communities, the impacts are compared with impacts that may be borne by all community members of the region.

Table 1 summarizes the evaluation results for minority and low-income populations in the Build Alternative study area.

TABLE 1: MINORITY AND LOW-INCOME POPULATIONS

Census Tract/ Area	Minority			Low-income		
	Minority Population	Total Population	Percentage Minority Population	Low-income Population ^a	Total Population for Which Low-income Status is Defined ^b	Percentage Low-income Population ^a
1042.05	2,308	5,247	44	1,302	5,189	25
1044.02	1,942	2,917	67	718	2,917	25
1055.01	1,973	2,608	76	806	2,608	31
1055.02	1,243	1,796	69	689	1,781	39
Maricopa County	1,666,248	3,947,382	42	821,297	3,895,963	21

Source: American Community Survey (2014)

^a Low-income is defined as a person whose median household income is at or below 150 percent of the poverty level as determined by the U.S. Department of Health and Human Services.

^b Defined as the population for whom poverty status is determined by the U.S. Census Bureau. Excludes persons living in college dormitories and institutional group quarters.

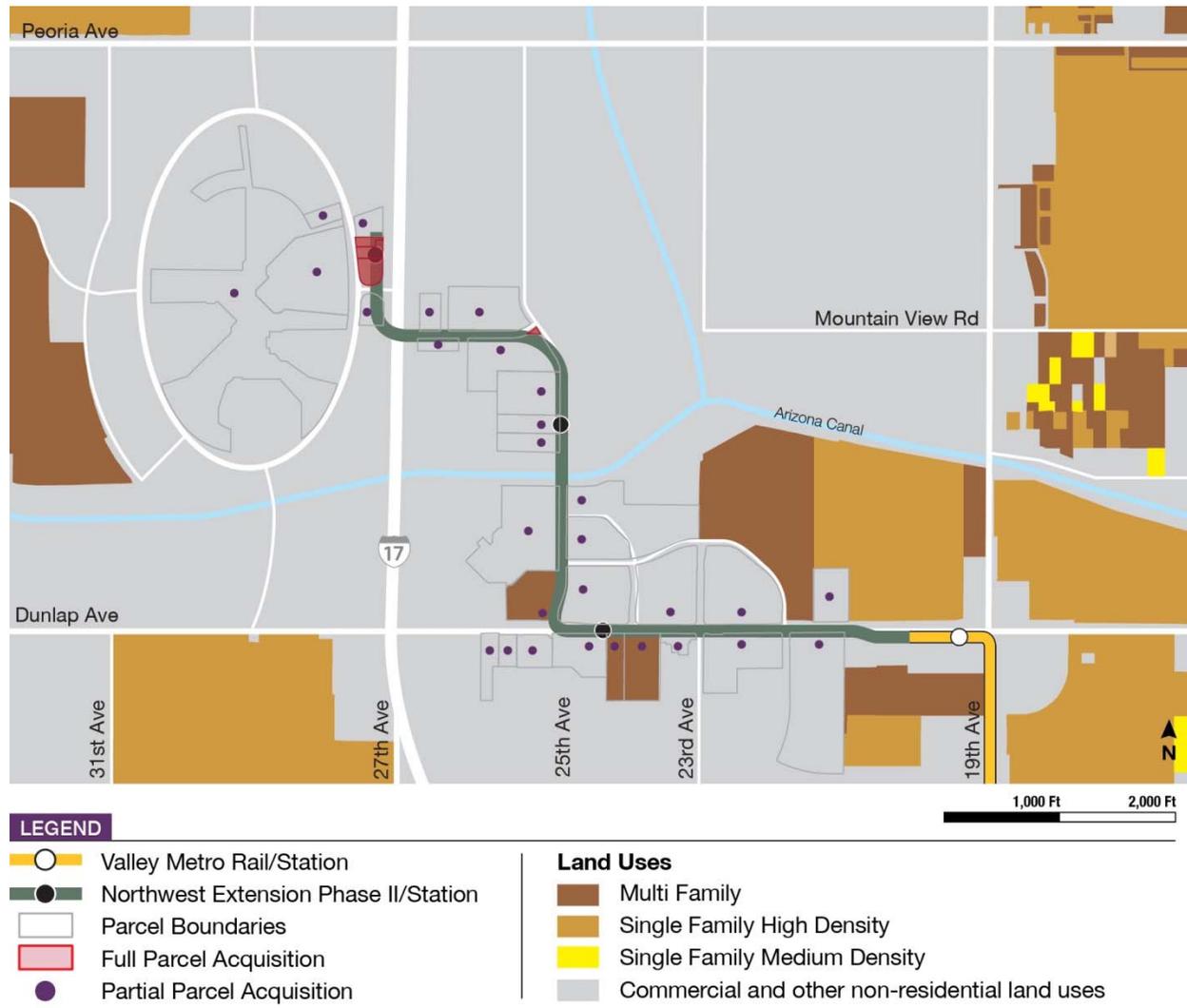
Based on the Census data shown above, the entire study area for the project may be considered an EJ area.

4.2 WHAT IS THE POPULATION AND LAND USE DATA WITHIN THE PROJECT AREA?

Socioeconomic data provides a first look at population dynamics that can inform the identification of EJ areas for a project. However, given the geographic size of Census tracts, and the dynamic nature of urban development patterns in the study area, it is important to cross-reference available population data with other forms of data to accurately inform an EJ analysis and help identify potential impacts to populations from either construction of the project or its long-term operation. To best understand how the potential impacts of the project may be borne by EJ areas, the above population data were considered in the context of existing land uses within the project study area. By considering land uses, the analysis is able to identify the locations where populations reside relative to the anticipated impacts of the project to address specific issues and any mitigation strategies.

Figure 3 illustrates existing land uses and the locations of residential housing in the study area. Observational analysis of these residential areas indicates that housing types along Dunlap Avenue are predominantly multi-family apartment buildings. The Royal Palm Mobile Home Park, is located immediately west of the intersection of 19th Avenue and Dunlap Avenue, but has direct access to the existing LRT station at 19th and Dunlap Avenues. The remaining land uses immediately surrounding the project alignment are a mixture of commercial office buildings, open space and civic facilities, and commercial retail space. While some multi-family residential buildings are located along Dunlap Avenue and 25th Avenue, residential land uses are generally located behind the commercial retail or office buildings that front Dunlap Avenue, 25th Avenue, Mountain View Road and the I-17 freeway. The business environment surrounding the Build Alternative alignment and stations is predominantly corporate commercial, intermixed with local and national restaurant chains, and major hotel chains. No industrial manufacturing or service businesses are located along the Build Alternative alignment or near station locations.

FIGURE 3: RESIDENTIAL LAND USE AND PROPERTY ACQUISITION IN THE STUDY AREA



4.3 WILL MINORITY AND/OR LOW-INCOME POPULATIONS EXPERIENCE ADVERSE IMPACTS AND DISPROPORTIONATELY HIGH AND ADVERSE IMPACTS COMPARED WITH OTHERS?

As stated earlier, the evaluation of adverse impacts considered the following: (1) displacements and relocations, (2) transportation, (3) noise and vibration, (4) community facilities/parklands and (5) construction impacts. The results of this evaluation are summarized in the sections below.

4.3.1 No-Build Alternative

The No-Build Alternative would have no impacts on communities, community character/cohesion, facilities or parks. Since construction would not be performed under the No-Build Alternative, no construction-related impacts would affect EJ populations. The No-Build Alternative would have the potential to degrade the traffic LOS at seven of the

roadway intersections studied. The intersection LOS is determined based on the delay (in seconds) experienced at that intersection. The No-Build Alternative would not result in noise and vibration impacts. The No-Build Alternative would have no effect to on-street parking or loading zones and no adverse effects to off-street parking, pedestrian and bicycle facilities, transit service or truck routes. The No-Build Alternative would not substantially increase transit service in the study area, and thus would not improve the mobility of the low-income and minority populations in the Build Alternative corridor. It would maintain the status quo with existing transit service levels and not provide enhanced access to employment and destinations through the regional high-capacity transit systems. The No-Build Alternative would also not promote higher-density development or transit-oriented development in the corridor.

4.3.2 Build Alternative

Implementation of the Build Alternative is anticipated to have several positive impacts for area residents and businesses, the City of Phoenix and the greater region. Implementation of the Build Alternative would necessitate some mitigation for certain environmental features to avoid adverse impacts. The potential impacts of the Build Alternative, their effects on EJ areas and populations and mitigation measures are discussed below.

Business and Residential Displacements and Relocations

The Build Alternative would require ROW acquisition for trackwork, stations, TPSSs/signal houses and a park-and-ride facility in Metrocenter. The ROW acquisition would consist of 33 parcels (approximately 426,698 sq ft.) along the entire length of the Build Alternative alignment (all four CTs). Of the 33 parcels, 29 would be partial acquisitions and 4 would be full acquisitions. Three of the four full acquisitions are required at Metrocenter for the relocated transit center, end-of-line station and the park-and-ride facility. The fourth parcel is for a TPSS unit. Unlike full acquisitions, partial acquisitions are minor adjustments to the existing curbs to maintain the vehicle travel lanes, accommodate vehicle turning movements, construct the LRT guideway within the existing roadway and necessary elements (overhead catenary poles and wires, etc.), and the light rail stations. These partial acquisitions would not alter, remove or reduce access to properties or the economic viability of the properties. Such partial acquisitions would allow the property owners to maintain ownership and use of their property after acquisition.

The Build Alternative would also require the construction of two TPSSs and three signal buildings. Two of the signal buildings would be located on the aerial structure crossing I-17 and would not require ROW acquisition. The third signal building would be located on property owned by the City of Phoenix. The actual TPSS sites selected for implementation would be determined during the later engineering phases as the design becomes more refined and more design information is available. Each TPSS site would require approximately 5,100 sq ft. and the locations would also be selected during final design. Of the three TPSS sites identified and evaluated, two would be located on vacant parcels and the third would be located within the proposed park-and-ride at Metrocenter.

The Build Alternative would not displace any residential properties. Of the four parcels requiring full acquisition, three would also require business relocation (Tombstone

Tactical, Hustler Hollywood and Souper Salad). Unlike Tombstone Tactical and Hustler Hollywood, the Souper Salad building (former Western Savings and Loan Branch Bank, a historic property) would be maintained and the inside would be redeveloped to serve a transit purpose (transit center, operator break room, etc.) The Souper Salad is currently a restaurant and the business would require relocation. The fourth full acquisition would be on the southwestern corner of 25th Avenue and Mountain View Road, and the property currently contains landscaping and utility boxes. The 29 remaining parcels would be partial acquisitions (see EA Section 3.1, *Land Acquisition and Relocation*, for more information regarding land acquisitions). Four of the 29 partial acquisitions would be from three multifamily residential apartment complexes (one apartment complex consists of two parcels). No apartments would be affected and no residences would be displaced.

Figure 3 shows the locations of partial and full property acquisitions in relation to the locations of residential and commercial properties. As illustrated, most of the partial and all of the full acquisitions would affect land used for commercial purposes, not residential. Refer to EA Appendix A, *Conceptual Engineering Plans*, for additional specifics on the project's ROW needs.

For completion of the Build Alternative, ROW acquisitions would be necessary from all four CTs within the study area: CT 1055.01, CT 1055.02, CT 1044.02 and CT 1042.05. Because the Build Alternative is entirely within EJ CTs and there are no alternatives that could avoid EJ CTs, the acquisition of ROW within an EJ community is unavoidable.

Impacts associated with the displacement of the three businesses would be mitigated through the provisions established under the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Public Law 91-646, 84 Stat. 1894) (see Section EA 3.1, *Land Acquisition and Relocation*, for more information). The businesses being fully acquired are not considered central to the community. None of the businesses are known to serve as a historically significant community gathering place, and similar services and products, including food services and retail sales of firearms and lingerie, are available to the community at other nearby businesses. The partial property acquisitions are required to construct the light rail guideway and stations and to maintain the existing travel lanes. These partial acquisitions would not alter, remove or reduce access to properties or the economic viability of the properties. Therefore, the Build Alternative would not result in a disproportionately high and adverse environmental impact on EJ populations.

Transportation

Construction and operation of the Build Alternative is not anticipated to have an adverse effect on traffic along Dunlap Avenue, 25th Avenue and Mountain View Road. As illustrated in Figure 4, the LOS at signalized and unsignalized intersections along Dunlap Avenue, 25th Avenue and Mountain View Road would remain at a level acceptable to City of Phoenix standards and would not require mitigation. While minor changes to operational performance would occur at some intersections with implementation of the Build Alternative, such as the intersection at Metro Parkway and Cheryl Drive changing from LOS A to LOS C, this increase in delay is attributable to the relocation of the transit center operations and proposed park-and-ride. The unsignalized intersection side street and driveway approaches on 25th Avenue that were experiencing delays would have an improved LOS with implementation of the Build Alternative from signalization of these

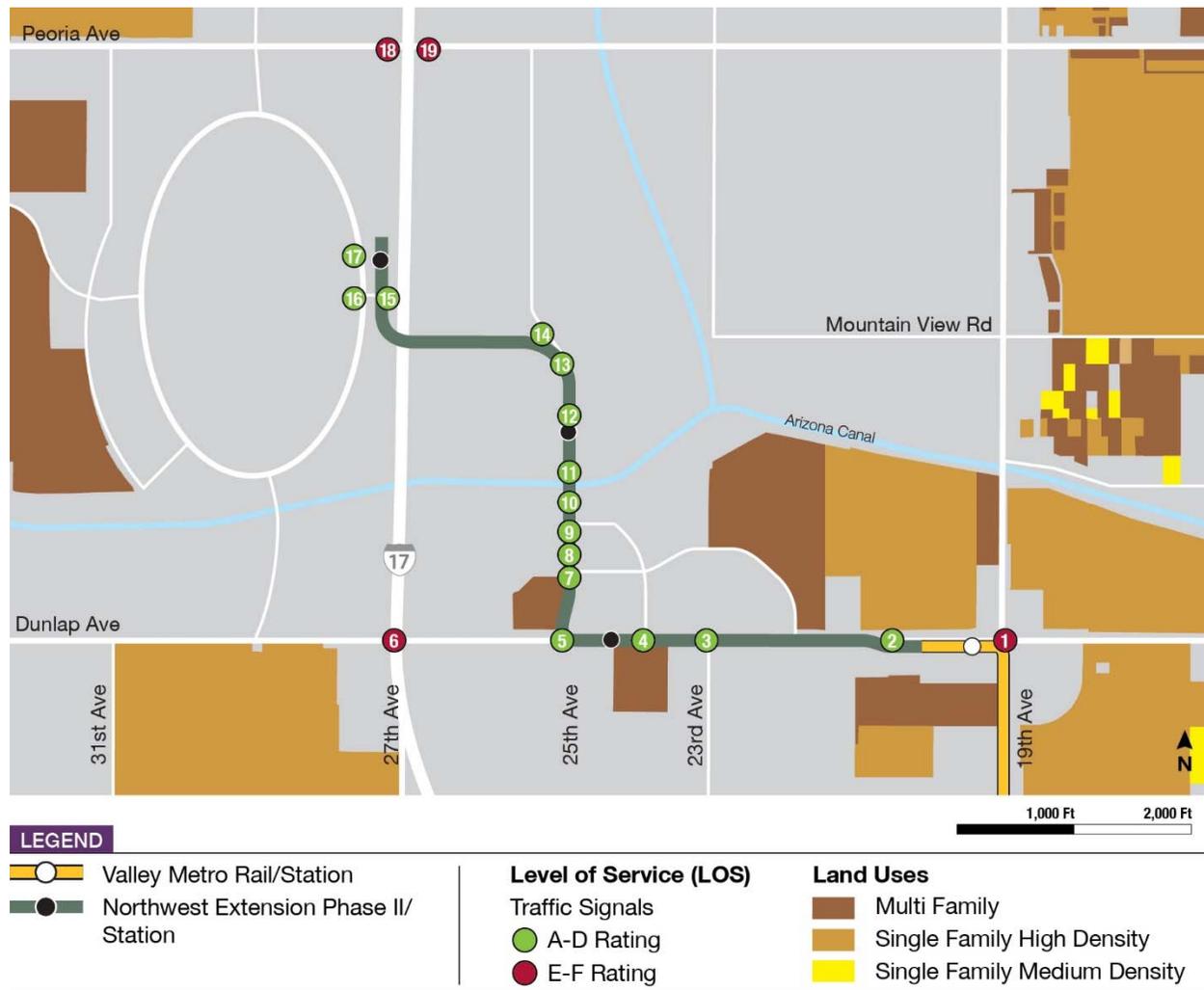
approaches (see EA Section 3.6, *Traffic/Parking/Pedestrians/Bicycles/Freight Routes/Transit*, for more information). It should be noted that changes to intersection LOS are also attributable to natural growth in traffic as the metropolitan region continues to grow. Based on the City of Phoenix acceptable intersection performance criteria and discussions with City of Phoenix traffic staff, no intersections would require mitigation under the Build Alternative.

The I-17 interchange ramps at Dunlap and Peoria Avenues currently operate at LOS F and would continue to do so in either the No-Build or Build Alternative conditions. However, ADOT, MAG and the City of Phoenix intend to address traffic congestion at these traffic interchanges through improvements planned as part of the MAG Spine study (the Interstate 10 and Interstate 17 Corridor Master Plan). As shown in Figure 4, these interchanges and intersections are located at substantial distances from residential and employment centers and, as such, would not affect EJ populations residing in the study area.

The conclusion of having no adverse impacts on traffic is similar to the conclusion identified for the CME project. Without adverse impacts, EJ populations living in the Build Alternative corridor would be affected similarly to and no greater than all populations in the region, including populations in non-minority and non-low-income areas.

The Build Alternative would have no impact to on-street parking or loading zones because no on-street parking or loading zones exist in the corridor.

FIGURE 4: TRAFFIC LEVELS OF SERVICE AND ADJACENT LAND USE TYPES



Approximately 435 off-street parking spaces (49 spaces along the alignment and 386 spaces that would be acquired for a park-and-ride in the existing Metrocenter parking lot associated with the Dillard's department store) are anticipated to be removed at five separate locations as a result of the Build Alternative. Of the 49 parking spaces lost along the alignment, 5 spaces (4.1 percent) occur at the Black Angus Steakhouse, 14 spaces (13.2 percent) occur at the Outback Steakhouse, 18 spaces (3.4 percent) occur at a large business center north of Mountain View Road, 9 spaces (2.1 percent) occur at a business center south of Mountain View Road and 3 spaces (0.7 percent) occur at a business center on Dunlap and 25th Avenue.

An approximately 260-space park-and-ride would be constructed in the existing Metrocenter parking lot near the Dillard's department store. The individual tenants at Metrocenter do not have specific parking requirements, rather, the mall as a whole has a parking requirement. That is because all parking at the Metrocenter is for all patrons regardless of which store they are shopping at. Although 386 parking spaces would be lost from the Build Alternative, Metrocenter would exceed the City of Phoenix parking requirements (5,459 parking spaces). Metrocenter currently has 6,924 spaces available

to all stores/shoppers in the mall. Additionally, Metrocenter has a high vacancy rate, and parking is sufficient during the holidays.

Lastly, approximately 179 parking spaces would be added to the existing RMSC parking area. Transit users would be restricted to a designated shared parking area (approximately 146 parking spaces), a park-and-ride, within Rose Mofford Sports Complex; however, recreational users would be able to use any of the sports complex parking, including the designated shared parking area. Thirty-three additional parking spaces would be added to the Rose Mofford dog park parking lot through its reconfiguration and driveway alignment with Ottawa University. No adverse impact is anticipated as a result of the shared parking lot and proposed park-and-ride.

Compared with the CME project, acquisition of ROW was necessary to provide an end-of-line park-and-ride to accommodate anticipated project-related parking demand. With no residential areas located adjacent to the proposed park-and-ride sites, the potential operational impacts on residential areas does not exist; therefore, the benefits of access to the parking would be similar to and no greater than benefits accrued by all EJ and non-EJ populations in the region.

The current transit center, located on the southwestern corner of Metrocenter, would be relocated approximately 0.6 mile to the northeast at the end-of-line station (that is, to the other side of the mall). The current and proposed transit center serves four local bus routes (Route 27, 35, 90, 106) and one express route (RAPID). The relocated transit center would be in the same CT (1042.05) as the existing transit center; this CT has the lowest percentage of low-income and minority populations of all the CTs adjacent to the Build Alternative alignment. According to boarding and alighting data from the *2014–2015 Valley Metro Transit On-Board Survey* for all local bus routes (excluding RAPID buses, since RAPID bus passengers almost exclusively use park-and-rides) serving the current transit center, approximately 20 percent of riders come from households within 1 mile of the transit center, with almost 70 percent of those riders coming from zero-auto households. A majority of transit riders walk to the transit center. Those passengers riding the RAPID either use the park-and-ride or are dropped off at the transit center.

Relocation of the transit center would potentially affect only the residents of CT 1042.05. The closest residential area to the existing transit center within the other three CTs of the study area is located in CT 1044.02 at 25th and Dunlap Avenues (Acclaim Apartment Homes). The shortest walking path from this residential area to the existing transit center site is 1 mile. The shortest walking path from this same residential area to the proposed transit center site in the Build Alternative is 0.8 mile.

Any impacts on residents of CT 1042.05 resulting from relocating the transit center would be minimal because the facility is located in the parking lot of Metrocenter and is not directly adjacent to any residential areas. The closest areas to the existing transit center site are located at 31st and Vogel Avenues (Sierra Pines Apartments), 31st Avenue and Mountain View Road (Villages at Metrocenter Apartments) and 35th Avenue and Arizona Canal (single-family residences). The shortest walking paths from the center of each residential area to the current transit center site, the Build Alternative transit center site and transit connections are provided below:

- 31st and Vogel Avenues (Sierra Pines):
 - Walking distance to current transit center site = 0.2 mile

- Walking distance to Build Alternative transit center site = 0.7 mile
- Route 35 would continue to stop on Metrocenter Parkway adjacent to the current transit center.
- Passengers that take Routes 27, 90 or 106 would walk to the current transit center, board Route 35 to travel to the new transit center and transfer to one of the other bus routes.
- 31st Avenue and Mountain View Road (Villages at Metrocenter):
 - Walking distance to current transit center site = 0.3 mile
 - Walking distance to Build Alternative transit center site = 0.8 mile
 - Route 35 would continue to stop on Metrocenter Parkway adjacent to the current transit center.
 - Passengers that take Routes 27, 90 or 106 would walk to the current transit center, board Route 35 to travel to the new transit center and transfer to one of the other bus routes.
- 35th Avenue and Arizona Canal (single-family residences):
 - Walking distance to current transit center site = 0.7 mile
 - Walking distance to Build Alternative transit center site = 1.2 mile
 - Route 35 operates on 35th Avenue, on the western edge of the neighborhood, and on West Cheryl Drive, on the northern edge of the neighborhood. Passengers could walk 0.2 mile to board Route 35 on either 35th Avenue or West Cheryl Drive to travel to the new transit center and transfer to one of the other bus routes, if the desired bus route is other than Route 35.

The distances from the Villages at Metrocenter and the single-family residences on 35th Avenue near the Arizona Canal to the existing transit center are 0.3 and 0.7 mile, respectively. The standard walkable distance in transit is generally considered to be 0.25 mile; therefore, both the Villages at Metrocenter and the homes on 35th Avenue are considered to have walking distances that people will typically avoid. In other words, from these two locations, the existing transit center was likely too far walk.

The Sierra Pines Apartments, however, is 0.2 mile from existing transit center and within the distance people will typically walk. However, it should be noted that that the distance was calculated from the center of the apartment complex and included cutting across parking lots and crossing the streets at locations other than designated crosswalks. In reality, the distance would be closer to the 0.25 mile walkability standard if people walked on designated sidewalks and used pedestrian crossings. Another consideration in Phoenix is that in the summer months, people are less likely to be willing to walk even 0.2 mile in the heat. This heat is even more challenging considering it would be over unshaded pavement, and the radiant heat would be substantially higher than the ambient air temperature. According to FHWA's Sustainable Pavement Program, radiant heat during a Phoenix summer can exceed 158 degrees Fahrenheit.¹

¹ https://www.fhwa.dot.gov/pavement/sustainability/articles/pavement_thermal.cfm

Even so, the relocated transit center would increase walking distances an additional 0.5 mile, a distance people will typically not walk. However, there are several bus options to help people get to the relocated transit center.

All bus routes (Routes 27, 35, 90, 106, and RAPID) would continue to serve the transit center once it is relocated, and would continue to serve the same regional destinations as they do today. However, only local Route 35 is planned to continue to stop at the original transit center location to allow passengers that normally walk there to have a means of getting to and from the new transit center and home. Passengers wishing to board Routes 27, 90 or 106 would either need to use Route 35 to reach the new transit center and then transfer to their desired bus or to light rail or walk across the mall. Transferring to another local bus route or to light rail would not require additional cost because the fares for the local bus routes and light rail are the same and there are no transfer fees. Route 35 operates at a 15-minute frequency, while the other three routes run at a 30-minute frequency. Therefore, a slight increase in travel time, approximately 7.5 minutes, resulting from transferring between routes would be experienced by a small percentage of local bus passengers desiring access to Routes 27, 90 or 106. However, the City of Phoenix under their T2050 Plan will increase the frequency of Routes 27 and 90 to fifteen minutes.

Depending on where current local bus riders reside within the CT (1042.05), some existing riders accessing these routes through the original transit center location could avoid a transfer altogether and access the local routes directly on Dunlap Avenue (Routes 27 and 90) and on Peoria Avenue (Route 106), further reducing the number of people affected by the relocation of the transit center.

The *2014–2015 Valley Metro Transit On-Board Survey* indicates that all RAPID passengers (100 percent) either use the park-and-ride lot or are dropped off at the transit center. Therefore, relocating the transit center would not affect RAPID passengers.

Relocating the transit center and maintaining all current bus operations would enhance transit operations and connections throughout the study area and would provide an important connection to people residing in the study area, including EJ populations, with expedient, frequent rail service and access to destinations across the Phoenix region. Furthermore, all populations would still have access to the bus services at the same or better frequency of service as today. The relocation of the transit center would be disproportionately borne by EJ populations; however, because Route 35 would remain as a way to get people who walked to the existing transit center over to the relocated transit center with a short delay (approximately 7.5 minutes) at no cost, the impact would not be high or adverse.

The Build Alternative also includes new light rail passenger stations at Dunlap Avenue/25th Avenue and at 25th Avenue/Mountain View Road (Rose Mofford Sports Complex). The station at Dunlap Avenue/25th Avenue would provide direct access (less than 0.5 mile) to residents, including EJ populations, who are adjacent to the corridor within CTs 1055.01, 1055.01 and 1044.02. The addition of this station would reduce the walking distance for some existing passengers using the Dunlap Avenue/19th Avenue station, while for others it would provide access that is currently not attainable by walking. The 25th Avenue/Mountain View Road station at Rose Mofford Sports Complex would provide direct access to open space and recreational opportunities for the population residing in

the study area as well as the population of the greater region including both EJ and non-EJ populations.

The CME project also included changes to preexisting bus transit services to provide optimal service and connectivity between the local bus and the light rail extension. The transit service changes included with the CME project affected CTs with EJ and non-EJ populations.

No impacts on existing truck or freight routes are anticipated.

Based on the following conclusions, the Build Alternative would not result in a disproportionately high or adverse impact with respect to transportation and EJ:

- Traffic – signalized and unsignalized intersections would remain at acceptable levels of service during peak travel periods, and access to all properties would be maintained
- Parking – additional parking will enhance access to the transit system and RMSC, while any modifications to existing parking would be mitigated
- Pedestrians/Bicyclists – Bridging I-17 provides a new crossing and access to properties on either side of the freeway that does not require an automobile (described in more detail in the *Communities, Community Character/Cohesion, Facilities and Parks* section below)
- Freight Routes – no impacts on existing truck or freight routes are anticipated
- Transit – with maintaining existing transit services, the relocation of the existing transit center and fixed-route bus services would improve regional connectivity with minimal affects to existing study area passengers. New passenger stations will improve access for study area residents to transit services and open space.

Noise and Vibration

The noise and vibration impact analyses for the Build Alternative were based on FTA's *Transit Noise and Vibration Impact Assessment* guidance manual. Potential noise impacts were assessed for the operation and construction of the Build Alternative. The key conclusions of the noise impact assessment are summarized below.

As shown in Figures 3-8 through 3-12 of Section 3.8 of the EA, two moderate noise impacts were identified during the noise analysis as a result of the Build Alternative's implementation. There are no severe noise impacts as a result of light rail operations at residential and hotel land uses. No adverse noise impacts would occur at other types of land uses. The moderate noise impacts identified would occur at two locations along the alignment, representing a total of approximately 74 multifamily apartment units. These moderate impacts would all be less than 1 dB above FTA's threshold for moderate impacts. Each of these impacts is either near special trackwork (24 units at the San Valiente Apartments) or near a train station or intersection where train bells are sounded (50 units at the Acclaim Apartments). No adverse noise impacts would occur at the Royal Palm Mobile Home Park (Section 3.8).

Potential vibration impacts are also likely to occur at a single residential location along the alignment, the San Valiente Apartments. Section 3.8.3 provides additional information about the impacts and locations of the affected sensitive uses relative to the Build

Alternative alignment. No other vibration impacts are anticipated near any other residential areas, including the Royal Palm Mobile Home Park and the Acclaim Apartments.

Noise mitigation would not be implemented for noise exceedances less than 1 dB of the moderate impact threshold. A less than 1 dB change in noise level with the Build Alternative is negligible given that 3 dB is considered the threshold at which an average listener can detect a change. Therefore, mitigation would not be implemented for exceedances less than 1 dB of the moderate impact threshold. However, with the mitigation measures implemented for vibration at the San Valiente Apartments for the special trackwork, the potential noise impacts would not occur. In addition, note that where train bells at stations cause a 1 dB exceedance, these bells are safety-related and already at a low-level setting, so no mitigation is recommended.

To mitigate the identified vibration impacts, a low-impact frog would be installed for the crossover special trackwork located near the affected portion of the San Valiente Apartments. With implementation of the low-impact frog, the vibration level would exceed the criteria by less than 1 dB. Use of a vibration-isolating rail boot design would lower the predicted levels by at least 1 to 2 dB, below the threshold of 72 VdB. A vibration-isolating rail boot uses thicker rubber than standard to provide vibration attenuation.

With implementation of the mitigation actions specified in Table 2 and in Section 3.8 of the EA, the Build Alternative would not result in noise or vibration impacts and therefore, would not result in a disproportionately high or adverse impact with respect to EJ and populations residing in the project study area. The mitigation defined for the Northwest Phase II Light Rail Extension is localized to the Build Alternative corridor and would not affect populations in other environmental justice or non-environmental justice communities in the region.

TABLE 2: NOISE AND VIBRATION MITIGATION MEASURES

Location of Impact ^a	Impact Type	Mitigation Measure
NB-08 San Valiente Apartments	Noise/Vibration	Low-impact frog, low-vibration rail boot
SB-09 Acclaim Apartments	Noise	Mitigation not recommended; ensure train bells are at lowest safe level

Notes: dB = decibel, NB = northbound side, SB = southbound side

^a Refer to Section 3.8 of the Environmental Assessment for maps showing locations of the impacts.

Communities, Community Character/Cohesion, Facilities and Parks

Operation of the Build Alternative would not disrupt the community character or cohesion in the study area. Located almost entirely within existing public street ROW, demarcated sidewalks would provide safe access across the light rail guideway, enabling connections to both sides of the streets. The full acquisitions necessary to implement the project would not affect any community facilities and, therefore, would not disrupt community cohesion or character. The partial acquisitions also would have no effect on community facilities since neither the facilities nor the services they provide would be affected.

The Build Alternative would cause no permanent barriers to the movement of people, goods and services in the area and no disruption of the community. As summarized in

Chapter 1.0, the study area shows higher rates of transit dependency, with a higher rate of zero-car households than the City of Phoenix and Maricopa County, along with higher rates of poverty (American Community Survey 2014). As such, the community depends on regular and reliable transit service to meet mobility needs, as expressed in the purpose and need statement for the project.

Concerns regarding community cohesion are brought into sharper relief by a sensitive understanding of the history of freeway construction in Northwest Phoenix. Over time, as the northwest metropolitan region grew, roads were upgraded to reflect increased demand for automobile travel. The continued reinforcement of the automobile as the primary means of urban mobility eventually led to the construction of grade-separated interchanges between the arterial street system and I-17. Local roads that connected neighborhoods, shopping and employment centers were severed. The crossing of I-17 enables populations living on either side of the freeway with another crossing opportunity that does not require an automobile, and could reduce the conflict points between automobiles and pedestrians who are forced to interact at the limited freeway crossing locations. The I-17 interchanges at Dunlap and Peoria Avenues experience heavy traffic congestion at all times of the day, even on weekends, creating hostile conditions for pedestrians and the increased opportunity for conflicts with automobiles. Bridging the I-17 divide with a dedicated transit service that offers stops on either side of the freeway would provide a new crossing and access to properties on either side of the freeway that does not require an automobile.

While the existing Rose Mofford Sports Complex driveway at Mountain View Road would be closed with implementation of the Build Alternative, a new driveway would be added north of Mountain View Road, resulting in a net benefit to access and no adverse effect on recreational uses of the park. In addition, a roadway connecting the main parking lot with the dog park parking lot would be constructed, allowing the northern driveway into the dog park to be used to access both parking lots. With regard to shared parking at this facility (the project would add approximately 146 spaces to the sports complex and approximately 33 spaces to the dog park parking lot), competition between sports complex users and light rail passengers is not expected to occur because events at the sports complex would generally occur outside of commuting hours when the lot would be used by light rail passengers and, thus, there would be no adverse impact to sports complex users.

Access to community services and facilities would be maintained during construction. The trails near the 25th Avenue bridge (Arizona Canal and Sun Circle Trails) would be closed during construction for safety precautions; however, pedestrians and cyclists traveling east to west and vice versa would be rerouted around the construction zone for safety purposes. Crossing the canals from north to south would be possible at 19th and 29th Avenues, approximately 0.5 mile away from 25th Avenue. Crossings would also be possible from the Sun Circle Trail (northern side of the Arizona Canal) at Rose Mofford Sports Complex, approximately 0.25 mile east of the 25th Avenue Bridge.

The Build Alternative would not result in dividing CTs or neighborhoods in the study area. The light rail alignment defined in the Build Alternative follows or is adjacent to the CT boundaries for CT 1055.01, CT 1055.02 and CT 1042.05. For CT 1044.02, a segment of the Build Alternative alignment follows the CT boundary for part of the CT and crosses through the CT in another segment. Where the Build Alternative alignment crosses

through CT 1044.02, the alignment follows existing roadways. Similarly, neighborhoods in the study area would not be divided by the Build Alternative. Connectivity between neighborhoods would be enhanced through light rail, which provides an additional safe crossing of I-17, and by maintaining or upgrading sidewalks, crosswalks, ramps, signals, pedestrian-actuated crosswalks and other features along the alignment.

During construction of the 25th Avenue bridges, Valley Metro or its Contractor would reroute pedestrian and bicycle traffic around the construction zone for safety purposes. Valley Metro would include information on its website regarding temporary trail closures or reroutes and would post signs along the trail as part of the public outreach process. Construction at the shared parking lot at Rose Mofford Sports Complex, including the two new accesses, would be undertaken in the summer, an off-peak period for the Rose Mofford Sports Complex. Valley Metro would include information on its website and post signs regarding temporary parking restrictions at Rose Mofford Sports Complex.

As a result of the positive effects and no known negative effects on community character and cohesion, the Build Alternative would not have any disproportionately high or adverse effects on community character and cohesion in the study area.

Construction

The construction of any capital project creates temporary impacts on the surrounding environment. All work would conform to State, County, and City specifications and standards. Construction would be phased to avoid lengthy impacts on adjacent residents and businesses. Construction of the project would result in temporary disruptions to roadway operations, but would maintain access to businesses, public utility services and pedestrian and bicycle facilities. Short-term impacts on air quality (most notably dust), noise and vibration are likely to be the most notable impacts experienced by the people and businesses adjacent to or near the construction zones. These short-term construction effects would not be disproportionately borne by the minority or low-income populations identified along the Build Alternative corridor. There are no locations where impacts would be concentrated or would require special mitigation measures that other portions of the study area would not experience. However, the heaviest construction activity, which includes construction of the end-of-line elevated passenger station, transit center and park-and-ride, would occur in one CT (1042.05). Construction of these end-of-line facilities would not directly affect residential areas. Likewise, as depicted in Figures 3-1 and 3-2 in the EA, a majority of the Build Alternative's trackway, passenger stations and other facilities would be located adjacent to non-residential land uses. Therefore, a majority of the construction activities would occur in areas with no residential population. Valley Metro and the City of Phoenix have worked and would continue to work closely with all Contractors to mitigate any temporary impacts attributable to construction of the project. It would be necessary to acquire property or obtain TCEs to accommodate the staging of equipment and materials during construction of the Build Alternative. EA Section 3.1, *Land Acquisition and Relocation*, provides additional information about TCEs and construction staging areas. The key construction activities are described in Table 3-31 of EA Section 3.20, *Construction*.

Valley Metro has a history of constructing rail projects across the Phoenix metropolitan region and has gained an understanding of what construction impacts can be anticipated and how to mitigate construction-related impacts. During construction of the 25th Avenue

bridges, Valley Metro or its Contractor would reroute pedestrian and bicycle traffic around the construction zone for safety purposes. Construction at the shared parking lot at Rose Mofford Sports Complex, including the two new access points, would be undertaken in the summer, an off-peak period for the sports complex. Valley Metro would include information on its website regarding temporary trail closures or reroutes and would post signs along the trail as part of the public outreach process. It would post signs regarding temporary parking restrictions at Rose Mofford Sports Complex. Because access to community facilities would be maintained during construction, no continuity or community cohesion concerns are anticipated as a result of the Build Alternative.

Although construction of the Build Alternative would provide short-term employment opportunities, it would result in temporary disruptions to businesses, residences and those traveling through the study area. Valley Metro intends to minimize the duration of any street closure or suspension of utility service, and a communication plan would be in place to notify businesses and residents of the temporary suspension of utility service.

Typical construction impacts are discussed in Table 3-37 of EA Section 3.20, *Construction*. With the implementation of mitigation measures and other means to minimize impacts discussed in Table 3-37 of EA Section 3.20, *Construction*, short-term construction effects would be disproportionately borne by minority or low-income populations identified along the Build Alternative corridor; however, these effects would not be disproportionately high or adverse effects.

The CME project also had short-term temporary construction impacts associated with air quality, noise and vibration. The mitigation measures for construction-related impacts proposed for the Build Alternative were applied during the construction phase of the CME project. For the CME, the temporary construction impacts and associated mitigation measures affected populations within EJ and non-EJ designated census units.

4.4 PROJECT BENEFITS

Construction of the Build Alternative is anticipated to produce offsetting project benefits to all communities living adjacent to the Build Alternative alignment that are affected by construction and operation of the line. These benefits include increased transit service, improvements to the existing streetscape environment and economic benefits.

The Build Alternative would provide improved transit access to Northwest Phoenix and Downtown Phoenix, enabling a more convenient and reliable transit access to regional destinations through a connection to the existing light rail system that now serves portions of Mesa, Tempe, and Phoenix. Increases in transit service associated with the Build Alternative will provide benefits to all populations. A documented benefit of LRT in the Build Alternative corridor is that it will provide faster, more reliable, more frequent, and higher capacity service for transit riders. Reliable transit service would improve mobility for residents of the Build Alternative study area by providing better access to and from major regional employment centers, higher education institutions, health care service campuses, and other regional activity centers. Mobility is further improved by the relocation of the existing transit center to the future Metrocenter LRT station to create seamless transfers between bus and rail modes. With a high volume of regular pedestrian traffic, and linkages to regional transit networks, the Build Alternative would capitalize on the redevelopment activity currently occurring at Metrocenter, foster future growth and

urban intensification in Northwest Phoenix, and greatly improve urban circulation throughout the city.

For residents living in the study area and near the Build Alternative corridor, the project presents a substantial capital infrastructure investment designed specifically to connect communities. In addition to LRT, approximately 1,730 feet (0.3 mile) of new bicycle lanes would be added to each side of Mountain View Road for an estimated total of 3,460 feet, or 0.6 mile, of new bicycle lanes. In years past, investments in freeway and roadway infrastructure severed and bifurcated neighborhoods and employment centers, leading to isolated land developments only accessible by automobiles. While bus service operates on the periphery of the study area, many locations within the study area remain accessible only by automobile. The introduction of dedicated stations that link key land uses and cross the I-17 freeway independently of the existing automobile interchanges helps more directly link residents with employers, civic institutions, and opportunities across the metropolitan region, regardless of socioeconomic characteristic.

As part of the Build Alternative, all existing pedestrian facilities would be maintained or upgraded in the study area, including sidewalks, crosswalks, ramps, signals, push buttons and other improvements along the alignment. Additionally, pedestrian-actuated signals would be added at all intersections with proposed traffic signals and at light rail stations. Pedestrian access to the Metrocenter station would be enhanced with the addition of signalized pedestrian crossings at Metro Parkway and the proposed signal north of Cheryl Drive. These pedestrian improvements would provide more active mobility options for all area residents, employees and visitors, including persons with disabilities, youth and elderly persons. Specifically, the new pedestrian-actuated traffic signals/crosswalks on Dunlap Avenue, 25th Avenue and Mountain View Road would provide new pedestrian access points not currently available today. Furthermore, the pedestrian crosswalks accessing the light rail stations on Dunlap Avenue offer pedestrians with mobility limitations such as elderly persons or persons using a mobility device an area of refuge in the center of the roadway. This reduces the overall distance required to travel across the roadway in a single attempt. Overall, the increased number of signalized pedestrian crossings would provide a safer alternative than what is provided today for connecting people with each other and with local destinations. The Build Alternative would have no adverse impact on pedestrian facilities and would benefit pedestrians using the improved facilities.

Valley Metro has adopted design standards that are incorporated on every new HCT project to improve and enhance pedestrian and bicycle movement, facilities and access. This generally includes the reconstruction of sidewalks to at least 6 feet in width and the addition of a landscaped buffer, bicycle lanes and crosswalks at all intersections. Bicycle lanes would retain their existing lengths on 25th Avenue, and new bicycle lanes would be added in each direction on Mountain View Road. New signs and signals would be added to the Arizona Canal Trail and the Sun Circle Trail crossings on 25th Avenue to allow for safer pedestrian and bicycle movements across the LRT guideway. All existing bicycle facilities would also be maintained.

The Build Alternative is anticipated to have positive effects on both commercial and residential development, including high-density affordable housing, near its alignment and stations. As a result, some of the growth that would have occurred elsewhere in the city or the region would be drawn to the Build Alternative corridor. This growth can lead

to more local opportunities for employment for low-income and minority populations residing in the Build Alternative area. For additional information on potential benefits of the Build Alternative, refer to EA Appendix B, *Economic Development Technical Memorandum*.

4.5 PUBLIC ENGAGEMENT

The public involvement program has been designed and executed to reach the affected population, including EJ populations in the area. Valley Metro routinely provides translation services in Spanish at all public meetings for agency projects or programs, and regularly monitors language translation needs as part of the agency's Title VI compliance efforts to help ensure access to important agency information for projects and programs by all community members. Spanish continues to be the primary language, other than English, that is spoken in the study area and region. Public meetings included means to ensure access and understanding for non-English speakers with Spanish-language interpreters available and bilingual (English and Spanish) reading materials provided. Handouts and reading materials were made available in both English and Spanish, and Valley Metro is ready to provide materials in other languages upon request. Valley Metro is ready to provide materials in other languages upon request. All public meetings have been held in transit-accessible locations.

As part of Valley Metro's on-going Title VI program, data on languages spoken is regularly updated to help ensure the meaningful involvement of populations for whom English may be a second language. During each Tri-annual review, Valley Metro conducts a Four Factor Analysis that incorporates a variety of data sources including Census data, local data resources, and on-board surveys in addition to on-going public outreach and communication efforts that engage a diverse set of stakeholders and the public. Spanish is regularly identified as a primary language spoken in the Valley Metro service area, in addition to English. Valley Metro also maintains an active list of persons or social service agencies who can help provide language translation services should a member of the public request project or program information in a language other than English or Spanish.

All public meetings were widely publicized through:

- Individual outreach to key business stakeholders, residents, government officials and other stakeholders
- Group outreach to community groups, government agencies, chambers of commerce, churches, schools and neighborhood/homeowner groups
- Media outreach through press releases for some but not all public meetings and paid advertisements in local print media, including the *Arizona Republic* and the Spanish-language publication *La Voz*
- Information posted on the Valley Metro website, with Build Alternative and public meeting details
- Bilingual door hanger meeting notices distributed to stakeholders within a quarter-mile of the study area

Throughout the Alternatives Analysis and Environmental Analysis, Valley Metro has conducted numerous public outreach efforts, including hosting general public meetings;

coordinating staff and agency meetings; presenting at Board, Committee and City Council meetings; attending stakeholder meetings and coordinating community and neighborhood meetings with local businesses, residents, community groups, neighborhood associations and transportation groups. All of the meetings provided opportunities for minority and low-income populations to take part in the decision-making process. For more information on specific meetings and topics, refer to Chapter 4.0 of the EA.

Should the Build Alternative move forward through the environmental process and into design and construction, Valley Metro will continue to work with the community through meetings at public venues accessible to all members of the community including minority and low-income households and businesses, and populations with limited English proficiency. Valley Metro would reach out to the community, including the EJ community members, through e-mail blasts, project website updates, door hangers and newspaper advertisements, including notification of upcoming events. Advertising would be in English and Spanish, as would a substantial amount of project information. Interpreters would be available to translate or provide additional information. Valley Metro also maintains consistent communication with all stakeholders including EJ community members and provides assistance during construction.

4.6 DETERMINATION OF WHETHER ENVIRONMENTAL JUSTICE POPULATIONS WOULD BE SUBJECTED TO DISPROPORTIONATELY HIGH AND ADVERSE IMPACTS

Implementation of the Build Alternative would not have disproportionately high or adverse effects on EJ populations. While minority and low-income residents account for the majority of the population base in each of the study area Census units, making the entire study area an EJ area, the identified impacts of the project are not concentrated in residential areas. The mitigation measures specified above and in other sections of this chapter and EA would eliminate or substantially reduce the identified impacts associated with the Build Alternative's construction and long-term operation.

The use of Census data provided a summary-level look at study area socioeconomic characteristics. However, the analysis cross-referenced the Census data obtained with local data resources, including land use data that allowed for a refined review of study area social and economic dynamics. Cross-referencing datasets also helped to differentiate the locations of identified impacts relative to the populations residing in the Census units. When considered in the context of current and future land uses, many of the land uses immediately surrounding the Build Alternative are commercial office buildings. The build lines of these properties are often set back from the street where the Build Alternative would operate, fronted by surface parking lots or landscaped areas.

Mitigation for each impact is identified that either eliminates or substantially reduces any short- or long-term impact (that is, below an adverse level) as a result of the Build Alternative's construction and ongoing operation. The impacts evaluation and mitigation measures for adverse impacts presented in Section 4.3 indicate that potential impacts associated with the Build Alternative would result in no long-term adverse effects with implementation of the mitigation measures specified in this technical memorandum and in the EA. The proposed mitigation measures would also minimize short-term impacts

associated with the Build Alternative's construction. The adverse impacts would be borne equally by all populations, and the mitigation would be applied throughout the Build Alternative as needed and would not be concentrated in any particular area.

In view of the fact that the benefits and the burdens of the Build Alternative are balanced across all demographic groups affected by the proposed light rail extension and that mitigation measures have been identified to minimize adverse impacts, the Build Alternative would provide considerable benefits and has garnered considerable local support. Therefore, no disproportionately high and adverse impacts on low-income or minority populations would occur.