EASTMARK

TRANSPORTATION PLAN FOR DEVELOPMENT UNIT 5-6

Prepared For:

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1. Introduction

DMB Mesa Proving Grounds LLC (DMB) is developing Eastmark, an approximately 3,155-acre master planned community within the City of Mesa (City). The *Mesa Proving Grounds Master Transportation Plan (MTP)*, September 23, 2008, was prepared by AECOM (formerly DMJM Harris) as part of the Planned Community District (PCD) zoning request for the site and was approved by the City. The *Eastmark Master Transportation Plan Update – March 2017* (MTP update) is being prepared by AECOM concurrently with this DU Traffic Report to address amendments made to the land use plans for the PCD.

The most recent land use plans include eleven (11) Development Units (DU) that comprise the PCD. The approved land use budget for the site in the initial MTP specifies the level of development and land use groups proposed for each of the nine original DU's. The initial MTP used mid-range level of density for each DU as the basis for estimating potential future land uses on the Site and projecting traffic volumes that may be generated. The MTP update will project volumes for two separate scenarios: the First Life Cycle scenario, and the Full Build-Out scenario. The First Life Cycle scenario uses the most recent Development Unit Plans for those DU's that have been approved, and a projected most-likely level of density of each of the remaining DU's. The initial MTP included approximately 15,000 dwelling units within Eastmark. The MTP update estimates approximately 10,000 dwelling units in the First Life Cycle and 15,000 dwelling units in the Full Build-Out.

DMB has submitted the Development Unit Plan (DUP) for DU 5-6 located north of Point Twenty-Two Boulevard and east of Eastmark Parkway. As shown in **Figure 1**, this DUP generally includes all of DU 5 and the portion of DU 6 South not previously accounted for in the DU 6 South DUP. Per the requirements of the *MTP,* this report addresses the transportation network associated with the proposed land uses and development densities on DU 5-6, which includes approximately 309 acres.

2. Proposed Development

2.1 Land Use

The planning framework for the site was outlined in the initial MTP which proposed a land use budget for each of the original nine DU's. The minimum and maximum land use densities for each DU present a range that will be balanced amongst the DU's as development, and ultimately, redevelopment occurs. The land use budget for DU 6 has a range of 890 – 3,310 dwelling units and a range of 0 – 2,000,000 square feet of gross floor area of non-residential land use. The land use budget for DU 5 has a range of 710 – 1,680 dwelling units and a range of 1,875,000 – 8,750,000 square feet of gross floor area of non-residential land use. Within DU's 5 and 6 several land use groups are defined which include estate, village, district, regional center/campus, resort/retreat, urban center, and general urban. The definitions to these land use groups are provided in Section 7 of the *Mesa Proving Grounds Community Plan*.

The DUP for DU 5-6 includes 1,000 single-family residential homes separated into 3 phases, with full build-out and occupancy anticipated in 2020. The comparison of the DUP to the budgeted development levels shows that the proposed development for combined DU 5 and DU 6 is within the approved land use budget stated in the original MTP.

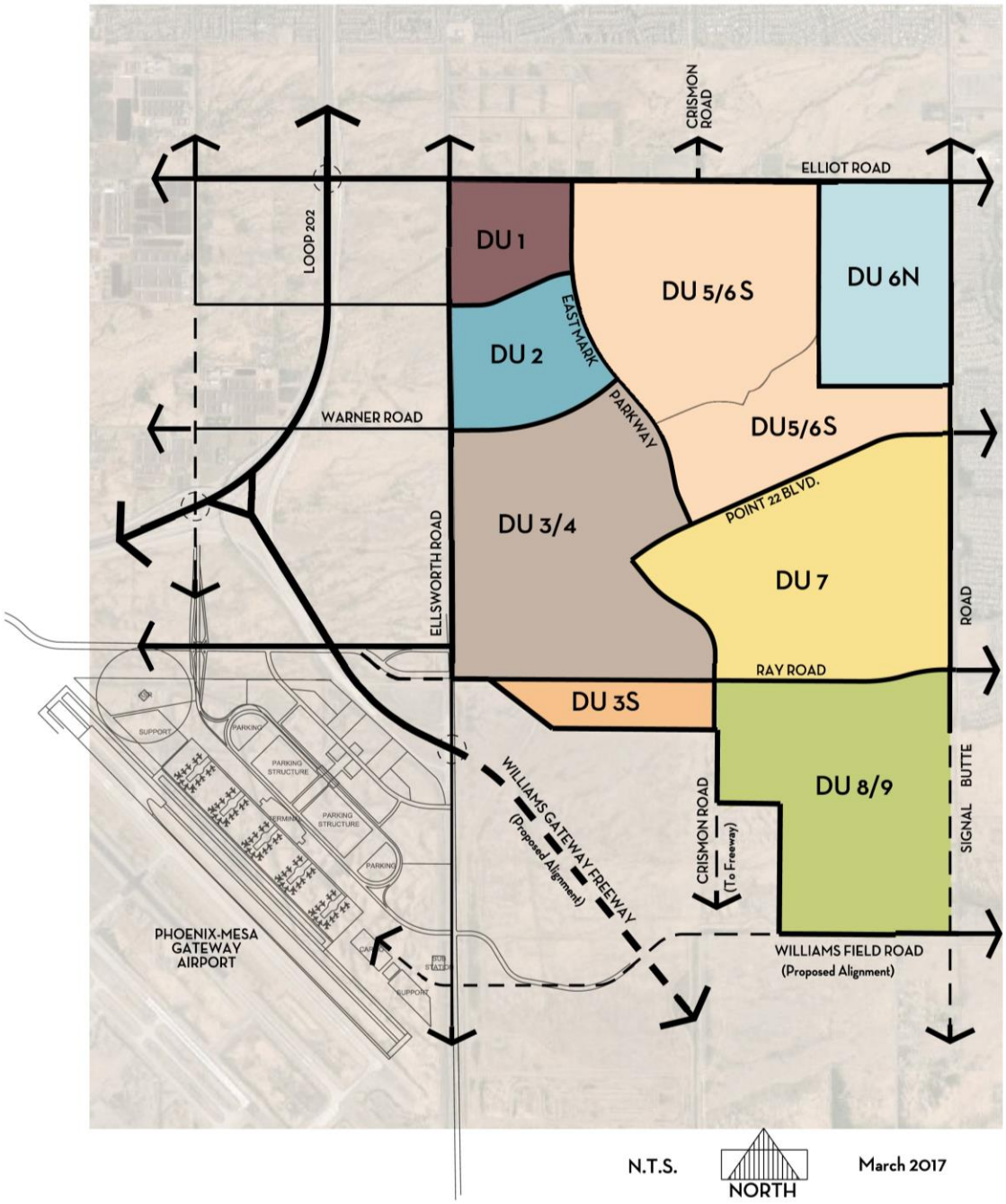

Figure 1. Eastmark Land Development Units

2.2 Street Circulation and Access Plan

The roadway network and circulation plan will follow the same requirements and characteristics as is documented in the March 2017 MTP update. Point Twenty-Two Boulevard and Eastmark Parkway are two-way, four-lane district streets that border DU 5-6 on the south and west, respectively. Everton Terrace is a two-way, two-lane district street aligned north-south through DU 5-6, extending from the intersection with Point Twenty-Two to the northern border of DU 5 in 2020. Both Eastmark Parkway and Everton Terrace will extend to Elliot Road at full site build-out. Neighborhood streets comprise the roadway network within DU 5-6 and provide connections from the perimeter roadways to the individual parcels. **Figure 2** displays the conceptual lotting plat for DU 6-South.

The site is segregated into three phases of construction as shown in **Figure 2**. Site access to Phase 1 is provided at one point to Point Twenty-Two Boulevard to the south, at two points to Everton Terrace to the east, and at two points to Eastmark Parkway to the west. Site access to Phase 2 is provided at three points to Everton Terrace to the west. Site access to Phase 3 is provided at two points to Everton Terrace to the east and at 2 points to Eastmark Parkway to the west. These access points will service the residential areas of the development, and all access points will meet spacing guidelines as stated in the MTP update. **Figure 3** shows the major roadway configurations and location of DU 5-6.

Per the *Master Transportation Plan Update - March 2017*, major collector approaches are anticipated to include one (1) left turn lane, one (1) right turn lane, and two (2) through lanes. District Streets (collectors) are recommended as 2-lane roadways with left and right-turn lanes at major intersections. These streets may also be constructed as 4-lane roadways with the outside through lane used for right turning traffic. Adjacent to this DU, Eastmark Parkway and Point Twenty-Two Boulevard are major collectors, and Everton Terrace is a district street.

The proposed roadway cross sections are presented in Section 10 “Street Standards” of the Community Plan. The design criteria and guidelines related to the design of the roadway facilities are also presented in Section 10 of the Community Plan. All local streets that are connecting to arterials are to be 34-foot wide cross sections.

2.3 Bicycle and Urban Trail Circulation Plan

The roadway network within Mesa Proving Grounds is designed to encourage multi-modal transportation, including, but not limited to, transit, bicycles, pedestrians, multiple electric vehicle options (MEVOs), including neighborhood electric vehicles (NEVs), electric scooters, and other plug-in electrically powered vehicles.

Bicycle and pedestrian accommodations are provided through the roadway network in DU 6-South. Sidewalks will be located on either one side or both sides of the local streets and the entry streets, providing pedestrian connectivity to neighboring parcels.

Figure 2. Conceptual Lotting Plat for DU 6-South

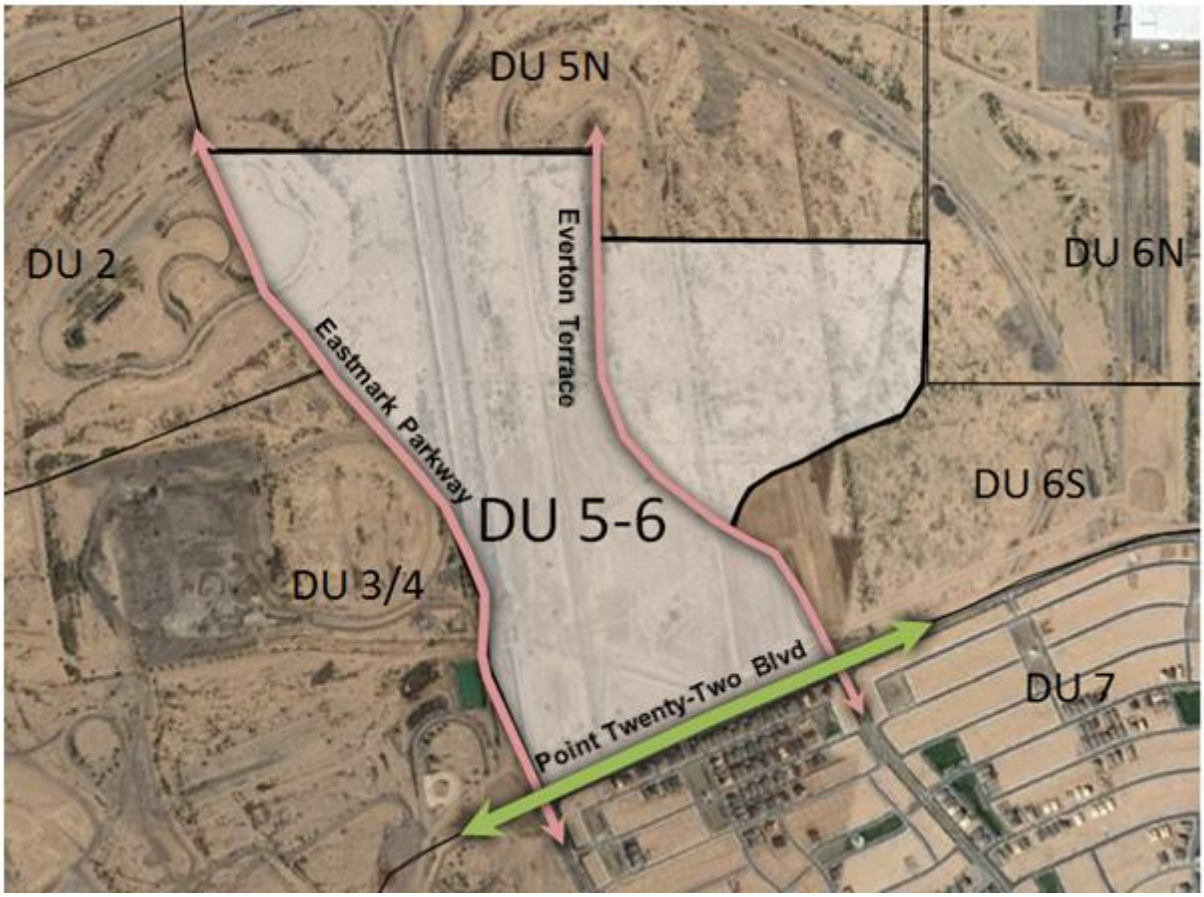

Figure 3. DU 5-6 Major Roadway Network

3. Projected Site Traffic

The projected build-out daily weekday traffic volumes for the site-generated traffic in the MTP update of March 2017 were estimated based on preliminary land use concepts that are within the Land Use Budget.

A generally accepted method of estimating the number of trips to be generated by new developments is to use the regression equations and/or average trip rates developed by the Institute of Transportation Engineers (ITE). These trip generation equations and rates were developed through a compilation of extensive field studies and traffic counts at existing developments throughout the United States. *Trip Generation, Eighth Edition*, published by ITE, is the result of these studies and provides these trip generation rates for various developments. It should be noted that the trip generation rate used for low and medium-density residential land

use comes from the Maricopa Association of Governments (MAG) *Maricopa Regional Household Travel Survey*, which estimates trip rates for Maricopa County residents specifically.

Table 1 presents the current proposed land uses and resultant ADT traffic for DU 5-6. **Table 2** presents the anticipated A.M and P.M. Peak hour generation for the current proposed land uses.

Table 1. DU 5-6 Trip Generation for Proposed DUP Land Uses

Phase	Land Use	Land Use Code (LUC)	LUC Units	Intensity	Trip Gen Rate, Avg Weekday	Internal Trip Capture	Pass-by %	Resultant Total ADT, Weekday
1	Residential	210	DU	315	7.38*	5%	0%	2,320
2	Residential	210	DU	266	7.38*	5%	0%	1,960
3	Residential	210	DU	419	7.38*	5%	0%	3,090
Total								**7,370 vpd**

Table 2. DU 5-6 Peak Hour Trips Generated

			Trip Generation Rates							Trips Generated					
			AM Peak Hour			PM Peak Hour			Daily Rate	AM Peak Hour			PM Peak Hour		
Phase	**Land Use**	**Intensity**	**Rate**	**In %**	**Out %**	**Rate**	**In %**	**Out %**		**Total**	**In**	**Out**	**Total**	**In**	**Out**
1	Residential	315	0.75	25%	75%	1.01	63%	37%	7.38	224	56	168	302	190	112
2	Residential	266	0.75	25%	75%	1.01	63%	37%	7.38	190	48	142	255	161	94
3	Residential	419	0.75	25%	75%	1.01	63%	37%	7.38	299	75	224	402	253	149
									Totals	**713**	**179**	**534**	**959**	**604**	**355**

In the MTP update, the internal trip capture factors for each District within the development vary as a result of the ratio between the different land uses. The internal trip capture factor used for the original DU 6 was 5%, which is maintained in this analysis.

Site trip distribution used the assumptions presented in Section 4.2, Site Trip Distribution, of the MTP update. Assuming 15 percent of the development trips remain internal and are distributed on the roadway network within the ultimate development, the remaining 85 percent is assumed to leave the development and be distributed to the external roadway network. Site traffic distribution is relatively consistent with the MTP distributions, which assumed 15 percent of the development trips remain internal to Eastmark, 15 percent travel north, 25 percent travel south, 20 percent travel east, and 25 percent travel west.

At the time of site build-out (Year 2020) Everton Terrace and Eastmark Parkway will both terminate at the northern boundary of DU 5. Inspirian Parkway will terminate at the intersection with Point Twenty-Two Boulevard, and Warner Road will not be built between Ellsworth Road and Eastmark Parkway. Crismon Road will not connect to the perimeter of the community, either in the north or in the south. Williams Field Road, while not connected to the future SR 24, will be connected to 222nd Street (not shown), which connects to the greater Maricopa County roadway network. The network will also include access to Elliot Road from an industrial development that will be located in DU 5 North. **Figure 4** presents total site traffic distribution for DU 5-6 at build-out. **Figure 5** provides turning movement volumes in the AM and PM peak hours for the intersections of Point Twenty-Two Boulevard with Everton Terrace and Eastmark Parkway. These peak hour turning movements contain only site traffic and do not include background volumes.

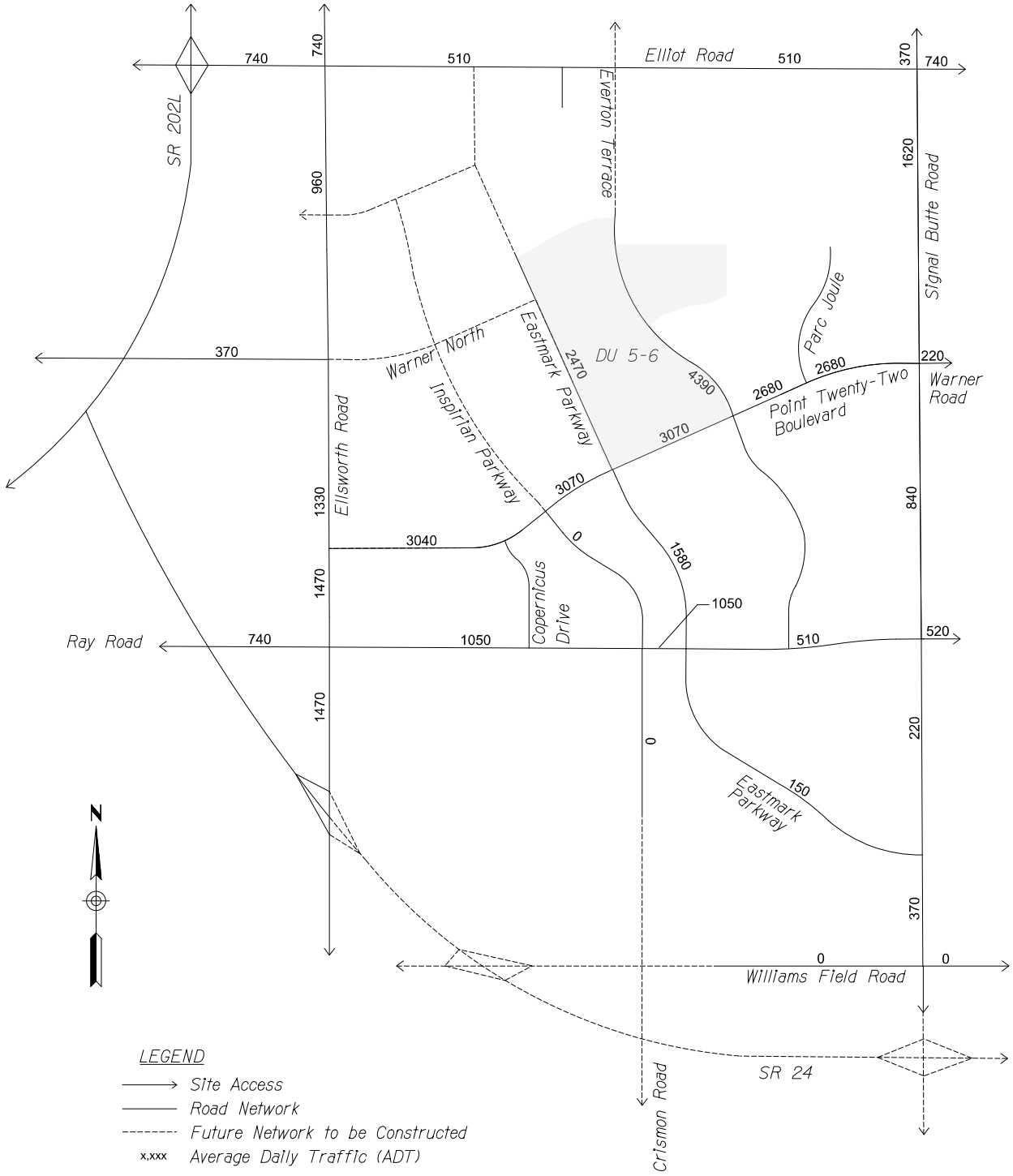

Figure 4. DU 5-6 Site Traffic Distribution

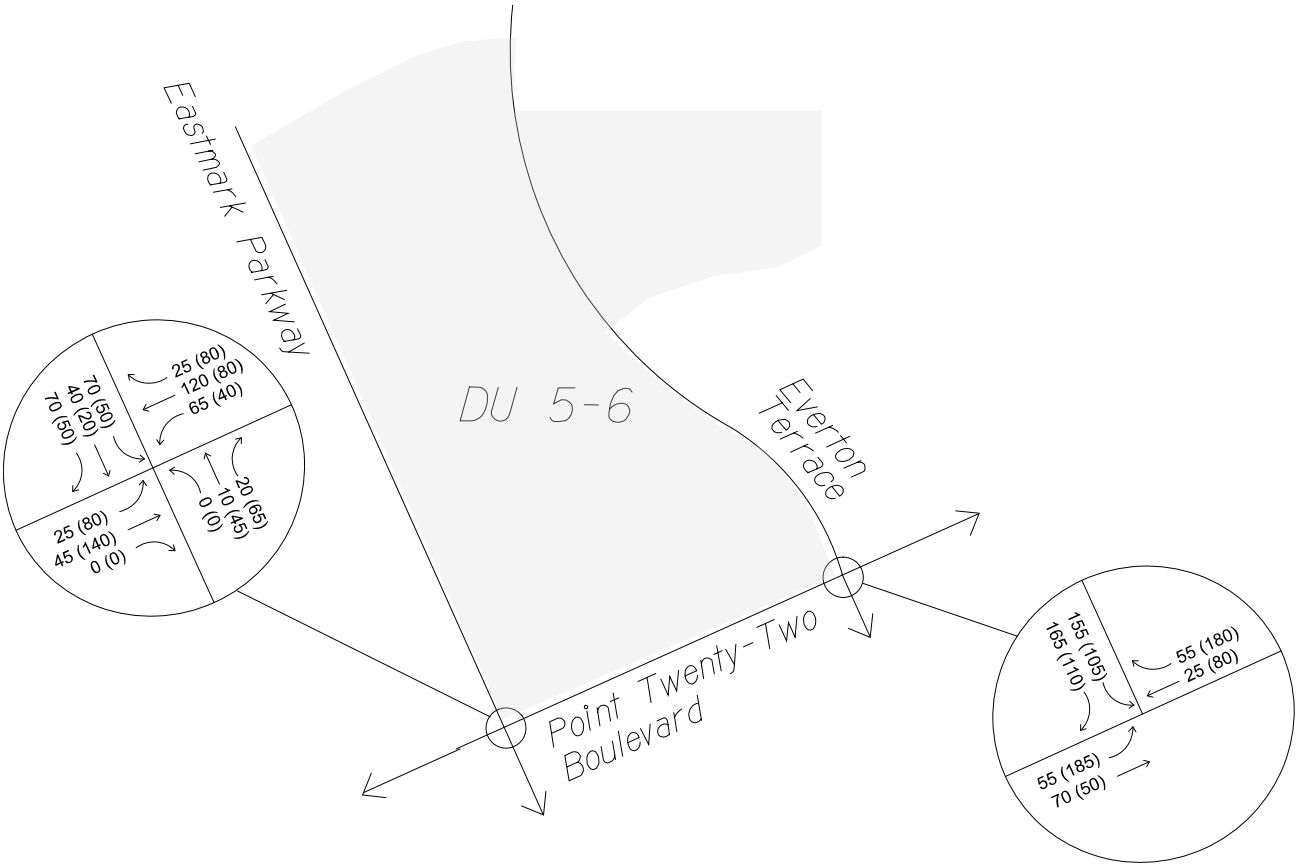

Figure 5. Year 2020 AM & PM Peak Hour Turning Movement Site Volumes

3.1 Build-out Year 2020 Total Traffic

The site opening for DU 5-6 is anticipated to proceed in three phases, with phase 1 opening in 2018, phase 2 in 2019, and full build-out (phase 3) in 2020. Background traffic adjacent to the site is projected for year 2020 utilizing a volume interpolation between recent 2015 and 2016 volume counts and the 2040 MAG regional travel demand model. Background traffic also includes the following Eastmark developments:

- DU 3 South
- DU 6 South
- DU 7
- DU 8
- DU 9
- A commercial parcel at the northeast corner of Ellsworth and Ray (part of DU 3/4)
- A high-density residential parcel west of Inspirian between Ray and Point Twenty-Two (part of DU 3/4)
- An industrial development at the southwest corner of Signal Butte and Elliot (part of DU 6 North)
- An industrial development north of DU 5-6 and south of Elliot (part of DU 5 North)

The remainder of the Eastmark development units are anticipated to be built after year 2020.

Current estimates from DMB indicate that Point Twenty-Two Blvd between Signal Butte Road and Ellsworth Road will be completed at site build-out. The portion of Eastmark Parkway adjacent to DU 5-6 is expected to be completed with the DU 5-6 phase 3 development. The remainder of Eastmark Parkway north of DU 5-6 is expected to be completed with the development of DU's 1, 2, and 5 North.

Figure 6 presents the resultant total traffic for DU 5-6 build-out and assumes the roadways mentioned above will be complete.

3.2 Year 2040 Total Traffic

Total build-out of Eastmark may take 35 to 40 years; however, MAG's capacity constrained traffic model for year 2040 was used to estimate the background traffic adjacent to Eastmark in the updated MTP.

Figure 7 presents full build-out site volumes for Year 2040 based on the DUP for Development Unit 5-6 and the *Updated Master Transportation Plan* being developed concurrently with this report. The land uses for all DU's besides DU 5-6 are assumed to be the same as those presented in the updated Master Transportation Plan. This figure indicates that there are some locations – for example Elliot Road – where the 2020 total volume exceeds the 2040 Full Build-Out volume. This is due to the fact that once the full site build out is accomplished and all interior roadways in the Eastmark network are completed, traffic will have more route options. Additionally, more traffic will be captured internally to Eastmark, as more non-residential land uses will be available.

In accordance with the MTP update, roadway level of service (LOS) analysis was performed to assess the general state of traffic operating conditions on the roadway system. Level of service for this analysis was assigned according to volume-to-capacity (V/C) ratio. The capacity of a roadway segment is the designation of how much traffic a roadway segment can carry, and is based on the road's functional classification and number of lanes. The V/C ratio is calculated as the 24-hour total volume on a particular roadway segment, divided by the 24-hour total capacity on that same segment. Therefore, values approaching one (1.0) represent worse LOS, and values greater than one represent a severely congested, over-capacity roadway. **Table 3** displays the V/C ratio associated with each level of service rating. Based on the LOS analysis displayed in **Figure 8**, the roadway classifications and lane configurations recommended in the MTP update are still appropriate for the proposed land uses with DU 5-6.

Table 3. V/C Ratio Thresholds for Levels of Service

Level of Service	V/C Ratio
A-C	<0.75
D	<0.90
E	<1.0
F	≥1.0

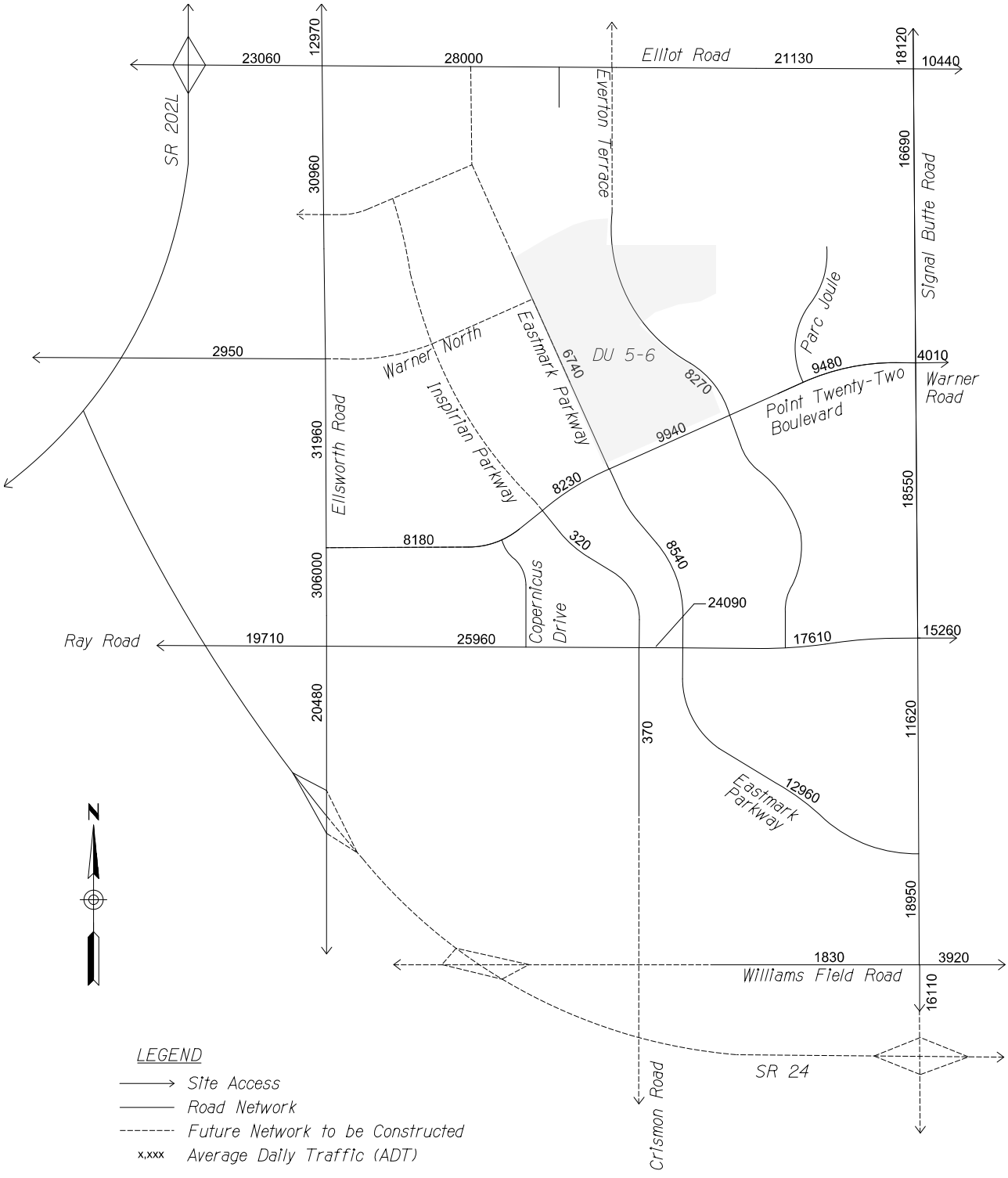

Figure 6. Year 2020 Total Traffic Volumes (includes DU 5-6)

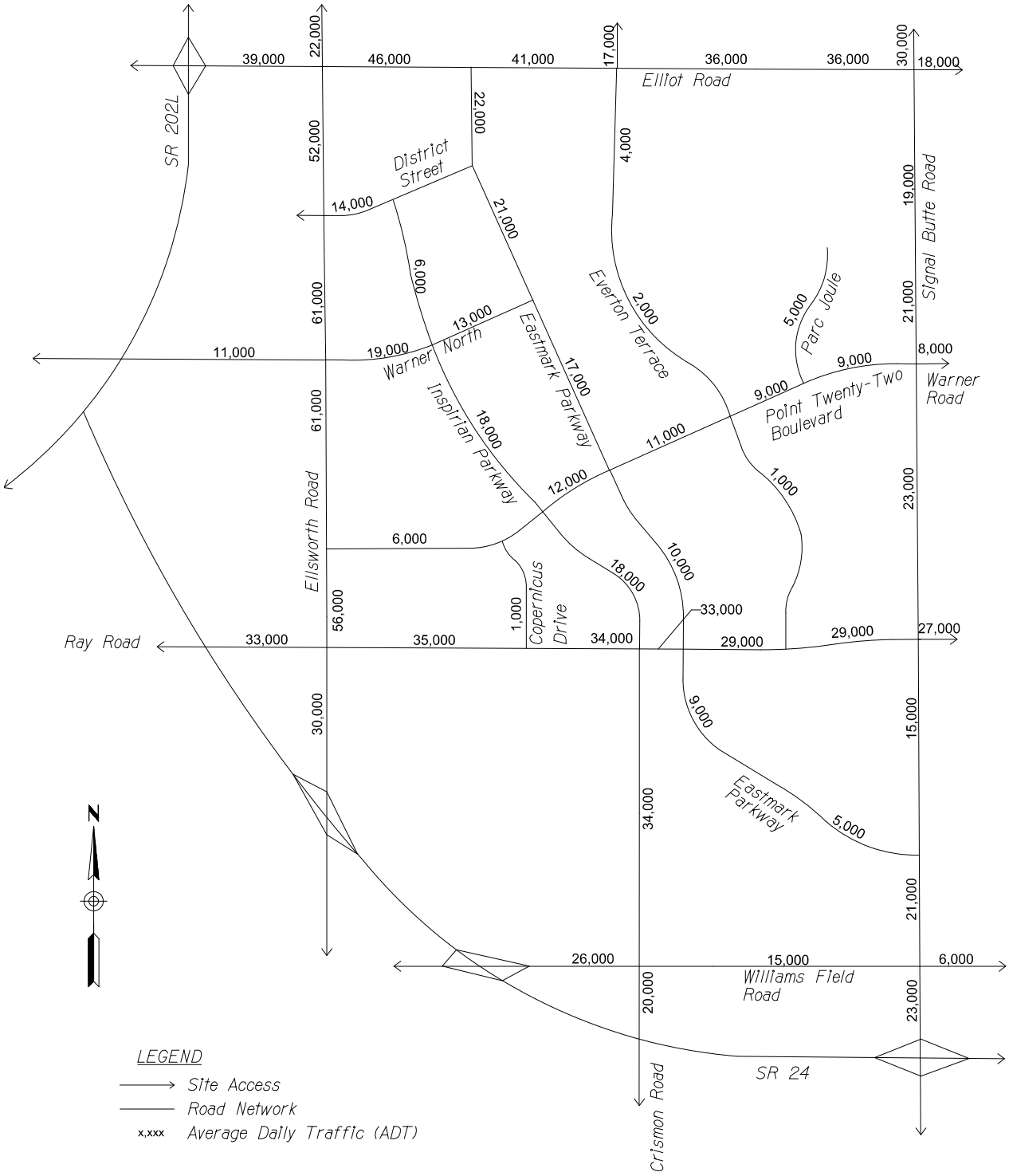

Figure 7. Year 2040 Total Traffic Volumes – Full Build Out

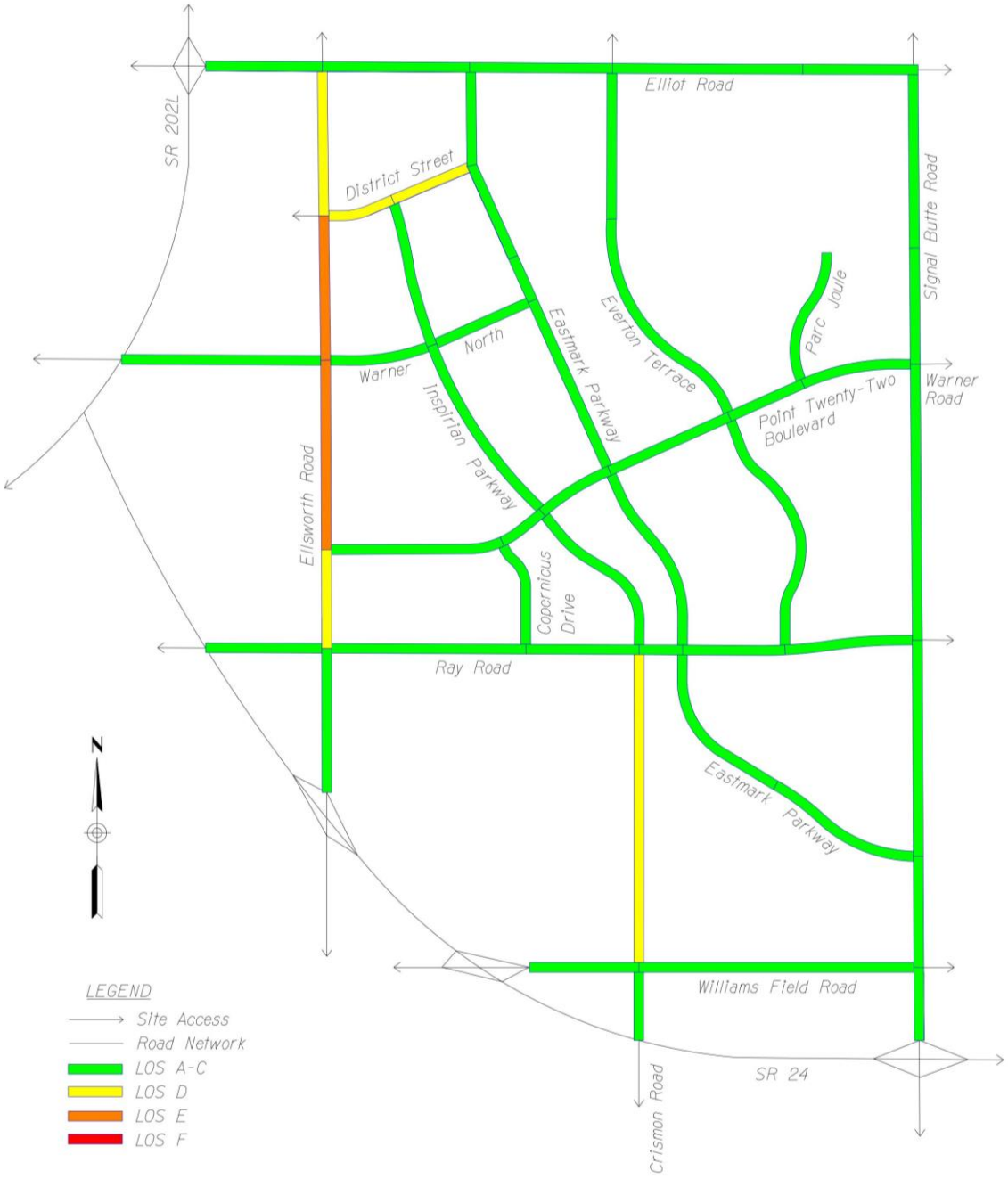

Figure 8. Year 2040 Segment Level of Service

4. Development Phasing

Construction of DU 5-6 is anticipated to occur in three phases:

Phase 1. The southern development area between Everton Terrace and Eastmark Parkway
Phase 2. The development area east of Everton Terrace
Phase 3. The northern development area between Everton Terrace and Eastmark Parkway

Build-out of Everton Terrace and Eastmark Pkwy adjacent to the site will be completed as adjacent parcels are developed. Infrastructure improvements will include roadway, utility, and landscaping work.

The conduit needed for signal installation at the intersections of Eastmark Parkway and Everton Terrace with Point Twenty-Two Boulevard has been included during the previous construction of Point Twenty-Two Boulevard. Necessary conduit for signal installation should be included along Eastmark Parkway near the future location of the intersection with Warner Road. The timing of the traffic signal installation for any signals deemed necessary shall be determined by the City Traffic Engineer.

5. Conclusions

The proposed land uses for DU 5-6 are within the approved land use budget for both dwelling units and non-residential square footage. Total build-out for Eastmark will not exceed 15,000 dwelling units and 20 million SF of commercial. The estimated trips generated in DU 5-6 is approximately 7,370 daily weekday trips. The roadway network and cross sections approved in the MTP and the current MTP update are appropriate for the proposed residential and commercial land uses within DU 5-6. The traffic volumes projected on the major arterials at the build-out (Year 2020) of DU 5-6 are estimated to be greater than those volumes projected in year 2040 at Full Site Build-Out. However, this is due to the reduced number of streets that will completed in Year 2020 as compared to Year 2040 and the resulting reduced number of routing options.

A preliminary signal warrant analysis indicates that traffic signals may be warranted in Year 2020 at the intersection of Point Twenty-Two Boulevard/Eastmark Parkway and Point Twenty-Two Boulevard/Everton Terrace. The installation of traffic signal shall be left to the discretion of the City Traffic Engineer. The previous roadway construction on Point Twenty-Two included box-in of the conduit for future traffic signal installation along that road, and construction of Eastmark Parkway should include similar necessary conduit at the location of the future intersection with Warner Road. The installation of any traffic signals shall be determined and approved by the City Traffic Engineer.