LIST OF FIGURES

LIST OF TABLES

I. EXECUTIVE SUMMARY

A. PROJECT SUMMARY

United Civil Group (UCG) was retained by Galeb Companies to perform this Traffic Impact Analysis (TIA) for the Borgata at San Tan Valley ("the Development"), an approximate 100-acre mixed-use development, located on the southwest side of Hunt Highway between Thompson Road and Mountain Vista Boulevard in Pinal County, Arizona. At full build out, the Development is being planned to include a mixture of single-family residential homes, multifamily rental units, and commercial uses.

UCG performed this TIA in general accordance with the Pinal County *Traffic Impact Assessment Guidelines & Procedures*, per scoping information provided by the Pinal County Traffic Engineer, locally accepted standards, and industry practice.

B. STUDY OBJECTIVES

This study is intended to investigate the existing and future traffic conditions and identify any potential roadway improvements necessary to serve the proposed development. Major study objectives of this traffic report are as follows:

- Evaluate the existing study area roadways and intersections and determine their existing AM and PM peak hour traffic volumes.

- Evaluate the future site access intersections to the site to provide necessary capacity to accommodate the forecasted site traffic volumes.

- Where applicable, recommend any safety, intersection and/or roadway improvements, sufficient to meet the needs of the development and adjacent roadway network due to the additional site generated traffic volumes.

C. CONCLUSIONS AND RECOMMENDATIONS

The Borgata at San Tan Valley is being planned to include a mixture of single-family residential, multifamily residential units, and commercial uses on approximately 100 acres. Initial opening of site ("Parcel A" - 430 units of multifamily residential) is planned for year 2023. Full build out of the site is assumed to occur by 2026.

External access points for the overall development site are proposed to be provided on Hunt Highway, Thompson Road, and San Tan Heights Boulevard, the latter of which will be extended from its current terminus to Hunt Highway. At the time of final site planning of the site's individual parcels, the access spacing and function should be designed per the *Pinal County Access Management Manual, 2017*.

On a typical weekday at full build out the proposed development is estimated to generate 688 trips in the AM peak hour, 1,276 trips in the PM peak hour, and 15,425 daily trips.

The proposed development under its proposed zoning is estimated to generate 6,043 fewer daily trips in comparison to allowable potential commercial development under the existing zoning of the site.

The signalized study area intersections along Hunt Highway operate at level of service (LOS) D or better in the AM and PM peak hours in the existing year 2021. All movements at the stop-controlled study area intersections operate at LOS C or better in the AM and PM peak hours in the existing year 2021.

For background traffic conditions, in 2026 several of the study area signalized intersections on Hunt Highway are forecasted to begin to operate at LOS E or LOS F in the AM and/or PM peak hours due to the projected ambient traffic growth and additional developments in the area. All movements at the existing stop-controlled intersections continue to operate at LOS C or better in the AM and PM peak hours through horizon background year 2036. Hunt Highway having its ultimate section (3 through lanes in each direction) would provide additional approach lanes at the intersections; the enhanced capacity would improve the forecasted level of service at the intersections from Empire Boulevard to Gary Road through the background year 2036. The full section of Hunt Highway will ultimately be implemented through developer-led improvements as Pinal County's recent Hunt Highway CIP implemented the current section of 2 through lanes in each direction.

It is reasonably assumed by full buildout year 2036, Hunt Highway will be constructed to its ultimate section (3 through lanes in each direction) by developer improvements, which will provide additional capacity at the intersections. For total traffic conditions, several of the study area signalized intersections along Hunt Highway are forecasted to operate at LOS E or LOS F in the AM and/or PM peak hours due to the projected ambient traffic growth and additional developments in the area. The compounded annual growth rate (CAGR) applied to the existing collected traffic volumes as part of this study is greater than the MAG-provided CAGR due to general developments occurring and planned in the study area. If ultimately the future projected traffic volumes based on the annual growth rates utilized for the purposes of this study are not realized, the reported forecasted levels of service would be improved at the Hunt Highway intersections.

At the site accesses intersections with Hunt Highway, the exiting driveway movements may experience average delay resulting in LOS E or LOS F in the peak hours, which is typical for stop-controlled movements from minor streets as they wait for an acceptable gap to turn onto to free-flowing major streets during the peak hours (Hunt Highway legs are LOS A). The total turn volumes with forecasted LOS E or LOS F are relatively minor, and the 95th percentile queue lengths of these legs are calculated to be minimal (See Section VII.F.1).

Traffic signal warrants are met at the planned intersection of Hunt Highway & San Tan Heights Boulevard/Spring Valley Parkway. Per input by Pinal County Engineering and Planning staff, a traffic signal will begin design in July 2021 for the Spring Valley Parkway leg of this intersection funded by the Promenade development. Signalization of this intersection is assumed to be implemented by year 2023.

Based on this Traffic Impact Study, the following recommendations apply for the Development:

- Provide right-of-way dedication and construction of the half-street improvements along the property's Hunt Highway frontage (Major Arterial/Regionally Significant Route) per coordination and input from the Pinal County Engineering staff. This should include width for the ultimate three southeast-bound through lanes.
- Provide right-of-way dedication and construction of the half-street improvements of San Tan Heights Boulevard along the property's frontage. Planned improvements include the completion of San Tan Heights Boulevard between Hunt Highway and its existing terminus approximately 2,100 feet south of Hunt Highway. The required right-of-way dedication and roadway improvements for San Tan Heights Boulevard should be per Exhibit 6.2 of the and/or per input and coordination with Pinal County Engineering staff. Appropriate right-of-way should be provided and account for any required turn lanes at the Hunt Highway & San Tan Heights Boulevard/Spring Valley Parkway intersection.
- Provide for and incorporate the San Tan Heights Boulevard leg into the planned signalized intersection of Hunt Highway & San Tan Heights/Spring Valley Parkway.
- Lane configuration of the northeast-bound San Tan Heights Boulevard approach at Hunt Highway should be planned to include dual left turn lanes, a through lane, and a right-turn lane.
- At the time of site planning for each individual parcel of the Development, the location and function of site access driveways should be per the *Pinal County Access Management Manual, 2017*.
- Provide dedicated right-turn and left-turn lanes at the proposed site access intersections and site access points as follows:
    - Hunt Highway/San Tan Heights Boulevard:
        - Left Turn Lanes
            - Northeast-bound – provide dual lefts with **225 feet storage length**
            - Northwest-bound – provide **325 feet storage length**
        - Right Turn Lanes
            - Northeast-bound – provide **175 feet storage length**

    - Southeast-bound – provide **175 feet storage length**
  - For all of the required left- and right-turn lanes at the site access driveways on Hunt Highway, San Tan Heights Boulevard, and Thompson Road, provide a minimum of **100 feet storage length**; the exception is the right-turn lane on southwest-bound San Tan Heights Boulevard at Access H which should have a minimum of **125 feet storage length**.
- Adequate sight distances and sight distance triangles at the site access points should be provided per AASHTO's A Policy on Geometric Design of Highways and Streets, Section 9.5, the Pinal County Traffic Impact Assessment Guidelines & Procedures and Subdivision and Infrastructure Design Manual.
- At the time of actual site planning of the individual parcels of the site, a subsequent Traffic Impact Analysis(es) should be conducted providing updated evaluations of the right turn lane warrants, queue length analyses, and storage lane length requirements based on refined traffic volume forecasts.

The following recommendations are for consideration for Pinal County and/or the Town of Queen Creek by horizon year 2036:

- Continually update and optimize signal timings at the study area signalized intersections along Hunt Highway based on actual traffic volumes once additional development occurs and ambient growth in the area is realized.

II. PROPOSED DEVELOPMENT

A. Site Location

The proposed Borgata at San Tan Valley development is located on the southwest side of Hunt Highway between Thompson Road and Mountain Vista Boulevard in Pinal County, Arizona. *Figure 1: Vicinity Map* and *Figure 2: Aerial View* present the location of the proposed development within the context of the immediate area.

B. Land Use

The Development is being planned to include a mixture of single-family residential, multi-family for-rent units, and commercial uses. The approximate 100-acre site is currently zoned C-2; the proposed zoning is C-2, MR, and R-7. *Figure 3: Conceptual Site Plan* illustrates the general parcel layout and potential access points for the site.

For the purposes of this study, utilizing near maximum allowable densities for the separate uses as a conservative approach, the following land use components of the site are assumed:

- "Parcel A": 430 multifamily for-rent dwelling units (approximately 26.9 acres @ 16 DU/acre density).
- "Parcel B": 417 multifamily for-rent dwelling units (approximately 26.1 acres @ 16 DU/acre density).
- Single-family residential: 115 dwelling units
- Commercial/Shopping Center: approximately 150,000 square feet.

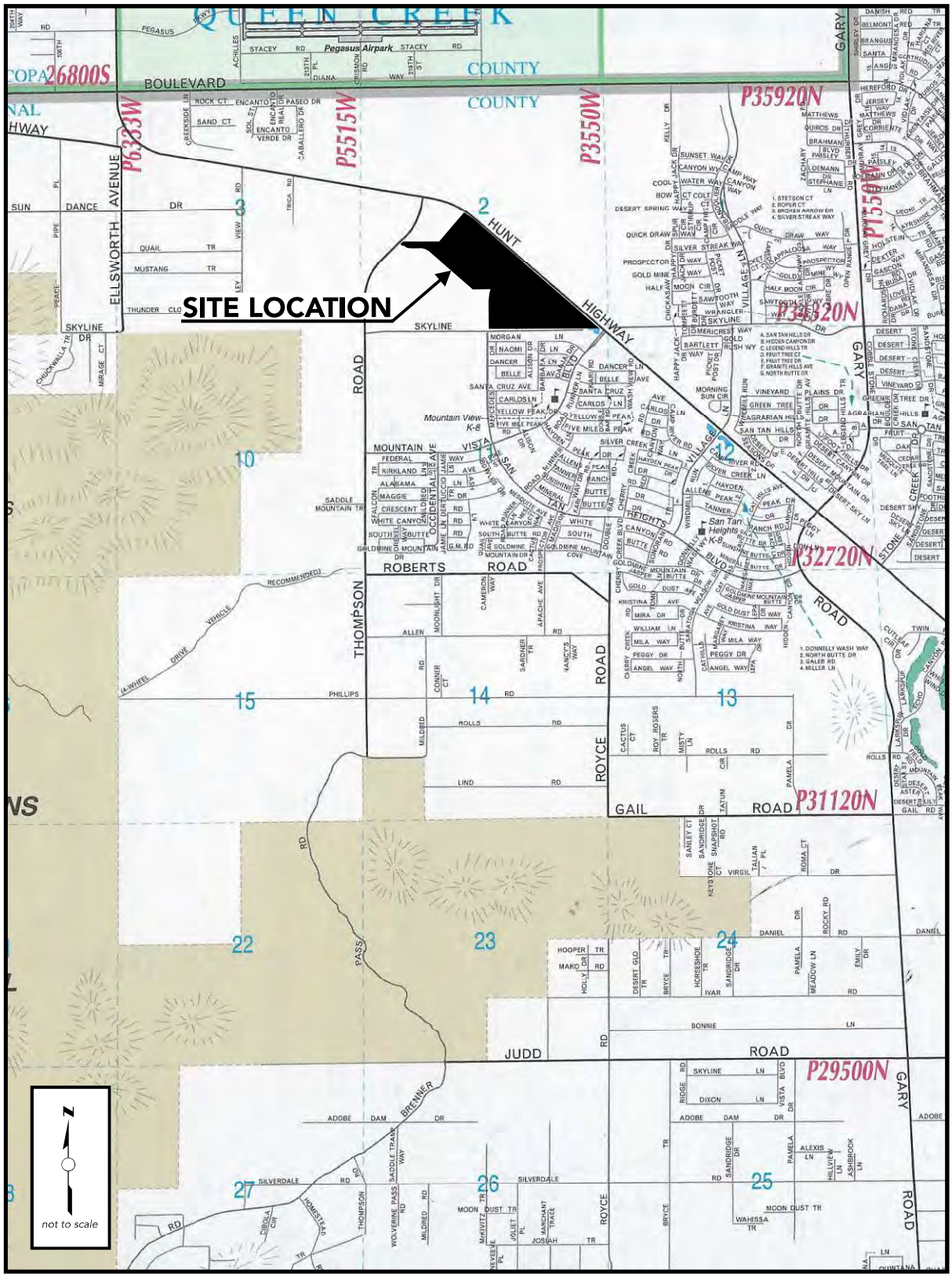
Note: the exact acreage of each parcel and the ultimate square footage and dwelling unit numbers may slightly change as the project progresses through the site planning and development process. The values above represent a conservative approach utilizing allowable densities.

C. Phasing and Timing

The planning and timing of the overall development will ultimately depend on market forces. Per input from the developer, the first component likely to be developed is planned to be "Parcel A", the multifamily component on the western side of the site, which is assumed to include 430 dwelling units. The opening year assumed to be year 2023. The analysis horizon years of this study are the initial opening year, year 2023; full build out of the site (assumed as year 2026 per input by the developer); and 10 years after full build out (year 2036).

D. Site Accessibility

At the time of final site planning of the site's individual parcels, access spacing and function should be designed per the *Pinal County Access Management Manual, 2017*. Potential site access points on Hunt Highway, San Tan Heights Blvd and Thompson Rd have been assumed for this study per these guidelines and are shown on Figure 3.



Wide World of Maps, Inc copyright notice and reproduced with permission No. 442166

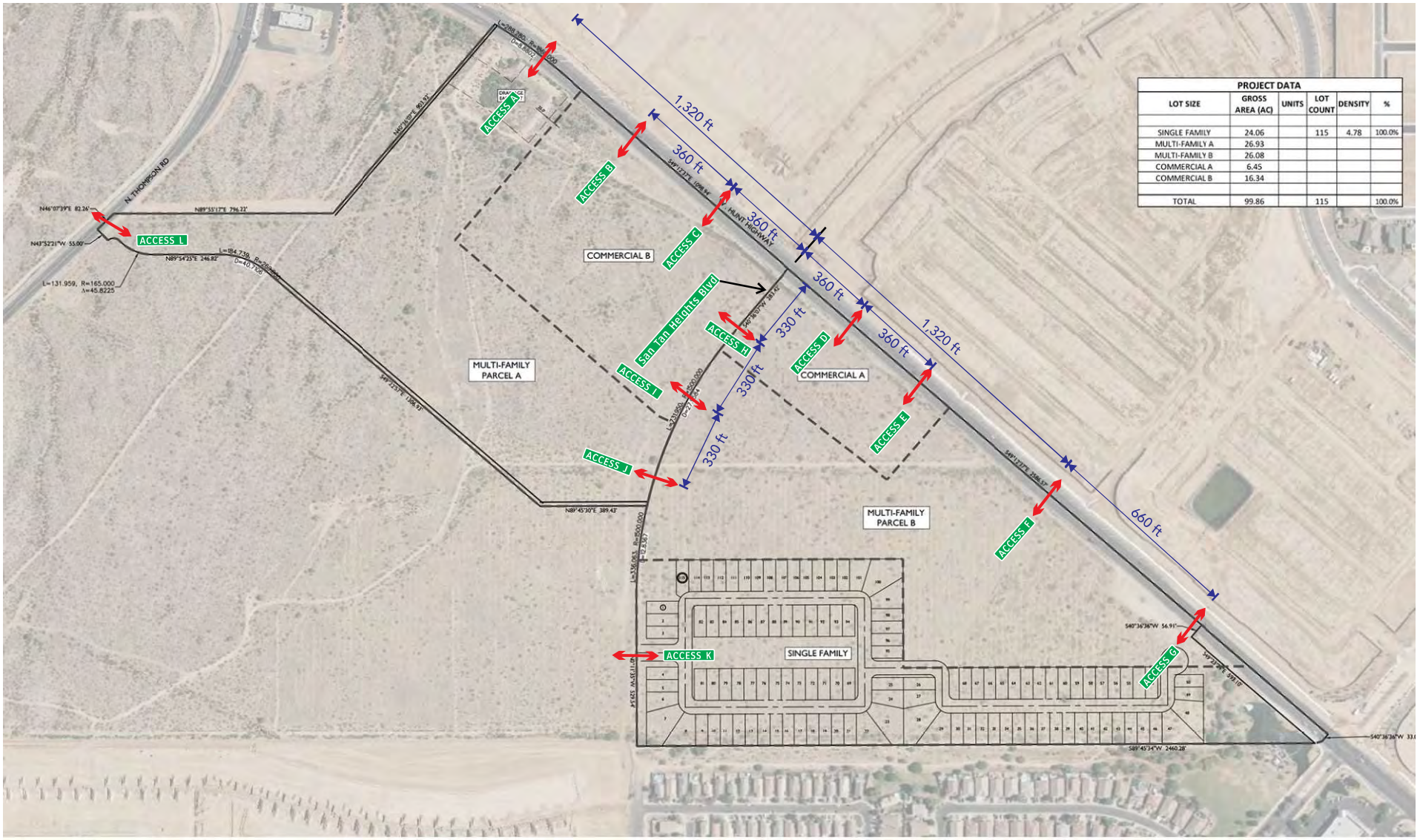
Figure 1: Vicinity Map

United Civil Group

Permission for commercial use granted by Google Earth

Figure 2: Aerial View

UCG
United Civil Group



LEGEND

↔ Potential Site Access Location
Minimum Driveway Spacing Shown Per Pinal County Access Management Manual, 2017

N

not to scale

Figure 3: Conceptual Site Plan

United Civil Group

III. STUDY AREA CONDITIONS

A. Study Area

Based on the forecasted trip generation for the Development (See Section V.A below) and per the Pinal County *Traffic Impact Assessment Guidelines & Procedures,* the Development falls under Category IIb. According to these category guidelines and per scoping discussions with the Pinal County Traffic Engineer, the study area includes the following intersections:

- Ellsworth Road/Empire Boulevard
- Hunt Highway/Ellsworth Avenue
- Hunt Highway/San Tan Flat Drive
- Hunt Highway/Signalized Leading Edge Academy Drive ("Leading Edge Access")
- Hunt Highway/Thompson Road
- Hunt Highway/Mountain Vista Blvd
- Hunt Highway/Village Lane
- Hunt Highway/Gary Road
- Thompson Road/Mountain Vista Boulevard
- San Tan Heights Boulevard/Mountain Vista Boulevard
- All site access intersections
- Hunt Highway/San Tan Heights Boulevard_Spring Valley Parkway (future)

B. Study Area Land Use

The following describes the existing land uses of the subject site and surrounding area:

SUBJECT SITE: Vacant desert land. Existing Zoning: C-2.

NORTH: Hunt Highway followed by the Promenade development.
SOUTH: Single-family residential communities.
EAST: Hunt Highway followed by the Promenade development.
WEST: Vacant desert land and Thompson Road.

C. Anticipated Future Development and Planned Improvements

C.1. Pinal County Capital Improvement Projects

Pinal County completed widening improvements of Hunt Highway Phase 2 through the study area in 2014. One future improvement project on Hunt Highway that would affect the study area is included in the Pinal County 5-Year Capital Improvement Plan (2020 – 2025). This project is the future signalization of the intersection of Hunt Highway/Spring Valley Parkway, which is developer funded. The design of this project is expected to begin in July 2021; construction is anticipated to be complete by horizon year 2023.

C.2. Adjacent Private Development Projects

One private development project has been identified within or adjacent to the study area having an approved TIA and requiring inclusion in the background traffic volumes and overall analysis for this study. The *San Tan Groves* residential community development is planned north of Hunt Highway generally to the west of Thompson Road. Ultimately the site is planned to consist of 462 single-family homes. Per the TIA completed for San Tan Groves (*Traffic Impact Analysis for San Tan Groves Development*, June 2018, United Civil Group) build out was initially planned for 2018. As of 2021, the site is not yet under construction. For the purposes of this Borgata at San Tan Valley TIA, full build out of the San Tan Groves will be assumed by 2026. The traffic volumes for this adjacent private development are included in the background traffic for this study and provided in *Appendix E: Traffic Volumes of Adjacent Developments*.

Several other developments have been identified within or adjacent to the study area. Due to their on-going development application and current lack of an approved TIA available through the Public Records Request process, their plans and site traffic volumes are not available for inclusion in this study. A compound annual growth rate higher than the MAG-provided growth rates (see Section V.A below) will be utilized to account for the additional planned developments in the area.

One development currently under construction, The *Promenade,* is located northeast of Hunt Highway at the future San Tan Heights Road alignment (becomes "Spring Valley Parkway" north of Hunt Highway). As described in the section above, a new traffic signal is planned and assumed to be implemented at Hunt Highway & Spring Valley Parkway/San Tan Heights Road. Because no forecasted site traffic volumes are available, some volume has been assumed and applied at the new legs of the intersection. This applied volume is equivalent to the collected volumes to/from the Promenade at Hunt Highway/Mountain Vista Boulevard (north leg).

IV. EXISTING ROADWAY CONDITIONS

A. PHYSICAL CHARACTERISTICS

Hunt Highway: is a classified as a Major Arterial and a Regionally Significant Route per the Pinal County *Regional Significant Routes for Safety & Mobility, 2017 Update.* Adjacent to the subject site, Hunt Highway currently is a 5-lane section consisting of two 12 foot travel lanes in both the northwest-bound and southeast-bound directions with a center two-way left-turn lane (TWLTL). Overall pavement section widths on Hunt Highway vary. Full section improvements (which include curb, sidewalk, bicycle lanes, and/or a raised median) are sporadically implemented on Hunt Highway between Empire Road and Thompson Road, and again between Mountain Vista Boulevard and Gary Road. The posted speed limit along Hunt Highway within the vicinity of the site is 45 miles per hour.

Thompson Road: is not classified in the Pinal County *Regional Significant Routes for Safety & Mobility, 2017 Update, nor Pinal County Small Area Transportation Study, 2006*. Thompson Road is classified as an Urban Major Collector per the *ADOT Federal Functional Classification* map. In the vicinity of the site south of Hunt Highway, Thompson Road currently has an overall width of approximately 34 feet, consisting of 12 foot travel lane in both the northeast-bound and southwest-bound directions with approximate 5 foot paved shoulders. South of the subject site in the vicinity of Mountain Vista Boulevard, the existing eastern half street of Thompson Road is improved with two northbound lanes as per the Minor Arterial section Pinal County's *Subdivision and Infrastructure Manual*. The posted speed limit along Thompson Road is 45 miles per hour.

Mountain Vista Boulevard: is not classified in the Pinal County *Regional Significant Routes for Safety & Mobility, 2017 Update, nor Pinal County Small Area Transportation Study, 2006*. Mountain Vista Boulevard is classified as an Urban Major Collector per the *ADOT Federal Functional Classification* map. In the vicinity of the site southwest of Hunt Highway, Mountain Vista Boulevard is fully improved having an overall width of approximately 48 feet (face of curb to face of curb), consisting one 12 foot travel lane in both the northeast-bound and southwest-bound directions, and center TWLTL, curb/gutter and sidewalk. The posted speed limit along Mountain Vista Boulevard is 35 miles per hour.

Village Lane is not classified in the Pinal County *Regional Significant Routes for Safety & Mobility, 2017 Update nor Pinal County Small Area Transportation Study, 2006*. Village Lane is classified as an Urban Minor Collector per the *ADOT Federal Functional Classification* map and its existing section and apparent function is in line with a minor collector street. Southwest of Hunt Highway, Village Lane is fully improved with curb/gutter and sidewalk; has an overall width of approximately 48 feet (face of curb to face of curb); and lacks pavement striping for lane delineation. The posted speed limit along Village Lane is 35 miles per hour.

Gary Road: North of Hunt Highway, Gary Road is a classified as a Major Arterial and a Regionally Significant Route per the Pinal County *Regional Significant Routes for Safety & Mobility, 2017 Update* as it is on the Meridian Road alignment and turns into Rittenhouse Road at Combs Road. South of Hunt Highway, Gary Road not classified in the Pinal County *Regional Significant Routes for Safety & Mobility, 2017 Update* and is classified as an Urban Major Collector per the *ADOT Federal Functional Classification* map. Gary Road is fully improved with curb/gutter and sidewalk, and bicycle lanes north of Hunt Highway. It is a 5-lane section within the study area consisting of two 12 foot travel lanes in both directions with a center TWLTL and sporadic raised medians. Overall pavement section widths on Gary Road vary. The posted speed limit along Gary Road south of Hunt Highway is 35 miles per hour; north of Hunt Highway the posted speed limit is 45 miles per hour.

The study area of this TIA includes 10 existing intersections. The existing intersections along with their traffic control and the responsible jurisdiction includes:

1. Ellsworth Road/Empire Boulevard is a signalized intersection with protected/permissive left-turn phasing on the eastbound and westbound legs; and protected left-turn phasing on the northbound and southbound legs. The intersection is maintained by the Town of Queen Creek.

2. Hunt Highway/Ellsworth Avenue is a signalized intersection with protected/permissive left-turn phasing on the eastbound and westbound legs; and protected left-turn phasing on the northbound and southbound legs. The intersection is maintained by Town of Queen Creek.

3. Hunt Highway/San Tan Flat Drive is a signalized intersection with protected/permissive left-turn phasing on the northbound and southbound legs; and protected left-turn phasing on the eastbound and westbound legs. The intersection is maintained by Town of Queen Creek.

4. Hunt Highway/Leading Edge Main Access is a signalized intersection with protected/permissive left-turn phasing on the eastbound leg. The intersection is maintained by Town of Queen Creek.

5. Hunt Highway/Thompson Road is a signalized intersection with protected/permissive left-turn phasing on the Hunt Highway legs. The intersection is maintained by Pinal County.

6. Hunt Highway/Mountain Vista Boulevard is a signalized intersection with protected/permissive left-turn phasing on all legs of the intersection. The intersection is maintained by Pinal County.

7. Hunt Highway/Village Lane is a signalized intersection with protected/permissive left-turn phasing on the northwest-bound and southeast-bound legs. The intersection is maintained by Pinal County.

8. Hunt Highway/Gary Road is a signalized intersection with protected/permissive left-turn phasing on the northwest-bound and southeast-bound legs and protected left-turn phasing on the northeast-bound and southwest-bound legs. The intersection is maintained by Pinal County.

9. Thompson Road/Mountain Vista Boulevard is a unsignalized one-way stop-controlled (on Mountain Vista Boulevard) intersection.

10. Thompson Road/Mountain Vista Boulevard is a unsignalized two-way stop-controlled (on Mountain Vista Boulevard) intersection.

The existing intersection roadway geometry of the study area is provided in *Figure 4: Existing Intersection Geometry – Year 2021.*

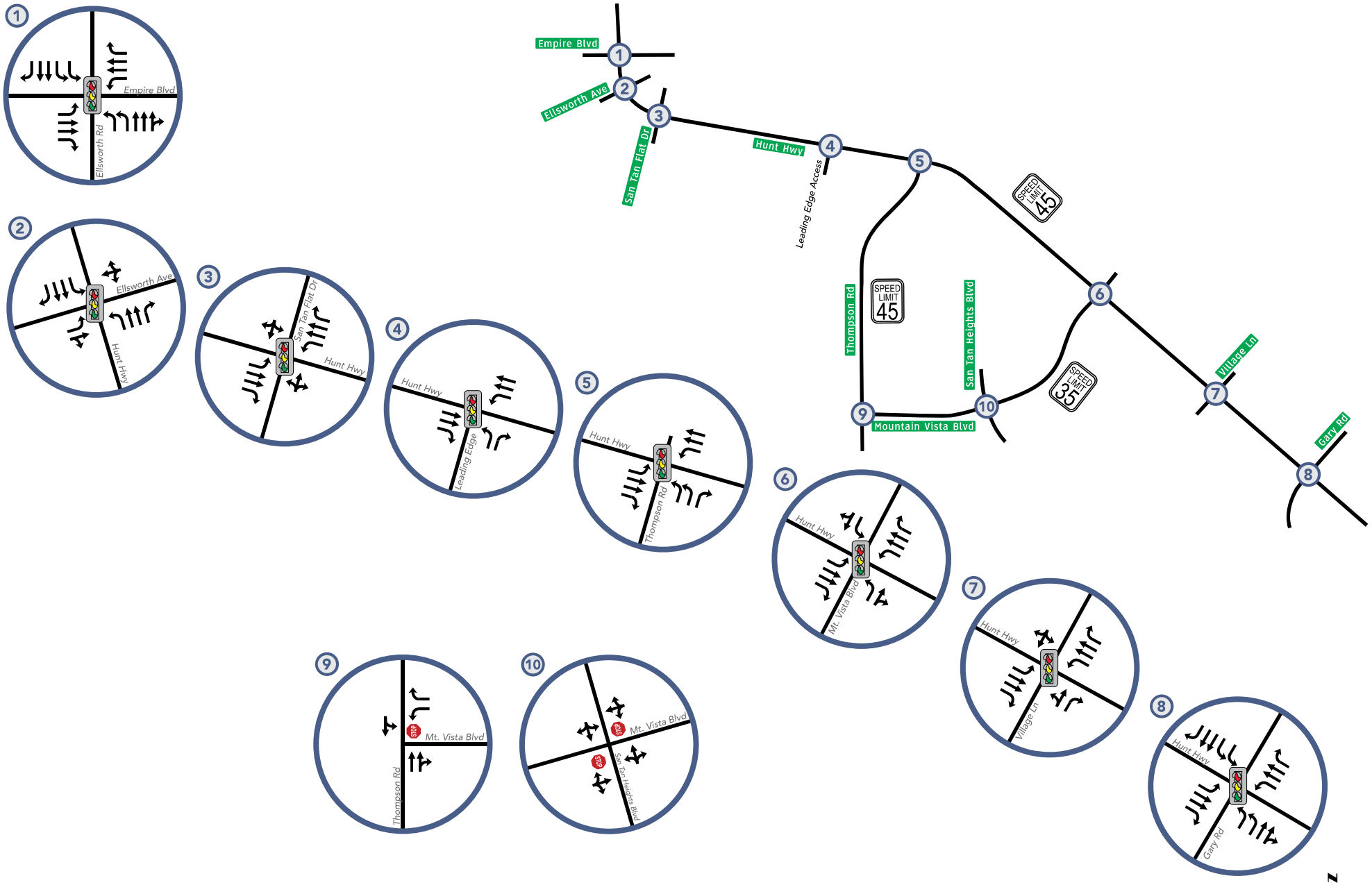


Figure 5: Existing Intersection Geometry - Year 2021

United Civil Group

B. Existing Traffic Volumes

Existing turning movement counts (TMC) in 15-minute intervals were collected at the existing study area intersections during the AM (6:00AM – 9:00AM) and PM (4:00PM – 7:00PM) peak periods on Tuesday, June 8, 2021, Wednesday, June 9, 2021, Thursday, June 10, 2021, and Tuesday, June 15th, 2021. The existing AM and PM peak hour traffic volumes are presented *Figure 5: Existing Traffic – Year 2021.*

Complete traffic count data can be found in *Appendix A: Traffic Data.*

The most recent existing 24-hour ADT volume counts for Hunt Highway within the study area was obtained from the Maricopa Association of Governments (MAG) Travel Demand Model (2021 Spring Conformity Run). Hunt Highway between Thompson Road and Mountain Vista Boulevard has a two-way daily vehicle volume of 29,140 (projected year 2020 data); 14,430 vpd eastbound and 14,710 vpd westbound.

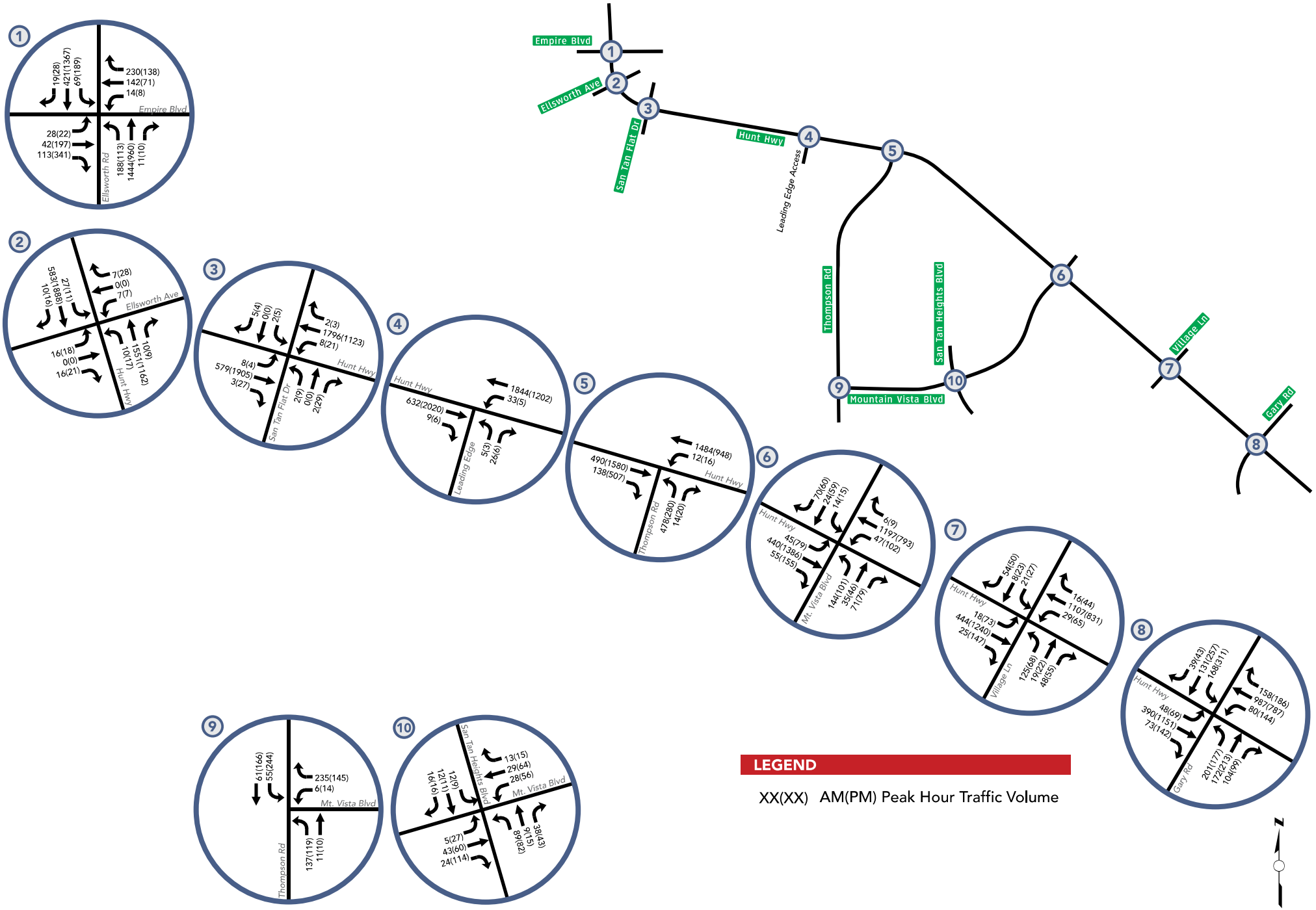


Figure 5: Existing Traffic - Year 2021

C. Existing Intersection Level of Service Analyses

The level of service (LOS) and overall average delay at the existing study area intersections were evaluated using the 2021 intersection volumes and lane geometry. The existing clearance intervals and phasing information for the signalized intersections were obtained from Pinal County and the Town of Queen Creek and utilized to prepare the traffic model. Vistro software, employing the methodologies as presented in the Highway Capacity Manual, was utilized for the capacity analyses to obtain the levels of service. Vistro output reports are included in *Appendix B: Capacity Analyses*. The results of the existing levels of service analysis are presented in *Table 1: Existing Conditions Intersection Levels of Service*.

Table 1: Existing Conditions Intersection Levels of Service

Intersection Location	NB LOS				SB LOS				EB LOS				WB LOS				Overall Intersection
	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot	AvgDelay/ LOS
Ellsworth Road/Empire Boulevard– Signalized																	
AM Peak Hour	E	B	B	**C**	E	B	B	**C**	D	D	E	**D**	D	E	E	**E**	**31.59 C**
PM Peak Hour	E	C	C	**C**	E	C	B	**D**	D	D	E	**E**	D	D	D	**D**	**39.38 D**
Hunt Highway/Ellsworth Avenue – Signalized																	
AM Peak Hour	A	C	A	**C**	B	B	A	**B**	D	D	D	**D**	D	D	D	**D**	**19.25 D**
PM Peak Hour	C	B	A	**B**	A	D	A	**D**	D	D	D	**D**	D	D	D	**D**	**29.34 C**
Hunt Highway/San Tan Flat Drive - Signalized																	
AM Peak Hour	D	D	D	**D**	D	E	E	**D**	E	A	A	**A**	E	B	A	**B**	**10.74 B**
PM Peak Hour	D	D	D	**D**	D	D	D	**D**	A	B	A	**B**	B	A	A	**A**	**15.28 B**
Hunt Highway/Leading Edge Access – Signalized																	
AM Peak Hour	D	-	D	**D**	-	-	-	**-**	-	A	A	**A**	A	A	-	**A**	**4.63 A**
PM Peak Hour	D	-	D	**D**	-	-	-	**-**	-	A	A	**A**	A	A	-	**A**	**6.83 A**
Hunt Highway/Thompson Road – Signalized																	
AM Peak Hour	D	-	C	**D**	-	-	-	**-**	-	A	A	**A**	A	A	-	**A**	**14.78 B**
PM Peak Hour	D	-	D	**D**	-	-	-	**-**	-	B	B	**B**	B	A	-	**A**	**16.71 B**
Hunt Highway/Mountain Vista Boulevard – Signalized																	
AM Peak Hour	D	D	D	**D**	C	E	E	**D**	B	B	B	**B**	A	B	A	**B**	**19.61 B**
PM Peak Hour	D	D	D	**D**	C	E	E	**D**	A	B	B	**B**	B	B	A	**B**	**20.17 C**
Hunt Highway/Village Lane – Signalized																	
AM Peak Hour	D	D	D	**D**	D	D	D	**D**	A	A	A	**A**	A	B	A	**B**	**15.01 B**
PM Peak Hour	D	D	D	**D**	D	D	D	**D**	A	B	A	**B**	A	A	A	**A**	**13.28 B**
Hunt Highway/Gary Road - Signalized																	
AM Peak Hour	D	D	E	**D**	D	D	D	**D**	B	B	B	**B**	A	B	B	**B**	**27.35 C**
PM Peak Hour	E	E	E	**E**	E	D	D	**D**	B	C	B	**C**	C	B	B	**B**	**32.22 C**
Thompson Road/Mountain Vista Boulevard – One-way Stop-Controlled																	
AM Peak Hour	-	A	A	**A**	A	A	-	**A**	-	-	-	**-**	B	-	B	**B**	**10.77 B**
PM Peak Hour	-	A	A	**A**	A	A	-	**A**	-	-	-	**-**	C	-	A	**B**	**18.88 C**
San Tan Heights Boulevard/Mountain Vista Boulevard – Two-way Stop-Controlled																	
AM Peak Hour	A	A	A	**A**	A	A	A	**A**	B	B	A	**B**	B	B	A	**B**	**11.89 B**
PM Peak Hour	A	A	A	**A**	A	A	A	**A**	B	B	A	**B**	B	B	A	**B**	**12.42 B**

*Per HCM, overall LOS letter grade not assigned for two-way stop-controlled intersections. Average delay and LOS letter grade shown is for the worst-case movement (as indicated by underline).

The signalized study area intersections operate at level of service (LOS) D or better in the AM and PM peak hours in the existing year 2021.

All movements at the stop-controlled intersections operate at LOS C or better in the AM and PM peak hours in the existing year 2021.

D. Crash Data

The most recent three years of available crash data (1/1/2018 – 12/31/2020) for the study area intersections on Hunt Highway and Ellsworth Road/Empire Boulevard were obtained from the Arizona Department of Transportation (ADOT) Arizona Crash Information System (ACIS). The detailed reports, including collision manner and injury severity, as provided by the ADOT ACIS are provided in *Appendix D: Crash Data*. A summary of the crash data is provided below.

Note: Crash reports on Hunt Highway at the intersection of Hunt Highway/San Tan Flat Drive and Hunt Highway/Leading Edge Access were not available or are filed under an unknown location for the queried period.

D.1. Crashes by Year

Table 2: Crashes by Year summarizes the total number of crashes at the study intersections for each year of the three-year analysis period. As shown, a total of 52 crashes were reported at the intersection of Ellsworth Road/Empire Boulevard; a total of 9 crashes were reported at the intersection of Hunt Highway/Ellsworth Avenue; a total of 21 crashes were reported at the intersection of Hunt Highway/Thompson Road; a total of 32 crashes were reported at the intersection of Hunt Highway/Mountain Vista Boulevard; a total of 26 crashes were reported at the intersection of Hunt Highway/Village Lane; and a total of 59 crashes were reported at the intersection of Hunt Highway/Gary Road during the analysis period.

Table 2: Crashes by Year

Intersection	2018	2019	2020	Total Crashes
Ellsworth Road & Empire Boulevard	20	17	15	52
Hunt Highway & Ellsworth Avenue	2	4	3	9
Hunt Highway & Thompson Road	10	4	7	21
Hunt Highway & Mountain Vista Blvd	7	12	13	32
Hunt Highway & Village Lane	11	6	9	26
Hunt Highway & Gary Road	24	27	8	59

D.2. Crashes by Type

Table 3: Crashes by Type summarizes the total number of crashes at the intersection by type over the three year period. Crash type categories include Rear End, Left Turn, Angle (front to side, other than left turn), and Other. "Other" crashes include Sideswipe (Same Direction and Opposite Direction), Head on, Single Vehicle.

TABLE 3: CRASHES BY TYPE

Intersection	Rear End	Left Turn	Angle	Other	Total Crashes
Ellsworth Road & Empire Boulevard	31	3	5	13	52
Hunt Highway & Ellsworth Avenue	6	1	1	1	9
Hunt Highway & Thompson Road	14	2	2	3	21
Hunt Highway & Mountain Vista Blvd	20	2	2	8	32
Hunt Highway & Village Lane	16	4	2	4	26
Hunt Highway & Gary Road	25	11	12	11	59

D.3. CRASHES BY SEVERITY

Table 4: Crashes by Severity summarizes the total number of crashes at the intersection by severity over the three year period. Crash severity is determined by the reporting officer at the time of the crash or soon thereafter based on the most severe injury sustained by an involved party. Crashes are ranked from most severe (Fatal) to least severe (No Injury).

TABLE 4: CRASHES BY SEVERITY

Intersection	A	B	C	D	E	Total Crashes
Ellsworth Road & Empire Boulevard	0	0	4	4	44	52
Hunt Highway & Ellsworth Avenue	0	0	2	3	4	9
Hunt Highway & Thompson Road	0	1	1	3	16	21
Hunt Highway & Mountain Vista Blvd	0	1	7	4	20	32
Hunt Highway & Village Lane	0	0	3	5	18	26
Hunt Highway & Gary Road	0	4	6	5	44	59

A=Fatal B=Suspected Serious Injury C=Suspected Minor Injury D=Possible Injury E=No Injury

Ellsworth Road & Empire Boulevard: For the most recent 3-year period, a total of 52 crashes were reported at this intersection, 44 of which (85%) were non-injury crashes with zero fatalities. The most common crash type was Rear End crashes (60%); this crash type is common at signalized intersections due to the introduction of stops to a traffic stream. The next highest percentage of crash type was Other (25%), which included 7 Sideswipe (Same Direction) crashes, 4 single vehicle crashes which included a rollover, and an unknown incident. Three Left Turn crashes were reported. The Ellsworth Road legs of the intersection have protected left turn phasing. The Empire Boulevard legs of the intersection have protected/permissive left turns. The Empire Boulevard approaches have a positive left-turn offset at the intersection; no sight distance issues on permissive left turn movements are apparent. Overall, based on the reported crashes, no unusual crash patterns or roadway condition issues contributing to excessive crash types or severity can be identified, other than slightly higher numbers of sideswipe crashes possibly due to the curvature of Ellsworth Road approaching Empire Boulevard.

Hunt Highway & Ellsworth Avenue: For the most recent 3-year period, a total of 9 crashes were reported at this intersection, 4 of which (44%) were non-injury crashes with zero fatalities. The most common crash type was Rear End crashes (67%); this crash type is common at signalized intersections due to the introduction of stops to a traffic stream. The remaining crash types had 1 incident each over the 3 year period. Overall, based on the reported crashes, no unusual crash patterns or roadway condition issues contributing to excessive crash types or severity can be identified.

Hunt Highway & Thompson Road: For the most recent 3-year period, a total of 21 crashes were reported at this intersection, 16 of which (76%) were non-injury crashes with zero fatalities. The most common crash type was Rear End crashes (67%); this crash type is common at signalized intersections due to the introduction of stops to a traffic stream. The next highest percentage of crash type was Other (14%), which included 2 single-vehicle crashes and 1 Sideswipe (Same Direction) crash. Two Left Turn crashes were reported. The northwest-bound leg of Hunt Highway has protected/permissive left turns. This leg has a negative left-turn offset which may present more sight distance conflicts with the ultimate implementation of the northeast leg of Thompson Road and additional southeast-bound left turning vehicles.

Hunt Highway & Mountain Vista Boulevard: For the most recent 3-year period, a total of 32 crashes were reported at this intersection, 20 of which (63%) were non-injury crashes with zero fatalities. The most common crash type was Rear End crashes (63%); this crash type is common at signalized intersections due to the introduction of stops to a traffic stream. The next highest percentage of crash type was Other (25%), which included 4 Sideswipe (Same Direction) crashes, 2 single-vehicle crashes, and a head-on crash. Two Left Turn crashes were reported. The north leg of Mountain Vista Boulevard was recently completed and opened, which may contribute to the slightly higher number of crashes in 2020; however, overall, based on the reported crashes, no unusual crash patterns or roadway condition issues contributing to excessive crash types or severity can be identified.

Hunt Highway & Village Lane: For the most recent 3-year period, a total of 26 crashes were reported at this intersection, 18 of which (69%) were non-injury crashes with zero fatalities. The most common crash type was Rear End crashes (62%); this crash type is common at signalized intersections due to the introduction of stops to a traffic stream. The next highest percentage of crash type was Other (15%), which included 2 Sideswipe (Same Direction) crashes and 2 single-vehicle crashes. Four Left Turn crashes were reported. The Hunt Highway legs have protected/permissive left turns; the Village Lane legs have permissive left turns. A median exists on Village Lane at the intersection which may present sight-distance issues for the permissive left turns.

Hunt Highway & Gary Road: For the most recent 3-year period, a total of 59 crashes were reported at this intersection, 44 of which (75%) were non-injury crashes with zero fatalities. The most common crash type was Rear End crashes (42%); this crash type is

common at signalized intersections due to the introduction of stops to a traffic stream. The next highest percentage of crash type was Angle (20%). Eleven Left Turn crashes were reported. The Gary Road legs of the intersection have protected left turn phasing. The Hunt Highway legs of the intersection have protected/permissive left turns. The Hunt Highway approaches have a minor negative left-turn offset at the intersection, which may present sight distance issues on permissive left turn movements and be the reason for the number of Left Turn crashes. Geometric improvements on Hunt Highway, including pulling the medians back from the intersection and restriping the left turns to provide a positive offset may help improve this situation. Implementing protected-only phasing for Hunt highway left turns is another alternative that could potentially reduce the frequency of Left Turn crashes.

V. BACKGROUND CONDITIONS

A. PROJECTED BACKGROUND TRAFFIC

"Non-site/No-build" or "background" traffic volumes representing the amount of traffic estimated to be on the area roadway network within the study area without the proposed development are projected for the horizon years - opening year of the Development (year 2023), full build out (year 2026), and 10-years after full build out (year 2036). The yearly ambient growth rates coupled with site traffic volumes from any known proposed developments in the study area are used to determine the background traffic volumes.

Site generated traffic volumes from the planned adjacent private development projects (as described in Section III.C above) are included in the background traffic.

To account for any potential additional ambient growth within the area, compound annual growth rates (CAGR) are applied to the existing traffic volumes. To determine an appropriate CAGR, travel demand model data was requested of and provided by MAG. Based on their 2021 Spring Conformity Runs, nearly flat compound annual growth rates (CAGR) are projected. However, Pinal County indicated several additional adjacent development projects area in various stages of planning within the study area. UCG made a Public Records Request for the TIAs for these developments; however, Pinal County indicated they do not yet have approved TIAs. For the purposes of this TIA, higher compound annual growth rates than those provided by MAG will be utilized. These include:

- 2021 – 2026: 5% CAGR
- 2026 – 2036: 1% CAGR

Figure 6: Background Traffic – Year 2023, Figure 7: Background Traffic – Year 2026, and Figure 8: Background Traffic – Year 2036 present the projected background traffic volumes for the study area for the horizon years of the study.

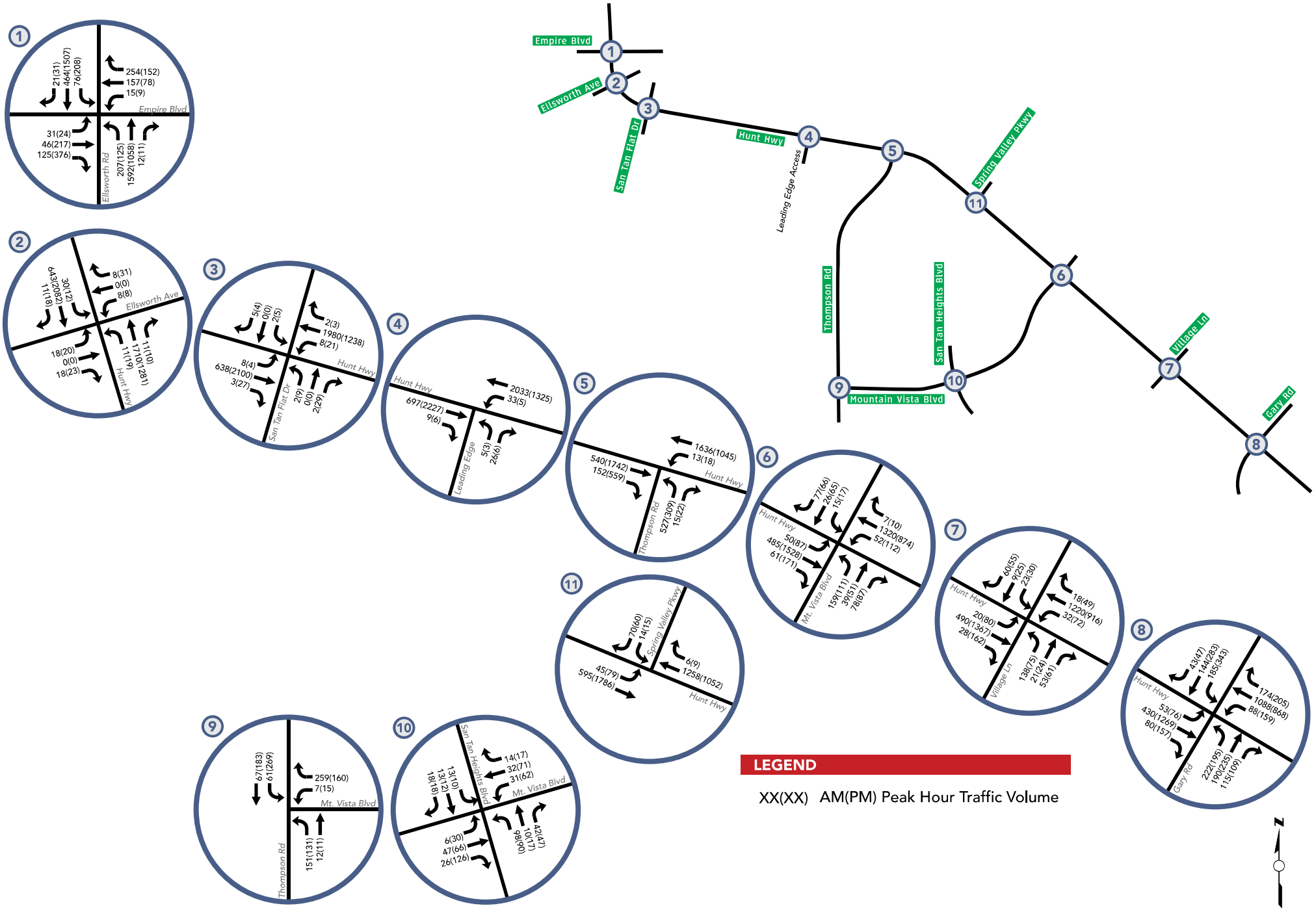


Figure 6: Background Traffic - Year 2023

United Civil Group

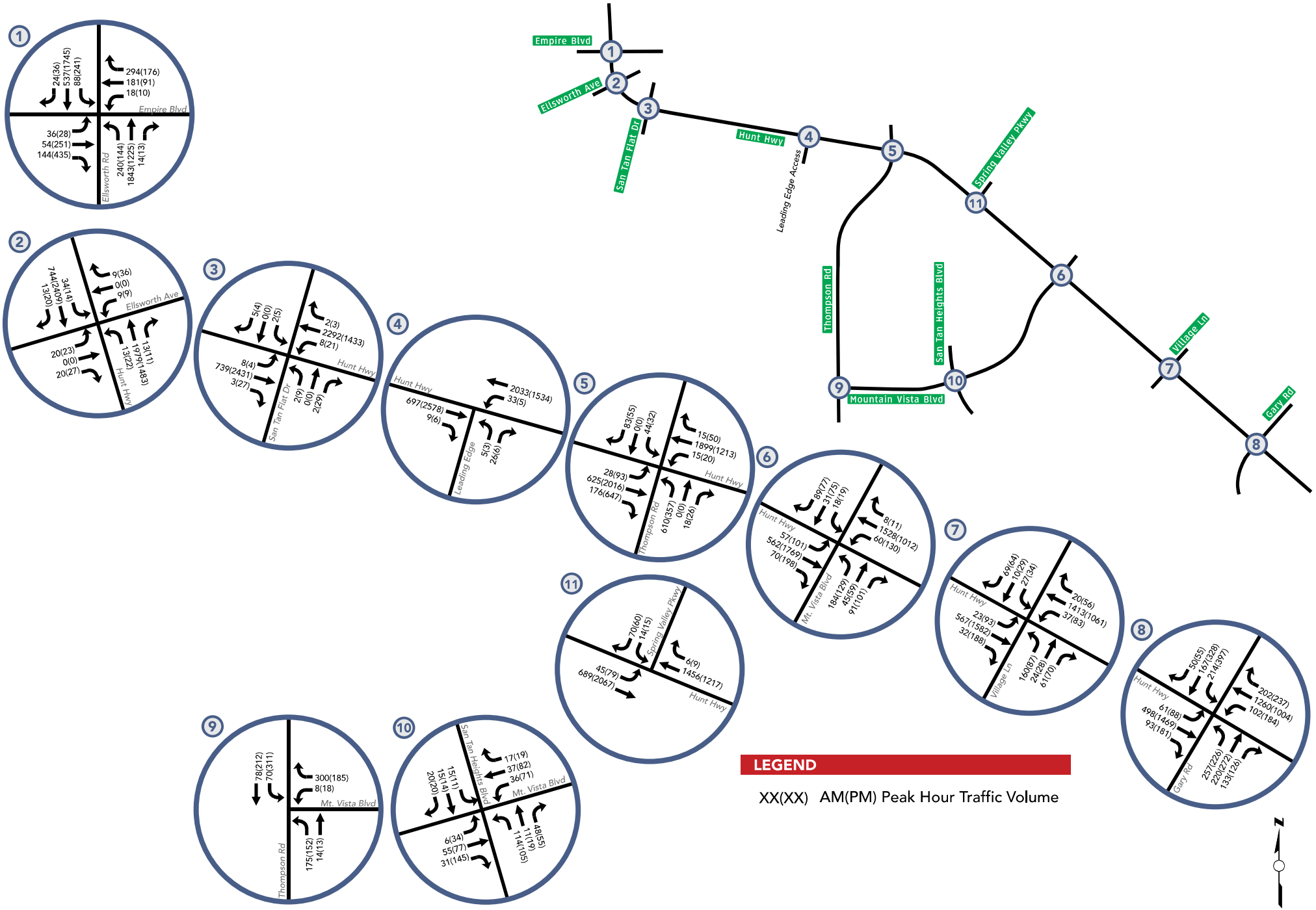


Figure 7: Background Traffic - Year 2026

United Civil Group

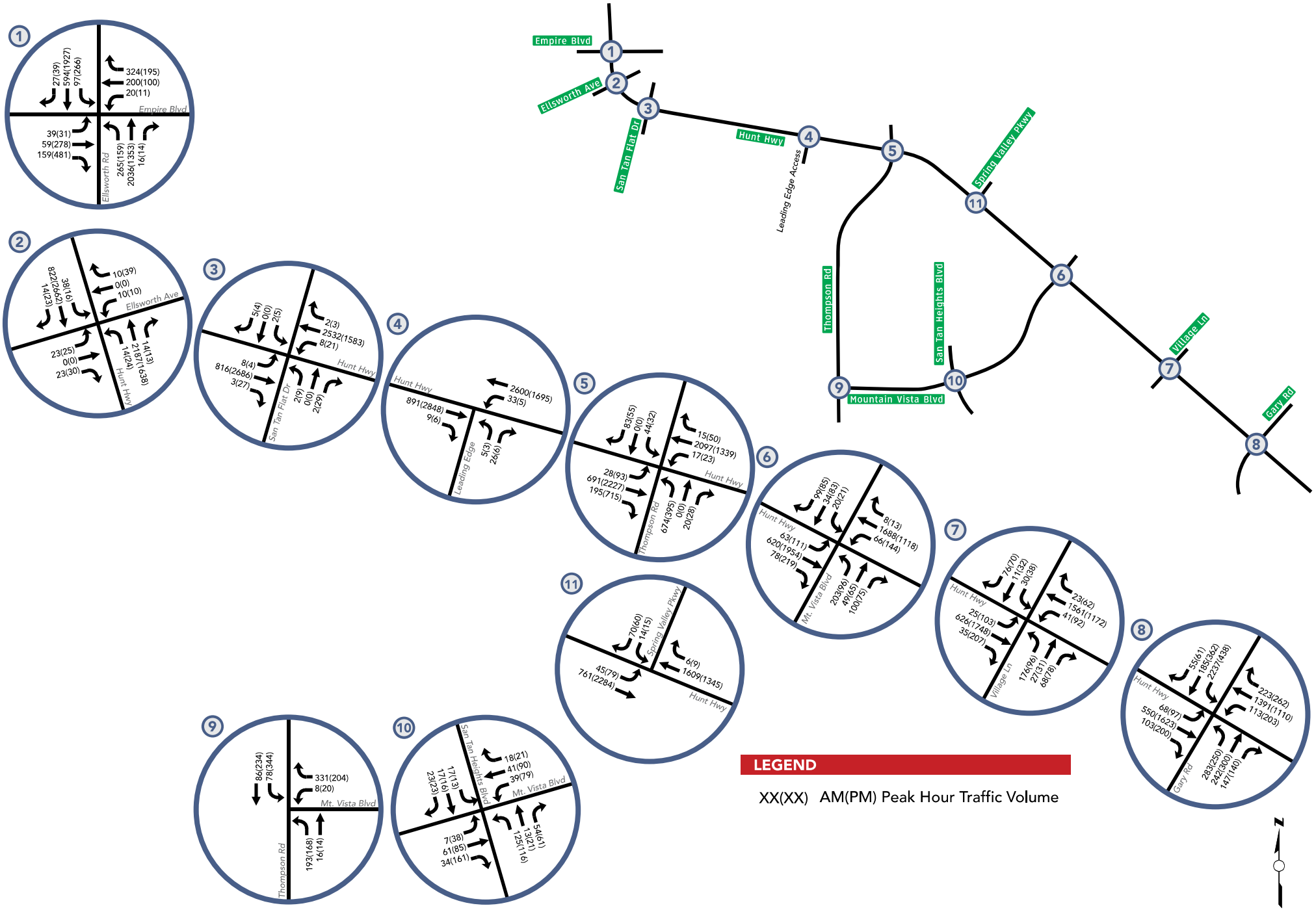


Figure 8: Background Traffic - Year 2036

United Civil Group

B. Intersection Level of Service Analyses – Background Traffic

Capacity analyses at the existing study area intersections were performed for the forecasted background traffic conditions utilizing the background traffic volumes (without the Development, i.e. "no build") and taking into account annual growth, any planned adjacent developments, and roadway improvements to the existing roadway geometries expected to be in place by the horizon years of this study (as described in Section III.C above). *Table 5: 2023 Background Traffic Levels of Service*, *Table 6: 2026 Background Traffic Levels of Service*, and *Table 7: 2036 Background Levels of Service present* the results. Vistro output reports are included in Appendix B.

Table 5: 2023 Background Traffic Levels of Service

Intersection Location	NB LOS				SB LOS				EB LOS				WB LOS				Overall Intersection
	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot	AvgDelay/ LOS
Ellsworth Road/Empire Boulevard– Signalized																	
AM Peak Hour	E	C	C	**C**	E	B	B	**C**	D	D	E	**D**	D	E	E	**E**	33.55 **C**
PM Peak Hour	F	C	C	**C**	F	D	B	**D**	D	D	E	**E**	D	D	D	**D**	44.54 **D**
Hunt Highway/Ellsworth Avenue – Signalized																	
AM Peak Hour	A	C	A	**C**	C	B	A	**B**	D	D	D	**D**	D	D	D	**D**	23.01 **C**
PM Peak Hour	C	B	A	**B**	B	F	A	**E**	D	D	D	**D**	D	D	D	**D**	45.11 **D**
Hunt Highway/San Tan Flat Drive - Signalized																	
AM Peak Hour	D	D	D	**D**	D	E	E	**D**	E	A	A	**A**	E	B	A	**B**	12.90 **B**
PM Peak Hour	D	D	D	**D**	D	D	D	**D**	A	C	A	**C**	C	A	A	**A**	20.97 **C**
Hunt Highway/Leading Edge Access – Signalized																	
AM Peak Hour	D	-	D	**D**	-	-	-	**-**	-	A	A	**A**	A	A	-	**A**	5.33 **A**
PM Peak Hour	D	-	D	**D**	-	-	-	**-**	-	B	A	**A**	B	A	-	**A**	9.40 **A**
Hunt Highway/Thompson Road – Signalized																	
AM Peak Hour	D	-	C	**D**	-	-	-	**-**	-	A	A	**A**	A	B	-	**B**	10.99 **B**
PM Peak Hour	D	-	D	**D**	-	-	-	**-**	-	C	B	**C**	B	B	-	**B**	19.62 **B**
Hunt Highway/Mountain Vista Boulevard – Signalized																	
AM Peak Hour	D	D	D	**D**	C	E	E	**D**	B	B	B	**B**	A	C	B	**B**	21.46 **C**
PM Peak Hour	D	D	D	**D**	C	E	E	**D**	A	C	B	**C**	C	B	B	**B**	22.97 **C**
Hunt Highway/Village Lane – Signalized																	
AM Peak Hour	D	D	D	**D**	D	C	C	**D**	A	B	A	**A**	A	B	A	**B**	16.39 **B**
PM Peak Hour	D	D	D	**D**	D	D	D	**D**	A	B	A	**B**	A	B	A	**B**	14.63 **B**
Hunt Highway/Gary Road - Signalized																	
AM Peak Hour	D	D	E	**D**	D	D	D	**D**	B	B	B	**B**	A	B	B	**B**	28.28 **C**
PM Peak Hour	E	E	E	**E**	E	D	D	**D**	B	C	B	**C**	C	C	B	**C**	35.51 **D**
Thompson Road/Mountain Vista Boulevard – One-way Stop-Controlled																	
AM Peak Hour	-	A	A	**A**	A	A	-	**A**	-	-	-	**-**	B	-	B	**B**	11.08 **B**
PM Peak Hour	-	A	A	**A**	A	A	-	**A**	-	-	-	**-**	C	-	A	**B**	21.30 **C**
San Tan Heights Boulevard/Mountain Vista Boulevard – Two-way Stop-Controlled																	
AM Peak Hour	A	A	A	**A**	A	A	A	**A**	B	B	A	**B**	B	B	A	**B**	12.37 **B**
PM Peak Hour	A	A	A	**A**	A	A	A	**A**	B	B	A	**B**	C	B	A	**B**	15.10 **C**
Spring Valley Parkway/Hunt Highway – Signalized																	
AM Peak Hour	-	-	-	**-**	D	-	D	**D**	A	A	-	**A**	-	B	A	**B**	10.62 **B**
PM Peak Hour	-	-	-	**-**	D	-	E	**D**	A	B	-	**B**	-	A	A	**A**	12.07 **B**

*Per HCM, overall LOS letter grade not assigned for two-way stop-controlled intersections. Average delay and LOS letter grade shown is for the worst-case movement (as indicated by underline).

TABLE 6: 2026 BACKGROUND TRAFFIC LEVELS OF SERVICE

Intersection Location	NB LOS				SB LOS				EB LOS				WB LOS				Overall Intersection
	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot	AvgDelay/ LOS
Ellsworth Road/Empire Boulevard– Signalized																	
AM Peak Hour	E	C	C	**C**	F	C	B	**C**	D	D	E	**D**	D	E	E	**E**	37.23 **D**
PM Peak Hour	F	C	D	**D**	F	F	C	**F**	D	D	F	**E**	D	D	E	**D**	65.16 **E**
Hunt Highway/Ellsworth Avenue – Signalized																	
AM Peak Hour	A	F	A	**D**	C	B	A	**B**	D	D	D	**D**	D	D	D	**D**	39.63 **D**
PM Peak Hour	C	C	A	**C**	B	F	A	**F**	D	D	D	**D**	D	D	D	**D**	87.63 **F**
Hunt Highway/San Tan Flat Drive - Signalized																	
AM Peak Hour	D	D	D	**D**	D	E	E	**D**	E	A	A	**A**	E	C	A	**C**	24.17 **C**
PM Peak Hour	D	D	D	**D**	D	D	D	**D**	A	F	A	**E**	C	B	A	**B**	50.33 **D**
Hunt Highway/Leading Edge Access – Signalized																	
AM Peak Hour	D	-	D	**D**	-	-	-	**-**	-	A	A	**A**	A	A	-	**A**	7.65 **A**
PM Peak Hour	D	-	D	**D**	-	-	-	**-**	-	F	A	**D**	C	A	-	**A**	27.26 **C**
Hunt Highway/Thompson Road – Signalized																	
AM Peak Hour	D	A	D	**D**	E	A	E	**E**	C	B	B	**B**	B	F	B	**F**	75.96 **E**
PM Peak Hour	D	A	D	**D**	E	A	E	**E**	B	F	B	**D**	C	B	B	**B**	43.19 **D**
Hunt Highway/Mountain Vista Boulevard – Signalized																	
AM Peak Hour	D	D	D	**D**	C	E	E	**D**	C	B	B	**B**	A	C	B	**C**	26.31 **C**
PM Peak Hour	D	D	D	**D**	C	E	E	**D**	B	F	B	**D**	C	B	B	**B**	36.30 **D**
Hunt Highway/Village Lane – Signalized																	
AM Peak Hour	D	C	C	**D**	D	C	C	**D**	B	B	A	**B**	A	B	A	**B**	19.26 **B**
PM Peak Hour	D	D	D	**D**	D	D	D	**D**	A	B	A	**B**	B	B	A	**B**	17.62 **B**
Hunt Highway/Gary Road - Signalized																	
AM Peak Hour	D	E	E	**E**	E	D	D	**D**	B	B	B	**B**	A	C	B	**C**	30.97 **C**
PM Peak Hour	E	E	E	**E**	E	D	D	**E**	B	F	C	**E**	D	C	C	**C**	50.29 **D**
Thompson Road/Mountain Vista Boulevard – One-way Stop-Controlled																	
AM Peak Hour	-	A	A	**A**	A	A	-	**A**	-	-	-	**-**	B	-	B	**B**	11.65 **B**
PM Peak Hour	-	A	A	**A**	A	A	-	**A**	-	-	-	**-**	D	-	A	**B**	27.08 **D**
San Tan Heights Boulevard/Mountain Vista Boulevard – Two-way Stop-Controlled																	
AM Peak Hour	A	A	A	**A**	A	A	A	**A**	B	B	A	**B**	B	B	A	**B**	13.46 **B**
PM Peak Hour	A	A	A	**A**	A	A	A	**A**	B	B	B	**B**	C	B	A	**B**	17.60 **C**
Spring Valley Parkway/Hunt Highway – Signalized																	
AM Peak Hour	-	-	-	**-**	D	-	D	**D**	A	A	-	**A**	-	B	A	**B**	11.59 **B**
PM Peak Hour	-	-	-	**-**	D	-	D	**D**	A	B	-	**B**	-	B	A	**B**	16.31 **B**

*Per HCM, overall LOS letter grade not assigned for two-way stop-controlled intersections. Average delay and LOS letter grade shown is for the worst-case movement (as indicated by underline).

TABLE 7: 2036 BACKGROUND TRAFFIC LEVELS OF SERVICE

Intersection Location	NB LOS				SB LOS				EB LOS				WB LOS				Overall Intersection
	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot	AvgDelay/ LOS
Ellsworth Road/Empire Boulevard– Signalized																	
AM Peak Hour	E	C	C	**D**	F	C	C	**C**	D	D	E	**D**	D	E	E	**E**	40.99 **D**
PM Peak Hour	F	D	D	**D**	F	F	C	**F**	D	D	F	**E**	D	D	E	**D**	93.65 **F**
Hunt Highway/Ellsworth Avenue – Signalized																	
AM Peak Hour	A	F	A	**F**	C	B	A	**B**	D	D	D	**D**	D	D	D	**D**	66.99 **E**
PM Peak Hour	C	C	A	**C**	B	F	A	**F**	D	D	D	**D**	D	D	D	**D**	123.76 **F**
Hunt Highway/San Tan Flat Drive - Signalized																	
AM Peak Hour	D	D	D	**D**	D	E	E	**D**	E	A	A	**A**	E	F	A	**E**	49.53 **D**
PM Peak Hour	D	D	D	**D**	D	D	D	**D**	A	F	A	**E**	C	B	A	**B**	81.62 **F**
Hunt Highway/Leading Edge Access – Signalized																	
AM Peak Hour	D	-	D	**D**	-	-	-	**-**	-	A	A	**A**	A	B	-	**B**	13.10 **B**
PM Peak Hour	D	-	D	**D**	-	-	-	**-**	-	F	A	**F**	C	A	-	**A**	55.00 **D**
Hunt Highway/Thompson Road – Signalized																	
AM Peak Hour	D	A	C	**D**	E	A	E	**E**	C	C	B	**C**	B	F	B	**F**	112.77 **F**
PM Peak Hour	D	A	D	**D**	D	A	E	**E**	B	F	C	**F**	C	C	B	**C**	70.63 **E**
Hunt Highway/Mountain Vista Boulevard – Signalized																	
AM Peak Hour	D	D	D	**D**	C	E	E	**E**	C	B	B	**B**	A	D	B	**D**	35.03 **D**
PM Peak Hour	D	D	D	**D**	C	E	E	**D**	B	F	B	**E**	D	B	B	**C**	54.43 **D**
Hunt Highway/Village Lane – Signalized																	
AM Peak Hour	D	C	C	**D**	D	C	C	**D**	B	B	B	**B**	A	C	A	**C**	22.37 **C**
PM Peak Hour	D	D	D	**D**	D	D	D	**D**	A	C	A	**C**	C	B	A	**B**	21.37 **C**
Hunt Highway/Gary Road - Signalized																	
AM Peak Hour	E	E	E	**E**	E	D	D	**D**	C	B	B	**B**	B	C	B	**C**	33.87 **C**
PM Peak Hour	E	E	E	**E**	E	D	D	**E**	C	F	C	**F**	D	C	C	**C**	75.32 **E**
Thompson Road/Mountain Vista Boulevard – One-way Stop-Controlled																	
AM Peak Hour	-	A	A	**A**	A	A	-	**A**	-	-	-	**-**	B	-	B	**B**	12.15 **B**
PM Peak Hour	-	A	A	**A**	A	A	-	**A**	-	-	-	**-**	D	-	B	**B**	33.43 **D**
San Tan Heights Boulevard/Mountain Vista Boulevard – Two-way Stop-Controlled																	
AM Peak Hour	A	A	A	**A**	A	A	A	**A**	B	B	A	**B**	B	B	A	**B**	14.42 **B**
PM Peak Hour	A	A	A	**A**	A	A	A	**A**	B	B	B	**B**	C	B	A	**B**	20.38 **C**
Spring Valley Parkway/Hunt Highway – Signalized																	
AM Peak Hour	-	-	-	**-**	D	-	D	**D**	B	A	-	**A**	-	B	A	**B**	12.70 **B**
PM Peak Hour	-	-	-	**-**	D	-	D	**D**	A	F	-	**C**	-	B	A	**B**	26.67 **C**

*Per HCM, overall LOS letter grade not assigned for two-way stop-controlled intersections. Average delay and LOS letter grade shown is for the worst-case movement (as indicated by underline).

As seen above in Table 6 and Table 7, by background year 2026, several of the study area signalized intersections on Hunt Highway begin to operate at LOS E or LOS F in the AM and/or PM peak hours due to the forecasted ambient traffic growth and additional developments in the area. All movements at the existing stop-controlled intersections continue to operate at LOS C or better in the AM and PM peak hours through horizon background year 2036.

Hunt Highway having its ultimate section (3 through lanes in each direction) would provide additional approach lanes at the intersections; the enhanced capacity would improve the forecasted level of service at the intersections from Empire Boulevard to Gary Road through the background year 2036. The full section of Hunt Highway will ultimately be implemented through developer-led improvements as Pinal County's recent Hunt Highway CIP implemented the current section of 2 through lanes in each direction.

VI. PROJECTED SITE TRAFFIC

A. TRIP GENERATION

Estimates of the traffic volumes that will be generated by the planned uses of the Development at full build out were determined from transportation planning data provided in the Institute of Transportation Engineers (ITE) *Trip Generation Manual, 10th Edition, 2017*.

Table 8: Trip Generation presents the estimated daily and peak hour trips generated by the Development for a typical weekday. ITE Land Use Code (LUC) 210 – Single-family Detached Housing, LUC 220 – Multifamily Housing (Low-Rise), and LUC 820 – Shopping Center have been utilized for the individual residential and commercial uses of the Development.

Given the mixture of uses of the development, some interaction between uses may present itself (for example, residents patronizing the commercial) and a certain portion of the site traffic may be captured internally without utilizing the external roadway network. Additionally, the commercial component may attract pass-by trips depending on the end-user(s). However, these are expected to be relatively minor, and as a conservative approach and considering the conceptual nature of the site plan, no reduction percentages are applied to the estimated site trip generation.

TABLE 8: TRIP GENERATION

Land Use	ITE Code	Units	Total Size	Daily	AM Peak			PM Peak		
					In	Out	Total	In	Out	Total
Single-Family Detached Housing	210	DUs	115	1,182	21	64	85	73	43	116
Multifamily Housing (Low-Rise) (Parcel A)	220	DUs	430	3,210	44	147	191	136	80	216
Multifamily Housing (Low-Rise) (Parcel B)	220	DUs	417	3,112	42	143	185	132	78	210
Shopping Center	820	1000s SF	150	7,921	141	86	227	352	382	734
			TOTAL	**15,425**	**248**	**440**	**688**	**693**	**583**	**1,276**

Single-Family Detached Housing – ITE LUC 210		
AM Peak Hour	T = 0.71(X) + 4.80	25% entering, 75% exiting
PM Peak Hour	Ln(T) = 0.96 Ln(X) + 0.20	63% entering, 37% exiting
Daily	Ln(T) = 0.92 Ln(X) + 2.71	50% entering, 50% exiting
Multifamily Housing (Low-Rise) – ITE LUC 220		
AM Peak Hour	Ln(T) = 0.95 Ln(X) - 0.51	23% entering, 77% exiting
PM Peak Hour	Ln(T) = 0.89 Ln(X) - 0.02	63% entering, 37% exiting
Daily	T = 7.56(X) - 40.86	50% entering, 50% exiting
Shopping Center – ITE LUC 820		
AM Peak Hour	T = 0.50(X) + 151.78	62% entering, 38% exiting
PM Peak Hour	Ln(T) = 0.74 Ln(X) + 2.89	48% entering, 52% exiting
Daily	Ln(T) = 0.68 Ln(X) + 5.57	50% entering, 50% exiting

On a typical weekday the proposed development is estimated to generate 688 trips in the AM peak hour, 1,276 trips in the PM peak hour, and 15,425 daily trips.

B. Trip Generation Comparison

The estimated traffic volumes projected to be generated by the Development under its proposed zoning (C-2, MR, and R-7) and conceptual development plan are compared to potential development of the site under its current zoning (C-2). For the trip generation comparison, under the existing C-2 zoning the approximate 100 acre site has been assumed to be developed with commercial/retail/"Shopping Center" uses at a typical and allowable 0.15 FAR. This provides for a potential commercial/shopping center comprising approximately 650,000 square feet. *Table 9: Trip Generation Potential Under Existing Zoning* presents the trip generation potential for the site if developed with allowable commercial uses under its existing C-2 zoning.

Table 9: Trip Generation Potential Under Existing Zoning

Land Use	Units	Size	Daily	AM Peak			PM Peak		
				in	out	total	in	out	total
Shopping Center	1000s SF	650	21,468	296	181	477	1,042	1,129	2,171

Table 10: Trip Generation Comparison presents the difference in estimated site generated traffic volumes between the conceptual plan for the Development under its proposed zoning (as presented in Table 8) and the potential commercial development under its existing zoning (as presented in Table 9).

Table 10: Trip Generation Comparison

Land Use	Daily	AM Peak			PM Peak		
		In	Out	Total	In	Out	Total
The Development under proposed zoning (C-2, MR, and R-7)	15,425	248	440	688	693	583	1,276
Potential Commercial use under existing zoning (C-2)	21,468	296	181	477	1,042	1,129	2,171
Total Difference	-6,043			+211			-895
Percent Difference	-28%			+44%			-41%

As shown above in Table 10, the Development under the proposed zoning is forecasted to generate 6,043 fewer daily trips than potential commercial development under the existing zoning.

C. Trip Distribution and Assignment

The trip distribution and assignment procedures determine the general pattern of travel for vehicles entering and leaving the subject site and the study area. For a development of this type, overall distribution is mainly based on the type of land uses of the development; the location of the site within the county; the connectivity of the site to the major roadway corridors of the area; the location of employment, commercial uses, and schools; and from the collected existing traffic data trends.

Differences are expected in the trip distribution patterns of each component of the site (residential vs commercial). For the residential components, distribution and assignment is generally based on the roadway connectivity to Hunt Highway and Ellsworth Road and based on the collected existing traffic volumes at the nearby intersections. For the commercial component, per discussions with the developer/owner the commercial uses will generally be "neighborhood"-style uses, which is assumed to serve mainly the residential areas close by and generally have a "market area" within approximately 3 miles of the site. The assumed trip distribution percentages for the development are shown in *Table 11: Trip Distribution Percentages*.

Table 11: Trip Distribution Percentages

Direction	Trip Distribution Arriving From and Departing To
Residential Components	
Ellsworth Road north of Empire Blvd	55%
Hunt Highway south of Gary Road	20%
Empire Road west of Ellsworth Road	10%
Gary Road north of Hunt Highway	5%
San Tan Heights Blvd south of Mountain Vista Boulevard	5%
Thompson Road south of Mountain Vista Boulevard	3%
Empire Boulevard east of Ellsworth Road	1%
Leading Edge Access south of Hunt Highway	1%
Commercial Component	
Spring Valley Parkway north of Hunt Highway	15%
Ellsworth Road north of Empire Blvd	13%
Mountain Vista Blvd north of Hunt Highway	10%
San Tan Heights Blvd south of Mountain Vista Blvd	10%
Gary Road north of Hunt Highway	10%
Village Lane north of Hunt Highway	10%
Thompson Road north of Hunt Highway	10%
Gary Road south of Hunt Highway	5%
Thompson Road south of Mountain Vista Blvd	5%
Hunt Highway south of Gary Road	5%
Empire Blvd west of Ellsworth Road	4%
Ellsworth Ave south of Hunt Highway	2%
Empire Boulevard east of Ellsworth Road	1%

Figure 9: Site Generated – Opening Year 2023 (Existing Intersections) and *Figure 10: Site Generated – Opening Year 2023 (Site Accesses)* present the assigned site

generated traffic to and from the site upon the initial opening of the site – the multifamily component of Parcel A.

Figure 11: Site Generated Traffic – Full Build Out (Existing Intersections) and *Figure 12: Site Generated Traffic – Full Build Out (Site Accesses)* present the assigned site generated traffic to and from the site upon full build out.

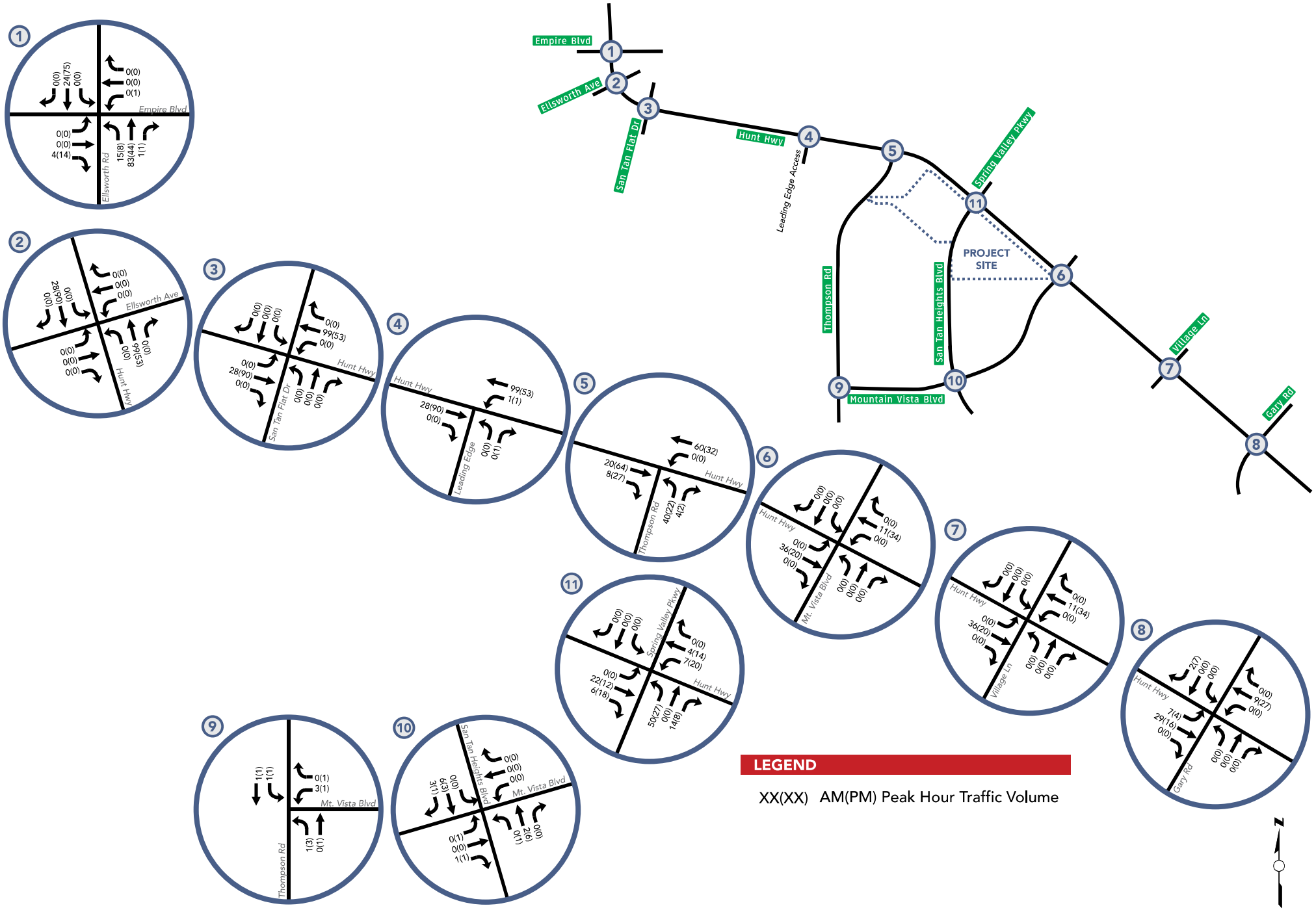
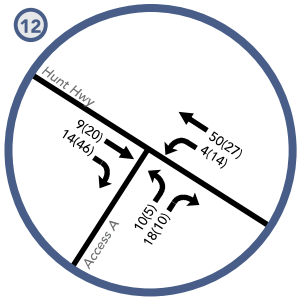
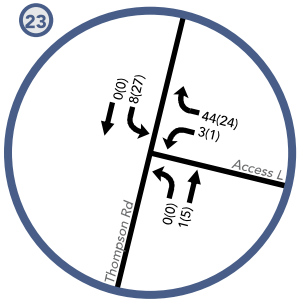
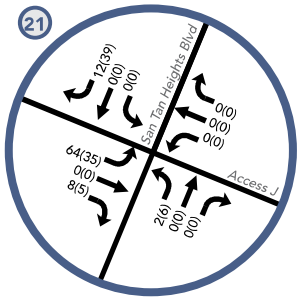
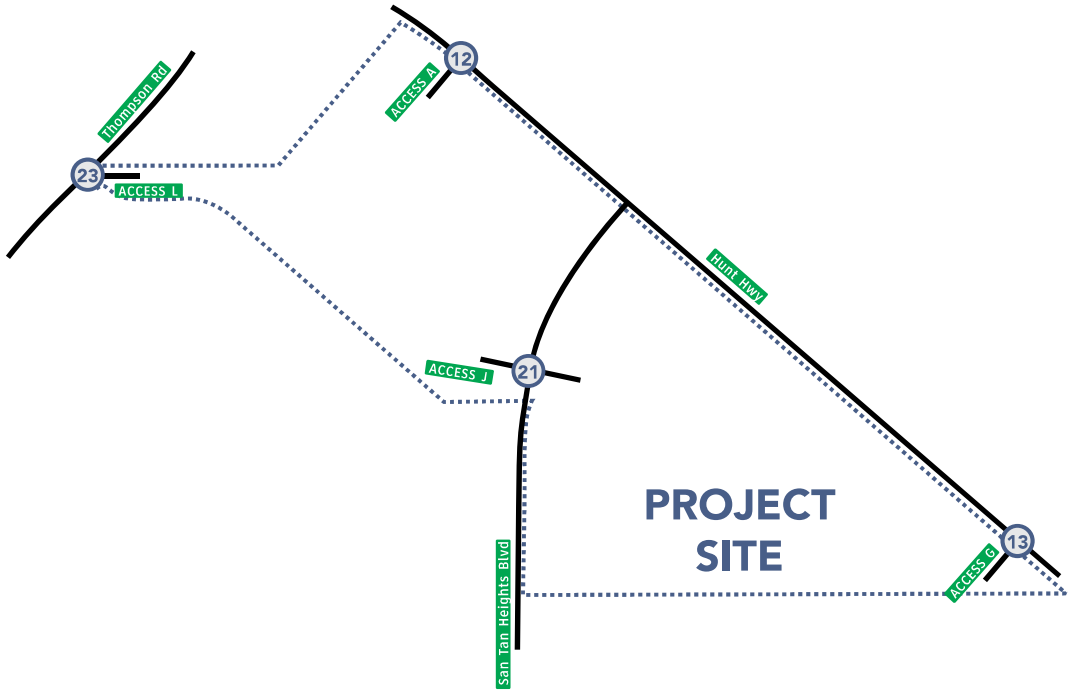


Figure 9: Site Generated Traffic - Opening Year 2023 (Existing Intersections)









LEGEND

XX(XX) AM(PM) Peak Hour Traffic Volume

not to scale

United Civil Group

Figure 10: Site Generated Traffic - Opening Year 2023 (Site Accesses)

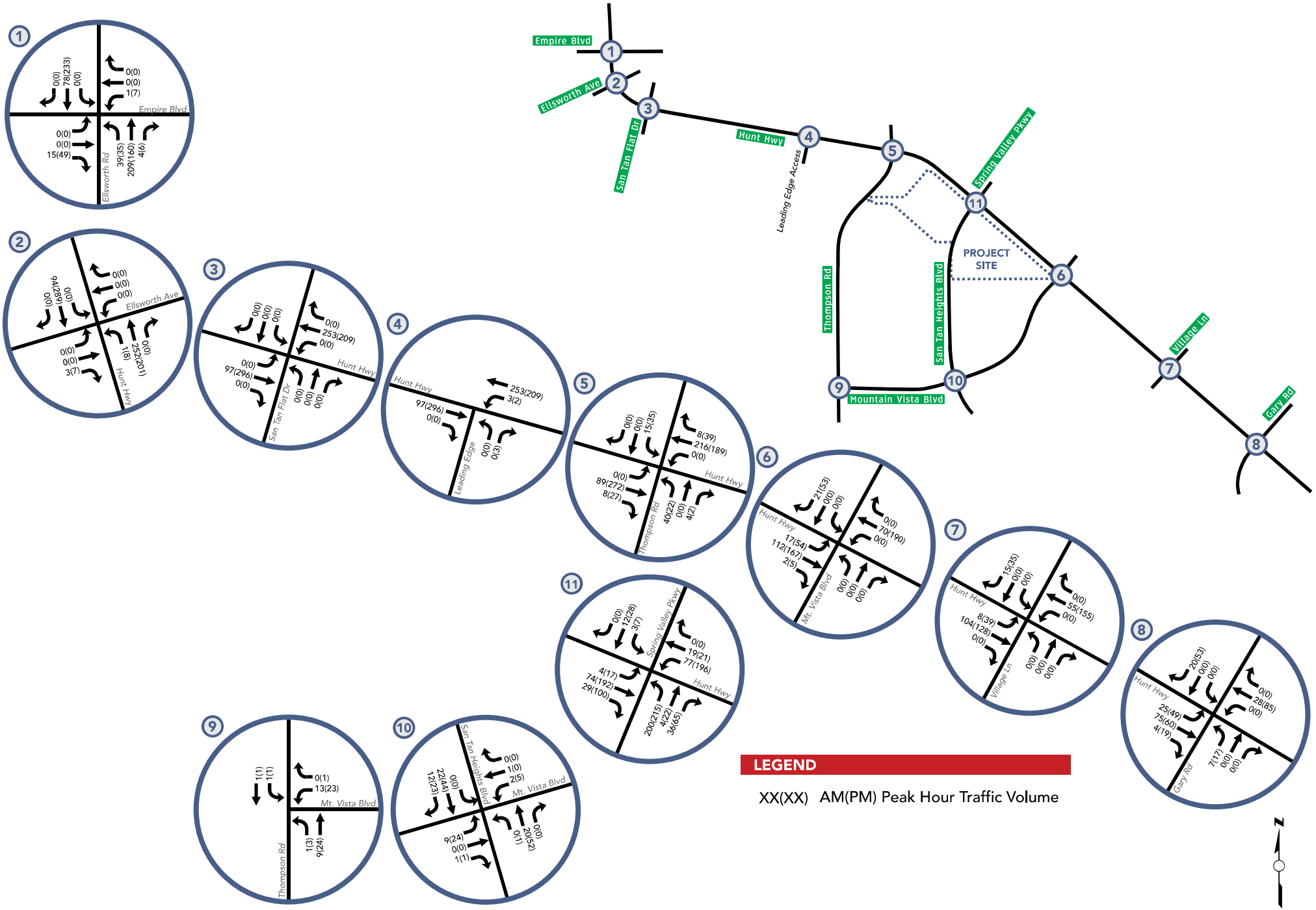


Figure 11: Site Generated Traffic - Full Build Out (Existing Intersections)

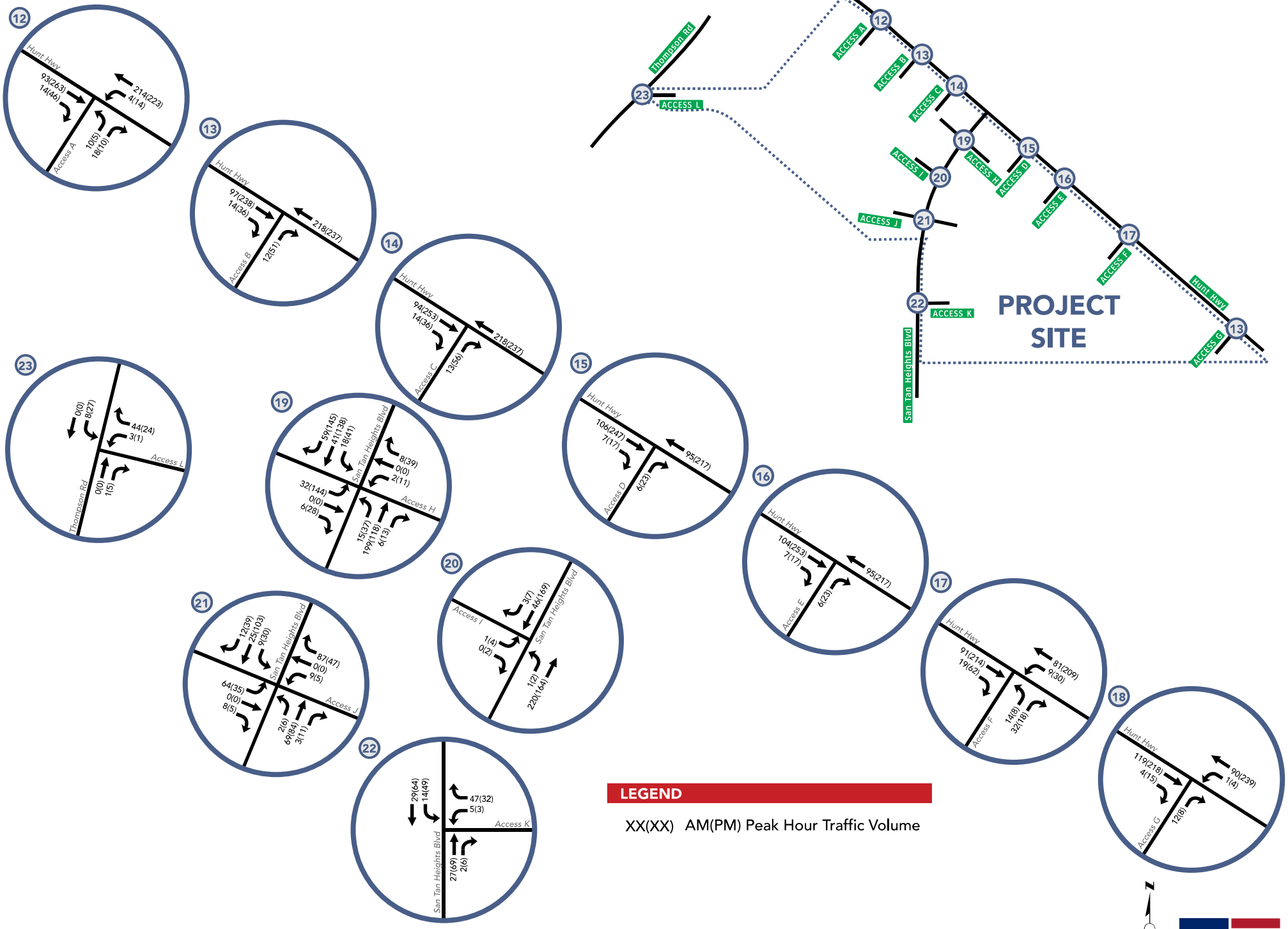


Figure 12: Site Generated Traffic - Full Build Out (Site Accesses)

VII. TOTAL TRAFFIC CONDITIONS AND ANALYSIS

The purpose of this section is to forecast the estimated total traffic volumes in the study horizon years of 2023 (opening year), 2026 (assumed full build out), and 2036 (10-year horizon after full build out); identify needs pertaining to progressive traffic flow and safety; and identify roadway improvement recommendations or alternatives for further consideration, where applicable.

A. TOTAL TRAFFIC VOLUMES

Total traffic projections for the horizon years of the development were determined by adding the proposed development's site generated traffic to the forecasted horizon background traffic volumes. The total traffic volumes for the opening year 2023, full build out year 2026, and 10-year horizon year after full build out (2036) are presented in Figure 13 through Figure 18.

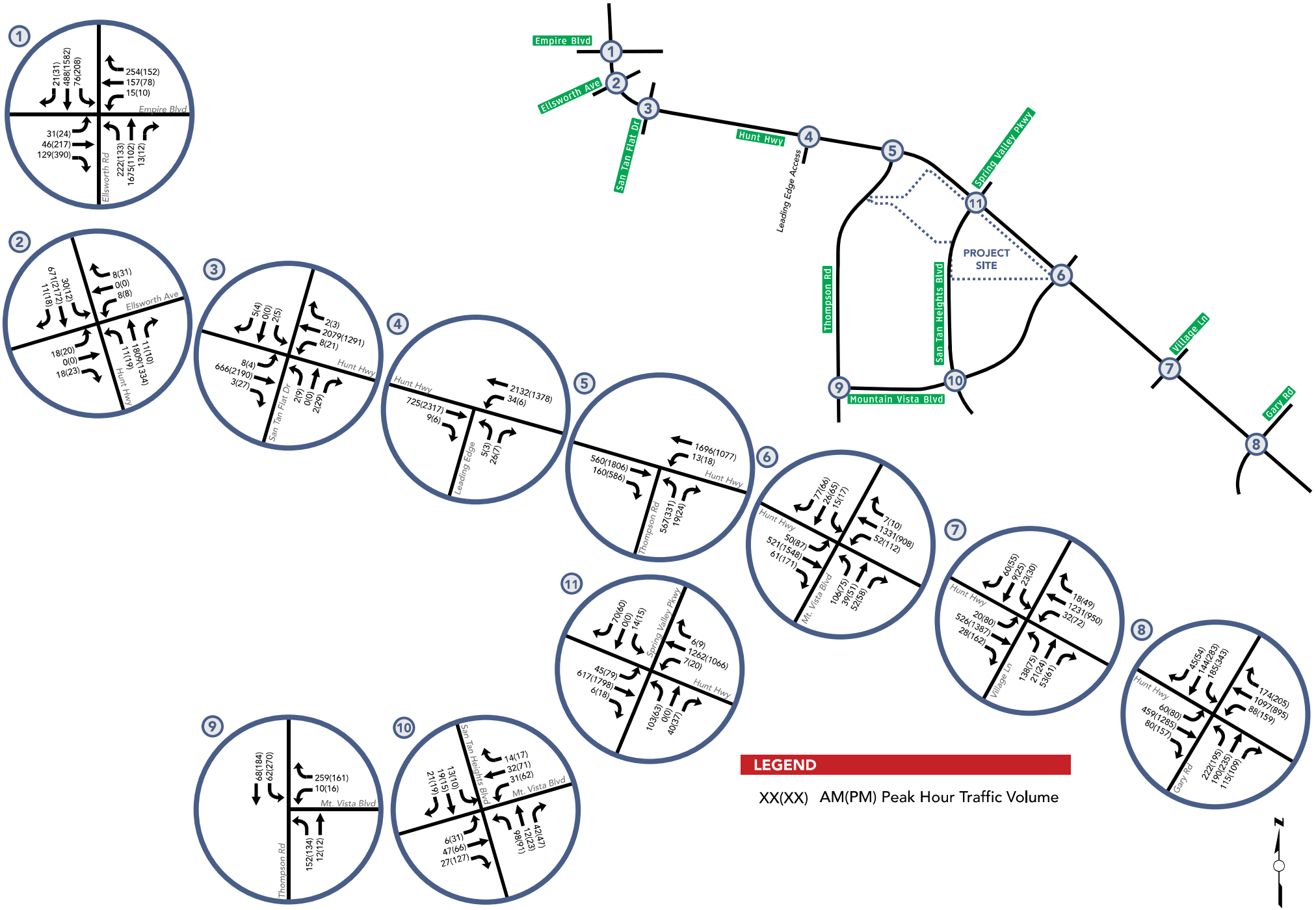
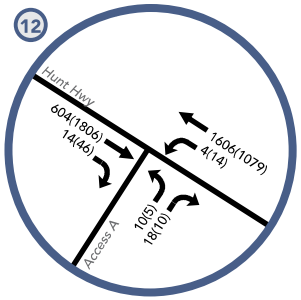
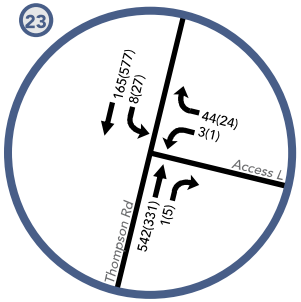
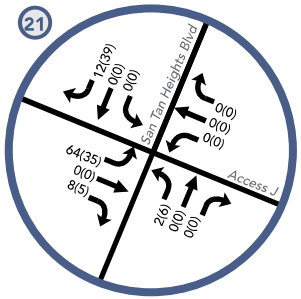


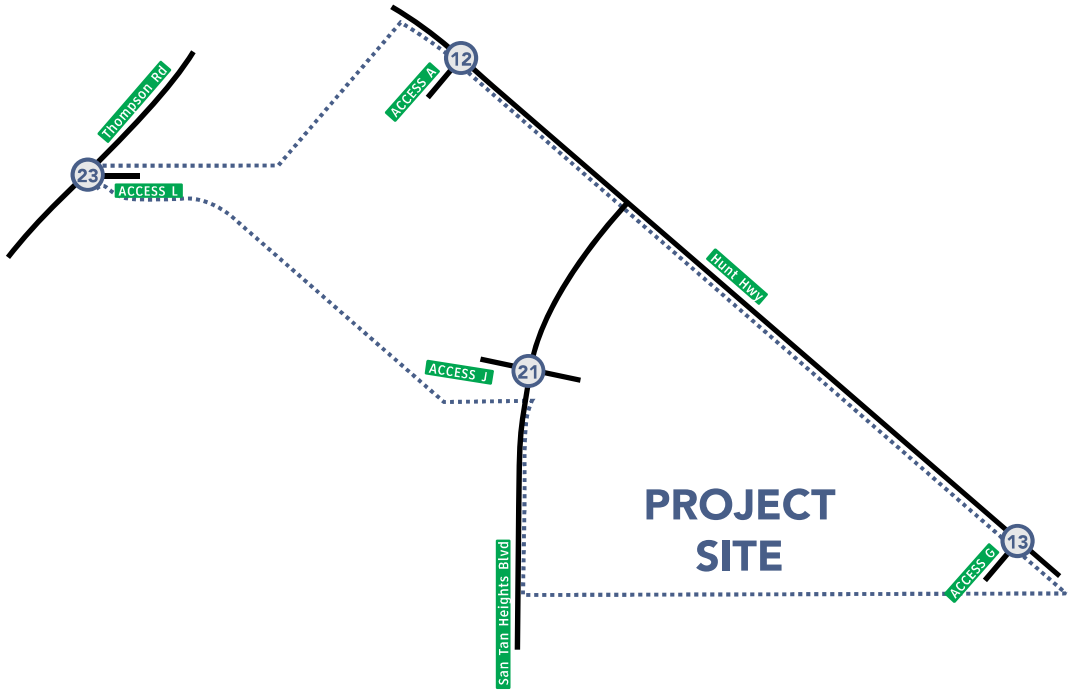
Figure 13: Total Traffic - Year 2023 (Existing Intersections)

United Civil Group









LEGEND

XX(XX) AM(PM) Peak Hour Traffic Volume

not to scale

United Civil Group

Figure 14: Total Traffic - Year 2023 (Site Accesses)

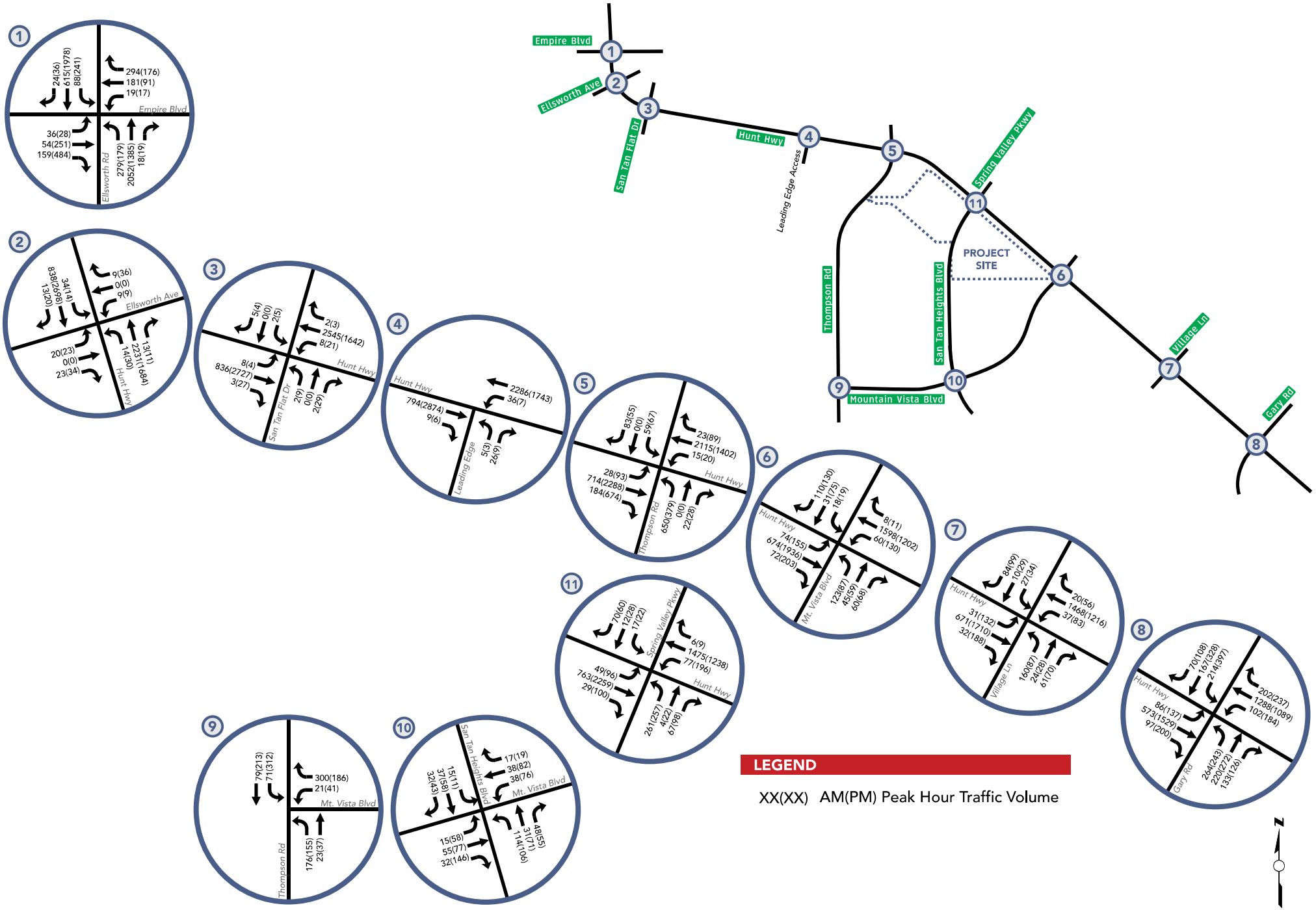


Figure 15: Total Traffic - Full Build Out Year 2026 (Existing Intersections)

United Civil Group

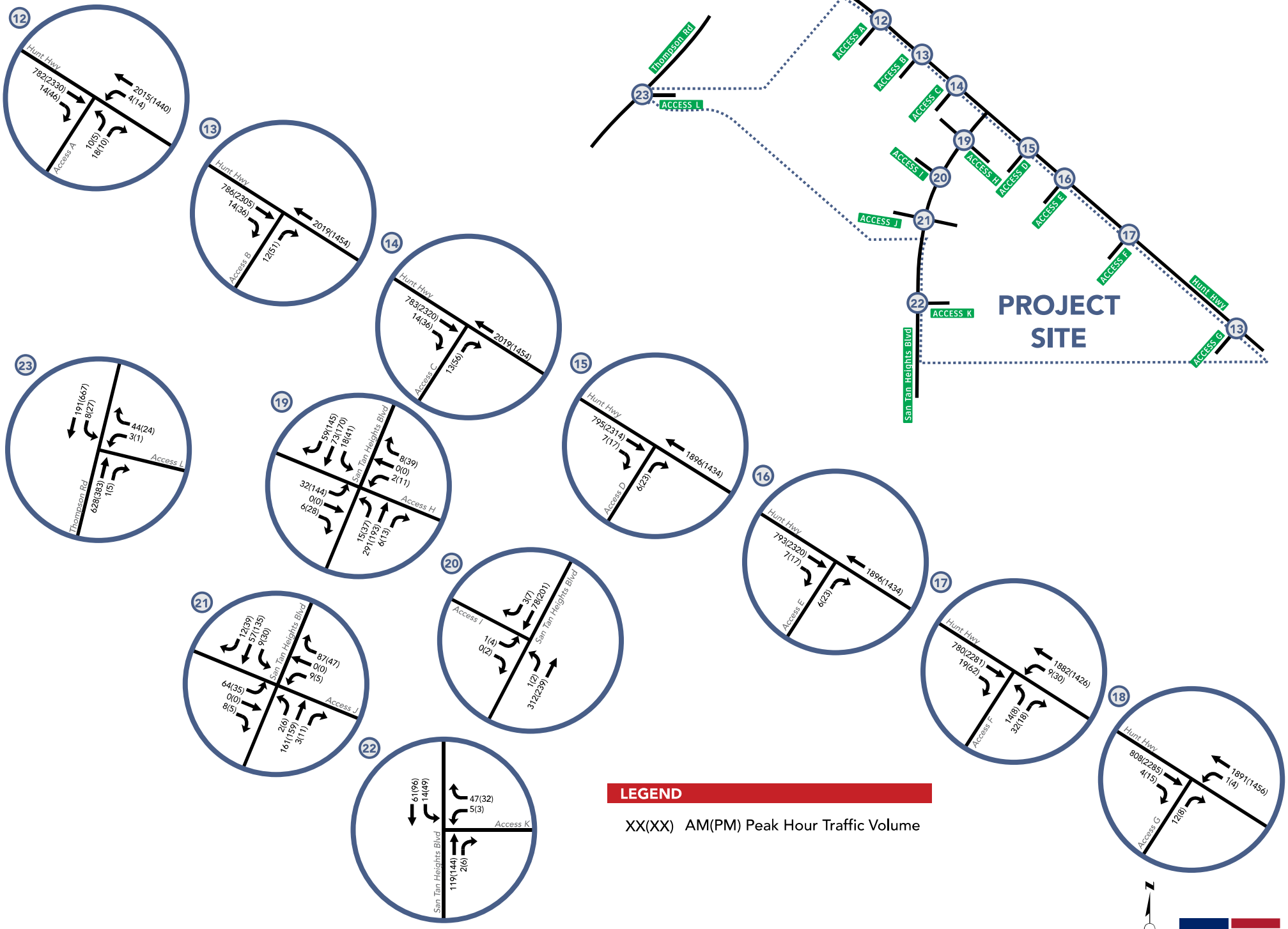


Figure 16: Total Traffic - Full Build Out Year 2026 (Site Accesses)

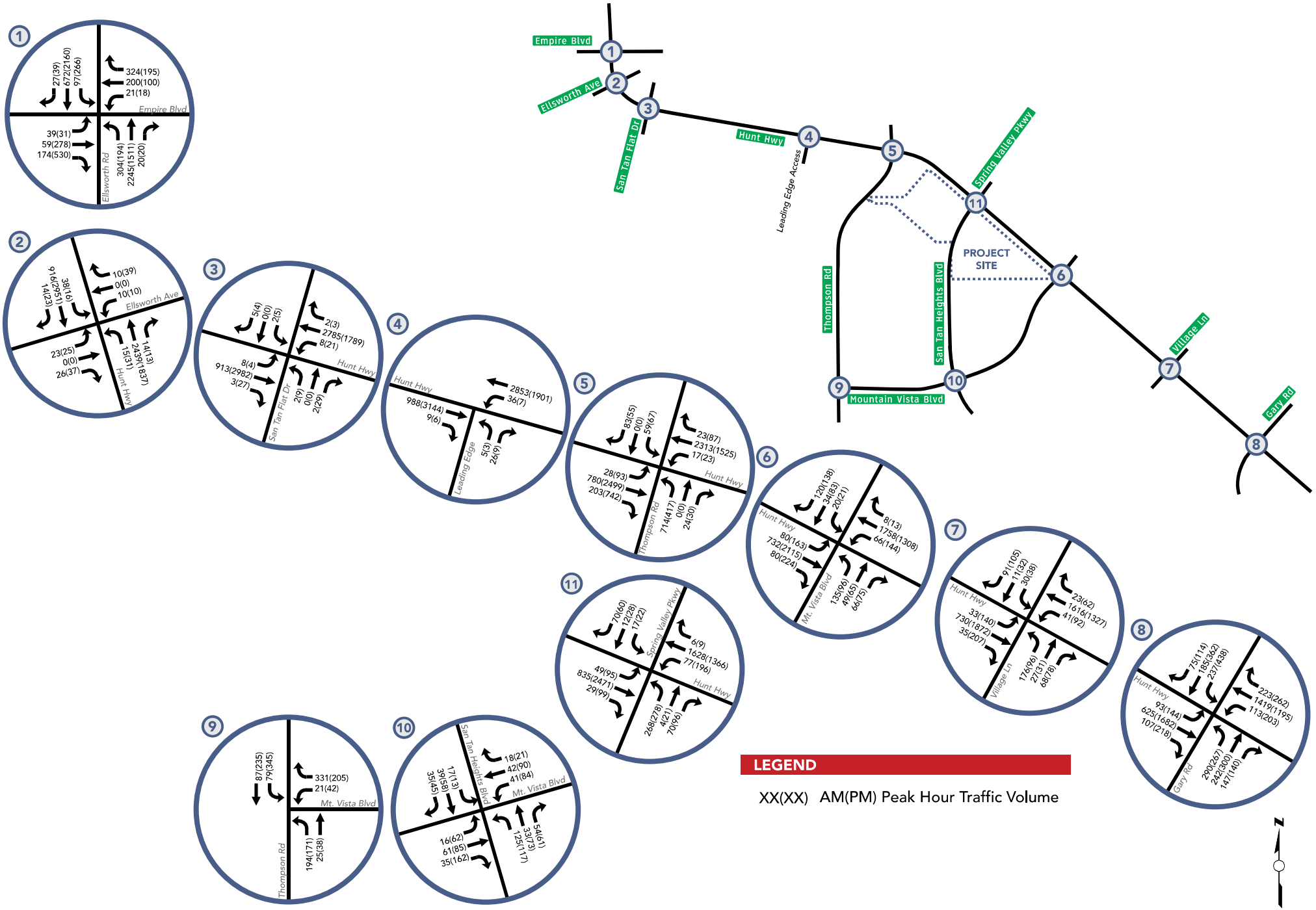


Figure 17: Total Traffic - Year 2036 (Existing Intersections)

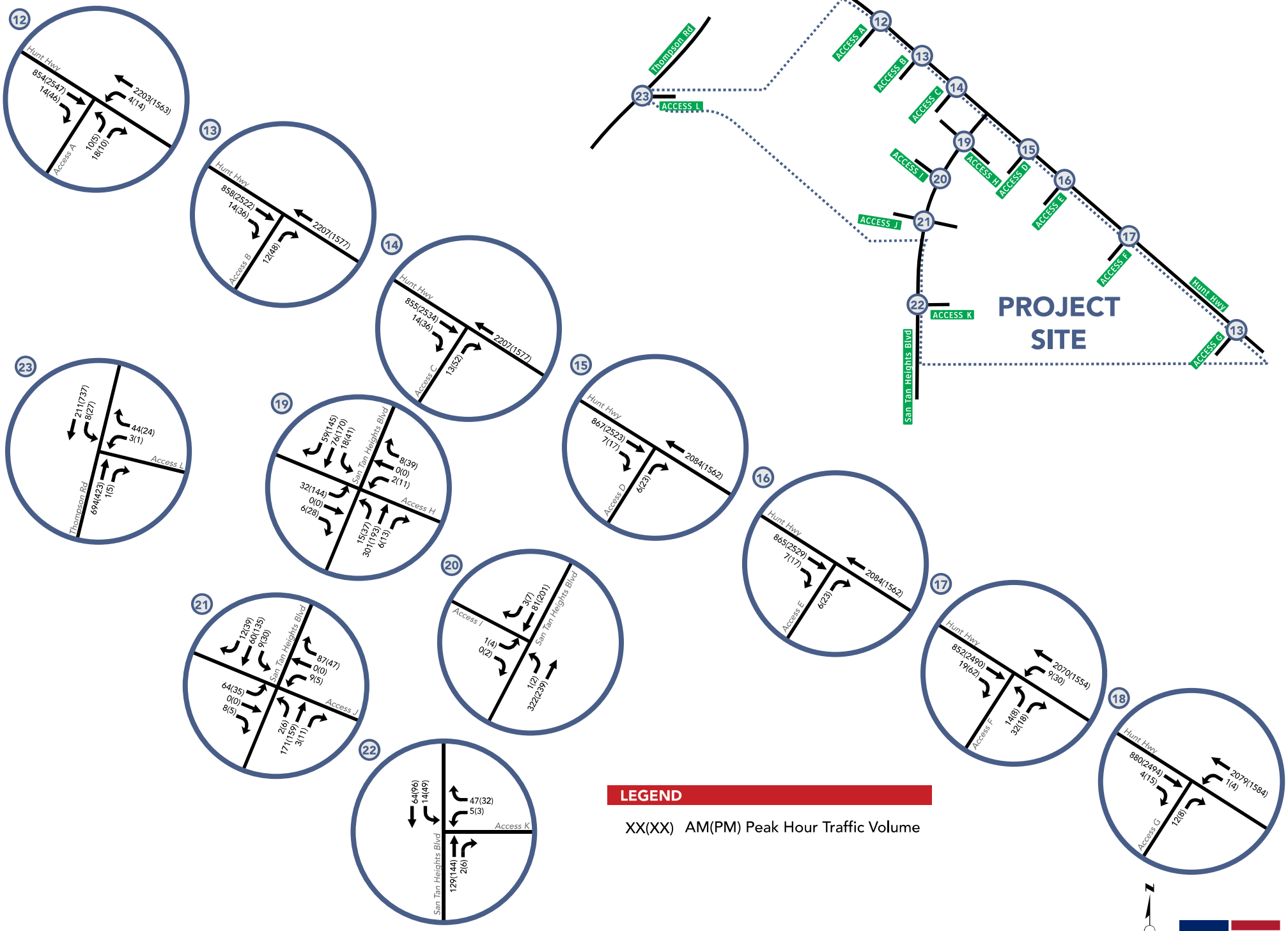


Figure 18: Total Traffic - Year 2036 (Site Accesses)

B. Roadway Improvements

Through the study area, Hunt Highway is classified as a Major Arterial and Regionally Significant Route. The required half street right-of-way dedication and roadway improvements for Hunt Highway along the property's frontage should be provided by the Development and be per Figure 8 of the *Regionally Significant Routes for Safety and Mobility Final Report* and/or per input and coordination with the Pinal County Engineering staff. Appropriate right-of-way should be provided and account for any required auxiliary right-turn lanes at proposed intersections.

The Development is planning for the right-of-way dedication and construction of the half-street improvements of San Tan Heights Boulevard along the property's frontage (planned improvements include the completion of San Tan Heights Boulevard between Hunt Highway and its existing terminus approximately 2,100 feet south of Hunt Highway). Although not classified as part of the *Regionally Significant Routes for Safety and Mobility, 2017 Update* nor the *Pinal County Small Area Transportation Study, 2006*, its existing section south of the subject site and function is in line with a Major Collector street. The required right-of-way dedication and roadway improvements for San Tan Heights Boulevard should be per Exhibit 6.2 of the *Pinal County Subdivision & Infrastructure Design Manual* and/or per input and coordination with Pinal County Engineering staff. Appropriate right-of-way should be provided and account for any required turn lanes at the Hunt Highway & San Tan Heights Boulevard/Spring Valley Parkway intersection.

C. Site Accessibility

C.1. Accessibility to the Exterior Roadway Network

By the opening year 2023, San Tan Heights Boulevard is planned be completed through to Hunt Highway by the Development and connect at the future Spring Valley Parkway intersection. The Hunt Highway & San Tan Heights Boulevard/Spring Valley Parkway is assumed to be signalized by opening year 2023 (see section VII.E below). The northbound approach of San Tan Heights Boulevard to Hunt Highway should be planned to have dual left-turn lanes, a single through lane, and single right-turn lane implemented as part of the Development.

Individual driveway access points are being planned for the Development on Hunt Highway, San Tan Heights Boulevard, and Thompson Road. At the time of site planning for each individual parcel of the Development, the location and function of site access driveways should be per the *Pinal County Access Management Manual, 2017*. Based on these spacing guidelines the following site accesses and their function have been assumed and utilized for the purposes of this TIA for the site:

- On Hunt Highway (Major Arterial):
    - Access A: Full access for the multifamily (Parcel A) component at a median opening. Located approximately 1,320 feet northwest of San Tan Heights Boulevard.

  - Access B: right-in, right-out access for the commercial component. Located approximately 360 feet northwest of Access C.
  - Access C: right-in, right-out access for the commercial component. Located approximately 360 feet northwest of San Tan Heights Boulevard.
  - Access D: right-in, right-out access for the commercial component. Located approximately 360 feet southeast of San Tan Heights Boulevard.
  - Access E: right-in, right-out access for the commercial component. Located approximately 360 feet southeast of Access D.
  - Access F: Full access for the multifamily Parcel B at a median opening. Located approximately 1,320 feet southeast of San Tan Heights Boulevard.
  - Access G: Partial access (left-out prohibited) median opening located approximately 660 feet southeast of Access F.
- On San Tan Heights Boulevard (Major Collector):
  - Access H: Full access for the commercial parcels located approximately 330 feet southwest of Hunt Highway.
  - Access I: Full access for the commercial component located approximately 330 feet southwest of Access H.
  - Access J: Full access for the multifamily (Parcel A & Parcel B) components located approximately 330 feet southwest of Access I.
  - Access K: Full access minor collector connection to interior local roads for the single-family component. Located approximately 680 feet south of Access J.
- On Thompson Road (Minor Arterial):
  - Access L: Full access for the multifamily (Parcel A) component. Located approximately 1,150 feet south of Hunt Highway.

C.2. INTERSECTION SIGHT DISTANCE

Sufficient intersection sight distance shall be provided to give drivers exiting the site a clear view of oncoming traffic on Hunt Highway, Thompson Road, and San Tan Heights Boulevard. Sight triangles shall be provided and maintained – the landscape and hardscape within the sight triangles must not obstruct the driver's view of the adjacent travel lanes. After a vehicle has stopped at an intersection, the driver must have sufficient sight distance to make a safe departure through the intersection area. To ensure adequate sight distances and sight distance triangles are provided, AASHTO's *A Policy on Geometric Design of Highways and Streets*, Section 9.5, the Pinal County *Traffic Impact Assessment Guidelines & Procedures* and *Subdivision and Infrastructure Design Manual* should be followed.

D. Auxiliary Turn Lane Analysis

D.1. Right-turn Lane Warrants

Per the Pinal County *Traffic Impact Assessment Guidelines & Procedures* dated January 2007, right-turn lanes are warranted based on the right turn lane warrant chart which takes into account design hourly volume on the roadway, the peak hour right turn volume at the access intersection and the posted speed. Utilizing this chart for the 2036 design year volumes at the access points on Hunt Highway (45 mph posted speed), Thompson Road (45 mph), and San Tan Heights Boulevard (35 mph), right-turn lanes are recommended at the following locations:

- Southeast-bound Hunt Highway
    - At all site access driveways
    - At San Tan Heights Boulevard
- Southwest-bound San Tan Heights Boulevard
    - At Access H (main full access into the commercial component)
- Northbound Thompson Road
    - At Access L

The right-turn lane warrants are not met at the other access driveways. At the time of actual site planning of the individual parcels of the site, subsequent Traffic Impact Analyses should provide updated refined analyses and the right-turn lane warrants should be re-evaluated at the site access intersections.

D.2. Left-turn Lanes Warrants

Per the Pinal County *Regionally Significant Routes for Safety and Mobility, 2017 Update*, left-turn lanes are required at all principal arterial access locations where left turns are permitted. Therefore, on Hunt Highway, left-turn lanes are recommended at the following full and partial (left-in permitted only, no left-outs) access locations:

- Northeast-bound Hunt Highway
    - At Access A
    - At Access F
    - At Access G
    - At San Tan Heights Boulevard
    - At 211th Avenue

On Thompson Road, the need for a left-turn lane at Access L is evaluated based on the left turn lane warrant chart within the Pinal County *Traffic Impact Assessment Guidelines & Procedures* dated January 2007. Utilizing this chart for the 2036 design year volumes and posted speed on Thompson Road (45 mph), a left-turn lane is warranted on southbound Thompson Road at Access L.

On San Tan Heights Boulevard, the required Major Collector street section includes a center lane that should be striped to provide dedicated left-turn lanes into the site accesses.

D.3. Auxiliary Turn Lane Queue and Storage Length Analysis

To determine the required storage lengths for the proposed/recommended right and left-turn lanes at the proposed new site accesses and the new legs at the Hunt Highway/San Tan Heights Boulevard intersection, storage length analyses were performed for year 2036 forecasted traffic volumes (using the higher of the forecasted AM and PM peak hour volumes) per Section 5.12 of the *Pinal County Traffic Impact Assessment Guidelines & Procedures, 2007*.

Table 12: Proposed Auxiliary Turn Lane Storage Length Analysis presents the calculated and recommended storage lane lengths for the recommended right and left-turn lanes. Detailed calculations are provided in *Appendix C: Queue Analyses*.

Table 12: Proposed Auxiliary Turn Lane Storage Length Analysis

Location	Peak Hour Turning Volume (2036)	Calculated Storage Length (Pinal County TIA Guidelines Section 5.12)	Recommended Turn Lane Storage Length
Signalized Intersection			
Hunt Highway/San Tan Heights Boulevard			
NEB Left Turn Lane	278	463 ft	225 ft (dual lefts)
NEB Right Turn Lane	96	160 ft	175 ft
NWB Left Turn Lane	196	327 ft	325 ft
SEB Right Turn Lane	99	165 ft	175 ft
Unsignalized Intersections			
Hunt Highway/Access A			
NWB Left Turn Lane	14	12 ft	100 ft
SEB Right Turn Lane	46	38 ft	100 ft
Hunt Highway/Access B			
SEB Right Turn Lane	36	30 ft	100 ft
Hunt Highway/Access C			
SEB Right Turn Lane	36	30 ft	100 ft
Hunt Highway/Access D			
SEB Right Turn Lane	17	14 ft	100 ft
Hunt Highway/Access E			
SEB Right Turn Lane	17	14 ft	100 ft
Hunt Highway/Access F			
NWB Left Turn Lane	30	25 ft	100 ft
SEB Right Turn Lane	62	52 ft	100 ft
Hunt Highway/Access G			
NWB Left Turn Lane	4	3 ft	100 ft
SEB Right Turn Lane	15	13 ft	100 ft

Table 12, Continued

San Tan Heights Boulevard/Access H			
NEB Left Turn Lane	37	**31 ft**	**100 ft**
SEB Right Turn Lane	145	**121 ft**	**125 ft**
San Tan Heights Boulevard/Access I			
NEB Left Turn Lane	2	**2 ft**	**100 ft**
San Tan Heights Boulevard/Access J			
NB Left Turn Lane	6	**5 ft**	**100 ft**
SB Left Turn Lane	30	**25 ft**	**100 ft**
San Tan Heights Boulevard/Access K			
SB Left Turn Lane	49	**41 ft**	**100 ft**
Thompson Road/Access L			
SB Left Turn Lane	27	**23 ft**	**100 ft**
NB Right Turn Lane	5	**4 ft**	**100 ft**

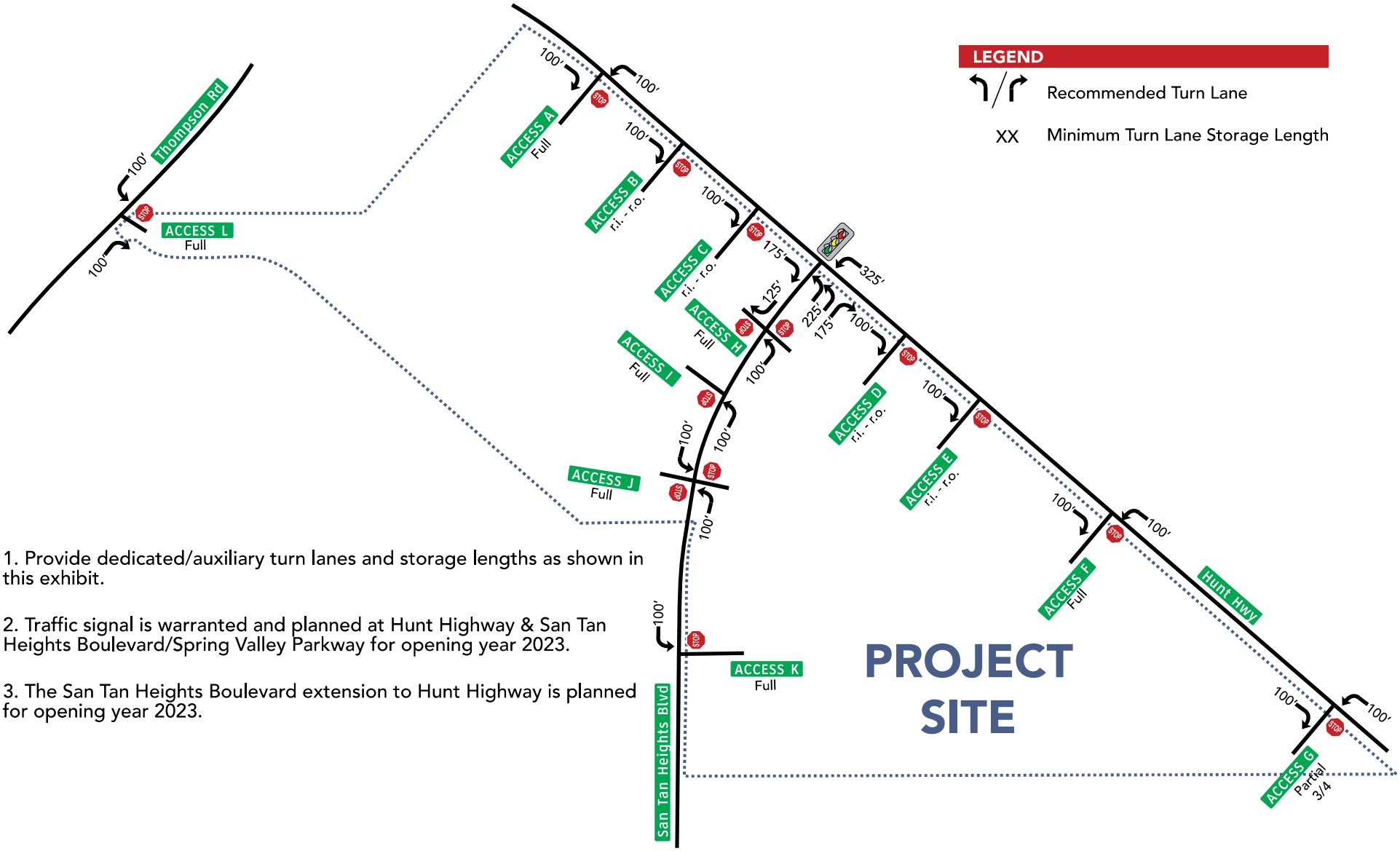
For each right-turn lane and left-turn lane, a turn lane taper (opening) of 100 feet minimum should be planned to be provided. At the time of actual site planning of the individual parcels of the site, subsequent Traffic Impact Analyses should provide updated storage length analyses. The storage lengths and taper (opening) lengths should be re-evaluated at the site access intersections based on refined forecasted traffic volumes at proposed site accesses and take into consideration any potential physical constraints.

D.4. Dual Left Turn Lanes

Per the Pinal County *Subdivision & Infrastructure Design Manual*, dual lefts may be considered when greater than 25 left turns are forecasted, opposing through volumes are greater than 100 vph, or the average delay of the left turn movement is greater than 45 seconds.

At the proposed intersection of Hunt Highway/San Tan Heights Boulevard, dual lefts should be considered for implementation on the NEB leg (San Tan Heights Boulevard) due to the high forecasted NEB left turn volume (268 in AM peak hour, 278 in PM peak hour). Dual left turn lanes would provide the calculated storage length within the available distance between Hunt Highway and the likely proposed location of main full access into the commercial parcels (Access H).

Figure 19: Recommendations presents the recommended improvements overall for the Development.



1. Provide dedicated/auxiliary turn lanes and storage lengths as shown in this exhibit.

2. Traffic signal is warranted and planned at Hunt Highway & San Tan Heights Boulevard/Spring Valley Parkway for opening year 2023.

3. The San Tan Heights Boulevard extension to Hunt Highway is planned for opening year 2023.

N

not to scale

UCG
United Civil Group

Figure 19: Recommendations

E. Traffic Signal Warrant Analysis

The 2009 *Manual on Uniform Traffic Control Devices* (MUTCD) was used as the primary tool to determine if traffic signals are warranted at the full access driveway and collector street intersections on Hunt Highway; these intersections include Hunt Highway & San Tan Heights Boulevard/Spring Valley Parkway, Hunt Highway & Access A (full access at MF Parcel A), and Hunt Highway & Access F (full access at MF parcel B). The signal warrants have been analyzed for the forecasted total traffic year 2036 conditions at full build out. Per the *Pinal County Access Management Manual, 2017,* minimum traffic signal spacing on an Urban Major Arterial (Hunt Highway) is 1/4 mile.

There are nine specific signal warrants in the MUTCD, however, not all warrants are applicable to this study. The warrants used in this analysis include:

Warrant 1 – Eight-Hour Vehicular Volume
Warrant 2 – Four-Hour Vehicular Volume

Traffic Signal Warrant Results

Hunt Highway & San Tan Heights Boulevard/Spring Valley Parkway:

- Warrant 1 is met; Warrant 2 is met; for total traffic year 2036 conditions.

Per information provided by Pinal County engineering staff, the three-legged intersection of Hunt Highway & Spring Valley Parkway will be signalized (Promenade developer-funded) with design expected to begin in July 2021; construction is anticipated to be complete by horizon year 2023. Modification of this new signal to incorporate the San Tan Heights leg of this intersection will be required at the time San Tan Heights Boulevard is completed to Hunt Highway (assumed in year 2023 as part of this study).

Hunt Highway & Access A:

- Warrant 1 and Warrant 2 are not met for total traffic year 2036 conditions.

Hunt Highway & Access F:

- Warrant 1 and Warrant 2 are not met for total traffic year 2036 conditions.

These traffic signal warrant analyses have been conducted largely on forecasted traffic volumes and are provided for informational and potential planning purposes. Additional traffic analyses and signal warrant analyses are recommended as individual parcels of the Development go through the site planning and approval process and actual future traffic volumes are realized once additional roadway connectivity and potential development within and adjacent to the study area progresses.

The results of the traffic signal analyses are provided in Appendix F.

F. Intersection Level of Service Analyses – Total Traffic

Capacity analyses at the existing and proposed study area intersections were performed for the forecasted total traffic conditions for the horizon years of the study, year 2023 (opening year), year 2026 (full build out), and year 2036 (10 years after full build out) as presented in *Table 13: 2023 Total Traffic Levels of Service, Table 14: 2026 Total Traffic Levels of Service, and Table 15: 2036 Total Traffic Levels of Service*. Summaries of the Vistro output calculations are included in Appendix B.

Table 13: 2023 Total Traffic Levels of Service

Intersection Location	NB LOS				SB LOS				EB LOS				WB LOS				Overall Intersection
	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot	AvgDelay/ LOS
Ellsworth Road/Empire Boulevard– Signalized																	
AM Peak Hour	E	C	C	**C**	E	B	B	**C**	D	D	E	**D**	D	E	E	**E**	33.86 **C**
PM Peak Hour	F	C	C	**C**	F	D	B	**D**	D	D	E	**E**	D	D	D	**D**	48.08 **D**
Hunt Highway/Ellsworth Avenue – Signalized																	
AM Peak Hour	A	C	A	**C**	C	B	A	**B**	D	D	D	**D**	D	D	D	**D**	26.63 **C**
PM Peak Hour	C	B	A	**B**	B	F	A	**E**	D	D	D	**D**	D	D	D	**D**	55.52 **E**
Hunt Highway/San Tan Flat Drive - Signalized																	
AM Peak Hour	D	D	D	**D**	D	E	E	**D**	E	A	A	**A**	E	B	A	**B**	14.79 **B**
PM Peak Hour	D	D	D	**D**	D	D	D	**D**	A	F	A	**D**	C	A	A	**A**	26.50 **C**
Hunt Highway/Leading Edge Access – Signalized																	
AM Peak Hour	D	-	D	**D**	-	-	-	**-**	-	A	A	**A**	A	A	-	**A**	5.83 **A**
PM Peak Hour	D	-	D	**D**	-	-	-	**-**	-	B	A	**A**	B	A	-	**A**	12.04 **B**
Hunt Highway/Thompson Road – Signalized																	
AM Peak Hour	D	-	C	**D**	-	-	-	**-**	-	B	B	**B**	A	C	-	**C**	28.07 **C**
PM Peak Hour	D	-	D	**D**	-	-	-	**-**	-	C	B	**C**	B	B	-	**B**	21.75 **C**
Hunt Highway/Mountain Vista Boulevard – Signalized																	
AM Peak Hour	D	D	D	**D**	C	E	E	**D**	B	B	A	**B**	A	B	A	**B**	18.98 **B**
PM Peak Hour	D	D	D	**D**	C	D	D	**D**	A	C	B	**C**	C	B	A	**B**	21.16 **C**
Hunt Highway/Village Lane – Signalized																	
AM Peak Hour	D	D	D	**D**	D	C	C	**D**	A	B	A	**B**	A	B	A	**B**	16.37 **B**
PM Peak Hour	D	D	D	**D**	D	D	D	**D**	A	B	A	**B**	A	B	A	**B**	14.75 **B**
Hunt Highway/Gary Road - Signalized																	
AM Peak Hour	D	D	E	**D**	D	D	D	**D**	B	B	B	**B**	A	B	B	**B**	28.20 **C**
PM Peak Hour	E	E	E	**E**	E	D	D	**D**	B	C	B	**C**	C	C	B	**C**	35.67 **D**
Thompson Road/Mountain Vista Boulevard – One-way Stop-Controlled																	
AM Peak Hour	-	A	A	**A**	A	A	-	**A**	-	-	-	**-**	B	-	B	**B**	11.15 **B**
PM Peak Hour	-	A	A	**A**	A	A	-	**A**	-	-	-	**-**	C	-	A	**B**	21.60 **C**
San Tan Heights Boulevard/Mountain Vista Boulevard – Two-way Stop-Controlled																	
AM Peak Hour	A	A	A	**A**	A	A	A	**A**	B	B	A	**B**	B	B	A	**B**	12.53 **B**
PM Peak Hour	A	A	A	**A**	A	A	A	**A**	B	B	A	**B**	C	B	A	**B**	15.40 **C**
San Tan Heights Boulevard & Spring Valley Parkway/Hunt Highway – Signalized																	
AM Peak Hour	D	A	D	**D**	C	E	E	**D**	A	A	A	**A**	A	B	A	**B**	14.61 **B**
PM Peak Hour	D	A	D	**D**	D	E	E	**E**	A	B	A	**B**	B	B	A	**B**	17.23 **B**
Access A/Hunt Highway – One-way Stop-Controlled																	
AM Peak Hour	C	-	B	**B**	-	-	-	**-**	-	A	A	**A**	A	A	-	**A**	17.85 **C**
PM Peak Hour	E	-	C	**D**	-	-	-	**-**	-	A	A	**A**	C	A	-	**A**	47.98 **E**

Table 13, Continued

San Tan Heights Boulevard/Access J – One-way Stop-Controlled																	
AM Peak Hour	A	A	-	**A**	-	A	A	**A**	A	-	A	**A**	-	-	-	**-**	8.88 A
PM Peak Hour	A	A	-	**A**	-	A	A	**A**	A	-	A	**A**	-	-	-	**-**	8.89 A
Thompson Road/Access L– One-way Stop-Controlled																	
AM Peak Hour	-	A	A	**A**	A	A	-	**A**	-	-	-	**-**	B	-	B	**B**	14.76 B
PM Peak Hour	-	A	A	**A**	A	A	-	**A**	-	-	-	**-**	C	-	B	**B**	15.41 C

*Per HCM, overall LOS letter grade not assigned for two-way stop-controlled intersections. Average delay and LOS letter grade shown is for the worst-case movement (as indicated by underline).

TABLE 14: 2026 TOTAL TRAFFIC LEVELS OF SERVICE

Intersection Location	NB LOS				SB LOS				EB LOS				WB LOS				Overall Intersection
	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot	AvgDelay/ LOS
Ellsworth Road/Empire Boulevard– Signalized																	
AM Peak Hour	E	C	C	**C**	F	C	B	**C**	D	D	E	**E**	D	E	E	**E**	38.78 D
PM Peak Hour	F	D	D	**D**	F	F	C	**F**	D	D	F	**E**	D	D	D	**D**	107.16 F
Hunt Highway/Ellsworth Avenue – Signalized																	
AM Peak Hour	A	F	A	**F**	C	B	A	**B**	D	D	D	**D**	D	D	D	**D**	72.28 E
PM Peak Hour	C	C	A	**C**	B	F	A	**F**	D	D	D	**D**	D	D	D	**D**	129.63 F
Hunt Highway/San Tan Flat Drive - Signalized																	
AM Peak Hour	D	D	D	**D**	D	E	E	**D**	E	A	A	**A**	E	F	A	**E**	51.00 D
PM Peak Hour	D	D	D	**D**	D	D	D	**D**	A	F	A	**F**	C	B	A	**B**	86.27 F
Hunt Highway/Leading Edge Access – Signalized																	
AM Peak Hour	D	-	D	**D**	-	-	-	**-**	-	A	A	**A**	A	B	-	**B**	13.31 B
PM Peak Hour	D	-	D	**D**	-	-	-	**-**	-	F	A	**F**	C	A	-	**A**	59.62 E
Hunt Highway/Thompson Road – Signalized																	
AM Peak Hour	D	A	D	**D**	E	A	E	**E**	C	C	B	**B**	B	F	B	**F**	112.79 F
PM Peak Hour	D	A	D	**D**	D	A	E	**E**	B	F	B	**F**	C	C	B	**C**	74.52 E
Hunt Highway/Mountain Vista Boulevard – Signalized																	
AM Peak Hour	D	D	D	**D**	C	E	E	**D**	C	C	C	**C**	A	C	B	**C**	25.50 C
PM Peak Hour	D	D	D	**D**	C	E	E	**D**	B	F	B	**E**	D	C	B	**C**	54.36 D
Hunt Highway/Village Lane – Signalized																	
AM Peak Hour	D	C	C	**D**	D	C	C	**D**	B	B	A	**B**	A	C	A	**B**	20.54 C
PM Peak Hour	D	D	D	**D**	D	D	D	**D**	B	C	A	**C**	C	B	A	**B**	21.27 C
Hunt Highway/Gary Road - Signalized																	
AM Peak Hour	D	E	E	**E**	E	D	D	**D**	B	B	B	**B**	A	C	B	**C**	31.11 C
PM Peak Hour	E	E	E	**E**	E	D	D	**E**	C	F	C	**E**	D	C	C	**C**	55.00 D
Thompson Road/Mountain Vista Boulevard – One-way Stop-Controlled																	
AM Peak Hour	-	A	A	**A**	A	A	-	**A**	-	-	-	**-**	B	-	B	**B**	11.92 B
PM Peak Hour	-	A	A	**A**	A	A	-	**A**	-	-	-	**-**	D	-	A	**B**	32.38 D
San Tan Heights Boulevard/Mountain Vista Boulevard – Two-way Stop-Controlled																	
AM Peak Hour	A	A	A	**A**	A	A	A	**A**	B	B	A	**B**	B	B	A	**B**	14.42 B
PM Peak Hour	A	A	A	**A**	A	A	A	**A**	C	C	B	**B**	C	C	B	**C**	22.49 C
San Tan Heights Boulevard & Spring Valley Parkway/Hunt Highway – Signalized																	
AM Peak Hour	D	D	D	**D**	C	E	E	**E**	B	B	B	**B**	A	C	A	**B**	20.99 C
PM Peak Hour	D	D	D	**D**	C	E	E	**E**	B	F	B	**F**	D	C	B	**C**	141.63 F

Table 14, Continued

Access A/Hunt Highway – One-way Stop-Controlled																		
AM Peak Hour	C	-	B	**C**	-	-	-	**-**	-	A	A	**A**	A	A	-	**A**	22.42	C
PM Peak Hour	F	-	D	**F**	-	-	-	**-**	-	A	A	**A**	D	A	-	**A**	100.25	F
Access B/Hunt Highway – One-way Stop-Controlled																		
AM Peak Hour	-	-	B	**B**	-	-	-	**-**	-	A	A	**A**	-	A	-	**A**	11.39	B
PM Peak Hour	-	-	E	**B**	-	-	-	**-**	-	A	A	**A**	-	A	-	**A**	37.79	E
Access C/Hunt Highway – One-way Stop-Controlled																		
AM Peak Hour	-	-	B	**B**	-	-	-	**-**	-	A	A	**A**	-	A	-	**A**	11.39	B
PM Peak Hour	-	-	E	**B**	-	-	-	**-**	-	A	A	**A**	-	A	-	**A**	40.28	E
Access D/Hunt Highway – One-way Stop-Controlled																		
AM Peak Hour	-	-	B	**B**	-	-	-	**-**	-	A	A	**A**	-	A	-	**A**	11.38	B
PM Peak Hour	-	-	D	**B**	-	-	-	**-**	-	A	A	**A**	-	A	-	**A**	31.19	D
Access E/Hunt Highway – One-way Stop-Controlled																		
AM Peak Hour	-	-	B	**B**	-	-	-	**-**	-	A	A	**A**	-	A	-	**A**	11.37	B
PM Peak Hour	-	-	D	**B**	-	-	-	**-**	-	A	A	**A**	-	A	-	**A**	31.36	D
Access F/Hunt Highway – One-way Stop-Controlled																		
AM Peak Hour	C	-	B	**B**	-	-	-	**-**	-	A	A	**A**	A	A	-	**A**	21.89	C
PM Peak Hour	F	-	D	**F**	-	-	-	**-**	-	A	A	**A**	D	A	-	**A**	102.56	F
Access G/Hunt Highway – One-way Stop-Controlled																		
AM Peak Hour	-	-	B	**B**	-	-	-	**-**	-	A	A	**A**	-	A	-	**A**	11.51	B
PM Peak Hour	-	-	D	**B**	-	-	-	**-**	-	A	A	**A**	-	A	-	**A**	27.90	D
San Tan Heights Boulevard/Access H – Two-way Stop-Controlled																		
AM Peak Hour	A	A	A	**A**	A	A	A	**A**	B	B	A	**B**	B	B	B	**B**	13.46	B
PM Peak Hour	A	A	A	**A**	A	A	A	**A**	D	C	A	**C**	C	C	A	**B**	25.08	D
San Tan Heights Boulevard/Access I – One-way Stop-Controlled																		
AM Peak Hour	A	A	-	**A**	-	A	A	**A**	B	-	A	**B**	-	-	-	**-**	11.18	B
PM Peak Hour	A	A	-	**A**	-	A	A	**A**	B	-	A	**B**	-	-	-	**-**	11.73	B
San Tan Heights Boulevard/Access J – Two-way Stop-Controlled																		
AM Peak Hour	A	A	A	**A**	A	A	A	**A**	B	B	A	**B**	B	B	A	**A**	12.33	B
PM Peak Hour	A	A	A	**A**	A	A	A	**A**	B	B	A	**B**	B	B	A	**A**	13.23	B
San Tan Heights Boulevard/Access K – One-way Stop-Controlled																		
AM Peak Hour	-	A	A	**A**	A	A	-	**A**	-	-	-	**-**	B	-	B	**B**	10.04	B
PM Peak Hour	-	A	A	**A**	A	A	-	**A**	-	-	-	**-**	B	-	B	**B**	11.13	B
Thompson Road/Access L– One-way Stop-Controlled																		
AM Peak Hour	-	A	A	**A**	A	A	-	**A**	-	-	-	**-**	B	-	B	**B**	16.48	B
PM Peak Hour	-	A	A	**A**	A	A	-	**A**	-	-	-	**-**	C	-	A	**A**	17.18	C

*Per HCM, overall LOS letter grade not assigned for two-way stop-controlled intersections. Average delay and LOS letter grade shown is for the worst-case movement (as indicated by underline).

Note: By horizon year 2036, it is reasonably assumed the ultimate section of Hunt Highway (3 through lanes in each direction) is completed through the study area by developers/others. The capacity analyses and the corresponding total traffic levels of service in Table 15 take into account this ultimate section of Hunt Highway.

TABLE 15: 2036 TOTAL TRAFFIC LEVELS OF SERVICE

Intersection Location	NB LOS				SB LOS				EB LOS				WB LOS				Overall Intersection
	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot	AvgDelay/ LOS
Ellsworth Road/Empire Boulevard– Signalized																	
AM Peak Hour	E	D	D	**D**	F	C	C	**C**	D	D	E	**E**	D	E	E	**E**	43.03 **D**
PM Peak Hour	F	C	C	**D**	A	F	C	**E**	D	D	F	**F**	D	D	D	**D**	55.75 **E**
Hunt Highway/Ellsworth Avenue – Signalized																	
AM Peak Hour	A	D	B	**D**	C	B	B	**B**	C	D	D	**C**	C	D	D	**C**	32.00 **C**
PM Peak Hour	C	B	A	**B**	B	F	A	**E**	D	D	D	**D**	D	D	D	**D**	43.80 **D**
Hunt Highway/San Tan Flat Drive - Signalized																	
AM Peak Hour	D	D	D	**D**	D	E	E	**D**	E	A	A	**A**	E	B	A	**B**	11.46 **B**
PM Peak Hour	D	D	D	**D**	D	D	D	**D**	A	C	A	**C**	C	A	A	**A**	18.51 **B**
Hunt Highway/Leading Edge Access – Signalized																	
AM Peak Hour	D	-	D	**D**	-	-	-	**-**	-	A	A	**A**	A	A	-	**A**	4.68 **A**
PM Peak Hour	D	-	D	**D**	-	-	-	**-**	-	B	A	**B**	B	A	-	**A**	8.32 **A**
Hunt Highway/Thompson Road – Signalized																	
AM Peak Hour	D	A	C	**D**	E	A	E	**E**	C	B	B	**B**	B	F	B	**E**	47.01 **D**
PM Peak Hour	D	A	D	**D**	E	A	E	**E**	B	C	C	**C**	C	B	B	**B**	28.46 **C**
Hunt Highway/Mountain Vista Boulevard – Signalized																	
AM Peak Hour	D	D	D	**D**	C	E	E	**D**	B	B	B	**B**	A	B	B	**B**	20.98 **C**
PM Peak Hour	D	D	D	**D**	C	E	E	**D**	B	C	B	**C**	C	B	B	**C**	25.99 **C**
Hunt Highway/Village Lane – Signalized																	
AM Peak Hour	D	C	C	**D**	D	C	C	**D**	B	B	B	**B**	A	B	B	**B**	18.51 **B**
PM Peak Hour	D	D	D	**D**	D	D	D	**D**	B	B	B	**B**	B	B	A	**B**	17.01 **B**
Hunt Highway/Gary Road - Signalized																	
AM Peak Hour	E	E	E	**E**	E	D	D	**D**	B	B	B	**B**	B	C	B	**C**	30.28 **C**
PM Peak Hour	E	E	E	**E**	E	D	D	**E**	C	D	C	**D**	D	C	C	**C**	42.67 **D**
Thompson Road/Mountain Vista Boulevard – One-way Stop-Controlled																	
AM Peak Hour	-	A	A	**A**	A	A	-	**A**	-	-	-	**-**	B	-	B	**B**	12.47 **B**
PM Peak Hour	-	A	A	**A**	A	A	-	**A**	-	-	-	**-**	E	-	A	**B**	41.88 **E**
San Tan Heights Boulevard/Mountain Vista Boulevard – Two-way Stop-Controlled																	
AM Peak Hour	A	A	A	**A**	A	A	A	**A**	B	B	B	**B**	C	B	A	**B**	15.58 **C**
PM Peak Hour	A	A	A	**A**	A	A	A	**A**	C	C	B	**B**	D	C	B	**C**	27.03 **D**
San Tan Heights Boulevard & Spring Valley Parkway/Hunt Highway – Signalized																	
AM Peak Hour	D	D	D	**D**	C	E	E	**E**	B	B	B	**B**	A	B	A	**B**	17.87 **B**
PM Peak Hour	D	D	D	**D**	C	E	E	**D**	B	F	B	**D**	D	B	B	**B**	38.49 **D**
Access A/Hunt Highway – One-way Stop-Controlled																	
AM Peak Hour	D	-	B	**C**	-	-	-	**-**	-	A	A	**A**	B	A	-	**A**	26.80 **D**
PM Peak Hour	F	-	E	**F**	-	-	-	**-**	-	A	A	**A**	F	A	-	**A**	312.10 **F**
Access B/Hunt Highway – One-way Stop-Controlled																	
AM Peak Hour	-	-	B	**B**	-	-	-	**-**	-	A	A	**A**	-	A	-	**A**	12.98 **B**
PM Peak Hour	-	-	F	**F**	-	-	-	**-**	-	A	A	**A**	-	A	-	**A**	58.58 **F**

Table 15, Continued

Access C/Hunt Highway – One-way Stop-Controlled																		
AM Peak Hour	-	-	B	**B**	-	-	-	-	-	A	A	**A**	-	A	-	**A**	12.97	B
PM Peak Hour	-	-	F	**F**	-	-	-	-	-	A	A	**A**	-	A	-	**A**	63.31	F
Access D/Hunt Highway – One-way Stop-Controlled																		
AM Peak Hour	-	-	B	**B**	-	-	-	-	-	A	A	**A**	-	A	-	**A**	12.93	B
PM Peak Hour	-	-	E	**E**	-	-	-	-	-	A	A	**A**	-	A	-	**A**	44.11	E
Access E/Hunt Highway – One-way Stop-Controlled																		
AM Peak Hour	-	-	B	**B**	-	-	-	-	-	A	A	**A**	-	A	-	**A**	12.91	B
PM Peak Hour	-	-	E	**E**	-	-	-	-	-	A	A	**A**	-	A	-	**A**	44.38	E
Access F/Hunt Highway – One-way Stop-Controlled																		
AM Peak Hour	D	-	B	**C**	-	-	-	-	-	A	A	**A**	B	A	-	**A**	26.70	D
PM Peak Hour	F	-	E	**F**	-	-	-	-	-	A	A	**A**	F	A	-	**A**	376.81	F
Access G/Hunt Highway – One-way Stop-Controlled																		
AM Peak Hour	-	-	B	**B**	-	-	-	-	-	A	A	**A**	B	A	-	**A**	13.83	B
PM Peak Hour	-	-	E	**E**	-	-	-	-	-	A	A	**A**	F	A	-	**A**	78.84	F
San Tan Heights Boulevard/Access H – Two-way Stop-Controlled																		
AM Peak Hour	A	A	A	**A**	A	A	A	**A**	B	B	A	**B**	B	B	B	**B**	13.68	B
PM Peak Hour	A	A	A	**A**	A	A	A	**A**	C	C	A	**C**	C	C	A	**B**	23.64	C
San Tan Heights Boulevard/Access I – One-way Stop-Controlled																		
AM Peak Hour	A	A	-	**A**	-	A	A	**A**	B	-	A	**B**	-	-	-	**-**	11.29	B
PM Peak Hour	A	A	-	**A**	-	A	A	**A**	B	-	A	**B**	-	-	-	**-**	11.82	B
San Tan Heights Boulevard/Access J – Two-way Stop-Controlled																		
AM Peak Hour	A	A	A	**A**	A	A	A	**A**	B	B	A	**B**	B	B	A	**A**	12.52	B
PM Peak Hour	A	A	A	**A**	A	A	A	**A**	B	B	A	**B**	B	B	A	**A**	13.36	B
San Tan Heights Boulevard/Access K – One-way Stop-Controlled																		
AM Peak Hour	-	A	A	**A**	A	A	-	**A**	-	-	-	**-**	B	-	A	**A**	10.14	B
PM Peak Hour	-	A	A	**A**	A	A	-	**A**	-	-	-	**-**	B	-	B	**B**	11.20	B
Thompson Road/Access L– One-way Stop-Controlled																		
AM Peak Hour	-	A	A	**A**	A	A	-	**A**	-	-	-	**-**	C	-	B	**B**	17.97	C
PM Peak Hour	-	A	A	**A**	A	A	-	**A**	-	-	-	**-**	C	-	A	**A**	18.77	C

*Per HCM, overall LOS letter grade not assigned for two-way stop-controlled intersections. Average delay and LOS letter grade shown is for the worst-case movement (as indicated by underline).

As seen above in Table 13 - Table 15, in horizon year 2036 several of the study area signalized intersections along Hunt Highway are forecasted to operate at LOS E or LOS F in the AM and/or PM peak hours due to the forecasted ambient traffic growth and additional developments in the area. The compounded annual growth rate (CAGR) applied to the existing collected traffic volumes is greater than the MAG-provided CAGR. If ultimately the future forecasted traffic volumes based on the annual growth rates utilized for the purposes of this study are not realized, the reported forecasted levels of service would be improved at the Hunt Highway intersections.

At the site accesses intersections with Hunt Highway, the exiting driveway movements may experience average delay resulting in LOS E or LOS F in the peak hours, which is typical for stop-controlled movements from minor streets as they wait for an acceptable gap to turn onto to free-flowing major streets during the peak hours (Hunt Highway legs are LOS A). The total turn volumes with forecasted LOS E or LOS F are relatively

minor, and the 95th percentile queue lengths of these legs are calculated to be relatively minor (See Section VII.F.1 below).

F.1. Driveway Throat Lengths

To account for the potential for exiting queuing on the access driveways as they wait to complete turning movements onto the major streets, site accesses should be designed with adequate exiting throat lengths to prevent on-site blockages, which may lead to issues on the adjacent roadways. *Table 16: Driveway Throat Lengths* presents the calculated 95th Percentile exiting queue lengths for the forecasted year 2036 total traffic conditions.

Table 16: Driveway Throat Lengths

Location	Driveway Function	Forecasted Year 2036 LOS	Calculated 95th Percentile Queue Length
Access A (on Hunt Highway)	Full Access from the multifamily Parcel A.	LOS F	21 feet
Access F (on Hunt Highway)	Full Access from the multifamily Parcel B/single-family parcel.	LOS F	36 feet
Access H (on San Tan Heights Blvd)	Full Access from the Commercial parcels.	LOS C (EB) LOS C (WB)	54 feet (EB) 3 feet (WB)
Access J (on San Tan Heights Blvd)	Full Access from the multifamily parcels.	LOS B (EB) LOS B (WB)	12 feet (EB) 11 feet (WB)
Access K (on San Tan Heights Blvd)	Full Access from the single-family parcel.	LOS B	5 feet
Access L (on Thompson Road)	Full Access from the multifamily Parcel A.	LOS C	1 foot

As seen in Table 16 above, calculated 95th percentile queue lengths are relatively minimal, even for the movements that may experience higher average delays with a corresponding LOS F in forecasted year 2036. At the time of actual site planning of the individual parcels of the site, subsequent Traffic Impact Analyses should provide updated queue length analyses based on refined forecasted traffic volumes at proposed site accesses and appropriate driveway throat lengths should be provided.