TRAFFIC IMPACT STUDY

MONARCH DATA CENTER

LYON COUNTY, NEVADA

APNs: 014-201-07 and 014-201-30

Prepared for:
Birch Infrastructure, PBLLC
600 A Avenue
Lake Oswego, Oregon 97034

Prepared by:
Kimley»Horn

April 2026
291565075

Kimley»Horn

TRAFFIC IMPACT STUDY

FOR

MONARCH DATA CENTER

Prepared for:
Birch Infrastructure, PBLLC
600 A Avenue
Lake Oswego, Oregon 97034

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TABLE OF CONTENTS

List of Figures

List of Tables

List of Appendices

1. INTRODUCTION

Kimley-Horn has been retained by Birch Infrastructure, PBLLC to prepare a traffic impact study for the proposed Monarch Data Center development. The purpose of this traffic study is to identify the project's traffic generation characteristics, potential traffic-related impacts on the local street network, and develop mitigation measures recommended for the identified impacts.

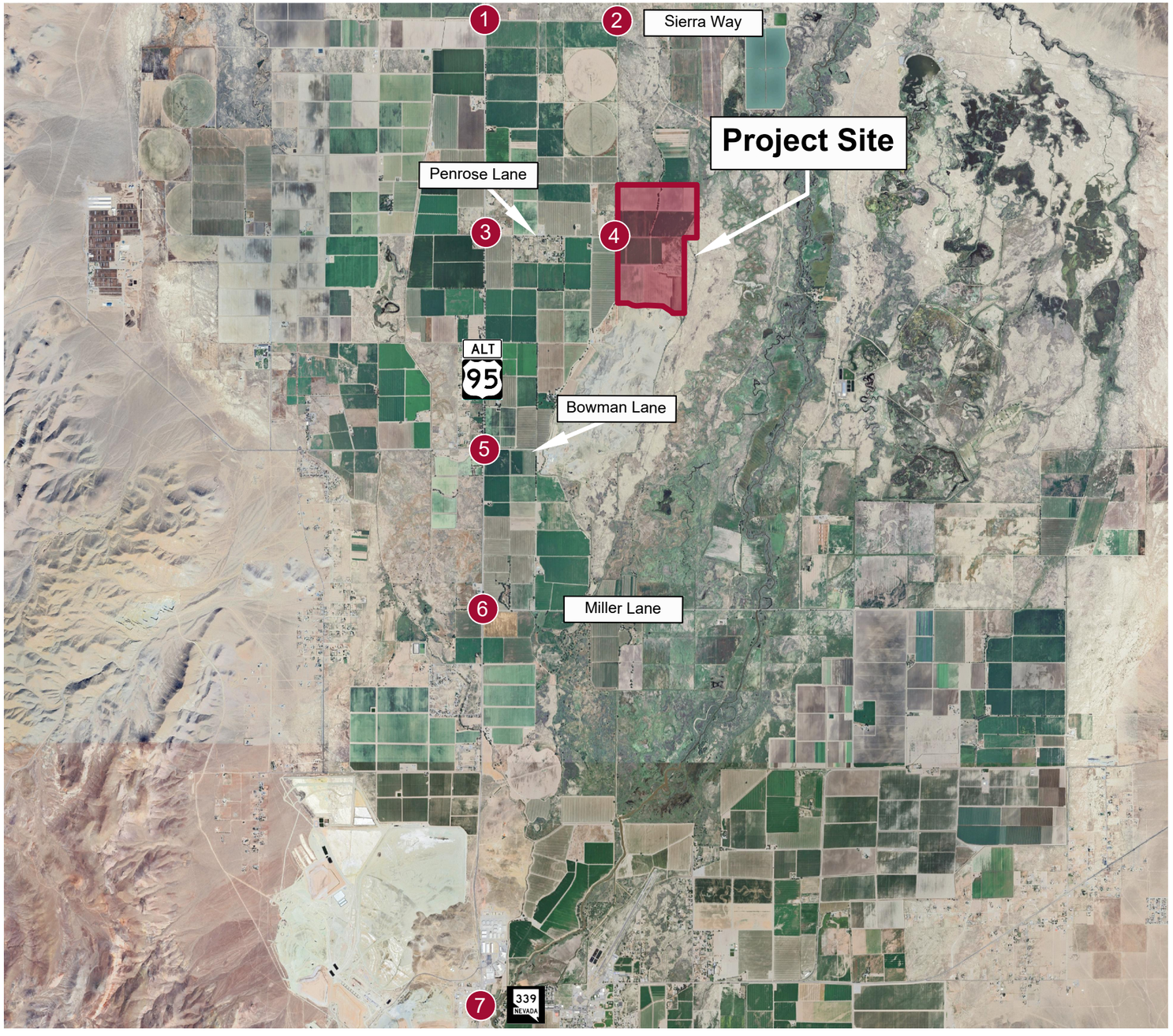
The proposed project is located on east of U.S. Route 95 Alternate (US-95A) at the end of Penrose Lane on approximately 505 acres within APN 014-201-07 and 014-201-30 in Lyon County, Nevada. Upon expected project completion, the project is anticipated to consist of a roughly 4.6 million square-foot (SF) data center campus. The project site currently consists of undeveloped and agricultural land. The location of the proposed development with respect to the City of Yerington is shown in **Figure 1**. The site plan is located in **Appendix I**.

US-95A provides regional access to the project site. Sierra Way provides primary access, while direct access to the site is provided by one full access drive at Sierra Way and Project Access Road (#2).

A scoping meeting was held with the Nevada Department of Transportation (NDOT) and Lyon County on May 12, 2025, and the agencies identified seven intersections for full analysis:

- US-95A and Sierra Way (#1)
- Sierra Way and Project Access Road (#2)
- US-95A and Penrose Lane (#3)
- Penrose Lane and Project Access Road (#4)
- US-95A and Bowman Lane/Campbell Lane (#5)
- US-95A and Miller Lane (#6)
- US-95A and SR-339 (#7)

Three revisions were made to this traffic impact study at the request of NDOT. Comments received from NDOT as well as comment response letters are located in **Appendix A**.



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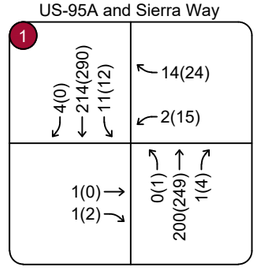
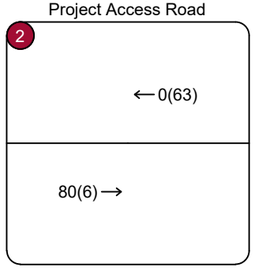
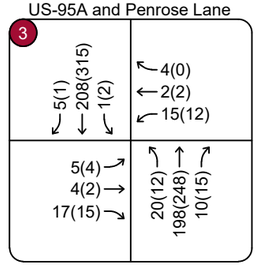
US-95A and Sierra Way



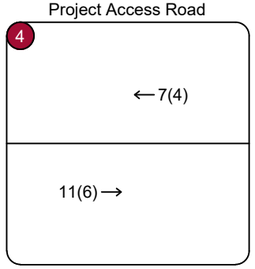
Sierra Way and Project Access Road



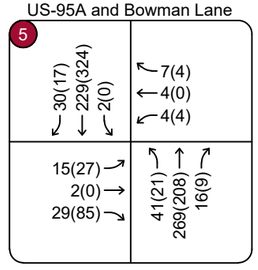
US-95A and Penrose Lane



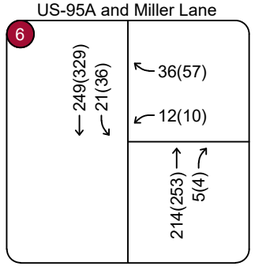
Penrose Lane and Project Access Road



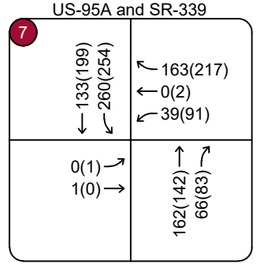
US-95A and Bowman Lane



US-95A and Miller Lane



US-95A and SR-339



North

NTS

Legend

#	Study Area Key Intersection
X	Project Access Drive
← xx (xx)	AM(PM) Peak Hour Volume

Monarch
2047 Horizon Year Peak Hour Traffic Volumes

Figure 7

Kimley»Horn ©2025

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2. EXISTING CONDITIONS

This section of the report details existing conditions near the project site.

2.1. Study Area Intersections

A scoping meeting was held with the Nevada Department of Transportation (NDOT) and Lyon County on May 12, 2025, and the agencies identified seven intersections for full analysis:

- US-95A and Sierra Way (#1)
- Sierra Way and Project Access Road (#2)
- US-95A and Penrose Lane (#3)
- Penrose Lane and Project Access Road (#4)
- US-95A and Bowman Lane/Campbell Lane (#5)
- US-95A and Miller Lane (#6)
- US-95A and SR-339 (#7)

2.2. Existing Land Uses

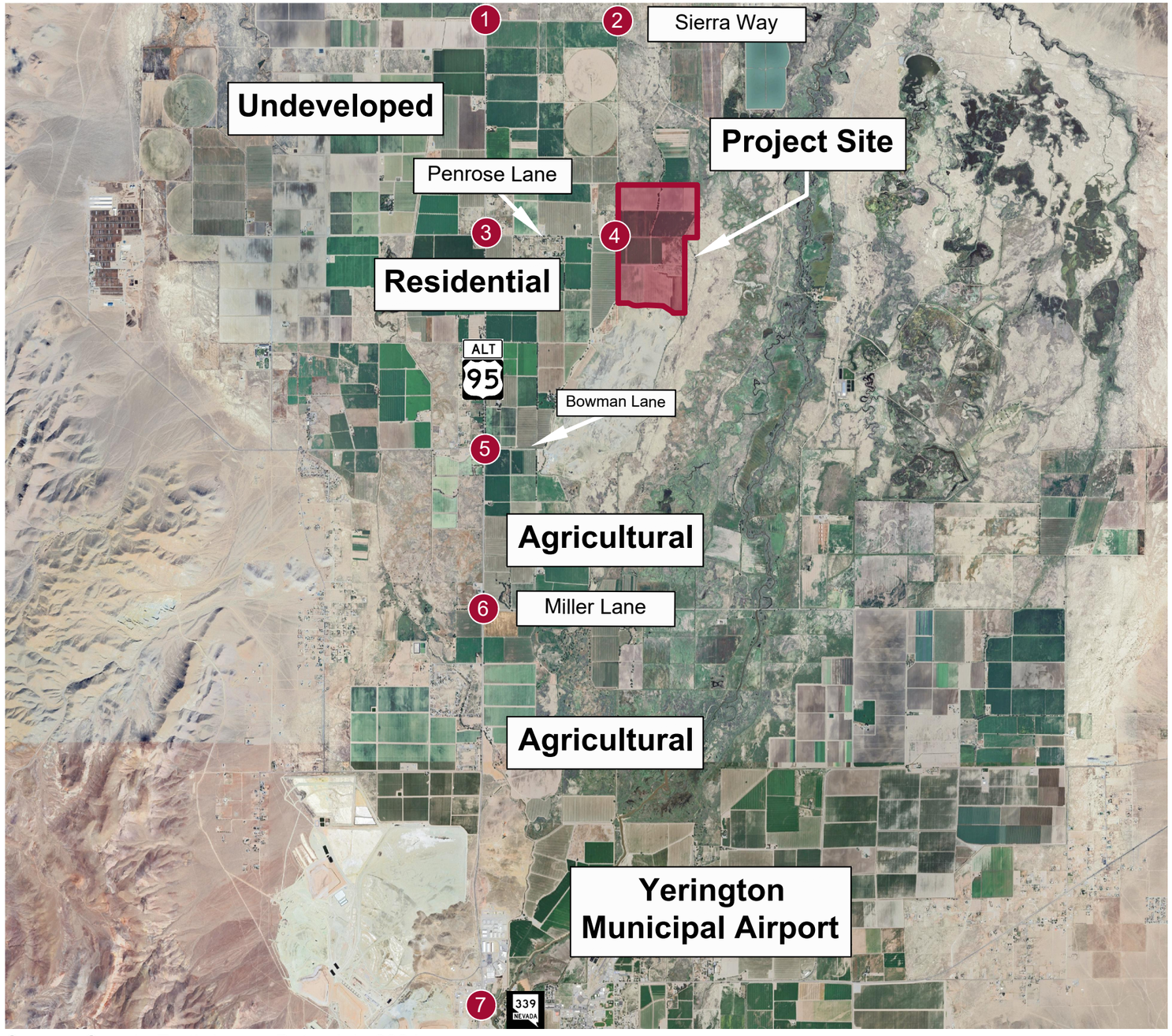
The location of the proposed project is currently undeveloped and agricultural land. The land uses surrounding the project site includes industrial, residential, agricultural, and undeveloped land uses. The location of the project site, study area intersections, and existing land uses are shown on **Figure 2**.

2.3. 2025 Existing Lane Configuration and Control

U.S. Route 95 Alternate (US-95A) provides regional access to the project site. Sierra Way provides primary access. Existing speed limits, lane configurations, and traffic control at the time of this study are illustrated in **Figure 3**.

2.4. Existing Turning Movements

Existing AM and PM peak hour turning movement data was field counted for the study area intersections identified in **Section 2.1** on Wednesday, May 14, 2025, and for US-95A and Bowman Lane/Campbell Lane (#5) on Tuesday, August 26, 2025. Data was collected for 24-hours to obtain the actual peak hours for each intersection. For conservative analysis, the highest peak hour in the AM and PM were used to analyze the conditions at peak traffic on the street network. A summary of the peak hour count data at the study area intersections is shown in **Figure 4** and the count data sheets are provided in **Appendix B**.



Source: Google Earth Image Date: July 2024

Monarch
Study Area

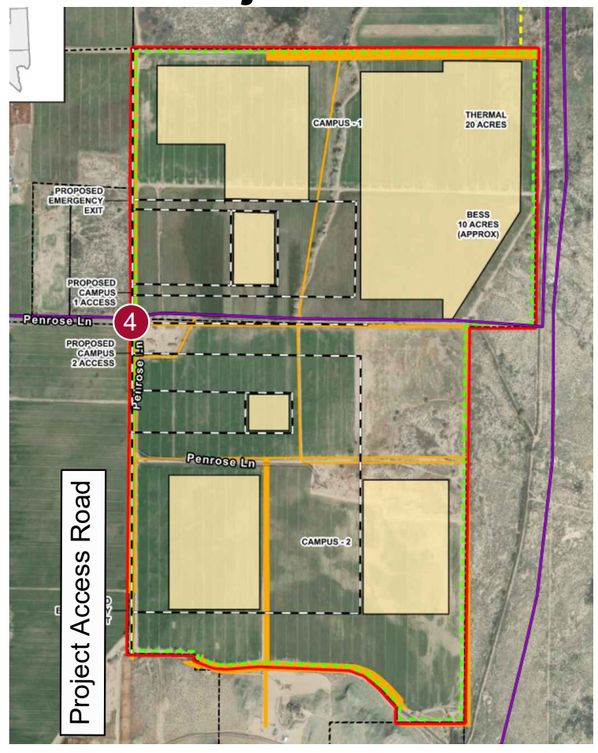
North

NTS

Study Area Intersections

1. US-95A and Sierra Way
2. Sierra Way and Project Access Road
3. US-95A and Penrose Lane
4. Penrose Lane and Project Access Road
5. UA-95A and Bowman Lane
6. US-95A and Miller Lane
7. US-95A and SR-339

Project Site



Legend

- # Study Area Key Intersection
- X Project Access Drive

Figure 2

Kimley»Horn ©2026

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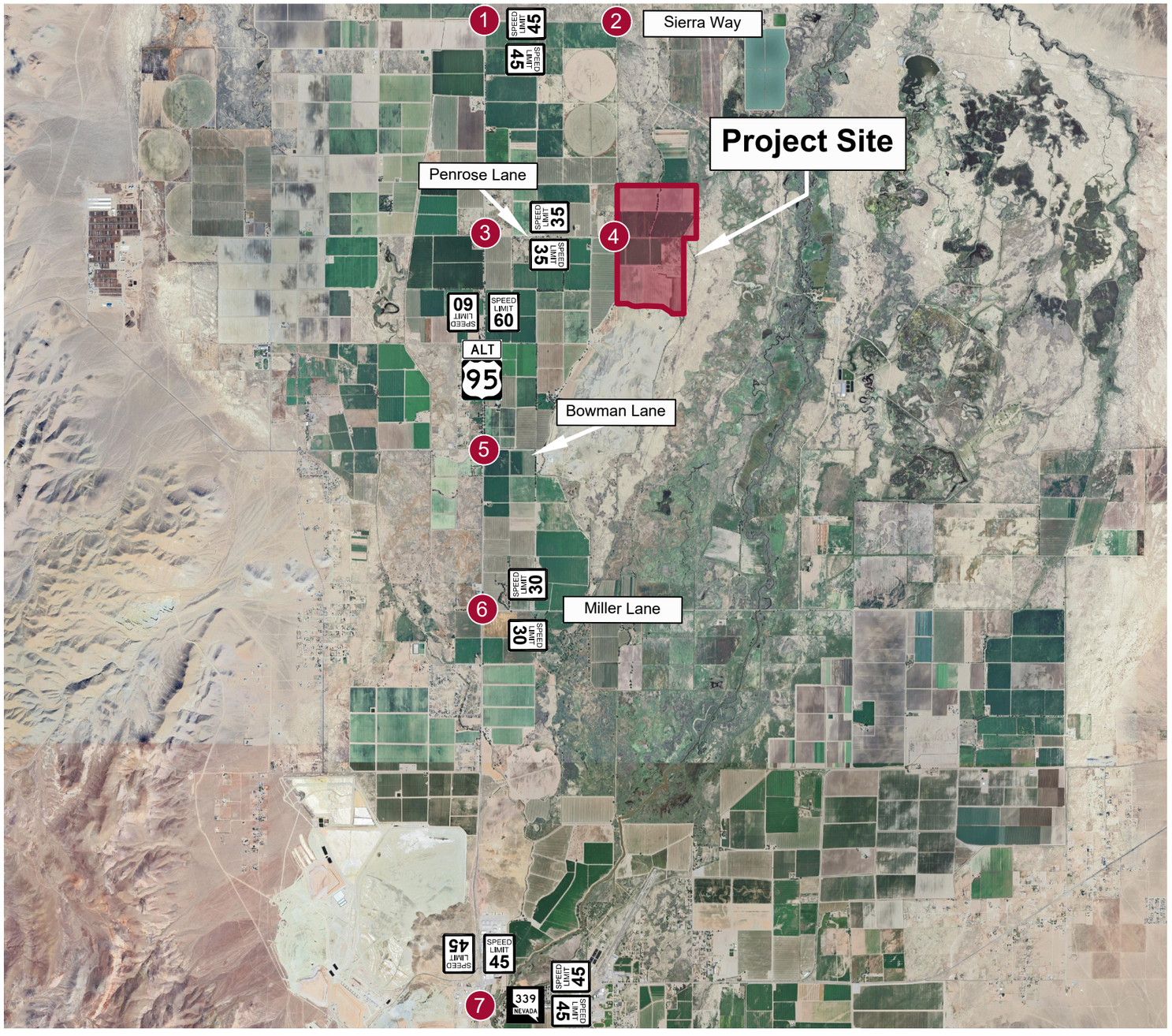
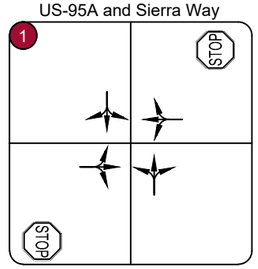
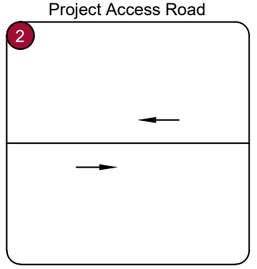


Source: Google Earth Image Date: July 2024

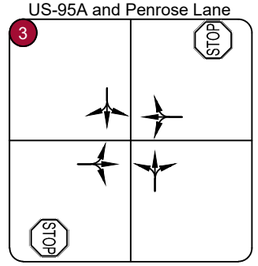
US-95A and Sierra Way



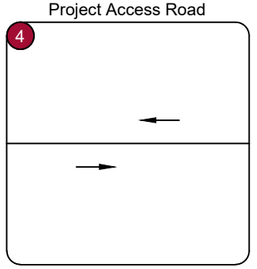
Sierra Way and Project Access Road



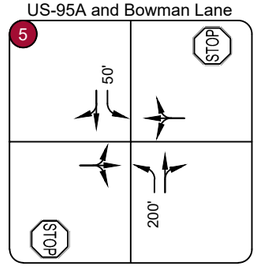
US-95A and Penrose Lane



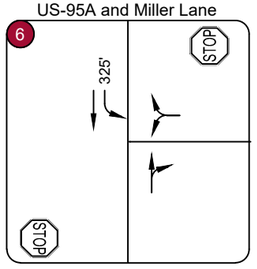
Penrose Lane and Project Access Road



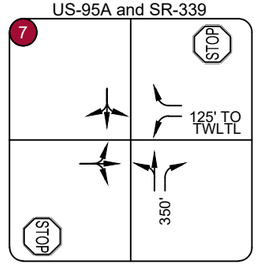
US-95A and Bowman Lane



US-95A and Miller Lane



US-95A and SR-339



North

NTS

Legend

- # — Study Area Key Intersection
- X — Project Access Drive
- SPEED LIMIT 25 — Roadway Speed Limit
- STOP — Stop Controlled Approach
- Existing Approach

Monarch
2025 Existing Lane Configuration and Control

Figure 3

Kimley»Horn ©2026

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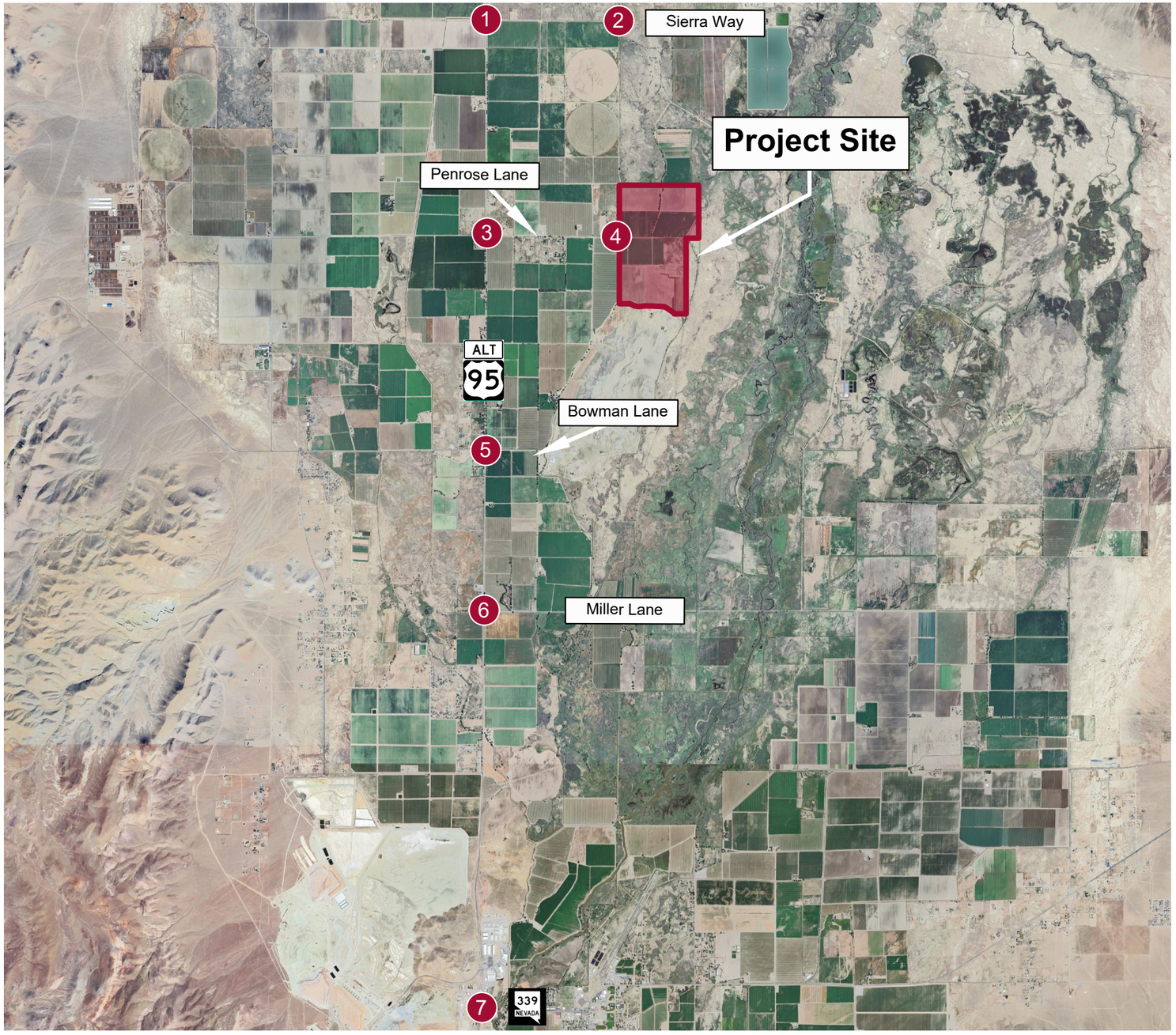

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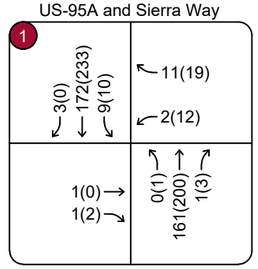
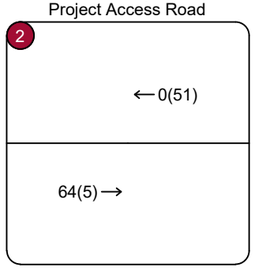
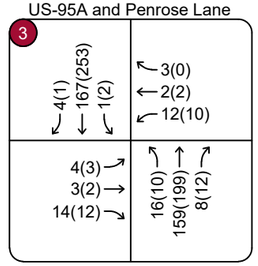
US-95A and Sierra Way



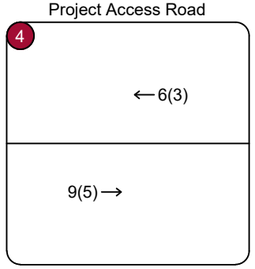
Sierra Way and Project Access Road



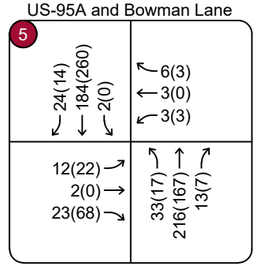
US-95A and Penrose Lane



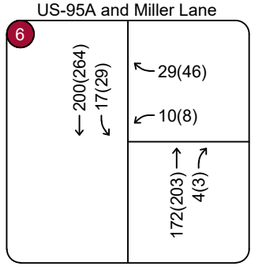
Penrose Lane and Project Access Road



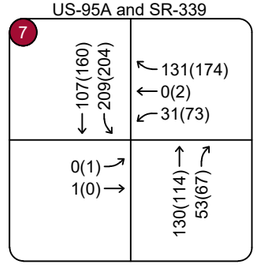
US-95A and Bowman Lane



US-95A and Miller Lane



US-95A and SR-339



North

NTS

Legend

#	Study Area Key Intersection
X	Project Access Drive
← xx (xx)	AM(PM) Peak Hour Volume

Monarch
2025 Existing Peak Hour Traffic Volumes

Figure 4

Kimley»Horn ©2026

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3. FUTURE CONDITIONS

This section of the report details conditions that are expected in the future at the time the proposed project is expected to be completed.

3.1. 2027 Background Lane Configuration and Control

Expected speed limits, lane configuration, and traffic control in 2027 are expected to remain the same as the 2025 existing speed limits, lane configuration, and traffic control as shown in **Figure 4**.

3.2. 2027 Background Traffic Volumes

To accurately determine the impact of project traffic, it is necessary to establish future baseline traffic volumes along roadways near the proposed development site. An annual growth rate of approximately 0.94% percent was obtained from the evaluation of four Nevada Department of Transportation (NDOT) count stations:

- US-95A, .45ft N of Sierra Way (0190048)
- Sierra Way, .5mi E of US-95A (0191627)
- Penrose Lane, 100ft W of US-95A (0191602)
- US-95A, 330ft N of SR 339 (0190051)

Growth rate calculations are included in **Appendix C**. The 2025 peak hour traffic volumes were grown for two years at a 1 percent annual growth rate to obtain future background traffic volumes in 2027 when the proposed project is anticipated to be completed. The 2027 background traffic volumes are illustrated in **Figure 5**.

3.3. 2027 Background plus Project Lane Configuration and Control

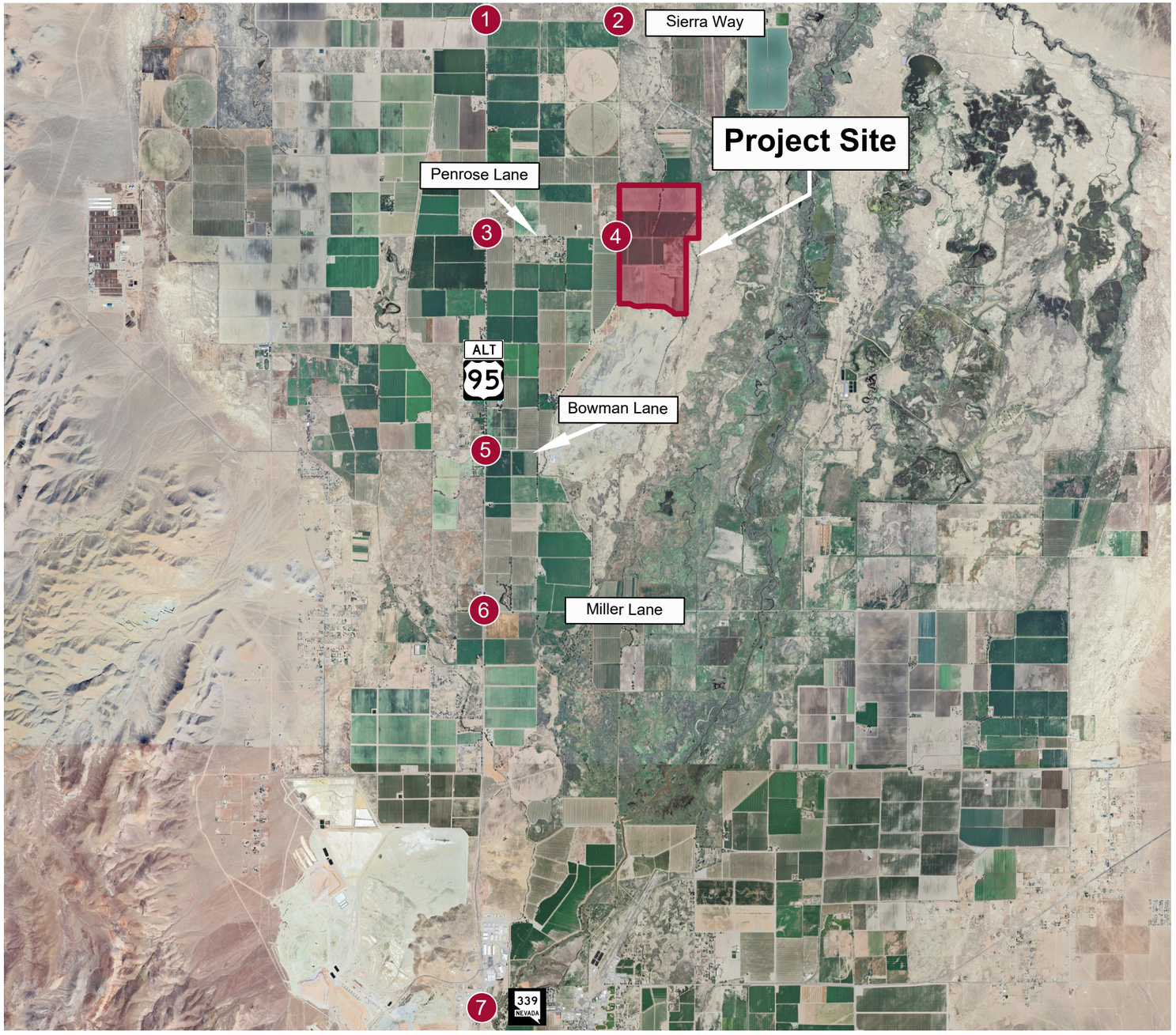
Lane configuration and control upon project completion in 2027 with the buildout of the project access road is shown in **Figure 6.** Direct access to the site is planned to be provided by one full access drive at Sierra Way and the Project Access Road (#2).

3.4. 2047 Horizon Year Lane Configuration and Control

Expected speed limits, lane configuration, and traffic control in 2047 are expected to remain the same as the 2027 background with project speed limits, lane configuration, and traffic control as shown in **Figure 4**.

3.5. 2047 Horizon Year Traffic Volumes

Following the same methodology discussed in **Section 3.2**, the 2027 background traffic volumes were grown to obtain 2047 Horizon Year traffic volumes for the project site. The 2027 peak hour traffic volumes were grown for 20 years at a 1 percent annual growth rate to obtain future horizon year traffic volumes in 2047. The 2047 background traffic volumes are illustrated in **Figure 7**.



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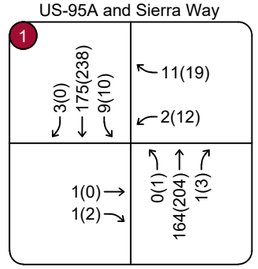
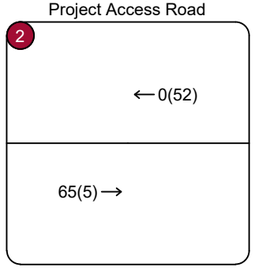
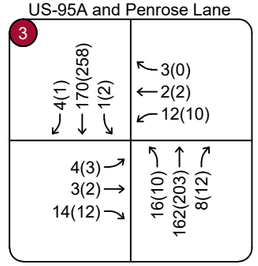
US-95A and Sierra Way



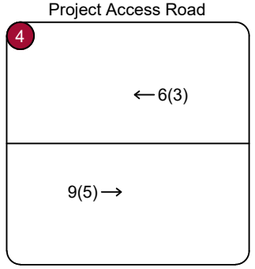
Sierra Way and Project Access Road



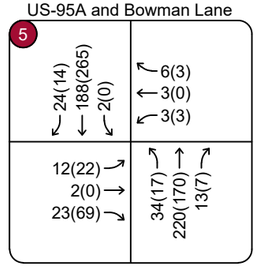
US-95A and Penrose Lane



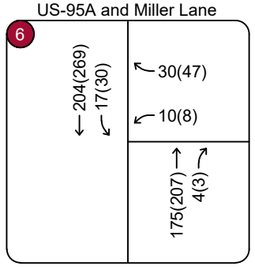
Penrose Lane and Project Access Road



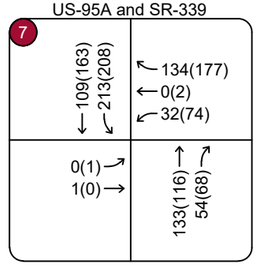
US-95A and Bowman Lane



US-95A and Miller Lane



US-95A and SR-339



North

NTS

Legend

#	Study Area Key Intersection
X	Project Access Drive
← xx (xx)	AM(PM) Peak Hour Volume

Monarch
2027 Background Peak Hour Traffic Volumes

Figure 5

Kimley»Horn ©2026

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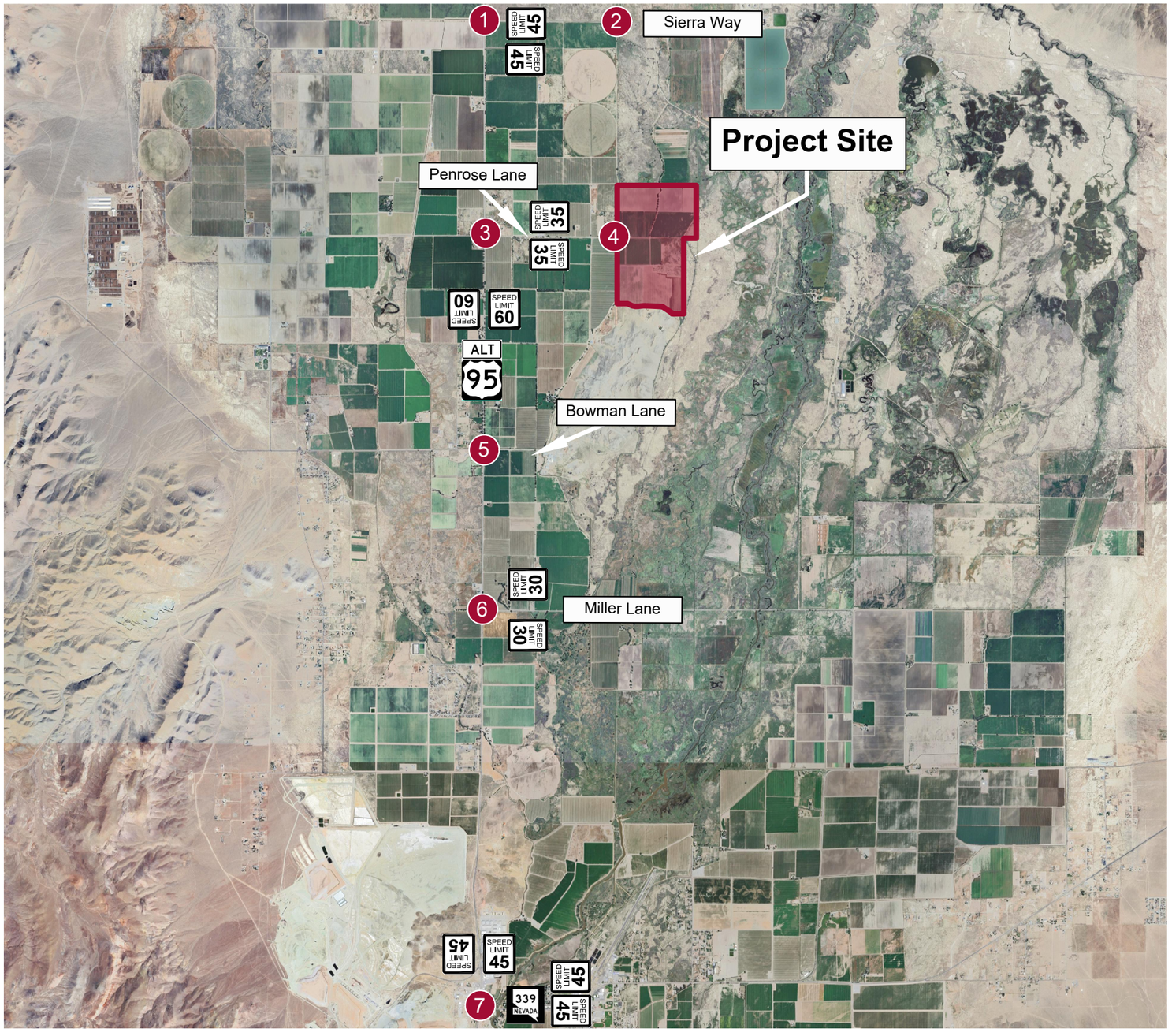
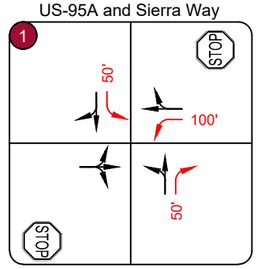
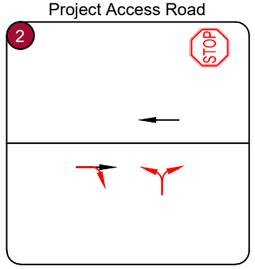


Source: Google Earth Image Date: July 2024

US-95A and Sierra Way



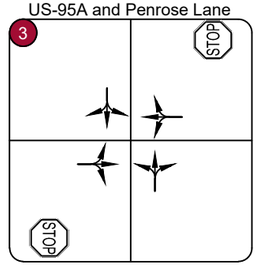
Sierra Way and Project Access Road



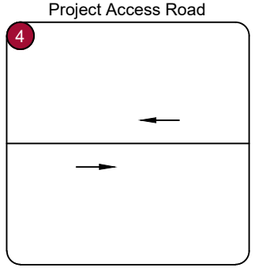
North

NTS

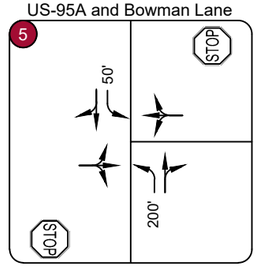
US-95A and Penrose Lane



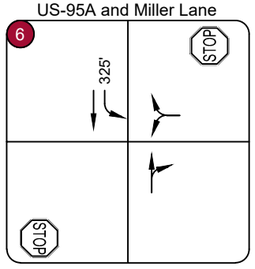
Penrose Lane and Project Access Road



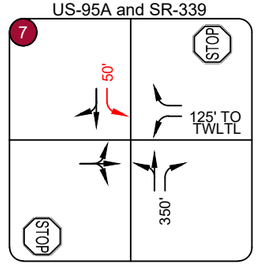
US-95A and Bowman Lane



US-95A and Miller Lane



US-95A and SR-339



Legend

- # — Study Area Key Intersection
- X — Project Access Drive
- SPEED LIMIT 25 — Roadway Speed Limit
- STOP — Stop Controlled Approach
- Existing Approach
- STOP — Project Improvement

Monarch

2027 Background Plus Project Lane Configuration and Control

Figure 6

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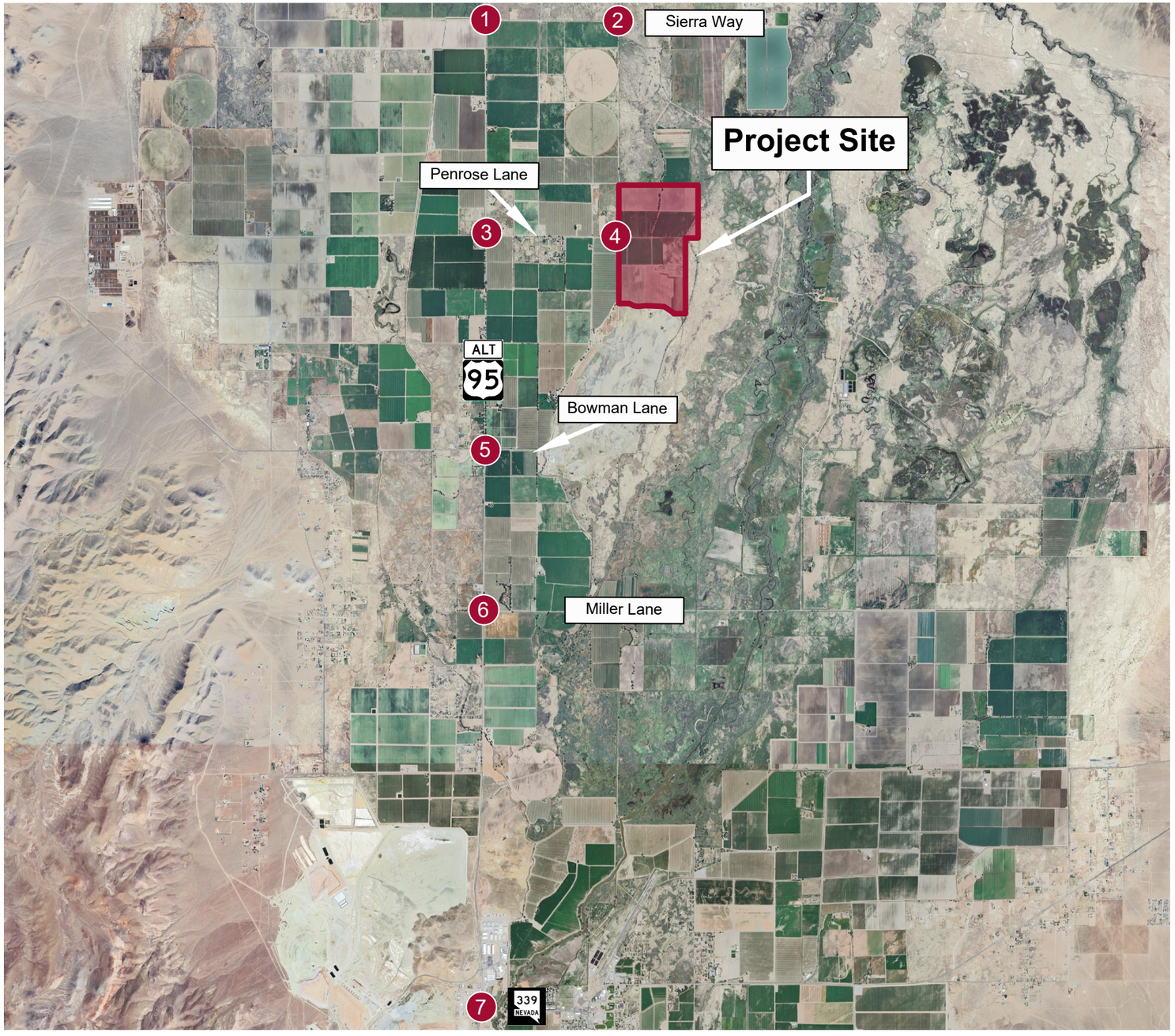
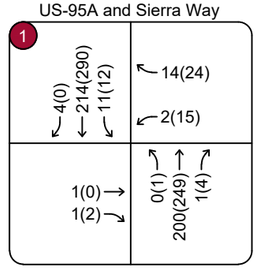
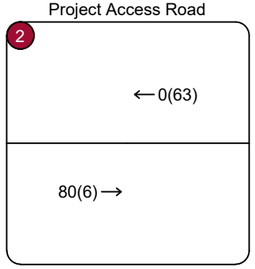


Source: Google Earth Image Date: July 2024

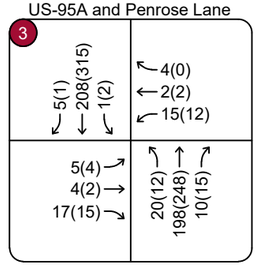
US-95A and Sierra Way



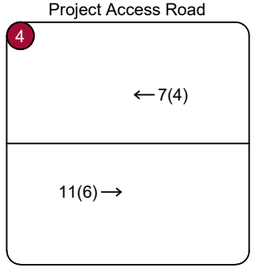
Sierra Way and Project Access Road



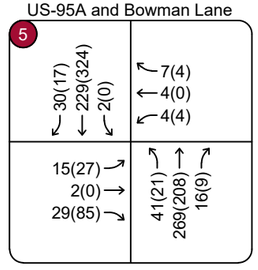
US-95A and Penrose Lane



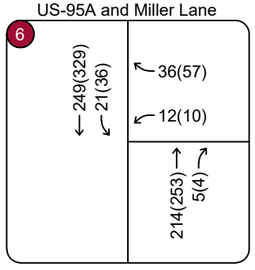
Penrose Lane and Project Access Road



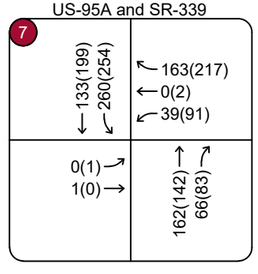
US-95A and Bowman Lane



US-95A and Miller Lane



US-95A and SR-339



North

NTS

Legend

#	Study Area Key Intersection
X	Project Access Drive
← xx (xx)	AM(PM) Peak Hour Volume

Monarch
2047 Horizon Year Peak Hour Traffic Volumes

Figure 7

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3.6. Trip Generation

The proposed Monarch Data Center is expected to have more trip generation during the construction phase than after full project buildout. At the request of NDOT and Lyon County, trip generation calculations and analysis were conducted for the project in both the construction phase and project buildout.

The Monarch Data Center trip generation for construction was calculated using data collected from previously completed studies for data centers. The construction trip generation used in those studies was scaled appropriately for the Monarch Data Center based on overall project building square footage. It is anticipated that the proposed project will generate 1,221 AM construction trips and 1,268 PM construction trips at peak levels during the construction phase, as shown in **Table 1**. It is anticipated that the Monarch Data Center will have approximately 4.6 million square feet of floor space after completion. Calculations are provided in **Appendix D**.

Table 1 – Trip Generation – Construction

ITE Code	Description	Size	AM Peak Hour			PM Peak Hour		
			In	Out	Total	In	Out	Total
NA	Data Center Construction	4.6 million SF	1,163	58	1,121	81	1,188	1,268

Source: Previously completed data center studies

ITE Trip Generation Manual, 11th Edition (ITE Land Use Code 160 – Data Center) was used to estimate the trips generated by the proposed project at project buildout. The ITE Trip Generation Manual is a standard reference used by jurisdictions throughout the United States and is based on actual trip generation studies performed at numerous locations in areas of various populations.

The proposed project is anticipated to generate 506 AM and 414 PM peak hour trips, as summarized in **Table 2**. Calculations are provided in **Appendix D**.

Table 2 – Trip Generation – Typical Operations

ITE Code	Description	Size	AM Peak Hour			PM Peak Hour		
			In	Out	Total	In	Out	Total
160	Data Center	4.6 million SF	278	228	506	124	290	414

Source: ITE Trip Generation Manual, 11th Edition

While ITE has a data center land use code, the size of this proposed development is significantly larger than the sites studied and reported in the trip generation manual. The trip generation calculated in **Table 2** is expected to be a conservative estimate as the consolidation of multiple data centers onto one campus is expected to create efficiencies that result in less overall trip generation. For a conservative evaluation, the ITE rates are used for this study.

3.7. Trip Distribution

The study area street network characteristics, including existing traffic patterns, expected street network, access to the regional facility (US-95A), and engineering judgment, were used to determine the distribution of construction generated traffic. The directional distribution of traffic is a means to quantify the percentage of site-generated construction traffic that approaches the site from a given direction and departs the site in the same or different direction.

It is anticipated that the trip distribution for construction traffic and typical operations will differ. Construction traffic was evaluated for two different scenarios. Construction Scenario 1 refers to the distribution of construction traffic using Sierra Way and Bowman Lane as access to the project site. Construction Scenario 2 refers to the distribution of construction traffic using Sierra Way as the only access to the project site. **Figure 8** and **Figure 9** show the trip distribution at study area intersections and project access drive for construction traffic Scenarios 1 and 2, respectively. **Figure 10** shows the trip distribution at the study area intersections and project access drive for typical operations.

3.8. Traffic Assignment

3.8.1. Construction Scenario 1 Traffic Assignment

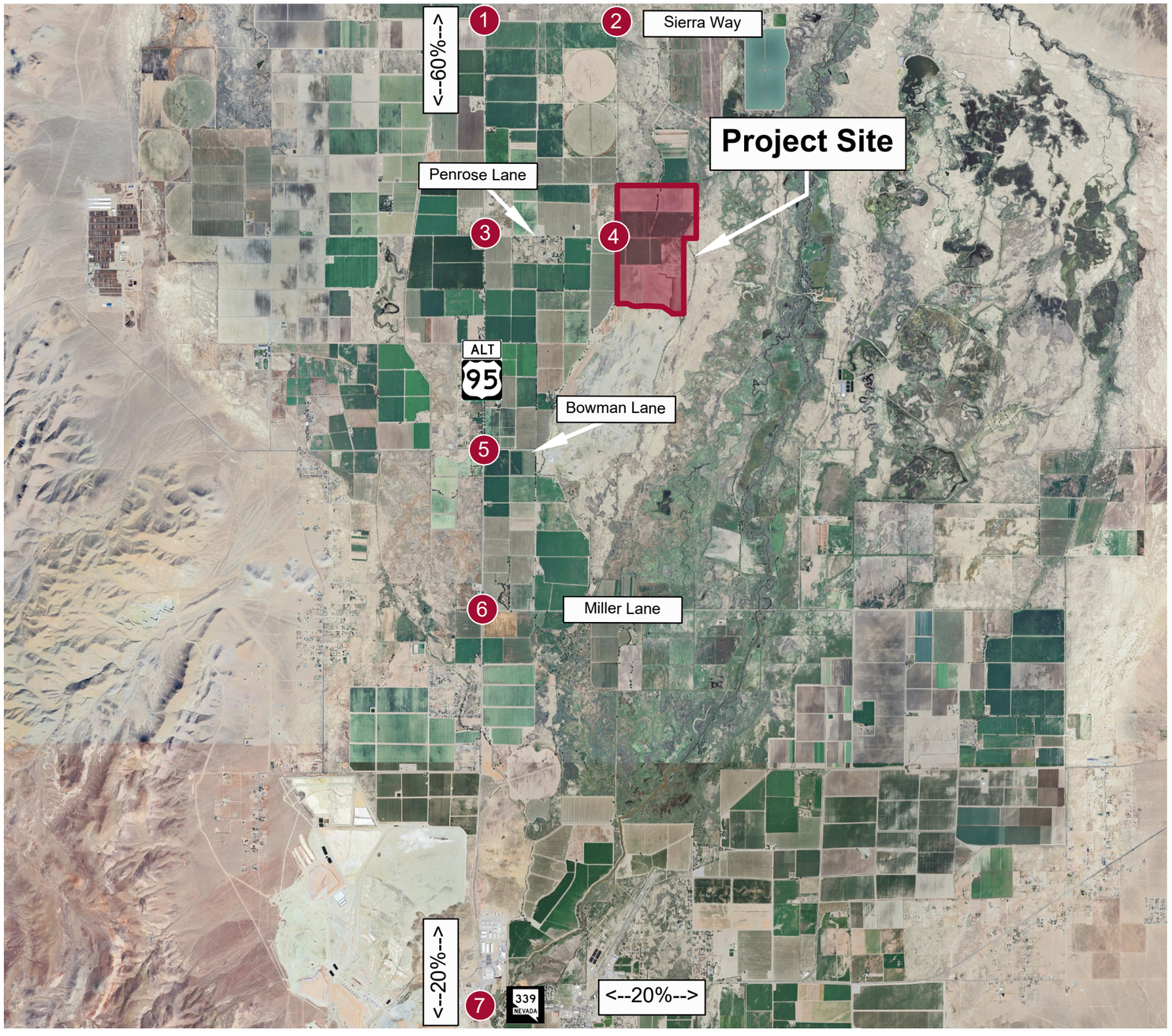
Assignment of project construction traffic was obtained by applying the developed trip distribution in **Figure 8** to the estimated construction traffic generation in **Table 1**. As previously noted, Construction Scenario 1 refers to the distribution of construction traffic using Sierra Way and Bowman Lane as access to the project site. The construction traffic assignment is illustrated in **Figure 11** for the study area intersections and project access drives. It should be noted that the entering and exiting trips at the project access drive were rounded up to the nearest whole number. Therefore, the number of trips assigned to the project driveway in **Figure 11** may differ slightly from the total trip generation.

3.8.2. Construction Scenario 2 Traffic Assignment

Assignment of project construction traffic was obtained by applying the developed trip distribution in **Figure 9** to the estimated construction traffic generation in **Table 1**. As previously noted, Construction Scenario 2 refers to the distribution of construction traffic using Sierra Way as the only access to the project site. The construction traffic assignment is illustrated in **Figure 12** for the study area intersections and project access drive. It should be noted that the entering and exiting trips at the project access drive were rounded up to the nearest whole number. Therefore, the number of trips assigned to the project driveway in **Figure 12** may differ slightly from the total trip generation.

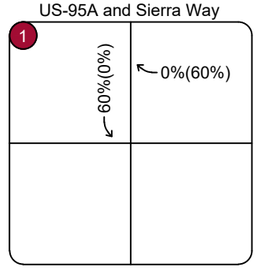
3.8.3. Typical Operations Traffic Assignment

Assignment of typical operations project traffic was obtained by applying the developed trip distribution in **Figure 10** to the estimated full buildout typical operations traffic generation in **Table 2**. The typical operation traffic assignment is illustrated in **Figure 13** for the study area intersections and project access drive. It should be noted that the entering and exiting trips at the project access drives were rounded up to the nearest whole number. Therefore, the number of trips assigned to the project driveways in **Figure 13** may differ slightly from the total trip generation.

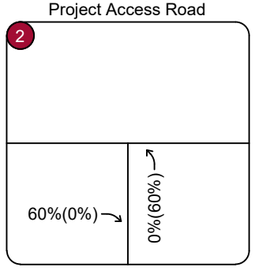


Source: Google Earth Image Date: July 2024

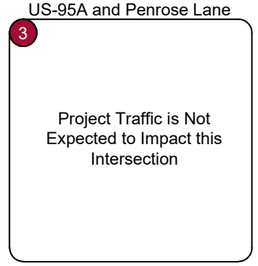
US-95A and Sierra Way



Sierra Way and Project Access Road

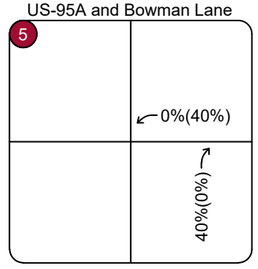


US-95A and Penrose Lane

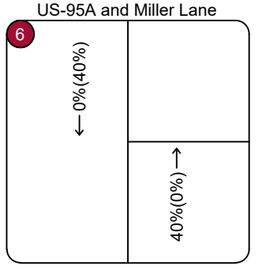


Penrose Lane and Project Access Road

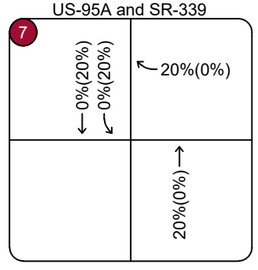
US-95A and Bowman Lane



US-95A and Miller Lane



US-95A and SR-339



North

NTS

Legend

#	Study Area Key Intersection
X	Project Access Drive
<--XX%-->	Global Peak Hour Trip Distribution
← XX% (XX%)	IN(OUT) Peak Hour Trip Distribution

Monarch

Project Trip Distribution - Construction Scenario 1

Figure 8

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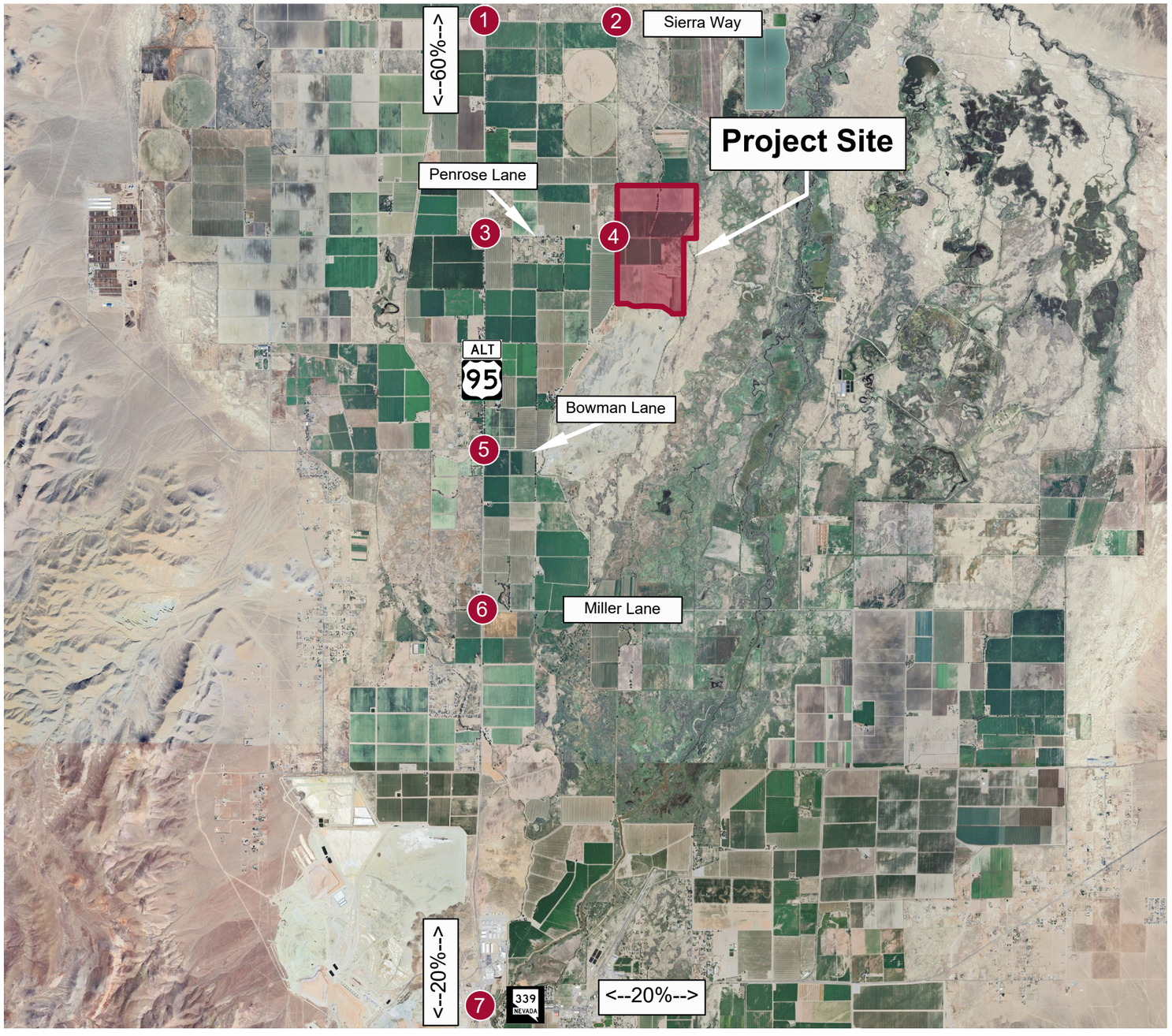

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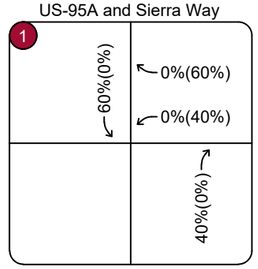
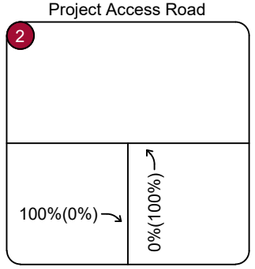
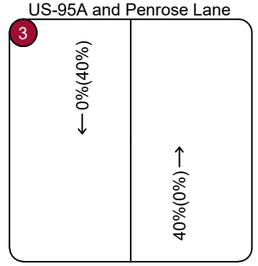
US-95A and Sierra Way



Sierra Way and Project Access Road

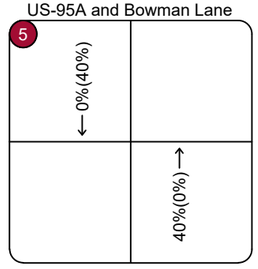


US-95A and Penrose Lane

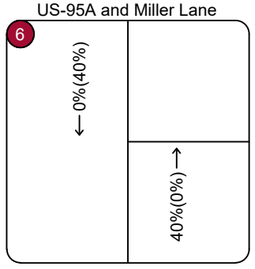


Penrose Lane and Project Access Road

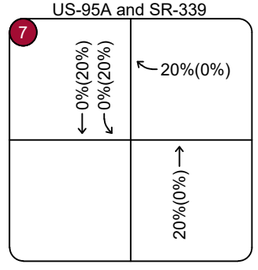
US-95A and Bowman Lane



US-95A and Miller Lane



US-95A and SR-339



Legend

#	Study Area Key Intersection
X	Project Access Drive
<--XX%-->	Global Peak Hour Trip Distribution
← XX% (XX%)	IN(OUT) Peak Hour Trip Distribution

North

NTS

Monarch

Project Trip Distribution - Construction Scenario 2

Figure 9

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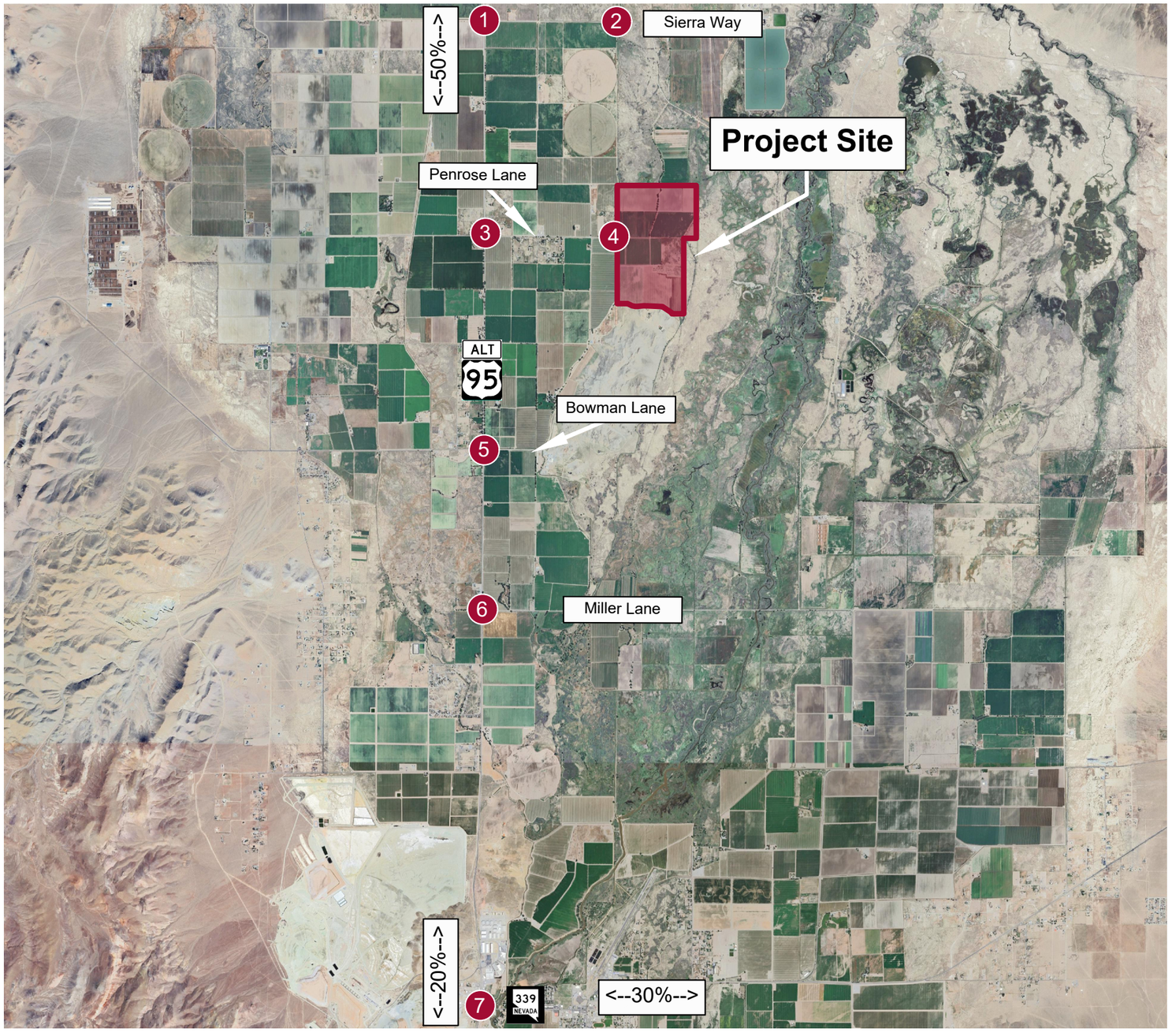

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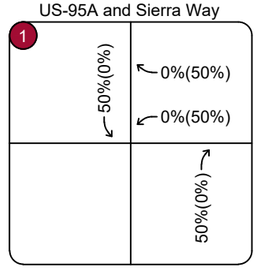
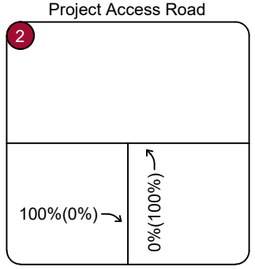
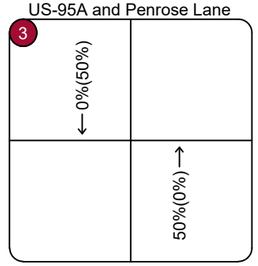
US-95A and Sierra Way



Sierra Way and Project Access Road

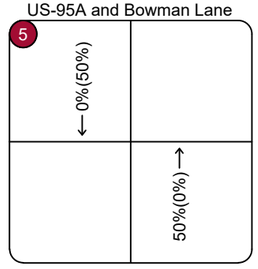


US-95A and Penrose Lane

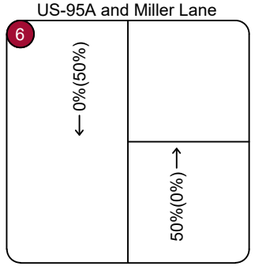


Penrose Lane and Project Access Road

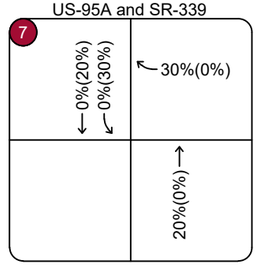
US-95A and Bowman Lane



US-95A and Miller Lane



US-95A and SR-339



North

NTS

Legend

#	Study Area Key Intersection
X	Project Access Drive
<--XX%-->	Global Peak Hour Trip Distribution
← XX% (XX%)	IN(OUT) Peak Hour Trip Distribution

Monarch
Project Trip Distribution - Typical Operations

Figure 10

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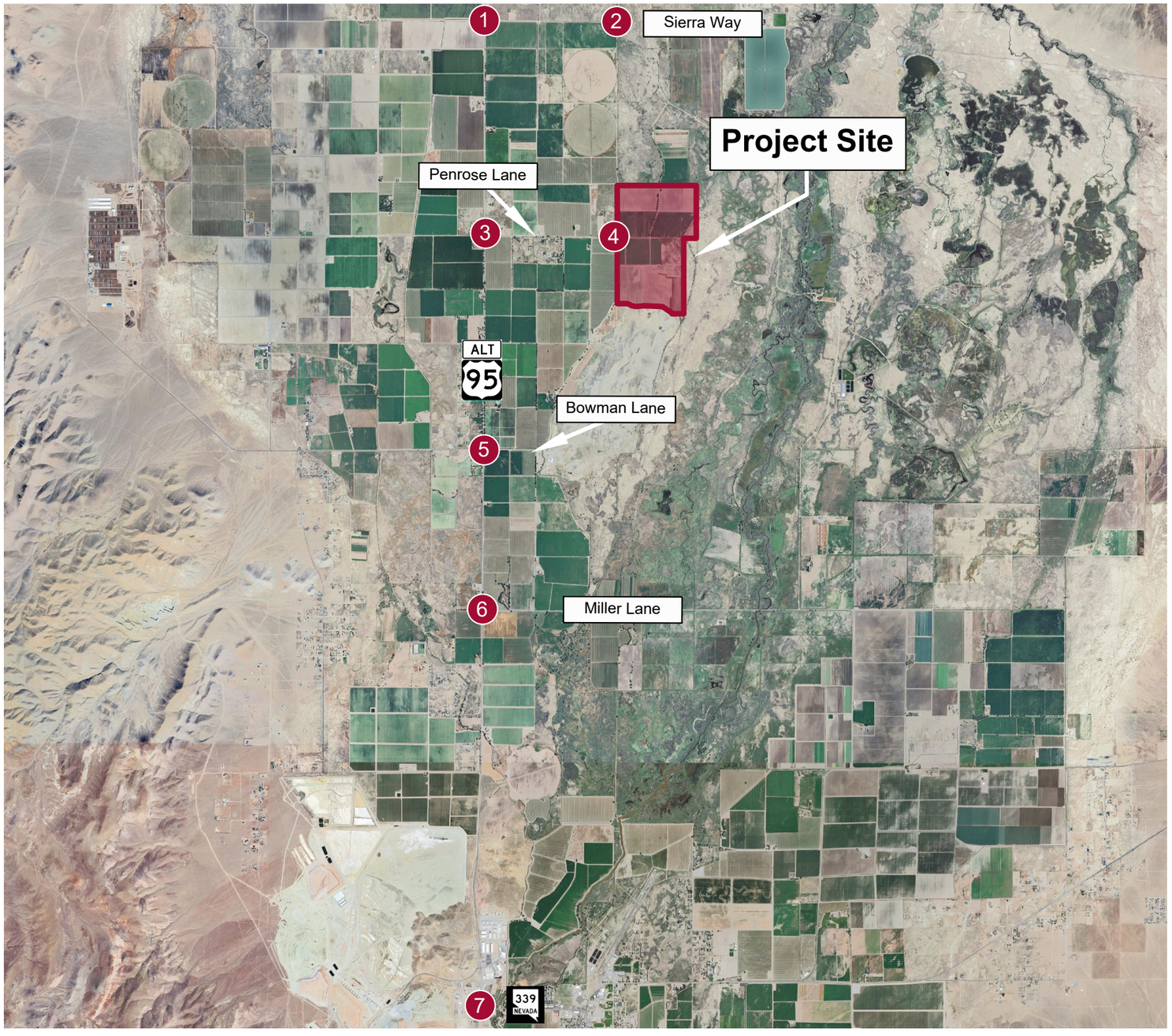

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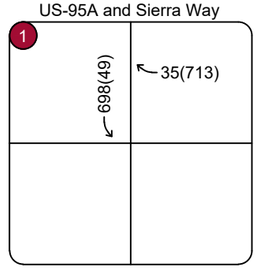
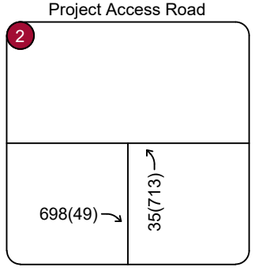
US-95A and Sierra Way



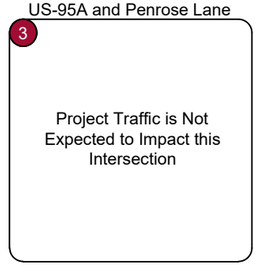
Sierra Way and Project Access Road



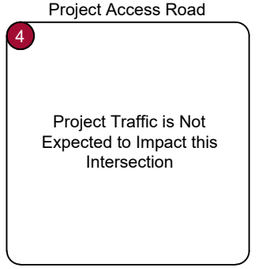
North

NTS

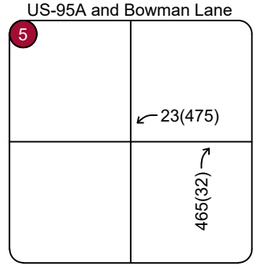
US-95A and Penrose Lane



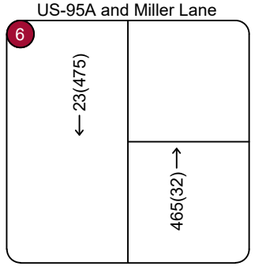
Penrose Lane and Project Access Road



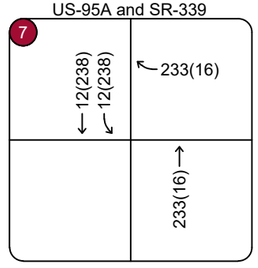
US-95A and Bowman Lane



US-95A and Miller Lane



US-95A and SR-339



Legend

#	Study Area Key Intersection
X	Project Access Drive
← xx (xx)	AM(PM) Peak Hour Volume

Monarch
Project Traffic Assignment - Construction Scenario 1

Figure 11

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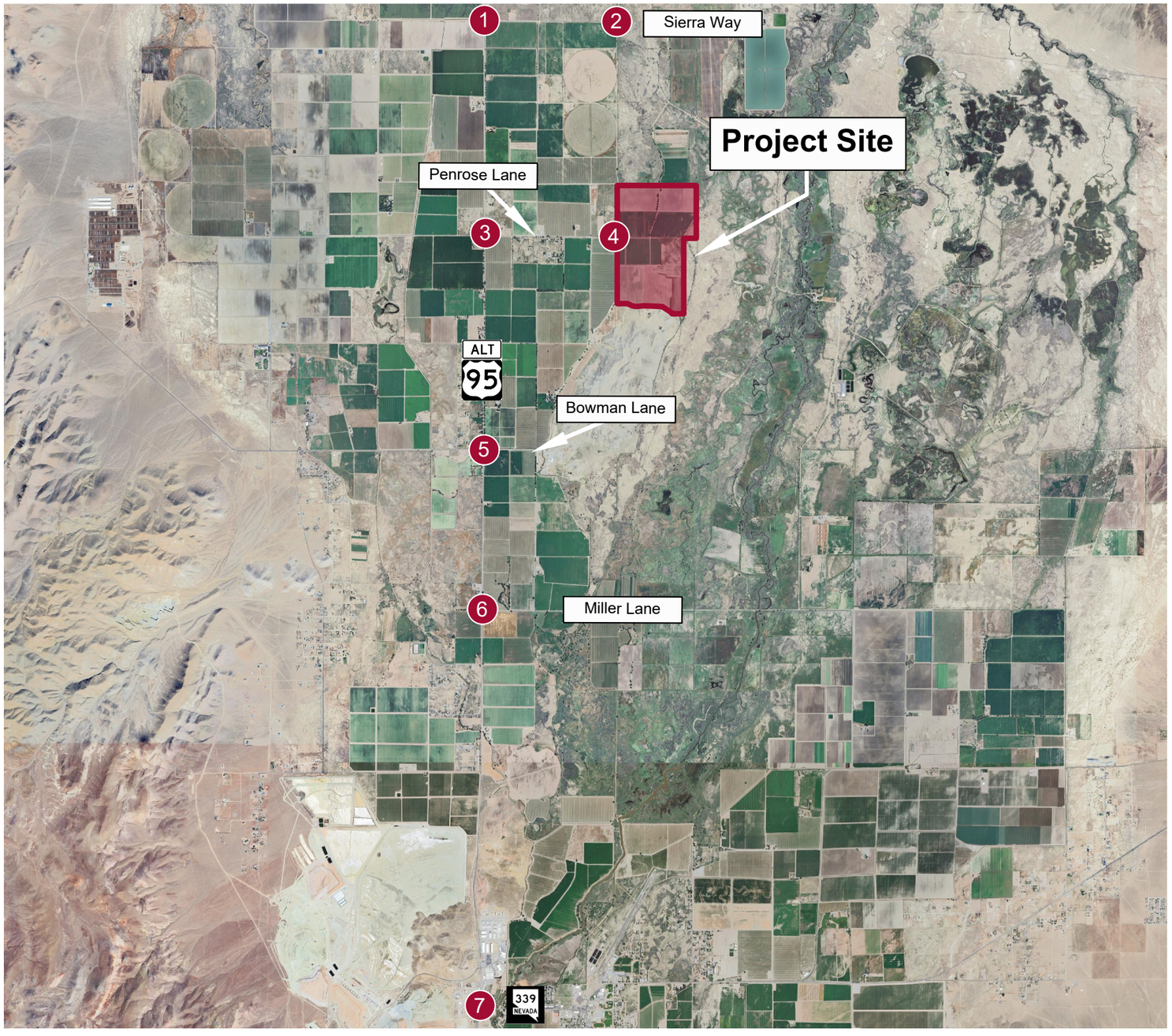
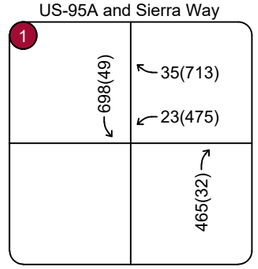
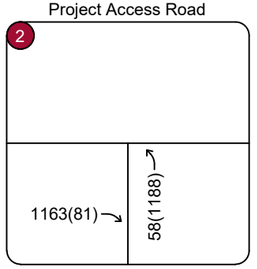


Source: Google Earth Image Date: July 2024

US-95A and Sierra Way



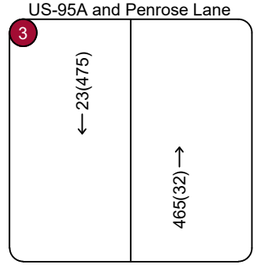
Sierra Way and Project Access Road



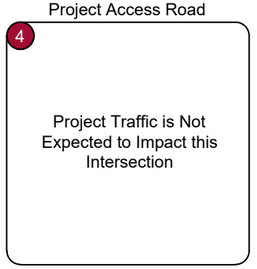
North

NTS

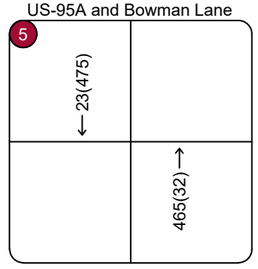
US-95A and Penrose Lane



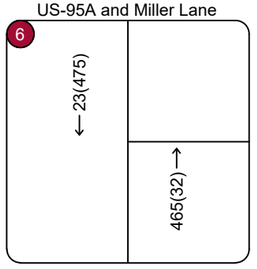
Penrose Lane and Project Access Road



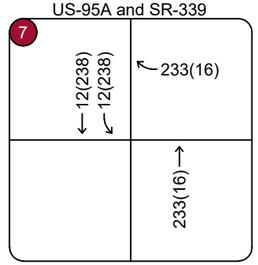
US-95A and Bowman Lane



US-95A and Miller Lane



US-95A and SR-339



Legend

#	Study Area Key Intersection
X	Project Access Drive
← xx (xx)	AM(PM) Peak Hour Volume

Monarch
Project Traffic Assignment - Construction Scenario 2

Figure 12

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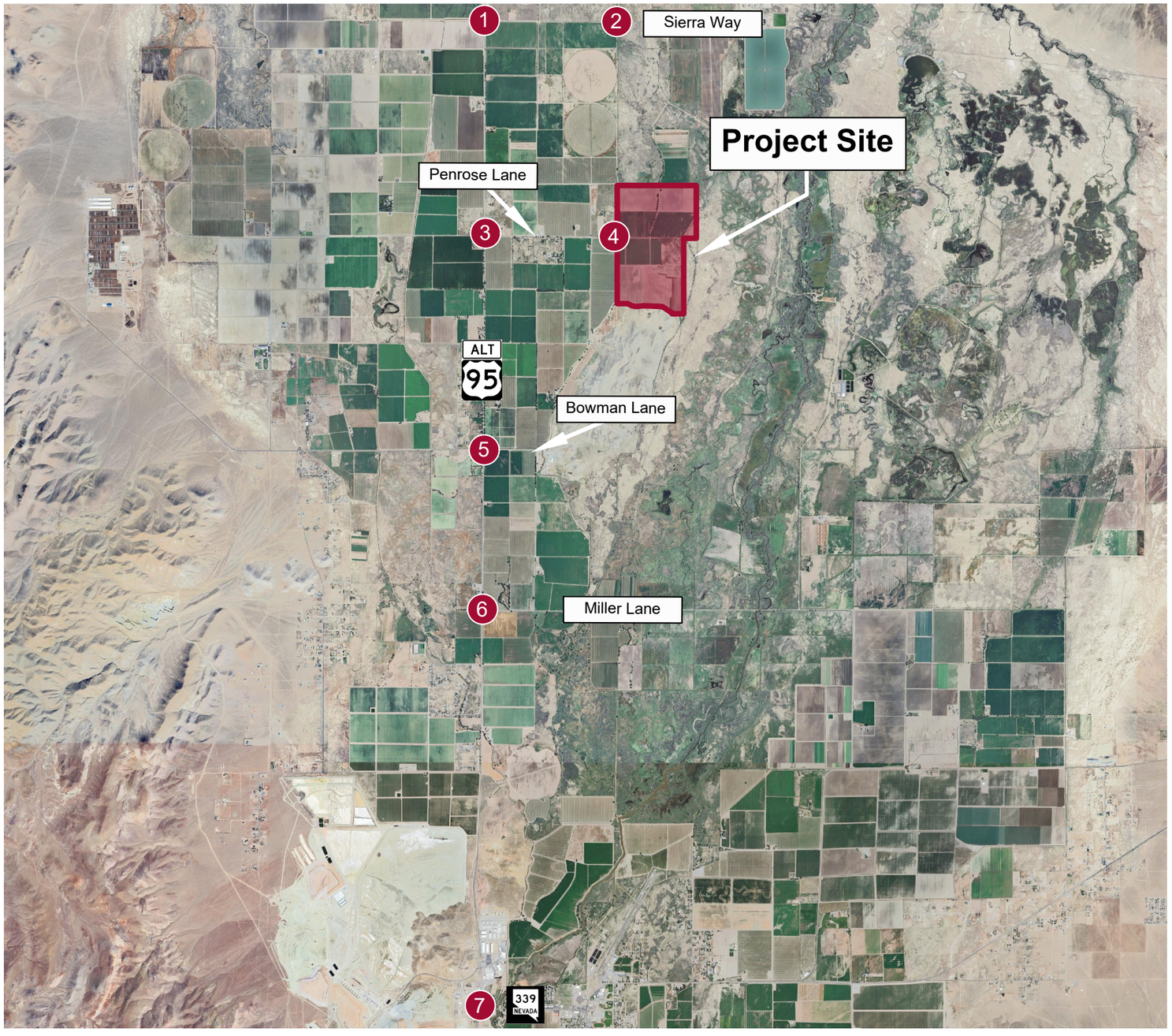
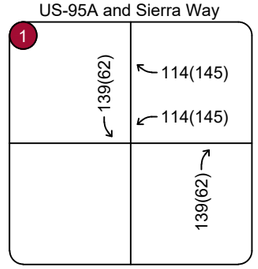
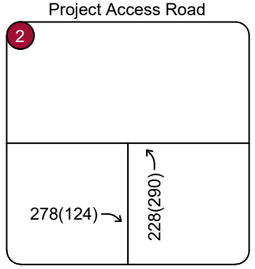


Source: Google Earth Image Date: July 2024

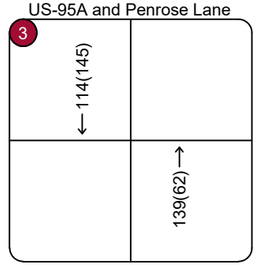
US-95A and Sierra Way



Sierra Way and Project Access Road

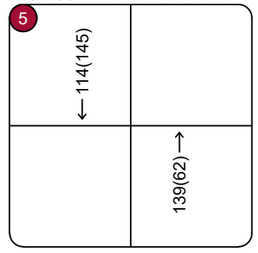


US-95A and Penrose Lane

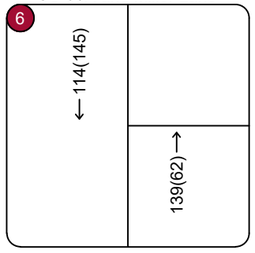


Penrose Lane and Project Access Road

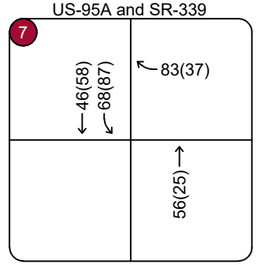
US-95A and Bowman Lane



US-95A and Miller Lane



US-95A and SR-339



North

NTS

Legend

#	Study Area Key Intersection
X	Project Access Drive
← xx (xx)	AM(PM) Peak Hour Volume

Monarch
Project Traffic Assignment - Typical Operations

Figure 13

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3.9. 2027 Background Plus Project Traffic Volumes

3.9.1. 2027 Background Plus Construction Scenario 1 Traffic Volumes

The project generated construction traffic volumes in **Figure 11** were added to the 2027 background peak hour traffic volumes in **Figure 5** to represent estimated traffic conditions during project construction for Scenario 1. The 2027 background plus construction traffic volumes for the study area intersections and project access drives are illustrated in **Figure 14**.

3.9.2. 2027 Background Plus Construction Scenario 2 Traffic Volumes

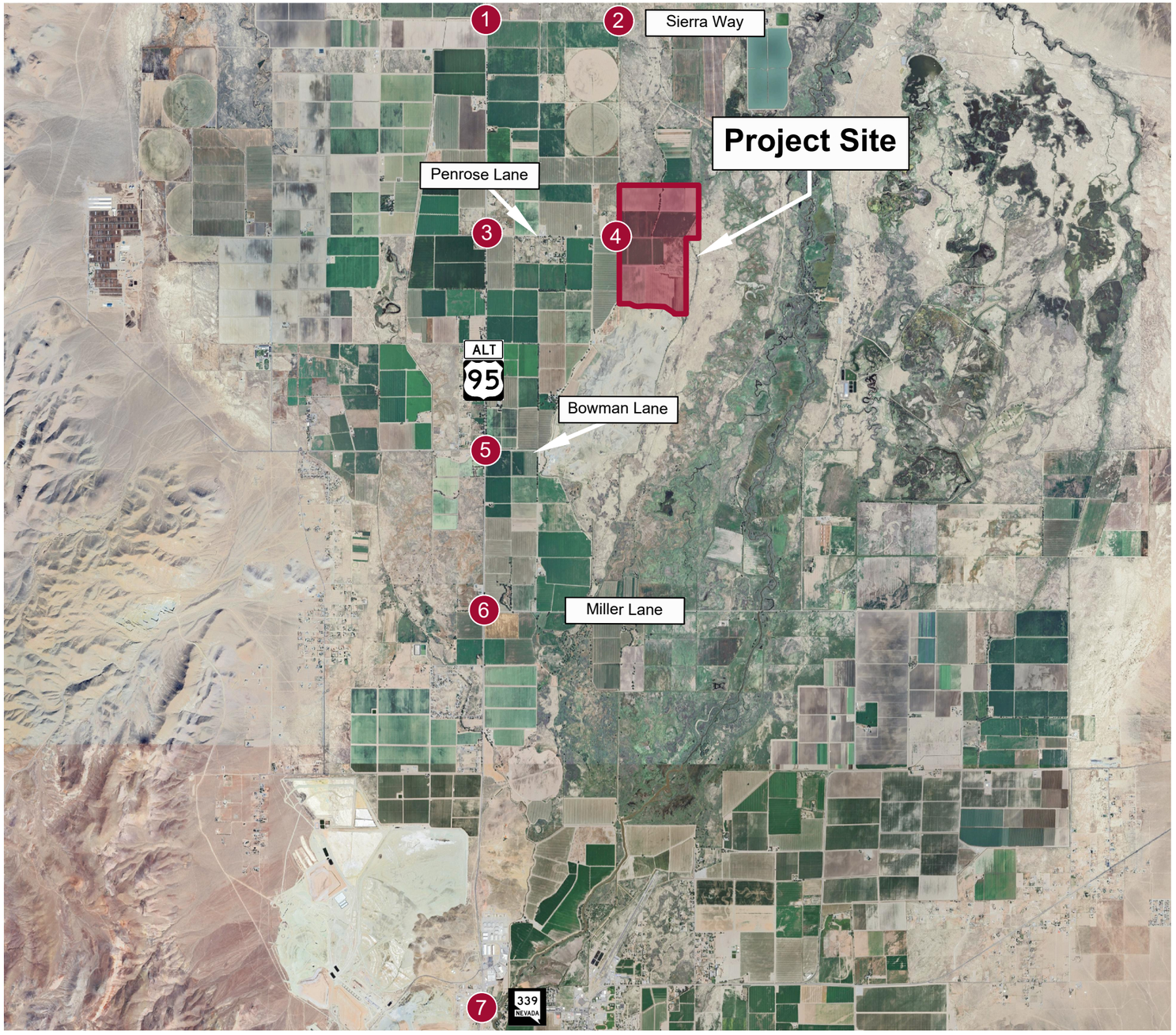
The project generated construction traffic volumes in **Figure 12** were added to the 2027 background peak hour traffic volumes in **Figure 5** to represent estimated traffic conditions during project construction for Scenario 2. The 2027 background plus construction traffic volumes for the study area intersections and project access drives are illustrated in **Figure 15**.

3.9.3. 2027 Background Plus Project Traffic Volumes

The project generated traffic volumes in **Figure 13** were added to the 2027 background traffic volumes in **Figure 5** to represent estimated traffic conditions for the project completion in 2027. The 2027 background plus project total traffic volumes for the study area intersections and project access drives are illustrated in **Figure 16**.

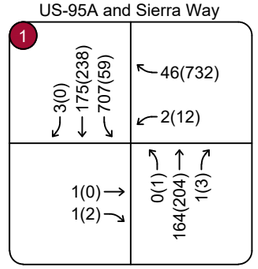
3.10. 2047 Horizon Plus Project Traffic Volumes

The project generated traffic volumes in **Figure 13** were added to the 2047 horizon year traffic volumes in **Figure 7** to represent estimated traffic conditions for 2047. The 2047 horizon plus project total traffic volumes for the study area intersections and project access drives are illustrated in **Figure 17**.

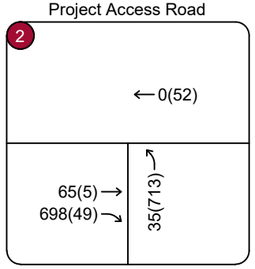


Source: Google Earth Image Date: July 2024

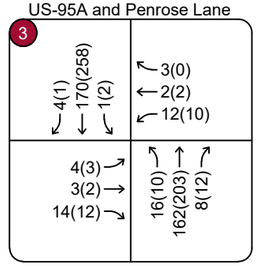
US-95A and Sierra Way



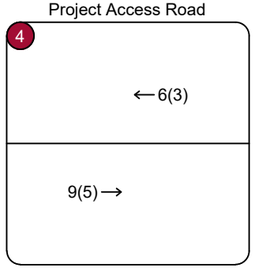
Sierra Way and Project Access Road



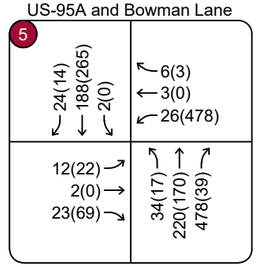
US-95A and Penrose Lane



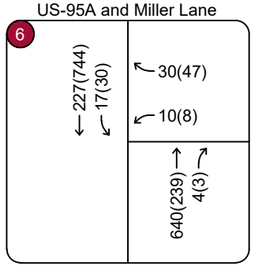
Penrose Lane and Project Access Road



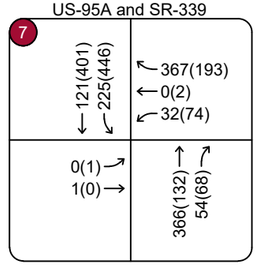
US-95A and Bowman Lane



US-95A and Miller Lane



US-95A and SR-339



North

NTS

Legend

#	Study Area Key Intersection
X	Project Access Drive
← xx (xx)	AM(PM) Peak Hour Volume

Monarch

2027 Background Plus Construction Scenario 1 Peak Hour Traffic Volumes

Figure 14

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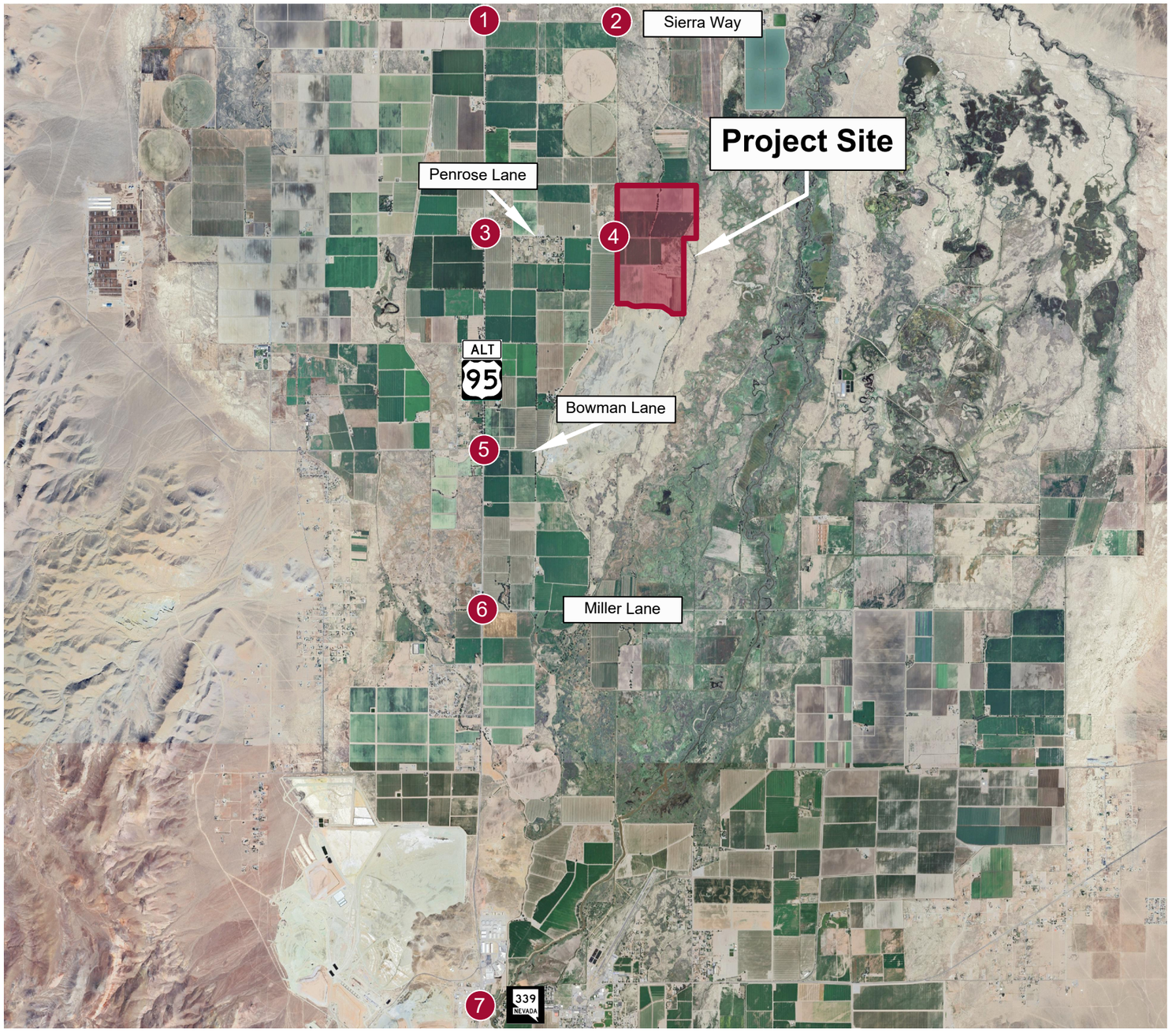

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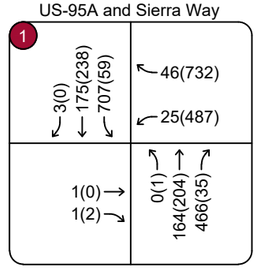
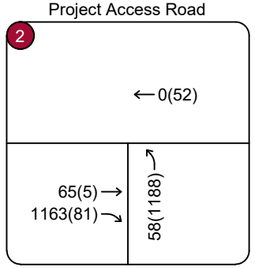
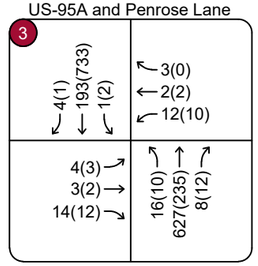
US-95A and Sierra Way



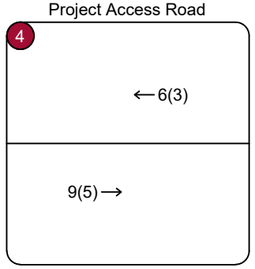
Sierra Way and Project Access Road



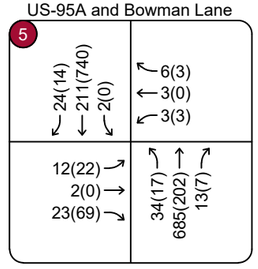
US-95A and Penrose Lane



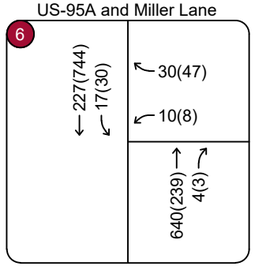
Penrose Lane and Project Access Road



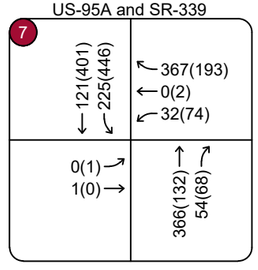
US-95A and Bowman Lane



US-95A and Miller Lane



US-95A and SR-339



North

NTS

Legend

#	Study Area Key Intersection
X	Project Access Drive
← xx (xx)	AM(PM) Peak Hour Volume

Monarch

2027 Background Plus Construction Scenario 2 Peak Hour Traffic Volumes

Figure 15

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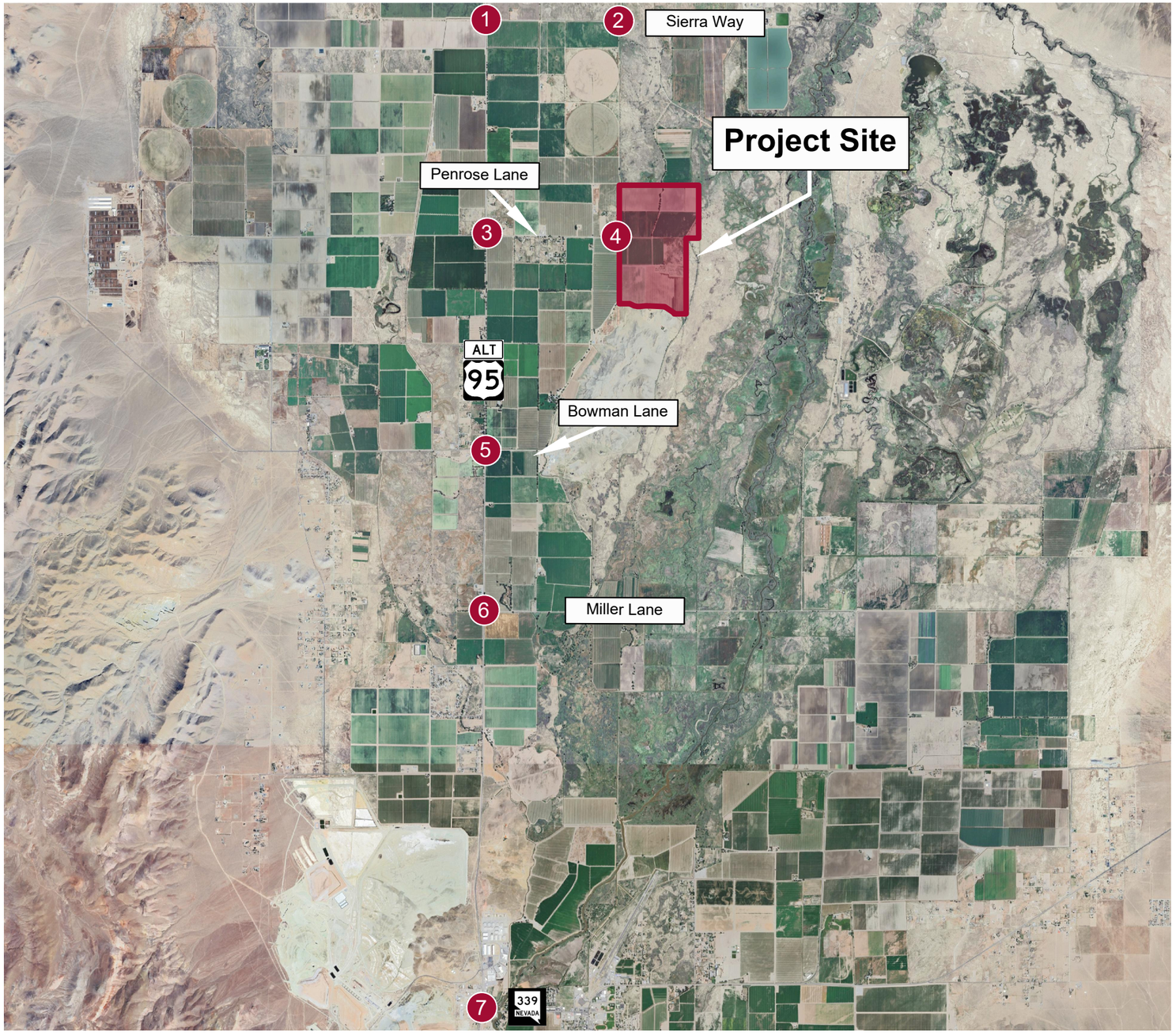
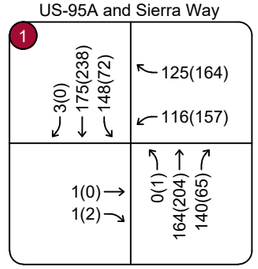
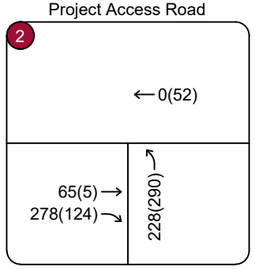


Source: Google Earth Image Date: July 2024

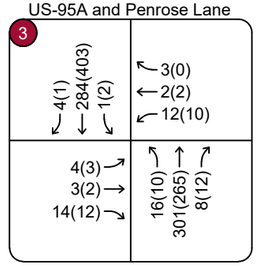
US-95A and Sierra Way



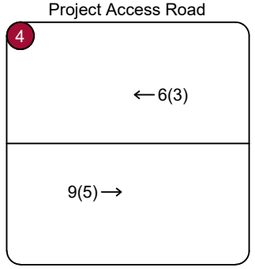
Sierra Way and Project Access Road



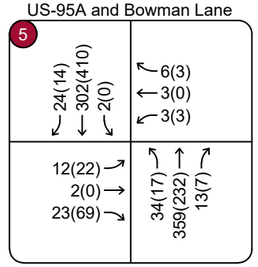
US-95A and Penrose Lane



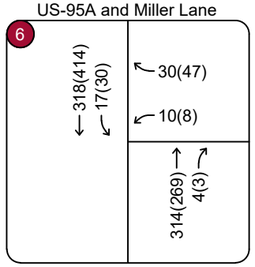
Penrose Lane and Project Access Road



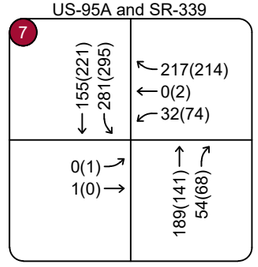
US-95A and Bowman Lane



US-95A and Miller Lane



US-95A and SR-339



North

NTS

Legend

#	Study Area Key Intersection
X	Project Access Drive
← xx (xx)	AM(PM) Peak Hour Volume

Monarch

2027 Background Plus Project Peak Hour Traffic Volumes

Figure 16

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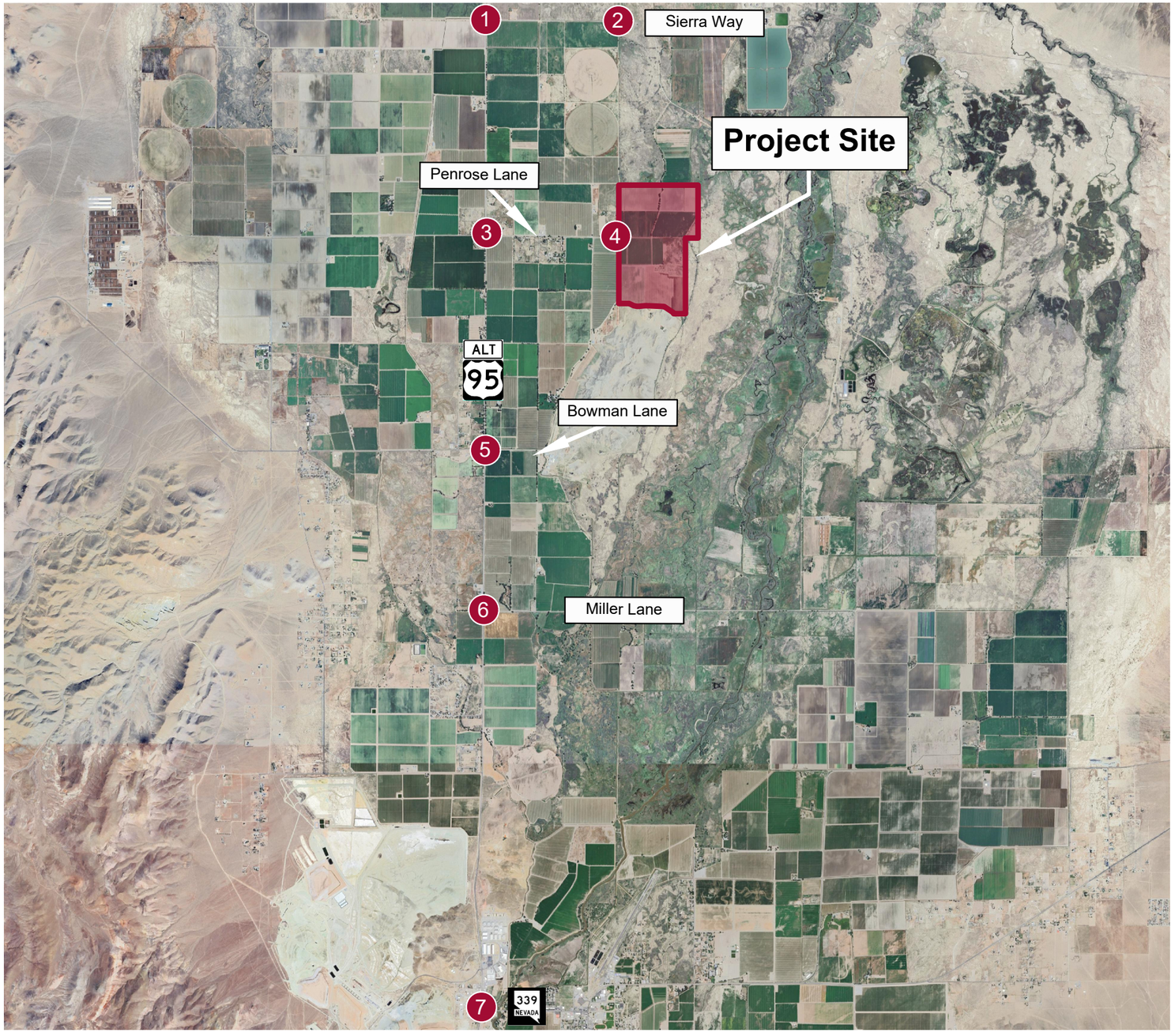
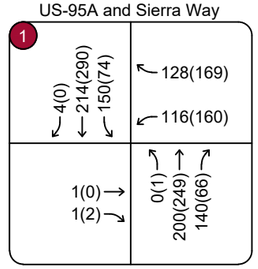
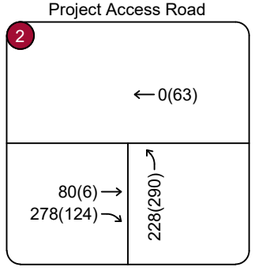


Source: Google Earth Image Date: July 2024

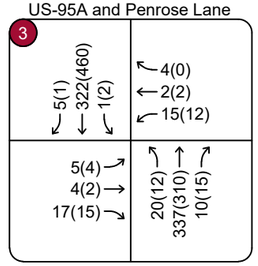
US-95A and Sierra Way



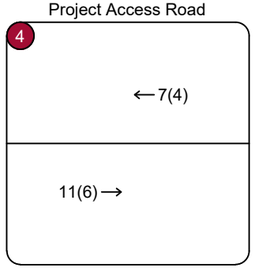
Sierra Way and Project Access Road



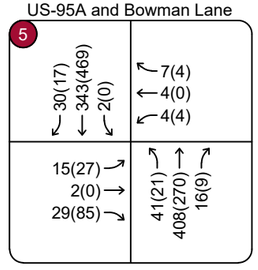
US-95A and Penrose Lane



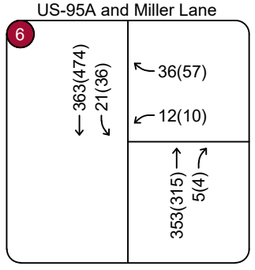
Penrose Lane and Project Access Road



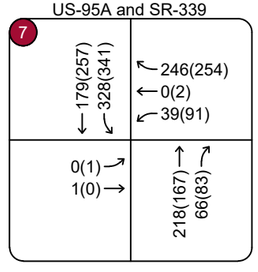
US-95A and Bowman Lane



US-95A and Miller Lane



US-95A and SR-339



North

NTS

Legend

#	Study Area Key Intersection
X	Project Access Drive
← xx (xx)	AM(PM) Peak Hour Volume

Monarch
2047 Horizon Plus Project Peak Hour Traffic Volumes

Figure 17

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4. TRAFFIC IMPACT ANALYSIS

Intersection analyses for the following scenarios were conducted at the identified key intersections to determine possible existing and/or future deficiencies in the street network:

- 2025 Existing
- 2027 Background
- 2027 Background Plus Construction Scenario 1
- 2027 Background Plus Construction Scenario 2
- 2027 Background Plus Project
- 2047 Horizon
- 2047 Horizon Plus Project

4.1. Analysis Methodology

The study area intersections and project access drives were analyzed using the methodologies for unsignalized intersections presented in the Transportation Research Board's "Highway Capacity Manual" 7th Edition. For the unsignalized intersections, the level of service (LOS) for a two-way stop-controlled intersection is determined by the computed or measured control delay and is defined for each minor movement. LOS for a two-way stop-controlled intersection is not defined for the intersection as a whole. LOS for a four-way stop-controlled intersection can be defined for the intersection as a whole. **Table 3** shows the LOS criteria for intersections.

Table 3 – Level of Service Criteria

Level of Service	Four-way Stop Control Average Control Delay (sec/veh)	Unsignalized Intersection Average Control Delay (sec/veh)
A	≤10	≤10
B	>10 and ≤20	>10 and ≤15
C	>20 and ≤35	>15 and ≤25
D	>35 and ≤55	>25 and ≤35
E	>55 and ≤80	>35 and ≤50
F	>80	>50

Criteria are from the Highway Capacity Manual, 7th Edition, Transportation Research Board.

Synchro 12 was used to analyze the LOS at the study area intersection and project access drives. Synchro is an interactive computer program that enables planners and engineers to forecast the traffic impacts of new developments, conduct area-wide traffic forecasting studies, test different mitigation measures, and compare different traffic scenarios. Synchro 12 utilizes the HCM 7 methodology to analyze intersection delay and LOS.

The analysis scenarios are based on the lane configuration, intersection control, and peak-hour traffic volumes summarized in **Table 4**.

Table 4 – Scenarios

Scenario	Lane Configuration and Control	Volumes
2025 Existing	**Figure 3**	**Figure 4**
2027 Background	**Figure 3**	**Figure 5**
2027 Background Plus Construction Scenario 1	**Figure 6**	**Figure 14**
2027 Background Plus Construction Scenario 2	**Figure 6**	**Figure 15**
2027 Background Plus Project	**Figure 6**	**Figure 16**
2047 Horizon	**Figure 6**	**Figure 7**
2047 Horizon Plus Project	**Figure 6**	**Figure 17**

4.2. Key Intersection Operational Analysis

The results of the Key Intersection LOS Analysis are shown in **Table 5**. Calculations are located in **Appendix E**. The study area intersections are expected to operate at acceptable LOS except for:

- US-95A and Sierra Way (#1)
- Sierra Way and Project Access Road (#2)
- US-95A and Bowman Lane/Campbell Lane (#5)
- US-95A and SR339 (#7)

The eastbound and westbound approaches at the intersection of US-95A and Sierra Way (#1) are expected to operate at high delays under both 2027 Background Plus Construction Scenarios 1 and 2 during the AM and PM peak hours. To mitigate the anticipated delay, the intersection is expected to operate at an acceptable LOS (LOS A and LOS B in the AM and PM peak hours, respectively) with the installation of a temporary traffic signal during the construction phase as well as the construction of a northbound right turn lane, a southbound left turn lane, and a westbound left turn lane.

To facilitate operations at the intersection of Sierra Way and Project Access Road (#2), it is recommended to relocate the stop control to the westbound approach and stripe the centerline through the eastbound and northbound approaches thus creating right-of-way for both directions of travel. In this configuration, all northbound movements and the eastbound right movement would operate as free movements, while eastbound through movements would yield to all northbound movements. The westbound approach would operate under stop control. These geometric and channelization improvements are expected to lower delays on the dominant movements, decrease conflict points, and result in an acceptable LOS under all construction and plus project scenarios.

The westbound left turning movement at the intersection of US-95A and Bowman Lane/Campbell Lane (#5) is expected to operate at high delay under the 2027 Background Plus Construction Scenario 1 during the PM peak hour. To mitigate the anticipated delay, the intersection is expected to operate at an acceptable LOS (LOS A) with the installation of a temporary traffic signal during the construction phase. Note that under the 2027 Background Plus Construction Scenario 2, installation of a temporary traffic signal is not necessary.

The eastbound approach and westbound left turn movements at the intersection of US-95A and SR-339 (#7) are expected to operate at high delays under the 2027 Background Plus Construction Scenarios 1 and 2, 2027 Background Plus Project, 2047 Background, and 2047 Background Plus Project scenarios during the AM and PM peak hours. Project traffic is not expected to impact either of these movements. The eastbound approach (McGowan Lane) is a low-volume (approximately one (1) vehicle during the peak hour) minor street. Generally, high delays are expected for traffic during the PM peak hour on the minor street of a two-way stop-control intersection. It is recommended that NDOT and Lyon County monitor the traffic operations and consider signalizing the intersection in the future. If the intersection were to be signalized in the future, the intersection would be expected to operate at acceptable LOS under the 2027 Background Plus Construction Scenarios 1 and 2, 2027 Background Plus Project, and 2047 Background Plus Project scenarios, as shown in **Table 5**.

Table 5 – Key Intersection Peak Hour LOS Analysis

Int. No.	Intersection	2025 Existing		2027 Background		2027 Background Plus Construction Scenario 1*		2027 Background Plus Construction Scenario 2**		2027 Background Plus Project		2047 Background		2047 Background Plus Project	
		AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
		Delay (LOS)	Delay (LOS)	Delay (LOS)	Delay (LOS)	Delay (LOS)	Delay (LOS)	Delay (LOS)	Delay (LOS)	Delay (LOS)	Delay (LOS)	Delay (LOS)	Delay (LOS)	Delay (LOS)	Delay (LOS)
1	**US-95A and Sierra Way**														
	Two-Way Stop-Control														
	Northbound Left	0.0 (A)	7.8 (A)	0.0 (A)	7.8 (A)	0.0 (A)	7.8 (A)	0.0 (A)	7.8 (A)	0.0 (A)	7.8 (A)	0.0 (A)	8.0 (A)	0.0 (A)	8.0 (A)
	Eastbound	10.4 (B)	9.8 (A)	10.5 (B)	9.8 (A)	**68.0 (F)**	9.8 (A)	*** **(F)**	9.8 (A)	14.1 (B)	9.8 (B)	11.0 (B)	10.2 (B)	15.1 (B)	10.2 (A)
	Westbound	9.6 (A)	11.4 (B)	9.6 (A)	11.5 (B)	16.4 (C)	**56.0 (F)**	*** **(F)**	**207 (F)**	16.9 (C)	18.7 (C)	9.9 (A)	12.7 (B)	19.4 (B)	24.9 (C)
	Westbound Left	-	-	-	-	**177 (F)**	15.6 (C)	*** **(F)**	*** **(F)**	24.3 (C)	26.9 (D)	-	-	29.5 (D)	**39.0 (E)**
	Westbound Through/Right	-	-	-	-	9.4 (A)	**56.7 (F)**	9.4 (A)	**95.2 (F)**	9.9 (A)	10.9 (B)	-	-	10.3 (B)	11.5 (B)
	Southbound Left	7.6 (A)	7.8 (A)	7.6 (A)	7.8 (A)	10.7 (B)	7.9 (A)	26.3 (D)	8.0 (A)	8.4 (A)	8.1 (A)	7.7 (A)	7.9 (A)	8.5 (A)	8.3 (A)
	Signalized	-	-	-	-	5.6 (A)	16.7 (B)	34.1 (C)	20.3 (C)	-	-	-	-	-	-
2	**Sierra Way and Project Access Road**														
	Two-Way Stop-Control (North)														
	Northbound Left	-	-	-	-	19.9 (C)	*** **(F)**	**78.8 (F)**	*** **(F)**	**35.7 (E)**	**199 (F)**	-	-	**41.5 (E)**	**94.7 (F)**
	Two-Way Stop-Control (West)														
	Westbound	-	-	-	-	0.0 (A)	15.5 (C)	0.0 (A)	30.1 (D)	0.0 (A)	10.4 (B)	-	-	0.0 (A)	10.5 (B)
3	**US-95A and Penrose Lane**														
	Two-Way Stop-Control														
	Northbound Left	7.6 (A)	7.9 (A)	7.6 (A)	8.0 (A)	7.6 (A)	8.0 (A)	7.7 (A)	10.0 (A)	7.9 (A)	8.5 (A)	7.7 (A)	8.1 (A)	8.0 (A)	8.7 (A)
	Eastbound Left	10.1 (B)	11.4 (B)	10.2 (B)	11.5 (B)	10.2 (B)	11.5 (B)	13.0 (B)	21.3 (C)	11.8 (B)	13.9 (B)	10.7 (B)	12.6 (B)	12.7 (B)	15.5 (C)
	Westbound Left	11.3 (B)	14.6 (B)	11.4 (B)	14.8 (B)	11.4 (B)	14.8 (B)	19.5 (C)	34.2 (D)	14.6 (B)	20.0 (C)	12.4 (B)	17.4 (C)	16.2 (C)	24.3 (C)
	Southbound Left	7.6 (A)	7.8 (A)	7.6 (A)	7.8 (A)	7.6 (A)	7.8 (A)	8.9 (A)	7.9 (A)	7.9 (A)	8.0 (A)	7.7(A)	7.9 (A)	8.0 (A)	8.1 (A)
4	**Penrose Lane and Project Access Road**														
	Two-Way Stop-Control														
	Northbound Left	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Eastbound Left	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Westbound Left	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Southbound Left	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	**US-95A and Bowman Lane/Campbell Lane**														
	Two-Way Stop-Control														
	Northbound Left	7.8 (A)	7.9 (A)	7.8 (A)	8.0 (A)	7.8 (A)	8.0 (A)	7.9 (A)	9.8 (A)	8.1 (A)	8.4 (A)	8.0 (A)	8.2 (A)	8.3 (A)	8.6 (A)
	Eastbound Left	11.4 (B)	11.8 (B)	11.5 (B)	11.9 (B)	12.1 (B)	11.9 (B)	17.3 (C)	24.7 (C)	14.4 (B)	14.6 (B)	12.7 (B)	13.5 (B)	16.4 (C)	17.4 (C)
	Westbound Left	11.8 (B)	11.7 (B)	11.9 (B)	11.8 (B)	19.0 (C)	**237 (F)**	20.5 (C)	20.8 (C)	15.0 (B)	14.3 (B)	13.3 (B)	13.2 (B)	17.3 (C)	16.5 (C)
	Southbound Left	7.8 (A)	0.0 (A)	7.8 (A)	0.0 (A)	9.4 (A)	0.0 (A)	9.4 (A)	0.0(A)	8.2 (A)	0.0 (A)	7.9 (A)	0.0 (A)	8.4 (A)	0.0 (A)
	Signalized	-	-	-	-	5.4 (A)	10.4 (B)	4.6 (A)	5.9 (A)	-	-	-	-	-	-
6	**US-95A and Miller Lane**														
	Two-Way Stop-Control														
	Westbound	10.3 (B)	10.8 (B)	10.3 (B)	10.9 (B)	17.2 (C)	13.5 (B)	17.2 (C)	13.5 (B)	12.2 (B)	12.1 (B)	10.7 (B)	11.9 (B)	13.2 (B)	13.5 (B)
	Southbound Left	7.7 (A)	7.8 (A)	7.7 (A)	7.9 (A)	9.4 (A)	8.0 (A)	9.4 (A)	8.0 (A)	8.1(A)	8.1 (A)	7.8 (A)	8.0 (A)	8.2 (A)	8.2(A)

Int. No.	Intersection	2025 Existing		2027 Background		2027 Background Plus Construction Scenario 1*		2027 Background Plus Construction Scenario 2**		2027 Background Plus Project		2047 Background		2047 Background Plus Project	
		AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
		Delay (LOS)	Delay (LOS)	Delay (LOS)	Delay (LOS)	Delay (LOS)	Delay (LOS)	Delay (LOS)	Delay (LOS)	Delay (LOS)	Delay (LOS)	Delay (LOS)	Delay (LOS)	Delay (LOS)	Delay (LOS)
7	**US-95A and SR-339**														
	Two-Way Stop-Control														
	Northbound Left	0.0 (A)	0.0 (A)	0.0 (A)	0.0 (A)	0.0 (A)	0.0 (A)	0.0 (A)	0.0 (A)	0.0 (A)	0.0 (A)	0.0 (A)	0.0 (A)	0.0 (A)	0.0 (A)
	Eastbound	22.2 (C)	21.2 (C)	22.7 (C)	21.7 (C)	**36.0 (E)**	**81.2 (F)**	**36.0 (E)**	**81.2 (F)**	34.7 (D)	34.5 (D)	30.8 (D)	29.8 (D)	**48.7 (E)**	**49.4 (E)**
	Westbound Left	25.3 (D)	22.6 (C)	26.4 (C)	23.4 (C)	**55.2 (F)**	*** **(F)**	**55.2 (F)**	*** **(F)**	**51.4 (F)**	**44.5 (E)**	**43.9 (E)**	**39.2 (E)**	**110.6 (F)**	**102.5 (F)**
	Westbound Right	10.1 (B)	9.8 (A)	10.2 (B)	9.9 (A)	31.9 (C)	10.1 (B)	31.9 (C)	10.1 (B)	12.0 (B)	10.4 (B)	10.8 (B)	10.4 (B)	13.2 (B)	11.0 (B)
	Southbound Left	8.4 (A)	8.1 (A)	8.4 (A)	8.1 (A)	9.9 (A)	9.1 (A)	9.9 (A)	9.1 (A)	9.1 (A)	8.5 (A)	8.9 (A)	8.4 (A)	9.7 (A)	8.8 (A)
	Southbound Through	0.0 (A)	0.0 (A)	0.0 (A)	0.0 (A)	0.0 (A)	0.0 (A)	0.0 (A)	0.0 (A)	0.0 (A)	0.0 (A)	0.0 (A)	0.0 (A)	0.0 (A)	0.0 (A)
	Signalized	-	-	-	-	14.8 (B)	15.1 (B)	14.8 (B)	15.1 (B)	13.1 (B)	14.6 (B)	-	-	14.2 (B)	15.9 (B)

** Construction Scenario 1 refers to the distribution of construction traffic using Sierra Way and Bowman Lane as access to the project site.*
*** Construction Scenario 2 refers to the distribution of construction traffic using Sierra Way as the only access to the project site.*
**** Indicates that delay exceeds 300 seconds.*

4.3. Left Turn Storage Analysis

Left-turn storage analysis was conducted for left-turn storage bays. The analysis was performed using the HCM 7 95% queue reported in the LOS reports located in **Appendix E**. The left turn storage bay calculations include AM and PM peak volumes. The length of the desired storage per lane was taken to be the maximum of the two peak hours. The results of the analysis are provided in **Table 6**.

Table 6 – Left Turn Storage Bay Analysis Results

Intersection Left Turn Movement	Desired Storage Per Lane						
	2025 Existing	2027 Background	2027 Background Plus Construction Scenario 1*	2027 Background Plus Construction Scenario 2**	2027 Background Plus Project	2047 Background	2047 Background Plus Project
US-95A and Sierra Way (#1)							
Two-Way Stop-Control							
Northbound Left	-	-	-	-	-	-	-
Eastbound Left	-	-	<25’	<25’	-	-	-
Westbound Left	<25’	<25’	<25’	943’	70’	<25’	100’
Southbound Left	-	-	88’	258’	<25’	-	<25’
Signalized							
Northbound Left	-	-	78’	98’	-	-	-
Eastbound Left	-	-	-	-	-	-	-
Westbound Left	-	-	-	-	-	-	-
Southbound Left	-	-	<25’	470’	-	-	-
Sierra Way and Project Access Road (#2)							
Two-Way Stop-Control							
Northbound Left	-	-	<25’	28’	965’	-	248’
Eastbound Left	-	-	-	-	-	-	-
Westbound Left	-	-	-	-	-	-	-
Southbound Left	-	-	-	-	-	-	-
US-95A and Penrose Lane (#3)							
Two-Way Stop-Control							
Northbound Left	-	-	-	-	-	-	<25’
Eastbound Left	<25’	<25’	<25’	<25’	<25’	<25’	<25’
Westbound Left	<25’	<25’’	<25’	<25’	<25’	<25’	<25’
Southbound Left	-	-	-	-	-	-	-
Penrose Lane and Project Access Road (#4)							
Two-Way Stop-Control							
Northbound Left	-	-	-	-	-	-	-
Eastbound Left	-	-	-	-	-	-	-
Westbound Left	-	-	-	-	-	-	-
Southbound Left	-	-	-	-	-	-	-

Intersection Left Turn Movement	Desired Storage Per Lane						
	2025 Existing	2027 Background	2027 Background Plus Construction Scenario 1*	2027 Background Plus Construction Scenario 2**	2027 Background Plus Project	2047 Background	2047 Background Plus Project
US-95A and Bowman Lane (#5)							
Two-Way Stop-Control							
Northbound Left	<25’	<25’	<25’	<25’	<25’	<25’	<25’
Eastbound Left	<25’	<25’	<25’	40’	<25’	<25’	<33’
Westbound Left	<25’	<25’	708’	<25’	<25’	<25’	<25’
Southbound Left	-	-	-	-	-	-	-
Signalized							
Northbound Left	-	-	<25’	<25’	-	-	-
Eastbound Left	-	-	<25’	<25’	-	-	-
Westbound Left	-	-	95’	<25’	-	-	-
Southbound Left	-	-	-	-	-	-	-
US-95A and Miller Lane (#6)							
Two-Way Stop-Control							
Northbound Left	-	-	-	-	-	-	-
Eastbound Left	-	-	-	-	-	-	-
Westbound Left	<25’	<25’	<25’	<25’	<25’	<25’	<25’
Southbound Left	<25’	<25’	<25’	<25’	<25’	<25’	<25’
US-95A and SR-339 (#7)							
Two-Way Stop-Control							
Northbound Left	-	-	-	-	-	-	-
Eastbound Left	-	-	-	-	-	-	-
Westbound Left	28’	30’	163’	163’	55’	25’	118’
Southbound Left	<25’	<25’	40’	40’	30’	28’	40’
Signalized							
Northbound Left	-	-	-	-	-	-	-
Eastbound Left	-	-	-	-	-	-	-
Westbound Left	-	-	43’	43’	35’	-	48’
Southbound Left	-	-	165’	165’	98’	-	125’

** Construction Scenario 1 refers to the distribution of construction traffic using Sierra Way and Bowman Lane as access to the project site.*
*** Construction Scenario 2 refers to the distribution of construction traffic using Sierra Way as the only access to the project site.*

Impacted left turn storage bays were calculated to have adequate storage to accommodate 2025 existing, 2027 background, 2027 background plus project, and 2047 background scenarios. The 2027 Background plus Construction Scenarios 1 and 2 storage lengths are anticipated to be mitigated with use of a temporary signal at the intersection of US-95A and Sierra Way (#1) and at US-95A and Bowman Lane/Campbell Lane (#5) during construction. The 2027 and 2047 background plus project scenarios are anticipated to be mitigated with the recommended stop control changes at the intersection of Sierra Way and Project Access Drive (#2) and exclusive left and right turn lanes at US-95A and Sierra Way (#1).

4.4. Signal Warrant Analysis

Traffic control signals are used to assign the right-of-way to each direction of travel at an intersection. The determination to install a traffic control signal should be based on an engineering study of existing traffic conditions, pedestrian characteristics, and the geometry of the intersection in question.

The Manual on Uniform Traffic Control Devices for Street and Highways (MUTCD), provides a series of signal warrants that define the minimum conditions under which the installation of a traffic control signal should be considered. The installation of a traffic control signal, even when justified by existing conditions, can be improperly designed, placed, and operated, causing excessive delay, driver disregard and increases in collision frequency. The MUTCD states; "The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal." As such, consideration should be given, when possible, to providing alternative, less restrictive, forms of traffic control, including the installation of multi-way STOP sign control, roundabouts, and turning movement restrictions.

According to the MUTCD, a traffic signal is warranted at a given intersection if the conditions at the intersection meet at least one of the MUTCD signal warrants. For this signal warrant analysis, only the peak hour traffic was used to evaluate these intersections.

A traffic signal warrant analysis was conducted based on the two expected construction scenarios and buildout traffic at the intersection of US-95A and Sierra Way (#1), US-95A and Bowman Lane/Campbell Lane (#5), and at the intersection of US-95A and SR 339 (#7). The results of the signal warrant analysis are summarized in **Table 7**, **Table 8**, and **Table 9** respectively. Detailed signal warrant evaluation results are included in **Appendix F**.

Table 7 – Temporary Signal Warrant Evaluation Results – US-95A and Sierra Way (#1)

Condition	Name	Satisfied
Background plus Construction Scenario 1	Peak Hour Warrant	Yes
Background plus Construction Scenario 2	Peak Hour Warrant	Yes
Background plus Project	Peak Hour Warrant	No

Table 8 – Temporary Signal Warrant Evaluation Results – US-95A and Bowman Lane/Campbell Lane (#5)

Condition	Name	Satisfied
Background plus Construction Scenario 1	Peak Hour Warrant	Yes
Background plus Construction Scenario 2	Peak Hour Warrant	No
Background plus Project	Peak Hour Warrant	No

It is noted that there is a possibility that construction traffic may ultimately ingress and egress via US-95A and Kathleen Way. The effects of this traffic distribution are not analyzed in this report, however it is highly likely that the mitigations at Kathleen Way would be comparable to that of the Bowman Lane (Intersection #5) should traffic ingress and egress via that location along US-95A. As such, as the project progresses into construction, if the developer chooses to designate Kathleen Way as a primary route for construction ingress and egress, the developer should submit an addendum to this study documenting signal warrant justification for any temporary signal mitigation at that intersection.

Table 9 – Temporary Signal Warrant Evaluation Results – US-95A and SR 339 (#7)

Condition	Name	Satisfied
Background plus Construction Scenario 1	Peak Hour Warrant	Yes
Background plus Construction Scenario 2	Peak Hour Warrant	Yes
Background plus Project	Peak Hour Warrant	No

This finding supports the installation of a temporary traffic signal at US-95A and Sierra Way (#1) and US-95A and SR 339 (#7) for both Construction Scenario 1 and 2. The findings support the installation of a temporary traffic signal at US-95A and Bowman Lane/Campbell Lane (#5) only for Construction Scenario 1. Considerations for alternative operation of a temporary traffic signal outside the expected peak hours during construction or during non-construction periods include turning the signal away from the roadway such that the intersection operates as a two-way stop-control (TWSC) intersection, or adjusting the signal such that the major roadway has a flashing yellow indication, while the minor roadway has a flashing red indication, again operating the intersection as a TWSC intersection. The temporary traffic signal is recommended to increase safety and improve traffic operations during high volume construction periods due to the high speed on US-95A.

Although the signal at US-95A and SR 339 (#7) is not expected to be warranted once the construction phase of the project is completed, it is recommended that NDOT and Lyon County monitor traffic volumes at this intersection in the future as a signal would allow the intersection to operate at acceptable LOS in the 2027 Background Plus Project and 2047 Background Plus Project scenarios.

5. NDOT ACCESS MANAGEMENT SYSTEMS AND STANDARDS

This section evaluates deceleration and acceleration lane warrants along US-95A per NDOT requirements stipulated by the Traffic Engineering Division of NDOT in the 2017 policy entitled "Access Management System and Standards" (AMSS).

5.1. Deceleration Lanes

Deceleration lane warrants were evaluated where project traffic is expected to impact the road network. Left turn deceleration lane warrants were evaluated using Table 4-13 in the AMSS and right turn deceleration warrants were evaluated using Table 4-17 in the AMSS (included in **Appendix G**).

Based on Table 4-13 in the AMSS, as the speed limit on US-95A is 60 mph, there are greater than 26 vehicles expected to make a southbound to eastbound left turn from US-95A to Sierra Way (#1), **a left turn lane is warranted**. Design shall comply with standards outlined in the NDOT AMSS.

Based on Table 4-17 in the AMSS, as the speed limit on US-95A is 60 mph, there are greater than 31 turning vehicles expected to make a northbound to eastbound right turn from US-95A to Sierra Way (#1), **a right turn lane is warranted**. Design shall comply with standards outlined in the NDOT AMSS.

Based on Table 4-13 in the AMSS, as the speed limit on US-95A is 60 mph, there are greater than 26 vehicles expected to make a southbound to eastbound left turn from US-95A to SR-339 (#7), **a left turn lane is warranted**. Design shall comply with standards outlined in the NDOT AMSS. Because project traffic is not expected to make a northbound to eastbound right turn from US-95A to SR-339 (#7) and from US-95A to Bowman Lane/Campbell Lane (#5), a **right turn lane is not warranted** based on project traffic. It should be noted that while construction traffic will make the northbound to eastbound right turn from US-95A to Bowman Lane/Campbell Lane (#5), the addition of a left turn lane to serve construction traffic is not recommended.

Based on Table 4-20 in the AMSS and the speed limit, **a deceleration lane is required** to be constructed for vehicles making the southbound to eastbound left turn from US-95A to SR-339 (#7). The deceleration lane length includes the taper. It is recommended that the southbound to eastbound left turn lane (deceleration plus storage) be constructed at US 95A and SR-339 to meet NDOT AMSS standards.

5.2. Acceleration Lanes

Acceleration lane warrants were evaluated in the study area where project traffic is expected to impact the road network. Acceleration lanes are warranted on high speed (greater than 45 mph) and high volume (greater than 10,000 vehicles per day) roadways.

As US-95A has an AADT lower than 10,000 vehicles per day (5,550 vehicles per day per NDOT TRINA), **acceleration lanes are <u>not</u> warranted for this project**.

6. CRASH DATA SUMMARY

Crash data was obtained using NDOTs publicly available serious injury and fatality data for years 2019-2023. A more extensive request was submitted to NDOT, but no response was received at the time this study was submitted. Only one serious injury crash recently occurred at the intersection of US-95A and Penrose Lane (#3) during the analysis period. The crash data is included in **Appendix H**. The intersection crashes include those on both the major and minor streets of the key intersection during the most recent five-year period.

7. RECOMMENDATIONS

The proposed Monarch Data Center traffic is anticipated to be accommodated on the surrounding street network expected to exist in the background year of 2027 and results in the following recommendations:

- All on-site and off-site signing and striping improvements should be incorporated into the Civil Drawings and conform to the Lyon County and NDOT Standards as well as the current MUTCD, as applicable.
- It is recommended that a temporary traffic signal be deployed at US-95A and Sierra Way (#1) during the construction period for both Construction Scenario 1 and 2. Once the construction phase of the project is completed, the signal is not expected to be warranted.
- It is recommended that a temporary traffic signal be deployed at US-95A and Bowman Lane/Campbell Lane (#5) during the construction period only for Construction Scenario 1. Once the construction phase of the project is completed, the signal is not expected to be warranted.
- It is recommended that a temporary traffic signal be deployed at US-95A and SR 339 (#7) during the construction period for both Construction Scenario 1 and 2. Once the construction phase of the project is completed, the signal is not expected to be warranted, but it is recommended that NDOT and Lyon County monitor traffic volumes at this intersection in the future.
- It is recommended that the westbound approach to Sierra Way and Project Access Drive (#2) be stop-controlled, and that the northbound and westbound approaches operate free with centerline striping and realignment through the intersection to facilitate such travel.
- No mitigation is recommended for the eastbound approach at the intersection of US-95A and SR 339 (#7) because the approach serves less than five vehicles in the peak hour.

In order to comply with NDOT AMSS, the following deceleration and acceleration lanes are required:

- The developer is recommended to install a northbound right turn lane at the intersection of US-95A and Sierra Way (#1)
- The developer is recommended to install a southbound left turn lane at the intersection of US-95A and Sierra Way (#1)
- The developer is recommended to install a westbound exclusive left-turn lane at the intersection of US-95A and Sierra Way (#1)
- The developer is recommended to install a southbound left turn lane at the intersection of US-95A and SR 339 (#7)