October 3, 2016

John R. Tobin, P.E.
G. C. Wallace, Inc.
1555 South Rainbow Boulevard
Las Vegas, Nevada 89102

RE: Clarification regarding Condition of Approval #8 of the Traffic Study and Addendum for The Two Fifty, SDR-62393 & DIR 63602, T64341

Dear Mr. Tobin:

The Transportation Engineering Division has reviewed and approved the traffic study and addendum for The Two Fifty, to be located on the southwest corner of Alta Drive and Rampart Boulevard. Per this study, the project is proposed to consist of 60 single-family detached dwelling units (SFDUs) and 3,020 multi-family dwelling units (MFDUs). Condition #8 states:

> The developer must provide proof of the ability to use and modify the existing access road between Sir Williams Court business park and the LVVWD well site prior to beginning work on Development Areas 2 & 3. Existing access to this access road must be maintained unless proof is provided that the users of this access no longer desire such access.

Development Areas 2 and 3 require this access road in order to function as specified in the traffic study. This access road is not required for Development Areas 1 or 4 to function as specified. Therefore, this condition is not intended to restrict any work in Development Areas 2 and/or 3 that is necessary to support Development Areas 1 or 4.

Please contact me at 229-2452 if you have any questions.

Sincerely,

Rick Schroder, P.E.
Transportation Planning

RES

cc: Mike Janssen, P.E.
Joanna Wadsworth, P.E.
Bart Anderson, P.E.
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September 14, 2016

John R. Tobin, P.E.
G. C. Wallace, Inc.
1555 South Rainbow Boulevard
Las Vegas, Nevada 89102

RE: Traffic Study and Addendum for The Two Fifty, SDR-62393 & DIR 63602, T64341

Dear Mr. Tobin:

The Transportation Engineering Division has reviewed the traffic study and addendum for The Two Fifty, to be located on the southwest corner of Alta Drive and Rampart Boulevard. Per this study, the project is proposed to consist of 60 single-family detached dwelling units (SFDUs) and 3,020 multi-family dwelling units (MFDUs). The study is approved, with the following conditions:

1. This development is subject to the Traffic Signal Impact Fee Ordinance adopted by the City Council in 2003, effective January 5, 2004. Consequently, no area traffic signal contributions will be required with the civil plan review process. Traffic signal impact fees will be assessed at the time building permits are issued.

2. Additional rights-of-way in accordance with Standard Drawing #201.1, 234.1 or 234.3 are not required at this time. In accordance with the recommendations of the Rampart Boulevard Traffic Operations Analysis Update, the developer is required to dedicate an additional 10' of right-of-way along the Rampart Boulevard frontage. Construction of improvements on these rights-of-way will be required as stated in the Development Agreement. The developer is also required to dedicate up to an additional 10' of rights-of-way on a portion of the Alta Drive frontage, in order to permit a 50 foot extension of the eastbound right turn storage at Rampart Drive.

3. Development Area 1 (720 MFDUs) of the project will take access from a driveway on Rampart Boulevard, opposite the northern driveway of Boca Park. This driveway will not be signalized at this time and will be restricted to left turns in and right turns in and out by an existing median. This driveway may be served by two entering and one exiting lane; however in the event of signalization, it will be required to have a minimum of two entering and three exiting lanes. After the buildout of Development Area 1, the need for a signal at this driveway may be reevaluated. If a signal is constructed at this access, it will be at the sole cost of the developer. Development Area 1 will also be served by access through Development Areas 2 & 3.

4. The developer is required to construct a second southbound left turn lane on Rampart Boulevard at the signalized driveways for Boca Park and Sir Williams Court. This must be constructed concurrent with the improvements for Development Area 1.

5. Development Areas 2 and 3 (2,300 MFDUs) will have one access each on Alta Drive and Rampart Boulevard, as well as access through Development Area 1.

6. The access on Alta Drive will be through the existing Clubhouse drive, which is currently signalized.

7. The access on Rampart Boulevard for Development Areas 2 & 3 is on the alignment of the existing access road between the Sir Williams Court business park and the LVVWD well site. This driveway will be served by two entering and one exiting lanes and will be restricted to left turns in and right turns in and out. The developer is required to modify the median to permit left turns into this driveway. This will also require the developer to move the existing left in access for Boca Park from the second driveway north of Charleston Boulevard to the first driveway north of Charleston per Figure 8 of the study. Prior to beginning construction for the median modification, the developer must provide a minimum of 14 days' notice to Boca Park of this work.

8. The developer must provide proof of the ability to use and modify the existing access road between Sir Williams Court business park and the LVVWD well site prior to beginning work on Development Areas 2 & 3. Existing access to this access road must be maintained unless proof is provided that the users of this access no longer desire such access.

9. If, in the opinion of the City Traffic Engineer, a need develops for a controlled pedestrian crossing of Rampart Boulevard at or near this access, the developer shall construct such a crossing with flashing beacons, a HAWK signal or similar device as directed by the City Traffic Engineer. This crossing will be constructed at the sole cost of the developer.

10. Development Area 4 (60 SFDUs) will have two accesses on Hualapai Way, and may also be served by access through Development Areas 1, 2 and 3. Please note that Development Areas 1, 2 and/or 3 may NOT have access through Development Area 4 unless subsequently approved by an update to this study. Also, note that the number of units in Development Area 4 may increase up to a total of 200 SFDUs without requiring an update to this study, provided the access remains unchanged.

11. The northbound right turn from Rampart Boulevard to Summerlin Parkway eastbound is shown to operate at an acceptable level of service (LOS) (LOS A to D) under all scenarios using Vistro and Synchro analysis. Due to the geometry of this intersection, HCS 2010 methodology can't be used, but using the HCM 2010 analysis from Synchro, this movement operates at an LOS of E in the AM peak hour with background and project traffic added. Mitigation for this movement will be addressed in the Development Agreement.

These conditions of approval do not supersede or eliminate conditions of approval imposed by the Planning Commission and/or the City Council. An addendum to this traffic study is required if the development of the site occurs in a manner not in keeping with the land use assumptions contained in the report. Please contact me at 229-2452 if you have any questions.

Sincerely,

Rick Schroder, P.E.
Transportation Planning

RES

cc: Mike Janssen, P.E.
Joanna Wadsworth, P.E.
Bart Anderson, P.E.
Victor Bolanos
file

840-050

TRAFFIC STUDY

FOR

THE TWO FIFTY

APRIL 2016

PREPARED FOR:

SEVENTY ACRES, LLC,
180 LAND CO LLC, AND
FORE STARS LTD
1215 SOUTH FORT APACHE ROAD
LAS VEGAS, NV 891177

PREPARED BY:

TRAFFIC STUDY

FOR

THE TWO FIFTY

APRIL 2016

PREPARED FOR:

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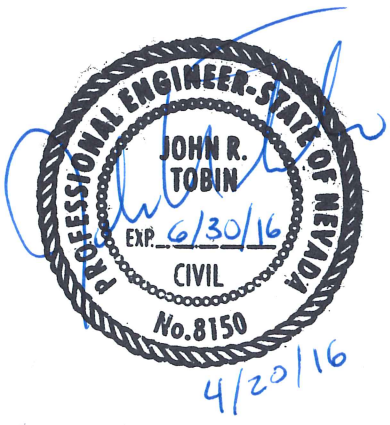

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EXECUTIVE SUMMARY

BACKGROUND

Seventy Acres LLC, 180 Land Co LLC, and Fore Stars LTD (Owners) propose to develop The Two Fifty (the "Project") on the land on which the Badlands golf course is operated. The 250-acre site is located between Rampart Boulevard and Hualapai Way, and is proposed to incorporate 3,020 multi-family residential units (≥ 4 stories) and 60 residential estate lots.

The multi-family residential use is to consist of a variety of products types with structured parking, including "podium," "wrap," and high-rise units. The multi-family density is approximately 45 dwelling units per acre (dua). It is anticipated that initial multi-family development will occur in the northeast corner of the site (near Rampart Boulevard/Alta Drive) with the balance of the multi-family and the estate lots development to occur as market conditions permit.

CONCLUSIONS AND RECOMMENDATIONS

The Project can be satisfactorily accommodated on the existing street network with proposed improvements. The project is also considered smart growth that accomplishes the following goals:

1) Places residential use in close proximity to commercial attractions to encourage walking and short vehicular trips, thus reducing reliance on single-occupant motor vehicle travel that leads to congested roadways.
2) Places residential use in close proximity to transit services, thus encouraging transit use and less reliance on single-occupant motor vehicle travel that leads to congested roadways.

ACCESS AND CIRCULATION

The site is proposed to incorporate a new non-gated street connection (open to public use), tentatively named Two Fifty Drive, that intersects Rampart Boulevard approximately 1/4 mile north of Charleston Boulevard, and connects to Alta Drive at the existing Clubhouse Drive/Suncoast signalized intersection. The Two Fifty Drive connection to Rampart Boulevard is proposed to be limited to right-in/right-out/left-in movements. Project frontage is *not* available on the north leg of the Two Fifty Drive/Rampart Boulevard intersection to provide an exclusive right-turn lane on Rampart Boulevard. A private street access is also proposed at the first median opening south of Alta Drive (identified as Access #3), which is to include an exclusive right-turn lane on Rampart Boulevard.

Two Fifty Drive is planned to be a four-lane, median-divided boulevard. However, the street section will need to be narrowed at the approaches to Alta Drive and Rampart Boulevard due to limited right-of-way. The configuration of on-site access intersections to Two Fifty Drive is still being developed.

Three access conditions to Rampart Boulevard have been analyzed. *Scenario 1* reflects existing median configurations and intersection control on Rampart Boulevard. *Scenario 2* reflects proposed signal control at the Access #3/Rampart Boulevard intersection, and *Scenario 3* reflects proposed median modifications to provide a N-to-W left-turn movement from Rampart Boulevard to Two Fifty Drive (in addition to Access #3 signal control).

Signal control at the Access #3/Rampart Boulevard intersection is recommended based on operational analyses (warrant evaluations and signal coordination analyses) and the need to provide a convenient pedestrian crossing opportunity of Rampart Boulevard that should encourage walking trips and discourage jaywalking.

It is recommended that the Access #3/Rampart Boulevard intersection include a south-leg crosswalk that would be compatible with a leading E-to-N protected left-turn phase followed by a permissive phase for the westbound approach. Proposed Access #3 traffic signal control is approximately 730 feet from the signalized Alta Drive intersection, and approximately 580 feet from the signalized Sir Williams-Boca Park intersection. Closely spaced signalized intersections are not unusual in areas of major commercial development and high density residential, where they are needed to provide adequate access for both vehicular and pedestrian modes. A few examples are listed below.

1) Near Downtown Summerlin the traffic signals on Sahara Avenue at the NB CC-215, Festival Plaza, and Pavilion Center Drive intersections are spaced 745 and 510 feet apart (center to center).
2) Near Downtown Summerlin the traffic signals on Charleston Boulevard at the NB CC-215, Redrock-Canyon Pointe and Pavilion Center Drive intersections are spaced 835 and 875 feet apart (center to center).
3) At the Best In The West shopping center access signals on Rainbow Boulevard and Lake Mead Boulevard are located 650 and 590 feet from the signalized Rainbow Boulevard/ Lake Mead Boulevard intersection.

The proposed N-to-W left-turn movement to the Project at the Rampart Boulevard/Two Fifty Drive intersection will require the reconfiguration of raised medians and median openings on Rampart Boulevard. The proposed Two Fifty Drive/Rampart Boulevard intersection is approximately 150 feet north of a driveway to Boca Park that has an S-to-E left-turn lane on Rampart Boulevard. It is proposed that this left-in access to Boca Park be relocated approximately 375 feet to the south, where it will provide better-spaced left-in access to Boca Park, while also accommodating N-to-W left-turn access to Two Fifty Drive.

The proposed location for the relocated left-in access to Boca Park is a major on-site drive aisle that will provide a more direct access to major uses on the southern portion of the Boca Park site,

as well as better spacing of left-in access. The current left-in access is nearly ¼-mile from Charleston Boulevard and is the last opportunity for a S-to-E left-in prior to Charleston Boulevard. If a motorist misses that opportunity they have to execute a left-turn or U-turn on the north leg of the Charleston Boulevard intersection to reach Boca Park, and as a result, adversely impact intersection capacity at Charleston Boulevard. Moving the S-to-E left-in access 375 feet south, to the major drive aisle approximately 1/8-mile north of Charleston, reduces the potential for out-of-direction travel and adverse capacity impacts to the Charleston Boulevard/Rampart Boulevard intersection.

It is also noted that the Two Fifty Drive street connection will provide an alternate route for motorists in the area to travel to and from the Suncoast and Boca Park properties, and will also provide and alternate route for motorists to avoid or clear congestion that occurs from time to time due to incidents.

PEDESTRIAN, BICYCLE AND TRANSIT FACILITIES

Residents of The Two Fifty are expected to frequently walk to commercial attractions at the Suncoast, Boca Park, and Tivoli Village. Adequate infrastructure is currently in place to accommodate these trips, including the signal-controlled pedestrian crossings on all legs of the Alta Drive/Rampart Boulevard, Sir Williams Court-Boca Park/Rampart Boulevard, and Charleston Boulevard/Rampart Boulevard intersections. It is recommended that the following measures be considered to enhance pedestrian access in the area.

1) It is recommended that residential use near the southwest corner of the Rampart Boulevard/Alta Drive intersection include pedestrian connections near the intersection to facilitate direct walking routes to nearby attractions that don't require out-of-direction travel to the vehicular access points.

2) It is recommended that consideration be given to providing additional pedestrian crossing opportunities of Rampart Boulevard to reduce out-of-direction travel for pedestrians, and to reduce the potential for jaywalking.

    a) It is recommended that review of proposed signal control at the Rampart Boulevard/ Access #3 intersection consider pedestrian access. Signal control will provide a convenient pedestrian crossing opportunity and will not require that pedestrians route to either Alta Drive or Sir Williams Court-Boca Park to cross Rampart Boulevard. This will significantly reduce out-of-direction travel for pedestrians, and reduce the potential for jaywalking.

    b) As Project development moves south/southwest from the northeast corner of the site, it is recommended that pedestrian crossing needs at the Two Fifty Drive/Rampart Boulevard intersection be evaluated. A pedestrian crossing at Two Fifty Drive would provide a convenient pedestrian crossing opportunity for residents, and not require them to walk to either Sir Williams Court-Boca Park or Charleston Boulevard in order

to cross Rampart Boulevard. A marked and signed pedestrian crossing on the north leg could also incorporate a median refuge and a HAWK beacon to facilitate safe crossings. The HAWK beacon could be timed to provide two-stage crossings that maintain coordinated progressive flow on Rampart Boulevard.

3) Where feasible, it is recommended that sidewalk along the Project's west-side frontage of Rampart Boulevard be widened or offset from the roadway to improve the pedestrian environment and LOS score. This is feasible along frontage near Alta Drive, but not along the south-to-west right-turn lane to Access #3.

4) Alta Drive has delineated bike lanes and is the route of the Downtown-to-Redrock Bike Trail. The residents of Two Fifty are likely to generate increased use of the Alta Drive bike lanes.

5) Transit service to the area is significant, and includes the Westcliff Airport Express (WAX), which provides a connection to the Westcliff Transit Center that facilitates connections to Route 121 on Durango and Route 208 on Washington Avenue. The WAX route also incorporates a Park and Ride on the northwest corner of the Rampart Boulevard/Alta Drive intersection (in the southeast corner of the Suncoast property). Other local routes include Route 120 on Rampart Boulevard, Route 207 on Alta Drive, Route 206 on Charleston Boulevard, and Route 209 on Vegas Drive,

6) Residents of Two Fifty will have convenient access to transit and can be expected to increase ridership on the nearby routes. The Two Fifty multi-family development is also in close proximity to the light rail/streetcar line being considered and preliminarily planned for Charleston Boulevard.

TRAFFIC PROJECTIONS

Background traffic assumptions include current and future traffic from Tivoli (currently under construction at the northeast corner of the Rampart Boulevard/Alta Drive intersection), and from undeveloped and vacant portions of Boca Park. The assumed additional background traffic demands are significantly higher than the projected Two Fifty demands in the PM peak hour. Total additional background traffic demands (primary external trips) assumed from Tivoli and Boca Park are 1,164 AM peak hour trips (690 in and 474 out) and 2,372 PM peak hour trips (1,200 in and 1,172 out).

It is noted that background traffic estimates do not include the previously approved "Renaissance" development in Boca Park. Renaissance as previously approved is no longer viable with the opening of Downtown Summerlin in 2014, and its entitlements will lapse in June 2016. Per its approved Traffic Study, Renaissance was estimated to generate 1,399 primary external trips in the PM peak hour, or 835 more trips than the uses now anticipated on the site (150 ksf of retail and 600 multi-family residential units).

Two Fifty trip generation at buildout is estimated to be 1,072 AM peak hour trips (206 in and 865 out), and 1,208 PM peak hour trips (749 in and 458 out). It is noted that in the busier PM peak hour, Project trip generation is approximately one-half of additional background traffic demands. Also important to note, is that the PM peak hour net reduction associated with the replacement of Renaissance with uses now anticipated (-835 PM peak hour trips) is equivalent to 69 percent of Project trip generation; said another way, 69 percent of the Project's PM peak hour trips were already previously provided for in the Renaissance approved Traffic Study (Renaissance trips that are no longer going to be generated).

OPERATIONAL ANALYSES

Projected demands at the Access #3/Rampart Boulevard intersection have been evaluated against traffic signal warrant criteria of the *Manual on Uniform Traffic Control Devices (MUTCD*), and have been found to satisfy Warrants 1, 2, and 3 of the *MUTCD.*

Analyses indicate that signal control can be provided at Access #3 without causing adverse impact to progressive signal coordination on Rampart Boulevard. The analyses indicate that signal control at Access #3 can provide for slightly wider progressive bandwidths than Scenario 1 (1 or 2 seconds). This is due to a reduction in the east-to-north left-turn at Alta Drive and reduced U-turn demands at Sir Williams-Boca Park, which accommodate a slight increase in green time on Rampart Boulevard at those intersections.

All signalized study intersections are projected to operate at LOS D or better with proposed improvements (Scenario 3), and the following is noted:

1) Under the Scenario 1 condition, the stop-controlled west-to-north right-turn at the Rampart Boulevard/Access #3 intersection (#3) is projected to be at LOS F. This is due to the addition of background traffic demands to and from future Boca Park development. This LOS F condition is mitigated with proposed signal control at the intersection.
2) The Sir Williams-Boca Park/Rampart Boulevard intersection (#7) is projected to operate acceptably under Scenario 1, but better under Scenarios 2 and 3 due to the elimination of U-turn demands.
3) The Rampart Boulevard/Alta Drive intersection (#2) is projected to operate at slightly lower volume-to-capacity (v/c) ratios and delay under Scenarios 2 and 3 (vs. Scenario 1) due to the reduction of left-turn trips on the west leg.
4) In the busier PM peak hour, the Project is estimated to use approximately 7 percent of Rampart Boulevard/Alta Drive intersection capacity (raising v/c ratio from 0.73 to 0.80). At the Rampart Boulevard/ EB Summerlin Parkway intersection the Project is estimated to use approximately 10 percent of capacity, and at the Rampart Boulevard/ Charleston Boulevard intersection the Project is estimated to use approximately 4 percent of capacity.

5) The Rampart Boulevard intersections at the EB Summerlin Parkway Ramp, Alta Drive, and Charleston Boulevard are projected to operate at PM peak hour v/c ratios of 0.76, 0.80, and 0.78 under projected background-plus-project demands and proposed Scenario 3 improvements. This indicates the Rampart Boulevard corridor will retain significant surplus capacity following completion of the Project and assumed background development.
6) The Hualapai Way intersections at Alta Drive (#1) and Charleston Boulevard (#5) are projected to continue to operate well under capacity under projected background-plus-project demands, with PM peak hour v/c ratios of 0.53 and 0.57, respectively. This indicates that substantial surplus automobile capacity exists in the Hualapai Way corridor.
7) Analyses indicate that left-turn and right-turn movements at the stop-controlled Rampart Boulevard/Two Fifty Drive and Rampart Boulevard/Boca Park Driveway intersections may incur high PM peak hour delays under both Background and Background-plus-Project demands, under all three access Scenarios. These unsignalized movements can be expected to operate at lower delays much of the day during non-PM-peak hours, and motorists have the option of utilizing alternate routes through signalized access intersections.

Southbound left-turn storage at the Rampart Boulevard/Access #3 intersection is inadequate for projected background demands under both unsignalized (Scenario 1) and signalized (Scenarios 2 and 3) conditions. Lengthening of the existing single-lane pocket from 150 feet to 225 feet is needed for Scenario 1. For the signalized Scenario 2 and 3 conditions, dual left-turn lanes are needed. Dual left-turn lanes can be accomplished by narrowing lanes and reconstructing the median. The need for additional southbound left-turn storage is driven by assumed development in Boca Park and not The Two Fifty Project. Accordingly, this improvement should be a condition of Boca Park development and not The Two Fifty Project.

Southbound left-turn storage at the Sir Williams-Boca Park/Rampart Boulevard intersection is inadequate for projected background demands for all three Scenarios. Dual left-turn lanes are needed on the north leg to provide adequate storage. This can also be accomplished by narrowing lanes and reconstructing the median. However, the need for this improvement is driven by assumed development in Boca Park and not The Two Fifty Project. Accordingly, this improvement should be a condition of Boca Park development and not The Two Fifty Project.

Under Scenarios 1 and 2, lengthening of the existing single-lane pocket from 150 feet to 250 feet is needed on the south leg of the Sir Williams-Boca Park/Rampart Boulevard intersection to accommodate U-turn demands destined to Two Fifty Drive. However, the need for this improvement is eliminated with proposed median modifications to provide direct left-in access from Rampart Boulevard to Two Fifty Drive.

2006 RAMPART BLVD TRAFFIC OPERATIONS STUDY

In 2006 the City of Las Vegas commissioned a study that evaluated the capacity of the Rampart Boulevard corridor. The study concluded that widening of Rampart Boulevard from a 6-lane to an 8-lane facility was needed to provide a satisfactory automobile LOS under future year demands. However, that study was based on traffic demand characteristics of the day that have changed significantly due to the development of Downtown Summerlin and other properties and transportation infrastructure. Also, the layered development scenarios on which the study was based are no longer valid.

All of the development assumptions of the 2006 Study have occurred or have been accounted for in this study in an updated fashion, with the exception of the Suncoast Hotel and Casino expansion. The current status of a potential Suncoast expansion is not known, but the previously planned expansion was estimated to generate 229 AM peak hour trips (131 in and 98 out) and 500 PM peak hour trips (260 in and 240 out). This trip generation represents approximately 14 percent of the additional background and project traffic that has been assumed in this study in the critical PM peak hour.

The potential development impact of a Suncoast expansion does not warrant the widening of Rampart Boulevard to an 8-lane facility, given the surplus capacity projected in the Rampart Boulevard corridor, and the substantial surplus capacity in the parallel Hualapai Way corridor. Additionally, widening to an 8-lane facility is *not* recommended for the following reasons:

1) Widening to an 8-lane facility would cause significant adverse impacts to the pedestrian, bicycle and transit modes, and runs counter to the "complete streets" approach to providing multimodal transportation solutions.
2) Rampart Boulevard is a built corridor and it would be extremely costly and impactful to widen to an 8-lane facility. The Project has limited frontage on Rampart Boulevard, and cannot provide the large majority of the right-of-way that would be needed.
3) An 8-lane widening of Rampart Boulevard has not been identified as a regional need, and is not reflected in the RTC's Regional Transportation Plan or the City's Planned Streets and Highways map.
4) The results of this study indicate that an 8-lane Rampart Boulevard is not justified.

CRASH DATA REVIEW

Crash data provided by the Nevada Department of Transportation (NDOT) for the three-year period from August 1, 2012 to August 1, 2015 has been. Based on that data, it is recommended that the following left-turn signal phasing changes listed below be considered. These are changes associated with existing conditions. Accordingly, these changes should not be a condition of Two Fifty development.

1) At the Hualapai Way/Alta Drive intersection it is recommended that conversion from protected-permitted (existing 5-section displays) to protected-only left-turn phasing be considered for the

NB and SB approaches to reduce left-turn crash frequency. Conversion to flashing yellow arrow (FYA) would accommodate protected-only operation on a time-of-day (TOD) basis.

2) At the Hualapai Way/ Charleston Boulevard intersection. it is recommended that conversion from protected-permitted (existing FYA) to protected-only left-turn phasing be considered for the WB approach to reduce left-turn crash frequency. The FYA display can accommodate protected-only operation on TOD basis.

1.0 INTRODUCTION

Seventy Acres LLC, 180 Land Co LLC, and Fore Stars LTD (Owners) propose to develop The Two Fifty (the "Project") on the land on which the Badlands golf course is operated. The 250-acre site is located between Rampart Boulevard and Hualapai Way, and between Charleston Boulevard and Alta Drive. The location of the Project site relative to the area street network is illustrated in **Figure 1**, which also identifies major off-site study intersections.

The Two Fifty Project is proposed to incorporate 3,020 multi-family residential units (≥ 4 stories) and 60 residential estate lots. A full-sized site plan is enclosed inside the back cover, and a reduced version is presented in **Figure 2**.

The multi-family residential use is proposed in the southwest quadrant of the Rampart Boulevard/Alta Drive intersection. The multi-family use is to take access from Alta Drive at the existing signalized Clubhouse Drive/Suncoast intersection, and from Rampart Boulevard at two locations approximately 1/8 mile south of Alta Drive (existing channelized median opening) and approximately one-quarter mile north of Charleston Boulevard. Emergency-only access is also proposed from Alta Drive.

Approximately 120 acres of the golf course area is to be preserved as open space, with 60 estate lots interspersed throughout. Approximately 23 of the estate lots are planned to take access from Hualapai Way at two locations approximately 1/8 mile south of Alta Drive and approximately midway between Alta Drive and Hualapai Way.

The multi-family residential use is to consist of a variety of products types with structured parking, including "podium," "wrap," and high-rise units. The multi-family density is approximately 45 dwelling units per acre (dua). It is anticipated that initial multi-family development will occur in the northeast corner of the site (near Rampart Boulevard/Alta Drive) with the balance of the multi-family and the estate lots development to occur as market conditions permit. The project is considered smart growth that accomplishes the following goals:

1) Places residential use in close proximity to commercial attractions to encourage walking and short vehicular trips, thus reducing reliance on single-occupant motor vehicle travel that leads to congested roadways.

2) Places residential use in close proximity to transit services, thus encouraging transit use and less reliance on single-occupant motor vehicle travel that leads to congested roadways.

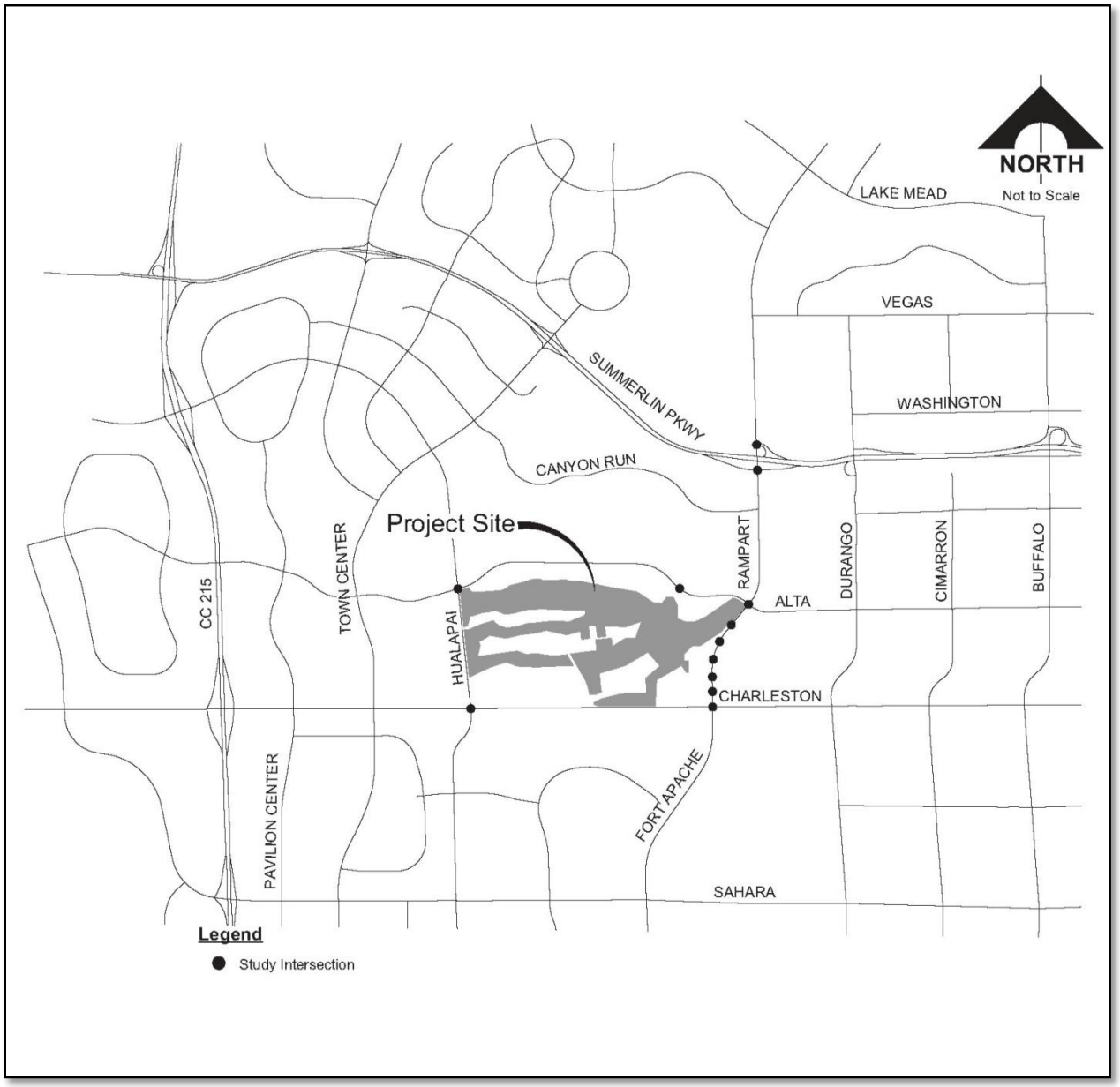

Figure 1. Vicinity Map

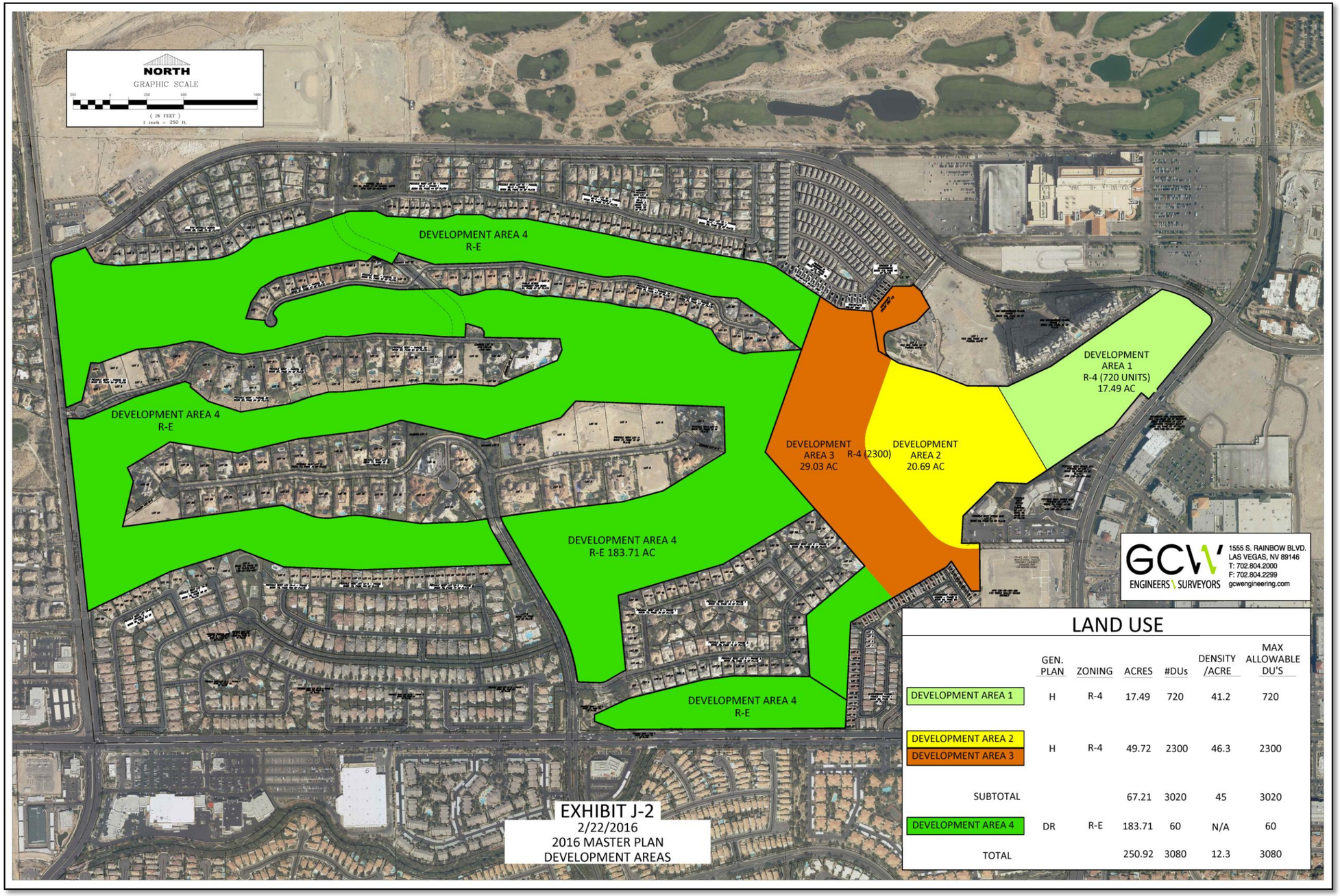

Figure 2. Site Plan

2.0 EXISTING CONDITIONS

2.1 ADJACENT LAND USE

The site is bounded by existing Queensridge residential use abutting the golf course site, the One Queensridge Place luxury high-rise residential use near the Alta Drive/Rampart Boulevard intersection, and the Sir Williams Court office development. The site also has frontage on Rampart Boulevard, Alta Drive, Charleston Boulevard, and Hualapai Way.

Major commercial attractions in the immediate vicinity of the site include the Suncoast Hotel and Casino located across Alta Drive, the Boca Park retail center is located across Rampart Boulevard, and the Tivoli retail and office development located on the northeast quadrant of the Rampart Boulevard/Alta Drive intersection.

2.2 AREA STREETS AND INTERSECTIONS

Existing lane configurations and control at study intersections are shown in **Figure 3**. Existing streets are further described below:

Rampart Boulevard exists as a fully-constructed, 45-mph, six-lane arterial. It does not incorporate bike lane delineation in the vicinity of the project.

Charleston Boulevard exists as a fully-constructed, 45-mph, six-lane arterial. It does not incorporate bike lane delineation in the vicinity of the project. Charleston Boulevard is also State Route (SR) 159 and under the jurisdiction of the Nevada Department of Transportation (NDOT).

Alta Drive exists as a fully-constructed, 35-mph, four-lane major collector with bike lane delineation. It is also the route of the Downtown-to-Redrock Bike Trail.

Hualapai Way exists as a fully-constructed, 45-mph arterial. It is delineated for three southbound through lanes. It is delineated for three northbound through lanes south of Alta Drive, with a right-turn drop lane at Alta Drive. North of Alta Drive it is delineated for two northbound through lanes and a buffered parking lane.

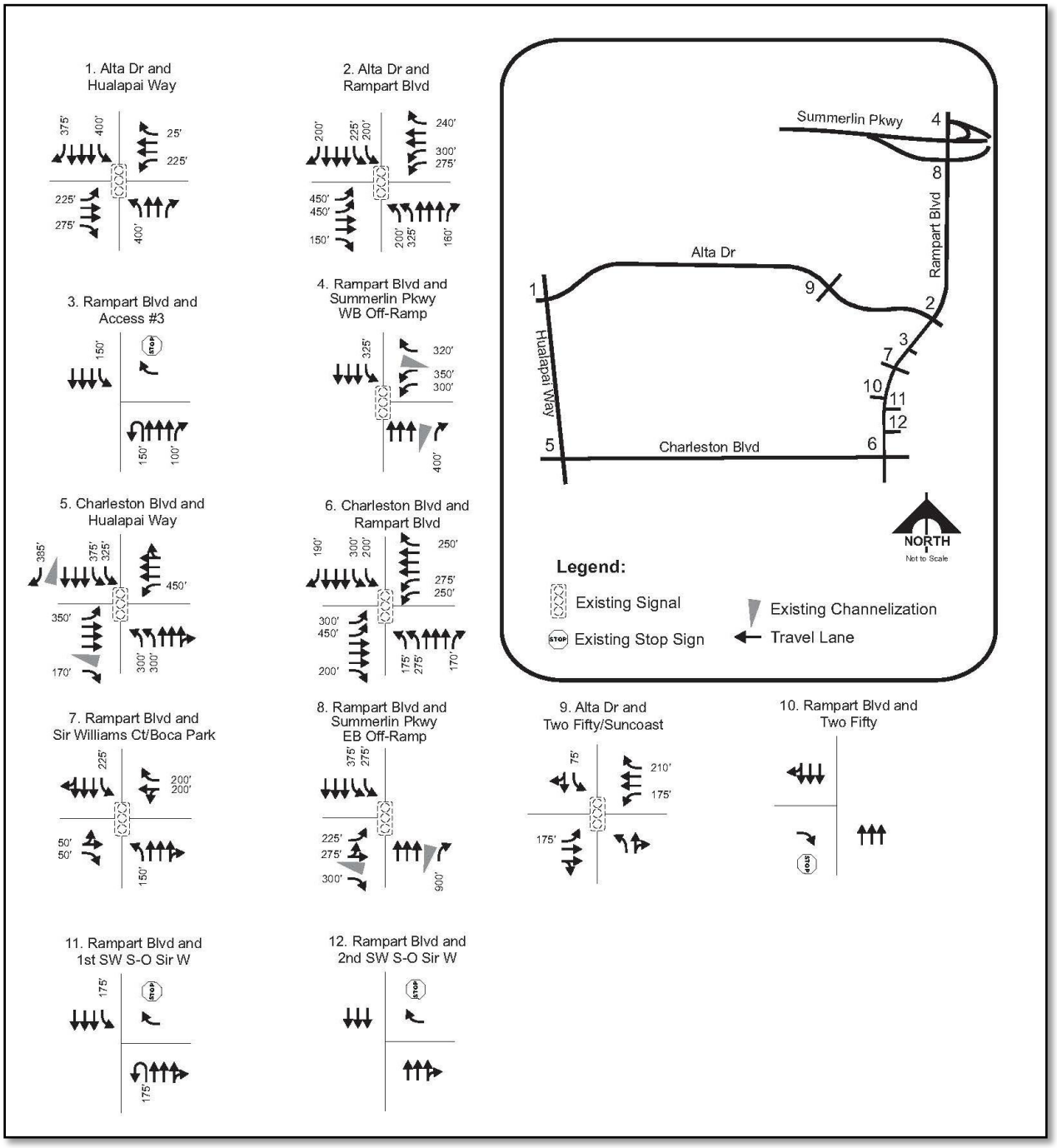

Figure 3. Existing Intersection Lane Configurations and Control

2.3 EXISTING TRAFFIC DEMANDS AND OPERATIONS

Traffic counts, including bicycles and pedestrians, were collected at study intersections on Wednesday, October 7, 2015, and on Wednesday April 6, 2016. Data sheets are enclosed in Section One of the Appendix. April 2016 counts were utilized for major intersections on

Rampart Boulevard to allow more time for north-south through demands to rebound from major sewer construction that was completed in the Rampart Boulevard corridor in the third quarter of 2015. The data are summarized in **Figures 4**.

AM peak hour demands on Rampart Boulevard in the vicinity of the project exhibit directional peaking slightly favoring the southbound direction. AM peak hour demands on the north leg of the Alta Drive intersection are 1,312 vph SB and 1,159 vph NB. PM peak hour demands are nearly balanced, and on the north leg of the Alta Drive intersection they are 1,726 vph SB and 1,693 vph NB.

Demands on Alta Drive in the vicinity of the project are nearly balanced in both the AM and PM peak hours. On the west leg of the Rampart Boulevard intersection they are 396 vph EB and 445 vph WB in the AM peak hour, and 617 vph EB and 653 vph WB in the PM peak hour.

Demands on Hualapai Way in the vicinity of the project are nearly balanced in both the AM and PM peak hours. On the north leg of the Charleston Boulevard intersection they are 657 vph SB and 575 vph NB in the AM peak hour, and 713 vph SB and 664 vph NB in the PM peak hour.

Intersection capacity and level-of-service (LOS) analyses of study intersections under existing demands have been conducted in accordance with procedures of the 2010 *Highway Capacity Manual* (HCM 2010) published by the Transportation Research Board. Results are summarized in Section 5.2 along with future conditions to facilitate comparisons. Calculation worksheets are enclosed in Section Two of the Appendix. All existing intersections are estimated to be operating at LOS D or better. Rampart Boulevard intersections with the Summerlin Parkway WB and EB ramps, Alta Drive and Charleston Boulevard operate at higher volume-to-capacity (v/c) ratios in the PM peak than the AM peak. They are estimated to be operating at PM peak v/c ratios of 0.57, 0.52, 0.59, and 0.69, respectively.

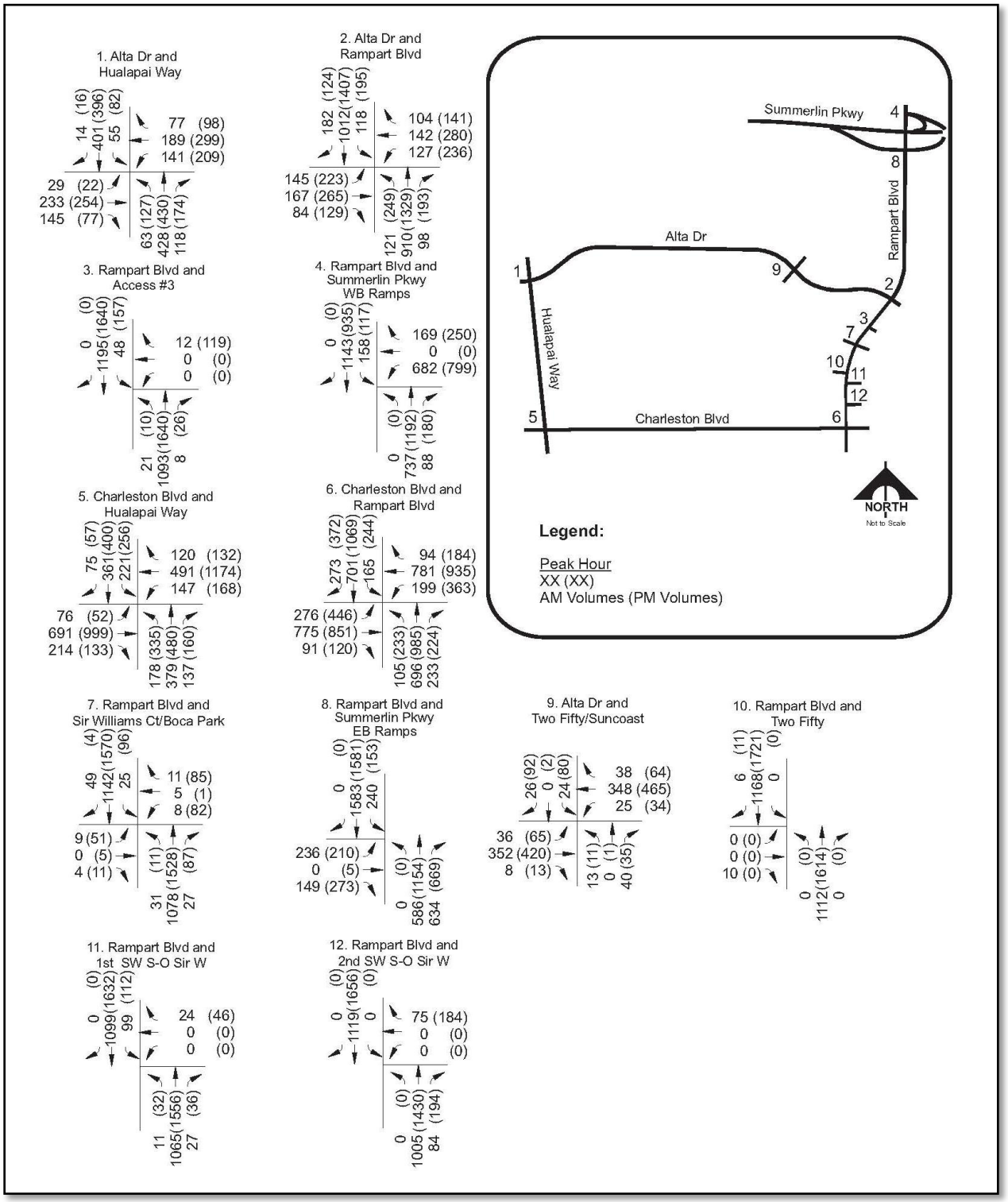

Figure 4. Existing Peak Hour Traffic Demands

3.0 FUTURE CONDITIONS

3.1 ACCESS AND CIRCULATION

The site is proposed to incorporate a new non-gated street connection (open to public use), tentatively named Two Fifty Drive, that intersects Rampart Boulevard approximately 1/4 mile north of Charleston Boulevard, and connects to Alta Drive at the existing Clubhouse Drive/Suncoast signalized intersection. The Two Fifty Drive connection to Rampart Boulevard is proposed to be limited to right-in/right-out/left-in movements. Project frontage is *not* available on the north leg of the Two Fifty Drive/Rampart Boulevard intersection to provide an exclusive right-turn lane on Rampart Boulevard. A private street access is also proposed at the first median opening south of Alta Drive (identified as Access #3), which is to include an exclusive right-turn lane on Rampart Boulevard.

Two Fifty Drive is planned to be a four-lane, median-divided boulevard with bike lanes. However, the street section will need to be narrowed at the approaches to Alta Drive and Rampart Boulevard due to limited right-of-way. The configuration of on-site access intersections to Two Fifty Drive is still being developed.

3.1.1 *SCENARIO 1 BASE CONDITION*

Three access conditions to Rampart Boulevard have been analyzed. The *Scenario 1 Base Condition* is reflected in **Figure 5**. This scenario reflects the existing median configurations and intersection control on Rampart Boulevard, and does *not* reflect proposed signal control at Access #3, or proposed median modifications to provide a N-to-W left-turn movement from Rampart Boulevard to Two Fifty Drive.

Scenario 1 requires dual left-turn lanes on the north leg of the Sir Williams Court - Boca Park intersection to provide adequate queue storage for future Boca Park background S-to-E left-turn demands. Also, without proposed signal control at Access #3, left-out demand from the northern portion of the site would turn right and execute a U-turn at the signalized Sir Williams Court - Boca Park intersection approximately 1/8 mile to the south (or incur out-of-direction travel to utilize access to Alta Drive approximately 2,000 feet west of Rampart Blvd). The S-to-N U-turn demand adds to the length of dual left-turn storage lanes needed on the north leg of the Sir Williams Court - Boca Park intersection. Dual left-turn lanes can be accomplished by narrowing lanes and reconstructing the median.

Scenario 1 also requires lengthening of the single S-E left-turn lane on the north leg of the Rampart Boulevard Access #3 intersection to provide adequate storage for future S-E left-turn

demands to Boca Park. This can also be accomplished by narrowing lanes and reconstructing the median.

Without the proposed N-to-W left-turn access to Two Fifty Drive, the left-in demand to Two Fifty from the south will need to execute a U-turn at the signalized Sir Williams Court -Boca Park intersection, which will require lengthening of the existing left-turn lane at that intersection.

3.1.2 *Scenario 2 Access*

Proposed signal control at the Rampart Boulevard/Access #3 intersection has been analyzed as the *Scenario 2 Access Condition*, as reflected in **Figure 6**. Signal control will provide dual left-out access for the Project and a convenient controlled pedestrian crossing of Rampart Boulevard (see Section 3.3).

Scenario 2 also includes dual left-turn queue storage improvements on the north leg of the Access #3 intersection for assumed future S-E left-turn demands to Boca Park. Signal-controlled left-turns typically produce more queuing than uncontrolled, requiring the need for dual left-turn lanes.

It is recommended that the Access #3/Rampart Boulevard intersection include a south-leg crosswalk that would be compatible with a leading E-to-N protected left-turn phase followed by a permissive phase for the westbound approach. It is estimated that the pedestrian crossing distance will be approximately 108 feet, requiring a pedestrian clearance time of approximately 31 seconds (108 ft/3.5 fps). Adding a 7-second walk interval yields a minimum split of 38 seconds to provide a controlled pedestrian crossing of Rampart Boulevard.

Proposed Access #3 traffic signal control is approximately 730 feet from the signalized Alta Drive intersection (615± feet stop line to stop line), and approximately 580 feet from the signalized Sir Williams-Boca Park intersection (480± feet stop line to stop line). The impact of additional signal control on progressive signal coordination on Rampart Boulevard is addressed in Section 5.5. Closely spaced signalized intersections are not unusual in areas of major commercial development and high density residential, where they are needed to provide adequate access for both vehicular and pedestrian modes. A few examples are listed below.

1) Near Downtown Summerlin the traffic signals on Sahara Avenue at the NB CC-215, Festival Plaza, and Pavilion Center Drive intersections are spaced 745 and 510 feet apart (center to center).
2) Near Downtown Summerlin the traffic signals on Charleston Boulevard at the NB CC-215, Redrock-Canyon Pointe and Pavilion Center Drive intersections are spaced 835 and 875 feet apart (center to center).

3) At the Best In The West shopping center access signals on Rainbow Boulevard and Lake Mead Boulevard are located 650 and 590 feet from the signalized Rainbow Boulevard/Lake Mead Boulevard intersection.

3.1.3 *SCENARIO 3 ACCESS*

The proposed N-to-W left-turn movement to the Project at the Rampart Boulevard/Two Fifty Drive intersection will require the reconfiguration of raised medians and median openings on Rampart Boulevard. The proposed Two Fifty Drive/Rampart Boulevard intersection is approximately 150 feet north of a driveway to Boca Park that has an S-to-E left-turn lane on Rampart Boulevard. It is proposed that this left-in access to Boca Park be relocated approximately 375 feet to the south. The relocated left-in access to Boca Park will facilitate an N-to-W left-turn access to Two Fifty Drive, as shown in **Figure 7.** This condition has been analyzed as the *Scenario 3 Access Condition*, and includes the proposed Scenario 2 signal control at the Rampart Boulevard/Access #3 intersection. Aerial exhibits of the existing and proposed median configurations on Rampart Boulevard near Two Fifty Drive are presented in **Figure 8**. Proposed Scenario 3 median and lane configurations on Rampart Boulevard from Charleston Boulevard to Alta Drive are presented in **Figure 9**.

The proposed location for the relocated left-in access to Boca Park is a major on-site drive aisle that will provide a more direct access to major uses on the southern portion of the Boca Park site, and it provides better spacing of left-in access to Boca Park. The current left-in access is nearly ¼-mile from Charleston Boulevard and is the last opportunity for a S-to-E left-in prior to Charleston Boulevard. If a motorist misses that opportunity they have to execute a left-turn or U-turn on the north leg of the Charleston Boulevard intersection to reach Boca Park, and as a result, adversely impact intersection capacity at Charleston Boulevard. Moving the S-to-E left-in access 375 feet south, to the major drive aisle approximately 1/8-mile north of Charleston, reduces the potential for out-of-direction travel and adverse capacity impacts to the Charleston Boulevard/Rampart Boulevard intersection.

It is noted that the Two Fifty Drive street connection will provide an alternate route for motorists in the area to travel to and from the Suncoast and Boca Park properties, and will also provide an alternate route for motorists to avoid or clear congestion that occurs from time to time due to incidents.

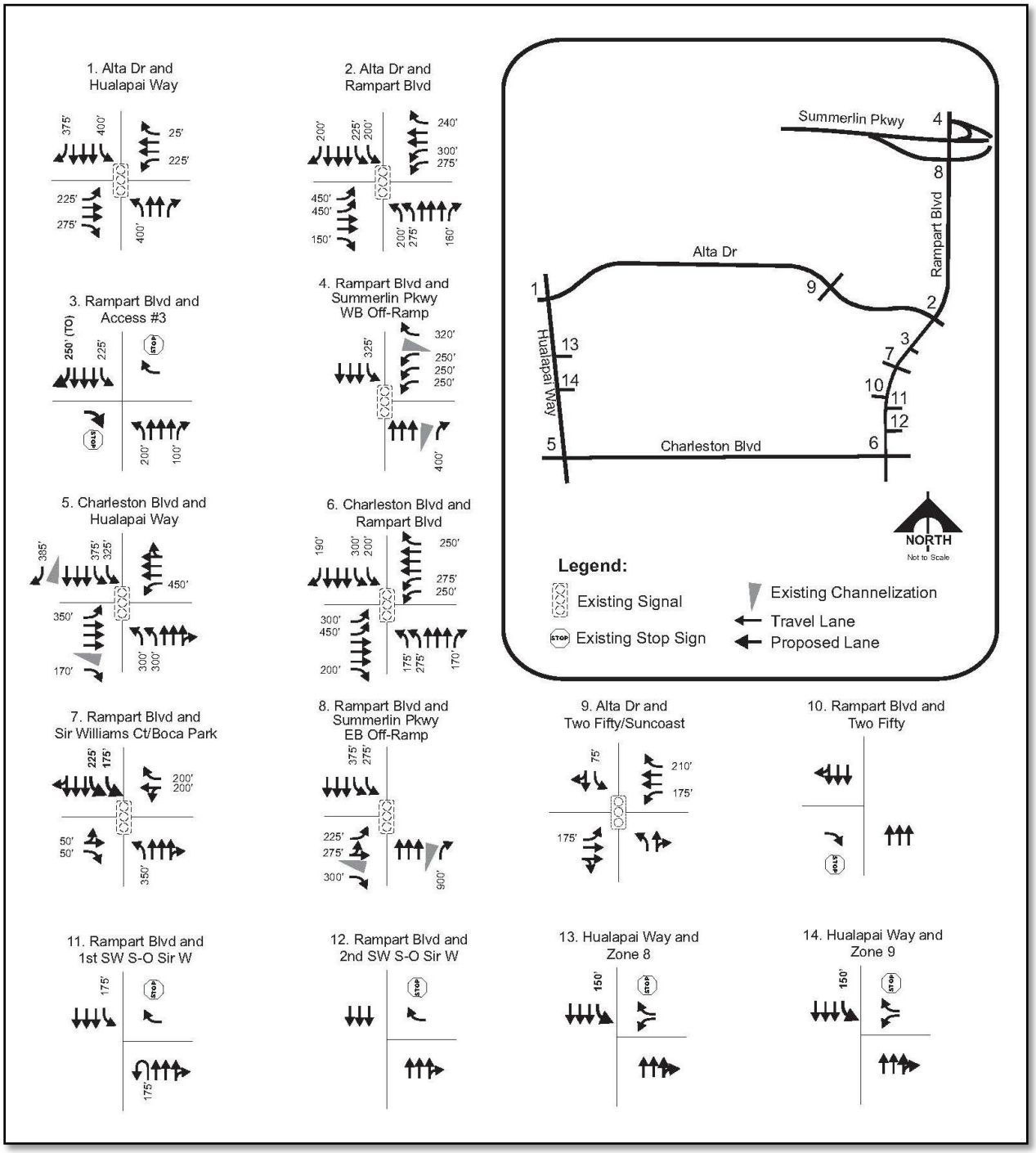

Figure 5. Intersection Lane Configurations and Control – Scenario 1

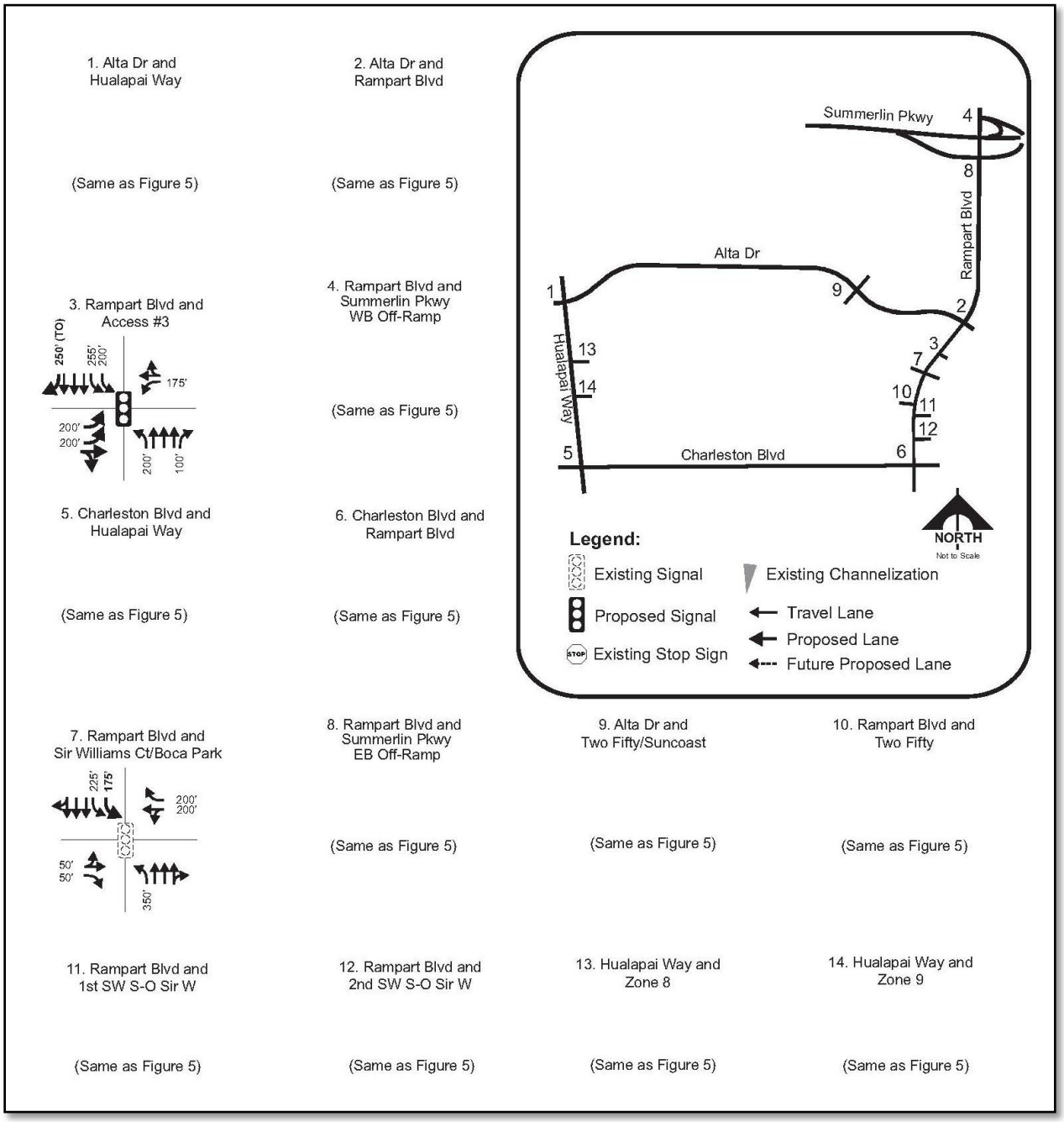

Figure 6. Intersection Lane Configurations and Control – Scenario 2

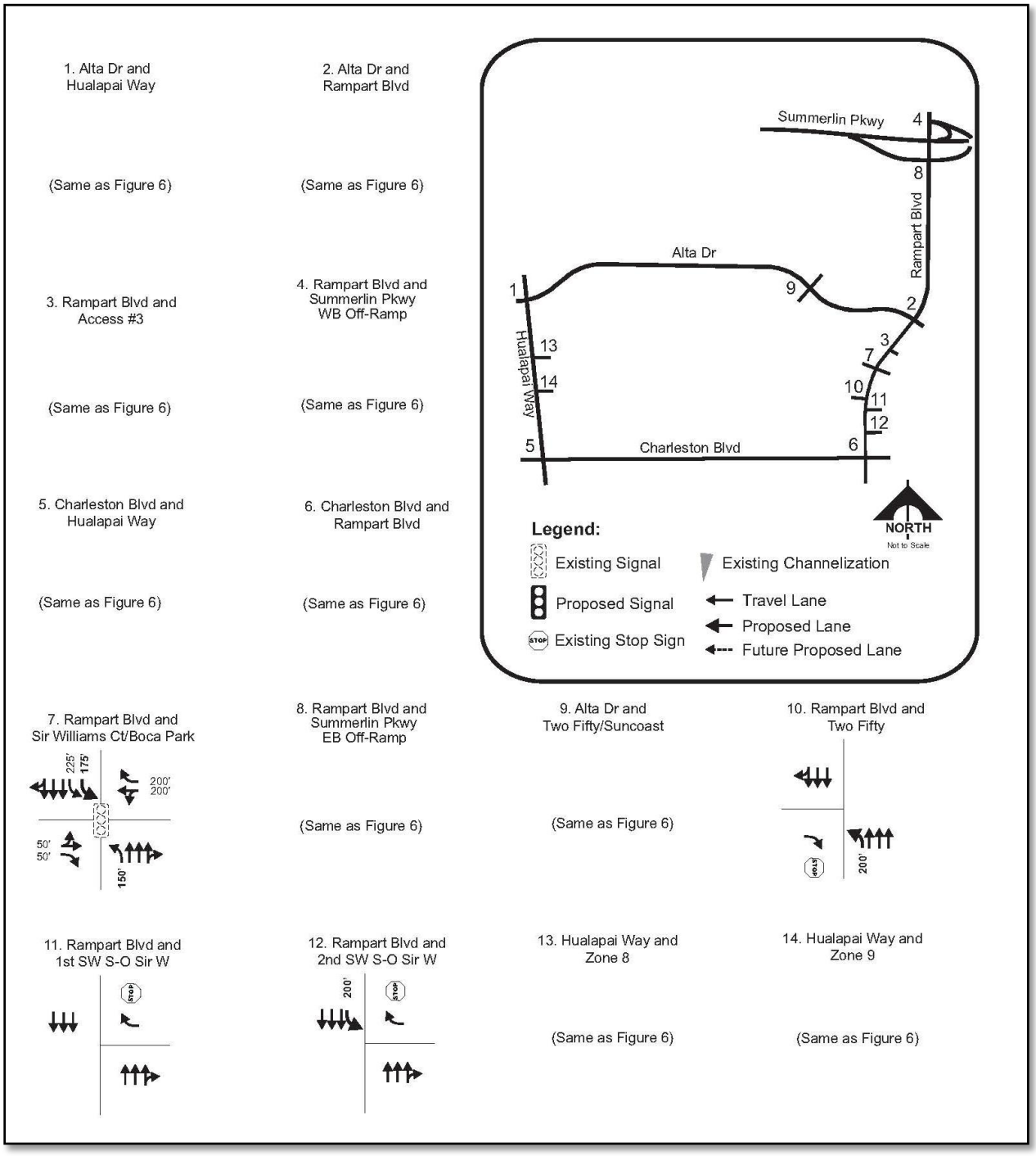

Figure 7. Proposed Lane Configurations and Control – Scenario 3

a) Existing Raised Median on Rampart Blvd

b) Proposed Raised Median Modifications

Figure 8. Proposed Median Configuration on Rampart Boulevard at Two Fifty Drive

Figure 9. Proposed Scenario 3 Median and Lane Configurations on Rampart Blvd

3.2 PUBLIC FACILITIES

No gaps in public facilities have been identified on existing streets in the vicinity of the project. Continuous sidewalk improvements are proposed on-site on Two Fifty Drive, which is to be open to public use.

3.3 PEDESTRIAN AND BICYCLE FACILITIES

Residents of The Two Fifty Project are expected to frequently walk to commercial attractions at the Suncoast, Boca Park, and Tivoli Village. Adequate infrastructure is currently in place to accommodate these trips, including the signal-controlled pedestrian crossings noted below.

1) Signal-controlled crossings on the east and west legs of the Suncoast/Two Fifty Drive intersection. It is recommended that the crosswalk markings be upgraded with 10-foot by 2-foot longitudinal bars.
2) Signal-controlled crossings of Rampart Boulevard on the north and south legs of the Sir Williams Court/Boca Park intersection.
3) Signal-controlled crossings on all legs of the Rampart Boulevard/Alta Drive and the Rampart Boulevard/Charleston Boulevard intersections.

It is recommended that the following measures be considered to enhance pedestrian access in the area.

1) It is recommended that residential use near the southwest corner of the Rampart Boulevard/ Alta Drive intersection include pedestrian connections near the intersection to facilitate direct walking routes to nearby attractions that don't require out-of-direction travel to the vehicular access points.
2) It is recommended that consideration be given to providing additional pedestrian crossing opportunities of Rampart Boulevard to reduce out-of-direction travel for pedestrians, and to reduce the potential for jaywalking.
    a) If signal control is approved for the first median opening south of Alta Drive (Access #3), it will provide a convenient pedestrian crossing opportunity that should discourage jaywalking and avoid the need for out-of-direction pedestrian travel to either Alta Drive or Sir Williams Court/Boca Park to cross Rampart Boulevard.
    b) As Project development moves south from the northeast corner of the site, it is recommended that pedestrian crossing needs at the Two Fifty Drive/Rampart Boulevard intersection be evaluated. A pedestrian crossing at Two Fifty Drive would provide a convenient pedestrian crossing opportunity for residents, and not require them to walk to either Sir Williams Court-Boca Park or Charleston Boulevard in order to cross Rampart Boulevard. A marked and signed pedestrian crossing on the north leg could also incorporate a median refuge and a HAWK beacon to facilitate safe crossings. The

HAWK beacon could be timed o provide a two-stage crossings to maintain coordinated progressive flow on Rampart Boulevard.

3) Where feasible, it is recommended that sidewalk along the Project's west-side frontage of Rampart Boulevard be widened or offset from the roadway to improve the pedestrian environment and LOS score. This is feasible along frontage near Alta Drive, but not along the south-to-west right-turn lane to Access #3.

Alta Drive has delineated bike lanes and is the route of the Downtown-to-Redrock Bike Trail. The residents of Two Fifty will have the benefit of being in close proximity to the facility, and are likely to generate increased use of the Alta Drive bike lanes.

3.4 TRANSIT FACILITIES

Transit service to the area is significant, and includes the routes listed below. Residents of Two Fifty will have convenient access to transit and can be expected to increase ridership on the nearby routes. The Two Fifty multi-family development is also in close proximity to the light rail/streetcar line being considered and preliminarily planned for Charleston Boulevard.

1) The Westcliff Airport Express (WAX), which currently operates on one-hour headways and provides a connection to the Westcliff Transit Center that facilitates connections to Route 121 on Durango and Route 208 on Washington Avenue. The WAX route also incorporates a Park and Ride on the northwest corner of the Rampart Boulevard/Alta Drive intersection (in the southeast corner of the Suncoast property).

2) Route 120 on Rampart Boulevard, currently running on 30-minute headways through much of the day. Route 120 has the following stops in the vicinity of the Project
   a) NB and SB on the south leg of Suncoast – Moda Corso
   b) NB and SB on the south leg of Alta
   c) NB in right-turn lane at first median opening south of Alta
   d) SB on south leg of Sir Williams Court
   e) NB and SB on the south and north legs of Charleston Boulevard

3) Route 207 on Alta Drive, currently running on one-hour headways. Route 207 ends at Rampart Boulevard where it has a layover.

4) Route 206 on Charleston Boulevard, currently operating on 15- to 20-minute headways through much of the day. Route 206 has EB and WB stops on the west and east legs of Rampart Boulevard .

5) Route 209 on Vegas Drive, which currently operates on one-hour headways and includes a stop at the Suncoast Park and Ride.

The Regional Transportation Commission of Southern Nevada has advised that a bus turnout is needed on southbound Rampart Boulevard on the south leg of the Alta Drive intersection. Due to conflicts with major electrical facilities near Alta Drive, this turnout is proposed to occupy the north end of a 250-foot right-turn lane at the Access #3 Access intersection. Proposed signal control at the Access #3 Access/Rampart Boulevard intersection will provide a signal controlled crossing of Rampart Boulevard for transit patrons walking to and from the south.

4.0 TRAFFIC PROJECTIONS

4.1 BACKGROUND TRAFFIC

Background traffic demand levels have been estimated by superimposing future traffic from Tivoli (currently under construction at the northeast corner of the Rampart Boulevard/Alta Drive intersection) and by estimating future demands from undeveloped and vacant portions of Boca Park.

The most recent traffic demand data from NDOT traffic count stations on Rampart Boulevard (#1080 & #1115) and Alta Drive (#2032 & #2033) show slightly declining demands over the most recent three years (2011 to 2014). Combined ADT demands have declined from 78,100 to 73,300 vehicles. Therefore, no ambient traffic growth has been assumed.

Tivoli has been assumed to be approximately 33 percent complete. Accordingly, 67 percent of Tivoli traffic projections from the approved Tivoli 2006 Traffic Study have been assumed as additional background traffic demand, as shown in Section Two of the Appendix. Additional primary external trips from Tivoli are estimated to be 734 (513 in and 221 out) in the AM peak hour and 1,265 (620 in and 645 out) in the PM peak hour.

Traffic from portions of Boca Park that are currently vacant has been included as additional background traffic. This consists of 207 ksf of retail and 14 ksf of restaurant as shown in Section Two of the Appendix. Estimates of future additional traffic from undeveloped portions of Boca Park are also included in Section Two of the Appendix. Owners believe the market will not support more than 150 ksf of additional retail use on the undeveloped 23.4 acres, and that the remainder of the site is likely to develop as residential. The residential use has been assumed at a density similar to that proposed on The Two Fifty site (45 dua), yielding 600 multi-family residential units. Assumed PM peak hour trip generation from the undeveloped 23.4-acre portion of Boca Park is 564 primary external trips (305 in and 259 out), which is comparable to the underlying retail zoning at a typical suburban floor area ratio of 0.25.

It is noted that background traffic estimates do not include the previously approved “Renaissance” development on the undeveloped 23.4-acre portion of Boca Park (635 ksf of retail and 100 residential condominiums). Renaissance as previously approved is no longer viable with the opening of Downtown Summerlin in 2014. Moreover, those entitlements are scheduled to lapse in June 2016. Per its approved 2011 Traffic Study, Renaissance was estimated to generate 1,399 primary external trips (692 in and 707 out) in the PM peak hour, or 835 more trips than the uses now anticipated on the site (150 ksf of retail and 600 multi-family units).

Additional primary external trips from Boca Park are estimated to be 430 (177 in and 253 out) in the AM peak hour and 1,107 (580 in and 527 out) in the PM peak hour. Total additional background

traffic demands (primary external trips) from Tivoli and Boca Park are estimated to be 1,164 AM peak hour trips (690 in and 474 out) and 2,372 PM peak hour trips (1,200 in and 1,172 out).

Total *additional* background traffic demand estimates are presented in **Figure 10** for Scenario 1. Additional background traffic demands have been added to existing demands (Figure 3), to yield projected background demands for the Project, as presented in **Figure 11** for Scenario 1 Background demands for Scenario 2 (signalized Access #3 intersection) and Scenario 3 (revised Rampart median configuration) are presented in **Figures 12 and 13.** Figures 12 and 13 only show Scenario 2 and Scenario 3 intersections that differ from Scenario 1.

4.2 TRIP GENERATION

Project trip generation has been based on the Institute of Transportation Engineers (ITE) publication *Trip Generation, 9th Edition*. Trip generation of the estate lots has been based on ITE land use Code 210 – Single-Family Detached Housing, and the trip generation of the high-density multi-family residential use is based on ITE land use Code 232 – High-Rise Residential Condominium/ Townhouse.

The Code 232 – High-Rise Residential Condominium/Townhouse category is described as residential buildings with *three or more stories*. The Code 232 trip rates are slightly less than those found in surveys of lower density multi-family developments in Summerlin. The Summerlin surveys of suburban multi-family developments found average AM and PM peak hour trip rates of 0.35/Dwelling Unit (DU) and 0.41/DU, respectively (vs. 0.34 and 0.38 for Code 232). The trip rates are therefore considered appropriate and conservative for the high-density residential use (45 dua) that will be within convenient walking distance to a variety of commercial attractions, employment, and transit options. Also, there will likely be some amenities incorporated into the multi-family residential sites (i.e. coffee shop, fitness center, recreation areas etc.) that will absorb residential walking and vehicular trips. That onsite absorption has not been assumed in traffic demand estimates in order to provide more conservative analyses.

The Project is estimated to generate 1,072 AM peak hour trips (206 in and 865 out), and 1,208 PM peak hour trips (749 in and 458 out) at buildout. Project trip generation estimates are presented in **Table 1.** It is noted that in the busier PM peak hour, Project trip generation is approximately one-half of additional background traffic demands. Also important to note, is that the PM peak hour net reduction associated with the replacement of Renaissance with uses now anticipated (-835 PM peak hour trips) is equivalent to 69 percent of Project trip generation; said another way, 69 percent of the Project's PM peak hour trips were already previously provided for in the Renaissance approved Traffic Study (Renaissance trips that are now not going to be generated).

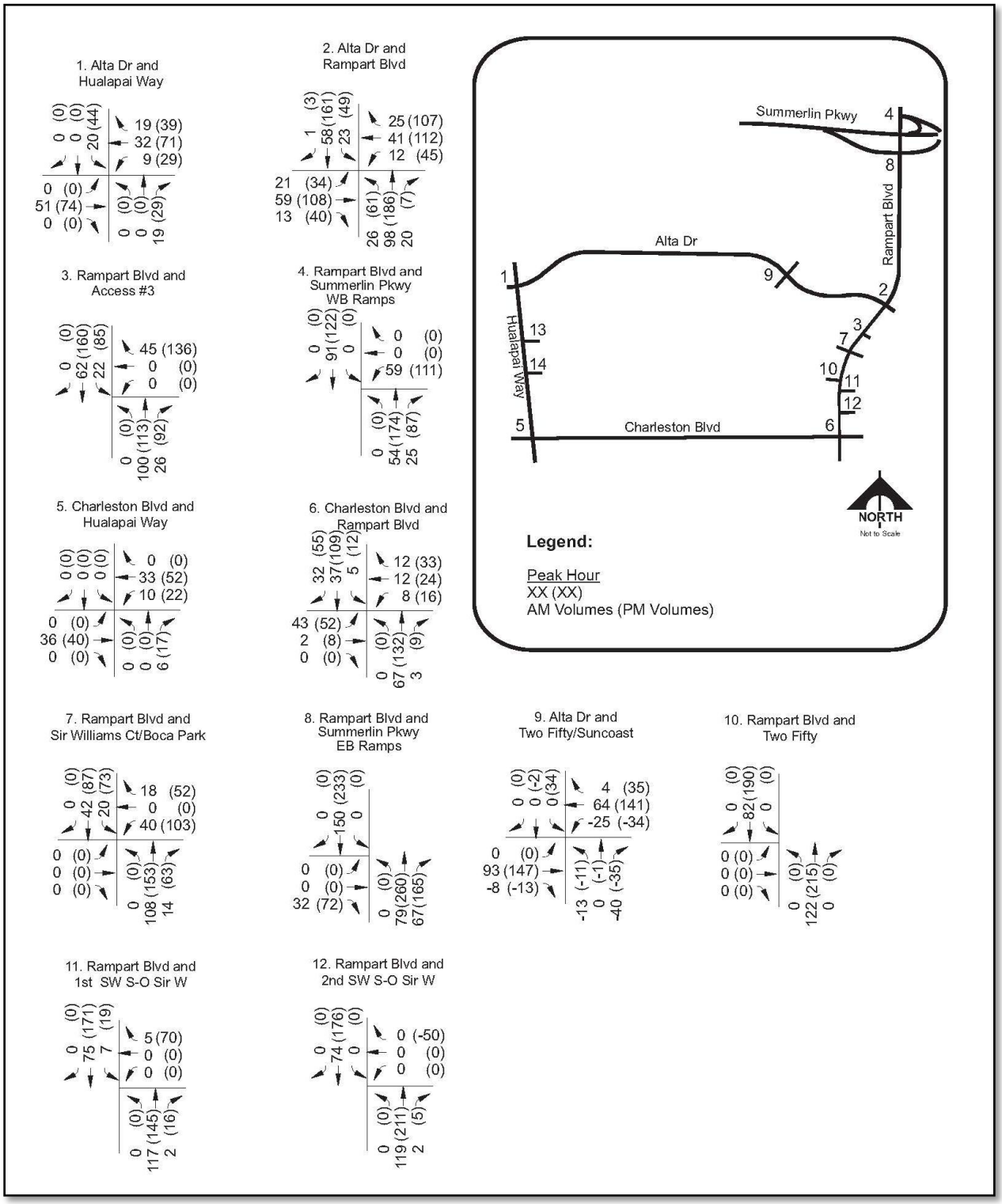

Figure 10. Additional Background Traffic Estimates (Scenario 1)

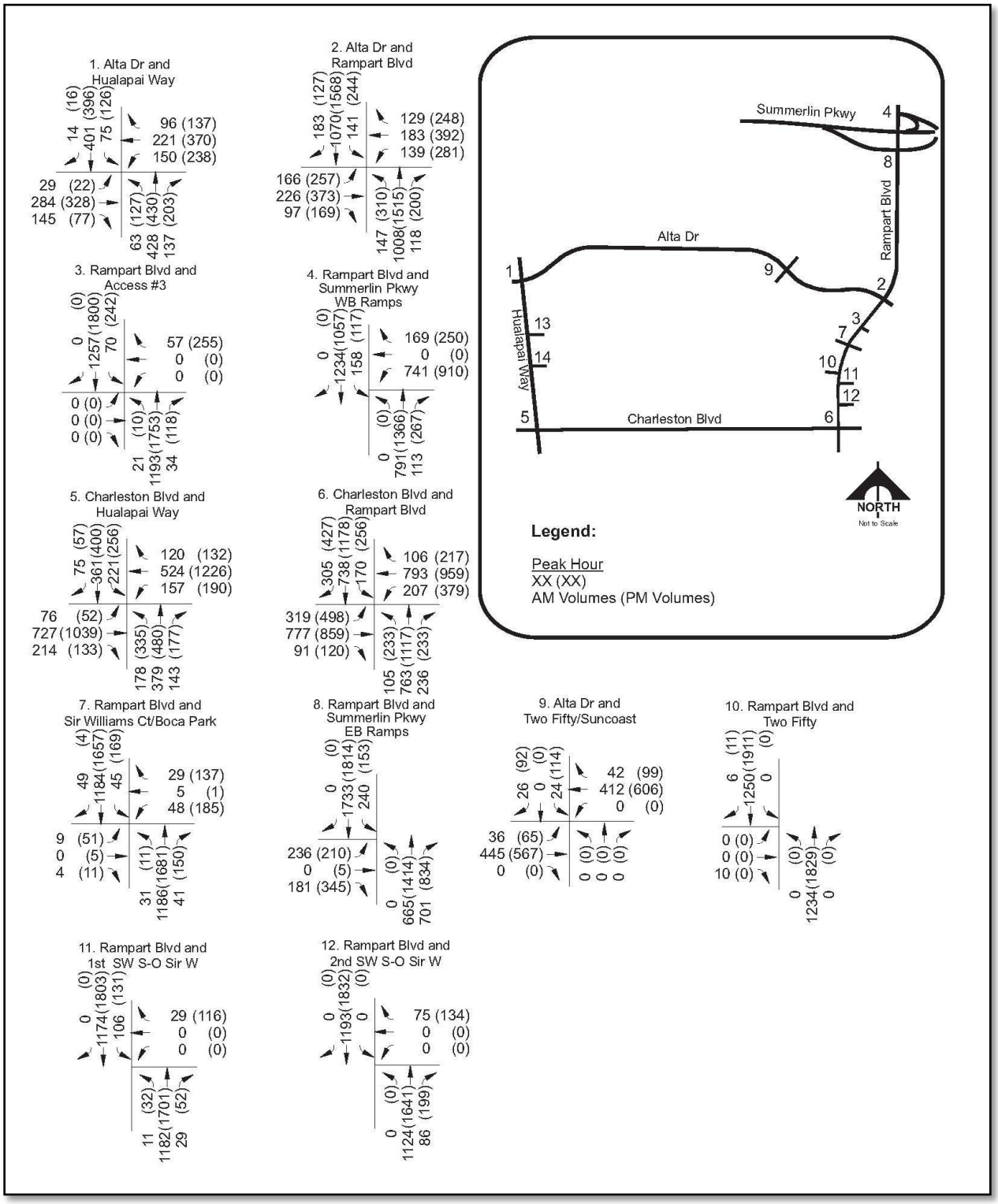

Figure 11. Background Traffic Demand Estimates (Scenario 1)

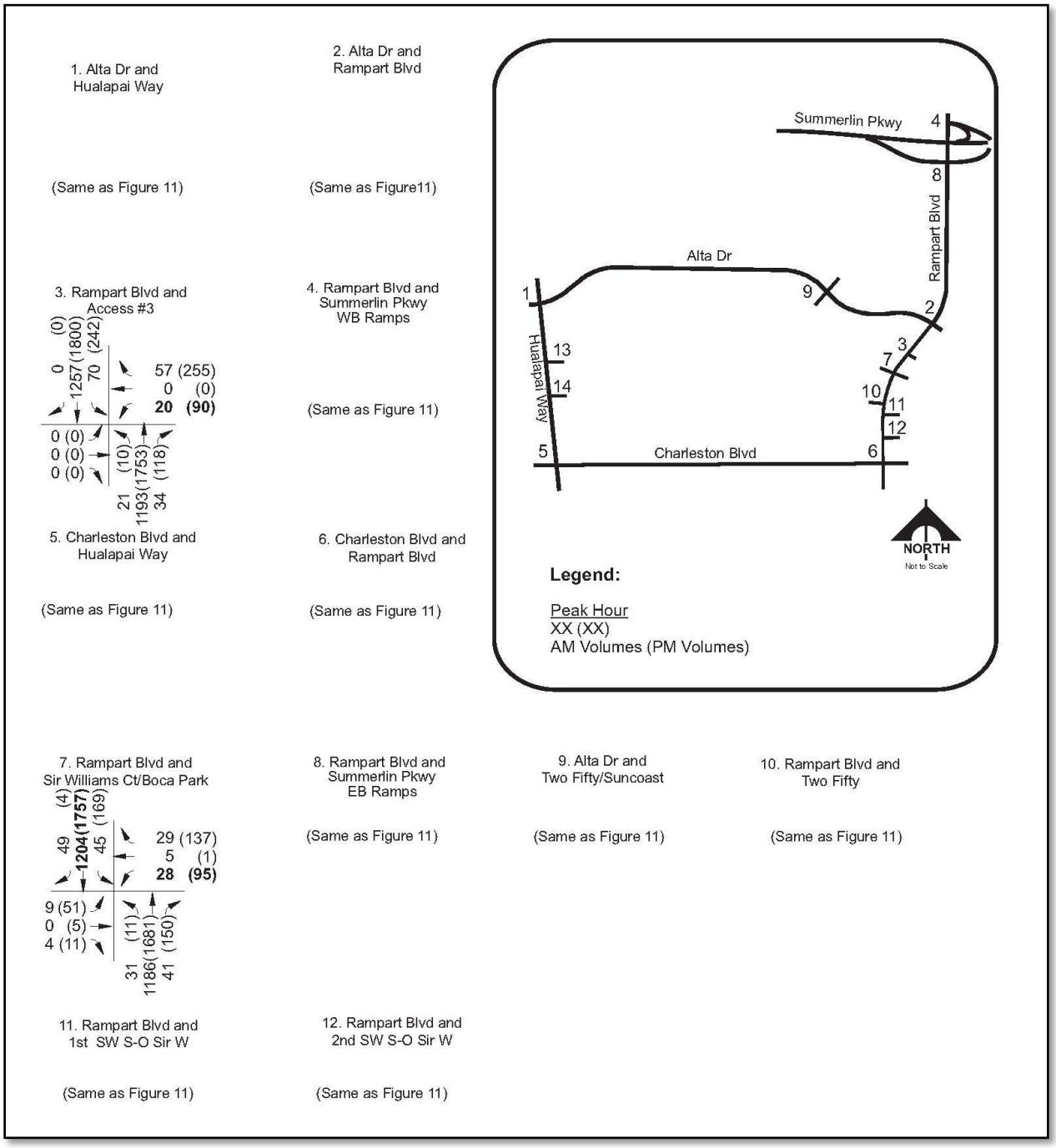

Figure 12. Background Traffic Demand Estimates (Scenario 2)

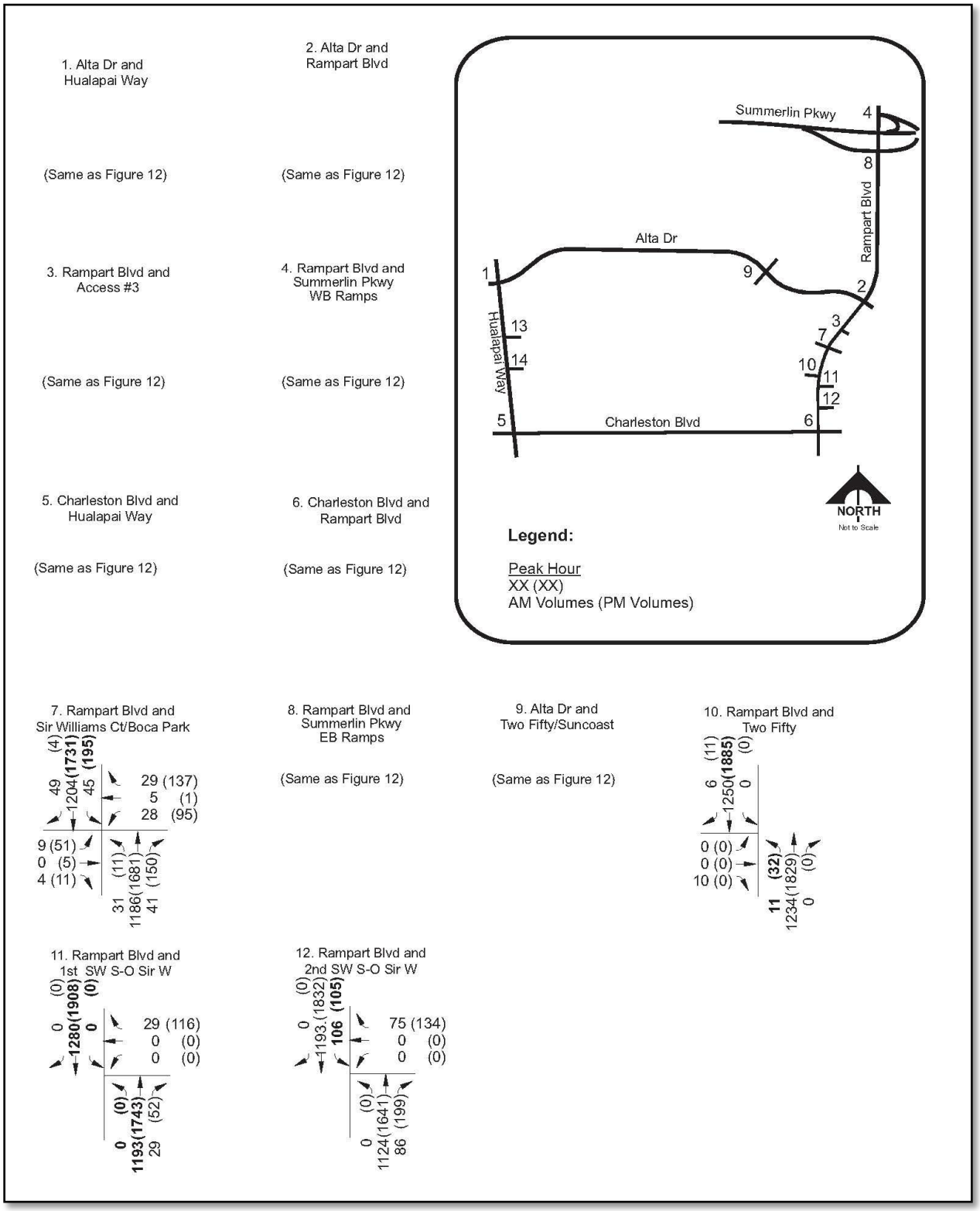

Figure 13. Background Traffic Demand Estimates (Scenario 3)

Table 1. Project Trip Generation

Model Zone	Use	ITE Code	Units	Trip Rates					Trip Generation		
				Daily	AM Peak		PM Peak		Daily	AM Peak	PM Peak
					Rate	Enter/ Exit	Rate	Enter/ Exit		In / Out	In / Out
1	Condos (≥ 3 Stories)	232	720 du's	4.18	0.34	19% / 81%	0.38	62% / 38%	3,010	47 / 198	170 / 104
2	Condos (≥ 3 Stories)	232	1500 du's	4.18	0.34	19% / 81%	0.38	62% / 38%	6,270	97 / 413	353 / 217
3	Condos (≥ 3 Stories)	232	400 du's	4.18	0.34	19% / 81%	0.38	62% / 38%	1,672	26 / 110	94 / 58
4	Condos (≥ 3 Stories)	232	400 du's	4.18	0.34	19% / 81%	0.38	62% / 38%	1,672	26 / 110	94 / 58
Condo Subtotal			**3020 du's**						**12,624**	**195 / 832**	**712 / 436**
6	Estate Lots	210	10 du's	9.52	0.75	25% / 75%	1.00	63% / 37%	95	2 / 6	6 / 4
7	Estate Lots	210	27 du's	9.52	0.75	25% / 75%	1.00	63% / 37%	257	5 / 15	17 / 10
8	Estate Lots	210	11 du's	9.52	0.75	25% / 75%	1.00	63% / 37%	105	2 / 6	7 / 4
9	Estate Lots	210	12 du's	9.52	0.75	25% / 75%	1.00	63% / 37%	114	2 / 7	8 / 4
Estate Lot Subtotal			**60 du's**						**571**	**11 / 34**	**38 / 22**
Grand Totals			**3080 du's**						**13,195**	**206 / 865 1,072**	**749 / 458 1,208**

4.3 TRIP DISTRIBUTION AND ASSIGNMENT

Project trips have been distributed to the area street network based on residential attractions and likely commuter routes. Trip distribution assumptions are presented in **Figure 14**. The following is noted:

1) The East Summerlin Parkway will provide freeway access to downtown Las Vegas and to the resort corridor along I-15.
2) North Hualapai Way will provide access to significant employment along Town Center Drive to the north.
3) West Charleston will provide access to significant commercial attractions at/near Downtown Summerlin.
4) East Charleston Boulevard and South Rampart will provide access to significant commercial attractions along major arterials south and east of the site.
5) A significant portion of trips to nearby commercial attractions can be expected to be made by automobile mode. The proportion of trips to nearby commercial has been based on capture rates reported in Tables 7.1 and 7.2 of the *Trip Generation Handbook*. For the PM peak hour the *Trip Generation Handbook* rates have been approximately halved to provide for conservative analyses, and then assigned to the Suncoast, Tivoli and Boca Park attractions. The inbound and outbound capture rates differ, consistent with Tables 7.1 and 7.2 of the *Trip Generation Handbook.*
6) Trip interactions with nearby commercial attractions are expected to be less significant in the AM peak hour, and have been assumed to be approximately one-third of the PM peak values.

Project trips have been assigned to the area street network using Vistro modeling software. Resulting trip assignments are presented in **Figures 15 and 16** for the Scenario 1 Base condition. Project trips have been added to background traffic estimates (Figure 10) to yield estimated traffic demands at Project buildout for Scenario 1, as presented in **Figures 17 and 18.**

Trip assignments for key intersections for the Scenario 2 condition (Access #3 Signal Control) are presented in **Figures 19 and 20**, and Scenario 2 Background-plus-Project estimates for key intersections are presented in **Figures 21 and 22.**

Trip assignments for key intersections for the Scenario 3 condition (NB Left-in to Two Fifty Drive) are presented in **Figures 23 and 24**, and Scenario 3 Background-plus-Project estimates for key intersections are presented in **Figures 25 and 26.**

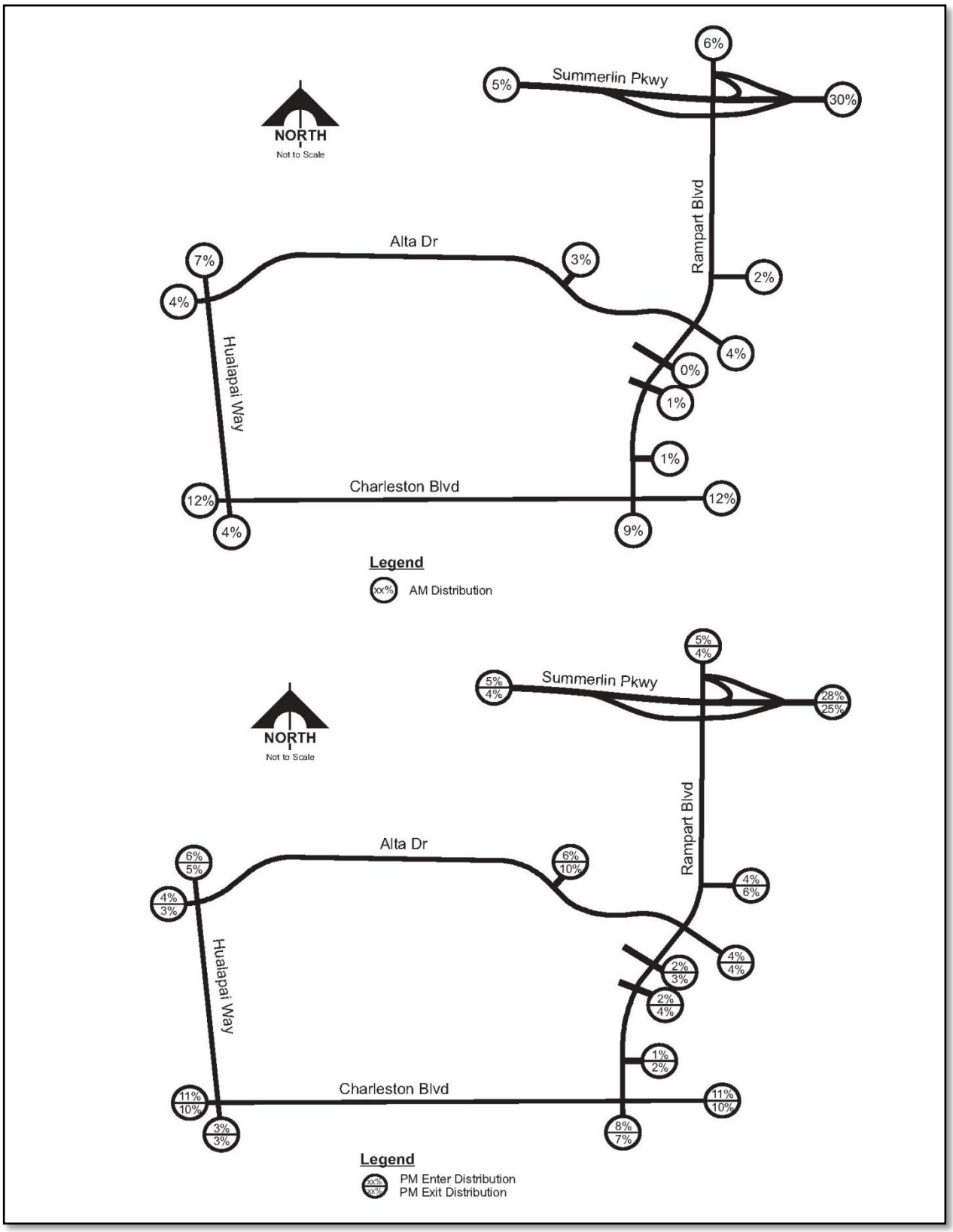

Figure 14. Off-Site Trip Distributions

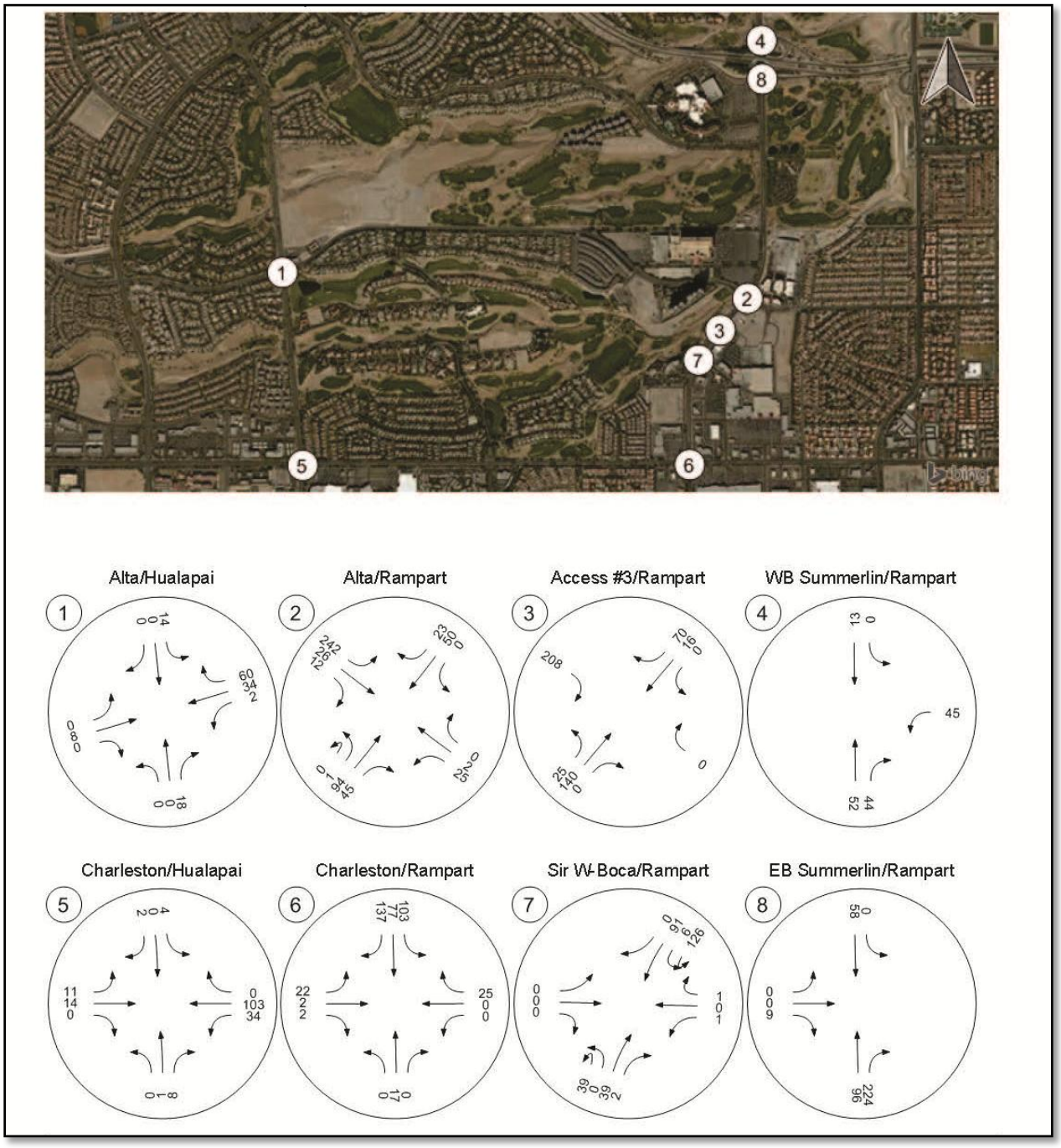

Figure 15. Trip Assignments – AM Peak Scenario 1

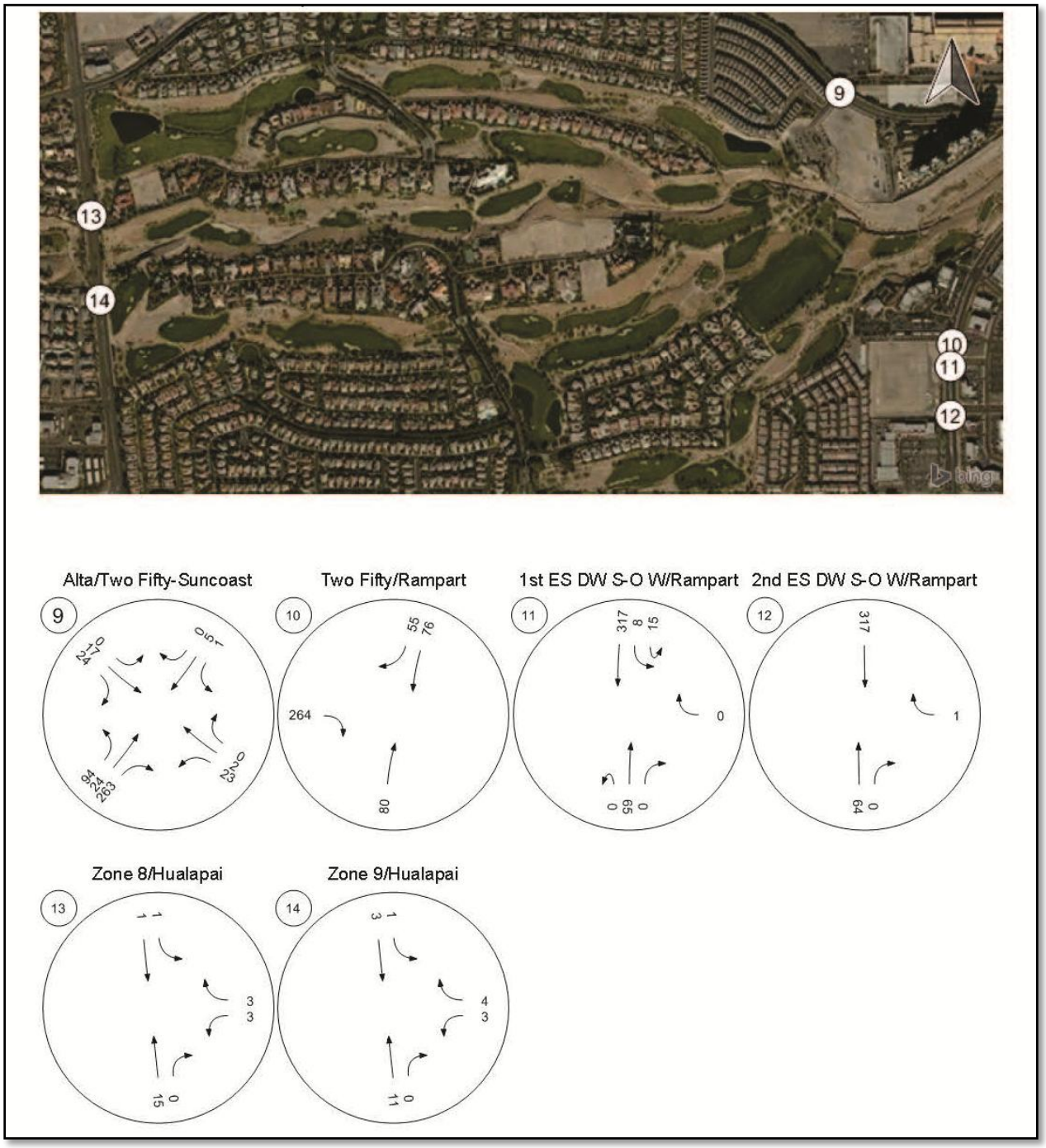

Figure 15. Trip Assignments – AM Peak Scenario 1 (Cont'd)

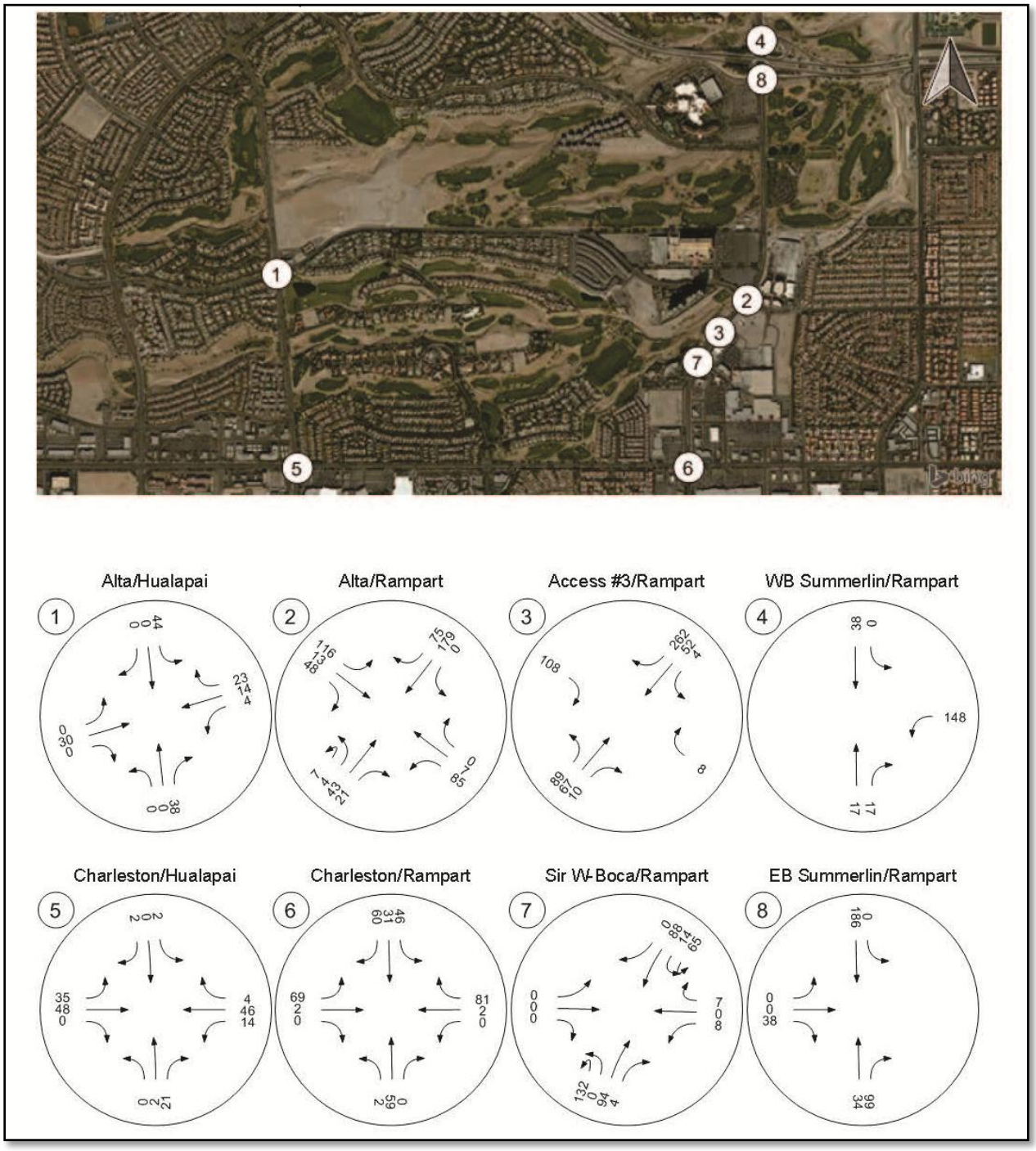

Figure 16. Trip Assignments – PM Peak Scenario 1

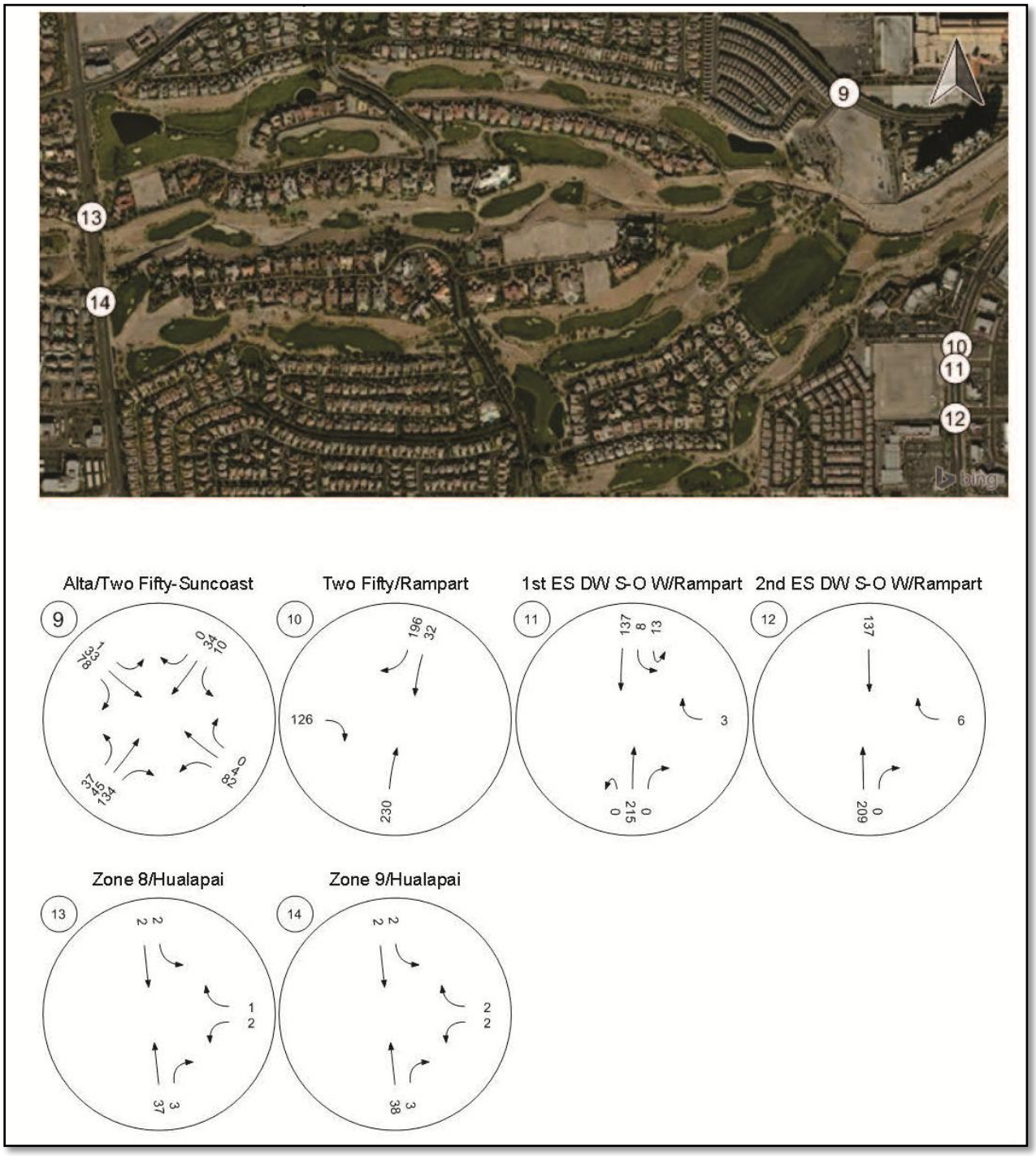

Figure 16. Trip Assignments – PM Peak Scenario 1 (Cont'd)

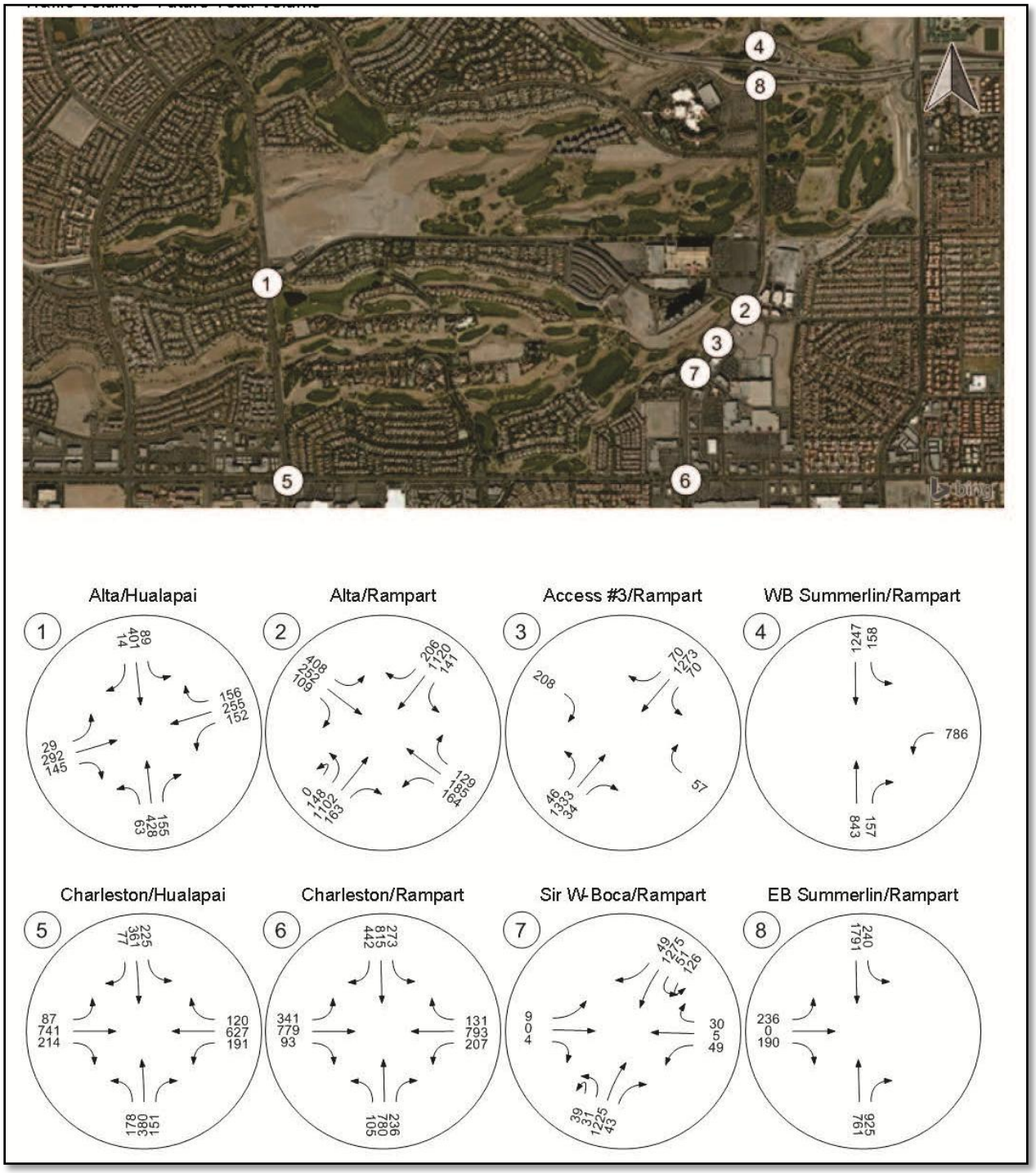

Figure 17. Background-Plus-Project – AM Peak Scenario 1

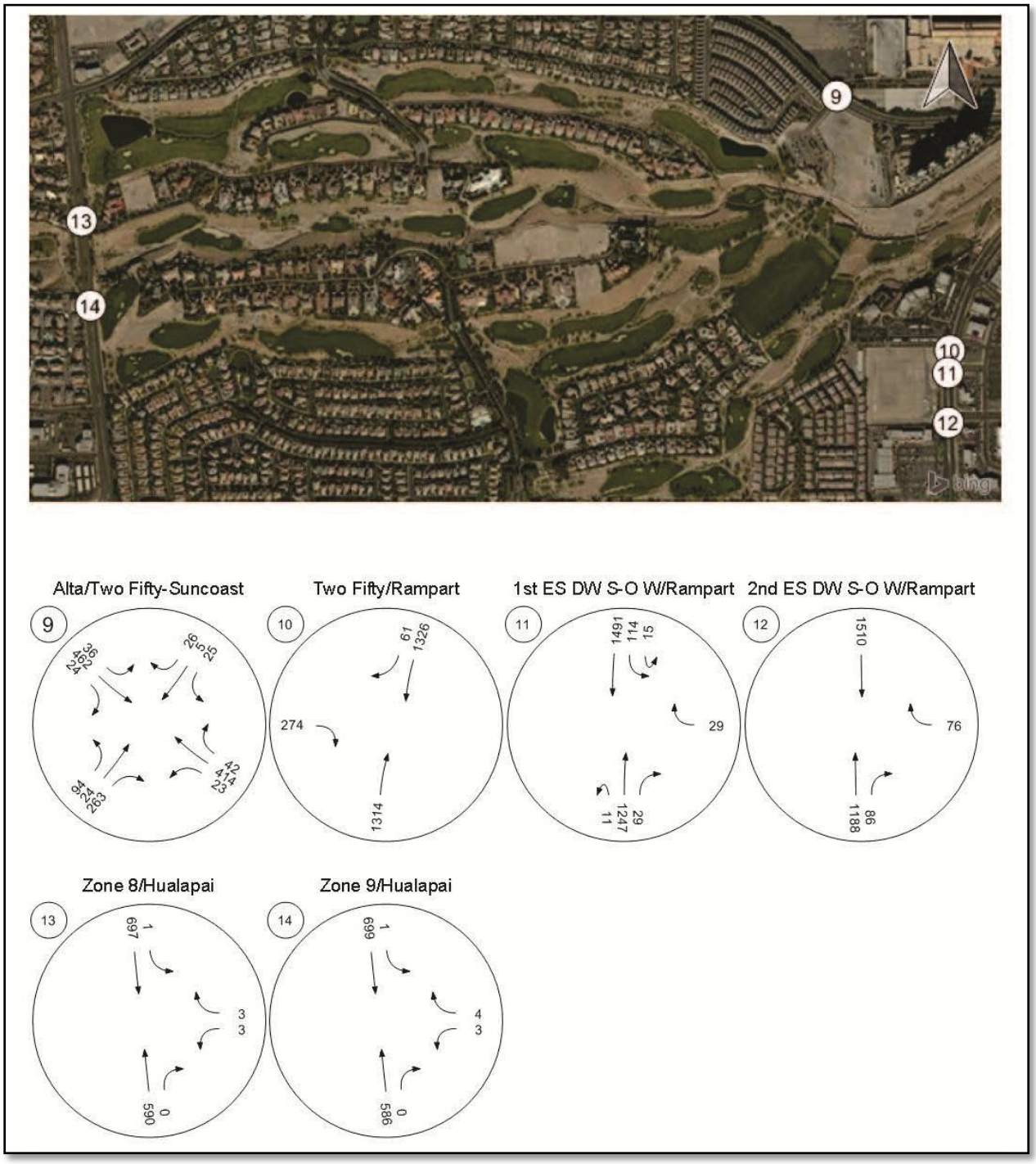

Figure 17. Background-Plus-Project – AM Peak Scenario 1 (Cont'd)

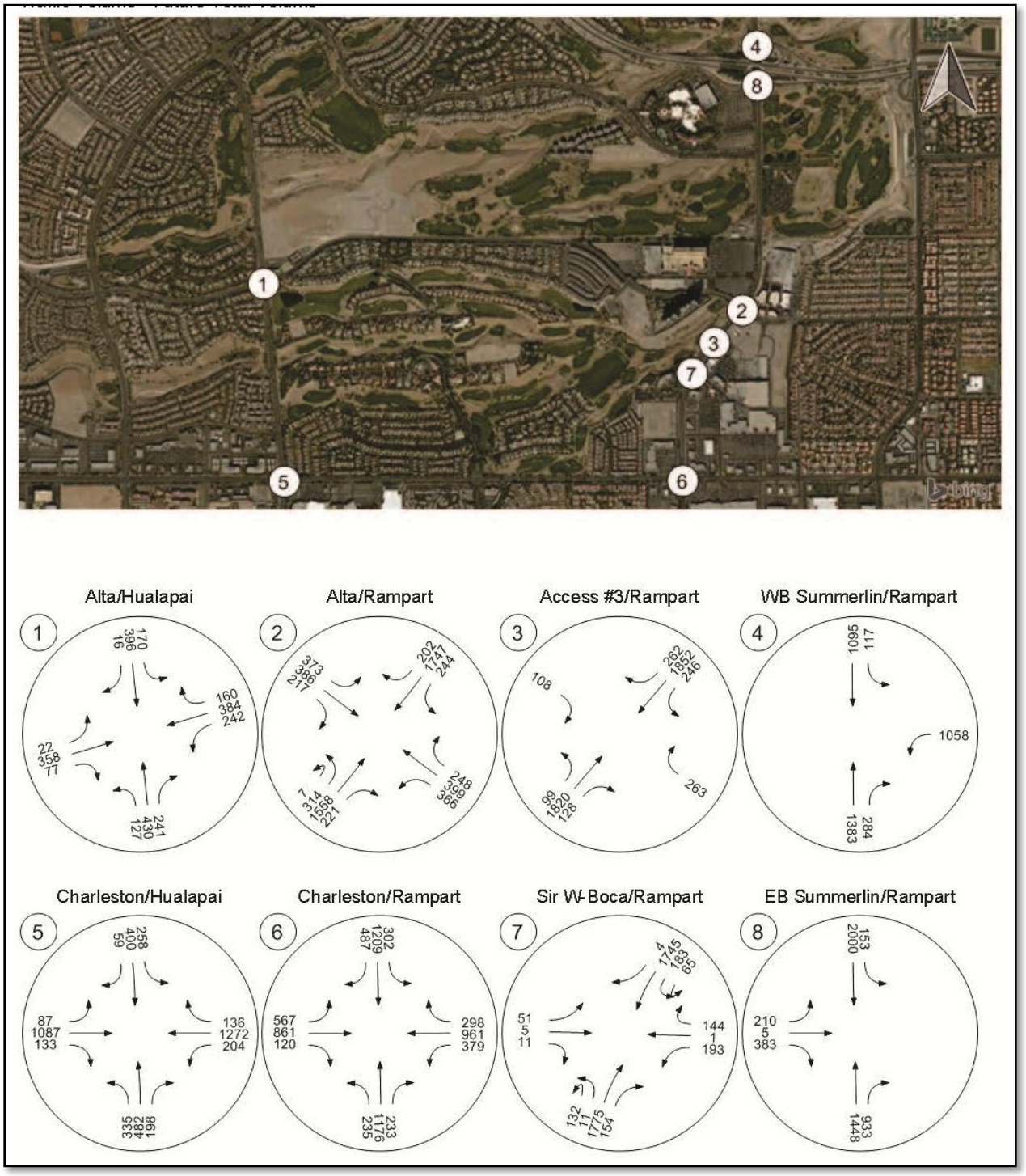

Figure 18. Background-Plus-Project – PM Peak Scenario 1

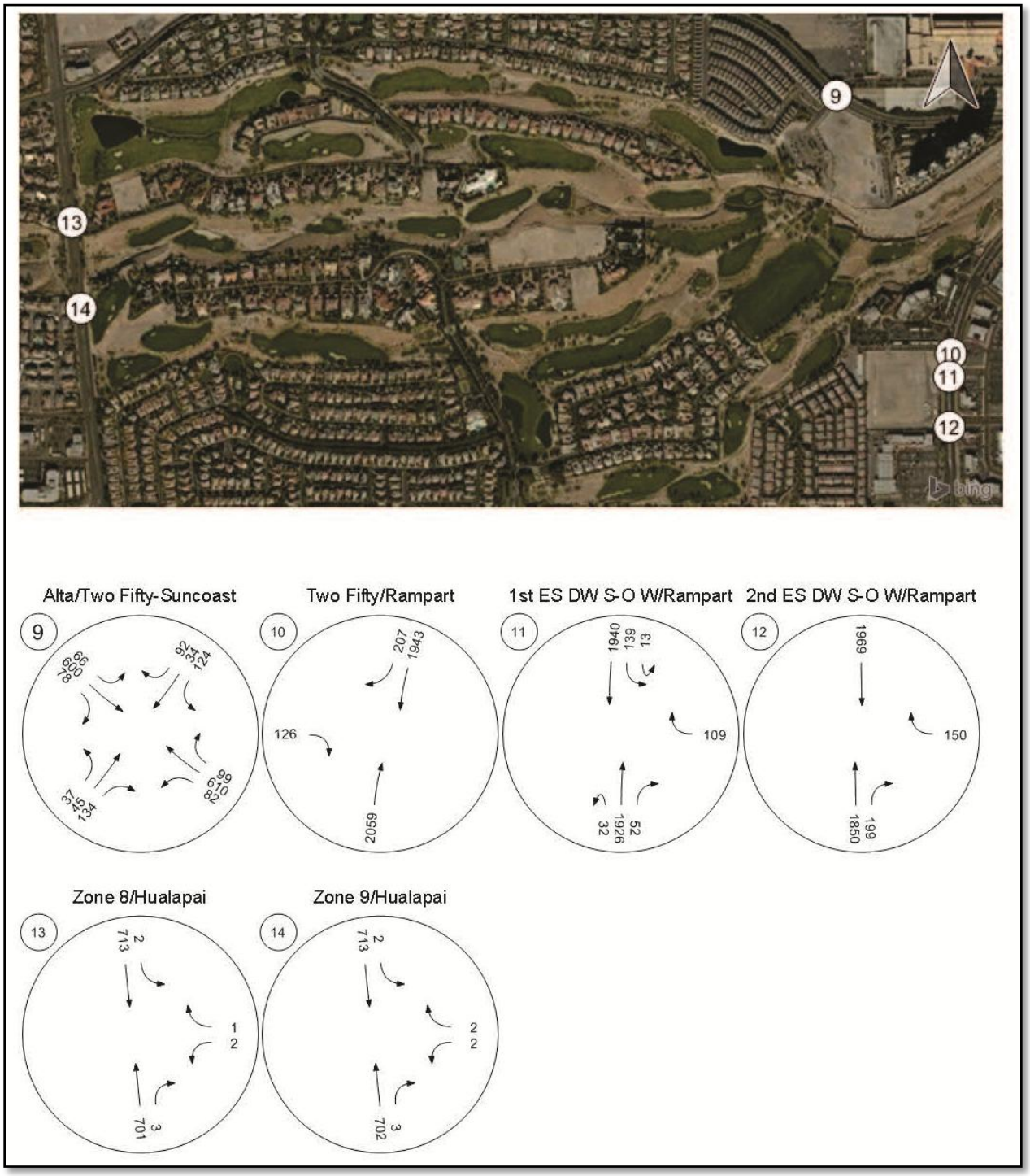

Figure 18. Background-Plus-Project – PM Peak Scenario 1 (Cont'd)

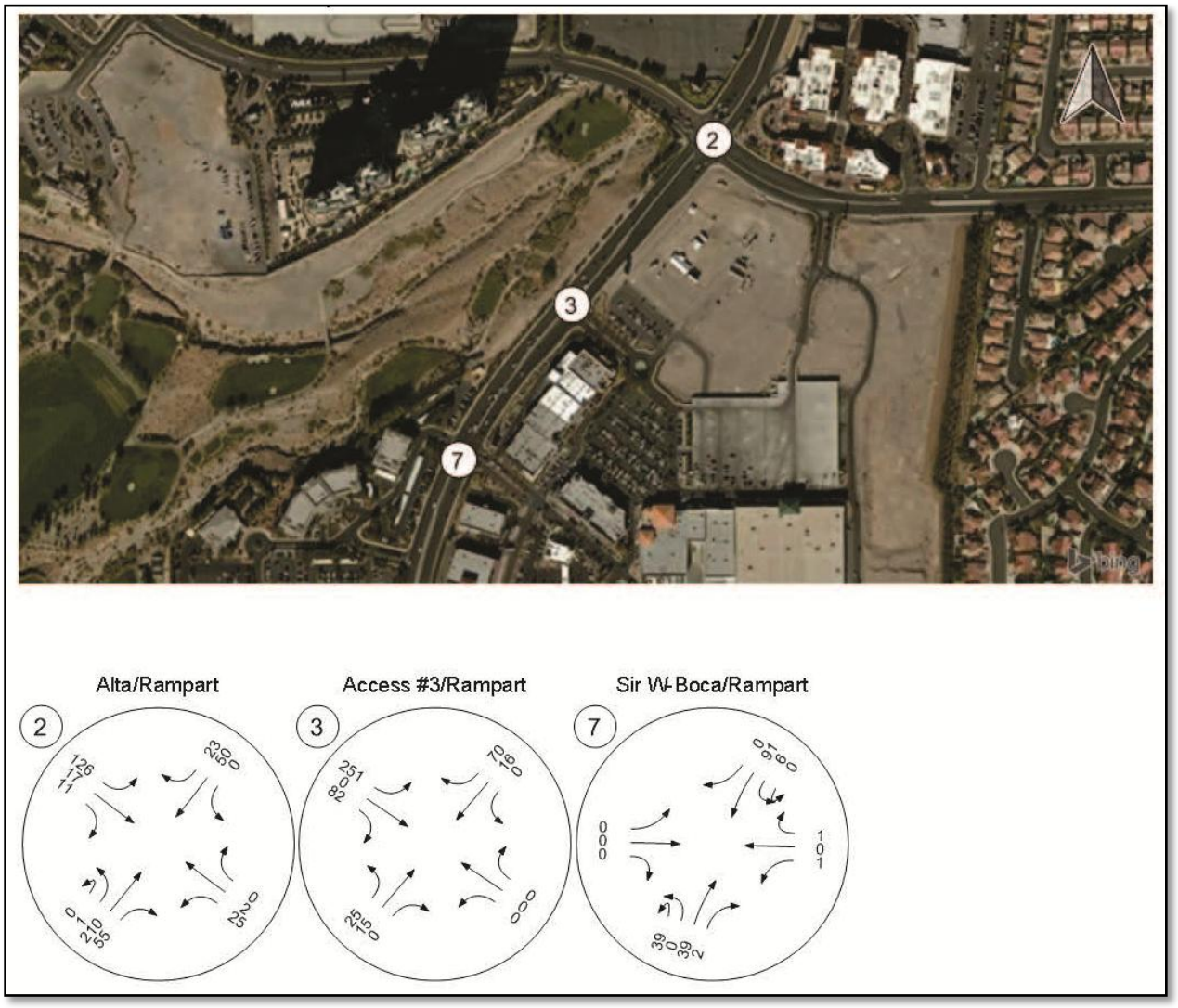

Figure 19. Trip Assignments – AM Peak Scenario 2

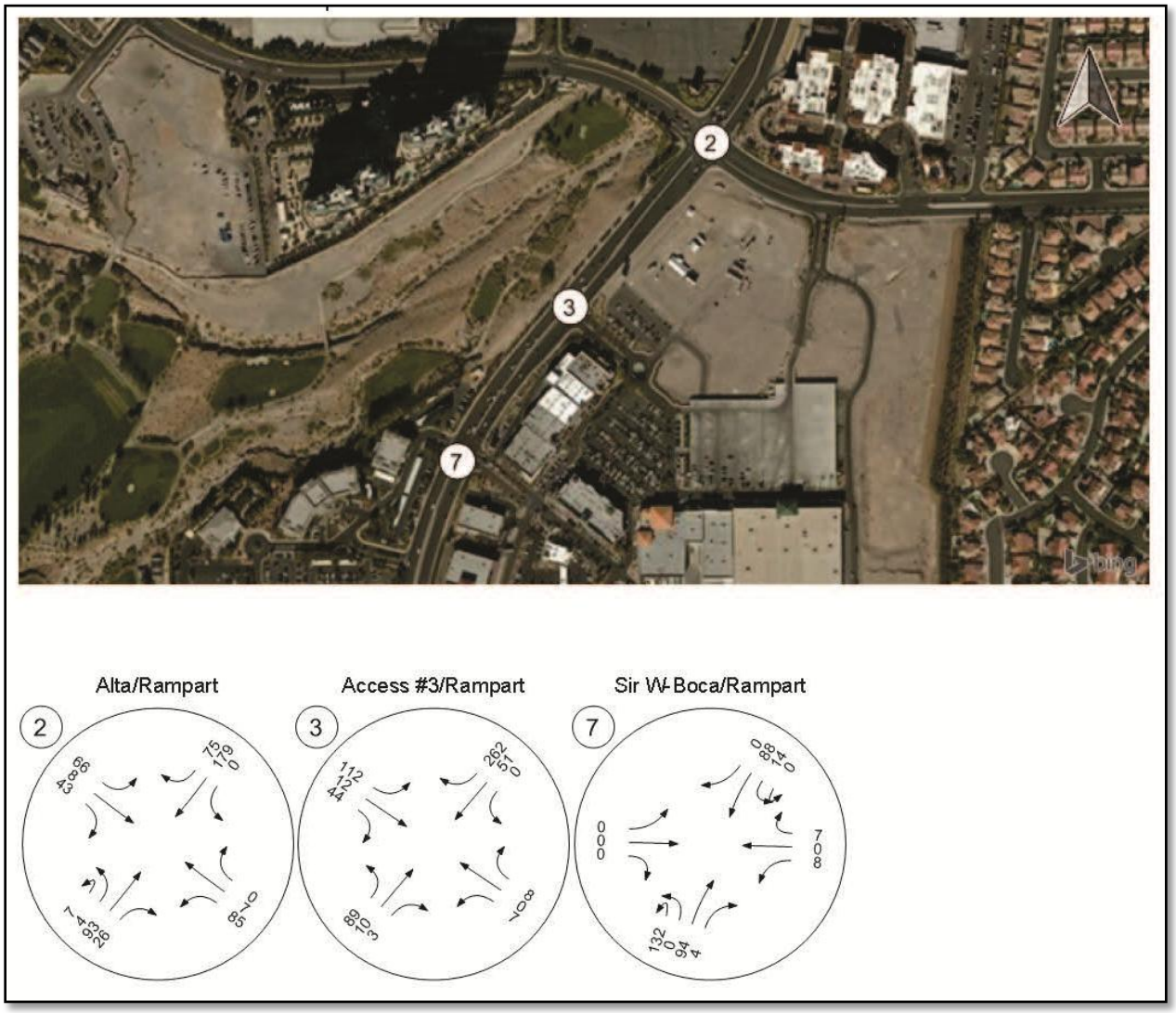

Figure 20. Trip Assignments – PM Peak Scenario 2

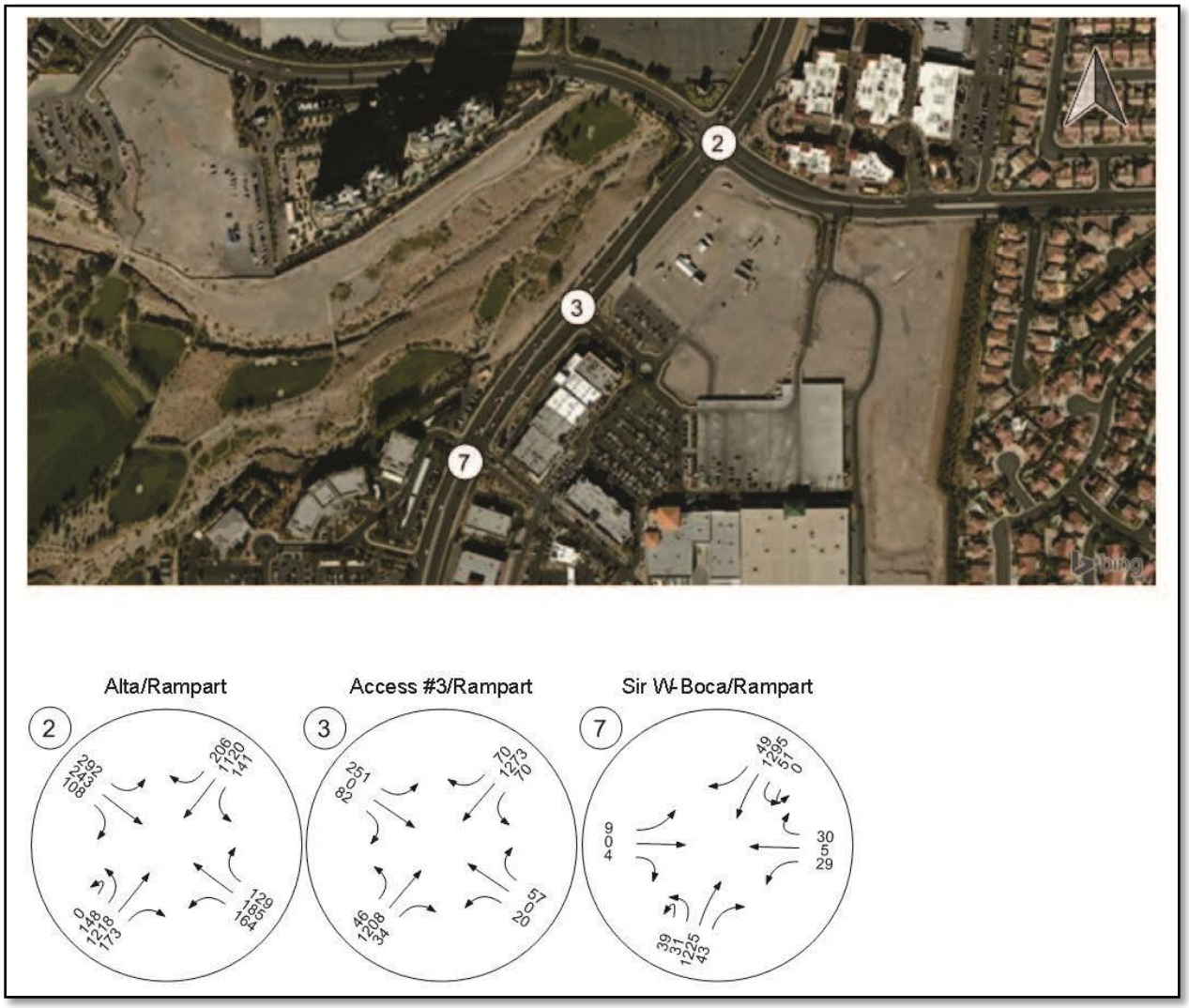

Figure 21. Background-Plus-Project – AM Peak Scenario 2

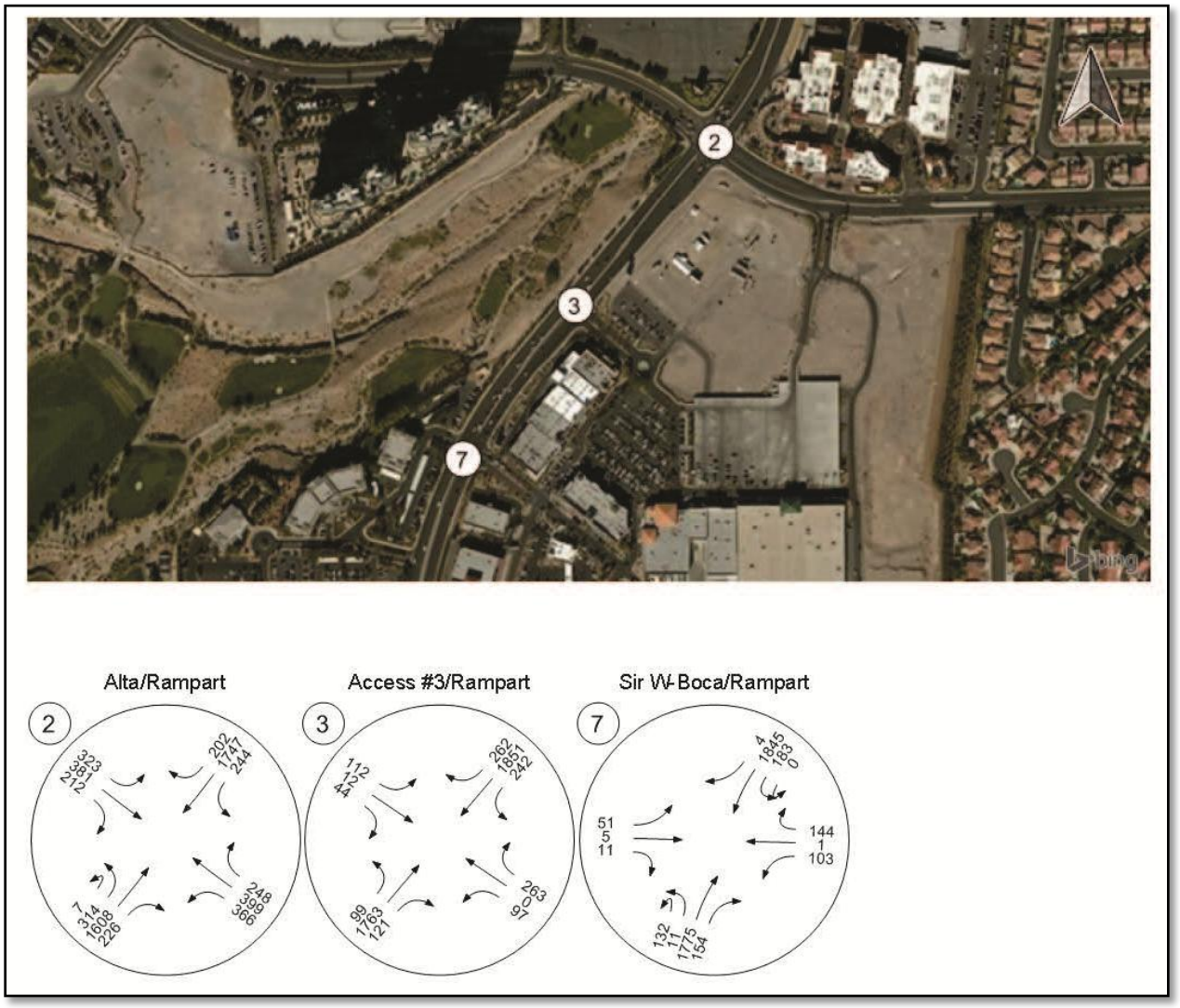

Figure 22. Background-Plus-Project – PM Peak Scenario 2

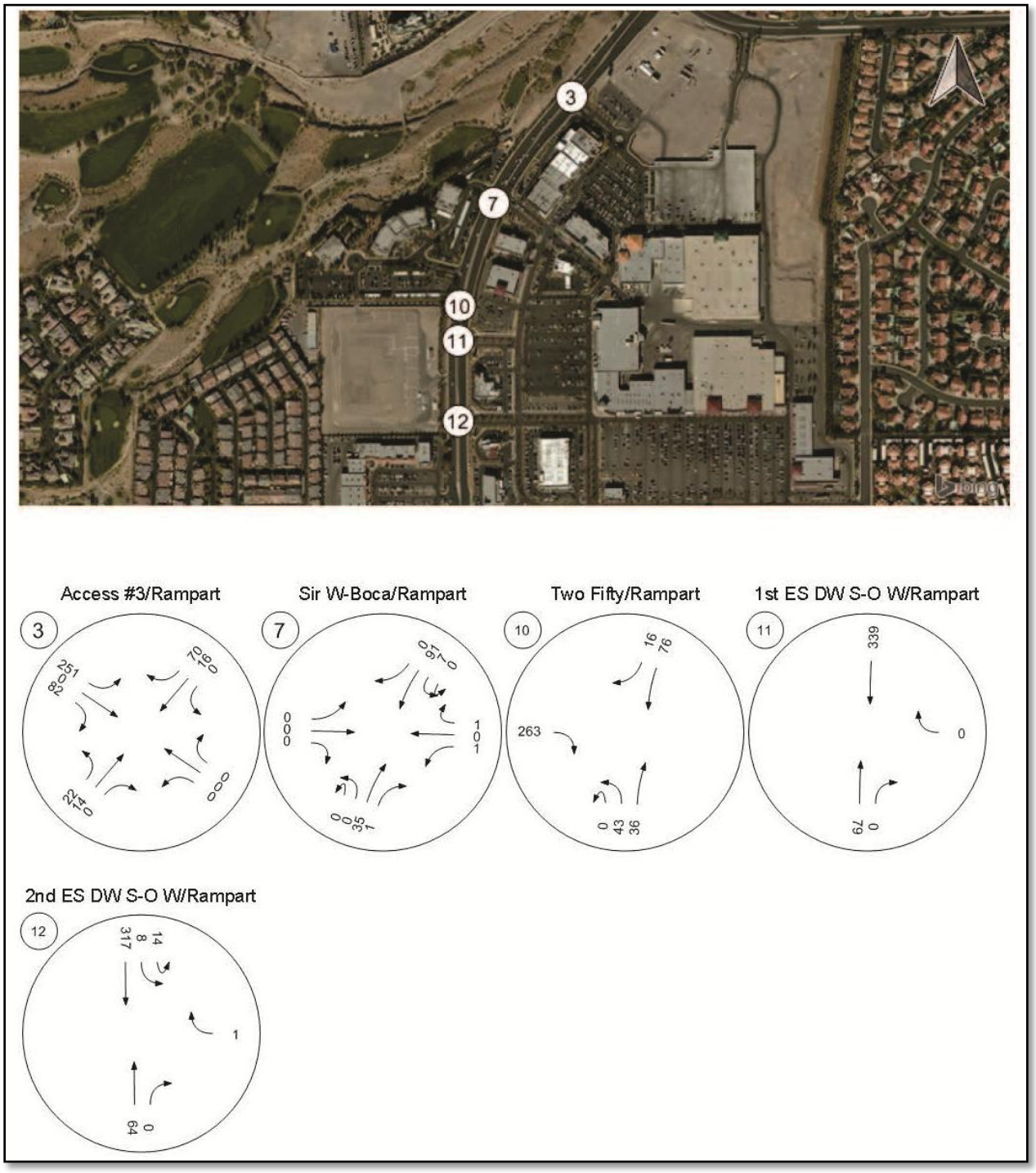

Figure 23. Trip Assignments – AM Peak Scenario 3

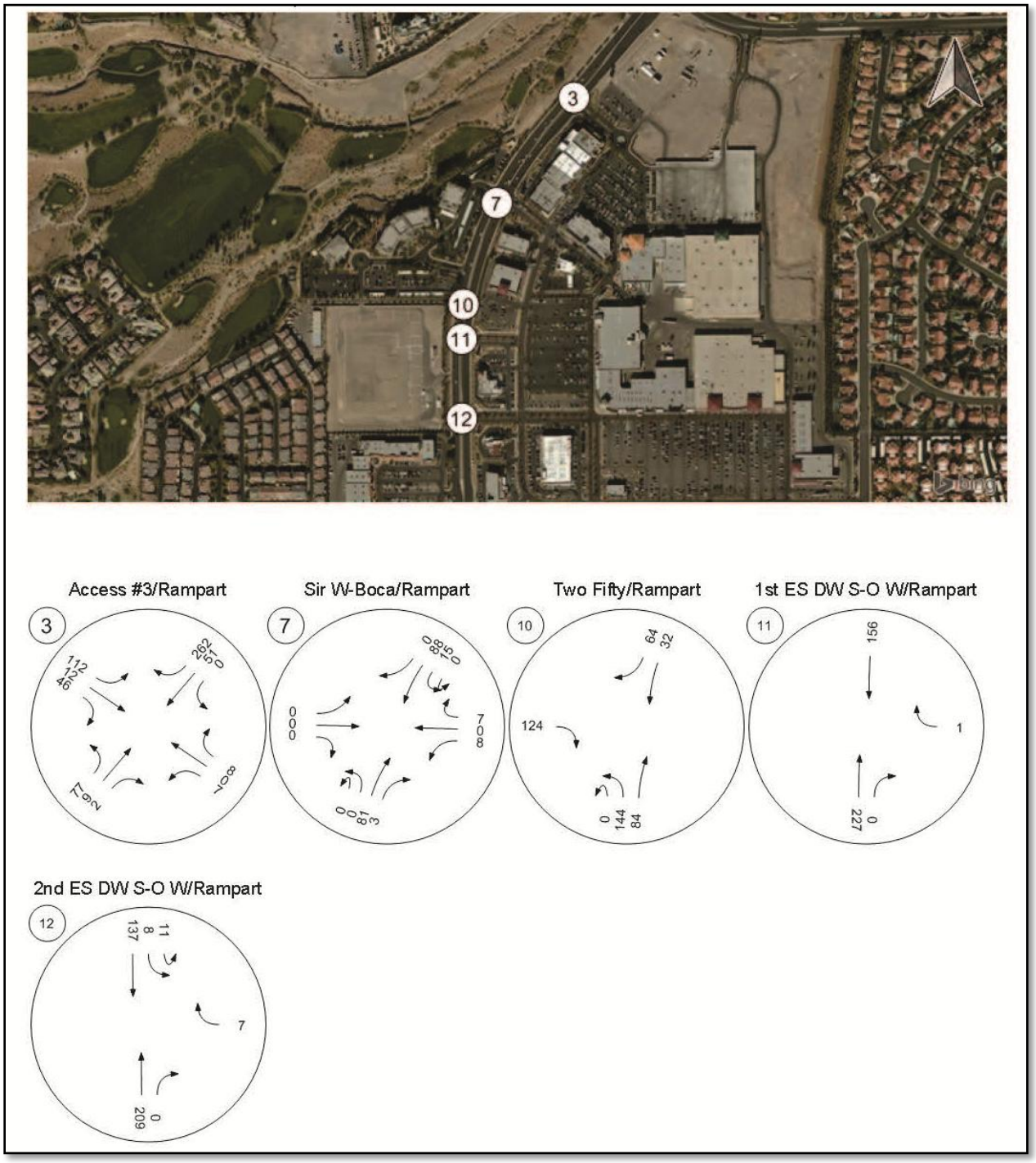

Figure 24. Trip Assignments – PM Peak Scenario 3

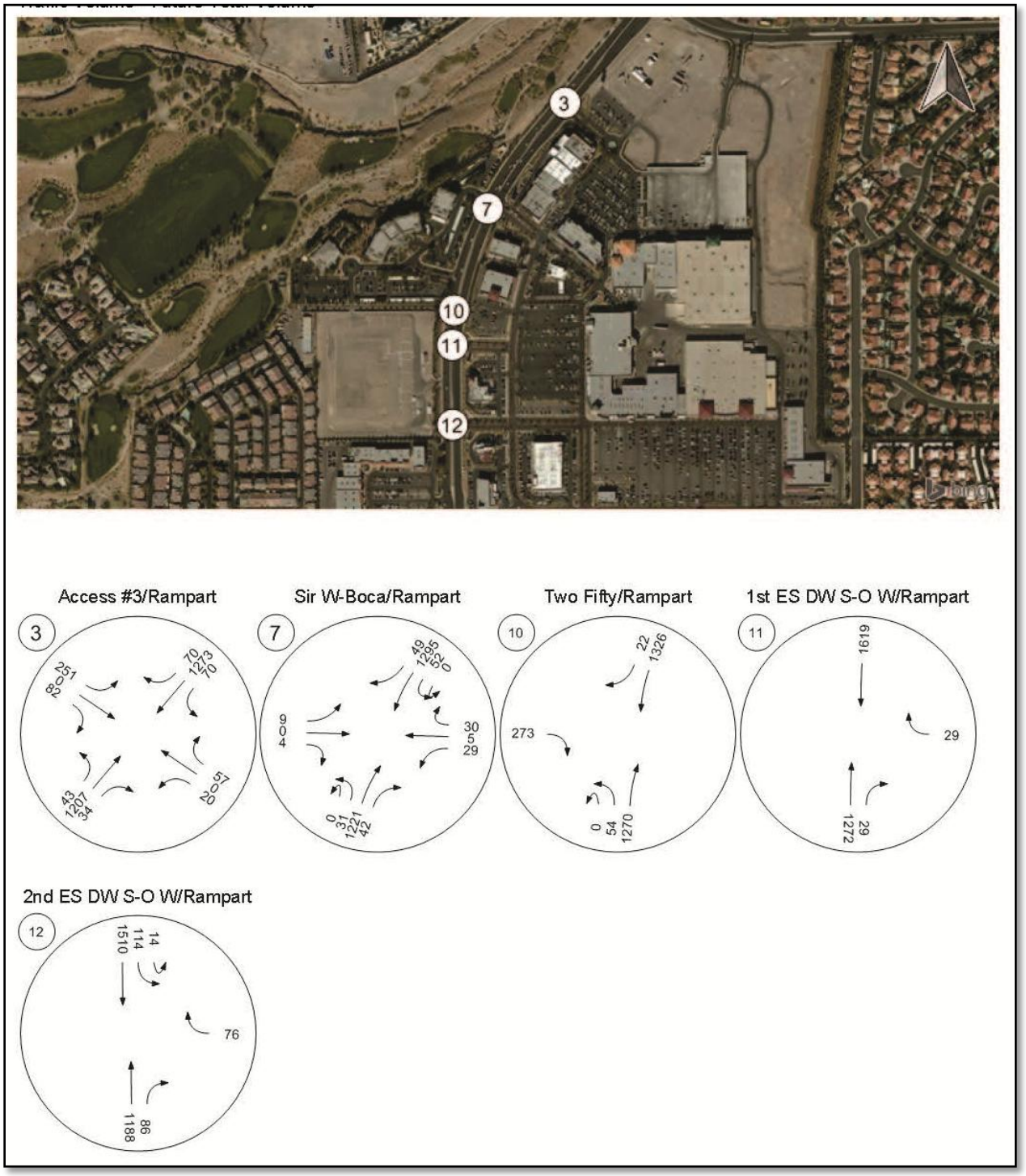

Figure 25. Background-Plus-Project – AM Peak Scenario 3

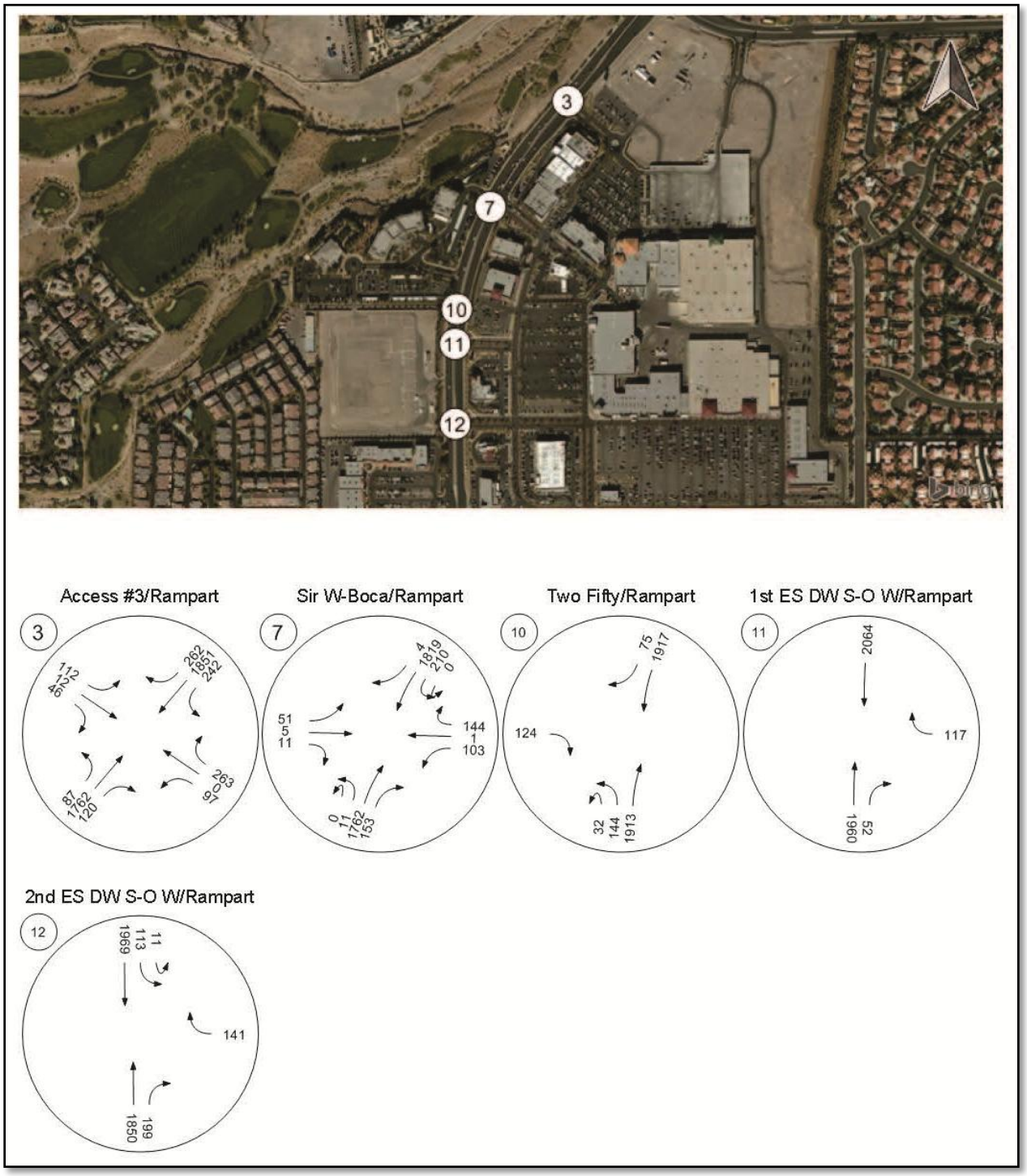

Figure 26. Background-Plus-Project – PM Peak Scenario 3

5.0 OPERATIONAL ANALYSES

5.1 SIGNAL WARRANT EVALUATIONS

5.1.1 *RAMPART BOULEVARD/ACCESS #3*

Peak hour traffic signal warrant evaluations (Warrant 3 of the *Manual on Uniform Traffic Control Devices (MUTCD*) have been conducted for projected demands at the Rampart Boulevard/Access #3 intersection. The primary need for signal control is driven by the E-to-N left-turn from the west leg. Warrant 3 criteria have been evaluated with two or more lanes on the major street and one lane on the minor street for the E-to-N left-turn demand. Warrant 3 criteria for above 40 mph (*MUTCD* Figure 4C-4) have been used given the 45-mph speed limit on Rampart Boulevard. In the AM peak hour the projected major street demand is 2,697 vph, and the projected minor street left-turn demand is 251 vph. In the PM peak the projected major street and minor street left-turn demands are 4,324 vph and 112 vph, respectively. For major street demands above 1300 vph, the required one-lane minor street demand to meet Warrant 3 is 75 vph. ***The projected AM and PM peak hour left-turn demands of 251 vph and 112 vph from Access #3 easily meet this Warrant 3 threshold.*** However Warrant 3 is intended for application in unusual cases where a land use attracts or discharges large numbers of vehicles over a short period of time. Therefore Warrants 1 and 2 have also been evaluated.

Projected demands have been evaluated against Warrant 1B 8-hour criteria and Warrant 2 4-hour criteria. Based on data from NDOT count station 1115 (0.1 mile south of Charleston), it is conservatively estimated that the 4th highest hour is 80% of the PM peak hour, and that the 8th highest hour is 70% of the PM peak hour. This yields 4th highest hour and 8th highest hour demands of 3,459 vph and 3,026 vph respectively on Rampart Boulevard (see Section Three of Appendix). For the minor street approach, the 4th highest hour and 8th highest hour minor street left-turn demands are conservatively estimated to be 111 vph and 97 vph, respectively.

The estimated 8th highest hour demand of 3,026 *vph on Rampart Boulevard easily meets the Warrant 1B threshold of 630 vph. The required one-lane minor street demand to meet Warrant 1B is 53 vph. The projected 8th highest hour of left-turn demand of 97 vph easily meets this Warrant 1B threshold.* ***It is therefore concluded that projected demands at the Access #3 intersection meet Warrant 1.***

The estimated 4th highest hour demand of 3,459 *vph on Rampart Boulevard requires a one-lane minor street demand of 60 vph to meet Warrant 2 per Figure 4C-2 of the MUTCD. The projected 4th highest hour of left-turn demand of 111 vph easily meets this Warrant 2 threshold.* ***It is therefore concluded that projected demands at the Access #3 intersection meet Warrant 2.***

As noted in Section 3.0, signal control at the Rampart Boulevard/Access #3 intersection avoids the need for significant U-turn demands on the north leg of the signalized Sir Williams Court – Boca Park intersection approximately 1/8-mile to the south, and provides for a convenient pedestrian crossing of Rampart Boulevard. **Based on these considerations, the projected satisfaction of multiple Warrants, and operational analyses summarized in subsequent sections (LOS, left-turn storage, and signal coordination), it is recommended that the Rampart Boulevard/Access #3 intersection be signalized with proposed development in the southwest corner of the Rampart Boulevard/Alta Drive intersection.**

It is recommended that the proposed Rampart Boulevard/Access #3 traffic signal incorporate protected-permitted left-turn phasing with flashing yellow arrow (FYA) on the NB and SB approaches. The flashing FYA displays can be operated as protected-only on a time-of-day or 24/7 basis as needed. As noted in Section 3.1.2, It is recommended that the Rampart Boulevard/Access #3 intersection include a south-leg crosswalk that would be compatible with a leading E-to-N protected left-turn phase followed by a permissive phase for the westbound approach.

5.1.2 *RAMPART BOULEVARD/TWO FIFTY DRIVE*

The N-to-W left-turn at the Rampart Boulevard/Two Fifty Drive intersection has also been evaluated for signal control assuming the N-to-W/S left-turn-plus-U-turn demand as the minor street demand, and the opposing southbound through movement as the major street demand. This type of evaluation is permitted per paragraph 13 of Section 4C.01 of the MUTCD. In the PM peak the projected major street SB through demand is 1,776 vph, and the projected N-to-W/S left-turn/U-turn demand is 183 vph. For major street demands above 1300 vph, the required one-lane minor street demand to meet Warrant 3 is 75 vph. The projected 183 vph N-to-W/S left-turn/U-turn demand at Two Fifty Drive in the PM peak hour easily meets this Warrant 3 threshold. However Warrant 3 is intended for application in unusual cases where a land use attracts or discharges large numbers of vehicles over a short period of time. Therefore Warrant 1 (8-hour) and Warrant 2 (4-hour) have also been evaluated.

The 4th highest hour and 8th highest hour of SB through demands on Rampart Boulevard are estimated to be of 1,421 vph (80%) and 1,243 vph (70%) respectively. For the minor street demand, the 4th highest hour and 8th highest hour N-to-W/S left-turn/U-turn demands are estimated to be 146 vph and 128 vph, respectively.

The estimated 8th highest hour demand of 1,243 *vph on Rampart Boulevard easily meets the Warrant 1B threshold of 630 vph. The required one-lane minor street demand to meet Warrant 1B is 53 vph. The projected 8th highest hour of left-turn/U-turn demand of 128 vph easily meets*

this Warrant 1B threshold. It is therefore concluded that projected demands at the Access #3 intersection meet Warrant 1.

The estimated 4th highest hour demand of 1,421 *vph on Rampart Boulevard requires a one-lane minor street demand of 60 vph to meet Warrant 2 per Figure 4C-2 of the MUTCD. The projected 4th highest hour of left-turn/U-turn demand of 146 vph easily meets this Warrant 2 threshold.* It is therefore concluded that projected demands at the Access #3 intersection meet Warrant 2.

Although projected demands at the Rampart Boulevard/Two Fifty Drive intersection meet warrant criteria, the intersection is projected to operate satisfactorily (LOS C) under minor street stop control (see Section 5.2). ***It is therefore recommended that signal improvements at the Rampart Boulevard/Two Fifty Drive intersection be limited to underground conduits and pullboxes to facilitate a ½-signal installation (for left-in and right-out movements) in the future in the event it is needed.*** This could be done as part of a HAWK pedestrian crossing installation on the north leg of the intersection as described in Section 3.3.

5.2 INTERSECTION CAPACITY/LOS ANALYSES

Capacity and level-of-service (LOS) analyses have been conducted for study intersections in accordance with procedures of the 2010 Highway Capacity Manual (HCM 2010) published by the Transportation Research Board. Calculation worksheets are enclosed in the Section Two of the Appendix. In accordance with HCM 2010 procedures, intersection LOS has been determined by estimating the average vehicular delay of the intersection and intersection movements. The ranges of traffic delays associated with each LOS are presented in **Table 3** for both signalized and unsignalized intersections. Delay thresholds for a given LOS at unsignalized intersections are lower than those for signalized intersections. As explained in the HCM 2000, this difference is to account for greater variability in delay associated with unsignalized movements and different driver expectations associated with each type of intersection control. Uncontrolled left-turn movements at unsignalized intersections on Rampart Boulevard have also been analyzed using SimTraffic simulation software to take into account the beneficial platooning effects of nearby signalized intersections.

Table 2. Level of Service Criteria

LOS	Signalized Intersections	Stop-controlled Intersections
A	≤10	≤10
B	>10-20	>10-15
C	>20-35	>15-25
D	>35-55	>25-35
E	>55-80	>35-50
F	>80	>50

LOS analyses are summarized in **Table 3.** As previously described in Section 3.1, analyses have been performed with and without proposed traffic signal control at the Rampart Boulevard/Access #3 intersection, and with and without proposed N-to-W left-turn access at the Rampart Boulevard/Two Fifty Drive intersection.

All signalized study intersections are projected to operate at LOS D or better with proposed improvements (Scenario 3), and the following is noted:

1) Under the Scenario 1 condition, the stop-controlled west-to-north right-turn at the Rampart Boulevard/Access #3 intersection (#3) is projected to be at LOS F. This is due to the addition of background traffic demands to and from future Boca Park development. This LOS F condition is mitigated with proposed signal control at the intersection.
2) The Sir Williams-Boca Park/Rampart Boulevard intersection (#7) is projected to operate acceptably under Scenario 1, but better under Scenarios 2 and 3 due to the elimination of U-turn demands.
3) The Rampart Boulevard/Alta Drive intersection (#2) is projected to operate at slightly lower volume-to-capacity (v/c) ratios and delay under Scenarios 2 and 3 (vs. Scenario 1) due to the reduction of left-turn trips on the west leg.
4) In the busier PM peak hour, the Project is estimated to use approximately 7 percent of Rampart Boulevard/Alta Drive intersection capacity (raising v/c ratio from 0.73 to 0.80). At the Rampart Boulevard/ EB Summerlin Parkway intersection the Project is estimated to use approximately 10 percent of capacity, and at the Rampart Boulevard/ Charleston Boulevard intersection the Project is estimated to use approximately 4 percent of capacity.
5) The Rampart Boulevard intersections at the EB Summerlin Parkway Ramp, Alta Drive, and Charleston Boulevard are projected to operate at PM peak hour v/c ratios of 0.76, 0.80, and 0.78 under projected background-plus-project demands and proposed Scenario 3 improvements. This indicates the Rampart Boulevard corridor will retain significant surplus capacity following completion of the Project and assumed background development.
6) The Hualapai Way intersections at Alta Drive (#1) and Charleston Boulevard (#5) are projected to continue to operate well under capacity under projected background-plus-project demands, with PM peak hour v/c ratios of 0.53 and 0.57, respectively. This indicates that substantial surplus automobile capacity exists in the Hualapai Way corridor.

7) Analyses indicate that left-turn and right-turn movements at the stop-controlled Rampart Boulevard/Two Fifty Drive and Rampart Boulevard/Boca Park Driveway intersections may incur high PM peak hour delays under all three access Scenarios. These unsignalized movements can be expected to operate at lower delays much of the day during non-PM-peak hours, and motorists have the option of utilizing alternate routes through signalized access intersections.

Table 3. Summary of Level of Service Analyses

Node	Intersection	Scenario	AM Peak			PM Peak		
			Critical Mvmt	v/c	Delay (s) LOS	Critical Mvmt	v/c	Delay (s) LOS
1	Hualapai Way / Alta Drive	Existing	Int.	0.44	40.6 D	Int.	0.42	42.3 D
		Background	Int.	0.46	41.6 D	Int.	0.49	43.6 D
		Background + Project	Int.	0.47	41.4 D	Int.	0.53	44.7 D
13	Hualapai Way / Node 8	Background + Project	WBL	0.01	15.5 C	WBL	0.01	17.2 C
14	Hualapai Way / Node 9	Background + Project	WBL	0.01	15.5 C	WBL	0.01	17.2 C
5	Hualapai Way / Charleston Boulevard	Existing	Int.	0.44	36.1 D	Int.	0.53	36.1 D
		Background	Int.	0.46	34.0 C	Int.	0.54	34.7 C
		Background + Project	Int.	0.48	33.7 C	Int.	0.57	36.6 C
9	Alta Drive/ Two Fifty - Suncoast	Existing	Int.	0.17	20.2 C	Int.	0.26	24.7 C
		Background	Int.	0.19	34.2 C	Int.	0.33	20.8 C
		Background + Project	Int.	0.39	32.3 C	Int.	0.39	31.0 C
4	Rampart Blvd/ WB Summerlin Parkway	Existing	Int.	0.53	24.2 C	Int.	0.57	22.7 C
		Background	Int.	0.56	24.7 C	Int.	0.64	23.4 C
		Background + Project	Int.	0.59	25.4 C	Int.	0.68	25.4 C
8	Rampart Blvd/ EB Summerlin Parkway	Existing	Int.	0.60	13.0 B	Int.	0.52	10.2 B
		Background	Int.	0.65	15.1 B	Int.	0.66	10.8 B
		Background + Project	Int.	0.84	20.0 B	Int.	0.76	11.9 B
2	Rampart Blvd/ Alta Drive	Existing	Int.	0.38	29.4 C	Int.	0.59	36.5 D
		Background	Int.	0.43	36.5 D	Int.	0.73	41.3 D
		Background + Project (Sc.1)	Int.	0.52	38.3 D	Int.	0.81	47.1 D
		Background + Project (Sc.2&3)	Int.	0.50	34.5 C	Int.	0.80	46.1 D

Table 3. Summary of Level of Service Analyses (Cont'd)

Node	Intersection	Scenario	AM Peak			PM Peak		
			Critical Mvmt	v/c	Delay (s) LOS	Critical Mvmt	v/c	Delay (s) LOS
3	Rampart Blvd/ Access #3	Existing	NBU[1]	-	23.0 C	WBR[1]	-	28.9 D
		Background	SBL[1]	-	21.1 C	WBR[1]	-	229.4 F
		Background + Project (Sc.1)	WBR[1]	-	19.9 C	WBR[1]	-	247.4 F
		Background + Project (Sc.2)	Int.	0.53	20.0 B	Int.	0.77	29.2 C
		Background + Project (Sc.3)	Int.	0.53	19.7 C	Int.	0.77	28.6 C
7	Rampart Blvd/ Sir Williams - Boca Park	Existing	Int.	0.35	3.7 A	Int.	0.47	7.6 A
		Background	Int.	0.39	6.1 A	Int.	0.61	13.3 B
		Background + Project (Sc.1)	Int.	0.45	9.1 A	Int.	0.69	19.3 B
		Background + Project (Sc.2)	Int.	0.43	5.3 A	Int.	0.59	15.1 B
		Background + Project (Sc.3)	Int.	0.33	4.5 A	Int.	0.58	11.5 B
10	Rampart Blvd/ Two Fifty Drive	Background + Project (Sc.1&2)	EBR[1]	-	18.8 C	EBR[1]	-	45.8 E
		Background + Project (Sc.3)	EBR[1]	-	18.5 C	EBR[1]	-	26.8 D
11	Rampart Blvd/ 2nd Boca Dwy N. of Charleston	Existing	NBU[1]	-	16.2 C	NBU[1]	-	22.8 C
		Background	NBU[1]	-	17.6 B	SBL[1]	-	41.3 E
		Background + Project (Sc.1&2)	NBU[1]	-	21.3 C	SBL[1]	-	109.1 F
		Background + Project (Sc.3)	WBR[1]	-	11.7 B	WBR[1]	-	32.9 D
12	Rampart Blvd/ 1st Boca Dwy N. of Charleston	Existing	WBR[1]	-	10.4 B	WBR[1]	-	16.0 C
		Background	WBR[1]	-	12.5 B	WBR[1]	-	21.1 C
		Background + Project (Sc.1&2)	WBR[1]	-	12.8 B	WBR[1]	-	77.3 F
		Background + Project (Sc. 3)	SBL[1]	-	15.2 C	SBL[1]	-	47.2 E
6	Rampart Blvd/ Charleston Blvd	Existing	Int.	0.53	36.7 D	Int.	0.69	42.7 D
		Background	Int.	0.56	38.0 D	Int.	0.74	44.1 D
		Background + Project	Int.	0.63	38.8 D	Int.	0.78	46.6 D

[1] Delay and LOS per SimTraffic model

5.3 TURN LANE EVALUATIONS

Existing and proposed left-turn lanes and exclusive right-turn lanes, and their lengths are identified in Figures 5 and 6. Left-turn queue storage evaluations for study intersections are presented in **Tables 4 and 5**. Design queue demands at signalized intersections have been calculated at 95th percentile confidence levels based on peak hour cycle lengths of 140 seconds. Design queues at unsignalized intersections have been based on uniform arrivals over a two-minute queuing interval. The following is noted:

1) Southbound left-turn storage at the Rampart Boulevard/Access #3 intersection is inadequate for projected background demands for both unsignalized (Scenario 1) and signalized (Scenarios 2 and 3) conditions. Lengthening of the existing single-lane pocket from 150 feet to 225 feet is needed for Scenario 1. For the signalized Scenario 2 and 3 conditions, dual left-turn lanes are needed. Dual left-turn lanes can be accomplished by narrowing lanes and reconstructing the median. The need for this improvement is driven by assumed development in Boca Park and not The Two Fifty Project. Accordingly, this improvement should be a condition of Boca Park development and not The Two Fifty Project.

2) Southbound left-turn storage at the Sir Williams-Boca Park/Rampart Boulevard intersection is inadequate for projected background demands for all three Scenarios. Dual left-turn lanes are needed on the north leg to provide adequate storage. This can be accomplished by narrowing lanes and reconstructing the median area. However, the need for this improvement is driven by assumed development in Boca Park and not The Two Fifty Project. Accordingly, this improvement should be a condition of Boca Park development and not The Two Fifty Project.

3) Under Scenarios 1 and 2, lengthening of the existing single-lane pocket from 150 feet to 250 feet is needed on the south leg of the Sir Williams-Boca Park/Rampart Boulevard intersection to accommodate U-turn demands destined to Two Fifty Drive. However, the need for this improvement is eliminated with proposed median modifications to provide direct left-in access from Rampart Boulevard to Two Fifty Drive.

Table 4. Signal Controlled Left-Turn Queuing Analyses

Node	Intersection	Approach	Peak Hour	Cycle Length	Volume (vph)			Design Queue (ft)[1]			Existing Storage (ft)			Proposed Storage (ft)		
					Exist.	Bkgd	Bkgd + Site	Exist.	Bkgd	Bkgd + Site	Lane 1	Lane 2	Total	Lane 1	Lane 2	Total
1	Alta Dr/ Hualapai Way	NB	PM	140	127	127	127	215	215	215	400	na	400	SAME		
		SB	PM	140	82	126	170	153	214	271	400	na	400	SAME		
		EB	AM	140	29	29	29	72	72	72	225	na	225	SAME		
		WB	PM	140	209	238	242	320	357	362	350[2]	na	350	SAME		
5	Charleston Blvd/ Hualapai Way	NB	PM	140	335	335	335	474	474	474	300	300	600	SAME		
		SB	PM	140	256	256	258	379	379	381	325	375	700	SAME		
		EB	AM	140	76	76	87	145	145	160	350	na	350	SAME		
		WB	PM	140	168	190	204	269	297	314	425	na	425	SAME		
4	WB Sum Pkwy/ Rampart Blvd	SB	AM	140	158	158	158	256	256	256	325	na	325	SAME		
		WB	PM	140	799	910	1058	1006	1129	**1293**	375	375[2,3]	750	SAME		
8	EB Sum Pkwy/ Rampart Blvd	SB	AM	140	240	240	240	359	359	359	275	375	650	SAME		
		EB	AM	140	236	236	236	354	na	354	225	275[2]	550	SAME		
2	Alta Dr/ Rampart Blvd	NB	PM	140	249	310	321	370	444	457	200	325	525	**200**	**275**	**475**
		SB	PM	140	195	244	244	303	364	364	200	250	450	SAME		
		EB - Sc.1	PM	140	223	257	373	338	380	519	450	450	900	SAME		
		EB - Sc.2&3	PM	140	223	257	323	338	380	460	450	450	900	SAME		
		WB	PM	140	236	281	366	354	409	511	275	300	575	SAME		
3	Rampart Blvd/ Access #3/	NB	PM	140	10	10	99	35	35	177	150	na	150	**200**		**200**
		SB-Sc.2&3[5]	PM	140	157	242	242	254	362	362	150	na	150	**200**	**225**	**425**
		EB - Sc.2&3	AM	140	na	na	251	na	na	373	na			**200**	**200**	**400**
		WB - Sc.2&3	PM	140	na	90	97	na	na	174	175		175	SAME - Private		
7	Sir Williams - Boca Park/ Rampart Blvd	NB - Sc.1&2	PM	140	31	31	143	75	75	236	150	na	150	**250**		**250**
		NB - Sc.3	PM	140	31	31	11	75	75	38	150	na	150	SAME		
		SB - Sc.1	PM	140	96	169	248	173	270	369	225	na	225	**175**	**225**	**400**
		SB - Sc.2&3	PM	140	96	169	183	173	270	288	225	na	225	**175**	**225**	**400**
		EB	PM	140	51	51	51	108	108	**108**	50	na	50	SAME - Private		
		WB - Sc.1	PM	140	82	185	193	153	290	**300**	200	na	200	SAME - Private		
		WB - Sc.2&3	PM	140	82	95	103	153	171	182	200	na	200	SAME - Private		
6	Charleston/ Rampart Blvd	NB	PM	140	233	233	235	350	350	353	175	275	450	SAME		
		SB	PM	140	244	256	302	364	379	435	200	300	500	SAME		
		EB	PM	140	446	498	567	605	665	744	300	450	750	SAME		
		WB	PM	140	363	379	379	508	526	526	250	275	525	SAME		
Node	Intersection	Approach	Peak Hour	Cycle Length	Volume (vph)			Design Queue (ft)[1]			Existing Storage (ft)			Proposed Storage (ft)		
					Exist.	Bkgd	Bkgd + Site	Exist.	Bkgd	Bkgd + Site	Lane 1	Lane 2	Total	Lane 1	Lane 2	Total

[1]95[th] % Queue = [(vehicle/interval)+Z(vehicle/interval)^0.5]*25 ft/veh

where,
(vehicle/interval) = VPH/3600 sec/hr x 140 sec queuing interval,
Z = 1.645 for 95% confidence level (one-tailed test),
25 feet = assumed vehicle length.

[2]Queue may extend into drop lane or TWLTL

[3]WB 250' triple LT lanes to be constructed at WB Sum Pkwy/Rampart

[4]For future demands

[5]See Table 5 for Scenario 1

Note: For dual left-turn lanes, Lane 1 is left-most turn lane and lane 2 is right-most turn lane.

Table 5. Unsignalized Left-Turn Queuing Analyses

Node	Intersection	Approach	Peak Hour	Volume			Deisgn Queue [1]			Existing Storage (ft)	Proposed Storage (ft)
				Existing (vph)	Background (vph)	Background + Site (vph)	Existing (ft)	Background (ft)	Background + Site (ft)		
3	Rampart Blvd/ Access #3	NB - Sc.1	PM	10	10	99	8	8	83	150	Same
		SB - Sc.1	PM	157	242	246	131	202	205	150	**225**
10	Rampart Blvd/ Two Fifty Dr	NB - Sc.3	PM	na	na	176	na	na	147	0	**200**
11	Rampart Blvd/ 2nd Boca Dwy N. of Charleston	SB - Sc.1&2	PM	112	131	152	93	109	127	150	**na**
12	Rampart Blvd/ 1nd Boca Dwy N. of Charleston	SB - Sc.3	PM	0	0	124	0	0	103	150	**200**

[1] Design Queue = (vehicle/interval)*25 ft/veh

where,
(vehicle/interval) = VPH/3600 sec/hr x 120 sec queuing interval,
25 feet = assumed vehicle length.

5.4 2006 Rampart Boulevard Traffic Operations Study

In 2006 the City of Las Vegas commissioned a Study that evaluated the capacity of the Rampart Boulevard corridor. The study concluded that widening of Rampart Boulevard from a 6-lane to an 8-lane facility was needed to provide a satisfactory automobile LOS under future year demands. However, that study was based on traffic demand characteristics of the day that have changed significantly due to the development of Downtown Summerlin and other properties and transportation infrastructure. Also, the layered development scenarios on which the study was based are no longer valid. More specifically, the study was based on 2006 traffic counts and the addition of independent trip estimates for the developments listed below. It should be noted that the trip estimates did not account for trip interactions (diverted-link and trip-chaining), and likely overestimated and double counted trips.

1) One Queensridge Place (luxury high-rise residential)
2) Village at Queensridge (Tivoli)
3) Boca Park development
4) Summerlin Centre Mall (Downtown Summerlin)
5) Suncoast Hotel and casino Expansion
6) Two percent per annum baseline traffic growth

All of the development assumptions listed above have occurred or been accounted for in an updated fashion in this study, with the exception of the Suncoast Hotel and Casino expansion. The current status of a potential Suncoast expansion is not known, but the previously planned expansion was to include 57 ksf of casino floor area and other amenities, which was estimated to generate 229 AM peak hour trips (131 in and 98 out) and 500 PM peak hour trips (260 in and

240 out). This trip generation represents approximately 14 percent of the additional background and project traffic that has been assumed in this study in the critical PM peak hour.

The potential development impact of a Suncoast expansion does not warrant the widening of Rampart Boulevard to an 8-lane facility, given the surplus capacity projected in the Rampart Boulevard corridor, and the substantial surplus capacity in the parallel Hualapai Way corridor. Additionally, widening to an 8-lane facility is *not* recommended for the following reasons:

1) Widening to an 8-lane facility would cause significant adverse impacts to the pedestrian, bicycle and transit modes, and runs counter to the "complete streets" approach to providing multimodal transportation solutions.

2) Rampart Boulevard is a built corridor and it would be extremely costly and impactful to widen to an 8-lane facility. The Project has limited frontage on Rampart Boulevard, and cannot provide the large majority of the right-of-way that would be needed.

3) An 8-lane widening of Rampart Boulevard has not been identified as a regional need, and is not reflected in the RTC's Regional Transportation Plan or the City's Planned Streets and Highways map.

5.5 REVIEW OF CRASH DATA

Crash data has been provided by the Nevada Department of Transportation (NDOT) for the three-year period from August 1, 2012 to August 1, 2015 (see Section One of Appendix), and is summarized in **Table 6**. The project is not expected to increase crash rates as long as improvements are constructed to appropriate standards.

Notable crash characteristics and recommendations are listed below. The left-turn phasing changes recommended for consideration at the Hualapai Way/Alta Drive and Hualapai Way/ Charleston Boulevard intersections are associated with existing conditions. Accordingly, these changes should not be a condition of Two Fifty development.

1) Out of 24 crashes At the Hualapai Way/Alta Drive intersection, 15 were categorized as Angle, and 6 were categorized as Rear-end.

2) At the Hualapai Way/Alta Drive intersection 12 of the 15 Angle crashes involved left-turn movements, with 11 of the 12 on the NB and SB approaches, including the one fatal. *It is recommended that conversion from protected-permitted (existing 5-section displays) to protected-only left-turn phasing be considered for the NB and SB approaches. Conversion to flashing yellow arrow (FYA) would accommodate protected-only operation on a time-of-day (TOD) basis.*

3) Out of 50 crashes at the Hualapai Way/Charleston Boulevard intersection, 26 were categorized as Angle, and 22 were categorized as Rear-end. Only 6 of the crashes (12%)

occurred in the most recent year of the 3-year period (38% in first year and 50% in second year).

4) At the Hualapai Way/ Charleston Boulevard intersection 15 of the 26 Angle crashes involved left-turn movements, with 11 of the 15 on the WB approach. *It is recommended that conversion from protected-permitted (existing FYA) to protected-only left-turn phasing be considered for the WB approach.* The FYA display can accommodate protected-only operation on TOD basis.

5) Out of 82 crashes at the Rampart Boulevard/WB Summerlin Parkway Ramp intersection, 33 were categorized as Rear-End, 25 were categorized as Non-collision, 16 were categorized as Angle, and 8 were categorized as Side-swipe. The direction of the crash was not given for 36 of the crashes, making it difficult to draw conclusions.

6) Out of 166 crashes at the Rampart Boulevard/EB Summerlin Parkway Ramp intersection, 91 were categorized as Rear-End, 42 were categorized as Non-collision, and 26 were categorized as Angle. The direction of the crash was not given for 44 of the Rear-Ends (48%) and for 27 of the Non-Collisions (64%), making it difficult to draw conclusions.

7) Out of 51 crashes at the Rampart Boulevard/Alta Drive intersection, 23 were categorized as Rear-End, and 18 were categorized as Angle. Fourteen (14) Read-end crashes were on the NB approach (out of 21 directions reported).

8) Out of 44 crashes at the Rampart Boulevard/Alta Drive intersection, 24 were categorized as Rear-End, and 16 were categorized as Angle. Crash frequency has declined over the three-year period, with 28 (63%) of the crashes in the first year, 10 (23%) in the second year, and 6 (14%) in the third year.

Table 6. Summary of Crash Data

Intersection	Accidents			
	PDO[1]	Injury	Fatal	Total
Hualapai /Alta	5	18	1	24
Hualapai /Charleston	24	26	0	50
Rampart/ Sum Pkwy WB Ramps	61	21	0	82
Rampart/ Sum Pkwy EB Ramps	114	50	2	166
Rampart/Alta	18	33	0	51
Rampart/Sir Williams-Boca	3	3	0	6
Rampart/Charleston	20	24	0	44

[1] Property Damage Only (PDO)

5.6 RAMPART BOULEVARD SIGNAL PROGRESSION ANALYSES

The impacts of the project on Rampart Boulevard signal progression has been evaluated using Synchro software. Existing conditions and three future scenarios have been analyzed, as described below:

Scenario 1. No additional signals and no raised median modifications on Rampart Boulevard. This scenario requires that outbound left-turn demands from the Project at Access #3 turn right and execute a U-turn on the north leg of the Sir Williams Court-Boca Park intersection. It also requires that inbound left-turn demands to the Project from the south execute a U-turn on the south leg of the Sir Williams Court-Boca Park intersection to reach Two Fifty Drive.

Scenario 2. Signal control that provides a direct E-to-N left-turn from the site to Rampart Boulevard at the Access #3 intersection.

Scenario 3. Scenario 2 signal control plus raised median modifications that facilitate a signal-controlled N-to-W left-turn at the Two Fifty Drive intersection.

Synchro time-space diagrams reflecting existing AM peak and PM peak signal coordination on Rampart Boulevard from Charleston Boulevard to the Suncoast-Moda Corso intersection are presented in Section Four of the Appendix. The diagrams reflect both "arterial bands" and "link bands" based on the 45 mph speed limit. As explained in the Synchro 7 User's Guide, arterial bands are green bands that "theoretically" carry a vehicle along the entire corridor without stopping, while link bands are green bands between two adjacent intersections.

Synchro time-space diagrams for Scenario 1 AM peak and Scenario 1 PM peak signal coordination on Rampart Boulevard are presented in Section Four of the Appendix. Scenario 1 represents a significant increase in traffic demands in the corridor. Therefore intersection signal splits, lead/lag phasing and coordination offsets have been optimized to maximize band widths. Future pedestrian crossings of Rampart Boulevard are expected to be frequent under future conditions. Pedestrian phase recall has therefore been assumed at the Sir Williams-Boca Park intersection. In the busier PM peak hour, the Scenario 1 time-space diagram indicate that 27-second progressive bandwidths can be achieved in the northbound and southbound directions. Achievable bandwidths in terms of seconds, percent of cycle, and attainability are summarized in **Table 7**. Attainability is the bandwidth divided by the minimum green split in that direction.

Synchro time-space diagrams for Scenarios 2 and 3 for AM and PM peak signal coordination on Rampart Boulevard are also presented in Section Four of the Appendix. Pedestrian phase recall has been assumed at both the Sir Williams-Boca Park and Access #3 intersections. The time-space diagrams indicate that progressive bandwidths slightly wider than Scenario 1 (1 or 2 seconds) can be achieved, as summarized in Table 7. This is due to the reduction in the east-to-north left-turn at Alta Drive and reduced U-turn demands at Sir Williams-Boca Park, which accommodate a slight increase in green time on Rampart Boulevard at those intersections.

Table 7. Summary of Signal Progression Analyses

Scenario	Cycle Length	Min Split NB / SB	Bandwidths - Seconds / % of Cycle / Attainability		
			Northbound	Southbound	NB & SB Avg
			AM PEAK HOUR		
1	140	47 / 47	28.0 / 20% / 60%	27.0 / 19% / 57%	27.5 / 20% / 59%
2	140	47 / 47	30.0 / 21% / 64%	28.0 / 20% / 60%	29.0 / 21% / 62%
3	140	47 / 47	30.0 / 21% / 64%	28.0 / 20% / 60%	29.0 / 21% / 62%
			PM PEAK HOUR		
1	140	47 / 47	27.0 / 19% / 57%	27.0 / 19% / 57%	27.0 / 19% / 57%
2	140	47 / 47	30.0 / 21% / 64%	28.0 / 20% / 60%	29.0 / 21% / 62%
3	140	47 / 47	30.0 / 21% / 64%	28.0 / 20% / 60%	29.0 / 21% / 62%

GCW
ENGINEERS \ SURVEYORS

840-050

July 7, 2016

Rick Schroder, P.E.
City of Las Vegas
Department of Public Works
333 N. Rancho Drive
Las Vegas, NV 89106

Re: Addendum 1 to Traffic Study for The Two Fifty (SWC of Alta Drive/Rampart Blvd, SDR 62393 and T64341)

Dear Mr. Schroder:

This Addendum addresses City of Las Vegas (CLV) Traffic Engineering Division comments received per June 13, 2016 correspondence. A copy of the correspondence is attached for reference. Comments have been addressed as follows:

Comment: "1. On Figures 17 and 18, Background-Plus-Project AM and PM peak Scenario 1, the westbound left turning volumes for intersection 4 (Westbound Summerlin Parkway and Rampart) were left off.

Response: Please find revised Figures 17 and 18 attached. Westbound *right-turning* volumes have been added (169 vph in the AM peak hour and 250 vph in the PM peak hour).

Comment: "2. On Figure 18, Background-Plus-Project PM peak Scenario 1, the following volumes appear to be in error:

a) Intersection 11 (1st ES DW S-O W/Rampart), westbound rights shown as 1928; should be 1916.
b) Intersection 11 (1st ES DW S-O W/Rampart), northbound throughs shown as 109; should be 119.
c) Intersection 12 (2nd ES DW S-O W/Rampart), westbound rights shown as 150; should be 140."

Response: Please find corrected Figures 10, 11 and 13 for background traffic attached. The change in left-turn and U-turn access was assumed to have a minor impact on the distribution of background right-turn demands. The corrected volumes added to Figure 16 trip assignments yields the Figure 18 volumes.

Comment: "3. Appendix, Section 2, Vacant Boca Park Background Trip Generation: the AM peak trip generation for the restaurant was assumed to be zero. Please justify this assumption, or revise the background trip generation."

Response: One of the vacant restaurants was the Kona Grill, which has since reopened following renovation, and does not serve breakfast. The other restaurant (previously Gordon Biersch) has also reopened as the Mixx Grill & Lounge, and does not serve breakfast.

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Las Vegas, Nevada 89146
O 702.804.2000
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info@gcwengineering.com
gcwengineering.com

Comment: "4. Appendix, Section 2, Multi-Use Development Trip Generation and Internal Capture Summary for future Boca Park: 900 MFDUs and 289.4 ksf retail were used for the worksheet; however the assumption for the remainder of Boca Park is 600 MFDUs and 150 ksf retail. Revise the internal capture calculations accordingly."

Response: Please find corrected spreadsheets attached. These were labeling errors and calculations did not change.

Comment: "5. Please note that, as this study assumes the expiration date of the existing entitlements for the buildout of the remainder of Boca Park, the study cannot be approved prior to the expiration of those entitlements unless the study is revised so that the background traffic assumes the current entitlements for Boca Park."

Response: Noted. However, we understand the entitlements have since lapsed.

Comment: "6. In 2006, the City of Las Vegas engaged a consultant to address future needs for Rampart Boulevard in the vicinity of this project. This study is currently being updated. Results of this update may impact the evaluation of this study."

Response: Noted.

Thank you for your cooperation and attention to this matter. Please let me know if there are any questions of if additional information is needed.

Cordially,

GCW, INC.

John R. Tobin, PE, PTOE
Senior Vice President

JRT

Enclosures

cc: Frank Pankratz, The Two Fifty
Mark Fakler, GCW

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June 13, 2016

John R. Tobin, P.E.
GCW
1555 S. Rainbow Boulevard
Las Vegas, NV 89146

RE: Traffic Study for The Two Fifty, on the southwest corner of Alta Drive and Rampart Boulevard, SDR 62393, T64341

Dear Mr. Tobin:

The Traffic Engineering Division of the City of Las Vegas has reviewed the traffic impact study for a 3,080 unit residential development, to be located on the southwest corner of Alta Drive and Rampart Boulevard. Before the study can be approved, the issues must be addressed:

1. On Figures 17 and 18, Background-Plus-Project AM and PM peak Scenario 1, the westbound left turning volumes for intersection 4 (Westbound Summerlin Parkway and Rampart) were left off.

2. On Figure 18, Background-Plus-Project PM peak Scenario 1, the following volumes appear to be in error:
   a) Intersection 11 (1st ES DW S-O W/Rampart), westbound rights shown as 1928; should be 1916.
   b) Intersection 11 (1st ES DW S-O W/Rampart), northbound throughs shown as 109; should be 119.
   c) Intersection 12 (2nd ES DW S-O W/Rampart), westbound rights shown as 150; should be 140.

3. Appendix, Section 2, Vacant Boca Park Background Trip Generation: the AM peak trip generation for the restaurant was assumed to be zero. Please justify this assumption, or revise the background trip generation.

4. Appendix, Section 2, Multi-Use Development Trip Generation and Internal Capture Summary for future Boca Park: 900 MFDUs and 289.4 ksf retail were used for the worksheet; however the assumption for the remainder of Boca Park is 600 MFDUs and 150 ksf retail. Revise the internal capture calculations accordingly.

5. Please note that, as this study assumes the expiration of the existing entitlements for the buildout of the remainder of Boca Park, the study cannot be approved prior to the expiration of those entitlements unless the study is revised so that the background traffic assumes the current entitlements for Boca Park.

6. In 2006, the City of Las Vegas engaged a consultant to address future needs for Rampart Boulevard in the vicinity of this project. This study is currently being updated. Results of this update may impact the evaluation of this study.

Please contact me at 229-2452 if you have any questions.

Sincerely,

Rick Schroder, P.E.
Transportation Planning

RES

cc: Mike Jansen, P.E.
Joanna Wadsworth, P.E.
Christina Karanikolas, P.E.
Bart Anderson, P.E.
Michael Yates, P.E., NDOT
file

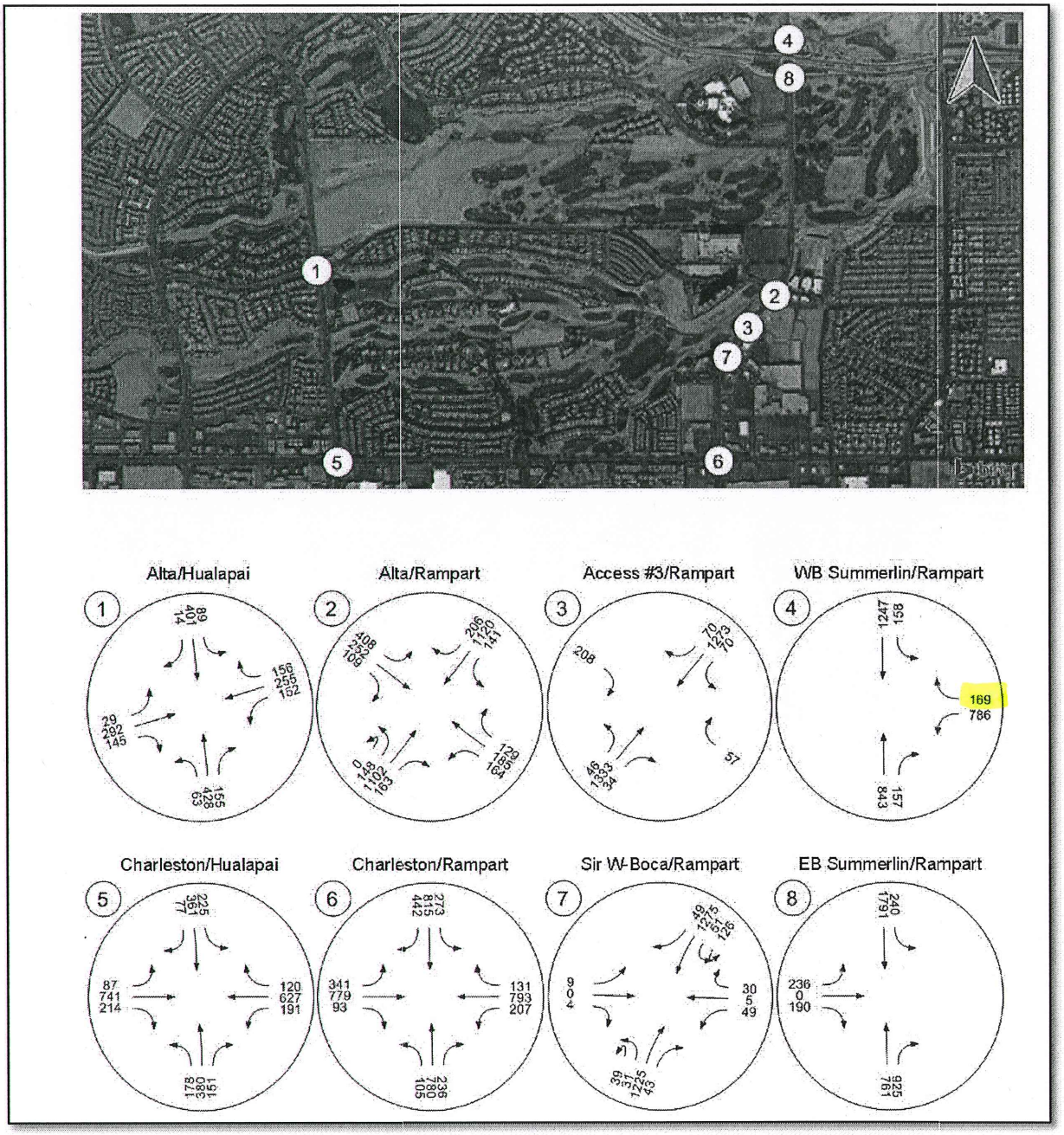


Figure 17. Background-Plus-Project – AM Peak Scenario 1

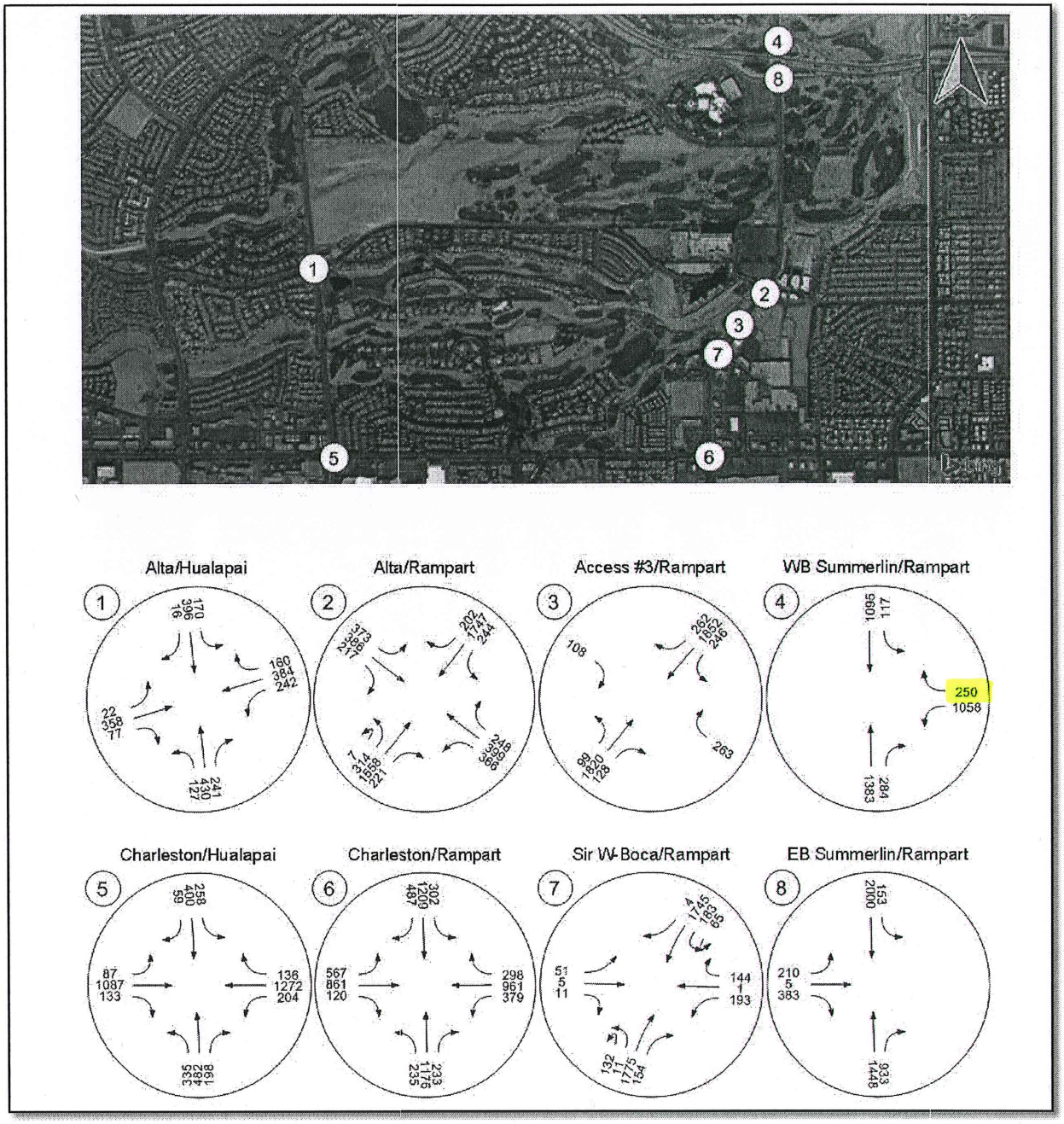


Figure 18. Background-Plus-Project – PM Peak Scenario 1

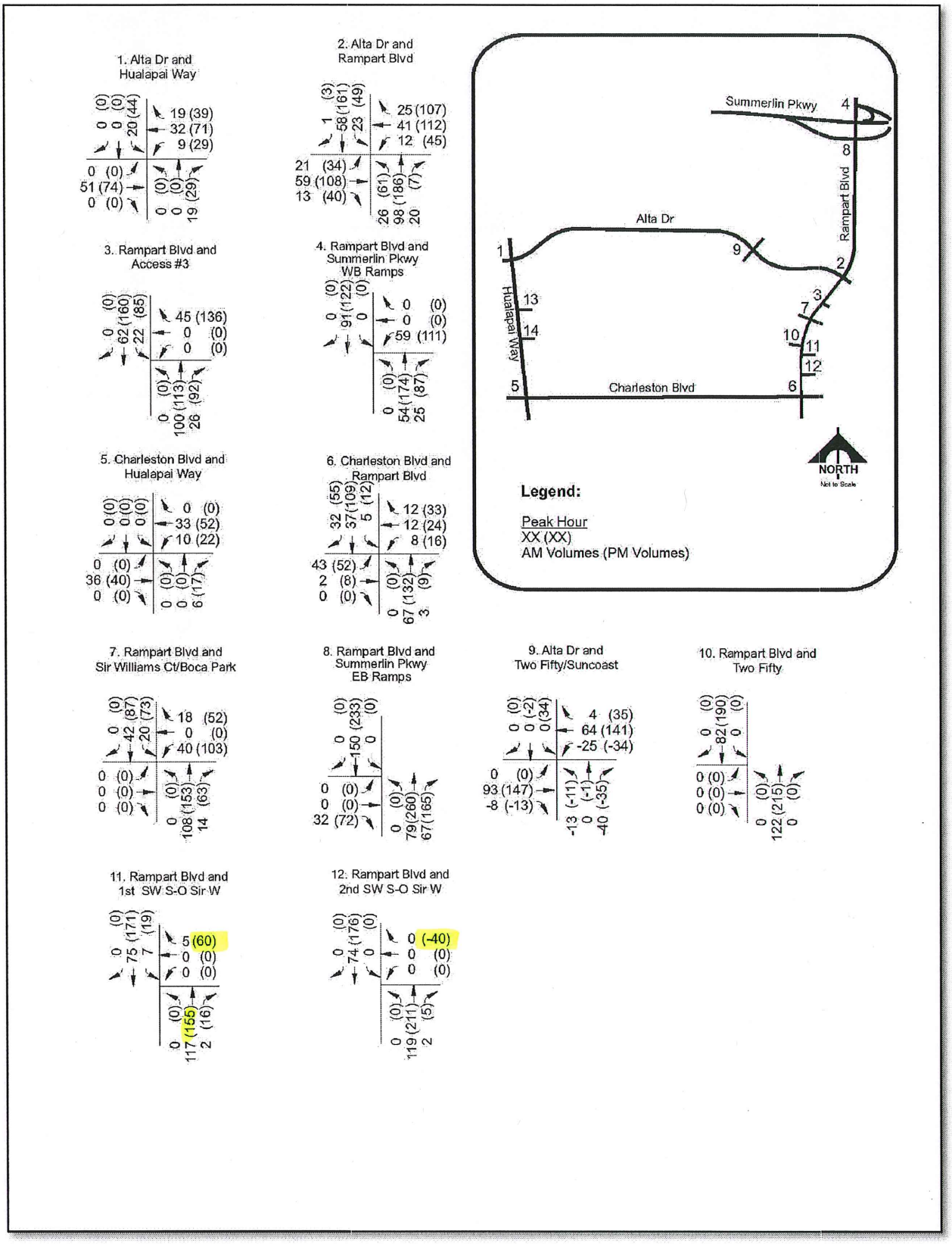


Figure 10. Additional Background Traffic Estimates (Scenario 1)

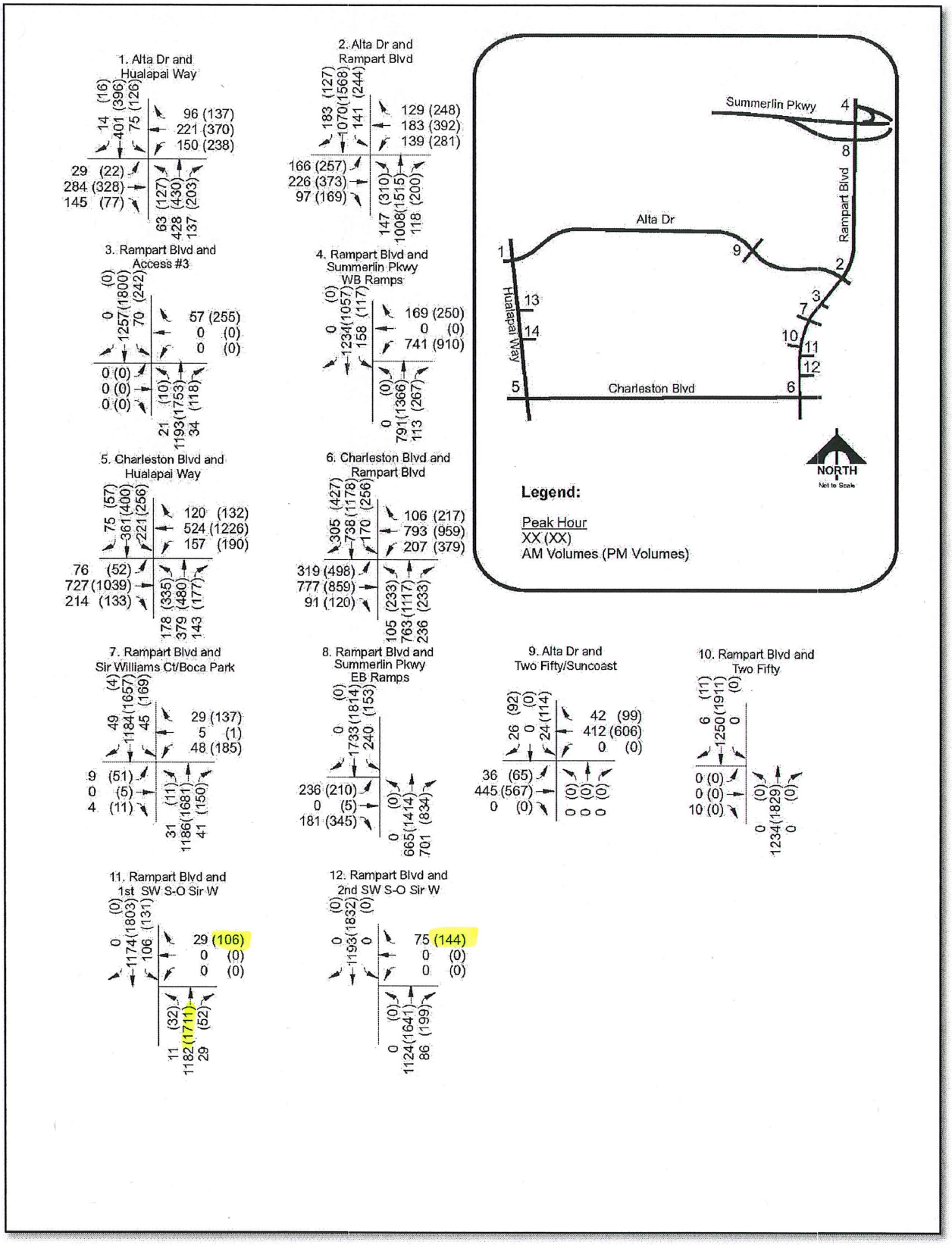


Figure 11. Background Traffic Demand Estimates (Scenario 1)

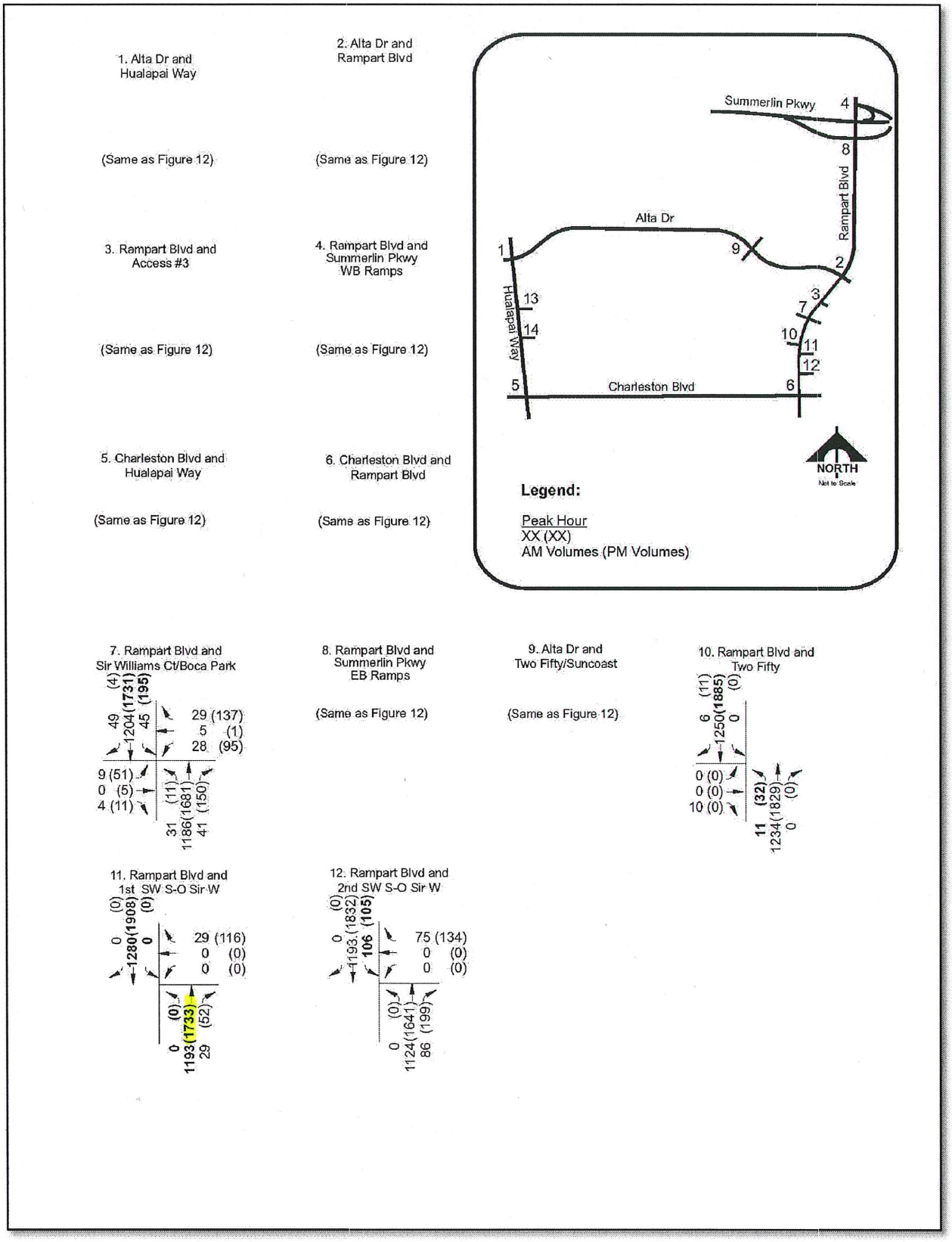


Figure 13. Background Traffic Demand Estimates (Scenario 3)

Analyst: John Tobin
Date: 11/13/2015

Multi-Use Development
Trip Generation
and Internal Capture Summary

Development: Futue Boca Park
Time Period: PM peak

Land Use A: *Retail*

ITE LU Code: 820			
Size: 150 ksf			
	Total	Internal	External
Enter	206	9	197
Exit	214	13	201
Total	420	22	398
%	100%	5%	95%

Land Use B: *Residential*

ITE LU Code: 232			
Size: 600 du's			
	Total	Internal	External
Enter	141	13	129
Exit	87	9	77
Total	228	22	206
%	100%	10%	90%

Land Use C: *Office*

ITE LU Code: 710			
Size: #REF!		#REF!	####
	Total	Internal	External
Enter			0
Exit			0
Total	0	0	0
%	100%	#DIV/0!	#DIV/0!

Land Use D

ITE LU Code:			
Size:		#REF!	####
	Total	Internal	External
Enter		0	0
Exit		0	0
Total	0	0	0
%	100%	#DIV/0!	#DIV/0!

Demand 5% 4.5% 9 | Balance 9 | Demand 18% 16 18%
Demand 6% 6% 13 | Balance 13 | Demand 10% 14 10%
Demand 0 | Balanced 0 | Demand 0
Demand 0 | Balanced 0 | Demand 0
Demand 0 | Balanced 0 | Demand 0
Demand 0 | Balanced 0 | Demand 0
Demand 0 | Balanced 0 | Demand 0
Demand 0 | Balanced 0 | Demand 0
Demand 0 | Balanced 0 | Demand 0
Demand 0 | Balance 0 | Demand 0
Demand 0 | Balance 0 | Demand 0
Demand 0 | Balance 0 | Demand 0

Net External Trips for Multi-Use Development

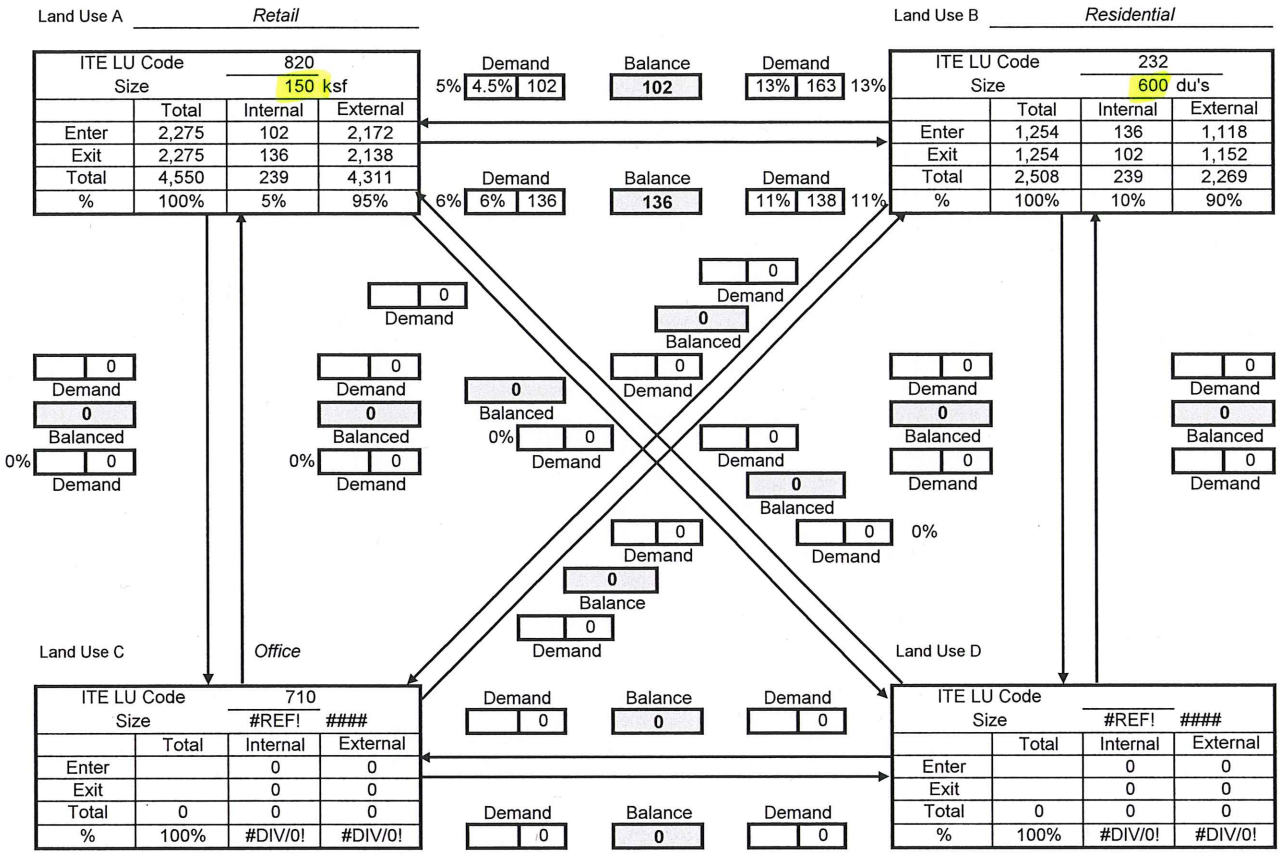
	Land Use A	Land Use B	Land Use C	Land Use D	Total
Enter	197	129	0	0	325
Exit	201	77	0	0	279
Total	398	206	0	0	604
Single Use Trip Gen. Estimate	420	228	0	0	648

Internal Capture: 7%

Analyst: John Tobin
Date: 11/13/2015

Multi-Use Development
Trip Generation
and Internal Capture Summary

Development: Future Boca Park
Time Period: Daily



Net External Trips for Multi-Use Development

	Land Use A	Land Use B	Land Use C	Land Use D	Total	
Enter	2,172	1,118	0	0	3,290	
Exit	2,138	1,152	0	0	3,290	
Total	4,311	2,269	0	0	6,580	Internal Capture
Single Use Trip Gen. Estimate	4,550	2,508	0	0	7,058	7%