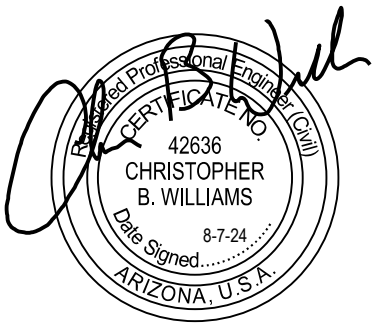
Y2K ENGINEERING



August 7, 2024

Preston Cooling
Curve Development
1661 E. Camelback, Ste. 275
Phoenix, AZ 85016

Phone: (602) 499-5370
Email: prestonc@curvedevelopment.com

Subject: Traffic Impact Statement
Palm Lane Residential Development – Scottsdale, Arizona

Dear Mr. Cooling,

Y2K Engineering, LLC. (Y2K) has been retained to prepare a traffic impact statement (TIS) for the proposed Palm Lane development, located on the northwest corner of Palm Lane and 74th Street in Scottsdale, Arizona. The project proposes 25 new residential units on a 2.53-acre lot and is proposed on developed land with an existing church building and parking lot. Redevelopment will occur throughout two phases, where Phase 1 will consist of redeveloping the R-5 zoned land with an existing retirement home adjacent to the existing church building. Phase 2 will consist of redeveloping the R1-7 zoned land where the existing church and parking lot are located. The site is anticipated to be served by three full-access driveways, two on Palm Lane and one on 74th Street.

As the site is located within the City of Scottsdale, this report has been prepared in accordance with their requirements. The proposed development is anticipated to generate less than 100 peak hour trips and meets the standard for a traffic impact statement.

A vicinity map is shown in **Figure 1**, and the surrounding area is shown in **Figure 2**.

EXISTING CONDITIONS

Palm Lane is an east-west roadway and is assumed to be a residential local roadway. This 40-foot-wide street is unstriped and provides sufficient space for bidirectional traffic and serves single family residences. Curbs, gutters, and sidewalks are present along both sides of Palm Lane. Streetlighting is present on the south side of Palm Lane along the project frontage and to the east and west. Bike lanes are not present but the wide roadway section provides ample room for cyclists. The posted speed limit is 25 miles per hour (mph).

74th Street is a north-south roadway and acts as a collector street in the vicinity of the project. This 35-foot-wide roadway is unstriped and provides sufficient space for bidirectional traffic and serves local roadways providing access to single-family residences. Curbs, gutters, and sidewalks are present along both sides of Palm Lane. Overhead streetlighting is present along the east side of the roadway. Bike lanes are not present but again, the wide nature of the roadway provides room for bicyclists. The posted speed limit on 74th Street is 25 mph.

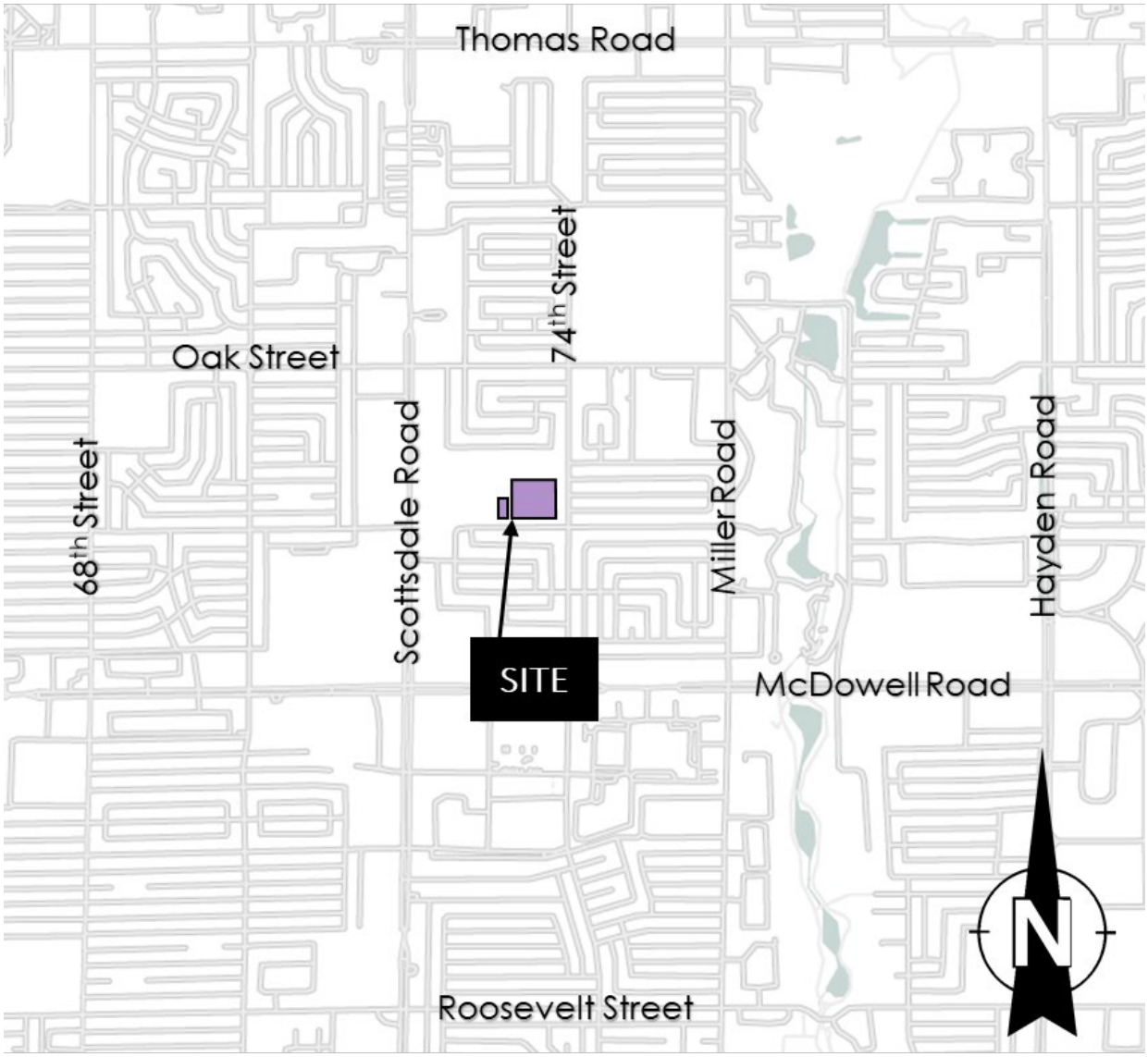


Figure 1: Project Vicinity

The intersection of ***Palm Lane and 74th Street*** is a four-legged unsignalized intersection operating with two-way stop-control on Palm Lane. All the approaches are unstriped, each providing shared left/through/right turn movements. Pedestrian curb cuts are present at each approach, where ADA tactile paving is present on the northwestern corner of the intersection. Crosswalk striping is not present along any of the approaches.

The existing roadway network and traffic control are shown in **Figure 3.**

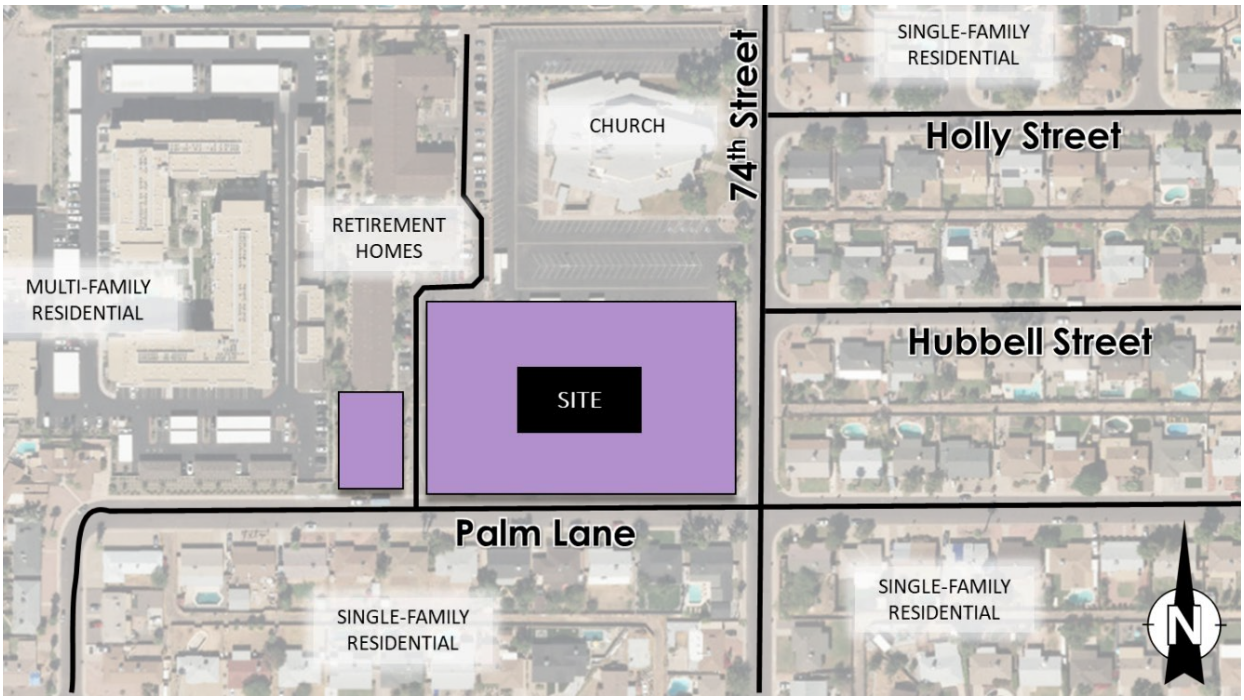


Figure 2: Proposed Site and Surrounding Area

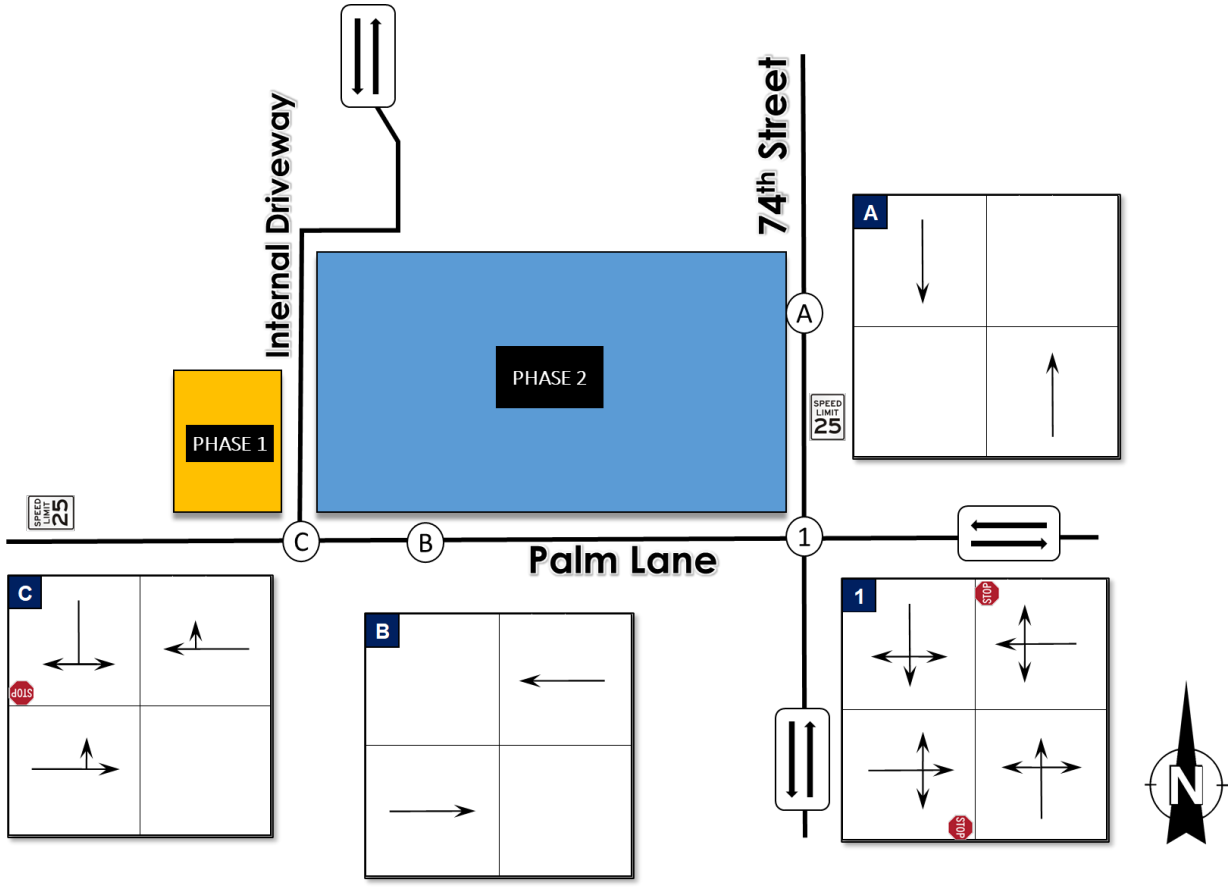


Figure 3: Existing Roadways and Lane Configurations

PROPOSED DEVELOPMENT

SITE LOCATION, LAND USE, AND ACCESS

The proposed residential development will be situated on the northwest corner of Palm Lane and 74th Street and will be developed in two phases. The 2.53-acre parcel is planned to provide 25 residential units, where the R-5 zoned land with 3 total residential units will be Phase 1 and 22 units will be constructed during Phase 2, which will be rezoned from the current R1-7 zoning to R-3 zoning. The project proposes constructing three full-access driveways to serve the site, where Driveway A will be on 74th Street and both Driveway B and Driveway C will be on Palm Lane. Driveway C will serve the 3 single family dwelling units and will not provide access to the 22 single family dwelling units in Phase 2. Driveway C will provide access to the existing retirement homes located north of the Phase 1 development. Driveway B is proposed to be relocated approximately 40 feet west of the existing driveway alignment providing access to the Phase 2 development area. Another existing driveway on Palm Lane located approximately 270 feet east of Driveway C will be removed for the development.

The site plan is shown in **Figure 4** and a detailed site plan is provided in **Attachment A.**

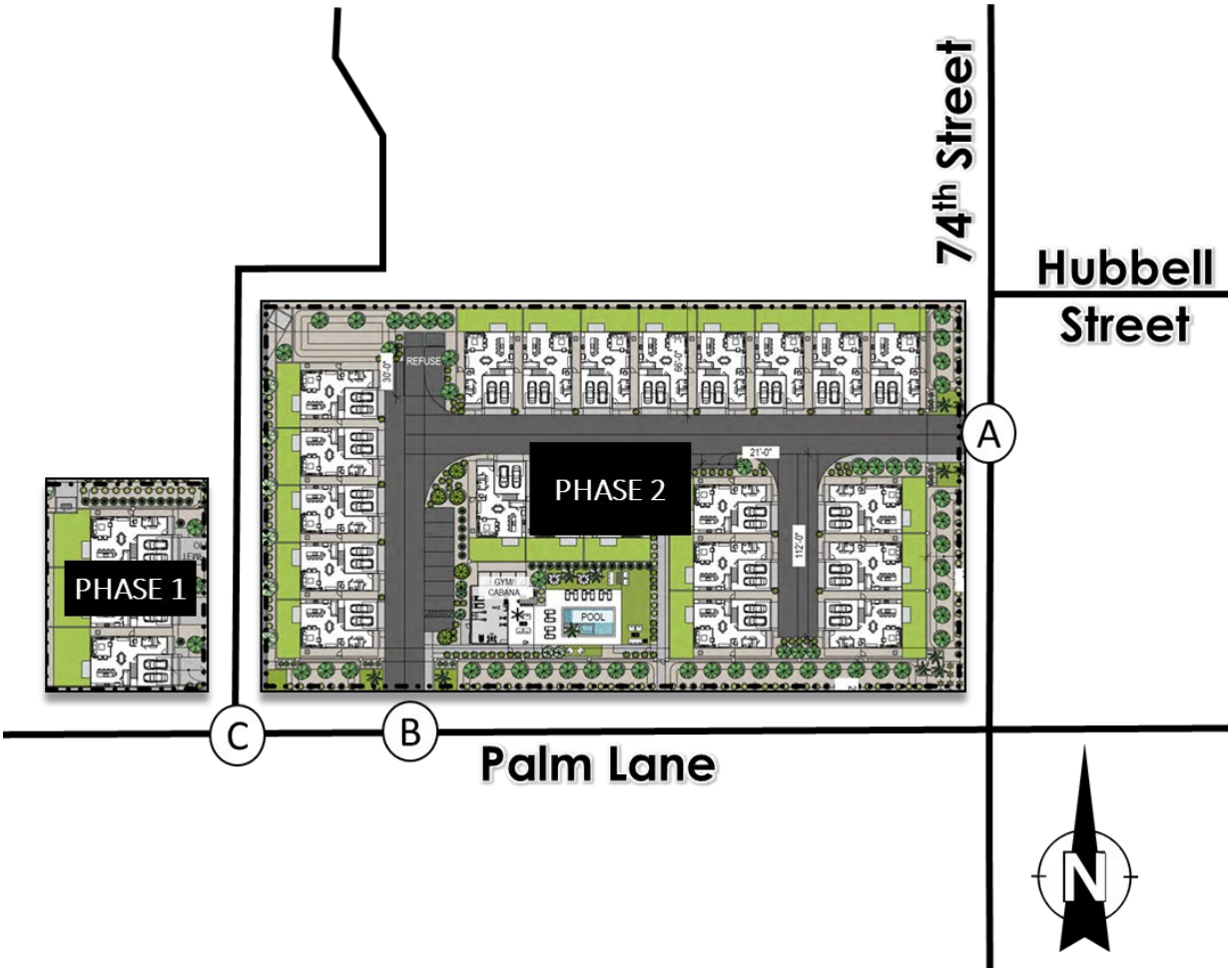


Figure 4: Site Plan

TRIP GENERATION

The trip generation for the proposed site was estimated using the Institute of Transportation Engineers' (ITE) *Trip Generation Manual, 11th Edition*. The manual contains data collected by various transportation professionals for a wide range of different land uses. The data summarized in the manual includes average rates and equations that have been established, correlating the relationship between an independent variable that describes the development size and the generated trips for each categorized land use. The manual provides information for daily and peak hour trips.

ITE Land Use Code 210 (Single-Family Residential) was utilized for analysis. During the preparation of this report, Phase 2 is undergoing a rezoning approval process, however, Phase 2 will be included in addition to Phase 1 to provide the total anticipated trips between the two development phases, assuming rezoning is approved by the City of Scottsdale.

The trip generation for Phase 1 of the development is summarized in Table 1 and the trip generation for Phase 2 of the development is summarized in Table 2. Supporting details for the trip generation are provided in Attachment B.

Table 1: Palm Lane Trip Generation Phase 1

DESCRIPTION OF LAND USE					VEHICLE GENERATED TRIPS						
					Daily	AM Peak Hour			PM Peak Hour		
ID	Land Use	ITE LUC	Size		Total	Enter	Exit	Total	Enter	Exit	Total
1	Single-Family Detached Housing	210	3	DU	28	0	2	2	2	1	3
				Total	**28**	**0**	**2**	**2**	**2**	**1**	**3**

The proposed residential development is anticipated to generate a total of 28 daily trips (entering and exiting), with 2 AM peak hour trips and 3 PM peak hour trips.

Table 2: Palm Lane Trip Generation Phase 1 and Phase 2

DESCRIPTION OF LAND USE					VEHICLE GENERATED TRIPS						
					Daily	AM Peak Hour			PM Peak Hour		
ID	Land Use	ITE LUC	Size		Total	Enter	Exit	Total	Enter	Exit	Total
1	Single-Family Detached Housing	210	3	DU	28	0	2	2	2	1	3
2	Single-Family Detached Housing	210	22	DU	208	4	11	15	13	8	21
				Total	**236**	**4**	**13**	**17**	**15**	**9**	**24**

The proposed residential development is anticipated to generate a total of 236 daily trips (entering and exiting), with 17 AM peak hour trips and 24 PM peak hour trips.

ALTERNATIVE DEVELOPMENT SCENARIO

An alternative scenario was considered for Phase 2 development if the concept plan for the 22 single-family dwelling units is replaced with an alternative land use. The alternative land use for this location would be an elementary school with approximately 500 students. For this analysis, the number of trips generated with an elementary school land use will be compared to the number of trips generated by the single-family detached housing land use.

The trip generation for the alternative development of the elementary school is summarized in Table 3.

Table 3: Palm Lane Trip Generation Elementary School

DESCRIPTION OF LAND USE					VEHICLE GENERATED TRIPS						
					Daily	AM Peak Hour			PM Peak Hour		
ID	Land Use	ITE LUC	Size		Total	Enter	Exit	Total	Enter	Exit	Total
1	Elementary School	520	500	Students	1,135	200	170	370	37	43	80
				Total	**1,135**	**200**	**170**	**370**	**37**	**43**	**80**

An elementary school is anticipated to generate a total of 1,135 daily trips (entering and exiting), with 370 AM peak hour trips and 80 PM peak hour trips. If an elementary school is considered for this location, an increase in entering and exiting trips will be expected. It is also significant to account for typical school operating hours and higher traffic in the morning as compared to ITE PM peak period (4 PM to 6 PM), considering elementary schools release students before 4 PM.

TRIP DISTRIBUTION AND ASSIGNMENT

Trip distribution percentages were assumed based on projected traffic patterns, access, the location of nearby commercial areas, and connections to the nearby major arterial roadways. The distribution percentages are depicted in **Figure 5**.

The site assignment at the project driveways were estimated based on the trip generation and trip distribution percentages. The estimated site traffic assignment is shown in **Figure 6**.

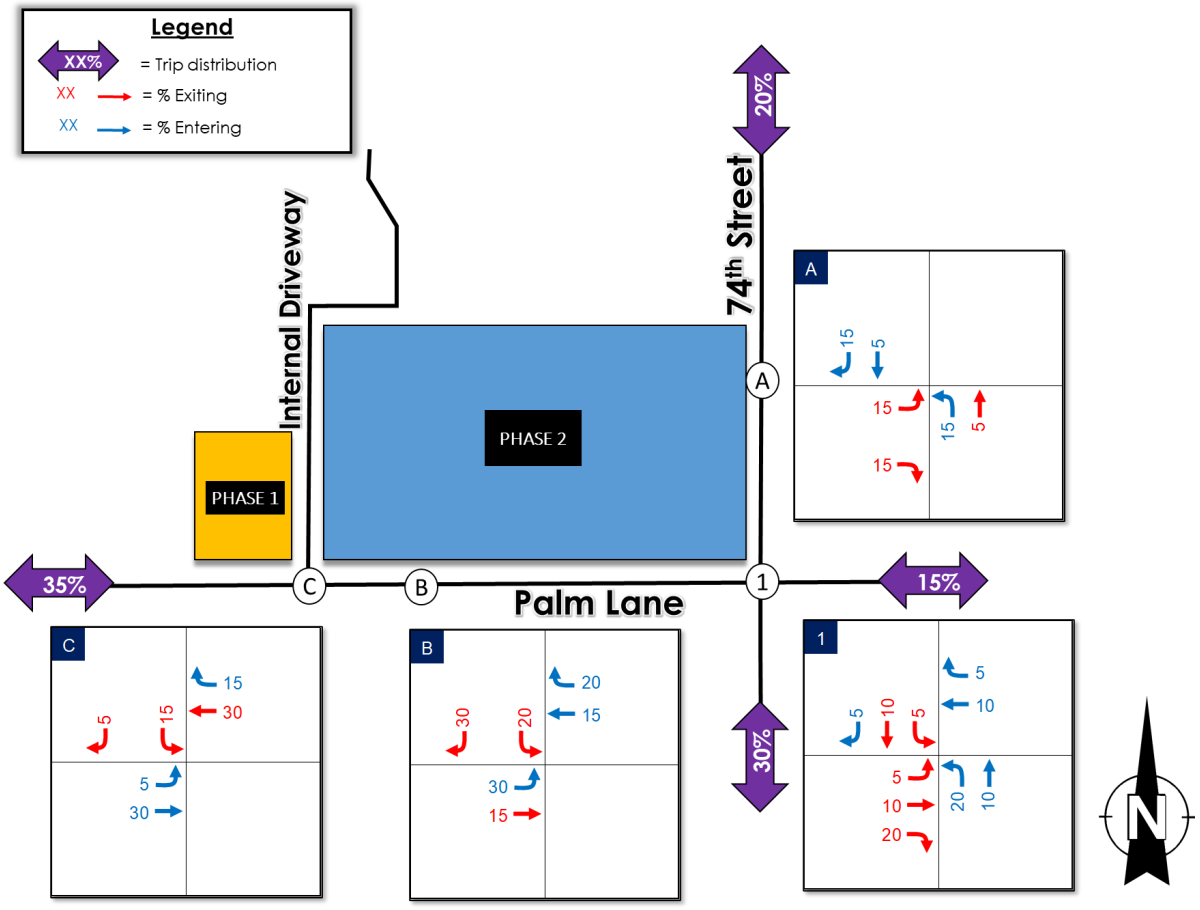


Figure 5: Trip Distribution

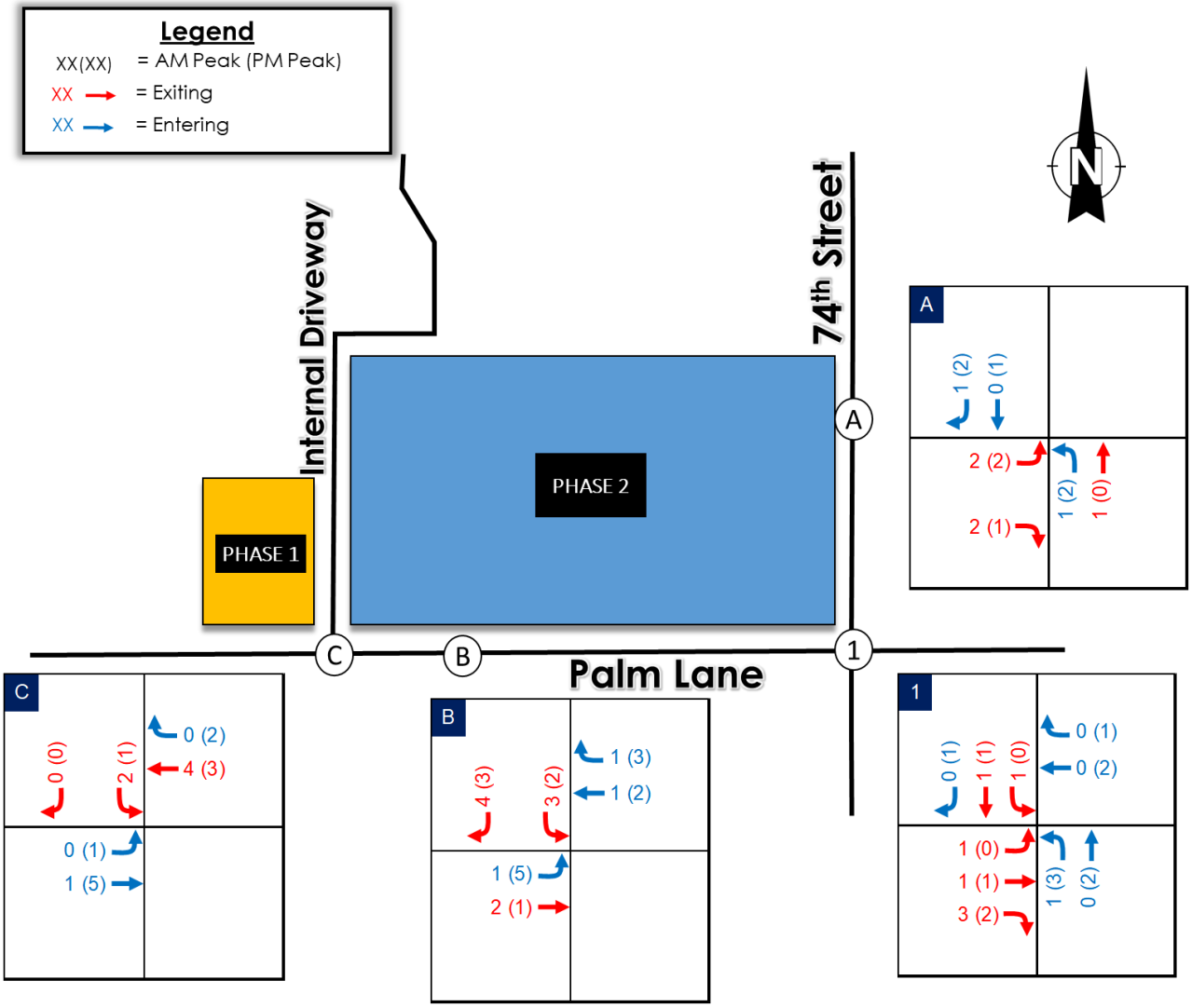


Figure 6: Trip Assignment

DRIVEWAY SPACING REQUIRMENTS

The site was analyzed to review spacing of the three driveways serving the Phase 1 and Phase 2 development areas. The Design Standards and Policies Manual provided by the City of Scottsdale was referenced. Based on these guidelines, the minimum distance between the driveway centerline on local residential/local collector roadways is 50 feet.

The distance between Driveway A and the intersection of Palm Lane and 74th Street is approximately 190 feet. The distance between the intersection of Palm Lane and 74th Street and Driveway B is approximately 365 feet. The distance between Driveway B and Driveway C is approximately 100 feet. Therefore, each driveway meets the spacing requirements according to the City of Scottsdale.

The spacing of the driveways is shown in **Figure 7.**

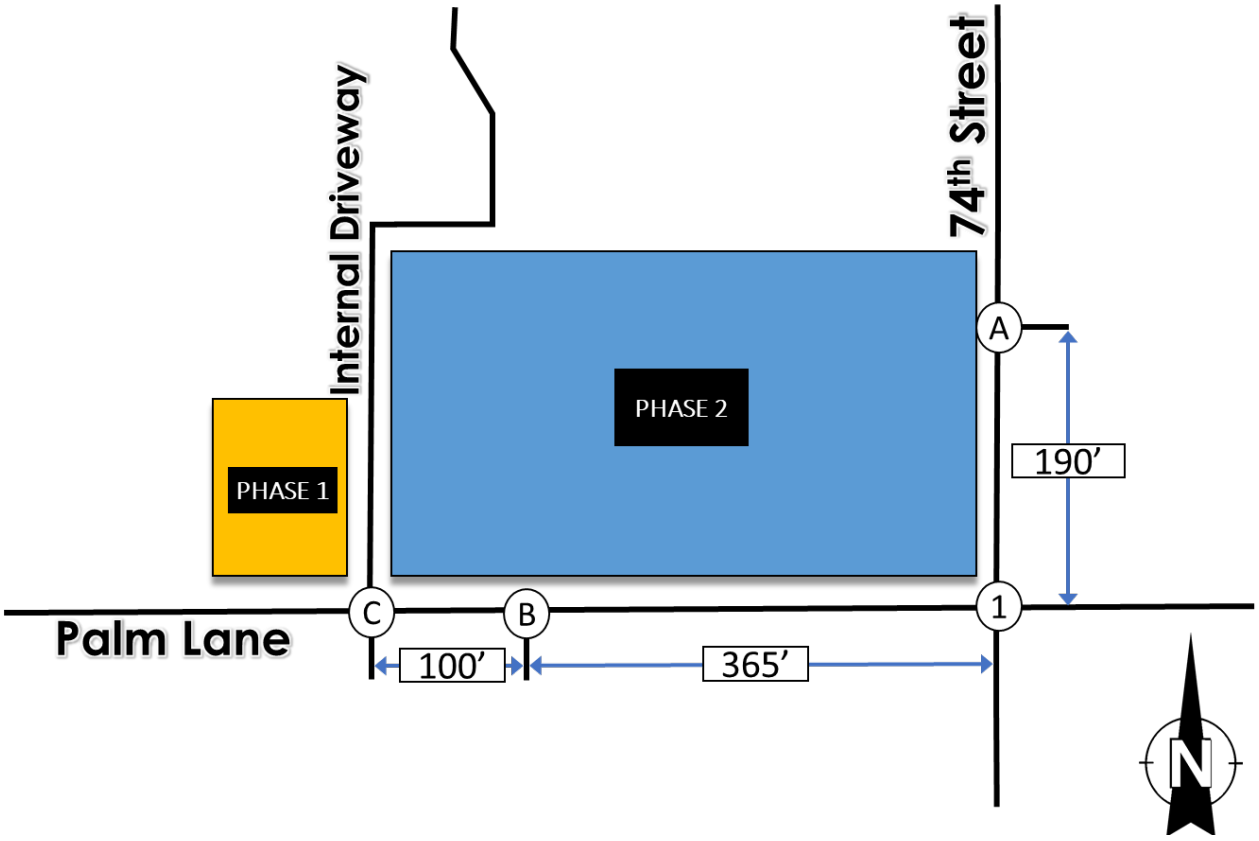


Figure 7: Driveway Spacing

CONCLUSIONS

- The planned residential development will span 2.53 acres and will be developed in two phases, where Phase 1 will consist of 3 single family dwelling units and Phase 2 will consist of 22 single family dwelling units.
- During Phase 1, the residential development is anticipated to create 28 daily trips, with 2 AM and 3 PM peak hour trips based on ITE Trip Generation data.
- During Phase 2, the residential development is anticipated to create 236 daily trips, with 17 AM and 24 PM peak hour trips based on ITE Trip Generation data.
- Based on the low trip generation associated with this site, limited impacts are expected on the adjacent roadway network.
- An alternative land use (elementary school) was considered for this analysis and was compared with the proposed single-family land use. When comparing the two land uses, significantly higher trips are expected especially during the AM peak hour for the elementary school. With 500 students, the school is anticipated to create 1,135 daily trips, with 370 AM and 80 PM peak hour trips based on ITE Generation data. AM trips are expected to be significantly higher than ITE PM peak period trips considering most schools let out well before 4 PM.

- The Phase 1 lot will utilize an existing full-access driveway (Driveway C) on Palm Lane that provides access to an existing retirement home community. This driveway will not provide access to Phase 2 of the development. Phase 2 of the development proposes a full access driveway (Driveway B) on Palm Lane and a full access driveway (Driveway A) on 74th Street.
- Each proposed driveway meets the spacing requirements according to the City of Scottsdale standards.
- Turn lanes were not considered for this analysis due to each roadway in proximity to the proposed development being local/collector roadways.
- A stop sign is recommended to be installed on the southbound approach at Driveway B and Driveway C and on the eastbound approach at Driveway A.

We appreciate the opportunity to prepare this study. Should you have any questions, please feel free to contact me by email at cwilliams@y2keng.com.

Sincerely,

Chris Williams, PE, PTOE
Senior Traffic Engineer

Attachments

ATTACHMENT A:
SITE PLAN

SITE PLAN

PROJECT DATA

Approx. 2.52 ACRES (NET)

AMENITIES
POOL
CABANA CLUBHOUSE
GYM
BACKYARDS

25 UNITS TOTAL

LARGE LOT
22 UNITS
2-STORY UNITS
+ ARIZONA PATIO (300 SF)
3 BED 2.5 BATH (BASE)
2200 SF CONDITIONED
600 SF BACKYARD

SMALL LOT
3 UNITS
2-STORY UNITS
+ ARIZONA PATIO (300 SF)
3 BED 2.5 BATH (BASE)
2200 SF CONDITIONED
850 SF BACKYARD

(2) PARKING SPACES PER UNIT
50 SPACES TOTAL(GARAGE)
+10 GUEST SPACES
+6 DRIVEWAY SPACES
= 66 SPACES TOTAL
2.6 SPACES PER UNIT

SCOTTSDALE, AZ
07 - 15 - 2024

PALM LANE

curve development

ATTACHMENT B:
TRIP GENERATION WORKSHEETS

Single-Family Detached Housing
(210)

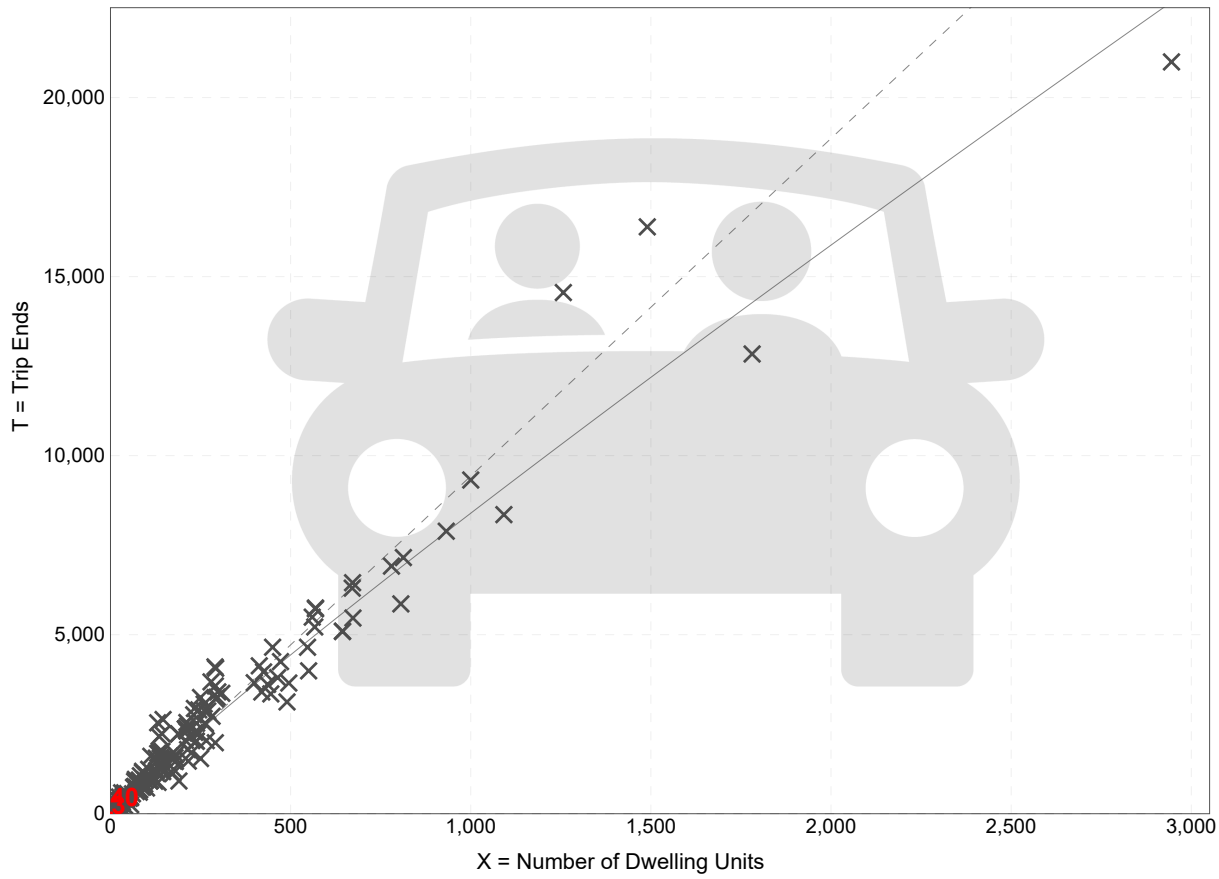
Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday**

Setting/Location: **General Urban/Suburban**
Number of Studies: 174
Avg. Num. of Dwelling Units: 246
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
9.43	4.45 - 22.61	2.13

Data Plot and Equation



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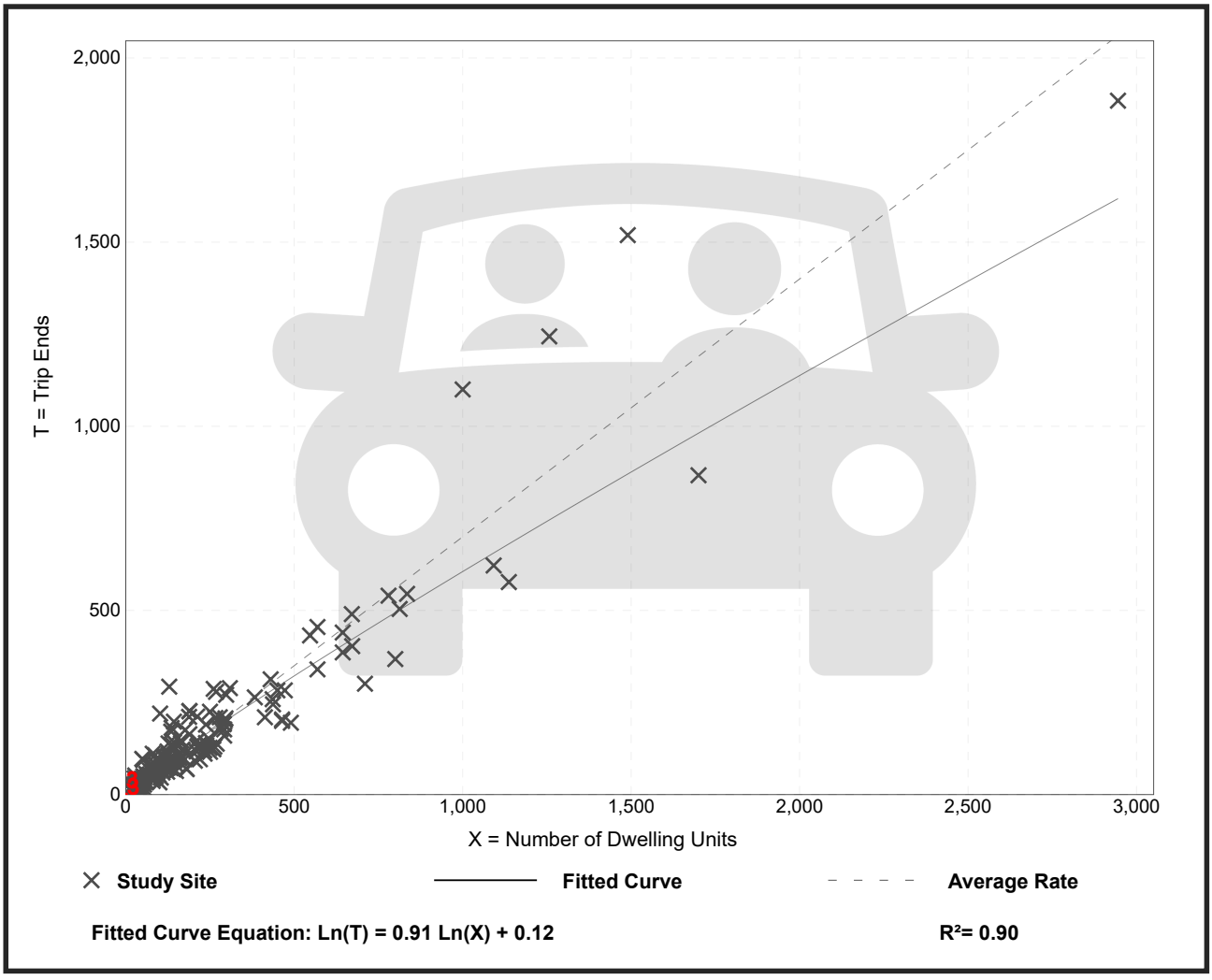
Single-Family Detached Housing
(210)

Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 192
Avg. Num. of Dwelling Units: 226
Directional Distribution: 25% entering, 75% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.70	0.27 - 2.27	0.24

Data Plot and Equation



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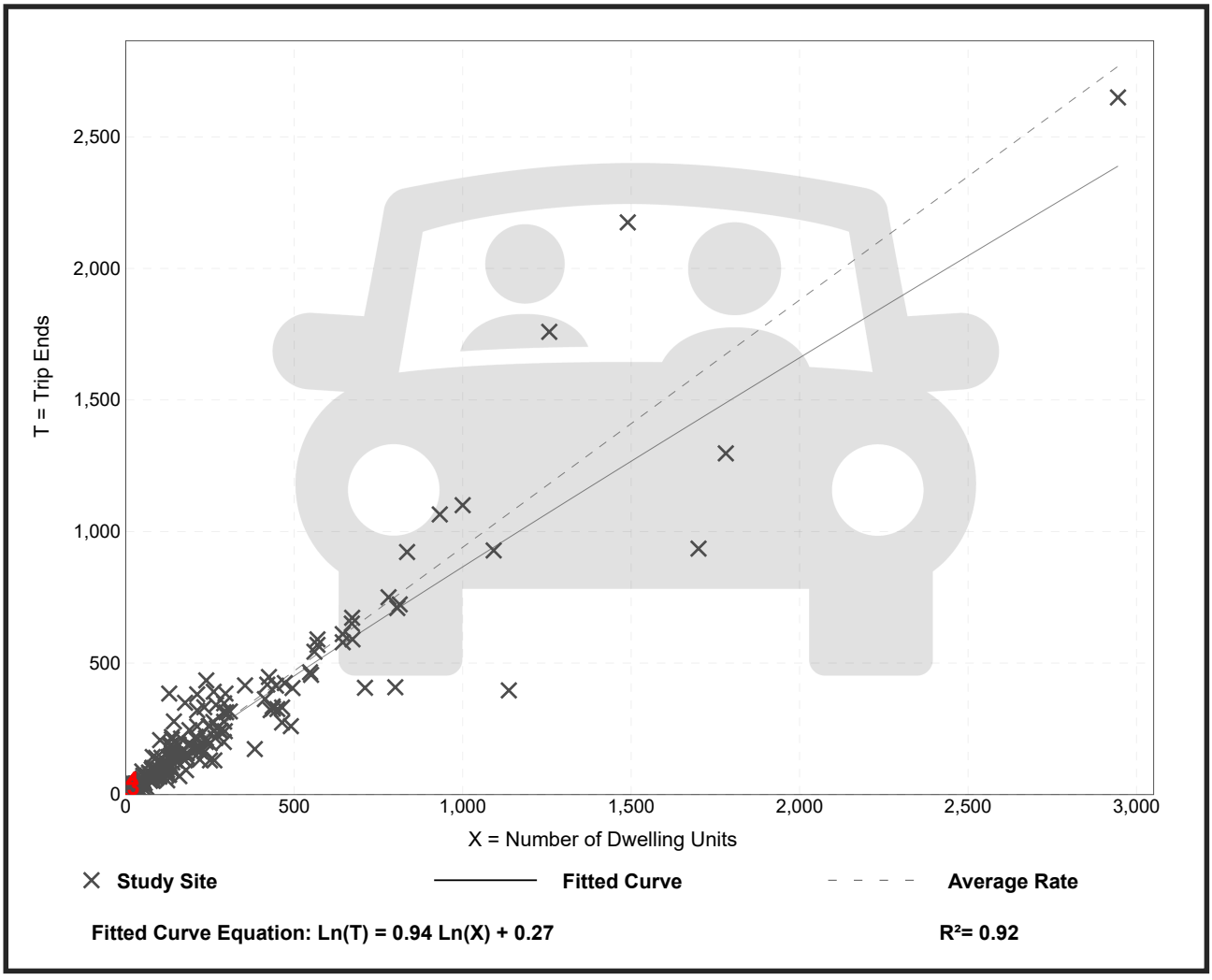
Single-Family Detached Housing
(210)

Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 208
Avg. Num. of Dwelling Units: 248
Directional Distribution: 63% entering, 37% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.94	0.35 - 2.98	0.31

Data Plot and Equation



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Elementary School
(520)

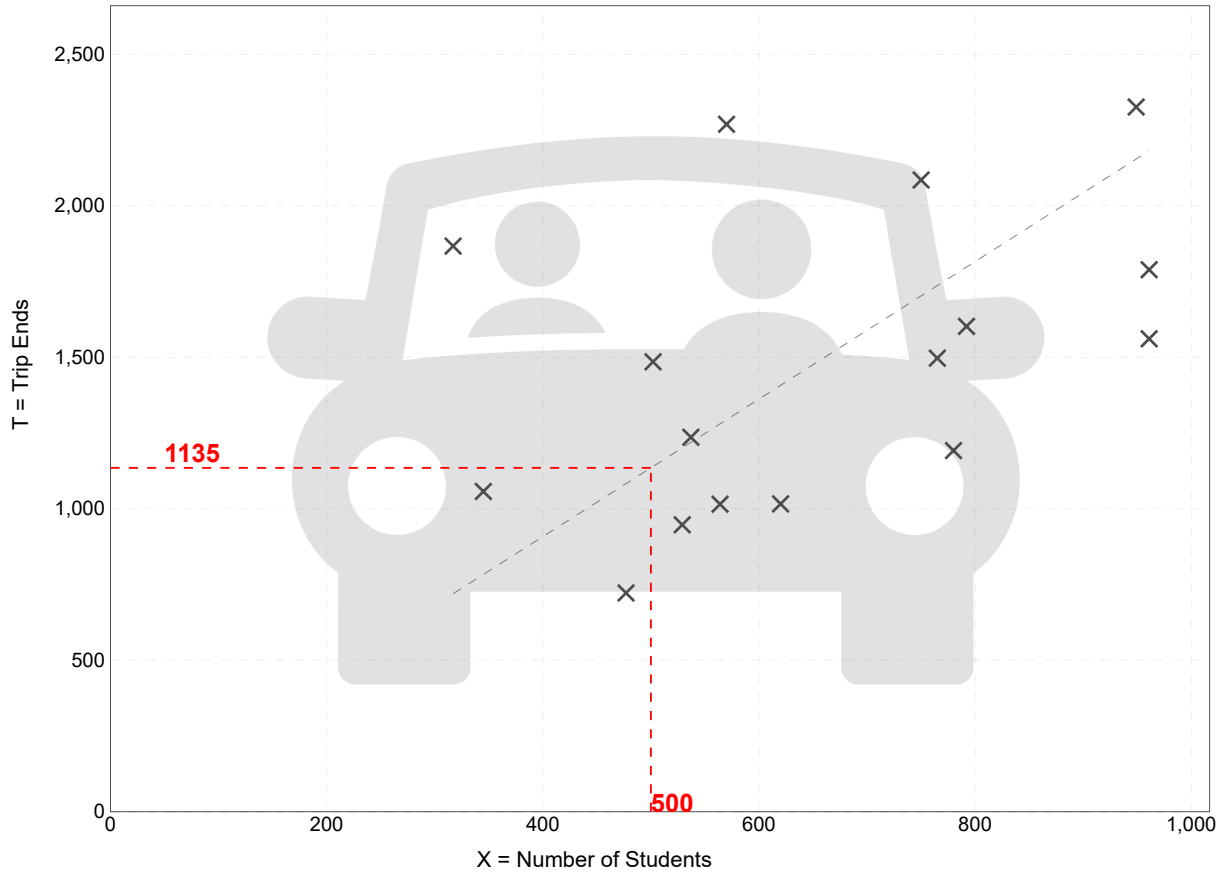
Vehicle Trip Ends vs: **Students**
On a: **Weekday**

Setting/Location: **General Urban/Suburban**
Number of Studies: 16
Avg. Num. of Students: 651
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Student

Average Rate	Range of Rates	Standard Deviation
2.27	1.51 - 5.89	0.93

Data Plot and Equation



Fitted Curve Equation: Not Given

R^2= **

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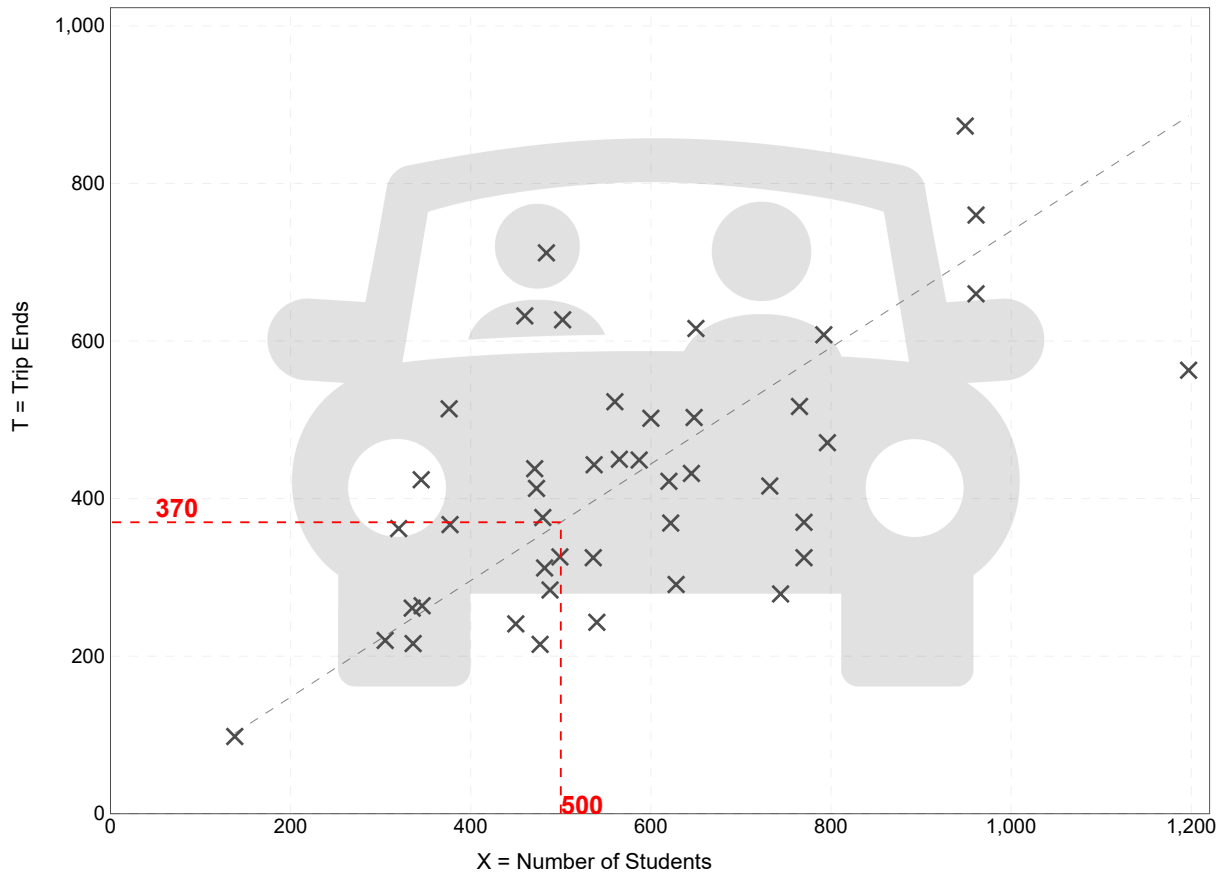
Elementary School
(520)

Vehicle Trip Ends vs: **Students**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 44
Avg. Num. of Students: 575
Directional Distribution: 54% entering, 46% exiting

Vehicle Trip Generation per Student

Average Rate	Range of Rates	Standard Deviation
0.74	0.38 - 1.47	0.25

Data Plot and Equation



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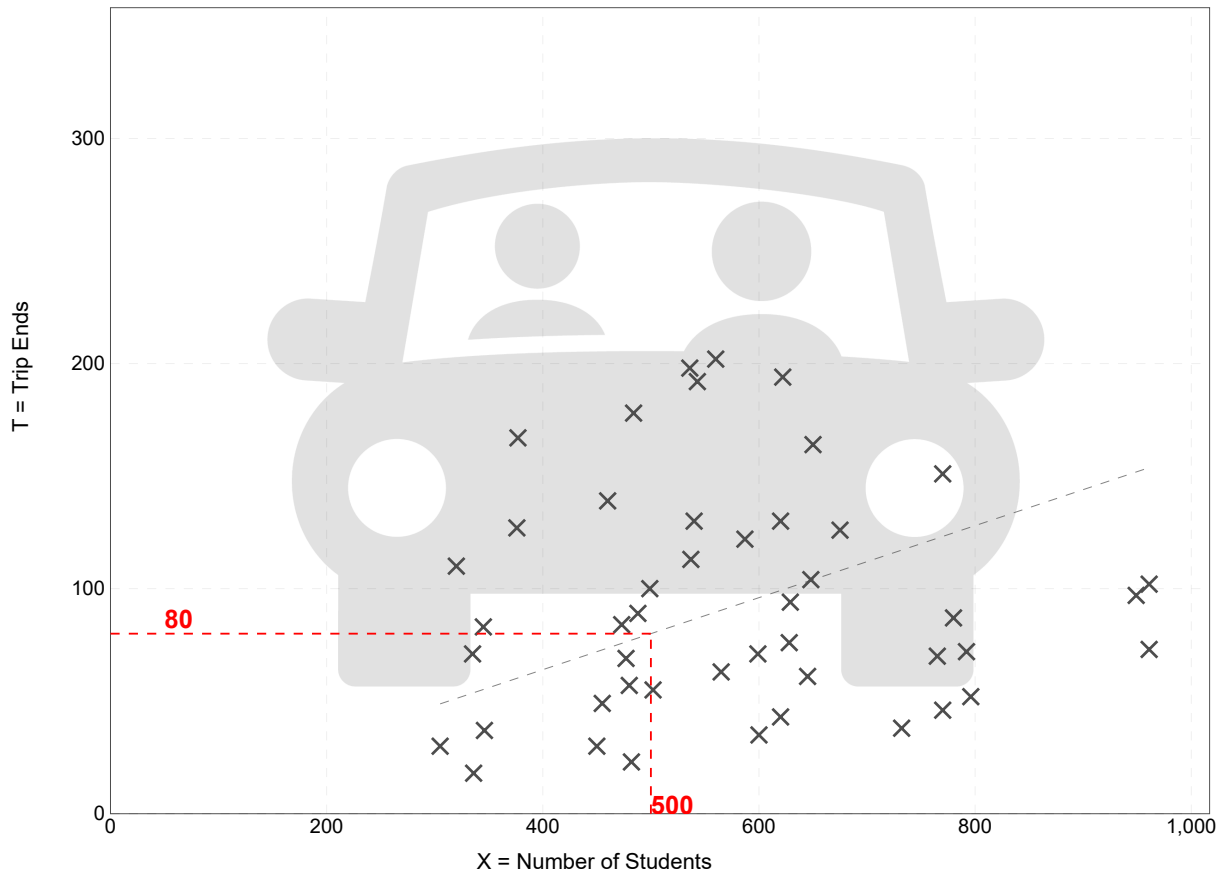
Elementary School
(520)

Vehicle Trip Ends vs: **Students**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 47
Avg. Num. of Students: 576
Directional Distribution: 46% entering, 54% exiting

Vehicle Trip Generation per Student

Average Rate	Range of Rates	Standard Deviation
0.16	0.05 - 0.44	0.10

Data Plot and Equation



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