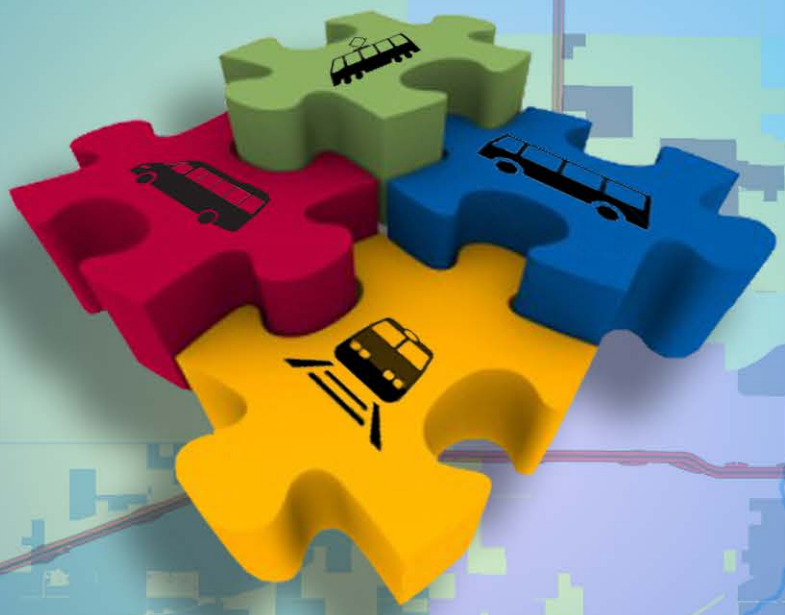
Southwest Valley Local Transit System Study

WORKING PAPER 4A: LOCAL TRANSIT SERVICE NEEDS ASSESSMENT



Avondale | Buckeye | Goodyear | Litchfield Park
Tolleson | West Phoenix | Maricopa County

Submitted to:

MARICOPA ASSOCIATION of GOVERNMENTS

AUGUST 2012

Submitted by:

URS

WORKING PAPER 4A:
LOCAL TRANSIT SERVICE NEEDS ASSESSMENT

SOUTHWEST VALLEY LOCAL TRANSIT SYSTEM STUDY

Prepared for

MARICOPA ASSOCIATION of GOVERNMENTS

Prepared by

FEHR & PEERS

With

URS

August 2012

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1.0 INTRODUCTION

Working Paper #4 is divided into two separate project deliverables. The first and current report (4A) summarizes the transit needs assessment for the study. The second companion report (Working Paper 4B) focuses on the development of alternatives that address the identified transit needs as presented herein.

As an important initial step in the overall plan development process, the transit needs assessment, as conducted for the Southwest Valley Local Transit System Study, included the following key steps, each of which is documented in the sections which follow:

1. Review of existing socio-economic variables, including income, vehicle ownership, and age factors, typically considered as indicators of transit dependency.

2. Assessment of existing and forecast development patterns, including land use density, development scale, and associated trip generation intensity.

3. Review of existing and forecast travel patterns both internal and external to the Southwest Valley study area.

The associated analyses provided the basis for an initial working definition of a long-range transit service area for the Southwest Valley. It is anticipated that the assessments as documented herein, along with the service needs identified through both the online survey and via the participants of the Southwest Valley Transportation Summit, will assist in the definition and evaluation of a range of transit service alternatives to address identified needs.

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2.0 SOCIO-ECONOMIC INDICATORS

Socio-economic indicators refer in general the demographic attributes of the study area population as depicted in Census data (2010) and specifically to income level, age groups, and vehicle ownership. The lower the income level and vehicle ownership, the greater the likelihood of transit dependency and utilization. Age groups which are not able to drive (youth and elderly) generally create a greater demand for transit services.

Note that MAG also projects similar key socio-economic indicators for future year conditions as part of the regional transportation planning and modeling processes. This current version of Working Paper 4A includes the 2010 Census data, with anticipation that similar future year data will be included as part of a subsequent update.

Figures 1 through **4** display the relevant Census data on low income households, zero-vehicle ownership, and age groups (youth and elderly). The information is shown as a percentage of total households by Traffic Analysis Zone (TAZ) in the Southwest Valley study area. While the analysis of the data shown in these maps shows no discernible patterns or concentrations of the above factors within the study area, the dispersed nature of the variables do indicate a level of transit dependency throughout the developed parts of the study area.

The eastern portions of the study area include a number of TAZ with a relatively high proportion (10% and over) of low income households. But most of the developed areas have a percentage of 6% and under (**Figure 1**).

For zero-vehicle households, the data shows a very scattered pattern of areas with 5% or above. Indicative of a lesser developed non-urbanized area with a strong auto dependency, the majority of the area is characterized with a very low percentage (3% and under) of zero-vehicle households (**Figure 2**).

Review of the distribution of the youth and elderly indicates that areas with currently a high elderly population (30% and over) typically have a relatively lower youth percentage (10% and under). Buckeye and the eastern portion of the study area have a relatively high percentage of young population (30% and over) (**Figure 3**) and also exhibit a relatively low elderly population rate (5% and under). A relatively high proportion of elderly population can be seen around Avondale and Goodyear, as well as north of I-10 and Avondale (**Figure 4**).

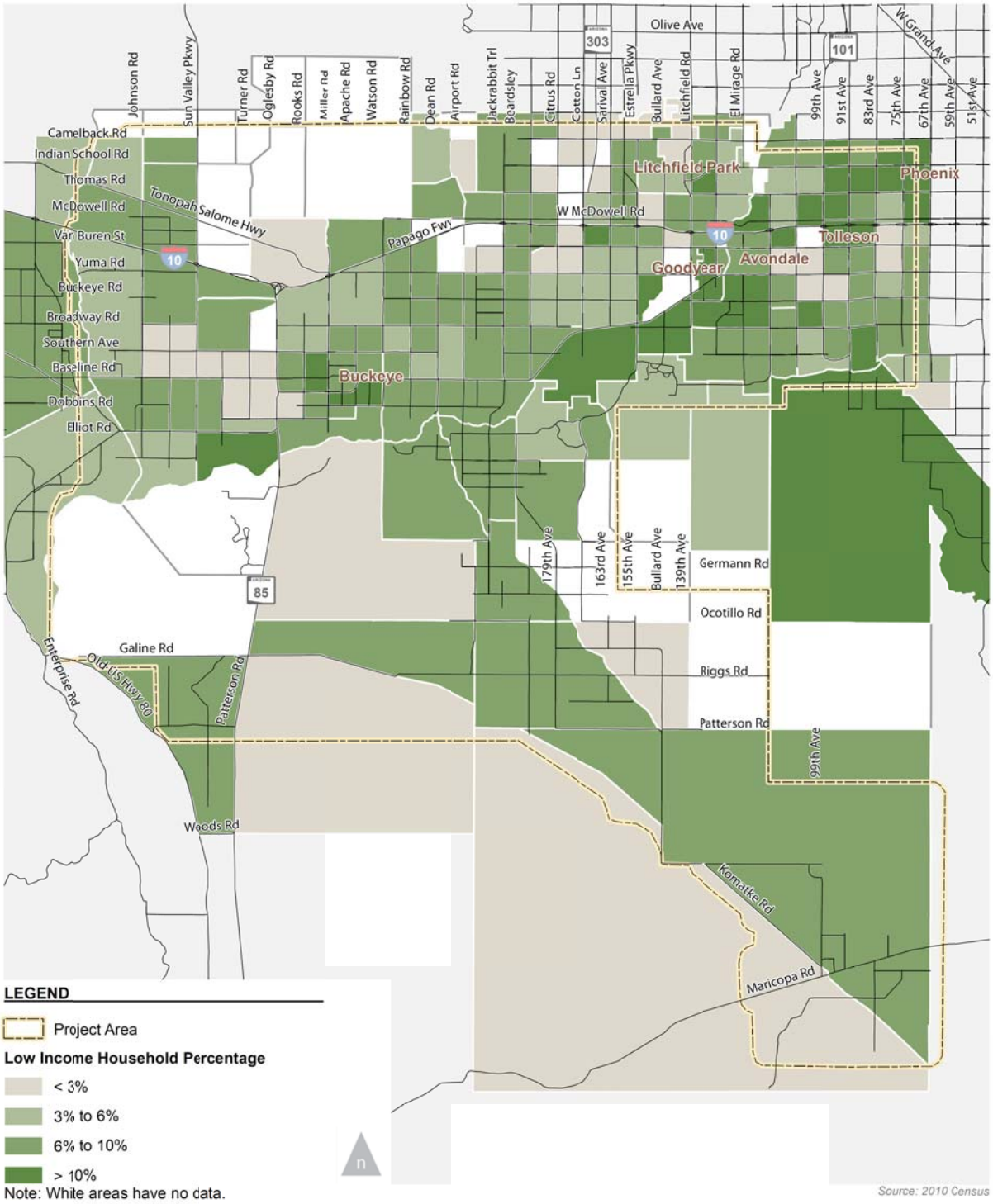

Figure 1

Low Income Household (Percentage) - Census 2010
Southwest Valley

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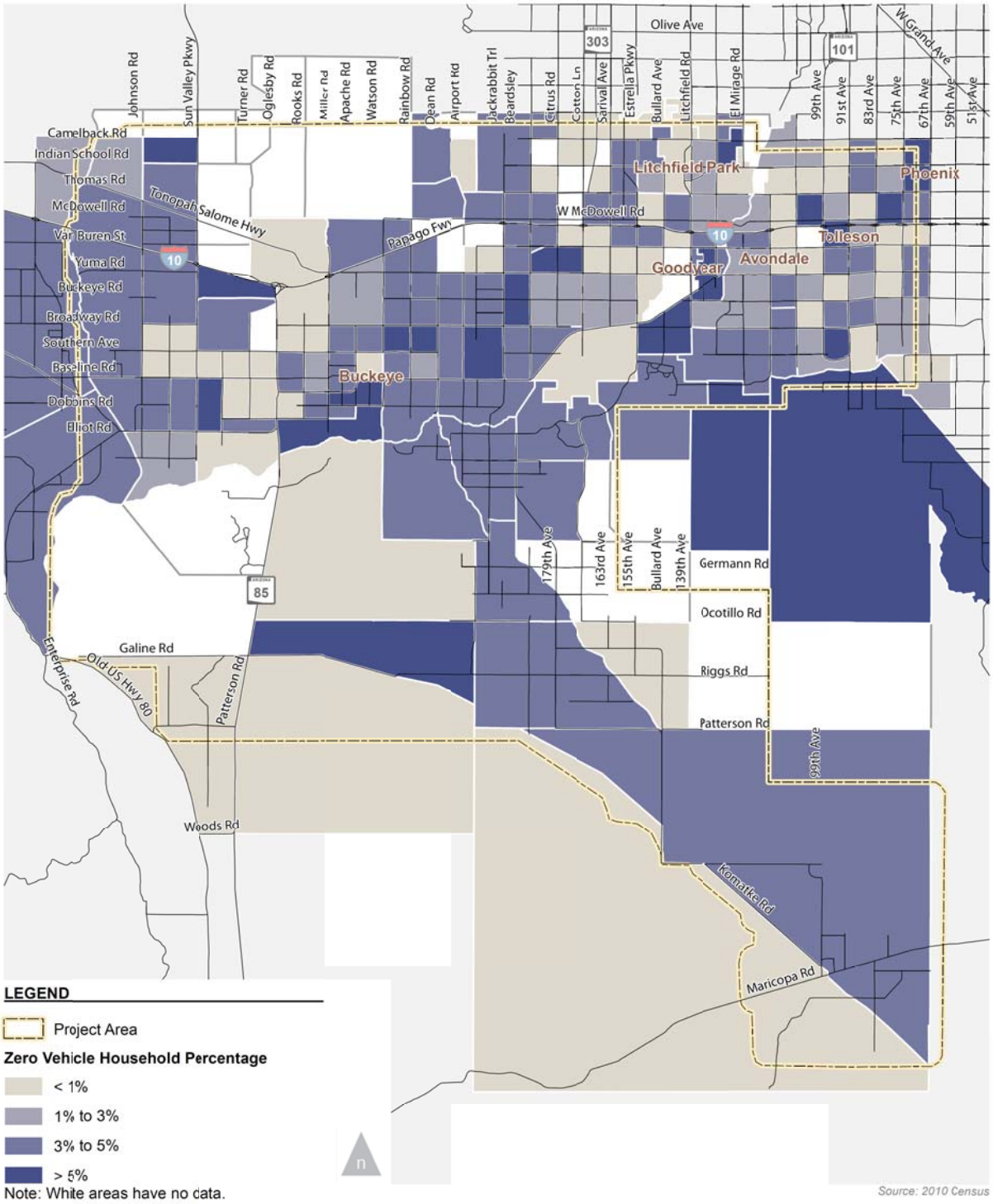

Figure 2

Zero Vehicle Household (Percentage) - Census 2010
Southwest Valley

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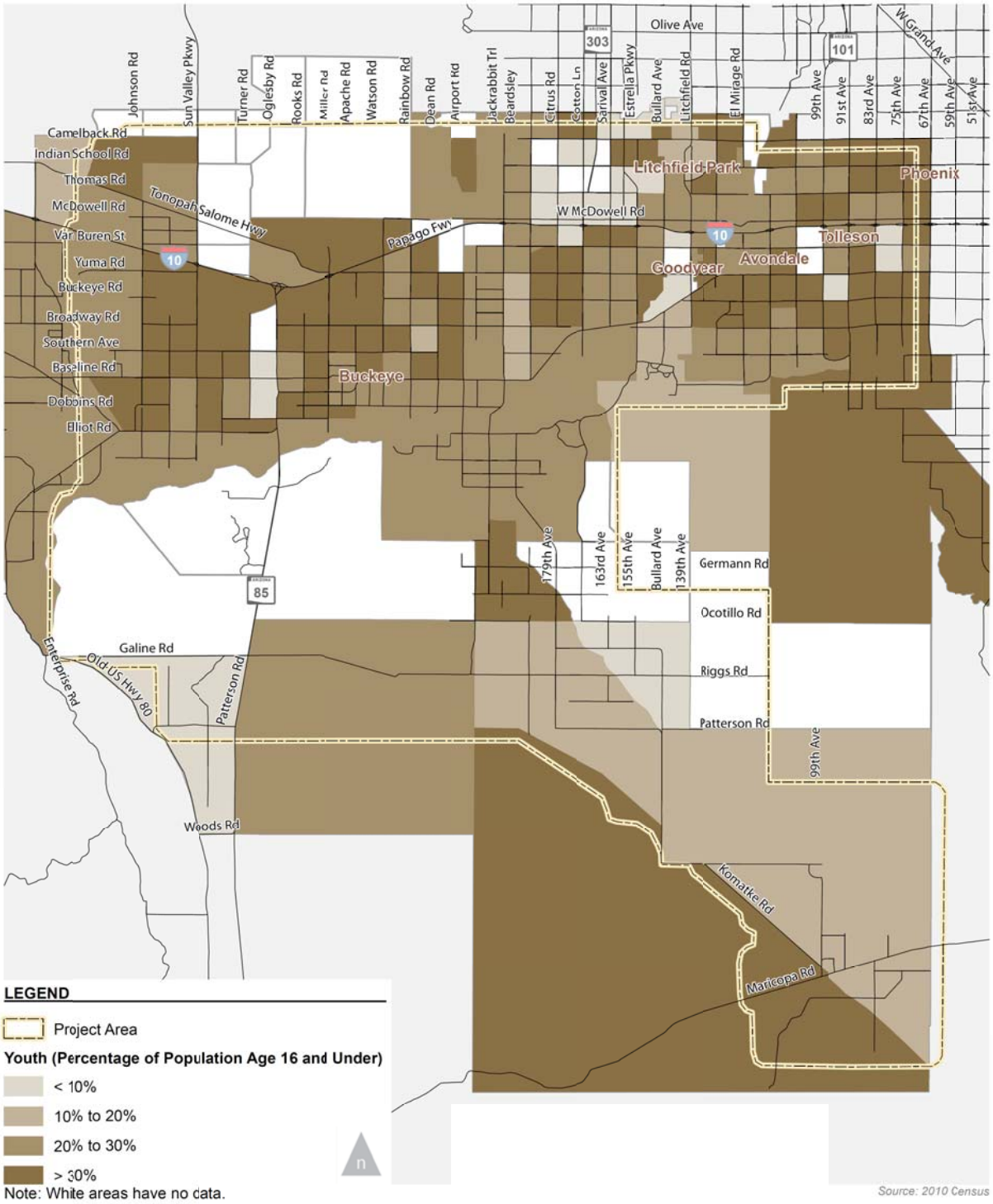

Figure 3

Youth (Percentage of Population Age 16 and Under)- Census 2010
Southwest Valley

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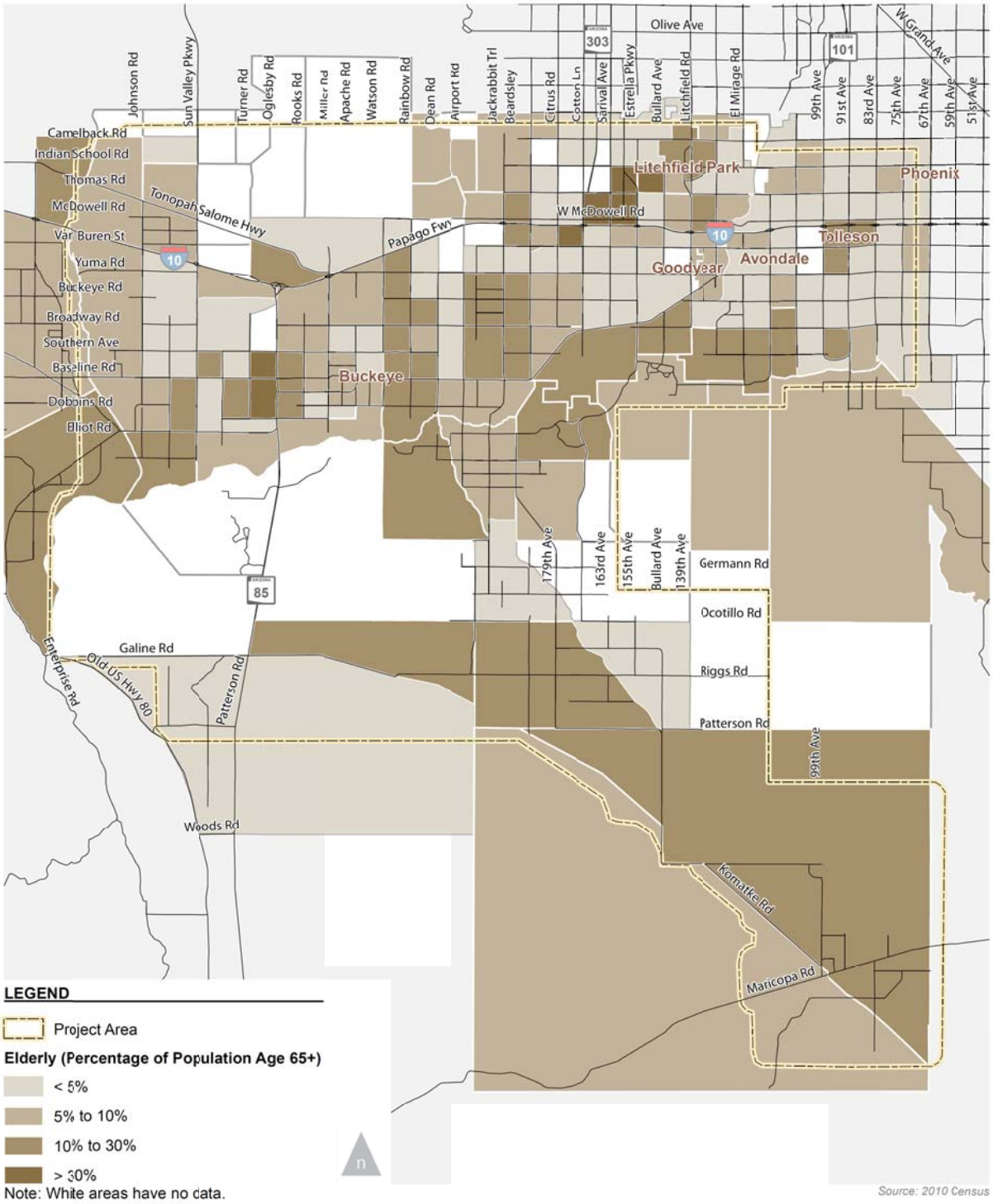

Figure 4

Elderly (Percentage of Population Age 65 and Above) - Census 2010
Southwest Valley

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3.0 STUDY AREA DEVELOPMENT PATTERNS

There are a variety of land use development related factors that can be used as indicators of the potential likelihood of transit need and utilization. One of the major factors is the density of population and employment.

Figures 5 through 8 summarize the development densities by TAZ: population and employment per square mile for both 2010 and forecast year 2031 conditions. **Figures 9 and 10** combine the densities of population and employment into an overall measure of magnitude of development; (e.g. development scale) for existing and 2031, respectively.

As shown for 2010 conditions, most of the development within the study area is in the eastern portions of the study area with some emerging population centers in the Buckeye area. In the future (2031) the development within the Southwest Valley is expected to intensify towards the west and somewhat towards the south. Also, the developed areas in the eastern portion of the study area will become denser in the future. In general, the densities within the Southwest Valley are not projected to exceed 10,000 people per square mile in the long term (**Figures 5** and **6**).

Existing employment centers are located around Tolleson and Avondale with over 2,000 jobs per square mile. In the future, both Avondale and Buckeye will experience increased employment densities, although centers exceeding 2,000 jobs per square mile are not forecast (**Figures 7** and **8**). The employment data shows a west oriented development pattern of migration over time, similarly to the population growth.

Figures 9 and **10** display the combined pattern of population and employment densities (e.g. development scale). The development magnitude is expected to intensify in the Southwest Valley between Buckeye and the eastern boarder of the study area. Under existing conditions, the highest densities of 7,500 and above (employment plus population per square mile) are seen within a few of the TAZ in the Avondale and Tolleson areas. In the future (2031) no further areas are anticipated to reach this level of development scale.

Trip densities are also a good indicator of major activity centers or where there are concentration of trip attractions and productions. Trip ends reflect the sum of trips that have either an origin or a destination (or both) in the TAZs. The opposite end of the trip can belong to any TAZ within or outside the study area. **Figures 11** and **12** display total daily (weekday) person trip end concentrations (all trip purposes combined) by study area TAZ for 2010 and forecast 2031 conditions, respectively. As shown, the major concentrations of 2010 trip ends are in the eastern portion of the Southwest Valley. This pattern is very similar to the pattern of population and employment. In 2031, areas west of Tolleson, Avondale, and Goodyear are expected to produce and attract trips of up to 25,000 per square mile. The eastern part of the

study area will remain the main focus of trip generation with several areas generating up to 50,000 daily trips, with a few TAZs even showing totals greater than that threshold.

Figures 13 and **14** display the concentration of daily work trip ends for study area TAZs, for both existing and forecast year 2031. It shows a similar pattern for the work trips as for total trips. In existing conditions all trips concentrate in the eastern portions of the study area with very little areas exceeding 7,500 daily work trips per square mile, with most trip generating areas under 5,000 daily work trips. In 2031, a greater number of TAZs in the east are forecast to generate over 5,000 daily work trips. Many areas in the western areas within the Southwest Valley will generate between 2,500 and 5,000 daily work trips.

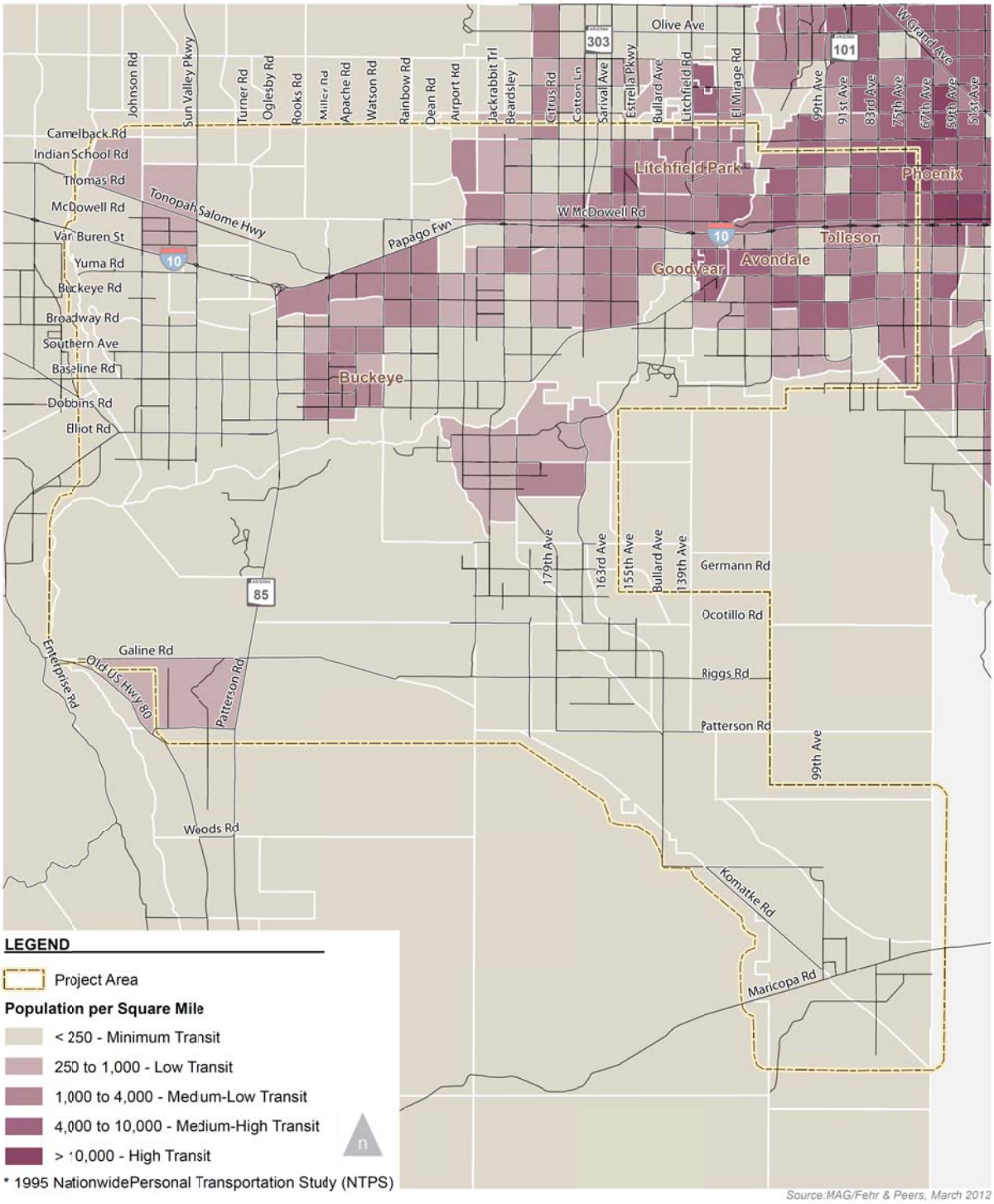

Figure 5

Population Density Transit Threshold* - 2010
Southwest Valley

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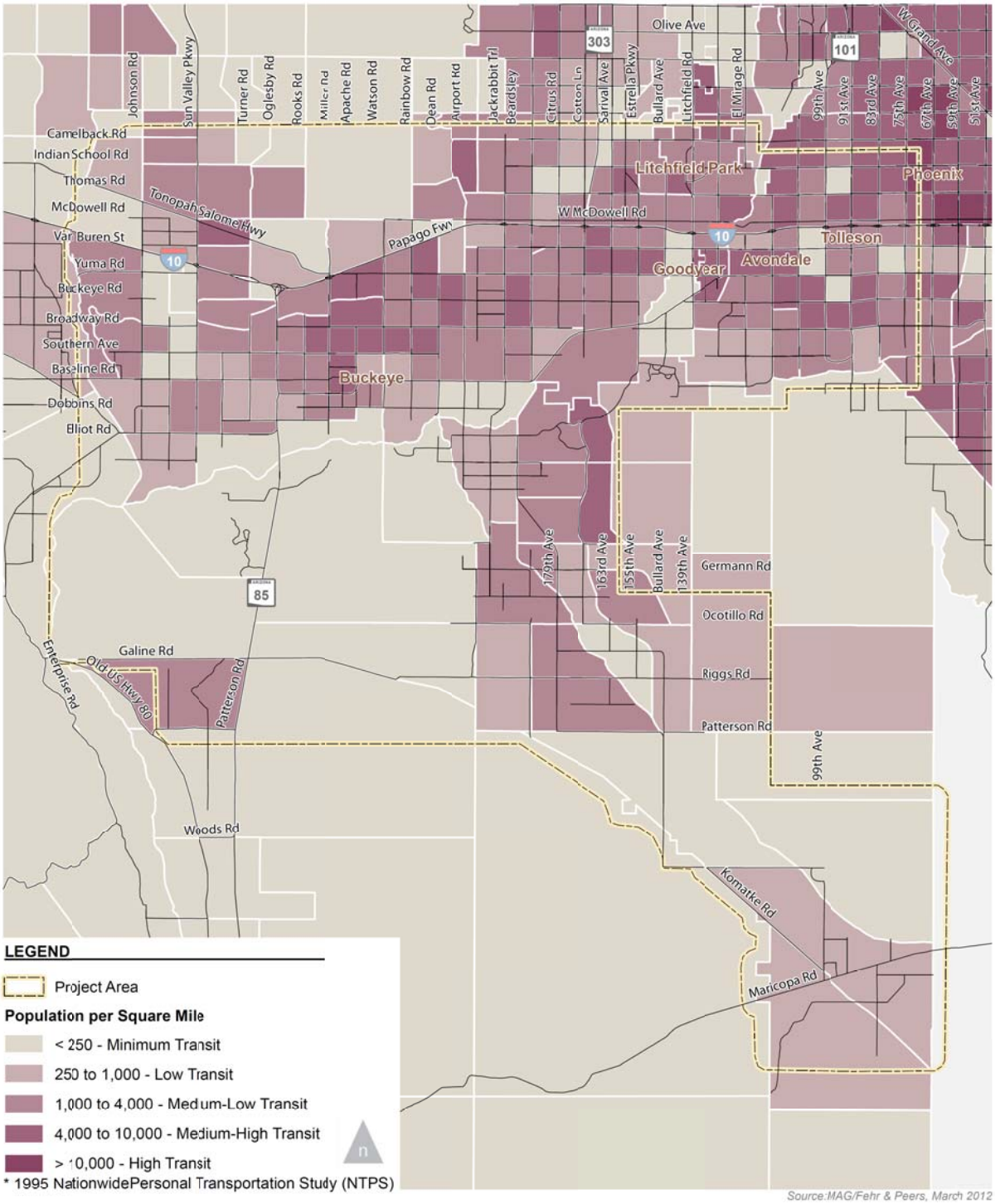

Figure 6

Population Density Transit Threshold* - 2031
Southwest Valley

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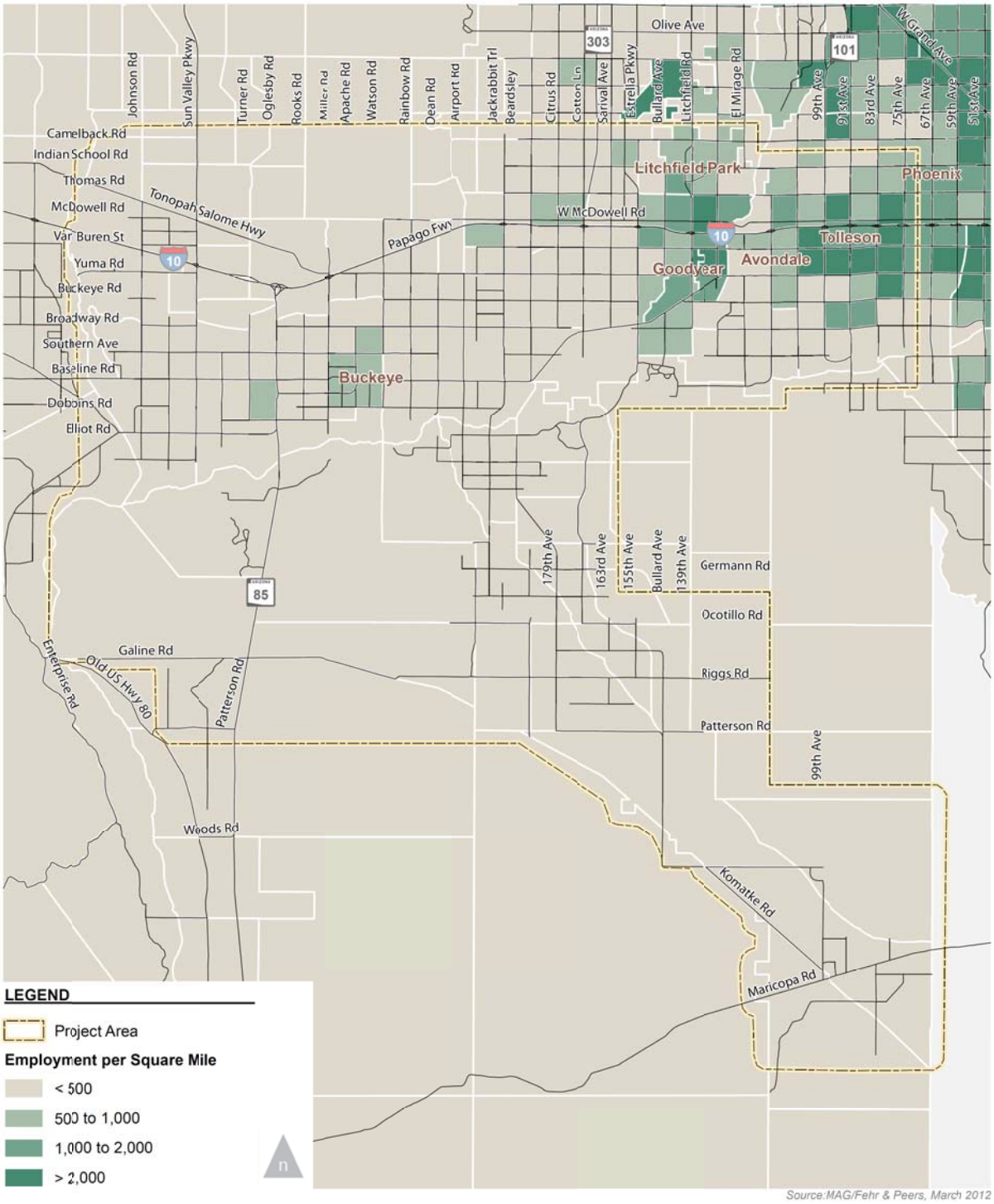

Source:MAG/Fehr & Peers, March 2012

Figure 7

Employment Density - 2010
Southwest Valley

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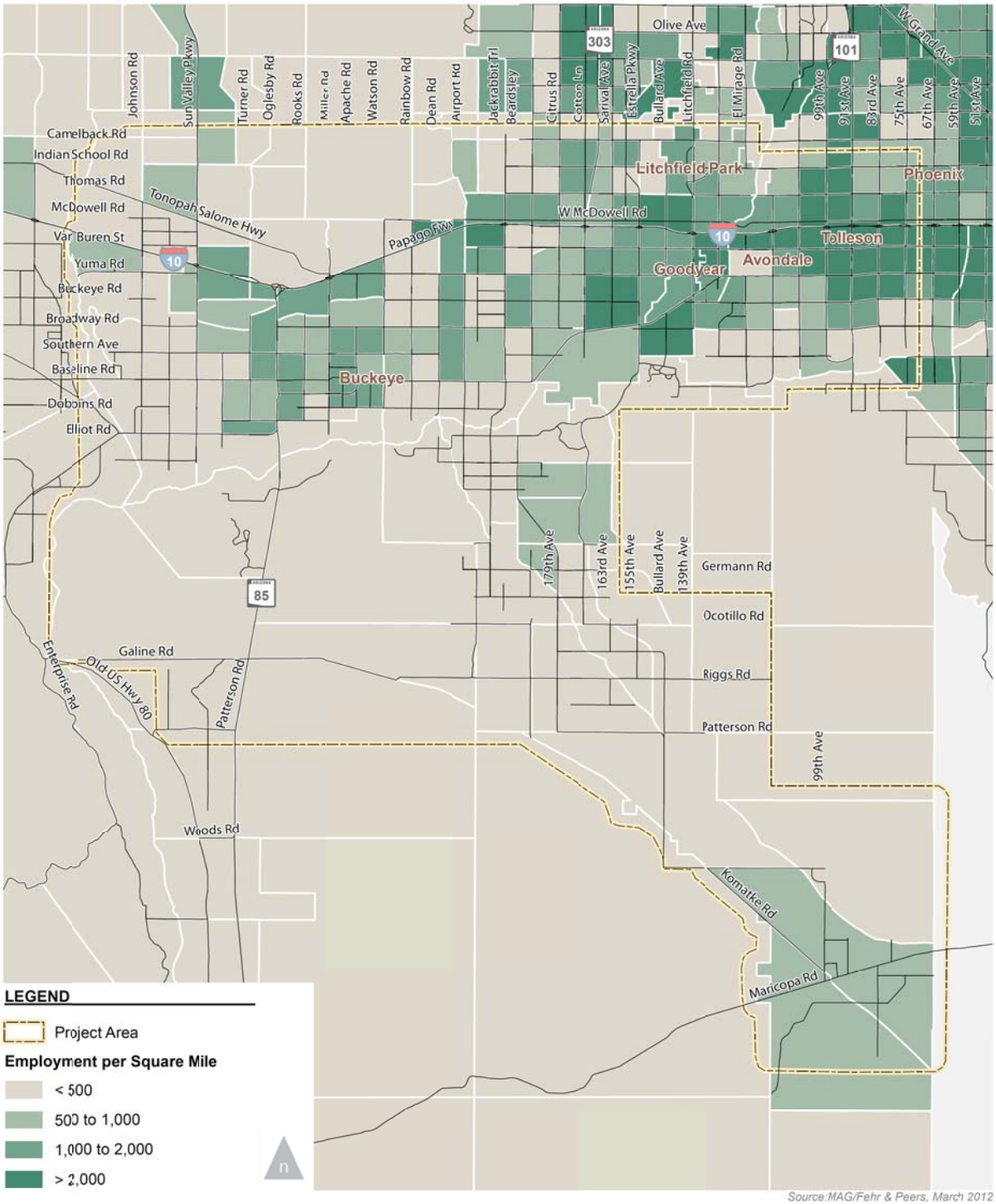

Figure 8

Employment Density - 2031
Southwest Valley

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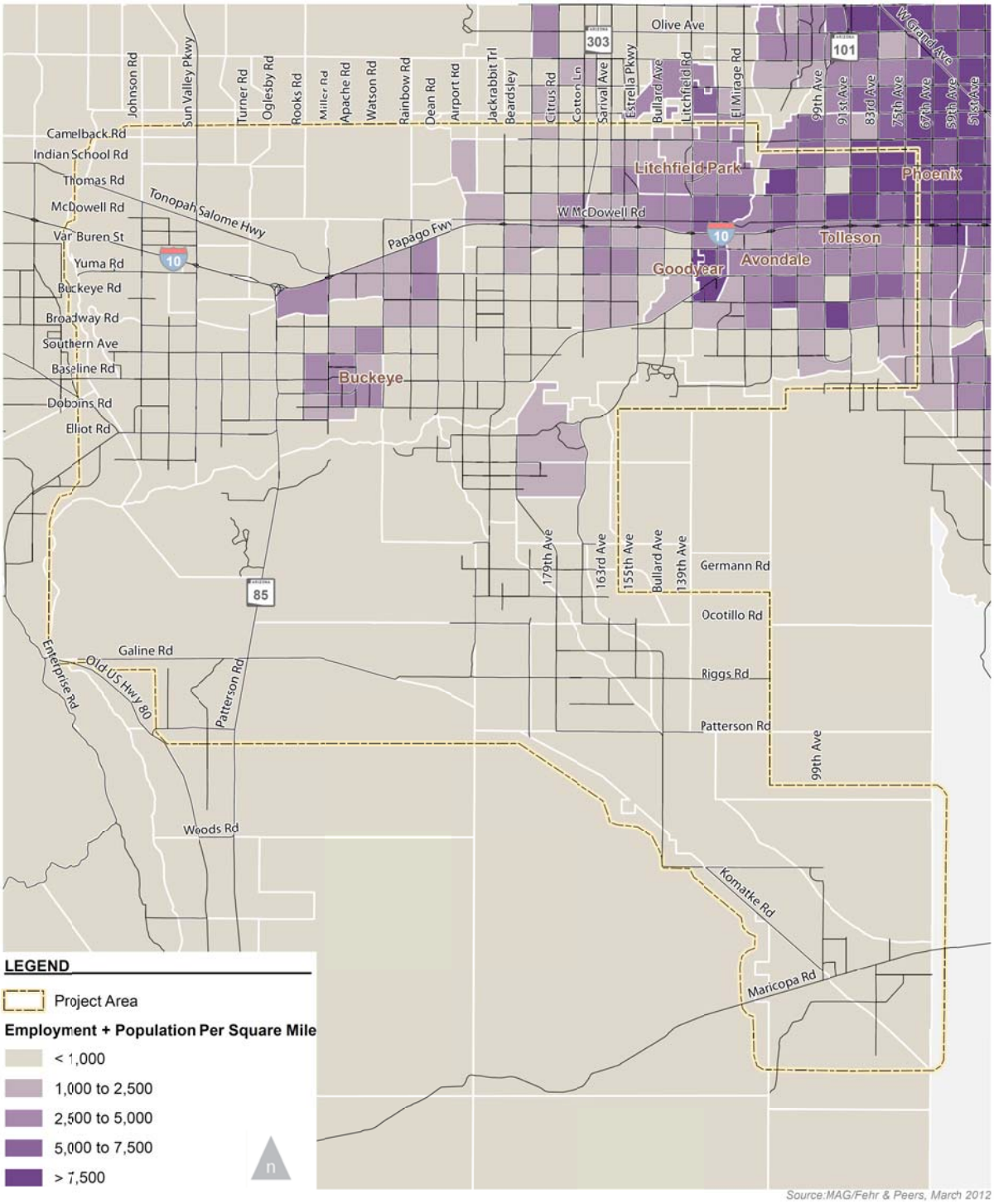

Figure 9

Total Employment Plus Population Density - 2010
Southwest Valley

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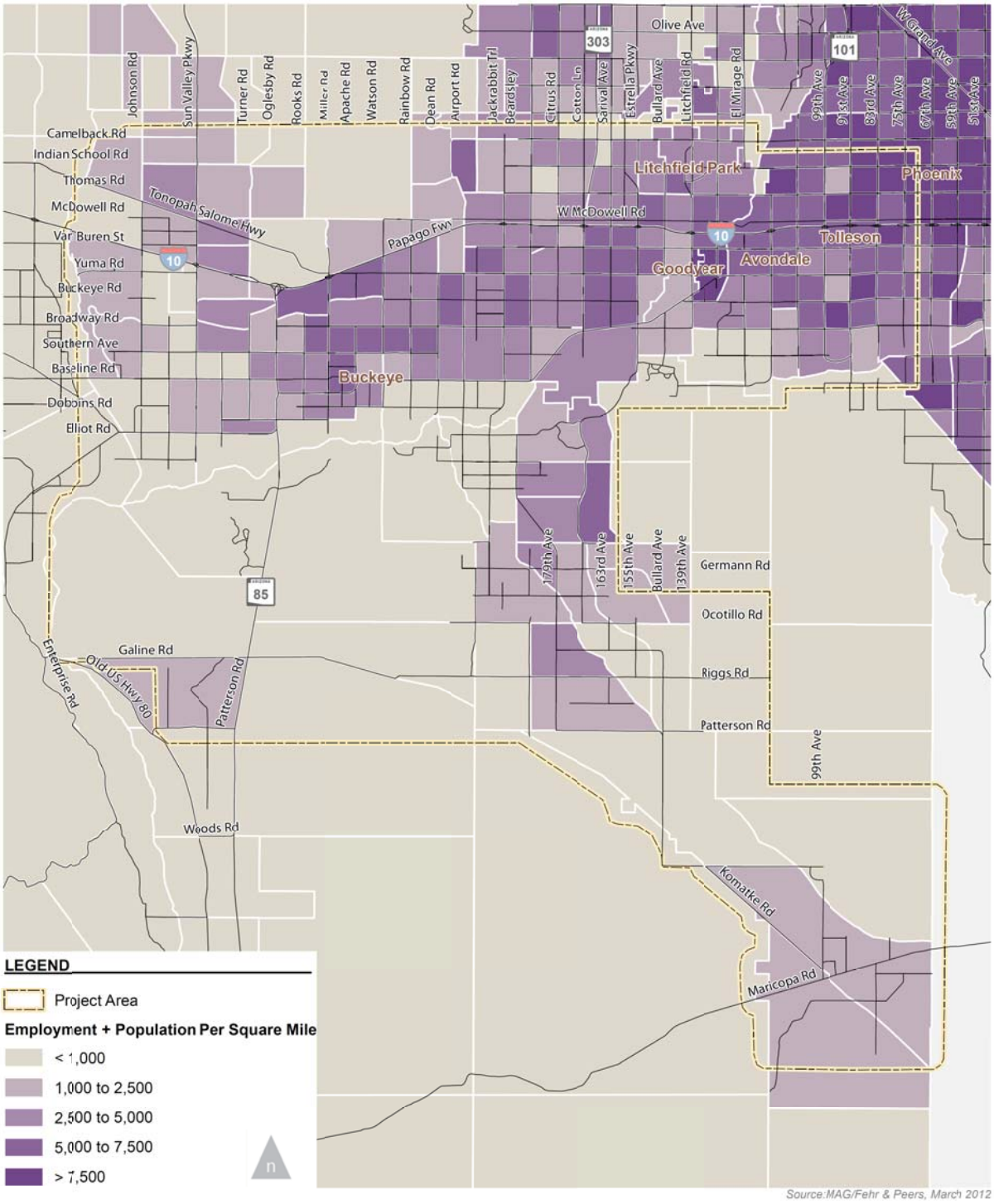

Figure 10

Total Employment Plus Population Density - 2031
Southwest Valley

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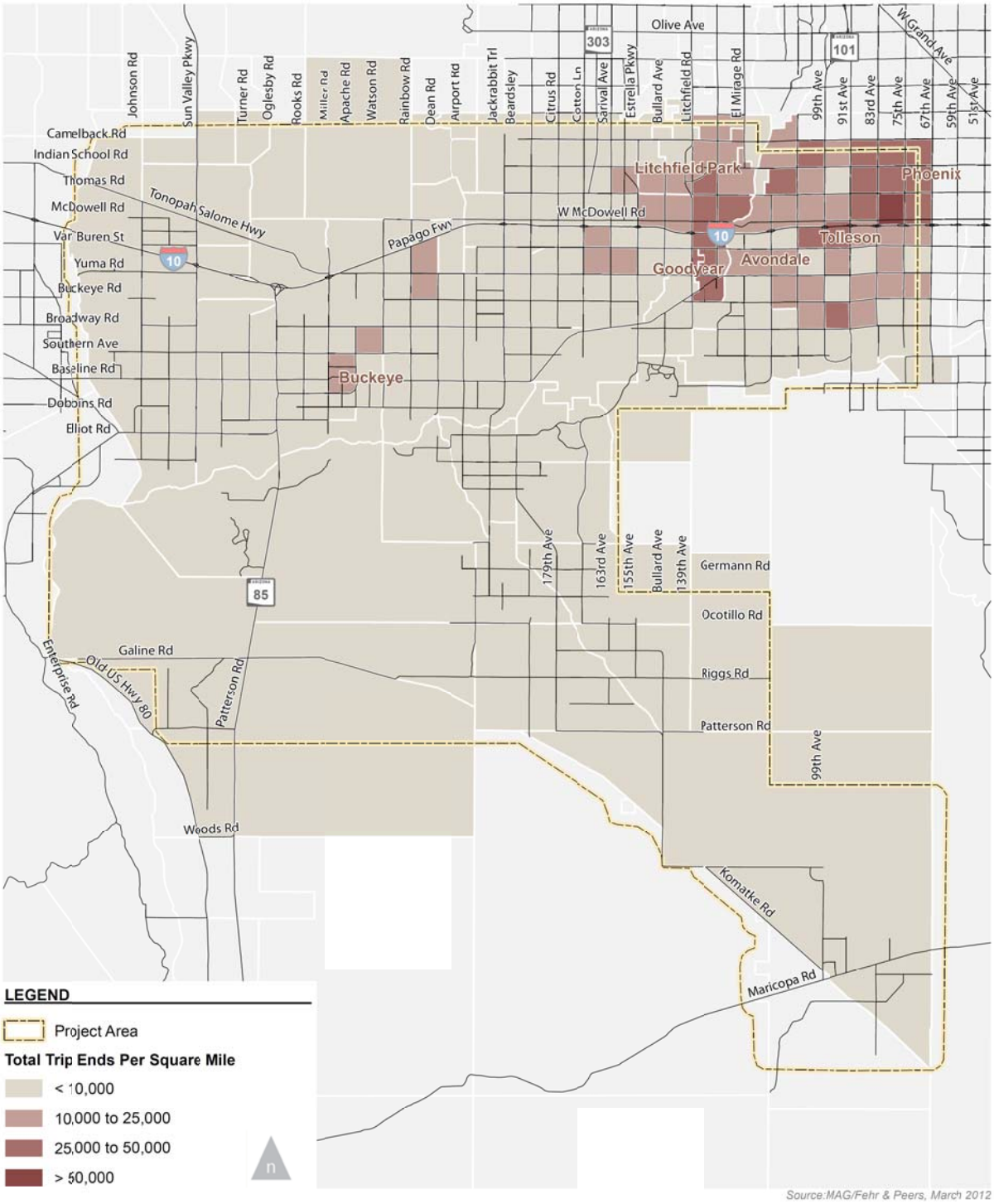

Figure 11

Total Trip Ends Density - 2010
Southwest Valley

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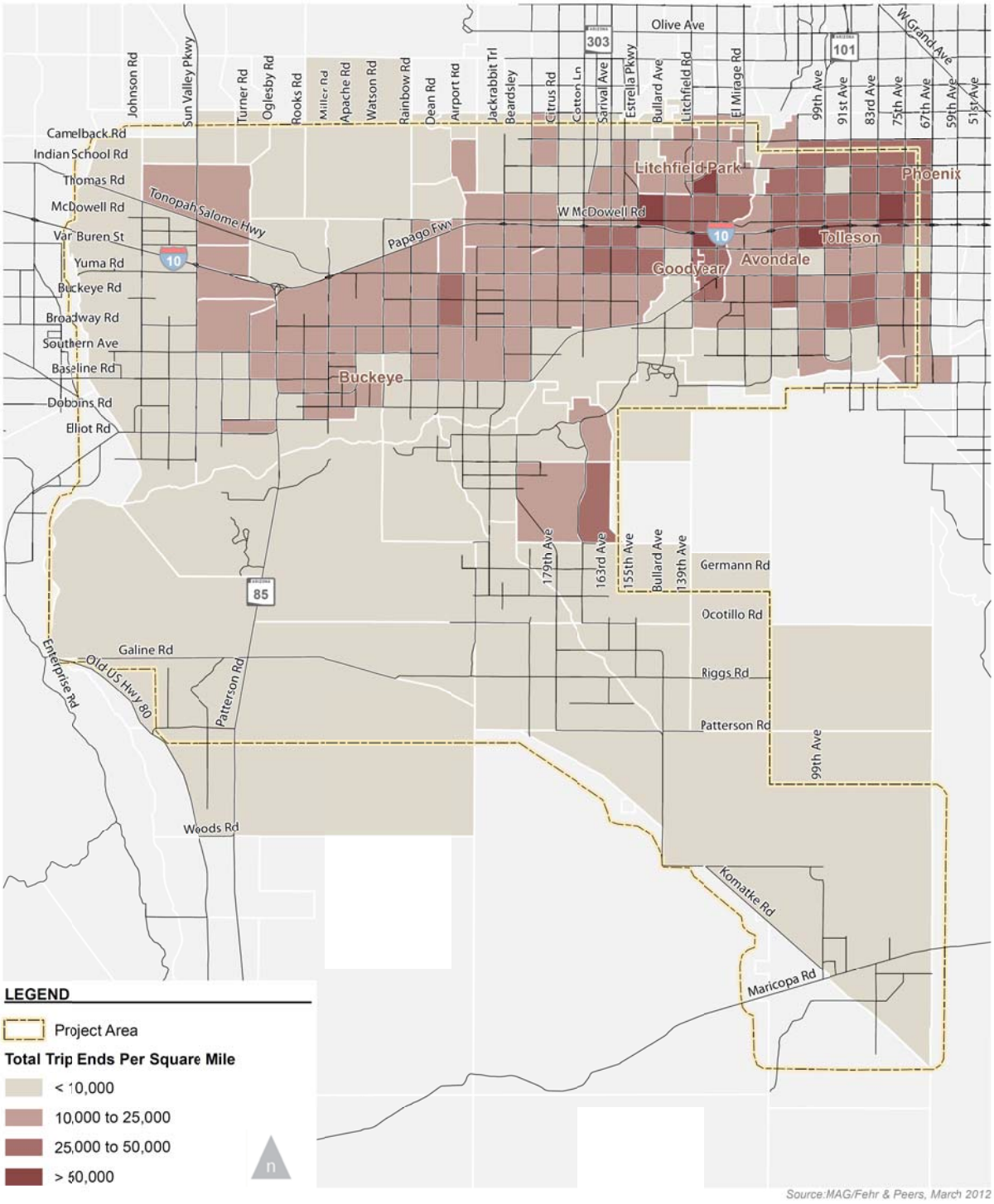

Figure 12

Total Trip Ends Density - 2031
Southwest Valley

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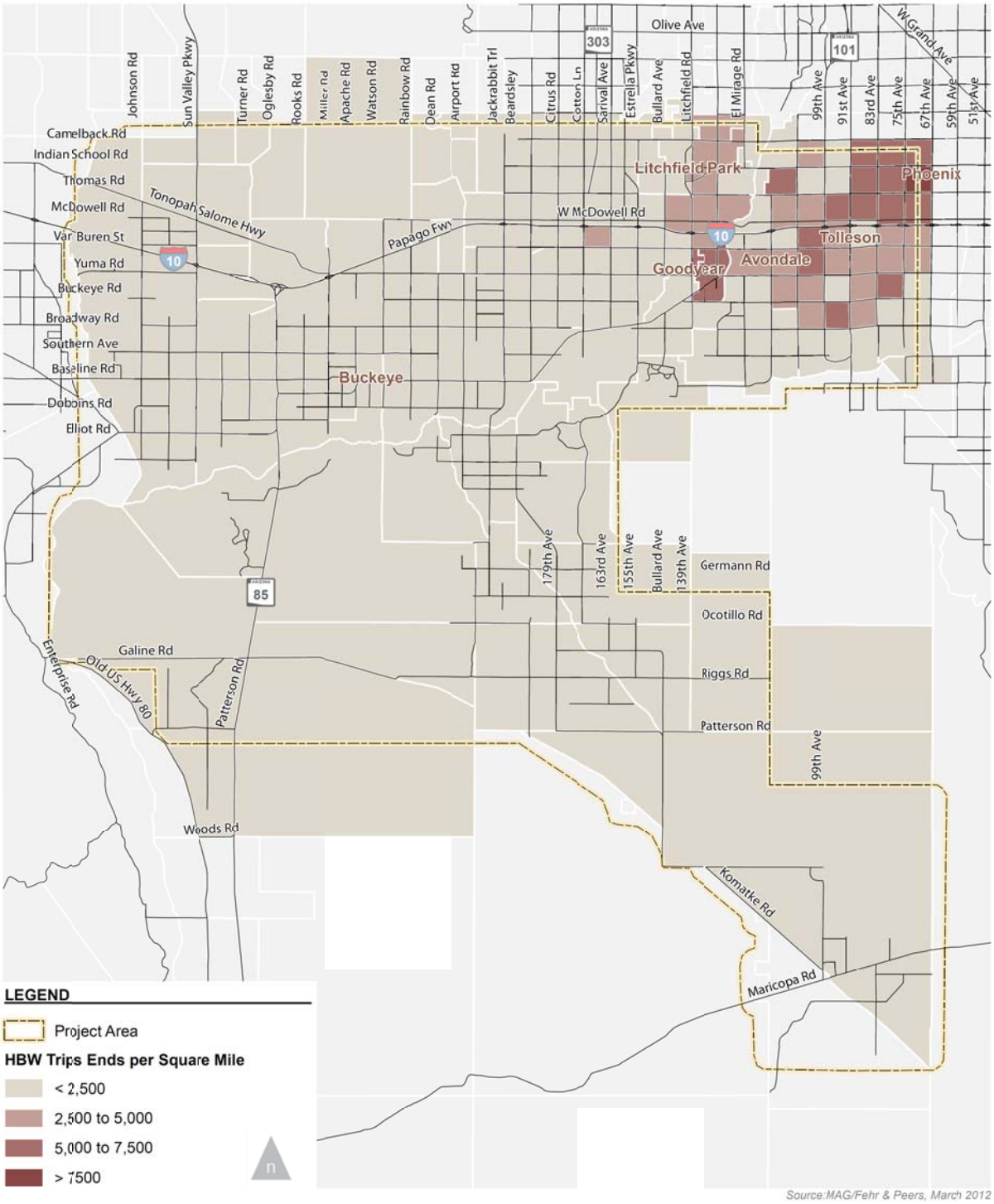

Source: MAG/Fehr & Peers, March 2012

Figure 13

Home Based Work Trip Ends Density - 2010
Southwest Valley

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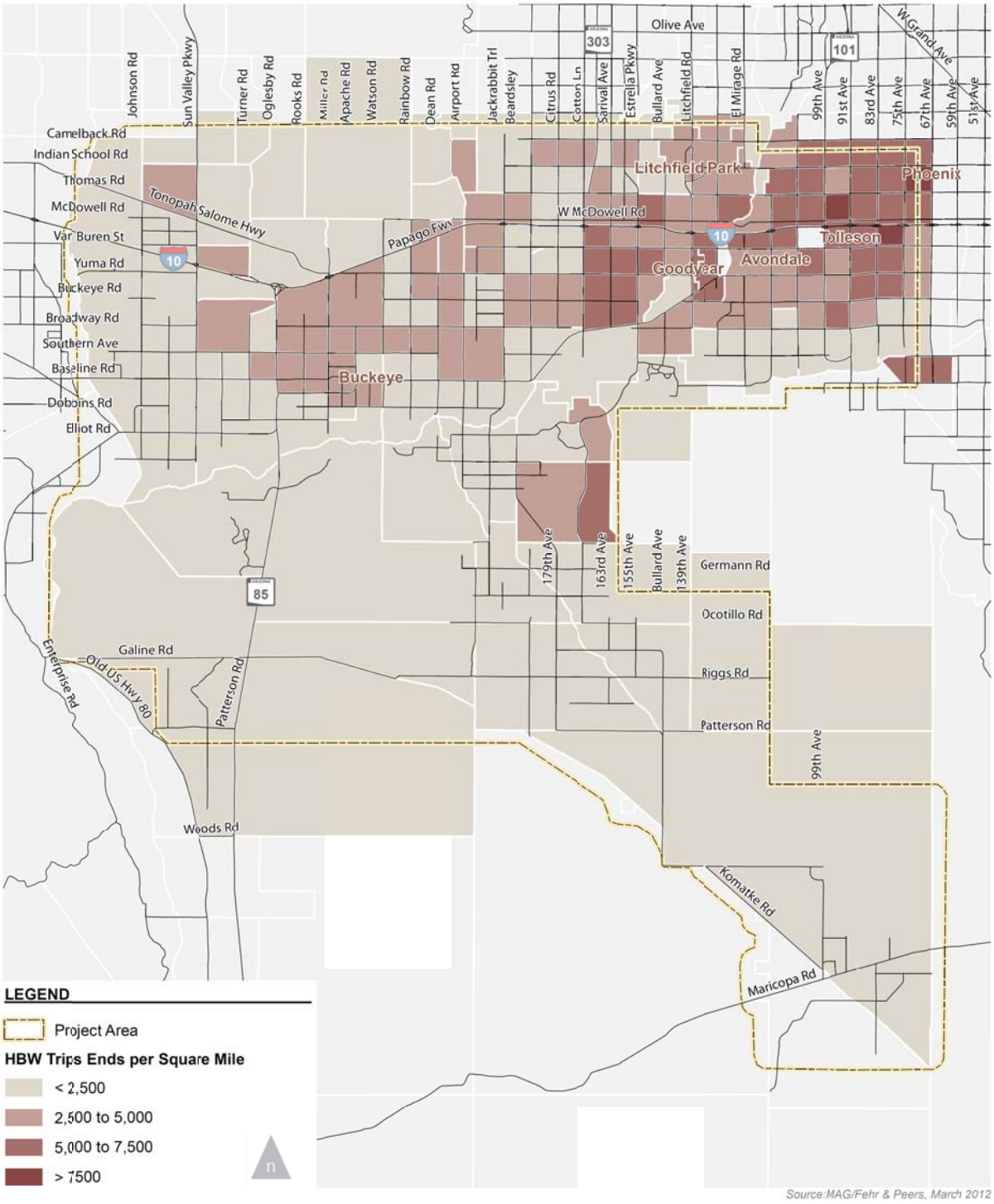

Figure 14

Home Based Work Trip Ends Density - 2031
Southwest Valley

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4.0 KEY TRAVEL PATTERNS

Data from the MAG Regional Transportation Model for the year 2010 (existing conditions) and future year 2031 (future conditions) were aggregated by district for ease of interpretation. A total of 17 districts, representing aggregation of the MAG traffic analysis zones (TAZs), were defined for the Southwest Valley study area.

The districts were created based on consideration of the following characteristics:

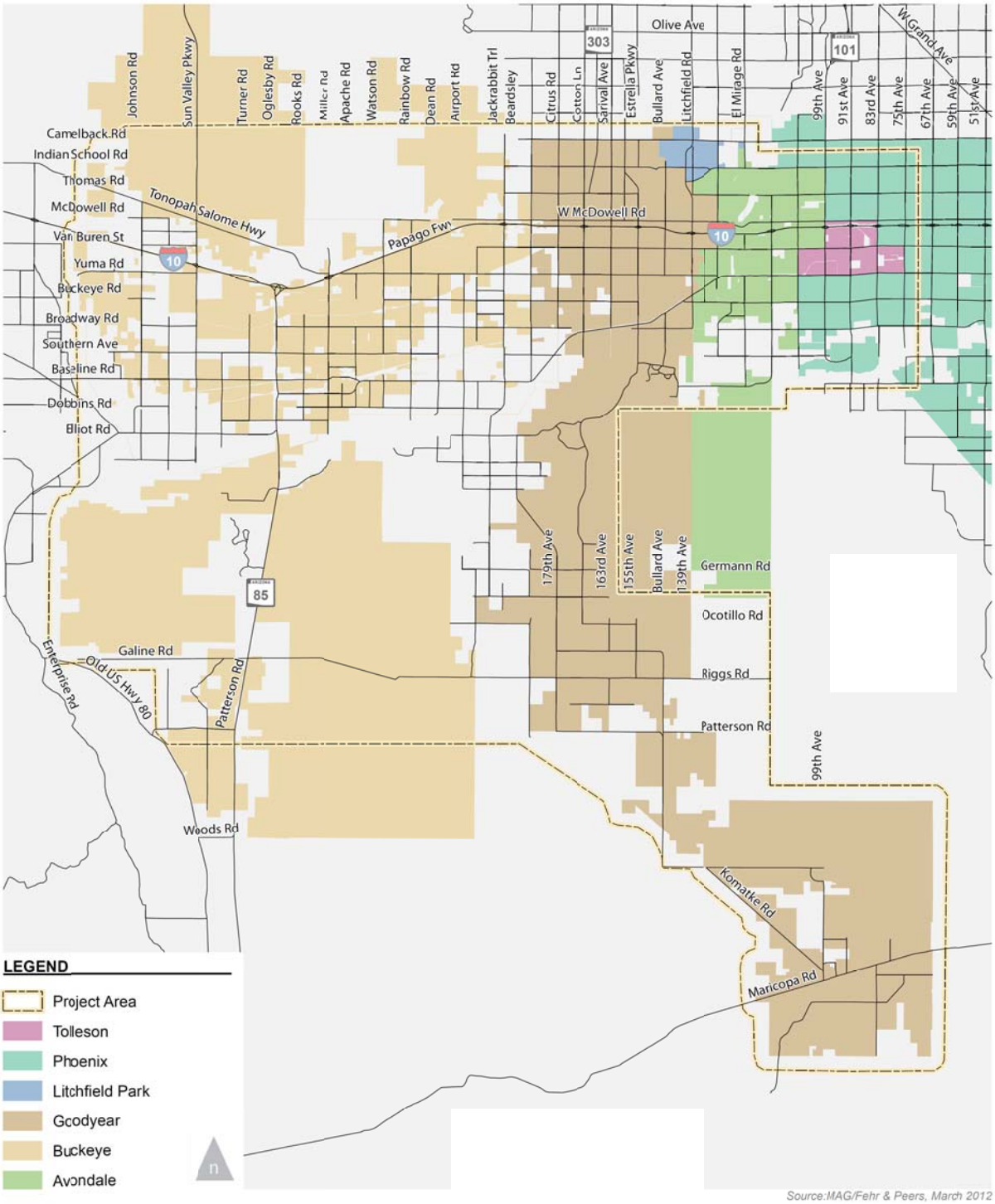
- Jurisdiction boundaries as displayed in **Figure 15A**
- Highway network
- Natural boundaries (rivers, for example)
- Refinement of district size with consideration of future development intensities

The area outside of the study area was defined as a whole separate district representing the external trips. **Figure 15B** displays the study area districts.

Trip interchange matrices were then developed at the district level for each of the respective years for both total trips (all purposes combined) and the home-based work trip. The trip matrices are attached as **Appendix 1** to this memorandum.

For purposes of this analysis, internal trips are trips with both trip ends (origin and destination) within the study area. Internal-external trips have an origin within the study area and a destination outside the study area. External-internal trips have an origin outside the study area, with a destination within the study area.

The data was analyzed to identify the magnitude of trip generation at the district level and the proportion of internal versus external trip making. The major (top five) district level internal trip interchanges were identified by purpose (total and work) for both existing 2010 and the future year 2031.



Source:MAG/Fehr & Peers, March 2012

Figure 15A

Southwest Valley Cities

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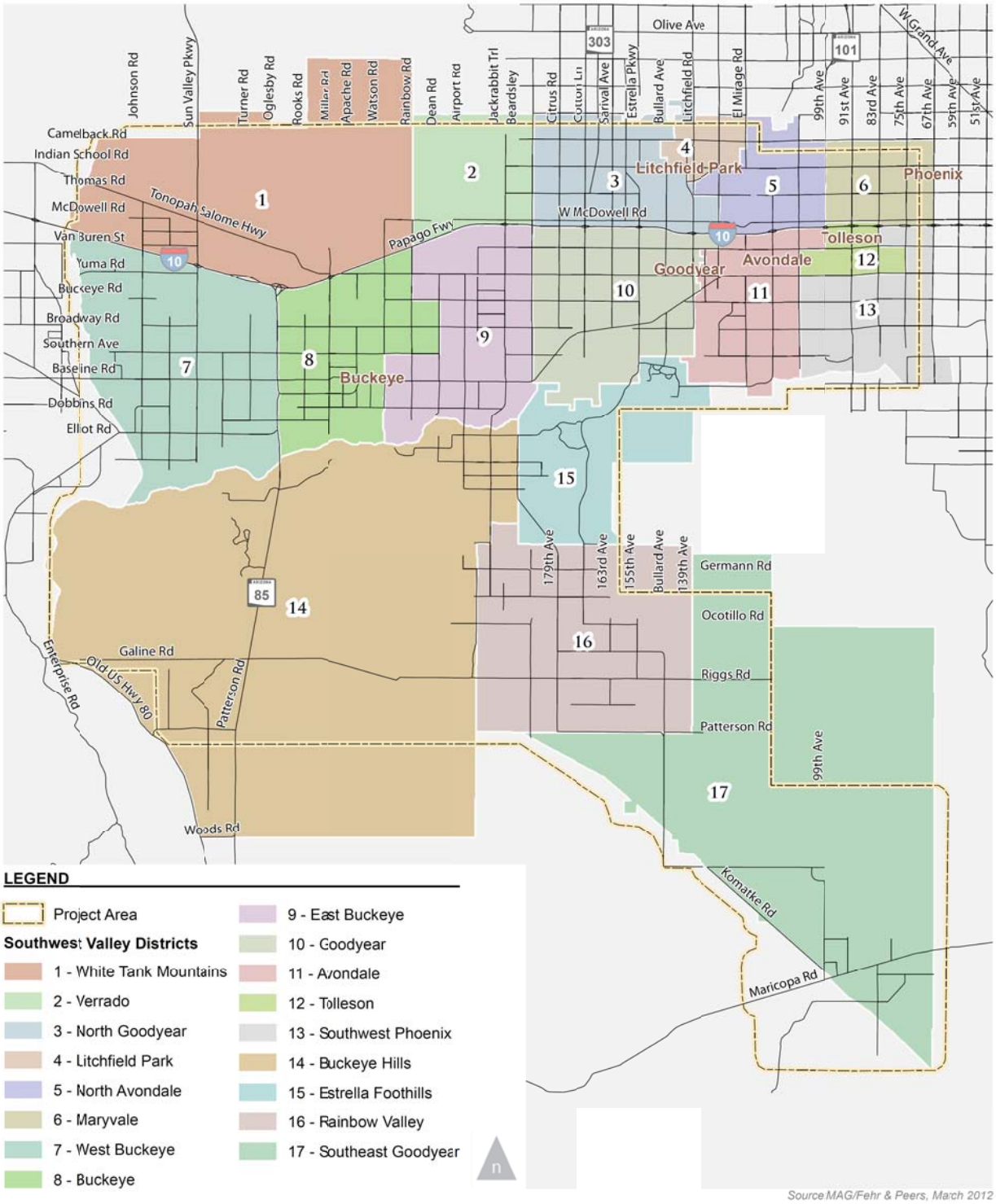

Figure 15B

Southwest Valley Districts

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Internal/External Travel Patterns

Tables 1 and **2** summarize study area internal and external daily trip making for the years 2010 and 2031, respectively.

Table 1 2010 Study Area Daily Trip Interchange Summary

Trip Type	Total Trips		Work Trips	
	#	Percent	#	Percent
Internal	769,080	59.8%	99,300	35.8%
Internal-External	313,430	24.4%	120,970	43.6%
External-Internal	203,930	15.9%	57,060	20.6%
Total	1,286,450	100.0%	277,340	100.0%

Source: MAG/Fehr & Peers, March 2012

Table 2 2031 Study Area Daily Trip Interchange Summary

Trip Type	Total Trips		Work Trips	
	#	Percent	#	Percent
Internal	2,242,660	67.8%	339,800	48.5%
Internal-External	609,140	18.4%	233,460	33.3%
External-Internal	456,400	13.8%	128,030	18.3%
Total	3,308,200	100.0%	701,290	100.0%

Source: MAG/Fehr & Peers, March 2012

As shown, the majority of total daily trips generated within the study area remain internal to the study area for both the years 2010 (59.8%) and 2031 (67.8%). For both existing and future year conditions, approximately one-third of total trips are external with either an origin or destination outside the study area, with the higher percentage of internal-external trips reflecting a net exporting of trips. From 2010 to 2031, the share of internal – external total daily trips will, however, decrease from 24.4% to 18.4%.

The percentage of internal study area daily work trips will increase from 35.8% in 2010 to 48.5% in the year 2031, as the study area more fully develops. Of the daily work trips that originate in the study area, the majority leaves the study area in 2010. In 2031, this pattern changes and about 60% of those trips stay within the study area.

District Level Trip Generation

Tables 3 and **4** display the study area districts (top five) with the highest trip generation (daily trip ends including both origins and destinations), for the years 2010 and 2031, respectively. Data is displayed for both total trips and work trips.

Table 3 District Level Daily Trip Generation 2010 Top Five

Total Daily Trips		
Rank	District Name (Number)	Trip Ends
1	Maryvale (6)	409,300
2	North Avondale (5)	253,020
3	Avondale (11)	243,610
4	Southwest Phoenix (13)	223,740
5	North Goodyear (3)	192,660
Daily Work Trips		
Rank	District Name (Number)	Trip Ends
1	Maryvale (6)	65,220
2	Southwest Phoenix (13)	46,060
3	Avondale (11)	42,520
4	North Avondale (5)	42,340
5	Goodyear (10)	34,480

Source: MAG/Fehr & Peers, March, 2012

Table 4 District Level Daily Trip Generation 2031 Top Five

Total Daily Trips		
Rank	District Name (Number)	Trip Ends
1	Goodyear (10)	503,320
2	Maryvale (6)	470,870
3	Buckeye (8)	468,580
4	East Buckeye (9)	403,390
5	Avondale (11)	398,030
Daily Work Trips		
Rank	District Name (Number)	Trip Ends
1	Goodyear (10)	111,170
2	Buckeye (8)	84,390
3	Southwest Phoenix (13)	82,710
4	Maryvale (6)	78,600
5	Avondale (11)	75,240

Source: MAG/Fehr & Peers, March, 2012

As shown, Maryvale (District 6) generates the highest number of both total and work trips in 2010, with all of the identified top five districts (6, 5, 11,13, and 3) generally being in the northeastern quadrant of the study area .

By 2031, while Goodyear (District 10) is forecast to be tops in both total and work trip generation, the top five includes a shift to the west with Buckeye (District 8) being third in overall trip generation and second in work trip generation.

Internal District-District Trip Interchanges

Tables 5 and **6** display the major (top five) internal district-to-district daily trip interchanges for the years 2010 and 2031, respectively. Data is displayed for both total trips and work trips. **Figures 16** through **19** display the district-to-district daily trip interchange information graphically for the years 2010 and 2031.

Table 5 2010 Internal Study Area District-to-District Daily Trip Interchange

Total Daily Trips		
Rank	District / District Interchange	Trip Ends
1	North Avondale (5) / Avondale (11)	22,260
2	North Goodyear (3) / North Avondale (5)	20,700
3	North Goodyear (3) / Goodyear (10)	20,290
4	Goodyear (10) / Avondale (11)	19,390
5	North Avondale (5) / Maryvale (6)	19,090
Daily Work Trips		
Rank	District / District Interchange	Trip Ends
1	Avondale (11) / Goodyear (10)	3,070
2	Maryvale (6) / Southwest Phoenix (13)	2,790
3	North Avondale (5) / Avondale (11)	2,710
4	Southwest Phoenix (13) / Tolleson (12)	2,680
5	Maryvale (6) / Tolleson (12)	2,380

Source: MAG/Fehr & Peers, March, 2012

Table 6 2031 Internal Study Area District-to-District Daily Trip Interchange

Total Daily Trips		
Rank	District / District Interchange	Trip Ends
1	North Goodyear (3) / Goodyear (10)	54,770
2	Buckeye (8) / West Buckeye (7)	47,750
3	Buckeye (8) / East Buckeye (9)	43,880
4	Avondale (11) / Southwest Phoenix (13)	33,550
5	East Buckeye (9) / Goodyear (10)	32,530
Daily Work Trips		
Rank	District / District Interchange	Trip Ends
1	Rainbow Valley (16) / Southeast Goodyear (17)	7,980
2	Buckeye (8) / West Buckeye (7)	7,880
3	Estrella Foothills (15) / Goodyear (10)	7,220
4	White Tank Mountains (1) / West Buckeye (7)	7,000
5	Avondale (11) / Goodyear (10)	6,790

Source: MAG/Fehr & Peers, March, 2012

As shown, in 2010 the interchange between North Avondale (District 5) and Avondale (District 11) had the highest number of total daily trips. The trip interchange between Avondale (District 11) and Goodyear (District 10) had the highest number of daily work trips.

Similar to the shift in trip generation to the western and southern portions of the study area, in 2031 the North Goodyear (District 3) / Goodyear (District 10) trip interchange is the highest (total trips), followed by Buckeye (District 8) to West Buckeye (District 7), and Buckeye (District 8) to East Buckeye (District 9).

The shift to and growth in the southern portion of the study area is apparent from the work trip interchange between Rainbow Valley (District 16) and Southeast Goodyear (District 17) which is the highest for the study area internal trips in the future year 2031.

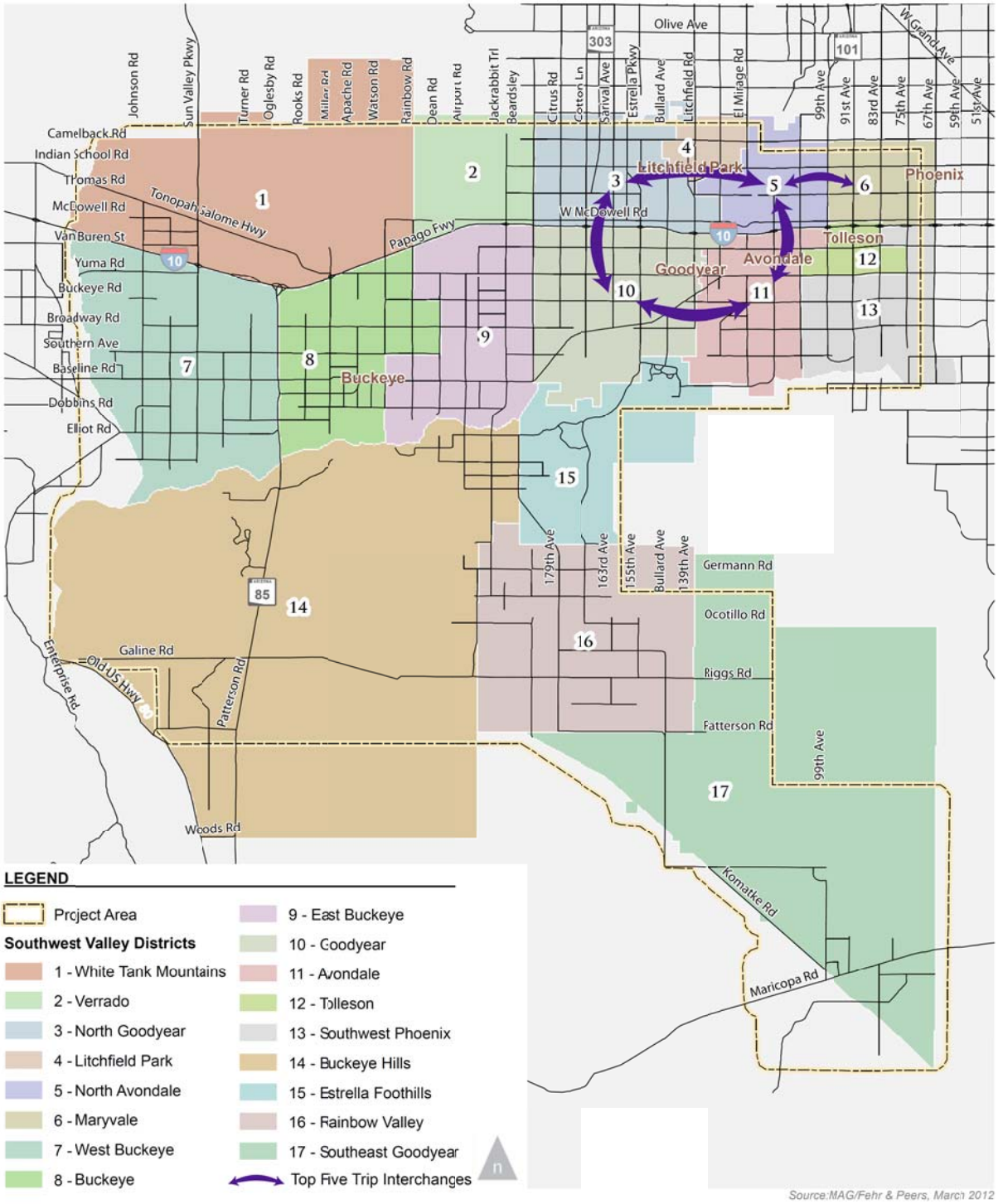

Figure 16

Southwest Valley Trip Interchanges (Top Five)
Total Trips, 2010

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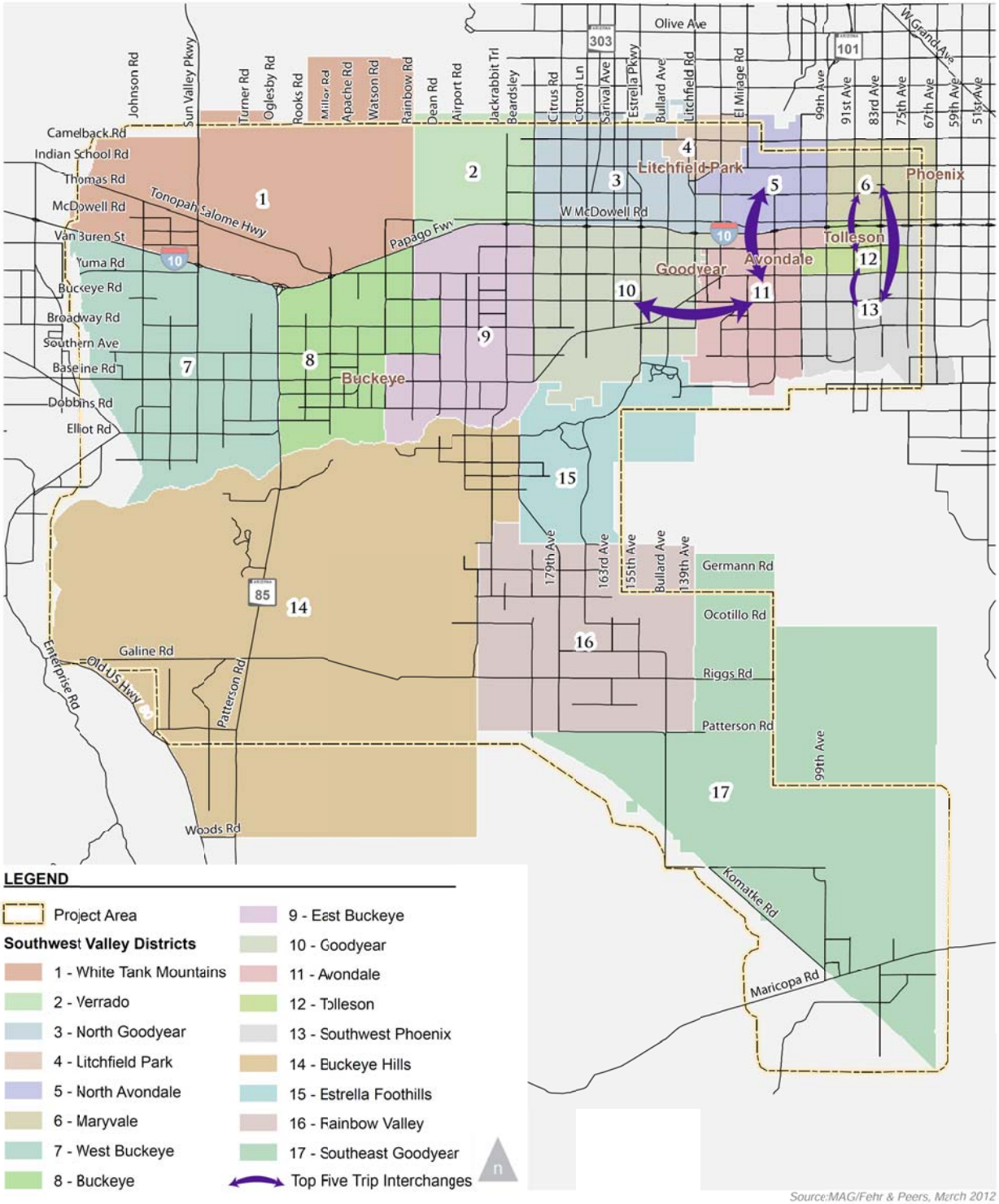

Figure 17

Southwest Valley Trip Interchanges (Top Five)
Home-Based-Work Trips, 2010

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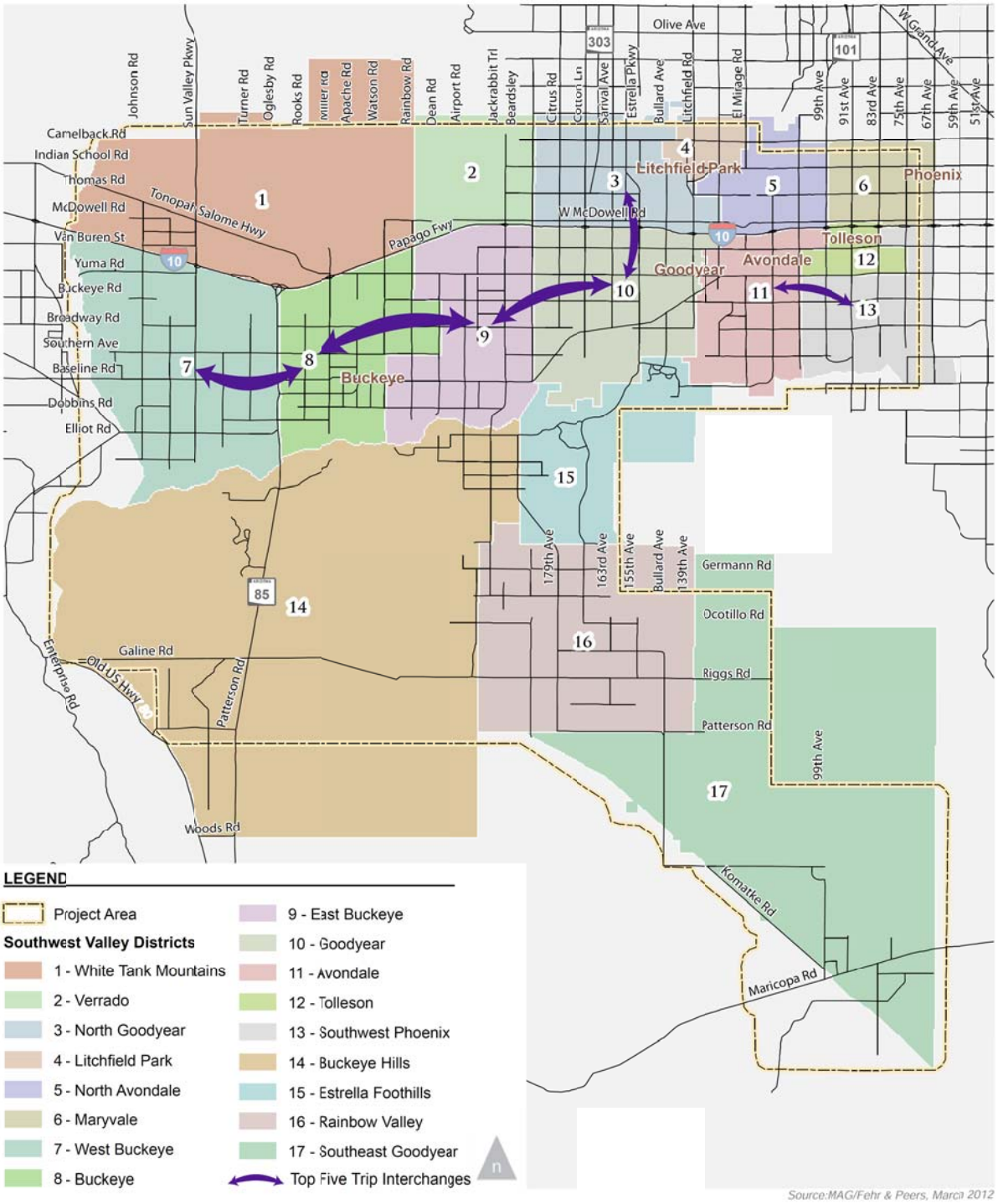

Figure 18

Southwest Valley Trip Interchanges (Top Five)
Total Trips, 2031

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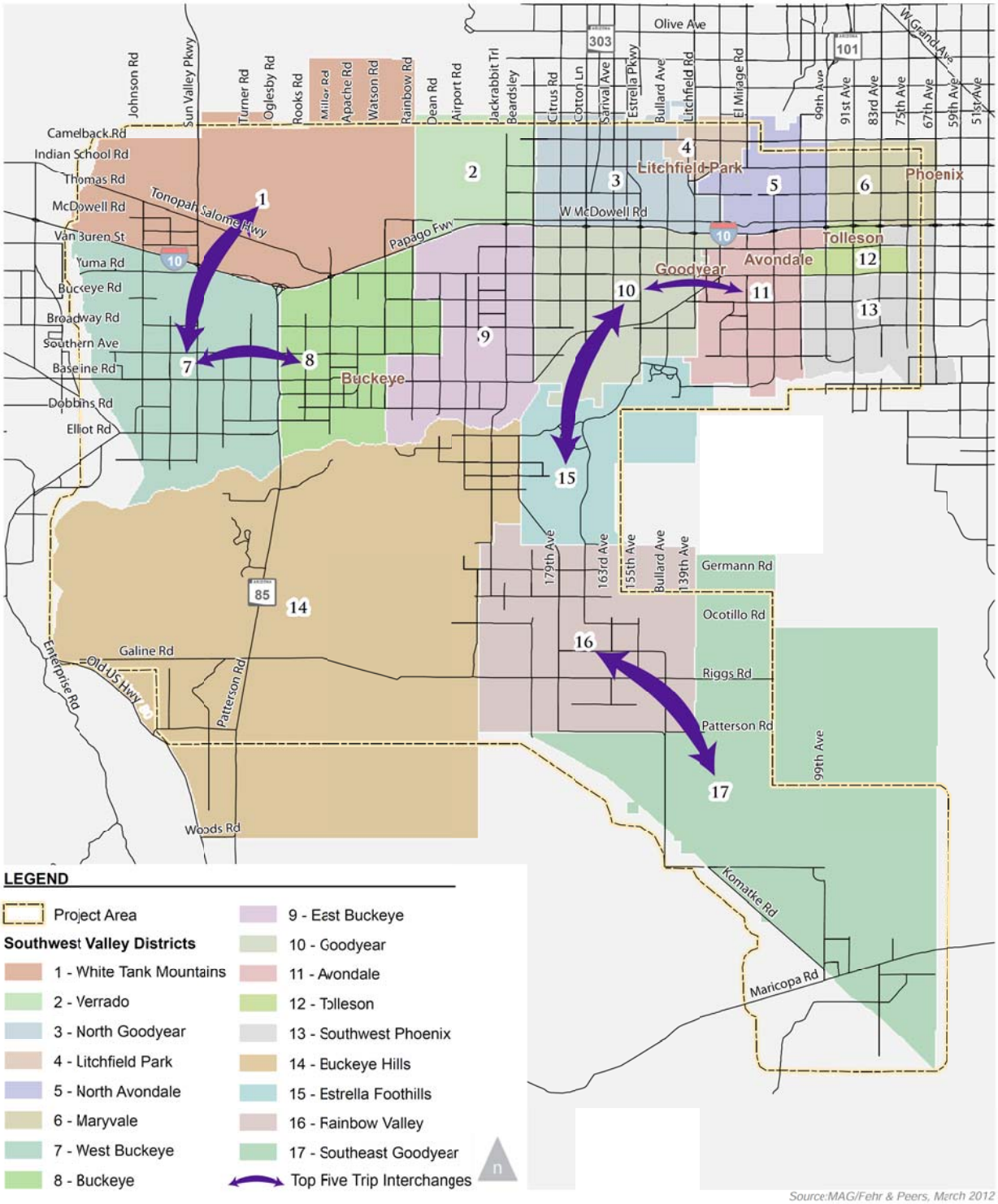

Figure 19

Southwest Valley Trip Interchanges (Top Five)
Home-Based-Work Trips, 2031

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District Level Internal Trips

Just as the districts with the major trip interchanges become candidates for provision of local connecting transit services, districts with a large number of internal trips can be viewed as candidates for circulator types of services. The districts with the highest number (top five) of internal daily trips were also identified as shown in **Tables 7** and **8** for the years 2010 and 2031, respectively.

Table 7 District Level Daily Internal Trips 2010 Top Five

Total Daily Trips		
Rank	District Name (Number)	Trips
1	Maryvale (6)	87,770
2	Buckeye (8)	56,010
3	Avondale (11)	48,050
4	North Avondale (5)	43,630
5	Southwest Phoenix (13)	43,020
Daily Work Trips		
Rank	District Name (Number)	Trips
1	Buckeye (8)	5,990
2	Maryvale (6)	4,470
3	Southwest Phoenix (13)	3,680
4	Avondale (11)	3,440
5	Goodyear (10)	3,390

Source: MAG/Fehr & Peers, March, 2012

Table 8 District Level Daily Internal Trips 2031 Top Five

Total Daily Trips		
Rank	District Name (Number)	Trips
1	Rainbow Valley (16)	132,040
2	Buckeye (8)	132,650
3	Southeast Goodyear (17)	115,690
4	West Avondale (10)	113,280
5	East Buckeye (9)	102,240
Daily Work Trips		
Rank	District Name (Number)	Trips
1	Southeast Goodyear (17)	16,640
2	Goodyear (10)	13,500
3	Rainbow Valley (16)	12,020
4	Buckeye (8)	11,710
5	West Buckeye (7)	10,170

Source: MAG/Fehr & Peers, March, 2012

As shown, a large proportion and a number comparable to the district-to-district trips stay internal to the district (district level internal trips). In 2010, Maryvale (District 6) had the highest number of internal daily total trips, followed by Buckeye (District 8). Buckeye (District 8) had the highest number of internal daily work trips, followed by Maryvale (District 6).

As seen previously, the growth and development of the study area by 2031 results in a shift in travel activity to the south and west. Rainbow Valley (District 16) has the highest number of internal daily total trips and Southeast Goodyear (District 17) contains the highest number of internal daily work trips.

5.0 PRELIMINARY LONG RANGE SERVICE AREA

Based on the data analyses and travel pattern identifications, a preliminary long-range transit service area was defined, as presented in **Figure 20**. The factors considered in defining this preliminary transit service area included the following:

- Socio-economic indicators
- Development densities
- Downtown and major activity center locations, as shown in Working Paper #3
- Trip patterns

Development densities included population densities, employment densities and development scale. The density data and resulting maps were reviewed to identify areas of relatively higher density levels and concentrations. A working assumption was to include TAZs in the preliminary service area that meet at least two of the following thresholds:

- 500 + jobs/sq mi
- 1000 + populations/sq mi
- 2500 + combined jobs and population /sq mi

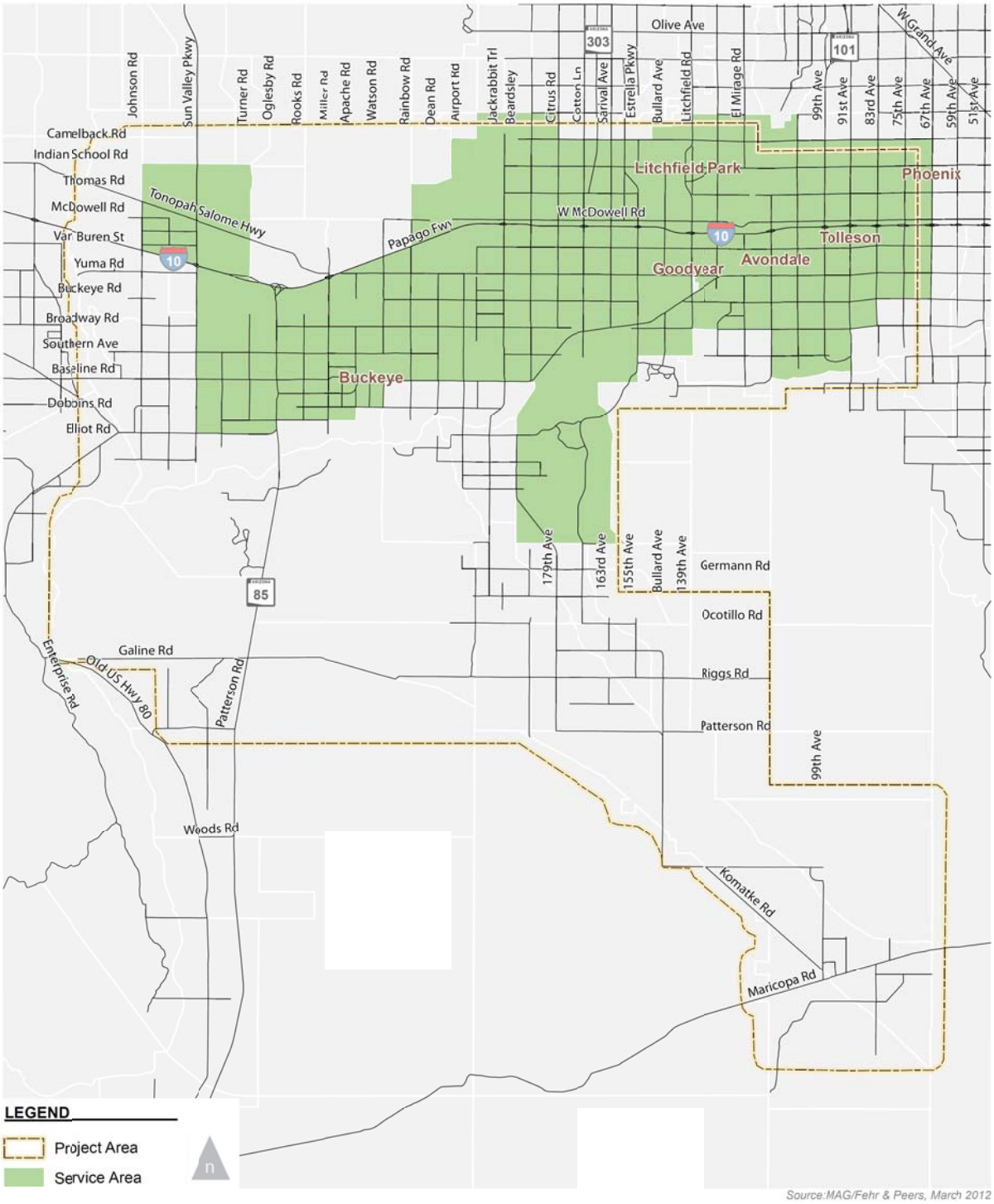
In addition, the preliminary service area definition considered the following:

- The inclusion of all downtowns and major activity centers
- The inclusion of districts as follows:
    - Top 5 districts of total trip ends
    - Top 5 districts of total trip interchanges
    - Top 5 districts of total work internal trips (with the exception of the southern most districts 16 and 17 due to large distance from the core service area.

The preliminary service area was based on a review of the aforementioned data which is intended to outline an area in which to focus planning efforts. This focused area represents the locations where transportation needs exist (based on trip and land use patterns) and areas where there may be a propensity for transit in the future (based on densities and activity centers).

<u>Conclusions</u>

The intent of this exercise was to define a preliminary long-range transit service area for the Southwest Valley which will be further refined in subsequent steps throughout this study process. Specifically, the identified service area will serve as the area of focus when developing and evaluating alternative transit service networks (based on transit needs for each time frame). Existing and planned transit services will be used as a starting point in the development of alternatives. Technical Memo #3 and Working Paper #4B will describe the methodology and concepts, respectively, for the alternatives development.



Source:MAG/Fehr & Peers, March 2012

Figure 20

Preliminary Long Range Service Area
Southwest Valley

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Appendix 1

District Trip Matrices

Southwest Valley

Total Trips Matrix, 2010

Districts		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	Sum
White Tank Mountains	**1**	7,385	890	362	42	336	82	650	1,834	616	308	201	75	77	167	82	5	1	3,304	**16,418**
Verrado	**2**	288	10,276	2,754	263	704	233	110	979	2,223	1,454	695	214	217	121	209	11	2	4,822	**25,574**
North Goodyear	**3**	143	1,507	38,322	4,761	9,743	1,136	77	611	1,110	8,647	6,383	711	830	103	450	19	3	17,226	**91,782**
Litchfield Park	**4**	36	251	6,418	10,390	5,351	1,043	26	163	180	1,559	2,411	497	483	34	124	5	1	15,822	**44,795**
North Avondale	**5**	78	392	10,958	3,808	43,631	11,835	60	361	376	3,447	12,866	3,920	3,455	82	295	13	2	44,706	**140,288**
Maryvale	**6**	39	176	1,054	471	7,253	87,768	29	170	170	966	4,981	7,398	8,114	40	157	7	1	104,689	**223,485**
West Buckeye	**7**	573	229	181	21	175	41	2,281	1,897	265	155	103	32	36	139	85	5	1	1,624	**7,842**
Buckeye	**8**	1,762	2,297	1,796	214	1,778	417	2,102	56,012	6,147	2,023	1,234	412	418	1,022	1,095	51	7	8,138	**86,926**
East Buckeye	**9**	582	2,664	2,680	180	994	317	205	4,861	12,188	3,599	1,256	278	292	355	723	32	4	5,405	**36,615**
Goodyear	**10**	174	1,369	11,638	989	3,961	1,167	121	1,058	2,641	32,533	10,558	930	1,135	239	1,370	41	6	15,373	**85,303**
Avondale	**11**	71	368	5,121	1,073	9,396	5,414	59	412	451	8,835	48,051	6,550	9,760	120	732	26	6	27,940	**124,385**
Tolleson	**12**	7	31	209	61	1,319	5,176	4	31	33	204	2,885	6,156	4,140	8	49	2	0	9,773	**30,087**
Southwest Phoenix	**13**	21	93	558	166	2,367	8,105	17	117	108	734	8,188	8,409	43,015	37	220	9	2	47,450	**119,617**
Buckeye Hills	**14**	44	110	152	24	169	57	85	469	311	319	202	59	88	3,456	2,047	141	7	1,179	**8,919**
Estrella Foothills	**15**	68	276	736	121	839	287	138	913	655	1,926	1,329	334	603	1,258	21,687	418	25	5,054	**36,667**
Rainbow Valley	**16**	4	15	28	5	38	13	7	47	34	56	41	11	19	94	302	631	20	321	**1,684**
Southeast Goodyear	**17**	1	4	7	1	6	4	2	11	7	11	10	2	5	10	39	22	1,380	608	**2,130**
External to Study Area	**18**	1,224	3,346	17,903	8,882	24,671	62,718	880	3,277	2,615	9,885	17,831	15,615	31,432	1,302	1,941	116	295	13,531,360	**13,735,292**
Sum		**12,500**	**24,296**	**100,876**	**31,472**	**112,731**	**185,813**	**6,852**	**73,223**	**30,128**	**76,660**	**119,229**	**51,603**	**104,120**	**8,586**	**31,606**	**1,556**	**1,764**	**13,844,794**	**14,817,808**

Note: District 18 includes all TAZ outside of the study area.

Southwest Valley

Home-Based-Work Trips Matrix, 2010

Districts		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	Sum
White Tank Mountains	**1**	511	141	124	15	36	37	239	476	125	123	80	59	45	139	30	1	0	1,469	**3,649**
Verrado	**2**	63	671	423	56	96	96	69	334	295	335	214	161	125	74	71	3	1	2,244	**5,331**
North Goodyear	**3**	41	223	1,788	205	317	228	44	215	179	823	553	379	301	49	95	4	1	5,053	**10,497**
Litchfield Park	**4**	19	107	781	491	494	276	20	100	84	490	496	373	285	24	54	2	0	6,596	**10,690**
North Avondale	**5**	45	206	1,428	425	2,487	1,239	48	238	195	1,153	1,880	1,649	1,190	56	122	5	1	19,656	**32,024**
Maryvale	**6**	22	105	514	146	740	4,469	23	110	96	552	1,068	2,162	2,038	26	64	2	0	34,931	**47,069**
West Buckeye	**7**	78	51	65	8	20	18	243	238	51	61	37	24	18	100	31	1	0	636	**1,680**
Buckeye	**8**	379	666	800	116	288	261	843	5,991	967	911	586	349	279	760	527	18	2	4,770	**18,512**
East Buckeye	**9**	123	452	514	59	143	150	117	826	918	650	302	211	170	147	225	8	1	2,822	**7,838**
Goodyear	**10**	66	370	1,498	172	428	386	81	436	465	3,386	1,201	612	521	119	351	12	2	7,749	**17,856**
Avondale	**11**	30	149	999	194	827	691	41	208	165	1,868	3,441	1,962	1,545	63	247	8	3	12,541	**24,984**
Tolleson	**12**	2	9	46	10	64	216	2	11	9	57	185	812	325	3	8	0	0	2,523	**4,281**
Southwest Phoenix	**13**	9	43	214	44	261	751	12	62	47	353	916	2,353	3,679	18	63	2	0	16,684	**25,510**
Buckeye Hills	**14**	10	38	58	8	20	20	31	150	81	140	67	42	40	151	308	14	3	460	**1,640**
Estrella Foothills	**15**	33	131	292	40	104	108	104	521	272	817	390	244	241	275	1,768	53	12	2,552	**7,957**
Rainbow Valley	**16**	1	5	9	1	3	3	4	20	11	23	11	7	6	28	69	34	8	81	**325**
Southeast Goodyear	**17**	0	1	2	0	1	1	1	3	2	4	2	1	1	4	14	5	184	205	**431**
External to Study Area	**18**	428	1,485	5,861	1,762	3,987	9,202	431	1,540	1,167	4,875	6,104	8,901	9,745	808	645	26	96	2,617,921	**2,674,985**
Sum		**1,862**	**4,854**	**15,417**	**3,753**	**10,316**	**18,150**	**2,352**	**11,480**	**5,129**	**16,621**	**17,532**	**20,301**	**20,554**	**2,842**	**4,692**	**198**	**314**	**2,738,893**	**2,895,259**

Note: District 18 includes all TAZ outside of the study area.

Southwest Valley

Total Trips Matrix, 2031

Districts		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	Sum
White Tank Mountains	**1**	72,263	3,178	1,341	147	2,690	267	15,552	9,462	3,589	1,953	711	255	296	885	273	146	56	56,374	**169,439**
Verrado	**2**	2,185	40,995	10,584	621	2,418	524	1,552	3,757	10,950	5,729	1,496	502	581	317	463	225	77	31,640	**114,617**
North Goodyear	**3**	672	5,078	72,874	6,207	9,456	1,328	624	1,388	4,168	22,140	6,784	886	1,176	160	794	264	86	31,508	**165,596**
Litchfield Park	**4**	121	502	9,846	10,673	6,126	847	124	227	484	3,116	2,475	447	531	34	142	51	22	18,734	**54,502**
North Avondale	**5**	258	735	12,088	4,714	67,256	11,220	271	481	977	6,707	17,870	5,054	4,538	82	348	125	55	50,274	**183,051**
Maryvale	**6**	152	324	1,597	599	11,634	92,587	155	248	471	2,073	8,455	10,470	10,435	55	213	100	49	104,427	**244,043**
West Buckeye	**7**	10,386	1,261	1,058	124	2,220	223	88,433	18,116	2,979	1,552	563	179	222	1,455	681	435	124	33,233	**163,245**
Buckeye	**8**	10,404	5,699	3,196	440	4,147	763	29,637	132,041	22,886	6,110	2,032	591	835	2,063	2,005	1,474	453	29,880	**254,657**
East Buckeye	**9**	3,059	9,652	7,245	565	3,646	978	4,386	20,992	102,237	18,395	2,874	725	1,203	1,418	3,061	1,856	704	25,104	**208,098**
Goodyear	**10**	1,087	4,165	32,625	1,857	7,102	1,921	1,194	3,379	14,134	113,278	16,236	1,680	2,913	490	4,969	1,157	554	36,052	**244,793**
Avondale	**11**	275	660	7,194	1,211	13,899	5,956	324	734	1,581	17,364	80,793	8,011	14,367	167	1,203	415	159	35,462	**189,776**
Tolleson	**12**	27	61	343	82	2,707	6,352	27	51	103	502	5,834	8,036	6,485	11	69	28	11	11,098	**41,825**
Southwest Phoenix	**13**	118	236	1,156	274	4,945	12,637	157	333	597	2,847	19,186	14,150	75,330	96	575	267	122	69,263	**202,291**
Buckeye Hills	**14**	532	423	399	46	675	96	1,898	2,410	2,620	1,188	361	86	174	27,836	2,548	1,985	388	6,656	**50,321**
Estrella Foothills	**15**	1,088	1,921	5,652	397	3,614	756	3,399	6,176	9,424	17,906	4,628	977	1,966	4,500	98,535	18,270	2,937	28,330	**210,477**
Rainbow Valley	**16**	614	997	1,301	158	2,904	337	1,706	3,063	3,987	4,403	1,472	404	828	2,404	11,740	132,647	14,116	26,189	**209,270**
Southeast Goodyear	**17**	131	192	275	37	968	84	323	567	708	805	306	70	164	370	1,564	8,631	115,685	14,914	**145,794**
External to Study Area	**18**	18,559	12,852	34,359	13,871	48,928	89,948	12,918	10,496	13,392	32,455	36,174	24,400	62,185	3,567	7,711	7,304	27,285	19,871,844	**20,328,246**
Sum		**121,930**	**88,930**	**203,132**	**42,019**	**195,337**	**226,825**	**162,680**	**213,921**	**195,289**	**258,524**	**208,249**	**76,924**	**184,230**	**45,911**	**136,894**	**175,381**	**162,881**	**20,480,984**	**23,180,041**

Note: District 18 includes all TAZ outside of the study area.

Southwest Valley

Home-Based-Work Trips Matrix, 2031

Districts		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	Sum
White Tank Mountains	**1**	6,861	1,017	729	82	204	178	4,670	2,700	1,248	1,152	473	219	223	547	71	25	7	17,808	**38,214**
Verrado	**2**	573	2,966	2,175	259	460	338	734	1,067	1,872	2,274	914	429	437	145	93	31	9	11,290	**26,067**
North Goodyear	**3**	149	510	3,668	433	626	436	192	287	517	2,433	1,145	519	512	40	81	21	6	9,382	**20,957**
Litchfield Park	**4**	41	133	895	529	659	389	54	80	149	838	698	332	325	11	25	6	2	7,168	**12,334**
North Avondale	**5**	96	255	1,564	497	4,192	1,848	125	186	343	2,034	3,006	1,712	1,539	27	56	14	5	20,798	**38,296**
Maryvale	**6**	60	139	616	172	1,391	4,843	69	92	178	996	1,617	2,283	2,498	18	45	27	11	33,466	**48,523**
West Buckeye	**7**	2,327	553	567	68	171	142	10,171	2,823	857	826	334	146	141	752	298	225	63	10,596	**31,059**
Buckeye	**8**	2,542	1,891	1,859	307	744	598	5,061	11,706	4,079	3,425	1,426	523	629	1,046	936	937	312	14,526	**52,548**
East Buckeye	**9**	712	1,823	2,240	278	719	687	1,074	2,373	7,068	5,101	1,500	595	821	469	1,044	989	507	12,868	**40,872**
Goodyear	**10**	283	822	3,549	408	1,090	909	385	690	1,605	13,499	3,174	1,158	1,463	122	611	270	304	17,391	**47,733**
Avondale	**11**	79	198	1,176	243	1,468	1,111	105	184	355	3,612	6,203	2,151	2,429	41	206	126	52	15,640	**35,380**
Tolleson	**12**	6	15	66	13	174	375	7	10	20	123	320	920	505	2	9	7	3	2,812	**5,387**
Southwest Phoenix	**13**	35	86	400	81	770	1,579	49	92	174	1,274	2,249	3,358	6,619	25	138	110	49	24,671	**41,761**
Buckeye Hills	**14**	162	178	189	22	57	51	550	661	569	577	179	66	99	2,932	300	387	195	2,720	**9,893**
Estrella Foothills	**15**	662	1,179	1,716	208	529	477	2,066	3,497	4,049	6,604	2,076	835	1,296	1,469	6,017	2,520	1,174	15,573	**51,947**
Rainbow Valley	**16**	379	666	805	93	236	212	1,199	2,026	2,344	2,927	914	344	582	1,006	2,745	12,023	5,844	11,717	**46,063**
Southeast Goodyear	**17**	58	100	124	15	38	34	179	301	344	425	126	47	73	155	400	2,132	16,638	5,030	**26,218**
External to Study Area	**18**	3,906	3,678	11,066	2,710	8,862	15,875	3,776	3,067	4,141	15,314	13,503	12,678	20,751	1,086	1,396	1,415	4,805	3,901,241	**4,029,269**
Sum		**18,931**	**16,210**	**33,405**	**6,419**	**22,391**	**30,081**	**30,466**	**31,842**	**29,911**	**63,436**	**39,857**	**28,315**	**40,945**	**9,891**	**14,470**	**21,267**	**29,986**	**4,134,696**	**4,602,519**

Note: District 18 includes all TAZ outside of the study area.