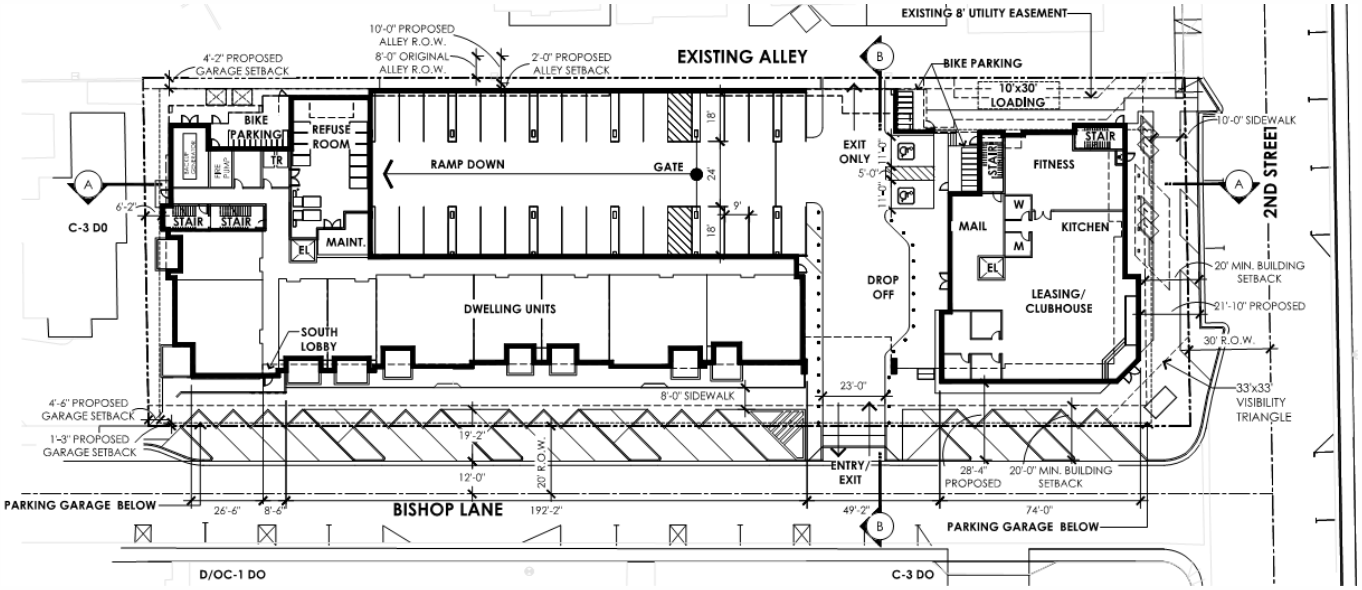
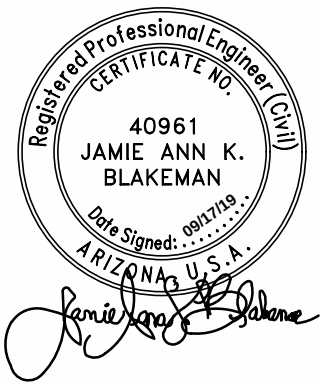
2nd Street and Bishop Lane

Parking Master Plan





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Project Number: 19.5022
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1. EXECUTIVE SUMMARY

Lōkahi, LLC was retained by The Morgan Group, Inc. to complete a Parking Master Plan for the proposed 2nd Street and Bishop Lane residential development located in Scottsdale, Arizona, and is bound by 2nd Street to the north and Bishop Lane to the east. It is a proposed 1.54-acre residential development which will be comprised of 199 multifamily units, including 72 studio, 91 1-bedroom and 36 2-bedroom units, in an 8-story development. The objective of this Parking Master Plan is to establish that the **250 total parking spaces provided on site, will provide sufficient parking** for the proposed 2nd Street and Bishop Lane residential development.

A total of 240 parking stalls will be located in a subsurface parking garage, beneath the development while the remaining 10 parking stalls will be located at-grade. A gate will be provided on-site at the access point to the subsurface parking garage, allowing only residents and permitted guests to enter.

Each of the 199 multifamily units will be assigned one (1) parking stall within the subsurface parking garage, and the remaining 51 parking stalls unassigned. The proposed 2nd Street and Bishop Lane residential development is anticipated to operate with between 3 and 5 employees.

Modifications of the existing curb adjacent north and east curb lines adjacent to the proposed development will be completed to increase public parking in the area. The curb line on the north side of the property will be modified to provide parallel parking stalls, and the curb line on the east side of the property will be modified to provide angled parking stalls. This results in a total of 20 public on-street parking stalls.

City of Scottsdale Required Parking

Using *Table 9.103.B.* entitled Schedule of Parking Requirements in Downtown, parking requirements for the proposed 2nd Street and Bishop Lane were calculated resulting in a parking requirement of 235 parking stalls. The proposed 2nd Street and Bishop Lane will have 250 parking stalls, which results in a **surplus of 15 parking stalls (+6.4%)**.

ITE Parking Generation

The ITE Parking Generation, 5th Edition Manual estimates parking demand based on research and experiences of transportation engineering and planning professionals. The available average and 85th percentile parking demand calculations for General Urban/Suburban (no nearby rail transit) on a weekday and weekend were calculated based on *The ITE Parking Generation, 5th Edition Manual* rates. The weekday 85th percentile results in the highest parking demand with 205 parking stalls. This results in a **surplus of 45 (+22.0%) parking stalls**.

Other Local Cities Required Parking

The City of Tempe is actively implementing lower parking requirements. Using Tempe's Downtown parking requirements for the 199-unit 2nd Street and Bishop Lane residential development results in a total of 138 parking spaces, **representing a surplus of 112 parking spaces (+81.2%).**

Additionally, Chandler's City Council recently approved amendments to the zoning code in preparation for changes in transportation behavior resulting from ride sharing and autonomous vehicles, which allows up to 40% reductions. Applying the City of Chandler's parking criteria with a 40% reduction results in a total of 170 parking spaces, which results in a **surplus of 80 parking spaces (+47.1%)**.

Parking Summary

	Reference Table	Parking Stalls (250 proposed)	Parking Surplus
City of Scottsdale Code			
Downtown Parking Requirement	1	235	15
ITE Parking Generation			
General Urban/Suburban, Weekday (average)	2	177	73
General Urban/Suburban, Weekday (85th percentile)	3	205	45
General Urban/Suburban, Weekend	4	181	69
Other Cities in Arizona			
City of Tempe	5	138	112
City of Chandler	6	170	80

MAG Demographic Data

Vehicle ownership within the MAG Map boundary that includes the proposed 2nd Street and Bishop Lane development is 9.4% lower than that of the national average. Additionally, Area B, which is also within the Old Town Scottsdale boundaries, has an average vehicle ownership rate that is 38.2% lower than the national vehicle ownership rate.

This data shows that the proposed development is located in an area where residents are choosing to own few vehicles per household than the national and state averages. Therefore, when compared to national standards such as the ITE Parking Generation, it can be anticipated this area has a parking demand significantly lower than the published national rates.

Parking Trends – In the News

There is a great deal of information in various publications regarding parking needs of multi-family developments. The overriding theme is that there are ongoing changes in land use and transportation that are driving down the demand for parking. Old Town Scottsdale is increasingly becoming a premier locale for walking, biking, and transit services. Ride-hailing services are becoming increasingly popular and can eliminate the need for personal vehicles entirely.

In conclusion, the request to provide 250 parking stalls for the proposed 2nd Street and Bishop Lane development results in a surplus of parking based on the City of Scottsdale Parking Requirements, the ITE Parking Generation, and other local cities. According to the MAG Map, the average vehicle ownership within the two Old Town Scottsdale MAG Map boundaries are between 9.4% and 38.2% lower than that of the national average vehicle ownership rate.

Additionally, the proposed development is located in Old Town Scottsdale within close proximity to nearby shopping, restaurants, and night life, which promotes and invites alternative modes of travel. The growing popularity of rideshare services such as Uber and Lyft, and bikeshare services, all contribute to the reliance on personal vehicles, and thereby reducing parking demand.

In addition to the 250 private parking stalls provided on-site, the proposed development will modify the existing adjacent curbs to provide 20 public on-street parking stalls.

Therefore, based upon the detailed analysis in this Parking Master Plan, the 250 proposed parking spaces is anticipated to exceed the parking demand for the 2nd Street and Bishop Lane residential development.

2. INTRODUCTION

Lōkahi, LLC was retained by The Morgan Group Inc, to complete a Parking Master Plan for the proposed 2nd Street and Bishop Lane residential development located in Scottsdale, Arizona. The proposed residential development will be located on the southwest corner (SWC) of the intersection of 2nd Street and Bishop Lane.

The proposed development includes the following multifamily units:

- Studio 72 dwelling units
- 1-Bedroom 91 dwelling units
- 2-Bedroom 36 dwelling units

Scope of Study

This Parking Master Plan calculates the number of parking spaces required for the proposed development based on the City of Scottsdale Code and other nearby City requirements. Ultimately, the objective of this Parking Master Plan is to establish that the 250 total parking spaces provided on site, will provide sufficient parking for the proposed 2nd Street and Bishop Lane residential development.

Surrounding Area

The study area is located in the Old Town area of City of Scottsdale, Arizona. The proposed development is bordered by 2nd Street to the north, Bishop Lane to the east, an alley to the west, and a commercial property to the south. See **Figure 1** for a vicinity map.

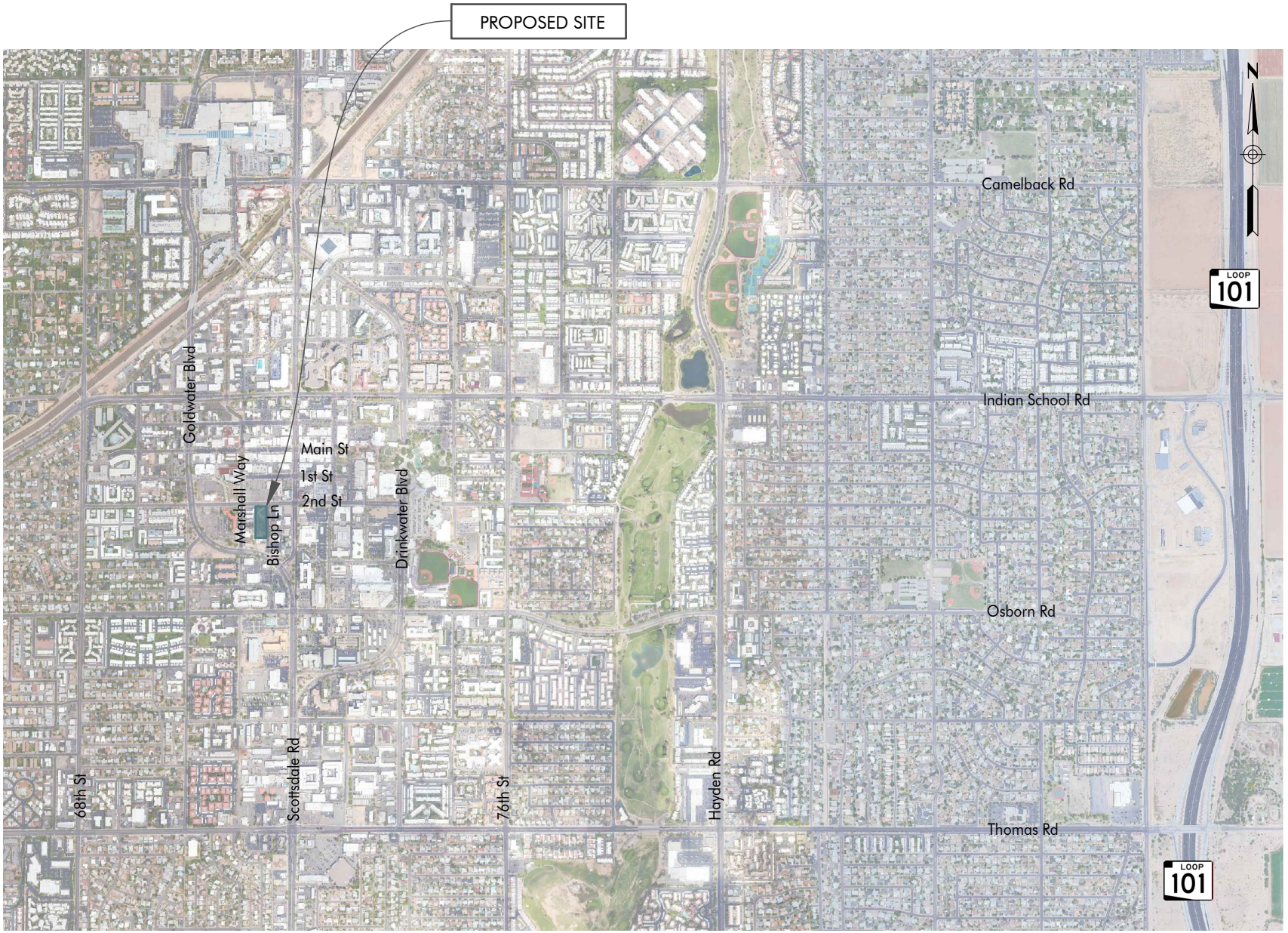


FIGURE 1 | VICINITY MAP

3. PROPOSED DEVELOPMENT

The proposed 2nd Street and Bishop Lane residential development will be comprised of 199 multifamily units in an eight-story development. Of the 199 multifamily units, 72 will be studio units, 91 are 1-bedroom units, and 36 are 2-bedroom units.

The proposed development will provide one (1) full access point, located along Bishop Lane, approximately 150 feet south of 2nd Street. This will be a full-access driveway allowing all movements into and out of the site. Additionally, an exit-only driveway will connect to the existing alley located immediately west of the proposed development.

The target market audience for the 2nd Street and Bishop Lane residential development is the age range of 29 to 40 years old. The proposed 2nd Street and Bishop Lane residential development is anticipated to operate with between 3 and 5 employees.

See **Figure 2** and **Appendix A** for the detailed site plan.

Proposed Parking

The proposed 2nd Street and Bishop Lane residential development will provide 250 parking stalls. A total of 240 parking stalls will be located in a subsurface parking garage, beneath the development while the remaining 10 parking stalls will be located at-grade. A gate will be provided on-site at the access point to the subsurface parking garage, allowing only residents and permitted guests to enter.

Each of the 199 multifamily units will be assigned one (1) parking stall within the subsurface parking garage. The remaining 51 parking stalls will be unassigned.

Modifications of the existing curb adjacent north and east curb lines adjacent to the proposed development will be completed to increase public parking in the area. The curb line on the north side of the property will be modified to provide parallel parking stalls, and the curb line on the east side of the property will be modified to provide angled parking stalls. This results in a total of 20 public on-street parking stalls.

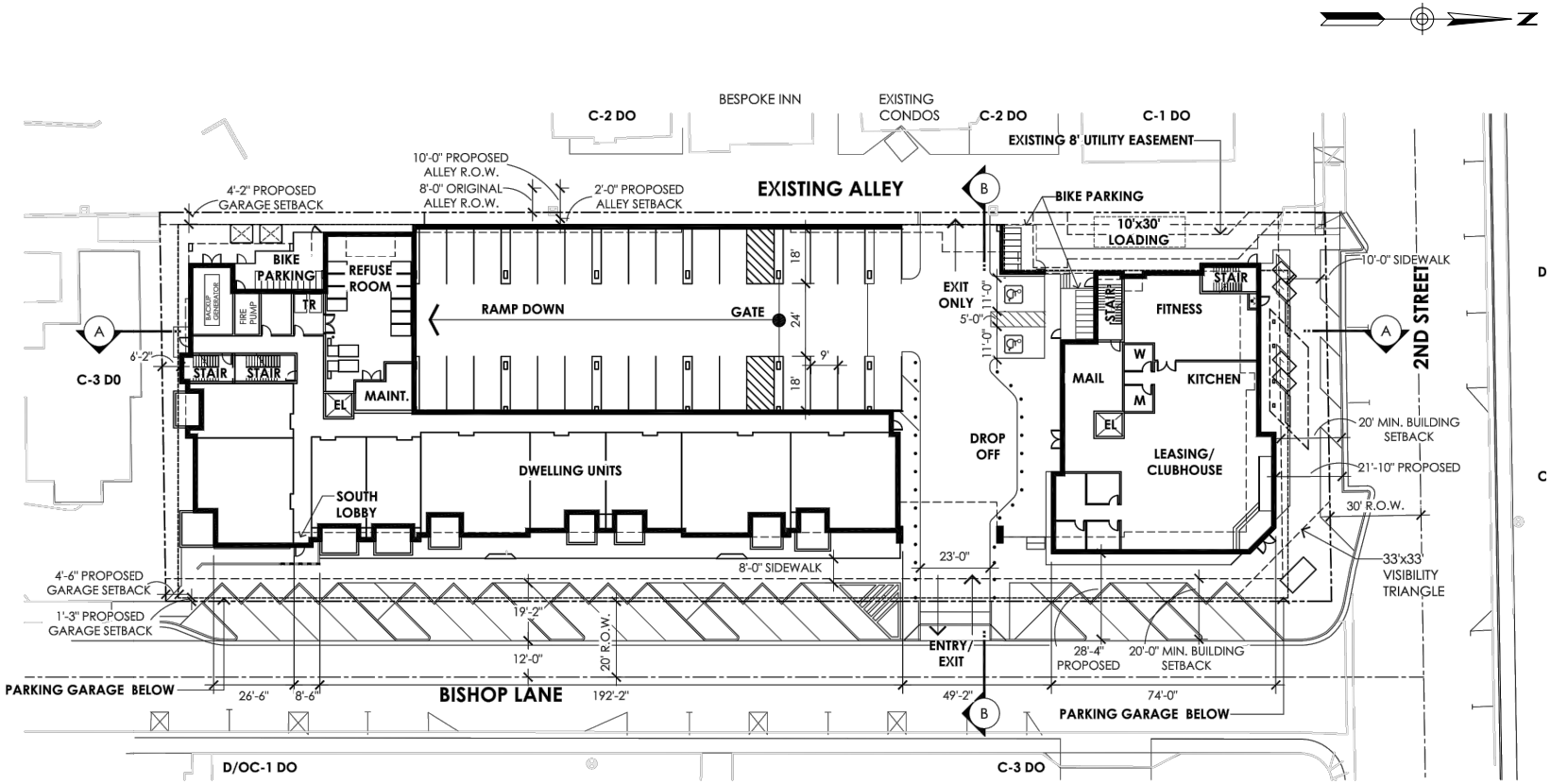


FIGURE 2 | SITE PLAN

4. CITY OF SCOTTSDALE REQUIRED PARKING

The proposed 2nd Street and Bishop Lane residential development will be comprised of:

- Studio 72 dwelling units
- 1-bedroom 91 dwelling units
- 2-bedroom 36 dwelling units

Table 9.103.B. entitled Schedule of Parking Requirements in Downtown, provides the general parking requirements. See **Appendix B**. The following categories and vehicle parking ratios minimums are relevant the proposed 2nd Street and Bishop Lane development land use:

- 1 bedroom or less 1 per dwelling unit
- 2 bedroom or more 2 per dwelling unit

Applying these rates to the proposed 2nd Street and Bishop Lane residential development results in the following parking requirement, see **Table 1**.

Table 1 – Scottsdale Parking Requirement

Use	Rate		Quantity	Units	Parking Stalls (250 proposed)
Dwellings, mult-family (1 Bedroom)	1	Per Dwelling Unit	163	Dwelling Units	163
Dwellings, mult-family (2+ Bedroom)	2	Per Dwelling Unit	36	Dwelling Units	72
				Total	**235**

Conclusion:
The City of Scottsdale parking requirement was calculated for the proposed 2nd Street and Bishop Lane residential development, which is a total of 235 parking stalls. The proposed 2nd Street and Bishop Lane Development is providing 250 parking stalls, which results in a surplus of 15 parking stalls (+6.4%).

5. ITE PARKING GENERATION

The Institute of Transportation Engineers (ITE) publication titled *Parking Generation, 5th Edition* is utilized for estimating parking demand based on research and experiences of transportation engineering and planning professionals.

The land use category that most closely represents the proposed 2nd Street and Bishop Lane development is Land Use 221.

Multifamily Housing (Mid-Rise) (Land Use 221)

Land Use 221 - Mid-rise multifamily housing includes apartments, townhouses, and condominiums located within the same building with at least three other dwelling units and with between three and 10 levels (floors) of residence.

The average weekday peak period parking demand for General Urban/Suburban (no nearby rail transit) site is 0.75 parking stalls per bedroom, and the 85th percentile peak period parking demand is 0.87 parking stalls per bedroom.

The average and 85th percentile weekday ITE peak period parking demand calculations for General Urban/Suburban locations are presented below in **Table 2** and **Table 3**, respectively.

Table 2 – ITE Parking Demand (Average - Weekday)

	Weekday Rate	Quantity	Units	Parking Stalls (250 proposed)
Dwellings, mid-rise (General Urban/Suburban, Weekday)	0.75	235	Bedrooms	177

Table 3 – ITE Parking Demand (85th Percentile - Weekday)

	Weekday Rate	Quantity	Units	Parking Stalls (250 proposed)
Dwellings, mid-rise (General Urban/Suburban, Weekday)	0.87	235	Bedrooms	205

Additionally, the average weekend (Saturday) peak period parking demand was 0.77 parking stalls per bedroom. The 85th percentile peak period parking demand is not provided for Land Use 221 in the *Parking Generation, 5th Edition.*

The weekend peak period parking demand calculations for General Urban/Suburban locations is presented below in **Table 4**.

Table 4 – ITE Parking Demand (Average - Weekend)

	Saturday Rate	Quantity	Units	Parking Stalls (250 proposed)
Dwellings, mid-rise (General Urban/Suburban, Saturday)	0.77	235	Bedrooms	181

Conclusion:

The parking demand calculations for General Urban/Suburban Land Uses based on *the ITE Parking Generation, 5th Edition* data shows that the 250 proposed parking stalls for the proposed 2nd Street and Bishop Lane residential development would provide more than adequate parking during a weekday and a Saturday peak period. The weekday 85th percentile results in the highest parking demand with 205 parking stalls. This results in a surplus of 45 (+22.0%) parking stalls.

6. OTHER LOCAL CITIES REQUIRED PARKING

The parking requirements for other nearby cities were researched for comparison. Locally, the City of Tempe has the lowest parking requirements for apartments within the city center district. The City of Mesa provides reduced parking requirement rates if located within ¼ mile of a bus transit station. Additionally, the City of Chandler recently passed zoning code amendments to provide the City with more flexibility to reduce minimum parking requirements as parking demand changes as a result of ride sharing and expected arrival of autonomous vehicles. The following tables show the parking requirements based on the respective City codes.

City of Tempe

Table 4-607A entitled City Center District Parking Standards within the City of Tempe – Zoning and Development provides the Downtown Parking Standards, see **Appendix C**.

The minimum parking requirement for multi-family residential is:

- Studio 0.5 spaces per bedroom or 0.5 space per dwelling unit
- 1-bedroom 0.5 spaces per bedroom or 0.5 space per dwelling unit
- 2-bedroom 0.5 spaces per bedroom or 1.0 spaces per dwelling unit
- Guest 0.1 spaces per unit

Applying the City of Tempe's parking criteria to the 2nd Street and Bishop Lane residential development results in 138 parking stalls. See **Table 5**.

Table 5 – City of Tempe (Downtown Area) Parking Requirement

	Rate		Quantity	Unit	Parking Stalls (250 proposed)
Multi-Family, Studio and 1 Bedroom	0.5	Per Dwelling Unit	163	Dwelling Units	82
Multi-Family, 2 Bedroom	1	Per Dwelling Unit	36	Dwelling Units	36
Guest	0.1	Per Dwelling Unit	199	Dwelling Units	20
				Total	138

City of Chandler

On May 10, 2018, the City of Chandler's City Council approved the adoption of Ordinance No. 4811, ZCA18-001, which amends Article XVIII Parking and Loading Regulations of Chapter 35 (Zoning Code) of the Chandler City Code in preparation for changes in transportation behavior resulting from an increase in ride sharing and autonomous vehicles. See **Appendix C**.

The proposed amendment adds a section titled "Ride Sharing and Autonomous Vehicles" which allows for reduction in parking when warranted by changes in transportation behavior such as widespread acceptance and use of ride sharing practices and/or autonomous vehicles and when said parking reduction is balanced with an appropriate number of passenger loading zones and staging areas, and said changes are supported by parking demand studies.

Ordinance No. 4811, ZCA18-001 allows the City to administratively reduce the minimum parking requirement by as much as 40%. Applying the City of Chandler's parking criteria with a 40% reduction to the 199-unit 2nd Street and Bishop Lane residential development results in 170 parking stalls. See **Table 6**.

Table 6 – City of Chandler Parking Requirement (40% Reduction)

	Rate		Quantity	Unit	Parking Stalls (250 proposed)
Multi-Family, Studio	0.6	Per Dwelling Unit	72	Dwelling Units	44
Multi-Family 1 Bedroom	0.9	Per Dwelling Unit	91	Dwelling Units	82
Multi-Family, 2 Bedroom	1.2	Per Dwelling Unit	36	Dwelling Units	44
				Total	170

Conclusion:

The City of Tempe is actively implementing lower parking requirements. Using Tempe's Downtown parking requirements for the 199-unit 2nd Street and Bishop Lane residential development results in a total of 138 parking spaces, which results in a surplus of 112 parking spaces (+81.2%).

Additionally, Chandler's City Council recently approved amendments to the zoning code in preparation for changes in transportation behavior resulting from ride sharing and autonomous vehicles, which allows up to 40% reductions. Applying the City of Chandler's parking criteria with a 40% reduction results in a total of 170 parking spaces, which results in a surplus of 80 parking spaces (+47.1%).

7. MAG DEMOGRAPHIC DATA

The Maricopa Association of Government's (MAG) Arizona Demographic Map Viewer is an online tool that provides interactive population, housing, and other data for the State of Arizona. The available data is based upon the 2010 Census and the 2013-2017 5-year American Community Survey (ACS). The Arizona Demographic Map Viewer provides predefined geographical boundaries that cannot be modified.

In addition to general population and housing statistics, the MAG Map data also provides statistics on vehicle ownership. There are two MAG Map boundaries within Old Town Scottsdale. See **Figure 4** for area boundaries. See **Appendix D** for the detail MAG Map statistics for Area A and B.

Area A is bound by the Arizona Canal to the north, Scottsdale Road to the east, 68th Street and Goldwater Boulevard to the west, Osborn Road 2nd Street to the south. The proposed 2nd Street and Bishop Lane residential development is located within these boundaries.

- 50.6% are between the ages 25 and 44
- 84.2% responded as living within a building with 10 or more apartments
- Vehicles available per household
  - No vehicles 0.0%
  - 1 vehicle 50.8%
  - 2 vehicles 44.0%
  - 3+ vehicles 5.2%
- Taking the weighted average of the above and assuming the 3+ vehicle household owns 3 vehicles, the average vehicle ownership per household is 1.54

Area B is bound by Camelback Road to the north, Miller Road to the east, Osborn Road to the south, and Scottsdale Road to the west.

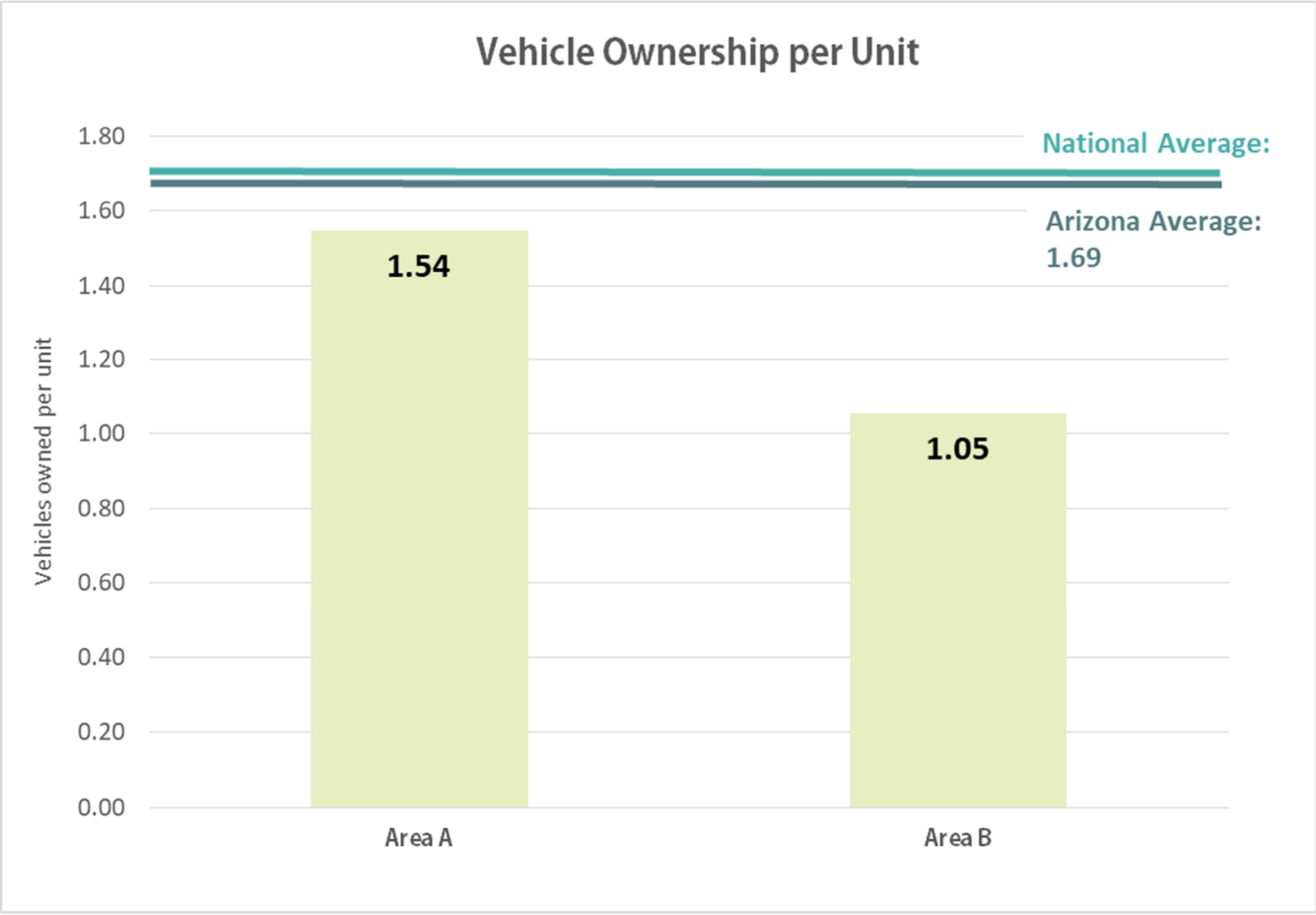
- 37.5% are between the ages 25 and 44
- 87.3% responded as living within a building with 10 or more apartments
- Vehicles available per household
  - No vehicles 8.9%
  - 1 vehicle 77.7%
  - 2 vehicles 12.7%
  - 3+ vehicles 0.7%
- Taking the weighted average of the above and assuming the 3+ vehicle household owns 3 vehicles, the average vehicle ownership per household is 1.05

According to the 2013-2017 5-year American Community Survey, the national average vehicle ownership is 1.70 vehicles per household and 1.69 in the State of Arizona. The vehicle ownership within the MAG Map boundary, Area A, that includes the proposed 2nd Street and Bishop Lane

development is significantly lower (-9.4%) than that of the national average. In addition, Area B, which is also within the Old Town Scottsdale boundaries has an even lower vehicle ownership rate. Area B's vehicle ownership rate is -38.2% lower than the national vehicle ownership rate. See **Figure 3** below.

The vehicle ownership characteristics of residents living in the Old Town Scottsdale area own significantly less vehicles per household than both the national and state average. **Section 8** describes car ownership trends declining in multi-family developments located within walking and bicycling distance to nearby retail and restaurants. The MAG Map data supports this trend.

Figure 3 - MAG Area Vehicle Ownership



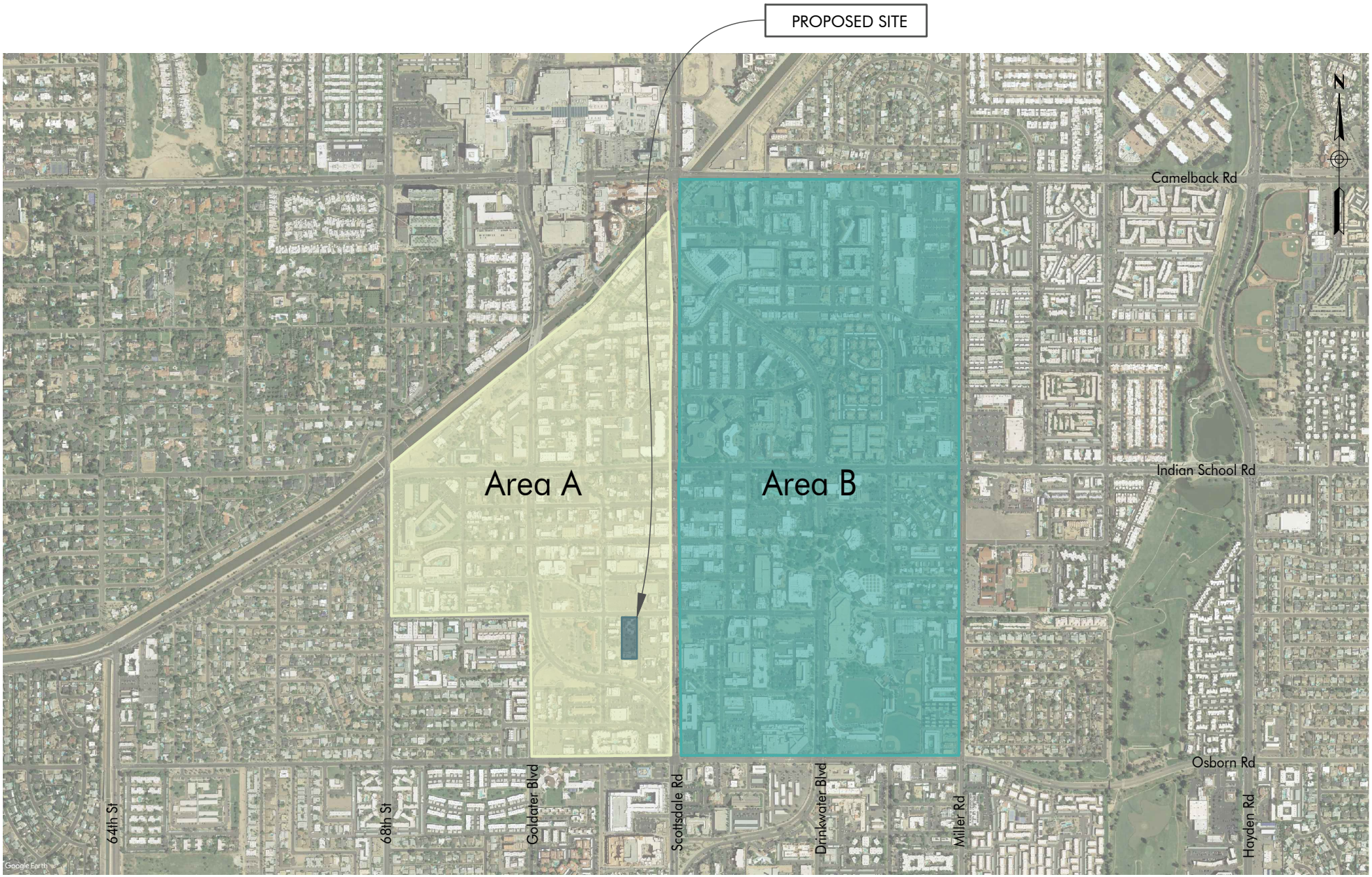


FIGURE 4 | MAG DEMOGRAPHIC AREAS

8. PARKING TRENDS – IN THE NEWS

There is a great deal of information in various publications regarding parking needs of multi-family developments. This section examines a small sample of books, articles, and significant points of interest.

The issue of parking needs for residential developments is not a new topic. In his book "The High Cost of Free Parking," published in 2005 by American Planning Association (revised in 2011), UCLA professor Donald Shoup found 129 articles reporting cities that have removed off-street parking requirement in their downtowns since 2005 in order "to promote the creation of downtown apartments (Greenfield, Massachusetts), to see more affordable housing (Miami), to give business owners more flexibility while creating a vibrant downtown (Sandpoint, Idaho), and to prevent ugly auto-oriented townhouses (Seattle)."

An extensive 2015 parking study "Right Size Parking" led by King County Metro gathered data from over 200 multi-family sites in King County, WA to determine that "existing multi-family parking capacity exceeded utilization by an average of 0.4 spaces per housing unit – a 40% oversupply". According to this report the RSP project has attracted national attention. Several regions and cities around the country are currently working to replicate the RSP study and web calculator concept for their own planning purposes, including the San Francisco Bay Area, Washington, D.C., Boston, and Chicago. Many regions are reexamining parking requirements in support of pedestrian-oriented design, transit access, and a compact mix of uses to include transportation choices." Website www.rightsizeparking.org also provides a multi-family residential parking calculator for King County area as well as guidance on unbundled parking prices and resulting rental prices adjustments.

The theme of livability and sustainability are common to much literature related to transportation and land planning in general. **Smart Growth America** published an article specific to the issue of parking needs entitled: *Empty Spaces: Real Parking Needs at Five TODs (Transit Oriented Developments).* Smart Growth America is a non-profit with the aim of improving lives by improving communities. Smart growth is described as an approach to development that encourages a mix of building types and uses, diverse housing and transportation options, development within existing neighborhoods, and community engagement. The article notes that the ITE Trip Generation and Parking Generation guides are based on data collected from mostly isolated suburban land uses – not walkable, urban places served by transit.

The article states: "…this study found that the five TODs generated fewer vehicle trips than ITE publications estimate, and used less parking than many regulations require for similar land uses. And in one case, actual vehicle trips were just one third of what ITE guidelines estimate."

The article goes on to conclude: "These findings underscore the obvious need for developers, regulators, and practitioners to rethink how they use parking guidelines intended for suburban development not served by transit. Current engineering standards are not designed to

accommodate this type of development but in time we hope studies like this can help change that. Better aligning industry standards with current needs can reduce the cost of development near transit, and make it easier to build more homes, shops, and offices in these high-demand locations."

This new focus on alternative transportation modes can take interesting twists in this new world of more cost-effective ride-hailing services, as evidenced by the Aug 8, 2017 article from the **Financial Post**: *Ontario Town's Experiment Using Uber As Public Transportation Is Working, Officials Say.* The following provides excerpts from this article.

The town of Innisfil, Ontario is hailing its two-month old experiment to subsidize Uber as the lone form of public transit as a success, with nearly 5,000 trips taken since the pilot project began in May. Innisfil — … home to about 36,000 people — has paid $26,462.41, or an average of $5.43 per trip, for 4,868 Uber rides taken in the two months since launching the unique-to-Canada project on May 15.

Creating additional transportation options across the sprawling area was declared a key priority in the community's strategic plan, but council found that a fixed-route bus service would be too costly, with a price tag of $270,000 per year for one bus, and $610,000 for two. Uber provides on-demand transit service to Innisfil residents that is partially subsidized by the municipality. Passengers pay between $3 and $5 for set routes within Innisfil, such as to Town Hall and the GO train station, and the town pays $5 for all other rides within town.

"We are really pleased we did go this route," said Paul Pentikainen, a senior policy advisor with the town. "This partnership with Uber had definitely proven to be a lot more cost effective for us, being able to provide this level of service to our residents."

Additionally, in May 2018, Choose Scottsdale reported that peer-to-peer car share venture Turo announced the opening of their Scottsdale office. The post indicates Turo, founded in 2009 and headquartered in San Francisco, is a car sharing marketplace where local car owners provide travelers with the perfect vehicle for their next adventure. The venture now operates in over 5,500 cities in North America and has facilitated over 1 million rental days to date. Choose Scottsdale reports that "Turo chose Scottsdale for it first expansion outside of San Francisco because of the region's existing talent and to bolster its success in one of its biggest markets." The post also quotes Mayor Lane, who said, in response to the announcement: "Innovation and technology are key drivers in Scottsdale's economic growth and we are excited to see Turo at the forefront of peer-to-peer car sharing. Their decision to expand operations and make additional investment is a testament to the positive business environment we have created in Scottsdale." The Turo office will be located at 4110 N. Scottsdale Road, in downtown Scottsdale.
A recent (May 8th, 2018) article found on Nation Real Estate Investor, www.nreionline.com, begins to give some idea of recent parking trends for apartment developments:

Apartment Developers Try to Figure Out the Parking Equation in a World with Fewer Cars

The article states that while apartment renters may still be dependent on their person vehicles, tenants are less dependent on automobiles more than they have been in recent years. The author claims that automobile dependency is lower in areas that tenants are able to walk to nearby amenities and have access to additional transportation methods.

This post continues on to discuss a successful apartment developer, which claims to provide parking stalls at a rate of "….typically 0.5 to 1.5 per apartment." Additionally, this developer even claims to see apartments being developed in urban areas without providing any parking at all.

An additional article entitled, *Toward Zero Parking: Challenging Conventional Wisdom for Multifamily*, by David Baker and Brad Leibon (July 2nd, 2018), mentions additional benefits with the recent shift in transportation trends:

> *"With the ubiquity of ride-hailing services, residents can walk out their front door, hop in a vehicle, and get dropped off at their destination rather than risk having to drive themselves, park several blocks from their destination, and walk the remaining distance, or walk through a parking garage getting to and from a car."*

The author of this article also notes that, "A future not dominated by privately owned cars may be a long way off, but increasingly the use of a car is becoming detached from the need for parking."

This brief summary of interconnected articles on the topic of parking needs in the news is by no means comprehensive, but does serve to point to several important issues when assessing parking needs as part of continued redevelopment in Old Town Scottsdale for developments that are located within an easy walking distances from retail and restaurant uses. See **Appendix E** for the articles referenced in this section.

9. RECOMMENDATIONS & CONCLUSIONS

Through this Parking Master Plan, the proposed 199-unit 2nd Street and Bishop Lane residential development is **requesting approval to provide 250 total parking spaces.**

Proposed Parking

Each of the 199 multifamily units will be assigned one (1) parking stall within the subsurface parking garage. The remaining 51 parking stalls will be unassigned. A total of 240 parking stalls will be located in a subsurface parking garage, beneath the development while the remaining 10 parking stalls will be located at-grade. The proposed 2nd Street and Bishop Lane residential development is anticipated to operate with 3 to 5 employees at any given time.

In addition to the 250 private parking stalls provided on-site, modifications to the existing adjacent curb lines are proposed which will provide a total of 20 public on-street parking stalls.

Parking Calculations

The proposed 250 parking stalls:

- Exceeds the City of Scottsdale's parking requirement by 15 parking stalls (+6.4%)
- Exceeds the ITE Parking Generation's peak parking demand by 45 parking stalls (+22%)
- Exceeds the City of Tempe's Downtown parking requirements by 112 parking spaces (+81.2%)
- Exceeds the City of Chandler's reduced parking ordinance by 80 parking spaces (+47.1%)

Parking Summary

	Reference Table	Parking Stalls (250 proposed)	Parking Surplus
City of Scottsdale Code			
Downtown Parking Requirement	1	235	15
ITE Parking Generation			
General Urban/Suburban, Weekday (average)	2	177	73
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General Urban/Suburban, Weekend	4	181	69
Other Cities in Arizona			
City of Tempe	5	138	112
City of Chandler	6	170	80

MAG Demographic Data

The proposed 2nd Street and Bishop Lane development is located within and adjacent to MAG area that show significantly lower vehicle ownership than the start or national average. Residents living in Old Town Scottsdale choose to own fewer vehicles per household. Therefore, when compared to national standards such as the ITE Parking Generation, it can be anticipated this area has a parking demand significantly lower than the published national rates.

Parking Trends – In the News

There is a great deal of information in various publications regarding parking needs of multi-family developments. The overriding theme is that there are ongoing changes in land use and transportation that are driving down the demand for parking. Old Town Scottsdale is increasingly becoming a premier locale for walking, biking, and transit services. Ride-hailing services are becoming increasingly popular and can eliminate the need for personal vehicles entirely.

In conclusion, the request to provide 250 parking stalls for the proposed 2nd Street and Bishop Lane development results in a surplus of parking based on the City of Scottsdale Parking Requirements, the ITE Parking Generation, and other local cities. According to the MAG Map, the average vehicle ownership within the two Old Town Scottsdale MAG Map boundaries are between 9.4% and 38.2% lower than that of the national average vehicle ownership rate.

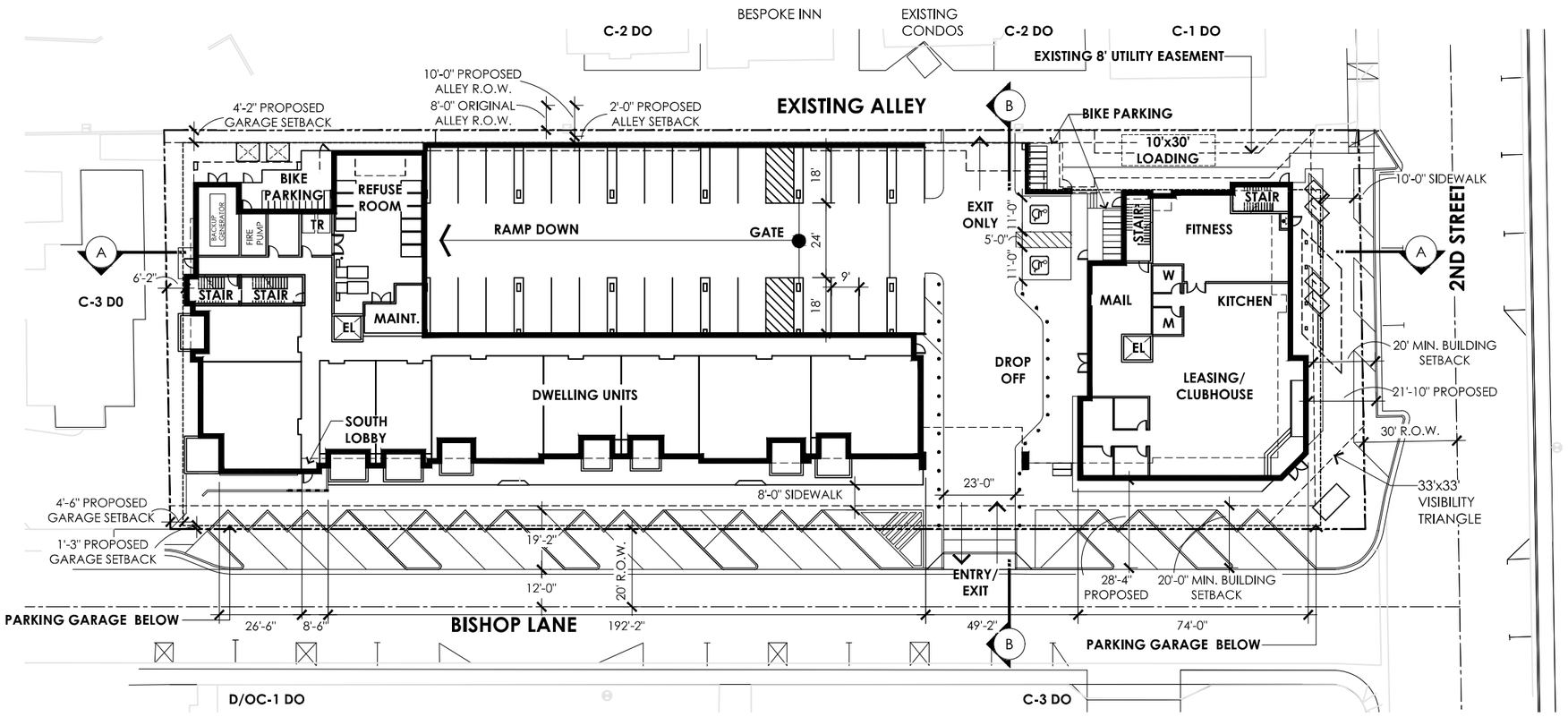
Additionally, the proposed development is located in Old Town Scottsdale within close proximity to nearby shopping, restaurants, and night life, which promotes and invites alternative modes of travel. The growing popularity of rideshare services such as Uber and Lyft, and bikeshare services, all contribute to the reliance on personal vehicles, and thereby reducing parking demand.

In addition to the 250 private parking stalls provided on-site, the proposed development will modify the existing adjacent curbs to provide a total of 20 public on-street parking stalls.

Therefore, based upon the detailed analysis in this Parking Master Plan, the 250 proposed parking spaces is anticipated to exceed the parking demand for the 2nd Street and Bishop Lane residential development.

Appendix A – Site Plan

A



SITE DATA

PROJECT NAME: BISHOP LANE
PARCEL ADDRESS: 7125 E 2nd ST

GROSS SITE AREA	+/- 1.54 AC
NET SITE AREA	+/- 1.13 AC
EXISTING ZONING	HIGHWAY COMMERCIAL, DOWNTOWN OVERLAY (C3, DO)
PROPOSED ZONING	DOWNTOWN, DOWNTOWN MULTIPLE USE TYPE 3, PLANNED BLOCK DEVELOPMENT, DOWNTOWN OVERLAY (D/DMU-3, PBD, DO)
DENSITY ALLOWED	+/- 50 DU/GROSS AC
GROSS DENSITY PROVIDED	+/- 129.22 DU/AC
OPEN SPACE REQUIRED:	NONE
OPEN SPACE PROVIDED:	±12,500 SF (±25%)

BUILDING HEIGHT: (PER TABLE 6.1310.C)

BUILDING HEIGHT MAX. ALLOWED W/BONUS:	90'
MAX. HEIGHT FOR BUILDING APPURTENANCES:	6'
BUILDING HEIGHT PROPOSED: (8 STORIES, W/ROOF DECK)	87'
BUILDING HEIGHT WITH APPURTENANCES PROPOSED:	95'

NOTE: BUILDING HEIGHT MEASURED PER CITY OF SCOTTSDALE DEFINITION. REFERENCE HEIGHT OF +53.83' ESTABLISHED 12" ABOVE AVERAGE ELEVATION OF BISHOP LANE TOP OF CURB OF +52.83'. SEE BUILDING ELEVATIONS & SECTIONS.

BUILDING SETBACKS:

REQUIRED:	
FROM LOCAL STREET:	MIN. 20'
FROM ALLEY:	NO SETBACK
FROM ADJACENT PROPERTY:	NO SETBACK
PROVIDED:	
FROM 2ND ST:	21'-6"
FROM BISHOP LANE:	28'-4"
FROM ALLEY:	4'-0"
FROM ADJACENT PROPERTY:	6'-2"

APARTMENTS - UNIT MIX

UNIT TYPE	RATIO	#DU
STUDIO	36.2%	72
1BR/1BA	45.7%	91
2BR/2BA	19.1%	36
TOTAL	100.0%	199

PARKING REQUIRED

	UNIT TYPE	#DU	P.S. RATIO	P.S. REQ.
S	STUDIO	72	1.0 P.S./DU	72
A	1BR/1BA	91	1.0 P.S./DU	91
B	2BR/2BA	36	2.0 P.S./DU	72
	TOTAL	199	(1.18 P.S./DU)	235

PARKING PROVIDED	(1.26 P.S./DU) 250*
	*INCLUDES 10 ACCESSIBLE P.S. (4%)
OFF-SITE PARKING (NOT INCLUDED IN COUNT)	20

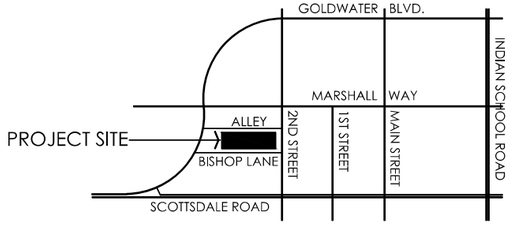
BICYCLE PARKING REQUIRED

1 BICYCLE SPACE PER 10 VEHICULAR SPACES = 250/10
= 25 BICYCLE PARKING SPACES

BICYCLE PARKING PROVIDED

COMBINED RESIDENT & PUBLIC ±25 BICYCLE P.S.

VICINITY MAP



TODD+ ASSOCIATES | THE MORGAN GROUP INC.

BISHOP LANE

REZONING RESUBMITTAL | SEPTEMBER 18, 2019

SITE PLAN

0' 10' 20' 40'
SCALE: 1"=20'

9-ZN-2019
9/23/2019

Appendix B – City of Scottsdale, Code of Ordinances Article IX

B

ARTICLE IX. - PARKING AND LOADING REQUIREMENTS

Sec. 9.100. - Parking.

Sec. 9.101. - Purpose and scope.

The purpose of preparing and adopting the parking regulations within this Zoning Ordinance is to implement the goals of the City of Scottsdale as they are set forth by the city's General Plan and further refined here. These regulations are to provide adequate parking within the community without sacrificing urban design which enhances the aesthetic environment, encourage the use of various modes of transportation other than the private vehicle and provides a generally pleasant environment within the community. Several purposes are identified herein to achieve the above stated purpose.

The purposes of the parking ordinances of the City of Scottsdale are to:

1. Provide parking facilities which serve the goal of a comprehensive circulation system throughout the community;
2. Provide parking, city-wide that will improve pedestrian circulation, reduce traffic congestion, and improve the character and functionality of all developments;
3. Promote the free flow of traffic in the streets;
4. Encourage the use of bicycles and other alternative transportation modes;
5. Design and situate parking facilities so as to ensure their usefulness;
6. Provide an adequate number of on-site bicycle parking facilities, each with a level of security, convenience, safety, access, and durability;
7. Provide for adequate parking at transfer centers and selected transit stops in order to encourage the use of mass transit;
8. Ensure the appropriate development of parking areas throughout the city; and
9. Mitigate potential adverse impacts upon land uses adjacent to parking facilities.

(Ord. No. 2736, § 1, 3-7-95; Ord. No. 3896, § 1(Exh. § 6), 6-8-10; Ord. No. 3980, § 1(Res. 8895, § 1, Exh. A, § 44), 12-6-11; Ord. No. 4143, § 1(Res. No. 9678, Exh. A, § 244), 5-6-14)

Editor's note— Ord. No. 2736, § 1, adopted Mar. 7, 1995, did not specifically repeal §§ 9.100—9.104, which pertained to off-street parking; hence, §§ 9.100—9.108 adopted in said ordinance have been treated as superseding former §§ 9.100—9.104.

Sec. 9.102. - Applications of and exemptions from parking.

A. *Additions and change of occupancy.* The standards for providing on-site parking shall apply at the time of the erection of any main building or when on-site parking is established. These standards shall also be complied with when an existing building is altered or enlarged by the addition of dwelling units or guest rooms or where the use is intensified by a change of occupancy or by the addition of floor area, seating capacity, or seats.

B. *Required parking must be maintained.* Required on-site parking spaces shall be maintained so long as the main building or use remains.

C. *Nonconforming parking.* Where vehicle parking space is provided and maintained in connection with a main building or use at the time this ordinance became effective and is insufficient to meet the

requirements for the use with which it is associated, or where no such parking has been provided, then said building or structure may be enlarged or extended only if vehicle parking spaces are provided for said enlargement, extension or addition, to the standards set forth in the district regulations. No existing parking may be counted as meeting this requirement unless it exceeds the requirements for the original building and then only that excess portion may be counted.

Any commercial property which provides sufficient parking spaces to supply at least fifty (50) percent of the requirement for the property and which is destroyed by fire, hurricane, flood, or other act of God, may be restored to its original use and building outline, provided the floor area is not increased, without conforming to the parking requirements of this ordinance.

D. *Building permits.* No building permit shall be issued until parking requirements have been satisfied. Off-street parking required by this Zoning Ordinance shall not be located within the right-of-way of a street or alley.

E. *Counting flexible units.* Whenever a residential building is designed so that it can be used for separate apartments or guest rooms under the City of Scottsdale Building Code, the vehicle parking requirements shall be based upon the highest possible number of dwelling units or guest rooms obtainable from any such arrangement.

F. *Application to multiple tenant developments.* Where there is a combination of uses, the minimum required number of on-site parking spaces shall be the sum of the requirements of the individual uses, unless otherwise considered a mixed use development, mixed use commercial center, or as provided per Section 9.104.E. and F. If, in the opinion of the Zoning Administrator, the uses would not be operated simultaneously, the number of vehicle parking spaces shall be determined by the use with the highest parking demand.

G. *Free parking in the Downtown Area.* Required parking for developments within the Downtown Area shall be provided at no cost to the patrons, employees, residents, or their guests of the development. If the required parking of a development, which the required parking is on the same site as the development, is only available through the use of a valet services, the valet service shall be provided at no cost to the user.

H. *Prohibited uses of parking areas.*

1. Parking of more than 5 vehicles on any unimproved lot is prohibited, except when used for special events parking. An improved lot shall mean 1 that fulfills the requirements of Section 9.103.

2. Parking or display of vehicles other than in designated and improved areas shall be prohibited.

3. Required parking spaces shall not be used for product display or advertising.

(Ord. No. 2736, § 1, 3-7-95; Ord. No. 3896, § 1(Exh. § 6), 6-8-10; Ord. No. 3920, § 1(Exh. § 103), 11-9-10; Ord. No. 3980, § 1(Res. 8895, § 1, Exh. A, § 45), 12-6-11; Ord. No. 4117, § 1(Res. No. 9563, Exh. A, § 95), 11-19-13; Ord. No. 4143, § 1(Res. No. 9678, Exh. A, § 245), 5-6-14; Ord. No. 4265, § 1, 6-21-16)

Sec. 9.103. - Parking requirements.

A. *General requirement.* Except as provided in Sections 9.103.B, 9.104, 9.107, and 9.108, and subsections therein, each use of land shall provide the number of parking spaces indicated for that use in Table 9.103.A. and Section 9.105.

B. *Requirement in the Downtown Area.* Except as provided in Sections 9.104, 9.107, and 9.108, and subsections therein each use of land in the Downtown Area shall provide the number of parking spaces indicated for that use in Table 9.103.b. and Section 9.105. Those uses that are not specifically listed in Table 9.103.B. shall provide the number of parking spaces indicated for that use in Table 9.103.A.

C. *Required bicycle parking.* Every principal and accessory use of land which is required to provide at least forty (40) vehicular parking spaces shall be required to provide bicycle parking spaces at a rate of one (1) bicycle parking space per every ten (10) required vehicular parking spaces; and after July 9, 2010, new development shall provide, at a minimum, two (2) bicycle parking spaces. No use shall be required to provide more than one hundred (100) bicycle parking spaces.

1. Subject to the approval of the Zoning Administrator, in the Downtown Area, bicycle parking spaces may be provided within a common location that is obvious and convenient for the bicyclist, does not encroach into adjacent pedestrian pathways or landscape areas, and the location shall be open to view for natural surveillance by pedestrians. Such common bicycle parking areas shall be subject to the approval of the Zoning Administrator.

D. *Bicycle parking facilities design.* Required bicycle parking facilities shall, at a minimum, provide a stationary object to which the bicyclist can lock the bicycle frame and both wheels with a user provided U-shaped lock or cable and lock. The stationary object shall generally conform to the Design Standards & Policies Manual. The Zoning Administrator may approve alternative designs. Bicycle lockers and other high security bicycle parking facilities, if provided, may be granted parking credits pursuant to Section 9.104.C., Credit for bicycle parking facilities.

E. *Calculating required parking for transportation facilities.* Required parking for park and ride lots and major transfer centers shall be determined by the Zoning Administrator. Subject to the Design Standards & Policies Manual and the following criteria:

1. Goals of the City with regard to transit ridership along the route on which the transportation facility is located.

2. Distance from other transportation facilities with parking.

F. *Fractions shall be rounded.*

1. When any calculation for the required parking results in a fraction of a parking space, the fraction shall be rounded up to the next greater whole number.

2. When any calculation for the provided parking results in a fraction of a parking space, the fraction shall be rounded down to the next greater whole number.

3. When any calculation of a Parking P-3 District credit, improvement district credit, or in-lieu parking credit results in a fraction of a credit, the fraction shall not be rounded.

G. *Interpreting requirements for analogous uses.* The Zoning Administrator shall determine the number of spaces required for analogous uses. In making this determination, the Zoning Administrator shall consider the following:

1. The number of parking spaces required for a use listed in Table 9.103.A., or Table 9.103.B., that is similar to the proposed use;

2. An appropriate variable by which to calculate parking for the proposed use; for example, building square footage or number of employees;

3. Parking data from the same use on a different site or from a similar use on a similar site;

4. Parking data from professional publications such as those published by the Institute of Transportation Engineers (ITE) or the Urban Land Institute (ULI);

H. *Additional requirements for company vehicles.* When parking spaces are used for the storage of vehicles or equipment used for delivery, service and repair, or other such use, such parking spaces shall be provided in addition to those otherwise required by this Zoning Ordinance. Before a building permit is issued the number of spaces to be used for vehicle storage shall be shown on the plans. Unless additional spaces are provided in excess of the required number of spaces, no vehicles in addition to that number shall be stored on the site.

———

Table 9.103.A. Schedule of Parking Requirements	
Amusement parks	Three (3) spaces per hole for any miniature golf course, plus one (1) space per three thousand (3,000) square feet of outdoor active recreation space, plus any additional spaces required for ancillary uses such as but not limited to game centers and pool halls.
Arts festivals, seasonal	A. One (1) space for each two hundred (200) square feet of indoor public floor area, other than public restaurant space. B. Restaurant at seasonal arts festivals shall be provided parking in accordance with table 9.103.a.
Banks/financial institutions	One (1) space per two hundred fifty (250) square feet gross floor area.
Bars, cocktail lounges, taverns, afterhours or micro-brewery/distillery with live entertainment	A. One (1) space per sixty (60) square feet of gross floor area; and B. One (1) space per two hundred (200) gross square feet of outdoor patio area, excluding the first two hundred (200) gross square feet.
Bars, cocktail lounges, taverns, afterhours or micro-brewery/distillery	A. One (1) space per eighty (80) square feet of gross floor area; and B. One (1) space per two hundred (200) gross square feet of outdoor patio area, excluding the first two hundred (200) gross square feet.
Boardinghouses, lodging houses, and other such uses	One (1) parking space for each one (1) guest room or dwelling unit.
Bowling alleys	Four (4) parking spaces for each lane, plus two (2) parking spaces for any pool table, plus one (1) parking space for every five (5) audience seats.
Carwash	Four (4) spaces per bay or stall plus one (1) space per employee plus ten (10) stacking spaces.
Churches and places of worship	A. With fixed seating. One (1) space per four (4) seats in main sanctuary, or auditorium, and c below; or B. Without fixed seating. One (1) space for each thirty (30)

	square feet of gross floor area in main sanctuary and c below. C. One (1) space per each three hundred (300) square feet gross floor area of classrooms and other meeting areas.
Club/lodge, civic and social organizations	One (1) space per two hundred fifty (250) square feet gross floor area.
College/university	One (1) space per two (2) employees plus one (1) space per four (4) students, based on projected maximum enrollment.
Community or recreation buildings	One (1) parking space for each two hundred (200) square feet of gross floor area.
Conference and meeting facilities, or similar facilities	A. One (1) parking space for every five (5) seats, if seats are fixed, and/or B. One (1) parking space for fifty (50) square feet of gross floor area of conference/meeting area.
Cultural institutions and museums	One (1) space per three hundred (300) square feet gross floor area.
Dance halls, skating rinks, and similar indoor recreational uses	One (1) parking space for each three hundred (300) square feet of gross floor area in the building.
Dance/music/and professional schools	One (1) space per two hundred (200) square feet of gross floor area classroom area.
Day care center	One (1) parking space for each employee; plus one (1) space for every fifteen (15) students, plus one (1) space for each company vehicle as per Section 9.103.H., additional requirements for company vehicles.
Dry cleaners	One (1) space per two hundred fifty (250) square feet gross floor area.
Dwellings, multiple-family	Parking spaces per dwelling unit at the rate of: efficiency units 1.25 one-bedroom 1.3 two-bedrooms 1.7

	three (3) or more bedrooms 1.9
Dwellings, single- and two-family and townhouses	Two (2) spaces per unit.
Elementary schools	One (1) parking space for each classroom plus one (1) parking space for each two hundred (200) square feet of gross floor area in office areas.
Funeral homes and funeral services	A. One (1) parking space for every two (2) permanent seats provided in the main auditorium; and B. One (1) parking space for every thirty (30) square feet of gross floor area public assembly area.
Furniture, home improvement, and appliance stores	A. Uses up to fifteen thousand (15,000) square feet of gross floor area. One (1)space per five hundred (500) square feet gross floor area; or B. Uses over fifteen thousand (15,000) square feet of gross floor area. One (1) space per five hundred (500) square feet for the first fifteen thousand (15,000) square feet of gross floor area, and one (1) space per eight hundred (800) square feet area over the first fifteen thousand (15,000) square feet of gross floor area
Galleries	One (1) space per five hundred (500) square feet of gross floor area.
Game centers	One (1) space per one hundred (100) square feet gross floor area.
Gas station	Three (3) spaces per service bay and one (1) space per 250 square feet of accessory retail sales gross floor area. Each service bay counts for one (1) of the required parking spaces.
Golf course	One (1) parking space for each two hundred (200) square feet of gross floor area in any main building plus one (1) space for every two (2) practice tees in the driving range, plus four (4) parking spaces for each green in the playing area.

Grocery or supermarket	One (1) space per three hundred (300) square feet gross floor area.
Health or fitness studio, and indoor recreational uses	A. Building area less than, or equal to, 3,000 square feet of gross floor area: one space per 250 square feet of gross floor area. B. Building area greater than 3,000 square feet of gross floor area, and less than 10,000 square feet of gross floor area: one space per 150 square feet of gross floor area. C. Building areas equal to, or greater than, 10,000 square feet of gross floor area, and less than 20,000 square feet of gross floor area: one space per 200 square feet of gross floor area. D. Building areas equal to, or greater than, 20,000 square feet of gross floor area: one space per 250 square feet of gross floor area.
High schools	One (1) parking space for each employee plus one (1) space for every six (6) students, based on projected maximum enrollment.
Hospitals	One and one half (1.5) parking spaces for each one (1) bed.
Internalized community storage	One (1) parking space for each two thousand five hundred (2,500) square feet of gross floor area.
Library	One (1) space per three hundred (300) square feet gross floor area.
Live entertainment (not including bars, restaurants, and performing arts theaters)	A. With fixed seating. One (1) parking space for two and one-half (2.5) seats. B. Without fixed seating. One (1) parking space for every sixty (60) square feet of gross floor area of an establishment that does not contain fixed seating.
Manufactured home park	One and one-half parking spaces per manufactured home space.
Manufacturing and industrial uses	One (1) parking space for each five hundred (500) square feet of gross floor area.

Mixed-use commercial centers In mixed-use commercial centers with less than 20,000 square feet of gross floor area, land uses (with parking requirements of one space per 250 square feet or fewer spaces) shall occupy at least 60 percent of gross floor area.	One (1) space per three hundred (300) square feet of gross floor area.
Mixed-use developments	A. One (1) space per three hundred twenty-five (325) square feet of gross floor area of nonresidential area; B. Multiple-family residential uses shall be parked at the ratios of the dwellings, multiple-family in other districts requirements, herein.
Office, all other	One (1) space per three hundred (300) square feet gross floor area.
Offices (government, medical/dental and clinics)	One (1) space per two hundred fifty (250) square feet of gross floor area.
Parks	Three (3) parking spaces for each acre of park area.
Personal care services	One (1) space per two hundred fifty (250) square feet gross floor area.
Plant nurseries, building materials yards, equipment rental or sales yards and similar uses	One (1) parking space for each three hundred (300) square feet gross site area of sales and display area.
Pool hall	Two (2) spaces per pool table.
Postal station(s)	One (1) parking space for each two hundred (200) square feet of gross floor area.
Radio/TV/studio	One (1) space per five hundred (500) square feet gross floor area, plus one (1) space per company vehicle, as per Section 9.103.H., additional requirements for company vehicles.
Ranches	One (1) space per every two (2) horse stalls.

Residential health care facilities	A. Specialized care facilities—0.7 parking space for each bed. B. Minimal care facilities—1.25 parking spaces for each dwelling unit.
Restaurants with live entertainment	A. When live entertainment limited to the hours that a full menu is available, and the area of live entertainment is less than fifteen (15) percent of the gross floor area, one (1) parking space per one hundred twenty (120) square feet of gross floor area; and B. One (1) parking space for each three hundred fifty (350) gross square feet of outdoor public floor area, excluding the first three hundred fifty (350) gross square feet of outdoor patio area, unless the space is located next to and oriented toward a publicly owned walkway or street, in which case the first five hundred (500) gross square feet of outdoor patio area is excluded. C. When live entertainment is not limited to the hours that a full menu is available, and/or the area of live entertainment is less than fifteen (15) percent of the gross floor area, one (1) parking space per sixty (60) square feet of gross floor area, plus patio requirements above.
Restaurants	A. One (1) parking space per one hundred twenty (120) square feet of gross floor area; and B. One (1) parking space for each three hundred fifty (350) gross square feet of outdoor patio area, excluding the first three hundred fifty (350) gross square feet of outdoor patio area, unless the space is located next to and oriented toward a publicly owned walkway or street, in which case the first five hundred (500) square gross feet of outdoor patio area is excluded.
Retail	One (1) space per two hundred fifty (250) square feet of gross floor area.
Retail, in a PCoC zoning district without arterial street frontage	One (1) space per three hundred (300) square feet gross floor area.
Stables, commercial	Adequate parking for daily activities shall be provided as

	determined by the Zoning Administrator.
Swimming pool or natatorium	One (1) space per one thousand (1,000) square feet gross floor area.
Tennis clubs	One (1) parking space per each two hundred (200) square feet of gross floor area, excluding court area, plus three (3) parking spaces per each court. The property owner shall provide additional parking spaces as necessary for tournaments, shows or special events.
Theaters, cinemas, auditoriums, gymnasiums and similar places of public assembly in PNC, PCC, PCP, PRC, or PUD zoning districts	One (1) space per ten (10) seats.
Theaters, cinemas, auditoriums, gymnasiums and similar places of public assembly in other districts	One (1) parking space per four (4) seats.
Trailhead - gateway	Five hundred (500) to six hundred (600) spaces, including those for tour buses and horse trailers.
Trailhead - local	None required.
Trailhead - major community	Two hundred (200) to three hundred (300) spaces, including those for horse trailers.
Trailhead - minor community	Fifty (50) to one hundred (100) spaces.
Transportation facilities	Required parking shall be determined by the Zoning Administrator per Section 9.103.E., Calculating required parking for transportation facilities.
Transportation uses	Parking spaces required shall be determined by the Zoning Administrator.
Travel accommodations	One (1.25) parking spaces for each one (1) guest room or dwelling unit.
Travel accommodations with conference	The travel accommodation requirements above.

and meeting facilities, or similar facilities	A. Travel accommodations with auxiliary commercial uses (free standing buildings) requirements above. B. One (1) parking space for every five (5) seats, if seats are fixed, and/or C. One (1) parking space for fifty (50) square feet of gross floor area of conference/meeting area.
Travel accommodations, with auxiliary commercial uses (free standing buildings)	A. The travel accommodation requirements above. B. Bar, cocktail lounge, tavern, after hours, restaurants, and live entertainment uses shall provide parking in accordance uses parking requirements herein this table. C. All other free standing commercial uses. One (1) parking space for every four hundred (400) square feet of gross floor area.
Vehicle leasing, rental, or sales (parking plans submitted for vehicle sales shall illustrate the parking spaces allocated for each of A, B, and C.)	A. One employee parking space per 200 square feet of gross floor area, B. One employee parking space per 20 outdoor vehicular display spaces, and C. One patron parking space per 20 outdoor vehicular display spaces.
Veterinary services	One (1) space per three hundred (300) square feet gross floor area.
Warehouses, mini	One (1) space per three hundred (300) square feet of gross floor area of administrative office space, plus one (1) space per each fifty (50) storage spaces.
Warehousing, wholesaling establishments, or separate storage buildings.	One (1) parking space for each eight hundred (800) square feet of gross floor area.
Western theme park	Total of all spaces required for the various uses of the theme park, may apply for a reduction in required parking per Section 9.104, Programs and incentives to reduce parking requirements.

Table 9.103.B. Schedule of Parking Requirements in the Downtown Area	
Bars, cocktail lounges, taverns, afterhours or micro-brewery/distillery with live entertainment	A. One (1) space per eighty (80) square feet of gross floor area; and B. One (1) space per two hundred (200) gross square feet of outdoor patio area, excluding the first two hundred (200) gross square feet.
Bars, cocktail lounges, taverns, afterhours or micro-brewery/distillery	A. One (1) space per one-hundred twenty (120) square feet of gross floor area; and B. One (1) space per two hundred (200) gross square feet of outdoor patio area, excluding the first two hundred (200) gross square feet.
Dwellings, multi-family	A. One parking space per dwelling unit for units with one bedroom or less. B. Two parking spaces per dwelling unit, for units with more than one bedroom.
Financial intuitions	A. In a Type 1 area, one (1) space per five hundred (500) square feet of gross floor area; or B. In a Type 2 area, all other lot widths, one (1) space per three hundred (300) square feet of gross floor area.
Fitness studio (no larger than 3,000 gross square feet)	A. One (1) space per three hundred (300) square feet of gross floor area. B. A fitness studio larger than 3,000 gross square feet shall comply with Table 9.103.a.
Galleries	One (1) space per three hundred (500) square feet of gross floor area.
Live entertainment (not including bars, restaurants, and performing arts theaters)	A. With fixed seating. One (1) parking space for two and one-half (2.5) seats. B. Without fixed seating. One (1) parking space for every eighty (80) square feet of gross floor area of an establishment that does not contain fixed seating.
Medical and diagnostic laboratories	One (1) space per three hundred (300) square feet of gross floor area.

Mixed-use commercial centers In mixed-use commercial centers with less than 20,000 square feet of gross floor area, land uses (with parking requirements of one space per 300 square feet or fewer spaces) shall occupy at least 60 percent of gross floor area.	One (1) space per three hundred fifty (350) square feet of gross floor area.
Mixed-use developments	A. One space per 350 square feet of gross floor area of nonresidential area; plus B. Parking spaces required for multiple-family dwellings as shown in this table, except as provided in Section 9.104.H.3.d.
Office, including government and medical/dental offices and clinics	A. In a Type 1 area, one (1) space per five hundred (500) square feet of gross floor area; or B. In a Type 2 area, all other lot widths, one (1) space per three hundred (300) square feet of gross floor area.
Performing arts theaters	One (1) parking space per ten (10) seats.
Restaurants that serve breakfast and/or lunch only, or the primary business is desserts, bakeries, and/or coffee/tea or non-alcoholic beverage	A. One (1) parking space for each four hundred (400) square feet of gross floor area; and B. One (1) space for each three hundred fifty (350) gross square feet of outdoor public floor area. Excluding the first three hundred fifty (350) gross square feet of outdoor public floor area, unless the space is located next to and oriented toward a publicly owned walkway or street, in which case the first five hundred (500) gross square feet of outdoor public floor area is excluded.
Restaurants, including restaurants with a micro-brewery/distillery as an accessory use.	A. One (1) parking space per three hundred (300) square feet of gross floor area; and B. One (1) parking space for each three hundred fifty (350) gross square feet of outdoor patio area. Excluding the first three hundred fifty (350) gross square feet of outdoor patio area, unless the space is located next to and oriented toward a publicly owned walkway or street, in which case the first five hundred (500) gross square feet of outdoor public floor area is excluded.

Restaurants, including restaurants with a micro-brewery/distillery as an accessory use, and with live entertainment	A. When live entertainment limited to the hours that a full menu is available, and the area of live entertainment is less than fifteen (15) percent of the gross floor area, one (1) parking space per three hundred (300) square feet of gross floor area; and B. One (1) parking space for each three hundred fifty (350) gross square feet of outdoor public floor area. Excluding the first three hundred fifty (350) gross square feet of outdoor patio, unless the space is located next to and oriented toward a publicly owned walkway or street, in which case the first five hundred (500) gross square feet of outdoor patio area is excluded. C. When live entertainment is not limited to the hours that a full menu is available, and/or the area of live entertainment is greater than fifteen (15) percent of the gross floor area, one (1) parking space per one hundred twenty (120) square feet of gross floor area, plus patio requirements above at all times.
Retail, personal care services, dry cleaners, and tattoo parlors	A. In a Type 1 area, one (1) space per five hundred (500) square feet of gross floor area; or B. In a Type 2 area, all other lot widths, one (1) space per three hundred (300) square feet of gross floor area.
Work/live	A. The required parking shall be based on the area of commercial uses, per Table 9.103.B and when applicable, Table 9.103.A. B. In addition to the parking requirement for the commercial area, parking shall be provide in accordance with the dwellings, multi-family and co-housing parking requirement for developments containing more than one (1) dwelling unit, excluding the first unit (except as provided in Section 9.104.H.3.d).
All other uses	As specified Table 9.103.A.

Note: 1. Type 1 and Type 2 Areas are locations of the Downtown Area described by the Downtown Plan.

(Ord. No. 2736, § 1, 3-7-95; Ord. No. 3048, § 2, 10-7-97; Ord. No. 3225, § 1, 5-4-99; Ord. No. 3879, § 1(Exh. § 26), 3-2-10; Ord. No. 3896, § 1(Exh. § 6), 6-8-10; Ord. No. 3899, § 1(Res. No. 8342, Exh. A, §§ 18, 19), 8-30-10; Ord. No. 3920, § 1(Exh. §§ 104—109), 11-9-10; Ord. No. 3926, § 1(Exh. § 13), 2-15-11; Ord. No. 3980, § 1(Res. 8895, § 1, Exh. A, § 46), 12-6-11; Ord. No. 3992, § 1(Res. No. 8922, Exh. A, § 17), 1-24-12; Ord. No. 4099, § 1(Res. No. 9439, Exh. A, §§ 17—23), 6-18-13; Ord. No. 4117, § 1(Res. No. 9563, Exh. A, §§ 96—98), 11-19-13; Ord. No. 4143, § 1(Res. No. 9678, Exh. A, §§ 246—249), 5-6-14; Ord. No. 4265, § 1, 6-21-16)

Sec. 9.104. - Programs and incentives to reduce parking requirements.

The following programs and incentives are provided to permit reduced parking requirements in the locations and situations outlined herein where the basic parking requirements of this Zoning Ordinance would be excessive or detrimental to goals and policies of the city relating to mass transit and other alternative modes of transportation.

A. *Administration of parking reductions.* Programs and incentives which reduce parking requirements may be applied individually or jointly to properties and developments. Where reductions are allowed, the number of required parking spaces which are eliminated shall be accounted for both in total and by the program, incentive or credit which is applied. The record of such reductions shall be kept on the site plan within the project review file. Additionally, the reductions and manner in which they were applied shall be transmitted in writing to the property owner.

B. *Credit for on-street parking.* Wherever on-street angle parking is provided in the improvement of a street, credit toward on-site parking requirements shall be granted at the rate of one (1) on-site space per every twenty-five (25) feet of frontage, excluding the following:

1. Frontage on an arterial, major arterial or expressway as designated in the Transportation Master Plan.
2. Frontage on a street that is planned to be less than fifty-five (55) feet wide curb-to-curb.
3. Frontage within twenty (20) feet of a corner.
4. Frontage within ten (10) feet of each side of a driveway or alley.
5. Frontage within a fire hydrant zone or other emergency access zone.
6. Locations within the Downtown Area.

C. *Credit for bicycle parking facilities.*

1. *Purpose.* The City of Scottsdale, in keeping with the federal and Maricopa County Clean Air Acts, wishes to encourage the use of alternative transportation modes such as the bicycle instead of the private vehicle. Reducing the number of vehicular parking spaces in favor of bicycle parking spaces helps to attain the standards of the Clean Air Act, to reduce impervious surfaces, and to save on land and development costs.
2. *Performance standards.* The Zoning Administrator may authorize credit towards on-site parking requirements for all uses except residential uses, for the provision of bicycle facilities beyond those required by this Zoning Ordinance, subject to the following guidelines:
    a. Wherever bicycle parking is provided beyond the amount required per Section 9.103.C., required bicycle parking, credit toward required on-site vehicular parking may be granted pursuant to the following:
        i. Downtown Area: one (1) vehicular space per eight (8) bicycle spaces.
        ii. All other zoning districts: one (1) vehicular space per ten (10) bicycle spaces.

b. Wherever bicycle parking facilities exceed the minimum security level required per Section 9.103.D., required bicycle parking, credit towards required onsite vehicular parking may be granted at a rate of one (1) vehicular space per every four (4) high-security bicycle spaces.

   High-security bicycle spaces shall include those which protect against the theft of the entire bicycle and of its components and accessories by enclosure through the use of bicycle lockers, check-in facilities, monitored parking areas, or other means which provide the above level of security as approved by the Zoning Administrator.

c. Wherever shower and changing facilities for bicyclists are provided, credit towards required on-site vehicular parking may be granted at the rate of two (2) vehicular spaces per one (1) shower.

d. The number of vehicular spaces required Table 9.103.A., or when applicable Table 9.103.B., shall not be reduced by more than five (5) percent or ten (10) spaces, whichever is less.

D. *Credit for participation in a joint parking improvement project.* After April 7, 1995, no new joint parking improvement projects shall be designated in the City of Scottsdale. Existing joint parking improvement projects may continue to exist, subject to the standards under which they were established.

   The joint parking improvement project was a program through which a group of property owners with mixed land uses including an area of more than three (3) blocks and at least six (6) separate ownerships could join together on a voluntary basis to form a parking improvement district, providing parking spaces equal to a minimum of thirty (30) percent of their combined requirements according to the ordinance under which they were established. Each participant property could have received credit for one and one-half (1½) times his proportioned share of the parking spaces provided. The project required that a statement be filed with the superintendent of buildings stating the number of spaces assigned to each participating property. No adjustments were to be permitted subsequent to the filing of this statement.

E. *Mixed-use shared parking programs.*

1. Purpose. A mixed-use shared parking program is an option to reduce the total required parking in large mixed-use commercial centers and mixed-use developments in which the uses operate at different times throughout the day. The city recognizes that strict application of the required parking ratios may result in excessive parking spaces. This results in excessive pavement and impermeable surfaces and discourages the use of alternate transportation modes.

2. Applicability. A mixed-use shared parking program is an alternative to a parking master plan.

3. Procedure.

   a. A mixed-use shared parking program may be proposed at the time a parking plan is required.

   b. The mixed-use shared parking program may also be requested exclusive of any other site plan review or permitting procedure.

   c. Mixed-use shared parking plans shall be reviewed by, and are subject to the approval of, the Zoning Administrator.

   d. Alternatively, the applicant may elect to have the shared parking plan reviewed by, and subject to the approval of, the City Council in a public hearing.

   e. For changes of use in mixed-use projects, the parking necessary for the new mix of uses shall not exceed the parking required by the previous mix of uses.

4. Limitations on mixed-use shared parking.

   a. The total number parking spaces required by Table 9.103.B. and the total number of parking spaces required for a mixed-use commercial center and mixed-use development indicated in Table 9.103.A. shall not be used to reduce the required parking in the Downtown Area or a development that is defined as mixed-use development or mixed- use commercial center not in the Downtown Area.

   b. The total number of parking spaces required by Table 9.103.A. shall not be reduced by more than twenty (20) percent.

5. Performance standards. The Zoning Administrator may authorize a reduction in the total number of required parking spaces for two (2) or more uses jointly providing on-site parking subject to the following criteria:

   a. The respective hours of operation of the uses do not overlap, as demonstrated by the application on Table 9.104.A., Schedule of Shared Parking Calculations. If one (1) or all of the land uses proposing to use joint parking facilities do not conform to one (1) of the general land use classifications in Table 9.104.A., Schedule of Shared Parking Calculations, data shall indicate there is not substantial conflict in the principal operating hours of the uses. Such data may include information from a professional publication such as those published by the Institute of Transportation Engineers (ITE) or the Urban Land Institute (ULI), or by a professionally prepared parking study.

   b. A parking plan shall be submitted for approval which shall show the layout of proposed parking.

   c. The property owners involved in the joint use of on-site parking facilities shall submit a written agreement subject to City approval requiring that the parking spaces shall be maintained as long as the uses requiring parking exist or unless the required parking is provided elsewhere in accordance with the provisions of this Article. Such written agreement shall be recorded by the property owner with the Maricopa County Recorder's Office prior to the issuance of a building permit, and a copy filed in the project review file.

Table 9.104.A Schedule of Shared Parking Calculations

General Land Use Classification	Weekdays			Weekends		
	12:00 a.m.— 7:00 a.m.	7:00 a.m.— 6:00 p.m.	6:00 p.m.— 12:00 a.m.	12:00 a.m.— 7:00 a.m.	7:00 a.m.— 6:00 p.m.	6:00 p.m.— 12:00 a.m.
Office and industrial	5%	100%	5%	0%	60%	10%
Retail	0%	100%	80%	0%	100%	60%
Residential	100%	55%	85%	100%	65%	75%
Restaurant and bars	50%	70%	100%	45%	70%	100%

Hotel	100%	65%	90%	100%	65%	80%
Churches and places of worship	0%	10%	30%	0%	100%	30%
Cinema/theater, and live entertainment	0%	70%	100%	5%	70%	100%

How to use the schedule of shared parking. Calculate the number of parking spaces required by Table 9.103.A. for each use as if that use were free-standing (the total number of parking spaces required by Table 9.103.B. and the total number of parking spaces required for a mixed-use commercial center and mixed-use development indicated in Table 9.103.A. shall not be used to reduce the required parking in the Downtown Area, or a development that is defined as mixed-use development or mixed-use commercial center not in Downtown Area.)

Applying the applicable general land use category to each proposed use, use the percentages to calculate the number of spaces required for each time period, (six (6) time periods per use). Add the number of spaces required for all applicable land uses to obtain a total parking requirement for each time period. Select the time period with the highest total parking requirement and use that total as your shared parking requirement.

F. *Parking master plan.*

1. *Purpose.* A parking master plan is presented as an option to promote the safe and efficient design of parking facilities for sites larger than two (2) acres or those sites in the Downtown Type 1 Area as designated by the Downtown Plan larger than sixty thousand (60,000) square feet. The city recognizes that strict application of the required parking standards or ratios may result in the provision of parking facilities of excessive size or numbers of parking spaces. This results in excessive pavement and impermeable surfaces and may discourage the use of alternate transportation modes. A parking master plan provides more efficient parking through the following requirements.
2. *Applicability.* The parking master plan is appropriate to alleviate problems of reuse and is also applicable as an alternative to the above mixed-use shared parking programs.
3. *Procedure.*
    a. A parking master plan may be proposed at the time a parking plan is required.
    b. The parking master plan may also be requested exclusive of any other site plan review or permitting procedure.
    c. Parking master plans shall be reviewed by, and are subject to the approval of, the Zoning Administrator.
    d. For changes of use in mixed-use projects, the parking necessary for the new mix of uses shall not exceed the parking required by the previous mix of uses.

4. Limitations on parking master plans.

   a. The total number parking spaces required by Table 9.103.B. and the total number of parking spaces required for a mixed-use commercial center and mixed-use development indicated in Table 9.103.A. shall not be used to reduce the required parking in the Downtown Area or a development that is defined as mixed-use development or mixed-use commercial center not in the Downtown Area.

   b. The Zoning Administrator shall only permit reductions of up to twenty (20) percent of the total parking required per Table 9.103.A.

   c. Reductions of more than twenty (20) percent of required parking shall be subject to approval by the City Council.

5. Elements of a parking master plan. The contents of the parking master plan shall include:

   a. A plan, which graphically depicts where the spaces and parking structures are to be located.

   b. A report, which demonstrates how everything shown on the plan complies with or varies from applicable standards and procedures of the City.

   c. The plan shall show all entrances and exits for any structured parking and the relationship between parking lots or structures and the circulation master plan.

   d. The plan, supported by the report, shall show the use, number, location, and typical dimensions of parking for various vehicle types including passenger vehicles, trucks, vehicles for mobility impaired persons, buses, other transit vehicles and bicycles.

   e. The plan, supported by the report, shall include phasing plans for the construction of parking facilities and any interim facilities planned.

   f. Whenever a reduction in the number of required parking spaces is requested, the required report shall be prepared by a registered civil engineer licensed to practice in the State of Arizona and shall document how any reductions were calculated and upon what assumptions such calculations were based.

   g. Parking ratios used within the report shall be based upon uses or categories of uses already listed within Table 9.103.A., Schedule Of Parking Requirements (the total number of parking spaces required by Table 9.103.B. and the total number of parking spaces required for a mixed-use commercial center and mixed-use development indicated in Table 9.103.A. shall not be used to reduce the required parking in the Downtown Area or a development that is defined as mixed-use development or mixed-use commercial center not in the Downtown Area.)

   h. Such other information as is determined by the reviewing authority to be necessary to process the parking master plan.

6. *Performance standards.* Parking shall comply with the requirements of the Zoning Ordinance as amended except where application of the following criteria can show that a modification of the standards is warranted. This shall be determined by the Zoning Administrator pending review of the materials described in Subsection 5. above.

   a. The parking master plan shall provide sufficient number and types of spaces to serve the uses identified on the site.

   b. Adequate provisions shall be made for the safety of all parking facility users, including motorists, bicyclists and pedestrians.

   c. Parking master plans shall be designed to minimize or alleviate traffic problems.

   d. Parking spaces shall be located near the uses they are intended to serve.

e. Adequate on-site parking shall be provided during each phase of development of the district.

f. The plan shall provide opportunities for shared parking or for other reductions in trip generation through the adoption of Transportation Demand Management (TDM) techniques to reduce trip generation, such as car pools, van pools, bicycles, employer transit subsidies, compressed work hours, and High Occupancy Vehicle (HOV) parking preference.

g. Surfacing of the lot shall be dust-proof, as provided by Section 9.106.C.1.

h. The parking master plan shall attempt to reduce environmental problems and to further the City's compliance with the federal Clean Air Act amendments of 1990 through appropriate site planning techniques, such as but not limited to reduced impervious surfaces and pedestrian connections.

i. Compliance with the federal Clean Air Act amendments of 1990 shall be considered.

j. Reductions in the number of parking spaces should be related to significant factors such as, but not limited to:

i. Shared parking opportunities;

ii. Hours of operation;

iii. The availability and incorporation of transit services and facilities;

iv. Opportunities for reduced trip generation through pedestrian circulation between mixed-uses;

v. Off-site traffic mitigation measures;

vi. Recognized variations in standards due to the scale of the facilities;

vii. Parking demand for a specified use; and

viii. The provisions of accessible parking spaces beyond those required per Section 9.105.

k. Reductions in the number of parking spaces for neighborhood-oriented uses may be granted at a rate of one (1) space for every existing or planned residential unit located within two (2) blocks of the proposed use, and one-half (0.5) space for every existing or planned residential unit located within four (4) blocks of the proposed use.

7. *Approval.* The property owner involved in the parking master plan shall submit a written agreement, subject to City approval, requiring that the parking facility and any associated Transportation Demand Management (TDM) techniques shall be maintained without alteration unless such alteration is authorized by the Zoning Administrator. Such written agreement shall be recorded by the property owner with the Maricopa County Recorder's Office prior to the issuance of a building permit, and a copy filed in the project review file.

G. *Reserved.*

H. *Downtown Overlay District Program.*

1. *Purpose.* This parking program will ease the process of calculating parking supply for new buildings, remodels, or for buildings with new tenants or new building area.

This parking program consists of two (2) elements: Parking required and parking waiver.

2. *Parking required.* The amount of parking required shall be:

a. *If there is no change of parking intensity.*

i. If there is no change of parking intensity of the land use on any lot that has a legal land use existing as of July 31, 2003, no additional parking shall be required.

b. *Parking credits.*

i. Parking credits under this program shall be only for: parking improvement districts, permanent parking in-lieu credits, approved zoning variances for on-site parking requirements - unless the Zoning Administrator finds that the justification for the parking variance no-longer exists, and Parking P-3 District, except as provided in Section 9.104.H.2.b.i.(1). Only these parking credits shall carry forward with any lot that has parking credits as of July 31, 2003.

(1) Parking credits associated with the Parking P-3 District shall continue to apply, unless the Parking P-3 District is removed from the property.

ii. The Downtown Overlay District does not void public agreements for parking payments of any type of parking program.

iii. Any parking improvement district credit(s) or permanent parking in-lieu credit(s) that the lot has that are in excess of the current parking demand shall remain with the lot.

iv. Property owners are still required to pay for any program that allowed them to meet the parking requirements.

c. *Increase in parking.*

i. When a property's parking requirements increase above the parking requirements on July 31, 2003, the new parking requirement is calculated as follows:

(N - O) + T = number of parking spaces required

N = new (increased) parking requirement

O = old parking requirement (on July 31, 2003)

T = total of on-site and any remote parking spaces, plus any parking credits required on July 31, 2003 to meet the old parking requirement (excluding excess on-site and remote parking spaces and any excess parking credits).

ii. As applicable, Table 9.103.A. Table 9.103.B. shall be used to calculate N and O.

iii. A waiver to this requirement is in Section 9.104.H.3.

3. *Parking waiver within the Downtown Overlay District.*

a. *Purpose.* This parking waiver is designed to act as an incentive for new buildings, and for building area expansions of downtown businesses, which the expansion will have a minimal impact on parking demand.

b. *Applicability.* Upon application, property owners may have parking requirements waived if they meet both the following criteria:

i. Are within the Downtown Overlay District, and/or the Downtown District; and

ii. The new building or the new area of a building expansion is used for retail, office, restaurant or personal care services uses allowed in the underlying district.

c. *Limitations on this parking waiver.*

i. Can be used only once per lot existing as of July 31, 2003.

ii. Can be used for retail, office, restaurant or personal care services uses allowed in the underlying district at a ratio of one (1) space per three hundred (300) gross square feet.

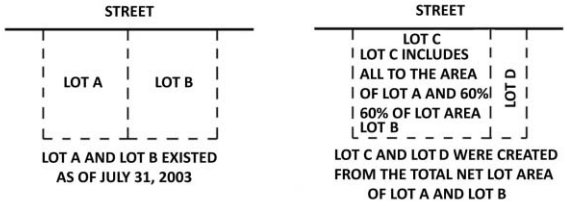
iii. Is limited to a maximum of two thousand (2,000) gross square feet of new building, or building area expansion. The two thousand (2,000) gross square feet per lot of new building, or building area expansion may be used incrementally, but shall not exceed two thousand (2,000) gross square feet of the building size of each lot existing as of July 31, 2003.

(1) Except as provided in Section 9.104.H.3.c.iii.(1)., a lot that is created after July 31, 2003 from more than one (1) lot that existed as of July 31, 2003 shall be allowed to utilize parking waiver as cumulative total of all lots that were incorporated into one (1) lot.

(2) A lot(s) that is created after July 31, 2003 from a portion of a lot(s) that existed as of July 31, 2003 shall be entitled to a waiver of area, as described in section 9.104.H.3.c.iii., based on the pro-rata portion of the net lot that was split from the existing lot(s) and incorporated into the new lot(s). For example:

As shown in Figure 9.104.A., Lot A and Lot B are reconfigured into two (2) new lot configurations, Lot C and Lot D. Lot C now includes all of the net lot area of Lot A and sixty (60) percent of the net lot area of Lot B. Lot C is entitled to the all of the waiver of Lot A and sixty (60) percent of the waiver of Lot B. Lot D is entitled only to forty (40) percent of the waiver of Lot B.

FIGURE 9.104.A.

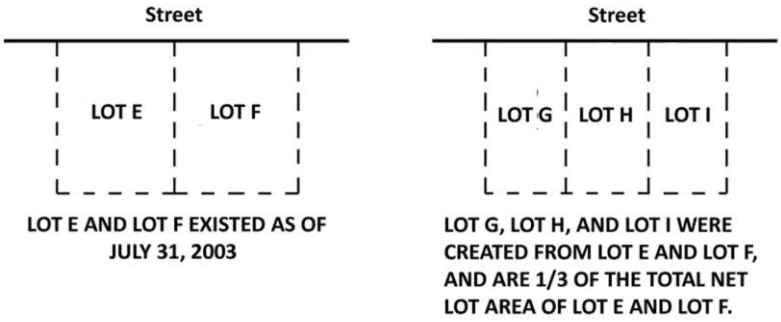


Therefore, Lot C's wavier would be three thousand two hundred (3,200) square feet of new building, or building area expansion; and Lot D's wavier would be eight hundred (800) square feet of new building, or building area expansion.

Another example may be:

As shown in Figure 9.104.B., Lot E and Lot F are reconfigured into three (3) new lots, Lot G, Lot H, and Lots I. Lot G, Lot H, and Lots I are each equal to one-third (1/3) of the total net lot area of Lot E and Lot F. therefore, Lot G, Lot H, AND Lots I each are entitled to one-third (1/3) of the total wavier that is allowed for Lot E and Lot F.

FIGURE 9.104.B.



Therefore, Lot G's, Lot H's, and Lot I's waiver each would be one thousand three hundred thirty-three and one-third (1,333.33) square feet of new building, or building area expansion.

iv. Cannot be used on land that issued to meet a property's current parking requirement unless the same number of physical parking spaces are replaced elsewhere on site, or through the purchase of permanent in-lieu parking credits.

d. *Residential addition parking waiver.* No additional parking is required for up to four new dwelling units that are added to a development as part of a 2,000 square foot (or smaller) nonresidential gross floor area expansion.

(Ord. No. 2736, § 1, 3-7-95; Ord. No. 3520, § 1, 7-1-03; Ord. No. 3543, § 1(Exh. 1), 12-9-03; Ord. No. 3774, § 2, 3-18-08; Ord. No. 3896, § 1(Exh. § 6), 6-8-10; Ord. No. 3920, § 1(Exh. §§ 110—114), 11-9-10; Ord. No. 3980, § 1(Res. 8895, § 1, Exh. A, § 47), 12-6-11; Ord. No. 4005, § 1(Res. No. 8947, Exh. A, § 199, 200), 4-3-12; Ord. No. 4099, § 1(Res. No. 9439, Exh. A, §§ 24, 25), 6-18-13; Ord. No. 4143, § 1(Res. No. 9678, Exh. A, §§ 250—261), 5-6-14)

Sec. 9.105. - Mobility impaired accessible spaces.

A. *Purpose.* The City encourages all development to provide adequate facilities for accessibility to people with mobility impairments covered by the Americans with Disabilities Act (ADA) and the Fair Housing Act (FHA), as amended.

B. *Required accessible parking spaces.*

1. Accessible parking spaces for any building or use shall conform to the ADA, FHA and Article IX.
2. Outpatient facilities in a hospital. Minimum: ten (10) percent of the provided parking.
3. Rehabilitation facilities specializing in treating mobility impairments. Minimum: twenty (20) percent of the provided parking.
4. Other uses. Minimum: four (4) percent of the provided parking.

C. *Reductions in the required accessible parking spaces.*

1. To reduce the number of accessible parking spaces, the property owner shall submit a development application to the Zoning Administrator, including the following:
   a. A report indicating the actual demand for the number of accessible parking spaces in the development project, and
   b. Any other information requested by the Zoning Administrator.

2. The Zoning Administrator may approve a reduction in the required accessible parking spaces, if:
    a. The development project provides over five hundred (500) parking spaces;
    b. The development project includes major employment use(s);
    c. The development project is within six hundred (600) feet of a public transit route and stop;
    d. The development project has minimal direct daily visitors;
    e. The reduced demand for accessible parking spaces is supported by the request; and
    f. The request is supported by other relevant information determined by the Zoning Administrator.
3. The accessible parking spaces required shall not be less than two (2) percent of the provided parking spaces, or as required by ADA, whichever results in more accessible parking spaces.

D. *Existing developments.*

1. The location and any restriping of accessible parking spaces shall comply with the approved site plan, and applicable ADA and FHA requirements.
2. Reconfiguring any onsite parking shall be subject to City approval. All reconfigured accessible parking spaces shall conform with Article IX. and the Design Standards & Policies Manual.

E. *Location of accessible spaces.*

1. Each accessible parking space shall be located adjacent to the shortest route to the accessible building entrance used by the public.
2. Accessible parking spaces shall be dispersed, but located nearest to accessible entrances, for any building with multiple accessible entrances.
3. Accessible parking spaces shall be dispersed, but located nearest to accessible entrances, throughout a development project with multiple buildings.
4. The minimum width of the accessible route shall conform to the ADA, FHA and the Design Standards and Policies Manual.
5. Accessible parking in a parking structure or podium parking may be provided on one level adjacent to the shortest route to the accessible building entrance.
6. Where a development project provides fewer than five (5) on-site parking spaces accessed from an alley, the Zoning Administrator may approve a nearby on-street accessible parking space upon finding the space affords:
    a. Greater accessibility to the accessible building entrance, and
    b. Greater convenience.

F. *Standards.* Accessible parking spaces and access aisles shall conform to the Design Standards & Policies Manual, and the following:

1. Minimum accessible parking space width: eleven (11) feet.
2. Minimum accessible parking space length: In accordance with Section 9.106.
3. Access aisle width: five (5) feet.
4. Two (2) adjacent accessible parking spaces may share an access aisle.

G. *Identification.* Identification, signage and markings of the accessible parking spaces, access aisles and access routes shall conform to the ADA, FHA, and the Design Standards and Policies Manual.

H. *Slope.*

1. Maximum slope of a ramp from the access aisle to a sidewalk: 1:12 ratio.

2. Maximum slope and cross slope of the access aisle and route: 1:50 ratio.

I. *Accessible tenant covered parking, podium parking, and parking structure parking spaces for multiple dwelling development projects.*

1. Minimum: the same percentage as non-accessible tenant covered, podium parking, and parking structure parking spaces.

J. *Accessible separate garage parking for multiple dwelling development projects.*

1. Where separate garages for the dwelling units are provided in a multiple dwelling development project, the site plan shall designate which garages are adaptable for accessible parking.

2. Minimum: the same percentage as non-accessible separate garages.

3. The dimensions of each accessible parking space and access aisle shall comply with Article IX.

K. *Accessible covered parking, garage, podium parking, and parking structure parking for visitors of multiple dwelling development projects.*

1. Minimum: the same percentage as non-accessible covered parking, garage, podium parking, and parking structure parking spaces.

L. *Common covered accessible parking for employees.* The property owner shall provide accessible covered parking space(s) upon request from an employee that is employed by an establishment on the property if the property owner provides non-accessible common covered parking.

M. *Accessible non-residential covered parking, garage, podium parking, and parking structure parking.*

1. Minimum: the same percentage as non-accessible covered parking, garage, podium parking, and parking structure parking spaces.

N. *Reasonable accommodations.* Property with a parking structure or podium parking that was permitted before January 26, 1992 with a Certificate of Occupancy issued before January 26, 1993, and which is unable to provide accessible parking within the parking structure or podium parking due to structural or other reasonable limitations, shall provide reasonable accommodations on the property for accessible covered parking, subject to the Zoning Administrator's approval.

O. *Vertical clearance.* In addition to ADA and FHA requirements:

1. Minimum accessible parking space vertical clearance: eight (8) feet two (2) inches.

2. Minimum vehicular drive aisle vertical clearance to and from covered parking, garage, podium parking, and parking structure accessible parking space(s): eight (8) feet two (2) inches.

P. *Passenger loading zones.* Passenger loading zones shall conform to the ADA, FHA and the Design Standards and Policies Manual.

Q. The ADA, FHA, and Section 504 of the Rehabilitation Act of 1973, as amended, apply if any part of this Section 9.105 is determined unenforceable.

(Ord. No. 2736, § 1, 3-7-95; Ord. No. 3896, § 1(Exh. § 6), 6-8-10; Ord. No. 3920, § 1(Exh. § 115), 11-9-10; Ord. No. 4117, § 1(Res. No. 9563, Exh. A, § 99), 11-19-13)

Sec. 9.106. - Design standards for public and private on-site ingress, egress, maneuvering and parking areas.

A. *Standard Parking space dimension.*

1. *Vehicular.*

a. Except for parallel parking spaces, as indicated below, and in Table 9.106.A. parking spaces shall have a minimum width of nine (9) feet and a minimum length of eighteen (18)

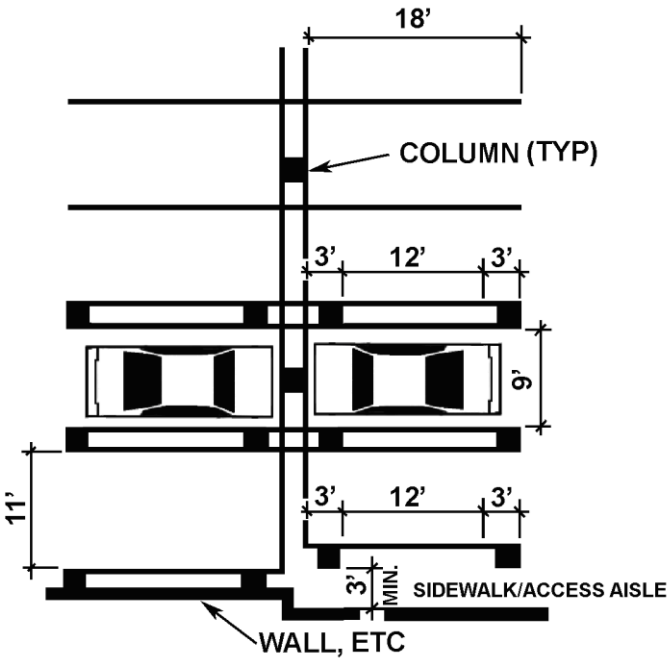
feet. Parallel parking spaces shall have a minimum width of nine (9) feet and a minimum length of twenty-one (21) feet.

i. For new development and/or redevelopment constructed after July 9, 2010, when a side of a parking space is adjacent to a wall, column, or other obstruction, except as provided in Sections 9.106.A.1.a.ii. and 9106.A.1.a.iii., that is taller than six (6) inches, and where a minimum three-foot wide unobstructed pedestrian access aisle is not provided between the wall, column, or other obstruction and the parking spaces, the width of the parking space shall be increased by two (2) feet on the obstructed side, as illustrated by Figure 9.106.A.

   (1). The entire required width and length of a parking space(s) shall not be obstructed by a column, or obstruction that is greater than six (6) inches in height, as illustrated by Figure 9.106.A.

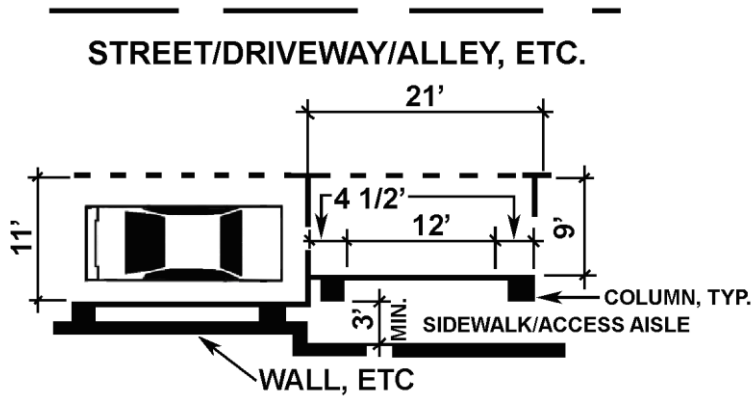
ii. For new development and/or redevelopment constructed after July 9, 2010, when a side of a parking space, excluding a parallel parking space, that is adjacent to a column that is taller than six (6) inches, the obstructed side shall be unobstructed for a minimum of twelve (12) feet, which is between the front three (3) feet and rear three (3) feet of the parking space, as further illustrated by Figure 9.106.A.

FIGURE 9.106.A. Column, etc. Obstructions



iii. For new development and/or redevelopment constructed after July 9, 2010, when a side of a parallel parking space that is adjacent to a wall, column, or other obstruction that is taller than six (6) inches, the obstructed side shall be unobstructed for a minimum of twelve (12) feet, which is between the front four and one-half (4½) feet and rear four and one-half (4½) feet of the parking space, as further delineated by Figure 9.106.B.

Figure 9.106.B. Parallel Parking Space Side Obstructions

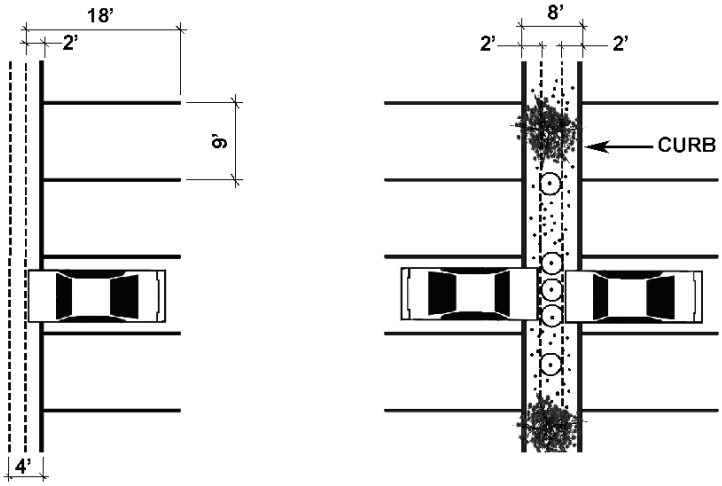


b. As illustrated in Figure 9.106.C., the front length of the space may over-hang a curb or low planter of a maximum height of six (6) inches and a maximum depth of two (2) feet which may not be calculated as required open space, or required parking lot landscaping. If a low planter is utilized the following conditions shall be met:

i. Where the front of a parking stall overhangs a curb or planter on one (1) side only, the minimum width of the planter shall be four (4) feet.

ii. Where the front of a parking stall overhangs a curb or planter on both sides, the minimum width of the planter shall be eight (8) feet.

Figure 9.106.C. Parking Stall Overhangs



c. Where special circumstances exist, such as, but not limited to, a lot size, the Development Review Board may approve parking space sizes different from the requirements of the sections of 9.106.A.1. and Table 9.106.A.; but may not approve aisle sizes different from the requirements of Table 9.106.A.

2. *Bicycle.* Bicycle parking spaces shall have a minimum width of two (2) feet and a minimum length of six (6) feet, unless the spaces are provided by a pre-manufactured bicycle rack or locker which differ from this dimension, in which case the dimension of the pre-manufactured rack or locker shall suffice.

B. *Parking layout.* Minimum layout dimensions are established in Table 9.106.A. and Figure 9.106.D. which shall apply to all off-street parking areas with the exception that parking spaces accessed by an alley shall require a minimum of ten (10) feet from the back of the space to the alley centerline.

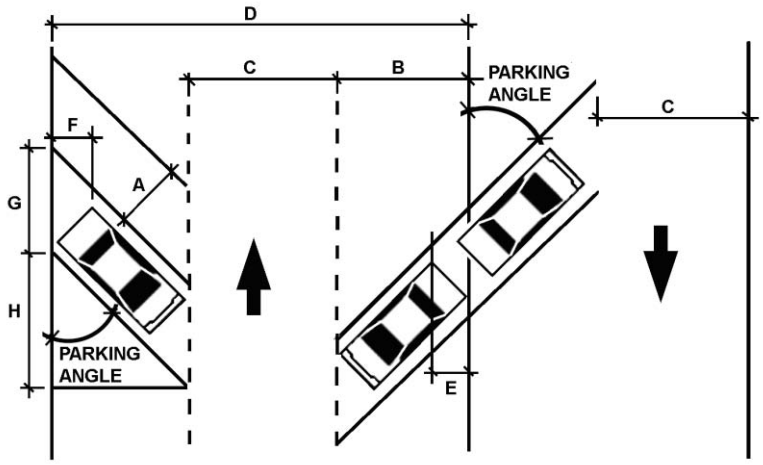
Table 9.106.A. On-Site Parking Dimensions

Angle	Stall Width (A) [1, 3]	Vehicle Projection (B) [1]	Aisle (C)* [1, 2]	Typical Module (D) [1]	Interlock Reduction (E) [1]	Overhang (F) [1]	Curb Length (G) [1]	End of Row Waste (H) [1]
0°	21	9.0	12.0	40.0	0	0	21.0	—
45°	9.0	19.1	12.0	50.2	6.4	1.4	12.7	19.1
50°	9.0	19.6	14.5	53.7	5.8	1.5	11.7	16.4
55°	9.0	19.9	16.0	55.8	5.2	1.6	11.0	13.9
60°	9.0	20.1	18.0	58.2	4.5	1.7	10.4	11.6
65°	9.0	20.1	20.0	60.2	3.8	1.8	9.9	9.4
70°	9.0	20.0	22.0	62.0	3.1	1.9	9.6	7.3
75°	9.0	19.7	24.0	63.4	2.3	1.9	9.3	5.3
90°	9.0	18.0	24.0	60.0	0	2.0	9.0	0

Note:

1. All measurements are in feet.
2. No two-way drive aisle shall be less than twenty-four (24) feet in width.
3. An accessible parking stall width and access aisle shall comply with Section 9.105.E.

Figure 9.106.D.



C. *Design and improvement standards.*

1. *Vehicular.*

a. Residential uses with up to four (4) units: parking, maneuvering, ingress and egress areas, for residential uses, with a total area of three thousand (3,000) square feet or greater, shall be improved in compliance with the Design Standards & Policies Manual and thereafter maintained by surfacing, to prevent emanation of dust, with (1) concrete, asphalt, cement or sealed aggregate pavement; (2) three (3) inches deep crushed rock completely contained in a permanent border; or (3) another stabilization material approved by Maricopa County.

b. Nonresidential uses and residential uses with more than four (4) units: parking, maneuvering, ingress and egress areas for (1) industrial, commercial, and nonresidential uses, and (2) residential uses with more than four (4) units shall be improved in compliance with the Design Standards & Policies Manual and thereafter maintained with regard to:

i. Grading and drainage.

ii. Surfacing, to prevent emanation of dust, with (1) concrete, asphalt, cement or sealed aggregate pavement; (2) three (3) inches deep crushed rock completely contained in a permanent border; or (3) another stabilization material approved by Maricopa County.

iii. Parking stall layout and markings.

iv. Protective pipes at driveway entrances.

v. Curbs, barriers and wheel stops. This requirement shall not apply within the taxilane safety area.

vi. Directional signs.

c. Nonresidential uses and residential uses with more than four (4) units: parking areas for (1) industrial, commercial, and nonresidential uses, and (2) residential uses with more than four (4) units shall meet the following standards:

i. The parking lot shall be designed so that vehicles exiting therefrom will not be required to back out across any sidewalk or street.

ii. Except as permitted in Section 9.106.C.1.c.ii.(1). All required on-site parking spaces shall be accessed directly from a drive aisle, alley or driveway. All on-site parking

facilities shall be provided with appropriate means of vehicular access to a public street.

(1) Residential parking space may be provided in a two (2) parking space tandem configuration if the tandem spaces are allocated to the same residential dwelling. Tandem parking spaces shall be accessed directly from a drive aisle, alley or driveway.

iii. All parking lots shall be illuminated in accordance with Section 7.600, Outdoor Lighting, or as determined by the Development Review Board.

iv. Illumination of an on-site parking area shall be arranged so as not to reflect direct rays of light into adjacent residential districts and streets. In no case shall such lighting cause more than one (1) footcandle of light to fall on adjacent properties as measured horizontally at the lot line, or as approved by the Development Review Board. Shields shall be used where necessary to prevent exposure of adjacent properties.

v. Any wall, fence or landscaping provided shall be adequately protected from damage by vehicles using the parking lot and shall be properly maintained and kept in good repair at all times.

d. The effective dates for the improvement standards regarding surfacing set forth in this section shall be:

i. October 1, 2008 for parking, maneuvering, ingress and egress areas for industrial, commercial, and nonresidential uses, and residential uses with more than four (4) units; and

ii. October 1, 2009 for parking, maneuvering, ingress and egress areas, for residential uses, with a total area of three thousand (3,000) square feet or greater.

2. *Bicycle.*

a. The type of bicycle parking facility provided shall be determined according to the requirements of Section 9.103.C., Required bicycle parking, and Section 9.104.C, Credit for bicycle parking facilities.

b. Bicycle facilities shall be located on the same site as the generating land use and within fifty (50) feet of the building entrance in a location which does not extend into pedestrian sidewalks or vehicular traffic lanes.

c. Lighting shall be provided along the access route from the bicycle facility to the building if the route is not completely visible from lighting on the adjacent sidewalks or vehicular parking facilities. Such lighting shall be provided in accordance with Section 7.600, Outdoor Lighting, or as determined by the Development Review Board.

3. *Covered parking.*

a. No covered parking shall be allowed in a required yard or building setback.

D. *Driveway parking prohibited except in residential districts.* Except in residential districts, parking in driveways connecting the public right-of-way with a parking area or garage shall not be permitted on or adjacent to the driveway.

E. *Landscape design.*

1. Parking lot landscaping and landscape islands shall be provided in accordance with Article X.

2. Parking structures fronting on a public street shall include pedestrian-related amenities such as sitting areas, planters, and visually-interesting wall surfaces at the street level along the street frontage, subject to design approval by the Development Review Board.

F. *Screening.*

1. Parking lot areas and on-site vehicular circulation (including drive-throughs and drive-ins, but excluding access driveways to streets and alleys) shall be screened from all streets and alleys by a three-foot tall masonry wall or berm and/or opaque landscape materials, subject to design approval by the Development Review Board.
2. Outdoor vehicle display areas shall be screened, subject to design approval by the Development Review Board.

(Ord. No. 2736, § 1, 3-7-95; Ord. No. 2887, § 1, 3-19-96; Ord. No. 2977, § 1, 12-17-96; Ord. No. 3225, § 1, 5-4-99; Ord. No. 3274, § 2, 12-7-99; Ord. No. 3774, § 3, 3-18-08; Ord. No. 3896, § 1(Exh. § 6), 6-8-10; Ord. No. 3920, § 1(Exh. § 116), 11-9-10; Ord. No. 4005, § 1(Res. No. 8947, Exh. A, § 201), 4-3-12; Ord. No. 4099, § 1(Res. No. 9439, Exh. A, §§ 26—28), 6-18-13; Ord. No. 4117, § 1(Res. No. 9563, Exh. A, § 100), 11-19-13; Ord. No. 4143, § 1(Res. No. 9678, Exh. A, § 262), 5-6-14)

Sec. 9.107. - Remote parking.

A. *Remote parking.* Parking off a development site is permitted under the following procedures.

B. *Remote parking agreement.* The remote parking agreement shall be subject to approval by the Zoning Administrator and City Attorney. The document shall contain the following and be recorded against the properties where the parking and served use are located.
   1. A term of at least five (5) years, to protect the city's interests in providing long-term, stable parking for the served use.
   2. Discontinuation of the served use if the remote parking becomes unavailable.
   3. Maintenance requirements.
   4. Termination, violations and enforcement provisions.

C. *Zoning Administrator review.* The Zoning Administrator shall consider whether the remote parking:
   1. Is within six hundred (600) feet of the property line of the served use.
   2. Is accessible to the served use by a direct, safe, continuous pedestrian way.
   3. Serves the purposes of this Zoning Ordinance.

(Ord. No. 4099, § 1(Res. No. 9439, Exh. A, § 29), 6-18-13)

Editor's note— Ord. No. 4099, § 1(Res. No. 9439, Exh. A, § 29), adopted June 18, 2013, repealed and reenacted § 9.107 in its entirety to read as herein set out. Prior to inclusion of said ordinance, said provisions pertained to locating required parking relative to the use served. See also the Code Comparative Table.

Sec. 9.108. - Special parking requirements in districts.

A. *Planned Regional Center (PRC).* The provisions of Article IX shall apply with the following exceptions:
   1. There shall be no parking required for courtyards or other open spaces, except that those portions thereof used for sales or service activities shall provide parking as specified elsewhere by this Zoning Ordinance.
   2. Parking for dwellings shall be covered.

B. *Theme Park District (WP).* The provisions of Article IX shall apply with the following exceptions:

1. The number of spaces required in Table 9.103.A. may be proportionately reduced by the provision of bus parking. Bus parking provided in lieu of automobile parking spaces may account for a maximum reduction of fifty (50) percent of the spaces required in Table 9.103.A.

2. If any bus parking is provided in lieu of automobile parking spaces, one (1) overflow automobile parking space shall be provided for each twenty-five (25) persons for whom seating is provided as indicated on the approved development plan.

C. *Downtown.* In Type 1 Areas of the Downtown Area, all parking shall be accessed from an alley or a street adjacent to a side yard. Unless approved by the Development Review Board, there shall be no curb cuts on streets abutting a front yard within any Type 1 Area.

D. *In-lieu parking program in the Downtown Overlay District (DO) and the Downtown District (D).*

1. *Purpose.* The purpose of the in-lieu parking program is to assist the property owners of small properties to reinvest, develop, and redevelop to the highest and best use of the property, and to accommodate different land uses throughout the life span of a development. In addition, the purpose of the in-lieu parking program is to foster a pedestrian-oriented environment with a sustainable urban design and character for all properties in the Downtown Area, by reducing the total number of physical parking spaces on a property. Also, as specified below, fees associated lieu parking program shall be utilized for the downtown parking program and downtown tram service.

2. *Parking requirements.* A property owner may satisfy a property's nonresidential parking requirement through the City's in-lieu parking program by an in-lieu parking payment(s) made to the City's downtown parking program enhancement account for in-lieu parking credits. The regulations of the in-lieu parking program shall not be eligible for a variance. The City shall not be obligated to approve a property owner's request to participate in the in-lieu parking program.

3. *Approvals required.*

a. The City Council shall determine whether or not to allow a property owner to participate in the in-lieu parking program based on the following considerations:

i. New development, reinvestment, or redevelopment of the property;

ii. The use of the property fosters a pedestrian-oriented environment with an urban design and character, and the use of public transit or the downtown tram service;

iii. Property size and configuration;

iv. The amount of public parking available to the area;

v. The future opportunity to provide public parking in the area; or

vi. Open space and public realm areas are maintained and/or parking lots convert into open space and public realm.

b. The Zoning Administrator may administratively approve participation in the in-lieu parking program for up to, and including five (5) in-lieu parking credits, provided that the allowance is based on the City Council considerations of Section 9.108.D.3.a. The Zoning Administrator approval shall not exceed a total of five (5) in-lieu parking credits per lot.

i. An appeal of the Zoning Administrator's, denial for participation in-lieu parking program shall be heard by City Council.

(1) Appeals must be filed with the City Clerk no later than thirty (30) days after the Zoning Administrator issues any written denial for participation in-lieu parking program.

ii. The City Council shall evaluate an appeal, and may approve or deny participation in-lieu parking program based on the considerations specified in Section 9.108.D.3.a.

4. *In-lieu parking credit fees.* The amount of the in-lieu parking credit fee(s) shall be established by the City Council, and may include penalty fees for late payment, legal fees, administrative fees, an interest rate to account for the time value of money for the in-lieu parking installment purchase option, and any other fee the City Council deems necessary to implement the in-lieu parking program.

5. *Use of in-lieu parking fees.* The use of the in-lieu parking fees paid to the City shall be used for the operation of a downtown parking program which may include, but is not limited to, the provision and maintenance of public parking spaces, the operation of tram shuttle services linking public parking facilities and downtown activity centers, and services related to the management and regulations of public parking.

6. *In-lieu parking payments.* Fractional parking requirements may be paid for on a pro-rata basis. The property owner may purchase, or the City Council may require in-lieu parking credits to be purchased, either as permanent parking credits or as term parking credits in accordance with the following:

    a. *Permanent in-lieu parking credits.* Parking space credits purchased under this permanent in-lieu option shall be permanently credited to the property. These parking credits may be purchased either by installment payments to the City over a fixed period of time, or by payment of a lump sum fee.

        i. Under the lump sum purchase option, purchase shall be made by the property owner through payment of the total fee, in accordance with the procedures adopted by the Zoning Administrator and a written agreement, satisfactory to the City, with the property owner.

        ii. The installment purchase option shall require an initial cash deposit and a written agreement, satisfactory to the City, binding the property owner to make subsequent monthly installment payments. The installment purchase agreement shall not create a payment term longer than fifteen (15) years, and shall include, but not limited to, payment procedures approved by the Zoning Administrator. Payment of the lump sum in-lieu fee, or payment of the installment purchase deposit and execution by both parties of the installment purchase agreement, shall be completed prior to the issuance of a building permit if a building permit is required, or to the issuance of a certificate of occupancy.

    b. *Monthly term in-lieu parking credits:* Parking credits obtained by payment of a monthly in-lieu fee under this option are only for the term of the activity requiring the parking and are not permanently credited to the property. A monthly term in-lieu parking credit(s) requires a written agreement, satisfactory to the City, binding the property owner to make subsequent monthly payments. The agreement shall include, but not limited to payment procedures approved by the Zoning Administrator. The first monthly payment shall be made in accordance with the agreement.

    c. *Evening-use term in-lieu parking credits.* Parking credits obtained by payment of a monthly in-lieu fee under this option are only for the term of the activity requiring the parking, limited to uses only open for business between the hours of 5:00 p.m. and 3:00 a.m., and are not permanently credited to the property. An evening-use term in-lieu parking credit requires a written agreement satisfactory to the City binding the property owner to make monthly payments. The agreement shall include, but not limited to payment procedures approved by the Zoning Administrator. The first monthly payment shall be made in accordance with agreement.

(Ord. No. 2736, § 1, 3-7-95; Ord. No. 3225, § 1, 5-4-99; Ord. No. 3520, § 1, 7-1-03; Ord. No. 3543, § 1(Exh. 1), 12-9-03; Ord. No. 3662, § 2, 2-7-06; Ord. No. 3879, § 1(Exh. § 27), 3-2-10; Ord. No. 3896, § 1(Exh. § 6), 6-8-10; Ord. No. 3920, § 1(Exh. § 119), 11-9-10; Ord. No. 4099, §

1(Res. No. 9439, Exh. A, § 30), 6-18-13; Ord. No. 4143, § 1(Res. No. 9678, Exh. A, § 263), 5-6-14)

Sec. 9.109. - Evening-use parking.

A. *Evening-use parking.* Evening-use parking is parking for establishments conducting business between 5:00 p.m. and 3:00 a.m.

B. *Evening-use parking application* . The property owner of the served use shall file an application for proposed evening-use parking, including:

1. A lighting plan for the parking in conformance with Article VII.
2. An analysis of the location and availability of private parking spaces.
3. A remote parking agreement in accordance with this article if the parking is not on the same property as the served use.

C. *Zoning Administrator approval of evening-use parking.* The Zoning Administrator may approve an application for evening-use parking if the plans and analysis show the parking:

1. Is within six hundred (600) feet of the property line of the served use.
2. Is accessible to the served use by a direct, safe, continuous pedestrian way.
3. Serves the purposes of this Zoning Ordinance.

(Ord. No. 4099, § 1(Res. No. 9439, Exh. A, § 31), 6-18-13; Ord. No. 4143, § 1(Res. No. 9678, Exh. A, § 264), 5-6-14)

Sec. 9.110. - High occupancy vehicle parking.

A. Parking for carpools, vanpools, and other high occupancy vehicles shall be located nearest the main building entrance with priority over all other parking except for mobility-impaired accessible parking.

(Ord. No. 4099, § 1(Res. No. 9439, Exh. A, § 32), 6-18-13)

Sec. 9.200. - Off-Street Loading.

Sec. 9.201. - General regulations.

All buildings hereafter erected or established shall have and maintain loading space(s) as determined by Development Review Board approval as outlined in article I, Section 1.900 hereof and subject to conditions herein.

A. No part of an alley or street shall be used for loading excepting areas designated by the city.

B. No loading space that is provided in an approved development review shall hereafter be eliminated, reduced or converted, unless equivalent facilities are provided elsewhere.

C. All loading space shall be surfaced and maintained subject to the standards of Section 9.106.C.1.

(Ord. No. 3225, § 1, 5-4-99; Ord. No. 3774, § 4, 3-18-08; Ord. No. 3896, § 1(Exh. § 6), 6-8-10)

Appendix C – Local Cities Required Parking

C

9-ZN-2019
9/23/2019

City of Tempe Parking Requirements

Section 4-607 - Downtown Parking Standards.

The following *parking* requirements have been established for uses located in the CC, City Center District and shall utilize parking ratios in Table 4-607A. If ratios are not identified in Table 4-607A, then the general parking standards found in Table 4-603E shall apply. The CC District shall be exempt from the reductions found in Table 5-612A - Transportation Overlay District Reductions to Minimum Parking.

A. The first five thousand (5,000) square feet of building area for commercial use, as defined in Table 4-607A, shall be waived for the purpose of determining the minimum required parking for the site.

B. Public parking shall be provided for all new development and determined as part of the parking management plan. For the purpose of this section, "Public parking" means, parking which is not allocated or not restricted for exclusive use by employees or residents, and shall remain available for customers or guests regardless of accessibility or associated fees for such parking.

C. Parking Management Plan. A parking management plan shall be provided as part of a comprehensive effort for establishing employee, resident, and public parking in a new development that provides either on-site and/or off-site parking locations and how those spaces are managed. The purpose of the plan is to minimize traffic, encourage alternate modes of transportation, and effectively allocate parking needs for the greater downtown area. The plan shall be based on a professional parking analysis and shall be processed as a part of the development plan review, subject to approval of the appropriate decision-making body. The plan shall comply with the following:

1. The parking management plan shall identify the location of specific parking facilities and the number of parking spaces in such facilities that are available to meet the parking demand of the new development.
2. Parking identified on the plan shall be delineated as being reserved for employees, residents, or public parking, and whether valet or other access control measures are used to ensure the availability and enforcement of the plan.
3. The professional parking analysis shall demonstrate that adequate parking for the public is provided, identifying existing supply and demand within the surrounding parking facilities and what will be provided on site. When off-site parking is proposed to satisfy the parking standards for employee/resident parking, the applicant shall demonstrate that all such parking is available within the specified parking facilities, based on the existing demand and supply as identified in the professional parking analysis.
4. A shared parking model, as identified in Section 4-604(B), shall not be used for the purpose of reducing the minimum parking standards found in Table 4-607A.
5. The owner or manager designee of a development approved under the parking management plan shall provide an accurate and current record of the uses and parking allocation for the development. The Community Development Director, or designee, may require this record be provided or updated when the owner applies for a change in use or development plan review for the subject site.

D. Parking Affidavit. When off-site parking is provided as part of the parking management plan, the owner of the site on which the shared parking is located shall file a parking affidavit with the Community Development Department. The parking affidavit shall transfer the right to the unqualified availability of a specific number of parking spaces from one (1) property (which can no longer take credit for them) to another. This agreement shall be completed prior to receiving building permits.

Table 4-607A: CC District Parking Standards

Use	Vehicle Parking Minimums	Bicycle Parking Minimums
Commercial (all types): bar, clinic, club, entertainment, office, restaurant, retail, fitness center, theater, etc.	first 5,000 sf waived. 1 space per 500 sf thereafter	See Table 4-603E
Commercial, outdoor	0	0
Church/place of worship	1 space per 300 sf for sanctuary + school, etc.	See Table 4-603E
Conference/assembly	First 10,000 sf waived for hotels, 1 space per 300 sf thereafter	0
Hotel/motel	0.3 spaces per unit + commercial, conference, etc.	See Table 4-603E
Residential		
Single-family	1 space	0
Multi-family (all types)		See Table 4-603E
Guest	0.1 per unit (without commercial)	
Studio	0.5 spaces per bedroom	
1 Bedroom unit	0.5 spaces per bedroom	
2 Bedroom unit	0.5 spaces per bedroom	
3 Bedroom unit	0.3 spaces per bedroom	
4 Bedroom unit or more	0.3 spaces per bedroom	
School	1 space per 300 sf of classroom + office	See Table 4-603E

Note: Public parking shall be provided and determined as part of a parking management plan.

Key:

SF = square feet

(Ord. No. 2015.60, 12-17-2015)

City of Chandler Parking Requirements

Chandler ✦ Arizona

9-ZN-2019
9/23/2019

35-1804. - Parking schedule.

The following schedule provides the minimum parking spaces required for individual stand-alone uses. Parking shared by multiple uses shall be subject to parking requirements for shopping centers where permitted by the underlying zoning and/or shared parking requirements pursuant to Section 35-1807(2) Shared Parking. All parking requirements are based on gross floor area unless otherwise stated.

(1) *Residential:*

Single-family	** 2 spaces/unit
Two-family	** 2 spaces/unit
Townhouse, patio home	** 2 spaces/unit
Multi-family: Efficiency or studio One-bedroom Two-bedroom Each additional bedroom	 *** 1 space/unit *** 1.5 spaces/unit *** 2 spaces/unit *** 0.25 spaces
Mobile home subdivision or park	*** 2 spaces/home or trailer

**2 spaces per unit shall be covered

***1 space per unit shall be covered

(Note: The entire space nine (9) by nineteen (19) feet as defined in Section 35-1802(1) shall be covered.)

(2) *Institutional:*

Elementary and junior high school	One (1) space/classroom Plus one (1) space for each two hundred (200) square feet of floor area in office use

High schools, colleges	One (1) space/two hundred (200) square feet gross floor space
Trade or business schools	One (1) space/two hundred (200) square feet
Library	One (1) space/two hundred fifty (250) square feet
Museum	One (1) space/two hundred fifty (250) square feet
Churches	One (1) space/four (4) seats
Hospitals	Three (3) space/bed
Convalescent homes	One (1) space/three (3) beds
Government offices	One (1) space/two hundred (200) square feet
Elderly care housing	0.75 spaces/unit Plus one (1) additional space per project employee/attendant

(3) *Commercial:*

Auditorium, theaters, stadium or similar place of assembly	One (1) space/two hundred (200) square feet or one (1) space/five (5) seats, whichever is greater
Private clubs, lodges (no overnight accommodations)	One (1) space/two hundred (200) square feet or one (1) space/five (5) seats, whichever is greater
Dance halls	One (1) space/two hundred (200) square feet

Health club or fitness club with multiple amenities (Gymnasium, fitness center and other recreational uses offering multiple amenities such as swimming pools, ball courts, and exercise equipment)	One (1) space/two hundred (200) square feet
Recreational community centers with multiple amenities (public or nonprofit facilities providing multiple amenities and recreational services such as swimming pools, ball courts, outdoor athletic fields, meeting rooms, classes, fitness center, day care, locker rooms, and lounge/snack area)	One (1) space/two hundred (200) square feet
Single use recreational facilities (athletic training, family recreational, or other recreational facilities specializing in a single use such as amusement centers, skating rinks, bounce gyms, party places, baseball/batting training facility, cheerleading training, dance studio, swimming, martial arts studio, yoga/pilates studio, personal training, fencing, laser tag, indoor paintball, boxing training) not hosting tournaments, exhibitions or other similar events	One (1) space/three hundred (300) square feet
Single use recreational facilities hosting tournaments, exhibitions or other similar regional events	To be determined by a parking demand study based on seating capacity prepared specifically for the subject use
Funeral homes	One (1) space/four (4) seats in main assembly area or one (1) space/three hundred (300) square feet, whichever is greater

Medical, dental offices, clinics	One (1) space/one hundred fifty (150) square feet
General offices, nonretail, excluding call centers	One (1) space/two hundred fifty (250) square feet
Call Center	One (1) space/one hundred fifty (150) square feet
Hotels, motels, boarding homes	One (1) spaces for each sleeping room Plus one (1) space/one hundred (100) square feet of meeting, banquet and restaurant space not solely intended for hotel guests and/or staff
Restaurants, cafes, bars, cocktail lounges	One (1) space/fifty (50) square feet of public serving area Plus one (1) space/two hundred (200) square feet of preparation area
Shopping centers (less than ten (10) gross acres in size)	Five and one-half (5.5) spaces/one thousand (1,000) square feet
Shopping centers (ten (10) gross acres or larger in size)	One (1) space/two hundred fifty (250) square feet
Retail sales	One (1) space/two hundred fifty (250) square feet
Childcare or Child daycare	One (1) space/three hundred (300) square feet
Bulky merchandise sales, nurseries, building materials, equipment rental	One (1) space/three hundred (300) square feet

Banks and personal service	One (1) space/one hundred fifty (150) square feet
Bowling alleys	Four (4) spaces/lane
Tennis, handball courts	Three (3) spaces/court
Golf course	One (1) space/two hundred (200) square feet in main building Plus four (4) spaces per green
Motor vehicle repair	Three and one-half (3.5) spaces/vehicle service bay
Motor vehicle sales and rental	One (1) space/two hundred fifty (250) square feet of interior display space and office Plus three and one-half (3.5) spaces/vehicle service bay
Motor vehicle wash	Two (2) spaces minimum Plus other uses (Retail sales, motor vehicle repair, restaurant, office)

(4) *Industrial:*

Manufacturing	One (1) space/one thousand (1,000) square feet gross floor area (Ord. No. 1506, 8-11-85) Plus one (1) space/two hundred fifty (250) square feet of office space

Warehousing	One (1) space/five hundred (500) square feet for the first ten thousand (10,000) square feet Plus one (1) space/five thousand (5,000) square feet for remaining warehouse Plus one (1) space/two hundred and fifty (250) square feet of office space

(5) *City Center District:* All required off-street parking within the City Center District shall be in accordance with Section 35-3204(F).

(6) *Parking Districts:* Any use which participates in a parking district shall be subject to the requirements of said parking district.

(7) *Unlisted uses:* In cases of unlisted uses or unusual circumstances, the Zoning Administrator may determine specific parking requirements based on the unique needs of the individual case, the requirements for the most comparable use, and any other relevant data regarding parking demand. In order to make this determination, the Zoning Administrator may require the applicant to submit a parking demand study pursuant to Section 35-1807(3) Parking Demand Studies.

(8) *Maximum Parking Spaces:* The number of parking spaces provided by any development shall not exceed one hundred twenty-five (125) percent of the minimum required spaces in the parking schedule, except as follows:

(a) Parking within the building footprint of a structure (e.g. rooftop parking, below grade parking, multi-level parking structure);

(b) When a change in use to an existing development causes a lower parking requirement;

(c) Parking spaces managed for shared parking;

(d) Phased projects do not need to comply with the maximum space requirement until the final phase is constructed;

(e) A site specific parking demand study justifies the need to exceed the maximum parking and a minimum fifty (50) percent of the site's parking area (including parking spaces, driveways, and sidewalks) is provided with one (1) or any combination of the following options to help mitigate the heat island effect:

1. Paving materials shall have a minimum solar reflectance index as required by the latest amended edition of the "International Green Construction Code" approved by the International Code Council;

2. Shade is provided by architectural devices or structures that have a minimum Solar Reflectance Index as required by the latest amended edition of the "International Green Construction Code", except for solar photovoltaic systems which shall not be required to comply with said minimum Solar Reflectance Index;

3. Shade is provided by open trellis-type structures that are designed to be covered with plant material and achieve mature coverage within five (5) years from the date of occupancy;

4. Shade is provided by trees. Hardscape areas located directly beneath trees shall be measured based on anticipated five-year canopy growth beginning from the date of occupancy. Duplicate shading credit shall not be granted for those areas where multiple trees shade the same hardscape;

5. Open-grid pavers and/or other permeable paving materials approved by the City Engineer that are less than fifty (50) percent impervious are utilized.

(Ord. No. 1291, § I, 1-9-84; Ord. No. 1421, II, 1-10-85; Ord. No. 1506, 8-11-85; Ord. No. 3063, § 3, 11-18-99; Ord. No. 3262, § 1, 5-10-01; Ord. No. 4375, § I, 8-13-12)

35-1808. - Passenger loading zones.

(1) *Applicability.* The intent of this Section is to encourage the installation of passenger loading zones to meet demand for passenger drop-off and pick-up areas generated by ride sharing and/or autonomous vehicles on all land uses except single family residential.

(2) *Number of passenger loading zones and correlated parking reduction.* The number of parking spaces required in Section 35-1804 may be reduced by ten (10%) percent for each passenger loading zone space provided in accordance with the following table up to a maximum of forty (40%) percent.

Commercial	1 loading zone space per 50,000 sq. ft.
General Office	1 loading zone space per 100,000 sq. ft.
Industrial	1 loading zone space per 200,000 sq. ft.
Institutional and Medical	1 loading zone space per 50,000 sq. ft.

Multiple Family	1 loading zone space per 150 units

(a) Passenger loading zone calculations shall be based on building gross square feet and shall be rounded to the nearest whole number. Loading zone spaces exceeding the number of spaces identified herein shall not be eligible for a ten (10%) percent parking reduction.

(b) Requests to exceed parking reduction ratios provided herein up to a maximum of forty (40%) percent may be submitted pursuant to Section 35-1807(3) or Section 35-1807(5).

(c) The Zoning Administrator is hereby granted the authority to deny a parking reduction as provided for herein upon making a determination that such a reduction will result in a shortage of parking spaces needed for the subject land use. In the event that a property owner disagrees with the Zoning Administrator's determination, the Zoning Administrator may request that the property owner submit a parking demand study for review pursuant to Section 35-1807(3) or Section 35-1807(5).

(d) Said passenger loading zone spaces shall comply with standards in Subsection (3) below.

(3) *Standards.*

(a) *Location.*

1. Each passenger loading zone space or contiguous loading zone shall be located within approximately fifty (50) feet of the primary entrance/exit of a stand-alone use. Contiguous passenger loading zones consist of two (2) or more loading zone spaces provided in tandem with no barriers separating said spaces thus enabling vehicles to move forward through multiple passenger loading zone spaces.

2. Notwithstanding the location requirement in Subsection 1 above, passenger loading zones located in shopping centers and other multiple user developments may be located greater than approximately fifty (50) feet from the primary entrance/exit of a tenant when placed in a centralized area or in multiple areas within said center that provide(s) pedestrian access to all tenants within the center. Furthermore, a passenger loading zone may be located greater than approximately fifty (50) feet from the primary entrance/exit of a tenant when said passenger loading zone is shared by multiple parcels located adjacent to or within close proximity to each other and the owners of said parcels have agreed to share said passenger loading zone pursuant to Section 35-1807(5)(b)3. and pedestrian access is provided from said passenger loading zone to all tenants in said parcels.

3. Loading zones shall be separate from fire lanes required in Section 35-1806.

(b) *Dimensions.* Passenger loading zone spaces shall comply with minimum dimensions in the standard detail adopted by the City.

(c) *Design.* All vehicular ingress and egress to and from passenger loading zones shall be forward motion only. All passenger loading zones shall be clearly marked in accordance with City of Chandler specifications.

(d) *Pedestrian amenities.* Pedestrian amenities such as but not limited to benches, trees or shade structures shall be provided adjacent to the passenger loading zones as determined by the Zoning Administrator.

(e) *Accessibility.* Accessible passenger loading zones shall be provided and comply with the accessibility requirements of the Chandler Building Code.

(Ord. No. 4811, § 2, 5-10-18)

Appendix D – MAG Demographic Data

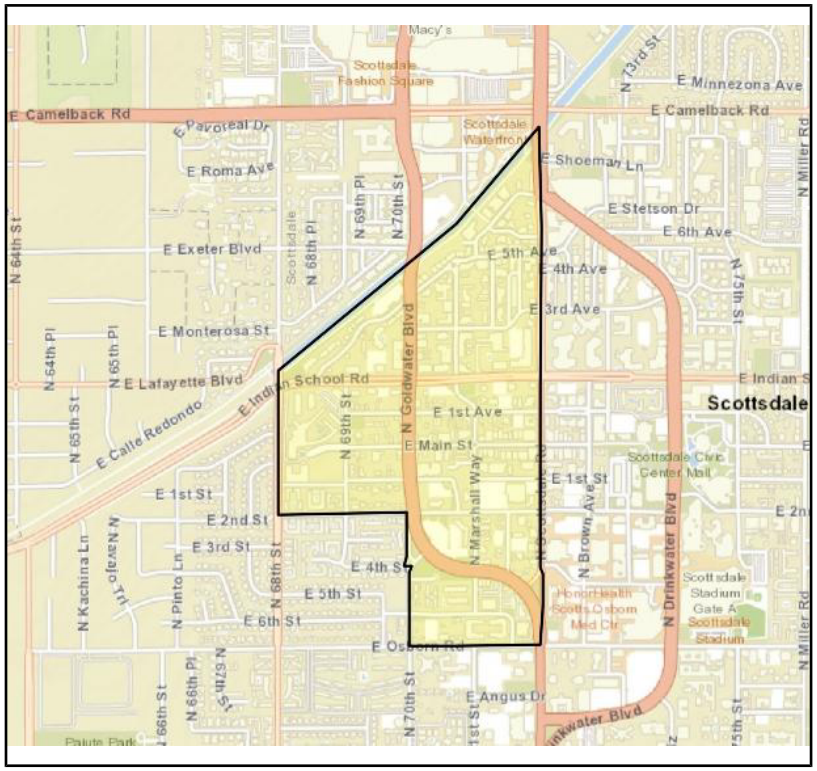
D

Block Group 1, Census Tract 2172.01, Maricopa County,

ARIZONA COGs & MPOs

Block Group 1, Census Tract 2172.01, Maricopa County, Arizona has a population of **575** with a minority* population of **61** or **10.61%**.

Block Group 1, Census Tract 2172.01, Maricopa County, Arizona has **327** total households.



About the U.S. Census Bureau's 2013-2017 American Community Survey 5 year Estimates

The American Community Survey (ACS) is a nationwide survey that uses continuous, multi-year sampling to produce estimates for a variety of geographical areas, the smallest being the Census Block Group. MAG uses the 5-year estimates because they provide increased statistical reliability for less populated areas and small population groups. ACS is a sample, meaning that it is not a full census of the population. For the 5 year estimates, surveys are collected from a sample population over the 5 year period. These surveys are then used to create estimates for the whole population. And, because it is an estimate of the whole population, there is a degree of uncertainty in the results. This degree of uncertainty is reflected in the margins of error that are calculated and reported along with the results of the survey. The margins of error are calculated at the 90 percent confidence level, meaning that users of the data can be 90 percent confident that the range reflected in the margin of error contains the true value. The margins of error are not reported on this web site, but are available from the Census at http://factfinder.census.gov/or are available upon request from MAG. More information on the methodology of the American Community Survey is available at http://www.census.gov/acs/.

* Minority population is defined as the population that is of any race other than non-hispanic white.

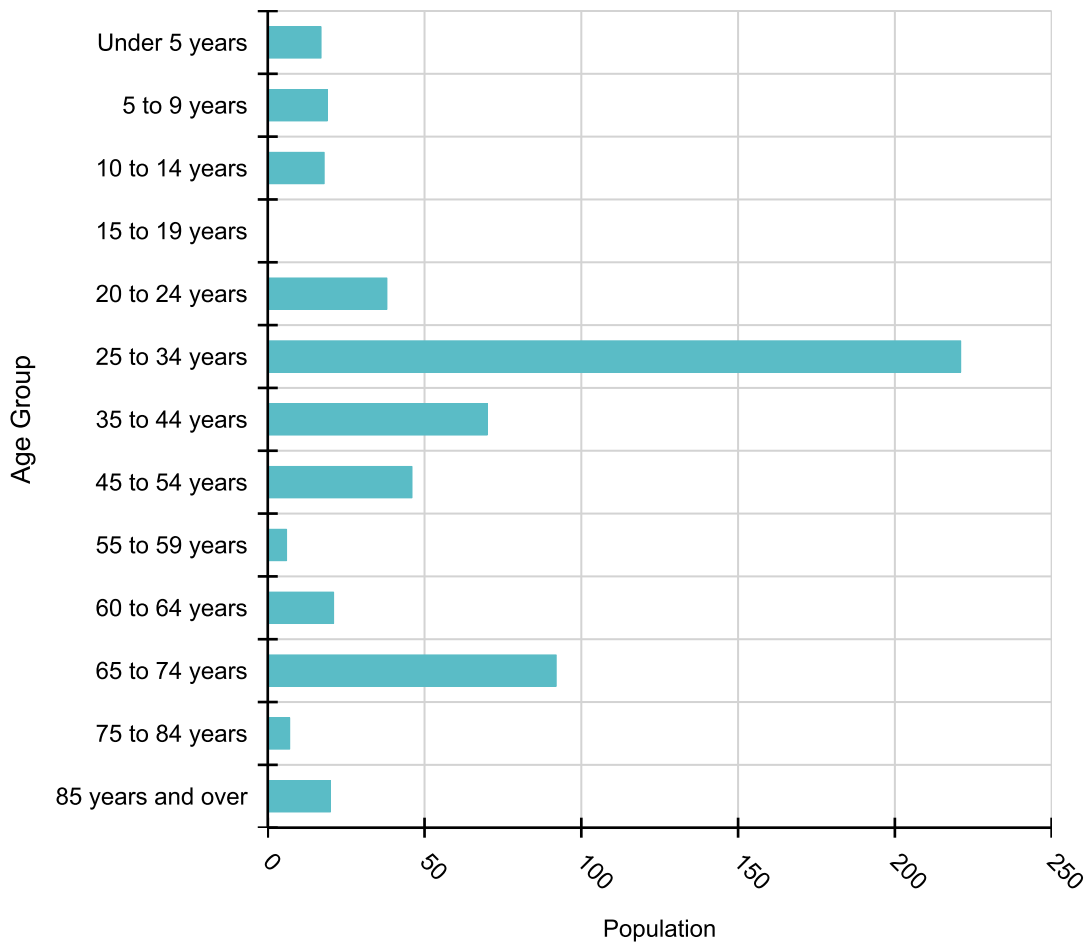
Age

ARIZONA COGs & MPOs

American Community Survey 2013-2017 5yr Estimates

Age		
Name	Total	Percent
Total	575	N/A
Under 5 years	17	3.0 %
5 to 9 years	19	3.3 %
10 to 14 years	18	3.1 %
15 to 19 years	0	0.0 %
20 to 24 years	38	6.6 %
25 to 34 years	221	38.4 %
35 to 44 years	70	12.2 %
45 to 54 years	46	8.0 %
55 to 59 years	6	1.0 %
60 to 64 years	21	3.7 %
65 to 74 years	92	16.0 %
75 to 84 years	7	1.2 %
85 years and over	20	3.5 %

Universe: Total Population



Source: U.S. Census Bureau American Community Survey 2013 - 2017

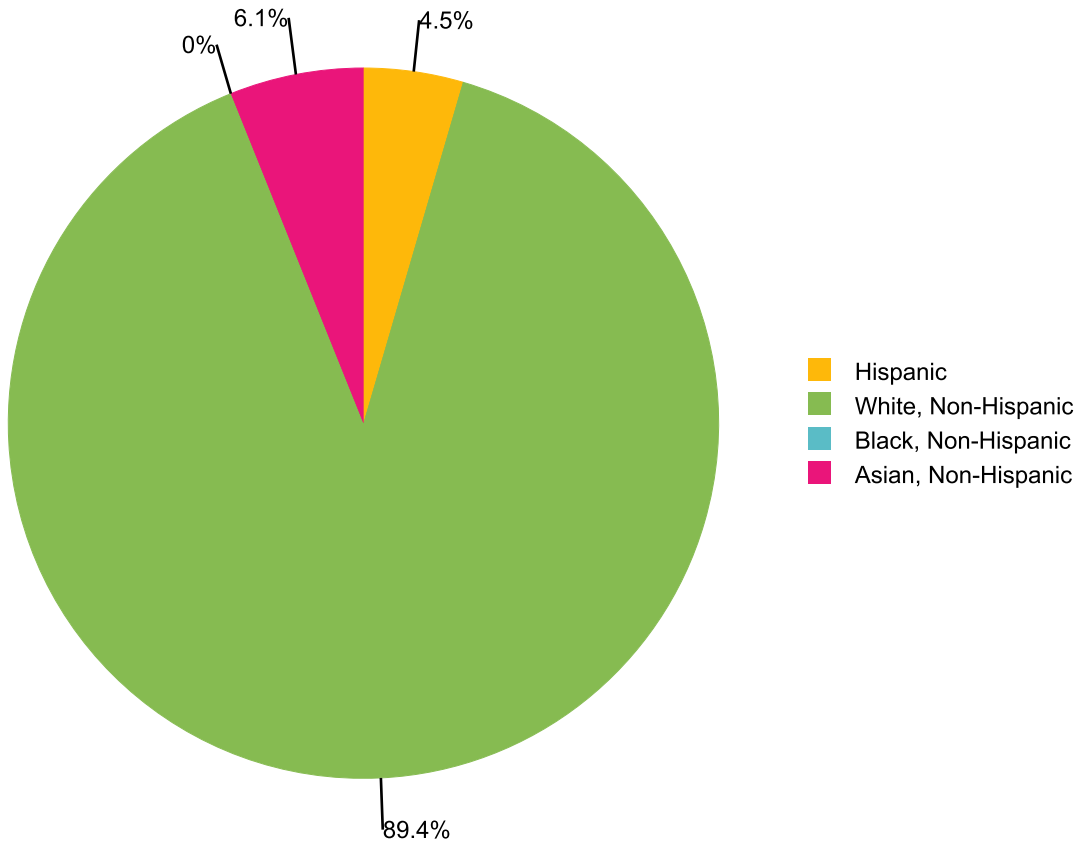
Race and Ethnicity

ARIZONA COGs & MPOs

American Community Survey 2013-2017 5yr Estimates

Race and Ethnicity		
Name	Total	Percent
Total	575	N/A
Hispanic	26	4.5 %
White, Non-Hispanic	514	89.4 %
Black, Non-Hispanic	0	0.0 %
Native American, Non-Hispanic	0	0.0 %
Asian, Non-Hispanic	35	6.1 %
Pacific Islander, Non-Hispanic	0	0.0 %
Two or More, Non-Hispanic	0	0.0 %
Other Race, Non-Hispanic	0	0.0 %

Universe: Total Population



Source: U.S. Census Bureau American Community Survey 2013 - 2017

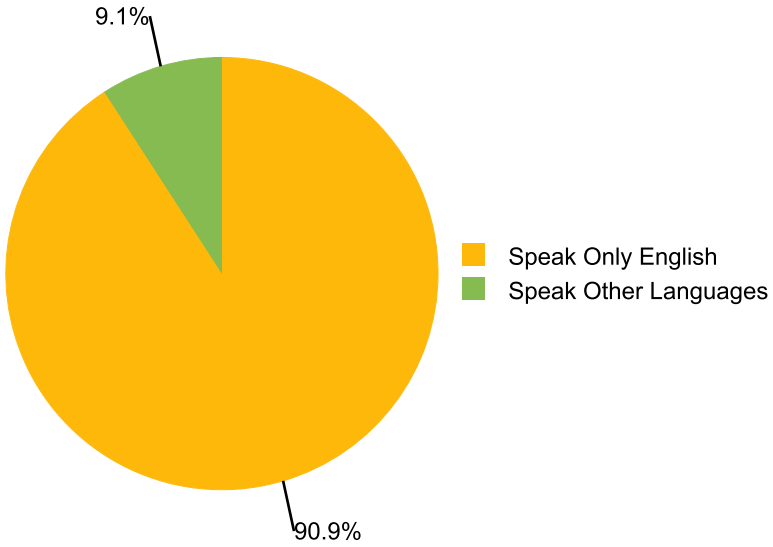
Ability to Speak English / Veterans Status by Age

ARIZONA COGs & MPOs

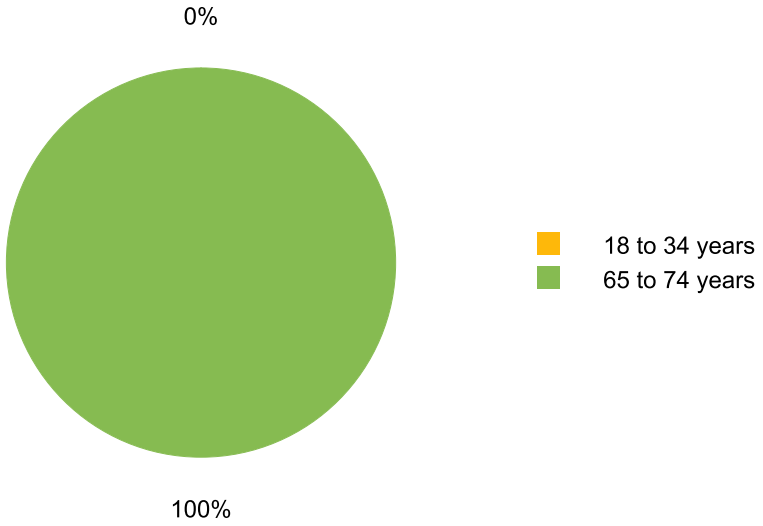
American Community Survey 2013-2017 5yr Estimates

Ability to Speak English		
Name	Total	Percent
Speak Only English	507	90.9 %
Speak Other Languages	51	9.1 %
Speak English "very well"	23	N/A
Persons with Limited English Proficiency (LEP)	28	N/A
Speak English "well"	28	N/A
Speak English "not well"	0	N/A
Speak English "not at all"	0	N/A

Veterans Status		
Name	Total	Percent
Civilian Population 18 years and over	515	N/A
Civilian veterans	7	1.4 %
Male	7	N/A
Female	0	N/A
18 to 34 years	0	0.0 %
35 to 54 years	0	0.0 %
55 to 64 years	0	0.0 %
65 to 74 years	7	100.0 %
75 years and over	0	0.0 %



Universe: Population 5 years and over



Universe: Civilian Population 18 years and over

Source: U.S. Census Bureau American Community Survey 2013 - 2017

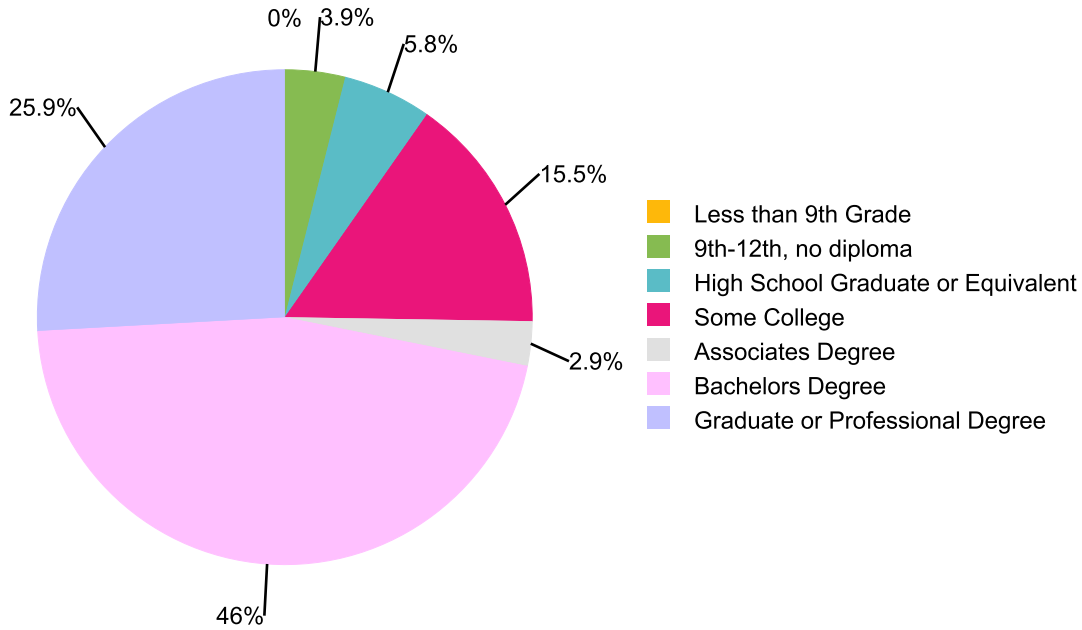
Educational Attainment

ARIZONA COGs & MPOs

American Community Survey 2013-2017 5yr Estimates

Educational Attainment		
Name	Total	Percent
Population 25 and over	483	100.0 %
Less than 9th Grade	0	0.0 %
9th-12th, no diploma	19	3.9 %
High School Graduate or Equivalent	28	5.8 %
Some College	75	15.5 %
Associates Degree	14	2.9 %
Bachelors Degree	222	46.0 %
Graduate or Professional Degree	125	25.9 %

Universe: Population Age 25 Years and Over



Source: U.S. Census Bureau American Community Survey 2013 - 2017

Household Income and Households

ARIZONA COGs & MPOs

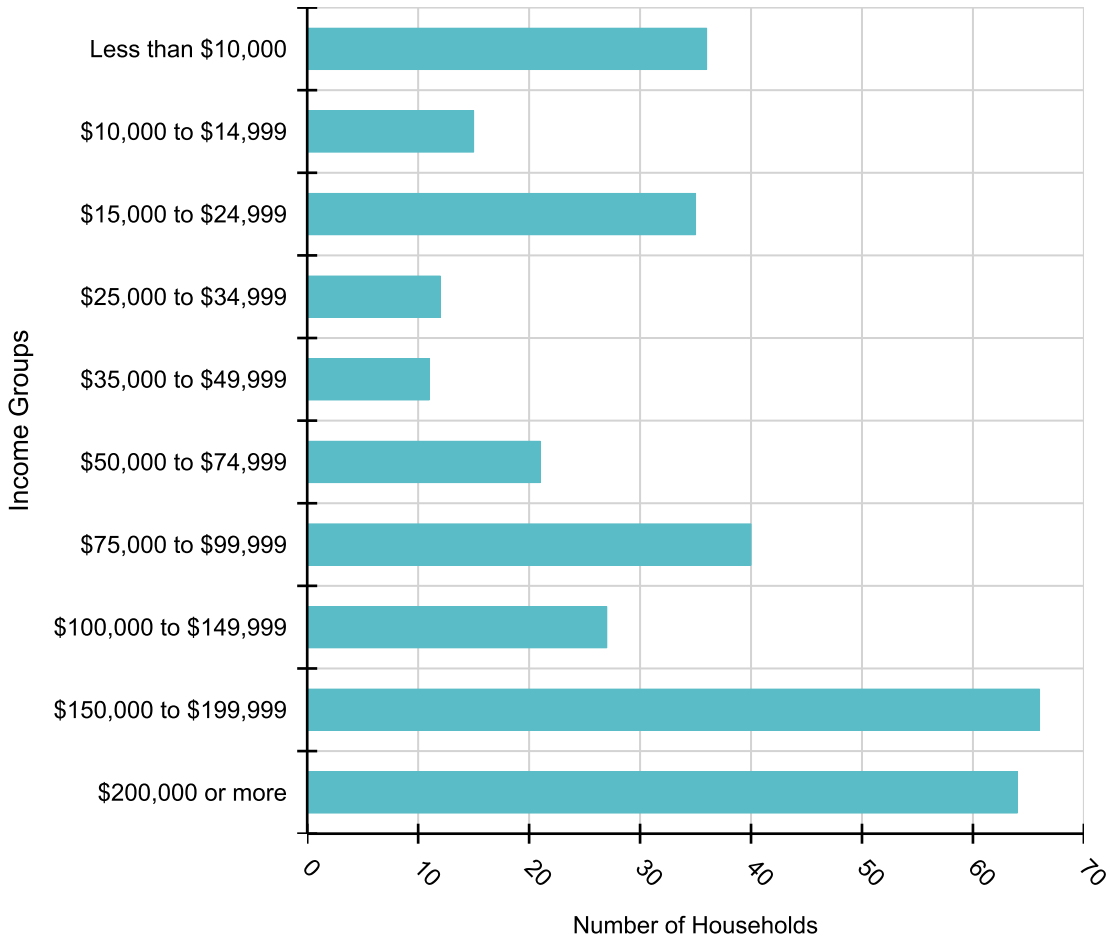
American Community Survey 2013-2017 5yr Estimates

Household Income (In 2017 inflation-adjusted dollars)		
Name	Total	Percent
Total Households	327	N/A
Median Household Income	$ 96,417	N/A
Less than $10,000	36	11.0 %
$10,000 to $14,999	15	4.6 %
$15,000 to $24,999	35	10.7 %
$25,000 to $34,999	12	3.7 %
$35,000 to $49,999	11	3.4 %
$50,000 to $74,999	21	6.4 %
$75,000 to $99,999	40	12.2 %
$100,000 to $149,999	27	8.3 %
$150,000 to $199,999	66	20.2 %
$200,000 or more	64	19.6 %

Universe: Households

Households		
Name	Total	Percent
Total Households	327	N/A
Average Household Size	2	N/A
Family Households (Families)	147	45.0 %
Married-couple family	118	N/A
Female Householder, no husband present	5	N/A
with own children under 18 years	0	N/A
Nonfamily Households	180	55.0 %
Householder living alone	141	N/A

Universe: Households



Source: U.S. Census Bureau American Community Survey 2013 - 2017

Poverty Status

ARIZONA COGs & MPOs

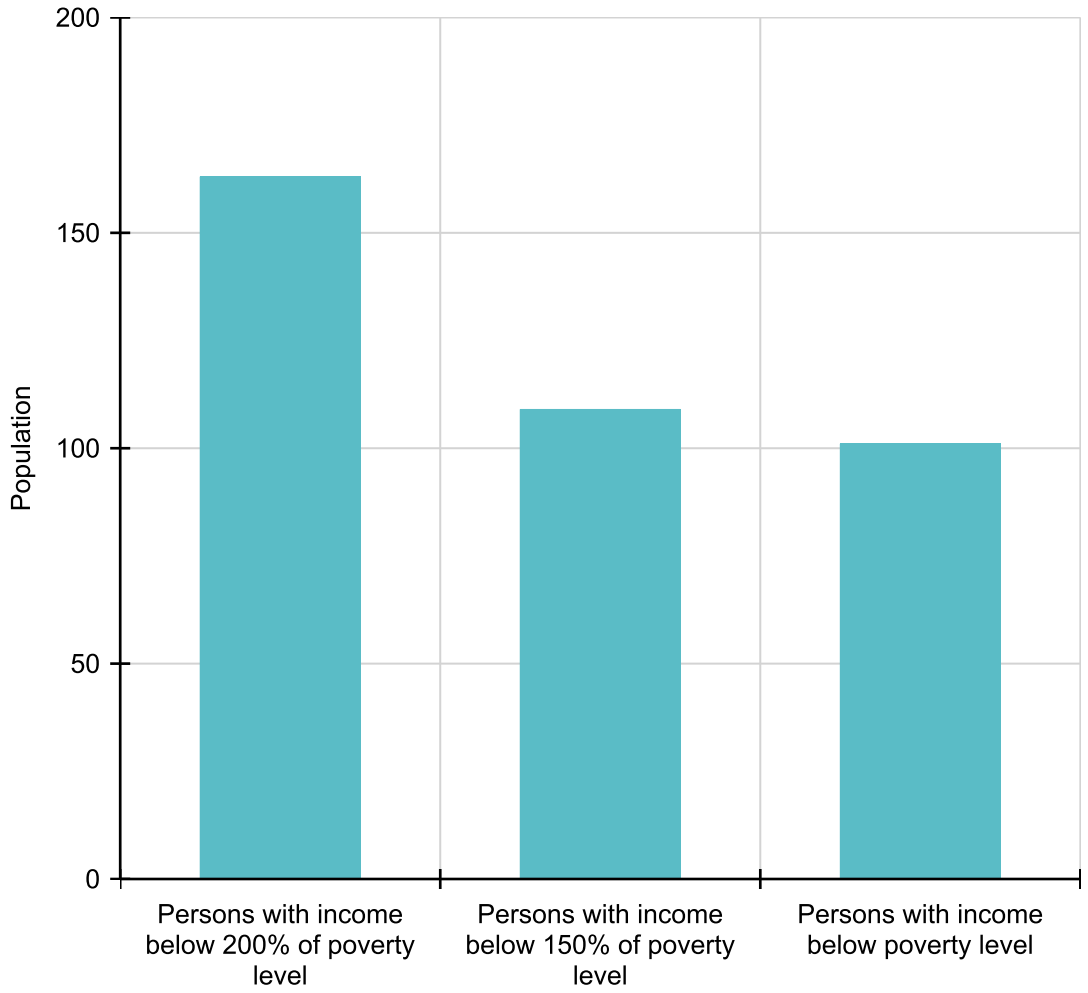
American Community Survey 2013-2017 5yr Estimates

Poverty Status in the Past 12 Months		
Name	Total	Percent
Persons for whom poverty status is determined	575	N/A
Persons with income below poverty level	101	17.6 %
Persons with income below 150% of poverty level	109	19.0 %
Persons with income below 200% of poverty level	163	28.3 %

Universe: Persons for whom poverty status is determined

Poverty Status for Families in the Past 12 Months		
Name	Total	Percent
Total Families	147	N/A
Families with income below poverty level	19	12.9 %
Married-couple family	0	N/A
with related children under 18 years	0	N/A
Female householder, no husband present	0	N/A
with related children under 18 years	0	N/A
Male householder, no wife present	19	N/A
with related children under 18 years	19	N/A

Universe: Families



Source: U.S. Census Bureau American Community Survey 2013 - 2017

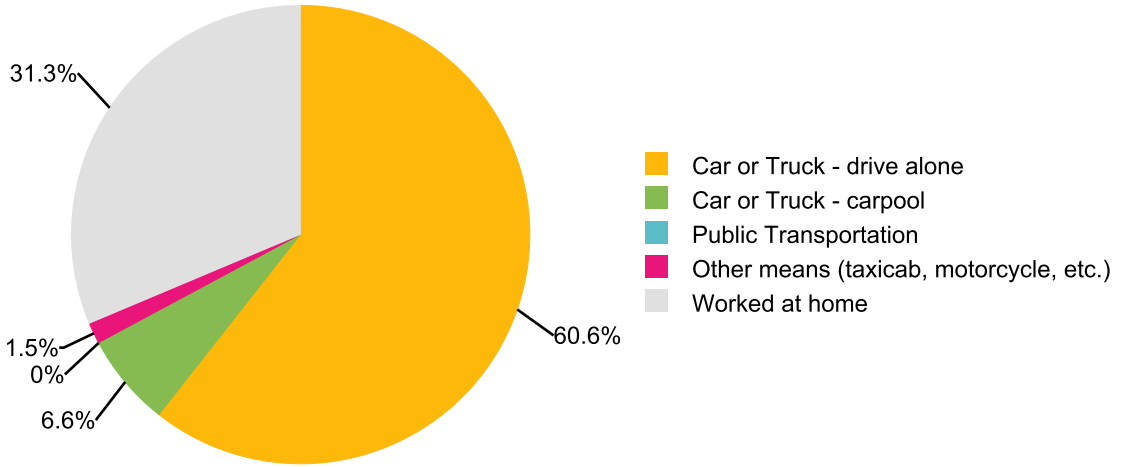
Modes of Transportation

ARIZONA COGs & MPOs

American Community Survey 2013-2017 5yr Estimates

Commuting to Work		
Name	Total	Percent
Workers 16 years and over	335	N/A
Car or Truck - drive alone	203	60.6 %
Car or Truck - carpool	11	3.3 %
Public Transportation	0	0.0 %
Bicycle	11	3.3 %
Walked	0	0.0 %
Other means (taxicab, motorcycle, etc.)	5	1.5 %
Worked at home	105	31.3 %

Universe: Workers age 16 years and over



Source: U.S. Census Bureau American Community Survey 2013 - 2017

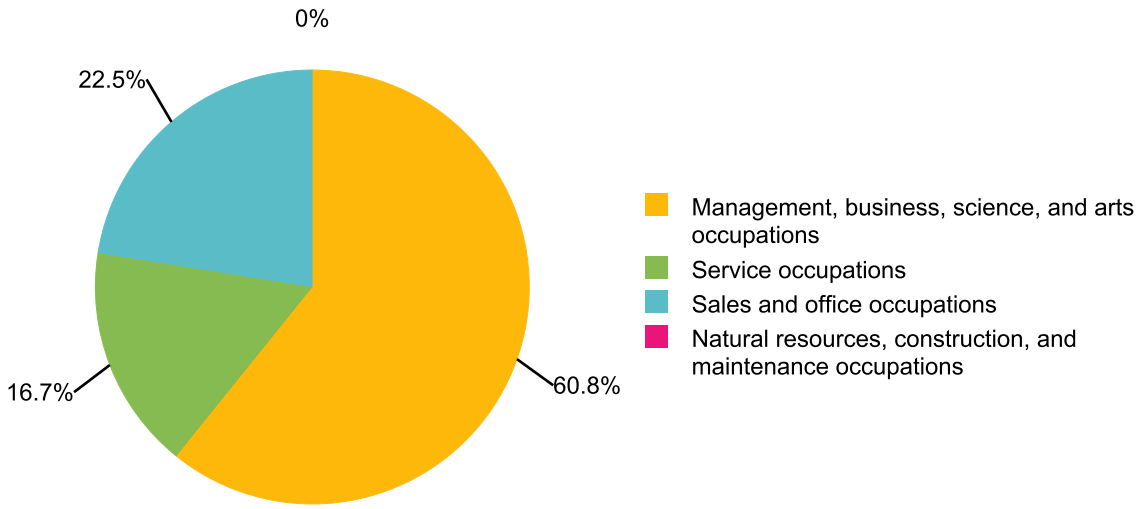
Occupation

ARIZONA COGs & MPOs

American Community Survey 2013-2017 5yr Estimates

Occupation		
Name	Total	Percent
Civilian employed population 16 years and over	329	N/A
Management, business, science, and arts occupations	200	60.8 %
Service occupations	55	16.7 %
Sales and office occupations	74	22.5 %
Natural resources, construction, and maintenance occupations	0	0.0 %
Production, transportation, and material moving occupations	0	0.0 %

Universe: Civilian employed population 16 years and over



Source: U.S. Census Bureau American Community Survey 2013 - 2017

Occupancy, Tenure, Value, and Rent

ARIZONA COGs & MPOs

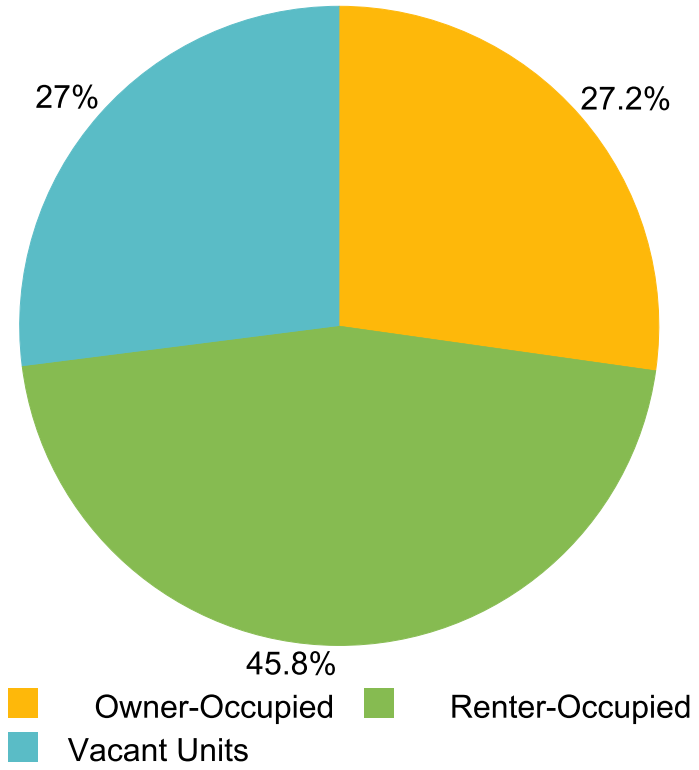
American Community Survey 2013-2017 5yr Estimates

Housing			
Name	Total	Percent	Per Sq Mile
Housing Units	448	N/A	1,490.9
Occupied Housing Units	327	73.0 %	1,088.2
Owner-Occupied	122	27.2 %	406.0
Renter-Occupied	205	45.8 %	682.2
Vacant Units	121	27.0 %	402.7
Median Housing Value	$ 173,300	N/A	N/A
Median Rent	$ 1,930	N/A	N/A

Universe: Housing Units

Housing		
Name	Total	Percent
Total Housing Units	448	N/A
1, detached	6	1.3 %
1, attached	30	6.7 %
2 to 9	35	7.8 %
10 or more	377	84.2 %
Mobile Home	0	0.0 %
Boat, RV, van, etc.	0	0.0 %

Universe: Housing Units



Source: U.S. Census Bureau American Community Survey 2013 - 2017

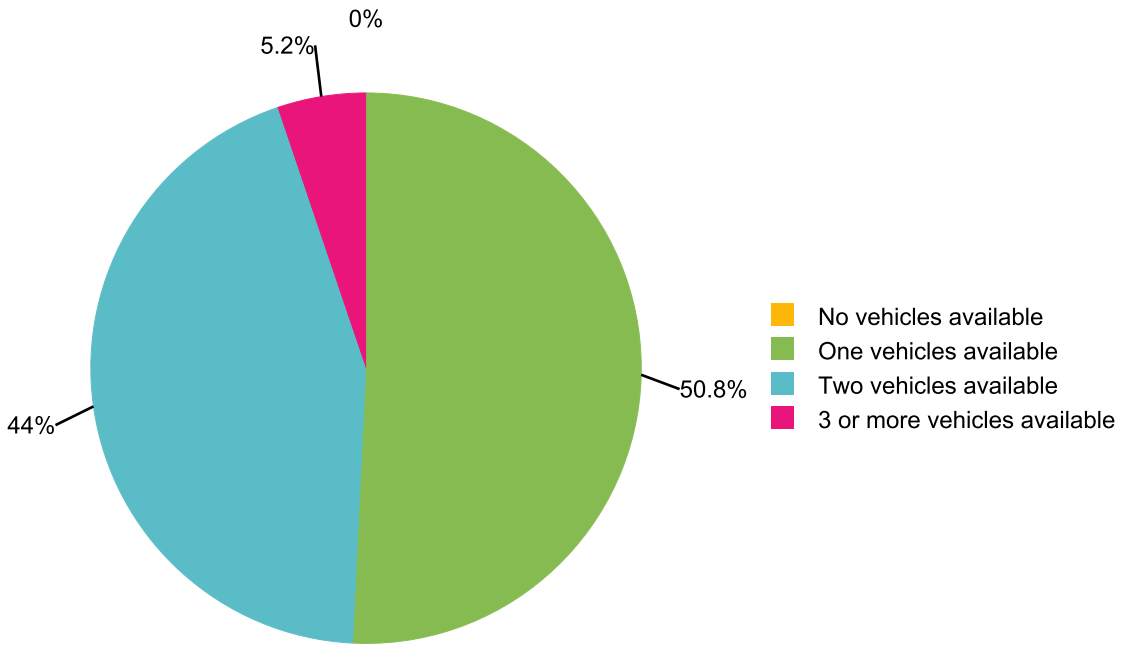
Vehicles Available

ARIZONA COGs & MPOs

American Community Survey 2013-2017 5yr Estimates

Vehicles Available		
Name	Total	Percent
Total Occupied Housing Units	327	N/A
No vehicles available	0	0.0 %
One vehicles available	166	50.8 %
Two vehicles available	144	44.0 %
3 or more vehicles available	17	5.2 %

Universe: Occupied Housing Units



Source: U.S. Census Bureau American Community Survey 2013 - 2017

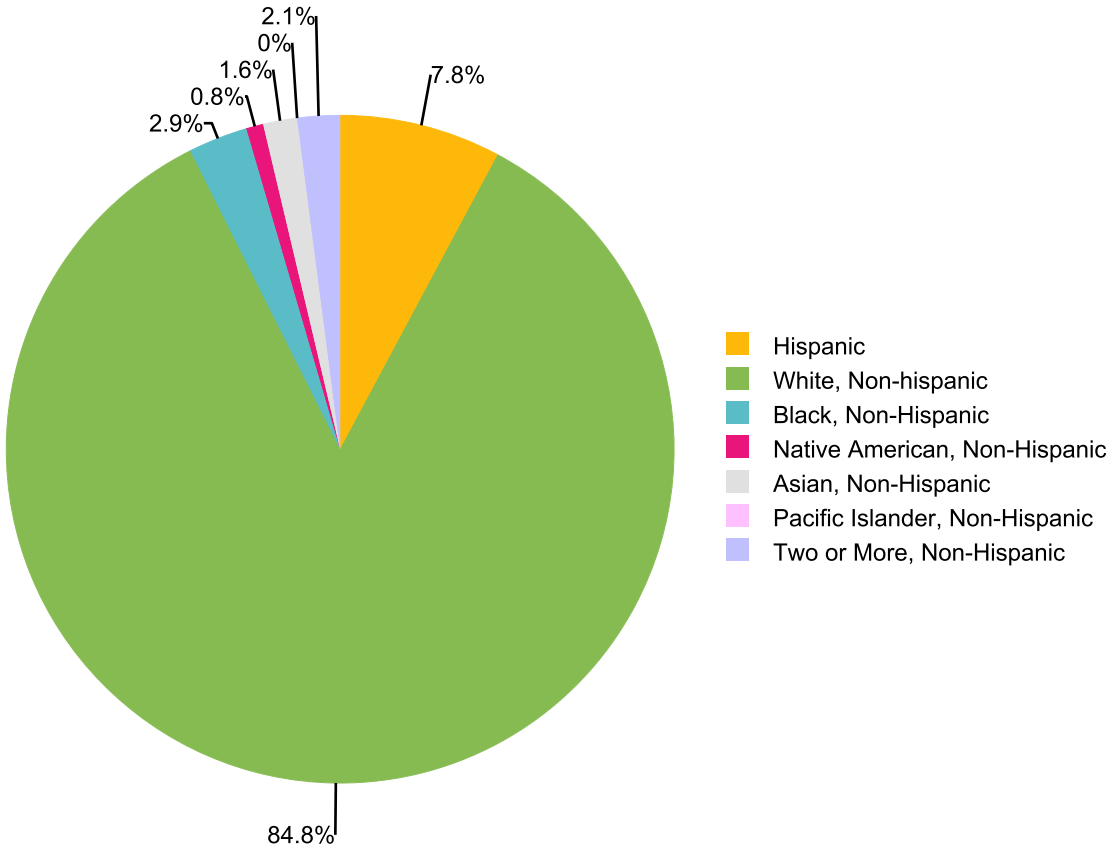
Race

ARIZONA COGs & MPOs

U.S. Census Bureau, 2010 Decennial Census

Race		
Name	Total	Percent
Total Population	243	N/A
Hispanic	19	7.8 %
White, Non-hispanic	206	84.8 %
Black, Non-Hispanic	7	2.9 %
Native American, Non-Hispanic	2	0.8 %
Asian, Non-Hispanic	4	1.6 %
Pacific Islander, Non-Hispanic	0	0.0 %
Two or More, Non-Hispanic	5	2.1 %
Other Race, Non-Hispanic	0	0.0 %

Universe: Total Population



Source: U.S. Census Bureau, 2010 Decennial Census

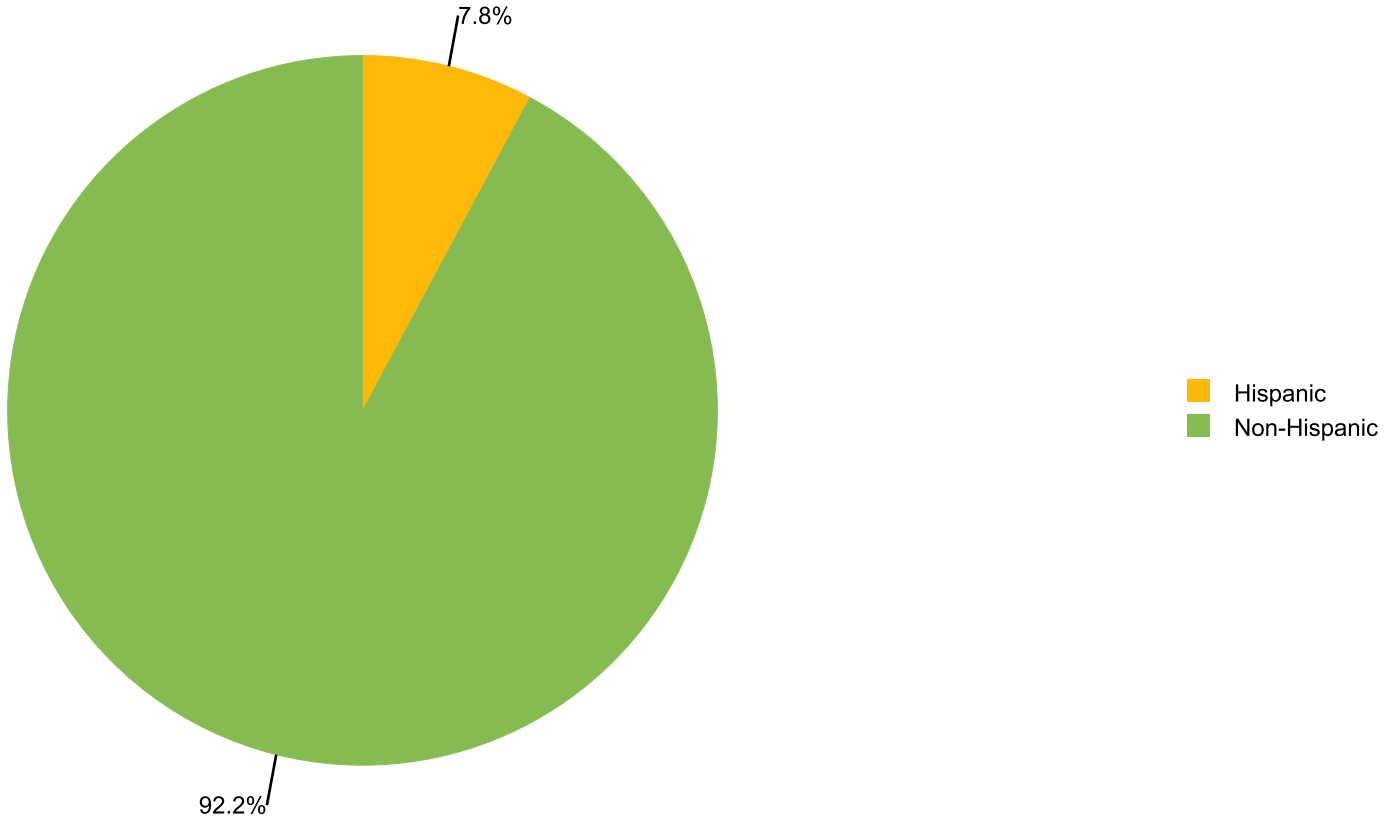
Ethnicity

ARIZONA COGs & MPOs

U.S. Census Bureau, 2010 Decennial Census

Ethnicity		
Name	Total	Percent
Total Population	243	N/A
Hispanic	19	7.8 %
Non-Hispanic	224	92.2 %

Universe: Total Population



Source: U.S. Census Bureau, 2010 Decennial Census

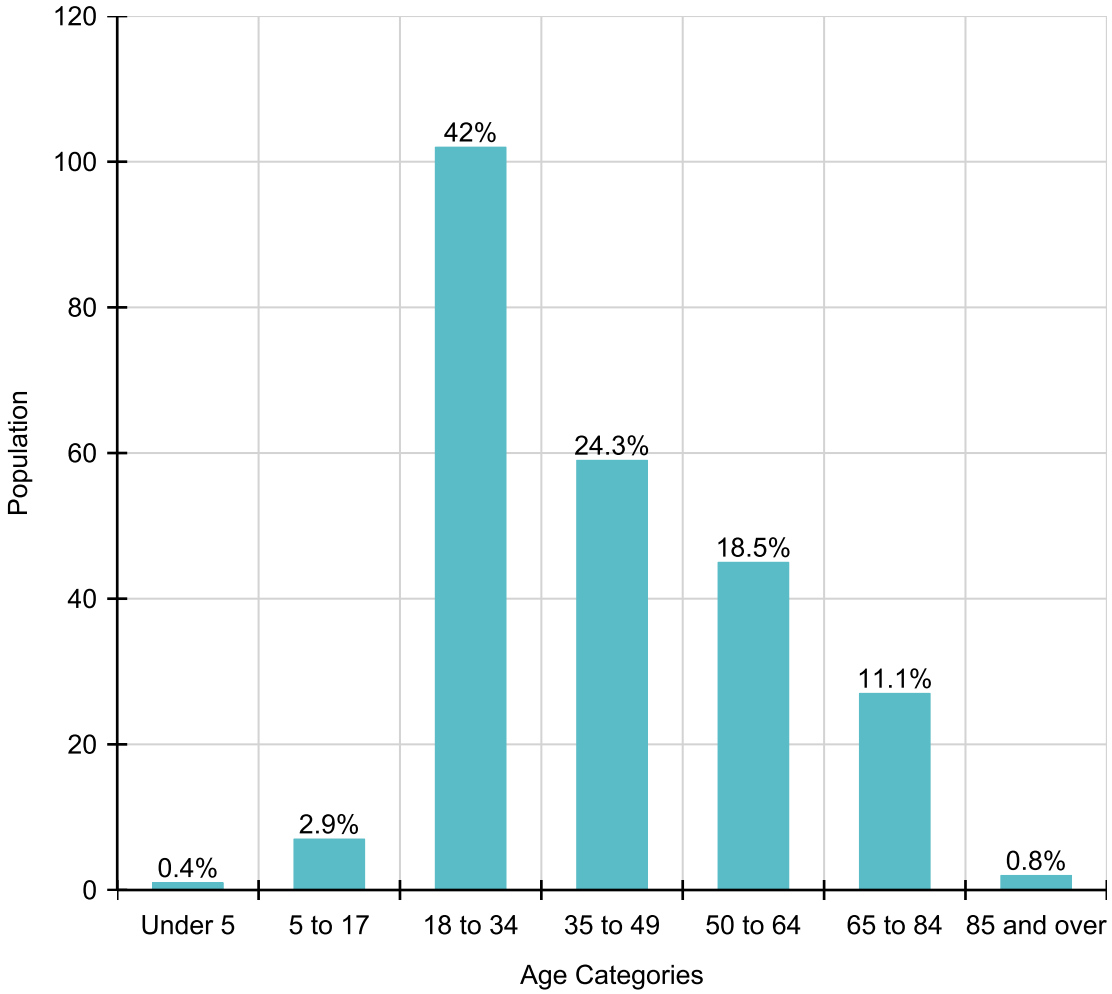
Age

ARIZONA COGs & MPOs

U.S. Census Bureau, 2010 Decennial Census

Age		
Name	Total	Percent
Median Age	37	N/A
Under 05	1	0.4 %
5 to 17	7	2.9 %
18 to 34	102	42.0 %
35 to 49	59	24.3 %
50 to 64	45	18.5 %
65 to 84	27	11.1 %
85 and over	2	0.8 %
50 Plus	74	30.5 %
60 Plus	47	19.3 %
65 Plus	29	11.9 %
70 Plus	22	9.1 %
75 Plus	11	4.5 %

Universe: Total Population



Source: U.S. Census Bureau, 2010 Decennial Census

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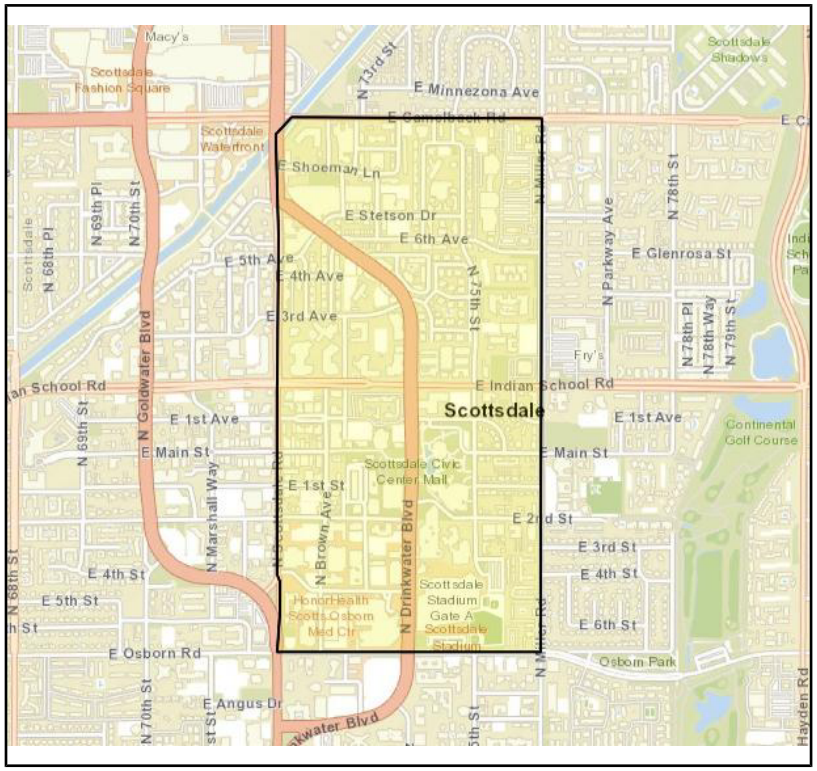
To provide comments or report problems please contact: Jason Howard, GIS Program Manager

Block Group 2, Census Tract 2172.01, Maricopa County,

ARIZONA COGs & MPOs

Block Group 2, Census Tract 2172.01, Maricopa County, Arizona has a population of **1,200** with a minority* population of **365** or **30.42%**.

Block Group 2, Census Tract 2172.01, Maricopa County, Arizona has **722** total households.



About the U.S. Census Bureau's 2013-2017 American Community Survey 5 year Estimates

The American Community Survey (ACS) is a nationwide survey that uses continuous, multi-year sampling to produce estimates for a variety of geographical areas, the smallest being the Census Block Group. MAG uses the 5-year estimates because they provide increased statistical reliability for less populated areas and small population groups. ACS is a sample, meaning that it is not a full census of the population. For the 5 year estimates, surveys are collected from a sample population over the 5 year period. These surveys are then used to create estimates for the whole population. And, because it is an estimate of the whole population, there is a degree of uncertainty in the results. This degree of uncertainty is reflected in the margins of error that are calculated and reported along with the results of the survey. The margins of error are calculated at the 90 percent confidence level, meaning that users of the data can be 90 percent confident that the range reflected in the margin of error contains the true value. The margins of error are not reported on this web site, but are available from the Census at http://factfinder.census.gov/or are available upon request from MAG. More information on the methodology of the American Community Survey is available at http://www.census.gov/acs/.

* Minority population is defined as the population that is of any race other than non-hispanic white.

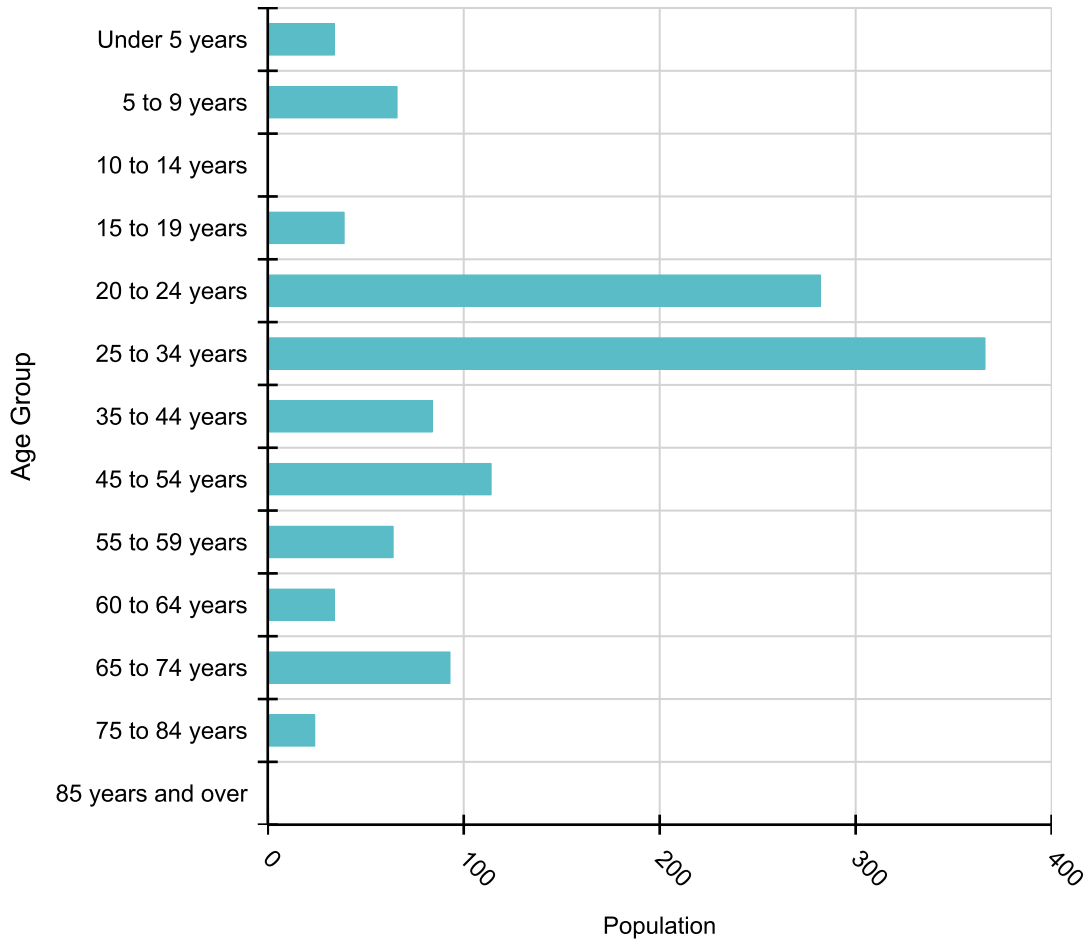
Age

ARIZONA COGs & MPOs

American Community Survey 2013-2017 5yr Estimates

Age		
Name	Total	Percent
Total	1,200	N/A
Under 5 years	34	2.8 %
5 to 9 years	66	5.5 %
10 to 14 years	0	0.0 %
15 to 19 years	39	3.3 %
20 to 24 years	282	23.5 %
25 to 34 years	366	30.5 %
35 to 44 years	84	7.0 %
45 to 54 years	114	9.5 %
55 to 59 years	64	5.3 %
60 to 64 years	34	2.8 %
65 to 74 years	93	7.8 %
75 to 84 years	24	2.0 %
85 years and over	0	0.0 %

Universe: Total Population



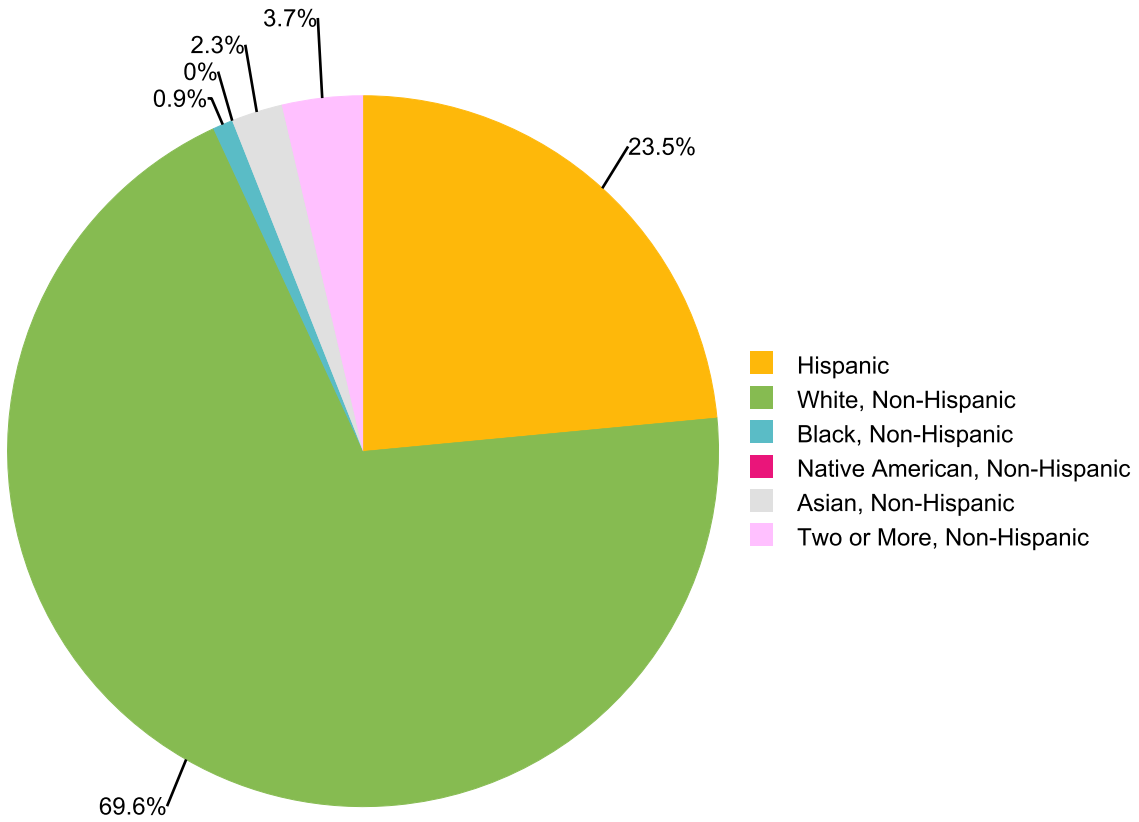
Source: U.S. Census Bureau American Community Survey 2013 - 2017

Race and Ethnicity

American Community Survey 2013-2017 5yr Estimates

Race and Ethnicity		
Name	Total	Percent
Total	1,200	N/A
Hispanic	282	23.5 %
White, Non-Hispanic	835	69.6 %
Black, Non-Hispanic	11	0.9 %
Native American, Non-Hispanic	0	0.0 %
Asian, Non-Hispanic	28	2.3 %
Pacific Islander, Non-Hispanic	0	0.0 %
Two or More, Non-Hispanic	44	3.7 %
Other Race, Non-Hispanic	0	0.0 %

Universe: Total Population



Source: U.S. Census Bureau American Community Survey 2013 - 2017

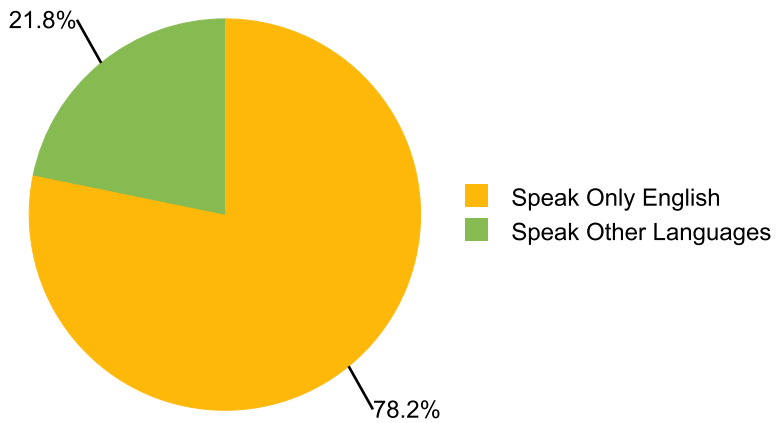
Ability to Speak English / Veterans Status by Age

ARIZONA COGs & MPOs

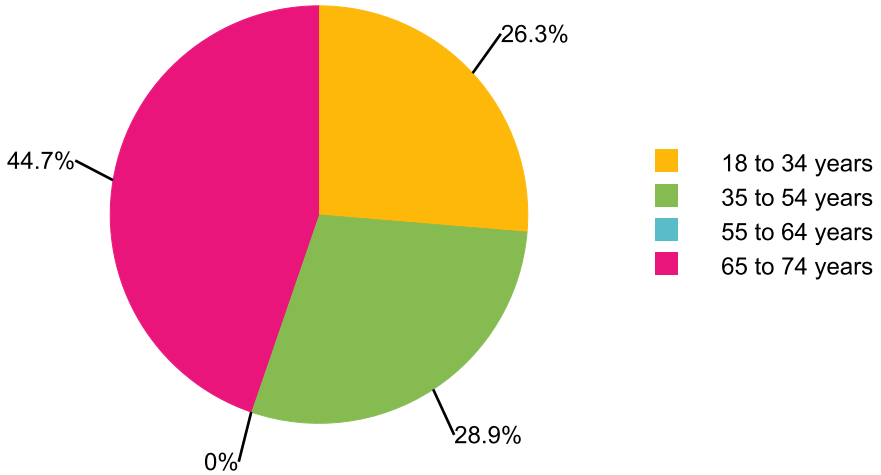
American Community Survey 2013-2017 5yr Estimates

Ability to Speak English		
Name	Total	Percent
Speak Only English	912	78.2 %
Speak Other Languages	254	21.8 %
Speak English "very well"	71	N/A
Persons with Limited English Proficiency (LEP)	183	N/A
Speak English "well"	54	N/A
Speak English "not well"	40	N/A
Speak English "not at all"	89	N/A

Veterans Status		
Name	Total	Percent
Civilian Population 18 years and over	1,100	N/A
Civilian veterans	38	3.5 %
Male	38	N/A
Female	0	N/A
18 to 34 years	10	26.3 %
35 to 54 years	11	28.9 %
55 to 64 years	0	0.0 %
65 to 74 years	17	44.7 %
75 years and over	0	0.0 %



Universe: Population 5 years and over



Universe: Civilian Population 18 years and over

Source: U.S. Census Bureau American Community Survey 2013 - 2017

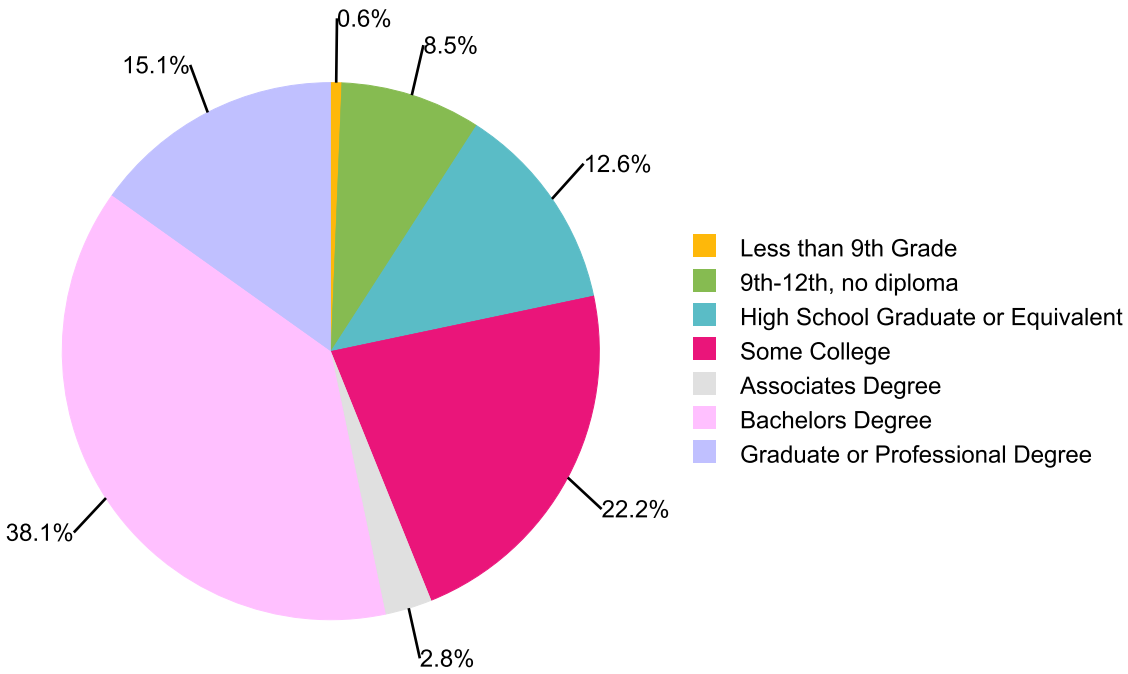
Educational Attainment

ARIZONA COGs & MPOs

American Community Survey 2013-2017 5yr Estimates

Educational Attainment		
Name	Total	Percent
Population 25 and over	779	100.0 %
Less than 9th Grade	5	0.6 %
9th-12th, no diploma	66	8.5 %
High School Graduate or Equivalent	98	12.6 %
Some College	173	22.2 %
Associates Degree	22	2.8 %
Bachelors Degree	297	38.1 %
Graduate or Professional Degree	118	15.1 %

Universe: Population Age 25 Years and Over



Source: U.S. Census Bureau American Community Survey 2013 - 2017

Household Income and Households

ARIZONA COGs & MPOs

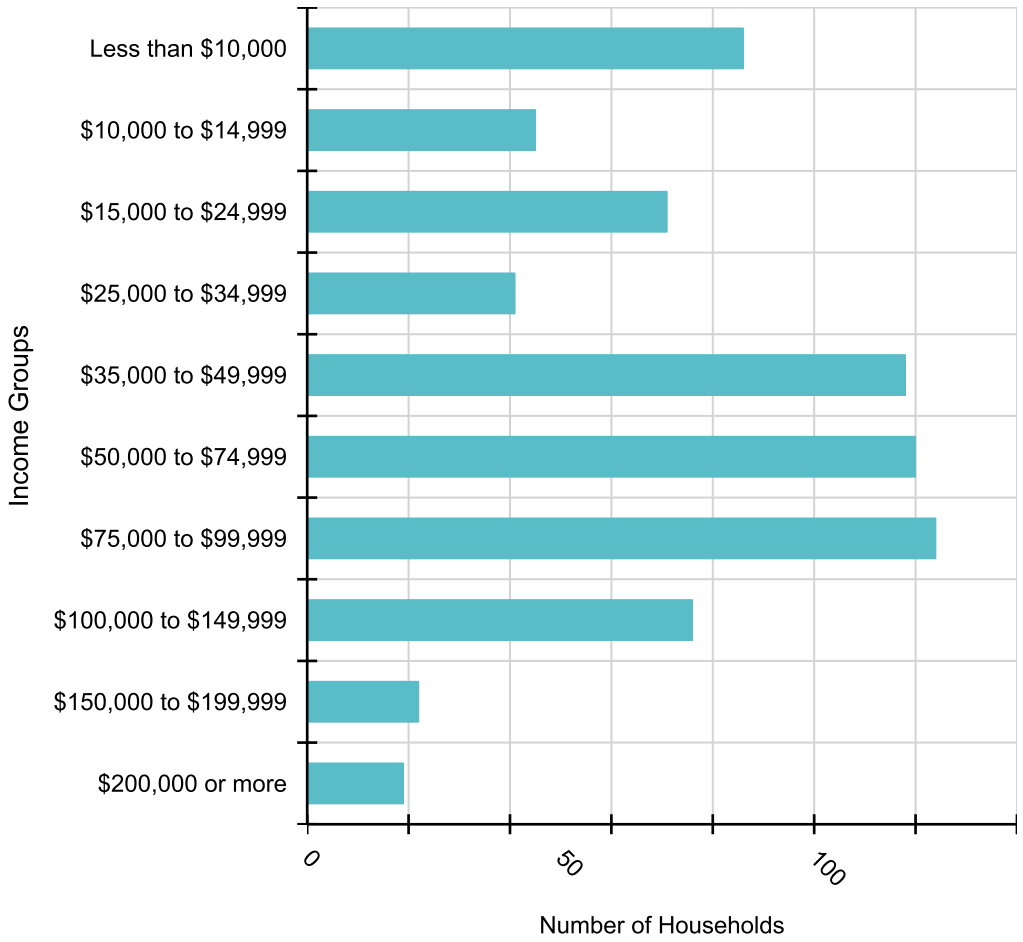
American Community Survey 2013-2017 5yr Estimates

Household Income (In 2017 inflation-adjusted dollars)		
Name	Total	Percent
Total Households	722	N/A
Median Household Income	$ 50,000	N/A
Less than $10,000	86	11.9 %
$10,000 to $14,999	45	6.2 %
$15,000 to $24,999	71	9.8 %
$25,000 to $34,999	41	5.7 %
$35,000 to $49,999	118	16.3 %
$50,000 to $74,999	120	16.6 %
$75,000 to $99,999	124	17.2 %
$100,000 to $149,999	76	10.5 %
$150,000 to $199,999	22	3.0 %
$200,000 or more	19	2.6 %

Universe: Households

Households		
Name	Total	Percent
Total Households	722	N/A
Average Household Size	2	N/A
Family Households (Families)	129	17.9 %
Married-couple family	76	N/A
Female Householder, no husband present	8	N/A
with own children under 18 years	0	N/A
Nonfamily Households	593	82.1 %
Householder living alone	485	N/A

Universe: Households



Source: U.S. Census Bureau American Community Survey 2013 - 2017

Poverty Status

ARIZONA COGs & MPOs

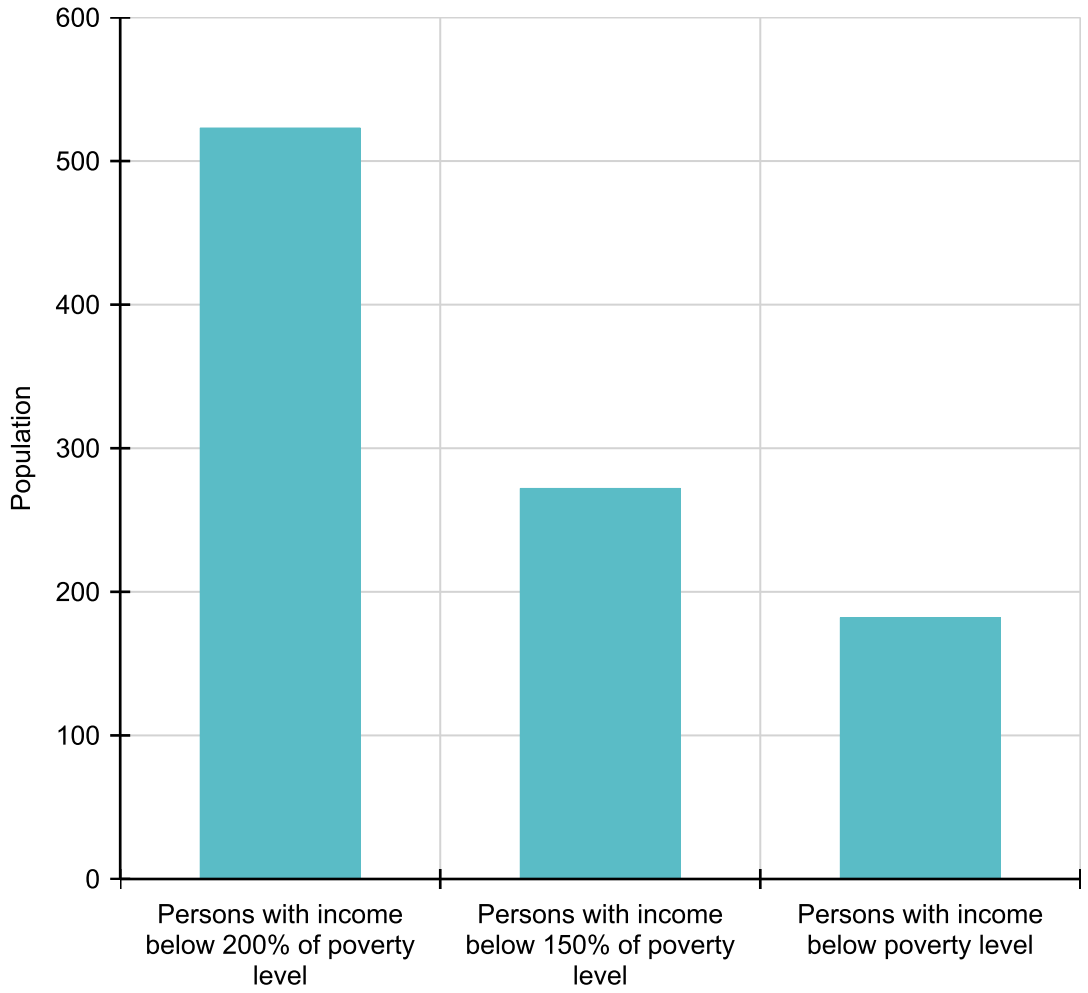
American Community Survey 2013-2017 5yr Estimates

Poverty Status in the Past 12 Months		
Name	Total	Percent
Persons for whom poverty status is determined	1,200	N/A
Persons with income below poverty level	182	15.2 %
Persons with income below 150% of poverty level	272	22.7 %
Persons with income below 200% of poverty level	523	43.6 %

Universe: Persons for whom poverty status is determined

Poverty Status for Families in the Past 12 Months		
Name	Total	Percent
Total Families	129	N/A
Families with income below poverty level	23	17.8 %
Married-couple family	23	N/A
with related children under 18 years	0	N/A
Female householder, no husband present	0	N/A
with related children under 18 years	0	N/A
Male householder, no wife present	0	N/A
with related children under 18 years	0	N/A

Universe: Families



Source: U.S. Census Bureau American Community Survey 2013 - 2017

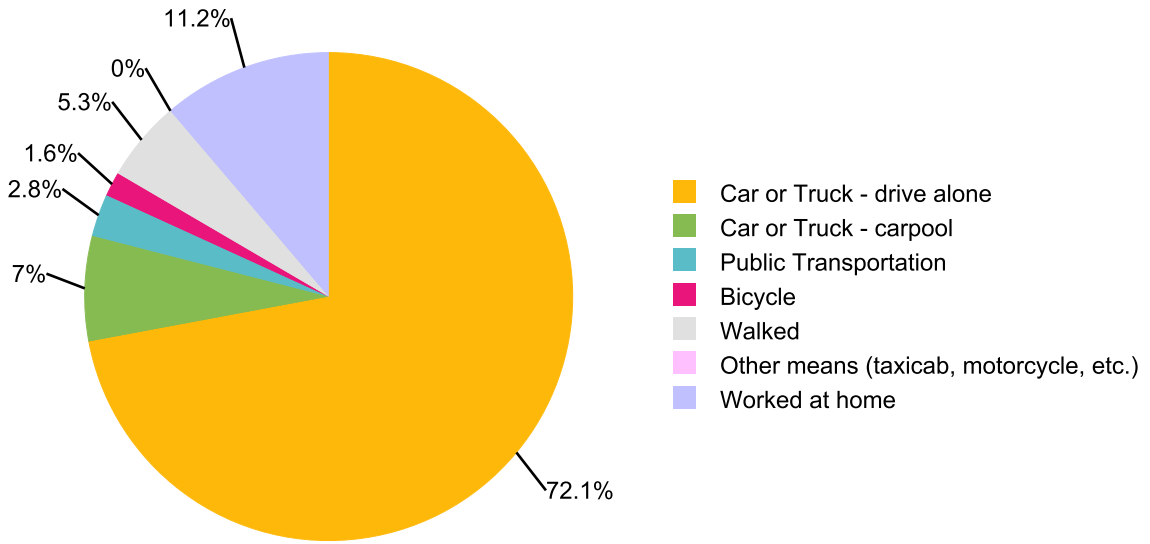
Modes of Transportation

ARIZONA COGs & MPOs

American Community Survey 2013-2017 5yr Estimates

Commuting to Work		
Name	Total	Percent
Workers 16 years and over	748	N/A
Car or Truck - drive alone	539	72.1 %
Car or Truck - carpool	52	7.0 %
Public Transportation	21	2.8 %
Bicycle	12	1.6 %
Walked	40	5.3 %
Other means (taxicab, motorcycle, etc.)	0	0.0 %
Worked at home	84	11.2 %

Universe: Workers age 16 years and over



Source: U.S. Census Bureau American Community Survey 2013 - 2017

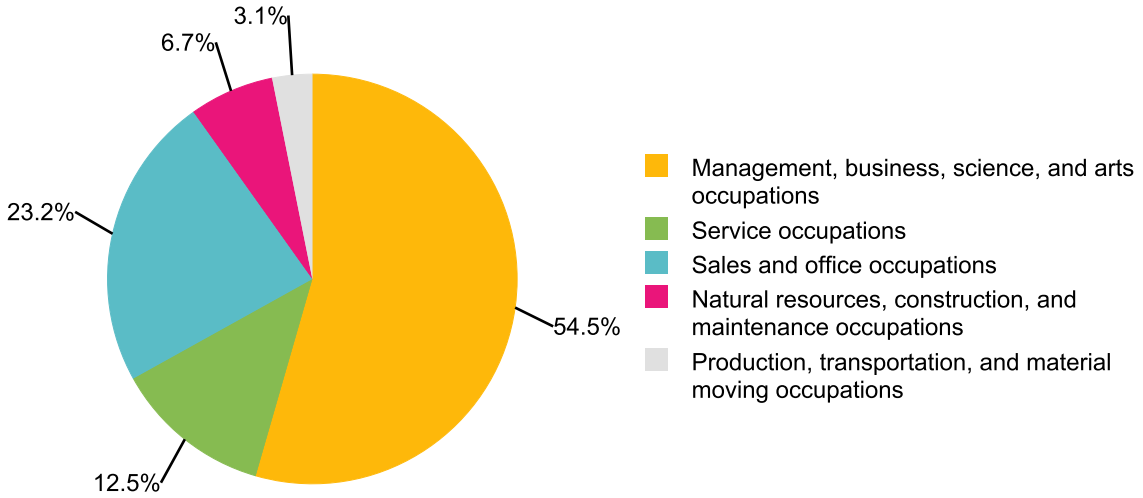
Occupation

ARIZONA COGs & MPOs

American Community Survey 2013-2017 5yr Estimates

Occupation		
Name	Total	Percent
Civilian employed population 16 years and over	762	N/A
Management, business, science, and arts occupations	415	54.5 %
Service occupations	95	12.5 %
Sales and office occupations	177	23.2 %
Natural resources, construction, and maintenance occupations	51	6.7 %
Production, transportation, and material moving occupations	24	3.1 %

Universe: Civilian employed population 16 years and over



Source: U.S. Census Bureau American Community Survey 2013 - 2017

Occupancy, Tenure, Value, and Rent

ARIZONA COGs & MPOs

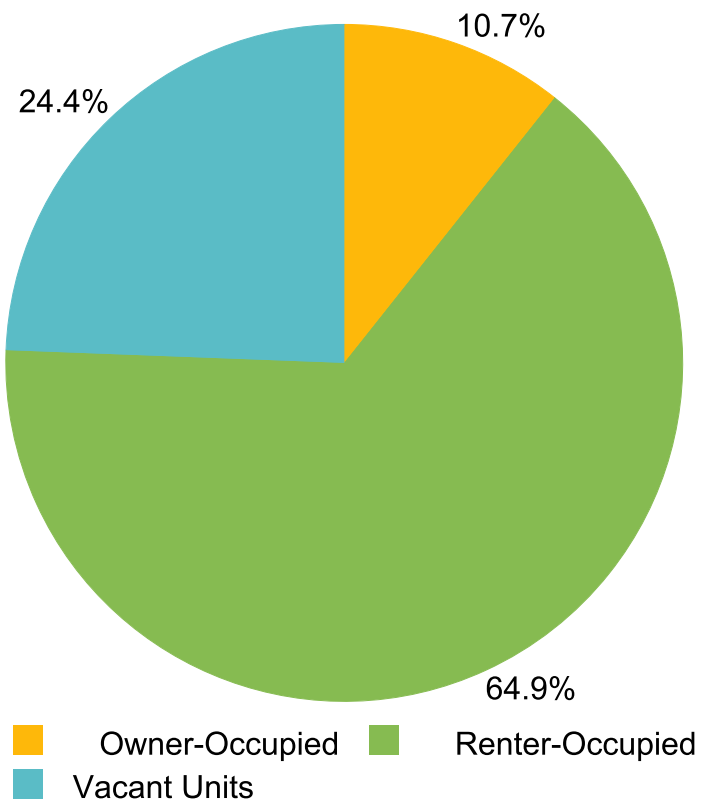
American Community Survey 2013-2017 5yr Estimates

Housing			
Name	Total	Percent	Per Sq Mile
Housing Units	955	N/A	1,911.8
Occupied Housing Units	722	75.6 %	1,445.4
Owner-Occupied	102	10.7 %	204.2
Renter-Occupied	620	64.9 %	1,241.2
Vacant Units	233	24.4 %	466.4
Median Housing Value	$ 247,900	N/A	N/A
Median Rent	$ 1,335	N/A	N/A

Universe: Housing Units

Housing		
Name	Total	Percent
Total Housing Units	955	N/A
1, detached	13	1.4 %
1, attached	0	0.0 %
2 to 9	103	10.8 %
10 or more	834	87.3 %
Mobile Home	5	0.5 %
Boat, RV, van, etc.	0	0.0 %

Universe: Housing Units



Source: U.S. Census Bureau American Community Survey 2013 - 2017

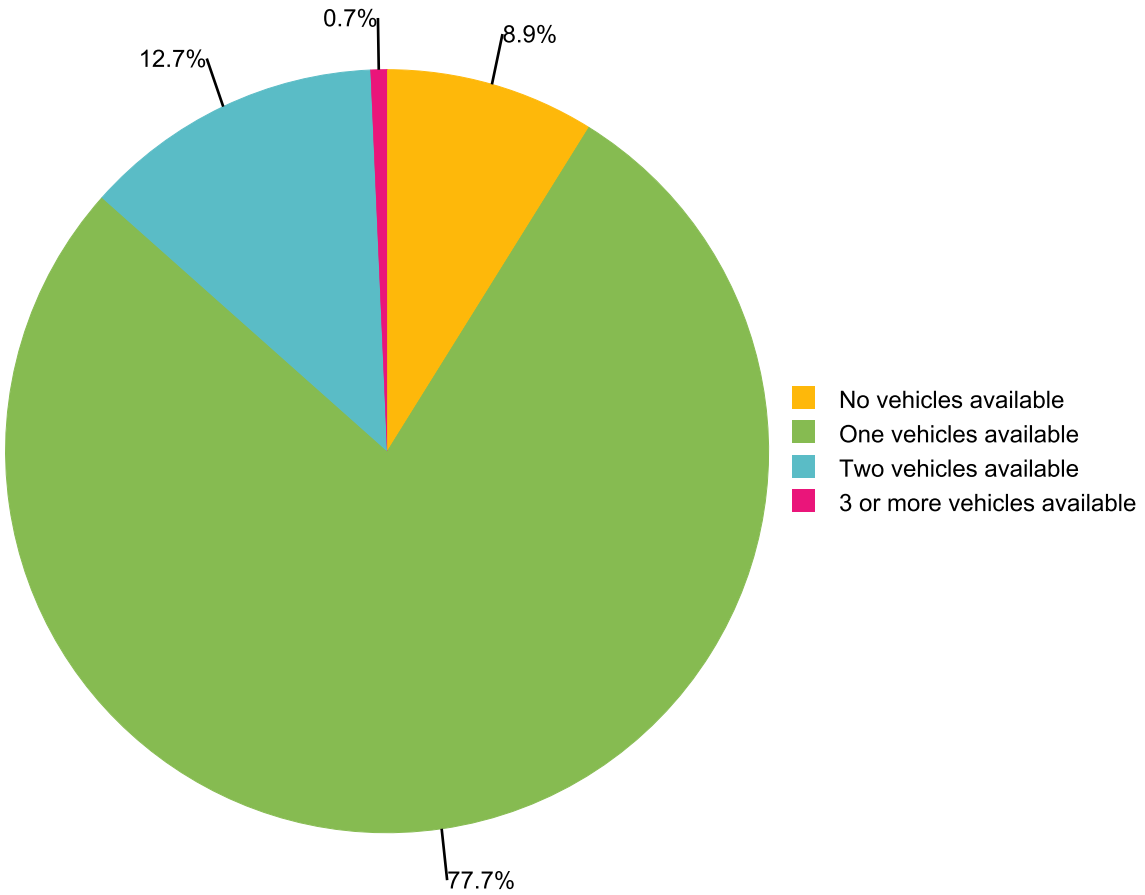
Vehicles Available

ARIZONA COGs & MPOs

American Community Survey 2013-2017 5yr Estimates

Vehicles Available		
Name	Total	Percent
Total Occupied Housing Units	722	N/A
No vehicles available	64	8.9 %
One vehicles available	561	77.7 %
Two vehicles available	92	12.7 %
3 or more vehicles available	5	0.7 %

Universe: Occupied Housing Units



Source: U.S. Census Bureau American Community Survey 2013 - 2017

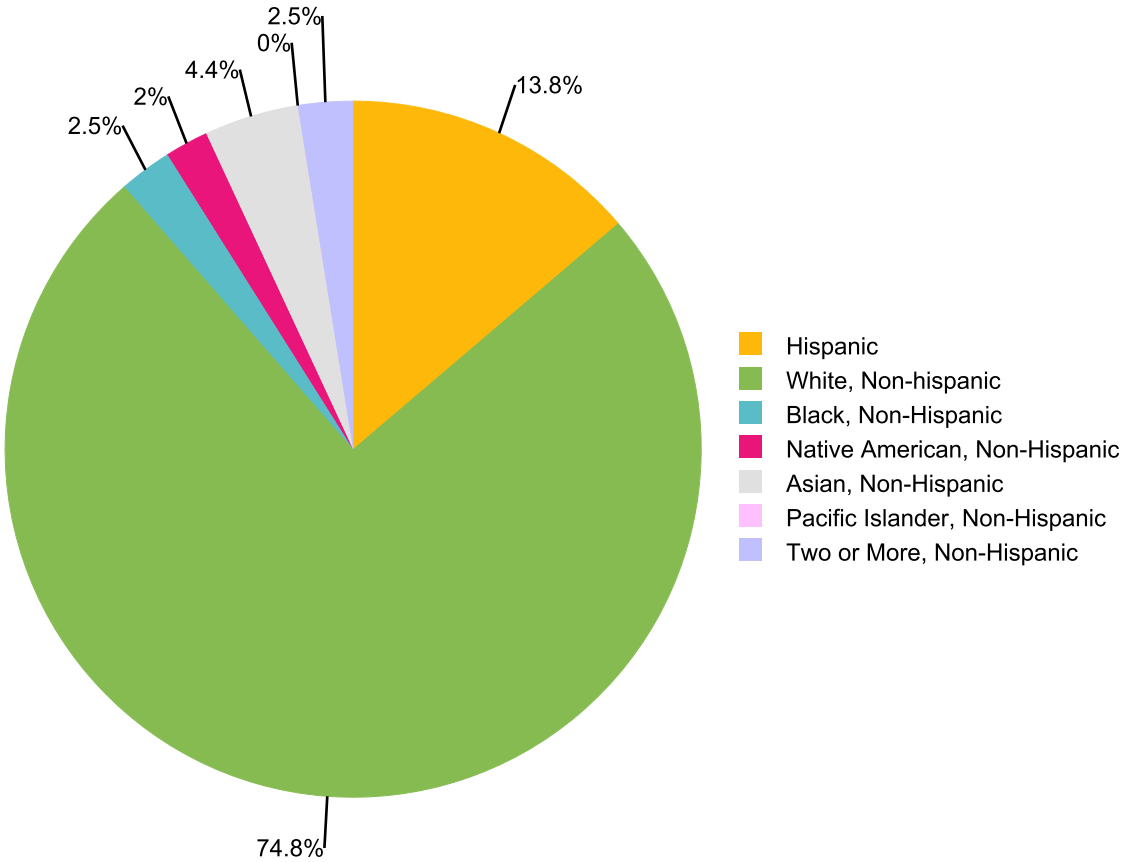
Race

ARIZONA COGs & MPOs

U.S. Census Bureau, 2010 Decennial Census

Race		
Name	Total	Percent
Total Population	1,140	N/A
Hispanic	157	13.8 %
White, Non-hispanic	853	74.8 %
Black, Non-Hispanic	28	2.5 %
Native American, Non-Hispanic	23	2.0 %
Asian, Non-Hispanic	50	4.4 %
Pacific Islander, Non-Hispanic	0	0.0 %
Two or More, Non-Hispanic	29	2.5 %
Other Race, Non-Hispanic	0	0.0 %

Universe: Total Population



Source: U.S. Census Bureau, 2010 Decennial Census

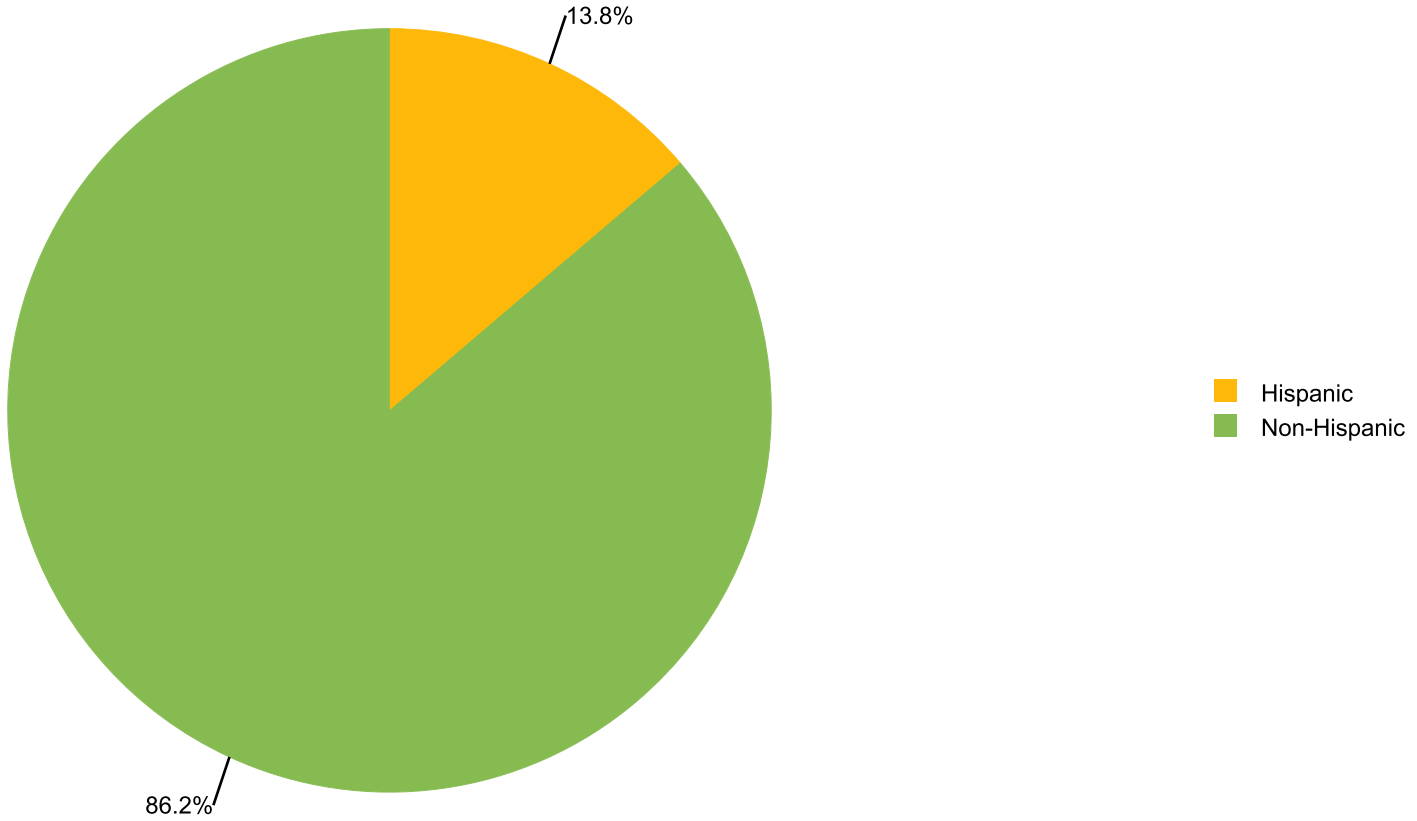
Ethnicity

ARIZONA COGs & MPOs

U.S. Census Bureau, 2010 Decennial Census

Ethnicity		
Name	Total	Percent
Total Population	1,140	N/A
Hispanic	157	13.8 %
Non-Hispanic	983	86.2 %

Universe: Total Population



Source: U.S. Census Bureau, 2010 Decennial Census

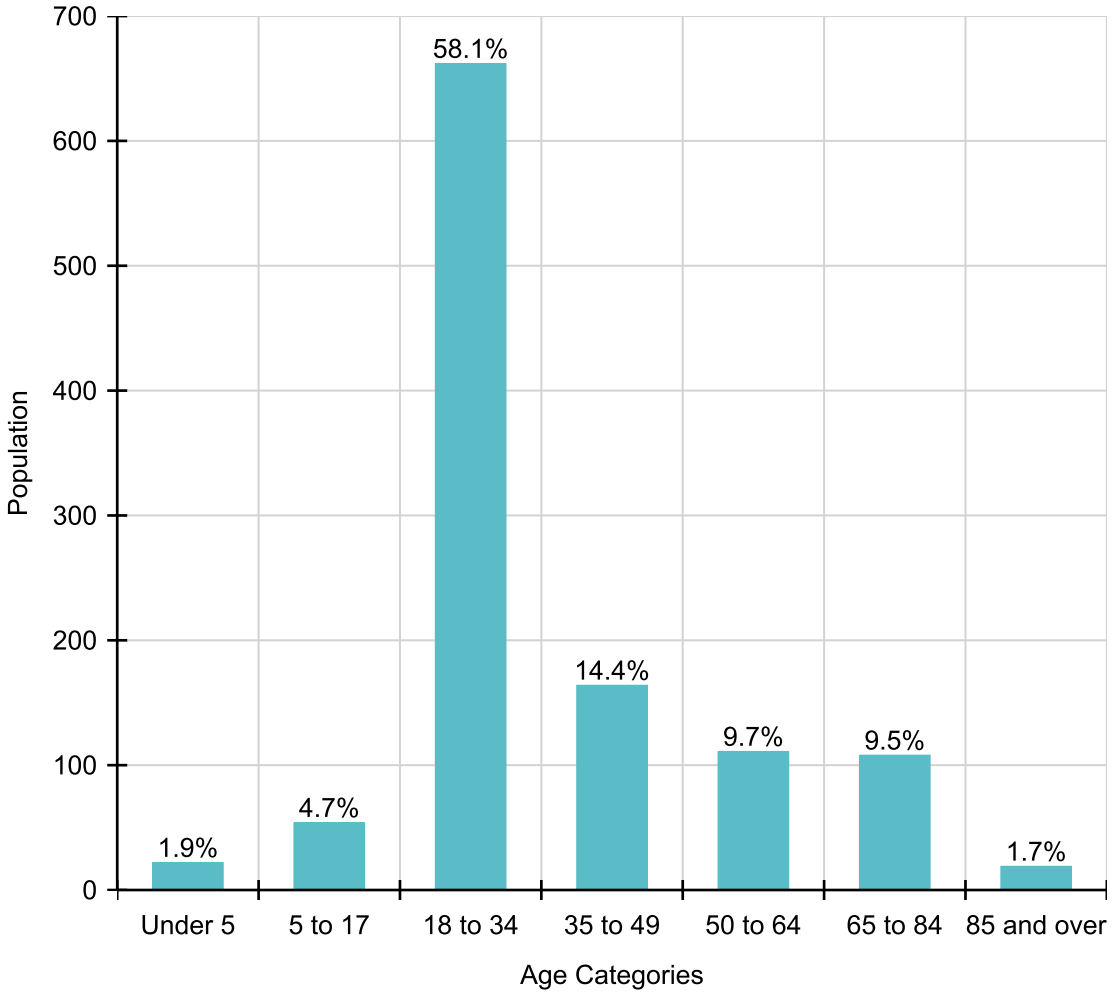
Age

ARIZONA COGs & MPOs

U.S. Census Bureau, 2010 Decennial Census

Age		
Name	Total	Percent
Median Age	29	N/A
Under 05	22	1.9 %
5 to 17	54	4.7 %
18 to 34	662	58.1 %
35 to 49	164	14.4 %
50 to 64	111	9.7 %
65 to 84	108	9.5 %
85 and over	19	1.7 %
50 Plus	238	20.9 %
60 Plus	166	14.6 %
65 Plus	127	11.1 %
70 Plus	92	8.1 %
75 Plus	70	6.1 %

Universe: Total Population



Source: U.S. Census Bureau, 2010 Decennial Census

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DP04: SELECTED HOUSING
2013-2017 American Community Survey 5-

Supporting documentation on code lists, subject definitions, data accuracy, and statistical testing can be found on the American Community Survey website in the Technical Documentation section.

Sample size and data quality measures (including coverage rates, allocation rates, and response rates) can be found on the American Community Survey website in the Methodology section.

Although the American Community Survey (ACS) produces population, demographic and housing unit estimates, it is the Census Bureau's Population Estimates Program that produces and disseminates the official estimates of the population for the nation, states, counties, cities, and towns and estimates of housing units for states and counties.

A processing error was found in the Year Structure Built estimates since data year 2008. For more information, please see the errata note #110.

Subject	United States				Arizona			
	Estimate	Margin of	Percent	Percent	Estimate	Margin of	Percent	Percent
HOUSING OCCUPANCY								
Total housing units	135,393,564	+/-8,863	135,393,564	(X)	2,941,894	+/-465	2,941,894	(X)
Occupied housing units	118,825,921	+/-229,026	87.8%	+/-0.2	2,482,311	+/-6,429	84.4%	+/-0.2
Vacant housing units	16,567,643	+/-220,852	12.2%	+/-0.2	459,583	+/-6,602	15.6%	+/-0.2
Homeowner vacancy rate	1.7	+/-0.1	(X)	(X)	2.4	+/-0.1	(X)	(X)
Rental vacancy rate	6.1	+/-0.1	(X)	(X)	7.4	+/-0.2	(X)	(X)
UNITS IN STRUCTURE								
Total housing units	135,393,564	+/-8,863	135,393,564	(X)	2,941,894	+/-465	2,941,894	(X)
1-unit, detached	83,547,309	+/-115,572	61.7%	+/-0.1	1,880,427	+/-5,152	63.9%	+/-0.2
1-unit, attached	7,903,046	+/-22,274	5.8%	+/-0.1	142,236	+/-2,251	4.8%	+/-0.1
2 units	4,948,642	+/-29,751	3.7%	+/-0.1	38,409	+/-1,361	1.3%	+/-0.1
3 or 4 units	5,950,261	+/-18,568	4.4%	+/-0.1	98,607	+/-2,178	3.4%	+/-0.1
5 to 9 units	6,440,975	+/-27,609	4.8%	+/-0.1	122,566	+/-2,480	4.2%	+/-0.1
10 to 19 units	6,053,982	+/-30,656	4.5%	+/-0.1	145,760	+/-2,658	5.0%	+/-0.1
20 or more units	11,924,671	+/-18,591	8.8%	+/-0.1	193,158	+/-2,799	6.6%	+/-0.1
Mobile home	8,509,712	+/-40,944	6.3%	+/-0.1	310,085	+/-4,024	10.5%	+/-0.1
Boat, RV, van, etc.	114,966	+/-2,220	0.1%	+/-0.1	10,646	+/-689	0.4%	+/-0.1
YEAR STRUCTURE BUILT								
Total housing units	135,393,564	+/-8,863	135,393,564	(X)	2,941,894	+/-465	2,941,894	(X)
Built 2014 or later	1,190,169	+/-7,474	0.9%	+/-0.1	31,337	+/-988	1.1%	+/-0.1
Built 2010 to 2013	3,112,243	+/-14,011	2.3%	+/-0.1	69,668	+/-1,825	2.4%	+/-0.1
Built 2000 to 2009	19,663,902	+/-34,481	14.5%	+/-0.1	737,665	+/-4,616	25.1%	+/-0.2
Built 1990 to 1999	18,945,953	+/-32,299	14.0%	+/-0.1	597,398	+/-4,141	20.3%	+/-0.1
Built 1980 to 1989	18,399,296	+/-25,772	13.6%	+/-0.1	526,795	+/-4,322	17.9%	+/-0.1
Built 1970 to 1979	20,920,173	+/-32,118	15.5%	+/-0.1	503,837	+/-4,334	17.1%	+/-0.1
Built 1960 to 1969	14,577,264	+/-24,450	10.8%	+/-0.1	217,663	+/-2,831	7.4%	+/-0.1
Built 1950 to 1959	14,229,384	+/-24,100	10.5%	+/-0.1	164,984	+/-2,833	5.6%	+/-0.1
Built 1940 to 1949	6,903,420	+/-17,670	5.1%	+/-0.1	44,994	+/-1,551	1.5%	+/-0.1
Built 1939 or earlier	17,451,760	+/-35,826	12.9%	+/-0.1	47,553	+/-1,303	1.6%	+/-0.1

ROOMS								
Total housing units	135,393,564	+/-8,863	135,393,564	(X)	2,941,894	+/-465	2,941,894	(X)
1 room	2,948,528	+/-19,715	2.2%	+/-0.1	73,435	+/-1,881	2.5%	+/-0.1
2 rooms	3,501,930	+/-16,936	2.6%	+/-0.1	109,214	+/-2,002	3.7%	+/-0.1
3 rooms	12,222,512	+/-36,567	9.0%	+/-0.1	300,912	+/-3,622	10.2%	+/-0.1
4 rooms	22,238,449	+/-73,033	16.4%	+/-0.1	513,789	+/-4,221	17.5%	+/-0.1
5 rooms	27,105,991	+/-78,378	20.0%	+/-0.1	643,861	+/-5,352	21.9%	+/-0.2
6 rooms	24,222,159	+/-34,618	17.9%	+/-0.1	532,037	+/-4,873	18.1%	+/-0.2
7 rooms	16,451,851	+/-37,464	12.2%	+/-0.1	346,216	+/-3,527	11.8%	+/-0.1
8 rooms	11,592,763	+/-53,042	8.6%	+/-0.1	213,135	+/-2,988	7.2%	+/-0.1
9 rooms or more	15,109,381	+/-110,602	11.2%	+/-0.1	209,295	+/-3,815	7.1%	+/-0.1
Median rooms	5.5	+/-0.1	(X)	(X)	5.2	+/-0.1	(X)	(X)
BEDROOMS								
Total housing units	135,393,564	+/-8,863	135,393,564	(X)	2,941,894	+/-465	2,941,894	(X)
No bedroom	3,251,368	+/-17,219	2.4%	+/-0.1	78,485	+/-1,876	2.7%	+/-0.1
1 bedroom	14,743,943	+/-24,091	10.9%	+/-0.1	329,222	+/-3,229	11.2%	+/-0.1
2 bedrooms	35,560,754	+/-65,738	26.3%	+/-0.1	791,122	+/-5,126	26.9%	+/-0.2
3 bedrooms	53,592,857	+/-54,928	39.6%	+/-0.1	1,099,663	+/-5,791	37.4%	+/-0.2
4 bedrooms	22,348,200	+/-54,769	16.5%	+/-0.1	521,344	+/-4,244	17.7%	+/-0.1
5 or more bedrooms	5,896,442	+/-17,375	4.4%	+/-0.1	122,058	+/-2,190	4.1%	+/-0.1
HOUSING TENURE								
Occupied housing units	118,825,921	+/-229,026	118,825,921	(X)	2,482,311	+/-6,429	2,482,311	(X)
Owner-occupied	75,833,135	+/-358,989	63.8%	+/-0.2	1,567,338	+/-8,662	63.1%	+/-0.3
Renter-occupied	42,992,786	+/-134,442	36.2%	+/-0.2	914,973	+/-5,719	36.9%	+/-0.3
Average household size of owner-occupied unit	2.70	+/-0.01	(X)	(X)	2.68	+/-0.01	(X)	(X)
Average household size of renter-occupied unit	2.52	+/-0.01	(X)	(X)	2.69	+/-0.01	(X)	(X)
YEAR HOUSEHOLDER MOVED INTO UNIT								
Occupied housing units	118,825,921	+/-229,026	118,825,921	(X)	2,482,311	+/-6,429	2,482,311	(X)
Moved in 2015 or later	12,543,072	+/-36,274	10.6%	+/-0.1	326,911	+/-3,586	13.2%	+/-0.1
Moved in 2010 to 2014	37,627,077	+/-35,783	31.7%	+/-0.1	950,148	+/-5,240	38.3%	+/-0.2
Moved in 2000 to 2009	34,404,681	+/-117,673	29.0%	+/-0.1	720,628	+/-5,391	29.0%	+/-0.2
Moved in 1990 to 1999	16,775,610	+/-82,436	14.1%	+/-0.1	292,115	+/-3,415	11.8%	+/-0.1
Moved in 1980 to 1989	8,190,533	+/-36,548	6.9%	+/-0.1	108,666	+/-1,699	4.4%	+/-0.1
Moved in 1979 and earlier	9,284,948	+/-35,380	7.8%	+/-0.1	83,843	+/-1,360	3.4%	+/-0.1
VEHICLES AVAILABLE								
Occupied housing units	118,825,921	+/-229,026	118,825,921	(X)	2,482,311	+/-6,429	2,482,311	(X)
No vehicles available	10,468,418	+/-21,640	**8.8%**	+/-0.1	160,656	+/-2,441	**6.5%**	+/-0.1
1 vehicle available	39,472,759	+/-34,387	**33.2%**	+/-0.1	911,260	+/-4,646	**36.7%**	+/-0.2
2 vehicles available	44,402,282	+/-137,249	**37.4%**	+/-0.1	946,422	+/-5,916	**38.1%**	+/-0.2
3 or more vehicles available	24,482,462	+/-88,615	**20.6%**	+/-0.1	463,973	+/-4,044	**18.7%**	+/-0.2

HOUSE HEATING FUEL								
Occupied housing units	118,825,921	+/-229,026	118,825,921	(X)	2,482,311	+/-6,429	2,482,311	(X)
Utility gas	57,294,573	+/-142,736	48.2%	+/-0.1	820,439	+/-5,534	33.1%	+/-0.2
Bottled, tank, or LP gas	5,663,929	+/-25,976	4.8%	+/-0.1	68,183	+/-1,598	2.7%	+/-0.1
Electricity	45,252,635	+/-57,951	38.1%	+/-0.1	1,497,573	+/-5,270	60.3%	+/-0.2
Fuel oil, kerosene, etc.	6,068,906	+/-14,018	5.1%	+/-0.1	1,836	+/-300	0.1%	+/-0.1
Coal or coke	128,511	+/-1,816	0.1%	+/-0.1	359	+/-133	0.0%	+/-0.1
Wood	2,362,351	+/-8,574	2.0%	+/-0.1	49,180	+/-1,151	2.0%	+/-0.1
Solar energy	120,950	+/-2,402	0.1%	+/-0.1	10,327	+/-705	0.4%	+/-0.1
Other fuel	587,805	+/-4,761	0.5%	+/-0.1	4,879	+/-519	0.2%	+/-0.1
No fuel used	1,346,261	+/-10,580	1.1%	+/-0.1	29,535	+/-1,095	1.2%	+/-0.1
SELECTED CHARACTERISTICS								
Occupied housing units	118,825,921	+/-229,026	118,825,921	(X)	2,482,311	+/-6,429	2,482,311	(X)
Lacking complete plumbing facilities	470,774	+/-5,569	0.4%	+/-0.1	16,013	+/-915	0.6%	+/-0.1
Lacking complete kitchen facilities	980,238	+/-6,061	0.8%	+/-0.1	20,292	+/-950	0.8%	+/-0.1
No telephone service available	2,775,560	+/-23,140	2.3%	+/-0.1	66,903	+/-1,649	2.7%	+/-0.1
OCCUPANTS PER ROOM								
Occupied housing units	118,825,921	+/-229,026	118,825,921	(X)	2,482,311	+/-6,429	2,482,311	(X)
1.00 or less	114,850,639	+/-247,004	96.7%	+/-0.1	2,371,885	+/-7,154	95.6%	+/-0.1
1.01 to 1.50	2,744,122	+/-19,370	2.3%	+/-0.1	75,785	+/-1,862	3.1%	+/-0.1
1.51 or more	1,231,160	+/-8,820	1.0%	+/-0.1	34,641	+/-1,257	1.4%	+/-0.1
VALUE								
Owner-occupied units	75,833,135	+/-358,989	75,833,135	(X)	1,567,338	+/-8,662	1,567,338	(X)
Less than $50,000	6,323,346	+/-33,601	8.3%	+/-0.1	142,094	+/-2,185	9.1%	+/-0.1
$50,000 to $99,999	10,539,890	+/-54,031	13.9%	+/-0.1	175,411	+/-2,955	11.2%	+/-0.2
$100,000 to $149,999	11,157,888	+/-58,825	14.7%	+/-0.1	229,363	+/-3,532	14.6%	+/-0.2
$150,000 to $199,999	11,090,587	+/-60,245	14.6%	+/-0.1	267,963	+/-3,286	17.1%	+/-0.2
$200,000 to $299,999	14,206,037	+/-71,723	18.7%	+/-0.1	347,801	+/-3,195	22.2%	+/-0.2
$300,000 to $499,999	13,090,934	+/-63,243	17.3%	+/-0.1	274,300	+/-2,971	17.5%	+/-0.2
$500,000 to $999,999	7,353,702	+/-34,504	9.7%	+/-0.1	106,584	+/-1,930	6.8%	+/-0.1
$1,000,000 or more	2,070,751	+/-9,450	2.7%	+/-0.1	23,822	+/-878	1.5%	+/-0.1
Median (dollars)	193,500	+/-156	(X)	(X)	193,200	+/-657	(X)	(X)
MORTGAGE STATUS								
Owner-occupied units	75,833,135	+/-358,989	75,833,135	(X)	1,567,338	+/-8,662	1,567,338	(X)
Housing units with a mortgage	48,185,314	+/-233,741	63.5%	+/-0.1	1,010,928	+/-7,402	64.5%	+/-0.3
Housing units without a mortgage	27,647,821	+/-128,807	36.5%	+/-0.1	556,410	+/-5,125	35.5%	+/-0.3
SELECTED MONTHLY OWNER COSTS (SMOC)								
Housing units with a mortgage	48,185,314	+/-233,741	48,185,314	(X)	1,010,928	+/-7,402	1,010,928	(X)
Less than $500	755,268	+/-8,043	1.6%	+/-0.1	19,130	+/-931	1.9%	+/-0.1
$500 to $999	9,304,185	+/-47,959	19.3%	+/-0.1	228,730	+/-3,287	22.6%	+/-0.3
$1,000 to $1,499	13,698,835	+/-65,803	28.4%	+/-0.1	353,777	+/-3,552	35.0%	+/-0.3
$1,500 to $1,999	9,858,438	+/-52,874	20.5%	+/-0.1	207,720	+/-3,057	20.5%	+/-0.3

$2,000 to $2,499	5,856,392	+/-34,216	12.2%	+/-0.1	100,912	+/-1,955	10.0%	+/-0.2
$2,500 to $2,999	3,494,948	+/-20,881	7.3%	+/-0.1	47,299	+/-1,324	4.7%	+/-0.1
$3,000 or more	5,217,248	+/-25,525	10.8%	+/-0.1	53,360	+/-1,360	5.3%	+/-0.1
Median (dollars)	1,515	+/-1	(X)	(X)	1,354	+/-5	(X)	(X)
Housing units without a mortgage	27,647,821	+/-128,807	27,647,821	(X)	556,410	+/-5,125	556,410	(X)
Less than $250	3,632,492	+/-20,479	13.1%	+/-0.1	111,667	+/-2,165	20.1%	+/-0.3
$250 to $399	6,899,706	+/-33,524	25.0%	+/-0.1	174,537	+/-2,605	31.4%	+/-0.4
$400 to $599	7,943,094	+/-40,228	28.7%	+/-0.1	162,088	+/-2,897	29.1%	+/-0.4
$600 to $799	4,286,265	+/-24,370	15.5%	+/-0.1	65,543	+/-1,492	11.8%	+/-0.3
$800 to $999	2,138,586	+/-12,476	7.7%	+/-0.1	22,529	+/-988	4.0%	+/-0.2
$1,000 or more	2,747,678	+/-16,086	9.9%	+/-0.1	20,046	+/-850	3.6%	+/-0.1
Median (dollars)	474	+/-1	(X)	(X)	394	+/-2	(X)	(X)
SELECTED MONTHLY OWNER COSTS AS A								
Housing units with a mortgage (excluding units	47,932,589	+/-234,703	47,932,589	(X)	1,001,781	+/-7,424	1,001,781	(X)
Less than 20.0 percent	20,992,031	+/-141,179	43.8%	+/-0.1	448,525	+/-4,866	44.8%	+/-0.3
20.0 to 24.9 percent	7,607,075	+/-50,511	15.9%	+/-0.1	155,734	+/-2,568	15.5%	+/-0.2
25.0 to 29.9 percent	5,202,903	+/-28,135	10.9%	+/-0.1	103,978	+/-2,168	10.4%	+/-0.2
30.0 to 34.9 percent	3,459,412	+/-17,011	7.2%	+/-0.1	69,759	+/-1,604	7.0%	+/-0.2
35.0 percent or more	10,671,168	+/-24,159	22.3%	+/-0.1	223,785	+/-3,217	22.3%	+/-0.3
Not computed	252,725	+/-4,101	(X)	(X)	9,147	+/-769	(X)	(X)
Housing unit without a mortgage (excluding units	27,259,804	+/-128,109	27,259,804	(X)	544,169	+/-5,106	544,169	(X)
Less than 10.0 percent	11,889,330	+/-71,702	43.6%	+/-0.1	272,742	+/-3,466	50.1%	+/-0.4
10.0 to 14.9 percent	5,326,647	+/-27,704	19.5%	+/-0.1	98,351	+/-1,659	18.1%	+/-0.3
15.0 to 19.9 percent	3,100,800	+/-13,957	11.4%	+/-0.1	56,600	+/-1,622	10.4%	+/-0.3
20.0 to 24.9 percent	1,904,462	+/-11,269	7.0%	+/-0.1	32,907	+/-1,184	6.0%	+/-0.2
25.0 to 29.9 percent	1,230,056	+/-7,526	4.5%	+/-0.1	20,354	+/-994	3.7%	+/-0.2
30.0 to 34.9 percent	833,791	+/-6,334	3.1%	+/-0.1	14,139	+/-734	2.6%	+/-0.1
35.0 percent or more	2,974,718	+/-13,927	10.9%	+/-0.1	49,076	+/-1,337	9.0%	+/-0.2
Not computed	388,017	+/-4,137	(X)	(X)	12,241	+/-664	(X)	(X)
GROSS RENT								
Occupied units paying rent	40,768,931	+/-132,362	40,768,931	(X)	869,268	+/-5,717	869,268	(X)
Less than $500	4,295,540	+/-15,570	10.5%	+/-0.1	63,459	+/-1,692	7.3%	+/-0.2
$500 to $999	16,741,754	+/-50,035	41.1%	+/-0.1	395,684	+/-3,562	45.5%	+/-0.4
$1,000 to $1,499	11,685,037	+/-50,579	28.7%	+/-0.1	296,126	+/-3,953	34.1%	+/-0.4
$1,500 to $1,999	4,789,482	+/-27,097	11.7%	+/-0.1	80,729	+/-2,151	9.3%	+/-0.2
$2,000 to $2,499	1,822,982	+/-12,476	4.5%	+/-0.1	19,935	+/-1,094	2.3%	+/-0.1
$2,500 to $2,999	733,525	+/-7,757	1.8%	+/-0.1	6,704	+/-508	0.8%	+/-0.1
$3,000 or more	700,611	+/-5,667	1.7%	+/-0.1	6,631	+/-588	0.8%	+/-0.1
Median (dollars)	982	+/-1	(X)	(X)	972	+/-4	(X)	(X)
No rent paid	2,223,855	+/-9,240	(X)	(X)	45,705	+/-1,454	(X)	(X)

GROSS RENT AS A PERCENTAGE OF								
Occupied units paying rent (excluding units where	39,799,272	+/-127,618	39,799,272	(X)	845,674	+/-5,566	845,674	(X)
Less than 15.0 percent	5,011,892	+/-28,016	12.6%	+/-0.1	106,481	+/-2,433	12.6%	+/-0.3
15.0 to 19.9 percent	5,004,777	+/-20,396	12.6%	+/-0.1	113,107	+/-2,676	13.4%	+/-0.3
20.0 to 24.9 percent	5,062,386	+/-19,188	12.7%	+/-0.1	115,302	+/-2,586	13.6%	+/-0.3
25.0 to 29.9 percent	4,581,896	+/-21,357	11.5%	+/-0.1	97,144	+/-2,190	11.5%	+/-0.2
30.0 to 34.9 percent	3,633,936	+/-17,209	9.1%	+/-0.1	72,677	+/-1,798	8.6%	+/-0.2
35.0 percent or more	16,504,385	+/-59,367	41.5%	+/-0.1	340,963	+/-4,061	40.3%	+/-0.4
Not computed	3,193,514	+/-13,683	(X)	(X)	69,299	+/-1,640	(X)	(X)

Data are based on a sample and are subject to sampling variability. The degree of uncertainty for an estimate arising from sampling variability is represented through the use of a margin of error. The value shown here is the 90 percent margin of error. The margin of error can be interpreted roughly as providing a 90 percent probability that the interval defined by the estimate minus the margin of error and the estimate plus the margin of error (the lower and upper confidence bounds) contains the true value. In addition to sampling variability, the ACS estimates are subject to nonsampling error (for a discussion of nonsampling variability, see Accuracy of the Data). The effect of nonsampling error is not represented in these tables.

Households not paying cash rent are excluded from the calculation of median gross rent.

Telephone service data are not available for certain geographic areas due to problems with data collection of this question that occurred in 2015 and 2016. Both ACS 1-year and ACS 5-year files were affected. It may take several years in the ACS 5-year files until the estimates are available for the geographic areas affected.

While the 2013-2017 American Community Survey (ACS) data generally reflect the February 2013 Office of Management and Budget (OMB) definitions of metropolitan and micropolitan statistical areas; in certain instances the names, codes, and boundaries of the principal cities shown in ACS tables may differ from the OMB definitions due to differences in the effective dates of the geographic entities.

Estimates of urban and rural populations, housing units, and characteristics reflect boundaries of urban areas defined based on Census 2010 data. As a result, data for urban and rural areas from the ACS do not necessarily reflect the results of ongoing urbanization.

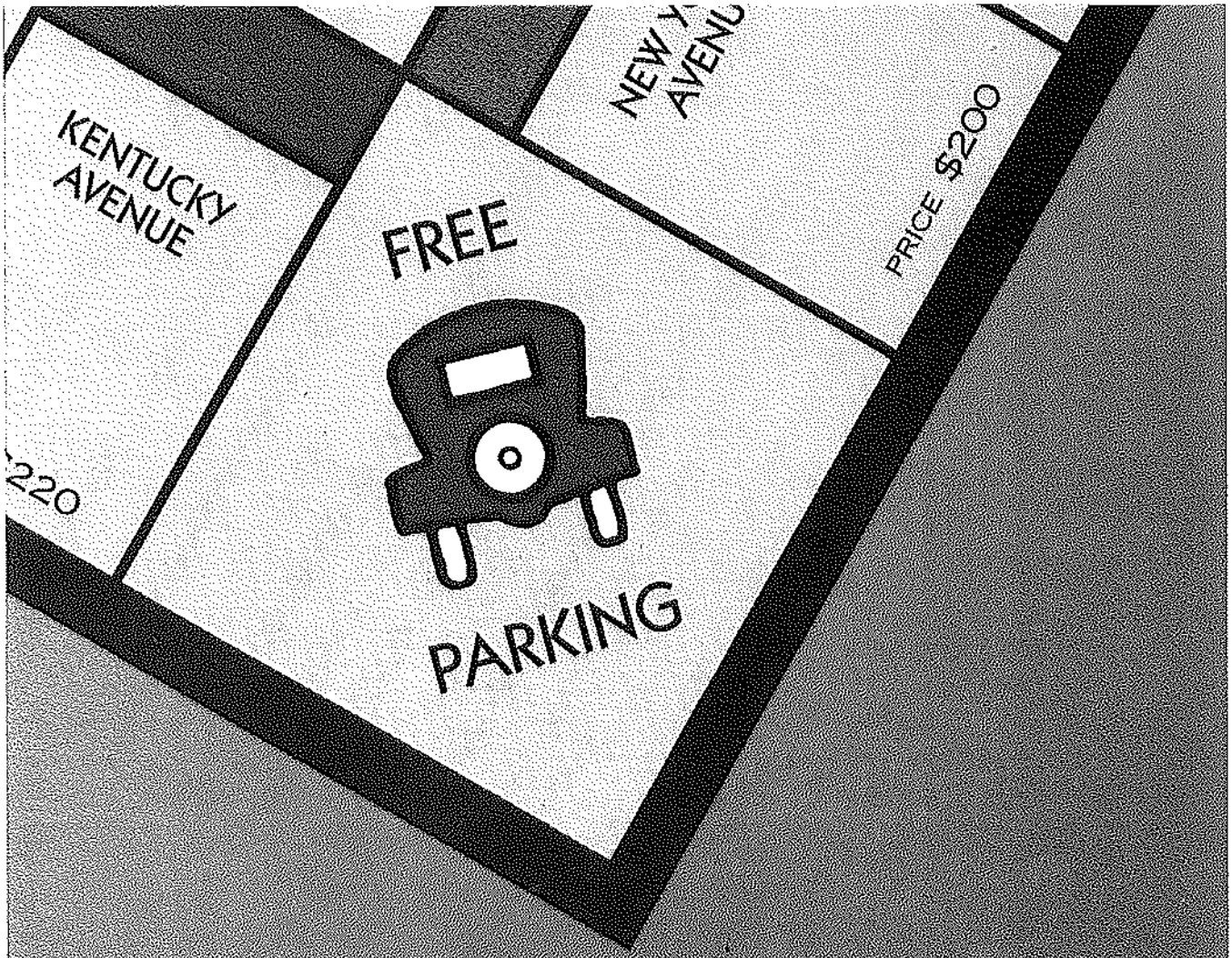
Source: U.S. Census Bureau, 2013-2017
American Community Survey 5-Year
Estimates

Explanation of Symbols:

1. An '**' entry in the margin of error column indicates that either no sample observations or too few sample observations were available to compute a standard error and thus the margin of error. A statistical test is not appropriate.
2. An '-' entry in the estimate column indicates that either no sample observations or too few sample observations were available to compute an estimate, or a ratio of medians cannot be calculated because one or both of the median estimates falls in the lowest interval or upper interval of an open-ended distribution.
3. An '-' following a median estimate means the median falls in the lowest interval of an open-ended distribution.
4. An '+' following a median estimate means the median falls in the upper interval of an open-ended distribution.
5. An '***' entry in the margin of error column indicates that the median falls in the lowest interval or upper interval of an open-ended distribution. A statistical test is not appropriate.
6. An '*****' entry in the margin of error column indicates that the estimate is controlled. A statistical test for sampling variability is not appropriate.
7. An 'N' entry in the estimate and margin of error columns indicates that data for this geographic area cannot be displayed because the number of sample cases is too small.
8. An '(X)' means that the estimate is not applicable or not available.

Appendix E – Parking Trends – In The News

E



The High Cost of Free Parking

DONALD SHOUP

Updated by the author

Preface

A Progress Report on Parking Reforms

All of us, if we are reasonably comfortable, healthy and safe, owe immense debts to the past. There is no way, of course, to repay the past. We can only repay those debts by making gifts to the future.

—JANE JACOBS

Who would have predicted that a 750-page book on parking could be popular enough to reprint as a paperback? One sign that *The High Cost of Free Parking* has attracted a following is a Facebook group for the book with about a thousand members, called the Shoupistas. Although the group sounds radical, the members support market-rate prices for parking, which sounds conservative. Because of this widespread interest across the political spectrum, the American Planning Association is publishing this paperback edition to make the book more affordable, especially for students who are the next generation of city planners.

When the hardback edition was published in 2005, the reviews were, with one unimportant exception, very good.[1] More important than good reviews, several cities have adopted the policies proposed in the book, and the paperback edition offers an opportunity to report on progress made in parking reforms during the past six years. In this preface I will discuss reforms that have taken place in relation to the three basic policies recommended in the book: (1) set the right price for curb parking, (2) return the parking revenue to pay for local public services, and (3) remove minimum parking requirements. (The Afterword on pages 683–709 presents more information about these reforms.)

I hope the progress reported here will convince readers that my policy proposals are not theoretical and idealistic but are instead practical and realistic. The good news about our decades of bad planning for parking is that the damage we have done will be far cheaper to repair than to ignore.

1. SET THE RIGHT PRICE FOR CURB PARKING

Cities should set the right price for curb parking because the wrong prices produce such bad results. Where curb parking is underpriced and overcrowded, a surprising share of traffic can be cruising in search of a place to park. Sixteen studies conducted between 1927 and 2001 found that, on average, 30 percent of the cars in congested traffic were cruising for parking (see Chapter 11). New studies continue to find that many drivers cruise for curb parking like hawks looking for prey. For example, when researchers interviewed drivers who were stopped at traffic signals in New York City, they found that 28 percent of the drivers on one street in Manhattan and 45 percent on a street in Brooklyn were cruising for curb parking.[2]

In another study, observers found the average time to find a curb space on 15 blocks in the Upper West Side of Manhattan was 3.1 minutes and the average cruising distance was 0.37 miles. These findings were used to estimate that cruising for underpriced parking on these 15 blocks alone creates about 366,000 excess vehicle miles of travel and produces 325 tons of CO_2 per year.[3]

Performance Parking Prices

Free curb parking in a congested city gives a small, temporary benefit to a few drivers who happen to be lucky on a particular day, but it creates large social costs for everyone else every day. To manage curb parking and avoid the problems caused by cruising, some cities have begun to adjust their curb parking prices by location and time of day to produce an 85 percent occupancy rate for curb parking, which corresponds to one vacant space on a block with eight curb spaces. The price is too high if many spaces are vacant and too low if no spaces are vacant. But if one or two spaces are vacant on a block and drivers can reliably find open curb spaces at their destinations, the price is just right. We can call this the Goldilocks principle of parking prices.

Although cruising may seem to be an inevitable consequence of living in a crowded city, some drivers believe they have good "parking karma," an uncanny ability to find a curb space when they arrive at a destination. Given the laws of probability, some drivers will be luckier than others in finding a parking spot, and they may interpret this luck as a rare gift rather than pure chance. Setting the right parking prices can give all drivers the gift of good parking karma.

Some cities refer to the policy of setting prices to produce one or two open curb spaces on every block as *performance pricing*. It can

improve performance in three ways. First, curb parking will perform more efficiently. If all but one or two curb spaces are occupied on every block, parking will be well used but also remain readily available for drivers who want to park. Second, the transportation system will perform more efficiently because cruising for curb parking will not congest traffic, waste fuel, pollute the air, and waste drivers' time. Third, the economy will perform more efficiently. In business districts, drivers will park, buy something, and leave promptly, allowing other customers to use the spaces.

SFpark. With a grant from the U.S. Department of Transportation, San Francisco has embarked on an ambitious program, called SF*park*, to get the prices of curb parking right. The city is installing meters that can charge variable prices and sensors that can report the occupancy of each space in real time. The city will thus have information on curb occupancy rates and the ability to adjust curb parking prices in response to the occupancy rates. The city intends to adjust prices once a month, by not more than 50¢ an hour. By nudging prices up or down in a trial-and-error process, the city will seek a structure of prices that vary by time and location throughout the city, yielding one or two open spaces on every block.[4]

The central idea of SF*park* is that you cannot set the right price for curb parking without observing the occupancy. The goal is to set the lowest price that will yield one or two open spaces on every block. Figure P-1 shows that nudging up the price on crowded Block A by enough to shift only one car to less crowded Block B can significantly improve the performance of the transportation system. This shift will eliminate cruising on Block A and take advantage of the empty spaces on Block B. Even if all the curb spaces are occupied on all the nearby blocks, shifting only one car per block from a curb space to nearby off-street parking can also eliminate cruising. Small changes in parking prices and location choices can lead to big improvements in transportation efficiency.

Beyond managing the curb parking supply, SF*park* can depoliticize parking by stating a clear principle for setting the prices for curb spaces: the

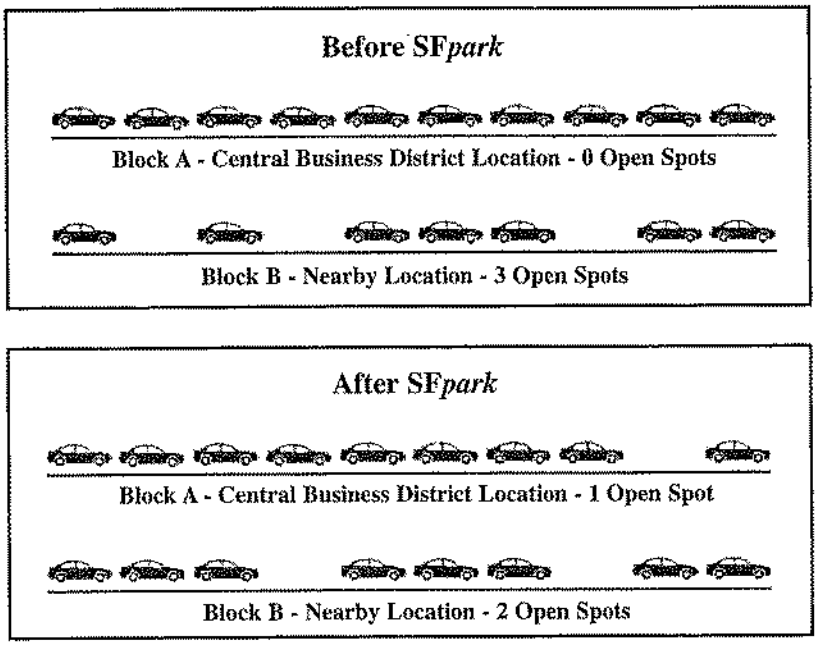


Figure P-1. Performance prices create open spaces on every block.

lowest prices the city can charge without creating a parking shortage. Because San Francisco has set a policy goal for how curb parking should perform, the demand for parking will set the prices.

Performance parking programs do not rely on complex models to set prices; they rely only on paying attention to the results. After shifting from a revenue goal to an outcome goal for the parking system and choosing the occupancy rate to indicate the desired outcome, the city council will no longer have to vote on parking prices. If too many curb spaces are vacant, the price will go down, and if no curb spaces are vacant, the price will go up. Wanting more money will no longer justify raising prices. Relying on the power of an impersonal rule to set prices makes an end run around the politics of parking.

In preparing for SF*park*, San Francisco conducted a census of its parking spaces and found 281,000 on-street spaces, which make up 58 percent of all publicly available parking in the city. San Francisco has one on-street parking space for every three people in the city, but only 9 percent of those spaces are metered.[5] Expanding SF*park* into areas that have a shortage of curb parking can greatly improve management of this valuable asset and also yield substantial revenue for local public investments.

Several other cities—including Los Angeles, New York, Seattle, and Washington, D.C.—have adopted similar performance parking policies. The Afterword explains their programs.

Opposition to SFpark. Drivers who cruise in search of free curb parking pay with time instead of money, and their cruising congests traffic, pollutes the air, and wastes fuel. In contrast, drivers who pay money for performance-priced curb parking provide funds to improve public services. Nevertheless, some people oppose charging anything for curb parking. One group in San Francisco, the Act Now to Stop War and End Racism (ANSWER) Coalition, has strongly but unsuccessfully tried to block SF*park*. One flyer proclaimed:

> Stop the parking meter hike! Make the rich pay, not the workers! Don't squeeze workers and small business. This is a tax on the people! It's time to organize and defeat the parking meter robbery![6]

The ANSWER Coalition opposes foreign wars for oil but supports free parking at home, and this sort of confusion is common in debates about parking policy. Thinking about parking seems to take place in the reptilian cortex, the most primitive part of the brain responsible for making snap decisions about urgent fight-or-flight choices, such as how to avoid being eaten.[7] The brain's reptilian cortex is said to govern instinctive behavior involved in aggression, dominance, territoriality, and ritual display—all important factors in cruising for parking and debating about parking policies.

The ANSWER Coalition's criticism of SF*park* is misguided. Thirty percent of households in San Francisco don't own a car, and the city uses all the parking meter revenue to subsidize public transit. Many poor people ride buses that are mired in traffic congested by richer drivers who are cruising for underpriced curb parking.[8]

Drivers who don't want to pay for parking often push poor people out in front of them like human shields, claiming that charging for parking will hurt the poor. Free curb parking limits the revenue available to pay for public services, and poor people are less able to replace public services with private purchases the way richer people can. The poorest people cannot afford cars, but they can benefit from public services—such as public transportation—that are financed by parking revenues. Using curb parking revenue to pay for local public services is much fairer than keeping curb parking free and requiring ample off-street parking (see pp. 530–539).

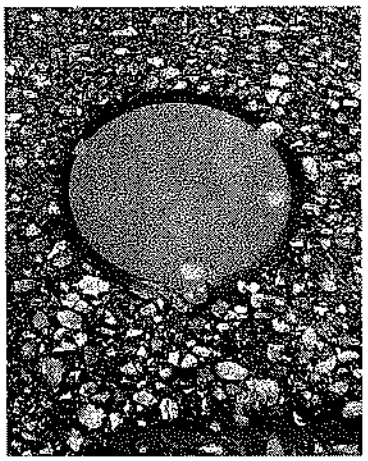
Some opposition to performance parking prices may be due to unfamiliarity, and only experience will change minds. Once drivers have become accustomed to performance prices and see that prices can decline as well as increase, they may come to value the ready availability of curb parking. What seems indefensible for a current generation

may become indispensable for future generations. Familiarity breeds acceptability and, as Thomas Paine wrote, "Time makes more converts than reason."

New Technology for Performance Pricing

Setting an occupancy goal is easier than achieving it. How can a city adjust parking prices to yield one or two open curb spaces on every block? Fortunately, the technology used to charge for parking and measure occupancy has advanced rapidly in recent years. This new technology enables cities not only to set different prices at different times of day but also to measure the resulting occupancy of curb spaces.

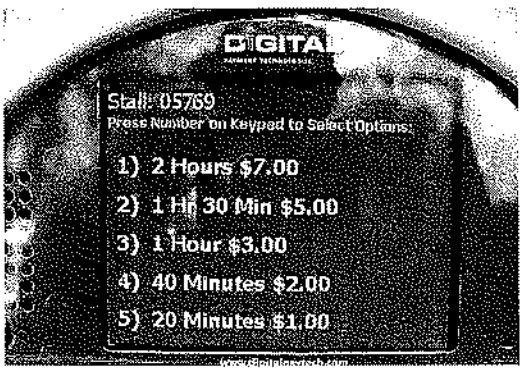
Occupancy sensors are one promising new technology (see Figure P-2).[9] These sensors are about the size of a hockey puck and are placed in every curb space, either on the surface of the street or a few inches beneath it. They sense changes in the earth's magnetic field when a ton of metal is parked above and send this information to a central database. San Francisco will use the data from sensors to adjust parking prices once a month to reach the occupancy goal.[10]



www.streetlinenetworks.com

Figure P-2. Occupancy sensor

The technology for charging variable prices has also advanced. Most multispace meters can charge variable prices through the day, and these prices can be remotely updated without touching the meters. Multispace parking meters on the UCLA campus charge four different prices during a day, and the price of parking is not printed anywhere on the meter. When drivers touch a button on the meter, the digital display shows the price of parking at that time (see Figure P-3). For example, during peak hours the price of parking at the center of campus is $3 for the first hour and $4 for the second hour. Is this too much to charge for parking at a university? You cannot answer this question without looking at the results. The right price of curb parking is like Supreme Court Justice Potter Stewart's definition of pornography: "I know it when I see it."



Donald C. Shoup

Figure P-3. Variable parking prices

UCLA has not installed occupancy sensors, but I took photographs of eight parking spaces governed by the meter in Figure P-3 every four minutes for an hour and calculated the occupancy rate. In effect, I was the occupancy sensor. The goal of having one or two vacant spaces was met 87 percent of the time, and the average occupancy rate was 83 percent (see Figure P-4). I am *not* saying that $3 an hour is the right price for curb parking. I am saying that $3 an hour was the right price *at that time, at that place*. The combination of high-tech meters and occupancy sensors will allow cities to charge the right prices for curb parking everywhere.

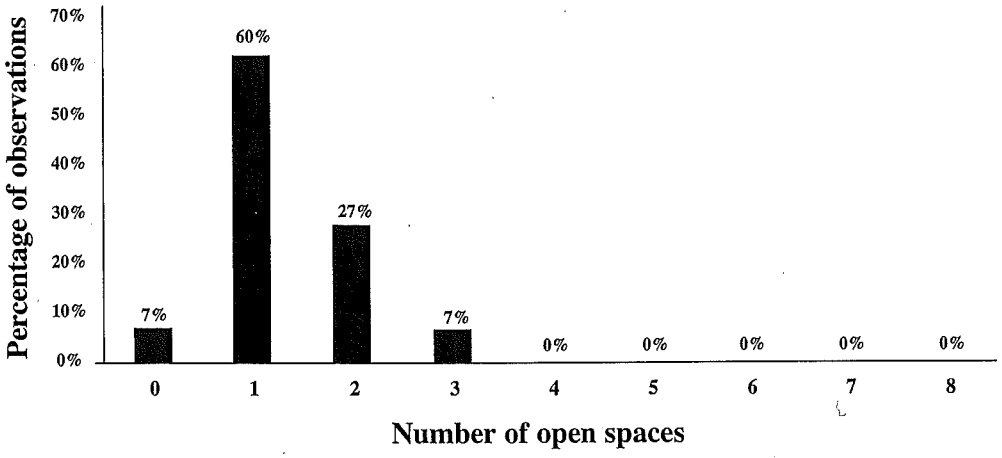
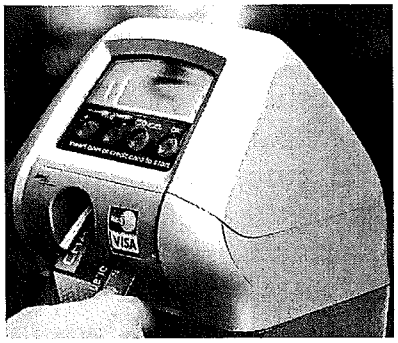


Figure P-4. Parking is well used but readily available.

Should the price of parking be lower? Then all the spaces will often be full and drivers will have to cruise for parking. This cruising will waste fuel, pollute the air, congest traffic, and increase carbon emissions. Should the price of parking be higher? Then more spaces will remain vacant because fewer drivers will pay to park in them. In business districts the stores will lose customers, the city will lose sales tax revenue, employees will lose jobs, and the economy will suffer. So other than aiming for one or two open spaces on every block, can anyone recommend a better principle for setting the price of curb parking?

Miniaturization is another technology that allows even single-space meters to offer sophisticated features such as variable prices, remote updates, payment by credit card, and solar power (see Figure P-5).[11] Drivers who pay by credit card can pay for more time than they expect to use, and, upon returning, reinsert the credit card to deduct the unused time before the card is charged.[12] This arrangement has two advantages. First, it reduces uncertainty. Drivers no longer have to guess how much to pay, worry that they have guessed wrong, or rush

back to the meter to avoid getting a ticket. Second, drivers pay only for the time they use.



IPS Group Inc., San Diego

Figure P-5. Smart meter

The increasingly common option of paying for parking by mobile phone also offers drivers the ability to pay only for the time parked, with no worry about returning before a meter has expired (see pp. 389–390). Paying for curb parking can thus be as convenient and worry free as paying for other services where the charge depends on the time used, such as long-distance telephone calls. If cities remove time limits at meters and give drivers the option to use credit cards at meters or pay by mobile phone, performance prices may become more acceptable, because they give drivers greater convenience.

Because occupancy sensors and parking meters provide real-time information for every parking space, the city has real-time information about the number of occupied but unpaid-for spaces on every block, enabling enforcement officers to focus on areas with high violation rates. Paying at a parking meter is like taking out an insurance policy against getting a parking ticket. It is a gamble, and a higher probability of being ticketed for overtime parking will encourage drivers to pay the meter rather than risk a ticket.

These two new technologies—occupancy sensors and remotely configured, variably priced parking meters—may change parking and transportation as profoundly as the invention of the cash register in the 19th century changed retail commerce. They can unlock the immense value of land now devoted to free parking and bring transportation into the market economy.

If the Price Is Right, Customers Will Come

Often when I present a proposal for performance parking prices in a city, someone in the audience vehemently says something like "If this city operates the parking meters in the evening, I will never drive downtown to eat in a restaurant again." This threat to boycott downtown restaurants would be a convincing argument if many curb spaces remained empty after the meters began operating in the evening. But this threat ignores the key argument for performance prices: *If the meters are priced right, cars will fill most of the curb spaces, leaving only one or two vacant spaces on each block.* If most curb spaces are filled, parking meters can't be chasing all the customers away.

Meters *will* chase away some drivers, but the curb spaces these drivers would have occupied will then become available to customers who are willing to pay for parking if they can easily find a convenient curb space on the block they want to visit. Because the curb spaces will remain almost fully occupied, merchants shouldn't be alarmed that performance prices will harm their businesses. And who is likely to leave a bigger tip in a restaurant? Drivers who are willing to pay for parking if they can always find open curb spaces at their destinations? Or drivers who will come only if they can park free after they circle the block a few times to find free parking?

The benefits do not stop with bigger tips. Whenever I am in a restaurant, I usually ask the waiters where they park. If the meters cease operating at 6 p.m. in the area, waiters often tell me they try to arrive shortly before 6 p.m. so they can find a meter and park free for the whole evening. But the curb spaces these waiters use are then not available for potential restaurant customers. If cities instead charge performance prices for curb parking and run the meters as late as needed to manage demand, waiters can park off-street or farther away in cheaper curb spots, making the most convenient spots available for more restaurant customers, who can leave more tips for the waiters.

Both common sense and empirical research suggest that performance-priced curb parking will motivate more people to carpool, because carpoolers can share the cost of parking while a solo driver pays the full cost (see p. 362). Waiters who park free at the curb will probably be solo drivers, but diners who pay to park may arrive with two, three, or four customers in a car. Further, performance prices will promote faster turnover because drivers will pay as long as they park. If a curb space turns over twice during the evening, each space can deliver two groups of diners to a restaurant rather than one waiter (see pp. 363–366). For both reasons—higher-occupancy vehicles and faster turnover—performance prices for curb parking will attract more customers to a business district. With more customers, the restaurants can expand and hire more waiters and pay more in sales taxes. Charging performance prices to manage curb parking can thus benefit many people, including even those who don't live in the metered areas.

A further advantage of performance prices is that they will decline when demand declines during a recession. The price of curb parking will automatically fall to keep the customers coming. The cheaper curb parking will help businesses survive and prevent job losses. But if curb parking prices remain high during a recession, curb spaces will be underoccupied, stores will lose customers, and more people will lose jobs.

If cities eliminate cruising by charging performance prices for curb parking, where will the cruising cars go? Because drivers will no longer have to arrive at their destinations 5 to 10 minutes early to search for a curb space, their vehicle trips will be 5 to 10 minutes shorter. The reduction in traffic will come not from fewer vehicle trips but from shorter vehicle trips.

Everybody wants something for nothing, but we should not promote free parking as a principle for transportation pricing and public finance. Using performance prices to manage curb parking can produce a host of benefits for businesses, neighborhoods, cities, transportation, and the environment. Parking wants to be paid for.

2. RETURN PARKING REVENUE TO PAY FOR LOCAL PUBLIC SERVICES

Drivers want to park free, and that will never change. What can change, however, is that people can want to *charge* for curb parking. The simplest way to convince people to charge for curb parking in their neighborhood is to dedicate the resulting revenue to paying for added public services in the neighborhood, such as repairing sidewalks, planting street trees, and putting utility wires underground. That is, the city can offer each neighborhood a *package* that includes both performance-priced curb parking *and* the added public services financed by the meters. Performance pricing will improve the parking and the revenue will improve the neighborhood. The people who live and work and own property in the neighborhood will see the meter money at work, and the package will be much more popular than meters alone.

Local Politics

Old Pasadena, a historic business district in Pasadena, California, is the leading example of a battered area that dramatically improved after the city used parking meter revenue to finance added public services (see Chapter 16). Spending more than $1 million a year of meter money on new public services helped convert what had been a commercial skid row into one of the most popular tourist destinations in Southern California. The success has even accelerated in recent years. In 2010, Marilyn Buchanan, a prominent business leader in Old Pasadena, said about the use of meter revenue:

> Our public-private parking management situation works because of the knowledge we [the Old Pasadena business community] bring to it. . . . We have the passion for Old Pasadena and the business sense to recognize long-term good. Money is still a very personal issue and you can't just take our money and throw it into the general fund. Our money belongs here in Old Pasadena and we know how to put it to good use. Not selfish use but use for the good of the community which in the end of course helps us, the business people.[13]

If all parking revenue disappears into a city's general fund, business leaders and residents probably won't campaign for meters, even with all the sophisticated hardware now available to charge performance prices. Dedicating the revenue to paying for local public services can be the political software necessary to create local support for performance prices. If meter money stays in the neighborhood, it will probably be spent on things the residents value highly. And if new public spending in a neighborhood is financed by new revenue generated in that neighborhood, residents in the rest of the city will probably find this spending more acceptable.

Some people seem to think that parking meter revenue should go neither into the general fund nor back to the neighborhood but instead into a trust fund for motorists—for example, to build off-street parking garages. But if each neighborhood's parking meter revenue goes into a trust fund for the neighborhood and the money can be spent for the neighborhood's highest priorities, such as cleaner and safer sidewalks, residents may soon realize that subsidizing cars is not the best use of their trust fund.

Redwood City

In 2005, Redwood City, California, south of San Francisco, adopted legislation establishing a performance parking policy and returning the meter revenue to the metered district. The city council set a performance goal for curb parking—a target occupancy rate of 85 percent—and gave city staff the responsibility for adjusting prices to achieve the target occupancy. The council thus set parking *policy*, not parking *prices*. The council also dedicated the meter revenue to pay for public improvements in the metered zone. Once the merchants understood that the revenue would remain in the metered district, they strongly backed the proposal, and the members of the city council voted for it unanimously.

REDWOOD CITY'S PERFORMANCE PARKING ORDINANCE

To accomplish the goal of managing the supply of parking and to make it reasonably available when and where needed, a target occupancy rate of eighty-five percent (85%) is hereby established.

The Parking Manager shall survey the average occupancy for each parking area in the Downtown Meter Zone that has parking meters. Based on the survey results, the Parking Manager shall adjust the rates up or down in twenty-five cent ($0.25) intervals to seek to achieve the target occupancy rate.

Revenues generated from on-street and off-street parking within the Downtown Meter Zone boundaries shall be accounted for separately from other City funds and may be used only . . . within or for the benefit of the Downtown Core Meter Zone.

Sections 20.120 and 20.121 of the Redwood City Municipal Code

When Redwood City began to charge performance prices for curb parking, it also removed the time restrictions at meters, and this has been the program's most popular feature.[14] Because curb parking prices are higher than the adjacent off-street prices, most drivers who want to park for a long time naturally choose the off-street spaces.

Removing time limits for curb parking is especially important if meters operate in the evening. Having a one-hour time limit can make the curb spaces almost useless for people who want to dine in a restaurant or go to a movie. In 2009, desperate for new revenue, Los Angeles extended the hours of meter operation to 8 p.m. in business districts but left many of the one-hour time limits in place. As a result, many spaces remain empty in the evening and most revenue is from tickets for overtime parking. The time limits harm the adjacent businesses by making it difficult for restaurant or theater patrons to park and by irritating customers who get tickets. If customers have convenient curb parking, businesses will prosper and the city will receive more sales tax revenue, so removing time limits and pricing curb spaces to yield one or two vacancies in each block can help everyone.

The Afterword reports on the programs in several other cities—including Austin, Texas; St. Louis, Missouri; Ventura, California; and Washington, D.C.—that earmark the revenue from curb parking to pay for public services in the metered districts.

3. REMOVE MINIMUM PARKING REQUIREMENTS

Reform is not only adopting good policies but also repealing bad policies. Charging performance prices for curb parking and dedicating the revenue to pay for local public services are two good policies that cities can adopt. In contrast, requiring all buildings to provide ample parking is a bad policy that cities can repeal.

In Greek mythology, a cornucopia always overflowed with whatever its owner wanted. Chapters 1 to 10 show how the prohibition against buildings without ample parking does give us all the free parking we want, but that this cornucopian parking distorts transportation choices, debases urban design, damages the economy, and degrades the environment. Like alcohol prohibition in the 1920s, minimum parking requirements do more harm than good and should be repealed.

Some cities have begun to remove minimum parking requirements, at least in their downtowns, for two reasons. First, parking requirements prevent infill redevelopment on small lots, where fitting both a new building and the required parking is difficult and expensive. Second, parking requirements prevent new uses for many older buildings that lack the parking spaces required for the new uses (see pp. 97–101 and 153–156).

A search of newspaper articles about minimum parking requirements found 129 reports of cities that have removed off-street parking requirements in their downtowns since 2005. Although newspaper articles do not represent what all cities are doing, the articles include many comments on *why* cities are beginning to change their policies. At least in downtown business districts, some elected officials have been convinced that parking requirements put the brakes on what they want to happen and accelerate what they want to prevent. Some of the reasons given for removing parking requirements are "to promote the creation of downtown apartments" (Greenfield, Massachusetts), "to see more affordable housing" (Miami), "to meet the needs of smaller businesses" (Muskegon, Michigan), "to give business owners more flexibility while creating a vibrant downtown" (Sandpoint, Idaho), and "to prevent ugly, auto-oriented townhouses" (Seattle).

According to these quotes, cities remove parking requirements to prevent bad results and to produce good ones. The logical corollary is that parking requirements produce bad results and prevent good ones.[15] Removing a minimum parking requirement is not the same, however, as restricting parking or putting the city on a parking diet. Rather, minimum parking requirements force-feed the city with parking spaces, and removing a parking requirement simply stops this force-feeding. Businesses will be free to provide as much parking as they like.

An Example from Downtown Los Angeles

Many older downtowns have some wonderful buildings in terrible condition. Minimum parking requirements make restoring these historic buildings difficult or impossible, because they rarely have all the parking spaces cities require for new uses. Spring Street in Los Angeles, once known as the Wall Street of the West, is a prime example. It has the nation's largest collection of intact office buildings built between 1900 and 1930. Starting in the 1960s, the city's urban renewal program moved most office uses a few blocks west to Bunker Hill and left many splendid Art Deco and Beaux Arts buildings on Spring Street vacant except for retail uses on the ground floor.

In 1999, Los Angeles adopted its Adaptive Reuse Ordinance (ARO), which allows the conversion of economically distressed or historically significant office buildings into new residential units—with no new parking spaces (Figure P-6). Before 1999, the city required two parking spaces per condominium unit in downtown Los Angeles; in effect, the city had determined that no housing was better than any housing without all the required parking spaces.[16] Michael Manville studied the results of the ARO and found that many good things can happen when a city removes its parking requirements.[17]

Developers used the ARO to convert 56 historic office buildings into at least 7,300 new housing units between 1999 and 2008. All the office buildings had been vacant for at least five years, and many had been vacant much longer. By contrast, only 4,300 housing units were added in downtown between 1970 and 2000.[18]

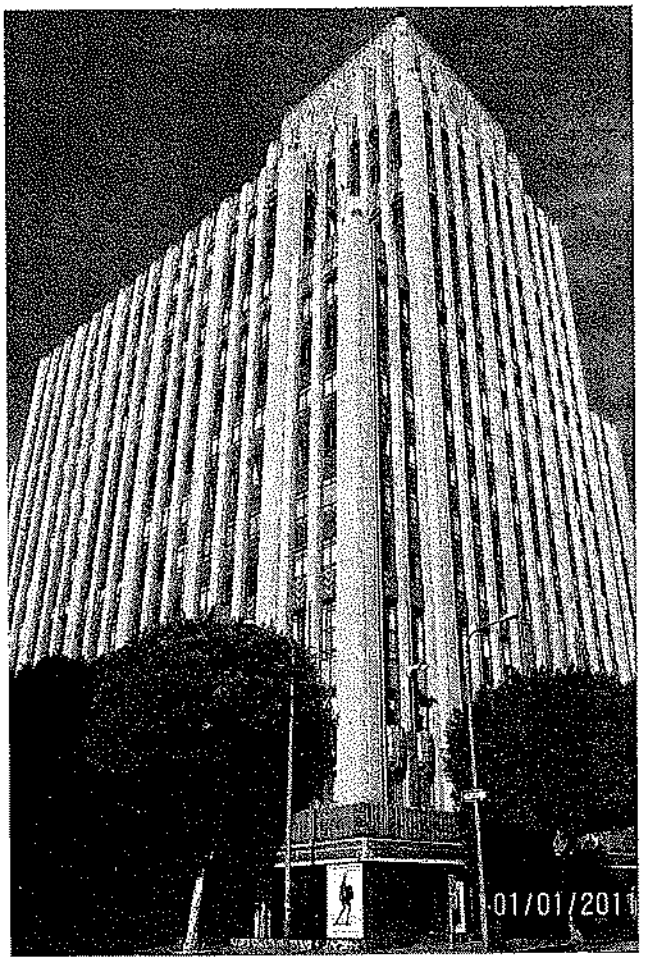
Skeptics doubted that banks would finance developers who wanted to convert office buildings into residential condominiums without two parking spaces each, but the skeptics were proved wrong. Developers provided, on average, only 1.3 spaces per unit, with 0.9 spaces on-site and 0.4 off-site in nearby lots or garages. Had the ARO not been adopted, the city would have required two *on-site* spaces for every unit, or more than twice as many as developers did provide. Manville noted, "The ability to supply parking off-site helped developers simultaneously satisfy lenders, minimize development costs, and maximize the potential of an old building."[19] Deregulating both the *quantity* and the *location* of parking for the new housing was a key factor in restoring and converting the 56 office buildings Manville studied. Manville concluded that removing the parking requirements "led to both *more* housing and a greater *variety* of housing. Not only were more units built, but these units were constructed in buildings and neighborhoods that had long been stagnant and underused. Further, almost half of these buildings

unbundled some or all of the parking from rent, allowing them to target an underserved demographic—people without cars."[20]

The ARO also exempts the converted office buildings from other planning requirements, such as density and height limits for residential uses, so the exemption from parking requirements isn't the sole reason for the conversions. Nevertheless, if the city hadn't removed the parking requirements these conversions couldn't have occurred, and the conversion boom shows that there is a residential market for people who don't own two cars. These results strongly suggest that until the ARO was adopted, minimum parking requirements had been preventing the restoration and conversion of many obsolete office buildings into housing.

The ARO also produced other benefits. It allowed the preservation of many historic buildings that had been vacant for years and might have been demolished if minimum parking requirements had remained in place. Historic buildings are a scarce resource in any city, and the evidence shows that parking requirements stood in the way of preserving these buildings. The ARO applied only to downtown when it was adopted in 1999, but the benefits were so quickly apparent that it was extended citywide in 2003.

The ARO preserved not only individual historic buildings but also a historic neighborhood. The Spring Street Financial District was listed in the National Register of Historic Places in 1979, but by then, the *Los Angeles Times* reported, it had become "a neighborhood of hoodlums, derelicts



Donald C. Shoup

Figure P-6. Office building in Los Angeles converted to residential use without adding on-site parking spaces.

and winos—a neighborhood of echoing buildings full of absolutely nothing above the ground floor."[21] If empty office buildings blight a neighborhood, preserving and converting them to residential use can help restore a neighborhood. The benefits of removing off-street parking requirements do not stop with historic preservation. The conversion projects created many jobs, and the government receives higher property tax revenue on the converted buildings.

Los Angeles's ARO shows the good results of removing off-street parking requirements. We usually can't see things that don't happen or count things that don't occur, but the beautifully restored buildings on Spring Street show us some wonderful things that parking requirements had been preventing in Los Angeles and are now preventing in many other cities.

An Example from Silicon Valley

Cities are removing or reducing off-street parking requirements in their downtowns, but most people live and work outside downtown. In the suburbs, cities often require more space for cars than for people. Figure P-7 shows the relationship between buildings and the required parking at a few land uses in San Jose, California.[22] The area required for parking at a restaurant, for example, is more than eight times larger than the dining area in the restaurant itself. Even if the required parking is used only intermittently, as at an auction house, the city requires the parking lots to be big enough to meet the peak demand for free parking.[23]

High parking requirements help to explain the parking-dominated landscape in many parts of San Jose and the rest of Silicon Valley. The top picture in Figure P-8 shows an example of the parking-disoriented development. Developers rarely provide more parking than cities require (see pp. 89–92), so the buildings in the picture are probably as big as they can be, given the number of parking spaces surrounding them. Many of the spaces, especially the ones at the periphery of the parking lots and adjacent to the streets, remain vacant almost all the time. So what would happen if

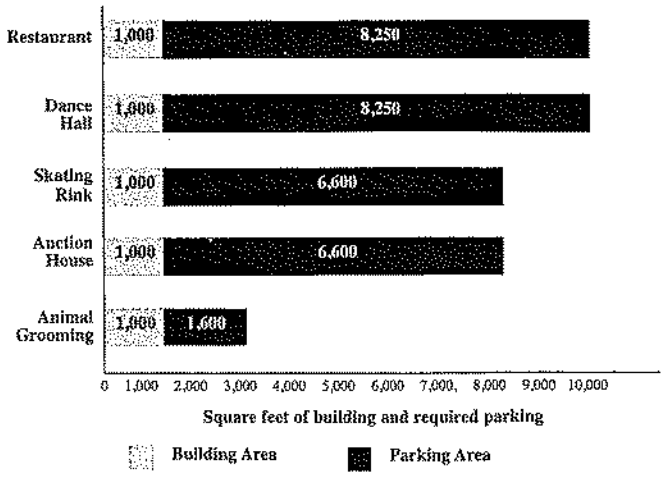
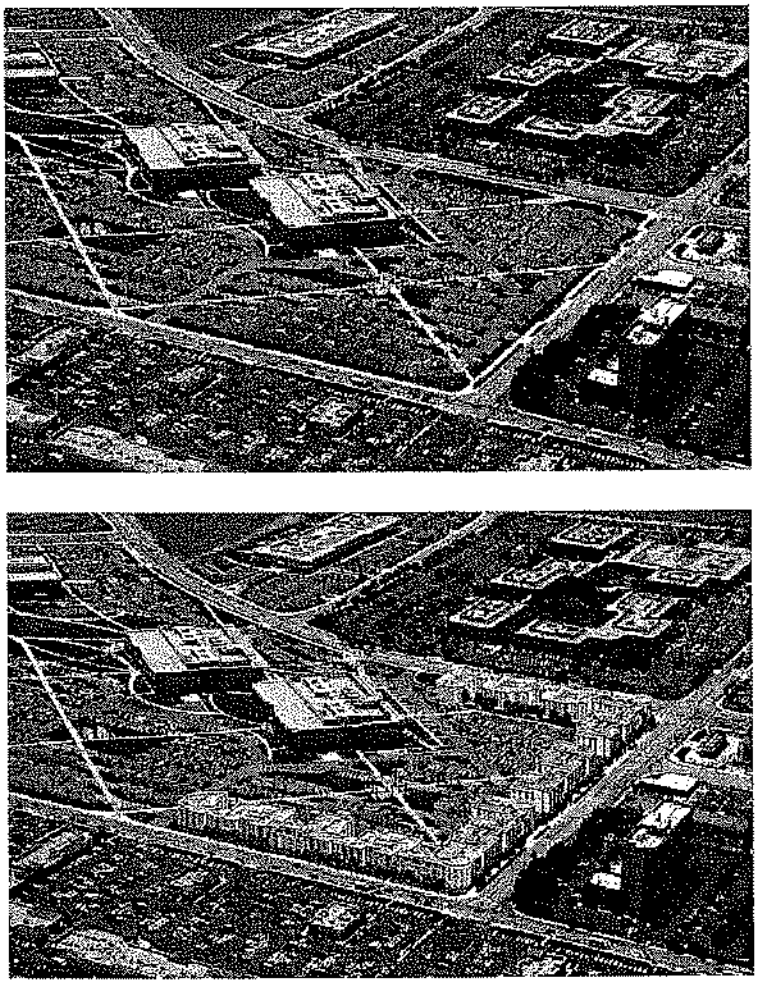


Figure P-7. San Jose's minimum parking requirements

San Jose removed off-street parking requirements, charged performance prices for on-street parking, and returned the resulting revenue to the metered neighborhoods? Property owners might decide their land was more valuable for housing than for vacant parking spaces.

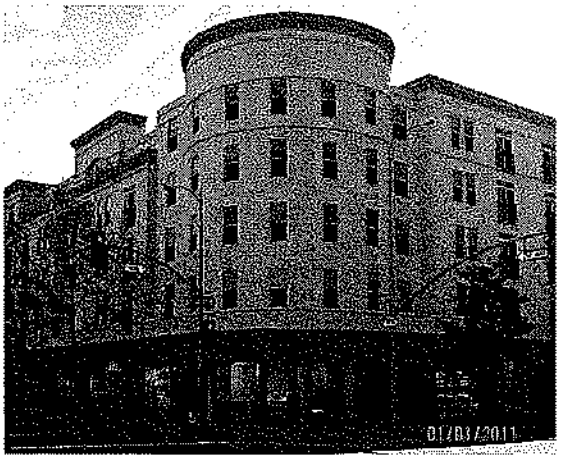
Everyone in Silicon Valley complains about high housing prices, long commutes, traffic jams, air pollution, and the difficulty of attracting employees. Building housing on the periphery of parking lots would help to solve all these problems. The bottom picture in Figure P-8 suggests what might happen without minimum parking requirements. If apartment buildings were built next to the sidewalks, anyone walking, biking, or driving by would see what looks like a real city. The smartest way to travel is to be near your destination already, and this job-adjacent housing would give commuters out-of-car experiences while walking to work.



Stuart Cohen, Transportation and Land Use Coalition

Figure P-8. Parking lots in Silicon Valley before and after liner buildings

Liner Buildings



Donald C. Shoup

Figure P-9. Liner building

New urbanists refer to buildings that mask a parking lot or garage from the street as *liner buildings*. Figure P-9 shows one of the liner buildings inserted in the bottom picture in Figure P-8.[24] The term *liner* suggests that the wrapping is a superficial way to hide what is inside, but in this case the wrapping would probably be far more valuable than the parking spaces it would replace. Parking is probably the least profitable use of this peripheral land since almost any other use would yield far more revenue. In parking, as in everything else, there are opportunity costs.

The land is already assembled, and the housing could be built without new parking because the existing spaces could be shared between office buildings and apartments. To avoid a parking shortage, the owner would probably have to unbundle the cost of parking from the rent for both apartments and offices, so car owners would pay only for the parking spaces they use (see Chapter 20). Some residents who work in a nearby office building may find they could easily live with only one car, and they would appreciate the freedom to rent an apartment without paying for two parking spaces.

If cities remove off-street parking requirements, they will have to charge performance prices for the curb spaces to prevent spillover, but this will produce another great benefit: All the money paid for curb parking will become a new revenue stream to pay for local public services. Curb parking will become too valuable not to meter.

Removing the parking requirements for both housing and offices can produce a cascade of benefits: shorter commutes, less traffic, a healthier economy, a cleaner environment, and more affordable housing. And the benefits don't stop there. If we reform our misguided planning for parking, the money now spent on cars and fuel will become available for other things. Cars and fuel are often imported, but we cannot import apartment buildings. Shifting spending from cars, fuel, and parking to housing construction will increase the demand for labor in a host of professions, such as architects, carpenters, electricians, engineers, gardeners, glaziers, laborers, lawyers, locksmiths, painters, plumbers, real estate agents, roofers, surveyors, and even urban planners. Importing

less oil and hiring all these people to build infill development will boost the whole economy.

The five-story apartment buildings shown in Figure P-8 are not the only option for liner buildings. Courtyard apartments, row houses, office buildings, stores, restaurants, or even single-family houses might be the best use for the land on the periphery of a parking lot. Liner buildings can create the atmosphere of a city, not a parking lot. If cities stop requiring off-street parking, vast suburban parking lots can evolve into real communities.

It is easy to see the bad results caused by parking requirements—asphalt everywhere and a lack of life on the streets. But it is hard to see the good results that parking requirements *prevent*. Photoshop can suggest, however, what cities might look like without parking requirements. The upside of the mess we have made is that we have an accidental land bank readily available for job-adjacent housing. This land is now locked up in required parking, but if cities remove their unwise parking requirements we can reclaim land on a scale that will rival the Netherlands.

A QUIET REVOLUTION IN PARKING POLICIES

Academic research has repeatedly shown that minimum parking requirements inflict widespread damage on cities, the economy, and the environment. But this research has had little influence on planning practice. Most city planners continue to set minimum parking requirements as though nothing has happened. The profession's commitment to minimum parking requirements seems to be a classic example of *groupthink*, which Yale professor of psychology Irving Janis defined as "a mode of thinking that people engage in when they are deeply involved in a cohesive in-group, when the members' striving for unanimity overrides their motivation to realistically appraise alternative courses of action."[25] The process of setting minimum parking requirements displays most of the symptoms of defective decision making that Janis identified with groupthink: incomplete survey of alternatives; incomplete survey of objectives; failure to examine risks of preferred choice; poor information search; and selective bias in processing information at hand.[26] Unfortunately, academic research on parking has had little effect on practitioners' groupthinking, even though the research shows that a central part of the practice does so much harm.

Requiring Peter to pay for Paul's parking, and Paul to pay for Peter's parking, was a bad idea. People should pay for their own parking, just as they pay for their own cars and their own gasoline. The planning profession has given cities bad advice about parking requirements, which

have misshaped our cities to fit the car—almost without planners' noticing.[27] Parking requirements hide the cost of parking, but they cannot make it go away, and free parking usually means fully subsidized parking. At the very least, parking requirements should carry strong warning labels about all the dangerous side effects.

Suppose cities required all fast-food restaurants to include french fries with every hamburger. The fries would appear free, but they would have a high cost in money and health. Those who don't eat the fries pay higher prices for their hamburgers but receive no benefit. Those who do eat the fries they wouldn't have ordered separately are also worse off, because they eat unhealthy food they wouldn't otherwise buy. Even those who would order the fries if they weren't included free are no better off, because the price of a hamburger would increase to cover the cost of the fries. How are minimum parking requirements different? Minimum parking requirements force people who are too poor to own cars to pay for parking spaces they don't use, and they encourage others to buy more cars and drive them more than they would if they had to pay separately for parking. I am not saying that there should be no parking. I am saying that parking should be supplied in a fair market.

Despite institutional inertia in the practice of planning for parking, reforms are sprouting. Paradigm shifts in urban planning are often barely noticeable while they are happening, and after they have happened it is hard to tell that anything has changed. But shifts happen. Planners simply begin to understand cities in a new way and can scarcely remember a time when they understood cities differently. The incremental reforms now under way suggest that off-street parking requirements will not quickly disappear but will gradually erode. Cities may slowly shift from minimum parking requirements to performance parking prices without explicitly acknowledging that planning for parking had ever gone wrong. Eventually, however, planners may recognize that minimum parking requirements were a poisoned chalice, providing ample free parking while hiding the many costs. Our ample free parking comes at the expense of our cities' future.

All parking is political, and the prospects for parking reform depend on what the political context allows. Diverse interests from across the political spectrum can for different reasons support a shift from minimum parking requirements to performance parking prices. Liberals will see that it increases public spending. Conservatives will see that it reduces government regulation. Environmentalists will see that it reduces energy consumption, air pollution, and carbon emissions. Business leaders will see that it unburdens enterprise. New urbanists will see that it enables people to live at high density without being over-

run by cars. Libertarians will see that it increases the opportunities for individual choice. Developers will see that it reduces building costs. Neighborhood activists will see that it devolves public decisions to the local level. Local elected officials will see that it reduces traffic congestion, encourages infill redevelopment, and pays for local public services without raising taxes. The current system of planning for parking does such widespread harm that the right reforms can benefit almost everyone.

But all these people also want to park free. They may not have an ideological or professional interest in free parking, but they do have a *personal* interest in it. This personal interest in free parking helps explain the popularity of minimum parking requirements. But the right use of parking meter revenue can also create a countervailing personal interest in *charging* for curb parking. Cities can create the necessary political support for performance parking prices by dedicating the meter revenue to pay for enhanced public services on the metered streets (see Chapters 16 and 17).

Both Jane Jacobs and Robert Moses might have agreed that charging performance prices for curb parking and using the revenue to improve the metered neighborhoods are good public policy. Jane Jacobs loved lively neighborhoods, and Robert Moses mastered the art of using tolls to finance public investments. Combining the best of both Jacobs and Moses can guide cities off the hard path of minimum parking requirements onto the soft path of performance parking prices.

In this book I focus on how performance parking policies can repair the damage minimum parking requirements have done to American cities, but the same policies are also appropriate for developing countries that do not yet have high levels of automobile ownership. Even countries with low automobile ownership have chaotic parking problems, as suggested by this description of Mexico City:

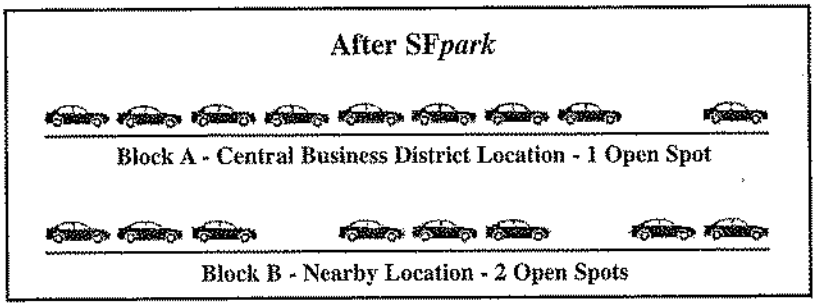
> Cars dominate nearly every square inch of Mexico City's public space. Vehicle owners double- and triple-park on the streets, to say nothing of curbs, sidewalks, gardens, alleys, boulevards and bike paths.[28]

Crowded cities in India also have problems with sacred cars, although only 14 percent of households in India own a car, and ownership is concentrated among the relatively rich.[29]

Many big cities in poor countries have such a high density of people that even a low rate of car ownership per household leads to a high density of cars. If these cities adopt performance prices for curb parking and use the revenue to pay for local public services, never before will so

many poor people receive so much public benefit paid for by so few rich people. Even drivers will benefit because performance prices will help solve the two most difficult problems of owning a car in these cities: traffic congestion and parking shortages.

Market prices can manage the demand for parking spaces. If cities continue to offer free curb parking and require ample off-street parking, it won't be because performance prices don't work but because planners and politicians choose not to change course. There is a way, but we need the will. We can make great gifts to the future by reforming our misguided planning for free parking. In both sprawling rich cities and crowded poor cities, charging performance prices for curb parking, spending the revenue on local public services, and removing off-street parking requirements can do a world of good.



PREFACE NOTES

1. Twenty-four reviews of the book are available at http://its.ucla.edu/shoup/BookReviews.pdf.

2. Schaller (2006, 1, 15) and Transportation Alternatives (2007, 1).

3. Transportation Alternatives (2008, 10). Another way to learn about cruising is to ask drivers how much time they spend hunting for parking spaces. A survey of 9,000 drivers in the United Kingdom in 2010 found that British drivers reported spending an average of 25 minutes per day, or 152 hours per year, cruising for parking (Macrae 2010). That adds up to 11 months for someone who drives over the course of 50 years. Londoners lost the most time cruising, an average of 182 hours a year, or 54 weeks in 50 years.

4. Also with a grant from the U.S. DOT, Los Angeles will establish a similar program, called ExpressPark (Groves 2010). Berkeley, California, is establishing a program of "dynamic parking pricing" in two neighborhoods. In Los Angeles, occupancy sensors send information on curb vacancies to an iPhone app, Parker, which provides a real-time map showing nearby city blocks with more than four, more than two, or less than two vacant curb spaces, as well as blocks with "rock star" parking—the closest blocks with the most open spaces. The app also shows information about meter time limits, meter prices, and whether meters take credit cards or coins.

5. The census did not include off-street residential parking spaces. The data are available at http://sfpark.org/2010/04/05/parkingcensus.

6. The ANSWER Coalition's website is www.answercoalition.org/national/index.html.

7. See, for example, Raskin (2007).

8. Even rich people who complain about paying for parking may shift to public transit. Consider this instance in Beverly Hills: "Glen Rosten, 60, a retired real estate investor in Beverly Hills, took the bus to shop at Cartier on Rodeo Drive on Friday. 'You hate to get ripped off for parking, especially if you're going to spend the money you generally spend in Beverly Hills,' said Rosten after buying new sunglasses for about $1,000. 'The parking wouldn't break me,' he said. 'It's just the principle. If I'm going to spend $1,000 for sunglasses, I shouldn't have to pay for parking'" (Hennessy-Fisk and Abdollah 2007).

9. Barry (2010).

10. SF*park* has an excellent website that describes the program, including a short video that shows how the program works: http://sfpark.org.

11. Pierce (2010). Multispace meters also offer a new twist: pay by license plate number. Drivers enter their license plate numbers at the pay station when paying for parking. They do not need to remember their space numbers or return to their cars to display receipts. Parking enforcement officers use vehicle-mounted license-plate-recognition cameras that communicate with the payment database to check whether drivers have paid or whether they have permits for residential parking districts.

12. The payment system has two forms: (1) start–duration, in which the driver inserts the credit card to pay for a fixed time in advance and reinserts the card when leaving to receive a rebate for unused time, or (2) start–stop, in which the driver inserts the credit card to start paying and reinserts the card when leaving to stop paying. Payment by cell phone can have the same start–duration and start–stop options.

13. Salzman (2010, 27).

14. In a *Wall Street Journal* article about Redwood City's program, Conor Dougherty (2007) wrote, "In the past, Cheryl Angeles has had to jump up in the middle of a coloring treatment, foil in her hair and a black-plastic cape around her neck, to pop more

quarters in the meter. Twice the self-storage company regional manager got $25 parking tickets when she didn't make it in time. Now that the time limits have been removed, she can pay once and return when the appointment is over."

15. Many other newspaper articles illustrate how off-street parking requirements affect the layout and restrict the use of buildings. Consider, for example, this report about the design of the $25 million Holocaust Memorial Museum in Illinois: "The number of seats in the main lecture hall of the museum, originally set at 293, has been reduced to 270 to meet parking requirements" ("Holocaust Museum makes modifications to site plan," *Pioneer Press*, December 1, 2005). Consider also this report about a restaurant in Florida: "Town planning staffers have recommended approval of the site plan changes, but tagged several conditions onto their recommendations. Chief among them are the requirements to reduce the restaurant area by 1,500 square feet to match the parking available during the day" ("Guanabanas seeks Jupiter's permission to become full-fledged restaurant," *Jupiter Courier*, December 4, 2005).

16. Behdad (2006) explains the history of the ARO. For conversion of an office building to residential use under the ARO, Section 12.222-A, 26(h)(3) of the Los Angeles Municipal Code requires that "the number of parking spaces shall be the same as the number of parking spaces that existed on the site on June 3, 1999."

17. Manville (2010).

18. Manville (2010, 12).

19. Manville (2010, 17).

20. Manville (2010, 26).

21. Dreyfuss (1982).

22. The average size of an off-street parking space is assumed to be 330 square feet, including the access aisles needed for circulation in the parking lot or structure. San Jose requires 25 parking spaces per 1,000 square feet of dining area in a restaurant, so the parking lot is 8,250 square feet for every 1,000 square feet of dining area (25 spaces x 330 square feet).

23. See Table 20-190 in the San Jose Municipal Code.

24. The apartment buildings inserted on the periphery of the parking lot are copied from downtown Los Angeles.

25. Janis (1982, 9). Other definitions of groupthink emphasize conformity and uncritical acceptance of a perceived majority point of view; the lack of creativity or individual responsibility in making decisions; the search for consensus without critically testing, analyzing, and evaluating ideas; the desire to minimize conflict; and making decisions without weighing all the facts, especially those contradicting the majority opinion.

26. Janis (1982, 175).

27. A survey of land-use plans in 30 cities and counties in North Carolina found that only two included any discussion of off-street parking requirements. Rodriguez et al. (2004, 7) explain that minimum parking requirements "lie at the intersection between land use and transportation planning, and as such are rarely included explicitly in either type of plan."

28. Dickerson (2004).

29. The Centre for Science and Environment (2009) explains how parking reforms in New Delhi can reduce traffic congestion, air pollution, and energy consumption; save drivers' time and fuel; and improve both neighborhood businesses and the environment. Barter (2010) studied parking policies in 14 Asian cities and recommends many promising policy reforms. The Institute for Transportation and Development Policy has also recently published two excellent reports on parking reforms in the United States (Weinberger, Kaehny, and Rufo 2010) and in Europe (Kodransky and Hermann 2011).

RIGHT SIZE PARKING

Final Report

AUGUST 2015

Right Size Parking
Tools to balance supply

King County METRO

Fehr & Peers
Transportation Consultants

VIA

Project partners

U.S. Department of Transportation
Federal Highway Administration

Washington State Department of Transportation

CNT
Sustainable Communities. Attainable Results.

ULI Urban Land Institute
Northwest

Consultant team

Rick Williams Consulting

FEHR & PEERS

VIA

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COMMERCIAL REAL ESTATE SOLUTIONS

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Report prepared by VIA Architecture

August 2015

Contents

What is the "right size" for parking?

Right-sizing parking means striking a balance between parking supply and demand.

Why does Right Size Parking matter?

Parking is expensive to build. Construction of parking in multi-family projects costs between $20,000 - $40,000 per stall, which has an impact on rent charged to tenants.

King County is over-parked. The Right Size Parking study found that on average, multi-family buildings in King County supply 40% more parking than is actually utilized.

Excess parking has negative effects on communities. Oversupply of parking leads to increased automobile ownership, vehicle miles traveled, congestion and housing costs.

The **Right Size Parking** project was designed to address the issues surrounding multi-family residential parking supply in King County, assembling local information on parking demand to guide parking supply and management decisions in the future.

King County
Right Size Parking
Tools to balance supply.

www.rightsizeparking.org

Introduction

Project overview

The Right Size Parking (RSP) project is an innovative, data-driven research and outreach effort focused on helping local jurisdictions and developers to balance parking supply and demand for multi-family buildings. Led by King County Metro, the public transit authority for King County, WA, the project advances the state of parking demand and pricing research by presenting up-to-date parking data in context.

Research has shown that multi-family parking is oversupplied. Based on parking utilization and pricing data gathered from over 200 multi-family properties in King County, WA, the RSP project determined that existing multi-family parking capacity exceeded utilization by an average of 0.4 spaces per housing unit — a 40% oversupply.

The RSP project determined that existing multi-family parking capacity exceeded utilization by an average of 0.4 spaces per housing unit — a 40% oversupply.

Excess parking presents significant barriers to smart growth and efficient transit service operations. Too much parking at residential properties is associated with more automobile ownership, vehicle miles traveled, and congestion as well as higher housing costs. On the other hand, too little parking can have negative impacts on the real estate marketability of multi-family housing projects in addition to on-street parking spillover impacts when on-street parking is not sufficiently managed and priced. Finding the balance of parking supply and demand supports transportation choice and walkable, more affordable neighborhoods.

The RSP project provides locally credible and context-sensitive data on parking demand, providing stakeholders with the information they need to make decisions that:

- Support economic development by reducing barriers to building mixed-use multi-family residential developments in urban centers near transit infrastructure
- Reduce housing costs as well as household monthly expenditures, allowing a larger demographic to participate in the urban and suburban infill housing markets
- Encourage transit use, ridesharing, biking and walking
- Reduce traffic congestion, vehicle miles traveled, and the amount of greenhouse gases (GHG) produced

Who benefits from RSP?

Developers, public decision makers, and communities all have the potential to benefit from the outcomes of this project. With updated context-sensitive information on parking demand, cities can regulate development in ways that meet local and regional goals. Developers can build more housing near transit and sell it for less.

This information is relevant to a wide variety of potential user groups, including jurisdictions, developers, and communities.

Sharing the research

A key goal of the RSP project is making the research available to and usable by the public. The data resources and tools created by the RSP project support a wide range of community and policy goals, such as providing a range of transportation choices (including transit), affordable housing, smart growth, and economic development. RSP tools have been designed for ease of use and adaptability.

Project background

The RSP project was funded through a grant from the Federal Highway Administration's (FHWA's) Value Pricing Pilot Program to address the issues around multi-family residential parking supply in King County. Initial data collection began in 2011, and the final RSP pilot projects were completed in 2015. The project directly addresses FHWA's call to action to develop policy that builds more livable communities. The project assembled local information on multi-family residential parking demand to guide future decisions regarding parking supply and management, therefore enabling the reduction of excess parking supply at multi-family housing developments in urban and suburban infill environments.

Why does right-sizing parking matter to affordability?

The high cost of parking construction and maintenance drives up the cost of housing and reduces the supply of affordable housing. Unless parking costs are separated from the cost of housing – "unbundled"- households are forced to pay for parking regardless of their needs. Even when parking costs are unbundled, developers often cannot

charge the full cost-recovery price for parking due to the required oversupply typical in zoning codes and 'sticker shock' concerns of their customers.

In King County, WA, parking makes up 10-20% of the cost to construct multi-family buildings, but only 6% is recovered through parking charges, meaning that the remainder must be accounted for through rent prices. This cross-subsidization, or recovering part of the parking investment through higher rental rates, causes a distorted market for parking and reduces the opportunity to use pricing as a tool to manage parking demand. Lower-income households are especially burdened by this distortion as they typically have lower rates of auto ownership and spend a larger percentage of their income on housing.

However, providing too little parking also can pose risks for real estate marketability and cause on-street parking impacts nearby, such as parking spillover, especially when on-street parking is not sufficiently managed and priced. These problems suggest that there is a "right size" to providing parking that strikes a delicate supply-to-demand balance, ensuring real estate marketability while meeting community goals.

Why King County Metro?

The RSP project is aligned with the mission of King County Metro Transit. King County Metro's Strategic Plan calls for supporting the integration of transit and land use to create compact, healthy communities. Communities that are compact and friendly to pedestrians and bicycles are most easily served by transit. Such communities foster healthier, more active lifestyles while reducing auto-dependency and associated road investments. By the same token, transit service can support and encourage development that is more compact.

Public transit is often most successful in markets in which parking is priced and supplied to reflect actual demand. As a transit agency, King County Metro has an interest in encouraging land uses and policies that prevent over-building of parking supply. Too much parking leads to increased automobile ownership, vehicle miles traveled, congestion and housing costs. In addition, it presents barriers to smart growth and efficient transit service. Right-sizing parking in locations where an oversupply of parking exists can be expected to help promote transit ridership and service efficiency.

RSP Project Approach

1. Get the Data
   - Scientific approach
   - Field counts collect local, up-to-date data
   - Statistical analysis
2. Provide New Tools
   - Web tools, model code, best practices
3. Check the Code
   - Find gaps and make changes
4. Engage Partners
   - Implement public and private demonstration projects

Project scope

In order to address the project need for up-to-date, context-sensitive data and user-friendly tools for understanding parking supply and demand, the RSP team engaged a diverse set of stakeholders, including developers, financiers and public-sector decision makers. In collaboration with this assemblage of multidisciplinary advisors, the team worked to develop technical policy best practices aimed at overcoming barriers to right-sizing parking supply.

The RSP project was structured around an interdisciplinary approach to developing innovative research and tools, as well as providing best practices on policy reform and parking management. These tools were implemented and tested through demonstration pilot projects with local partners.

Through the coordinated work efforts of the project team, the RSP project was able to achieve the following objectives:

- Provide context-sensitive multi-family residential parking demand information on a dynamic website to guide stakeholder decisions about building new parking and managing existing parking
- Offer tools and incentives to jurisdictions and developers to test pricing and right-sizing of parking supply in residential and commercial developments
- Engage the development community through professional forums to utilize new parking demand information and implement pricing and management techniques

At the project outset, the RSP team conducted an audit of principal technical policy issues pertinent to achieving right-sized parking in multi-family residential buildings. From this assessment, the team compiled a Technical Policy Memorandum summarizing the known barriers and potential solutions for RSP in addition to a set of policy and action recommendations that set the stage for the project research. The Technical Policy Memorandum can be found at:

http://metro.kingcounty.gov/programs-projects/right-size-parking/pdf/rsp-technical-policy-memo-final-09-17-12.pdf

RSP research and modeling

The primary goals of the project research were to bring clarity to the existing lack of consensus on the factors that influence parking demand and to make the findings easily accessible to a broad audience. Despite a recent surge in research, a lack of consensus still exists on the factors that drive demand for parking in multi-family buildings across a variety of urban and suburban contexts. While socio-demographic, housing, and built environment variables have all been shown to have an impact on residential parking and vehicle availability, their relative influence is a source of debate.

The RSP research identified independent variables to be tested in a regression analysis of parking utilization within 208 multi-family housing developments in King County, WA, which was conducted in 2012. Parking utilization was correlated to building characteristics as well as to neighborhood characteristics where the building resides. The final model derived from this regression analysis incorporated seven variables – five pertaining to the property or development characteristics and two to the built environment – and has a high R-square value of 0.81, meaning that the model has very substantial explanatory power.

Web calculator

The King County Multi-Family Residential Parking Calculator is a map-based web tool that enables users to estimate parking use for multi-family developments in the context of specific building and site/neighborhood characteristics. The website tool condenses the research findings and RSP model into a simple interactive calculator format accessible to a wide variety of stakeholders. The web calculator can help analysts, planners, developers, and community members weigh factors that will affect parking use at multi-family housing sites, including consideration of how much parking is "just enough" when making economic, regulatory, and community decisions about development.

Users are able to create custom multi-family parking scenarios and adjust them using variables related to the building and its location, including proximity to transit, unit and parking pricing, jobs and population. Understanding the influence of these variables helps determine how much parking is "just enough" for a particular site.

More detailed information about the web calculator can be found in Chapter 3. Try out the calculator online at:

www.rightsizeparking.org

Project partners and potential users

King County Metro applied for the FHWA grant in partnership with the Center for Neighborhood Technology (CNT) and the Urban Land Institute (ULI). As the leader of the RSP effort, King County Metro provided project administration and management as well as technical support for the project team. Recognizing that the issues addressed in the RSP project span multiple disciplines, Metro assembled a multidisciplinary team in order to ensure that the appropriate resources and expertise would be available to support the wide-ranging needs of the project.

What's in this document?

This document describes the RSP project goals, research methodology, and the results of the RSP pilot projects; provides an overview of stakeholder outreach efforts; and outlines next steps for RSP applications and research. In addition, this report introduces the tools and strategies created by the project for those interested in implementing RSP practices in other jurisdictions or communities. These tools can help analysts, planners, developers, and community members weigh factors that will affect parking use at multi-family housing sites.

Throughout this document, look for the RSP toolkit icon (above) to learn more about RSP tools and products. Links to additional project resources can be found in the Appendix.

Research

Research scope and context

Today, multi-family residential buildings often provide too much automobile parking, which can be an impediment to achieving a wide range of community goals. An oversupply of parking can have deleterious effects on economic development, consumers, the community at large and the environment.

Excess parking consumes valuable urban real estate, which contributes to sprawl, lower-density development, and greater distances between buildings. Those outcomes can deter walking, transit use and efficient transit service operations. An oversupply of parking can also damage natural landscapes through urban sprawl, increase impervious surfaces and add to greenhouse gas emissions. These considerations pose challenges for communities that want to encourage multi-modal transportation options and promote smart growth land use planning strategies.

In auto-dominated suburban developments with little transit service, parking decisions are relatively straightforward; planners or developers can apply findings from parking generation studies conducted in similar communities across the country found in the Institute of Transportation Engineers (ITE) Parking Generation Manual. However, parking supply decisions become more complicated as suburban communities introduce more compact development, mixed uses, and new multimodal transportation options in addition to welcoming a more diverse demographic of multi-family housing users. Current suburban parking generation studies do not meet the objectives of these settings, nor do they account for factors that may influence parking demand. They also do not serve as an adequate model to guide parking provision in urban areas.

Despite a recent surge in research, a lack of consensus still exists on the factors that drive demand for parking and account for the variation in auto ownership in multi-family buildings across a variety of urban and suburban contexts. While socio-demographic, housing, and built environment variables have all been shown to have an impact on residential parking and vehicle availability, their relative influence is a source of debate.

Academics and practitioners have responded to this gap in research through a growing body of studies showing how the oversupply of parking can lead to increased auto ownership, vehicle miles traveled, congestion and housing costs. In addition, studies have shown that misaligned parking policies present barriers to smart growth and efficient transit service. There is some agreement that parking supply and pricing have a significant impact on parking demand and auto ownership, but these variables have been understudied.

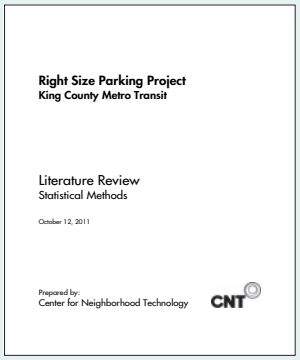
The Right Size Parking research applies extensive data collection and analysis to provide clarity on the factors that influence parking demand in multi-family developments. Specifically, the objective of this research was to identify independent variables to be tested in regression analysis of parking utilization within 208 multi-family housing developments which were surveyed in King County, Washington in 2012.

The RSP research question: What are the contextual factors that influence parking demand for multi-family buildings?

Drawing upon an extensive literature review of existing parking standards and studies, the RSP team used regression analysis to develop a model of parking utilization. Where other studies have stopped at modeling parking demand based upon the utilization of existing parking supply, the RSP project went further to develop a robust statistical model that describes parking demand as a complex equation composed of strongly correlated independent and context-sensitive variables.

It is the goal of the RSP team that the new data, research, and tools developed by the project provide the information needed to help developers, financiers, jurisdictions, and neighborhood groups better estimate the optimum amount of parking for new multi-family developments across a wide variety of development contexts. The results are intended for use by practitioners and are made easily accessible through an interactive website tool.

Literature Review of Statistical Methods



The project team worked with the Center for Neighborhood Technology (CNT) to conduct a thorough literature review of parking supply standards and studies in order to determine the current state of knowledge and inquiry surrounding the balance of parking supply and demand. This initial survey of accepted standards most often used to guide parking supply indicates that they are typically based on a single independent variable — unit count — and do not account for independent variables such as building type, transit and land use factors.

The incorrect application of existing parking data has been criticized both locally and nationally and has been identified as a major barrier to successful transit-oriented development. As a case in point, the ITE manual continues to be used as a standard for determining parking supply. However, these guidelines consider only the number of units in a building in its parking supply calculation and draw from mainly suburban data gathered in the 1980s.

The RSP team compiled an overview of current statistical methods for estimating parking demand and studied new models aimed at linking contextual factors, such as sociodemographic characteristics, to parking demand. The literature review included many studies that begin to address and model the relationships between parking demand and contextual variables such as household characteristics, housing type, qualities of the built environment, and parking price. Additionally, data sources that assess auto ownership or vehicle availability were reviewed to ascertain the extent to which vehicle ownership could serve as a proxy measure for estimating parking demand.

The RSP Literature Review can be found at:

http://metro.kingcounty.gov/programs-projects/right-size-parking/pdf/rsp-litreview_11-2011.pdf

Background research findings

The RSP team laid the foundation for the development of the research methodology by conducting a thorough literature review (see sidebar) to determine the current state of the industry methods for estimating parking demand. The findings of the literature review indicated that parking supply requirements and guidelines are typically not tied to demand and that there is currently no clear understanding of the factors contributing to parking demand.

The team reviewed multiple studies indicating that there is often a measurable oversupply of parking in multi-family buildings. This phenomenon is often caused by a combination of factors: developer overestimation, financier requirements, and/or jurisdictional parking requirements. The review of these studies clarified that the importance of considering parking demand is widely recognized while the impacts of contextual factors, although documented in many cases, are still debated. The two largest identified gaps were 1) a lack of consensus on factors that influence demand for parking; and 2) omission of data on parking availability, cost and pricing.

It was clear to the team that the tools and methods that have informed parking supply regulations in the past are often not appropriate for guiding parking supply decisions for new development in King County today. The literature review included several studies that have begun to establish a meaningful link between parking demand and a range of building and site characteristics. These initial findings served as the basis for the development of the RSP model.

RSP Research Guiding Principles

- Scientific approach
- Based on data and statistical analysis
- Local data with hyper-local applicability
- Relevant to community goals
- Actionable
- Support policy change, informed participation in project review and investment/development decisions
- Designed to support creation of interactive web tool

Methodology development

The RSP team set out to design the research to address the gaps in understanding regarding parking demand and vehicle availability uncovered during the literature review. A primary goal of the RSP study is to provide clarity on these issues in the form of practical tools for use in development and policy discussions. The literature review served as the basis for drafting the research methodology, which was vetted by a Methods Review Committee.

Methods Review Committee

The RSP team assembled a Methods Review Committee to assist with developing and vetting the research methodology. The committee consisted of a panel of parking experts, including national and local academics, practicing professionals, leaders of the urban planning and engineering fields, and ITE members.

Methods Review Committee

Cynthia Chen, University of Washington

Donald Shoup, University of California Los Angeles

John Holtzclaw, Sierra Club

John McIlwain, Urban Land Institute

Jeffrey Tumlin, Nelson\Nygaard

Robert Cervero, University of California Berkeley

Ransford McCourt, DKS Associates

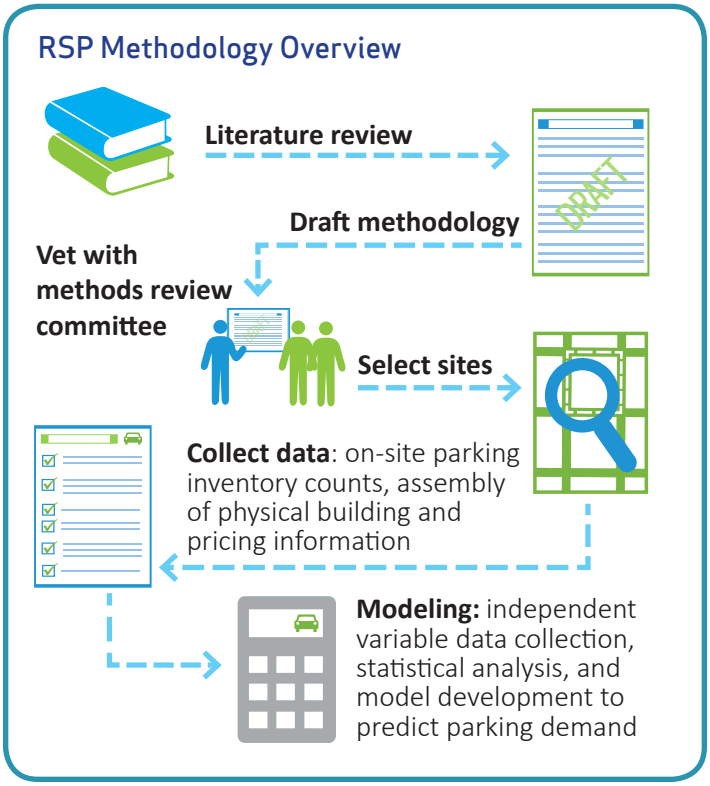
Rachel Weinberger, University of Pennsylvania

Richard Willson, California State Polytechnic University

Steffen Turoff, Walker Parking Consultants

The Methods Committee worked to ensure that the RSP research methodology met the highest academic and industry standards, honored the budget allocation, and provided statistically significant and replicable results.

Comments and input from the Methods Review Committee were integrated into the final research methodology documents, which documented background research, outlined the research objectives, and provided a road map for project development.



Site selection and data collection

Site selection process

Convenience and quota sampling techniques were used to assemble a total of 223 multi-family sites representing various types of multi-family development around King County, Washington. Study sites were chosen to provide a well-distributed sample of the dependent variable and many of the site-specific independent variables used to generate the RSP model.

The geographic location of eligible properties was defined to ensure that the sample was focused in areas where future multi-family residential development could potentially occur. Within the defined boundary, eligible sites included multi-family residential properties with a minimum of ten units either leased as apartments or sold as condominiums. For properties that contained a mix of uses, only the residential portion of the parking supply was studied.

Numerous developers, property owners, and property management companies were asked to participate in the data collection effort. Targets to ensure a representative sample were established based on transit connectivity, employment access, average medium gross rent, and average median household income.

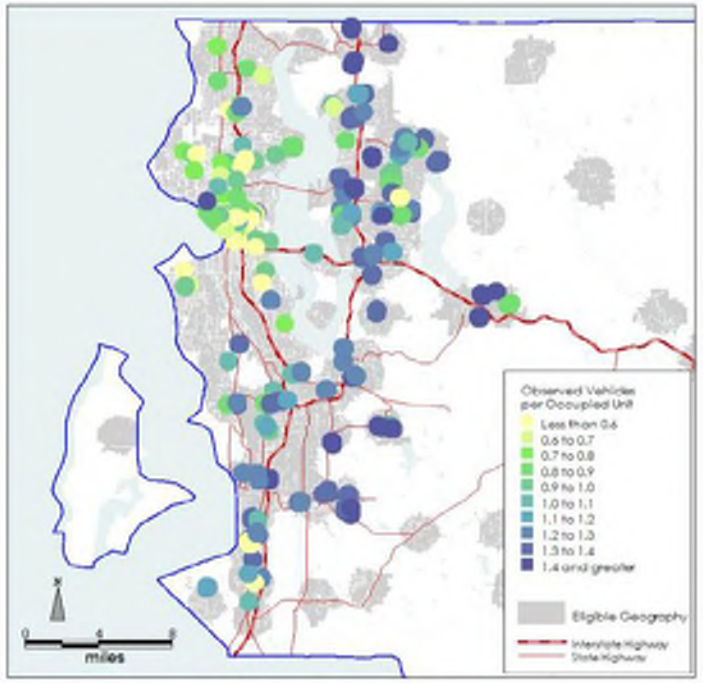


Fig. 1: Observed Vehicles per Occupied Unit.

Field counts

The RSP team collected data for 33,166 occupied apartment units throughout King County accompanied by 46,420 residential parking stalls (32,608 of which were observed to be occupied with vehicles). The field counts required at least two visits to the site: an initial visit to meet with the property manager and discuss data needs, and a second to perform the parking utilization count. The parking utilization count followed the Institute of Transportation Engineer's Parking Generation Manual method of counting between the parking peak hours of 12:00 a.m. and 5:00 a.m. on weekdays only for multi-family land uses.

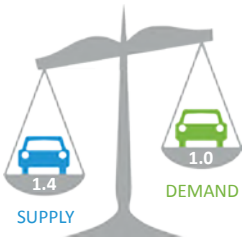
The sample represented a range of parking types but included all residential parking, including visitor parking, identified by the property manager at each multi-family development. Parking was generally provided in off-street garages or lots located on the multi-family parcel, but some parking was located in dedicated on-street stalls or satellite garages.

Sites selected for the study were screened for building age and available parking supply to control for potential under-supplied parking where constrained supply made actual demand unknowable. The end result was the identification of 223 sites for which parking utilization could be measured via parking counts, and the exclusion of sites for which undefined off-site, on-street parking may have resulted in underrepresentation of parking use. The initial 223 sites were cut to 208 sites, as explained later in this document, in order to eliminate statistical outliers.

RSP data collection summary

What did we find?

The RSP team found that, on average, parking is supplied at 1.4 spaces per dwelling unit but is only used at about 1 space/unit.



What does this imbalance mean?

When these average supply and utilization findings are applied to a typical suburban project with 150 units, roughly $800,000 would be wasted on unused parking. This estimate assumes a conservative construction cost of $15,000/stall .

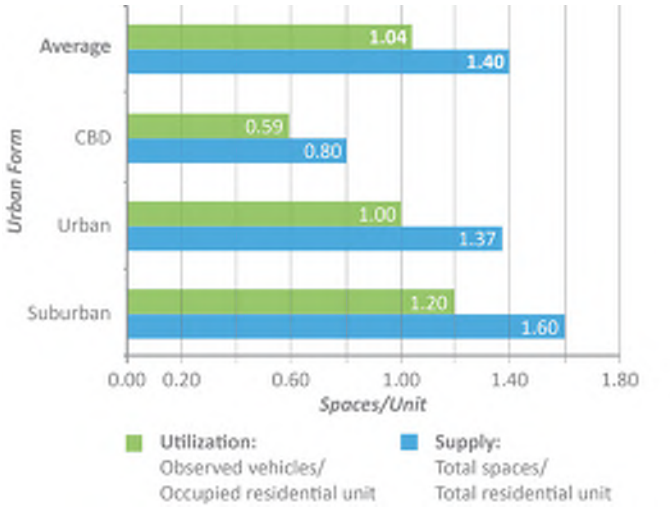


Fig. 2: Observed Vehicles per Occupied Unit as a function of urban form. Both parking utilization and the gap between parking supply and demand tend to be greater in suburban areas on average.

Parking oversupply by the numbers:

Oversupply of parking adds unnecessary cost to project development and inefficient use of land:

- Excess surface parking can add $2 per foot to annual unit leasing cost (@ $8,000 per stall)
- Excess garage parking can add $6.00- $7.00 per foot to annual unit leasing cost (@ $30,000 per stall)
- For a typical affordable housing development, adding one space per unit increases leasing costs by about 12.5%; adding two parking spaces increases leasing costs by about 25%

Data modeling

Modeling parking utilization, dependent variable

The dependent variable used in the model estimating parking utilization was "observed vehicles per occupied residential unit" collected from the field data. This dependent variable analysis was comparable to the approach of some of the studies included in the literature review. However, the RSP study sought to determine the effect of contextual factors on parking demand in addition to the much more basic number of housing units.

Modeling parking utilization, independent variables

The RSP project went beyond modeling parking demand based on the utilization of existing supply per each unit of housing by also considering the effects of a host of other potential independent variables. The collection of the primary parking utilization data enabled a unique statistical analysis and the development of a model for predicting parking utilization at multi-family residential developments. Based on the field data, the Center for Neighborhood Technology used regression analysis to test a set of independent variables and to create a statistical model that would identify the building and environmental characteristics that best described the relationship between parking utilization and demand.

During the regression analysis and model development process, over 100 distinct potential independent variables grouped into five categories—parking supply and price, property/development characteristics, neighborhood household characteristics, accessibility, and built form characteristics — were analyzed, enabling the consideration of the greatest number of possible variables to create a complete picture of the primary factors contributing to parking demand. These external data were collected from a variety of sources, including the American Community Survey, the King County GIS Center, Zipcar, and Walkscore.

Because one variable can be represented in many different formats using different metrics, an extensive list of potential explanatory variables was analyzed. For example, while it was expected that transit access would correlate with parking utilization rates, the best measure of transit access to explain utilization rates was unknown, so several different kinds of transit access measurements were included in the study.

Parking supply as a variable

Parking supply is often cited as one of the most important variables in determining demand, and many past studies have found a high correlation between the two factors. A similarly high correlation was found in the RSP research data, indicating that it should be included in the model.

However, estimating parking utilization for the purposes of informing supply decisions should not be a function of supply. Parking supply was ultimately excluded from the model because its inclusion addresses a different research goal. The RSP research objective was to estimate the full quantity of parking that would be demanded at a given property in order to help inform a decision on the amount of parking that should be supplied at that location. Therefore, it was not desirable for the model to take into account situations for which parking utilization was low because of inadequate supply rather than low demand.

If supply were to be included in the regression model, its coefficient would indicate the effect of parking supply on usage, conditional on the other observable characteristics included in the model. Therefore, parking supply was excluded as an independent variable from the model.

Regression analysis

Because the regression analysis began with the presumption that the ordinary least squares (OLS) transformation would provide the optimal approach, a simple linear regression model was used at the outset of the modeling effort. However, because relationships between the dependent and independent variables were not all assumed to be linear, all variables were tested using various transformations (e.g. natural log, inverse, square root, etc.). Variables were tested for their correlation with the dependent variable as well as for the form that provided the best and most logical fit.

To construct the regression analysis, many approaches were tested to find the best method of including, removing, and ultimately assembling the best set of variables. In the end, the goal was to find the set of variables that provided the most robust theoretical framework while remaining relevant from a practical development and planning standpoint, keeping in mind that the resulting formula must ultimately be applied and made accessible via an online tool.

RSP Technical Research Memo

The RSP Technical Research Memo outlines the RSP research objectives and explains the project research methodology and model development in detail. The report identifies the key variables that describe parking demand in King County according to the RSP research. It also discusses the connection between characteristics of multi-family buildings and the parking and transportation needs of residents. The RSP Technical Research Memo can be found at:

http://www.rightsizeparking.org/Right_Size_Parking_Technical_Memo.pdf

Maintaining the criteria that all variables be significant (the probability that the coefficient is non-zero, or $p < 0.05$) and all multicollinearity be low (as assessed through variance inflation factors, or VIF values, less than 5) was considered throughout the modeling process. Because each factor or characteristic was represented using many independent variables (as well as multiple transformations of each), multicollinearity, or a high level of correlation between independent variables, was an important consideration.

The most effective modeling approach identified, which served as the basis for the parking utilization model, began with a set of variables that appeared in the highest-scoring results of multiple approaches. A stepwise method was used, with an entry criterion of 0.05 and a removal criterion of 0.10.

Variables were then considered based on their logical candidacy from a planning or development context. For example, for a case in which a variable representing the count of three-bedroom units was included in the final set of variables in the absence of any other count or average number of bedrooms, the three-bedroom unit count was removed and variables pertaining to average bedroom counts were added and tested in a stepwise method. Or, if two variables had high collinearity, such as block size and the transit connectivity index, one was removed and various variables were tested to replace the other.

Throughout the modeling process, outlying cases were tested to ensure that no single property was significantly influencing the fit. Sample properties, or cases, with high leverage values (approximately > 0.5) or outlying residuals (as identified through separated tails in a residual histogram) were removed from the sample. In the end, 15 cases were removed based on these criteria, resulting in a final sample size of 208 properties.

Further details on the regression analysis can be found in the RSP Technical Memo (see sidebar to left).

Results and summary of findings

The final model derived from the regression analysis incorporated seven variables – five pertaining to the property or development characteristics and two describing the built environment (these variables are described in further detail on p. 12). The final equation for the model is:

$$P_u = b + \sum_{i=1}^{7} C_i X_i$$

where P_u is the modeled value of the parking utilization, b is a constant term, C_i is the coefficient for the "ith" variable (derived from the regression equation), and X_i is the value of the "ith" variable representing a location or building characteristic.

Parking utilization was found to be correlated to individual building characteristics as well as to the neighborhood in which the building resides. In other words, parking utilization cannot be determined from the characteristics of the building alone, nor from the setting alone. To understand and accurately assess parking needs, both building type and location must be considered in tandem.

RSP independent variables

CNT identified seven variables that produce a combined R-square value of 81.0%, an adjusted R-square of 80.3%, and a standard error of 0.16: Table 1 identifies the seven independent variables as well as their individual R-square and stepwise R-square values. Individual R-square values represent the correlations between the given variable and the dependent variable. The stepwise R-square values represent the improved R-square value as each variable is added to the final model.

Independent variable	Individual R Square	Stepwise R Square
Gravity measure of transit frequency	55.5%	55.5%
Percent of units designated affordable	27.6%	67.1%
Average occupied bedroom count	34.3%	73.7%
Gravity measure of intensity (population + jobs)	53.3%	76.2%
Units per residential square feet	17.1%	78.7%
Average rent	6.7%	80.0%
Parking price as a fraction of average rent	18.1%	81.0%

Table 1: Independent Variables and Summary of Regression Results.

Figure 3 illustrates the final fit of the observed or measured data as compared to the predicted model results.

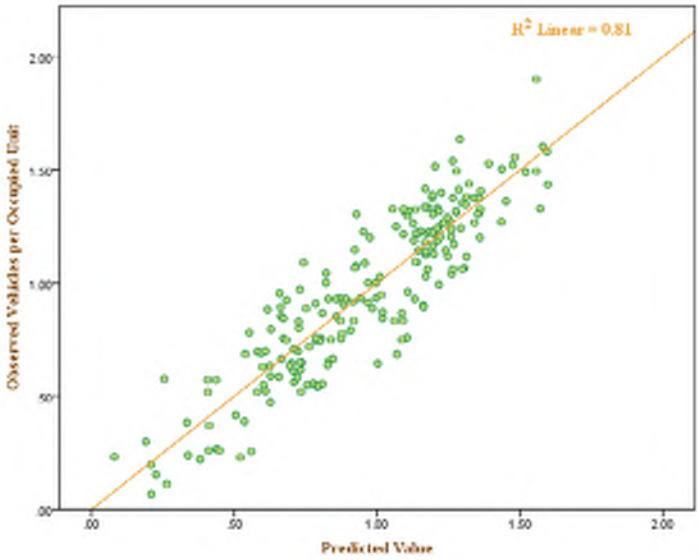


Fig. 3: Observed vehicles per occupied unit versus modeled value.

Limitations

The final model resulting from the RSP regression analysis can help to support and guide decisions about parking supply and management. However, it cannot provide definitive answers about specific future policies or developments. Rather, the model is intended to serve as a resource to inform discussions as users weigh the factors affecting parking use and consider how much parking is needed.

Model estimates and data collection

Although the final model is statistically very strong, it is important to keep in mind that it represents an estimate, which by definition has inherent limitations. Real-world parking use can and will vary from RSP estimates for many reasons. For example, some property managers provide transit passes to building residents as a transit demand management (TDM) strategy, which is likely to reduce the demand for parking in those buildings beyond what the RSP model estimates.

Limitations on data collection also affect the model's accuracy. For the most part, observed parking included supply that was on-site and off- street, unless additional resident parking was noted by property managers. The sites selected for the study were screened based on building age and available parking supply to control for potential under-supplied parking that could result in spillover and unmet on-site parking demand. The result was that the sites studied were those for which parking could be measured through parking counts rather than those for which undefined off-site parking would have resulted in an underrepresentation of parking demand.

Due to a lack of on-street parking data and limitations on scope, this research was not able to fully account for on-street parking supply, occupancy, and pricing in the modeling of off-street multi-family parking. Using neighborhood on-street parking counts and resident surveys, future research opportunities exist to establish a more comprehensive understanding of multi-family parking demand.

Additionally, the data collected and utilized in the model represents a single point in time. As factors related to both the built environment and parking usage change (e.g. expanded transit service), the independent variables may need to be updated and their relationships to the dependent variable (parking utilization) reassessed.

RSP Independent Variables

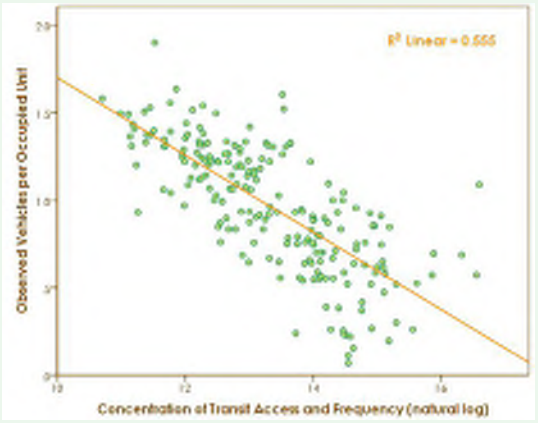


Fig. 4: Gravity measure of transit frequency.

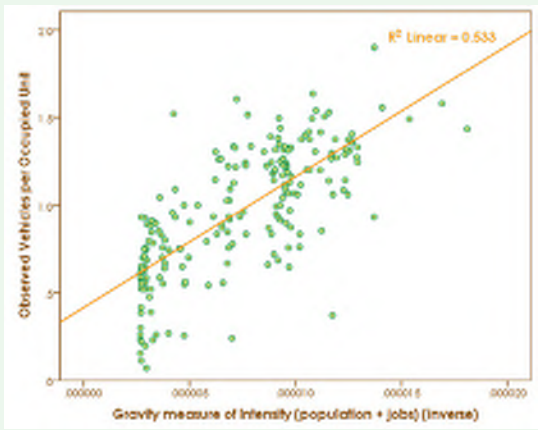


Fig. 5: Gravity measure of intensity (jobs + population).

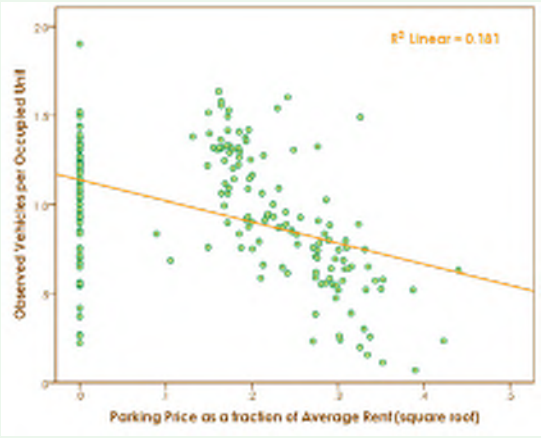


Fig. 6: Parking price as a fraction of average rent.

1. Gravity measure of Transit Frequency

Gravity measures take into account both the quantity and proximity of the factor being measured. RSP data indicated a strong correlation between concentration of transit frequency and observed vehicles per occupied unit. Transit concentration was able to serve as a proxy for many other built environment factors.

2. Percent of Units Designated Affordable

This variable includes all units identified as affordable by any designation as a percent of all units (regardless of occupancy). RSP data indicated that as the percent of affordable units increases, parking utilization decreases.

3. Average Occupied Bedroom Count

Average occupied bedroom count is the average number of bedrooms in all occupied units. To calculate this average, studio units were assumed to have a bedroom count of one. RSP data indicates that the average count of bedrooms has a positive correlation with parking utilization: as average bedroom count increases, parking utilization increases.

4. Gravity measure of Intensity (Population + Jobs)

Previous research often found a strong correlation between both residential density and job access with auto ownership. The strong correlation of the gravity measure of intensity and observed vehicles per occupied unit observed in the RSP data supports these findings.

5. Units per Residential Square Feet

Obtained from the property managers, units per residential square feet is calculated as total residential units divided by the residential square feet of the development. RSP data indicates that as units per residential square feet increase, or as average unit size decreases, parking utilization decreases.

6. Average Rent

Average rent (measured in dollars) represents the average monthly cost of all residential units in the building. RSP data indicates that observed parking utilization increases as average rent increases.

7. Parking Price as a Fraction of Average Rent

Parking price as a fraction of average rent is calculated as the monthly price of parking per stall divided by the average monthly rent. RSP data indicates a negative trend, revealing that as parking price increases, parking utilization decreases.

Model coverage

To ensure confidence in the model estimates, limits were established for the coverage area. The sample utilized for data collection covered a wide range of built environment characteristics and land uses, but it did not cover the full spectrum found throughout the county. Therefore, the coverage for which model estimates were calculated was limited to the range of built environment characteristics found in the data collection sample. In other words, areas of the county that had lower transit service, population, or job concentrations than those found within the RSP research sample were removed from the coverage area.

Applications

A principal goal of the RSP project is to provide stakeholder access to the research. The King County Multi-family Residential Parking Calculator, which is described in detail in the following chapter, condenses the project's complex research findings into a simple map-based format accessible to a wide variety of stakeholders. Using the RSP model to estimate parking utilization, resulting outputs for most developable parcels in King County, Washington are clearly illustrated on this interactive, mapping website.

Conclusions

The RSP project provides analysts with new tools to consider the proper provision of parking, given several land use, transit and walk factors. Block size, population and job density, and walk and transit access to trip destinations influence parking utilization, in some cases by as much as 50 percent. They provide clear indication of where parking for low auto ownership characteristics can be applied. CBD multi-family parking utilization of 0.51 vehicles per occupied dwelling unit in the sites studied, compared with suburban 1.18 vehicles per occupied dwelling unit, indicates that accommodations and environments conducive to low- and zero-auto-ownership households correlate with reduced need for parking. Economic and pricing considerations were also found to matter, including average rent units, the share of units that are affordable, and the price charged for parking.

Web Tool

Background and goals

A principal goal of the RSP project is to provide stakeholder access to the project research. To achieve this goal, the RSP team used the project data and conclusions to design and build an easy-to-use web calculator tool that can provide useful information and guidance for the broad spectrum of RSP stakeholders and potential users. The web calculator is a map-based tool that provides place-specific estimates of parking demand at the parcel level. The web tool has been designed to demonstrate RSP research findings, illustrate the influence of the identified predictive factors, and present data that multiple stakeholders will find valuable in their efforts to right-size parking supply.

Design and function

In order to achieve the project outreach goals, King County Metro partnered with the Center for Neighborhood Technology (CNT) to create a dynamic website with the ability to estimate multi-family residential parking demand across King County. The multi-family residential parking demand information provided by the calculator can be used for both policy guidance and market research.

Data-based

The calculator is based on the RSP model developed during the research phase of the project, which was created using local data of actual parking use collected in 2012 at over 200 developments in urban and suburban localities across King County, Washington. The interactive calculator tool uses the RSP statistical model to estimate parking use for multi-family developments throughout King County in the context of specific sites. The parking use data is correlated with factors related to the observed building, its occupants, and its surroundings - particularly concentrations of transit, residents and jobs, as well as the price charged directly to the users of parking. Using best available research findings and industry-accepted rule of thumb assumptions, additional impacts were estimated to highlight the associated 'costs' of parking, which are displayed as part of the web calculator interface.

King County Multi-Family Residential Parking Calculator

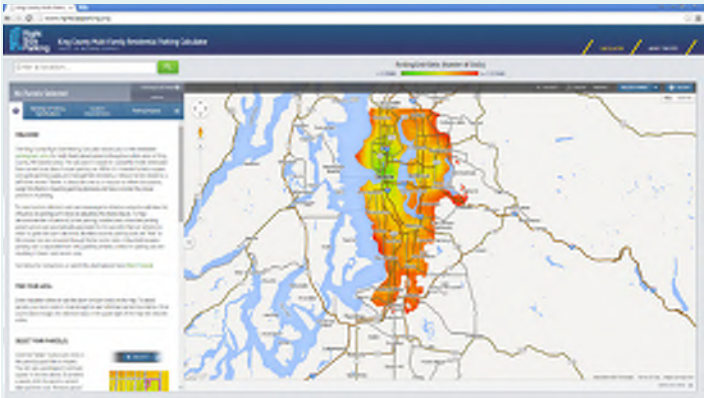


Figure 7. Screenshot of the King County Multi-Family Residential Parking Calculator.

To highlight the importance of parking price and presence of affordable units on parking utilization, the calculator automatically calculates and displays the different parking utilization estimates for two scenarios: a given parcel and building with 1) parking pricing bundled with or unbundled from rent, and 2) 100% affordable units or no affordable units. Additional calculator functions include:

- Viewing estimated parking/unit ratios for multi-family developments in urban King County, WA
- Creating scenarios for a specific parcel or custom area by inputting variables particular to a proposed development (instead of relying on default values representing development averages), such as number of units, unit type and size, and average rent
- Adjusting scenarios for contextual factors such as concentration of population, jobs and transit service to estimate parking use if neighborhood characteristics were to change in the future
- Comparing the impacts of alternative parking scenarios, including information about cost, greenhouse gas (GHG) emissions and estimated vehicle miles traveled (VMT) of building users

See the following pages for step-by-step instructions on how to use the web calculator tool. The King County Multi-family Residential Parking Calculator is online at:

http://www.rightsizeparking.org/

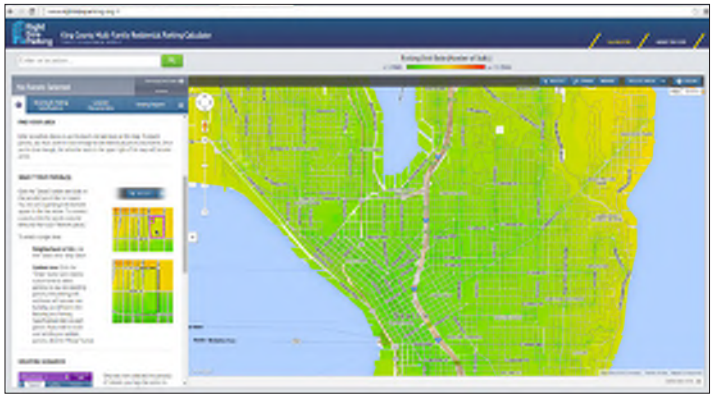
Web Calculator Overview

Calculator basics

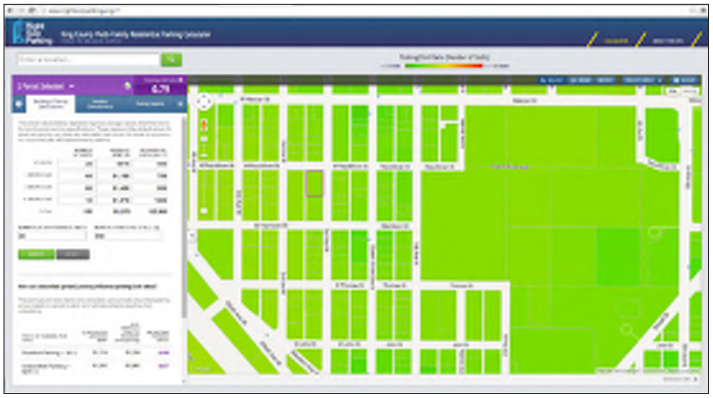
The King County Multi-Family Residential Parking Calculator is a map-based web tool that helps users estimate parking demand for multi-family developments at specific sites. The calculator can help analysts, planners, developers, and community members weigh factors that will affect parking use at multi-family housing sites and determine how much parking is "just enough" when making economic, regulatory, and community decisions about development.

The RSP web calculator can be accessed online at: www.rightsizeparking.org

How to use the King County Multi-Family Residential Parking Calculator:



Enter an address or use the zoom tool to find an area of interest.



Select an individual parcel using the "Select" arrow tool.

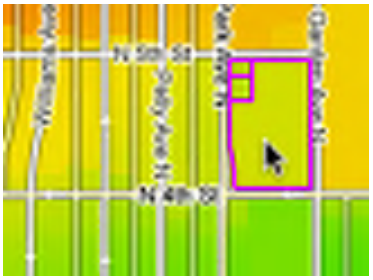
1 Find your area

Enter a location or use the zoom and pan tools on the map to zoom in to the area of interest. When zoomed in close enough, individual parcels boundaries will become visible and the selection tools in the upper right of the map will become active.

2 Select your parcels

Click the "Select" button and then click on the parcel(s) of interest. A parking/unit estimate will appear in the calculator box. Parcels can be added to or subtracted from a selection using the "Select" tool. A larger area, such as an entire neighborhood or city, can be selected using the "Select Area" drop down menu.

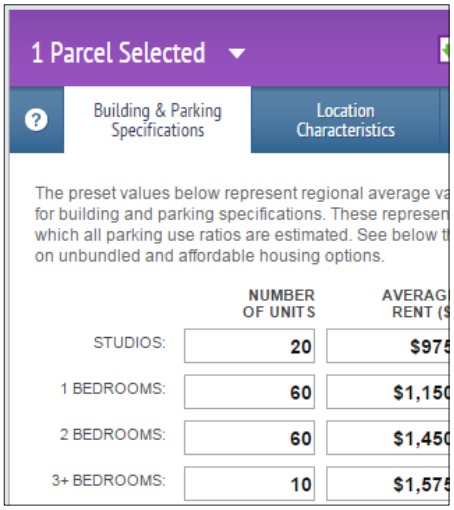
Parking demand can be estimated for a custom area by using the "Draw" tool to select multiple parcels. In a custom calculation, the parking/unit estimates assume that one building will be assigned to each parcel. The "Merge" tool allows users to assign one building to multiple parcels.



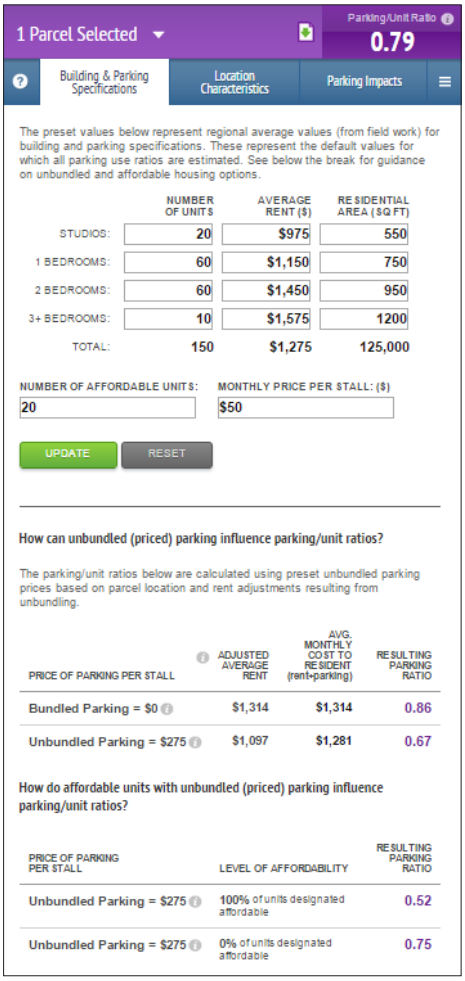
Select multiple parcels or draw a custom area if desired.

3 Create scenarios

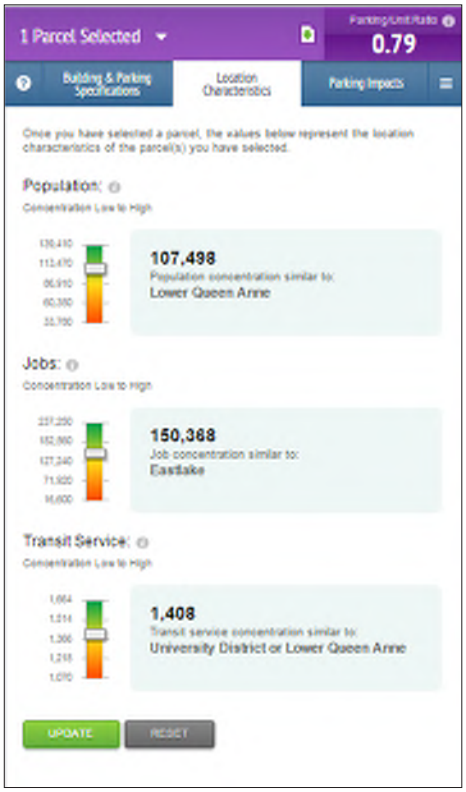
Once the parcel(s) of interest have been selected, the default inputs are shown and can be adjusted using the "Building and Parking Specifications" and "Location Characteristics" tabs. Two preset scenario options (unbundled parking and affordable housing) are provided on the "Building and Parking Specifications" tab to provide a starting point for developing custom scenarios.



Adjust default inputs under the first two tabs.



Enter building and parking specifications.



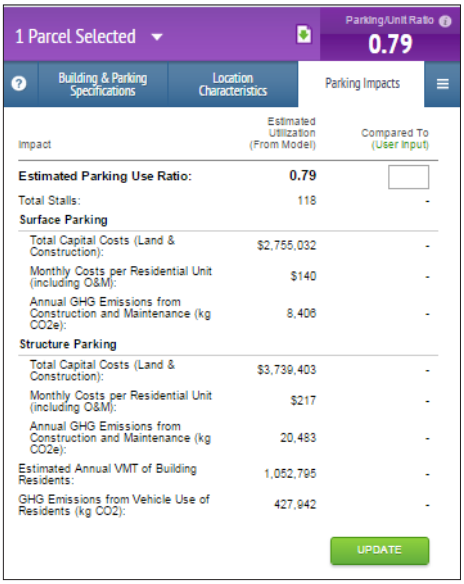
Make adjustments for location characteristics.

4 View results

Parking/Unit Ratio: The calculator tool displays the estimated parking spaces per residential unit for the selected building(s), or the parking/unit ratio. When multiple parcels are selected, an average is displayed. The calculator also provides additional information about the selection, such as parcel data and the estimated parking use ratio for the selected parcel(s).

Parking Impacts: This tab provides average parking construction costs and estimated vehicle miles traveled (VMT) as well as greenhouse gas (GHG) emissions based on the amount of parking supplied.

Selection Info: Click the up arrow in the bottom right of the map screen for trip generation reduction estimates and Census data on average commute distance and journey to work mode split.



View parking use estimates and impacts.

User interface

The RSP web calculator condenses complex research findings into a user-friendly, map-based format accessible to a wide variety of stakeholders. The tool allows users to apply the RSP statistical model to real-world scenarios, whether it be planning at the neighborhood level or designing and financing a building at the parcel level.

Outputs for most developable parcels in King County, Washington are illustrated on this interactive website calculator. Users have the ability to select a parcel, input details specific to a proposed development (replacing the default values that represent development averages), adjust factors of the built environment, and view the resultant parking utilization estimate. Users can also adjust scenarios using variables related to a specific site and its location, including proximity to transit, jobs and/or population.

This ability to adjust variables enables users to compare the impacts of alternative scenarios in order to weigh factors that will affect parking use at multi-family housing sites when making economic, regulatory, and community decisions about development.

When variables are entered, the calculator displays the impacts of creating the stated amount of parking, including: total capital costs of parking, monthly costs per residential unit, annual vehicle miles traveled (VMT) of building residents, and greenhouse gas (GHG) emissions from building construction and maintenance as well as from the vehicle use of residents. Understanding the variables influencing parking supply and demand helps users to determine how much parking is "just enough" for a particular site.

Built-in scenarios

RSP research found that parking pricing and the presence of affordable units are two factors that have a pronounced effect on parking utilization. In order to highlight these findings, the website includes two "built-in" scenarios that automatically calculate and display the different parking utilization estimates for a given parcel and building with:

- Parking pricing bundled with or unbundled from rent, and
- 100% affordable units or no affordable units

Who benefits and how?

Developers, public decision makers, and communities will all benefit from the King County Multi-family Residential Parking Calculator.

Developers and financiers: Decreased costs of housing development, ownership, rental and operation

Action: Right-size new developments; build more housing near transit and sell it for less

Jurisdictions: Improved pedestrian environment, walkable neighborhoods, and transportation choices

Action: Adjust code to reflect findings

Neighborhoods: Improved pedestrian environment, transit operations and efficiency; decreased housing costs

Action: Community participation in the development process

Users and intended applications

Calculating parking use at multi-family developments can help provide information to users that can guide and inform decisions on building and managing parking. The calculator can help analysts, planners, developers, and community members weigh factors that will affect parking use.

The calculator can also be used as a resource to inform discussions and help consider the proper provision of parking. With updated context-sensitive information on parking demand, the calculator allows communities to regulate development in a way that meets both local and regional goals.

This new approach provides public and private sector practitioners with information and tools to better align parking supply with demand, preserving resources and supporting a range of community goals including transit-oriented development and housing affordability. The tool also facilitates developers in building more housing, especially affordable housing, in areas well-served by transit.

While the web calculator tool is intended to help support and guide parking supply and management decisions, it should not be viewed as providing a definitive answer on parking provision. Rather, it should be seen as a resource for informing discussions and weighing the factors impacting parking demand.

USER TESTIMONIALS RSP WEB CALCULATOR

Web calculator users representing both municipal and developer stakeholder groups provided the RSP team with feedback on the utility of the interactive RSP tool:

City of Kirkland

"The City of Kirkland used the King County Multi-Family Residential Parking Calculator to help draft new parking requirements for multi-family zoning districts within the City. The parking calculator was fundamental in establishing a baseline parking requirement, which we then modified based on additional parking information and policy direction from City officials."

- Jon Regala, Senior Planner, City of Kirkland Department of Planning and Community Development

William Popp Associates

"The tool has been very helpful in our parking demand studies for predicting demands for multi-family apartments in urban settings with abundant public transportation and nearby shop, restaurant, and socio-recreational opportunities. We have found the tool very useful in that we can narrow down our study area to a parcel specific condition or expand out to a larger block area or neighborhood community when predicting demand. Previous data sources for parking demand are often all-encompassing, and they are often only stratified into urban and suburban areas. In general, the tool has been very useful in our recent parking analysis endeavors, particularly in urban settings."

- William Popp Jr., Transportation Engineer

Beacon Development Group

"As a development consultant to non-profits building affordable housing, Beacon used the Right Size Parking calculator to help one of our clients plan for the amount of parking needed by their new mixed-use project. The tool is very easy to use, and it gave us a firm number to start from so that our client could formulate a parking plan during project development rather than simply react to parking needs after the project was completed."

- Boting Zhang, Housing Developer

Capitol Hill Housing

"The King County Multi-Family Residential Parking Calculator web tool has been a great resource for advocacy about parking in our neighborhood of Capitol Hill. Capitol Hill is a dense urban neighborhood in which many residents do not own a car and large households only own one car. Many developers, new to the neighborhood, are skeptical of the low parking demand or need hard evidence to show during their financing negotiations.

King County's parking calculator, and the research behind it, has provided that evidence. We can sit down with developers and pull up recommendations for their specific site, mix of unit sizes, levels of affordability, and the price they are planning to charge. Working with the parking calculator results in lower, more realistic parking ratios in new buildings. Increasingly, new developers have already consulted the parking calculator before we meet with them.

The calculator is also helpful for assuaging neighborhood fears about parking spillover. The tool allows everyone to easily access accurate information about parking demand and make informed decisions."

- Alex Brennan, Senior Planner

City of Renton

"The ability to compare the City's regulations with RSP findings allowed City staff to verify that the adopted City parking regulations were appropriate. The ability to compare our regulations to such an extensive study instead of simply comparing to neighboring jurisdictions gave City staff the confidence that our parking numbers were appropriate for the development patterns in Renton. "

- Vanessa Dolbee, Current Planning Manager, Community & Economic Development Department

Usage cases and stakeholder input

During its initial two years of use, the calculator website has seen constant use, with visits originating from across the country. The most frequently performed actions by visitors to the RSP web calculator include running the model and viewing the information tabs that allow for user scenario adjustments and display information about parking impacts. Of these tabs, the Building and Parking Specifications tab has been most highly utilized.

King County Multi-Family Residential Parking Calculator usage statistics (Feb 1, 2013 - Feb 1, 2015)

Total Events & Unique Events by Event Category		
Run Model	40,017	2,834
View Tab	27,856	10,104
Update	5,667	1,412
Location Search	2,233	926
Total & Unique Events by Event Action		
Building/Parking Specs	4,152	1,174
Location Specs	758	331
Parking Impacts	757	383

Demonstration Projects 4

Introduction

The final stage of the RSP project consisted of the development and implementation of pilot demonstration projects with local partners. The project team engaged seven demonstration pilot project partners, including both local jurisdictions and property owners, to put RSP research into practice through policy and management pilots. Pilot project partners were selected through a competitive bid process.

The **policy-based pilots** were designed to align jurisdiction parking regulations with regional goals for vehicle miles traveled (VMT), housing affordability, and greenhouse gas (GHG) emissions. Four King County cities - Kent, Kirkland, Seattle, and Tukwila - were selected as partners and worked with the RSP team to analyze potential policy changes.

The **management-based pilots** utilized innovative Transportation Demand Management (TDM) strategies, including parking pricing and incentive strategies, to test parking management scenarios. The partners for the management pilots included Capitol Hill Housing, an affordable housing provider; El Centro de la Raza, a community-based civil rights organization and housing provider; and Hopelink, an emergency services center.

In order to best support and empower these pilot projects, the RSP team developed a set of tools to assist policy makers and developers in understanding the market demand for parking based on location-specific characteristics. These tools, which include the Right Size Parking Model Code, a Parking Requirements and Utilization Gap Analysis, and a Multi-Family Parking Strategies Toolkit, are described in more detail in the following sections of this chapter.

Policy pilots

Pilot funding and technical support to test innovative parking policy approaches were awarded to four partner King County cities: Seattle, Kent, Kirkland, and Tukwila. These pilot projects began in 2014.

The intent of the policy pilot projects was to apply the RSP research findings in order to achieve better alignment between jurisdiction parking regulations and regional goals, such as increased transit ridership and provision of affordable housing.

Policy changes considered by the partner municipalities ranged from reductions in parking minimums for development to parking management strategies, including shared parking and residential parking program reform.

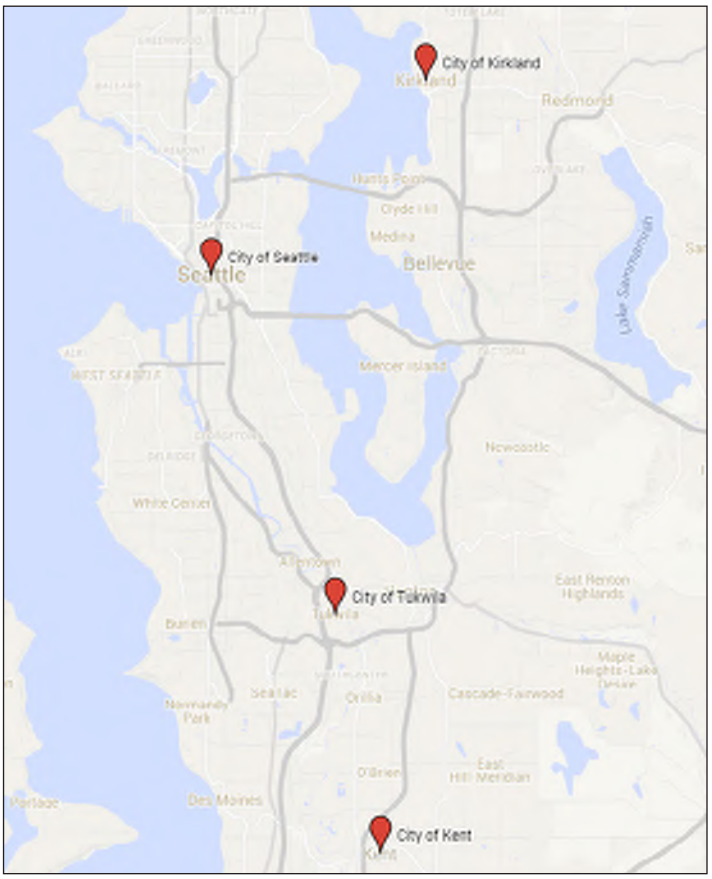


Fig. 8: A map of the Right Size Parking Policy Pilot Project partner locations.

Policy pilot partners

The selected pilot partners worked with RSP staff and consultants to analyze potential policy changes using the RSP web calculator. Both the RSP Model Code and the Parking Requirements and Utilization Gap Analysis were used to provide guidance for the recommendations for each partner city.

Each pilot project had a unique focus based on local issues and context:

- **Kent:** Identify best code and management strategies for mixed-use areas in a suburban context
- **Kirkland:** Establish parking requirements that reflect market demand and prevent spillover
- **Seattle:** Evaluate existing parking policies and programs and explore private shared parking opportunities
- **Tukwila:** Identify parking strategies for the Tukwila International Boulevard Station area; explore the potential for implementing private shared parking

Parking Requirements & Utilization Gap Analysis

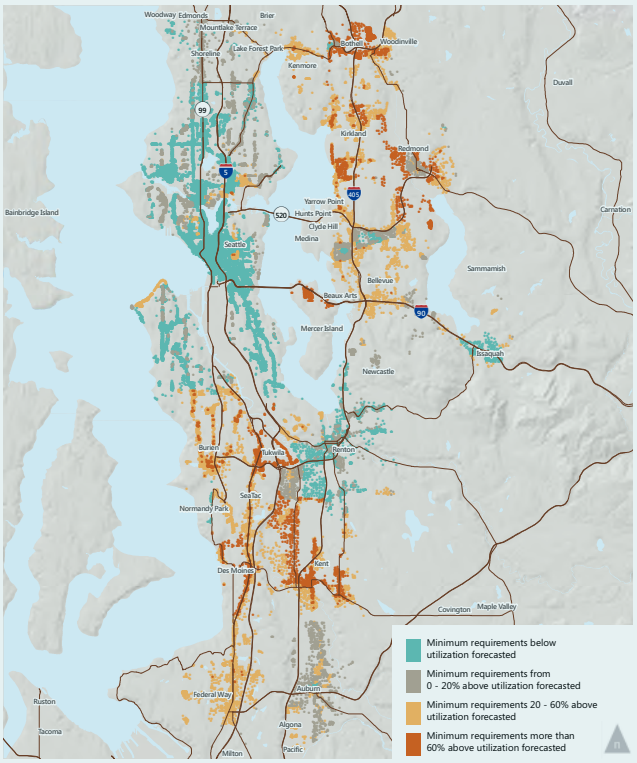


Fig. 9: Data map illustrating the gap between minimum parking requirements and observed parking utilization in King County.

The **Parking Requirements and Utilization Gap Analysis** provides a comparison of local municipal code minimum parking requirements with multi-family off-street parking utilization forecast by the RSP web calculator. The motivation behind this research is that misaligned parking requirements may spur new development to supply more parking than necessary, leading to oversupply and increased housing costs. They can also make it difficult to unbundle the price of parking from rent as it would only lead to a higher parking vacancy rate, but no cost savings.

The analysis indicates that in most King County locations, parking requirements are higher than forecast parking utilization, often by around 50%. More than 82% of King County parcels outside the City of Seattle have minimum parking requirements that are greater than the RSP model utilization. For more information, see:

http://metro.kingcounty.gov/up/projects/right-size-parking/pdf/gap-analysis-7-12-13.pdf

Right Size Parking Model Code

The RSP study found that many parts of King County have established minimum parking requirements that exceed modeled utilization. In many King County municipalities, parking codes may not be up to date with changes in land use, demographics and consumer preferences that have already reduced – and could potentially further reduce – the demand for parking. In some municipalities, parking minimums do not take into account the fact that demand for parking varies based on unit type, occupant income, proximity to transit, or other contextual factors.

In order to address this gap, the RSP team developed the **Right Size Parking Model Code** to help local jurisdictions implement policies that more accurately reflect their stated goals, such as housing affordability and neighborhood walkability. The model code document provides policy options and model code for cities looking to better match their local parking supply with demand using an adaptable, customizable menu of options with an explanation of each policy choice.

The purpose of the model code is to provide a resource for municipalities that are interested in implementing code changes to help right-size local parking supply. The model code draws from several other components of the RSP project, including best practices research, the RSP Technical Policy Memo, multi-family utilization surveys, parking code gap analysis, the RSP calculator, and stakeholder input.

The primary recommendation of the model code is for a market-based approach to parking supply in multi-family buildings and for spillover to be controlled by on-street parking pricing in lieu of parking minimums. The document also provides, as a second best alternative, recommendations for a context-based regulatory approach in which minimums are set based on a comprehensive assessment of neighborhood and project-specific conditions.

http://metro.kingcounty.gov/programs-projects/right-size-parking/pdf/140110-rsp-model-code.pdf

CITY OF KENT POLICY PILOT

PILOT FOCUS

Parking code adjustments and parking management strategies

CONTEXT

The Kent Downtown area is experiencing tensions as it urbanizes from a suburban retail center to a mixed-use transit node. Large surface parking lots provide public parking free of charge throughout the Downtown, and several arterials traversing the area do not currently accommodate on-street parking.

As new multi-family development integrates with the existing urban fabric, the City of Kent desires to ensure that parking is managed as a valuable resource for livability and economic development within the Downtown area. In order to provide the City with tools for achieving this goal and addressing the transitional tensions affecting Downtown Kent, the RSP team worked to identify parking code and parking management strategies appropriate for this urbanizing, mixed-use area located within a broader suburban region.

RSP FINDINGS

A multi-family parking utilization survey conducted by the RSP team indicated that in Kent actual parking demand is less than what is required by the City's parking codes. When presented with this information, both the City and other project stakeholders expressed interest in exploring strategies for right-sizing the parking supply in Downtown Kent.

RSP RECOMMENDATIONS

The pilot project consisted of the creation of a parking code and parking management strategy that recognize the economic value and cost of parking stalls and support the appropriate prioritization of parking users within a mixed-use context. In general, the project team found the need for consistent and user-friendly communication of parking expectations and regulations to different user types as well as a need for focused enforcement and management of surface parking, including dedicated employee parking.

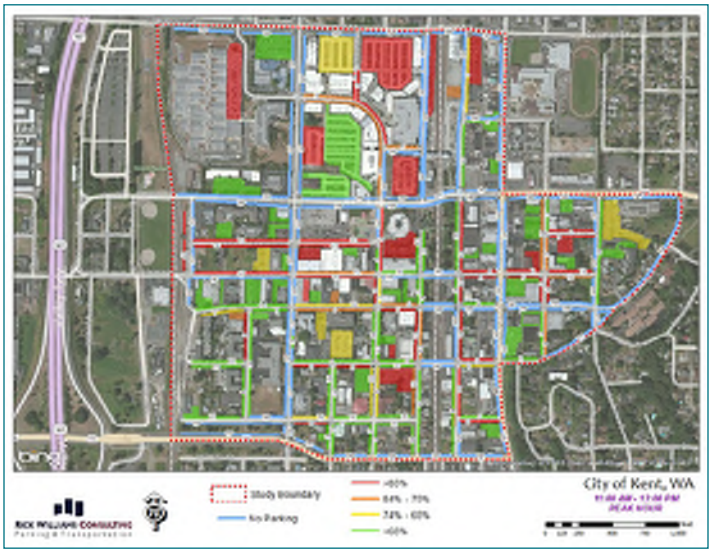


Fig. 10: Combined On and Off-Street Peak Hour Occupancies.

Project deliverables included:

- Documentation of existing parking conditions and identification of parking challenges and barriers
- A policy technical memo with code alternatives that are right-sized for Kent's development context
- Prioritized recommendations for parking code adjustments
- A context-specific parking management strategy that supports RSP standards while directly addressing and responding to stakeholder concerns

CITY OF KIRKLAND POLICY PILOT

PILOT FOCUS

Establish parking requirements based on actual parking demand

CONTEXT

The Kirkland Planning Commission and Houghton Community Council expressed interest in gaining a better understanding of how the RSP calculator tool results compared with observed multi-family parking utilization in Kirkland. To address this issue, the RSP team compared the results obtained by using the web calculator to observed parking utilization rates collected at 24 multi-family developments across the City of Kirkland.

RSP FINDINGS

The team found that the RSP web calculator generally predicts parking utilization in the City of Kirkland accurately, with most sites within +/-15 percent of the observed value. Using the results of this analysis, the team compiled a technical memo that included recommendations for adjustments in parking requirements that reflect documented parking demand and prevent parking spillover.

The team also found that in certain transit-rich environments, the calculator may overestimate parking utilization due to the sensitivity of the transit score to relatively small differences in walking distances to transit. They determined that it was reasonable to manually adjust the RSP web model accordingly to more accurately consider the availability of high quality transit service in portions of Kirkland.

RSP RECOMMENDATIONS

- Use a unit-based approach to developing parking standards

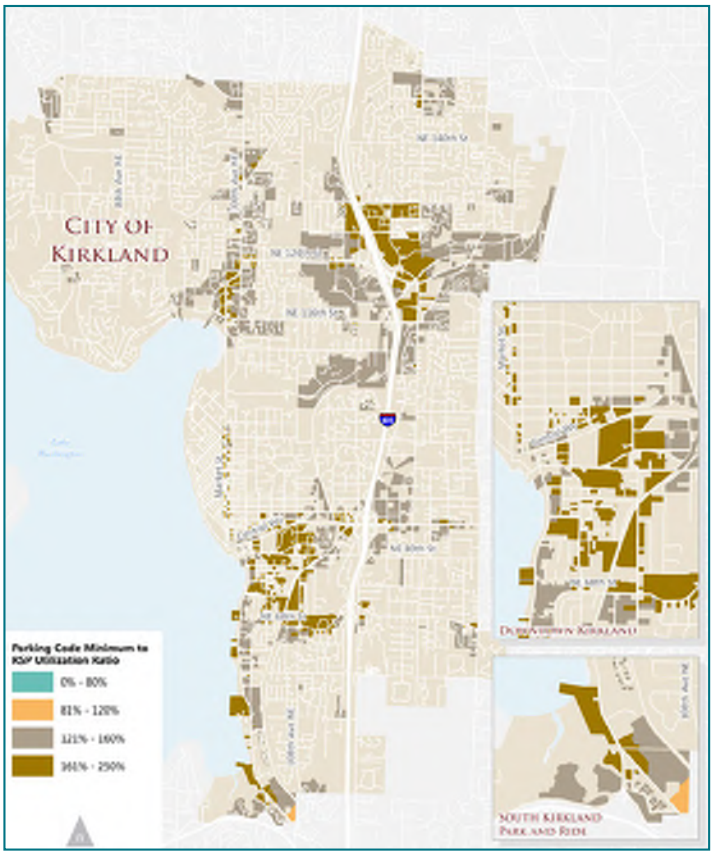


Fig. 11: RSP comparison of Kirkland parking code minimum requirements to RSP utilization ratio.

- Set minimum requirements at or just below utilization rates (may warrant additional on-street parking management)
- Supplement adjustments for parking requirements that respond to transit service with additional on-street parking management strategies

CITY OF SEATTLE POLICY PILOT

PILOT FOCUS

Parking Code Review, Shared Parking Strategies, and Residential Parking Zone (RPZ) Review

CONTEXT

The City of Seattle participated in the RSP pilot to identify methods, including code and policy changes, for better balancing on and off-street parking supply and pricing. This pilot included an evaluation of existing parking codes and policies, an assessment of the existing Restricted Parking Zone (RPZ) program, and identification of opportunities to expand the feasibility of private shared parking. The goal of the project was to develop key revisions to the parking management process, tying together RSP goals of off-street requirements with effective on-street management.

RSP FINDINGS

Parking Code Review: Seattle parking standards are extremely varied, with distinct separations by use types, making it difficult to "right size" parking requirements.

Shared Parking Strategies: Building design can facilitate shared use parking by bringing the parker to a plaza connected to both the street and the building's private space. Signage and wayfinding systems are also important to supporting successful shared use parking.

Residential Parking Zone Review: The number of parking permits issued exceeds the actual supply of parking. The relationship between the cost of on-street and off-street parking is skewed to favor on-street parking, particularly where off-street parking is unbundled from rent.

RSP RECOMMENDATIONS

The RSP team researched each of these issues and produced reports focused on each of the three analytical tasks. It is hoped that these preliminary recommendations will spur discussion around clarifying issues and strategies for making adjustments to the City of Seattle's parking management practices:

Fig. 12: Signage regulating Seattle's Restricted Parking Zones (RPZs).

Fig. 13: RPZ locations in Seattle.

Minimum and Maximum Requirements Recommendations

- Consider the context of vision goals for unique areas of the City and develop an encompassing policy foundation to "right size" parking everywhere for consistency
- Simplify the parking code by creating broader land use categories

Shared Parking Recommendations

- Research and understand the range of shared use options that could be met within existing parking surpluses
- Establish consensus on those types of shared parking that are acceptable to the City
- Develop communication and facilitation strategies that bring potential shared use partners together

Residential Parking Zone Review Recommendations

- Increase the base price of residential parking permits and shift to monthly permit billing
- Graduate the price of residential parking permits in high-demand neighborhoods
- Modify institutional agreements
- Tie permit eligibility to off-street parking availability

CITY OF TUKWILA POLICY PILOT

PILOT FOCUS

Private shared parking strategies and on-street parking user prioritization

CONTEXT

The RSP team partnered with the City of Tukwila to perform an "audit" of the RSP web calculator tool to determine how accurately it reflected parking utilization and demand in the Tukwila International Boulevard (TIB) light rail station area. The City also sought parking policy recommendations that would support a walkable, affordable, transit-oriented neighborhood around the TIB station.

RSP FINDINGS

The team found that the RSP model estimates parking utilization accurately for the majority of the selected sites: 15 of 18 sites fell within a 20 percent level of error. On average, apartments in the study area do not share as strong a link between good transit service and lower parking utilization as elsewhere in the County. This relationship is not very strong because current levels of transit service in Tukwila do not vary enough to make a meaningful impact on parking use.

The team found that many businesses actively take measures to prevent non-patron parking in their lots to eliminate spillover. They also found that Tukwila enforces more regulations for non-residential parking than other cities, making shared parking difficult to implement.

RSP RECOMMENDATIONS

Based on the data gathered through the RSP audit, the team worked to identify parking strategies for the TIB station area, including an exploration of private shared parking. The RSP team proposed recommendations and strategies that would enable the City of Tukwila to achieve its vision of creating a welcoming place, supporting equity, and preserving affordabilty. RSP recommendations included:

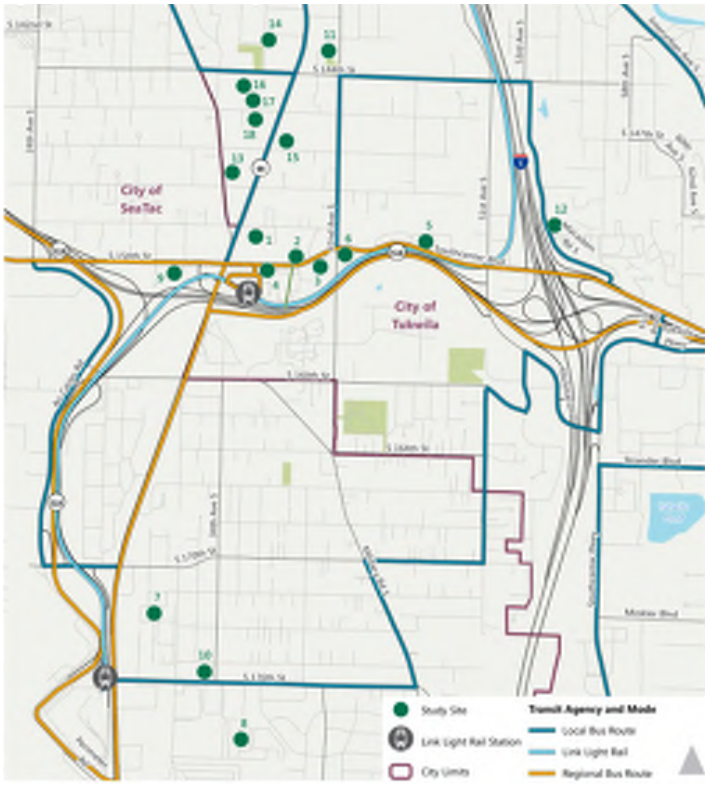


Fig. 14: Tukwila and SeaTac Study Site Locations

- Reduce multi-family parking minimums
- Develop clear policy language about the purpose and intent of on-street parking
- More directly facilitate the use of shared parking agreements between commercial and/or residential lots for off-street parking
- Create design standards that include on-street parking for new and improved streets
- Continue to monitor occupancy levels at the TIB station and transition the area to transit-oriented development

Management pilots

Pilots to test innovations in parking management, pricing, and transportation demand management to reduce parking demand were awarded to three non-profit partners at multi-family properties in King County: Capitol Hill Housing, Hopelink, and El Centro de la Raza.

The intent of the management pilots is to generate data and case studies that reflect the impact of implementing innovative parking pricing and TDM strategies. In some cases, the RSP team took various approaches to address financial incentives that would support future pricing initiatives. Strategies explored by the partner municipalities included developing shared parking strategies at multiple scales, identifying TDM strategies for affordable housing projects, and applying RSP strategies at multi-family properties with unique federal constraints and requirements. Additional support and funding for the management pilot projects was provided by the Federal Transit Administration.

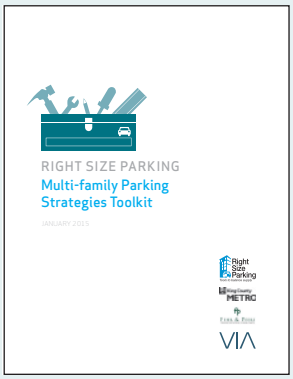
In response to stakeholder input received during the course of the pilot projects, the RSP team developed both a Multi-family Parking Toolkit and a Multi-family Development Passport transit product for use by multi-family property owners and managers. More information on these tools can be found on the following pages.

Management pilot partners

The management pilots were selected to test RSP concepts aimed at supporting regional smart growth goals of dense, compact development that leads to non-auto mode share growth, thereby promoting affordable housing, transit and other travel alternatives. Three partners were selected through a competitive bid process:

- **Capitol Hill Housing:** Test district shared parking strategies; identify a business model to coordinate shared parking at the neighborhood level
- **El Centro de la Raza:** Identify TDM and parking management tools for a planned affordable housing project using the RSP web calculator
- **Hopelink:** Implement TDM and parking management strategies at senior and low-income properties with unique needs and constraints, including federal restrictions on pricing parking

Multi-family Parking Strategies Toolkit



The **RSP Multi-family Parking Strategies Toolkit** is a guide that presents a set of tools for developers and property managers to use for managing parking supply in multi-family buildings. The toolkit addresses pricing, transportation demand management (TDM) strategies, design, and parking management as well as providing a case study and additional RSP resources.

Some of the tools presented can reduce the amount of parking needed to serve residential demand, resulting in a significant positive impact on project bottom line in terms of both construction costs and rent. Others can increase parking utilization and create new revenue streams.

By encouraging alternatives to driving, these parking strategies can help facilitate transit-oriented development, protect the environment, reduce congestion, and support local businesses. Reduced parking can also earn points in green building ratings systems such as LEED.

The tools in this guide address pricing, transportation demand management, design, and parking management. They can be applied to new developments or existing buildings, and many work best when combined in a multi-pronged approach. A case study that employed some of the recommended tools is included at the end of the document.

The “toolkit” is intended only as an overview of the best tools. Further details on implementation can be obtained from widely available publications or from a parking or transportation demand management expert.

The Multi-Family Parking Strategies Toolkit can be found online:

http://metro.kingcounty.gov/programs-projects/right-size-parking/pdf/multifamily-parking-toolkit.pdf

CAPITOL HILL HOUSING MANAGEMENT PILOT

PILOT FOCUS

District shared parking strategies and business model

CONTEXT

Capitol Hill Housing (CHH), an affordable housing provider, engaged the RSP team to develop district shared parking strategies in the Pike/Pine corridor of Seattle's Capitol Hill neighborhood as a means of managing oversupply. Shared parking fits strongly within Capitol Hill's EcoDistrict program and supports neighborhood goals of developing neighborhood-scale strategies that benefit the environment while increasing housing affordability. The RSP team analyzed current Pike/Pine parking practices and economics, reviewed best practices case studies, and provided next steps toward the creation of a district parking system. The team identified a business model that could be used to coordinate shared parking at the neighborhood level.

RSP FINDINGS

CHH carried out the bulk of the data collection and research, drawing upon its long-standing neighborhood relationships to identify and recruit initial participants for pilot leases. The team conducted focus groups with residents as well as with owners and property managers to help develop and test the pilot lease agreements. The team generally found that neighborhood stakeholders strongly support transitioning to a shared parking system. Stakeholder interviews revealed the following findings:

- Developers supply excess parking to reduce risk of a shortage; if that risk could be mitigated through shared parking strategies, parking ratios could be reduced
- Employers are concerned about the cost of employee time spent searching for parking
- Residents parking on the street tend to base parking decisions on price rather than on time spent looking for or walking to and from a more distant location

RSP RECOMMENDATIONS

The RSP team developed a four-step approach toward creating a district parking system in the Pike/Pine corridor. The progressive process, which describes an evolution from a relatively simple "Broker" model to a more complex and dynamic "Internet of Parking" model, would allow CHH to make adjustments gradually and minimize risk (see Fig. 15). Specific recommendations were made at each step regarding operations, responsibilities, and technologies.

The final report for this pilot can be accessed online:

https://capitolhillecodistrict.org/projects/pike-pine-shared-parking/

DISTRICT SHARED PARKING BUSINESS MODEL PROGRESSION

	Broker	Smart Broker	Intranet of Parking	Internet of Parking
Buyers	Residents, Buildings	*Broker* Plus Businesses	Same as *Smart Broker*	*Smart Broker* Plus Visitors
Data Collection Method	N/A	Automated	Same as *Smart Broker*	Same as *Smart Broker*
Data Collection Times	N/A	Real Time	Same as *Smart Broker*	Same as *Smart Broker*
Space Assignment	Assigned	Unassigned	Same as *Smart Broker*	Same as *Smart Broker*
Garage Assignment	Assigned	Same as *Broker*	Unassigned	Same as *Intranet*
Notification Incentives	No	Yes	Yes	Yes
Peak Demand Incentives	No	Yes	Yes	Yes
Valet Service	No	Yes	Yes	Yes
Equipment Changes	None	Occupancy Tracking	*Smart Broker* Plus Card Readers	Same as *Intranet*
Garage Communication	None	One-Way	Two-Way	Same as *Intranet*
Rental Period Length	Monthly	Same as *Broker*	Same as *Broker*	*Broker* Plus Daily, Hourly
Time Restrictions For	Businesses	Same as *Broker*	Same as *Broker*	*Broker* Plus Individuals
Target Occupancy	Low	Medium	Medium-High	High
Cost	Low	Low-Medium	Medium-High	High
Revenue	Low-Medium	Medium	Medium-High	High

Fig. 15: The recommended business model for progression toward shared parking in Pike/Pine. Table from final report, ***District Shared Parking: Program, Policy and Technology - Strategies for a More Resilient Parking System in Pike Pine***. Link to complete report provided above.

HOPELINK MANAGEMENT PILOT

PILOT FOCUS

Assistance with parking demand management and improving affordable housing resident mobility

CONTEXT

Hopelink is a non-profit community action agency that provides mobility management services in King County. Hopelink proposed implementing TDM and parking management strategies at senior and low-income properties in King County, including an exploration of parking pricing options.

In partnership with Senior Housing Assistance Group (SHAG) and Catholic Housing Services (CHS), Hopelink's Mobility Management team created Existing Conditions Reports for three SHAG properties and two CHS properties. Parking management plans were created for four of the five properties. The plans incorporated TDM best practices with site-specific factors to prioritize implementation strategies.

During the second half of 2014, prioritized strategies determined by project partners to be most feasible within the constraints of each property were implemented. Strategies specific to each study site were selected, which included shared and/or remote parking, nonmotorized infrastructure improvements, mobility management strategies, financial incentives, and parking regulation and enforcement, among others. A parking utilization assessment was conducted to gauge the relative success of the implemented strategies, and the team followed up with household surveys and staff interviews.

RSP FINDINGS

One of the primary pilot implementation strategies was the facilitation of a Transit Incentive Program (TIP) to encourage use of public transit by residents. The program, implemented across all of the study properties, was designed to reduce dependence on private automobiles, allowing residents to consider giving up vehicles or ensuring that additional vehicles are not purchased. The TIP gave participants a fully-loaded ORCA card for four months during 2014. As a result, an overall increase in resident mobility and comfort with use of transit was observed. A majority of participant survey respondents reported an increase in weekly transit use (see Fig. 16). Data collected on parking utilization showed a slight decrease in parking utilization at all properties.

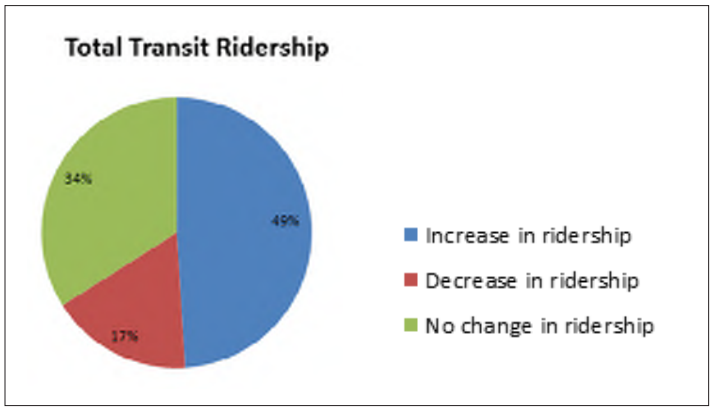


Fig. 16 A Transit Incentive Program implemented during the pilot project resulted in increased total transit ridership.

Additional implementation strategies included pedestrian safety enhancements, a Car2Go waiver for SHAG residents, and clarification of existing parking policies and operations practices.

RSP RECOMMENDATIONS

Due to the regulatory framework governing facilities built using low income tax credits, the team recognized that unbundling parking, a potential strategy explored during the course of the project, would require a policy change at the federal level.

As an outcome of the pilot project, SHAG staff expressed interest in self-funding a parking utilization assessment of a nearby park-and-ride lot as well as implementing a community rideshare program for group trips.

Hopelink is currently exploring opportunities to help partner agencies develop mobility plans for residents, develop tools to explain cost differentials between gas and transit for certain trips, and facilitate financial workshops for CHS residents who are burdened by high-interest car loans.

EL CENTRO DE LA RAZA MANAGEMENT PILOT

PILOT FOCUS

Traffic study and TDM plan

CONTEXT

El Centro de la Raza (ECDLR), a social services organization and housing provider, sought to explore and select TDM and parking management tools for application at a planned affordable housing project, Plaza Roberto Maestas. The mixed-use project and auxiliary garage would replace existing parking lots, keeping total parking in the campus context at approximately 150 stalls while bringing new residents and businesses to the site. The team was charged with determining the parking and traffic needs on the campus after completion of the project.

The RSP team worked together with ECDLR, Beacon Development Group, the project developer, and the City of Seattle's Department of Transportation to balance parking supply and demand for the entire campus. The project began with a community meeting to gather feedback about the design of the proposed parking garage. Needed parking supply was determined using the RSP web calculator. The team conducted a parking and traffic study, which included consideration of construction parking and staging as well as recommended project-related outreach efforts.

RSP FINDINGS

During the course of the project, the team learned that the Columbia City Station Apartments (CCSA), a 52-unit low-income 1- and 2-bedroom apartment building adjacent to the Columbia City Light Rail Station, has nearly filled its 23 rentable stalls while being situated in a similar restricted parking zone. Recognizing that paid parking could help the project and ECDLR in a number of ways, including inducing and underwriting transit ridership, ECDLR is exploring the possibility of charging households for parking with pricing scaled to reflect a percentage of tenant rent.

Though not an initial focus of the project, it became clear during the study that office-related parking demand will also influence parking demand in the completed ECDLR campus. To address ECDLR's office parking uses, the RSP team explored a TDM strategy that included layered parking uses throughout the day, establishing an organizational account with ZipCar for ECDLR staff members, and providing 50% subsidies for employee ORCA passes.

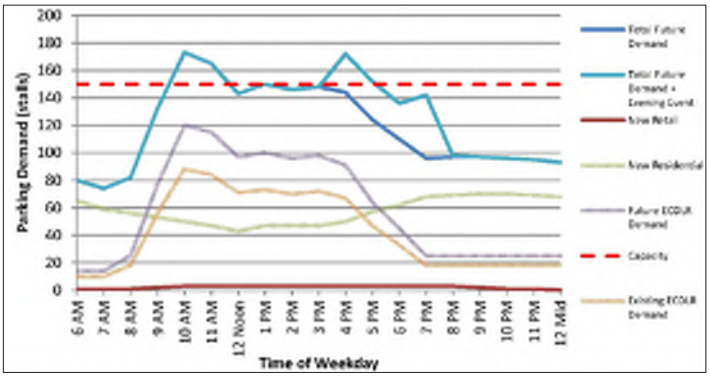


Fig. 18: Future on-site parking demand compiled for the Plaza Roberto Maestas Traffic Study.

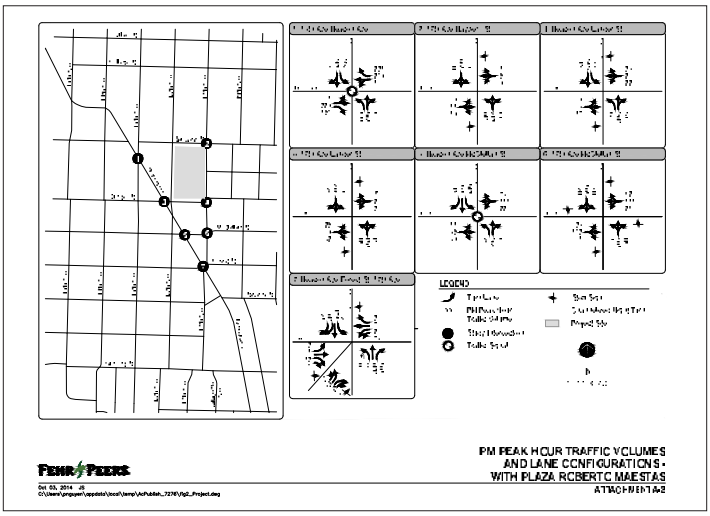


Fig. 19: Projected future peak hour traffic volumes and lane configurations from the Plaza Roberto Maestas Traffic Study.

RSP RECOMMENDATIONS

The calculator projections were used to identify TDM strategies for the completed project. The final RSP deliverable was an operating plan for TDM at the completed project that outlined guiding principles for implementing TDM and provided detailed recommendations regarding residential parking, alternative transportation, office and shared daytime parking, and event parking.

ORCA Multi-family Development Passport Pilot Program

The **ORCA Multi-family Development Passport** pilot program provides an ORCA card that is an annual transportation pass for multi-family property owners or managers to offer to residents. Participating multi-family property owners and managers purchase the ORCA cards to offer to their residents. In exchange for a substantial discount, the program requires that the ORCA card be offered to every residential unit in the building; however, participation by residents is not mandatory.

The program benefits multi-family property owners and managers by providing an amenity for residents that encourages transit use, in turn reducing traffic congestion around buildings, lessening neighborhood parking impacts, and facilitating easier building parking management. Offering this product to residents can also give building owners and managers a competitive edge in a crowded rental and real estate market and contribute to more sustainable building and transportation management practices.

Residents benefit from receiving a single card to access comprehensive transit services throughout Seattle and beyond, ensuring a convenient, flexible, and affordable transportation option for choosing how to get to work, run errands, or visit family and friends.

The cost of the passport varies depending on property location and existing transit use. After the first year of the program, the cost is adjusted based on resident participation and use from the previous year. Property owners and managers may elect for residents to co-pay up to 50% of the cost of the product.

More information on the ORCA Multi-family Development Passport program and other transportation programs available to multi-family property owners and managers can be found here:

http://www.seattle.gov/waytogo/navSeattle.htm

Stakeholder Involvement & Project Outreach 5

Telling the RSP story

Though rooted in academically-rigorous statistical analysis, it was Metro's intention that the RSP story not be solely an academic exercise. RSP's goal is to put data in the hands of those who make parking decisions in order to have a direct impact on communities, both within King County and beyond.

It was critical for the RSP project to create a call-to-action among stakeholders in order to spread the word about RSP research and to affect meaningful change in parking pricing behavior. The RSP findings tell a compelling story about the dynamics surrounding parking supply and the necessity for taking action to implement change in order to support community and regional goals.

RSP tools and education

RSP interfaces and products have been designed with ease of use and flexibility of application in mind. The primary means by which RSP research and data have been made easily accessible to stakeholders — including policymakers, project planners and developers, and the general public — is via the RSP web calculator. In order to best leverage the research and web tool products, the RSP project also developed guidelines for parking best practices that address both regulatory and property development topics.

These products, which include the RSP Model Code, the Parking Requirements and Utilization Gap Analysis, and the Multi-family Parking Strategies Toolkit, provide hands-on guidance for decision-makers and practitioners seeking to meet organizational goals through parking reform.

Stakeholder involvement

The RSP team recognized at the outset of the project that stakeholder outreach and involvement would be an essential component of sharing the RSP message and research. To that end, the RSP project sought an interdisciplinary approach, soliciting input from a wide array of parking stakeholders, developing innovative research and tools, providing best practices on policy reform and parking management, and implementing demonstration pilot projects with local partners. Stakeholder input came from a variety of forums, including focus groups as well as a methods committee of national academics and practicing professionals that guided the development of the research.

The RSP team has made a concerted and comprehensive effort to spread the word about RSP findings and tools via outreach through publications, conference presentations, and meetings with interested stakeholder groups.

The project team presented the RSP research and findings at conferences focused on issues of transportation, parking management, smart growth, real estate, land use, and urban planning. The team also presented to municipal, agency, and organizational audiences that were interested in potential applications of the RSP tools and research. RSP presentations were a feature of multiple FHWA-sponsored parking pricing and management workshops throughout the country. In addition, the RSP project was shared with student audiences at the University of Washington and the University of Oregon.

The realization and implementation of the pilot projects are also a testament to the success of the RSP outreach efforts. The project team partnered with seven developer and jurisdictional partners to successfully complete pilot projects focused on parking management and policy reform.

RSP project outreach goals and audiences

Primary RSP outreach goals included the following:

- Educate a broad range of stakeholders regarding the availability and utility of RSP tools and products
- Increase stakeholder understanding of the impacts of building too much or little parking
- Raise awareness of individual stakeholder perspectives and concerns between and among the broader stakeholder group
- Promote the website tool and other RSP products; Explain how to use the tool
- Create momentum around RSP concepts and actions within relevant industries and professions (for example, use of the web calculator by developers or policy changes on the part of jurisdictions)
- Identify new partners for RSP implementation and continued research

"Supply & Demand: A Balanced Approach to Parking" Presentation and Panel

Fig. 20: Professor Donald Shoup presents on parking supply and demand at a Right Size Parking event. Photo courtesy ULI.

In February 2013, the Urban Land Institute Northwest partnered with King County Metro to present a lunch event entitled **'Supply & Demand: A Balanced Approach to Parking'**. The event featured opening remarks from King County Executive Dow Constantine, a keynote presentation by Donald Shoup, Professor of Urban Planning at UCLA, and a panel of local industry experts. The discussion focused on issues surrounding the art and science of parking and the presentation of groundbreaking data from the Right Size Parking Project.

Key points presented by Shoup, a highly-regarded expert in balancing parking supply and demand, included the observation that municipal land use codes have a tendency to require the provision of quantities of parking that exceed actual demand. In Shoup's experience, city codes that keep street parking free or cheap and that seek to prevent spillover parking effects actually have the effect of distorting the parking market.

Shoup presented three potential solutions: implementing variable pricing for street parking that targets 85% parking space occupancy, returning parking meter revenue directly to the district in which it is generated, and removing off-street parking requirements for buildings in coordination with changes in land use.

A video of the full presentation can be found at:

https://vimeo.com/65086043

Audiences include:

- Developers of multi-family and mixed-use projects
- Financiers of multi-family and mixed-use developments
- Local government staff and decision-makers (transportation, land use/permitting, neighborhoods, economic development)
- Local, regional, national levels of public sector, industry/professional organizations
- Urban planning and architecture consultants
- Neighborhood groups with an interest in parking supply issues
- Advocacy groups with interest in the environment, smart growth, transit, health, and active transportation
- Chambers of commerce and business groups
- Academics
- Media

Project team partners

The RSP team, which included agency, private and non-profit sector partners, worked to balance issues of parking supply with competing interests while creating tools that support economic development and community goals alike. Project outreach included the range of user types and multidisciplinary experts necessary to assure a relevant and accurate product.

Within the RSP project team, several committees were organized that helped to provide guidance for the various initiatives of the RSP project, including a **Jurisdictional/ Technical Committee,** a **ULI Development Committee,** a **Methods Committee,** and an **Education Outreach Committee**. The following is a list of the key partners in the RSP project:

Federal Highway Administration (FHWA)

The FHWA provided project funding, grant oversight, and technical review of deliverables.

Washington State Department of Transportation (WSDOT)

WSDOT provided project management, grant oversight and progress review.

Center for Neighborhood Technology

Metro engaged the Center for Neighborhood Technology (CNT), a non-profit organization and leader in the promotion of livable and sustainable urban communities, to assist in the development of the project research methodology. CNT worked with Metro staff and project partners to design the research to meet RSP project goals. CNT also supported the analysis and reporting of the RSP data and produced statistical models to enable the development of data-driven tools for informing and influencing development and parking supply decisions. In addition, CNT supported the production of the website calculator tool to help disseminate project information to a broad audience of potential users.

Urban Land Institute

Metro collaborated with the Urban Land Institute (ULI) to structure the community engagement and outreach component of the RSP project. ULI reviewed the project research, explored concepts and strategies, and helped to develop and recommend guidelines and incentives to be advanced by the RSP project.

In addition, ULI established a committee to engage multi-family development professionals to support the overall program development and implementation of the RSP project. ULI was also charged with marketing and communicating the RSP work products and concepts to existing and potential project stakeholders as well as to the broader public.

Consultant team

In addition to the project partners listed above, Metro enlisted a consultant team to provide technical expertise in the various disciplines engaged by the RSP project:

- **VIA Architecture:** Urban design and planning consultants
- **Rick Williams Consulting:** Parking and Transportation Demand Management consultants
- **Fehr & Peers:** Transportation consultants
- **Kidder Mathews:** Commercial real estate consultants

The consultant team conducted local parking demand research and data collection. The team used this information to develop guidelines for best practices and strategies for addressing parking issues in complex, mixed-use urban environments. In addition, the consultant team facilitated the stakeholder committee meetings and gathered feedback from participants.

The consultant team identified potential barriers and challenges to achieving RSP goals and collaborated to provide solutions. They also developed guidelines for implementing incentive program pilot projects.

Pilot partners

The RSP project engaged several municipal and developer partners to participate in seven policy and management pilot projects to test the RSP model and findings. See Chapter 4 for more information on the RSP pilot projects.

Stakeholder committees

The RSP project organized two stakeholder committees to provide valuable input and feedback to project deliverables: the **ULI Development Committee** and a **Jurisdiction Technical Committee**. These two committees were developed to provide unique skills and experience that are necessary for effectively addressing residential multi-family parking issues in King County. The two groups met together several times throughout the course of the project to ensure efficient review and input on project concepts and deliverables, including:

- Developing a common understanding of project parameters, assumptions, and outcomes
- Discussion of public/private conflicts, finding common ground, and identifying project opportunities
- Developing ideas about function, content and target audience for the RSP website and web calculator

ULI Development Committee

The ULI Development Committee comprised a broadly representational stakeholder group consisting of ULI members representing the multi-family development community, financiers, property managers, engineers, and city planning managers.

This committee was convened to serve as a sounding board to the larger RSP project team by supporting the overall program development and implementation. The ULI Development Committee was tasked with advocating for the outcomes and solutions developed through the project and serving as a liaison to the real estate community during project implementation. In addition, the committee provided targeted support to the following RSP project efforts:

- Identification of barriers and solutions to RSP development in multi-family and mixed-use properties within King County
- Development of a list of monitoring and measurement metrics, including identification of gaps in information
- Creation of technical program guidelines, model code language and development of incentives
- Oversight of RSP community engagement and outreach, including development of a project implementation plan

Jurisdiction Technical Committee

The Jurisdiction Technical Committee was composed of members familiar with the technical issues surrounding parking demand and its implications for urban development and transportation. Committee members included jurisdiction technical staff members from cities throughout King County, with a representative mix of expertise in permit review, long range planning, code writing, traffic demand management, and traffic engineering.

The Jurisdiction Technical Committee provided public sector stakeholder review and input on technical aspects of the RSP project, such as new methods to assess multi-family residential parking demand, and suggested policy and zoning regulations to allow a reduction in parking supply when appropriate. The committee provided additional support to the RSP project in the following ways:

- Identification of barriers to RSP and the corresponding development of innovative but practical solutions that could be implemented locally
- Contribution to the creation of products that help jurisdictions and developers build successful transit-oriented communities
- Review, revision, and testing of RSP products
- Provision of advice and feedback for the development of technical program guidelines and incentives necessary for the implementation of a new approach to parking

Recommendations & Next Steps 6

The RSP project has attracted national attention. Several regions and cities around the country are currently working to replicate the RSP study and web calculator concept for their own planning purposes, including the San Francisco Bay Area, Washington, D.C., Boston, and Chicago. Many regions are reexamining parking requirements in support of pedestrian-oriented design, transit access, and a compact mix of uses to increase transportation choices. Such priorities demonstrate a long-term commitment to RSP principles such as lowering reliance on cars, and they provide justification for reductions in or elimination of requirements for off-street parking in multi-family developments.

The strategies and tools created by the RSP project offer a model to jurisdictions aiming to base parking decisions on local data and sound scientific methods, as well as to developers seeking to determine how much parking to supply in a multi-family building. In particular, the web calculator tool advanced the parking industry by developing a context-sensitive approach to predicting multi-family residential parking utilization.

Overall challenges and successes

Challenges

The primary challenges faced by the RSP team during the course of the project involved questioning and challenging institutionally-entrenched "status quo" assumptions about parking utilization and demand. These assumptions influence public perception of parking supply and demand dynamics. They provide the foundation for developer and financier decisions regarding the building of new parking in multi-family projects and are not necessarily aligned with the realities of current conditions in many urban contexts, as the RSP research revealed.

Another challenge faced by the team was ensuring property manager follow-through with research assistance during the data collection stage of the project.

Successes

RSP has significantly advanced the industry's understanding of residential parking dynamics through its high-quality, comprehensive research, originality, and transferability to other regions. RSP presentations were a feature of multiple FHWA-sponsored parking pricing and management workshops throughout the country. The RSP study was also recently featured by both ITE and the Transportation Research Board, and it has received national attention for its innovative data-driven process, strategies of public engagement, and best practice policy development.

The pilot projects have demonstrated that the results of the RSP research can help to successfully support and guide decisions about parking supply and management. RSP tools and strategies can serve as resources to inform discussions as users weigh the factors affecting parking use and consider how much parking to provide or how much to reduce parking requirements.

Top Tips for Implementing RSP

Following are the top recommendations from the project team to other cities looking to implement RSP:

- **Good communication is important.** Maintain good relationships between real estate and jurisdictional communities.
- **Data collection takes time.** Develop strong methods that can be implemented efficiently and consistently.
- **Consider your audience.** Create tools and products that are audience-specific, context-relevant and user-friendly.
- **Improve upon the research.** The RSP project is one approach to understanding the relationship between parking supply and demand, and it lays the groundwork for future research efforts. The RSP team would like to see future efforts continue to develop and improve the research methodology. This might include conducting resident surveys, analyzing vehicle licensing information, and including on-street parking counts in the project data.

Next steps for RSP

RSP data and methodologies are currently being shared with ITE and other interested parties beyond King County, leading to subsequent projects in other regions and potential inclusion in the next edition of the ***ITE Parking Generation Manual***. RSP has garnered national attention, spurring initiatives in other regions, and many communities are examining the project to identify how RSP concepts can be implemented in their area.

One of the most important aspects of the RSP project is its up-to-date and context-specific data. Because many of the areas included in the RSP data collection sample continue to experience rapid development that results in an ever-changing context, it is important that data collection and database updates remain an ongoing piece of the RSP effort. The RSP team is analyzing options for regularly updating RSP data and the website calculator to ensure the continued accuracy of the model estimates.

Current RSP goals include continuing to gather momentum on data-driven parking allocations and securing additional partnerships for pilot projects. The RSP team also plans to develop a monitoring evaluation program to measure the effectiveness of the incentive program pilot projects.

See the project website for more information on the Right Size Parking Project: http://metro.kingcounty.gov/programs-projects/right-size-parking/

GREENTRIP PARKING DATABASE CASE STUDY

The GreenTRIP Parking Database provides data from more than 65 multi-family residential sites around the San Francisco Bay Area, a region that has shown a trend in decreased car ownership in recent years.

The GreenTRIP Parking Database project built upon the research methods developed by the King County Multi-family Residential Parking Calculator. Although not a predictive model like the RSP calculator, the GreenTRIP Parking Database takes into account many similar factors, such as income and access to transit.

Working together with CNT, the GreenTRIP team used lessons learned from RSP to optimize data collection, resulting in a wider range of data for each site. The database also incorporated more about depth of affordability than the RSP data set.

The parking database can be used to search for specific sites and to view actual total parking used at a particular location or for a particular building type. Reports can be printed and shared freely with developers and decision-makers.

The Metropolitan Transportation Commission (MTC) partially funded the research that served as the basis for the GreenTRIP database, with additional support from a U.S. Department of Housing and Urban Development grant.

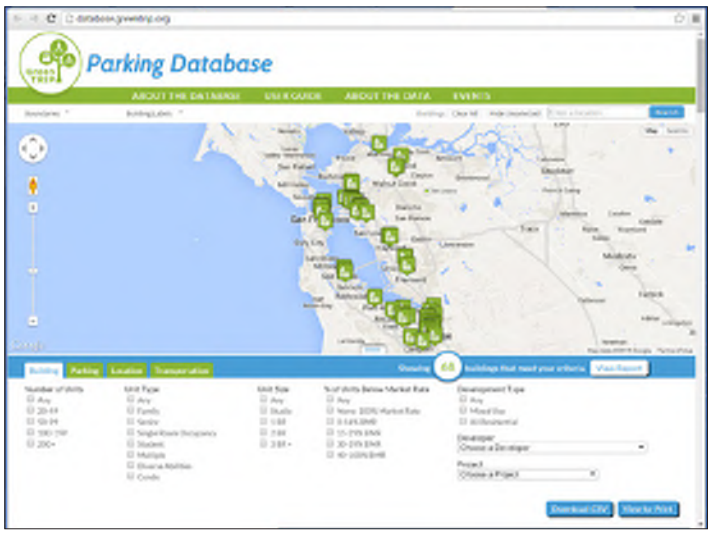


Fig. 21: The GreenTRIP user interface.

The GreenTRIP Parking Database can be found at:

http://database.greentrip.org/

Appendix

Right Size Parking products and tools

In an effort to ensure that the project data and findings continue to be easily accessible and usable by the full spectrum of stakeholders, the team created a set of technical memoranda, RSP "toolkit" documents, and a multifaceted web calculator tool to aid users in determining how much parking is "just enough" for a specific site. These tools, listed below, are described in further detail throughout this report (look for the RSP tool icon below) and can also be accessed online:

- **Right Size Parking Literature Review**
  Review of existing parking supply standards and studies
  http://metro.kingcounty.gov/programs-projects/right-size-parking/pdf/rsp-litreview_11-2011.pdf
- **King County Multi-family Residential Parking Calculator**
  Interactive map-based RSP web calculator
  http://www.rightsizeparking.org/
- **Right Size Parking Technical Research Memo**
  A summary of the RSP research findings
  http://www.rightsizeparking.org/Right_Size_Parking_Technical_Memo.pdf
- **Right Size Parking Technical Policy Memo**
  Provides policy-based solutions to identified RSP barriers
  http://metro.kingcounty.gov/programs-projects/right-size-parking/pdf/rsp-technical-policy-memo-final-09-17-12.pdf
- **Right Size Parking Model Code**
  A menu of RSP model code language for jurisdictions
  http://metro.kingcounty.gov/programs-projects/right-size-parking/pdf/140110-rsp-model-code.pdf
- **Parking Requirements and Utilization Gap Analysis**
  Comparison of code requirements and actual utilization
  http://metro.kingcounty.gov/up/projects/right-size-parking/pdf/gap-analysis-7-12-13.pdf
- **Multi-family Parking Strategies Toolkit**
  RSP parking management toolkit for property owners
  http://metro.kingcounty.gov/programs-projects/right-size-parking/pdf/multifamily-parking-toolkit.pdf

King County Metro web resources

King County Metro Right Size Parking website

The **King County Metro Right Size Parking website** includes an introduction to the RSP project and web tool, an overview of the project objectives, and links to project deliverables and additional resources.

http://metro.kingcounty.gov/programs-projects/right-size-parking/

King County Multi-family Residential Parking Calculator

The **King County Multi-family Residential Parking Calculator** is the interactive web tool that enables a wide variety of audiences to interact with the RSP data and apply the project research and findings to specific projects or areas.

http://www.rightsizeparking.org/

Right Size Parking Glossary

The **Right Size Parking Glossary** provides definitions for project-related terminology and further describes key project concepts and variables.

http://www.rightsizeparking.org/glossary.php

Additional resources & related research:

- Minimum Efforts: How a City Successfully Addressed Minimum Parking Requirements for Multi-family Properties, Daniel Rowe, ***Parking Professional Magazine***, November 2013. http://metro.kingcounty.gov/programs-projects/right-size-parking/pdf/parking-professional-article-nov-2013-drowe.pdf
- Do Land Use, Transit, and Walk Access Affect Residential Parking Demand?, Daniel Rowe, Ransford S. McCourt, P.E., PTOE, Stephanie Morse, and Peter Haas, Ph.D., ***ITE Journal***, February 2013. http://metro.kingcounty.gov/programs-projects/right-size-parking/pdf/ite-journal-feb-2013-drowe.pdf
- Contemporary Approaches to Parking Pricing: A Primer, U.S. Department of Transportation, Federal Highway Administration, May 2012. http://metro.kingcounty.gov/programs-projects/right-size-parking/pdf/fhwa-parking-pricing-primer.pdf
- Getting the Parking Right for Transit-Oriented Development, Ming Zhang, Katie Mulholland, Jane Zhang, and Ana J. Gomez-Sanchez, Center for Transportation Research, University of Texas at Austin, March 2012. http://metro.kingcounty.gov/programs-projects/right-size-parking/pdf/getting-the-parking-right-transit-oriented-development.pdf
- Searching for the Right Spot: Minimum Parking Requirements and Housing Affordability in New York City, Furman Center for Real Estate & Urban Policy, New York University, March 2012. http://metro.kingcounty.gov/programs-projects/right-size-parking/pdf/furman-parking-requirements-policy-brief_3-21-12-final.pdf
- Evaluating the Impact of Transit Service on Parking Demand and Requirements, Daniel H. Rowe, C.-H. Christine Bae, and Qing Shen, ***Transportation Research Record 2245***, December 2011. http://metro.kingcounty.gov/programs-projects/right-size-parking/pdf/trb-rowe-transit-service-impacts-parking.pdf
- San Diego Affordable Housing Parking Study, Wilbur Smith Associates, December 2011. http://www.sandiego.gov/planning/programs/transportation/mobility/pdf/111231sdafhfinal.pdf
- Parking Evaluation: Evaluating Parking Problems, Solutions, Costs, and Benefits, Victoria Transport Policy Institute, October 2011. http://www.vtpi.org/tdm/tdm73.htm
- Parking Pricing Implementation Guidelines, Todd Litman, Victoria Transport Policy Institute, March 2011. http://metro.kingcounty.gov/programs-projects/right-size-parking/pdf/park-pricing.pdf
- Parking Demand and Zoning Requirements for Suburban multi-family Housing, Richard Willson and Michael Roberts, 90th Annual Meeting of the Transportation Research Board, January 2011. http://metro.kingcounty.gov/programs-projects/right-size-parking/pdf/willson-parking-demand-suburban.pdf
- A Parking Utilization Survey of Transit-Oriented Development Residential Properties in Santa Clara County, San Jose State University and Santa Clara Valley Transportation Authority, December 2010. http://metro.kingcounty.gov/programs-projects/right-size-parking/pdf/vta-tod-parking-survey-report-vol2.pdf
- The Trouble With Minimum Parking Requirements, Donald Shoup, December 1999. http://www.vtpi.org/shoup.pdf
- Smart Growth Alternatives to Minimum Parking Requirements, Christopher V. Forinash, Adam Millard-Ball, Charlotte Dougherty and Jeffrey Tumlin. http://www.urbanstreet.info/2nd_sym_proceedings/Volume%202/Forinash_session_7.pdf

EMPTY SPACES: REAL PARKING NEEDS AT FIVE TODS

The land near transit stations is a valuable commodity. Hundreds or thousands of people travel to and through these places each day, and decisions about what to do with this land have implications for local economies, transit ridership, residents' access to opportunity, and overall quality of life for everyone in a community.

Many communities choose to dedicate at least some of that land for parking. The question is, how much? Too little parking could discourage people from coming to the station, but too much parking is unnecessarily expensive and gets in the way of other uses like homes, shops, or offices. How much parking should transportation engineers build?

To answer that question, many engineers and planners consult the Institute of Transportation Engineers' (ITE) Trip Generation and Parking Generation guides. These publications represent data collected from mostly isolated suburban land uses—not walkable, urban places served by transit. There are few alternative guidelines for engineers building this other type of development, however, so despite these shortcomings many planners continue to use ITE's publications.

The goal of this study was to determine how much less parking is required at transit-oriented developments (TODs) and how many fewer vehicle trips are generated than standard industry estimates. It is clear that TODs require less parking than development without transit, or transit without development. This study sought to gather information about how much parking is used at TOD to help developers and engineers make more-informed decisions in the future.

To do that, Professor Reid Ewing and his research team at the University of Utah College of Architecture + Planning selected five TODs across the country, each with a slightly different approach to development and parking: Englewood, CO in the Denver region; Wilshire/Vermont station in Los Angeles, CA; Fruitvale Transit Village in Oakland, CA; the Redmond, WA station in the Seattle region; and Rhode Island Row in Washington, DC. The research team together with two transportation consulting firms, Fehr & Peers Associates and Nelson\Nygaard Consulting Associates, counted all persons entering and exiting the TOD buildings, and conducted brief intercept surveys of a sample of them. Researchers also conducted parking inventory and occupancy counts.

Consistent with other research, this study found that the five TODs generated fewer vehicle trips than ITE publications estimate, and used less parking than many regulations require for similar land uses. And in one case, actual vehicle trips were just one third of what ITE guidelines estimate.

The TODs included in this study also built less parking than recommended by ITE. Yet even this reduced amount of parking was not used to capacity: the ratio of demand to actual supply was between 58 and 84 percent. Fewer vehicle trips is one likely reason why parking occupancy rates were lower than expected. Another possible reason is that ITE's data do not fully account for other travel modes that are available and actively encouraged at TODs. In each of the five TODs studied, at least 33 percent of trips were taken by modes other than driving. Additional reasons for low parking rates is that parking is shared between commercial and residential uses at two TODs, is shared between transit and park-and-ride uses at one TOD, is unbundled with apartment rents at two TODs, and is priced at market rates for commercial users at three TODs

These findings underscore the obvious need for developers, regulators, and practitioners to rethink how they use parking guidelines intended for suburban development not served by transit. Current engineering standards are not designed to accommodate this type of development but in time we hope studies like this can help change that. Better aligning industry standards with current needs can reduce the cost of development near transit, and make it easier to build more homes, shops, and offices in these high-demand locations.

Ontario town's experiment using Uber as public transportation is working, officials say

Innisfil – located just south of Barrie and home to about 36,000 people — has paid $26,462.41, or an average of $5.43 per trip, for 4,868 Uber rides taken in the two months since launching the unique-to-Canada project on May 15

Alicja Siekierska

August 8, 2017
5:18 PM EDT

Filed under
Transportation

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The town of Innisfil, Ont. is hailing its two-mo subsidize Uber as the lone form of public trar nearly 5,000 trips taken since the pilot projec

Innisfil — located just south of Barrie and hor people — has paid $26,462.41, or an averag 4,868 Uber rides taken in the two months sin unique-to-Canada project on May 15.

“We are really pleased we did go this route,” a senior policy advisor with the town.

“This partnership with Uber had definitely pro cost effective for us, being able to provide thi residents. You don’t need to be within walkin or a bus route, so it’s something that works fo

More

Last summer, Innisfil's city council was at a c
additional transportation options across the s
declared a key priority in the community's str
found that a fixed-route bus service would be
tag of $270,000 per year for one bus, and $6

Instead, the town decided to partner with glob
Uber to launch a partnership to provide on-de
Innisfil residents that is partially subsidized by
Passengers pay between $3 and $5 for set ro
such as to Town Hall and the GO train statior
for all other rides within town.

Pentikainen and Tim Cane, Innisfil's manage
will provide city council with a two-month upd
on Wednesday.

So far, demand is keeping pace with the budg
Innisfil's council committed $100,000 for the f
and an additional $125,000 next year.

There are certain times where meeting dema
but according to Uber people have been able
time," Pentikainen said.

"As a 24/7 service, we're quite pleased," Pen
that using Uber as an on-demand public tran
the best option for the town for the foreseeab

"With our large geography, the distance betw
bus routes to provide the same level of servic
expensive," he said. "Maybe decades into the
much higher population we may look at other
right now this is working for us."

Pentikainen added that, in the short term, the
to tweak the service to make it more efficient
users, as well as surveying residents about th

Uber spokesperson Susie Heath said the ride
pleased with the results of the report that was
will be presented on Wednesday.

“Since we launched this exciting public transi
has been great to see Innisfil residents acces
demand rides to get around their community
transit hubs,” Heath said in an emailed stater

“We look forward to continued dialogue with
transit authorities across Canada to explore s

The past several months have proven to be a
ride sharing company. In June, chief executiv
resigned after a lengthy investigation that wa
former engineer publicly accused the compar
and discrimination. The report, conducted by
General Eric Holder, had many recommenda
Kalanick’s authority should be reduced.

Newsroom

Turo opens new Scottsdale offices with official ceremony

May 15, 2018

Scottsdale, Arizona, May 17, 2018 - Pioneering peer-to-peer car sharer Turo announces today the official opening of its Scottsdale, Arizona offices. To celebrate the milestone, Turo has planned an official ribbon cutting at its new location.

The ribbon cutting will occur from 6:30 to 8:30 PM at the new offices, which are located at 4110 N. Scottsdale Road. Opening remarks will be given by Michelle Peacock, Vice President and Head of Government Relations at Turo.

"Innovation and technology are key drivers in Scottsdale's economic growth and we are excited to see Turo at the forefront of peer-to-peer car sharing. Their decision to expand operations and make an additional investment is a testament to the positive business environment we have created in Scottsdale," said Mayor W.J. "Jim" Lane.

Representatives from Turo include Alex Benn, President; Andrew Mok, Chief Marketing Officer; Michelle Peacock, Vice President and Head of Government Relations; Tristam Hewitt, Head of CS and Claims; Steve Webb, Senior Director of Communications & Community; Tyler Hamilton, Facilities Manager and Chris Witmer, Community Manager.

The Turo event will also include some fun added bonuses. Guests and employees will enjoy drink trucks, a GIFbooth, a DJ and free Turo merchandise.

Turo operated from a DeskHub in Scottsdale, beginning in February 2018. Turo chose Scottsdale for its first expansion site outside of San Francisco because of the region's existing talent and to bolster its success in one of its biggest markets.

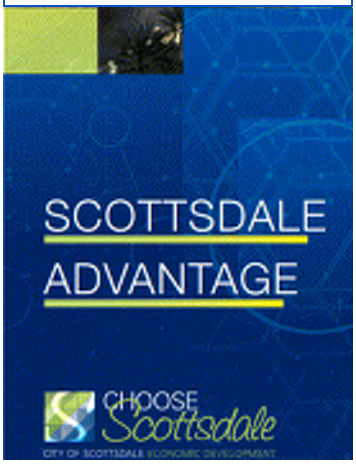
Turo, founded in 2009 and headquartered in San Francisco, has grown to operate in over 5,500 cities in North America and has safely facilitated over 1 million rental days to date. The average active US member makes USD $625 per month renting out a car in the marketplace.

#####

About Turo

Turo is a car sharing marketplace where local car owners provide travelers with the perfect vehicle for their next adventure. Across the country or across town, travelers choose from a unique selection of nearby cars, while car owners earn extra money and help fuel the adventures of travelers from around the world. A pioneer of the sharing economy and travel industry, Turo is a safe, supportive community where the car you book is part of a story, not a fleet. Whether it's

FEATURED DATA



SEE ALL DATA & REPORTS

About the City of Scottsdale

Scottsdale is one of the state's leading job centers, with a diverse economy built on medical research, high-tech innovation, tourism and corporate headquarters. Scottsdale is home to nearly 18,000 businesses supplying over 150,000 jobs. The high-tech innovation center SkySong, located just a few miles from Downtown, is designed to help companies grow through a unique partnership with nearby Arizona State University. The Scottsdale Cure Corridor is a partnership of premier health care providers and biomedical companies seeking to advance medicine and patient care through cutting-edge research. For more information, visit ChooseScottsdale.com.

City of Scottsdale Economic Development
3839 N. Drinkwater Blvd. | 2nd Floor | Scottsdale, AZ 85251
480-312-7989 | **Business@ScottsdaleAZ.gov**

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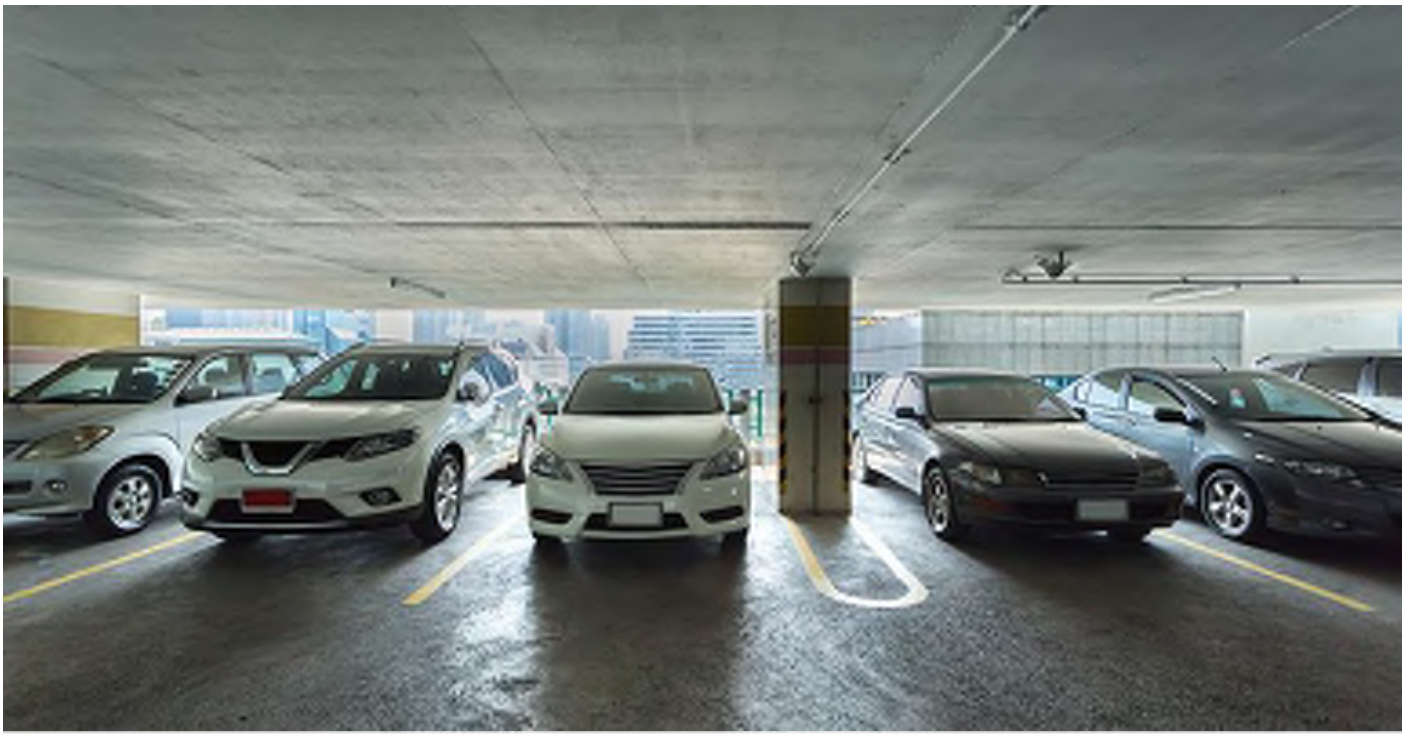


MULTIFAMILY

Apartment Developers Try to Figure Out the Parking Equation in a World with Fewer Cars

Tenants today are still less dependent on automobiles than they have been in years past, especially if they live a market where they can walk to amenities.

Bendix Anderson | May 08, 2018

Nobody knows for sure how much parking a new apartment property is going to need, and that uncertainty can have a big impact on developers' building decisions.

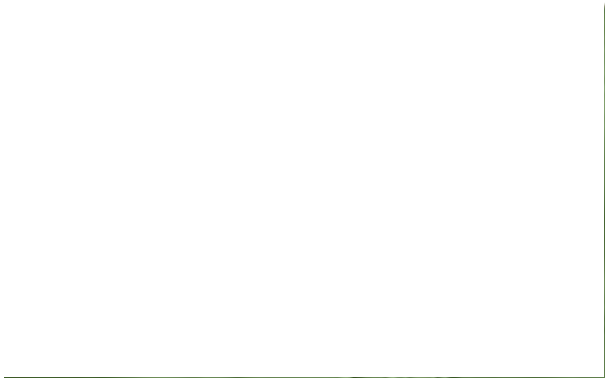
"More and more frequently, developers are telling us that the difference between a new construction deal working financially or not working comes down to the parking requirement," says Greg Willett, chief economist with RealPage, Inc., a provider of property management software and services.

Many apartment renters still depend on cars to get around, at least part of the time. However, tenants today are still less dependent on automobiles than they have been in years past, especially if they live a market where they can walk to amenities and have access to other transportation options. If automakers succeed in creating self-driving cars that become widely used, renters will need even fewer parking spaces in the near future.

"What will you do with all these parking spaces that you might not need in 10 years if all these trends with ride-sharing and self-driving cars continue as projected?" asks Rick Haughey, vice president for the National Multifamily Housing Council (NMHC), an industry group. Developers are doing their best to build more flexibility into their apartment buildings, especially in more urban areas.

Parking is expensive

Developers pay about $30,000 per space, on average, to create structured parking, according to NMHC. In addition to the cost in dollars, the developer must give up valuable space for parking space. If those spaces turn out to be unnecessary after the building opens, a concrete parking garage is very difficult to demolish or convert to another use.



At the same time, developers often also get punished if they do not build enough parking.

“Parking is still a desired amenity [in our Kingsley Survey of the amenities] that renters desire the most,” says NMHC’s Haughey, referring to the *Kingsley Apartment Renter Preferences Report*. “Though if you break that down by urban and suburban, you would probably get completely different results.”

In suburban areas, leading apartment developers like The NRP Group often build 1.6 to 1.8 parking spaces for every apartment. “Location is absolutely the key,” says Carolyn Mendel, vice president of development for The NRP Group. “In the suburbs, people love to have easy access to the commuter rail, but more often than not, residents who commute via train will still have a car to get around on weekends.”

In many urban areas that provide more transit options for residents NRP builds far fewer parking spaces—typically 0.5 to 1.5 per apartment. “We are even starting to see apartment projects in the urban core building without any parking at all, which is a relatively new phenomenon for this market [Boston],” says Mendel.

is a relatively new phenomenon for this market [Boston]," says Mendel.

These needs are changing rapidly, especially as options like Uber and bike-share programs change how urban residents get around, Mendel notes.

As a result, to succeed, developers will need to do more than just repeat what worked for them in the past. A building that barely had enough parking for its residents a few years ago might have empty parking spaces today.

"The best way to gauge your assumptions is to survey other comparable properties," says Mendel.

The market study may also reveal where potential residents are likely to work, which will help the developer gauge their need for cars. Developers should also look at the amenities within walking distance of the property when assessing how much parking residents are likely to need.

Fighting with local officials about parking

Traditionally, apartment developers have fought with local officials to build fewer parking spaces, according to Haughey.

That's also changing. A few large cities now require less parking for apartment projects. Sometimes, financing providers, not zoning officials, ask for more parking spaces. "Many investors still believe in one to two parking spaces per unit," sa

Haughey.

As times change, some developers are building as much flexibility as possible into their parking arrangements. “Shared parking agreements are great options for mixed-use developments. If the development is intended for retail or office use on the first floor, and apartments above, the heavy traffic hours are flipped,” says Jenny Redlin, principal and relationship manager at Partner Engineering and Science, Inc., an engineering and environmental consulting firm.

Developers can also help reduce the need for parking at their properties. This can be done by providing locked storage areas for bikes or bike-sharing stations, partnering with companies like Zipcar to provide car rentals on an as-needed basis and subsidizing resident passes for local mass transit. Landlords can even provide shuttle bus service to the nearest transit station.

“Proposing transportation demand management (TDM) measures can be very helpful in convincing local officials of why your proposed parking ratio will be sufficient,” says Mendel.

Because of the latest transportation trends, sometimes an older apartment building may have more parking spaces than it needs. These empty spaces may provide a different kind of opportunity.

“When looking at acquisitions opportunities, some investors are beginning to take into consideration whether an existing property has excess parking capacity that can be used to generate additional revenue,” says RealPage’s Willett.

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Toward Zero Parking: Challenging Conventional Wisdom for Multifamily

By David Baker and Brad Leibin
July 2, 2018

The 69 condos in 388 Fulton (left center) in San Francisco's Hayes Valley sold easily in 2017 without any structured parking being provided. (Bruce Damonte)

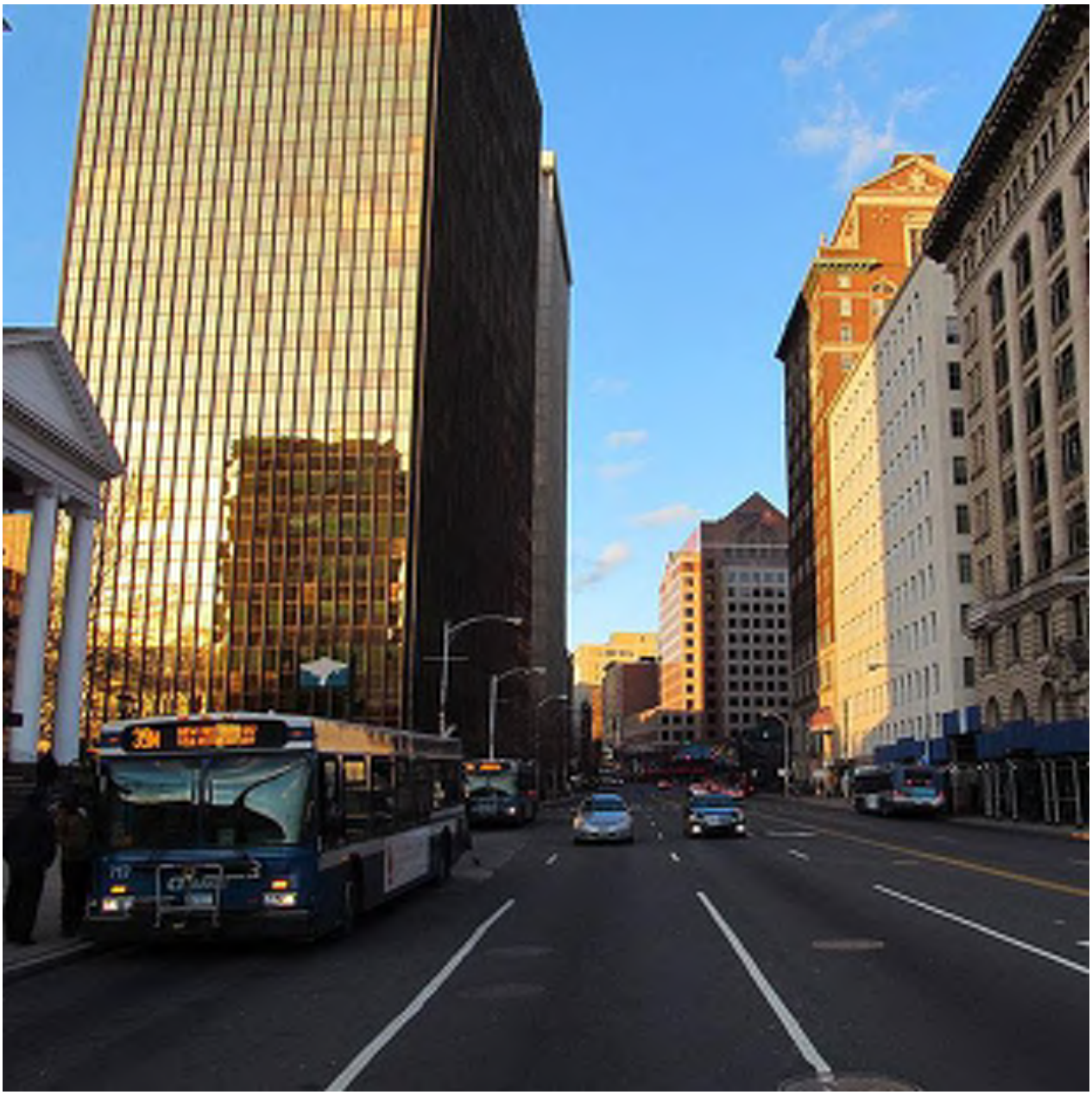
This article appeared in the spring issue of Urban Land *on page 146.*

The rising popularity of human-powered transportation, walking and bicycling, and widespread availability of ride-hailing services like Lyft and Uber plus car-sharing services like Zipcar and Getaround, and the introduction of same-day delivery services have all reduced the need for individuals to own—and park—cars.

At the same time, costs of construction are at historic highs in dense urban areas, creating a challenge for developers to meet housing demand. Individual unit sizes are shrinking in response, allowing greater density. However, with smaller units, the number of parking spaces goes up, too, if traditional parking ratios hold. High construction expenses result in a very high per-space cost for parking spaces, especially for structured parking, which can run $50,000 or more for a single space.

In response to these factors, municipalities are changing the way they handle parking. Cities around the United States are eliminating minimum parking requirements for new developments.

Last year, officials in Buffalo, New York, removed parking minimums citywide for commercial and residential projects of less than 5,000 square feet (465 sq m). Also last year, Hartford, Connecticut, scratched parking minimums across the city for commercial and residential developments, regardless of size. Many other municipalities have removed parking minimums for at least one part of the city or have lowered or removed minimums for certain uses. San Francisco has gone a step further, establishing parking maximums for downtown and nearby areas well served by public transit, capping the amount of parking that developers are allowed to build for multifamily housing.



In 2017, Hartford, Connecticut, scrapped parking minimums across the city for commercial and residential developments, regardless of size. (John Phelan/Wikimedia Commons)

Nevertheless, even multifamily housing developers who support creating walkable neighborhoods and prioritizing alternative forms of transit still think they need to follow traditional parking ratios or the units will not rent or sell. What

follows are common concerns we have heard in our architecture practice, as well as the experiences and counterarguments we have come across that make us optimistic about reaching a future in which parking plays a much-diminished role in the urban environment.

1. Will planning commissions embrace attempts to reduce or eliminate parking?

About 20 years ago, a development proposal came before the San Francisco Planning Commission: a new restaurant with two residential units above and no parking spaces for the residents. Even though the project was small, dozens of neighbors showed up at the commission hearing to share their fears about the loss of street parking. The commission chairman responded by saying, "I moved from Manhattan to San Francisco so I could park." The commission voted down the no-parking proposal. Back then, the primary concerns of neighbors of proposed projects were increased traffic and competition for street parking.

In the intervening years, as voter attitudes toward automobiles have changed, the San Francisco Planning Commission has reversed its approach.

In 2005, the commission established caps specifically addressing the amount of parking developers can build for multifamily housing downtown and nearby areas well served by public transit. The commission encourages projects with active uses on ground floors, and not requiring parking makes this easier by freeing space for commercial or residential use and obviating the need for a wide parking garage door on the street. Limiting driving also reduces infrastructural maintenance costs. Last year, San Francisco's Transportation Demand Management Ordinance acknowledged that parking generates auto traffic (rather than the converse—that traffic is mainly caused by cars circling in the hunt for scarce parking, which is often the pro-parking argument).

2. What about irate neighbors?

Although some community groups still push developers to add parking, many neighborhood associations are now recognizing that car ownership is dropping. We recently designed a project in central San Francisco, the Brady Block, which will have about 600 new units of housing, a new office building, and new public realm and streetscape improvements on Market Street. The parking ratio is about 0.5 spaces per apartment. The local neighborhood group, the Hayes Valley Neighborhood Association, would have preferred that the ratio be 0:1, and, in fact, we were concerned members would come to the Planning Commission hearing to demand less than the 0.5 ratio. In the past, we would face local resident groups who would oppose projects for the opposite reason.

Urban advocacy groups have played a key role in changing public opinion. Locally, these include SPUR (San Francisco Bay Area Planning and Urban Research Association), Livable City, the San Francisco Bicycle Coalition, TransForm, and the San Francisco Housing Action Coalition, among others. They have been highly active in encouraging reliance on—and infrastructure support for—walking, bicycling, and transit, and they endorse developments that deemphasize reliance on the automobile.

In place of parking in San Francisco, Curran House's ground floor includes community spaces, a peaceful courtyard, office space for the building developer, and additional affordable family-sized units. (Brian Rose)

3. Even if residents say they drive less, don't they really want to own a car?

We have not found this to be the case.

An example is one of our recently completed projects, Potrero 1010, a 453-unit mixed-use, mixed-income development in San Francisco's Potrero neighborhood. Developed by Chicago-based Equity Residential, Potrero 1010 has 0.65 parking spaces per unit, which was the city's allowed parking maximum, and the parking spaces are not bundled with the units but available for rent separately.

About half of the parking spaces are rented, while the others remain empty, indicating that the development could have succeeded with half the parking. The building promotes walkability and alternative forms of transit: it has extensive bike storage with bike repair stands, and it is organized around a new city-owned one-acre (0.4 ha) park accessible to the public via a midblock passage lined with active uses.

4. Renters may be willing to forgo cars, but what about condominium buyers?

We designed a no-parking condo building, 388 Fulton, in Hayes Valley, San Francisco, for local developer 7×7 Development, with 69 studio and two-bedroom market-rate units. Even with zero parking, the units sold out easily in 2016 and early 2017.

5. Don't residents prefer the security of driving in their own cars?

At 388 Fulton, most of the 35 325-square-foot (30 sq m) micro-unit studios were purchased by single women in their 20s and 30s. This challenges the idea that car ownership is perceived as safer even though parking garages are high-crime areas. With the ubiquity of ride-hailing services, residents can walk out their front door, hop in a vehicle, and get dropped off at their destination rather than risk having to drive themselves, park several blocks from their destination, and walk the remaining distance, or walk through a parking garage getting to and from a car.

The Brady Block, in design in San Francisco, will have 600 new units of housing, a new office building, a new public realm, and streetscape improvements on Market Street—plus a 0.5:1 parking ratio. (David Baker Architects)

6. How can affordable-housing developers and operators help residents travel to jobs and schools without providing parking?

"While our priority is to provide housing, we do not want simply to pass the cost of parking on to our residents," says Jerry Jai, senior project manager at East Bay Asian Local Development Corporation (EBALDC), an Oakland-based nonprofit provider of affordable housing. "If we don't offer parking, does that limit job opportunities? What about costs due to towing, break-ins, and parking tickets?"

Jai notes that car ownership is not just about quality of life; it can also help parents transport their kids to school. "We don't want to be in a patronizing position where we say to residents, 'You should be able to get by without parking.'" However, Jai points to new sources of funding like California's Affordable Housing and Sustainable Communities Program (AHSC) as a promising opportunity. "Sources like AHSC are exciting because they encourage affordable-housing developers to build in transit-rich areas and to increase transportation connections—bus, light rail, etc."

Not paying to build parking can also free up money to provide other supportive resources to residents in need. In San Francisco's Tenderloin neighborhood, Curran House, completed in 2005, has 67 affordable family apartments an

parking spaces. Most of the low-income residents cannot afford a car, and the central site has excellent public transit connections. Providing parking would have added several million dollars to the construction cost.

By not spending money—or dedicating space—for structured parking, the nonprofit housing developer, Tenderloin Neighborhood Development Corporation (TNDC), was able to provide additional units, a courtyard, space for supportive services, neighborhood-serving retail space, and office space for itself.

Our firm is working on another project with TNDC, 222 Taylor Street, just a block from Curran House on the site of a former parking lot. The design includes 113 affordable family apartments and no parking, reserving the ground level for a much-needed community grocery.

Now that Congress's overhaul of the federal tax code has lowered the tax rate for corporations and federal affordable housing tax credit programs have less value to corporations, developers of affordable housing will be even more strapped for funds, and eliminating parking will become even more essential as a strategy for meeting housing demand.

7. Will lenders be willing to finance low- and no-parking developments?

Developers who plan to build multifamily housing and then sell it have to convince equity investors and loan committees to accept lower parking ratios. The investment community is often reluctant to embrace lower amounts of parking, fearing that renters and especially buyers will be turned off, particularly in places outside highly dense urban areas like San Francisco.

However, this is changing, says Will Goodman, vice president of San Francisco–based Strada Investment Group. "There is an evolution happening with the investment community to accept no parking or low parking," he says. "We are seeing parking utilization rates go down in new buildings and technologies like ride share expanding. So, investors are increasingly buying into the story that most people don't need parking day to day, especially if they are in an area that is near to transit and where traffic is bad. In these locations, people are typically not driving to work. They may want a car for weekend excursions, but it does not need to be on site."

Particularly in super-hot markets like San Francisco, there are many precedents that investors can look at to understand that renters are willing to forgo on-site parking. But even in slightly cooler markets like downtown Oakland, Goodman says he is finding that investors are willing to take the risk.

Strada is about to break ground on a new luxury high-rise rental development in downtown Oakland, where there has not been a luxury high-rise completed since 2009. "All the comps are based on 2009 or pre-2009 parking-to-dwelling-unit ratios, which are 1:1," Goodman says. "There were some members of the investment community who were not comfortable with not providing parking. We were ultimately able to find the right investors who saw the project as representing the future of Oakland development. They understood that this is a project in an extremely transit-rich part of the city. Additionally, there are a number of garages nearby so that our residents could have a secure parking space off site."

The simplest solution is for municipalities to put parking maximums in place for transit-rich areas, as San Francisco has done. These maximums change the culture, providing successful examples of developments with limited parking, which consequently makes it much easier for developers to persuade investors to get behind low- and no-parking developments.

Even in more car-oriented markets, some developers are seeing an opening for reducing parking. In Minneapolis, we are working with local developer Lander Group on a mixed-use residential project on a 1.5-acre (0.6 ha) site in the Lyn Lake neighborhood. It is in the conceptual design phase, and the developer aims to balance density and parking requirements with a desire to create a vibrant streetscape and public realm.

"The larger projects with institutional investors are going to be very cautious about reducing parking ratios," says Michael Lander, founder and president of Lander Group. "But lenders are starting to understand that in some of the denser, more transit-rich markets there is not as much need for parking. And they know the enormous cost of parking. So there is beginning to be a changing of the status quo."

In San Francisco's Tenderloin neighborhood, 222 Taylor (left) is replacing a little-used parking lot with 113 homes for low-income residents and a neighborhood-serving grocery store. (David Baker Architects)

8. Millennials may be forgoing car ownership, but are baby boomers still attached to owning their own cars?

Even many baby boomers are beginning to question the need for cars and parking, Lander says. "The baby boomer generation in the Midwest is often still saying the same thing when it comes to proposed new developments: 'not enough parking, too much traffic.' It is a relearning process for baby boomers," says Lander. "When empty-nesters move downtown, they often bring two cars. But once they try the alternatives, like ride share, many of them reconsider the practicality of owning more than one vehicle."

9. Does this idea have traction beyond San Francisco?

Last year, San Francisco developer Panoramic Interests proposed building 1,031 market-rate apartments near the West Oakland station on the Bay Area Rapid Transit (BART) system and providing no parking for residents. The project is going through the approval process. Also in Oakland, EBALDC is looking for creative ways for projects to make economic sense despite rapid construction-cost escalation. One of these ways is reducing or eliminating parking. "The elimination of parking in one of our recent projects resulted in major savings, which made the difference between a feasible project versus one that was not," says Jai.

Even outside coastal markets, possibilities exist to minimize parking. "Midwestern cities like Minneapolis are different from denser, more transit-rich cities," Lander says. "There is more need for a car. So, I think there will still be a lot of auto mobility in the future, but many more alternatives to private ownership like Uber and car-sharing services. This will significantly reduce the need for parking."

10. Is the preference for not owning a car just a short-term trend?

A future not dominated by privately owned cars may be a long way off, but increasingly the use of a car is becoming detached from the need for parking. In urban areas, driverless taxis are likely to hit the streets much sooner than anticipated. Waymo, Google's self-driving car project, has teamed with Fiat Chrysler Automobiles to announce plans to

start offering driverless ride-hailing service in Phoenix by the end of this year. General Motors plans to launch a fleet of driverless taxis in multiple cities in 2019. At the same time, municipalities that once focused on providing ample street parking are now prioritizing bus stops, loading zones, bicycle lanes, and ride-hailing stops.

The days when multifamily housing developers must provide individual parking spaces are numbered. "Who knows? Perhaps in 20 years, no one will be having this debate because of autonomous vehicles, ride sharing, and improvements in public transportation," says Jai. "We need to remember that we are building housing that is supposed to last 50 years."

David Baker *is a principal and* ***Brad Leibin*** *is an associate at David Baker Architects in San Francisco.*

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Juergen Fenk Appointed Chairman of ULI Europe

By Trisha Riggs
July 6, 2018

Text Size: A A A

Juergen Fenk, member of the Group Executive Board of SIGNA Group, has been named the new chair of ULI Europe. Fenk, who succeeds Jon Zehner, global head of the client capital group for LaSalle Investment Management, will serve on a voluntary basis for a two-year term.

Fenk brings extensive ULI leadership experience to his new role. A member of ULI for over a decade, Fenk has just completed a four-year term as chair of ULI Germany, ULI's second largest national council in Europe. He is also a Global Governing Trustee, a member of ULI Europe's Executive Committee, and serves on ULI's Global Board of Directors.

"On behalf of all of the ULI members in Europe, I would like to thank Jon Zehner for his visionary leadership over the past two years," said Fenk. "During Jon's term as chair, ULI Europe has grown rapidly to nearly 3,500 members, and expanded the opportunities for members to engage by increasing the number of National Council events, creating new Product Councils, and advancing programmes such as UrbanPlan. Undoubtedly one of Jon's greatest achievements as chair is the creation of our new Strategic Plan that will act as ULI Europe's roadmap for the next four years."

Fenk will lead the implementation of the ULI Europe Strategic Plan, which is part of ULI's Global Strategic Plan, recently approved by the Institute's Global Board of Directors. The four-year plan strives to strengthen member engagement and expand its impact around the world. The Europe Strategic Plan will focus on five key areas: growing individual and corporate membership in the region; strengthening ULI's position in Europe as a multi-disciplinary real estate and land use knowledge network, which leads in applying big ideas and emerging trends to business practices; further developing National Councils and Product Councils to increase member engagement; focusing on mission-driven activities, such as UrbanPlan and Advisory Services to distinguish ULI from other organizations; and establishing a financially resilient platform for sustainable growth.

"ULI in Europe is in an exciting phase of its development," said Fenk. "The approval of the new Strategic Plan will provide us with the focus and investment needed to grow our membership, develop our networks, and expand our reach across Europe. Our approach will be to continue building each National Council by developing its local programme and growing its membership, while at the same time increasing the knowledge sharing and collaboration between councils to ensure we build a truly European network."

"ULI's global and genuinely multi-disciplinary membership is something that makes us unique among real estate organisations. ULI's origins in Europe have always made it more historically focused on capital markets and finance, and while we want to maintain our strong presence in this area, we also want to continue our growth in other sectors and disciplines to ensure we are truly reflective of the whole real estate market," continued Fenk. "Advisory Services is one programme that can really help us broaden our engagement with the public sector. During my term as chair for ULI Germany, we undertook an Advisory Services panel in Frankfurt / Offenbach. The panel not only tackled an important real estate challenge for the city, but really helped drive engagement between members and facilitated a much richer dialogue