

December 2014

downtown allentown

development and urban design plan

APPENDIX: SHARED PARKING ANALYSIS



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1 LAND USE ANALYSIS

Parking does not exist independently, but it is intricately intertwined with the overall mix of land uses and activities it serves. As downtown Allentown evolves and attracts a variety of land uses, this relationship is critical. This appendix explores the current relationship between existing land use and parking, and models the expected land use and parking given known and potential development.

Downtown Allentown does not represent typical suburban development. The mix and proximity of land uses, walkable environment, active small-scale retail, supportive residential neighborhoods, and growing local dining scene helps enhance its local feel. When land is at a premium in this center of activity, careful consideration of what the land is dedicated to (built environment, roadways, open space, parking) has a significant impact on the vitality of downtown.

This appendix uses a model to understand the ratio of land use and parking supply and demand in three sub-areas of activity in downtown. The model determines how much parking would be needed assuming that the parking is used by more than one land use and driver (customers, employees, visitors) visiting multiple destinations. Ideally, the combined results of this analysis would be compared to the actual observed parking demand, but this data was unavailable. Each activity area also includes a long-term buildout scenario which includes expected and future potential development.

ABOUT LAND USE AND PARKING RATIOS

The Institute of Transportation Engineers (ITE) produces a periodic report titled *Parking Generation*, which is the prevailing national standard in determining parking demand for a development. ITE standards are based on parking demand studies submitted to ITE by a variety of parties, including public agencies, developers and consulting firms. The most recent parking generation manual available is the 4th edition (2010) and is a comparative starting point to determine baseline assumptions. This study includes ITE peak period parking demand rates as guidelines to benchmark how the existing parking supply in Allentown compares to its land uses.

Expected parking demand is a way to examine the amount of parking that would be needed to support the level of development and activity present within the study area. In this case, the analysis is completed using industry standard methodology to equate land use with expected parking demand. ITE parking standards are often based on peak hour demands of suburban sites with isolated, single land uses which have free parking (Institute of Transportation Engineers, *Parking Generation* 4th Edition, 2010, page 2). Nelson\Nygaard's experience indicates that projections using standard ITE parking rates tend to overestimate demand for downtown areas like Allentown. Mixed-use areas offer the opportunity to use one parking space for multiple land uses. This reduces the total number of spaces which would be required by the same land-uses in stand-alone developments.

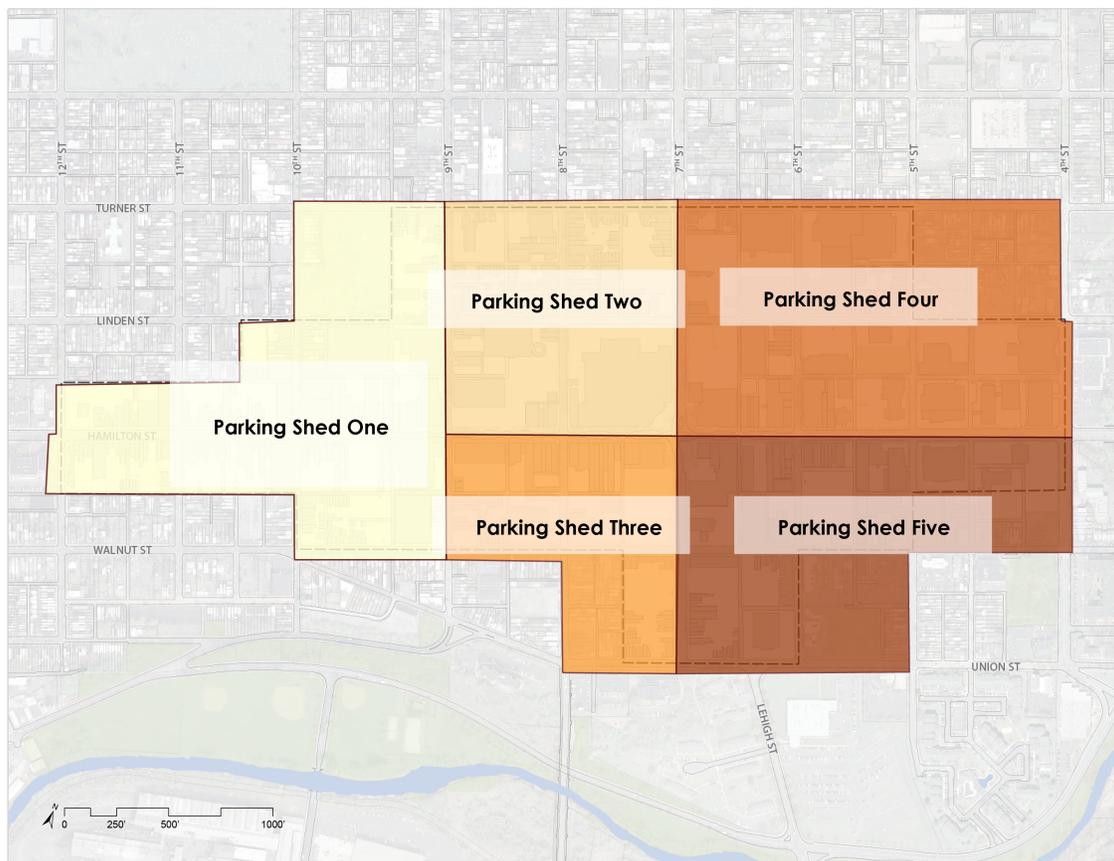
To demonstrate the efficiency of a park-once environment, Nelson\Nygaard used an adapted shared parking model using inputs from the Urban Land Institute's (ULI) Shared Parking Manual (2nd Edition, 2005) and ITE's Parking Generation (4th Edition, 2010). Besides demand by time of day, the model is calibrated for downtown Allentown with a reduction for internal capture. Mixed-use downtowns allow for parking efficiencies through "internal capture" or "captive market" trips. Such trips are made by patrons who, having already parked, travel between uses without accessing their vehicle. Restaurants and retail services are common generators of internal capture trips in mixed-use developments, as they serve both employees and residents within the same area. The model includes a conservative percent reduction to account for the mix of Allentown development patterns.

PARKING SHED SUBAREAS

The team identified five parking sheds, or subareas, within downtown. These areas were identified based on existing land uses and the propensity, and walking distance, to park on one end of the subarea and walk to the other. Understanding that there are multiple options to analyze the downtown environment, the study team determined that these five areas best represented reasonable subareas of activity.

A separate analysis is conducted for each subarea.

Figure 1 Allentown Downtown Land Use Subarea/Node Analysis Zones



PARKING SHED ONE

Land Use

Currently, within Parking Shed One, there is approximately 700,000 SF of commercial and retail space, approximately 350 residential units, and 220 hotel rooms. This space analysis excludes single-family homes. Land uses are grouped as accurately as possible into categories created by the *Institute of Transportation Engineers Parking Generation 4th Edition* (2010). The future build out scenario for Parking Shed One includes an additional 37,000 SF of commercial and office space and approximately 150 residential units. Figure 2 shows the breakdown of existing and future land use by category in this subarea. The square feet and unit numbers are adjusted for existing vacancies.

Figure 2 Parking Shed One- Existing and Build Out Land Uses

Land Use	Existing Square Feet/ Units	Build Out Square Feet/ Units	Net SF/ Units
Light Industrial	2,745 SF	2,745 SF	-
Community Center	34,236 SF	34,236 SF	-
General Retail	111,357SF	117,035 SF	+ 5,678 SF
Restaurant	111,357SF	117,035 SF	+ 5,678 SF
Office	1,014,673 SF	1,041,300 SF	+26,627 SF
Low to mid rise apartments	345 Units	513 Units	168 Units
Hotel	224 Rooms	224 Rooms	-
Total	1,274,368 SF 224 Rooms 354 Units	1,312,351 SF 513 Units 224 Rooms	+37,983 SF 168 Units

Parking Demand

According to national parking standard calculations from ITE, the needed number of parking spaces for Parking Shed One is 2,689 spaces. As shown Figure 3, the subarea has an existing total of 2,180 spaces, approximately 500 below the expected ITE demand.

The parking model, Figure 4, shows the number of parking spaces needed after factoring in time of day demands by land use and Allentown’s mixed-use environment. The estimates show that the peak demand is at 12pm with 1,535 spaces. Currently there is adequate supply to meet demand, with a surplus of approximately 650 spaces during the peak demand period.

The team worked with a buildout scenario to model the expected parking demand of a proposed land use mix. The scenario assumes that some vacant or underutilized properties (including some surface parking lots) are used for commercial, office, residential, and parking supply. This buildout scenario results in a net loss of about 50 parking spaces. Regardless, Figure 6 shows that there is expected to be enough parking supply to meet demand, with a surplus of about 470 parking spaces during the peak period.

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Figure 3 Existing Parking Demand by Land Use

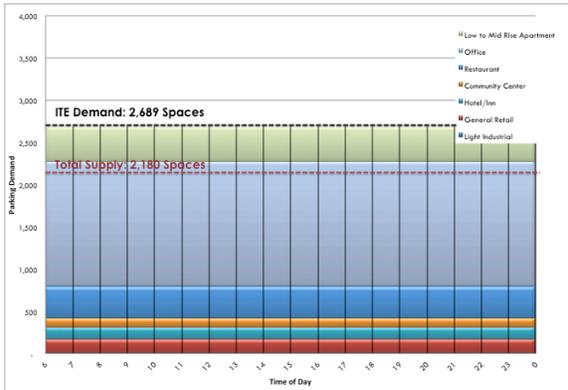


Figure 4 Existing Parking Demand by Land Use with Time of Day Adjustments

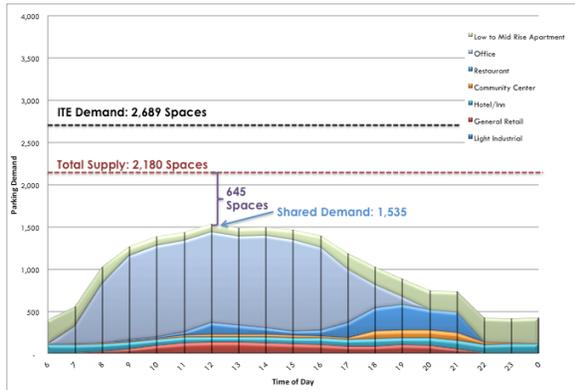


Figure 5 Buildout Parking Demand by Land Use

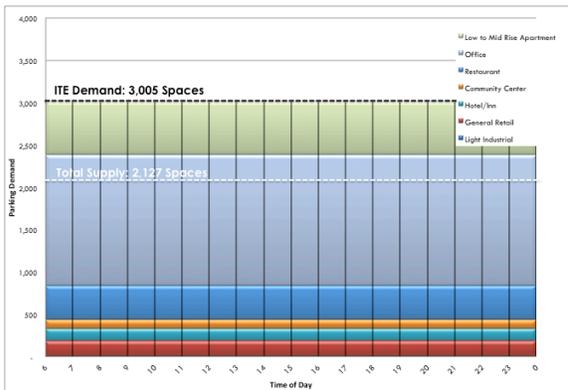
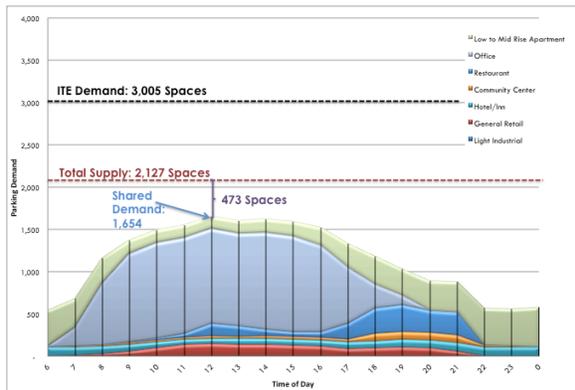


Figure 6 Buildout Parking Demand by Land Use with Time of Day Adjustments



PARKING SHED TWO

Land Use

Overall, there is about 670,000 square feet of commercial and retail space, 315 residential units, and an 8,500 seat arena within Parking Shed Two. This analysis excludes single-family homes. Land uses are grouped as accurately as possible into categories created by the *Institute of Transportation Engineers Parking Generation 4th Edition (2010)*. Figure 7 shows the breakdown of existing and future land use by category in the subarea. The square feet and unit numbers are adjusted for existing vacancies.

Figure 7 Parking Shed Two- Existing and Build Out Land Uses

Land Use	Existing Square Feet/ Units*	Build Out Square Feet/ Units	Net SF/ Units
Church	10,896 SF	10,896 SF	-
Community Center	21,887 SF	21,887 SF	-
Light Industrial	26,076 SF	22,572 SF	-3,504 SF
General Retail	52,905 SF	53,364 SF	+459 SF
Restaurant	52,905 SF	53,364 SF	+459 SF
Office	717,536 SF	1,021,136 SF	+303,600 SF
Low to mid rise apartments	315 Units	433 Units	+118 Units
Arena	8,500 Seats	8,500 Seats	-
Hotel	180 Rooms	180 Rooms	-
Total	882,205 SF 315 Units 8,500 Seats	1,183,219 SF 433 Units 8,500 Seats 180 Rooms	+301,014 SF 118 Units

Parking Demand

According to national parking standard calculations from ITE, the needed number of parking spaces for Parking Shed Two is about 4,700 spaces. As shown Figure 8, the subarea has an existing total of 2,143 spaces, approximately 2,500 below the expected ITE demand.

The parking model, Figure 9, shows the number of parking spaces needed after factoring in time of day demands by land use and Allentown's mixed-use environment. The model estimates that the peak demand is at 8pm with 2,566 spaces (this assumes there is an event at the PPL Center). This means that on event nights, there is an expected shortage of about 425 spaces within this Parking Shed; however, there is available evening parking supply available within walking distance in other parking sheds. As the Fall 2014 event counts have shown, the parking demand has not exceeded available parking supply.

The team worked with a buildout scenario to model the expected parking demand of a proposed land use mix. The scenario assumes that some vacant or underutilized properties (including some surface parking lots) are used for commercial, office, residential, and parking supply. This scenario results in a net loss of about 40 parking spaces. With the added land uses and no new parking supply, the model estimates that this Parking Shed would have a deficit of about 600 parking spaces.

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Figure 8 Existing Parking Demand by Land Use

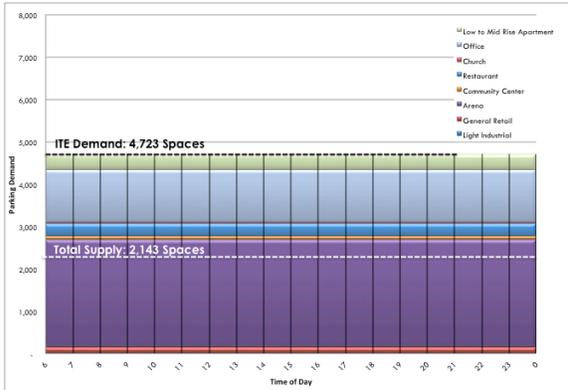


Figure 9 Existing Parking Demand by Land Use with Time of Day Adjustments

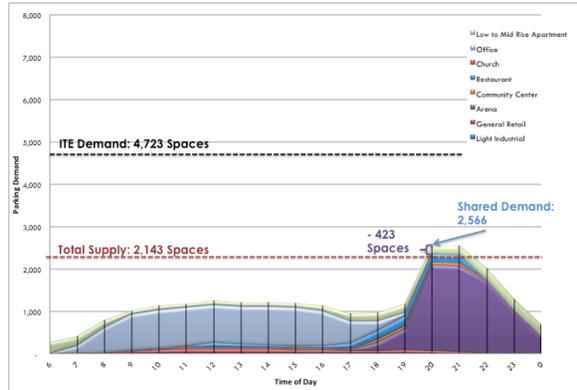


Figure 10 Buildout Parking Demand by Land Use

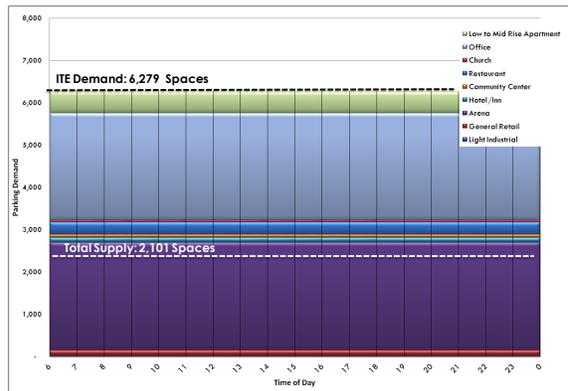
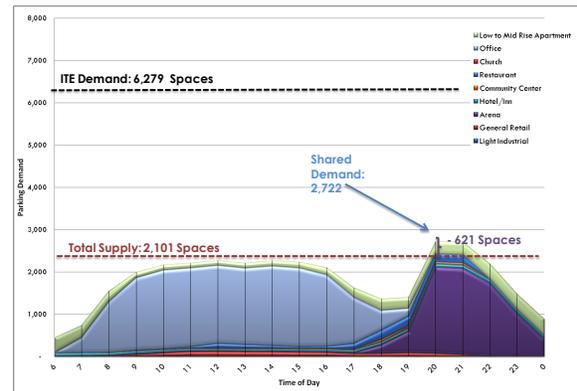


Figure 11 Buildout Parking Demand by Land Use with Time of Day Adjustments



PARKING SHED THREE

Land Use

Overall, there is about 360,00 square feet of commercial and office use, and 144 residential units in Parking Shed Three. This analysis excludes single-family homes. Land uses are grouped as accurately as possible into categories created by the *Institute of Transportation Engineers Parking Generation 4th Edition (2010)*. Figure 12 shows the breakdown of existing and proposed build out land uses by category in this subarea; the square feet and unit numbers are adjusted for existing vacancies.

Figure 12 Parking Shed Three- Existing and Buildout Land Uses

Land Use	Existing Square Feet/ Units	Build Out Square Feet/ Units	Net SF/ Units
Light Industrial	7,470 SF	7,470 SF	-
Church	19,330 SF	19,330 SF	-

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General Retail	70,502 SF	67,745 SF	- 2,758 SF
Restaurant	70,502 SF	67,745 SF	- 2,758 SF
Office	342,520 SF	453,387 SF	+110,867 SF
Low to mid rise apartments	144 Units	342 Units	+198 Units
Total	510,324 SF 144 Units	615,677 SF 342 Units	+105,353 SF + 198 Units

Parking Demand

According to national parking standard calculations from ITE, the needed number of parking spaces for Parking Shed Three is about 1,200 spaces. As shown Figure 13, the subarea has an existing total of 644 spaces, approximately 550 below the expected ITE demand.

The parking model results (Figure 14) show the number of parking spaces needed after factoring in time of day demands by land use and Allentown’s mixed-use environment. The estimates show that the peak demand is at 12pm with about 650 spaces. This is about the same number of spaces that exist in this area today.

The team worked with a buildout scenario to model the expected parking demand of a proposed land use mix. The scenario assumes that some vacant or underutilized properties (including some surface parking lots) are used for commercial, office, residential, and parking supply. This scenario results in an increase of approximately 1,460 spaces. However, Figure 16 shows that the expected demand at peak is less than the total number of spaces by about 1,200 spaces in the afternoon.

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Figure 13 Existing Parking Demand by Land Use

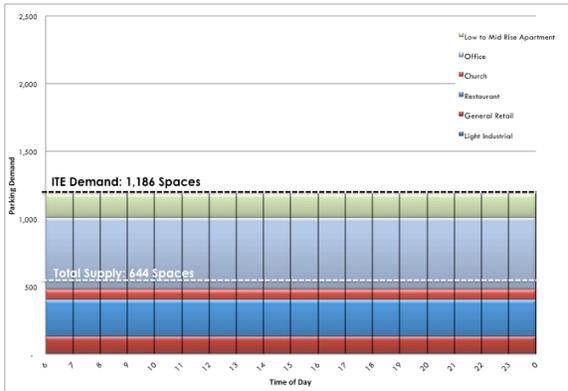


Figure 14 Existing Parking Demand by Land Use with Time of Day Adjustments

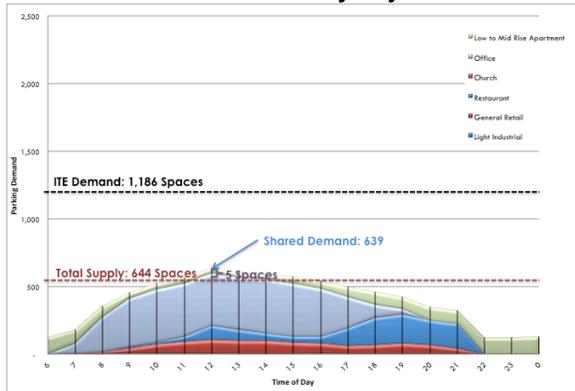


Figure 15 Buildout Parking Demand by Land Use

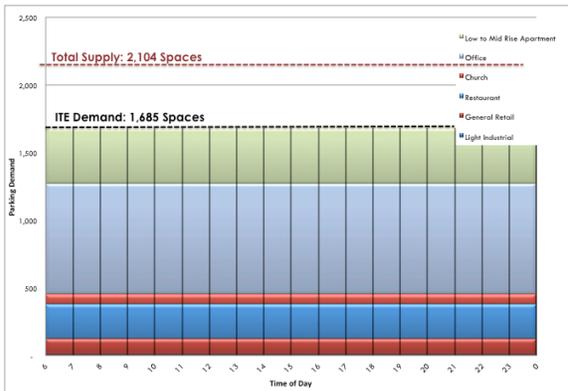
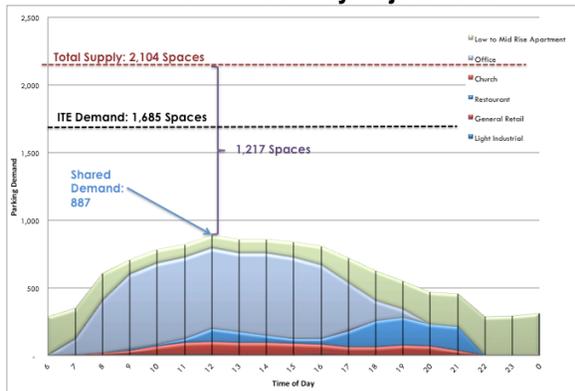


Figure 16 Buildout Parking Demand by Land Use with Time of Day Adjustments



PARKING SHED FOUR

Land Use

Overall, there is about 480,000 square feet of commercial and office use, 196 residential units, a 1,150 seat performance theater, and schools totaling 2,415 students in Parking Shed Four. This analysis excludes single-family homes. Land uses are grouped as accurately as possible into categories created by the *Institute of Transportation Engineers Parking Generation 4th Edition* (2010). Figure 17 shows the breakdown of existing and proposed build out land uses by category in the subarea; the square feet and unit numbers are adjusted for existing vacancies.

Figure 17 Parking Shed Four- Existing and Buildout Land Uses

Land Use	Existing Square Feet/ Units	Build Out Square Feet/ Units	Net SF/ Units
Church	10,950 SF	10,950 SF	-
General Retail	57,076 SF	70,336 SF	+13,260 SF
Restaurant	57,076 SF	70,336 SF	+13,260 SF
Museum	26,512 SF	-	-26,512 SF
Office	871,565 SF	1,051,369 SF	179,804 SF
Government Office	267,173 SF	267,173 SF	-
Low to mid rise apartments	380 Units	743 Units	+363 Units
School	2,415 Students	2,415 Students	-
Performing Arts Center	1,150 Seats	1,150 Seats	-
Total	1,290,352 SF 196 Units 2,415 Students 1,150 Seats	1,470,164 SF 743 Units 2,415 Students 1,150 Seats	+179,812 SF +363 Units

Parking Demand

According to national parking standard calculations from ITE, the needed number of parking spaces for Parking Shed Four is approximately 2,275 spaces. As shown Figure 18, the subarea has an existing total of 1,641 spaces, approximately 1,080 below the expected ITE demand.

The parking model, Figure 19, estimates that 1,527 spaces are needed at 10am, after adjusting for time of day demands by land use and Allentown’s mixed-use environment. The projected peak demand is 114 spaces below the existing supply.

The team worked with a buildout scenario to model the expected parking demand of a proposed land use mix. The scenario assumes that some vacant or underutilized properties (including some surface parking lots) are used for commercial, office, residential, and parking supply of 470 spaces. The model (Figure 21) estimates that 840 more parking spaces would be needed than what exists. This gap may be mitigated by adjusting the land use mix, a change in

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mode split (e.g. more traveling to downtown via transit, biking, walking, carpooling, etc.), and/or relying on the parking supply in adjacent parking sheds.

Figure 18 Existing Parking Demand by Land Use

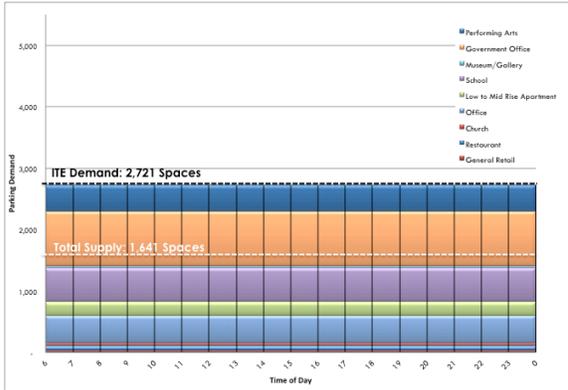


Figure 19 Existing Parking Demand by Land Use with Time of Day Adjustments

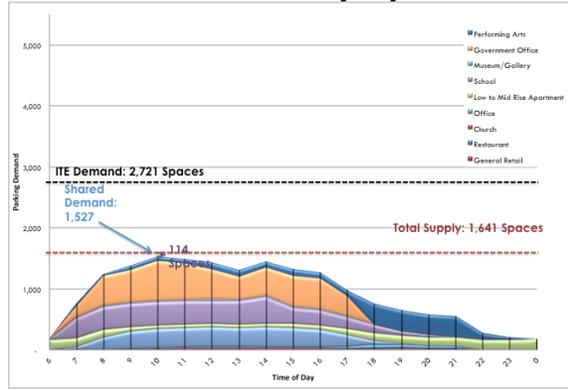


Figure 20 Buildout Parking Demand by Land Use

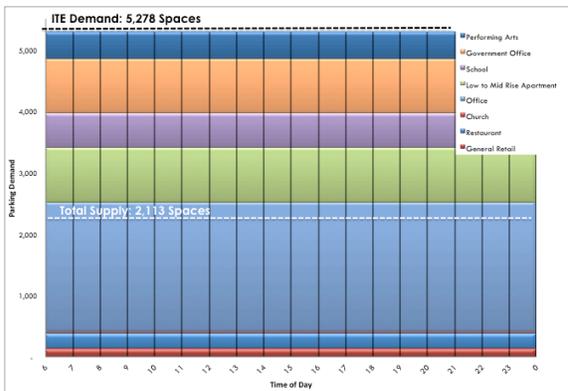
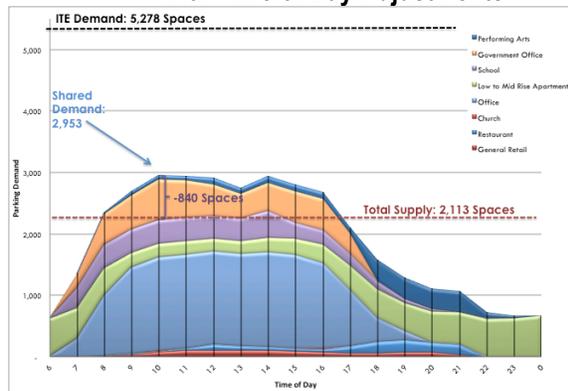


Figure 21 Buildout Parking Demand by Land Use with Time of Day Adjustments



PARKING SHED FIVE

Land Use

Overall, there is about 510,000 SF of commercial and office space and 107 residential units in Parking Shed Five. This analysis excludes single-family homes. Land uses are grouped as accurately as possible into categories created by the *Institute of Transportation Engineers Parking Generation 4th Edition (2010)*. Figure 22 shows the breakdown of existing and proposed build out land uses by category in the subarea; the square feet and unit numbers are adjusted for existing vacancies.

Figure 22 Parking Shed Five- Existing and Buildout Land Uses

Land Use	Existing Square Feet/ Units	Build Out Square Feet/ Units	Net SF/ Units
Industrial	9,588 SF	9,588 SF	-
Community Center	24,332 SF	24,332 SF	-
Church	33,636 SF	33,636 SF	-
General Retail	71,844 SF	60,642 SF	-11,202 SF
Restaurant	71,844 SF	60,642 SF	-11,202 SF
Office	252,087 SF	238,875 SF	-13,212SF
Government Office	255,568 SF	211,300 SF	-44,268 SF
Low to mid rise apartments	107 Units	550 Units	+442 Units
Total	718,899 SF 107 Units	639,015 SF 550 Units	-79,884 SF +442 Units

Parking Demand

According to national parking standard calculations from ITE, the needed number of parking spaces for Parking Shed Five is approximately 1,800 spaces. As shown Figure 23, the subarea has an existing total of about 1,200 spaces, approximately 650 below the expected ITE demand.

The parking model, Figure 24, shows that parking demand is 977 spaces at peak (10am) after factoring in time of day demands by land use and Allentown’s mixed-use environment. The projected peak demand is about 220 spaces below the existing supply.

As an illustrative exercise, the team worked with a buildout scenario to determine the parking impact if currently vacant or underutilized properties (including some surface parking lots) were developed. The buildout scenario introduces additional commercial, office, and residential uses within the subarea, and includes an increase of approximately 760 spaces. As shown in Figure 26, the large-scale build scenario project peak is approximately 1,030 spaces below the future proposed supply.

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Figure 23 Existing Parking Demand by Land Use

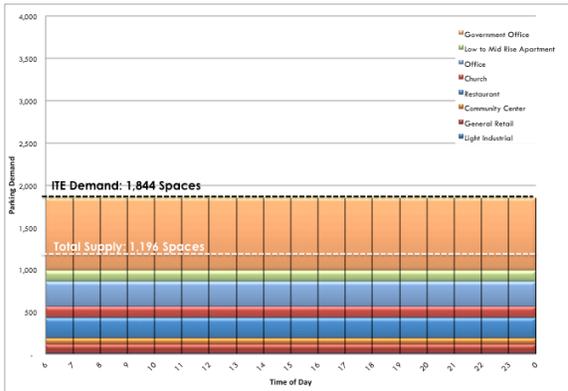


Figure 24 Existing Parking Demand by Land Use with Time of Day Adjustments

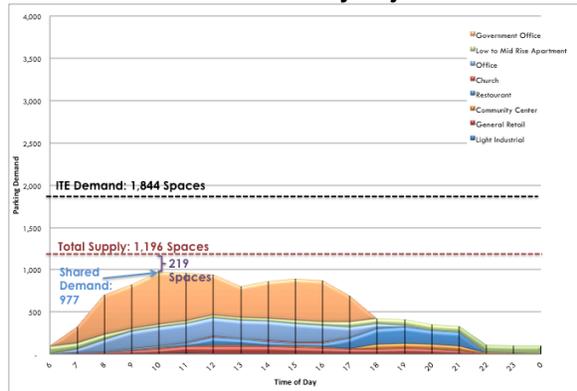


Figure 25 Buildout Parking Demand by Land Use

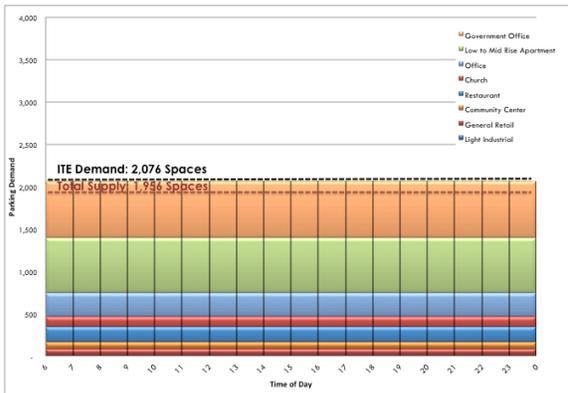


Figure 26 Buildout Parking Demand by Land Use with Time of Day Adjustments

