LANCASTER PARKING SUPPLY, DEMAND, AND FORECASTING STUDY

Downtown Core & New Holland/East Walnut Commercial Corridor



PREPARED FOR:







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Executive Summary

Background and Introduction

The last downtown parking supply and demand analysis for the City of Lancaster, Pennsylvania was completed in 2001 and the City, in partnership with the Lancaster Parking Authority (LPA) and commissioned through a competitive procurement process, retained the services of Kimley-Horn to conduct a parking supply, demand, and forecasting study that would estimate future conditions for the next decade.

This report and forecast includes two areas defined by *Building on Strength – Economic Development Strategic Plan, June 2015*; the Downtown Core commercial hub and the New Holland/East Walnut commercial corridor. The Lancaster Housing Opportunity Partnership (LHOP) and SoWe Civic Association wished to expand the boundary of that forecast to include the Southeast Neighborhood Revitalization Area (Southeast) and the Southwest Neighborhood Revitalization Area (SoWe). Though the methodology was identical, it was agreed that those efforts and findings would be produced in a separate report.

The key product in this effort was the creation of a Geographic Information System (GIS) tool that combines current land use activity, current peak parking occupancy, and visions of future development and travel mode to forecast current and future parking demand by land type and block. This GIS database and background information was provided to the City for its use and modeling.

During evening work sessions and presentations to the public, several questions were posed about new parking structures, changes to parking rates and public policy, and the residential parking permit program. The audience who attended those events were informed that the parking inventory and forecast does not include recommendations on new garages or changes in management policy or procedure. Those decisions would be made following future public debate and discourse and would be greatly informed by the data and model presented herein.

Downtown Commercial Core

The Downtown Core covers 67 City blocks and consists of a total off-street supply of 8,368 parking spaces and a total on-street parking supply of 1,505 spaces. Cumulatively, within the Downtown Core there is a total parking supply of 9,873 spaces. Of the 8,368 off-street spaces, LPA managed 4,491 parking spaces. The space inventory and occupancy surveys were completed during a weekday in October 2018 and since that time the Central Garage with 755 spaces was separated from LPA management and, though still available to the public, is under management by the garage owner, LNP.

Following guidance from the City, LPA, and downtown stakeholders, parking occupancy surveys were completed between 10:00 AM and 12:00 pm and 4:00 PM and 6:00 PM during a typical non-event weekday in October. The 10:00 AM to 12:00 PM surveys represented, as a system, the peak period. At this time 62 percent of all public and private off-street and all one-street spaces were occupied. Of the 4,491 spaces that the LPA owned and/or operated in October, 2,824, or 63 percent, were occupied during the same peak weekday period.

While this would suggest that considerable excess capacity exists in LPA's system, these figures do not include parking activity associated with a special event or an event at the Convention Center. Furthermore, these occupancy figures do not take into consideration space commitments and lease agreements which reduce the number of available spaces. Additionally, the findings presented here for the LPA and for the entire Downtown are in aggregate. Data and mapping does provide insight into the individual supply and differences in peak utilization between different off-street

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lots and garages and curbside parking that was recorded with some parking facilities and City block exhibiting rates of occupancy that exceeded 85 percent capacity. This level of occupancy is an operational measure of frustration and perceived deficit.

The City of Lancaster maintains a GIS database of all land use activity in the Downtown Core. In total there is approximately 2.5 million square feet of commercial space, 2,050 residential dwelling units, 1,200 theater seats, 1,100 hotel rooms, and more than 970,000 square feet of institutional, cultural, and educational space.

As opposed to observed peak period parking occupancy, the land-use-based demand estimate identifies blocks where the demand for parking generated by office buildings, shops, restaurants, apartments and other uses exceeds the supply of all spaces, public and private, on- and off-street that exists within that block. There are numerous blocks, particularly within the heart of the Downtown Core, that do not have sufficient parking to accommodate the land-use-based parking demand. For example, the block bound by Orange Street, Grant Street, Christian Street, and Duke Street (see Block 36) and which includes the United Church of Christ, Lancaster County Courthouse, and associated County offices, generates a peak weekday daytime demand for 392 spaces but there are only 26 on- and off-street spaces within that block. Therefore, a deficit of 366 spaces is determined.

Conversely, blocks that have a large parking structure, which primarily but does not exclusively highlight the LPA parking facilities, exhibited large surpluses as the supply of spaces significantly exceed the demand that is generated by the land uses/buildings within those blocks. A more nuanced observation suggests that LPA garages are strategically placed throughout the Downtown Core to accommodate parking needs within a reasonable walking distance. There are only a handful of blocks approaching or having a parking deficit within the study area that are outside of a 500-foot radius from an LPA facility.

Three community meetings were held at the inception of the project and follow-up meetings were conducted to present the draft forecast. The purpose of these meetings was to introduce the scope and scale of the project to the community, share draft parking supply, occupancy, and demand forecasting findings, and to listen to the community's concerns, needs, and perceptions about parking in the City of Lancaster

In addition to the public meetings, a community input survey was also issued between October 2018 and January 2019. A total of 423 respondents provided input on their parking and mobility behaviors and perspectives throughout the City of Lancaster. Sixty-eight percent of respondents indicated that they drive alone to the Downtown Core while another 15 percent carpool. With respect to perspectives on the adequacy of parking, 68 percent of respondents are satisfied with the parking supply noted that it was either very adequate or mostly adequate.

To determine a baseline future parking forecast for the Downtown Core, information on known, proposed, and potential development was provided by the City, LHOP, and LCA. Information included the land use type, density, location, number of spaces that might be provided, and the number of existing parking spaces that would be displaced. In total, 12 upcoming and potential projects were identified with a total of 111,684 square feet of office, 72,574 square feet of retail, 501 dwelling units, 30,715 square feet of restaurant, 197 hotel rooms, and a 300-space parking structure. Additionally, it is anticipated that 615 existing spaces would be displaced due to construction.

Like the assessment of existing land-use-based parking demand, blocks shaded black identify areas of deficit, red suggests areas of stress where demand reaches or exceeds 85 percent of the supply, and yellow and green show areas of surplus. New areas of parking deficit extended from the center of Downtown south from Orange Street. The anticipated loss of 200 spaces in the "Hager" parking lots between Orange Street, King Street, Prince Street, and Market Street will be particularly impactful.

As it is unlikely that parking demand generated by new development will be satisfied by private/restricted off-street lots and garages, LPA's parking program was assessed as to its ability to meet this need. This analysis includes 300 spaces in a new Lancaster Square Garage but excludes 755 spaces in the Central Garage. LPA parking facilities can

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satisfy the parking demand that could be generated for all known, proposed, and potential development activity without any support from existing privately-owned lots/garages, without LPN's Central Garage, but with the aid of a new 300-space Lancaster Square garage. However, this analysis does not include parking demand generated by special events or an event and the Convention Center, nor does it adjust for space lease commitments. As such, this summation may be deemed aggressive. LPA policy toward and management of lease commitments was not evaluated as part of the demand model as the model is based on observed occupied space.

Excluding large special events but including average, 85th percentile, and maximum attended weekday events at the Convention Center, the ability of the LPA facilities to satisfy these events was reexamined. Average event parking demand required an additional 319 spaces, 85th percentile demand required 517 spaces, and the largest single event, McCaskey Graduation generated a demand/need for 1,330 spaces. While system-wide LPA facilities could absorb the additional demand generated by average and larger events it would require many event patrons to walk several blocks from an LPA facility to the Convention Center.

The City of Lancaster has capable planning staff who can manipulate the GIS land-use-based parking demand files that were created for this assignment. As development information changes, the City, LPA, LHOP, and LCA can recalculate how parking demand will change. That information, combined with healthy public outreach and community input, could be used by the LPA to plan and anticipate how its on- and off-street assets could be managed to maximize their benefit.

New Holland/East Walnut Commercial Corridor

The New Holland/East Walnut corridor study area represents the northeast gateway into the City of Lancaster. It includes all the parking (on-street, off-street, public, and private) within the area bounded by Lime Street to the west; Fulton Street and Lehigh Avenue to the south; Marshall Street, Franklin Street, and Walnut Street to the east; and Madison Street, New Holland Avenue, Hamilton Street, Burrowes Avenue, and Pleasure Road to the north.

The corridor encompasses 13 City blocks and consists of a total off-street parking supply of 4,722 spaces and a total on-street parking supply of 537 spaces. Cumulatively, within the corridor there is a total parking capacity of 5,259 parking spaces. There are no publicly owned or operated lots or garages in this area and all off-street parking is provided for the benefit of the property owner, tenant (commercial and residential), or tenant visitor.

During the morning, on-street and off-street parking in the study area is 55 percent occupied. Off-street facilities are in slightly higher use compared to on-street facilities (56 percent occupancy compared to 44 percent occupancy). During the afternoon, the on- and off-street parking system study area parking is at approximately 38 percent parking occupancy. Off-street facilities and on-street facilities are similarly occupied during this period. The lower evening parking occupancy is consistent with the employment and residential-heavy land uses in this study area.

Based on information provided by the City, the study area has 540,300 square feet of office, 84,100 square feet of retail, 46,400 square feet of restaurant, 466 residential dwelling units, 37,700 square feet of institutional and cultural space, and 1,690,000 of research and light industrial uses. Based on the land use to parking analysis most blocks in the corridor study area are operating at a parking surplus. The only parking deficits are located near the Downtown Core within blocks bounded by Shippen Street, Walnut Street, Ann Street, and Fulton Street.

Only one new development opportunity was provided by the City and it was a mixed-use project located at the corner of New Holland Avenue, Plum Street, and Walnut Street; that project would provide 126 off-street parking spaces. As such, the vision of future parking supply and demand in this corridor was nearly identical to the existing condition. Like the Downtown study area, the City and its planners have been provided the GIS database to model changes in land use activity and parking demand for planning purposes.

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INTRODUCTION

Parking and its supporting infrastructure of garages, surface lots, and curbside spaces can be many things to many people. To a parking authority, parking is a public asset to be operated and maintained to maximize the benefit to the community while being financial self-supporting. To a city and/or development agency, parking is a key tool supporting vital economic development and the broader goals of the commercial, residential, and cultural communities. Parking demand for these groups can provide visual evidence of the success or failure of established goals. For most of the public that is presently dependent on the automobile, whether they are employees, residents, or visitors, parking is a needed commodity that never seems to be in the right place, in the right amount, or at the right price. While some of the public feels that there is never enough parking, others believe there is already too much. Typically, these groups are unaware of the true cost to provide, maintain, and operate a parking garage, surface lot, or on-street space or their role in economic development and sustainability. Ultimately, all community stakeholders must debate the merits of parking and, therefore, arrive at sound parking practices and best management strategies that are important to the broader group, regardless of personal perspectives on the "more or less" of parking.

The City of Lancaster and Lancaster Parking Authority (LPA) understood the importance of management efficiency, development responsibility, and public discourse with respect to the City's critical downtown parking assets. These groups engaged the services of Kimley-Horn to conduct a parking supply, demand, and forecasting study to assess existing and future stress on the public and private, on- and off-street parking system in the Downtown Core (Downtown Commercial Hub) and the New Holland/East Walnut Commercial Corridor. The scope of services that was completed included:

- An inventory—tabulated and summarized on a block-by-block basis—of on-street and off-street parking spaces, both public and private, including church and other commercial parking lots
- Public outreach through stakeholder interviews, evening work sessions, and an online survey to absorb and understand current parking frustrations and the community's willingness to support changing parking needs and conditions
- A comparison of parking demand with the current parking supply and an identification of areas with parking deficits and surplus
- A projection of future parking surplus and deficit conditions given the potential impact of known, proposed, and potential development and redevelopment activity
- An analysis of the impact of current and future transportation options such as public transportation, rideshare programs such as Uber and Lyft, bicycle share, and autonomous/self-driving vehicles

PURPOSE AND CONTEXT

The key product in this effort was the creation of a Geographic Information System (GIS) tool that combines current land use activity, current peak parking occupancy, and visions of future development and travel mode to forecast current and future parking demand by land type and block. The importance of this tool cannot be overstated as field surveys of parking utilization within a public garage, church lot, or curbside space do not provide insight into why those spaces are occupied, who is parking in those spaces, or if the experience between parking and arriving at a destination is an acceptable one. An analysis that attempts to connect the relationship between building type, location, and density, however, does provide great insight into true destination of the parker and the success (or frustration) they experience when finding a parking space near (or far) their destination. The parking supply, demand, and forecasting study and associated land-use-based model are intended to:

- Provide a comprehensive picture of the entire parking system in the Downtown Core and along the New Holland/East Walnut Commercial Corridor
- Educate City and LPA staff, civic leaders, business/property owners, residents, and the general public on current and project trends in parking supply and demand
- Serve as a continuously-evolving tool to calculate how changes in development, land use activity, public transit services, and personal mobility choices will impact the parking system

Additionally, as the single largest provider of public parking, this report and interactive database can be used by the LPA to make management decisions which maximize the performance of the Authority's existing on- and off-street parking facilities and, if warranted, anticipate the need for additional public facilities. It should be noted in the introduction that during evening work sessions and presentations to the public, several questions were posed about new parking structures, changes to parking rates and public policy, and the future impact of autonomous vehicles, scooters, and alternative mobility. While the report and interactive model do include theoretical impacts of autonomous vehicles, transportation network companies (TNCs) like Uber and Lyft, and other emerging technologies, this document does not include any recommendations on new downtown garages or changes in management policy or procedure. Those types of decisions would be made following future public debate and discourse and would be greatly informed by the data and model presented herein. Additionally, parking supply, demand, and forecasting study benefits from the work completed previously by the City, Lancaster Civic Association, LHOP, and others. These include:

- City of Lancaster Strategic Plan 2015–2017, March 2015
- Lancaster, Pennsylvania Downtown Walkability Analysis, April 2015
- Building on Strength Economic Development Strategy Plan for the City of Lancaster, June 2015
- Southwest Lancaster Neighborhood Revitalization Study, September 2016
- Lancaster Comprehensive Housing Market Analysis, April 2017
- Lancaster Commercial and Industrial Market Overview, February 2018
- Lancaster Active Transportation Plan (Draft for Public Comment), February 2019

Finally, it should be noted that Kimley-Horn completed a parallel forecast of parking supply and demand for the Southwest (SoWe) neighborhood and the Southeast residential neighborhood as sponsored by LHOP and the SoWe Civic Association. While the methodology was identical to the Downtown Core and New Holland/East Walnut Commercial Corridor studies, the findings and land use model for SoWe and the Southeast Neighborhood are reported separately.

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STUDY AREAS

The Downtown Core represents the commercial and economic center of the City of Lancaster and the parking study areas is bound by Lemon Street to the north, Lime Street to the east, Church Street to the southeast, Farnum Street to the south, Strawberry Street to the southwest, and Mulberry Street to the west. Most of the Downtown Core study area is zoned as Central Business Core (CB1) or Commercial Central Business (CB). Additional parcels along the fringe of the study area are zoned for mixed-use or higher densities of residential (e.g. MU, R3, and R4). The Downtown Core also contains nine of the ten LPA-managed garages/lots:

- Water Street Garage
- North Cherry Street Lot
- South Cherry Street Lot
- Duke Street Garage
- Prince Street Garage

- East King Street Garage
- Penn Square Garage
- Mifflin Lot
- Central Garage

The North Queen Street Garage is located outside the study area to the north of Lemon Street, but as it is likely to serve some parking need generated within the study area, it is referenced within. LPA also operates, maintains and manages 946 parking meters, the majority of which are in the Downtown Core. It must be noted that the inventory and parking occupancy data that was conducted for this study was completed in October 2018. Since that time, management of the Central Garage reverted to the owner of the garage, LNP. And while that garage remains available to the public through monthly permits or transient/hourly parking fees, it is no longer under the purview of the LPA.

The Downtown Core study area is shown on **Figure 1**. Each block within the study area was assigned a unique code that was used to geographically link on- and off-street parking supply and demand. This is an important distinction as the parking demand model and forecast of future condition is based on land use information which is best defined by city block. As a result, inventory and occupancy data is expressed in terms of block coding and, for curbside parking, expressed by block face. A block face can be the north, south, east, or west side of a city block and includes only those spaces that are contiguous/within each block.

The New Holland/East Walnut Commercial Corridor study area (see **Figure 2**) represents the northeast gateway into the City of Lancaster and is bound by Lime Street to the west; Fulton Street and Lehigh Avenue to the south; Marshall Street, Franklin Street, and Walnut Street to the east; and Madison Street, New Holland Avenue, Hamilton Street, Burrowes Avenue, and Pleasure Road to the north. The New Holland/East Walnut Commercial Corridor is zoned for a mixture of higher density residential (R2 and R3), commercial (C2, C3, MU), and industrial (CM) uses. The New Holland/East Walnut Commercial Corridor is also identified as an emerging commercial hub in its own right.

Figure 1: Study Area Boundary and Block Coding – Downtown



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Figure 2: Study Area Boundary and Block Coding – New Holland/East Walnut Commercial Corridor

ASSESSMENT OF EXISTING CONDITIONS

The assessment of existing conditions was a foundational component of this comprehensive parking study. During this assessment, the parking supply within each study area was confirmed and aggregated by block:

- A count of parked cars along each street and in each parking facility was conducted on a typical weekday to identify peak- and off-peak parking occupancy
- Land-use-based parking demand was linked to the available parking supply to determine the adequacy of the existing parking system's capacity
- Critically, the community was engaged to better understand the perceptions of the state of parking

PARKING SUPPLY

This study includes all on-street, off-street, public, and private parking facilities in each study area.

Downtown Core

The Downtown Core covers 67 City blocks and consists of a total off-street supply of 8,368 parking spaces and a total on-street parking supply of 1,505 spaces. Cumulatively, within the Downtown Core, there is a total parking supply of 9,873 parking spaces. Of the 8,368 off-street spaces, LPA managed 4,491 parking spaces. The off-street parking supply in the Downtown Core is shown visually in Figure 3. As noted previously, the LPA office street facilities are the largest provider of publicly accessible parking spaces in downtown Lancaster. Those facilities are designed and operated to maximize accessibility to the public regardless of trip purpose. Unlike a private parking lot or garage which is restricted to a specific user group or tenant, the LPA facilities are available to anyone presuming that spaces are available. Therefore, the LPA facilities will be highlighted throughout this report to reinforce their importance in the overall public and private/restrict parking system. The on-street parking supply in the Downtown Core is shown visually in Figure 4. The figure shows available parking capacity for each side of the street for streets where parking is allowed (denoted by blue linework). Streets where parking is not allowed are denoted by white linework. For example, in the block bound by Walnut Street, Chestnut Street, Queen Street, and Christian Street (Block 15), there are six curbside spaces on Walnut, four on Chestnut, six on Queen, but zero spaces on Christian. Christian Street permits one one-way traffic and has no curbside parking. Therefore, the summary of on-street parking for Block 15 equals 16 spaces (6+4+6+0). The on- and off-street parking inventory for each block in the Downtown Core is detailed in Appendix A.

New Holland/East Walnut Commercial Corridor

The New Holland/East Walnut Commercial Corridor encompasses 13 City blocks and consists of a total off-street parking supply of 4,722 spaces and a total on-street parking supply of 537 spaces. Cumulatively, there is a total parking capacity of 5,259 parking spaces. The off-street parking supply in the New Holland/East Walnut Commercial Corridor is shown visually in **Figure 5**. There are no publicly owned or operated lots or garages in this area and all off-street parking is provide for the benefit of the property owner, tenant (commercial and residential), or tenant visitor. The largest single provider of off-street spaces (2,584) is in the northern-most sector of the corridor, falls within Block 13, and serves the various business within the Burle Business Park. The on-street parking supply in the corridor is shown visually in **Figure 6**. The figure shows available parking capacity for each side of the street for streets where parking is allowed (denoted by blue linework). Streets where parking is not allowed are denoted by white linework. Parking capacities for each block are detailed in **Appendix A**.

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Figure 3: Public and Private Off-Street Parking Locations and Inventory – Downtown Core

Figure 4: On-Street Parking Inventory – Downtown Core



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Figure 5: Private Off-Street Parking Locations and Inventory – New Holland/East Walnut Commercial Corridor

Figure 6: On-Street Parking Inventory – New Holland/East Walnut Commercial Corridor



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PARKING OCCUPANCY

Parking counts were conducted for all public and private, on- and off-street parking spaces in the Downtown Core and the New Holland/East Walnut Corridor study areas. Parking counts were conducted between 10:00 AM and 12:00 PM and between 2:00 PM and 4:00 PM on Tuesday, October 23. These time periods were chosen, in coordination with LPA, LHOP, and the City, to identify peak- and off-peak periods of parking activity on an area-wide and per-block level. Additionally, given the parking access and revenue control equipment that the LPA uses to manage their facilities, 18 hours of occupancy data for LPA off-street facilities was also provided.

Tuesday, October 23 was selected as it represented a day when there wasn't a large special event or an event scheduled at the Lancaster Convention Center. For purposes of developing a land-use-based parking demand forecast and model, the analysis needed to avoid any unusual conditions. However, there are nearly 100 events scheduled during a weekday at the Convention Center during a year and given the consistency and frequency of these event activities the parking demand that is generated under average, 85th percentile, and maximum event attendance was modelled separately and is presented later in this report. The assessment of existing conditions presented in this section, therefore, is offered as a baseline condition upon which the City, LPA, and LHOP could model demand associated with special events and new development activity and layer that parking demand onto existing baseline conditions.

Downtown Core

During the morning, the Downtown Core study area parking occupancy peaked, as a system, when 62 percent of all public and private, on- and off-street spaces were occupied. LPA facilities are also similarly in use at 64 percent occupancy during this period. All public and private off-street facilities are in slightly higher use compared to all onstreet facilities (63 percent occupancy compared to 56 percent occupancy). During the afternoon, all public and private, on- and off-street parking in the Downtown Core is at 59 percent parking occupancy. All off-street facilities (55 percent) are in slightly higher use compared to on-street facilities.

Figure 7 shows the system-wide off-street parking occupancy in LPA facilities between 6:00 AM and 12:00 AM on a typical non-event Tuesday. Of the 4,491 spaces that the LPA owned and/or operated in October 2, 824, or 63 percent, were occupied during the peak weekday daytime period of 10:00 AM. While this would suggest that considerable excess capacity exists in LPA system, these figures do not include special event activity or an event at the Convention Center. Furthermore, these occupancy figures do not take into considerable number of parking spaces in the Penn Square Garage are reserved 24/7 for the Marriott Hotel's valet and guest parking. Nonetheless, for purposes of developing a land-use-based parking demand model, the analysis needed to focus on occupied parking spaces not on promises or commitments for spaces that at 10:00 AM on a weekday in October are vacant. Detailed parking counts and occupancies for each block are detailed in **Appendix C**.



Figure 7: Current (October) Parking Utilization and Capacity of LPA Facilities

Based on the system-wide weekday daytime peak of parking activity in the Downtown Core, the following exhibits illustrate the relative occupancy of each lot, garage, and block face.

Figure 8 shows the peak hour public and private off-street occupancy for all public and private lots and garages in the Downtown Core while **Figure 9** shows peak on-street occupancy. These figures use color coding to illustrate parking occupancy for each off-street lot and garage and for each curbside block face during the non-event weekday daytime peak hour of parking activity. Black coding illustrates facilities and block faces that are one hundred percent occupied, red illustrates 85 to 90 percent occupancy, orange is 70 to 84 percent, yellow is 50 to 69 percent, and green is 49 percent or less. Parking facilities and curbside spaces that reach and exceed 85 percent occupancy are considered operationally full as a potential parker can be frustrated when trying to find an available space under this condition.



Figure 8: Peak Public and Private Off-Street Parking Occupancy – Downtown Core



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As it may be difficult to interpret the occupancy data that is presented in Figure 8 and 9, **Figure 10** was created to illustrate the combined public and private off-street and on-street peak weekday parking occupancy on a block-byblock basis. As before, blocks shaded black and red illustrate blocks where all on- and off-street parking is at or above levels of operational capacity. For example, the block that is bound by Walnut Street, Queen Street, Chestnut Street, and Christian Street (see Block 15), and which includes the Red Rose Transit Garage, a small private lot off Christian Street, and curbside parking on three of the four sides of the block, has a total supply of 414 parking spaces, of which 352 (85 percent) were occupied during the weekday daytime peak period of parking activity. Note that the Red Rose Transit Garage is not part of the LPA parking system but is available to the public through hourly rates and monthly parking permits.



Figure 10: Peak Combined (Off-Street and On-Street) Parking Occupancy – Downtown Core

New Holland/East Walnut Commercial Corridor

During the morning, on-street and off-street parking in the commercial corridor area was 55 percent occupied. Offstreet facilities are in slightly higher use compared to on-street facilities (56 percent occupancy compared to 44 percent occupancy). During the afternoon, the on- and off-street parking system is at 38 percent parking occupancy. Off-street facilities and on-street facilities are similarly occupied during this period. Based on these trends, peak hour public and private parking occupancy figures were developed.

Figure 11 shows the peak hour occupancy for all off-street facilities while **Figure 12** shows the peak hour for on-street occupancy. Note that there are no publicly owned or operated off-street parking lots or garages in this study area. **Figure 13** shows the combined (off-street and on-street) peak hour parking occupancy. As before, blocks or street faces shaded black on Figure 11, Figure 12, and Figure 13 identify areas where parking occupancy exceeds supply. Red suggests areas of stress where parking capacity exceeds 85 percent of the supply, and yellow and green areas show where ample parking is available. Parking counts and occupancies for each block are detailed in **Appendix C.**



Figure 11: Peak Public and Private Off-Street Parking Occupancy – New Holland/East Walnut Commercial Corridor

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Figure 12: Peak On-Street Parking Occupancy – New Holland/East Walnut Commercial Corridor



Figure 13: Peak Combined (Off-Street and On-Street) Parking Occupancy – New Holland/East Walnut Commercial Corridor

LAND USE AND PARKING DEMAND

As noted in the introduction, the modeling of existing and forecasting of future parking demand is based on an analysis of the relationship between current peak weekday daytime parking activity and land use activity. Parking occupancy only records where a vehicle is parked but the land-use-based analysis suggests where the individual would prefer to park if they can park in the same block where they live, work, or play. The City of Lancaster maintains a GIS database of all land use activity in the Downtown Core and New Holland/East Walnut corridor. For purposes of this study, land uses were classified as either office, retail, restaurant, residential, institutional/cultural, theatre, hotel, or research/industrial. Institutional and culture uses included courts, churches, the Convention Center, and other historical or cultural landmarks. The total density (in square feet or units) was quantified for the study area and for each block. Land use for the Downtown Core and New Holland/East Walnut Commercial Corridor study areas are shown in **Table 1**. Note that the City's GIS database wasn't initially organized into these eight land use categories and Kimley-Horn needed to make several assumptions to fit the data into this format.

Table 1: Existing Land Use and Densities

					Institutional/			Industrial/
Study Area	Office	Retail	Restaurant	Residential	Cultural	Theater	Hotel	Research
	Sq. Ft.	Sq. Ft.	Sq. Ft.	Units	Sq. Ft.	Seats	Rooms	Sq. Ft.
Downtown Core	1,491,600	736,000	281,000	2,050	976,900	1,200	1,100	50,500
New Holland/East Walnut	540,300	84,100	46,400	466	37,700	0	200	1,690,000

Parking demand ratios were then developed for each land use type based on the observed count of peak parking, calibrated by past planning experience. The demand ratios were applied to each specific land use within each block to recalculate weekday daytime parking demand. Recommended land-use-based parking demand ratios are shown in **Table 2**. In effect, the total system-wide peak volume of parked vehicles in all on-street and public and private off-street spaces were used to adjust the land-use-based parking demand ratios so that the demand estimates by building and block equaled the occupancy of all spaces observed during a typical non-event weekday daytime period.

Table 2: Recommended Weekday Daytime Parking Demand Ratios (Spaces Demanded per Unit)

					Institutional/			Industrial/
Study Area	Office	Retail	Restaurant	Residential	Cultural	Theater	Hotel	Research
	Sq. Ft.	Sq. Ft.	Sq. Ft.	Units	Sq. Ft.	Seats	Rooms	Sq. Ft.
Downtown Core	2.2	1.0	1.8	0.3	0.5	0.0	0.2	0.4
New Holland/East Walnut	2.3	2.0	2.4	0.3	0.5	na	0.2	1.0

It must be restated that these ratios reflect a weekday daytime period between 10:00 AM and 12:00 PM when parking activity as a system peaks but without a special event or convention event. Land use activities and associated parking demand ratios that typically peak in the evening and weekend are not referenced in this analysis. For example, residential dwelling units in an urban area can generate parking demand ratios as high as 1.0 and 2.0 spaces per unit depending on the number of bedrooms. However, during a weekday daytime period, many downtown residents have driven their cars to their place or work. As such, the parking demand ratio for residential development during the weekday daytime period could be as low as 0.2 to 0.4 per unit.

Downtown Core

Figure 14 shows the land-use-specific parking demand for the Downtown Core. Like Figure 10, blocks or street faces shaded black identify areas where there is a deficit of parking based on the comparison between land-use-specific parking demand and parking supply. Red suggests areas of stress where parking capacity exceeds 85 percent of the supply and parking surplus is low, and yellow and green areas show where ample parking is available. Also mapped on Figure 14 is a 500-foot radius around each LPA facility as a measure of a potential acceptable walking distance between parking locations and end destination. There are numerous blocks, particularly within the heart of the Downtown Core, that do not have sufficient parking to accommodate the land-use-based parking demand. For example, the block bound by Orange Street, Grant Street, Christian Street, and Duke Street (see Block 36) and which includes the United Church of Christ, Lancaster County Courthouse, Lancaster County Sheriff's Department, and associated County offices generates a peak weekday daytime demand for 392 spaces but there are only 26 on- and off-street spaces within and on that block. Therefore, a deficit of 366 spaces is determined.

However, shaded colors of orange, green, and yellow illustrate blocks where the supply of on- and off-street spaces is greater than the demand that is generated by the buildings that occupy those blocks. Not surprisingly, blocks that have a large parking structure, which primarily but does not exclusively highlight the presence of LPA parking facilities, exhibited large surpluses (green shading) as the supply of spaces significantly exceed the demand that is generated by the land uses/buildings within those blocks. A more nuanced observation suggests that LPA garages are strategically placed throughout the Downtown Core to accommodate parking need within a reasonable walking distance. There are only a handful of blocks approaching or having a parking deficit within the study area that are outside of a 500-foot radius from an LPA facility.

New Holland/East Walnut Commercial Corridor

Figure 15 shows the land use-specific parking demand for the New Holland/East Walnut Commercial Corridor. Like Figure 13, blocks or street faces shaded black identify areas where there is a deficit of parking based on the land-use-speific demand. Red suggests areas of stress where parking capacity exceeds 85 percent of the supply and parking surplus is low, and yellow and green areas show where ample parking is available. Most of the New Holland/East Walnut Commercial Corridor study area is operating at a parking surplus. The only parking deficits are located near the Downtown Core within blocks bounded by Shippen Street, Walnut Street, Ann Street, and Fulton Street.







Figure 15: Estimated Existing Peak Parking Surplus/Deficit based on Land-Use Demand – New Holland/East Walnut Commercial Corridor

COMMUNITY INPUT

A critical element in the successful management of parking assets is the support of and services provided to the community at large. A well-functioning parking system supports mobility, transportation choice, economic activity, and allows the community to experience its destination activities with minimal friction. As part of this parking supply, demand, and forecasting study, the project stakeholders sought to engage and better understand the parking users. In the Downtown Core and New Holland/East Walnut Commercial Corridor, that meant engaging with a diverse mix of retail and restaurant patrons, business owners and employees, visitors and tourists, residents, and the many other users that interact with on- and off-street parking as part of their daily or occasional visits.

Three community meetings were held at the inception of the project during the week of October 21, 2018 and followup meetings were conducted during the week of March 25, 2019. The purpose of these meetings was to introduce the scope and scale of the project to the community stakeholders; share draft parking supply, occupancy, and demand forecasting findings; and to listen to the community's concerns, needs, and perceptions about parking in the City of Lancaster. The dialogue and feedback during this meeting was integral in setting a clear focus for the study and a realistic preview of likely study outcomes. It is noted that much of what was discussed during this meeting extended beyond the sole dimension of parking and touched on aspects of mobility, congestion, equity, placemaking, public versus private elements, asset management and maintenance, policy, and other topics. While many of these areas are beyond the scope of this study, the dialogue, perspectives, and perceptions were integral to framing the greater context that affects parking management decisions in the City.

In addition to the public meetings, a community input survey was issued between October 2018 and January 2019. A total of 423 respondents provided input on their parking and mobility behaviors and perspectives throughout the City of Lancaster. Specific to this report, 303 people provided responses that relate to the Downtown Core and 22 people provided responses specific to the New Holland/East Walnut Commercial Corridor. The responses for the Downtown Core and New Holland/East Walnut Commercial Corridor reveal the following trends:



DOWNTOWN CORE



Mostly adequate; occasionally it can be tough to find a spot quickly.

- Never adequate; every time I come to this neighborhood, it's difficult to park.
- Rarely adequate; I usually drive around before I find parking.
- Very adequate; I never have a hard time finding a reasonable parking spot.

"How much time do you typically spend looking for a parking space as a driver or passenger of a car?"

"In general, how adequate is

the parking supply?"



"Where do you prefer to park as a driver or passenger of a car?"



Primary Downtown Core Findings

- The primary purpose of visiting the Downtown Core is to shop, eat, or visit commercial establishments. Only a quarter of respondents indicated that they live in the Downtown Core.
- A significant majority of respondents (68 percent) drive alone within or to the Downtown Core. Another 15 percent of respondents carpool. Of the active transportation modes, walking within the Downtown Core is the most likely as indicated by 12 percent of respondents. Only three percent of respondents indicated that they use TNCs such as Uber or Lyft to visit the Downtown Core. This seems to contrast current transportation travel trends in urban environments and may be the result of the small response size. Most respondents visit the Downtown Core daily, weekdays, or three to four days per week (a total of 59 percent of respondents). This indicates a recurring need for adequate parking.
- With respect to perspectives on the adequacy of parking, most respondents are satisfied with the parking supply. Sixty-eight percent of respondents indicated that the supply of parking was either very adequate or mostly adequate. Twenty-five percent of respondents indicated that because they usually must drive around before finding parking, the supply of parking was rarely adequate. This perspective is not uncommon in urban environments—time spent looking for parking, particularly in congested traffic conditions, can often lead to dissatisfaction with parking management and a perception, whether accurate or not, that there is not enough parking. Such perceptions could be addressed with a better understanding of where available and adequate parking (by proximity to end destination) is located.
- Most respondents are looking for parking in the Downtown Core during or just before the congested morning commuter peak period or during or just after the congested afternoon/evening commuter peak period. Thirty-six percent of respondents are looking for parking between 7:00 AM and 11:00 AM, and 35 percent of respondents are looking for parking between 4:00 PM and 8:00 PM. Fourteen percent of respondents are looking for parking midday between 11:00 AM and 2:00 PM.

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- Even though LPA garages are centrally located within the Downtown Core, most respondents (60 percent) prefer to park on the street, likely as close as possible to their end destination(s). Twenty-five percent of respondents prefer to park in a City parking garage.
- When asked the typical distance between the parking space and their destination, 27 percent of respondents parked within the same block and another 57 percent parked within one to two blocks. Somewhat supporting the perspectives on the adequacy of parking supply, 63 percent of respondents can find parking immediately or within five minutes of searching.
- Twenty-four percent of respondents stay in the Downtown Core for one to two hours. Seventeen percent stay for two to three hours. Short-term parking (less than 30 minutes) was indicated by 13 percent of respondents. Forty-eight percent of respondents rate the parking experience as excellent to good, while 20 percent say it does not meet average expectations.

NEW HOLLAND/EAST WALNUT COMMERCIAL CORRIDOR

- A significant majority of respondents (75 percent) drive alone within or to the New Holland/East Walnut Commercial Corridor. Another 20 percent of respondents carpool, which suggests a potential need for adequate parking for personal or carpool vehicles. Seventy percent of respondents visit the New Holland/East Walnut Commercial Corridor daily. With respect to perspective on the adequacy of parking, most respondents are satisfied with the parking supply. Seventy-five percent of respondents indicated that the supply of parking was either very adequate or mostly adequate.
- Most respondents are looking for parking in the New Holland/East Walnut Commercial Corridor during or just before the congested morning commuter peak period or during or just after the congested afternoon/evening commuter peak period. Thirty-two percent of respondents are looking for parking between 7:00 AM and 11:00 AM, and 36 percent of respondents are looking for parking between 4:00 PM and 8:00 PM.
- Most respondents (55 percent) prefer to park on the street, likely as close as possible to their end destination(s). When asked the typical distance between the parking space and their destination, 45 percent of respondents parked within the same block and another 27 percent parked with one to two blocks.
- Somewhat supporting the perspectives on the adequacy of parking supply, 68 percent of respondents can find parking immediately or within five minutes of searching. Most respondents (68 percent) are parked for more than three hours. Fifty-four percent of respondents rate the parking experience as excellent to good, while 23 percent say it does not meet average expectations.

Community input is summarized in Appendix E.

ASSESSMENT OF FUTURE CONDITIONS

The future parking supply and demand forecasting includes four scenarios. The first scenario is defined as the baseline forecast as it uses the current relationship between land use activity and peak parking utilization. The second forecast reexamines parking demand under the potential influence of dedicated bicycle lanes, TNCs, and the emergence of autonomous vehicles. The third and fourth scenarios revisit these two future conditions by applying the parking demand that would be generated by an average, large (85th percentile), and maximum event at the Lancaster Convention Center.

KNOWN, PROPOSED, AND POTENTIAL DEVELOPMENT ACTIVITY

To determine a baseline future parking forecast for the Downtown Core and, separately, the New Holland/East Walnut Commercial Corridor, Kimley-Horn obtained information on known, proposed, and potential development information within those two areas. Kimley-Horn worked with the City, LHOP, and LCA to identify the land use type, density, location, number of spaces that might be provided, and the number of existing parking spaces that would be displaced for each potential development. *Building on Strength – Economic Development Strategy Plan for the City of Lancaster*, published by the LCA in June 2015, was a key resource. Kimley-Horn also conducted interviews with others in the business and development community to determine if any new opportunities were on the horizon. Those conversations included staff or representatives with the Lancaster Convention Center, the Marriott Hotel, and LPN.
Figure 16 illustrates the location of the development opportunities in the Downtown Core, and **Table 3** and **Table 4** summarize the development information that was collected for the Downtown Core and New Holland/East Walnut Commercial Corridor, respectively. No map/graphic was created for the lone development opportunity listed in the New Holland/East Walnut study area, but its location is within the south end of Block 7 at the corner of New Holland Avenue, Plum Street, and Walnut Street.

Development		L	and Use Type &	& Density				
	Office	Retail	Residential	Restaurant	Hotel	Other	Parking	g to be
Name	(Sq.ft.)	(Sq.ft.)	(Units)	(Sq.ft.)	(Rooms)	(Sq.ft.)	Displaced	P rovided
"101NQ"	80,000	17,000	16	5,215	0	0	0	0
City Crossing Lot	0	0	0	0	0	0	167	0
Southern Market	25,684	18,574	0	0	0	0	0	0
Queen & Vine Site	0	16,000	150	0	0	0	0	0
Hager Parking Lots	0	0	0	0	0	0	200	0
Library & LPA Garage	0	0	0	0	0	43,600	0	300
Queen & Chestnut Infill	0	9,000	80	0	0	0	27	0
Fulton Financial Corporation expansion	6,000	0	0	2,000	0	0	0	0
Hotel Lancaster/Holiday Inn renovation	0	0	0	5,000	87	0	87	0
Lancaster Marriott at Penn Square	0	0	0	5,500	110	0	110	0
118 North Price	0	2,000	80	3,000	0	0	24	0
225 Place	0	10,000	175	10,000	0	0	0	0

Table 3: Known, Proposed, and Potential Development Information in the Downtown Core

Table 4: Known, Proposed, and Potential Development Information in New Holland/East Walnut Commercial Corridor

Development		L	and Use Type &	& Density				
	Office	Retail	Residential	Restaurant	Hotel	Other	Parking	to be
Name	(Sq.ft.)	(Sq.ft.)	(Units)	(Sq.ft.)	(Rooms)	(Sq.ft.)	Displaced	Provided
Plum and Walnut Anchor	27,000	0	25	5,000	40	0	0	126



Figure 16: Known, Proposed, and Potential Development Impact – Downtown Core

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Downtown Core

Using the recommended parking demand ratios that were derived from the comparison between current land use activity and surveyed peak weekday parking utilization, Kimley-Horn then estimated the weekday daytime demand that would be generated by future development, added the number of spaces to be provided, if any, and subtracted the number of existing spaces that would be displaced due to development. In aggregate, new development activity in the Downtown Core will generate a demand for 809 spaces during the peak weekday daytime period, 615 existing spaces would be displaced, and assuming the LPA developed a new parking structure on Lancaster Square, approximately 300 new/replacement spaces would be provided.

Figure 17 shows the impact that new development, parking displacement, and parking replacement would have on the Downtown Core. Like Figure 14, which estimated the parking demand that may currently be generated by existing land use activity on a block-by-block basis and compared that parking demand to the existing supply of public and privately available spaces within that block, Figure 17 layers demand, replacement, and displacement associated with new development activity onto the existing condition. Do note that this analysis does not include a special event or a schedule activity at the Lancaster Convention Center. The impact of the Convention Center will be modeled and presented separately.

As before, blocks shaded black identify areas of deficit, red suggests areas of stress where demand reaches or exceeds 85 percent of the supply, and yellow and green show areas of surplus. The analysis assumes that public and private on- and off-street spaces within each block could be available to satisfy current and future demand within that block. That may be an oversimplified vision of actual conditions as existing private lots may not wish to satisfy the demand generated by new land use activity. However, LPA's parking facilities, which are available to the public, would be the first alternative for new or displaced parking demand should the private parking in a block not be willing to meet new demand within that block.

To illustrate LPA's ability to absorb existing and future parking demand, Figure 17 also identifies the surplus spaces in blocks with LPA facilities and the conceptual acceptable walking distance from the center of those facilities. The black dot pinpoints the center of an LPA facility while the red dash line represents a 500-foot radius from that point which, for purposes of this analysis, equals an acceptable walking distance for most trip purposes. At a casual walking speed of three miles per hour, 500 feet equates to less than two minutes, but when adjusting for pedestrian pathways, stairs/elevators, signal timing/crossing, and other factors, would equal a walking time of three to five minutes. For example, the seven blocks bound by North Market, East Orange, North Lime, and East King Street (Blocks 33 through 40) have a combined peak weekday daytime deficit of 1,770 spaces. This is an area of Lancaster that has the Lancaster County Courthouse and administrative offices, The Fulton Building, Rite Aid Pharmacy, First Reformed Church, and numerous smaller offices, shops, and restaurants. However, those blocks are within a three- to five-minute walking distance to LPA's King Street Garage (487 space capacity), Penn Square Garage (759 spaces), Duke Street Garage (519 spaces), the Prince Street Garage (1,126), and over 100 curbside spaces.



Figure 17: Known, Proposed, and Potential Development Impact – Downtown Core

Parking Supply, Demand & Forecasting Study | Downtown Core & New Holland/East Walnut Commercial Corridor City of Lancaster | May 2019 | Final Another examination of LPA's capacity to satisfy existing and future parking demand is shown on Figure 18 which layers all development demand (shaded green) onto the current occupancy of all LPA parking facilities (shaded blue). Note that the LPA occupancy figures were obtained from the October 2018 surveys. The LPA capacity number includes the estimated 300 spaces anticipated for the new Lancaster Square Garage (100 North Queen Street/Library garage) but excludes 755 spaces in the Central Garage. Based on conversations with the LPA and LPN, the LPA no longer manages the Central Garage which is owned by LPN, and the newspaper could change how the Central Garage is operated. LPN does not have, at present, a defined vision for the property or when and if the garage would no longer be available to the public. Therefore, the assessment on Figure 18 presents a worst-case scenario. Nonetheless, LPA parking facilities can satisfy the parking demand that could be generated for all known, proposed, and potential development activity without any support from existing privately-owned lots/garages, without LPN's Central Garage, but with the aid of a new 300-space Lancaster Square Garage. However, should the LPA not build the Lancaster Square Garage, the total supply of spaces available to meet future parking demand will be reduced. This may cause a shortfall in spaces to materialize, requiring some future office workers, residents, and shoppers/visitors to be dependent on private/restricted parking spaces, many of which are unlikely to be available to the public. Please note that this summation does not take into consideration leased space commitments, an event at the Convention Center, or other large special events.



Figure 18: Layering of All Future Development Parking Demand onto Existing LPA Parking Utilization and Capacity

In summary, there are blocks in Lancaster's Downtown Core that have little parking. Strategically however, there are large commercial, residential, and/or institutional parking demand generators within one or two blocks of a significant parking surplus that is associated with an LPA garage. The LPA's parking facilities, including the proposed 300 space (+/-) LPA facility at Lancaster Square less the 755 spaces in the Central Garage, are well positioned to meet current and project demand, but this assumes careful management of current/future space lease commitments and it does not include impacts associated with Convention Center or special events.

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New Holland/East Walnut Commercial Corridor

Figure 19 presents the same land use and development impact analysis for the Hew Holland/East Walnut Commercial Corridor as was prepared for the Downtown Core. However, the New Holland/East Walnut Commercial Corridor is dramatically different in terms of scale, density, and street network. Additionally, apart from the unmetered on-street spaces in the area, there are no LPA-owned/operated facilities. The Plum and Walnut Anchor development which is planned for 3 Tobacco Avenue (Block 7) will add to an existing surplus of spaces in that block. However, the parking deficits calculated for Block 4 south of Walnut Street will persist. This block has four- and five-story office buildings, some light industrial uses, a restaurant, and it is assumed that the employees and visitors to this block must be satisfying their weekday daytime parking needs in available spaces in adjacent lots.



Figure 19: Known, Proposed, and Potential Development Impact – New Holland/East Walnut Commercial Corridor

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EMERGING TRANSPORTATION TRENDS AND SHIFTS IN ACTIVE MOBILITY OPTIONS

The following presents an alternative forecast of the future where improvements to public transportation, rideshare programs such as Uber and Lyft, bicycle share, self-driving vehicles, and shifts of travel demographics and mobility are realized. Nonetheless, this section presents a theoretical assessment of parking demand in these areas after the influences of emerging technologies and shifts in land use patterns have been realized. Projected trends related to TNCs effects on auto ownership and autonomous vehicles' influence on public transportation and "last mile" connectivity is briefly summarized. While those trends are discussed and utilized to defend reductions in auto utilization and auto ownership, more localized and immediate impacts associated with potential walking, biking, and bus lane improvement strategies in Lancaster are also examined. This more immediate summary is based on a review of the Lancaster, Pennsylvania Downtown Walkability Analysis produced by the City of Lancaster in April 2015 and the Lancaster Active Transportation Plan (ATP), produced by the Lancaster County Planning Commission, Lancaster Intermunicipal Committee, and City of Lancaster in February 2019.

LANCASTER, PENNSYLVANIA DOWNTOWN WALKABILITY ANALYSIS

The City completed a walkability analysis that included the Amtrak and Northwest Gateway areas, the Downtown Core, and several blocks extending from the Downtown Core along the corridors of the New Holland/East Walnut Commercial Corridor, Manor Street, Prince/Queen Street, South Duke Street, and King Street. The study looks at national trends, best design practices, and specific to Lancaster, records of car/pedestrian car/bicycle collisions, roadway and intersection design configurations, and the width and condition of sidewalks. In a criticism that vehicle travel lanes are too wide because they encourage speeding and endanger pedestrians, the Downtown Walkability Analysis identified dozens of locations where curbside parking can be returned or introduced to improve the pedestrian experience.

LANCASTER ACTIVE TRANSPORTATION PLAN

A draft of the Lancaster ATP was released in February 2019. The ATP offers recommendations to create an interconnected network of pedestrian, bicycle, and transit facilities throughout Lancaster County and includes a chapter on a bicycle network for the Downtown Core. In review, the ATP continues the work presented in the 2015 Downtown Walkability Analysis at a policy level.

Given the opportunity to introduce curbside space to improve the pedestrian experience and walkability as presented in the Downtown Walkability Analysis and the limited number of shared roadway design concepts that would cause a loss of curbside space as anticipated in the Walkability Analysis and Lancaster ATP, the parking supply assumptions that follow assume that no meaningful increases or decreases in the existing supply of on-street spaces in the Downtown Core or along the New Holland/East Walnut Commercial Corridor will occur.

Implementation of dedicated and shared bicycle lanes and other improvements to pedestrian circulation could only reduce the current dependence on the automobile and single occupancy vehicle travel. Therefore, any reductions in parking demand proposed in this parking forecasting study would, in combination with other transit network changes, the growth of transit network companies, and the potential of autonomous vehicles, assume that some shift from automobiles and parking to biking and walking will occur.

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TRANSPORTATION NETWORK COMPANIES (TNC)

With the advent of TNCs or ride-hailing services such as Uber, Lyft, Juno, Sidecar, and food delivery services like Grubhub, Uber Eats, Door Dash and Seamless, municipalities are rethinking their approach to off-street parking requirements for new development and curbside parking management. The rethinking of curbside management is not only an effort to accommodate these very short-term parking users but also provide a level of safety for users entering or exiting ride hailing services.

Several models have been developed by various municipal governments to accommodate on-street parking for TNC use. One approach is to designate limited onstreet spaces for TNC use and allow rideshare operators to be licensed (fee direct from Uber, Lyft, etc.) to utilize these spaces. Signage would be required to identify these spaces to prevent other users from using this reserved space. However, some municipalities shy away from reserved on-street spaces as they prefer to keep public parking on a first-come first-served basis.



Dedicated Rideshare Loading Zone Sign

Another problem faced by municipalities is where to place passenger loading zones. As to not show favoritism to any business or district by placing space directly in front of a specific business, some communities are increasing the curbside length of their current commercial loading zones to include passenger loading and unloading.

It is important that the introduction of these shared mobility zones does require the loss of one or two metered spaces based on current space dimensions. The success of the expanded loading/unloading zones for TNC use also may require moderate enforcement of stopping and standing ordinances to discourage the continued practice of stopping in traffic to allow passengers to load or unload.

AUTONOMOUS VEHICLES

The term "autonomous vehicle" means different things to different people. The Society of Automotive Engineers (SAE) has developed categories for the different levels of coming autonomous vehicle (AV) technology. These categories are identified as follows:

- Level 1 automation means some small steering or acceleration tasks are performed by the car without human intervention, but everything else is fully under human control.
- Level 2 automation works like adaptive cruise control (ACC) or an autopilot system on some Tesla vehicles; the car can automatically take safety actions, but the driver needs to stay alert at the wheel.
- Level 3 automation still requires a human driver, but the human can put some "safety-critical functions" to the vehicle, under certain traffic or environmental conditions. This poses some potential dangers as humans pass the major tasks of driving to or from the car itself, which is why some car companies are interested in jumping directly to level 4.
- Level 4 automation is a car that can drive itself almost all the time without any human input but might be programmed not to drive in unmapped areas or during severe weather. A driver could sleep in this car.
- Level 5 automation means full automation in all conditions.
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Based on the realistic implementation and acceptance of this technology, the impact on parking demand and the need to provide curbside accommodations for AV is not immediate. However, it is important to note that AV technology has the potential to increase the curbside needs of TNCs as well. Although the timing and regulation of AV is very uncertain at this time, some reductions in vehicle ownership and parking demand must be anticipated and planning for the curbside accommodation of these types of vehicles should be kept in mind.

E-SCOOTERS

The utilization of e-scooter services such as Bird, Lime, Skip, Lyft, and Spin is providing a huge challenge to cities nationwide. This type of transportation is mostly unregulated by governing bodies due to its quick growth in popularity. New York City and the City of Miami have banned the use of these devices, citing pedestrian and user safety concerns. Some cities are also issuing citations for operating the devices without a helmet. As an industry, the regulations vary from city-to-city, making the rental of these devices confusing when utilizing this service while traveling.

When renting an e-scooter, all suppliers require that a user agrees to "fully release, indemnify, and hold harmless" the company for injury, death, property damage and other losses. In addition, personal medical insurance or car insurance may cover medical bills incurred because of an accident to property or persons.

Where the use of these devices is popular, both the public and private sector has begun to accommodate the storage of these devices. In the private sector, parking operators are supplying bicycle style racks in their facilities to store escooters for a fee.

Part of the reason New York City and the City of Miami banned the use of these devices is the concern that they would be used on sidewalks and jeopardize the safety of pedestrians. Other communities like Santa Monica have designated dedicated e-scooter lanes.

Ultimately, the approach taken by a city in allowing the use of these devices is predicated on the input of the respective city's legal and public works department.



Bicycle and E-Scooter Parking



Dedicated Bicycle and E-Scooter Lane

IMPACTS OF EMERGING TRANSPORTATION TRENDS AND SHIFTS IN ACTIVE MOBILITY OPTIONS

Using the existing land use and known, proposed, and potential development impacts as a baseline, Kimley-Horn calculated how parking demand and parking surplus/deficit conditions would change under the influence of improvement to the pedestrian environment, introduction of dedicated and shared bicycle lanes, the growing influence of Uber, Lyft, and other TNCs, and AVs. It must be noted that the transportation and parking industries, institutional research agencies, and educational institutions of higher learning do not have a confirmed and unified vision on how these changes to mobility will affect parking demand. While it is reasonable to suggest that automobile ownership and single occupancy vehicle use will decline, the rate of decline is unknown. Furthermore, many of those studies also noted a corresponding increase in development density. In urban areas, the average square foot per bedroom is declining and the number of office employees per square foot is increasing. Though automobile ownership in urban areas is declining overall, the volume of people who occupy existing and new residential and commercial buildings may be offsetting that decline. Therefore, it could be argued that the assumptions that follow regarding a decline in office, retail, restaurant, residential, and cultural/institution parking demand are too aggressive. Conversely, it could be argued that they are not aggressive enough. To allow the City, LPA, LHOP, LCA, and the stakeholders of Lancaster to explore the range of possible outcomes from TNC, AVs, and changes in mobility, the GIS land use parking model that has been created will be provided to the City and its stakeholder to independently forecast potential scenarios.

Figure 20 and **Figure 21** update the baseline forecast of future parking surplus or deficit conditions by block for the Downtown Core and New Holland/East Walnut Commercial Corridor, respectively, under the presumption that office parking demand ratios will decrease by 15 percent and all other land-use-based demand ratios will decline by 10 percent. Office demand ratios would likely decline at a greater rate as access to offices in Lancaster today is dominated by single occupancy vehicles. Moreover, the changes in mobility and technology may have a greater effect on current commuting patterns than they would on retail, entertainment, or residential patterns. In comparison with the baseline forecast of future parking surplus and deficit conditions in the Downtown Core, the areas of deficit would remain largely unchanged.

As noted before, these are blocks where there is considerable commercial, residential, and institutional building activity but little to no in-block parking. However, the number of blocks that would experience high levels of stress (red shaded blocks) would be reduced dramatically with reductions in parking demand.



Figure 20: Forecasted Future Peak Parking Surplus/Deficit by Block with TNC and AV Impacts – Downtown Core

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Figure 21: Forecasted Future Peak Parking Surplus/Deficit by Block with TNC and AV Impacts – New Holland/East Walnut Commercial Hub

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Parking Supply, Demand & Forecasting Study | Downtown Core & New Holland/East Walnut Commercial Corridor City of Lancaster | May 2019 | Final

SUMMARY OF EXISTING, FUTURE BASELINE, AND FUTURE WITH TNCs, AVs, AND MOBILITY SHIFTS

Table 5 and Table 6 summarize the system-wide conditions and forecasts for the existing, future baseline, and future with potential parking demand reductions, respectively. Note that the future forecasts are based on land use activity for the entirety of both study areas, and detailed demand estimates could not be provided for the on- and off-street spaces. It must be noted that these figures present all parking supply, public and private, on- and off-street for each study area in aggregate. While the total demand numbers are accurate as it related to a demand model and forecasting, changes in development activity will affect the results. More critical is the fact that the supply figures appear to presume that all private and restricted off-street parking lots and garages are able and willing to work in concert with the City, LPA, and the public parking facilities in the Downtown Core to share the burden of responsibility of meeting current and future demand. The fact is, only the LPA facilities are designed and managed specifically for that purpose, as even the RRTA Garage and Central Place Garage, which are owned and operated by the RRTA and LNP, respectively, may in the future be used for other more specific purposes.

Note that the forecast of conditions under the future baseline scenario did identify the fact that existing LPA facilities, with the new Lancaster Square Garage and without the 755-space Central Garage, can satisfy all future development demand without support from any non-LPA lots or garages. Therefore, it must be assumed that the LPA facilities could satisfy all future development demand under the future with demand reductions forecast.

Condition	Facility	Inventory	Number	Percentage	Surplus/Deficit
	On-Street	1,505	841	56%	664
Evisting Occupancy	LPA Off-Street	4,491	2,819	63%	1,672
Existing Occupancy	Private Off-Street	3,963	2,481	63%	1,482
	Total	9,959	6,141	62%	3,818
	On-Street	1,505	-	-	-
Pasalina Futura Domand	LPA Off-Street	4,036	-	-	-
Baseline Future Demanu	Private Off-Street	3,782	-	-	-
	Total	9,323	6,733	72%	2,590
	On-Street	1,505	-	-	-
Future Demand with	LPA Off-Street	4,036	-	-	-
Potential Demand Reductions	Private Off-Street	3,782	-	-	-
	Total	9,323	6,060	65%	3,263

Table 5: Downtown Core System-Wide Summary of Existing, Future Baseline, and Future with Reductions Forecasts

Parking Supply, Demand & Forecasting Study | Downtown Core & New Holland/East Walnut Commercial Corridor City of Lancaster | May 2019 | Final Table 6: New Holland/East Walnut Commercial Corridor System-wide Summary of Existing, Future Baseline, and Future with Reductions Forecasts

Condition	Facility	Inventory	Number	Percentage	Surplus/Deficit
	On-Street	537	238	44%	299
Evisting Occupancy	LPA Off-Street	-	-	-	-
Existing Occupancy	Private Off-Street	4,722	2,647	56%	2,075
	Total	5,259	2,885	55%	2,374
	On-Street	537	-	-	-
Deseline Future Demond	LPA Off-Street	-	-	-	-
Baseline Future Demand	Private Off-Street	4,848	-	-	-
	Total	5,385	3,070	57%	2,315
	On-Street	537	-	-	-
Future Demand with	LPA Off-Street	-	-	-	-
Potential Demand Reductions	Private Off-Street	4,848	-	-	-
	Total	5,385	2,763	51%	2,622

LANCASTER CONVENTION CENTER IMPACT

As noted previously, the land-use-based parking demand model is a baseline condition upon which impacts associated with different influences can be measured including but not limited to new development, loss of existing capacity, addition of new publicly available facilities, and changes in modality and travel patterns. As that baseline excluded the impact of an event at the Lancaster Convention Center, the following offers an independent assessment of parking demand under average, high, and maximum event attendance. That analysis was then layered onto the existing and future forecast.

The Lancaster Convention Center carefully tracks and reports attendance to all event activities. As the parking demand model and forecast is based on a typical weekday daytime period, the assessment of event demand focused only on events scheduled during that period. During the previous 12 months there were 87 events scheduled during a weekday daytime period. The average number of attendees to a weekday daytime event was 955 persons, a large event, which is defined as the 85th percentile of volume, generated 1,550 attendees, while the maximum scheduled event, the McCaskey High School graduation ceremony, generated an estimated 4,000 attendees. Convention Center staff and the LPA staff have no way to measure parking demand associated with these events so estimates of persons per auto were assumed and used to convert attendance figures to peak weekday daytime parking demand. For the McCaskey graduation, youth sporting events, and related performance competitions, it was assumed that the average number of persons per vehicle was 3.0. Events like the "daddy/daughter dance" and Pennsylvania Public Transportation Association (PPTA) Annual Spring Conference, a ratio of 2.0 persons per auto were used. For trade shows and related association/business conferences a ratio of 1.5 persons per auto were referenced. Using these attendance figures and persons per auto assumptions, Figure 22 present graphically the frequency and volume of convention parking demand during the previous 12 months. For an average event, it is estimated that the Convention Center would generate a demand for 319 spaces, 517 spaces during a large event, and approximately 1,330 spaces for the maximum attended event.



Figure 22: Estimate of Weekday Daytime Parking Demand Generated by Recent Lancaster Convention Center Events (Monday, January 15, 2018 through Wednesday, December 12, 2018)

Parking Supply, Demand & Forecasting Study | Downtown Core & New Holland/East Walnut Commercial Corridor City of Lancaster | May 2019 | Final With Convention Center demand estimated, **Figure 23** presents the layering of event demand onto the existing and base future condition. The figure focuses on a subarea of the Downtown that are bound by Orange Street, Prince Street, Farnum Street, and Lime Street as the only additional parking demand that is generated is generated within the block that houses the Convention Center (see Block 55). The numbers circled in blue in Block 55 for each figure illustrates the deficit in that block with an average event, purple presents the deficit during a large event, and the pink illustrates the deficit under the maximum attendance scenario.





Including average, 85th percentile, and maximum-attended weekday events at the Convention Center, the ability of the LPA facilities to satisfy these events was reexamined. As noted previously, average event parking demand required an additional 319 spaces, large events (85th percentile) required 517 spaces, and the largest single event, McCaskey High School graduation, generated a demand/need for 1,330 spaces. While system-wide LPA facilities could absorb the additional demand generated by average and larger events (see the supply and demand graph on **Figure 24**), it would require many event patrons to walk several blocks from an LPA facility to the Convention Center. This analysis includes the Water Street Garage, North Queen Street Garage, and other lots and garages that are more than three blocks from the Convention Center. With future development, the loss of management of the Central Garage, and the impact of a large Convention Center event, the LPA could not satisfy parking demand under this scenario without assistance/participation from existing and available private/restricted facilities and/or and shuttle service to a special event intercept lot.



Figure 24: Existing LPA Parking System Capacity, Utilization, and Ability to Satisfy a Large Convention Center Event

While Figure 24 examines the LPA's capability to satisfy existing parking needs and the impact of a large event at the Convention Center, **Figure 25** also includes the impact associated with all future development activity. Under this scenario peak weekday parking demand that includes current LPA occupancy, a large Convention Center activity, and all future development impact would equal 4,441 occupied spaces. LPA capacity without the Central Garage but with a proposed 400-space Lancaster Square Garage would equal a supply of 4,136 and illustrates the importance of a new parking facility.





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SUMMARY

The City of Lancaster, with its partners LPA and LCA, retained a consultant to conduct a parking supply, demand, and forecasting study that would estimate future conditions for the next decade. This report includes an inventory of all public and private, on-street and off-street parking, provides a comparison of observed parking occupancy with the current supply, an assessment of the impact associated with future development, and an identification of areas both current and future that experience or will experience parking deficits. Additionally, the forecast includes a vision of the future of parking demand when influences of transportation alternatives such as Uber, Lyft, autonomous vehicles, and bicycle/scooter share programs are realized. Through the creation of a GIS tool, the City, LPA, and LCA, and the Downtown Commercial Core and New Holland/East Walnut Commercial Corridor stakeholders that they represent can forecast changes in parking supply and demand associated with changes in development vision and transportation. And while this supply, demand, and forecasting effort does not offer recommendations on new garages or changes to parking rates, policy, or management, this effort does provide the critical data needed for more informed debate and discourse on these and other topics.

APPENDIX

- Appendix A Existing Parking Supply by Study Area
- Appendix B Existing Parking Count and Occupancy by Study Area
- Appendix C Existing Land Use and Parking Data by Study Area and Block
- Appendix D Existing Land-Use-Based Parking Demand by Study Area
- Appendix E Public Survey Response Charts by Study Area
- Appendix F Future Parking Supply and Land-Use-Based Demand by Study Area
- Appendix G Future Land-Used Based Parking Demand with TNC and AV Impacts by Study Area

Appendix A

Table A1 Existing On- and Off-Street Parking Supply – DOWNTOWN CORE

Block	On-	Off	-Street Ca	pacity	Total	Block	On-	Off-Str	eet Cap	acity	Total
#	Street	Non-	LPA	Total	Block	#	Street	Non-	LPA	Total	Block
	Capacity	LPA			Capacity		Capacity	LPA			Capacity
1	49	88	0	88	137	35	10	40	0	40	50
2	24	121	0	121	145	36	4	22	0	22	26
3	20	168	0	168	188	37	9	0	0	0	9
4	32	123	0	123	155	38	0	38	0	38	38
5	31	89	0	89	120	39	4	0	0	0	4
6	34	87	0	87	121	40	13	0	0	0	13
7	33	131	0	131	164	41	15	100	0	100	115
8	21	70	0	70	91	42	12	103	0	103	115
9	12	18	0	18	30	43	10	0	0	0	10
10	25	0	44	44	69	44	13	5	0	5	18
11	21	36	67	103	124	45	10	56	0	56	66
12	39	201	0	201	240	46	17	37	0	37	54
13	24	111	0	111	135	47	37	124	0	124	161
14	23	101	0	101	124	48	23	99	0	99	122
15	16	398	0	398	414	49	45	55	0	55	100
16	27	109	0	109	136	50	7	27	0	27	34
17	7	81	0	81	88	51	9	0	0	0	9
18	28	24	0	24	52	52	18	35	0	35	53
19	45	48	609	657	702	53	17	0	755	755	772
20	50	8	0	8	58	54	3	38	0	38	41
21	24	17	0	17	41	55	44	14	759	773	817
22	22	16	0	16	38	56	25	116	487	603	628
23	18	43	0	43	61	57	24	80	39	119	143
24	12	36	0	36	48	58	69	0	0	0	69
25	17	47	0	47	64	59	13	13	0	13	26
26	14	70	0	70	84	60	14	45	0	45	59
27	11	0	1126	1126	1137	61	34	72	0	72	106
28	32	21	519	540	572	62	34	102	0	102	136
29	16	24	0	24	40	63	42	32	0	32	74
30	35	66	0	66	101	64	28	43	0	43	71
31	20	65	0	65	85	65	20	40	0	40	60
32	18	55	0	55	73	66	18	0	0	0	18
33	9	24	0	24	33	67	12	0	0	0	12
34	40	131	0	131	171	68	3	0	0	0	3
Total	1505	3963	4405	8368	9873						

Table A2 Existing On- and Off-Street Parking Supply – NEW HOLLAND/EAST WALNUT COMMERCIAL HUB

Block Number	On-Street Capacity	Off-Street Capacity	Total Block Capacity
1	35	110	145
2	45	20	65
3	44	55	99
4	33	80	113
5	26	149	175
6	62	21	83
7	81	1014	1095
8	47	87	134
9	35	57	92
10	29	0	29
11	33	14	47
12	67	531	598
13	0	2584	2584
Total	537	4722	5259

Appendix B

Table B1 Existing On- and Off-Street Parking Count, 10AM to 2PM – Downtown Core

Block	On-	Off	-Street Co	ount	Total	Block	On-	Off	-Street Co	ount	Total
#	Street	Non-	LPA	Total	Block	#	Street	Non-	LPA	Total	Block
	Count	LPA			Count		Count	LPA			Count
1	27	32	0	32	59	35	8	28	0	28	36
2	18	90	0	90	108	36	2	11	0	11	13
3	9	103	0	103	112	37	7	0	0	0	7
4	10	100	0	100	110	38	3	15	0	15	18
5	9	73	0	73	82	39	5	0	0	0	5
6	11	34	0	34	45	40	15	0	0	0	15
7	13	84	0	84	97	41	8	75	0	75	83
8	11	39	0	39	50	42	8	67	0	67	75
9	4	3	0	3	7	43	9	0	0	0	9
10	12	0	10	10	22	44	4	3	0	3	7
11	11	19	31	50	61	45	8	35	0	35	43
12	25	124	0	124	149	46	2	22	0	22	24
13	12	56	0	56	68	47	16	43	0	43	59
14	13	59	0	59	72	48	18	22	0	22	40
15	12	340	0	340	352	49	33	12	0	12	45
16	12	81	0	81	93	50	5	5	0	5	10
17	2	74	0	74	76	51	3	0	0	0	3
18	12	19	0	19	31	52	11	21	0	21	32
19	15	35	321	356	371	53	10	0	519	519	529
20	23	6	0	6	29	54	2	45	0	45	47
21	8	11	0	11	19	55	24	22	329	351	375
22	3	19	0	19	22	56	17	85	365	450	467
23	8	35	0	35	43	57	27	53	40	93	120
24	6	35	0	35	41	58	43	0	0	0	43
25	8	28	0	28	36	59	5	2	0	2	7
26	12	25	0	25	37	60	8	41	0	41	49
27	13	0	717	717	730	61	21	29	0	29	50
28	19	13	466	479	498	62	21	19	0	19	40
29	11	17	0	17	28	63	17	42	0	42	59
30	33	34	0	34	67	64	11	7	0	7	18
31	20	43	0	43	63	65	16	8	0	8	24
32	13	34	0	34	47	66	6	0	0	0	6
33	5	22	0	22	27	67	9	0	0	0	9
34	17	82	0	82	99	68	2	0	0	0	2
Total	841	2481	2798	5279	6120						

Table B2 Existing On- and Off-Street Parking Occupancy, 10AM to 2PM – Downtown Core

Block	On-	Off-	Street Co	ount	Total	Block	On-	Off	-Street Co	ount	Total
#	Street	Non-	LPA	Total	Block	#	Street	Non-	LPA	Total	Block
	Count	LPA			Count		Count	LPA			Count
1	55%	36%	-	36%	43%	35	80%				
								70%	-	70%	72%
2	75%	74%	-	74%	74%	36	50%	50%	-	50%	50%
3	45%	61%	-	61%	60%	37	78%	-	-	-	78%
4	31%	81%	-	81%	71%	38	-	39%	-	39%	47%
5	29%	82%	-	82%	68%	39	125%	-	-	-	125%
6	32%	39%	-	39%	37%	40	115%	-	-	-	115%
7	39%	64%	-	64%	59%	41	53%	75%	-	75%	72%
8	52%	56%	-	56%	55%	42	67%	65%	-	65%	65%
9	33%	17%	-	17%	23%	43	90%	-	-	-	90%
10	48%	-	23%	23%	32%	44	31%	60%	-	60%	39%
11	52%	53%	46%	49%	49%	45	80%	63%	-	63%	65%
12	64%	62%	-	62%	62%	46	12%	59%	-	59%	44%
13	50%	50%	-	50%	50%	47	43%	35%	-	35%	37%
14	57%	58%	-	58%	58%	48	78%	22%	-	22%	33%
15	75%	85%	-	85%	85%	49	73%	22%	-	22%	45%
16	44%	74%	-	74%	68%	50	71%	19%	-	19%	29%
17	29%	91%	-	91%	86%	51	33%	-	_	_	33%
18	43%	79%	-	79%	60%	52	61%	60%	-	60%	60%
19	33%	73%	53%	54%	53%	53	59%	-	69%	69%	69%
20	46%	75%	-	75%	50%	54	67%	118%	-	118%	115%
21	33%	65%	-	65%	46%	55	55%	157%	43%	45%	46%
22	14%	119%	-	119%	58%	56	68%	73%	75%	75%	74%
23	44%	81%	-	81%	70%	57	113%	66%	103%	78%	84%
24	50%	97%	-	97%	85%	58	62%	-	-	-	62%
25	47%	60%	-	60%	56%	59	38%	15%	-	15%	27%
26	86%	36%	-	36%	44%	60	57%	91%	-	91%	83%
27	118%	-	64%	64%	64%	61	62%	40%	-	40%	47%
28	59%	62%	90%	89%	87%	62	62%	19%	-	19%	29%
29	69%	71%	-	71%	70%	63	40%	131%	-	131%	80%
30	94%	52%	-	52%	66%	64	39%	16%	-	16%	25%
31	100%	66%	-	66%	74%	65	80%	20%	-	20%	40%
32	72%	62%	-	62%	64%	66	33%	-	-	-	33%
33	56%	92%	-	92%	82%	67	75%	-	-	-	75%
34	43%	63%	-	63%	58%	68	67%	-	-	-	67%
Total	56%	63%	64%	63%	62%						

Table B3 Existing On- and Off-Street Parking Count, 2PM to 4PM – Downtown Core

Block	On-	Off-	-Street Co	ount	Total	Block	On-	Off	-Street Cc	unt	Total
#	Street	Non-	LPA	Total	Block	#	Street	Non-	LPA	Total	Block
	Count	LPA			Count		Count	LPA			Count
1	32	44	0	44	76	35	10	27	0	27	37
2	15	69	0	69	84	36	1	14	0	14	15
3	5	91	0	91	96	37	4	0	0	0	4
4	20	91	0	91	111	38	5	13	0	13	18
5	17	79	0	79	96	39	5	0	0	0	5
6	18	42	0	42	60	40	18	0	0	0	18
7	14	55	0	55	69	41	7	74	0	74	81
8	13	40	0	40	53	42	8	68	0	68	76
9	1	4	0	4	5	43	8	0	0	0	8
10	17	0	9	9	26	44	6	8	0	8	14
11	5	17	25	42	47	45	7	32	0	32	39
12	22	127	0	127	149	46	4	11	0	11	15
13	9	65	0	65	74	47	16	40	0	40	56
14	10	49	0	49	59	48	22	33	0	33	55
15	10	279	0	279	289	49	29	27	0	27	56
16	10	92	0	92	102	50	0	8	0	8	8
17	5	85	0	85	90	51	4	0	0	0	4
18	5	18	0	18	23	52	10	32	0	32	42
19	19	35	323	358	377	53	9	0	497	497	506
20	31	4	0	4	35	54	4	8	0	8	12
21	14	21	0	21	35	55	27	15	305	320	347
22	8	12	0	12	20	56	22	75	310	385	407
23	8	36	0	36	44	57	20	51	42	93	113
24	5	21	0	21	26	58	41	0	0	0	41
25	6	39	0	39	45	59	6	3	0	3	9
26	8	32	0	32	40	60	5	37	0	37	42
27	10	0	639	639	649	61	18	26	0	26	44
28	13	13	408	421	434	62	17	28	0	28	45
29	7	18	0	18	25	63	16	41	0	41	57
30	26	38	0	38	64	64	12	13	0	13	25
31	15	40	0	40	55	65	14	29	0	29	43
32	6	30	0	30	36	66	10	0	0	0	10
33	8	13	0	13	21	67	7	0	0	0	7
34	26	79	0	79	105	68	1	0	0	0	1
Total	831	2391	2558	4949	5780						

Table B4 Existing On- and Off-Street Parking Occupancy, 2PM to 4PM – Downtown Core

Block	On-	Off-	Street Co	ount	Total	Block	On-	Off	-Street Cc	ount	Total
#	Street	Non-	LPA	Total	Block	#	Street	Non-	LPA	Total	Block
_	Count	LPA			Count		Count	LPA			Count
1	65%	50%	-	50%	55%	35	89%	54%	-	54%	64%
2	63%	57%	-	57%	58%	36	65%	60%	-	60%	61%
3	25%	54%	-	54%	51%	37	100%	68%	-	68%	74%
4	63%	74%	-	74%	72%	38	25%	64%	-	64%	58%
5	55%	89%	-	89%	80%	39	44%	-	-	-	44%
6	53%	48%	-	48%	50%	40	-	34%	-	34%	47%
7	42%	42%	-	42%	42%	41	125%	-	-	-	125%
8	62%	57%	-	57%	58%	42	138%	-	-	-	138%
9	8%	22%	-	22%	17%	43	47%	74%	-	74%	70%
10	68%	-	20%	20%	38%	44	67%	66%	-	66%	66%
11	24%	47%	37%	41%	38%	45	80%	-	-	-	80%
12	56%	63%	-	63%	62%	46	46%	160%	-	160%	78%
13	38%	59%	-	59%	55%	47	70%	57%	-	57%	59%
14	43%	49%	-	49%	48%	48	24%	30%	-	30%	28%
15	63%	70%	-	70%	70%	49	43%	32%	-	32%	35%
16	37%	84%	-	84%	75%	50	96%	33%	-	33%	45%
17	71%	105%	-	105%	102%	51	64%	49%	-	49%	56%
18	18%	75%	-	75%	44%	52	0%	30%	-	30%	24%
19	42%	73%	53%	54%	54%	53	44%	-	-	-	44%
20	62%	50%	-	50%	60%	54	56%	91%	-	91%	79%
21	58%	124%	-	124%	85%	55	53%	-	66%	66%	66%
22	36%	75%	-	75%	53%	56	133%	21%	-	21%	29%
23	44%	84%	-	84%	72%	57	61%	107%	40%	41%	42%
24	42%	58%	-	58%	54%	58	88%	65%	64%	64%	65%
25	35%	83%	-	83%	70%	59	83%	64%	108%	78%	79%
26	57%	46%	-	46%	48%	60	59%	-	-	-	59%
27	91%	-	57%	57%	57%	61	46%	23%	-	23%	35%
28	41%	62%	79%	78%	76%	62	36%	82%	-	82%	71%
29	44%	75%	-	75%	63%	63	53%	36%	-	36%	42%
30	74%	58%	-	58%	63%	64	50%	27%	-	27%	33%
31	75%	62%	-	62%	65%	65	38%	128%	-	128%	77%
32	33%	55%	-	55%	49%	66	43%	30%	-	30%	35%
33	65%	50%	-	50%	55%	67	70%	73%	-	73%	72%
34	63%	57%	-	57%	58%	68	56%	-	_	_	56%
Total	55%	60%	58%	59%	59%						

Table B5 Existing On- and Off-Street Parking Count, 10AM to 2PM – New Holland/East Walnut Commercial Hub

Block Number	On- Street Count	Off-Street Count	Total Block Count
1	21	72	93
2	15	13	28
3	23	35	58
4	19	52	71
5	10	97	107
6	21	14	35
7	33	660	693
8	20	57	77
9	17	37	54
10	5	0	5
11	3	5	8
12	51	396	447
13	0	1209	1209
Total	238	2647	2885

Table B6 Existing On- and Off-Street Parking Occupancy, 10AM to 2PM – New Holland/East Walnut Commercial Hub

Block Number	On- Street Count	Off-Street Count	Total Block Count
1	60%	65%	64%
2	33%	65%	43%
3	52%	64%	59%
4	58%	65%	63%
5	38%	65%	61%
6	34%	67%	42%
7	41%	65%	63%
8	43%	66%	57%
9	49%	65%	59%
10	17%	-	17%
11	9%	36%	17%
12	76%	75%	75%
13	-	47%	47%
Total	44%	56%	55%

Table B7 Existing On- and Off-Street Parking Count, 2PM to 4PM – New Holland/East Walnut Commercial Hub

Block Number	On- Street Count	Off-Street Count	Total Block Count
1	16	43	59
2	25	10	35
3	23	31	54
4	13	44	57
5	6	45	51
6	14	6	20
7	20	335	355
8	22	26	48
9	14	18	32
10	5	0	5
11	11	2	13
12	32	244	276
13	0	996	996
Total	201	1800	2001

Table B8 Existing On- and Off-Street Parking Occupancy, 2PM to 4PM – New Holland/East Walnut Commercial Hub

Block Number	On- Street Count	Off-Street Count	Total Block Count
1	46%	39%	41%
2	56%	50%	54%
3	52%	56%	55%
4	39%	55%	50%
5	23%	30%	29%
6	23%	29%	24%
7	25%	33%	32%
8	47%	30%	36%
9	40%	32%	35%
10	17%	-	17%
11	33%	14%	28%
12	48%	46%	46%
13	-	39%	39%
Total	37%	38%	38%

Appendix C



Table C1 Existing Land Use and Parking Data by Study Sector and Block – DOWNTOWN CORE

		Land Use Type and Density/Units					Park	ing				
		Office	Retail	Restaurant	Institutional	Theater	Hotel	Industrial	Other	Residential	Total	Peak
Sector and B	lock Code	Sq.ft.	Sq.ft.	Sq.ft.	Sq.ft.	Sq.ft.	Rooms	Sq.ft.	Sq.ft.	DU	Inventory	Occupancy
Downtown												
1001	1	2058	0	1120	2622	0	0	0	0	64	137	108
1002	2	17740	8267	5058	3033	0	0	0	0	20	145	108
1003	3	0	10152	0	0	0	0	0	0	315	100	112
1004	4	0	3//53	16661	15361	0	0	8364	0	31	135	110
1005	5	980	40687	5318	15501	0	0	0304	0	33	120	45
1000	7	500	40087	2210	0	0	0	0	0	33	121	43
1007	2	5751	0	0	0	0	0	0	0	42	104	50
1008	0	8091	1926	0	0	0	0	0	13558	10	30	
1005	10	0001	1520	0	0	0	0	0	15558	53	69	22
1010	11	0	0	0	0	0	0	0	0	30	124	61
1011	11	896	7154	0	0	0	0	0	0	81	240	149
1012	13	14912	3114	0	19461	0	0	0	0	86	135	68
1013	14	72868	21305	1222	0	0	0	0	0	49	124	72
1015	15	0	4019	15034	21021	0	0	0	0	36	216	82
1016	16	51009	66287	5940	0	0	0	0	0	14	136	93
1017	17	39025	33805	9585	62250	0	0	0	0	0	88	76
1018	18	0	40333	32094	44946	0	0	0	0	3	52	31
1019	19	0	0	0	41088	0	0	0	0	17	702	371
1020	20	0	2680	0	0	0	0	0	0	87	58	29
1021	21	0	0	0	0	0	0	0	0	14	41	19
1022	22	0	0	0	70224	0	0	0	0	0	38	22
1023	23	1430	1262	0	5528	600	0	0	0	24	61	43
1024	24	750	13300	10683	10371	10455	0	0	0	44	48	41
1025	25	6833	9626	0	0	0	0	0	0	14	64	36
1026	26	34121	0	0	0	0	0	0	0	0	84	37
1027	27	52680	0	0	2948	0	0	0	0	0	1137	730
1028	28	82926	15607	0	0	0	187	0	0	0	572	498
1029	29	33304	8086	2695	0	0	0	0	0	13	40	28
1030	30	10532	6021	1235	21422	0	0	0	0	13	101	67
1031	31	19541	0	0	0	0	0	0	0	29	85	63
1032	32	15781	3050	0	0	0	0	0	11365	8	73	47
1033	33	6796	0	0	0	0	0	0	0	24	33	27
1034	34	73768	13689	9395	26979	0	0	0	0	20	171	99
1035	35	74632	0	0	33199	0	0	0	0	0	50	36
1036	36	178234	0	0	0	0	0	0	0	1	26	13
1037	37	62411	72482	0	0	0	0	0	0	0	9	7
1038	38	41534	43981	5800	9384	0	0	0	0	3	38	18
1039	39	204469	16820	16820	0	0	0	0	0	0	4	5
1040	40	58482	90277	42298	0	0	0	0	0	42	13	15
1041	41	0	5187	6089	0	0	0	0	0	14	115	83
1042	42	/360	6606	1/4/2	0	0	0	0	0	28	115	/5
1045	43	1469	05//	1094	0	44426	0	0	0	11	10	9
1044	44	0	26576	1084	0	44420	0	0	0	11	10	/ /3
1045	43	937	20370	0	0	0	0	0	17202	21	54	43
1040	40	1666	2027	4504	7336	0	0	0	1/202	21	161	50
1047	47	4000	27505	3860	9707	0	0	0	0	30	101	 ⊿∩
1049	48	0	1026	0.000	19617	0	n	0	0	61	100	45
1050	50	500	1020	n	1301/	n	n	0	0	75	.34	10
1051	51	0	630	0	0	0	0	0	0	39	9	3
1052	52	129494	24192	21572	14127	0	0	0	0	14	53	32
1053	53	0	0	0	0	0	0	0	0	21	772	529
1054	54	13078	0	0	0	0	0	0	0	0	41	47
1055	55	76419	39165	36303	450370	0	909	0	0	0	817	375
1056	56	54107	15247	3352	9370	0	0	0	0	16	628	467
1057	57	0	0	0	31478	0	0	0	0	45	143	120
1058	58	0	0	0	0	0	0	0	0	38	69	43
1059	59	0	0	0	0	0	0	0	0	30	26	7
1060	60	0	0	0	0	0	0	0	0	99	59	49
1061	61	0	1314	0	28209	0	0	0	0	18	106	50
1062	62	17084	2886	0	6624	0	0	0	0	56	136	40
1063	63	0	0	1104	0	0	0	0	0	21	74	59
1064	64	0	0	0	12283	0	0	0	0	38	71	18
1065	65	9000	0	0	0	0	0	0	0	9	60	24
1066	66	0	0	0	0	0	0	0	0	14	18	6
1067	67	0	611	0	0	0	0	0	0	22	12	9
1068	68	0	0	0	0	0	0	0	0	0	3	2
Total Downt	own	1491551	736386	282072	976936	120487	1096	8364	42125	2055	9675	5850

Table C2 Existing Land Use and Parking Data by Study Sector and Block – NEW HOLLAND/EAST WALNUT COMMERCIAL HUB

		Land Use Type and Density/Units								Parking		
		Office	Retail	Restaurant	Institutional	Theater	Hotel	Industrial	Other	Residential	Total	Peak
Sector and Bl	lock Code	Sq.ft.	Sq.ft.	Sq.ft.	Sq.ft.	Sq.ft.	Rooms	Sq.ft.	Sq.ft.	DU	Inventory	Occupancy
New Holland												
2001	1	19746	0	0	0	0	0	0	0	55	145	93
2002	2	4622	0	0	0	0	0	0	0	56	65	28
2003	3	10974	3306	13640	0	0	0	0	0	52	99	58
2004	4	70640	4071	2240	0	0	0	41000	0	38	113	71
2005	5	33628	0	0	0	0	0	74520	0	0	175	107
2006	6	0	1624	0	0	0	0	0	63353	6	83	35
2007	7	78002	52883	14271	0	0	236	479986	54696	122	1095	693
2008	8	6282	6282	10486	37695	0	0	0	0	30	134	77
2009	9	0	13739	0	0	0	0	0	0	18	92	54
2010	10	0	0	0	0	0	0	0	0	16	29	5
2011	11	0	162	1702	0	0	0	0	0	22	47	8
2012	12	77752	2082	4067	0	0	0	0	21732	50	598	447
2013	13	238678	0	0	0	0	0	0	954712	0	2584	1209
Total New Ho	olland	540324	84150	46406	37695	0	236	595506	1094493	466	5259	2885

Appendix D



Table D1 Existing Land Use Based Parking Demand – DOWNTOWN CORE

Block #	Existing Total Block Capacity	Existing Block Land-Use Demand	Existing Block Surplus	Block #	Existing Total Block Capacity	Existing Block Land-Use Demand	Existing Block Surplus
1	137	26	111	35	50	181	-131
2	145	64	81	36	26	392	-366
3	188	0	188	37	9	210	-201
4	155	105	50	38	38	151	-113
5	120	86	34	39	4	497	-493
6	121	62	59	40	13	308	-295
7	164	26	138	41	115	20	95
8	91	30	61	42	115	63	52
9	30	28	2	43	10	37	-27
10	69	16	53	44	18	14	4
11	124	9	115	45	66	28	38
12	240	33	207	46	54	18	36
13	135	71	64	47	161	61	100
14	124	199	-75	48	122	30	92
15	414	52	362	49	100	29	71
16	136	193	-57	50	34	24	10
17	88	168	-80	51	9	12	-3
18	52	121	-69	52	53	359	-306
19	702	26	676	53	772	6	766
20	58	29	29	54	41	29	12
21	41	4	37	55	817	680	137
22	38	35	3	56	628	150	478
23	61	14	47	57	143	29	114
24	48	55	-7	58	69	11	58
25	64	29	35	59	13	9	17
26	84	75	9	60	14	30	29
27	1137	117	1020	61	34	21	85
28	572	235	337	62	34	61	75
29	40	90	-50	63	42	8	66
30	101	46	55	64	28	18	53
31	85	52	33	65	20	22	38
32	73	45	28	66	18	4	14
33	33	22	11	67	12	7	5
34	171	212	-41	68	3	0	3
Total	9873	5894	3979				

Table D2 Existing Land Use Based Parking Demand – NEW HOLLAND/EAST WALNUT COMMERCIAL HUB

Block Number	Existing Total Block Capacity	Existing Block Land-Use Demand	Existing Block Surplus
1	145	62	83
2	65	27	38
3	99	80	19
4	113	228	-115
5	175	152	23
6	83	43	40
7	1095	916	179
8	134	80	54
9	92	33	59
10	29	5	24
11	47	11	36
12	598	221	377
13	2584	1122	1462
Total	5259	2980	2279


Appendix E











Figure E3: How You Typically Arrive in the Study Area (Mode) - DOWNTOWN CORE

Figure E4: How Far Between Parking Location and Destination - DOWNTOWN CORE







Figure E5: What Days Are You Typically Parking in the Study Area - DOWNTOWN CORE







Figure E7: When Are You Typically Looking for Parking - DOWNTOWN CORE







Figure E9: How do you rate the Parking Experience in the Study Area- NEW HOLLAND/EAST WALNUT COMMERCIAL HUB







Figure E11: Respondent Category - NEW HOLLAND/EAST WALNUT COMMERCIAL HUB









Figure E13: How Long do You Spend Looking For Parking - NEW HOLLAND/EAST WALNUT COMMERCIAL HUB

Figure E14: How Far Between Parking Location and Destination - NEW HOLLAND/EAST WALNUT COMMERCIAL HUB





Figure E15: What Days Are You Typically Parking in the Study Area - NEW HOLLAND/EAST WALNUT COMMERCIAL HUB

Figure E16: When Are You Typically Looking for Parking - NEW HOLLAND/EAST WALNUT COMMERCIAL HUB





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Figure E17: Where Do You Prefer to Park - NEW HOLLAND/EAST WALNUT COMMERCIAL HUB

Appendix F

Table F1 Future On- and Off-Street Parking Supply – DOWNTOWN CORE

Block	On-	Future Off-Street Capacity		Total	Block	On-	Futur	Future Off-Street		Total	
#	Street			Block	#	Street	С	Capacity		Block	
	Capacity	Non-	LPA	Total	Capacity		Capacity	Non-	LPA	Total	Capacity
		LPA						LPA			
1	49	88	0	88	137	35	40	0	40	50	40
2	24	121	0	121	145	36	22	0	22	26	22
3	20	1	0	1	21	37	0	0	0	9	0
4	32	123	0	123	155	38	38	0	38	38	38
5	31	89	0	89	120	39	0	0	0	4	0
6	34	87	0	87	121	40	0	0	0	13	0
7	33	131	0	131	164	41	0	0	0	15	0
8	21	70	0	70	91	42	3	0	3	15	3
9	12	18	0	18	30	43	0	0	0	10	0
10	25	0	44	44	69	44	5	0	5	18	5
11	21	36	67	103	124	45	56	0	56	66	56
12	39	201	0	201	240	46	37	0	37	54	37
13	24	111	0	111	135	47	124	0	124	161	124
14	23	101	0	101	124	48	99	0	99	122	99
15	16	398	0	398	414	49	55	0	55	100	55
16	27	82	0	82	109	50	27	0	27	34	27
17	7	81	0	81	88	51	0	0	0	9	0
18	28	24	0	24	52	52	35	0	35	53	35
19	45	48	609	657	702	53	0	755	755	772	0
20	50	8	0	8	58	54	38	0	38	41	38
21	24	17	0	17	41	55	-96*	759	663	707	-96
22	22	16	0	16	38	56	116	487	603	628	116
23	18	43	0	43	61	57	80	39	119	143	80
24	12	36	0	36	48	58	0	0	0	69	0
25	17	23	0	23	40	59	13	0	13	26	13
26	14	70	0	70	84	60	45	0	45	59	45
27	11	0	1126	1126	1137	61	72	0	72	106	72
28	32	-66*	819	753	785	62	102	0	102	136	102
29	16	24	0	24	40	63	32	0	32	74	32
30	35	66	0	66	101	64	43	0	43	71	43
31	20	65	0	65	85	65	40	0	40	60	40
32	18	55	0	55	73	66	0	0	0	18	0
33	9	24	0	24	33	67	0	0	0	12	0
34	40	131	0	131	171	68	0	0	0	3	0
Total	1505	3348	4705	8053	9558						

*A negative capacity suggests a loss in parking from planned development demand but does not reflect in-field conditions. The real change in parking supply will depend on final plans for any future development.

Table F2 Future Land Use-Based Parking Demand – DOWNTOWN CORE

Block #	Future Development Total Block Capacity	Future Development Block Land- Use Demand	Future Development Block Surplus	Block #	Future Development Total Block Capacity	Future Development Block Land- Use Demand	Future Development Block Surplus
1	137	26	111	35	50	181	-131
2	145	64	81	36	26	392	-366
3	21	0	21	37	9	230	-221
4	155	105	50	38	38	151	-113
5	120	86	34	39	4	497	-493
6	121	62	59	40	13	308	-295
7	164	26	138	41	15	20	-5
8	91	30	61	42	15	63	-48
9	30	28	2	43	10	37	-27
10	69	16	53	44	18	14	4
11	124	9	115	45	66	28	38
12	240	33	207	46	54	18	36
13	135	71	64	47	161	61	100
14	124	199	-75	48	122	30	92
15	414	52	362	49	100	29	71
16	109	239	-130	50	34	24	10
17	88	278	-190	51	9	12	-3
18	52	121	-69	52	53	359	-306
19	702	26	676	53	772	6	766
20	58	29	29	54	41	113	-72
21	41	4	37	55	707	738	-31
22	38	35	3	56	628	150	478
23	61	14	47	57	143	29	114
24	48	55	-7	58	69	11	58
25	40	72	-32	59	26	9	17
26	84	75	9	60	59	30	29
27	1137	117	1020	61	106	21	85
28	785	592	193	62	136	153	-17
29	40	90	-50	63	74	8	66
30	101	46	55	64	71	18	53
31	85	52	33	65	60	22	38
32	73	45	28	66	18	4	14
33	33	22	11	67	12	7	5
34	171	212	-41	68	3	0	3
Total	9558	6704	2854				

Table F3 Future On- and Off-Street Parking Supply – NEW HOLLAND/EAST WALNUT COMMERCIAL HUB

Block Number	On- Street Capacity	Future Development Off-Street Capacity	Future Development Total Block Capacity
1	35	110	145
2	45	20	65
3	44	55	99
4	33	80	113
5	26	149	175
6	62	21	83
7	81	1140	1221
8	47	87	134
9	35	57	92
10	29	0	29
11	33	14	47
12	67	531	598
13	0	2584	2584
Total	537	4848	5385

Table F4 Future Land Use-Based Parking Demand – NEW HOLLAND/EAST WALNUT COMMERCIAL HUB

Block Number	Future Development Total Block Capacity	Future Development Block Land- Use Demand	Future Development Block Surplus
1	145	62	83
2	65	27	38
3	99	80	19
4	113	228	-115
5	175	152	23
6	83	43	40
7	1221	1006	215
8	134	80	54
9	92	33	59
10	29	5	24
11	47	11	36
12	598	221	377
13	2584	1122	1462
Total	5385	3070	2315



Appendix G

Table G1 Future Technology and Land Use-Based Parking Demand – DOWNTOWN CORE

Block #	Future Development Total Block Capacity	Future Technology Block Land- Use Demand	Future Technology Block Surplus	Block #	Future Development Total Block Capacity	Future Technology Block Land- Use Demand	Future Technology Block Surplus
1	137	23	114	35	155	-105	155
2	145	56	89	36	334	-308	334
3	21	0	21	37	199	-190	199
4	155	94	61	38	132	-94	132
5	120	77	43	39	425	-421	425
6	121	56	65	40	270	-257	270
7	164	22	142	41	18	-3	18
8	91	27	64	42	56	-41	56
9	30	24	6	43	33	-23	33
10	69	14	55	44	13	5	13
11	124	8	116	45	25	41	25
12	240	30	210	46	16	38	16
13	135	63	72	47	54	107	54
14	124	171	-47	48	27	95	27
15	414	47	367	49	26	74	26
16	109	209	-100	50	21	13	21
17	88	246	-158	51	11	-2	11
18	52	109	-57	52	309	-256	309
19	702	23	679	53	6	766	6
20	58	26	32	54	100	-59	100
21	41	4	37	55	655	52	655
22	38	32	6	56	129	499	129
23	61	13	48	57	26	117	26
24	48	49	-1	58	10	59	10
25	40	63	-23	59	8	18	8
26	84	64	20	60	27	32	27
27	1137	100	1037	61	19	87	19
28	785	515	270	62	132	4	132
29	40	77	-37	63	7	67	7
30	101	40	61	64	16	55	16
31	85	44	41	65	19	41	19
32	73	39	34	66	4	14	4
33	33	19	14	67	6	6	6
34	171	183	-12	68	0	3	0
Total	9558	5855	3703				

Table G2 Future Land Use-Based Parking Demand – NEW HOLLAND/EAST WALNUT COMMERCIAL HUB

Block Number	Future Development Total Block Capacity	Future Development Block Land- Use Demand	Future Development Block Surplus
1	145	56	89
2	65	24	41
3	99	72	27
4	113	205	-92
5	175	137	38
6	83	39	44
7	1221	905	316
8	134	72	62
9	92	30	62
10	29	4	25
11	47	10	37
12	598	199	399
13	2584	1010	1574
Total	5385	2763	2622