

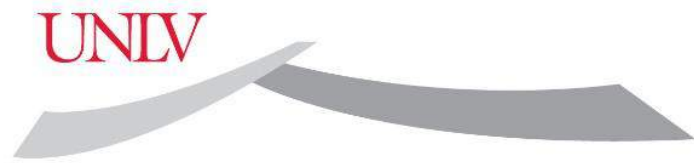
UNLV

Campus Parking and Transportation Plan

Master Plan Final Report

June 2020

Kimley»Horn
Expect More. Experience Better.



Campus Parking and Transportation Plan



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I. Executive Summary



I. Executive Summary

Project Overview

The University of Nevada Las Vegas (UNLV) is taking steps to promote its distinction as a Tier 1 Doctoral University with very high research activity. Future campus and community planning/development has the potential to impact the character of the University and its surrounding areas. This UNLV 2020 Campus Parking and Transportation Master Plan provides data and strategies to improve campus access and parking, enhance campus circulation, develop transportation alternatives, and improve customer service interactions for the UNLV community.

This Campus Parking and Transportation Master Plan is intended to provide guidance for physical campus development over the next decade and beyond and includes planning best practices. It entails a thorough study of UNLV's current parking program to project future parking and transportation needs. This planning process will assist in optimizing future capital investments to best serve the campus' strategic parking plans. It will also help to assure the maximization of parking and campus circulation functionality and available technology.

Per the project's RFP, the selected consultant was to prepare a master plan outlining implementation and funding needs associated with enhancing UNLV's parking and transportation program. The study will focus on a 15-year planning horizon. The plan will specify action measures, cost estimates and phasing recommendations for an enhanced multimodal campus system including technology recommendations, alternative transportation enhancements, bike facilities, and parking. It will also determine the appropriate relationship with future regional transit systems. Campus student/staff growth, traffic congestion levels related to proposed garage construction. Master plan facility trends and local transportation system changes will also be considered in the master plan. Reviews of peer university systems, industry best practices, and input from stakeholders were part of the planning process.

There are five primary objectives for the UNLV 2020 Parking and Transportation Master Plan:

1. To serve as a planning, management, and policy document for campus parking and alternative transportation initiatives
2. Limit the travel of automobiles in the core campus to increase safety for pedestrians and other forms of active transportation
3. Create an environment that focuses on the use of parking and other mobility options
4. Provide a dynamic parking demand/price model for forecasting revenue and demand for future parking needs based on University growth estimates, planned capital projects, and for accurately pricing the true cost of parking replacement due to displacement by capital projects

5. Create flexible plans that will meet UNLV's future needs through integrating functions, supporting partnerships, smart utilization and agile implementation. The Parking Master Plan will reflect the University's commitment to these strategies and building upon them as appropriate, assisting with planning efforts to achieve the goal of an inclusive and accessible campus.

Integration with 2020 Campus Master Plan

This plan will serve as a complementing component to the overall UNLV 2020 Campus Master Plan, that is being conducted by Sasaki on a parallel schedule. An important element of the Campus Parking and Transportation Master Plan is alignment with the 2020 Campus Master Plan and how the two impact and influence each other. Key Master Plan elements related to parking and mobility are:

- Prioritize a pedestrian core and pedestrian first environment on campus
- Limit vehicular circulation in the core to service and emergency vehicles
- Focus vehicular circulation to the periphery of campus and create a multi-modal strategy with the location of garages at all main vehicular entry points on campus
- Create a series of drop-off zones on campus to support multi-modal strategy
- Address proposed parking losses and new facilities

These Master Plan elements support the multi-modal and mobility strategies outlined in the Parking and Transportation Master Plan and together both documents provide the University with steps to enhance the transportation experience over the next 15 years.

Project Approach and Report Organization

This Executive Summary provides an overview of the study process, key areas of evaluation, and primary report recommendations. The larger Campus Parking Master Plan is organized by the following major sections:

Introduction

This section provides project history and 2020 Campus Master Plan observations.

Planning Context

This section outlines key University planning documents and their goals and objectives that impact campus parking and transportation.

Current Parking Program Review

This section outlines the current Parking and Transportation department structure and operations.

Current Parking System Assessment

This section provides assessment of the current parking program and is based on data provided in the 2018 and 2019 Parking Annual Reports and data collected in the fall of 2019.

Traffic Operations Analysis and Campus Cordon Study

This section documents the results of a traffic study of future traffic conditions associated with the UNLV 2020 Parking and Transportation Master Plan and the complementary UNLV 2020 Campus Master Plan in preparation by Sasaki.

Community Engagement

This section outlines the results of the Campus Parking Master Plan online survey, distributed in the fall of 2019.

Strategic Communication Plan

The strategic communication plan documents current communication efforts and provides strategies to expand and enhance engagement.

University Parking Expert Advisory Panel

This section summarizes the University Parking Expert Advisory Panel held on March 9 through 11 of 2020 and includes preliminary panel recommendations.

Future Campus Growth

This section examines both the anticipated campus enrollment, as well as the recommendations from the Campus Master Plan.

Transportation Demand Management (TDM)

This section provides a current program overview, a review of existing and past strategies, and a best practices peer review.

Funding and Financing Strategies

This section provides a review of potential funding/financing sources to support parking facilities development as part of the UNLV Parking Master Plan.

Recommendations and Implementation

This section provides parking and mobility strategy and implementation recommendations.

Appendices

Supporting documents and additional resources for UNLV's Parking and Transportation Services to review and consider.

COVID-19 Statement

This project was approximately 90% complete when the COVID-19 pandemic struck the globe. This pandemic continues to wreak havoc with institutions of all sizes as the country complies with government directives and general health safety protocols to flatten the curve of the virus. UNLV has not been immune to these impacts.

As a result of this unanticipated event, the financial projections developed as part of this study, as well as the timing of some recommendations, will likely need to be reassessed once the impacts of this still unfolding situation are better understood, budgets are adjusted and conditions settle into a new normal over the next several months.

II. Introduction



II. Introduction

Project Purpose and Background

Purpose

The purpose of this project is to create a new Campus Parking Master Plan with a 15-year horizon to guide physical campus development over the next decade and beyond. It entails a thorough study of UNLV's current parking program and projects future parking and transportation needs. This planning process will assist in optimizing future capital investments to best serve the campus' strategic parking plans. It will also help to assure the maximization of parking and campus circulation functionality and available technology. The plan will serve as a complimenting component to the overall Campus Master Plan which is being conducted by Sasaki on a parallel timeline with this plan.

Background

UNLV is located in the city of Las Vegas and is emerging as a premier urban university. UNLV currently has over 220 undergraduate, masters, and doctoral degree granting programs and serves over 31,000 students with over 3,000 faculty and staff. The University's 340-acre campus is located in the southeast part of the City, near the McCarran International Airport and the Las Vegas Strip.

Parking was initially a function of the campus public safety division but was later relocated from this reporting structure and the Parking and Transportation Services (PTS) department was created under Administrative Services in 2005 to better address the campus parking and transportation issues. Today, PTS is a self-supporting auxiliary department with a \$6 million budget, committed to creating, maintaining, and enforcing the campus parking areas in the most cost-efficient manner possible and to promote commuting alternatives for University of Nevada, Las Vegas faculty, staff, students and guests. Parking permit sales represent 65% of PTS' gross revenue, with the remaining revenue coming from meters, citations, events, and other sources.

In addition to the typical academic and research components of a major state university, PTS also provides services at the Shadow Lane campus to several health care departments, including the School of Dental Medicine and most recently the School of Medicine. With two major hospitals in the area, this area is considered the new medical district.

The University of Nevada Las Vegas has been experiencing significant physical and population growth over the last few years and this trend is expected to continue. This growth will continue to increase the demand placed upon the University's parking and transportation systems while parking supply will be eroded to facilitate renovation, expansion and new facility construction. The University currently has over 14,000 parking spaces in a mix of surface parking lots and three parking structures. It is easy to predict that

student enrollment could easily increase by twenty percent over the next fifteen years, with campus construction expected to continue from departmental expansions, new programs, and donated projects.

With these mounting pressures on the University's parking and transportation infrastructure, the University is at a critical juncture and seeks to develop a comprehensive parking and transportation master plan, which will inform the future of campus access and mobility.

Objectives and Project Scope

Per the project's RFP, the selected consultant was to prepare a master plan outlining implementation and funding needs associated with enhancing UNLV's parking and transportation program. The study will focus on a fifteen-year planning horizon. The plan will specify action measures, cost estimates and phasing recommendations for an enhanced multimodal campus system including technology recommendations, alternative transportation enhancements, bike facilities, and parking. It will also determine the appropriate relationship with future regional transit systems. Campus student/staff growth, traffic congestion levels related to plan proposed garage construction, master plan facility trends and local transportation system changes will be considered in the master plan. Reviews of peer university systems, industry best practices, and input from stakeholders will be part of the planning process.

The plan will encompass the Maryland and Shadow Lane campuses and will consider: Parking and Transportation space needs, land use as outlined in the Campus Master Plan that addresses future building locations and future use of existing buildings, vehicular circulation and parking, and pedestrian and bicycle circulation. The plan will identify specific improvements to the parking system infrastructure and programs within the study area to achieve a more cohesive and functional system that is integrated with existing infrastructure and accommodates future growth on campus.

There are five primary objectives for the UNLV Parking Master Plan:

1. To serve as a planning, management, and policy document for campus parking and alternative transportation initiatives
2. Limit the travel of automobiles in the core campus to increase safety for pedestrians and other forms of active transportation
3. Create an environment that focuses on the use of parking and other mobility options
4. Provide a dynamic parking demand/price model for forecasting revenue and demand for future parking needs based on University growth estimates, planned capital projects, and for accurately pricing the true cost of parking replacement due to displacement by capital projects
5. Create flexible plans that will meet UNLV's future needs through integrating functions, supporting partnerships, smart utilization and agile implementation. The Parking Master Plan will reflect the University's commitment to these strategies and building upon them as appropriate, assisting with planning efforts to achieve the goal of an inclusive and accessible campus

2020 Campus Master Plan Coordination and Observations

While the Campus Parking and Transportation Master Plan was underway, the University was also conducting a Campus Master Plan, led by the consultant Sasaki out of Boston, MA. (Kimley-Horn was also included as part of the Sasaki team for traffic planning support and integration.) UNLV master planning involves the evaluation of existing space to optimize use and functionality in meeting the institutional mission. The University has a proactive and consistent history of maintaining a forward vision for the campus to include new projects and an evolving vision through master plans and master plan updates.

Parallel schedules for the two efforts provided unique opportunities for coordination. Both teams wanted to avoid participant fatigue while gathering as much data as possible from students, faculty, and staff. Major coordination effort was applied toward surveys for both projects and each consultant team used different but complementary survey technologies for participants. Dissemination was provided by University offices to ensure the broadest dissemination possible and gave UNLV an opportunity to remind the community of their active planning efforts.

An important element of the Campus Parking and Transportation Master Plan is alignment with the 2020 Campus Master Plan and how the two impact and influence each other. Key Master Plan elements related to parking and mobility are:

- Prioritize a pedestrian core and pedestrian first environment on campus
- Limit vehicular circulation in the core to service and emergency vehicles
- Focus vehicular circulation to the periphery of campus and create a multi-modal strategy with the location of garages at all main vehicular entry points on campus
- Create a series of drop-off zones on campus to support multi-modal strategy
- Address proposed parking losses and new facilities

These Master Plan elements support the multi-modal and mobility strategies outlined in this Parking and Transportation Master Plan and together both documents provide the University with steps to enhance the transportation experience over the next 15 years.

III. Planning Context



III. Planning Context

Planning Context

Kimley-Horn received multiple documents provided by the University for review. The documents have been sorted into the following four categories:

- Campus Master Plans
- Parking and Transportation Services Annual Reports
- Campus Development
- Parking Inventory and Utilization Data

Below is a list of documents by category:

Category One - Campus Master Plans

- UNLV Framework for Campus Development 2012 Campus Master Plan Update
- UNLV Framework for Campus Development 2016 Campus Master Plan Update

Category Two - Campus Development

- 2017 Campus Plan

Campus Goals and Priorities

UNLV's Charter is driven by an emphasis on the following broad goals:

- Demonstrate leadership in academic excellence and accessibility
- Establish national standing in academic quality and impact of colleges and schools in every field
- Establish UNLV as a leading global center for interdisciplinary research, discovery, and development
- Enhance our local impact and social embeddedness

The documents listed above provide further detail supporting these goals, as do PTS's goals and objectives.

Campus 2020 Goals and Objectives

The following goals have been established by UNLV and supported by the documents provided by the University. Parking and Transportation Services use these goals as guidelines and have established common goals that coincide with the goals of the university.

Campus Goal One: Community Partnership & Engagement

UNLV aims to improve campus interaction and connection to the community of Las Vegas in numerous ways, including the physical campus as well as how the university coordinates with the surrounding area. The university is incorporated in an area with a vast variety of both public and private ownership and land uses. Campus development is heavily reliant on coordination with these surrounding entities. The University has also expressed interest in the development of a 'University District' to the east of the Maryland Campus. The district will provide a cohesive space to attract the surrounding community to the University and bridge the separation to cohesively combine the surrounding community and the university. With the addition of both the 'University Village' and the 'Mega-Events Center' and their connection between each other, the campus population and the surrounding community can be provided with fining and housing opportunities. The development of the district will combine both the needs of the university and Clark County to extend many components of UNLV into the surrounding community. Goals of community partnership and engagement are found in the following documents:

- UNLV Framework for Campus Development 2016 Campus Master Plan Update
- UNLV Framework for Campus Development 2012 Campus Master Plan Update
- 2017 Campus Plan

Campus Goal Two: Enhance Academic and Research Core

The university plans to implement developments that will improve academics and research at UNLV. This includes investment in space dedicated to the specifically academics and research to allow the best use of resources already existing on campus. This objective is displayed in the following documents:

- UNLV Framework for Campus Development 2016 Campus Master Plan Update
- UNLV Framework for Campus Development 2012 Campus Master Plan Update
- 2017 Campus Plan

Campus Goal Three: Expand Campus Housing

The university hopes to expand housing opportunities both in and adjacent to the Maryland campus. These developments may also consist of living-learning communities. These housing opportunities will support future development of the campus while also improving residential housing at the Maryland campus. The documents below include this goal:

- UNLV Framework for Campus Development 2016 Campus Master Plan Update
- UNLV Framework for Campus Development 2012 Campus Master Plan Update
- 2017 Campus Plan



Campus Goal 4: Enhance Athletics and Recreation

University of Nevada Las Vegas aims to enhance the athletics and recreation programs as well as facilities. The university is also planning ways to enhance the future success of the Thomas and Mack Center as it will continue to play a key role in the campus. The documents below include and support this goal:

- UNLV Framework for Campus Development 2016 Campus Master Plan Update
- UNLV Framework for Campus Development 2012 Campus Master Plan Update
- 2017 Campus Plan

Campus Goal 5: Improve Campus Flow

The improvement of campus flow is a key component of the university’s future goals and objectives. On a magnified level, UNLV hopes enhance and add open spaces and walkable paths throughout campus to improve connectivity and circulation. This will help improve organized and connectivity between facilities on campus as well as the surrounding community. A large component of campus flow includes parking and access to campus. UNLV aims to approach parking in sensitivity to land use, convenience, and efficiency. Critical analysis of how parking can support campus through conversion of surface lots to structured parking will occur in addition to vehicular circulation and access. Campus edges and access will also be improved to better determined how campus interacts and connects with the surrounding community. The university also plans to prioritize expansions of the transit network in hopes to link students and staff and the community with campus. The following documents produced by the university supports these efforts:

- UNLV Framework for Campus Development 2016 Campus Master Plan Update
- UNLV Framework for Campus Development 2012 Campus Master Plan Update
- 2017 Campus Plan
- Parking CY 2019 Annual Report
- 2010 Traffic Signal Warrant Study / Tropicana Avenue and Bock Street

Campus Goal 6: Enhance Campus Sustainability & Innovation

As shown in the objectives of UNLV Maryland campus, the past campus master plans were all congruent with one another, framing goals for the campus enhancing, academics, athletics, development, and campus flow. One of the most important elements of this Campus Parking Master Plan is the degree to which it aligns with and supports the 2020 Campus Master Plan. Kimley-Horn is working with Sasaki on the transportation related tasks of the Master Plan such as pathways and access for deliveries, bicycles, and pedestrians. Coordination to key elements is built into both processes with the goals of preventing survey fatigue and maximizing participation. Like past Maryland campus master plans, the 2020 Campus Master Plan has similar objectives and priorities for the campus. The 2020 Campus Master Plan aims to improve the campus through various efforts including: campus parking through the conversion of surface parking to structured parking and alternative transit methods,

vehicular circulation on and around campus, and the implementation of a UNLV transit center on campus. These goals will be considered when analyzing the current parking program and system to make inferred recommendations that align with not only the goals of Parking and Transportation Services but the entire UNLV campus. The following documents support these efforts:

- UNLV Framework for Campus Development 2016 Campus Master Plan Update
- 2017 Campus Plan

Aligning Parking Plan Goals with the Goals and Vision of UNLV

Introduction

UNLV’s Charter is driven by an emphasis on the following broad goals:

- Demonstrate leadership in academic excellence and accessibility
- Establish national standing in academic quality and impact of colleges and schools in every field
- Establish UNLV as a leading global center for interdisciplinary research, discovery, and development
- Enhance our local impact and social embeddedness

Purpose

The purpose, recommendations, and spirit of this plan are rooted in advancing and supporting these larger institutional goals. Plan strategies and recommendations are aimed at:

- Providing adequate parking to meet future demands
- Improving campus access and circulation
- Reducing the carbon footprint of UNLV’s transportation and parking system by providing enhanced transportation alternative and transportation demand management programs and
- Development of a connected and flexible multimodal system of travel and access options for a diverse group of users

Plan Goals

This plan works to continue UNLV’s place as a leader and innovator in providing parking and mobility services, and positions UNLV to sustainably meet the emerging needs and challenges of the future. Plan goals include:

- Improve and enhance the quality and flexibility of parking access and mobility options for students, faculty, staff, and visitors to, from, between, and around UNLV’s campuses.
- Continue to focus on a high-level of customer service and improving the parking and transportation experience to and between campuses for system users.
- Promote and advance a sustainable transportation system that lowers the campus carbon footprint.
- Collaborate with and support university stakeholders to align the parking and transportation system strategies with the goals, vision, and growth objectives of the university.
- Position the university’s parking and transportation system to be resilient and receptive to changing transportation dynamics and emerging mobility and technology platforms.

Important Funding and Operational Principals include:

1. Parking and Transportation Services (PTS) is an auxiliary enterprise that should fund its own expenses, including debt service.
2. Funding concerns should be addressed through price structures of annual permits, visitor rates, service charges and fines.
3. PTS administers all parking services at UNLV; other departments will not run their own parking operations. PTS is responsible for the development of a parking system which meets the needs of primary customers (permit-holders), external users (non-permit-holders), and special events patrons, now and in the future
4. Parking and Transportation Services are purchased commodities and not student, employee or department benefits. PTS should establish a transit system that facilitates intra-campus travel and supports the convenient operation of remote parking, to minimize the need for on-campus use of private automobiles. This system will encourage the use of alternative means of transportation to and within the campus, including walking and bicycling.
5. Permit rates should be variable, based on time, location, or the service provided. Development of new infrastructure and maintenance of existing parking facilities, including garages, surface lots and supportive infrastructure are factors in parking and transportation fee rate setting.

6. Parking and Transportation Services should be included in all long-range campus master and strategic planning. Temporary and permanent parking revenue losses due to construction shall be addressed in the planning process.
7. Fines should be established to discourage illegal parking. PTS will consider local, city, state and municipality rates when recommending a UNLV fine structure.
8. Provision of a safe, secure and comfortable environment in all parking and transit facilities is a priority.
9. Incorporate new technologies to improve the efficiency and effectiveness of the transportation system.
10. Parking and transportation systems are a critical component of the UNLV campus’ overall campus master plan which incorporates general guidance re: campus land use and access. These systems must be consistent with and support the overall campus master plan.

Campus Population

When assessing the parking system on campus, the current parking inventory and permitting can be assessed through comparison to trends in campus population. This measure can be assessed to determine the appropriateness of the current inventory compared to the campus demands.

Referencing the University Student Profiles provided by the Office of Decision Support, the following trends in campus enrollment are shown in **Table 1** below:

Table 1. Changes in Campus Population Chart

Changes in Campus Population			
Enrollment Year	Student Population	F/S Population	Total Campus Population
2018	30,457	3,900	34,357
2017	30,471	3,341	33,812
2016	29,702	3,268	32,907
2015	28,600	3,069	31,669
2014	28,515	3,077	31,592
2013	27,848	2,977	30,825

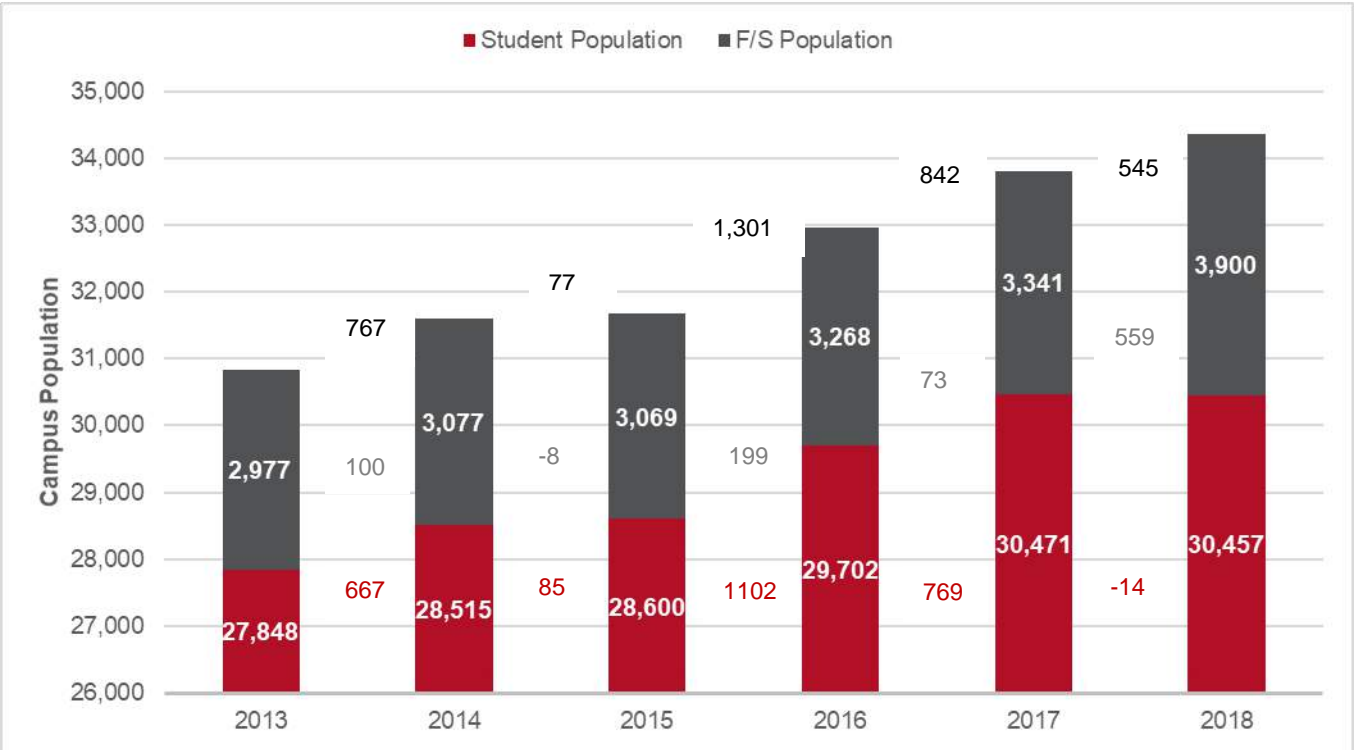
Source: <https://www.unlv.edu/about/facts-stats>

Enrollment on campus for Fall of 2019 is, 31,171 students while the faculty/staff (F/S) population has not been recorded for the Fall of 2019.

Analyzing trends in the campus population over a five-year period, **Figure 1** shows trends within population data, comparing student, F/S and total populations where the numbers above the columns display the

change in population between years for total campus population in black, faculty/staff population in gray, and student population in red.

Figure 1. Campus Population Trends



Source: <https://www.unlv.edu/about/facts-stats>

The total population at UNLV is increasing, as shown in the five-year period shown above where F/S population is growing at a faster rate in the more recent years than that of the growth of the student population. The growth rate of the campus population between the 2016 and 2017 was 2.6% while the following year saw a growth of 1.6%. An average growth rate of approximately two percent is seen throughout the UNLV campus population over the five-year period.

IV. Current Parking Program Review



IV. Current Parking Program Review

Current Parking Administration Structure

As an auxiliary unit of the University, Parking and Transportation Services (PTS) is charged with creating, maintaining, and enforcing parking for both the Maryland and Shadow Lane campuses with the goal of operating in the most cost-efficient way possible. Staff pride themselves on working efficiently to keep staffing costs low for the services provided while providing the best possible customer service.

Primary PTS programs include administration, permit sales, hourly payments, enforcement, transportation and maintenance coordination.

The department helps coordinate over 1,900 events annually in addition to the issuing of parking permits and maintenance such as striping, crack sealing, seal coating, and paving. PTS also contributes to the community by coordinating closely with local professionals to plan for future transportation enhancements, clean air management, and overall campus parking management.

Mission, Vision, and Philosophy

The Parking and Transportation Services team aims to provide the best customer service to faculty, staff, students, and visitors of the University of Nevada, Las Vegas. This is exemplified in their value statement, “Focused on value. Dedicated to quality.” and their mission statement, “Parking and Transportation Services (PTS) is an auxiliary unit of the University committed to creating, maintaining, and enforcing the parking areas on both the Maryland and Shadow Lane campuses in the most cost-efficient manner possible.”

The department focuses on opportunities to improve customer service while keeping an eye on future demand and finances. This is reflected in their annual goals, reporting, and engagement with customers throughout the year to assess satisfaction with services.

Strategic Planning

The department’s strategic planning considers financial longevity, future demand, and improved customer service. Budgets are created to show demand statistics, financial needs for baselines and improvements, and care is taken to make comparisons with peer institutions to clarify and verify trends. Budgets can also illustrate parking and transportation need correlations with other campus projects such as new or expanded buildings and/or events.

Part of this strategic planning also includes SWOT analyses to document what the department does well and what needs could become larger problems if not planned for.

Care is also taken to clearly account for annual revenues by various type categories. This is especially helpful in illustrating how changes - or no change - in permit fees impact the fiscal health of the department.

Organizational Structure

Parking and Transportation Services consists of 29 FTE:

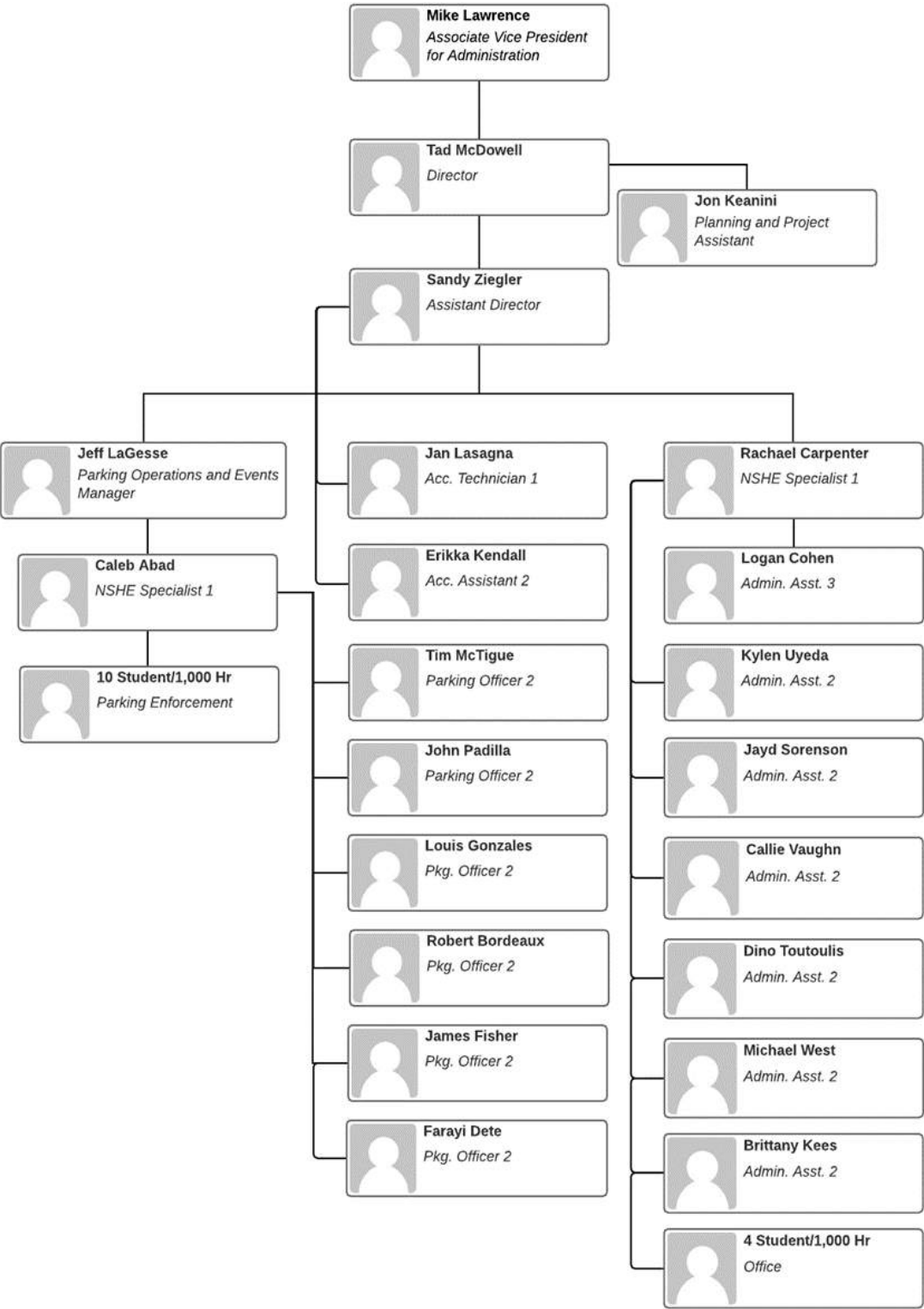
- Director
- Assistant Director
- Planning Assistant
- Enforcement Manager
- Office Manager
- Event Coordinator
- Support staff
- Student workers
- Temporary labor

These FTE belong to several divisions within PTS:

- Administration
- Project management and planning
- Permit sales
- Reserved parking management
- Event coordination
- Departmental accounting and payroll
- Motorist assistance
- Multi-modal transportation

The department completed a review of staffing and support levels with the intention of reorganizing as needed. This resulted in a decrease of FTE as temporary positions were approved for full-time status, replacing most casual labor. These changes created a more functional model that satisfies work demands. **Figure 2** below shows the organizational chart and how the department is structured.

Figure 2. Parking and Transportation Services Organizational Chart



As an auxiliary department of the University, PTS is self-funded and falls under the oversight of Administrative Services. The Director reports to the Associate Vice President for Administration, illustrated in the organizational chart to the left.

One of the Director’s responsibilities is to provide an annual report each calendar year for the Division of Business Affairs. These reports cover Parking and Transportation Services financials, staffing, performance metrics, completed goals, and goals for the coming year.

Professional Development

The department is supportive of professional development, certifications, and advanced training. When possible, staff may attend conferences to learn about new parking and transportation operational methods, trends, and technologies. Two staff hold advanced certifications and ten completed leadership training with Rapport Leadership International.

Development goes beyond parking and transportation subject matter and there is a dedicated staff library for continuing knowledge of success in the workplace, task management, customer service, teamwork, and management. A new monthly training program was developed for the department with topics including conflict resolution, phone etiquette, safety, stress management, and more.

PTS boasts low staff turnover. Employees understand there are opportunities for advancement or are content in their positions knowing there are other ways to grow and take on more responsibility.

Program Practices, Technology, and Revenue

The University of Nevada Las Vegas PTS program is comprised of multiple facility types and technologies that collectively define the UNLV parking and transportation system. In addition to developing and managing these facilities and technologies, Parking & Transportation Services oversees enforcement of the parking system and program. The following sections provide an overview of parking facilities, enforcement, and parking technologies at UNLV.

Enforcement Practices and Outcomes

Enforcement is key for the University campuses since all faculty, staff, students, and visitors must pay for parking when used.

Parking and Transportation Services reports a dramatic change in enforcement over the course of the last two years. The recent implementation of a license plate recognition (LPR) system was a challenge to complete but will increase parking enforcement capabilities and efficiencies. The major challenge to implementation was finding a successful path for data sharing between the parking management system vendor, the LPR vendor, and the University. Contract amendments and data access method changes ensured the system could work.

The discovery of an average of 15 vehicles per day with large ticket balances - before the fall semester began - was a surprise and unintended data point for the new system. Not only is it important to issue citations when necessary, it is also important to collect citations in a short period of time following issuance. As time goes on, it is harder and harder to collect. This surprise allowed the department to remind repeat violators to pay their citations.

The departmental enforcement goal for CY18 was to “enforce parking on the UNLV campuses in an effective and efficient manner, reducing the number of parking abuses on campus in all spaces, to include reserved, ADA, fire lanes, etc.” The collection rate for CY18 was 62.06 percent, 2.06 points higher than the desired rate of 60 percent for the University.

Current Technology

Permits are currently available for purchase online, a change that has decreased lines dramatically during the permit sales period. Permits will become virtual beginning fall semester 2021, eliminating physical permits and providing an enhanced customer experience.

Meters, pay-by-phone, and pay stations are available for short term parkers. An overhaul of current meters is planned within the next 24 months and the department intends to review and utilize advanced technology such as virtual permits as much as possible. Pay-by-phone has been embraced by the campus, eliminating the need for physical permits, the scramble to find correct change, and lines for garage parking and/or PTS visits.

In partnership with NV Energy, additional electric vehicle charging stations were upgraded in CY19. The charging stations were first implemented in fall of 2014 and are used extensively.

Kimley-Horn has provided several documents in the report appendices that provide tools and resources related to parking management best practices. These include:

- A set of parking garage design guidelines
- Information of pedestrian safety in parking environments
- Information of the latest parking count systems technology
- Information on the concept of Parking Lids
- Information on the development of Mobility Hubs
- An extensive collection of parking management and design best practices
- A recommended reading list for parking professionals
- A white paper entitled *Assessing an Uncertain Transportation Future*, which addresses the issues related to the emergence of autonomous and connected vehicles as well as new shared mobility and garage adaptive reuse strategies
- A parking program Emergency Preparedness Manual developed by IPMI

- Two documents were provided related to parking enforcement. One was a sample “parking enforcement officer manual” and the second was a parking enforcement program audit checklist tool.
- The TDM Quick Guide document provides high-level overview of recommended TDM practices and strategies.



V. Current Parking System Utilization Assessment



Current Parking System Utilization Assessment

V. Current Parking System Utilization Assessment

The intention of this section is to assess the current parking supply/demand conditions on the UNLV campus. This encompasses the supply in the facilities, the type of parking, permit types and sales, enforcement practices, and utilization of lots on the campus. The UNLV parking system was assessed using a variety of data metrics, listed below.

- **Parking Inventory** - total number of spaces on the campus available for staff, faculty, students, and visitors.
- **Campus Population** - number students, faculty, and staff that are part of the campus and could be coming to campus on any given day
- **Parking Occupancy** - number of vehicles parked at various times of the day in each parking facility
- **Sale of Permits** - how many of each permit is being sold adds another layer of demand for a facility. Also provides understanding for how the parking is allocated throughout the campus to various users.

The parking supply/demand assessment for this Master Plan is based on data that was collected in September 2019. The data collection consisted of counting the total number of spaces in each parking facility and documenting the utilization of spaces by type in each facility.

Thomas & Mack Arena

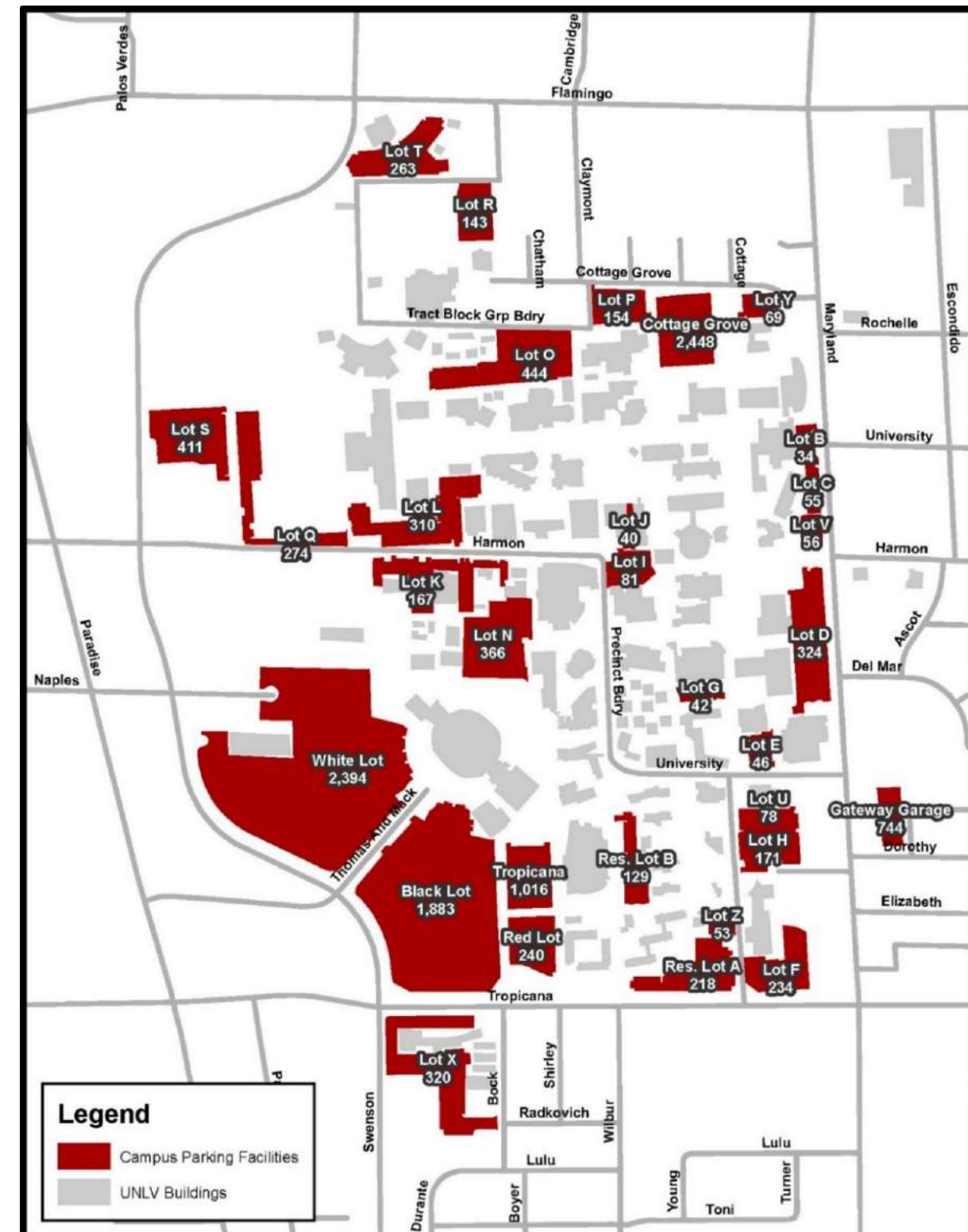
Within the UNLV campus sits the Thomas and Mack Arena. This 18,000-seat arena hosts approximately 150 events per year. Arena events create different traffic patterns and parking demands than typical university operations. The type of events and number of attendees all impact the traffic demands for events at the Thomas and Mack Center. For example, these events include various concerts, touring productions, sporting events, and high school and UNLV graduation ceremonies. The two lots that serve the Thomas & Mack Arena, the White and Black lots, create unique challenges for parking planning. For example, the White Lot is often allocated toward events at the arena rather than an available parking option for campus users. Further analysis of the Thomas & Mack impact is found later in this section and throughout the report.

Campus Inventory & Facilities

In September 2019, field data collection was conducted that counted the total number of spaces on campus by facility type and by the type of space. **Figure 3** illustrates the location of the parking on the campus.

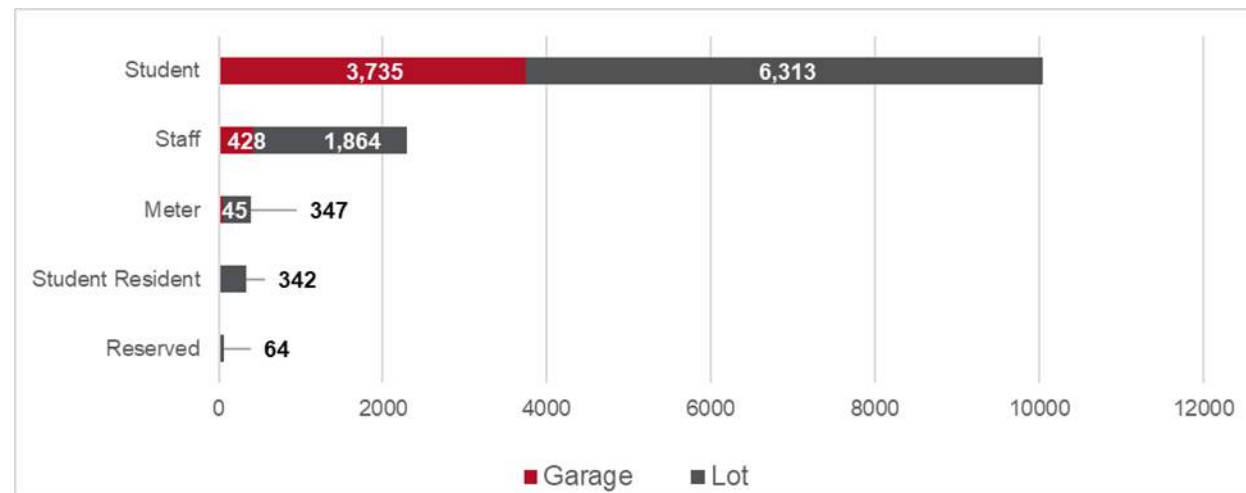
When assessing the inventory of the facilities on campus, it is important to note that some parking facilities may have had spaces that could not be counted or occupied due to construction staging, being blocked, etc. A summary of this inventory information is shown in **Figure 4**.

Figure 3. Campus Parking Map with Inventory by Facility



Current Parking System Utilization Assessment

Figure 4. Parking Inventory by Facility Type and User Type



Source: Parking Inventory & Utilization Data

Each user type is associated with a permit that either allows or restricts parking in various facilities. The summary below defines who can park in each type of space.

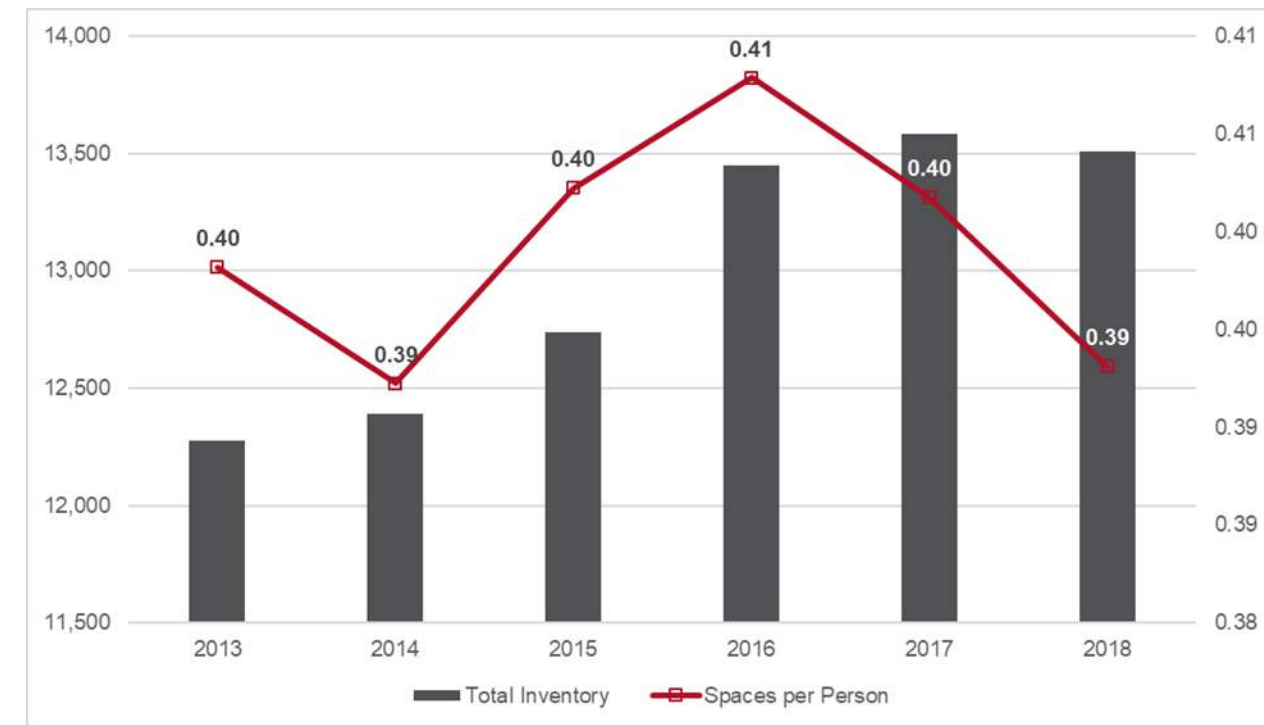
- **Faculty/Staff Spaces:** parking spaces allocated to faculty and staff permits - other users are not able to park in these facilities without the proper permit
- **Student Spaces:** parking spaces allocated to student permits - those with a Faculty/Staff permit can park in student spaces, as well as the Faculty/Staff spaces
- **Meter:** spaces utilizing parking meters/kiosks throughout campus
- **Resident:** spaces requiring resident permit in resident lots A and B
- **Other:** spaces not accounted for in the above categories, including:
 - reserved spaces
 - motorcycle parking
 - EPA
 - general parking

Of the total 13,138 spaces on campus, 77% of the inventory is allocated for students, leaving approximately 17% for faculty and staff, and 6% for other types of uses. Although a large majority of the parking on campus is designated for students, those with faculty/staff permits can park in designated faculty/staff spaces OR student spaces, so all inventory accounted for in this figure is available to faculty/staff permit holders.

A meaningful indicator of campus efficiency is a comparison of inventory with the campus population over the years. This spaces-to-student ratio is indicative of what parking ratio is enough to meet campus needs. A higher ratio indicates a higher reliance on single occupancy vehicles. Lower ratios indicate use of other

modes of transportation. Figure 5 below illustrates the trends between the number of spaces and the campus population.

Figure 5. Spaces Per Person vs Total Spaces



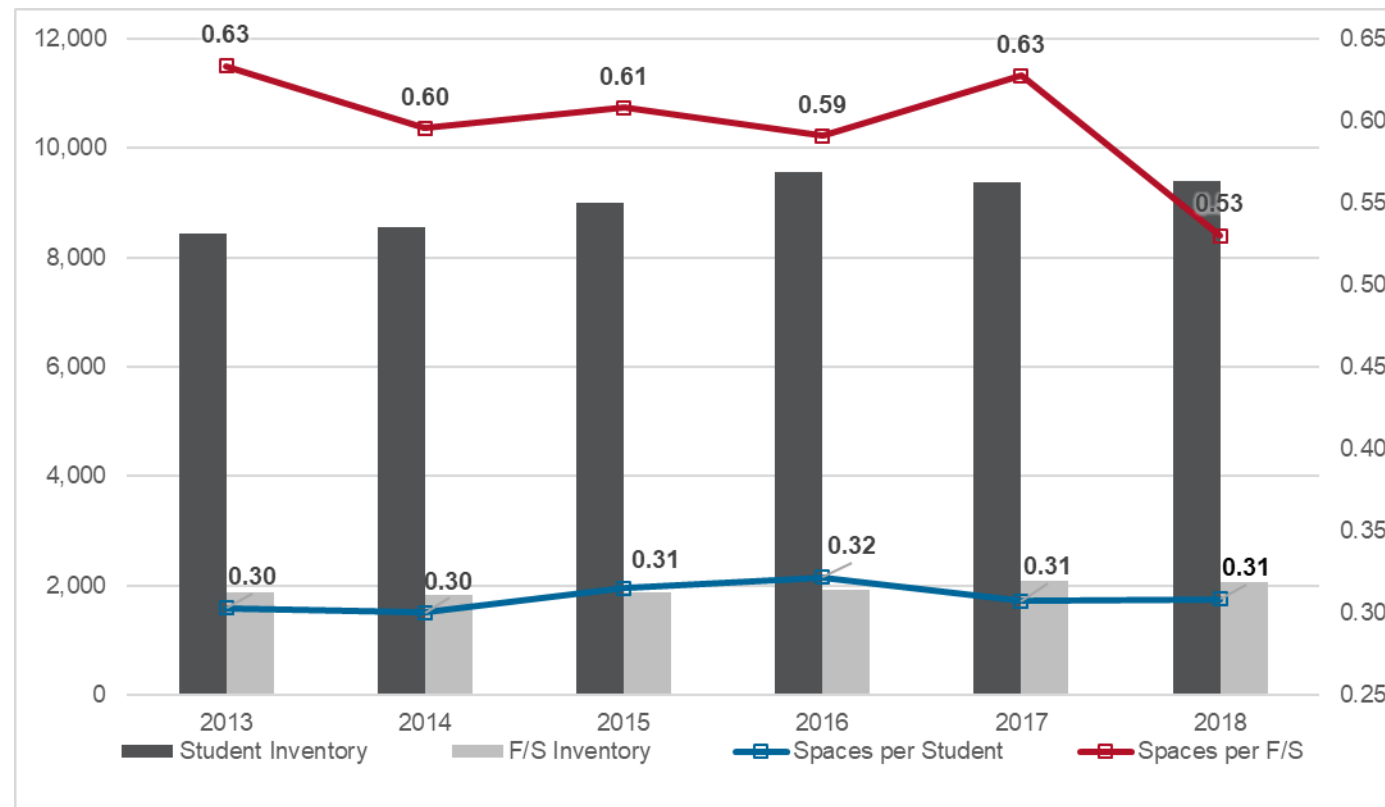
Source: Parking Inventory & Utilization Data, <https://www.unlv.edu/about/facts-stats>

The trends in spaces-per-person compared to inventory suggests that the spaces-per-person varies per year with no defined trends. This constant change may be due to the change in inventory due to construction and various space closures that vary throughout time. The most recent ratio of space-per-person from 2018 is 0.39. This shows that for each person there is 0.39 spaces available.

A deeper look at the data can reveal the spaces-per-person ratio for students and for faculty and staff, as shown in Figure 6. The graph below is based on the number of students compared to the number of student-allocated spaces. Similarly, the Faculty and Staff (F/S) ratio is derived from a comparison of total faculty and staff on campus versus the number of faculty and staff-allocated parking spaces. However, it is important to remember that faculty and staff can park in student-allocated spaces as well. Figure 6 displays the Spaces-per-person ratio by spaces-allocated to each user while Figure 7 displays the ratio for faculty and staff given the spaces available to them.

Current Parking System Utilization Assessment

Figure 6. Spaces per Person vs Inventory by User-Type



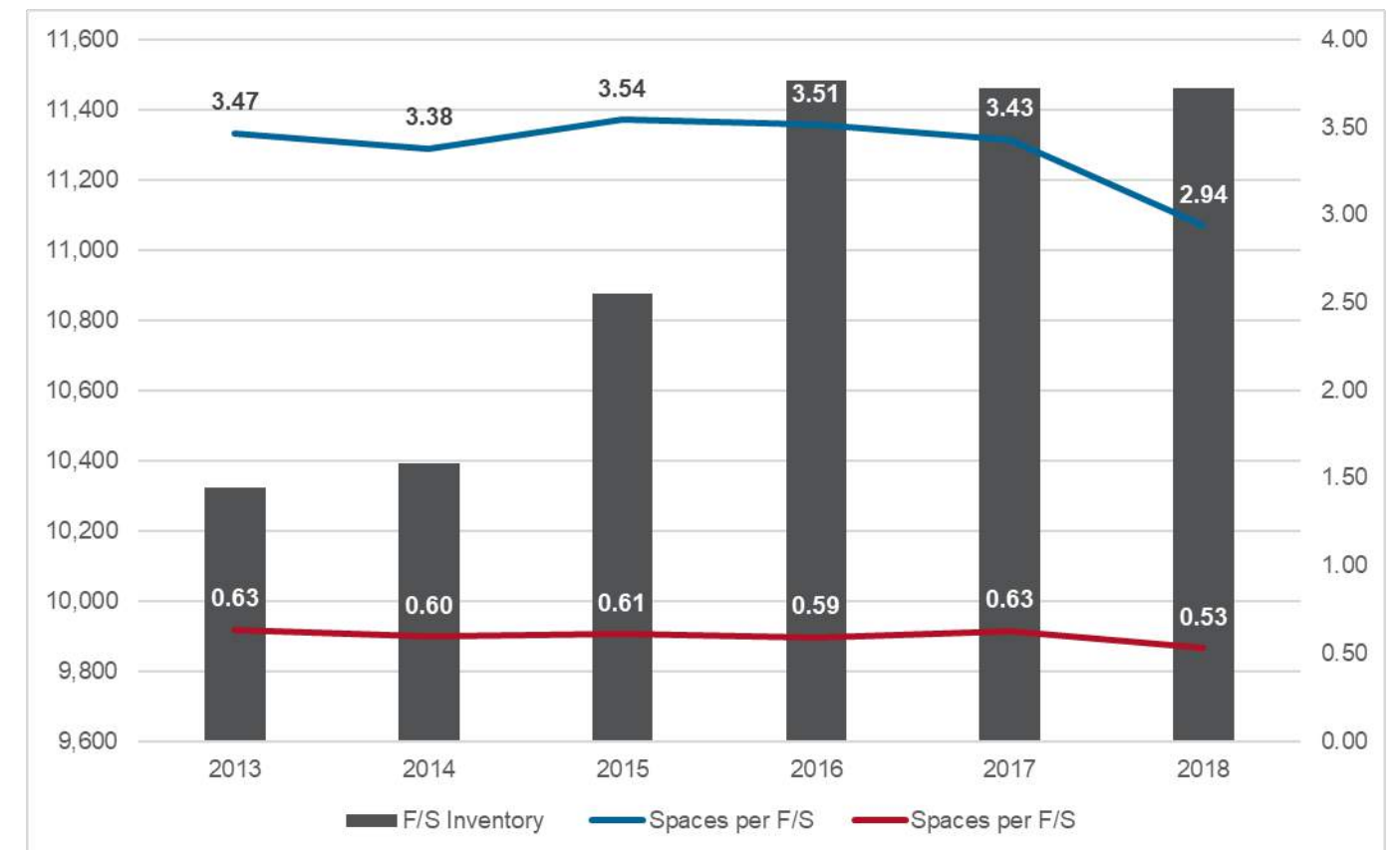
Source: UNLV Parking and Transportation Services Annual Reports for 2014-2019, <https://www.unlv.edu/about/facts-stats>

For the five-year period spanning from 2013-2018, the parking inventory followed the trend of the enrollment for that associated year. As a result, the spaces per person ratio has remained relatively consistent over the last five years. In 2016, the University Gateway Garage was constructed. This year also experienced the highest increase in student enrollment in the last five years. Between 2013 and 2019, enrollment has typically increased by 600-700 students. In 2016, the enrollment increased by over 1,000 students. Refer to Figure 1 in Section 3. The increase in both enrollment and population for this year helped to maintain a spaces per overall population parking ratio of 0.53. This ratio is high compared to other campuses and reflects the auto dominated culture of the Las Vegas area.

Even though, the ratio is high, there is a downward trend on the campus, which means that as population increases, the parking supply on campus is not increasing. This trend is seen in other campuses across the country as students and staff utilize other modes of transportation to travel to and around campus. When comparing the space-per-faculty ratio and space-per-student ratio, large differences are seen between the two. Student inventory accounts for a significant amount of parking inventory between these two user groups as well as has a larger presence on campus. The student-per-space ratio most recently is 0.31 while the faculty-per-space ratio is 0.53. Faculty have more parking available to them than the students.

It is important to note, that the ratios presented in Figure 6 represent a comparison of spaces specifically allocated to F/S. It does not take into account the fact that F/S are also allowed to park in student spaces as well. Because of this, the faculty-and-staff ratio is not accurate for what that population really has available to them for parking opportunities. Figure 7 below accounts for faculty and staff spaces-per-person ratio accounting for all spaces they have available.

Figure 7. Spaces per F/S Population Given the Spaces Available to Them



Source: UNLV Parking and Transportation Services Annual Reports for 2013-2019, population source, <https://www.unlv.edu/about/facts-stats>

When the Faculty and staff inventory includes all spaces available to that user group, including both faculty parking and student spaces, the ratio of spaces per F/S member greatly increases. In 2018, the F/S ratio when accounting for all available spaces to them resulted in a ratio of 2.94 spaces per faculty member. Comparing this ratio to the 0.31 spaces per student available displays a large gap between parking available for students and parking available for F/S members.

Key Takeaways

The following are key observations from the inventory data collected and analyzed for UNLV.

Current Parking System Utilization Assessment

The inventory data shows that student parking is the highest portion of the overall campus parking inventory at UNLV, and that 70% of this student parking is in garages.

Faculty and staff may have the smallest portion of parking allocated to them; however, they are able to park in facilities that are allocated to students. As a result, faculty and staff have a hunting license to park throughout the campus. While this is less restrictive for faculty and staff, it is harder to manage and properly allocate the correct portion of spaces to various users.

There is a small downward trend in the spaces to enrollment ratio, indicating that reliance on single occupancy vehicles to get to campus is declining as population continues to increase.

Parking Utilization

Effective parking management ensures that each parking facility on the campus is typically no more than 90% occupied during peak hours. For a university, where most users are familiar with the campus and park in the same facilities daily or even annually, occupancies above the 90% threshold will frustrate users as they try to find the remaining few spaces on campus.

Industry terms are used in this section to describe the parking conditions on the campus. These include the following terms:

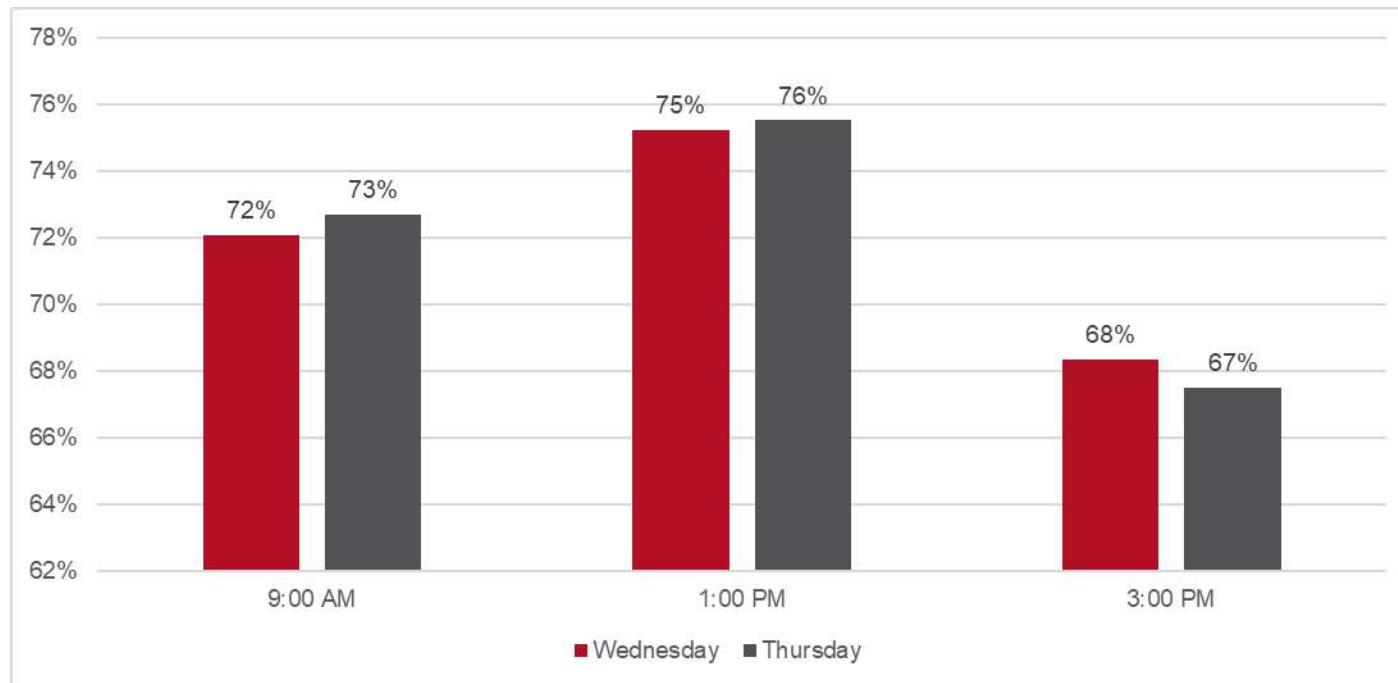
- **Observation Period** - days and times when data was collected in the field. For this Plan, parking occupancy data was collected, which means parked vehicles and total parking inventory were counted. The observation period for this Plan was Wednesday, September 4th and Thursday, September 5th, 2019 during the following periods:
 - 9am-10am
 - 1pm-2pm
 - 3pm-4pm
- **Peak Conditions** - Time when the most vehicles are parked on the campus during the observed periods. The peak conditions were found to be Wednesday between 1pm and 2pm.
- **Total Spaces** - Number of spaces in a facility.
- **Available Spaces** - Number of spaces that were observed as empty.
- **Occupied Spaces** - Number of spaces observed to be occupied by a vehicle during observation period.
- **Occupancy** - Number of spaces occupied by a vehicle divided by total spaces.

The following section presents the findings of the data analysis for the parking utilization of the campus. **Figure 8** on the following page displays the occupancy collected for each observation period taken from the data collected.



Current Parking System Utilization Assessment

Figure 8. Occupancy for Each Observation Period



Source: Parking Inventory & Utilization Data

Figure 8 illustrates the parking occupancies for each time in the observation period.

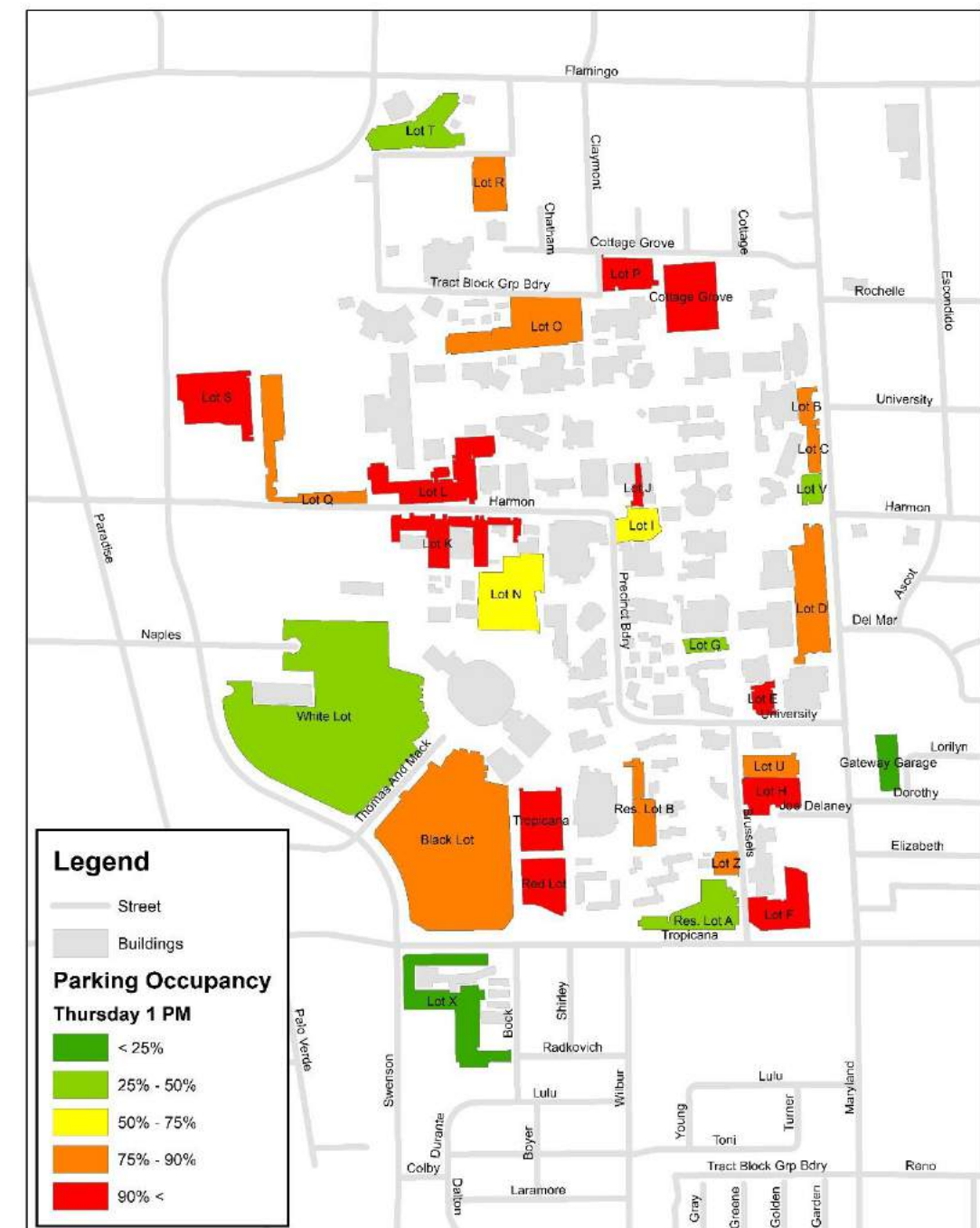
The peak conditions for the UNLV campus were found to occur on Thursday at 1pm with an occupancy of 76%. It is important to note that the occupancy collected for Wednesday is very similar to what was observed on the peak day. This parking occupancy falls within the optimum range for the campus, displaying that the overall parking system is being utilized efficiently. This indicates that there may be available parking on the campus, but it is difficult to find at this time of day. **Figure 10** illustrates the parking data to identify which lots are at capacity during this peak period and which user groups are impacted.

Figure 9 illustrates the occupancy seen within the parking system during the peak observed period. As the map shows, the exterior lots are being underutilized while the interior of campus is exceeding capacity. This shows that the campus population prefers to park closer to the center of campus while other parking facilities are less likely to be utilized because of their location.

As the map shows, the White Lot is large and underutilized when there is no event. This impacts the overall occupancy of the campus, making it seem lower. The Thomas and Mack hosts many events throughout the year, many that occur during school hours. Many of these events are not campus affiliated, but rather act as an event center for the entire city. This is rather unique for a university campus and therefore, the

White Lot should be reviewed separately from the rest of the campus parking supply. There is a subsection following the map that provides further analysis to account for the special relationship with the Thomas and Mack on campus.

Figure 9. Peak Hour Parking Occupancy (Thursday 1pm)



Current Parking System Utilization Assessment

Parking Occupancy and the Thomas and Mack Arena

The White Lot on campus is a primary resource that serves the Thomas & Mack Arena. This lot is often allocated towards events at the arena rather than being a dedicated parking option for normal campus users. As shown in **Figure 9** above, the occupancy seen at the time of observation at the White Lot was less than 25 percent occupancy. Although this occupancy seems to indicate that the lot is underutilized, that may be the case if the lot was always available for users on campus, but it is often occupied for events at the arena. The occupancy available may differ when events occur at Thomas & Mack Arena. Under the conditions that the White Lot is being utilized for the arena, the following parking occupancy conditions would have been analyzed:

Figure 10. Occupancy for Each Observation Period without the White Lot

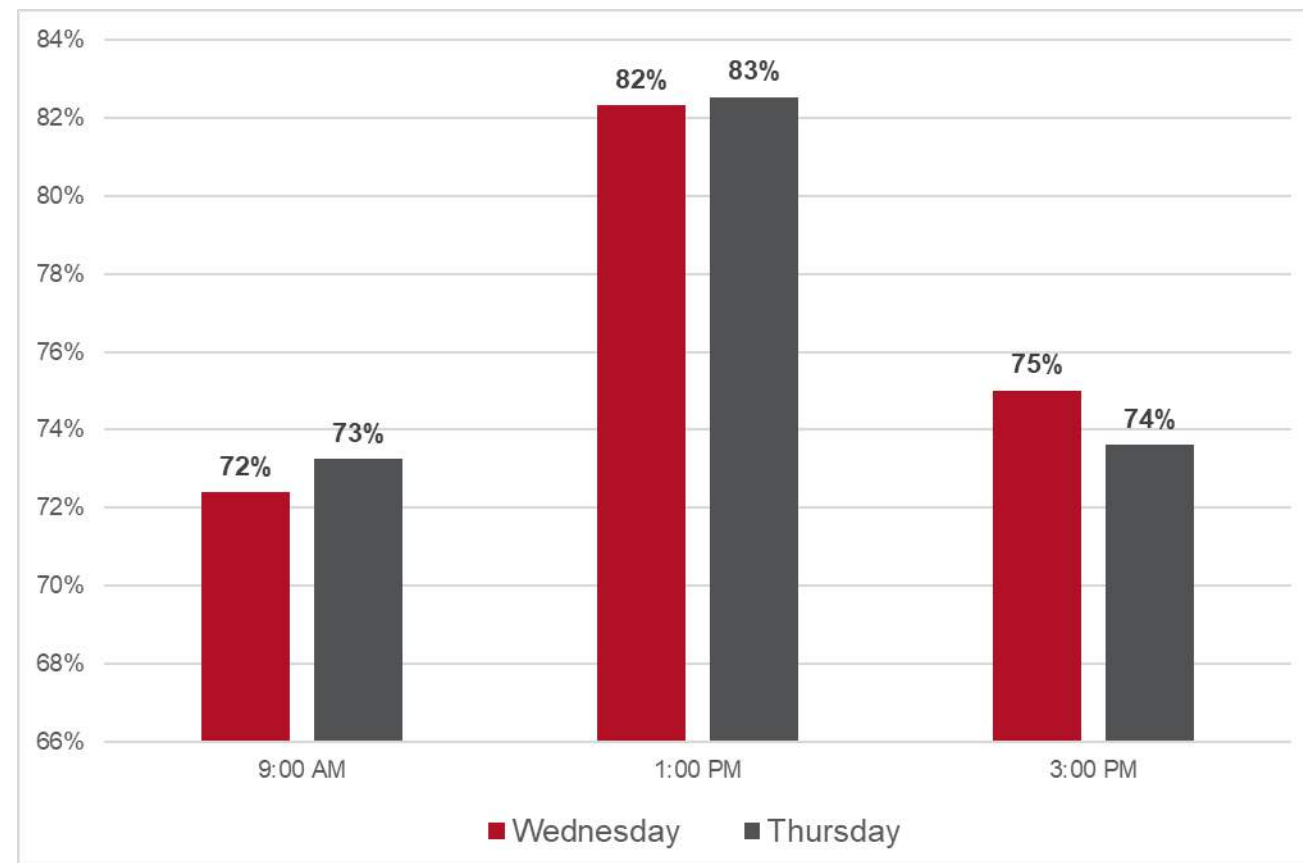
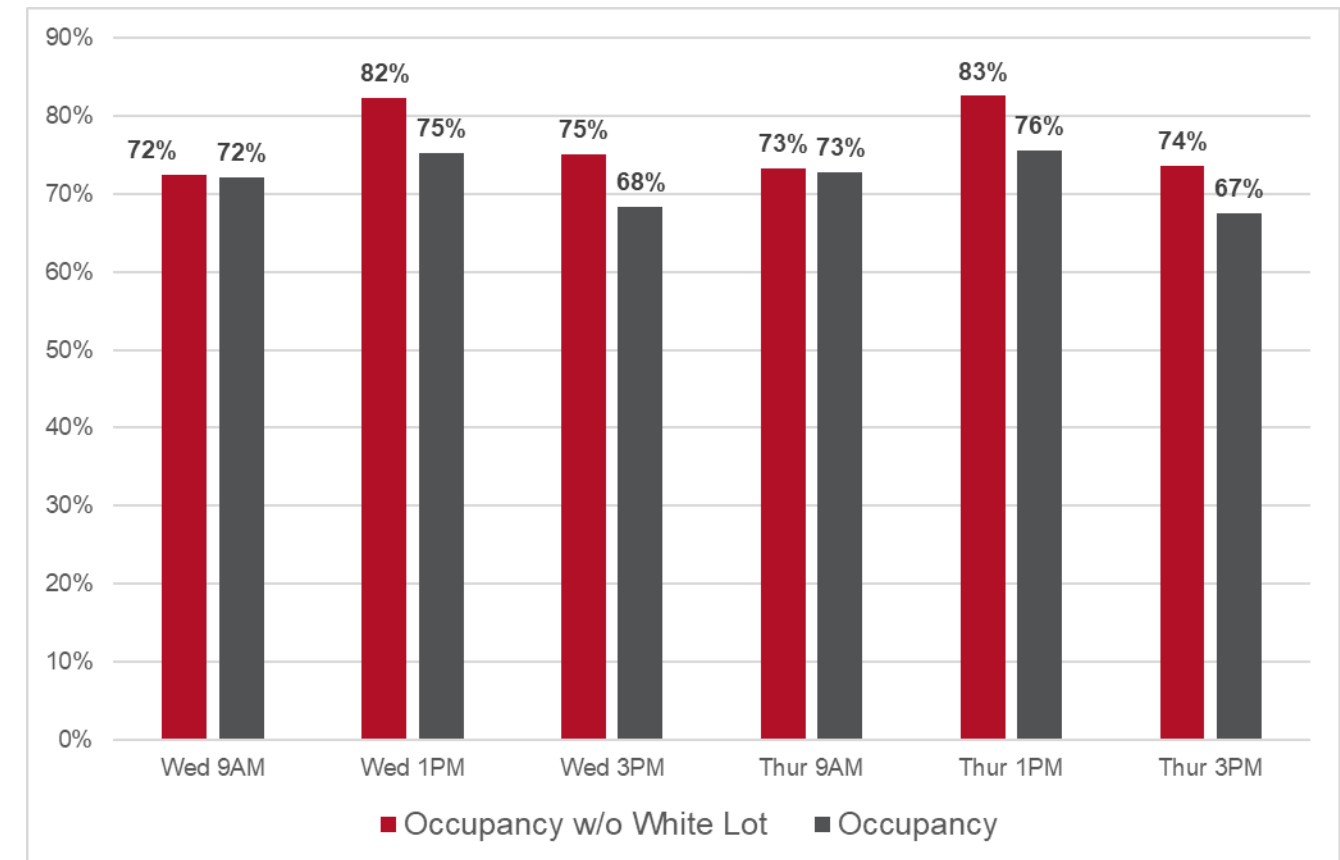


Figure 11 compares the parking occupancies with and without the White Lot. With this comparison, it is clear the White Lot has an impact on the occupancy seen throughout the campus's entire parking system, especially during the middle of the day. The altered occupancy data displays the conditions that can be expected when an event is occurring at the arena. On such days, the occupancy is much higher, with a 7% increase at the peak hour.

Figure 11. Occupancy With & Without White Lot

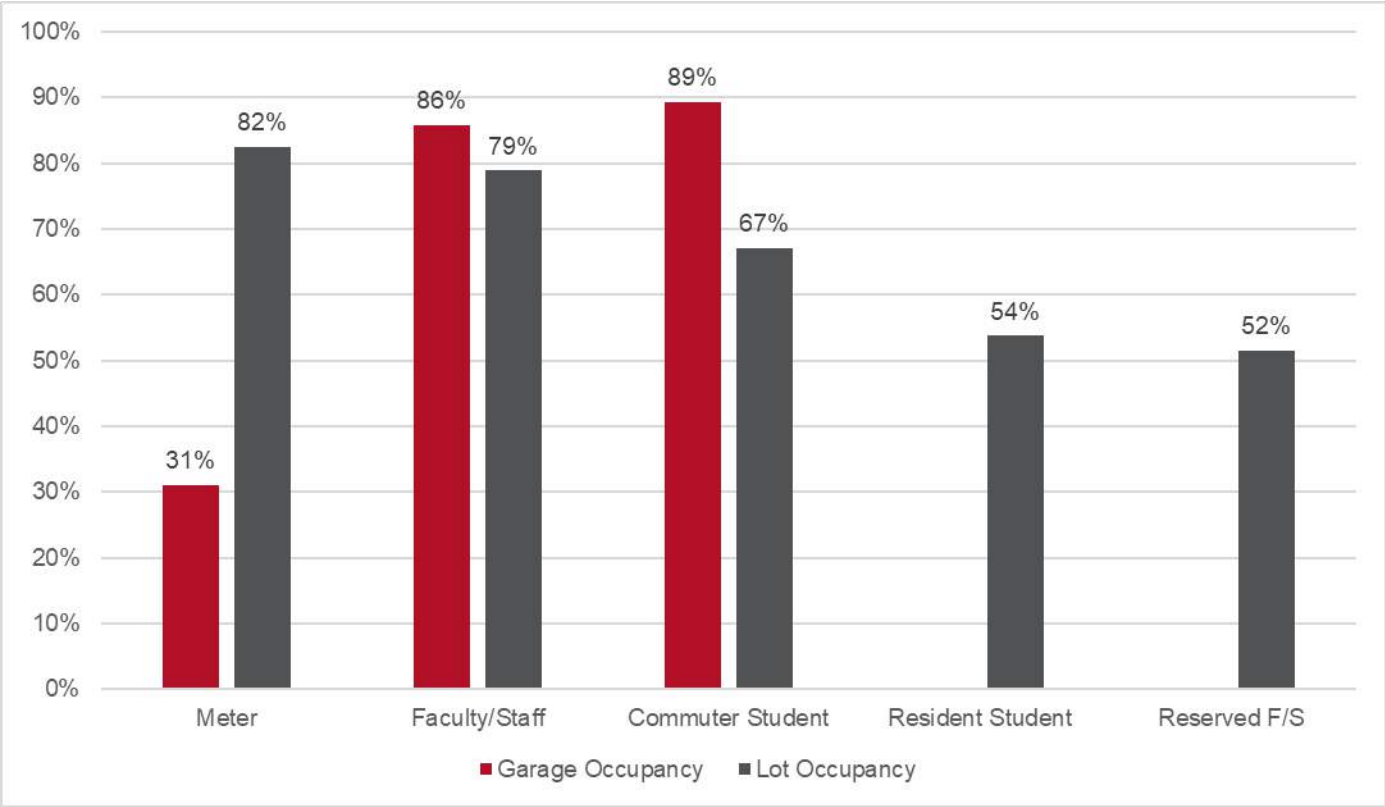


With the White Lot removed from the parking analysis for the campus, the parking on campus increases to 83% during the peak, which is approaching that critical effective capacity threshold of 90%. This indicates that users on the campus will experience frustrations when finding an available space. Especially visitors, who may be unfamiliar with the campus.

Occupancy by User Group

Drilling deeper into the peak hour, we can look at the occupancy by user groups across the campus. Through this data we can analyze occupancy from multiple angles (user and facility type) as was done with inventory. Comparisons can then be made to establish trends between occupancy based on user and occupancy based on facility type. **Figure 12** displays the peak occupancy by time of day and user-type.

Figure 12. Occupancy by User Group and Time of Day (Peak Hour - Thursday 1p.m.)



Source: Parking Inventory & Utilization Data

During the peak hour garage occupancy has an occupancy of 88% and lots have an overall occupancy of 69% amongst all user groups. It should be reiterated that faculty/staff are able to park in any student spaces as well, so it is difficult to determine what portion of that utilization is due to student usage or faculty/staff usage. Additionally, most garage spaces are designated as student spaces. Garage occupancy is higher than that of surface lot parking for all user groups besides metered parking.

Parking Utilization Key Takeaways

The following are key observations from the occupancy data collected and analyzed for UNLV.

- Overall parking utilization is adequate on campus; however, the available parking is located furthest from the core of campus.
- Although the occupancy data by facility and user type may show that parking is below effective capacity, it is clear through the figure that there are lots that are above effective capacity and therefore are experiencing conditions associated with a highly occupied parking facility.
- There are lots that are significantly underutilized, with an occupancy ranging from 17% to 53%. These include: White Lot, Resident Lot A, Lot X, Lot T, Lot I, and Lot G. Many of which are on the outskirts of campus. Peripheral parking is usually less desired and therefore the last to fill because of the walking distance to campus destinations.
- Based on the data, the following lots and garages are above effective capacity: Cottage Grove Garage, Lot E, Lot F, Lot H, Lot K, Lot J, Lot L, Lot P, Lot S, Red Lot, and Tropicana Garage. These lots are smaller lots in the inner parts of UNLV’s campus and garages closer to the center of campus.
- The garages on campus are within ideal occupancy range but closer to reaching effective capacity while surface lots can absorb more demand on the campus since overall utilization of the surface parking facilities is lower.

Permitting

The number of permits sold is another indicator of the demand for parking on the campus. Whereas the occupancy accounts for the actual vehicles, the permits sold represents the intent or desire to park on the campus even though those spaces may or may not be available. It may also indicate that people will purchase multiple types of permits to park in more places on campus. The following section looks at the permit sales and how it relates to the use of campus parking.

Permitting can also be an indicator of the suitability of the current parking system and the demand of parking on campus. Permitting information was obtained from the Annual Report released by the University of Nevada Las Vegas Parking and Transportation Services department.

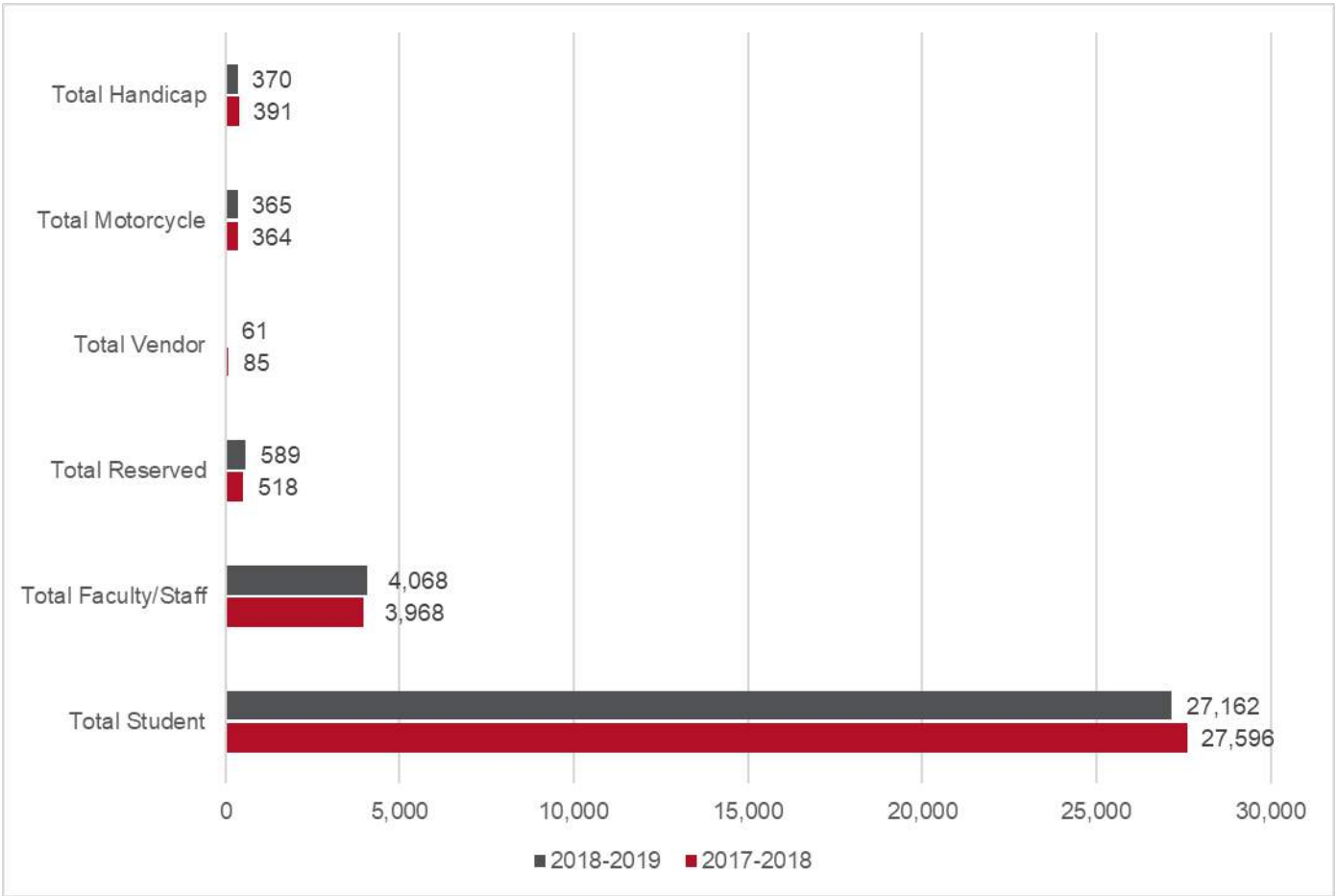
Campus faculty, staff, students, and vendors can acquire the following types of permits: annual, 9-month, semester, monthly, weekly, and daily. Handicap, reserved, and motorcycle permits are also available. The permit system hierarchy is shown in **Figure 13**.

Figure 13. Available Permits per User Group

Vendor & M/C	Reserved Permits	Faculty & Staff Permits	Student Permits
Vendor Annual - \$484	Annual - \$755	Annual - \$300	Annual - \$150
M/C Annual - \$100	9-Month - \$675	9-Month - \$247.50	9-Month - 123.75
M/C Fall - \$45	Fall - \$337.50	Fall - \$123.75	Fall - \$61.88
M/C Spring - \$45	Spring - \$337.50	Spring - \$123.75	Spring - \$61.88
M/C 9-Month - \$90	Summer - \$262.50		

Figure 14 shows the number of parking permits sold in both the 2017-2018 and 2018-2019 school years. The chart displays the total number of permits sold by user. Each permit type, as shown in Figure 11, is compiled to provide a total number of permits for each user.

Figure 14. Permits Sold by Type



Source: UNLV Parking and Transportation Services Annual Reports for 2018-2019

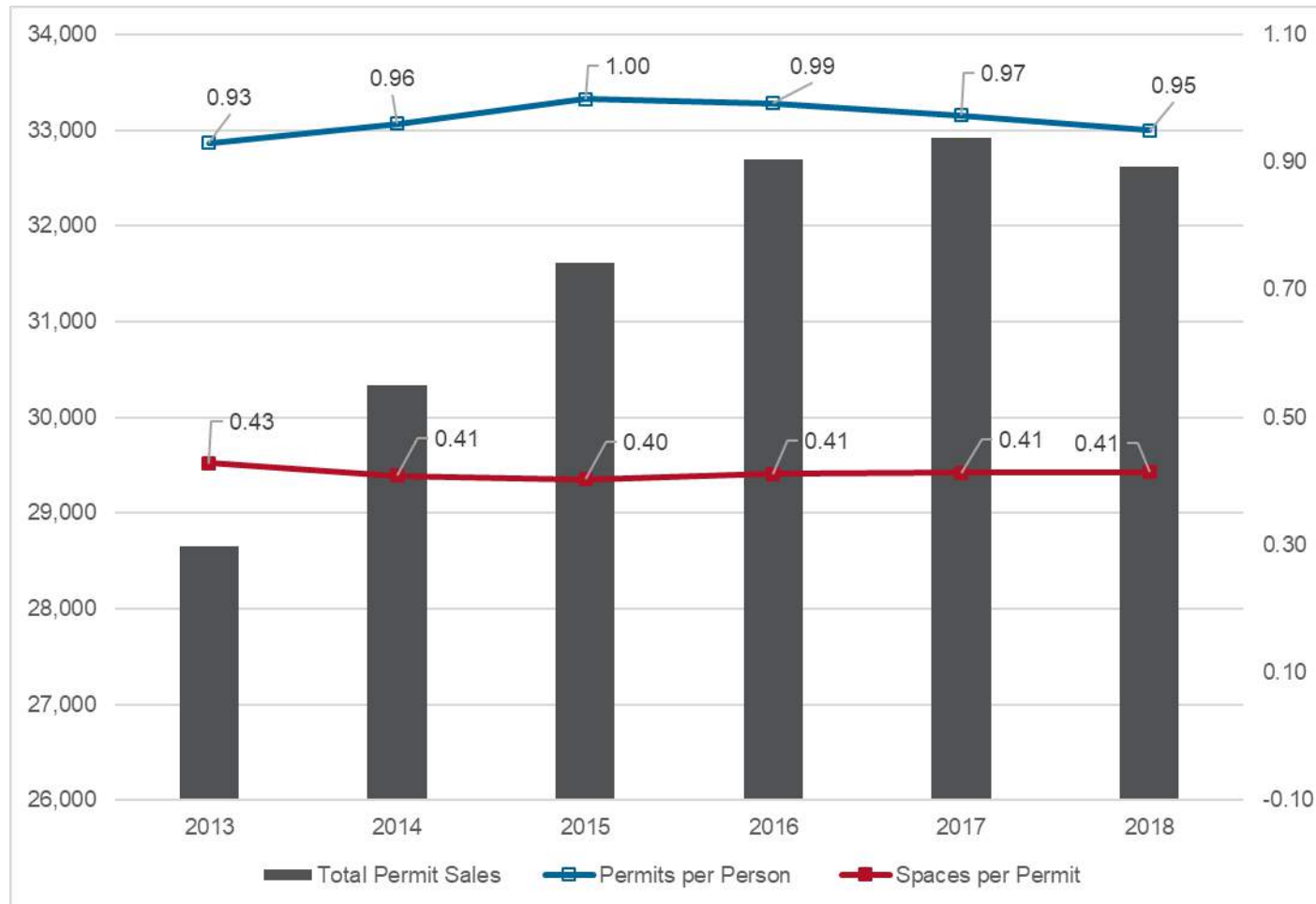
Student permits are the majority of permits sold each year. This can be expected since they are the majority of both the total campus population and the number of parking spaces on campus. When comparing the permits sold between the 2017-2018 school year and the 2018-2019 school year, there has been a decrease in the purchasing of student permits while there is an increase faculty/staff and reserved permit sales.

Like parking inventory being used for the persons per space ratio, the same campus population data can be applied to permits sold. This comparison will establish a ratio of permits per space available on campus. This can be a beneficial measure for the suitability of the number of permits sold in terms of campus

Current Parking System Utilization Assessment

population- which establishes the demand for permits on campus. The following table, **Figure 15**, displays the inventory compared to the number of permits sold over a period of time.

Figure 15. Spaces per Permit



Source: UNLV Parking and Transportation Services Annual Reports for 2014-2019, <https://www.unlv.edu/about/facts-stats>

Based on the ratios above, trends have shown that in recent years the number of spaces per permit has stayed relatively constant over the period observed. This means that for each permit, the number of spaces available to that permit-holder is the ratio. Over the five-year period, in 2018, 0.41 spaces were available per permit sold. If the permit holders have a similar schedule of being on campus, a permit holder has more than a 50% chance of not finding a space where desired.

Table 2 displays the number of permits available for each student on campus while **Table 3** shows the number of permits available for faculty and staff on campus.

Table 2. Permits per Student

Permit per Student Ratio			
Enrollment Year	Student Population	Number of Permits	Permits Per Student
2013	27,848	24,051	0.86
2014	28,515	25,605	0.90
2015	28,600	26,511	0.93
2016	29,702	27,386	0.92
2017	30,471	27,596	0.91
2018	30,457	27,162	0.89

Source: UNLV Parking and Transportation Services Annual Reports for 2014-2019, <https://www.unlv.edu/about/facts-stats>

Table 3. Permits per Faculty/Staff

Permit per Faculty and Staff Ratio			
Enrollment Year	F/S Population	Number of Permits	Permits Per F/S
2013	2,977	3,305	1.11
2014	3,077	3,373	1.10
2015	3,069	3,724	1.21
2016	3,268	3,909	1.20
2017	3,341	3,968	1.19
2018	3,900	4,068	1.04

Source: UNLV Parking and Transportation Services Annual Reports for 2014-2019, <https://www.unlv.edu/about/facts-stats>

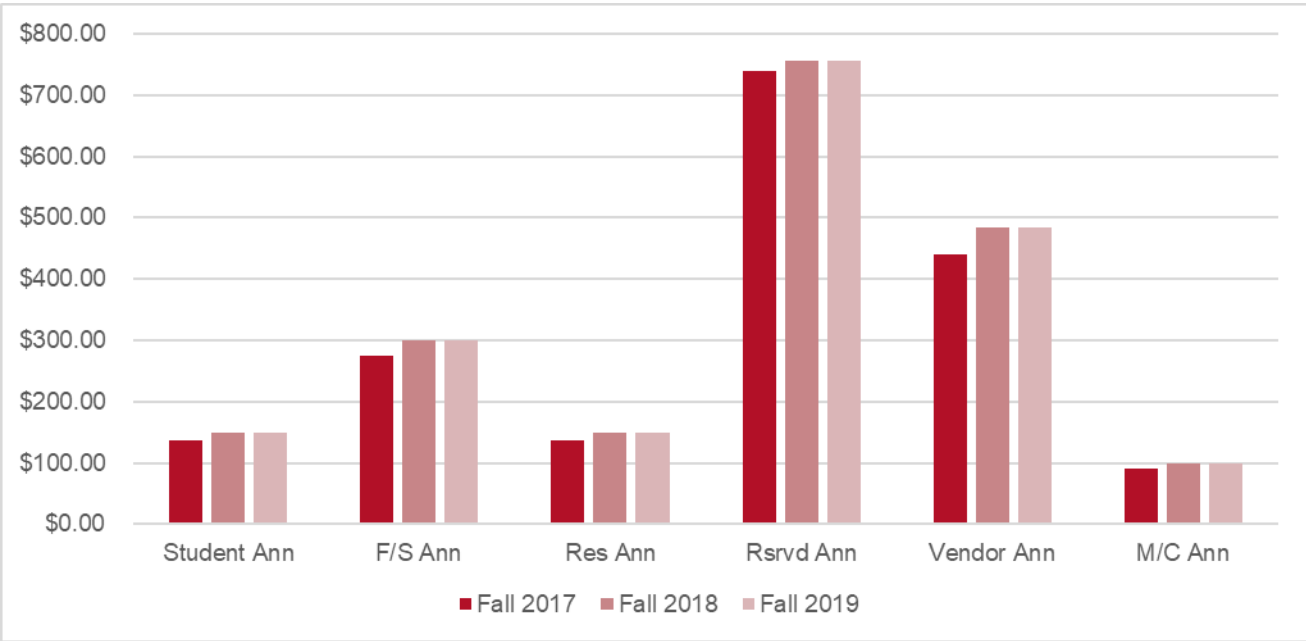
The data above shows that over the five-year period, number of permits per student has increased, where available permits are increasing faster as the student population grows. In 2018, the permits per student ratio reached 0.89, meaning there are 0.89 permits available per student under the assumption that all student permit holders are on campus at any given time. Note that enrollment numbers do not include the faculty and staff population on campus so although it may appear as though there are more than enough permits available for the student population, this is most likely not the case when vendor and faculty & staff are accounted for in the population.

Referencing Table 3, the same conclusions can be drawn for Faculty and Staff population compared to permit availability. In 2018, the permit per faculty/staff ratio was 1.04, resulting in more than 1 permit per F/S on campus. Comparing the ratios for student permit holders and faculty/staff permit holders, faculty/staff permit holders have a larger availability to parking even before considering that F/S permit holders can also park in spaces designated for students.

In addition to the number of permits sold, the trends in permit fees can be assessed to make conclusions regarding permitting and how it contributes to the campus parking system. **Figure 16** below displays the

permit fees over 2017, 2019, and 2019 by permit type. This visual allows trends in fees to be identified. **Figure 19**, in the next section of the report, displays permit by revenue type for 2017-2018 and can later be compared to permit fee trends. The two graphs can be compared to make conclusions between trends in permit revenue and permit fee.

Figure 16. Annual Permit Fee Trends

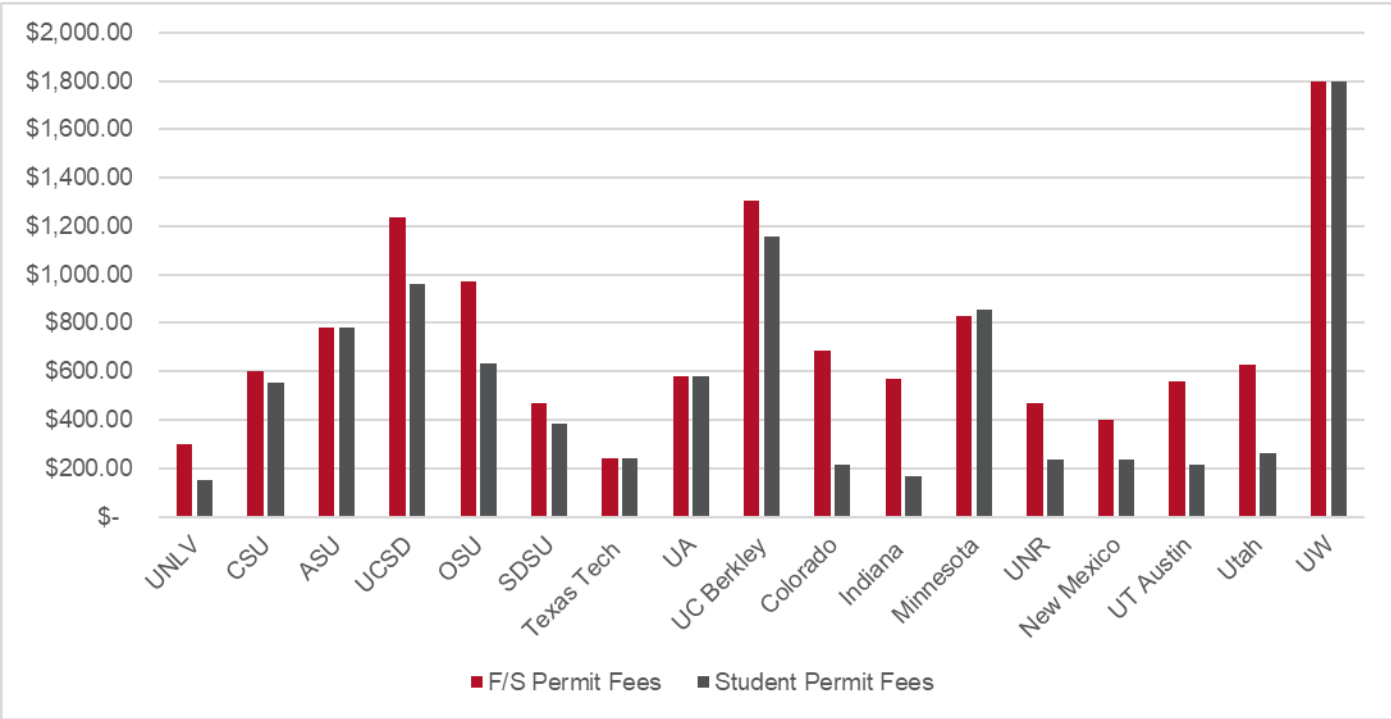


Source: UNLV Parking and Transportation Services Annual Reports for 2018-2019

Referencing **Figure 16**, the number of permits sold can be compared to the changes in permit fees from fall of 2017 to fall of 2019. Looking at the permits that yield the most sales, they are some of the cheaper permit fees whereas the more expensive permits, like reserved permits, make up a minimal amount of permit sales for the campus.

The universities included in the peer evaluation includes: Colorado State University (CSU); Arizona State University (ASU); University of California, San Diego (UCSD); The Ohio State University (OSU); San Diego State University (SDSU); Texas Tech University (TTU); University of Arizona (UA); University of California, Berkley (UC Berkley); University of Colorado(CU); University of Indiana (UI); University of Minnesota (UM); University of Nevada, Reno (UNR); University of New Mexico (UNM); University of Texas, Austin (UT Austin); University of Utah (UU); and University of Washington (UW). The comparison of permit fees amongst peer universities is shown in **Figure 17**.

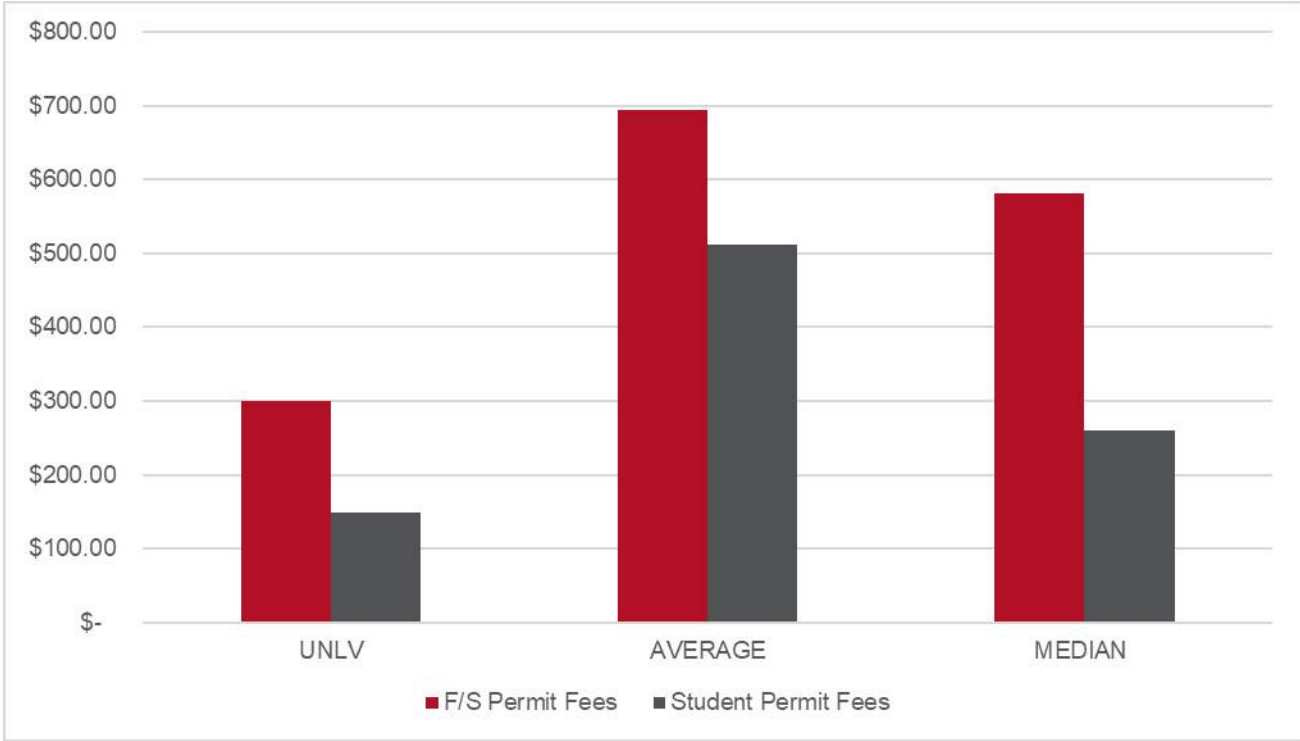
Figure 17. Permit Fees per Peer University



Source: UNLV Parking and Transportation Services 2019 Annual Report

It is common amongst all universities reviewed that faculty and staff permits are more expensive compared to the fees for student permits. It is also noted that the fees associated with permits differ greatly among the participatin universities. UNLV has the lowest cost student permits of the participating universities while the university has the second lowest F/S permit cost amongst peers. Compiling peer university data for permits fees, the average and median fees for both faculty and staff and student permits can be compiled as a benchmark to compare to the University of Nevada Las Vegas permit fees currently in place, as shown in the following figure, **Figure 18**.

Figure 18. UNLV Permit Fees vs. Average Peer University Permit Fees



Source: UNLV Parking and Transportation Services 2019 Annual Report

The graph above excludes data for Arizona State University and University of California, San Diego. The average student and F/S permit fees are \$695 and \$512. UNLV’s current permit values are 43% less than the average F/S permit costs among peers and 29% less than the average student permit cost. The University of Nevada Las Vegas’s current permit fees for F/S and students are significantly below both the median and average of the peer universities.

Key Takeaways

Through the analysis of permit sales, fees and revenue generated, trends can be identified in permitting when comparing past years data to the 2018-2019 school year. Permit sales are highest for annual and semester student and nine-month student and faculty/staff permits. This trend is also seen when comparing revenue of permit sales. It can also be determined that number of annual student permits purchased are going down while semester and 9-month permits may be replacing these sales.

Through the comparison of permit fees of peer universities, UNLV has low permit fee rates compared to peer universities. These low rates contribute to the continued use of single occupancy vehicles over alternative methods of transportation.

Parking Revenue

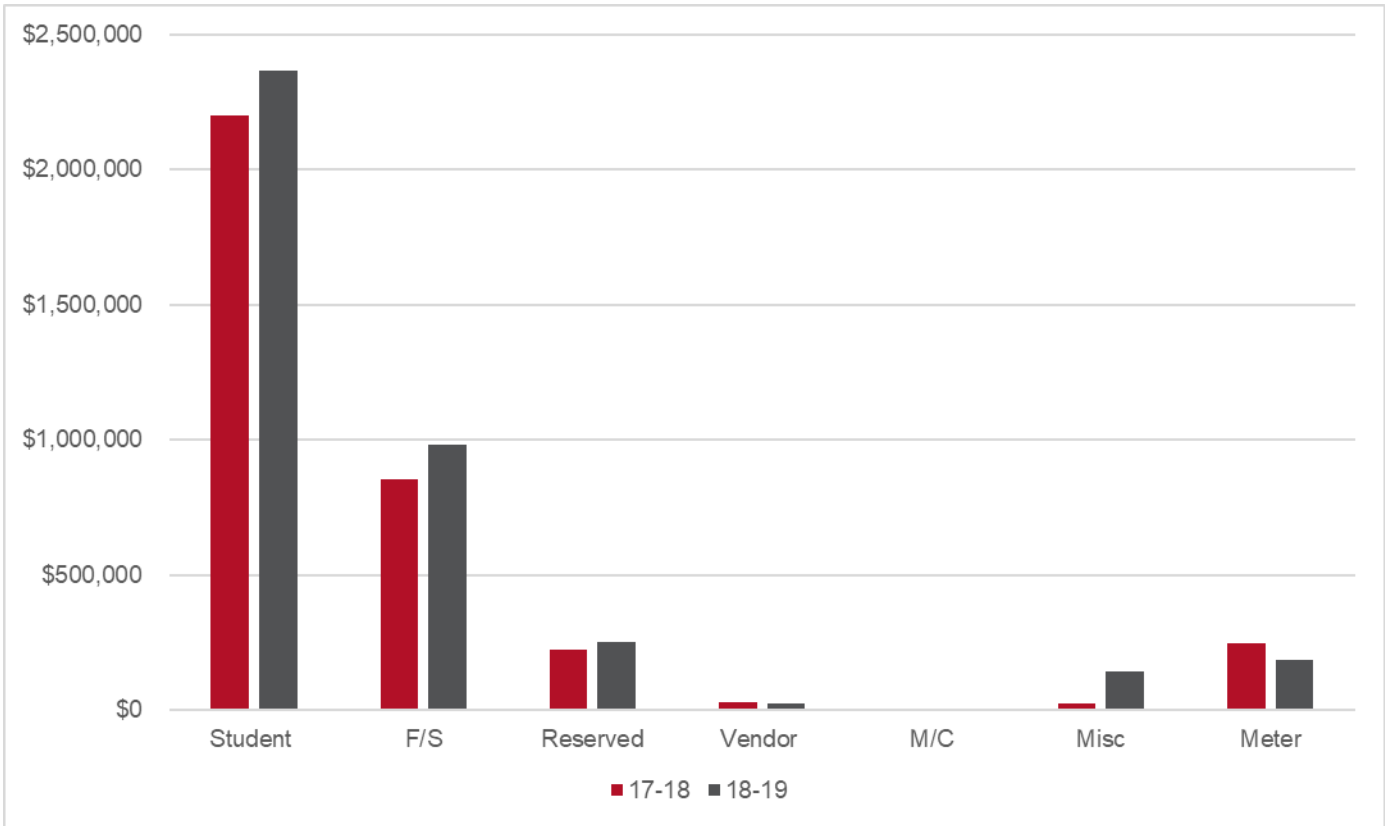
The department is self-funded. Should faculty, staff, students, or visitors choose to park on-campus, they are required to pay either through permits, digital methods, or by meters/pay stations. Parking can be purchased hourly, daily, weekly, monthly, nine-month, semester, or annually. These fees are imposed to pay for costs associated with maintaining and developing campus parking.

As PTS looks to the future, they are concerned about their ability to meet future parking demand from enrollment increases and Campus Master Plan implementation without a clear path for increasing parking fees. Fee increases halted in the fall of 2010, a departure from previous increases of approximately ten percent per year. In 2015, after five years of no increases, the Parking Advisory Committee reviewed financial planning documents presented by PTS and voted to increase fees at a minimum interval of fall 2015, 2018, and 2022. The department’s current financial projections show a “dramatic” fee increase schedule starting in 2023 through 2025 needed to make up for the loss of increases in previous years.

The annual reports released share information regarding revenue goals and intake for various parking components at the university. As mentioned previously, the departmental enforcement goal for CY 2018 was to enforce parking more effectively while reducing the number of parking abuses on campus. There were no specific numbers included in this goal but over 20,000 citations were written, being an annual increase of \$25,484 with a total collected revenue of \$688.915.

In addition to enforcement, parking permitting, and short-term parking can have a large impact on revenue brought in by the parking system. In 2018, 32,922 permits were sold where 22,866 of these permits were annual permits. Annual permit revenue totaled \$3,334,043. Trends in permitting and meter revenue over time is shown below in Figure 19.

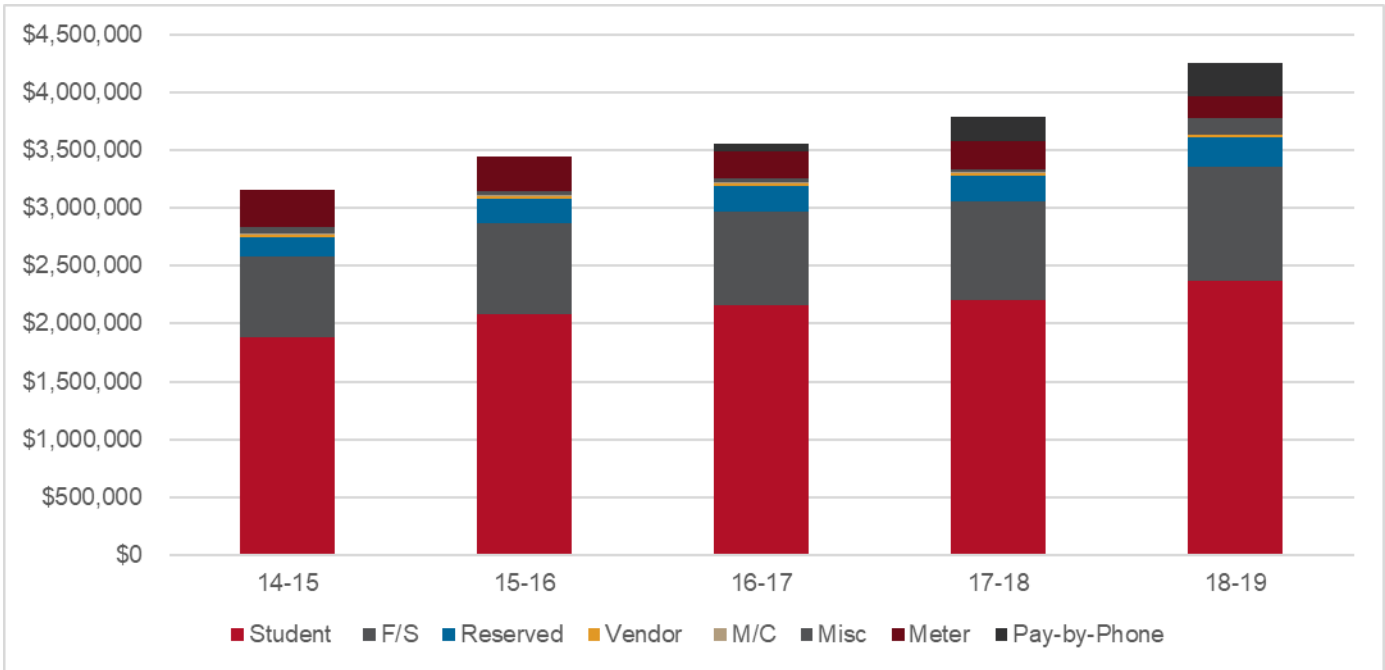
Figure 19. Permit Revenue Trends by Permit Type



Source: UNLV Parking and Transportation Services Annual Reports for 2018-2019

Student permits generate the most revenue from permits and metered parking with Faculty and Staff permits accounting for the second most revenue generator. It is also clear that the revenue generated from most permit user-types have increased between CY17 to CY18 whereas metered parking and vendor permit revenue has decreased. Comparing the revenue generated by permit type to the permit fee trends, the largest revenue generator is the permit type with the lowest permit fees. **Figure 20**, next, shows cumulative permit and meter revenue trends over a five-year period.

Figure 20. Cumulative Permit Revenue per Year

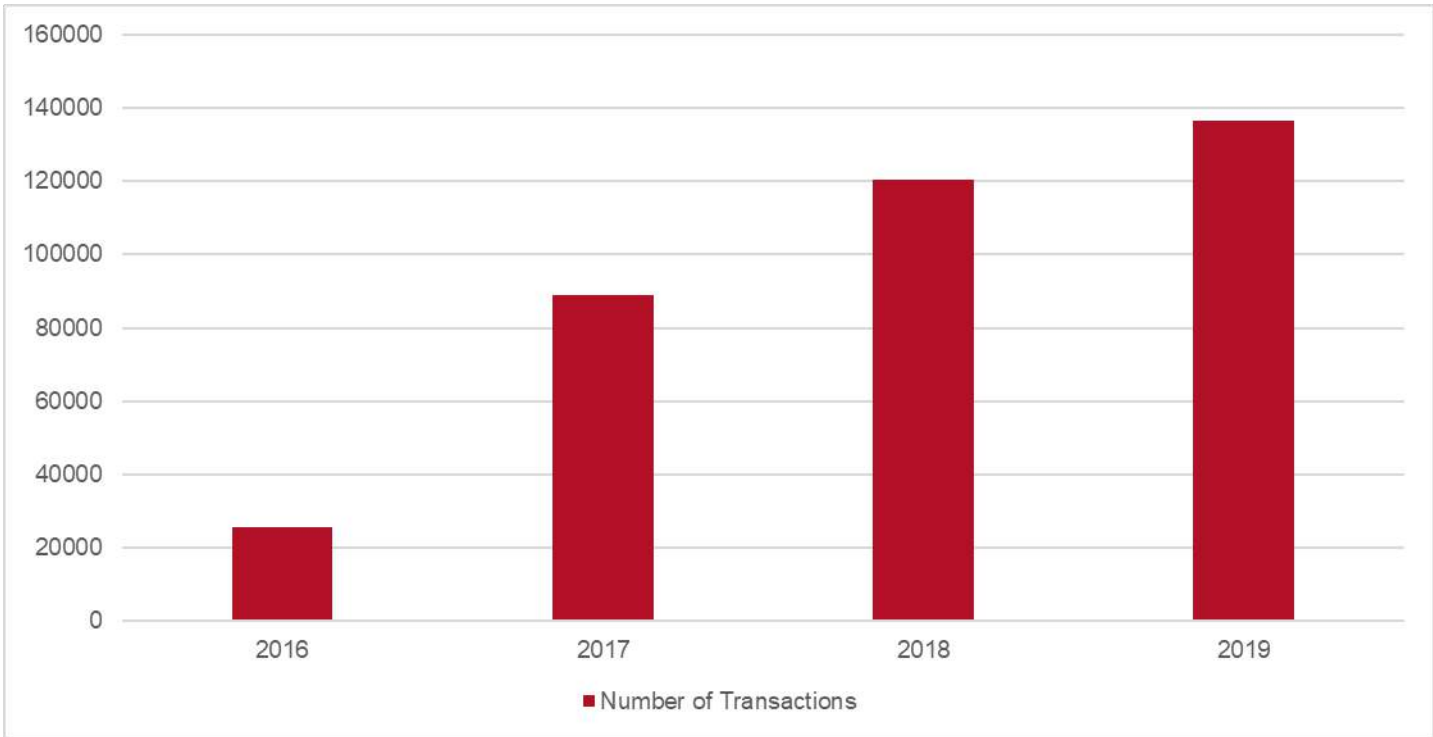


Source: UNLV Parking and Transportation Services Annual Reports for 2015-2019, UNLV Pay-by-Phone Report

The 2014-2015 school year produced \$3,157,494 whereas the 2018-2019 school year brought in \$4,257,605 in permit and meter revenue, resulting in an increase of \$1,100,111 over the five-year period analyzed.

As shown in the figure above, Pay-by-Phone parking is another short-term parking option offered at the UNLV Maryland Campus to students, faculty, staff, and visitors. Pay-by-Phone parking is an hourly parking that is operated over a mobile app. The app allows users to check remaining parking duration or extend time while being away from the space. Pay-by-Phone usage and revenue is available from 2016-2019. **Figure 21** below shows transactions of Pay-by-Phone parking over time.

Figure 21. Pay-by-Phone Transactions Time



Source: UNLV Pay-By-Phone Report

Trends show that the use of Pay-by-Phone parking has been utilized significantly more in recent years and the associated revenue brought in from this parking option also follows this trend.

Key Takeaways

Permitting sales, fees, and revenues are significantly interconnected. Student permits account for the most permits sold. Student permits also have the lowest permit fee of the two user-types. Although student permits have the highest sales, students also have the least availability for parking on campus. As the fees have increased over the years, the number of permits sold are also increasing. Factoring in revenue, student permits produce the most revenue despite them being the cheapest permit between users.

VI. Traffic Operations Analysis and Campus Cordon Study



VI. Traffic Operations Analysis and Campus Cordon Study

Introduction

Kimley-Horn prepared this section to document the results of a traffic study of future traffic conditions associated with the UNLV 2020 Parking and Transportation Master Plan and the complementary UNLV 2020 Campus Master Plan in preparation by Sasaki. The Campus Master Plan includes construction of four new parking structures, which would allow for a net increase of 4,500 parking spaces available for use by faculty, staff, and students of UNLV. Future parking structures will be constructed as needed on campus and will be in existing surface lots. UNLV is planning an on-campus bus transit system that will generally operate within the south western portion of the campus. A vicinity map illustrating the UNLV main campus and the study area key intersections surrounding the campus are shown in **Figure 22**.

The proposed parking additions and transit options have been included in the 2020 Master Plan because of a current need for additional parking resources based on projected increases in student admissions. During the 2019-2020 school year, approximately 31,171 students attended UNLV. The student enrollment for the ten-year planning horizon of 2030 is 38,003 students, a 22% increase.

The purposes of this cordon study include the following:

- Determine existing vehicle, bicycle, pedestrian, and scooter volumes accessing campus
- Evaluate major directions of arrival and departure for each transportation mode
- Identify future vehicle volumes based on UNLV parking garage demands
- Analyze existing and future traffic volumes to determine intersection lane and control improvements needed to adequately accommodate all modes of traffic

Existing Conditions

The following subsections outline existing conditions near UNLV.

Study Area and Roadway Network

The study area includes developed areas on and surrounding the UNLV campus. Transportation modes used by commuters traveling to and from campus include driving, biking, walking, scootering, carpooling, and transit. This study primarily focuses on the driving (car), biking (bicycle) and walking (pedestrian) commuting modes.

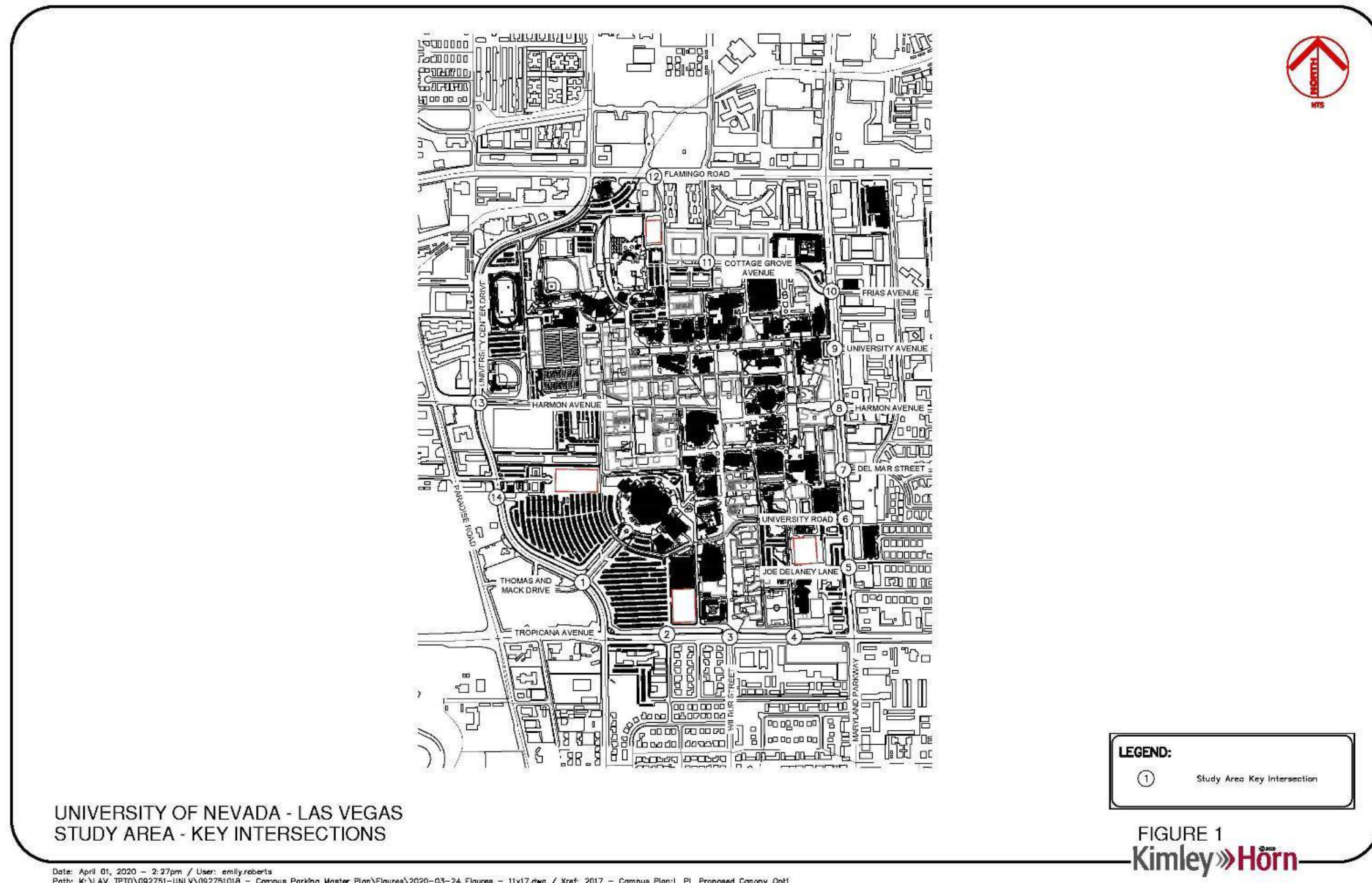
Working with UNLV, Kimley-Horn identified 10 key intersections for evaluation as shown in **Figure 23**. A list of the key intersection can also be seen in **Table 4**.

Table 4. Key Intersections

Key Intersections	
Intersection Number	Location
1	University Center Drive & Thomas and Mack Drive
2	Tropicana Avenue & Black Lot Exit Only
3	Tropicana Avenue & Wilbur Street
4	Tropicana Avenue & Brussels Street
5	Maryland Parkway & Joe Delaney Lane/Dorothy Avenue
6	Maryland Parkway & University Road
7	Maryland Parkway & Del Mar Street
8	Maryland Parkway & Harmon Avenue
9	Maryland Parkway & University Avenue
10	Maryland Parkway & Rochelle Avenue/Cottage Grove Avenue
11	Cottage Grove Avenue & Claymont Street
12	Flamingo Road & Entrance West of Claymont
13	University Center Drive & Harmon Avenue
14	University Center Drive & White Lot Exit Only

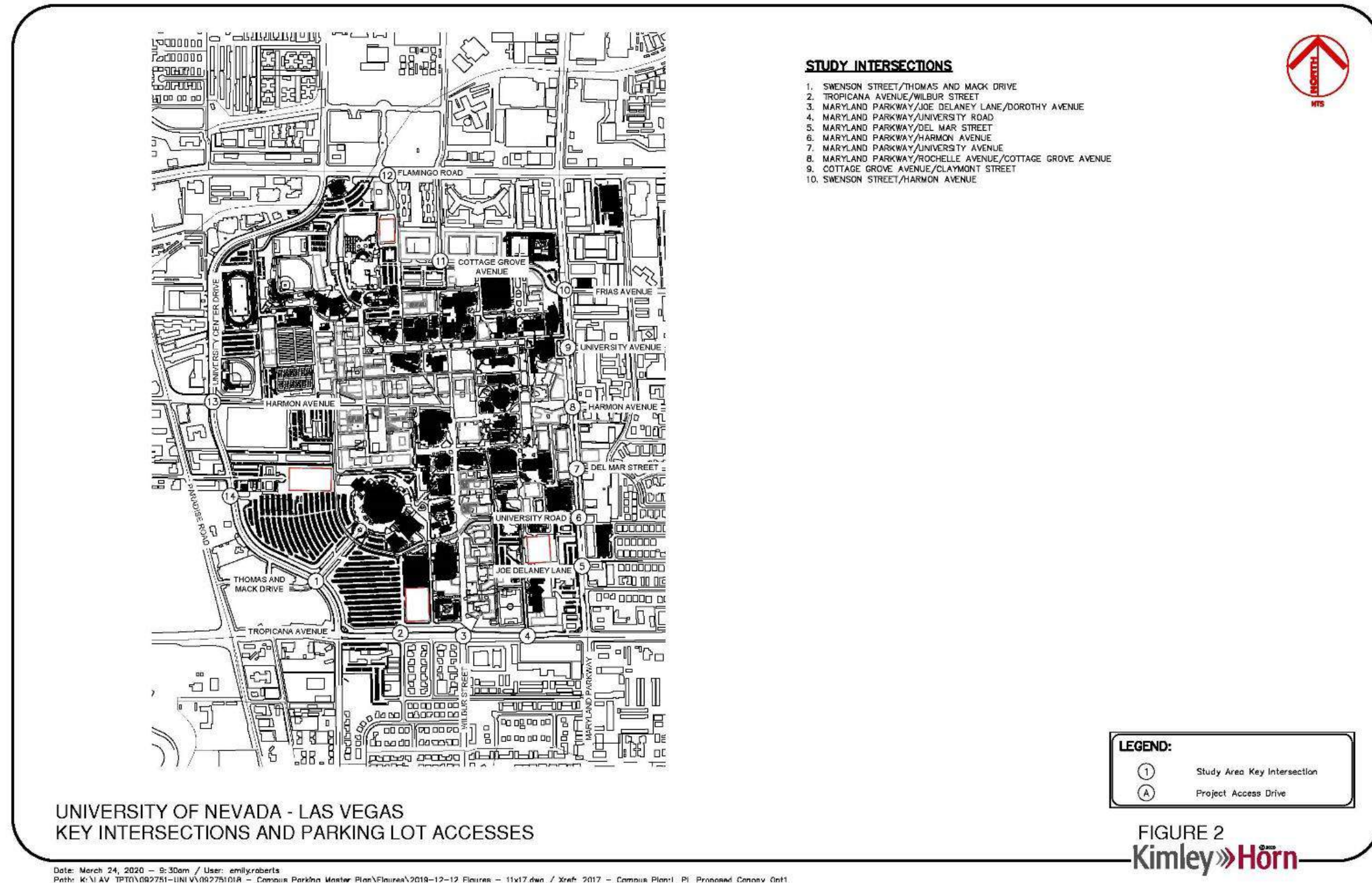
Traffic Operations Analysis and Campus Cordon Study

Figure 22. Study Area



Traffic Operations Analysis and Campus Cordon Study

Figure 23. Key Intersections and Parking Lot Accesses



Existing Roadway and Intersection Configurations

The key university roadways surrounding and within the UNLV Campus providing access to the university are described within the following paragraphs and can also be found in **Figure 24**.

Flamingo Road

Flamingo Road is the northern boundary of the UNLV Campus. It provides three through lanes eastbound and three through lanes westbound between University Center Drive and Maryland Parkway. Flamingo Road has a posted 45 mile per hour speed limit. Striped left-turn lanes have been designated at the major intersections. Three signalized intersections exist along Flamingo Road: University Center Drive, Claymont Street, and Maryland Parkway.

Cottage Grove Avenue

Cottage Grove Avenue provides a single lane in each direction with a continuous two-way left turn lane. Cottage Grove Avenue has a posted 25 mile per hour speed limit. The intersection of Cottage Grove Avenue with Claymont Street forms a “T” intersection with stop control on Claymont Street. The intersection of Cottage Grove Avenue with Maryland Parkway is signalized.

Harmon Avenue

Harmon Avenue provides one eastbound through lane and one westbound through lane with a posted 25 mile per hour speed limit within the interior of the campus. Harmon Avenue is not continuous through campus as it terminates in the campus core at parking lot I but also serves as an access drive from Maryland Parkway on the east side of campus. There are two signalized intersections along Harmon Avenue: University Center Drive and Maryland Parkway.

Thomas and Mack Drive

Thomas and Mack Drive is a five-lane roadway with flexible lanes for event traffic. On typical school days the roadway provides two lanes in each direction and a center turn lane, with a posted speed limit of 15 miles per hour. The intersection of Thomas and Mack Drive with University Center Drive operates with stop control on Thomas and Mack Drive. Thomas and Mack Drive provides parking lot access to the White and Black Lots as it terminates in front of the Thomas and Mack event center.

Tropicana Avenue

Tropicana Avenue is the southern boundary of the UNLV main campus. It provides four westbound through lanes and three eastbound through lanes between University Center Drive and Wilbur Street; and three westbound through lanes and three eastbound through lanes from Wilbur Street to Maryland Parkway. Tropicana Avenue is posted with a 45 mile per hour speed limit. A continuous two-way left turn lane has been designated for a portion of the length adjacent to campus. Striped left turn lanes have been designated at the major intersections and access points. Three signalized intersections exist along Tropicana Avenue: University Center Drive, Wilbur Street, and Maryland Parkway.

University Center Drive

University Center Drive (formally named Swenson Street) is the western boundary of the UNLV campus. It provides two northbound through lanes and two southbound through lanes with a continuous two-way left turn lane between Flamingo Road and Harmon Avenue. It is a one-way outbound street with four through lanes between Harmon Avenue and Tropicana Avenue. University Center Drive has a posted 35 mile per hour. Striped left turn lanes have been designated at the major intersections.

Claymont street

Claymont Street provides a single lane in each direction, northbound and southbound between Flamingo Road and Cottage Grove Avenue. Claymont Street has a posted speed limit of 25 miles per hour. The intersection of Claymont Street with Flamingo Avenue is signalized. The T-Intersection of Claymont Street with Cottage Grove Avenue operates with stop control on Claymont Street.

Wilbur Street

Wilbur Street provides one northbound through lane and one southbound through lane and operates with a speed limit of 25 miles per hour. Wilbur Street crosses Tropicana Avenue and curves on campus to travel in the westbound directions. The street provides access to the Black Lot and the Tropicana Parking Garage. The intersection of Wilbur Street with Tropicana Avenue is signalized.

Maryland Parkway

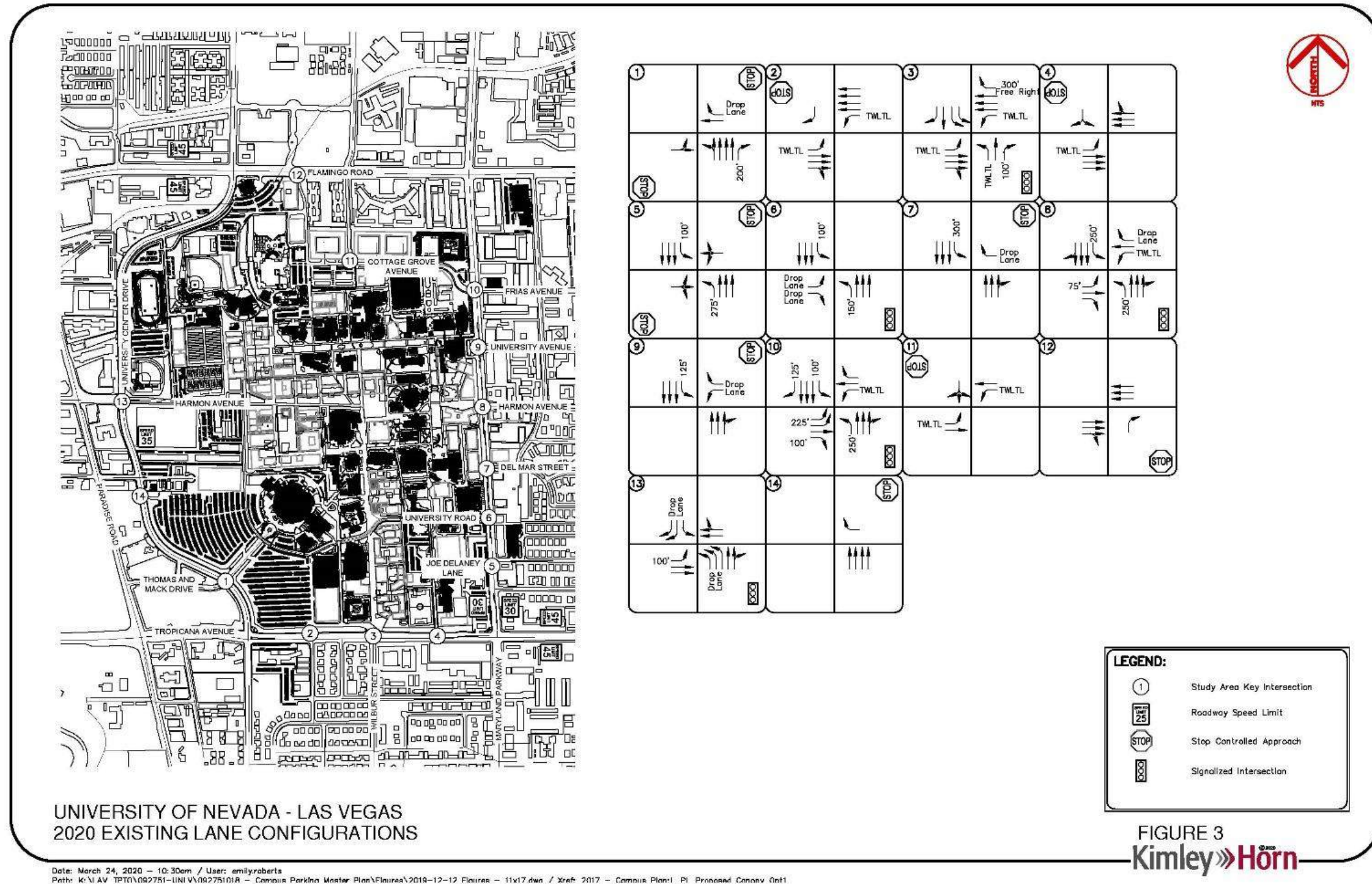
Maryland Parkway is the eastern boundary of the main UNLV campus. It provides three northbound through lanes and three southbound through lanes. Maryland Parkway has a posted 30 mile per hour speed limit. Delineated left turn lanes have been designated at the major intersections and campus access points. Several signalized intersections exist along Maryland Parkway: Flamingo Road, Cottage Grove Avenue, Harmon Avenue, University Road, and Tropicana Avenue.

Existing Traffic Volumes

Existing University peak-period turning movement counts were conducted at the key intersections on Wednesday, September 25, 2019 at the beginning of the fall school term. The counts were obtained in 15-minute intervals from 8:00 AM to 9:00 AM, 12:00 PM to 1:00 PM and 3:00 PM to 5:00 PM. Traffic count data sheets are provided in **Appendix 2**. The existing turning movement counts for automobile, bicycle, pedestrian, and scooter volumes are summarized in **Figure 25** through **Figure 28**.

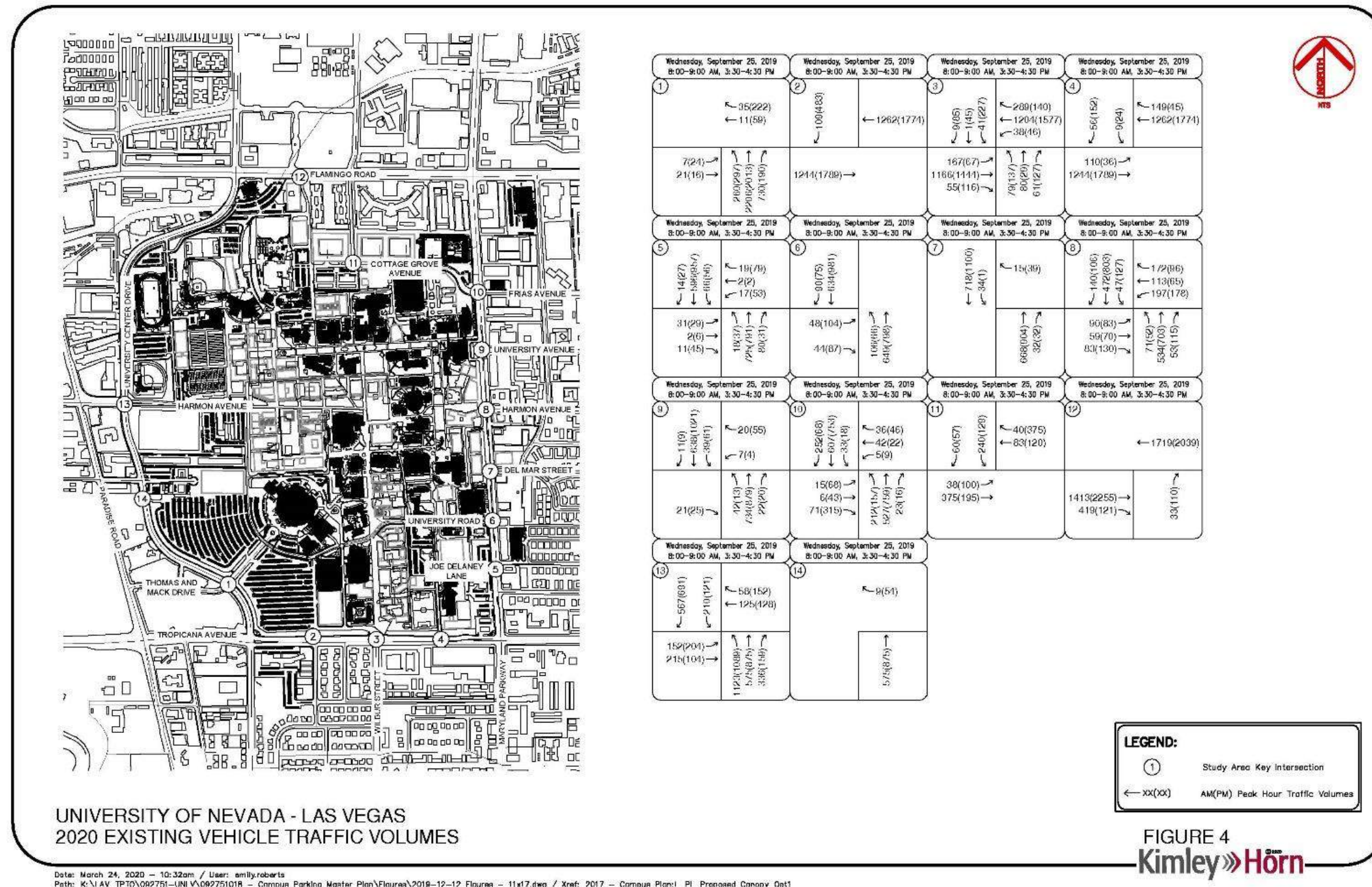
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Figure 24. 2020 Existing Lane Configurations



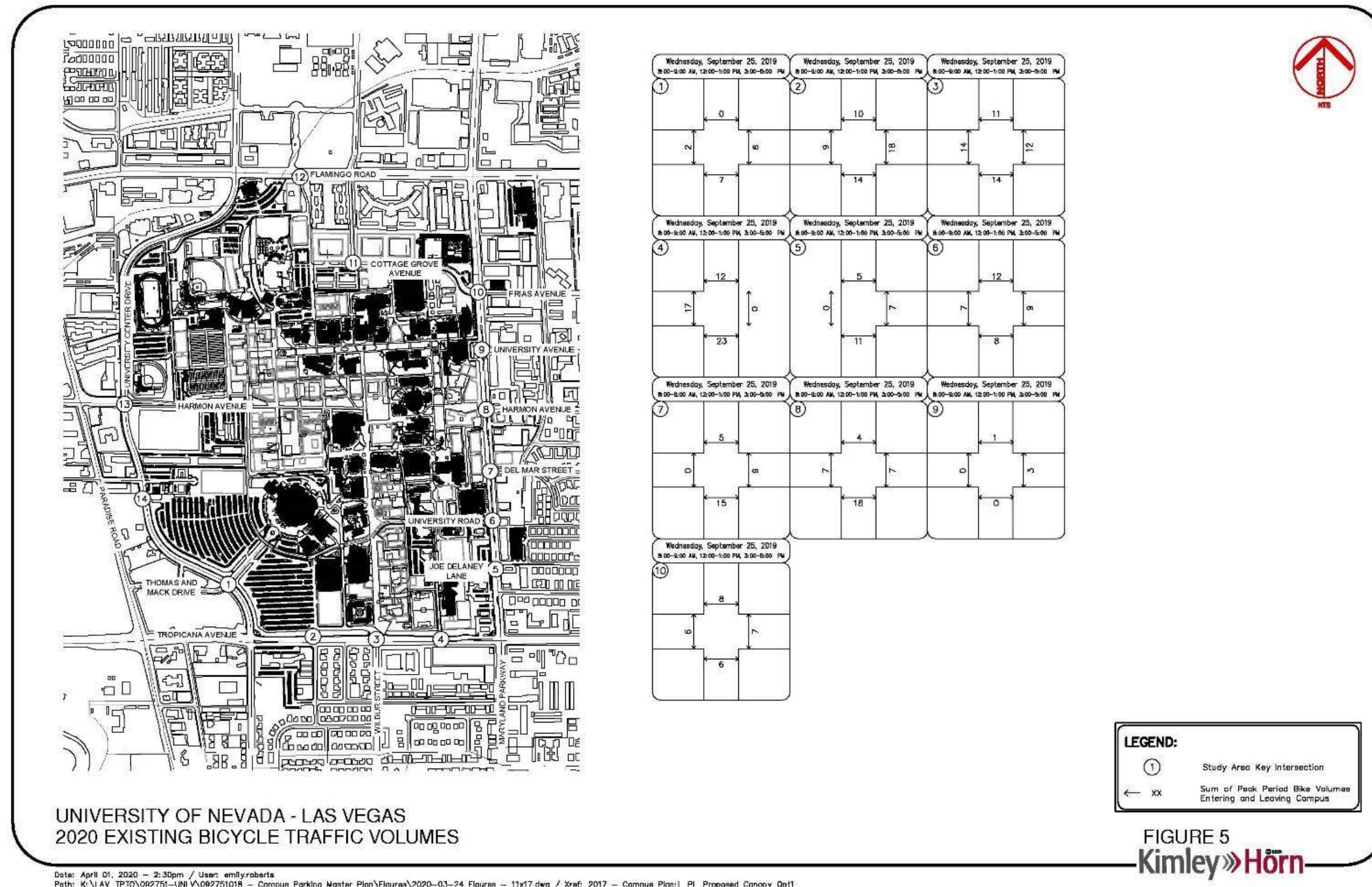
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Figure 25. 2020 Existing Vehicle Traffic Volumes



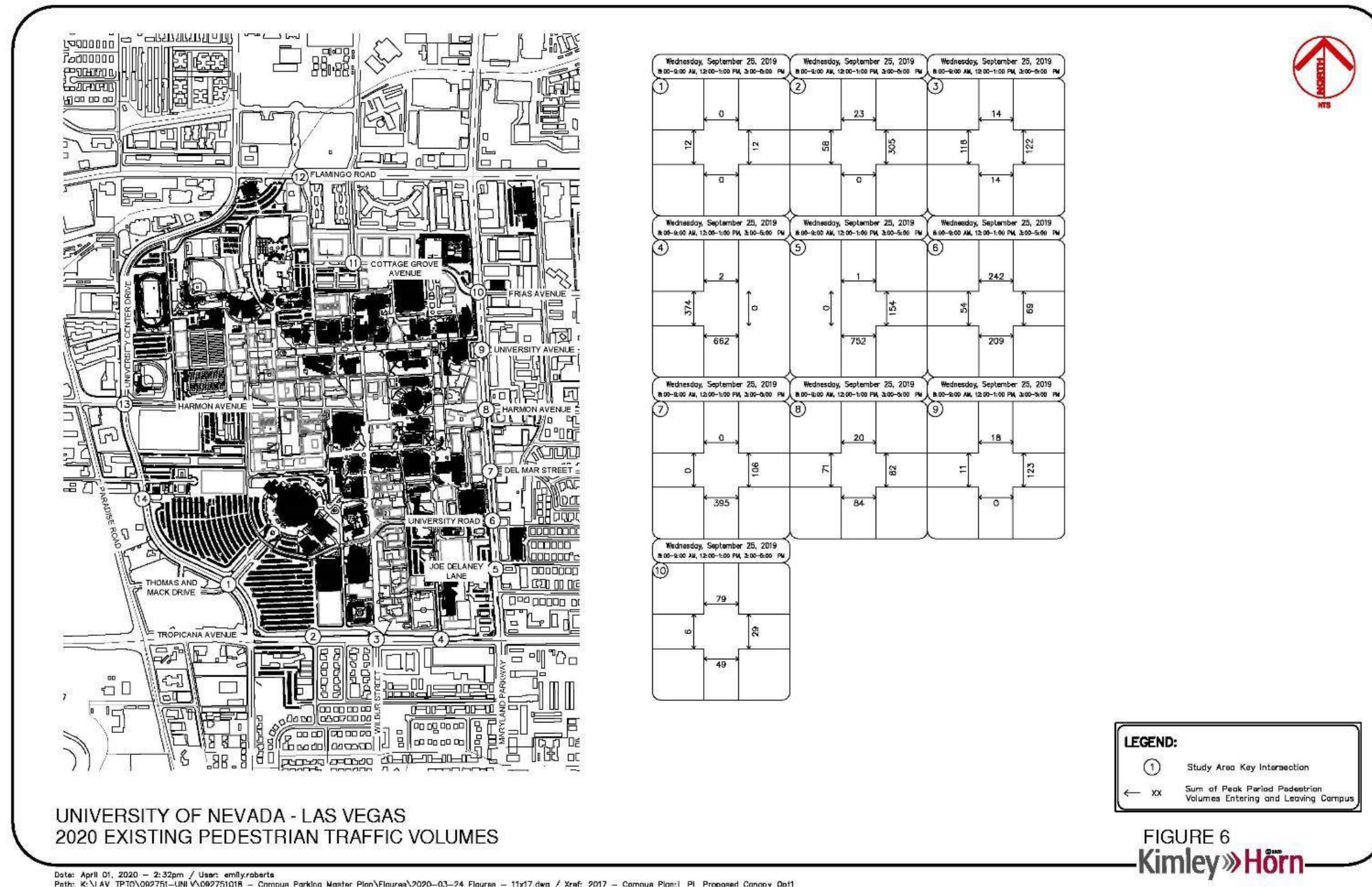
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Figure 26. 2020 Existing Bicycle Traffic Volumes



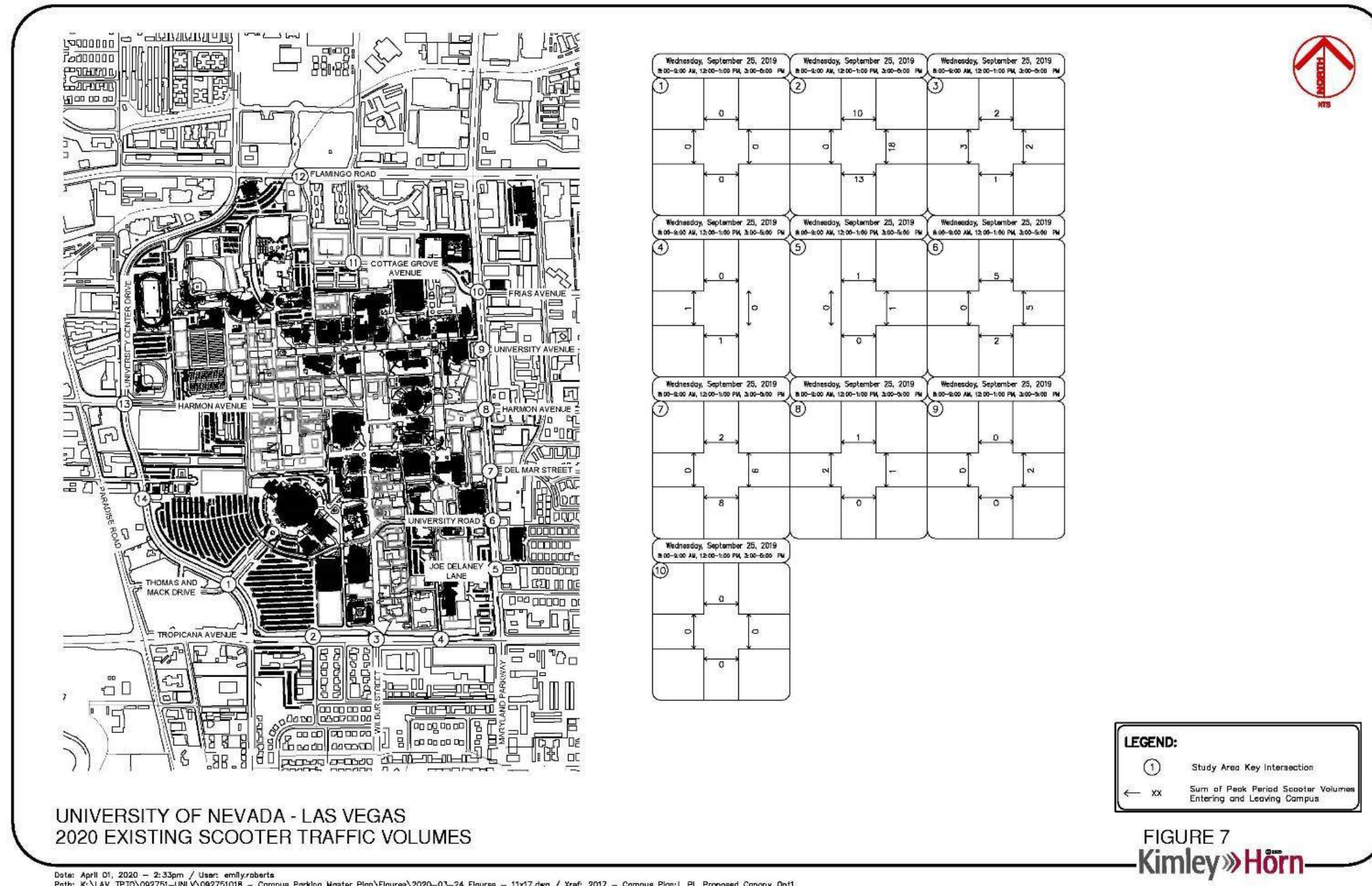
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Figure 27. 2020 Existing Pedestrian Traffic Volumes



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Figure 28. 2020 Existing Traffic Scooter Traffic Volumes

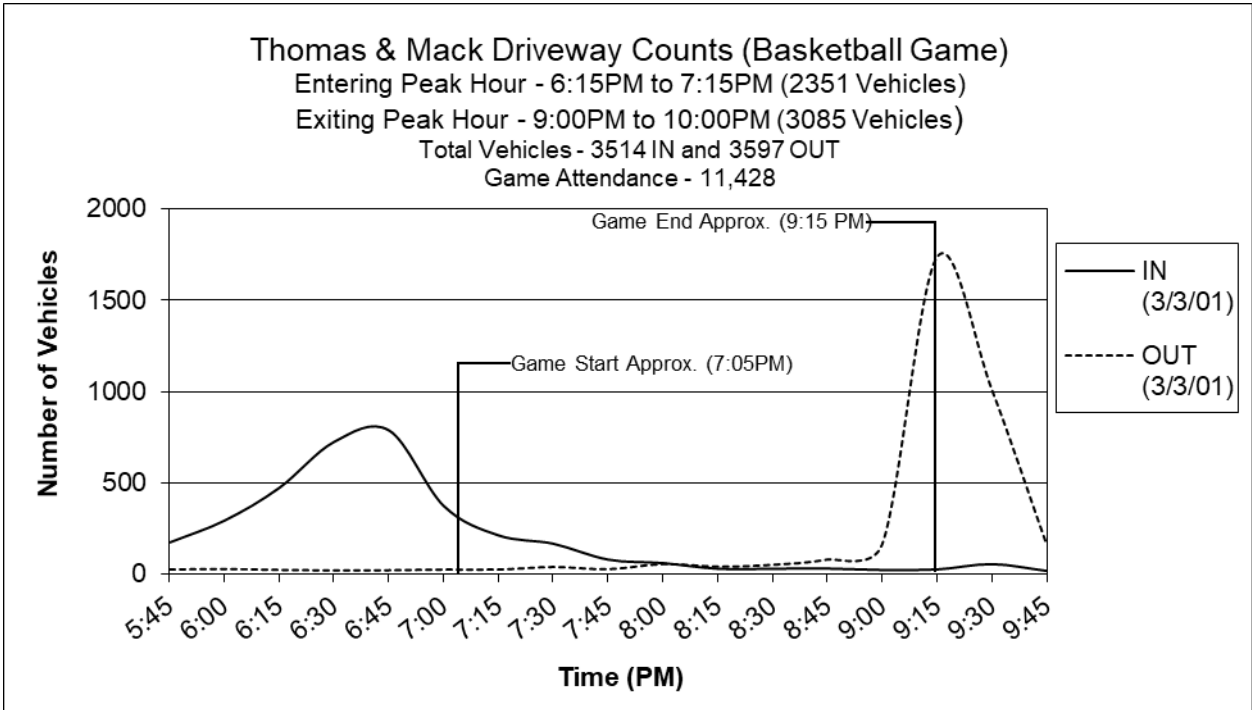


Thomas and Mack Event Operations

Within the UNLV campus sits the Thomas and Mack Arena. This 18,000-seat arena hosts approximately 150 events per year. Arena events create different traffic patterns and demands than typical university operations. The type of events and number of attendees all impact the traffic demands for events at the Thomas and Mack Center. For example, these events include various concerts, touring productions, sporting events, and high school and UNLV graduation ceremonies.

It was beyond the scope of this review to estimate the specific existing special event traffic volumes at UNLV and the Thomas and Mack Center for the numerous types and size of events that occur throughout the year, however observations conducted at the Thomas and Mack Arena by Kimley-Horn to prepare the March 2001 *The Orleans Expansion - Traffic Impact Study* for the constructions of The Orleans Arena are shown below in **Figure 29**.

Figure 29. Thomas and Mack Center Event Traffic Distribution



Vehicle volume counts obtained at the driveways serving the Thomas and Mack Center indicated that 2,351 vehicles entered the event parking lots in the peak hour leading up to the start of an observed basketball game. Traffic studies associated with the *2012 UNLV Master Plan Update - Preliminary Traffic Evaluation* identified the benefits of installing eastbound to northbound triple left turns at the Tropicana Avenue / University Center Drive intersection. Clark County is currently exploring alternatives to improve the traffic flow at the Tropicana Avenue intersections with Paradise Road and University Center Drive. The various alternatives will also improve access to UNLV and The Thomas and Mack Arena.

Cordon Study Assessment

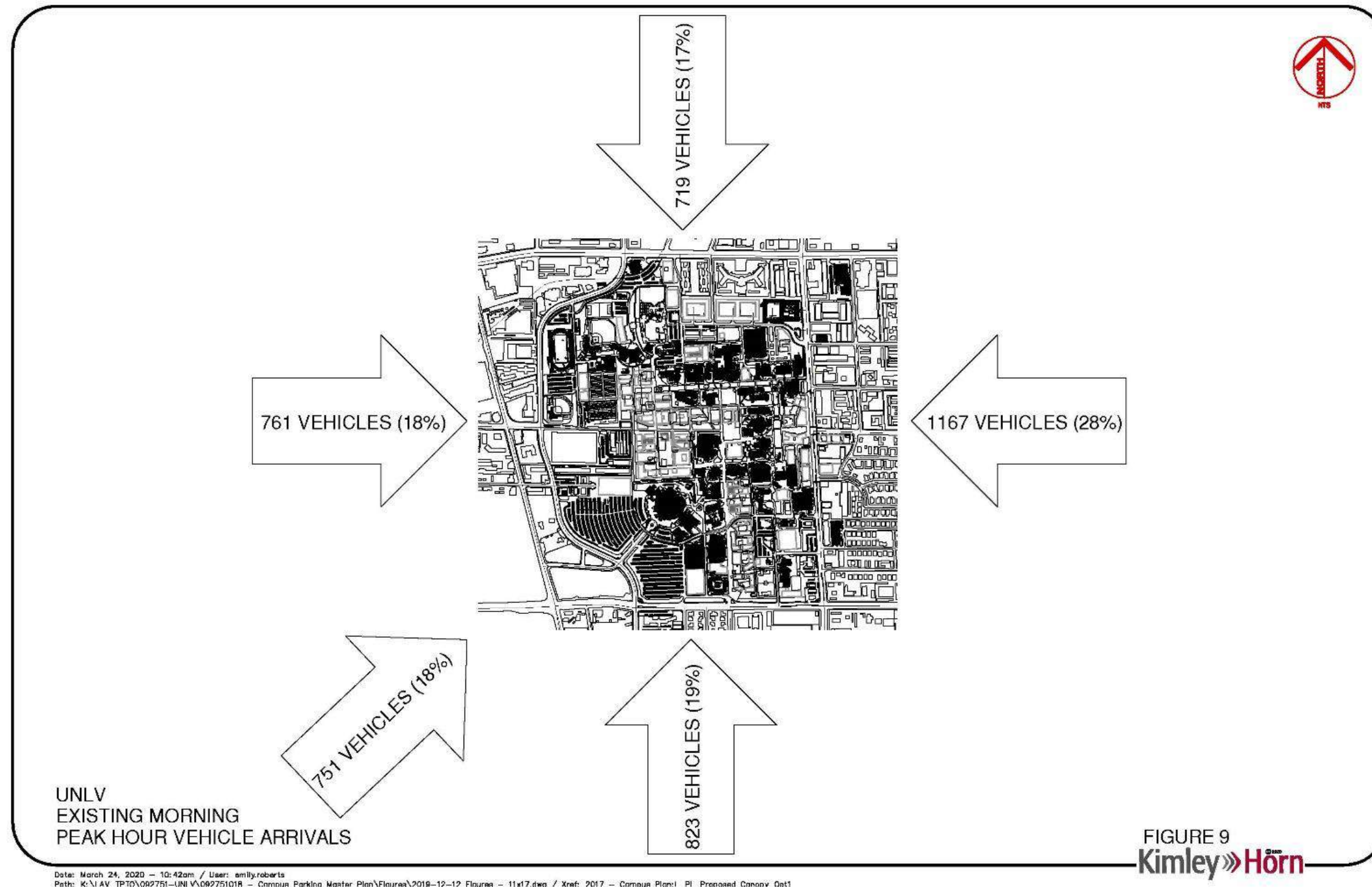
This section of the study identifies the cordon assessment requested by UNLV. The cordon study identified the arrival and departure directions of traffic to and from campus for the four modes studied: vehicles, bicycles, pedestrians, and scooters.

Existing Travel Arrivals to Campus

After the existing traffic count data had been analyzed, counts were assigned a direction from which the traffic accessed the UNLV campus. As seen in **Figure 30**, the largest amount of vehicle traffic arrives to campus from the west along Harmon Avenue and Tropicana Avenue. Due to the small peak volumes for AM, Midday, and PM time periods for the travel mode of bicycles, pedestrians, and scooters, the volume for arrivals and departures were combined into a single value for each mode. **Figure 31** through **Figure 33** show the arrival and departure patterns of bicycles, pedestrians and scooters.

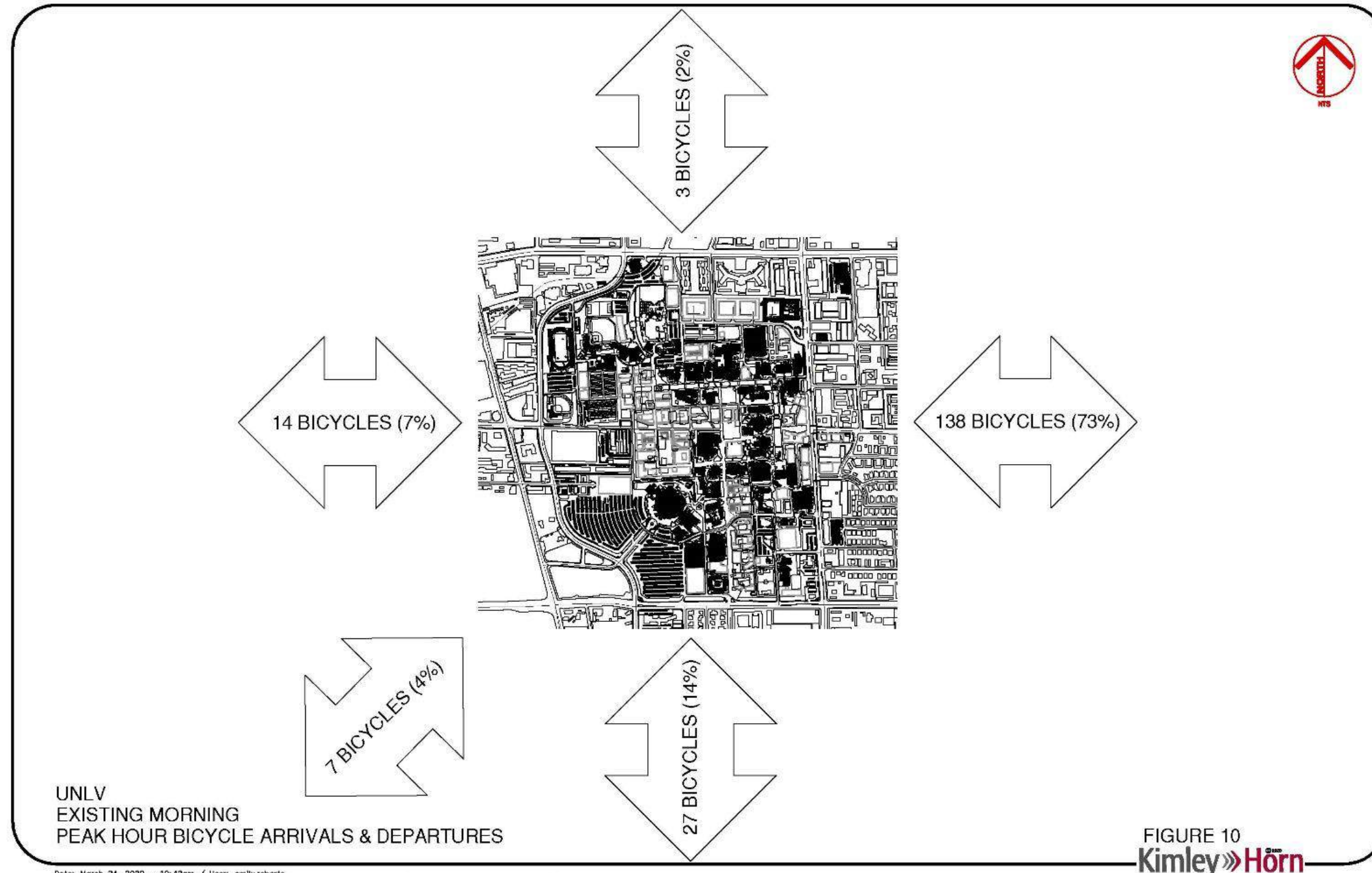
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Figure 30. Peak Hour Vehicle Arrival



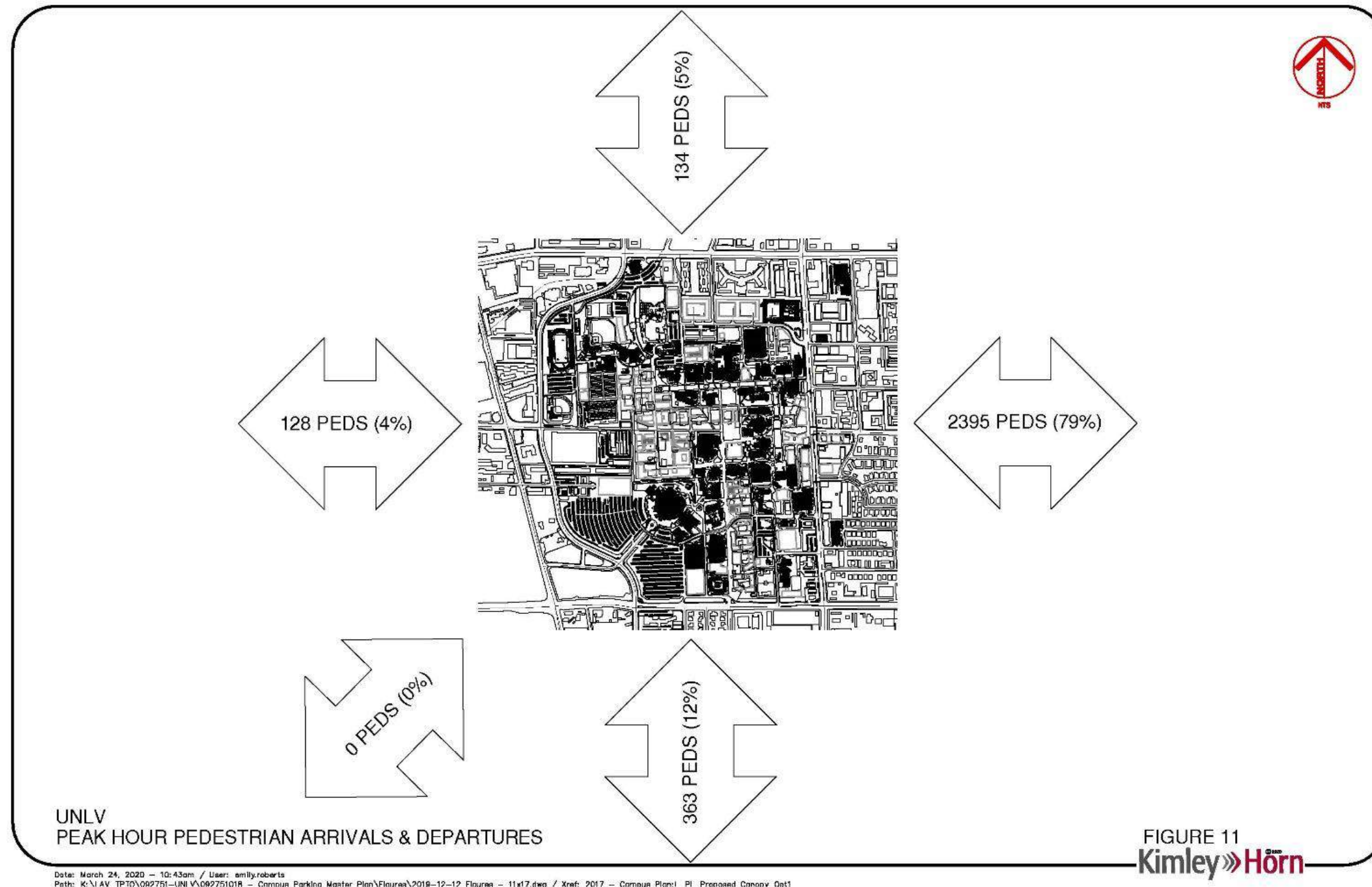
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Figure 31. Peak Hour Bicycle Arrival and Departure



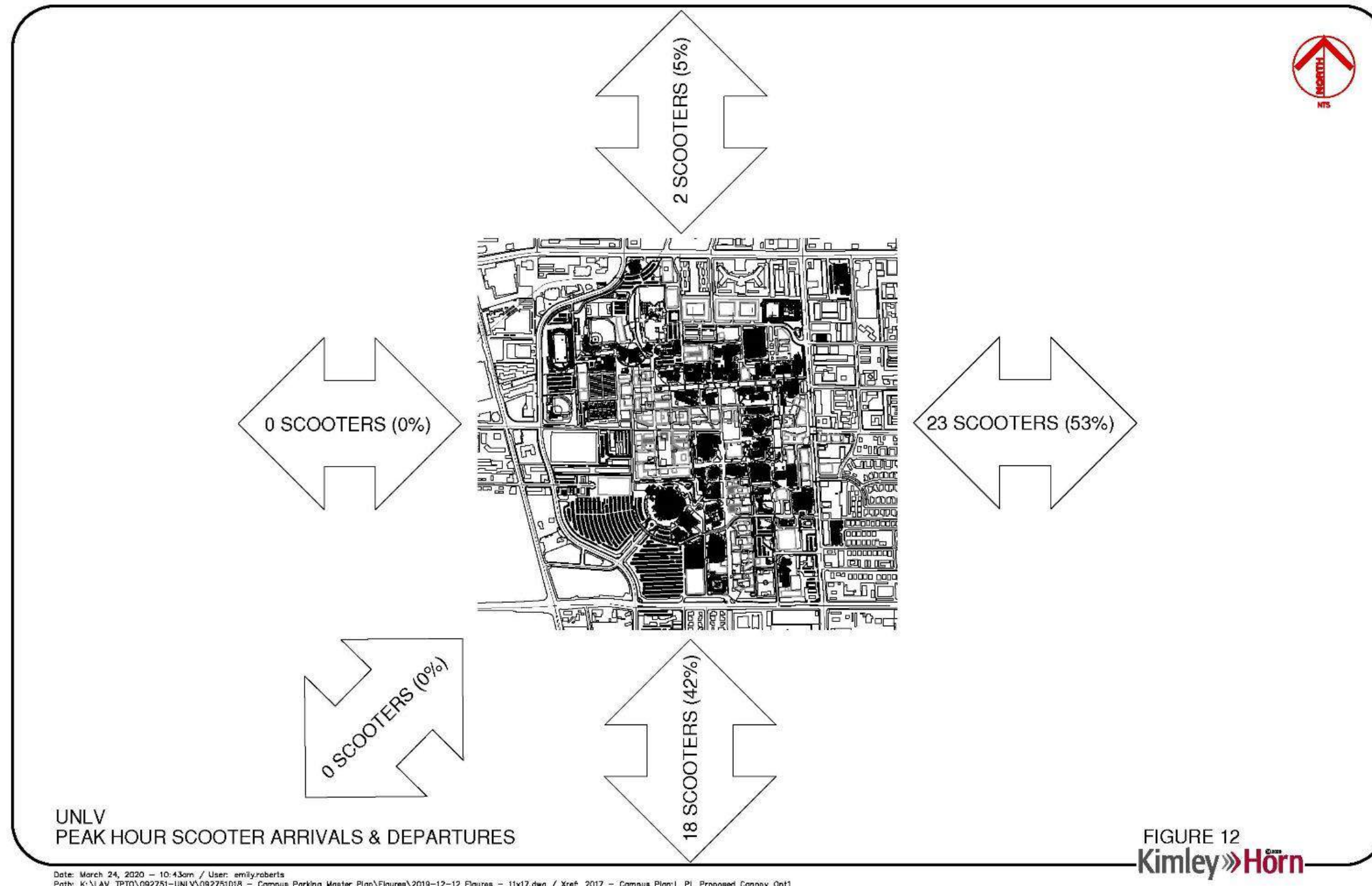
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Figure 32. Peak Hour Pedestrian Arrival and Departure



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Figure 33. Peak Hour Scooter Arrival and Departure



Existing Traffic Departures from Campus

Afternoon peak departures for vehicles leaving the UNLV campus are shown in **Figure 34**. The percentage of vehicles leaving the campus was consistent with the morning arrivals. Unlike the vehicle arrival and departures from the west, the highest percentage of bicycles, pedestrians and scooters was found to be arriving and departing campus to the east along the Maryland Parkway side of the campus.

Future Conditions

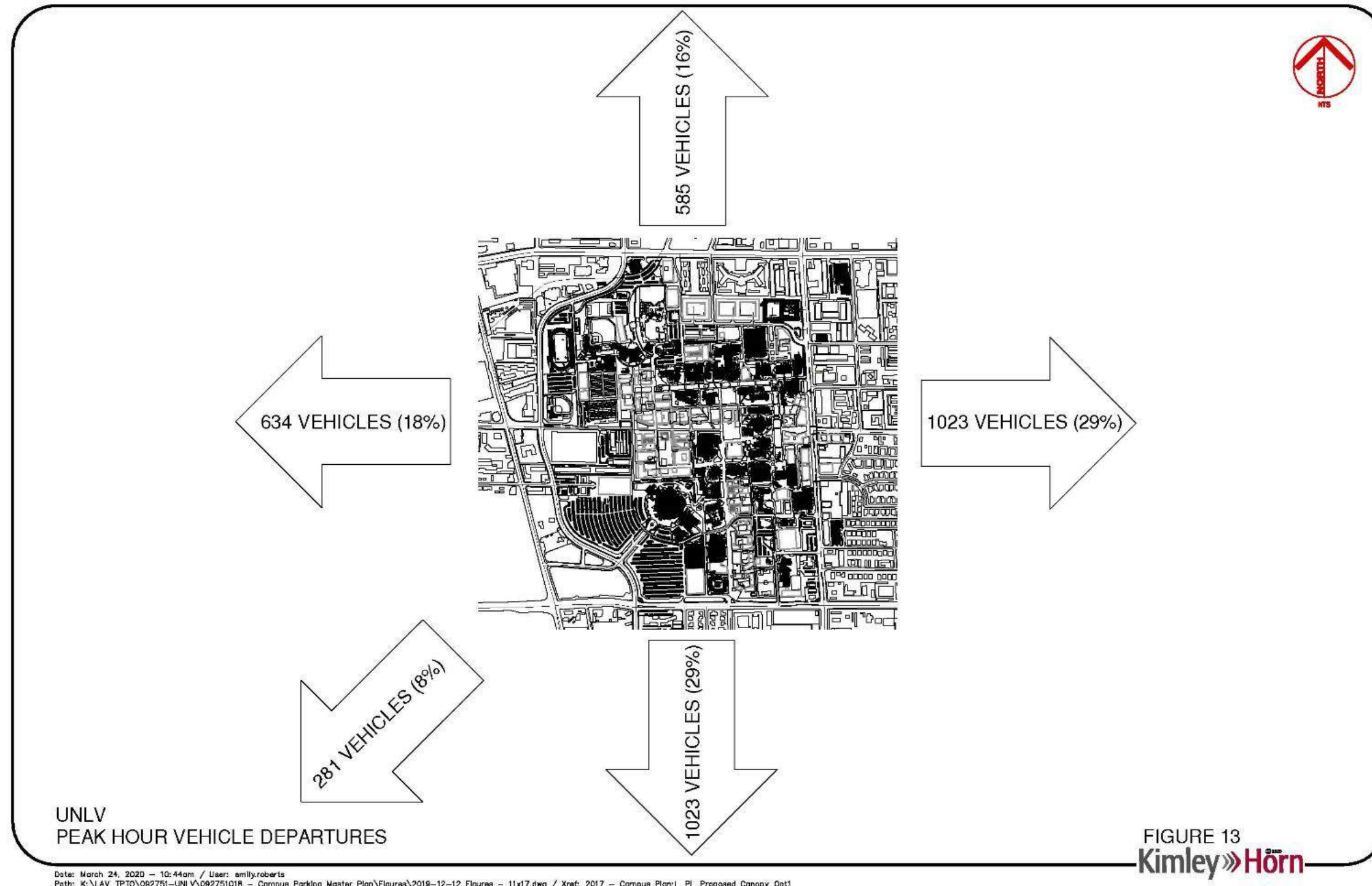
This section of the study details the future traffic conditions expected in the 2030 planning horizon year of the UNLV Master Plan.

Development of Traffic Growth

According to the UNLV 2030 Master Plan, the UNLV student population may grow by approximately 7,000 students, from 31,000 students to 38,000 students, which equates to a 22.6 percent increase between the years of 2020 and 2030. However, traffic volumes being used by Clark County for improvement to the Tropicana Avenue intersections of Paradise Road and University Center Drive are based on 20-year volume projections or a 2040 planning horizon. The 2040 traffic projections for Tropicana Avenue can be found in the County DDI Integration report (**Appendix 3**). To have consistent planning evaluations the 2040 background volumes were used for the analysis of university roadway access and circulation roadways. The County DDI concept option with the UNLV Master Plan is shown in **Figure 35**. The potential Clark County DDI roadway project was evaluated with the UNLV Master Plan to minimize potential impacts to the campus parking and transportation planning. The 2040 background values for the key university intersections are provided in **Figure 36**.

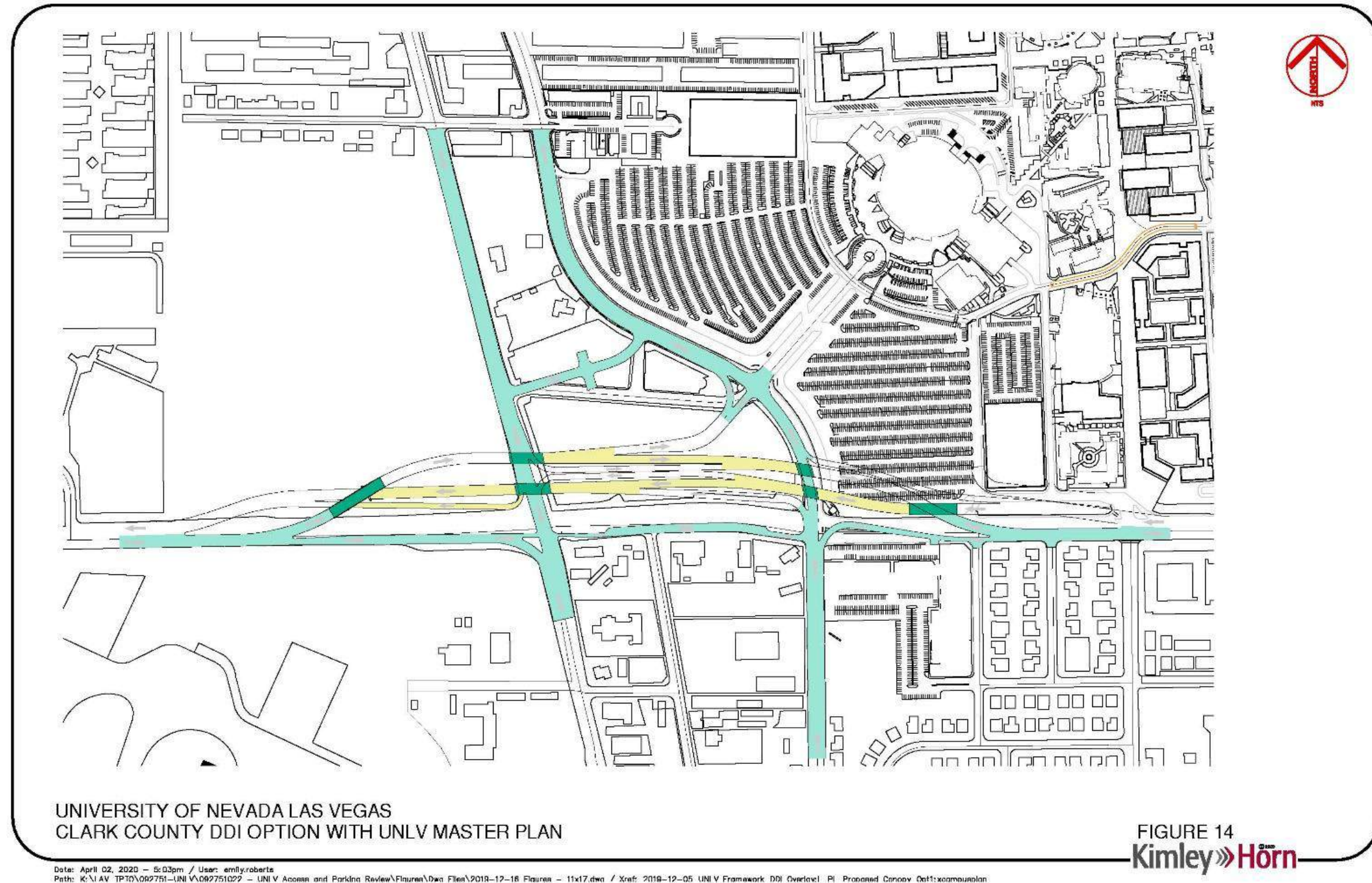
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Figure 34. Peak Hour Vehicle Departure



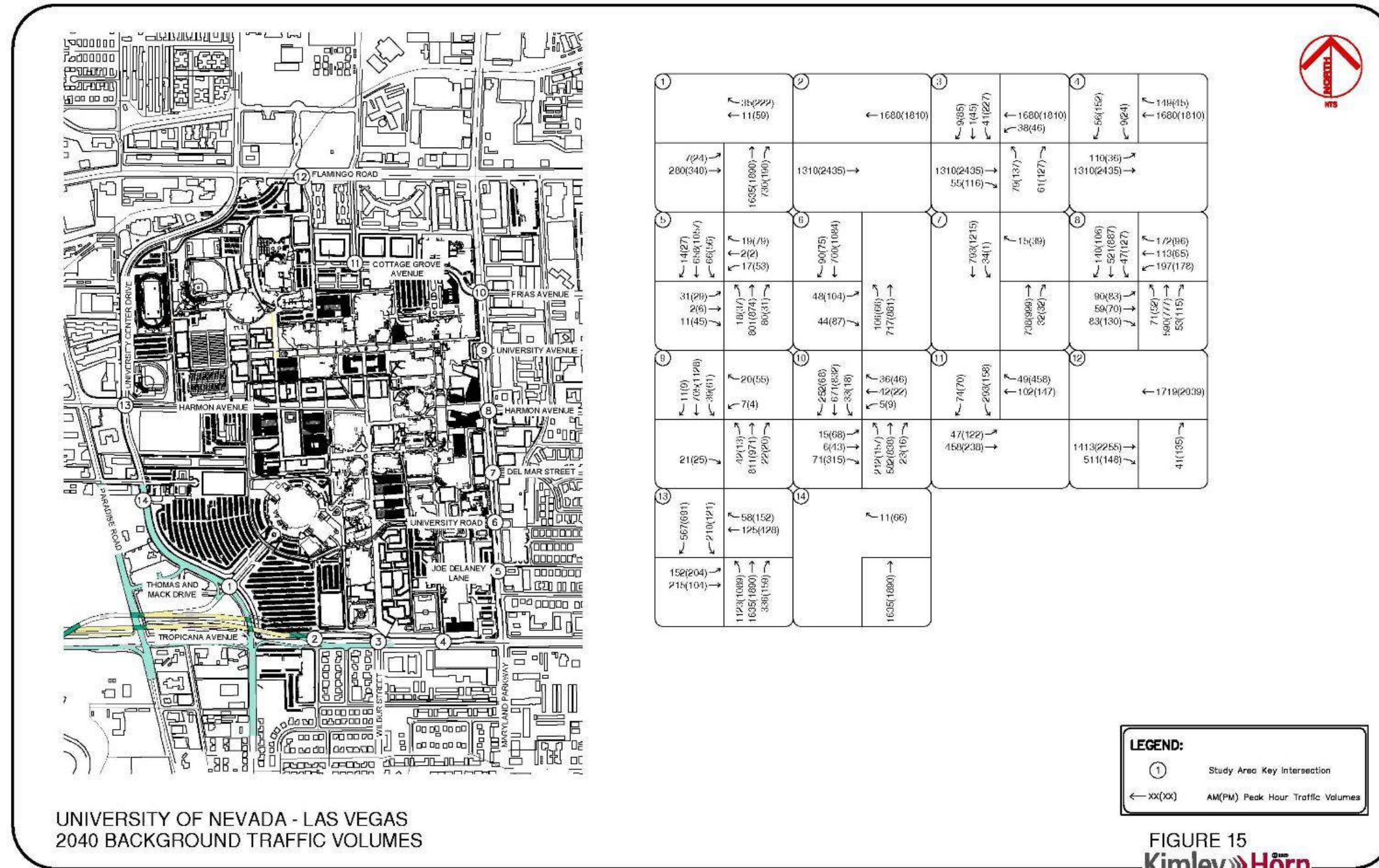
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Figure 35. County DDI Option and UNLV 2030 Master Plan



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Figure 36. 2040 Background Volumes



Date: April 02, 2020 - 5:18pm / User: emilyroberts
 Path: K:\1\AV TPT0\092751-UNI V\09275101R - Campus Parking Master Plan\Flaures\2020-03-24 Flaures - 11x17.dwg / Xref: I PI Proposed Canopy Opt1:2018-12-05 UNLV Framework DDI Overlay

FIGURE 15
Kimley»Horn

As part of the UNLV Master Plan, additional parking facilities are anticipated to be needed to serve increased student populations. UNLV is planning to provide four (4) new parking garages around campus. The anticipated locations of the four (4) future parking garages are shown in **Figure 37**.

Using data obtained from traffic counts conducted at existing parking lots of UNLV as well as the number of total existing parking spaces, an average rate of traffic generated per parking space was determined. The 2040 traffic demands for each proposed garage based upon number of spaces and occupancy was used to estimate future 2040 traffic volumes and the impacts to the future Master Plan street network. The vehicle trip assignments for each proposed parking garage are shown in **Figure 38** through **Figure 41**.

The Tropicana Parking Garage on the south end of the UNLV campus is proposed to be expanded to provide an additional 1,016 parking spaces. The parking garage expansion is projected to have a net of 800 parking spaces upon completion. This proposed parking garage addition will be located directly south of the existing Tropicana Parking Garage and will support the parking needs of the Thomas and Mack Center and the remainder of the UNLV's campus. The Red Lot is to be demolished to construct the expansion of the Tropicana Parking Garage. On a typical day the Red lot has a peak occupancy of 97% of its capacity.

The Transit Center Parking Garage is to be located on the east side of the UNLV campus, directly south of the RTC Transit Center. It is expected to have a net of 800 new parking spaces upon completion. Currently Lot H and Lot U are expected to be demolished in order to construct the Transit Center Parking Garage. These lots currently have a 97% occupancy on a typical day.

The North Parking Garage is expected to be located on the north end of the UNLV campus within existing Lot R. The North Parking Garage is expected to have a net of 400 new parking spaces. It is anticipated to support the growing demand on the north side of the campus and the surrounding athletic fields.

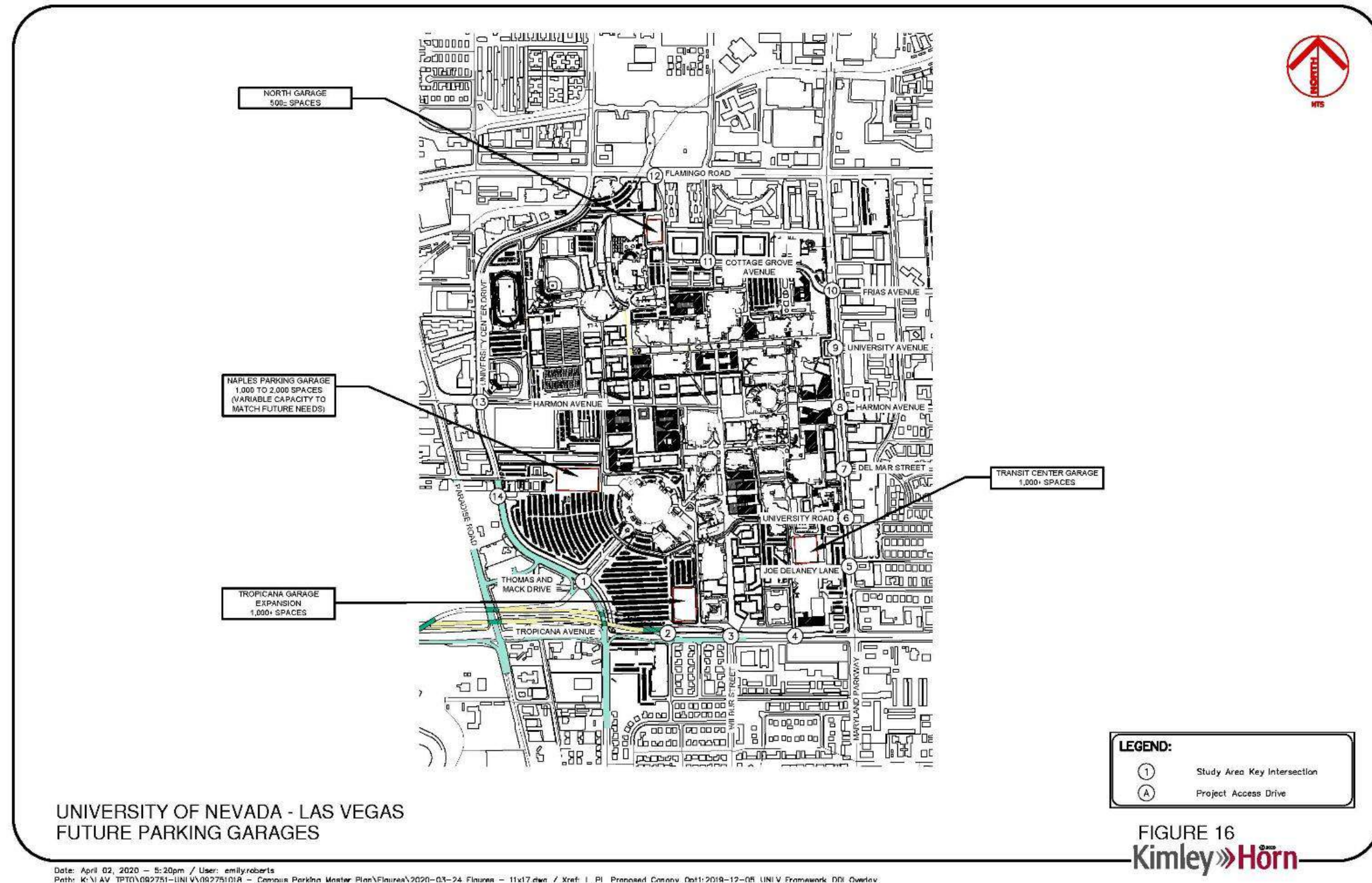
The Naples Parking Garage is to be located on the west side of the UNLV campus and is planned to be constructed on the north end of the White Lot. It is expected to have a net of 800-1,500 new parking spaces upon completion. Currently, the lot where the Naples Parking Garage is to be constructed has typical day occupancy of 51% of its capacity.

A detailed study on the Tropicana Parking Garage Expansion and the Naples Parking Garage in addition to the integration of the County DDI option can be found in **Appendix 3**. A detailed study on the impacts of the Transit Center Garage can be found in **Appendix 4**.

The addition of 2,800 to 3,500 parking spaces is anticipated to adequately meet the parking demands for students in 2030. The number of spaces provided by the proposed Naples Parking Garage is estimated as a range to provide flexibility as parking demands are determined for UNLV in the future.

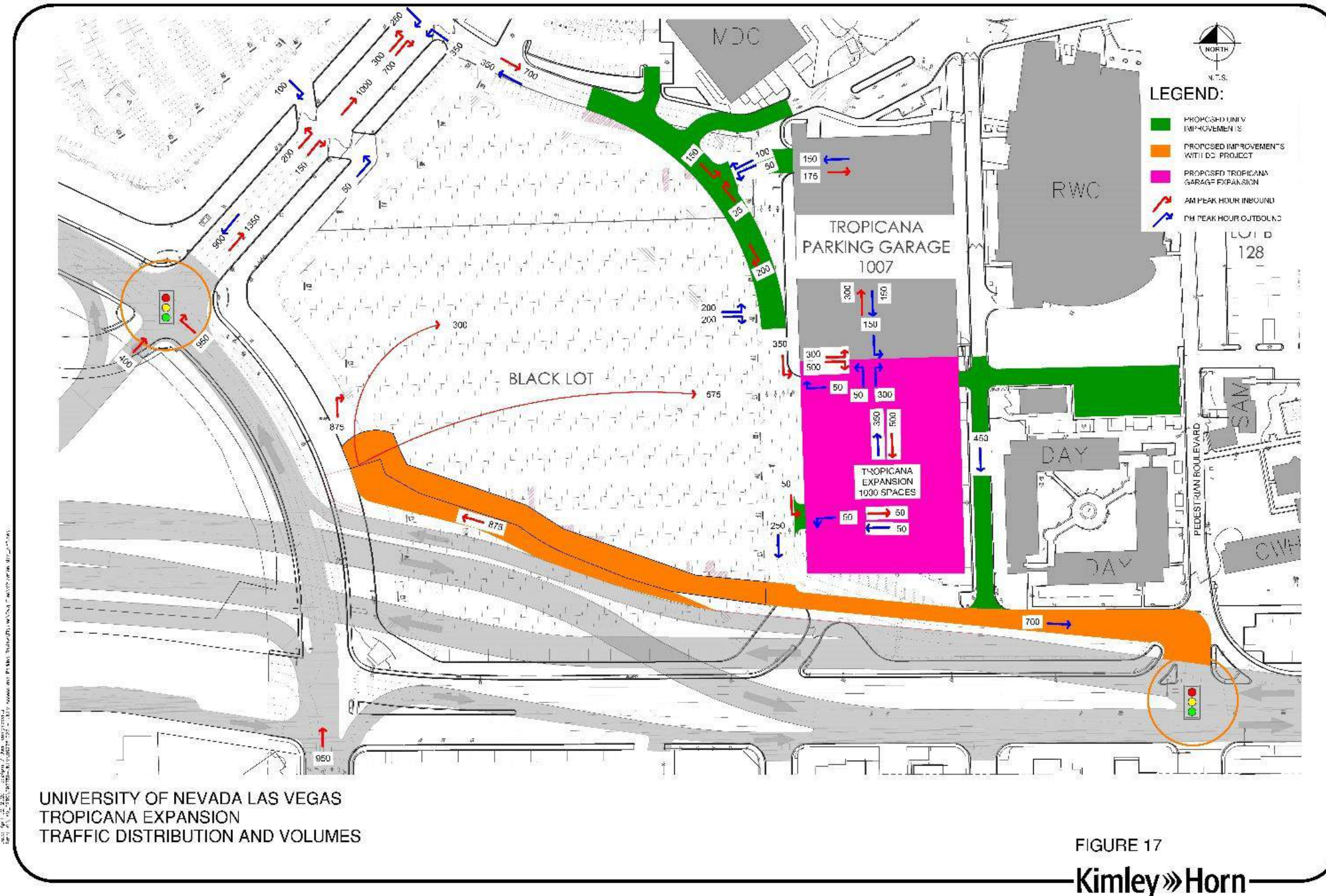
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Figure 37. Future Parking Garages



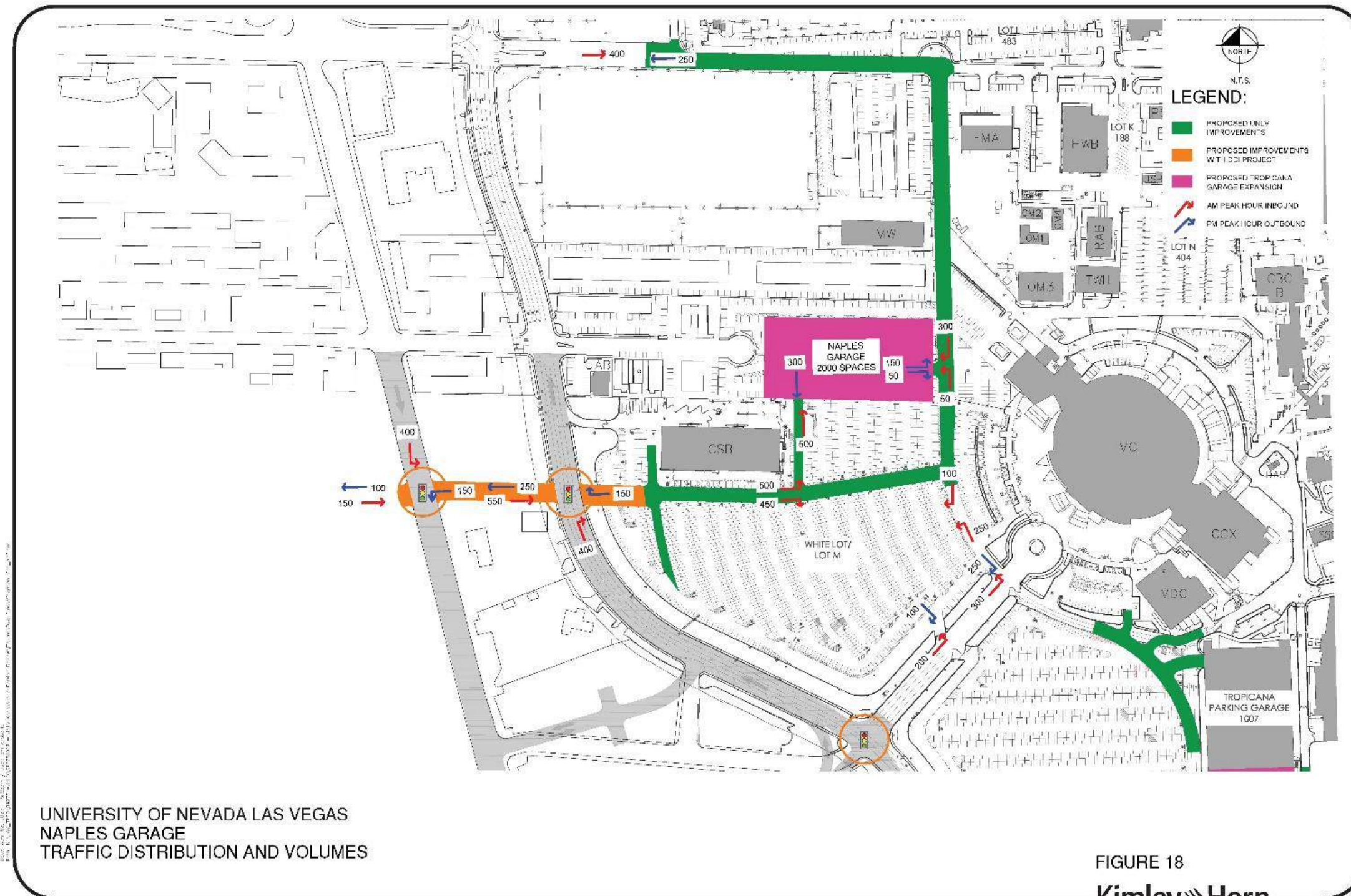
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Figure 38. Tropicana Parking Garage Expansion Trip Assignment



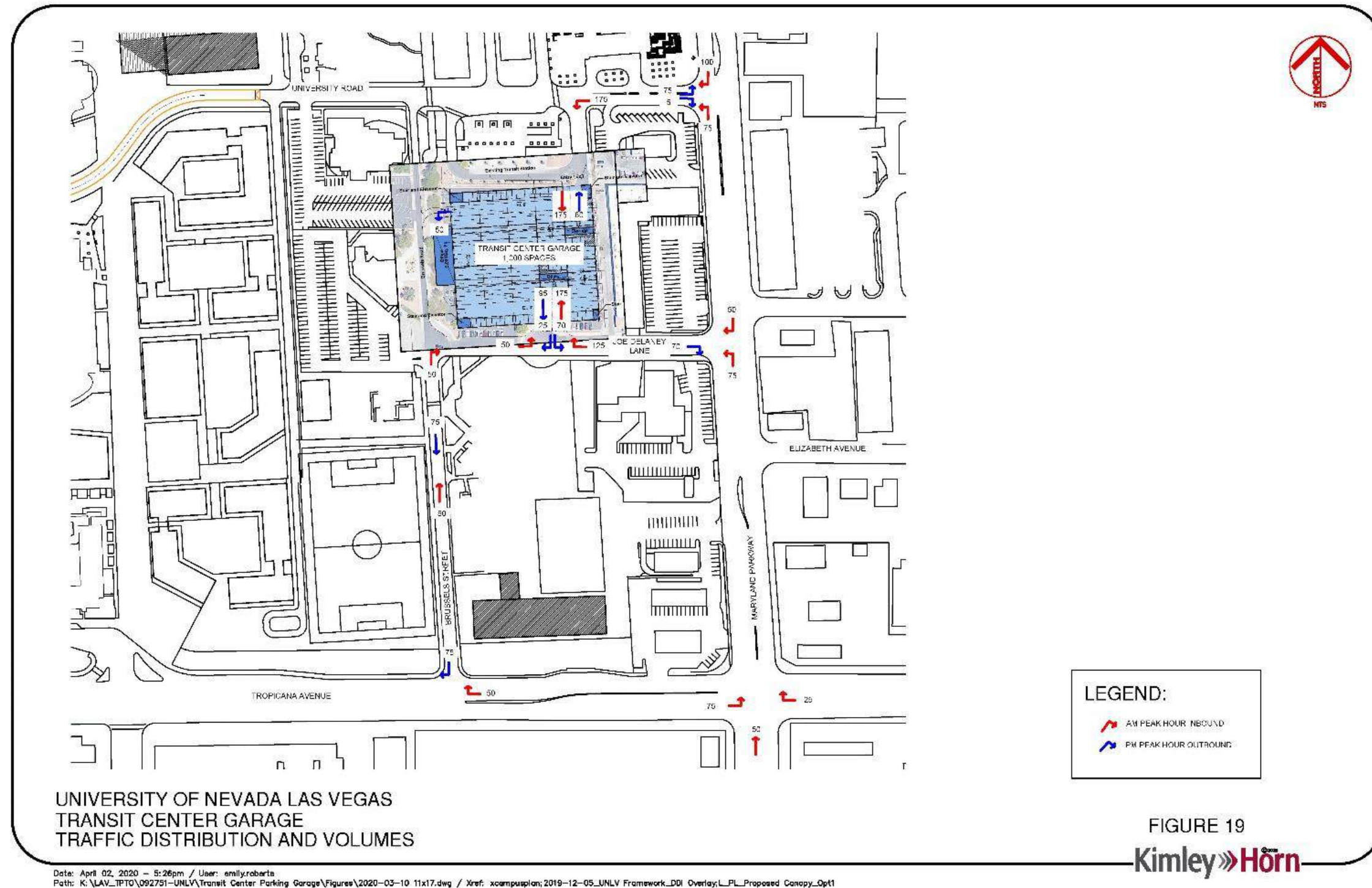
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Figure 39. Naples Parking Garage Trip Assignment



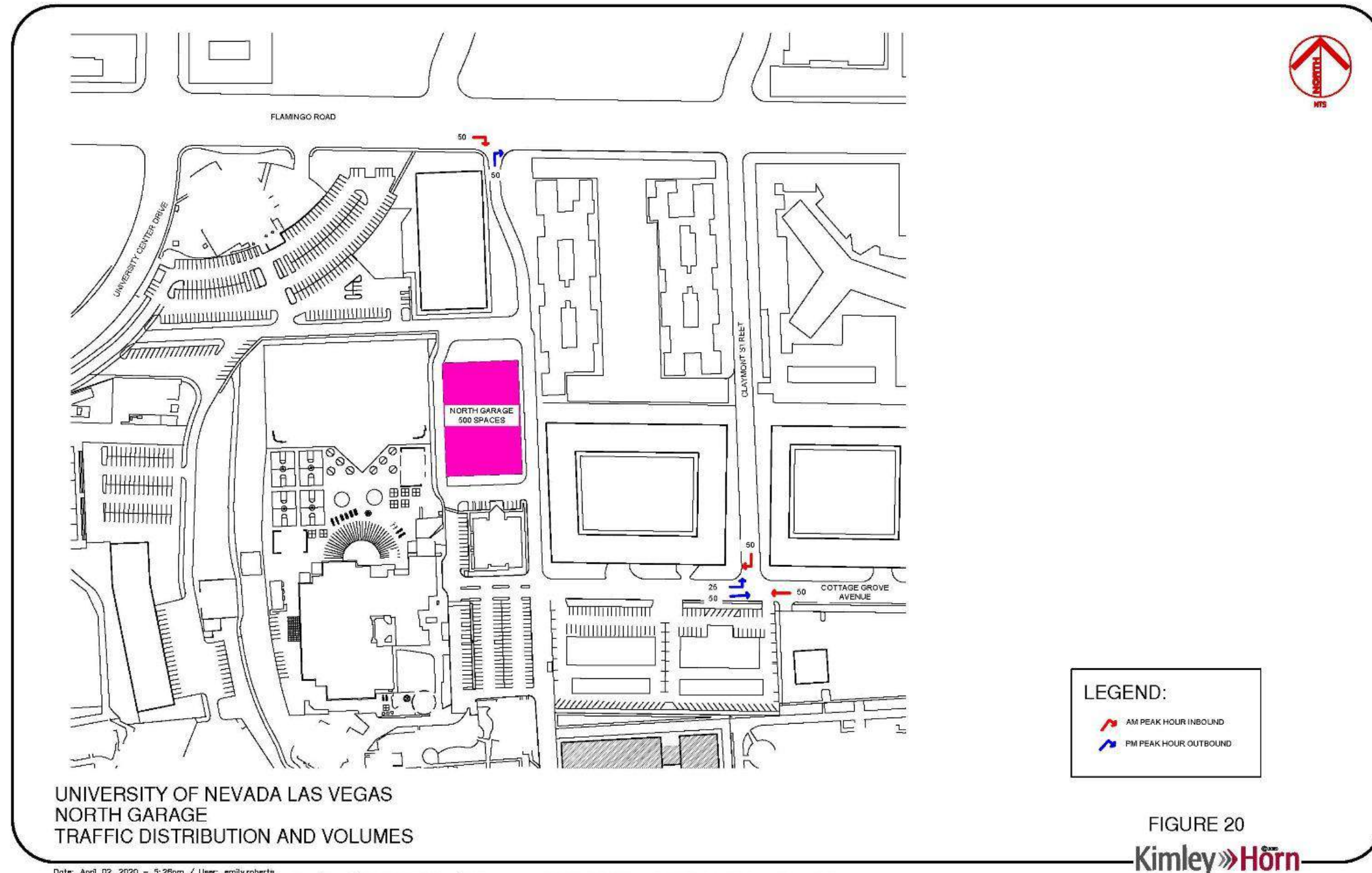
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Figure 40. Transit Center Parking Garage Trip Assignment



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Figure 41. North Parking Garage Trip Assignment



Traffic Operation Analysis

Kimley-Horn’s analysis of traffic operations was conducted to determine potential capacity deficiencies in the 2030 development horizon at the key university intersections. The acknowledged source for determining overall capacity is the *Highway Capacity Manual*.

Analysis Methodology

Study area intersections were analyzed based on average total delay analysis for signalized and unsignalized intersections presented in the Transportation Research Board’s 2016 “Highway Capacity Manual 6th Edition” (HCM 6). Under the unsignalized analysis, the level of service (LOS) for a two-way stop-controlled intersection is determined by the computed or measured control delay and is defined for each minor movement. LOS for a two-way stop-controlled intersection is not defined for the intersection. LOS for a signalized or four-way stop controlled intersection is defined for the intersection. **Table 5** shows the definition of LOS for intersections.

Table 5. Level of Service Definitions

Level of Service	Signalized Intersection Average Total Delay (sec/veh)	Unsignalized Intersection Average Total Delay (sec/veh)
A	≤10	≤10
B	>10 and ≤20	>10 and ≤15
C	>20 and ≤35	>15 and ≤25
D	>35 and ≤55	>25 and ≤35
E	>55 and ≤80	>35 and ≤50
F	>80	>50

Definitions provided from the Highway Capacity Manual 6th Edition, Transportation Research Board, 2016

Synchro 10 Analysis and Optimization Software was used to analyze the study area intersections and driveways for LOS. Synchro is an interactive computer program that enables planners and engineers to: forecast the traffic impacts of new developments; conduct area-wide traffic forecasting studies; test different mitigation measures and compare different traffic scenarios. Synchro 10 utilizes HCM 6 methodology to analyze intersection delay and LOS.

Key Intersection Operational Analysis

Calculations for the LOS at the key university intersections can be found in **Appendix 5**. Existing 2020 analysis is based on the lane geometry shown in **Figure 24**. Using the 2040 Background vehicle volumes shown in **Figure 36** and the Parking Garage Trip Assignments shown in **Figure 38** through **Figure 41**, the 2040 total traffic volumes including student parking demands and new travel patterns due to parking garage construction are shown in **Figure 43**.

Future 2040 Background plus student parking demands is based on the lane geometry shown in **Figure 42**. The LOS analysis for 2020 existing traffic can be found in **Table 6** and is summarized graphically in **Figure 44** and **Figure 45**.

The 2040 background traffic plus student parking demands is based on the anticipated UNLV growth and the addition of four (4) parking garages on campus. The LOS for each intersection can be found in **Table 6** and is summarized in **Figure 46** and **Figure 47** Due to 2040 volumes being used, LOS values calculated are conservative for the 2030 planning year and are expected to address long term growth needs of the UNLV campus.

Table 6. Existing Level of Service Calculations

Scenario	Existing				Background Plus Parking Demands			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS
University Center Drive/Thomas and Mack Drive UNSIGNALIZED – TWO-WAY STOP								
Eastbound Left/Through	326.2	F	428.3	F	-	-	-	-
Westbound Through	55.5	F	121.3	F	-	-	-	-
Westbound Right	13.9	B	19.8	C	-	-	-	-
SIGNALIZED (Future with DDI)	-	-	-	-	18.5	B	29.9	C
SIGNALIZED (Future without DDI)	-	-	-	-	13.2	B	29.2	C
Tropicana Avenue/Black Lot Exit Only UNSIGNALIZED – ONE-WAY STOP								
Southbound Right	22.2	C	43.3	F	-	-	-	-
Tropicana Avenue/Wilbur Street SIGNALIZED TWO WAY STREET	8.4	A	31.3	C	13.2	B	57.9	E
SIGNALIZED ONE WAY EASTBOUND	-	-	-	-	25.3	C	33.3	C
Tropicana Avenue/Brussels Street UNSIGNALIZED – ONE-WAY STOP								
Southbound Left/Right	27.8	D	43	E	-	-	-	-
Eastbound Left	21.2	C	34.4	D	-	-	-	-
Future – Southbound Right Only	-	-	-	-	32.3	D	223.7	F
Maryland Parkway/Joe Delaney Lane UNSIGNALIZED – TWO-WAY STOP								
Northbound Left	11.6	B	16.2	C	14.1	B	17.9	C
Eastbound Left	18.7	C	33.4	D	32.8	D	41.3	E
Eastbound Right	11.5	B	14.7	B	12.1	B	18.8	C

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Maryland Parkway/University Road SIGNALIZED	3.7	A	4.9	A	3.9	A	5.6	A
Maryland Parkway/Del Mar Street UNSIGNALIZED – ONE-WAY STOP								
Southbound Left	12.6	B	14.4	B	13.9	B	16.6	C
Westbound Right	12	B	14.1	B	12.8	B	15.7	C
Maryland Parkway/Harmon Avenue SIGNALIZED	20.7	C	20.2	C	20.9	C	20.4	C
Maryland Parkway/University Avenue UNSIGNALIZED – ONE-WAY STOP								
Southbound Left	13.3	B	15.7	C	14.8	B	18.7	C
Westbound Left	21	C	32.1	D	26.8	D	43	E
Westbound Right	12.5	B	14.2	B	13.3	B	15.8	C
Maryland Parkway/Cottage Grove Avenue SIGNALIZED	7.6	A	18.7	B	7.7	A	20.4	C
Cottage Grove Avenue/Claymont Street UNSIGNALIZED – ONE-WAY STOP								
Southbound Left	22.3	C	17.1	C	-	-	-	-
Southbound Right	9	A	9.2	A	-	-	-	-
Eastbound Left	7.6	A	8.9	A	-	-	-	-
ALL-WAY STOP*	-	-	-	-	34.7	D	23.9	C
Flamingo Road/Lot R Access Road UNSIGNALIZED – TWO-WAY STOP								
Northbound Right	18.9	C	92.6	F	19.4	C	264.5	F
University Center Drive/Harmon Avenue SIGNALIZED	32.5	C	56.1	E	29	C	61.3	E
University Center Drive/White Lot Exit Only UNSIGNALIZED – ONE-WAY STOP								
Westbound Right	27.3	D	37	E	-	-	-	-
University Center Drive/Tompkins Avenue SIGNALIZED	-	-	-	-	21.8	C	15.9	B
Paradise Road/Tompkins Avenue SIGNALIZED	-	-	-	-	23.5	C	0.1	A

* A Level of Service F condition was identified for the future traffic conditions with the construction of the North Garage at Claymont/Cottage Grove intersection. An All-Way Stop was identified as a potential mitigation measure for the future traffic volumes at the intersection. Prior to the installation of the All-Way Stop, the future traffic conditions will need to be studied for vehicle queueing at the intersection with or without the installation of stop signs along Cottage Grove. A traffic engineering study documenting the roadway operations will need to be prepared and accepted by Clark County prior to any changes to the existing stop control conditions.

As shown in Table 6 and summarized in Figure 44 through Figure 45, all existing signalized and unsignalized intersections currently operate with acceptable level of service during the 2020 existing weekday morning and afternoon peak hours except for:

- University Center Drive and Thomas and Mack Drive Eastbound and Westbound Movements
- Tropicana Avenue and Brussels Street Southbound Movements
- Flamingo Road and Lot R Access Road Northbound Movements
- University Center Drive and Harmon Avenue

Low levels of service are due to egressing right-out turning movements conflicting with high through traffic demands on main roadway. LOS does not reflect signal progression gaps created in the through traffic flow.

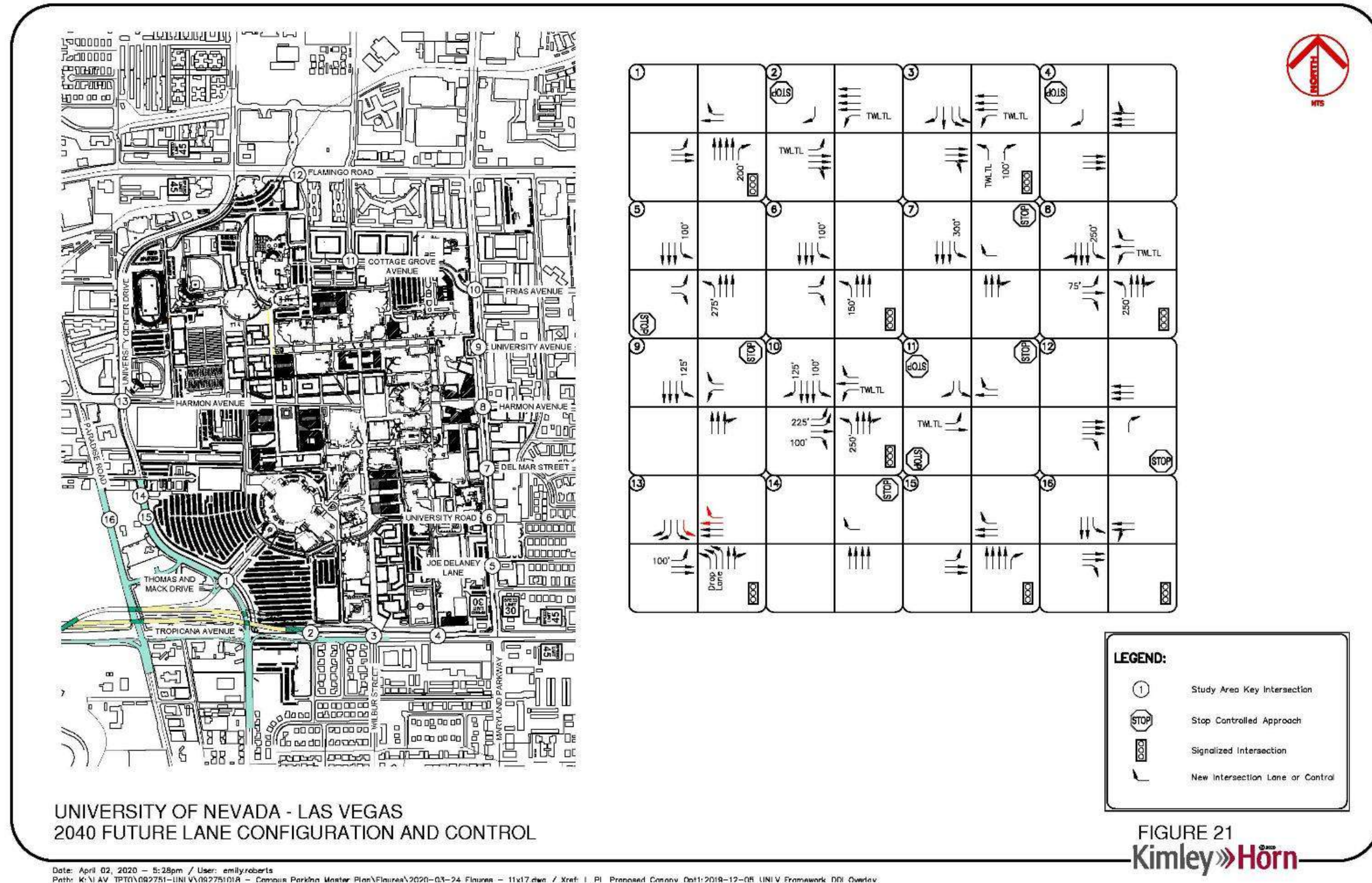
Based on the analysis performed using 2040 traffic volumes consistent with the County DDI option the following was determined:

- With County DDI
 - Provides acceptable LOS to the surrounding street network
 - Evaluated plan provides adequate circulation to the UNLV Campus with the circulation roadway improvements identified in the DDI Report in Appendix 3.
 - Install All-Way stop control at the unsignalized intersection of Claymont Street and Cottage Grove Avenue with an engineering justification study. All-Way stop control intersection expected to operate at LOS D.
- Without DDI
 - Acceptable LOS would be expected for the surrounding street network and the university campus circulation roadways with signalized intersections at University Center Drive and Thomas and Mack and a two-way Wilbur Street and Tropicana Avenue. A two-Way Wilbur Street intersection would operate at LOS E and a Thomas and Mack signalized intersection would operate at LOS C.
 - Install All-Way stop control at the unsignalized intersection of Claymont Street and Cottage Grove Avenue with an engineering justification study. All-Way stop control intersection expected to operate at LOS D.

The DDI concept is only a roadway improvement project that is being explored for possible funding and implementation. In the event that the grade separated DDI concept moves forward by the County for construction, this Campus Parking and Transportation Plan has taken into account how the access circulation can be integrated with the County concept plan with minimal UNLV on-site improvements.

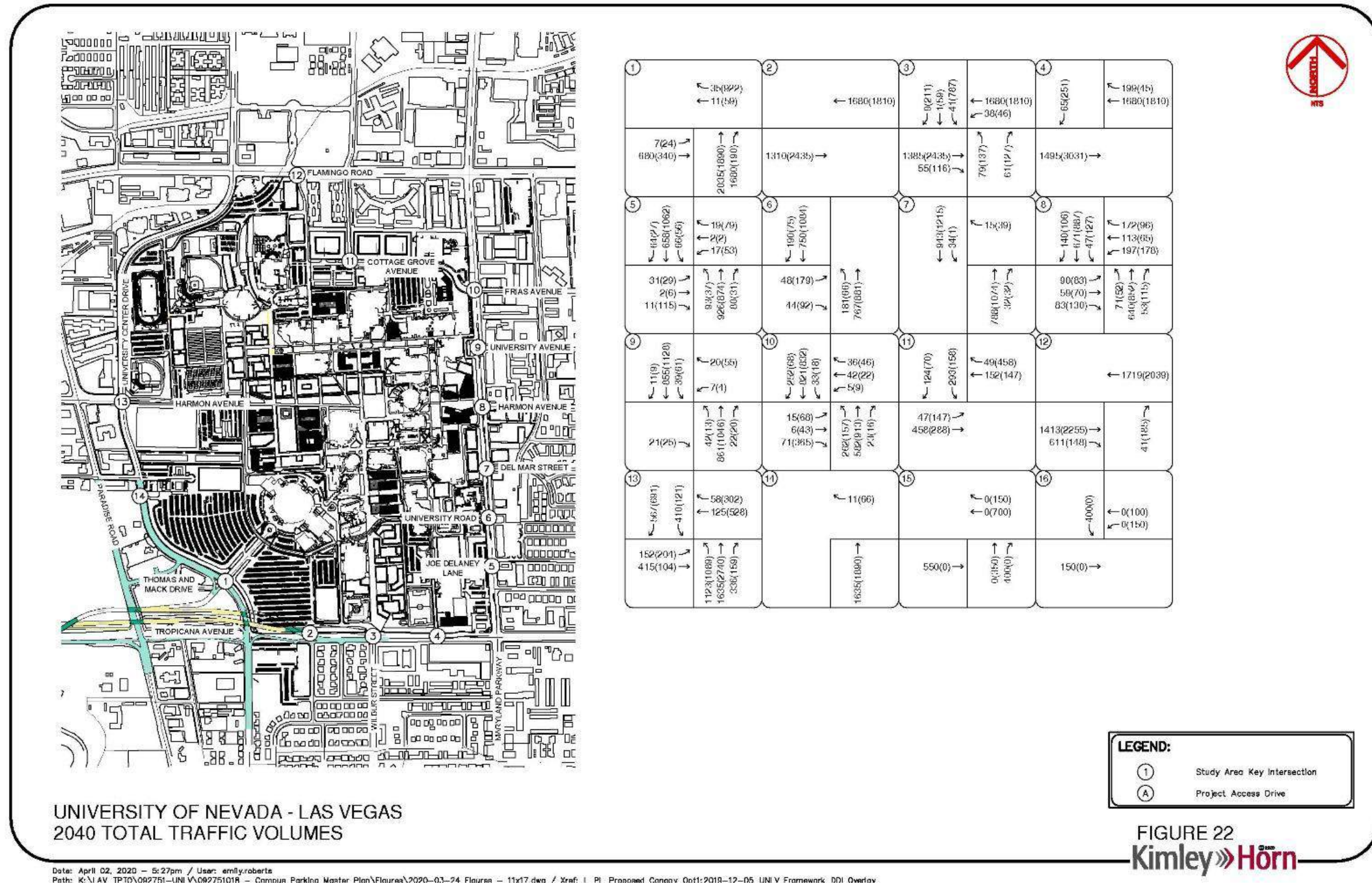
Traffic Operations Analysis and Campus Cordon Study

Figure 42. Future Lane Configuration and Control



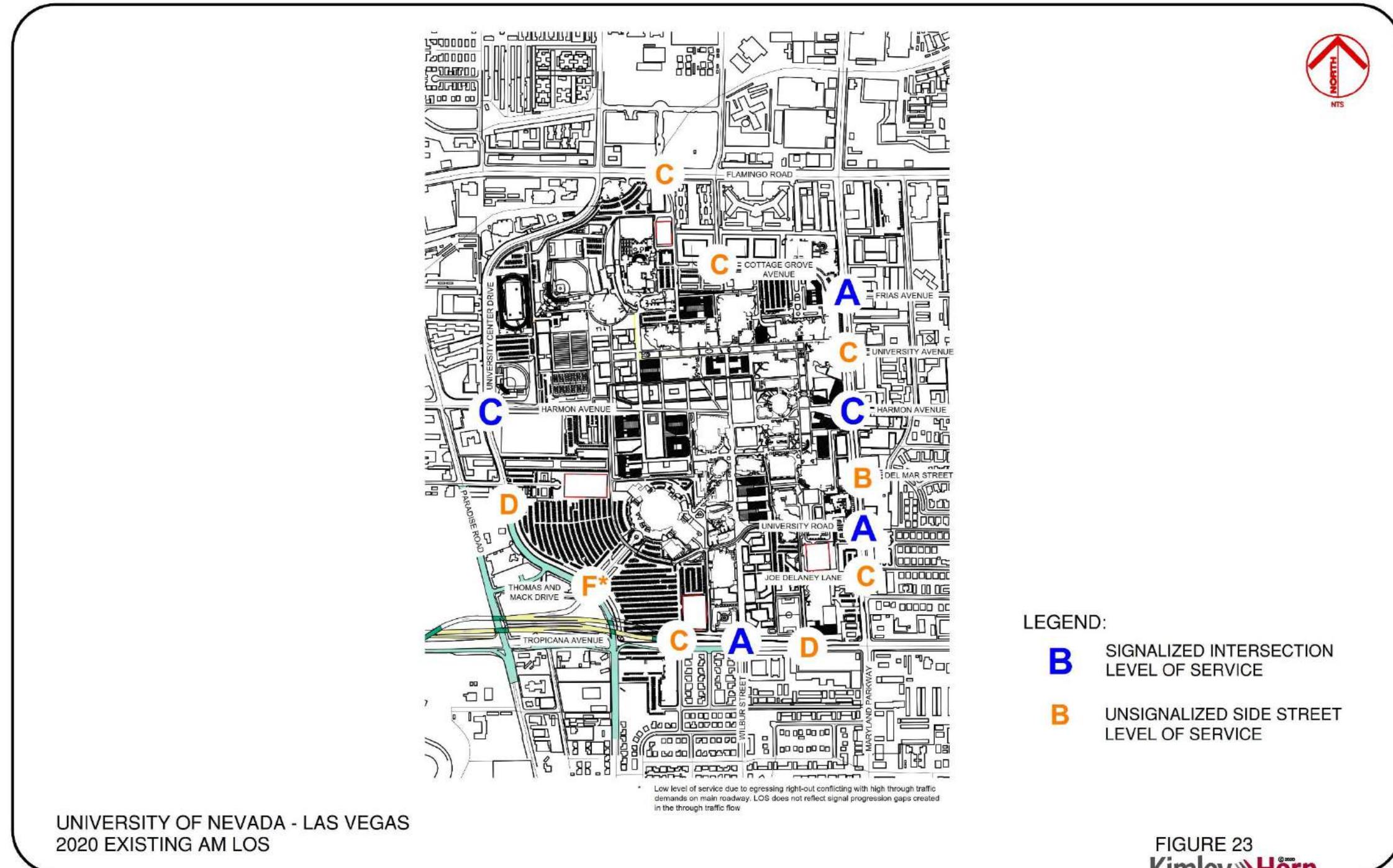
Traffic Operations Analysis and Campus Cordon Study

Figure 43. 2040 Total Volumes



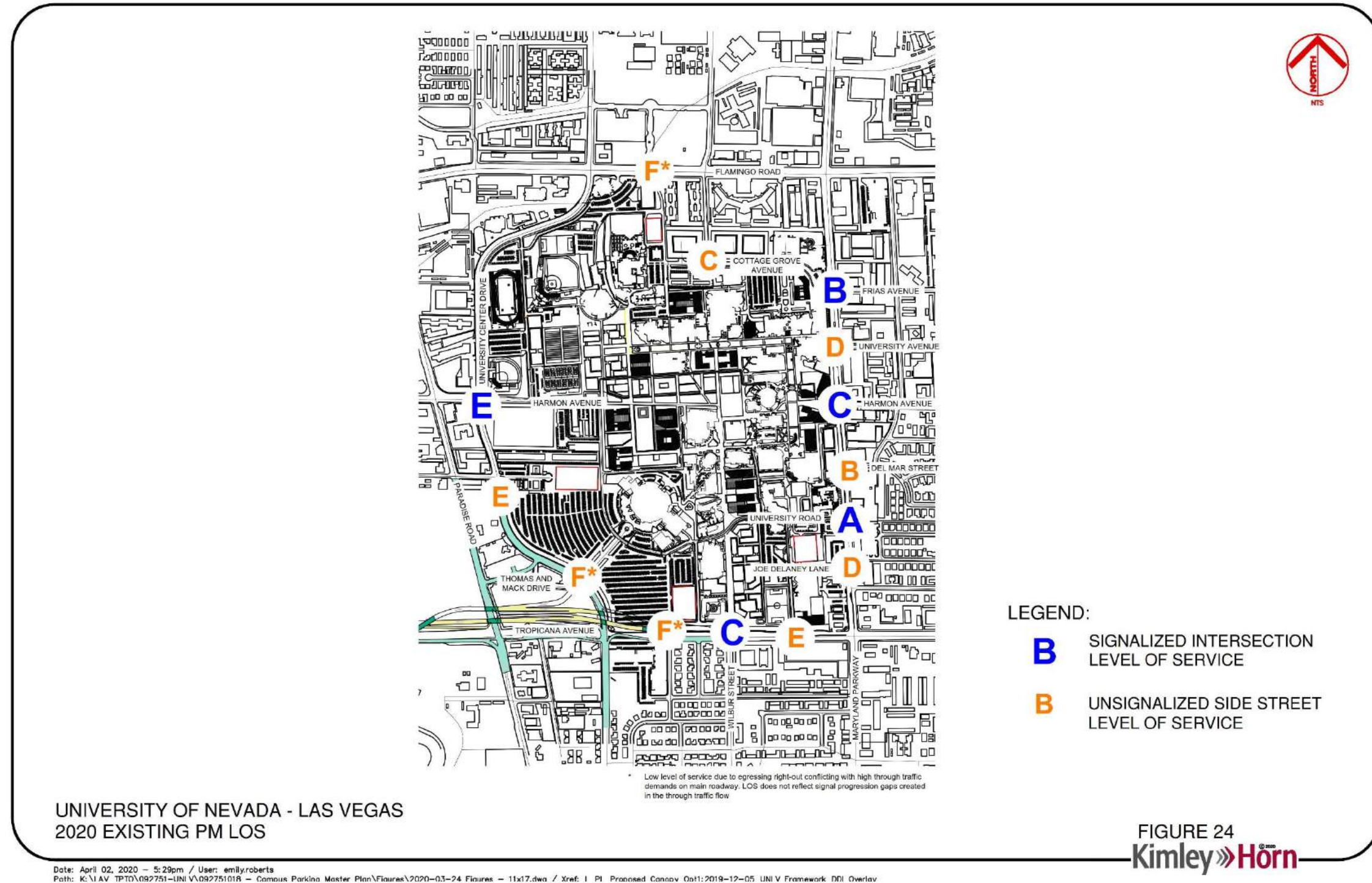
Traffic Operations Analysis and Campus Cordon Study

Figure 44. 2020 Existing Morning Level of Service



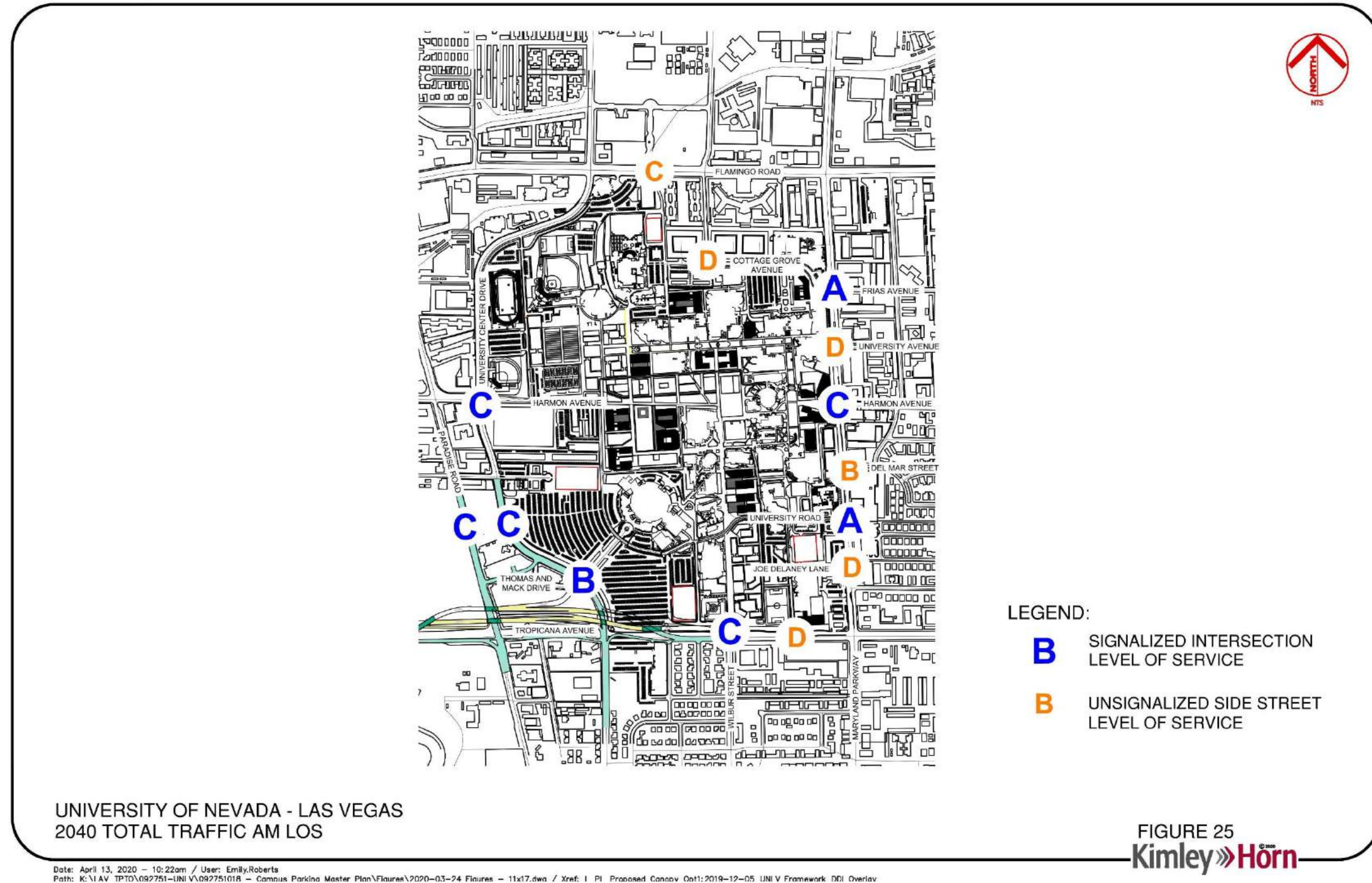
Traffic Operations Analysis and Campus Cordon Study

Figure 45. 2020 Existing Afternoon Level of Service



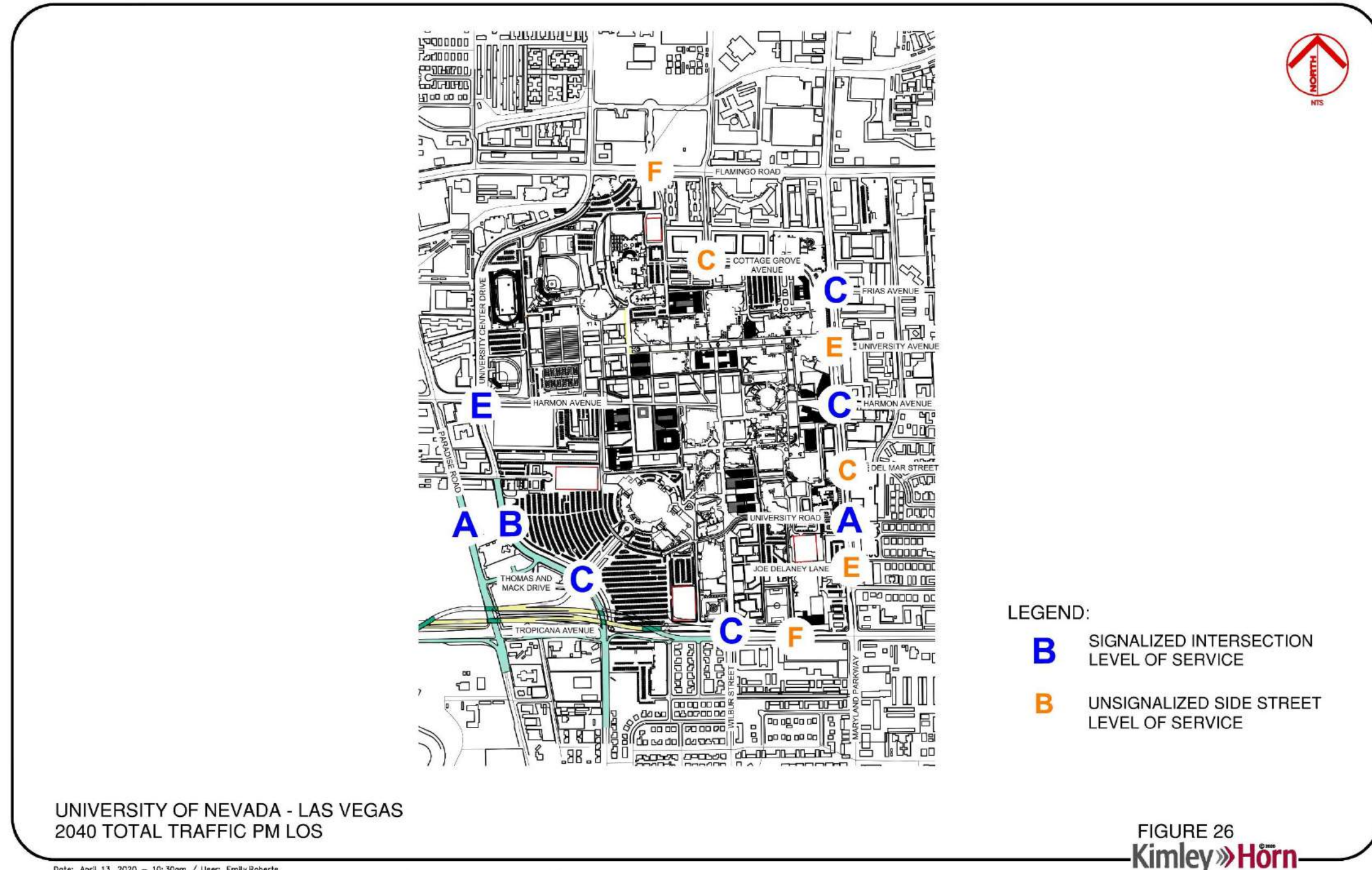
Traffic Operations Analysis and Campus Cordon Study

Figure 46. 2040 Total Morning Traffic Level of Service



Traffic Operations Analysis and Campus Cordon Study

Figure 47. 2040 Total Afternoon Level of Service



VII. Community Engagement



VII. Community Engagement

Campus Community Parking and Transportation Survey Overview

A 25-question online survey was available from November 2019 through January 2020 to gather feedback and priorities from the campus community. 3,402 individuals completed the survey including 2,178 students¹ (undergraduate and graduate) and 1,224 faculty/staff. The following section summarizes the findings and key observations from the survey.

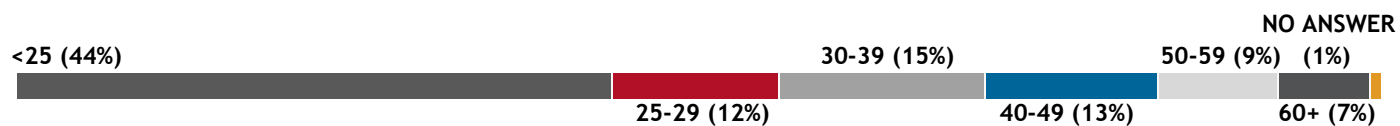
Demographics

Figure 48. Gender Identity

Gender Identity



Age



Affiliation²

Results

Commute

Using a trip diary format, students and faculty/staff were asked to identify their mode of travel during the most recent week (or a recent representative week). By allowing everyone to select a mode of travel for up to seven (7) days, a more refined mode split number can be developed that is more representative of actual travel patterns compared to asking about a “typical” mode of travel.

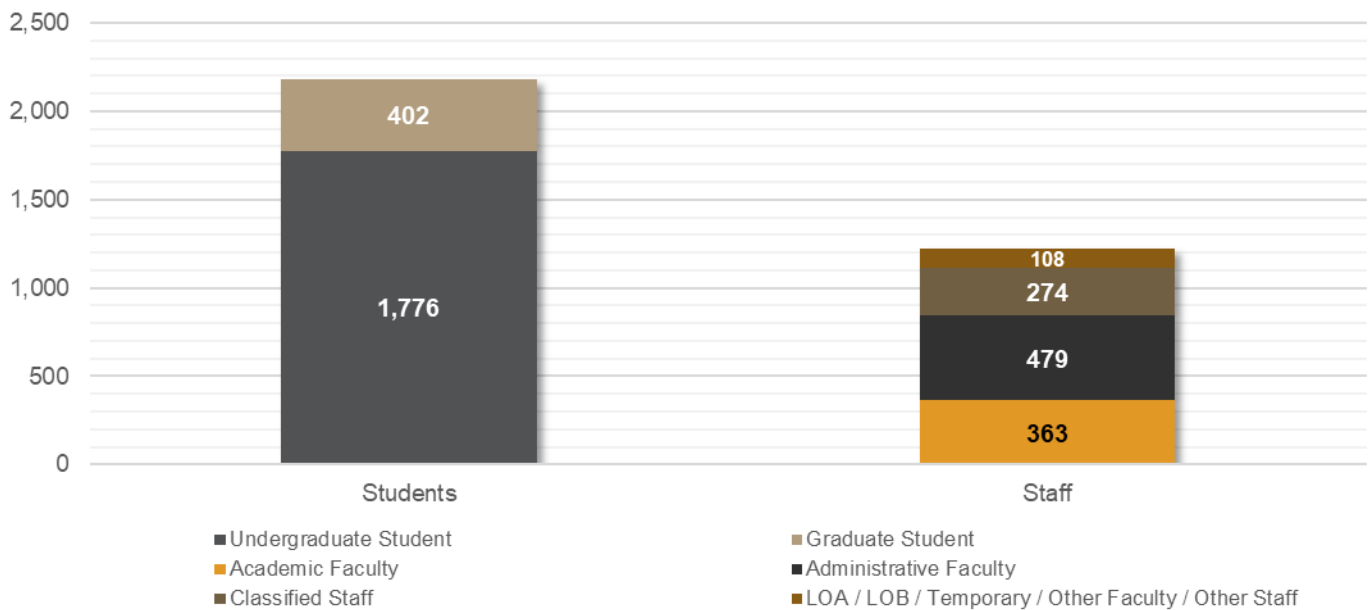
Based on a sample size of 13,867³ total reported weekday trips to campus, 93.0% of weekday trips to campus are drive alone trips (93.4% for students, 92.4% for faculty/staff). The next most common type of travel to campus is by carpool with 5.6% of weekday trips. Combined, these results indicate that approximately 99% of weekday trips to campus are made by private automobile (either alone or with others).

The drive alone rate is slightly higher on weekends, accounting for 94.5% of weekend trips (95.6% for students, 92.2% for faculty/staff)⁴.

Current utilization of alternative modes, including bus, bike, and walking, is very limited, with none of these mode accounting for more than 1% of trips to campus.

Among those who carpool or vanpool, approximately 90% commute with one (1) other person. Only 10% of carpool trips are made in vehicles with three (3) or more people.

Figure 49. Respondent Classification



¹ Students who also indicated they were employed by UNLV were classified as students.

² If multiple selections were made, the first selection is shown in the chart.

³ Trips exclude “telecommute / work from home / online class”, “not Applicable / did not travel / regular day off / no class,” as well as blank responses; includes 8,336 trips reported by students and 5,531 trips reported by faculty/staff.

⁴ Sample size of 796 trips, including 527 trips reported by students and 269 trips reported by faculty/staff.

Figure 50. Weekday Commute Results

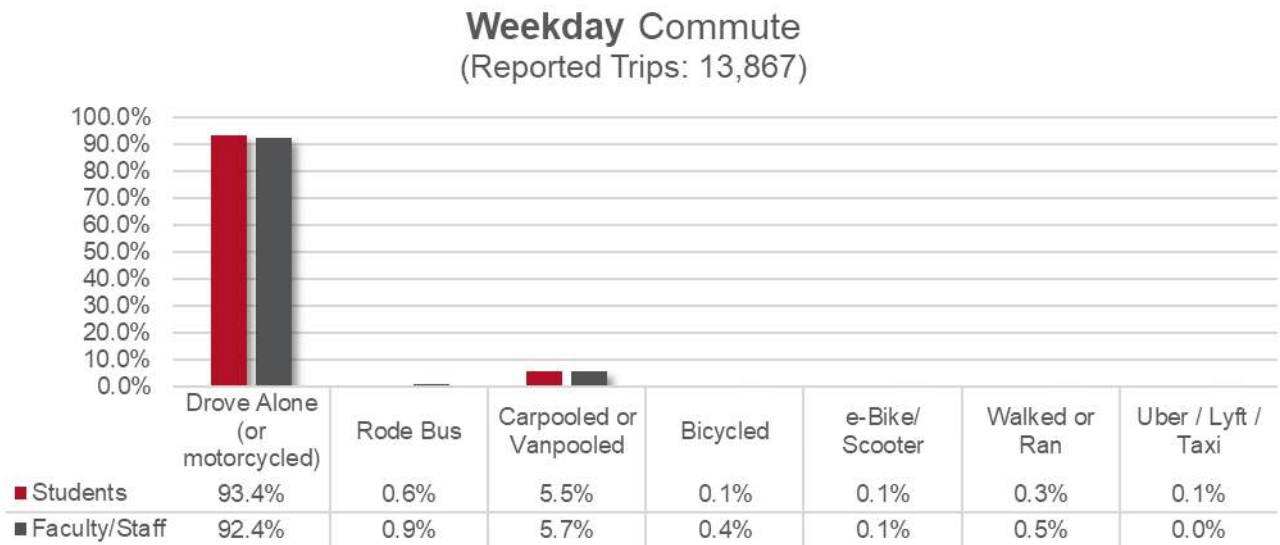


Figure 51. Weekend Commute Results

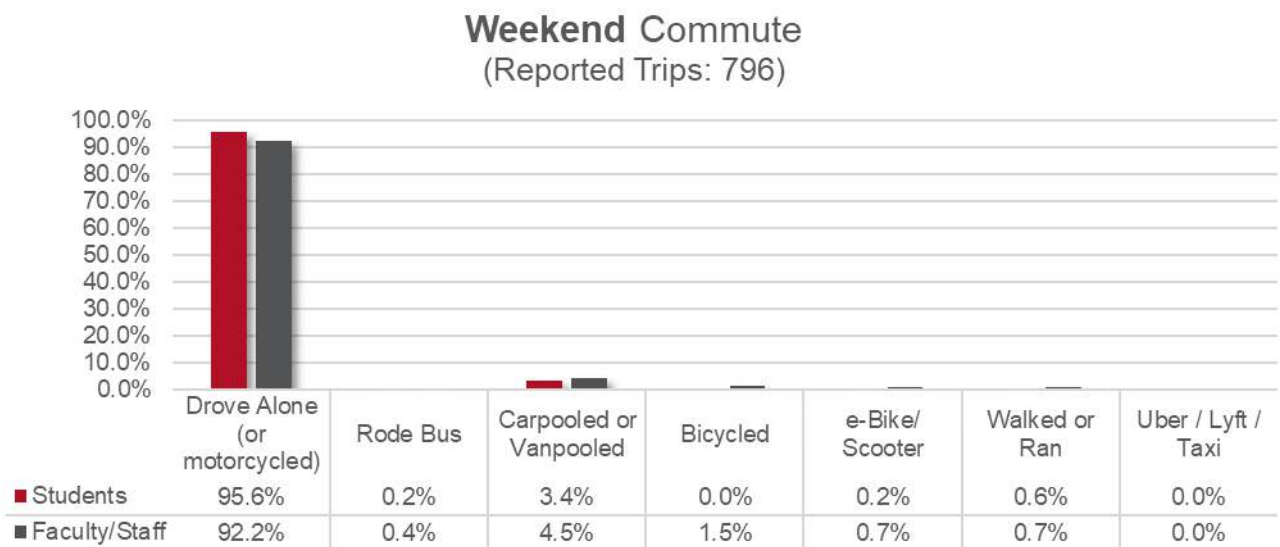
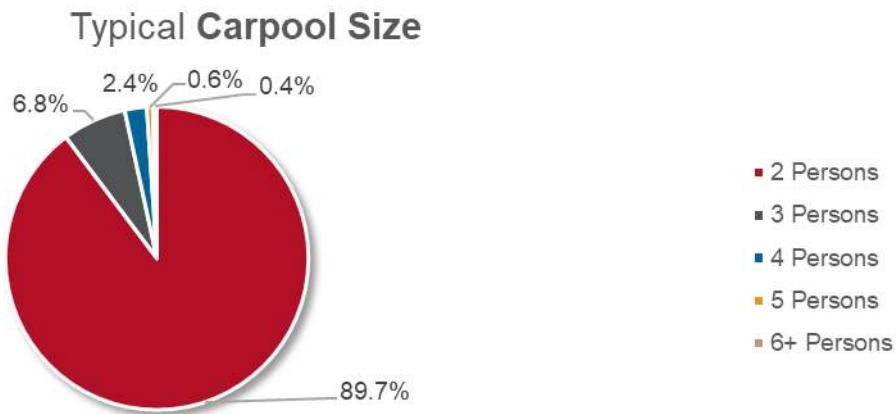


Figure 52. Typical Carpool Size



Arrival/Departure Times

As part of the trip diary questions, respondents were also asked to identify the time of their first arrival on and last departure from campus each day. Using this information, the following charts show campus “occupancy” by hour based on data provided by the 3,402 survey respondents.

Monday through Thursday show consistent patterns, with the period of highest campus occupancy occurring between the hours of 11:00 AM and 1:00 PM. Tuesday is shown as a representative midweek day; with approximately 2,470 survey respondents (out of 3,402) on campus at 1:00 PM on Tuesday (73%), Tuesday was the highest demand midweek day.

The number of students on campus is markedly lower on Fridays, with fewer than 55% of survey respondents reporting being on campus during the midday peak period on Friday.

Weekend peak occupancies did not exceed 10% of survey respondents; with very limited Sunday demand, Saturday is shown as a representative weekend day.

Figure 53. Tuesday Arrival/Departure Times

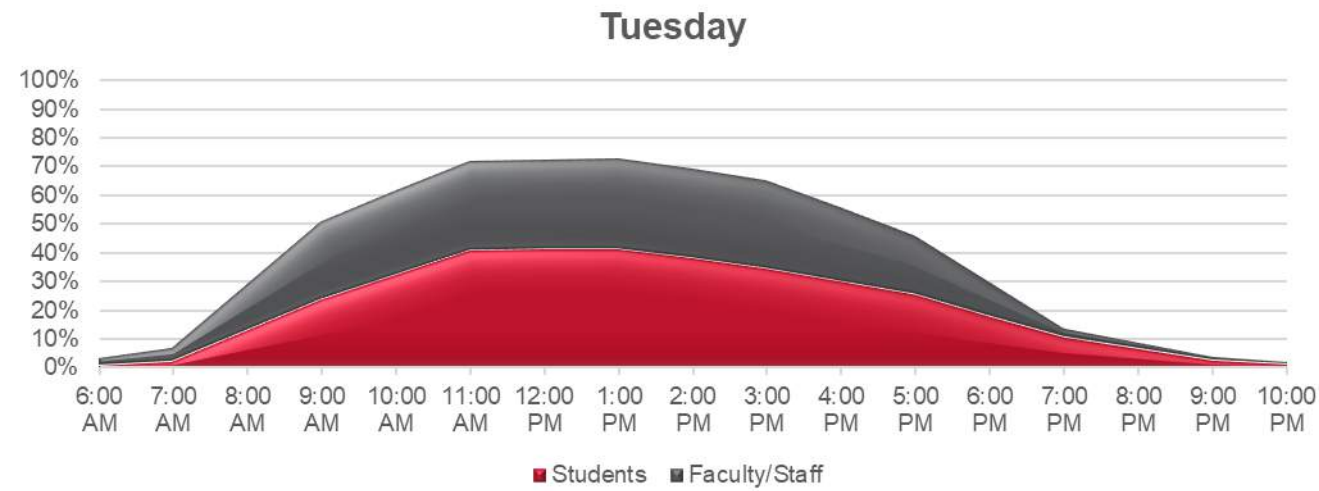


Figure 54. Friday Arrival/Departure Times

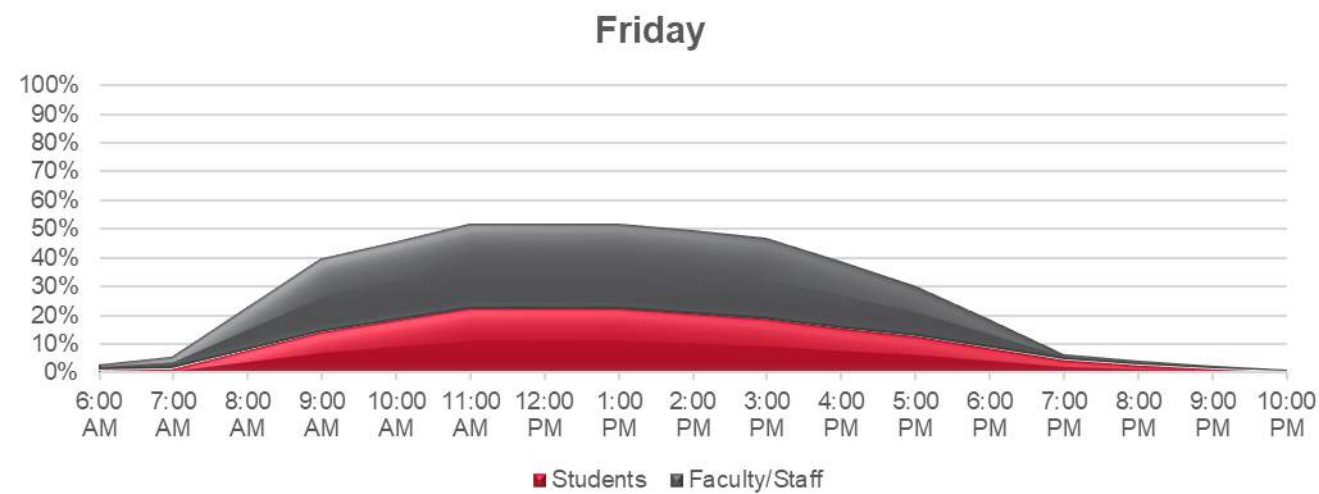
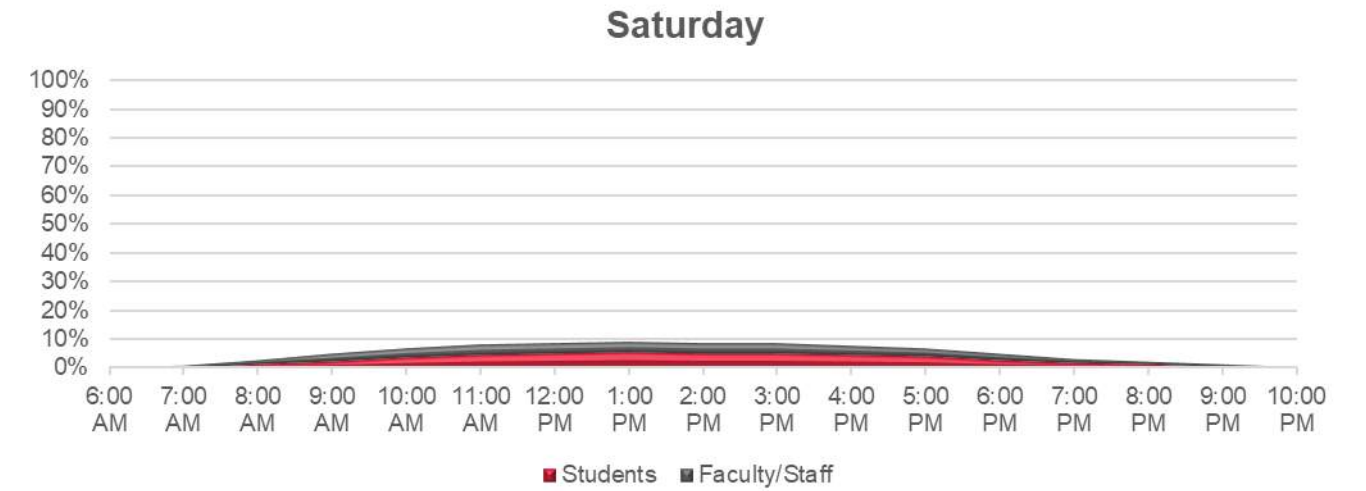


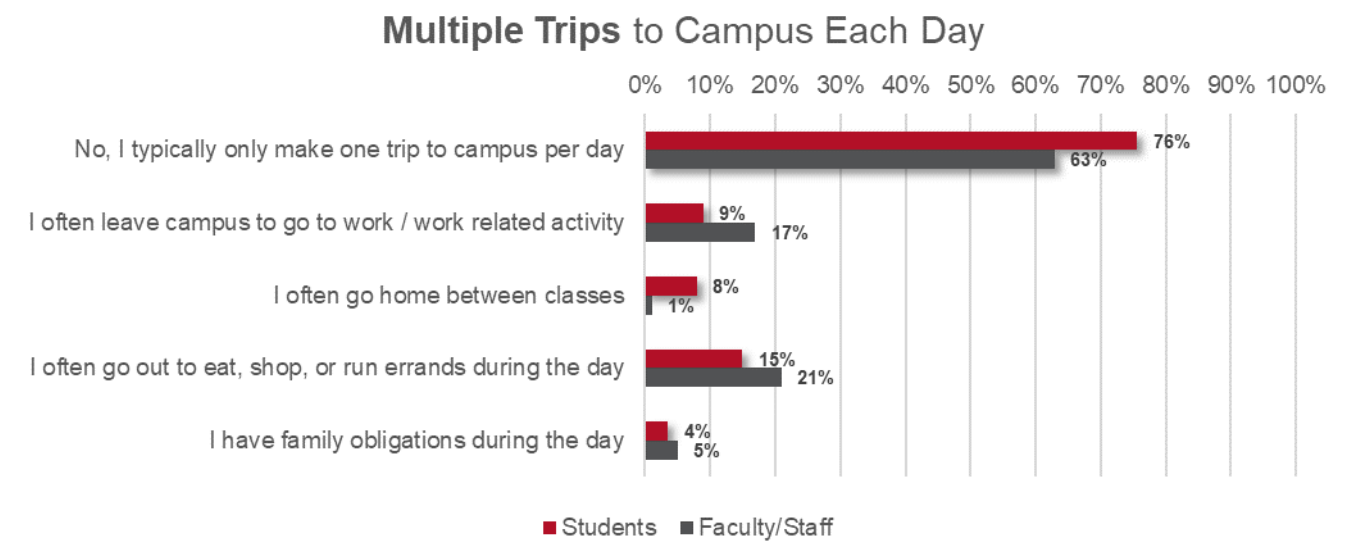
Figure 55. Saturday Arrival/Departure Times



Multiple Trips To/From Campus Each Day

Most of both students and faculty/staff indicated that they typically only make one trip to campus per day (**76%** of student respondents and **63%** of faculty/staff respondents). Many survey respondents (approximately 40) used the write-in option to stress that the primary reason that they typically only make one trip to campus per day is specifically due to concerns about finding parking again if they attempt to depart and come back.

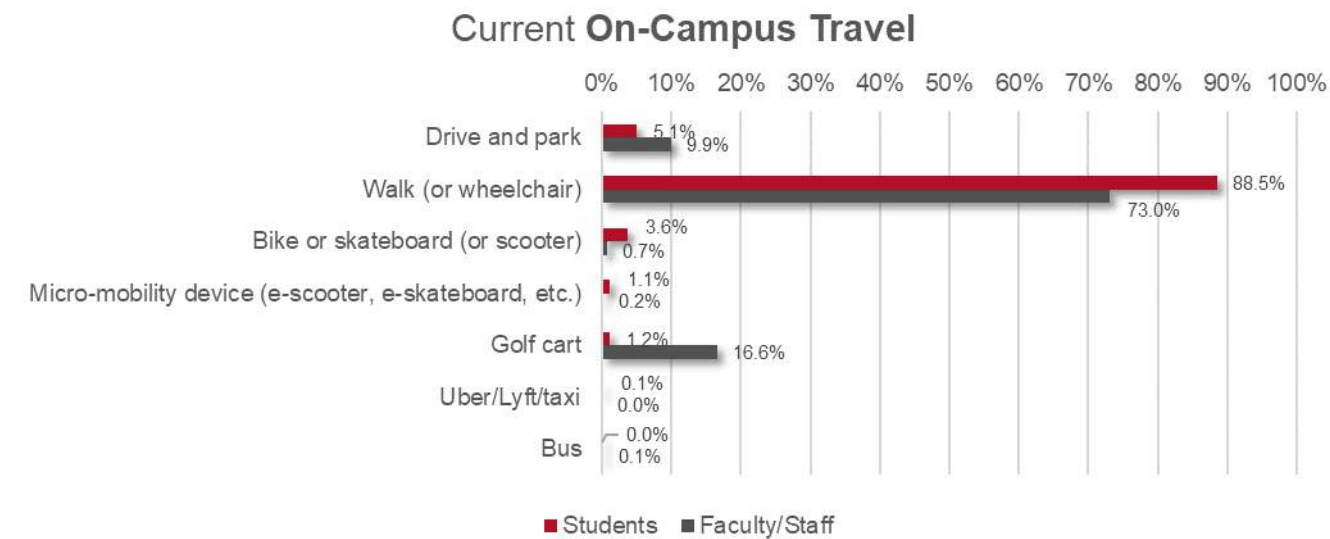
Figure 56. Multiple Trips



On-Campus Travel

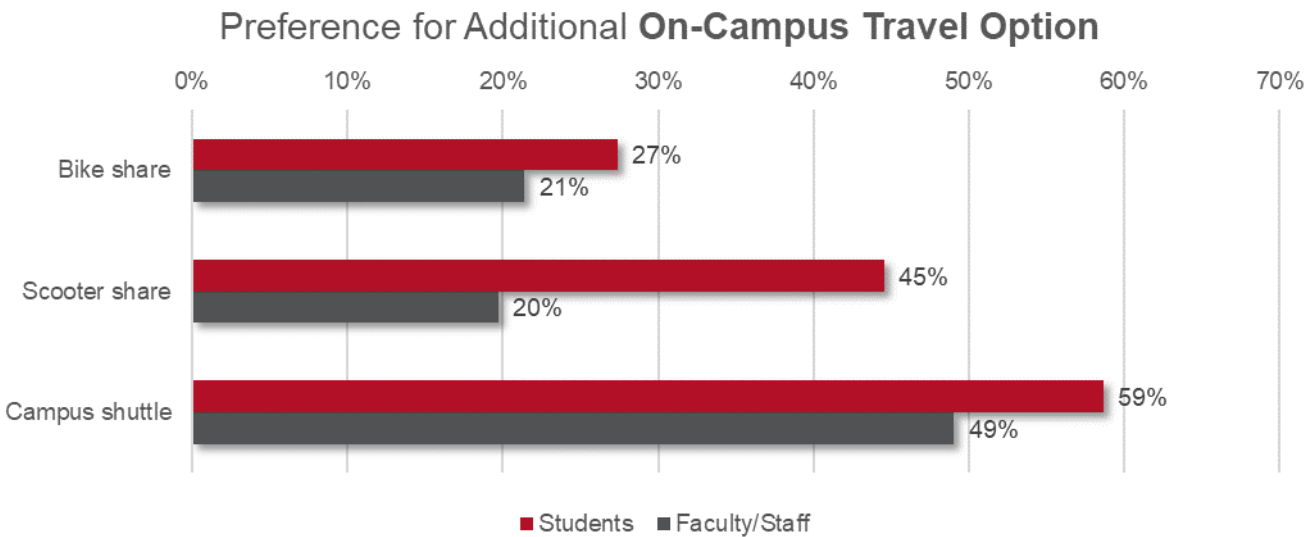
Once on campus, most survey respondents (83%) reported that they walk to other destinations on campus as needed. Nearly 17% of faculty and staff reported frequently using a golf cart to get around campus, leading to lower walk rates compared to students given this option. Less than 10% of faculty staff and around 5% of students report that they often drive to other parts of campus.

Figure 57. Current On-Campus Travel



When presented with three options for an additional on-campus transportation option, 55% of survey respondents indicated that they would consider using a campus shuttle to travel to other parts of campus. A higher percentage of students were open to this option compared to faculty and staff (note that faculty and staff who currently use golf carts and would likely prefer to continue using this option). Students were also much more open to a scooter share program; many respondents commented that they were concerned about the safety of e-scooters on campus. The most cited write-in option was some form of golf cart sharing program.

Figure 58. Additional On-Campus Travel Option



Bicycling Conditions and Preferred Improvements

Both students and faculty/staff generally agree that on-campus bicycling conditions are **mediocre**, with each group ranking on-campus bicycle conditions **2.5 out of 5.0** on average (based on 2,087 responses, or 61% of survey respondents).

Both groups also agree that bicycle conditions are **poor** outside of campus. Faculty/staff have a slightly worse perception of off-campus bicycle conditions with an average rating of **1.6 out of 5.0** compared to **2.0 out of 5.0** for students (based on 2,227 responses, or 65% of survey respondents).

Among potential options for improving bicycling conditions, 31% of survey respondents expressed a desire for additional **protected bike lanes**. Based on write-in comments provided, even non-bicyclists often selected this option as many feel that protected bike lanes can help to encourage bicyclists to bike on-street rather than on sidewalks.

While more than 60% of survey respondents indicated that they would not consider biking even with improvements (distance to campus too far, no access to a bike, physical limitations, family obligations, etc.), improvements to accommodate those interested in bicycling can help to incrementally reduce vehicles from the network and therefore benefit non-bicyclists.

Figure 59. On-Campus Bicycling Conditions

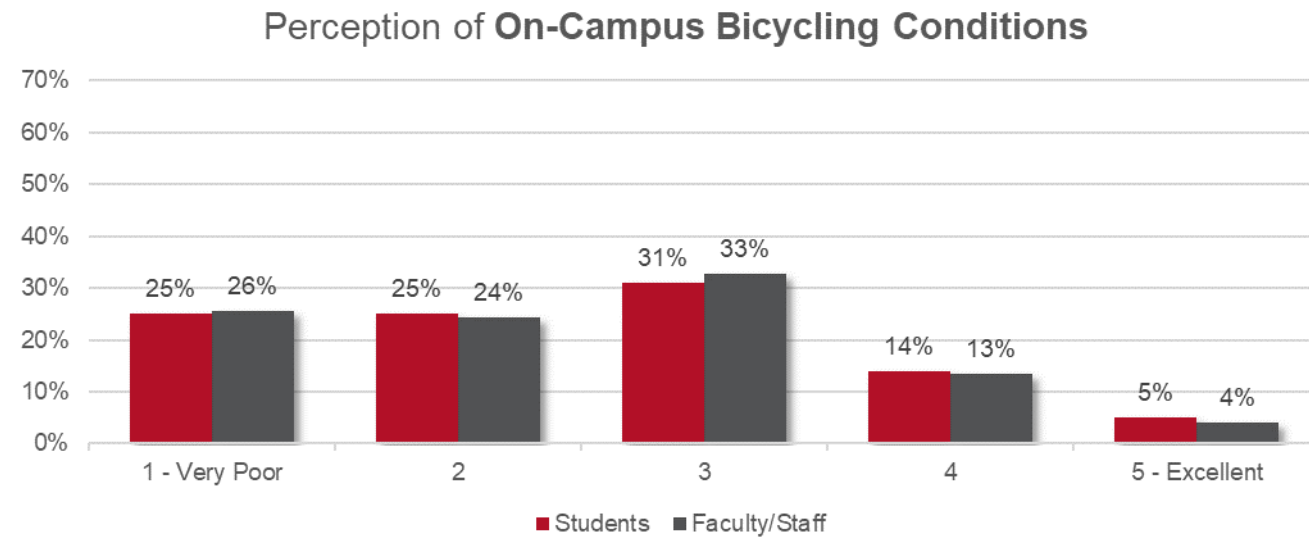


Figure 60. Off-Campus Bicycling Conditions

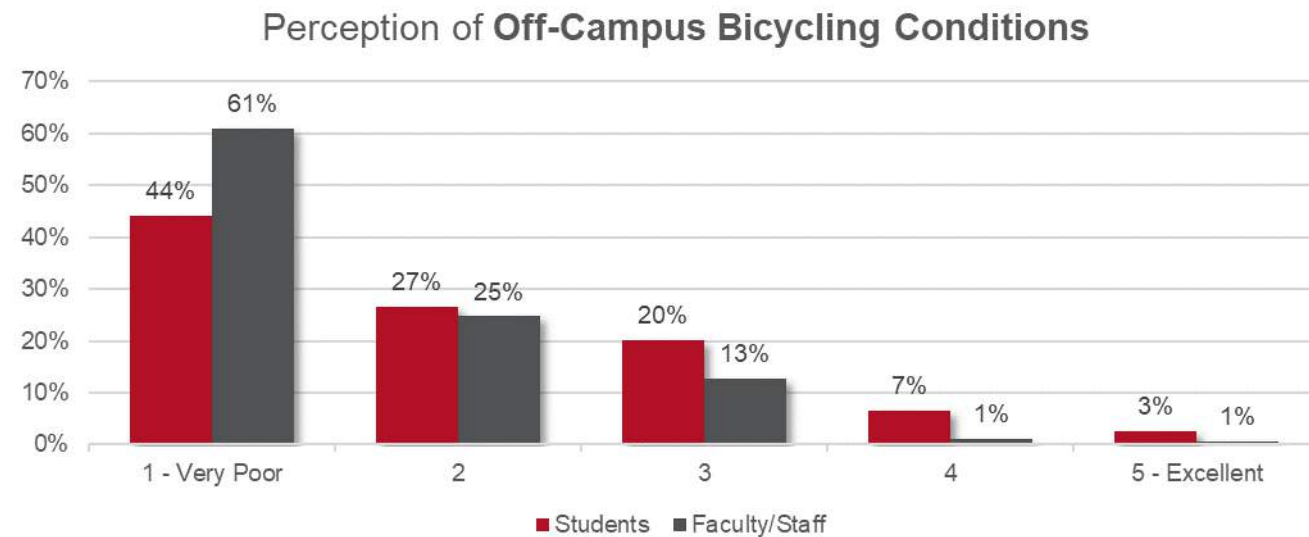
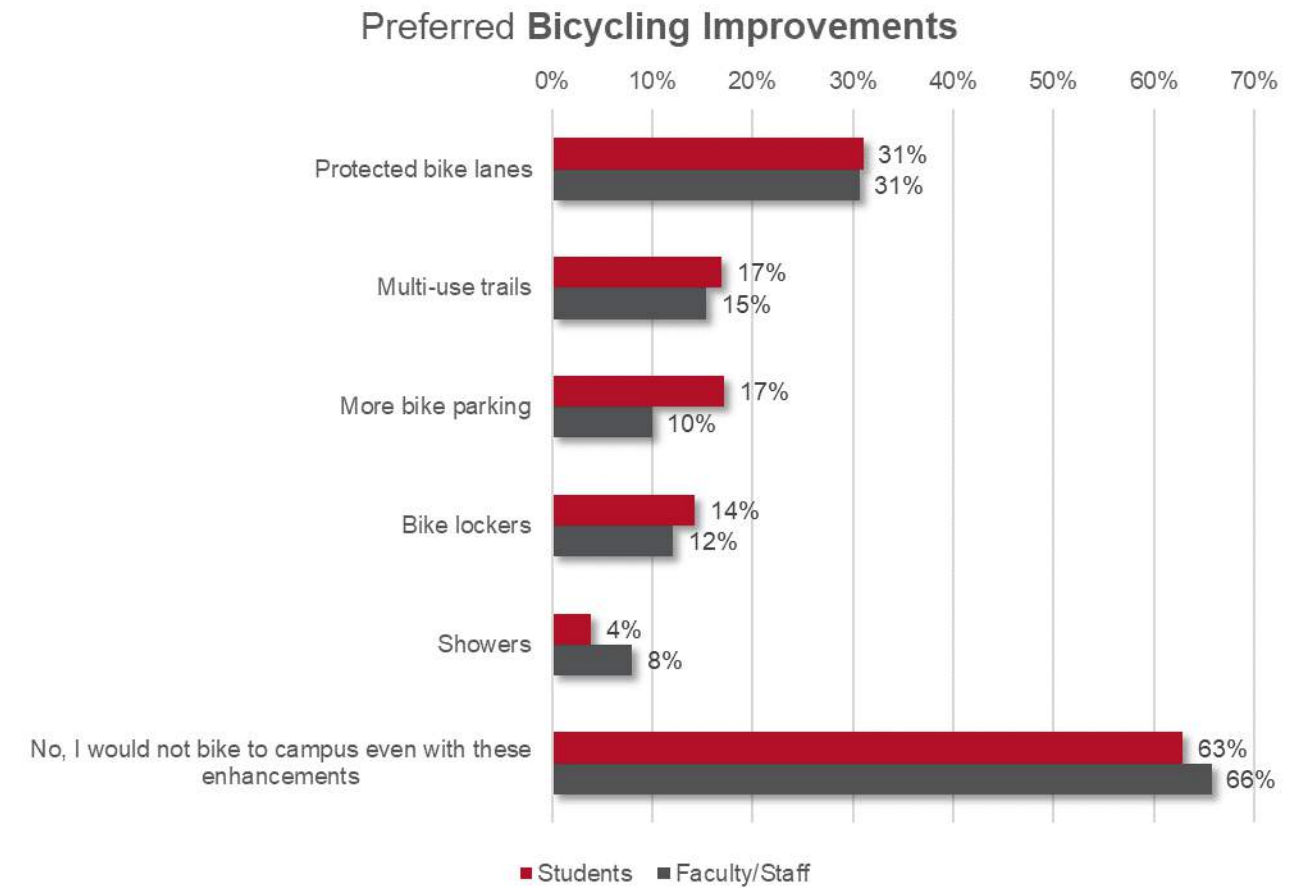


Figure 61. Bicycle Improvements



Bus Service

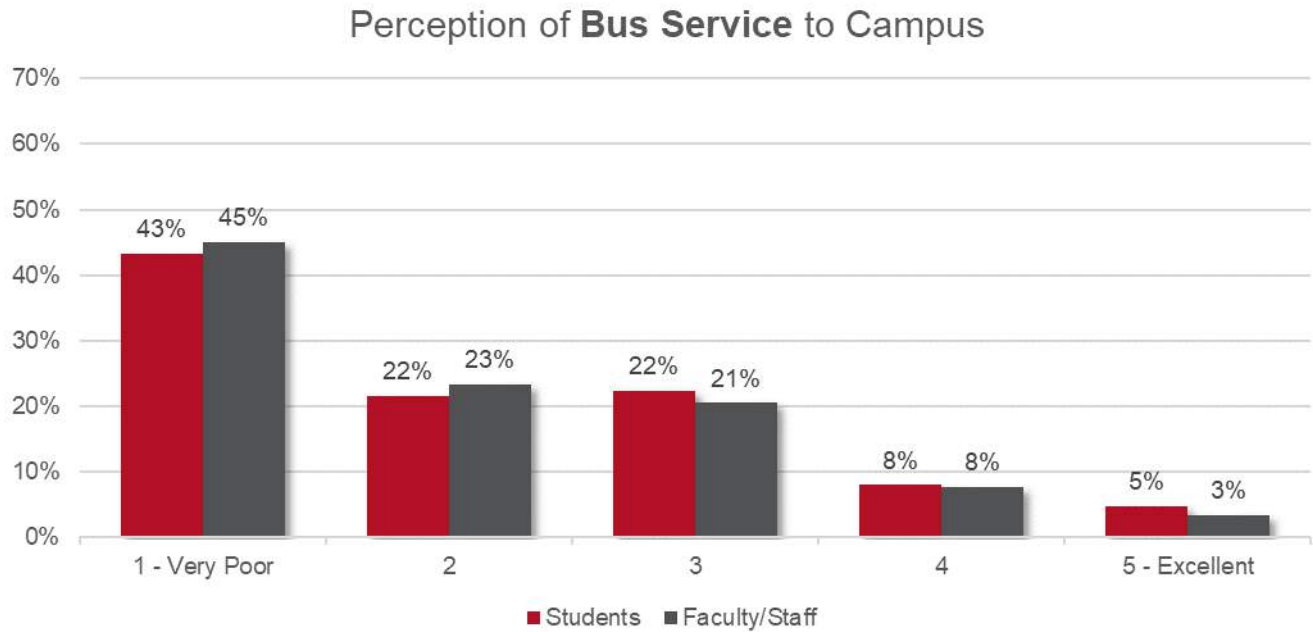
Both students and faculty/staff generally agree that bus service to campus is poor: **2.1 out of 5.0** for students, **2.0 out of 5.0** for faculty/staff (1,434 responses, or 42% of survey respondents).

The most popular options for improving bus service and incentivizing users to consider this mode include providing a **free bus pass** (33% of respondents expressed interest) and implementing **higher frequency bus service** (23% of respondents expressed interest).

Within the write-in comments, many survey respondents took the opportunity to identify their concerns with existing service that prevents them from taking the bus and other preferred improvements. Commonly cited issues included:

- Safety on buses and at bus stops
- Need for faster travel times / more direct service
- Poor reliability of service / not running on schedule
- Lack of bus maintenance / cleanliness
- Desire for a park-and-ride with frequent shuttle service

Figure 62. Bus Service Perception



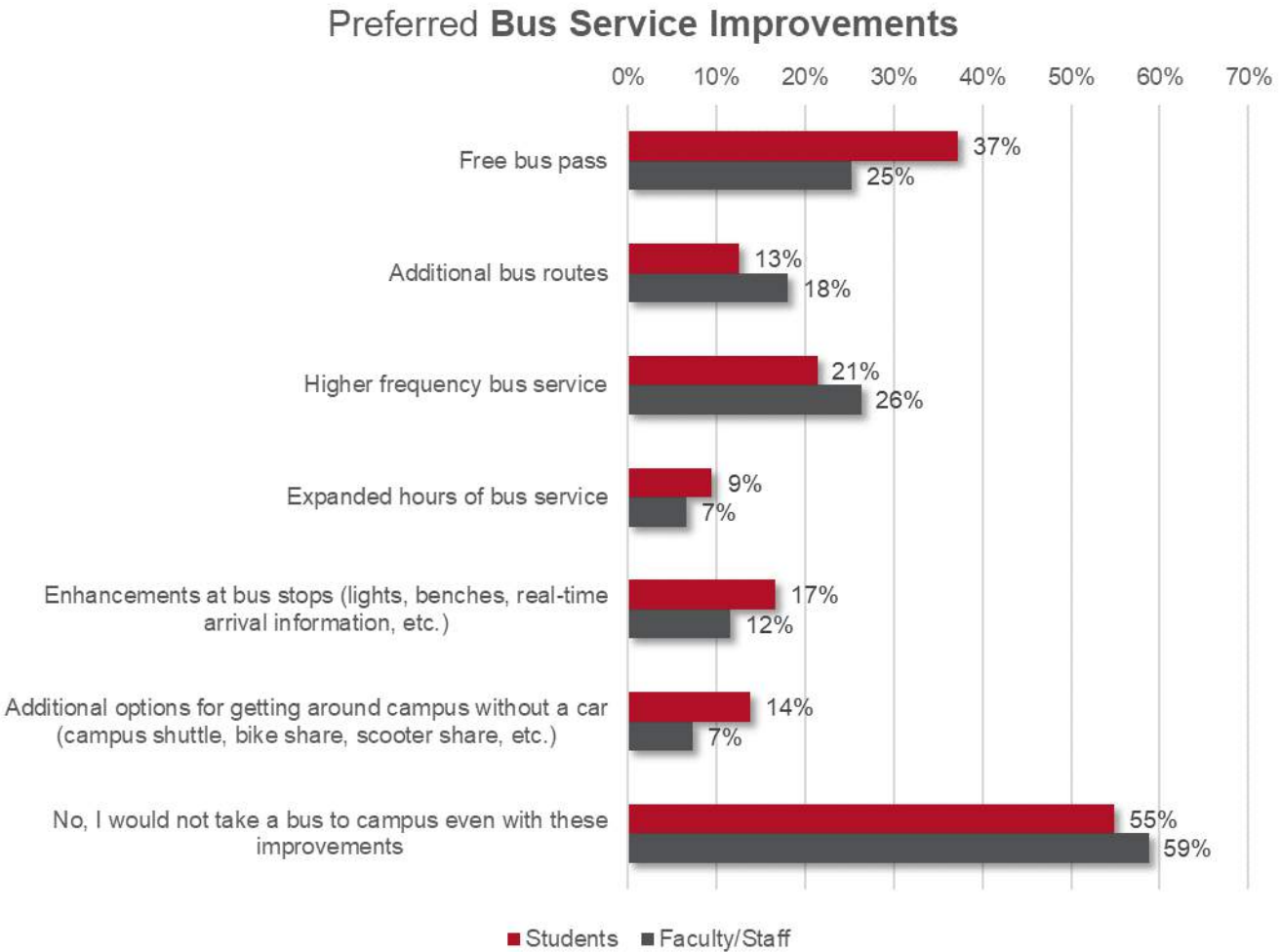
Current Parking Location and Parking Preferences

Consistent with the mode split data, which suggests around 99% of trips to campus are made by private vehicle (carpool and drive alone), only 1.2% of survey respondents indicate that they do not park on campus. Most users (67%) make use of the general permit, with the North Garage, South Garage, and Gateway Garage accounting for the next most common parking locations. Compared to results from the 2017 campus survey when only 51% of students reported using a general permit, student utilization of the general permit is up (now 65%).

Regardless of the permit type or parking location, most survey respondents indicated that the reason for selecting their typical parking location is for the **proximity to their destination**. In addition to the answer choices provided, other reasons cited for selecting their primary parking location included the following:

- Covered parking
- Avoid traffic congestion
- Handicapped/ADA parking
- Safety concerns with other locations
- Lower cost or free parking
- EV charging stations

Figure 63. Bus Service Improvements



Students and faculty/staff have slightly different preferences for preferred parking locations. Most students (64%) prefer either Southwest (32%) or Northeast campus (32%). Most faculty/staff (53%) prefer either Central (27%) or Southeast (25%) campus.

Figure 64. Type of Parking

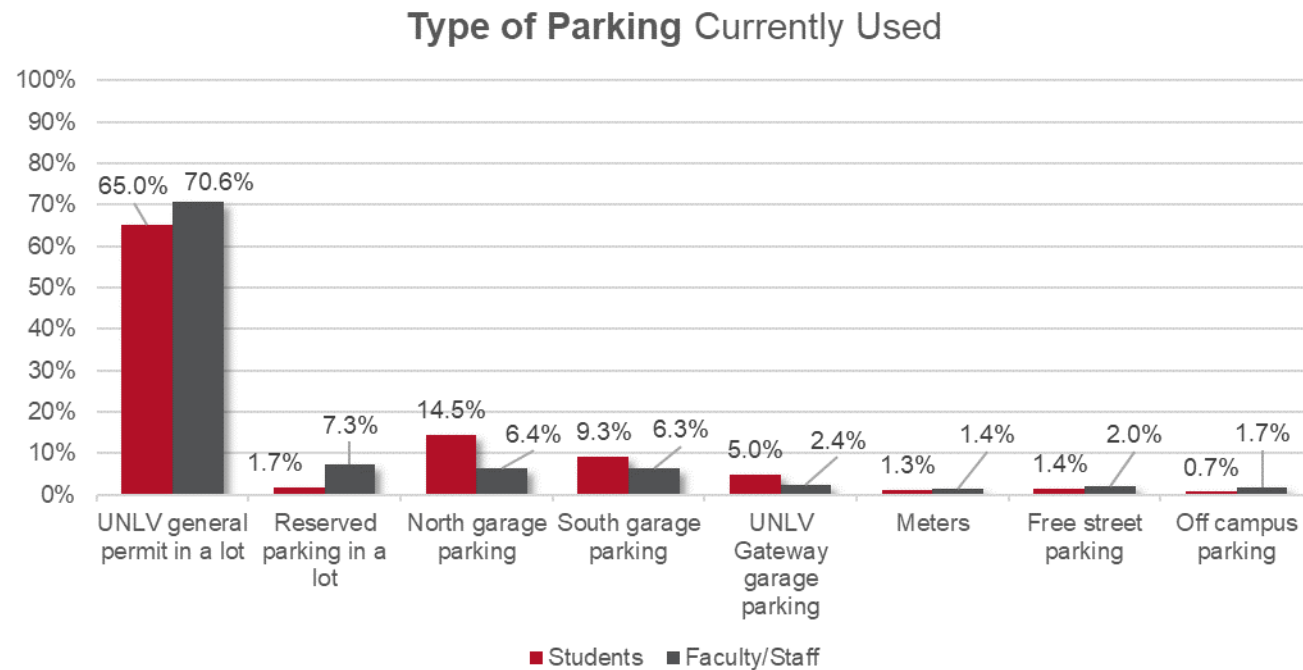


Figure 65. Reason for Parking

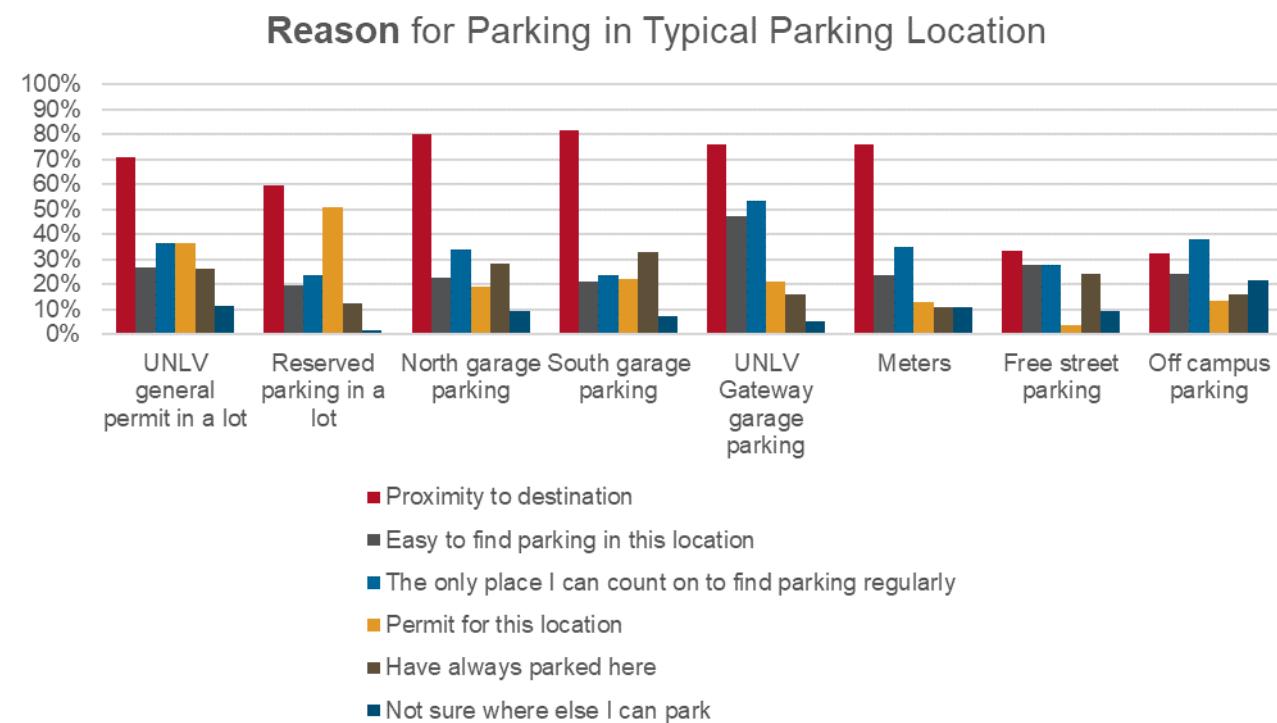
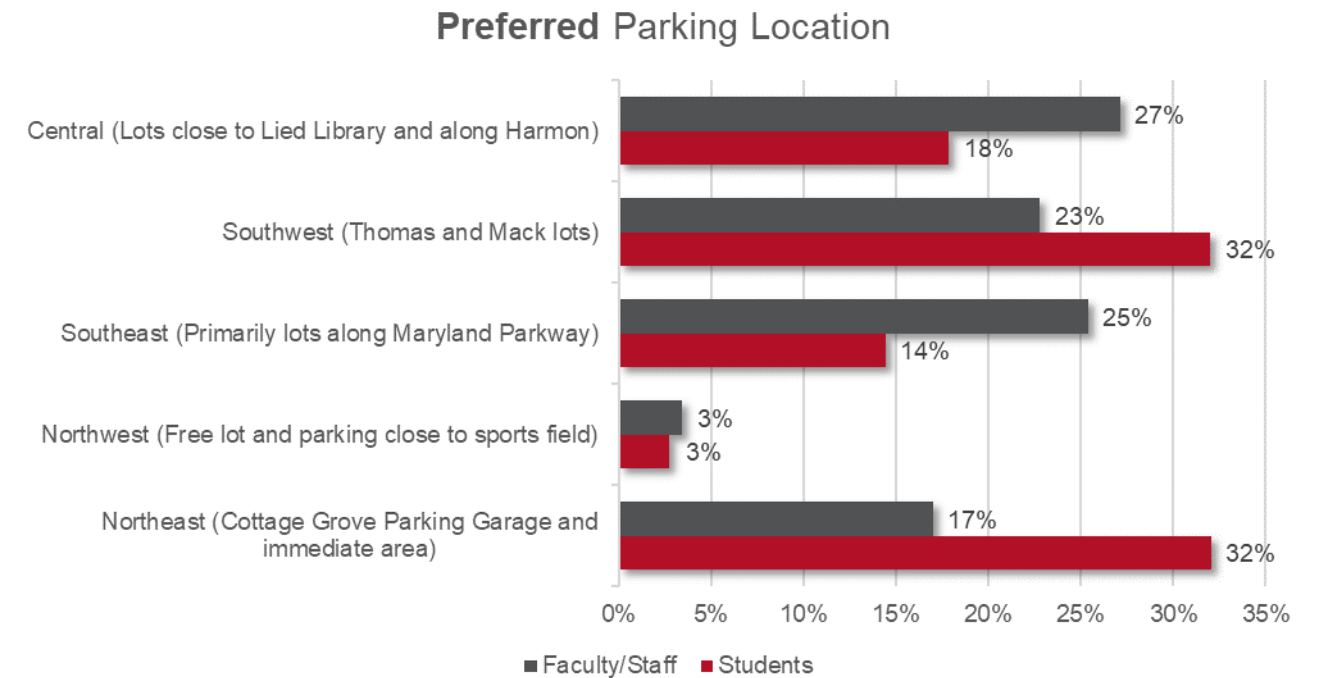


Figure 66. Preferred Parking Location



Willingness to Pay More for Parking

Survey respondents were asked if they were willing to pay more for parking either 1) closer to the destination, 2) in a garage, or 3) covered, and if so, how much more. Approximately 27% of students indicated that they would be willing to pay more for parking **closer to their typical campus destination**. Perhaps a reflection of general satisfaction with the proximity of their existing parking options, 21% of faculty/staff indicated that they would be willing to pay more **covered parking**.

Figure 67. Willingness to Pay More - Students

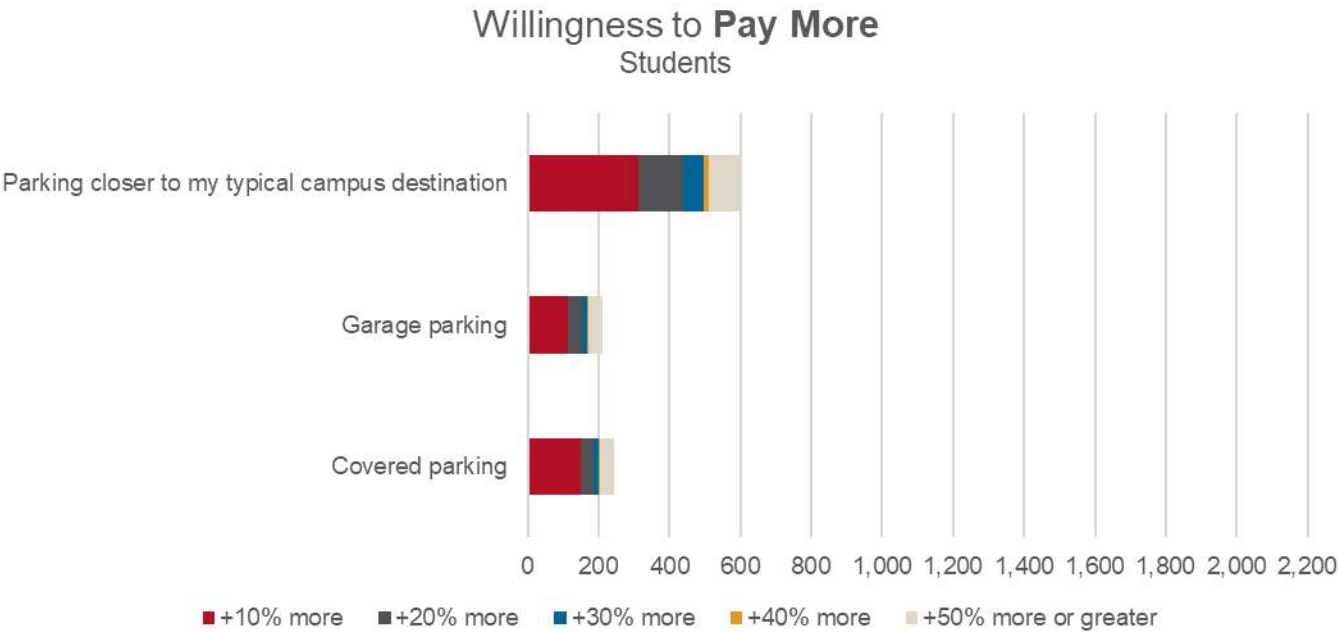
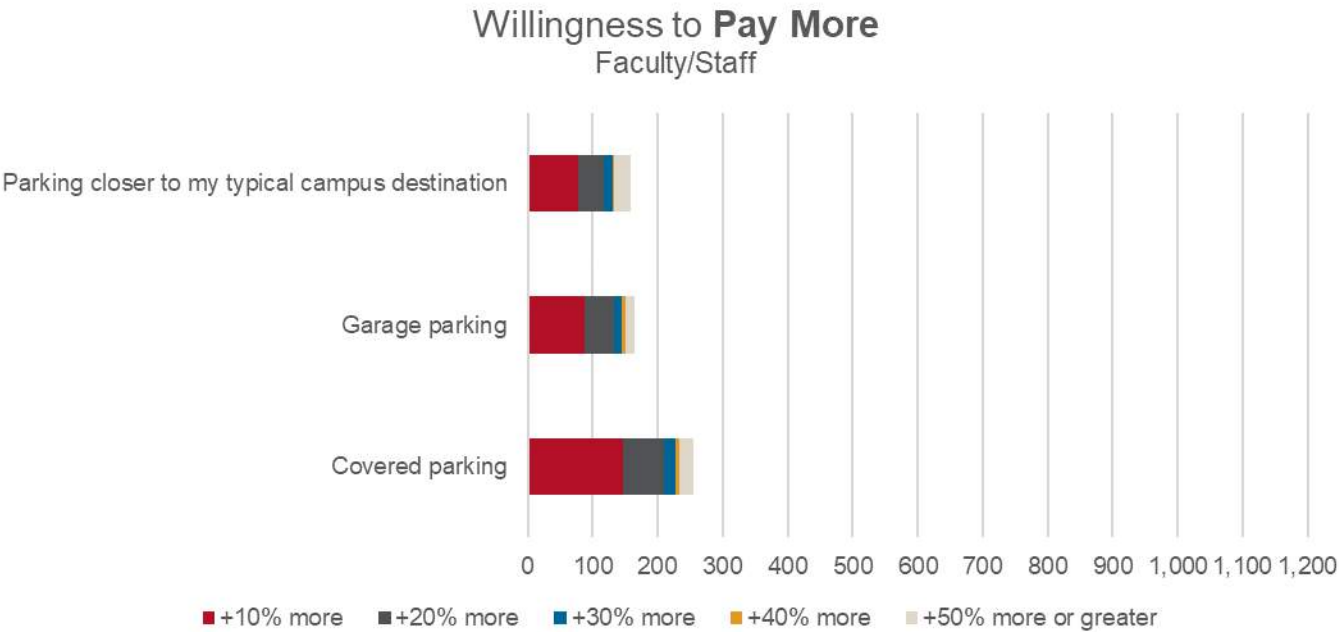


Figure 68. Willingness to Pay More - Faculty/Staff



General Comments

At the end of the survey, respondents were asked to share any additional comments regarding parking and transportation options, and 1,650 respondents (49%) elected to do so. Based on a review of the comments, 24 comments categories were established, and each comment was classified in up to four (4) of these established categories. The top five categories provide a sense of the key issues on the minds of much of the campus community:

- Parking fees / rates: General concern regarding current permit rates or future rate increases
- Additional parking on campus: Desire for additional parking capacity on campus
- Event parking: Concern or opposition to current management practices related to Thomas and Mack
- Safety / security: Concerns related to safety walking on campus or personal security when accessing their vehicle at night or in a parking garage
- Parking availability near destination: General frustration with finding parking near their preferred destination, or parking management suggestions regarding current allocation of parking stalls

Figure 69. Additional Comments by Topic



- Primarily Park Once** - More than 70% of survey respondents indicated that they typically only make one trip to campus per day; based on several write-in comments, many users avoid leaving campus during the day out of concern that they will be unable to find a parking stall when they return.
- Limited On-Campus Transportation Option** - While students overwhelmingly walk between destinations on campus (89%), faculty and staff are more likely than students to use golf carts (17%) or drive and park (10%). The lack of an on-campus shuttle option likely contributes to higher utilization of these auto modes by faculty and staff.
- Desire for a Campus Shuttle** - 55% of survey respondents indicated that they would likely use a campus shuttle.
- Poor Bicycle Connectivity to Surrounding Communities** - The campus community generally feels bicycling options for accessing campus are poor to very poor (1.8 out of 5.0), and only slightly better once on campus (2.5 out of 5.0).
- Poor Perception of Bus Service** - Options for accessing campus by bus are generally rated poor (2.1 out of 5.0). While a free bus pass was the most preferred option to incentivize bus usage, this would need to be combined with additional bus routes and more frequent and reliable service to change perceptions of bus service as a viable alternative to driving alone.
- Proximity to Destination is a Key Priority** - With few on-campus transportation options, most of the campus community clearly prioritizes proximity of parking over most other factors; 27% of students indicated that they would be willing to pay more for parking closer to their destination.

Key Takeaways

The following summarizes several key observations and findings from the community survey.

- Car-Dominant** - With nearly 99% of trips to campus made by private automobile (and around 1% of respondents indicating that they do not park on campus), the UNLV transportation system currently depends on accommodating the parking demands of nearly all campus users.
- Midday Peak** - Based on reported arrival and departure times, it is likely most difficult to find parking during the midday peak period, between approximately 11:00 AM and 1:00 PM. These personal observations by respondents aligns with the data observed for the campus parking occupancy. Mid-day is the most occupied time period.

VIII. Strategic Communication Plan



VIII. Strategic Communication Plan

Review of Current Program Communications

Overview

The following section includes a brief overview of UNLV’s Parking and Transportation Services (PTS) existing communication program. The purpose of this summary is to document existing branding, marketing, and communication tools that are currently being used by the University to communicate and engage campus stakeholders regarding campus parking and transportation options.

Guiding Statements

Vision Statement: Focused on value. Dedicated to quality.

Mission Statement: Parking and Transportation Services is an auxiliary unit of the University committed to creating, maintaining, and enforcing the parking areas on both the Maryland and Shadow Lane campuses in the most cost-efficient manner possible.

Functions and Responsibilities Statement: Parking & Transportation Services strives to make parking your vehicle as efficient and convenient as possible by providing:

- Safe and well-maintained parking facilities
- Pleasant and courteous customer service
- Equitable enforcement of parking regulations
- Efficient and service-oriented sales of parking permits
- Alternative means of transportation
- Proactive planning for parking needs
- An effective motorist-assistance program

Parking & Transportation Services is committed to improving campus parking. We pursue this goal by researching solutions, evaluating their effectiveness, and making recommendations and adjustments.

University Parking Advisory Committee

UNLV maintains a wide range of governing and advisory committees throughout campus. The Parking Advisory Committee makes parking recommendations to the University and cooperates with PTS on parking planning efforts. All recommendations developed by the Parking Advisory Committee are first provided to the Associate Vice President of Administration for review before advancing to the Vice President of Finance and Business.

The committee consists of 20 members:

- **6 undergraduate students** appointed by the Consolidated Students of the University of Nevada, Las Vegas (at least one off-campus resident, at least one on-campus resident, and at least one student who qualifies for accommodations through ADA)
- **2 graduate students** appointed by the Graduate and Professional Student Association
- **4 faculty members** appointed by the Faculty Senate
- **4 professional staff members** appointed by the Professional Staff Committee
- **4 classified staff members** appointed by the Classified Staff Council

The director of PTS (or a designated representative) is present at all meetings in a nonvoting capacity, and PTS is responsible for maintaining minutes and attendance records.

Meetings are held monthly from September through April, and additional meetings may be requested by the Chair or the Director of PTS.

The stated responsibilities of the committee include:

- Make appropriate recommendations regarding specific fees relating to permits, fines, and meters.
- Review and recommend proposed changes in major parking policies before implementation.
- Review and recommend parking Capital Improvement Projects.
- Act in an advisory capacity to the Vice President of Finance and Business.
- Serve as a forum for public input concerning parking.
- Inform the University organization the member represents relating to parking matters brought before the committee.

The Parking Advisory Committee does not maintain a readily searchable publicly available website showing membership, minutes, or other details.

Annual Goals and Objectives

As part of the Parking & Transportation Services’ Annual Report, an annual Work Plan, Goals, & Objectives section is established for the following year. Examples of the Work Plan for 2019 included: “Complete a new Campus Parking Master Plan,” “Complete the Shadow Lane Campus parking redesign,” and “Complete the installation of fixed cameras for monitoring supply and demand in all garages.”

Strategic Communication Plan

Although the Work Plan and Goals & Objectives identify specific ways in which PTS will use funds each year in support of specific goals, these are not posted publicly through the website so are not generally accessible to the campus community.

A brand can be broadly defined as the relationship established with customers or service users. It is typically the foundation of all marketing activities and provides the structure to align promotional and marketing efforts. A brand is not a logo and logos are not brands, but a logo provides a visual and quick representation of the brand.

PTS is considered a self-funded or auxiliary department of the University. As noted within the FAQ of the PTS website, “tuition fees and taxpayer funds are not used to fund the parking program so that those funds can further support the academic mission of the university.” Further, “the fees generated from permits, combined with other revenues generated from a self-funded parking program (meters, citations, and events), go towards the operation, maintenance, and future development of parking.”

Although PTS operates independently, it does not maintain a separate brand from the general University branding. The following examples show the various types of branding used by PTS around campus:



PTS also partners with pay by phone, RTC, and Club Ride (through RTC) in the delivery of various programs and services. Each of these partners maintain independent branding:



Communication Tools

Website

PTS maintains a website that provides access to a wide variety of information related to parking rules, permits, citations, and other transportation services. A “What’s Happening” section provides news and recent updates, and content is generally organized assuming most users are looking for details related to parking rules and permit costs. The “permit” page of the official website is the first result when searching for “UNLV Parking” on Google, and the search result includes multiple access points to programs and contacts. Link: <https://www.unlv.edu/parking>

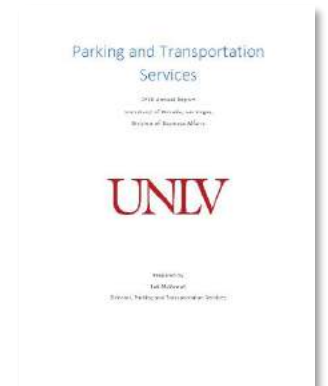
Social Media

PTS does not maintain a separate social media presence from the University. The various social media links at the bottom of the PTS website link to the general UNLV accounts (these accounts include Facebook, Instagram, Snapchat, Twitter, and YouTube).

Annual Reports

Each year, PTS produces a detailed annual report covering current financials, accomplishments from the previous year, goals & objectives for the upcoming year, and other details regarding the operation of the department. The Annual Reports are not readily available to the public, however.

While written as a technical summary of department operations, there are several elements that PTS may wish to consider making available to the public to highlight how permit fees are being used, such as accomplishments from the previous year and goals & objectives for the upcoming year.



News Center

UNLV’s News Center is a service of UNLV Marketing & Communication and regularly reports on transportation issues on campus. Proposed changes to parking options are typically profiled, and recent articles include details related to renewing parking permits, general tips for smart parking practices on campus, and updates regarding parking for the National Finals Rodeo (NFR).

Strategic Communication Plan

Email and List Server Posts

Any major announcements that impact parking on campus (such as major events in the Thomas and Mack Center) are sent out by email through the PTS permit system, sent from UNLV Official by way of Finance Official, and sent to Rebel Announcement via E-mail (RAVE). All posts sent through these channels are also placed on the PTS website.

Electronic Signs

In addition to the communication channels listed above, PTS uses electronic signs placed strategically on campus to alert permit holders of key information. Specifically, two days prior to any major event at Thomas and Mack, electronic signs alert permit holders of the upcoming event.

Strategic Communications

PTS maintains a robust communication program and makes use of a variety of tools to share information including the website, the News Center, email announcements, list server announcements, and electronic signs. In general, these announcements tend to focus very specifically on parking-related information, particularly for large events and major changes.

While PTS is very effective at sharing key parking information, as the department begins to offer more transportation services and focus more broadly on general campus transportation issues, PTS will likely benefit from establishing a Strategic Communications program that brands PTS and showcases how the department functions in service of the campus community. Comments submitted within the transportation survey suggest that at least some portion of the campus community does not see PTS as a separate entity from the University, and views permit costs and citation fees as subsidies for other University activities. Any future investments in shuttle service, transit pass subsidies, mobility enhancements, park-and-ride options, or other Transportation Demand Management programs will require significant outreach to clearly communicate the goals, objectives, anticipated costs, and performance metrics for such programs.

Building on PTS' existing communication program, the following recommendations were developed to help guide PTS' approach to strategic communications as the department begins to directly offer more non-parking related services. The goals of this Strategic Communications program include:

- Continually increase the effectiveness of the communication, marketing, and outreach efforts related to promotion of campus transportation offerings;
- Increase awareness of and engagement with the various transportation programs and services offered by PTS;
- Increase engagement with all user groups, including visitors, faculty, and staff, as well as members of the surrounding community including residents, workers, and the business and development community.
- Build partnerships to promote PTS transportation offerings and programs.

Messaging

Messaging provides the foundation for creating content and tone for marketing and customer education efforts. The three key elements to effective messaging include:

Consistency

Keeping similar tone/feeling when communicating to your audience.

Frequency

The driving force—keeping the message in front of the audience as often as possible—and not just focusing on providing “must have” details about a proposed change, but also providing information that reinforce the goals of the organization and reminds users of the “bigger picture.”

Anchoring

Messaging that provides a compelling call to action. Memorable, high impact language, and visual presentation that talks to the patron, not at the patron.

When crafting key messaging for public education and communication about operational, programmatic, and/or other customer-facing changes to the PTS system, it is vitally important to carefully consider how communication will be perceived by all campus user groups and stakeholders. In a discipline as complex as transportation and parking management, it is often easy to get caught up in creating messages that try to convey too much information, often in a way that is full of jargon or technical instructions. The following section identifies “Key Messages & Topline Talking Points” and additional talking points that help support the key messages by providing more detail for longer conversations with or presentations to stakeholders. While all the messages included below are appropriate for most stakeholder groups, the audience segments that each message is most effective for is listed below the talking point.

Key Messages & Topline Talking Points

Parking and Transportation Services will:

Cost-effectively invest in parking, transportation services, and programs to provide a variety of convenient access options for the campus community.

Most effective for the following audiences:

- Students
- Faculty and staff
- Key community and public sector partners
- Media

Make strategic investments in safety, technology, and programming that improve the experience for all customers regardless of travel mode.

Most effective for the following audiences:

- Students
- Faculty and staff
- Business owners and merchants
- Property owners
- Residents of adjacent communities
- Key community and public sector partners
- Media

Expand and enhance efficient and sustainable transportation options in addition to maintaining a variety of parking choices.

Most effective for the following audiences:

- Students
- Faculty and staff
- Key community and public sector partners
- Media

Continue to be an active partner that supports broader community-focused development and transportation projects.

Most effective for the following audiences:

- Development community
- Property owners
- Residents of adjacent communities
- Key community and public sector partners

Additional Talking Points

UNLV students, faculty, and staff can save up to 68% on transit passes through an exclusive partnership with RTC. Passes are valid on all RTC transit routes. RTC operates five bus routes that serve campus, including the Centennial Express (CX), which provides daily service from the UNLV Transit Center.

Texas A&M University

To improve intersection safety and promote walking and biking, researchers at Texas A&M University implemented a Dutch intersection design at a key campus intersection and added solar-powered paint that is bright green in the day and glow-in-the-dark at night. The design reduces conflicts between motorists and bicycle riders and improves visibility where they do cross paths. The intersection received widespread press coverage, and A&M Transportation Services effectively used a one-page project sheet to promote the project benefits for all users:



Win prizes and receive exclusive discounts to area merchants just for using sustainable transportation options. Anyone can sign up for a free membership to the Club Ride program, and each trip logged using an alternative mode of transportation (carpooling, riding public transit, walking, biking and more) earns an entry for monthly gift card drawings.

Parking permit fees are unbundled, so users can select the option that best fits their needs. Parking permit fees always go towards improving parking and transportation options on campus, and students, faculty, and staff always have the option to opt out of the purchase of a parking permit and make use of other transportation options to campus. Recognizing that not all students, faculty, and staff have the option to travel by alternative modes, permit costs are kept low, with all permit price increases announced at least a year in advance.

Investing in multiple transportation options is a cost-effective way to improve access and mobility. Incentives to increase ridesharing, biking, walking, and transit usage allows users to select the mode that works best for them while helping to minimize the need to increase fees to fund additional costly parking.

Tools to Support Strategic Communications

Communicating about parking and transportation requires both technical savvy and an understanding of the often-intense emotions that are experienced when dealing with parking and transportation issues.

Regardless of what the message is, any change to a customer’s “normal” parking experience can lead to frustration, complaints, and rapid dissemination of incorrect information through informal networks. And in the absence of information, one thing is certain: people will make up their own “truths”, so it is strongly recommended that PTS continue its investment in organizational time and resources to successfully communicate about parking and transportation program changes.

As such, the following communication strategies are recommended to guide PTS staff as they continue to inform, educate, and forecast changes to key stakeholder groups.

Short-Term Strategies

Create a Project “One Pager” / FAQ Sheet for all New Programs / Pricing Changes

At a minimum, this document should include:

- Why:** Use the Key Messages / Talking Points as a foundation for this brief narrative.
- What:** Rate changes; changes to enforcement days/times; new campus shuttle options, etc.
- Who:** Contact information for questions / concerns
- When:** Timing for change
- Resources:** Website link and brief FAQ

This information should be available in print form, on the website, and posted on social media.

Release Annual Recap of PTS Accomplishments and Outreach Activities

PTS already takes the time to create a detailed accounting of department finances and documentation of accomplishments from the previous year. However, the current Annual Report is typically around 100 pages, and is not drafted as a public facing document.

By consolidating some of the key accomplishments, goals, and outreach activities into a single easy-to-skim document that is added to the website each year, PTS can begin to build a readily searchable public document of accomplishments over time. Anyone interested in learning more about PTS can learn a great deal about the department’s goals and objectives from scanning the annual reports. Additionally, the documents will provide key publicly available documentation about how decisions were made and how the campus community helped shape the investment of transportation dollars each year.

The University of Maryland’s Department of Transportation Services produces a public annual report each year with a message from the director, mission statement, an outline of functions and responsibilities, key statistics, accomplishments from the previous year, and goals and objectives for the upcoming year.



Leverage Partnerships

For any new program, pricing change, or service change, PTS should contact key community partners and request inclusion of information about the change in their regular stakeholder communication vehicles. This ask should be made in a targeted way to a specific and trusted staff person. All written Information that is shared or promoted by a partner organization through their channels should be crafted (and/or thoroughly reviewed for accuracy) by the appropriate PTS staff member.

Website: Brief story in the news section (or similar location) with a link to the PTS website.

Social media: Teaser with a link to the Project Fact Sheet / FAQ on the PTS website.

Presentation: to Parking Advisory Committee and/or other membership gathering

Developing and maintaining relationships with key partners will be important not only for effective communication, but also in identifying community needs over time and building consensus around new programs and projects.

Mid-to Longer-Term Strategies

Develop a PTS Brand

As an independent unit of the University with responsibility for providing and expanding campus parking and transportation options, PTS may benefit from developing a publicly facing brand. This will be

particularly important if PTS begins to directly offer additional transportation services, such as a campus shuttle or bike share program.

By clearly identifying all services and partnerships funded in whole or in part by PTS, the campus community will begin to associate with PTS with all things transportation. Over time this branding will help shape perceptions of how permit fees are invested to serve the transportation needs of the campus community.

Performance Measures

Just as PTS tracks several performance measures within the Annual Report related to services, permit usage, and revenue, performance measures related to the Strategic Communication Program are a key component of tracking progress. The following performance measures can serve as a useful starting point to track over time, but should be adapted to fit PTS specific needs:

- Website Visits
- Social Media Posts
- RAVE distributions
- News Center Articles
- Community Presentations / Events

Currently, most PTS communications typically relate to parking permit changes and special events. It will be particularly important to track communication related to new innovations and investments (such as online services), community outreach activities (that gather input on new offerings), and communications related to alternative transportation (such as a campus shuttle service, transit pass subsidies, etc.)

After developing and tracking a refined list of strategic communication performance metrics, PTS can then make annual comparisons of the return on investment of communication dollars. Additional investments in outreach events, as an example, may require additional staff resources, and specific measures of community outreach success may be important to maintain continued investments in a strategic communication program.

Monitor Progress Towards Meeting All IPMI APO “Marketing and Communication” Criteria

IPMI’s Accredited Parking Organization (APO) Program is a tool to help guide parking and mobility organizations towards meeting national and internationally endorsed standards for professionalism, accountability, creativity, responsibility, and performance. “Accredited Parking Organizations” are recognized as national leaders in parking and mobility management, and regardless of whether PTS wishes to pursue accreditation, the criteria related to “Marketing and Communication” can provide a useful benchmark in tracking the success of the communication program.

Accreditation Criteria

1. Develops and maintains a communications and marketing plan that supports the program's larger strategic goals.
2. Strategic-planning documents specifically focus on communications and marketing, which are reviewed annually and current.
3. Annual budget includes dedicated funding for communication and marketing activities.
4. Provides opportunities for customer feedback (at least quarterly) and responds to feedback.
5. Media relations protocols include a specific list of approved media spokespeople and chain of command for approving and reviewing information that is released to the media.
6. Employs a current media list that includes key media organizations and contact information for key staff.
7. Uses a press/news release template.
8. Crisis/emergency protocols, including a specific list of key contacts, clearly defined chain of command, and areas of responsibility are in place.
9. Maintains expedited method of communication specifically for crisis/emergency situations.
10. Maintains policies and/or procedures for addressing annual, seasonal, campaign-based, and event-specific communications functions in a timely manner (i.e., special events, construction, service disruption, and routine maintenance).
11. Branding includes a logo or distinct visual marker that is consistent across media.
12. Website includes 1) map of facilities, pricing, payment options; 2) contact email, phone number, hours of operation; 3) instructions for after-hour emergencies; 4) how to pay and/or appeal a citation; 5) information on monthly parking, if applicable; 6) ADA information

Accreditation with Distinction Criteria

13. Shares best practices in marketing and communications with parking industry colleagues.
14. Conducts information sessions for the public and can demonstrate how feedback is incorporated into operational efforts.
15. Posts up-to-date information on programs and practices in public places and online.
16. Participates in public events, public-education sessions, lunch-and-learn sessions, or other awareness- and confidence-building activities.
17. Utilizes new communication technologies (YouTube, social media, blogs, etc.) to reinforce its message to the public.

18. Uses resources to support community quality-of-life programs.

Summary of Strategic Communication Recommendations

PTS plays a key role in how all users access and first experience the UNLV campus each day. As PTS' role in providing transportation services expands and evolves, it will be important to maintain a strategic communication program to share information, promote successes, and leverage partnerships within the community.

Below is a summary of the key recommendations:

General Goals of the Strategic Communication Program

- Continually increase the effectiveness of the communication, marketing, and outreach efforts related to promotion of campus transportation offerings;
- Increase awareness of and engagement with the various transportation programs and services offered by PTS;
- Increase engagement with all user groups, including visitors, faculty, and staff, as well as members of the surrounding community including residents, workers, and the business and development community;
- Build partnerships to promote PTS transportation offerings and programs.

Short-Term Strategies

- Create a Project "One Pager" / FAQ Sheet for all New Programs / Pricing Changes to improve clarity and transparency of program changes.
- Release annual recap of PTS accomplishments and outreach activities to showcase how parking permit fees are being used to improve access to campus.
- Leverage University departmental partnerships by requesting inclusion of information about program changes in their regular stakeholder communication vehicles.

Mid-to Longer-Term Strategies

- Develop a PTS branding that is used consistently throughout all department communications, press releases, annual reports, as well as transportation offerings on campus.
- Track a series of performance measures specifically designed to allow for annual comparisons of outreach activities and strategic campus communication.
- Monitor progress towards meeting all IPMI APO "Marketing and Communication" criteria.

IX. University Parking Expert Advisory Panel



IX. University Parking Expert Advisory Panel

Introduction

On March 9 through 11, 2020, a panel of university parking experts convened in Las Vegas to provide input on the current program as part of the UNLV Campus Parking Master Plan. These experts were invited due to their comparable campuses and their experience in the parking and mobility industry. Each panelist achieved parking and mobility excellence for their institutions and brought a unique set of experiences and knowledge to UNLV.

Panelists included:

- David Bradford, CAPP - Director, Parking and Transportation Services, Colorado State University
- Josh Kavanagh, CAPP - Director, Transportation, University of California San Diego
- Beth Snoke, CAPP - Director, Transportation and Traffic Management, The Ohio State University

Members of the Kimley-Horn team included:

- Ken Ackeret, P.E., PTOE - Project Manager
- L. Dennis Burns, CAPP - Regional Vice President
- Adria Koller, AICP - Senior Planner
- Leslie Tabor - Parking Planner

Preparing the Panel

In preparation for the panel, a digital briefing packet was compiled for the panelists to review. Information included initial supply/demand data, initial information from the campus master plan consultant (Sasaki), fee schedules, and past Parking annual reports. Panel members were familiar with Las Vegas as a travel destination but brought fresh eyes and ears to UNLV’s Parking and Transportation Services.

It should be noted that this panel took place during the early days of higher education’s response to the COVID-19 pandemic. In fact, one additional panelist, Melinda Alonzo from Arizona State University, had already received authorization to attend and had purchased airline tickets when ASU decided to suspend all non-essential travel. The team felt lucky to be able to complete the panel before heavy travel restrictions were in place and before campuses transitioned to virtual classrooms. Due to their roles and expertise, the panelists were fielding calls and emails to help guide their campus responses by the time the panel concluded on March 11.

Panel Overview

On day one the group was given a walking tour of the campus led by Tad McDowell, MCRP, Director of Parking and Transportation Services. The panelists were shown campus garages, potential new

development sites, parking demand hot spots, the campus transit center, and sites that could be impacted by future development and/or recommendations from other campus planning initiatives. One detail that stood out during walk-throughs of the garages was that garage washings are infrequent due to the weather; a couple of the panelists wished they had that luxury! The group also enjoyed the perfect walking weather and the pieces of art sprinkled throughout the campus.

On day two the panel rolled up their sleeves and dug in. Mr. Bradford, Ms. Snoke, and Mr. Kavanagh each provided summaries of their programs including recent highlights and challenges.

Colorado State University (CSU) boasts impressive bicycle usage and has seen impressive mode split numbers over the years. The campus is now facing the challenge of slowing bicycle traffic down to ensure public safety. CSU also has strong connectivity with the local bus system and there are only two routes that do not come onto the campus.

The University of California San Diego (UCSD) walked the panel through their interactive and data-rich Transportation website, which includes information about what parking fees pay for and updates on capital projects. Mr. Kavanagh also gave an overview of the planned Voigt Transportation Center, which will boast both sustainability and enormous marketing impact for UCSD.

The Ohio State University (OSU) is still adjusting to the privatization of campus transportation. Like many campuses nationwide, they are looking to continue to promote alternative transportation options around campus, though incentivizing raises complications with the private contract. OSU would like to consider a zoned approach to parking and move away from the hunting license model. (UCSD is also currently in a hunting license model.)

The group discussed the benefits and challenges of coordinating with student government to initiate or raise campus fees. Mr. Kavanagh shared success stories of collaborating with students and newly graduated students to help promote and educate students about campus transportation needs. While he was at the University of Washington, he employed a recent graduate to liaise with students and student government, which helped give his department credibility and put students in the driver’s seat to help with the process of introducing change.

As the conversation continued, the panel also discussed campus transportation fees. CSU described their alternative transportation fee and alternative transportation fee advisory board (ATFAB), which was implemented a couple of years ago with lots of support from the student body. The fee pays for additional campus bus routes via city buses and alternative transit-related items like bike trails and a covered solar bike parking trial. Similar fees could be used at UNLV for a campus shuttle, for example.

Later in day two, the group spent time with Mike Lawrence, UNLV Associate Vice President for Administration, and Jacob Snow with Paceline Consulting. Mr. Lawrence made it clear that his desires are to make sure staff is taken care of by having adequate resources for them to perform their job duties and for teams to have a positive work environment. He expressed interest in seeing how the Parking Master Plan aligns with the larger campus master plan and better understanding the financial impacts of each plan. One of his duties is to understand what changes can and should be made to services and operations for the benefit of the University. The group turned their attention to the brief campus master plan update and reviewed the presentation provided by Sasaki. This review spurred conversation about the impact to parking and transportation that the campus master plan may have, and the group delved into the topic of campus circulation and the benefit of a campus shuttle. Mr. Lawrence mentioned that a transportation fee would need to be approved by the Board of Regents and any student fee boards. Mr. Snow then walked the group through an overview of potential funding options available to the University to support the Parking Master Plan. Options include concession opportunities, contributing capital, fee-based, and demand-based systems. Ideas such as charging transportation network companies (TNCs) a fee for Lyft and Uber services on campus and opportunities for shared parking between the airport and University were outlined. There is also the possibility of combining revenue sources in combined projects when possible.

The last major event of day two was a panel session with Parking and Transportation Services staff. After introductions around the room, all available staff were provided with an update of the Parking Master Plan process and then the session was opened for dialogue between staff and the panel. Panels asked the parking and transportation team what they needed to be successful in their jobs and heard answers ranging from an online event management system to an updated dispatch system and options for more effective ways to impound vehicles. The staff relayed the success of the pay-by-phone option for students. Staff discussed how a larger budget from increased permit fees, or a new transportation fee could provide the funding for the resources they need. Staff also described a need for strategic staff positions including a Parking and Transportation-specific communications team that could help manage website information, daily updates, and social media and a statistician or data analyst. The communications team could especially help with connection to the student body.

Day three consisted of wrap-up and review by the panel with Mr. McDowell and Sandy Ziegler, Assistant Director of Parking and Transportation Services. This group reviewed what was heard from staff, assessed the impact of preliminary campus master plan information such as impact to parking inventory, and reviewed the frequency and size of Thomas and Mack Center events. The consultant team offered to provide general guiding principles, preliminary appendix information, and a working report outline following the panel.

Initial Observations

During the walking tour through campus, the panel made the following initial observations:

1. Strong traditional campus ambiance with sidewalks, mature trees, and a mix of old and new facilities
2. Opportunities for garage maintenance to be improved - elevators observed had large glass windows with dirt and bird droppings, floors needed thorough cleaning
3. Opportunities for campus transit center to be improved or moved
4. Potential for issues with signage and maintenance in new Gateway garage - trash can was overflowing, elevators needed cleaning, and signage reserving spaces for certain types of users could cause challenges as population and use grows
5. Observed heavy usage of Maryland Parkway corridor
6. Interesting and eye-catching collection of campus art
7. Support for alternative mobility options such as scooters should be considered

What Was Heard

- Potential for campus transportation fee and subsequent campus shuttle
- Rates are the lowest of peer universities
- Thomas & Mack events greatly impact parking demand
- Opportunities for improved technology and technology integration for staff and customer service
- Potential to increase use of alternative modes of transportation such as bikes
- Need for additional Parking and Transportation staff for communication, social media, and data analysis
- Opportunities for better student engagement and integration
- Need for improved and expanded visitor parking
- Opportunities for improved campus wayfinding and signage
- Great parking is part of the Tier 1 experience that allows students to be successful (and can potentially be a factor for recruiting and retention)

Preliminary Recommendations

Four major preliminary recommendations came out of the panel process:

Data-based decision making must be used for the planning and implementation of parking and mobility strategies

- Data should always be used to support the case for parking and transportation related improvements, capital projects, and departmental changes
- Data will guide where improvements and changes should be made by showing trends and utilization

Look for opportunities and plan for transportation demand management and alternative transportation applications

- Panelists shared success stories from their own campuses and highlighted the benefits of planning and implementing TDM and alternative transportation applications including robust bike and pedestrian plans, campus bus/shuttle programs, and trail projects
- Micro-mobility may be an area to implement new programs such as scooter sharing. These programs also have the potential to bring in revenue for the University
- The 2020 Campus Master Plan contains key elements that support expanded alternative mobility

Student body buy-in is essential for the successful adoption of a student transportation fee to support parking and mobility initiatives like a campus shuttle and expanded mobility options

- Panelists shared their experiences successfully implementing fees to support parking and transportation. A key element that was stressed was the importance of understanding all student body processes for approval by governing boards, etc.
- Panelists also stressed the value of ongoing relationships with student body leadership, noting the challenges of maintaining momentum and continuity as leadership positions cycle through elections. Panelists offered ideas such as creating liaison positions specifically for the parking and transportation department and being committed to ongoing relationship building.
- UNLV's Parking and Transportation Services staff commented that they are interested in and supportive of efforts to engage the student body more routinely. They stated that they do not receive much negative feedback, so they are in a good position to enhance engagement and involvement with students.

Enhance the current parking and transportation website by adding more information about planning, projects, construction, and how parking fees are determined and what they are used for

- Panelists shared details about what content is included on their websites and how that transparency helps customers understand the why and how of campus fees
- Specifically, it was recommended to show how fees are applied for campus services and to show what services would go away if fees were reduced or eliminated and what services can be maintained or enhanced as fees keep up with the market

- High level information about debt service and other financial impacts could also be included in family budget style graphs and tables
- The website could also include parking and transportation project descriptions, schedule updates, and explanations of how the projects are being funded

X. Future Campus Growth



X. Future Campus Growth

Introduction

Historically, campus enrollment has been growing at approximately 2% per year, and this trend is not expected to change significantly in the foreseeable future. Although the current parking supply is largely adequate to serve existing parking demands in the near-term, the increasing demand for trips to campus and losses of existing parking lots may eventually lead to significant parking constraints over time if left unaddressed.

The UNLV Campus Master Plan incorporates new parking supply in short, mid-, and long-term planning horizon phases. The short-term phase includes construction of the Tropicana Garage expansion project. This parking expansion project has been vetted through the Parking Advisory Committee and can be funded at nearly 50% from existing funding reserves. Although the timing may shift, for planning purposes, it has been assumed that funding reserves will be used in FY 2021 to fund this project. The 1,000-stall garage is expected to create a net increase of 758 spaces in FY 2022.

With the Tropicana Garage expansion providing relief for short-term parking pressure, this Chapter focuses on the various options available to the University to address growing travel demands to campus, through either Transportation Demand Management strategies to slow the growth of parking demand, construction of additional parking, or a combination of these strategies. Two funding scenarios are presented as a baseline, followed by an analysis of various parking demand growth curves to assist with determining when additional investments need to be considered.

Funding Analysis

Parking and Transportation Services' 2019 Annual Report presents a budget to fund construction of the Tropicana Garage expansion project in FY 2021, as well as a garage at the Transit Center in FY 2022 (financed at a cost of approximately \$2 million per year through bond payments). While the Tropicana Garage expansion project can be assumed in any baseline scenarios, delaying the Transit Center garage project to allow the University to build a financial reserve for a partial down payment could significantly reduce bond obligations for when the project is needed. Current parking permit fees are much lower than peer institutions, and programmed increases are likely inadequate to build a significant reserve to fund additional parking construction costs. The following two scenarios build on the forecasts from the 2019 Annual Report to determine a parking permit fee escalation schedule that will help to build a reserve to fund parking expansion when needed. The following assumptions are included within both forecasts:

- Enrollment increases by 2% annually
- Permit sales increase by 1% annually (as a conservative approach)
- Starting baseline permit revenue calculated using actual Fall 2019 (FY 2020) permit sales

- Salaries, student wages, and fringe benefits were assumed to escalate at 2% per year, starting Fall 2021 (FY 2022)
- Operations costs were escalated at 3% per year, starting in Fall 2020 (FY 2021)
- Annual bond payments for the Tropicana Garage project assume the use of \$13,000,000 in current reserve funds (see the 2019 Annual Report for specific bond payment assumptions)
- When there is an ending balance of more than \$250,000 at the end of each Fiscal Year, \$250,000 is carried forward, and the remaining amount is allocated to the Reserve

Programmed Parking Permit Fee Increases Only

The next round of parking permit fee increases includes the following programmed changes to monthly permit fees:

- Faculty/Staff: +\$2.50 per month (\$27.50 to \$30.00)
- Student: +\$1.25 per month (\$13.75 to \$15.00)
- Visitor: +\$5.00 per month (\$25.00 to \$30.00)
- Vendor: +\$4.00 per month (\$40.50 to \$44.50)

Although these increases are currently programmed for implementation in Fall 2022 (FY 2023), PTS expects to implement these changes in Fall 2021 (FY 2022) instead. The monthly permit fee increases (and the corresponding increases to the annual, weekly, and daily permits) can be expected to increase annual revenue by approximately 10% (\$385,000 per year). With no other revenue increases, the following budget builds on the assumptions presented in the 2019 Annual Report. As shown, after running a deficit in FY 2021, the proposed permit fee increases are expected to allow the University to gradually replenish the reserve fund. However, by FY 2026, the reserve fund is expected to be under \$1,000,000, and annual revenues well below \$2,000,000 (which is the annual cost of bonding to fully fund an additional garage). Further, increasing costs are expected to outpace increasing revenues associated with additional permit sales, meaning the annual ending balance is projected to decrease over time.

Table 7. Budget with Programmed Parking Permit Fee Increases

	Growth Factor	2019-20 FY 2020	2020-21 FY 2021	2021-22 FY 2022	2022-23 FY 2023	2023-24 FY 2024	2024-25 FY 2025	2025-26 FY 2026
Balance Forward		\$871,073	\$131,375	\$0	\$250,000	\$250,000	\$250,000	\$250,000
New Permit Revenue		\$0	\$0	\$385,000	\$385,000	\$385,000	\$385,000	\$385,000
Base Permit Revenue	1.01	\$3,806,741	\$3,844,808	\$3,883,256	\$3,922,089	\$3,961,310	\$4,000,923	\$4,040,932
Citations	1.00	\$796,941	\$796,941	\$796,941	\$796,941	\$796,941	\$796,941	\$796,941
Meters	1.00	\$377,908	\$377,908	\$377,908	\$377,908	\$377,908	\$377,908	\$377,908
Internal Transfers	1.00	\$951,327	\$951,327	\$951,327	\$951,327	\$951,327	\$951,327	\$951,327
Miscellaneous Revenue	1.00	\$39,625	\$39,625	\$39,625	\$39,625	\$39,625	\$39,625	\$39,625
TOTAL REVENUE		\$5,972,542	\$6,010,609	\$6,434,057	\$6,472,890	\$6,512,111	\$6,551,724	\$6,591,733
Professional Salaries	1.02	\$446,414	\$446,414	\$455,342	\$464,449	\$473,738	\$483,213	\$492,877
Classified Salaries	1.02	\$778,422	\$778,422	\$793,990	\$809,870	\$826,068	\$842,589	\$859,441
Wages	1.02	\$177,769	\$177,769	\$181,324	\$184,951	\$188,650	\$192,423	\$196,271
Fringe Benefits	1.02	\$485,412	\$485,412	\$495,120	\$505,023	\$515,123	\$525,426	\$535,934
Operations	1.03	\$1,030,200	\$1,061,106	\$1,092,939	\$1,125,727	\$1,159,499	\$1,194,284	\$1,230,113
Recharges	1.00	(\$182,948)	(\$182,948)	(\$182,948)	(\$182,948)	(\$182,948)	(\$182,948)	(\$182,948)
Current Bond Payments		\$2,941,228	\$2,138,440	\$2,140,244	\$2,143,722	\$2,141,399	\$2,141,399	\$2,141,399
Tropicana Bond Payment		\$0	\$1,021,763	\$843,658	\$843,658	\$843,658	\$843,658	\$843,658
Maint./Improvements	1.00	\$360,000	\$360,000	\$360,000	\$360,000	\$360,000	\$360,000	\$360,000
TOTAL EXPENSES		\$6,036,497	\$6,286,378	\$6,179,671	\$6,254,452	\$6,325,187	\$6,400,043	\$6,476,745
ENDING BALANCE		\$807,118	(\$144,394)	\$254,387	\$468,438	\$436,924	\$401,681	\$364,988
Contribution to Reserve		\$675,743	(\$144,394)	\$4,387	\$218,438	\$186,924	\$151,681	\$114,988
Balance Carried Forward		\$131,375	\$0	\$250,000	\$250,000	\$250,000	\$250,000	\$250,000
Reserve Withdrawal		\$0	(\$13,000,000)	\$0	\$0	\$0	\$0	\$0
Reserve Balance		\$13,311,019	\$166,625	\$171,012	\$389,450	\$576,374	\$728,055	\$843,043

Phased Permit Fee Increases

As shown in the previous scenario, the programmed permit fee increases will be adequate to fund the Tropicana Garage, but additional revenue (or new funding sources) will likely be needed to fund additional parking construction.

The following scenario was developed with the goal of increasing revenues to allow for the financing of the Transit Center Garage project (with an estimated annual bond payment of approximately \$2,000,000) by FY 2026.

To simplify the permit pricing structure over time, the following relationships between the various permit offerings will be phased in as part of this scenario:

- **Annual Permit** = Monthly Permit Cost x 11
- **Weekly Permit Cost** = 50% of Monthly Permit Cost
- **Daily Permit Cost** = 25% of Monthly Permit Cost

With these relationships established, increasing the cost of each monthly permit corresponds to a fixed and predictable increase in all other permit offerings.

Increasing annual revenues by approximately \$2 million will require increasing permit revenue by more than 50% over 2019 levels. It is estimated that this can be achieved by increasing monthly permit rates each year by **\$2.00 per month** for each of the permit types. With the revised permit rate schedule, this would also require increasing weekly rates each year by \$1.00 per week, increasing daily rates each year by \$0.50 per day, and increasing annual rates each year by \$22.00 per year. **Table 8** shows the corresponding permit rates if these increases are phased in between FY 2022 and FY 2026.

To help phase in these permit rate increases while also establishing a fixed relationship between the various permits, some slight modifications to these assumptions will be needed in FY 2022-24:

- **In FY 2022:**
 - The monthly faculty/staff rate would only increase by \$1.75 per month (less than expected), the weekly rate for faculty and staff would increase by \$3.75 per week (more than expected), and the daily rate would increase by \$1.75 per day (more than expected) to establish a fixed relationship between permits.
 - The monthly vendor rate would increase by \$5.50 per month (more than expected) and the weekly vendor rate would increase by \$10.00 per week (more than expected) to correct for the current disparity between the rates for that permit type.
 - The weekly and daily rate for students would remain fixed at current levels (\$9.00 per week and \$4.50 per day) to avoid a rate reduction.
 - The weekly rate for visitors would increase by \$2.75 per week (more than expected) to correct for the current disparity in rates for that permit type, and the daily rate for visitors would remain fixed at the current rate of \$7.50 per day to avoid a rate reduction.
- **In FY 2023:**
 - The weekly rate for students would remain fixed at the current rate (\$9.00 per week) to avoid a rate reduction.
 - The daily rate for visitors would remain fixed at the current rate of \$7.50 per day to avoid a rate reduction.

Future Campus Growth

- In FY 2024:

- The weekly rate for students would only increase by \$0.75 per week (less than expected) to establish a fixed relationship.
- The daily rate for visitors would only increase by \$0.25 per week (less than expected) to establish a fixed relationship.

Other than these noted disparities for the phase in period, this scenario assumes that the monthly rate for each permit type would increase by \$2.00 per month each year (and \$22.00 per year, \$1.00 per week, and \$0.50 per day).

Table 8. Proposed Parking Permit Rates

		2019-20 FY 2020	2020-21 FY 2021	2021-22 FY 2022	2022-23 FY 2023	2023-24 FY 2024	2024-25 FY 2025	2025-26 FY 2026
Annual Rate (Monthly x11)	Faculty/Staff	\$300.00	\$300.00	\$322.00	\$344.00	\$366.00	\$388.00	\$410.00
	Student/Resident	\$150.00	\$150.00	\$172.00	\$194.00	\$216.00	\$238.00	\$260.00
	Vendor	\$484.00	\$484.00	\$506.00	\$528.00	\$550.00	\$572.00	\$594.00
	Visitor	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Motorcycle	\$100.00	\$100.00	\$122.00	\$144.00	\$166.00	\$188.00	\$210.00
	Reserved	\$755.00	\$755.00	\$777.00	\$799.00	\$821.00	\$843.00	\$865.00
Monthly Rate	Faculty/Staff	\$27.50	\$27.50	\$29.25 [↑]	\$31.25	\$33.25	\$35.25	\$37.25
	Student	\$13.75	\$13.75	\$15.75	\$17.75	\$19.75	\$21.75	\$23.75
	Vendor	\$40.50	\$40.50	\$46.00 [↑]	\$48.00	\$50.00	\$52.00	\$54.00
	Visitor	\$25.00	\$25.00	\$27.00	\$29.00	\$31.00	\$33.00	\$35.00
	Motorcycle	\$9.00	\$9.00	\$11.00	\$13.00	\$15.00	\$17.00	\$19.00
	Reserved	\$68.75	\$68.75	\$70.75	\$72.75	\$74.75	\$76.75	\$78.75
Weekly Rate (Monthly / 2)	Faculty/Staff	\$11.00	\$11.00	\$14.75 [↑]	\$15.75	\$16.75	\$17.75	\$18.75
	Student	\$9.00	\$9.00	\$9.00 [*]	\$9.00 [*]	\$9.75 [↓]	\$10.75	\$11.75
	Vendor	\$13.00	\$13.00	\$23.00 [↑]	\$24.00	\$25.00	\$26.00	\$27.00
	Visitor	\$10.75	\$10.75	\$13.50 [↑]	\$14.50	\$15.50	\$16.50	\$17.50
	Motorcycle	\$4.50	\$4.50	\$5.50	\$6.50	\$7.50	\$8.50	\$9.50
	Reserved	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Daily Rate (Monthly / 4)	Faculty/Staff	\$5.50	\$5.50	\$7.25 [↑]	\$7.75	\$8.25	\$8.75	\$9.25
	Student	\$4.50	\$4.50	\$4.50 [*]	\$4.50 [*]	\$5.00	\$5.50	\$6.00
	Vendor	\$11.00	\$11.00	\$11.50	\$12.00	\$12.50	\$13.00	\$13.50
	Visitor	\$7.50	\$7.50	\$7.50 [*]	\$7.50 [*]	\$7.75 [↓]	\$8.25	\$8.75
	Motorcycle	\$2.25	\$2.25	\$2.75	\$3.25	\$3.75	\$4.25	\$4.75
	Reserved	N/A	N/A	N/A	N/A	N/A	N/A	N/A

[↑]Increase greater than typical increase to establish relationship between permits

[↓]Increase less than typical increase to establish relationship between permits

*No change in permit rate from previous year to avoid a permit rate decrease

By FY 2026, the proposed permit rate increases would be expected to increase annual permit revenue by nearly 60% over FY 2020 levels while keeping permit costs in line with or lower than peer institutions. With these rate increases in place, by FY 2026, annual net revenues would be expected to exceed \$2 million, with a reserve balance of approximately \$5.6 million. The annual rate increases could be reduced at this point (for example, to a \$1.00 per month increase each year), as revenues would allow for the funding of additional campus parking as well as transportation demand management investments to slow the growth of parking demand on campus.

Table 9. Budget with Revised Parking Permit Fee Increases

	Growth Factor	2019-20 FY 2020	2020-21 FY 2021	2021-22 FY 2022	2022-23 FY 2023	2023-24 FY 2024	2024-25 FY 2025	2025-26 FY 2026
Balance Forward		\$871,073	\$131,375	\$0	\$250,000	\$250,000	\$250,000	\$250,000
New Permit Revenue		\$0	\$0	\$446,000	\$892,000	\$1,339,000	\$1,786,000	\$2,232,000
Base Permit Revenue	1.01	\$3,806,741	\$3,844,808	\$3,883,256	\$3,922,089	\$3,961,310	\$4,000,923	\$4,040,932
Citations	1.00	\$796,941	\$796,941	\$796,941	\$796,941	\$796,941	\$796,941	\$796,941
Meters	1.00	\$377,908	\$377,908	\$377,908	\$377,908	\$377,908	\$377,908	\$377,908
Internal Transfers	1.00	\$951,327	\$951,327	\$951,327	\$951,327	\$951,327	\$951,327	\$951,327
Miscellaneous Revenue	1.00	\$39,625	\$39,625	\$39,625	\$39,625	\$39,625	\$39,625	\$39,625
TOTAL REVENUE		\$5,972,542	\$6,010,609	\$6,495,057	\$6,979,890	\$7,466,111	\$7,952,724	\$8,438,733
Professional Salaries	1.02	\$446,414	\$446,414	\$455,342	\$464,449	\$473,738	\$483,213	\$492,877
Classified Salaries	1.02	\$778,422	\$778,422	\$793,990	\$809,870	\$826,068	\$842,589	\$859,441
Wages	1.02	\$177,769	\$177,769	\$181,324	\$184,951	\$188,650	\$192,423	\$196,271
Fringe Benefits	1.02	\$485,412	\$485,412	\$495,120	\$505,023	\$515,123	\$525,426	\$535,934
Operations	1.03	\$1,030,200	\$1,061,106	\$1,092,939	\$1,125,727	\$1,159,499	\$1,194,284	\$1,230,113
Recharges	1.00	(\$182,948)	(\$182,948)	(\$182,948)	(\$182,948)	(\$182,948)	(\$182,948)	(\$182,948)
Current Bond Payments		\$2,941,228	\$2,138,440	\$2,140,244	\$2,143,722	\$2,141,399	\$2,141,399	\$2,141,399
Tropicana Bond Payment		\$0	\$1,021,763	\$843,658	\$843,658	\$843,658	\$843,658	\$843,658
Maint. / Improvements	1.00	\$360,000	\$360,000	\$360,000	\$360,000	\$360,000	\$360,000	\$360,000
TOTAL EXPENSES		\$6,036,497	\$6,286,378	\$6,179,671	\$6,254,452	\$6,325,187	\$6,400,043	\$6,476,745
ENDING BALANCE		\$807,118	(\$144,394)	\$315,387	\$975,438	\$1,390,924	\$1,802,681	\$2,211,988
Contribution to Reserve		\$675,743	(\$144,394)	\$65,387	\$725,438	\$1,140,924	\$1,552,681	\$1,961,988
Balance Carried Forward		\$131,375	\$0	\$250,000	\$250,000	\$250,000	\$250,000	\$250,000
Reserve Withdrawal		\$0	(\$13,000,000)	\$0	\$0	\$0	\$0	\$0
Reserve Balance		\$13,311,019	\$166,625	\$232,012	\$957,450	\$2,098,374	\$3,651,055	\$5,613,043

The following section examines various metrics that could be used to guide the timing of investments in additional parking on campus.

Student Parking Demand Forecasts

Baseline Student Parking Demand Forecasts

Based on the Fall 2019 parking inventory and occupancy study (see **Chapter V**), as of 2019 there were **10,048 student parking spaces** on the Maryland Campus, serving approximately **31,171 students**, or **0.3224 built parking spaces per student**. On event days, the University needs to maintain 1,200 parking spaces for event parking (taken from the student parking areas in the White Lot), meaning the effective campus student parking supply on event days is 8,848 student parking spaces. At the peak time observed during the Fall 2019 occupancy study (Thursday afternoon), **7,569 student parking spaces** were occupied. This equates to an effective peak hour occupancy rate of **85.5%**, excluding the spaces that need to be maintained for events. Expressed per student, UNLV’s *measured parking demand* is approximately **0.2428 parking spaces per student** on the Maryland campus.

Table 10 presents a modified version of the table from Page 11 of the 2019 PTS Annual Report, with the following key changes:

- FY 2020 added
- Starting enrollment set to 31,171 (Fall 2019), escalated at 2% per year
- Only Tropicana Garage Expansion assumed (Transit Garage excluded)
- Peak student parking demand set to 0.2428 per student
- Starting student parking supply set to 10,048
- Effective occupancy added (after removing 1,200 parking spaces for events)

Using 2% student growth and a student parking demand rate of 0.2428 parking spaces per student, effective student parking occupancies are expected to reach approximately 89% by Fall 2025 (assuming the Tropicana Garage expansion project is completed in FY 2022). More than 1,000 student parking spaces are expected to be unused at peak times on campus, even after excluding 1,200 spaces for events.

Table 10. Forecasted Student Parking Demand

	2019-20 FY 2020	2020-21 FY 2021	2021-22 FY 2022	2022-23 FY 2023	2023-24 FY 2024	2024-25 FY 2025	2025-26 FY 2026
Estimated Enrollment	31,171	31,794	32,430	33,079	33,740	34,415	35,104
Assumed Parking Supply Increase	0	0	758	0	0	0	0
Total Parking Supply (Maryland Campus)	13,144	13,144	13,902	13,902	13,902	13,902	13,902
Student Parking Supply (Maryland Campus)	10,048	10,048	10,806	10,806	10,806	10,806	10,806
Total Parking Supply per Student	0.4217	0.4134	0.4287	0.4203	0.4120	0.4039	0.3960
Student Parking Supply per Student	0.3224	0.3160	0.3332	0.3267	0.3203	0.3140	0.3078
Assumed Parking Demand per Student	0.2428	0.2428	0.2428	0.2428	0.2428	0.2428	0.2428
Assumed Student Parking Demand	7,569	7,720	7,875	8,032	8,193	8,357	8,524
Student Parking Supply Reserved for Events	1,200	1,200	1,200	1,200	1,200	1,200	1,200
Fall Starting Semester Open Spaces	1,279	1,128	1,731	1,574	1,413	1,249	1,082
Student Parking Peak Occupancy	85.5%	87.3%	82.0%	83.6%	85.3%	87.0%	88.7%

Options to Address Student Parking Needs

Overview

With the parking industry, “85% occupancy” is a commonly cited metric, and when parking demands begin to exceed 85%, it is widely considered to be difficult to find parking. This metric is typically applied in the context of *customer and visitor* parking, however, where local demands and durations of stay are more variable than the daily parking demands of employees or students.

For student, faculty, and staff parking on campuses, it is often feasible to effectively manage parking to 92% - 95% occupancy levels (5% - 8% buffer). This is due to the closed nature of campus environments, where parking demands and permit sales allow for a detailed assessment of hourly parking demands. Managing to 92% - 95% occupancy often requires several active parking management strategies, including real-time parking availability and on-campus transportation systems to allow better utilization of remote and edge parking supplies.

The following sections present several approaches to addressing growing student parking demands on campus.

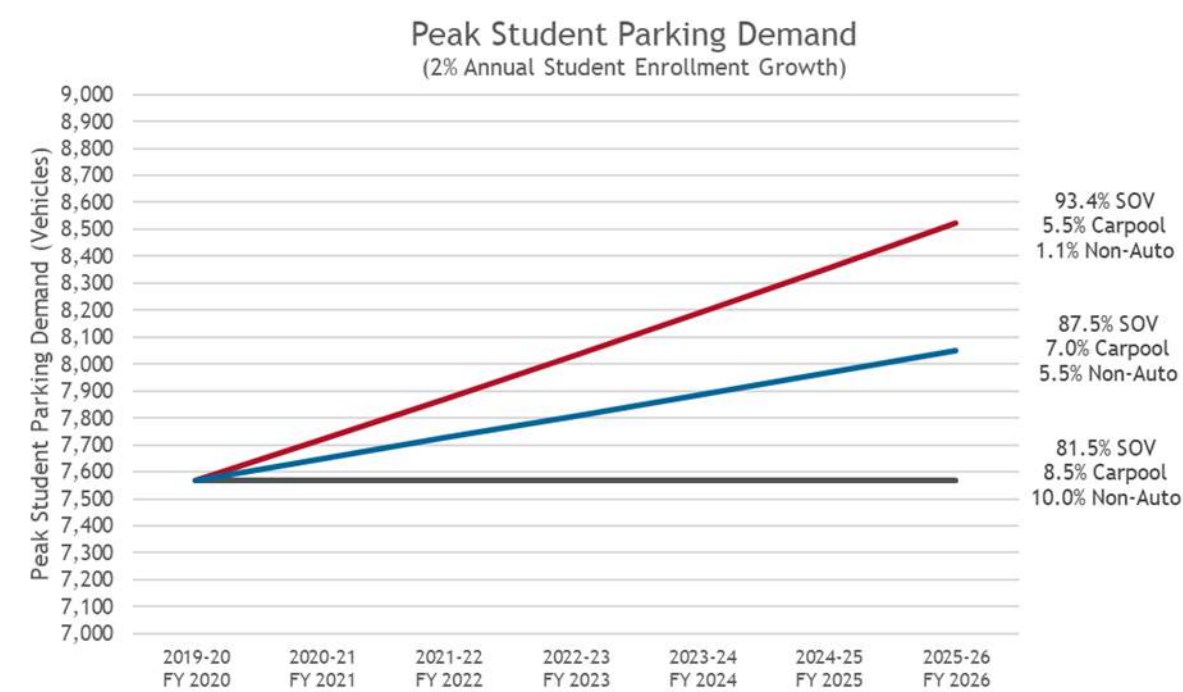
Transportation Demand Management (TDM) Strategies to Reduce Peak Hour Demands

To predict future parking demands, it was assumed that for every additional 100 students, 24 additional parking stalls will be needed to serve their peak hour parking needs (0.2428 parking stalls per student). With no changes to student drive alone behavior, it is anticipated that peak student parking demand will increase by 955 parked vehicles by 2026 to serve projected student growth.

However, investments in transit service, bike amenities, and incentives to encourage the use of alternative modes of transportation have the potential to reduce the amount of additional parking needed to serve campus growth. **Figure 70** shows three different scenarios for student peak parking demand over time, using the following assumptions:

- 2019 Peak Student Parking Demand: 7,569 vehicles
- 2019 Student Population: 31,171 students
- Baseline Mode Split Factors⁵:
 - Single-Occupancy Vehicle (SOV): 93.4%
 - Carpool: 5.5%
 - Non-Auto (Walk, Bike, Transit, etc.): 1.1%
- Carpool Persons per Vehicle: 2.5 persons/vehicle
- Proportion of Student Population on Campus at Peak Time: 0.2540⁶
- Student Population Annual Growth: 2.0%

Figure 70. Peak Student Parking Demand Over Time Based on Mode Split Assumptions



Based on this analysis, to maintain flat peak parking demand with increasing enrollment, the proportion of students driving alone to campus cannot exceed 81.5% by 2026. A non-auto rate of 10.0% and a carpool rate of 8.5% was assumed in this scenario, although any increase in non-auto trips would further reduce peak parking demand (as carpool trips still require parking, just less than SOV trips). With these assumptions, by 2026, peak parking demand per student would drop to **0.2156 parking stalls per student**. Assuming the construction of new parking costs approximately \$30,000 per stall, reducing peak parking demand by 955 stalls has the potential to save **\$28.7 Million** in deferred or delayed parking construction costs.

The middle scenario assumes less aggressive investments in Transportation Demand Management strategies, with an assumed SOV rate of 87.5% by 2026. With this assumption, by 2026, peak parking demand per student would drop to **0.2293 parking stalls per student**. This scenario has the potential to reduce peak parking demand by 473 student parking stalls, saving approximately **\$14.2 Million** in deferred or delayed parking construction.

⁵ From 2019 Campus Survey, Student Responses

⁶ Derived from 2019 peak student parking demand (7,569), assumed 2019 student population (31,171), student mode split factors, and assumed persons per vehicle for carpools (2.5 persons/vehicle).

Various strategies that could be used to incentivize carpooling and the use of alternative modes of transportation are outlined in the following Chapter (**Chapter XI: Transportation Demand Management**). The Regional Transportation Commission (RTC) could serve as a key partner as the University considers additional investments in TDM to address growing parking demand. One option is to pursue a partnership with RTC as a key mobility partner moving forward, as discussed further in **Chapter XII: Funding and Financing Strategies**. Investing in TDM in the near term to address growing parking demand could provide the time needed to work in partnership with RTC on a Mobility Hub & Transit Center Garage project.

Strategies that incentivize the use of alternative modes help to reduce peak parking demand by shifting students into forms of transportation that do not require parking a car on campus (or increase the average occupancy of each parked car on campus through carpooling). The scenarios above assume a fixed proportion of students are on campus at peak times (25.4% of the student population at the peak). However, two additional strategies can also help to reduce peak parking demand: **peak spreading** (through schedule adjustments) and **telecommuting/online learning**. Both strategies focus on *reducing the total number of students on campus during peak times*. This may or may not be a desired and/or feasible approach, so a detailed analysis is not included here.

Investments in Improved On-Campus Transportation Options

The areas with available parking are currently on the edges of campus. When parking on the very edges of campus, some students might need to walk up to ½ mile to get to the center of campus (approximately 10 minutes). This distance could be even longer if they are unable to park on the side of the campus closest to their destination. Investments in on-campus transportation options, such as a shuttle service, offers one approach to making better use of outlying parking areas. Implementing shuttle service comes with often significant costs, and a few of the key issues that should be explored prior to implementing shuttle service are outlined **Chapter XI** (including elements such as number of buses needed, stations, staffing, infrastructure to maintain reliability, etc.). Below is a brief discussion of funding approaches to implement and fund ongoing shuttle service.

Student Transportation Fee

Chapter XII includes a discussion of various ways Universities implement transportation fees to invest in campus mobility services. Whether priced per credit hour or per semester, student transportation fees are often charged as part of tuition and are therefore applied independently from other transportation costs (such as parking permit fees or transit passes). If UNLV elects to move forward with a Transportation Fee, it will likely be necessary to maintain a separate fund within PTS to track how these revenues are allocated to transportation services.

Tiered Permit Pricing (or Demand-Based Pricing)

Currently, students have access to a single parking permit which provides them access to all the different student lots on campus, regardless of the convenience of each lot. Most airports and many Universities

offer “economy” parking areas, which are priced at a lower rate as they require either a longer walk or use of a shuttle. UNLV could consider implementing a two-tiered (or demand-based) permit pricing system (Premium and Economy) where the premium parking revenues are used to help fund a shuttle service to the economy parking lots. This is also discussed in **Chapter XII**.

Combination Approach

Shuttle services are often funded through a variety of sources, and a combination approach may be needed to maintain operation of a high-frequency shuttle (10 minutes or less). For example, PTS could introduce new permit options and commit to a fixed annual payment into a Mobility Enterprise Fund that is also funded by a new Student Transportation Fee.

Ultimately, a shuttle program would likely serve two primary goals: 1) Improve on-campus mobility, thereby making it easier to access and move around campus without the use of a vehicle and 2) make more efficient use of outlying or off-campus parking areas in order to delay the need to invest in additional structured parking. While a campus shuttle would not necessarily reduce student parking demand, it could help to reduce the assumed number of open parking spaces that should be maintained during peak times.

Real-Time Parking Availability

In order to effectively manage parking to less than a 15% buffer (85% occupancy), it is typically critical to provide real-time parking information to commuters so that they can decide in real-time where they will be able to find parking on campus. Attempting to manage campus parking with very little buffer in the absence of real-time information can create both frustration as well as increased traffic on campus as students search for parking.



Many airport garages make use of individual stall sensors, which can direct parkers to available parking spaces. In a campus environment, particularly for student parking where users are quite familiar with the parking options, individual space sensors are likely not necessary. Tracking space availability by parking lot or area is likely perfectly adequate to help direct commuters to the areas of campus where they will be able to find parking. Some of the most cost-effective solutions on the market today rely on either cameras or sensors embedded in rubber speed humps that can be placed on parking lot access points to constantly track vehicle entries and exits to maintain a live tally of parking availability which can be displayed on a message board, online, or through a mobile app (the example shown is from Parking Logix).

Daily Pay-As-You-Go Parking Pricing

Robust TDM programs typically strongly advocate for moving away from annual parking permits. The reason is that once a user has pre-paid for parking, there is no financial benefit to occasionally taking another mode (and a strong disincentive from paying to take transit). Should the University consider moving away from annual or monthly parking permits to a daily “pay-as-you-go” type program, real-time parking availability can provide an important tool in making this transition. Additionally, real-time parking

availability can also be coupled with a performance-based pricing program where the areas that experience highest demands can be priced higher to help incentivize the use of outlying parking areas.

Performance Measures

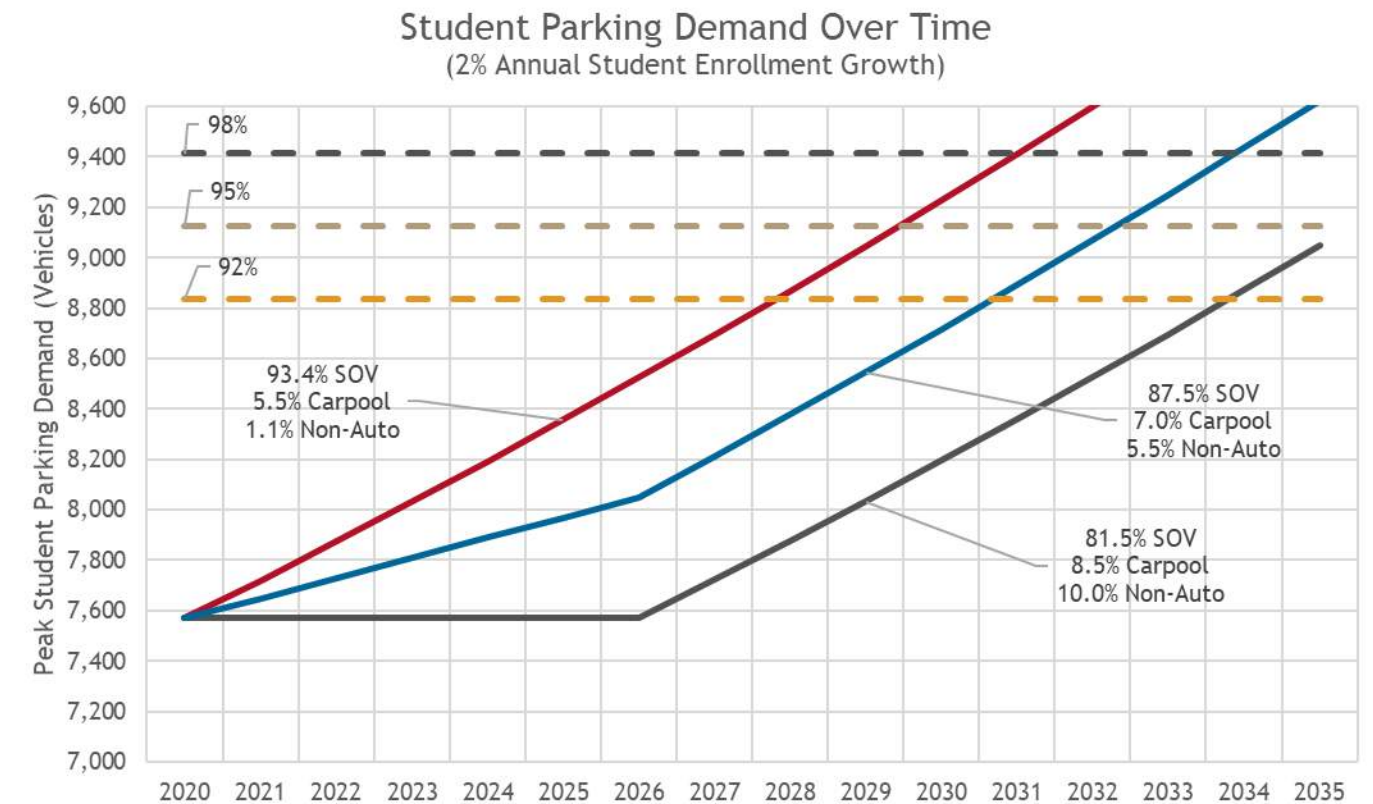
The decision to invest in additional on-campus parking for students depends on a variety of factors including:

- Investments in Transportation Demand Management strategies to reduce parking demand
- Investments in on-campus transportation options to make better use of outlying parking resources
- Investments in real-time parking availability to manage to the existing parking supply
- Acceptable levels of peak hour occupancy (linked to the strategies above)

Figure 71 extends the timeline previously presented in **Figure 70** and shows three different occupancy thresholds that could be used to guide the timing of investing in additional parking (assuming a fixed effective student parking supply of 9,606 spaces, which assumes completion of the Tropicana Garage and excludes 1,200 spaces which need to be reserved for event parking on event days). The two scenarios with revised mode split assumptions build in a 6-year period to phase in TDM strategies.

With no investments in TDM and if the maximum acceptable effective occupancy is held to 92% (approximately 770 open student parking stalls at peak times, after excluding 1,200 stalls for events), the University will likely need to invest in additional student parking by around 2027-28. Even with no investments in TDM, shuttle service and real-time parking availability could allow the University to manage to around a 5% buffer (95% occupancy); in this case, investing in additional parking could be delayed until around 2029 (allowing more time to contribute to a reserve fund for a down payment, therefore reducing debt service payments on a new garage).

Figure 71. Peak Student Parking Demand Over Time



The graph demonstrates that combining various approaches can extend this timeline even more. For example, combining aggressive TDM investments with shuttle service and real time-parking availability could allow the University to delay investments in additional student parking on campus until around 2035.

Regardless of the specific TDM measures implemented, the University will likely be able to delay investing in additional parking (such as the Transit Center Garage) until at least 2027-28. As shown previously, if permit rates are strategically increased each year, revenues will likely be adequate to fully finance the next parking garage by that time.

Other Considerations

To accommodate anticipated growth, new buildings are planned on campus grounds. Some of the new buildings are expected to be located on existing parking supply. The map in **Figure 72** illustrates the preliminary campus master plan being developed by Sasaki.

Figure 72. Future Campus Development

Future Campus Growth

Phasing



It is estimated that the new buildings will replace the lots listed in Table 7.

Table 11. Future Parking Reductions

Lot	Number of Spaces
Lot B	34
Lot C	55
Lot D	324
Lot I	81
Lot J	40
Lot K	167
Lot L	310
Lot N	366
Lot V	56
Total Spaces Removed	1,433 spaces

If these removed spaces are not replaced elsewhere on campus when they are removed, the timeline presented in **Figure 71** may shift accordingly. It will be important to track the timing of implementation of the Campus Master Plan to assist with determining when additional parking investments may be needed.

Notably, the new parking supply identified in the Campus Master Plan is primarily along the periphery of campus and the parking identified for removal is in the interior. This approach would strengthen the pedestrian nature of the core campus by reducing vehicular traffic, gradually shifting priority to pedestrians and non-motorist. The benefits of a campus circulator shuttle would only increase with additional parking concentrated on the edges of campus.

Conclusions and Recommendations

Based on the budget review, parking demand review, and analysis of potential impacts of TDM strategies, shuttle service, and real-time parking availability, the following phased recommendations have been developed.

Phase 1 - Initial Parking Expansion (Tropicana Garage) & Permit Rate Increases

The Tropicana Garage expansion is on track to grow the student parking supply by nearly 8% (from 10,048 to 10,806 spaces) and can be funded at nearly 50% from existing reserves. In order to ensure the nearly \$1 Million in annual debt service can be covered while also continuing to contribute to the reserve fund, it is recommended that PTS increase permit fees by approximately **\$2.00 per month** annually through 2026 across all permit types. Fully financing the Transit Center Garage would have the potential to exhaust all revenues, and it is recommended that this project be delayed until needed based on demand. This delay could also provide additional time to pursue a funding partnership, as will be discussed in **Chapter XII**.

Phase 2 - Transportation Demand Management and Redistribution of Demand

Moderate investments in TDM can lead to significant savings in the long term, particularly if investments in additional parking can be delayed until an adequate reserve fund is available or funding partnership identified to minimize financing expenses. **Chapter XI** identifies several near and long term TDM investments that could help to reduce the percentage of students driving alone to campus. A student transportation fee is highly recommended to assist with the funding of a campus shuttle system.

In combination with the recommended TDM strategies (including a campus shuttle system), investments in real-time parking availability tracking will help to maximize the use of existing parking resources, which will have the effect of delaying the need for additional parking on campus. Reserve funds could be used to fund installation of sensors at the access points to several large lots on campus, and this data could be provided to students in real-time either through an app or on the website.

This combination of TDM, shuttle service, and real-time parking availability should allow the University to manage the student parking supply to a buffer of 8% (or less), delaying the need for investments in additional parking supply (which typically costs at least \$3 million per 100 stalls).

Phase 3 - Additional Parking Expansion Based on Demand

Ultimately, with a growing campus community, additional parking will likely be needed. **Figure 71** was developed to help guide when this investment will be needed. Preliminary projections indicate that with

Future Campus Growth

the above recommendations, additional parking beyond the Tropicana Garage expansion can be delayed until at least 2027-28. However, these assumptions should be revisited annually as many of these underlying assumptions are likely to change, particularly if existing parking resources are removed for new building construction. Regardless of the specific timing, exploring potential funding partnerships early on will help to identify the interim steps that need to be taken now to line up funding sources in the future.

XI. Transportation Demand Management



XI. Transportation Demand Management

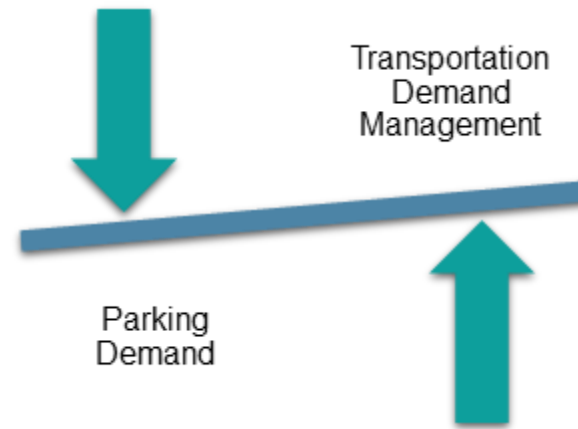
Transportation Demand Management (TDM) is an increasingly important transportation tool for colleges and universities to reduce the need to continue to invest in costly additional parking resources to accommodate campus growth. Investing in multimodal infrastructure and incentivizing the use of alternative modes of transportation is often a key component of broader sustainability goals for campus communities, but TDM programs typically bring benefits to all users, regardless of their preferred transportation mode. TDM programs that are effective in reducing the number of vehicle trips per person on campus help reduce traffic congestion, relieve parking pressure, and save money over time by minimizing the need for parking infrastructure investments. While driving alone is often one of the most commonly selected transportation modes, even with a robust TDM program in place, TDM helps to increase the number of convenient and cost-effective transportation *options*. By providing those interested in taking alternative modes of transportation with safer and more robust transit, walking, and biking options, the entire campus community benefits, even those who don't make use of alternative modes.

TDM programs and investments that focus on reducing “drive alone” trips can take a variety of forms—transit pass subsidies, bike share systems, carpool programs, investments in trail networks, University-funded bus and shuttle service, rewards programs, and much more. Many of these programs have expanded rapidly with the aid of technology and smartphone applications that make a variety of transportation options easier to use and more accessible to the casual user.

As UNLV continues to grow and as campus land use patterns evolve, balancing how the community accesses campus will only grow in importance. Auto use will be a large portion of the mode use for the foreseeable future; however, harnessing transportation options will help manage growing parking demand allowing for less costly investment into more sustainable options.

This section is organized as follows:

- UNLV's existing TDM programs and incentive systems.
- TDM best practices at similar universities, including successful and innovative programs and projects that can serve as templates for future investments.



- Near and Longer-Term Recommendations for investing in TDM and reducing parking demand per person on campus over time.

Current TDM Program Review

Mode Split and Perceptions of Alternative Modes

Student, staff, and faculty perceptions of alternative modes and TDM programs are measured regularly through campus surveys. Some key findings from the most recent survey (see the **Community Engagement** section) include:

Current Weekday Mode Choice

- Faculty & Staff
 - 92.4% drive alone (or motorcycle)
 - 5.7% carpool or vanpool
 - 0.9% ride bus
 - 0.5% walk/run
 - 0.4% bike
 - 0.1% e-bike/scooter
 - 0.0% Uber/Lyft/taxi
- Students
 - 93.4% drive alone (or motorcycle)
 - 5.5% carpool or vanpool
 - 0.6% ride bus
 - 0.3% walk/run
 - 0.1% bike
 - 0.1% e-bike/scooter
 - 0.1% Uber/Lyft/taxi

Perceptions of Bicycling Conditions

- On-Campus
 - ✓✓ 17% of faculty/staff and 19% of students rated on-campus bicycling conditions as good or excellent.
 - 👎👎 50% of students/faculty/staff rated on-campus bicycling conditions as poor or very poor.
- Off-Campus
 - ✓✓ 2% of faculty/staff and 9% of students rated off-campus bicycling conditions as good or excellent.
 - 👎👎 86% of faculty/staff and 71% of students rated off-campus bicycling conditions as poor or very poor.

The top-rated bike improvement among faculty/staff and students is the creation of more protected bike lanes.

21% of faculty/staff and 27% of students indicated that they would consider using a bike share system as an option for getting around campus.

Perceptions of Bus Conditions

- Bus Service
 - ✓✓ 11% of faculty/staff and 13% of students rated bus services as good or excellent.
 - 👎👎 68% of faculty/staff and 65% of students rated bus services as poor or very poor.

The top-rated potential bus service improvements/TDM programs were higher-frequency bus service for faculty/staff (26%) and a free bus pass program for students (37%).

49% of faculty/staff and 59% of students indicated that they would consider using a campus shuttle as an option for getting around campus.

Under current conditions, the campus is heavily auto dependent, and investments will likely be needed in bus service and bicycle infrastructure to increase the share of the campus community that considers these to be viable alternatives to driving. However, given the percentage of users who would consider using a campus shuttle or a bike share program, there is clearly interest in alternative modes that can be tapped into over time.

Overview of Existing and Past TDM Programs

U-Pass Program

Started as a pilot program in 2013, the U-Pass program allows students, faculty, and staff to purchase heavily discounted bus passes for use on the entire RTC transit system. Available to purchase to anyone with a valid UNLV Rebel Card, the transit pass can save up to 68% on public transportation use. The cost of a semester U-pass is \$104.00 (68% savings) or \$32.50 per month (50% savings). The passes can be used not only to get to/from class, but also on nights and weekends for recreational use. In the past, a U-Pass was available for purchase at the UNLV Student Union, Parking Office or at the RTC Administration building. In 2019, the U-Pass program transitioned to a new mobile application eliminating the need for UNLV as a necessary pass-through; largely relieving the staff of stocking bus passes and credit card transaction fees.



Club Ride

Club Ride is an incentive-based, self-reporting program designed to encourage the use of alternative transportation options (carpooling, vanpooling, riding transit, walking, bicycling, motorcycling, or telecommuting) by commuters. Administered by RTC, the program has commuters log each trip made by an alternative mode into a database using email, text, phone, or the Club Ride app. Participants are then eligible for discounts at local retailers and restaurants as well as monthly drawings for prizes (including \$10, \$20, \$25, and \$50 gift cards as well as 30-Day RTC bus passes, valued at \$65).



Daily Parking Permits

For most students, faculty, and staff who primarily drive to campus, annual or monthly permits represent the lowest cost permit option. However, UNLV also offers daily and weekly parking permits for those who prefer to only drive occasionally:

Figure 69. Daily and Weekly Parking Permit Costs

	WEEKLY	DAILY
Faculty/Staff	\$11.00	\$5.50
Student	\$9.00	\$4.50
Vendor	\$13.00	\$11.00
Visitor	\$10.75	\$7.50

Under the current pricing structure, those who park even just four or five times on campus per month are better off purchasing a monthly or annual permit. However, these daily and weekly permits provide one additional tool for UNLV to help encourage the use of alternative modes as even those who prefer to bike

or take transit often also need to drive on occasion. These passes provide these users that option, while not requiring everyone to purchase an “unlimited” parking pass up front that discourages the use of alternative modes since the parking fee has already been paid.

Past Program: Car Sharing

Zipcar, a car sharing service, serviced the UNLV campus from 2014 to 2019. Car sharing helps support TDM by providing those who choose to make use of alternative modes an option to easily obtain a car when needed.

As of July 2019, Zipcar ceased operating. A new provider is being considered.

Sustainable Transportation: EV Charging Stations

Electric vehicles (EVs) are not traditionally considered part of TDM programs as accommodating EVs does not reduce traffic or lessen parking demands. However, EVs are an important part of any sustainable transportation program, which is also a key goal of TDM.

First installed in 2013, there are now a total of eight electric vehicle charging stations located on campus. Initially beginning with four locations, these stations allow for two vehicles to be charged at once. The use of the EV stations has been extensive, with kilowatt hour use increasing almost 300% (2015: 22,082 to 2019: 63,243). All noted station improvements were completed in 2019, doubling the capacity and adding a new location on the west side of Lot 0. The upgrades and new stations received partial subsidy through NV Energy.



Active Projects/Studies That Will Support Alternative Transportation

Maryland Parkway Alternatives Analysis

A critical corridor in Las Vegas, the Maryland Parkway connects many major centers including UNLV. RTC is exploring options for improved mobility along Maryland Parkway including through high-capacity transit. As one of the major activity centers along the 8.7-mile route, UNLV will be in close coordination as this project moves forward. Benefits to bringing high-capacity transit along this corridor include new transportation infrastructure, better transit service (frequency and accessibility), and safety upgrades. In 2019, an environmental assessment of the analysis was completed, and later that year, the RTC Board voted to move forward with bus rapid transit (BRT) as the option to pursue. The project application will be submitted for federal funding in 2020.



Expanded Harmon Route

This proposed new RTC route and new roadway connection will provide east/west service through the Maryland campus. The road design was completed at 30% at the request of RTC. Though one of RTC's top priorities, funding and other aspects of the project have made the implementation timeline uncertain at this point.

Bicycle Infrastructure Enhancements

Recent studies have identified priority locations and costs for improvements to enhance bicycling to and around campus. In 2015, UNLV was awarded a \$50,000 grant from the RTC Unified Planning Work Program (UPWP) to study bicycling on campus in conjunction with the local Spencer Greenway Project. The study focused on connecting UNLV to the city bicycle routes, connections to downtown, and other areas off-campus. In addition, on-campus bicycle routes and infrastructure enhancements (bicycle lanes, arrival statics from off-campus, and possible bicycle locker or bicycle share stations) were identified. One such improvement is the bicycle repair station and separate air station located at the UNLV/RTC Transit Center. This free station contains repair tools and an air station to help encourage the use of bicycling as an alternative commute mode. A follow-up report will review cost estimates associated with some of these improvements as well as a draft scope of work for a bicycle share RFP.



Transportation Demand Management

Bike Share Program

In 2015, with the support of RTC, a bicycle share program survey was administered, aimed at understanding the perception of the proposed bicycle sharing system and the locations of docking stations. In 2017, a follow up survey was administered by PTS. RTC's current bike share program is exclusively in downtown Las Vegas with 21 stations and 200 bicycles. The bicycles are available 24/7 in Downtown Las Vegas. Pass costs are as low as \$5.00 for a 24-hour pass, \$10 for a 3-day pass, and \$15 for a 30-day pass, and various promotion codes can reduce the costs. Currently, the closest bicycle station is located at the intersection of Las Vegas Boulevard and East Sahara Avenue, 2.5 miles from campus. Given the potential interest in bringing bike share to campus, an RFP was recently drafted and will be distributed in the future if warranted.



Bike Lockers

Knowing that bicycle security is an important component of bicycle use for students, faculty, and staff, UNLV is actively reviewing bicycle locker bicycle storage options on campus. In 2013, a bicycle use study was conducted to determine the locations of greatest demand. Additional University departments have been working together to develop a plan for the installation of more secure bicycle racks in the near future. Once installed, these locations will be evaluated for use and determine next steps for future demand. Bicycle locker installation plans have also been developed by Campus Housing, CSUN and Planning and Construction.

Partnership with FlixBus

In 2019, a partnership with FlixBus was implemented. This partnership allows FlixBus to use UNLV as one of three stops in Las Vegas, providing the campus community with an alternative option to driving during peak travel times. Key destinations from Las Vegas include Los Angeles, Salt Lake City, and Phoenix.



Photo Credit: Las Vegas Review Journal

TDM Best Practices and Peer Review

With the average cost of a single structured parking stall now reaching \$30,000 to \$50,000, TDM programs and services that help to reduce the need to invest in parking are expanding around the country. As noted by PTS:

UNLV is a strong supporter of alternative transportation initiatives in and around the campus. Parking and Transportation Services, as the name suggests, works diligently on trying to improve aspects of

transportation to, on and from the campus. Alternative transportation is a major focus of most parking programs. Few major universities today ignore the benefits of bus transportation on and off a campus to reduce the number of vehicles parked daily. UNLV will continue to maintain a focus in this direction and be a strong supporter of sustainability programs.

As seen by UNLV's recent grant applications, partnerships, and investments, TDM programs go far beyond just bus transportation. In fact, as car ownership declines for younger people and technology makes shared mobility increasingly accessible, TDM is growing in importance in many transportation planning efforts.

While all university systems face different existing conditions and priorities, examining peer institutions is an excellent tool to use for inspiration and lessons learned. Goals and objectives vary by campus but monitoring and measuring the success of other TDM strategies gives insight into emerging challenges and opportunities. The following sample provides some examples of TDM programs offered at other universities.

Colorado State University

CSU students get a discounted Zipcar membership rate of \$15/year - then pay hourly while driving a Zipcar.

A Transfort transit pass is loaded onto students' ID cards (RamCard). The cost is built into student fees so that students can travel off-campus and utilize MAX, the city's rapid bus system. The pass can also get students to neighboring communities including Loveland, Longmont, and Boulder via the FLEX, a regional bus service operated by Transfort.

Located throughout campus and downtown Fort Collins, e-scooters are available to rent for short trips. For low-income riders, the first 50 rides per month of 30 minutes or less are free.

"Around the Horn" is a free campus shuttle service that connects parking areas to stops on the main campus. The shuttle runs every 10 minutes.

As skiing is an important part of life for students, faculty, and staff, CSU offers round-trip transportation between CSU and many Colorado ski resorts for \$20 per student and \$30 per employee. The service is called SkiSU.

In warmer weather, CSU encourages use of longboards (long skateboards) on all sidewalks and trails. There are several longboard rack locations throughout campus for safe storage.



Transportation Demand Management

Fort Collins is one of four bicycle platinum bike-friendly cities in the country. There are more than 17,000 bike parking spaces on campus. CSU offers a keycard-accessible Secure Bicycle Parking Shelter at the transit station. Permits are available for both students and employees.

Pace Bike Share Bicycle is a bikeshare program on campus. CSU employees receive 50% off an annual membership. A Campus Bicycle Advisory Committee helps oversees and manages bicycle efforts on campus, while a Bicycle Master Plan steers long-term policy and planning efforts.

Carpooling is facilitated through a regional on-line platform (Way to Go), and the cost of the carpool permit is split between riders. License plates of the registered carpool vehicles are recorded, and a carpool agreement form is filled out. Vanpooling is also an option for groups of five people or more traveling 10 to 80 miles to/from work. An emergency ride home program allows carpool/vanpool riders a means to go home in case of an emergency.

Flexible parking permit options, including daily parking 10-packs, can be purchased through CSU's Parking and Transportation Services. This allows commuters who would like to use transportation options as their primary commute means to not have to commit to monthly or annual parking passes.

Finally, the CSU employee manual touts the importance of flexible work arrangements such as flextime schedules, compressed work weeks, or telecommuting.

University of New Mexico

Eligible UNM students, faculty, and staff can ride ABQ Ride/ART (City of Albuquerque transit system) for free with a bus pass sticker. Riders can track buses in real-time using the UNM application (ABQ RIDE) or information can be received via text. All ABQ buses are equipped with bicycle racks.

The League of American Bicyclists awarded UNM with a Bronze level Bicycle Friendly University award. There are numerous bike racks on campus and 94 bike lockers available to rent for \$48/year (there is currently there is a waiting list).

The UNM Shuttle offers rapid and convenient campus travel free of charge to UNM students, staff, faculty, and visitors. The shuttle routes connect to the Downtown New Mexico Rail station, local parking lots, and throughout campus (including North, South, and Main campus).

There are two ChargePoint Level 2 Commercial Charging Stations located on campus. The electric charge is free while the cars are parked.

University of California Los Angeles

One quarter (academic term) of free transit access for eligible UCLA students, staff or faculty. This pass (Go Metro) which is loaded on the University ID (BruinCard) provides unlimited rides on any Metro rail or bus line.

UCLA students and employees are eligible for subsidized transit passes from seven different transit agencies.

Substantial investments have been made in bicycle infrastructure through a combination of on-road and end-of-trip bike facilities, promoting and providing a more bikeable campus for students, employees, and visitors. There are over 3,000 bike racks and lockers located on campus.

- Eligible students and employees who select walking or biking as their primary commute mode receive incentives such as vouchers to the UCLA Bike Shop, gift cards for shoe and footwear retailers, shower access at recreation centers on campus, or a membership to the local bicycle coalition.
- Through the "Earn-a-Bike" program, certain employees and graduate students (with restrictions) are eligible to turn in their parking permit in exchange for a \$450 bicycle package that includes a bike, light, lock set, helmet, and Bruin Commuter Club welcome kit.
- Bruin Bike Share is the on-campus bike share program with university pricing options (annual/monthly), public pricing options (annual/monthly) and daily rates.

UCLA encourages use of their own Trip Planner, an online program which helps determine the best route to campus using alternative modes.

UCLA offers a Vanpool and Carpool program at subsidized rates. The vanpool program is for weekday commuting traveling to/from campus and users do not have to purchase a parking permit. Carpool permit rates are tiered based on the number of passengers in a vehicle.

University of Southern California

Offers free transportation mobile app that is designed to provide users with real-time information about the service they offer and the services they are partnered with, which includes bus times and locations as well as alerts for route changes and other pertinent information.



Transportation Demand Management



USC employees (faculty and staff) are eligible for a 50% subsidy on the cost of transit passes purchased through USC Transportation. Employees can pay for the transit passes using pre-tax payroll deductions further reducing the cost of the passes. As a bonus, all transit pass participants are eligible for up to three free daily parking passes per month in a parking structure.

Reduced cost carpool permits are available for faculty, staff, and students. All carpool members must commute at least 2 miles and carpool 80% of the distance to qualify

for a carpool permit.

A carsharing option (Maven) is available allowing access to a range of cars at multiple locations.

Partnering with Enterprise rent-a-car, discounted rates are available for faculty, staff, and students over 21.

DART is a program to assist students, faculty, and staff facing temporary mobility issues in getting around campus providing campus golf carts to those in need.

USC offers a graduate student U-Pass program that provides a reduced fare transit pass for graduate students.

Students taking classes at night can get a lift using the Campus Cruiser, a free car service which offers either walking or vehicle escort to campus destinations.

The Shower Pass Program allows those commuting to campus more than two miles who do not have a USC parking permit to shower on campus for free. Participants are granted access to the gym and are eligible for a discounted membership to the recreation center.

Arizona State University

ASU students, faculty, and staff can ride local buses and light rail for discounted rates by purchasing an ASU transit pass.

Students can purchase a highly discounted U-Pass. The transit pass is largely subsidized by ASU.

Free emergency ride home options are available for transit pass riders and bike commuters.

Arizona State University manages an intercampus bus shuttle service, which provides regular connections among campuses. Shuttles can be tracked with real-time information.

Sustainable parking options including electric vehicle charging stations, carpool permits, and eco-passes for various transportation choices.

As a gold level Bicycle Friendly University, ASU has a host of bicycle benefits including extensive routes (shared paths, bicycle boxes, etc.), bike racks, fix-it stations, and a bike co-op.

As ASU continues to grow, the total parking spaces per person has been declining since 2011, which is a result of increased mobility options (walking, bicycling, and shuttle use).

University of Wisconsin - Madison

A student fee (\$55.48) funds a transit partnership with Metro Transit to allow unlimited rides for faculty and students. Through this partnership, Metro Transit operates all University of Wisconsin routes (26 that pass close to campus and nine that serve destinations on campus itself), and with these various transit offerings, students make up approximately 22% of Metro Transit's overall ridership and the University of Wisconsin program contributes around \$3.7 million to Metro Transit's budget.



Through extensive investments in bicycle infrastructure, UW-Madison is a Platinum-level Bike Friendly University and offers a free long-term bike rental program (Madison's Red Bike Project), reduced BCycle memberships (bike sharing program), and free bike air and repair stations all around campus.

UW-Madison offers a carpool program where a shared carpool permit also comes with six (6) complimentary temporary daily parking passes per carpool member, per parking year (for use when the main permit is unavailable, or a member cannot ride in the carpool that day).

Transportation Demand Management

University of Minnesota

The University of Minnesota operates several buses, including one route (the Campus Connector) that runs on a dedicated transitway that connects the Minneapolis and St. Paul campus with service every five minutes during the day. The transitway is only open to buses, bicycles, and emergency vehicles, and ensures a reliable trip between campuses by avoiding traffic congestion.

Students are eligible for a deeply discounted metro area transit pass, which can be used on all regular route bus lines and the light rail.

For those riding exclusively on campus, there is a Campus Zone Pass which allow for free travel among the three-campus light-rail stops. This is a pilot program and eligible for students, faculty, and staff.

Cyclists who ride to campus 3 or more days per week are eligible for the guaranteed ride home program.

The campus has two bikeshare systems - green Nice Ride bicycles which can be checked out and returned to any Nice Ride station and the blue dock less bikes, which can be left at any bike rack.

The campus also has several rental vehicles available for those not wanting to bring a car to campus or simply do not own a car.

Finally, the campus has its own app to connect potential carshare riders - called Gopher Rideshare.

University of Maryland at College Park

Several current technologies and new shared mobility options are currently or will soon be incorporated into the transportation network including bike sharing, dock less bicycles, scooter sharing, shared mobility, and smart city technologies (e.g. sensors).

Telecommuting is becoming an increasingly popular option due to the enhancement of telecommunications technology and success of remote classrooms in the academic setting.



Pre-tax dollars can be used to purchase transit passes for employees, graduate/teaching assistants. A guaranteed ride home program is available for commuters who choose transportation options at least twice a week.

Low emission vehicles are eligible for a 20% discount on parking permits.

If signed up via the campus bike incentive program, bike commuters can gain access to secured bike parking and on-campus showers.

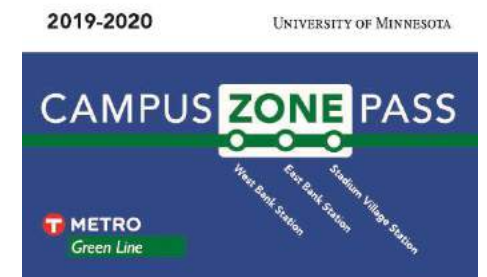
Carpool permits are offered at a 50% discount, and users are eligible for the guaranteed ride home program.

Vanpool participants pay a flat fee for costs associated with the vehicle. Parking is free. Each vanpool participant can receive 10 daily parking permits for the days they need to drive alone. The campus department will pay 50% of the monthly vanpool fees for up to six months.

Student rates for Zipcar memberships.

Shuttle-UM has a fleet of over 75 vehicles, including hybrids and clean diesel models. Complimentary bus passes are available to City of College Park residents.

There are several short and long-term bike storage options throughout campus. There are six bike repair stations as well as air pump stations.



TDM Recommendations

Based on a review of UNLV's existing programs and services, best practices, programs offered at peer institutions, and UNLV's stated goals, the following near and long-term TDM have been developed to help guide TDM investments, reduce the need to expand parking over time, and encourage the use of alternative modes of transportation.

Near-Term

Establish TDM Goals & Objectives

A key part of any TDM program requires establishing goals and objectives to help determine where investments should be prioritized and/or reallocated when not achieving the intended outcomes. Below is a draft set of goals and objectives that can be modified to meet UNLV's specific program goals:

- Increase the percentage of campus trips made by alternative modes of transportation, including carpool, bike, walk, run, transit, and telecommute trips

- Reduce peak parking demand per person
- Improve bicycle connectivity
- Enhance pedestrian and bicyclist safety
- Encourage high-occupancy vehicle trips (carpooling and vanpooling)
- Invest in high-frequency, reliable transit service
- Incentivize or subsidize the use of public transit
- Improve perceptions of personal safety and security when using all forms of alternative transportation
- Measure the effectiveness of all transportation programs, including costs, participation, and greenhouse gas reductions
- Partner with other agencies to share costs of programs that benefit the broader community
- Utilize effective communication strategies to increase awareness and understanding of TDM programs and services

Transit Pass Subsidy Program

The current U-Pass program offered by RTC represents a good start, but even a discounted semester transit pass (\$104.00) is more expensive than parking on campus (5 monthly student passes would cost \$68.75). Most students and University employees with access to a car would likely find it more cost effective to drive rather than take transit under the current pricing structure.

Given that the cost to PTS per vehicle trip to campus (including costs to construct and maintain parking) is much greater than the cost per transit trip (made using existing RTC routes), subsidizing the purchase of transit passes for any student, faculty, or staff member willing to forgo the purchase of a parking pass has the potential to reduce PTS costs in the long term.

An example program could include the following requirements and benefits:

- Free transit pass (valued at \$104 per semester) for any student, faculty, or staff members willing to waive the right to purchase either monthly or annual parking permits.
- Receive four (4) free daily parking permits per semester each semester enrolled in the program.

Carpool Incentive Program

While some campus students and employees may already carpool or share parking permit costs, the low parking permit costs and lack of incentives to carpool likely keep carpooling to a relative minimum. A

clearly defined carpool program could help to increase the rate of carpooling, while making it a more convenient option than simply sharing a single permit.

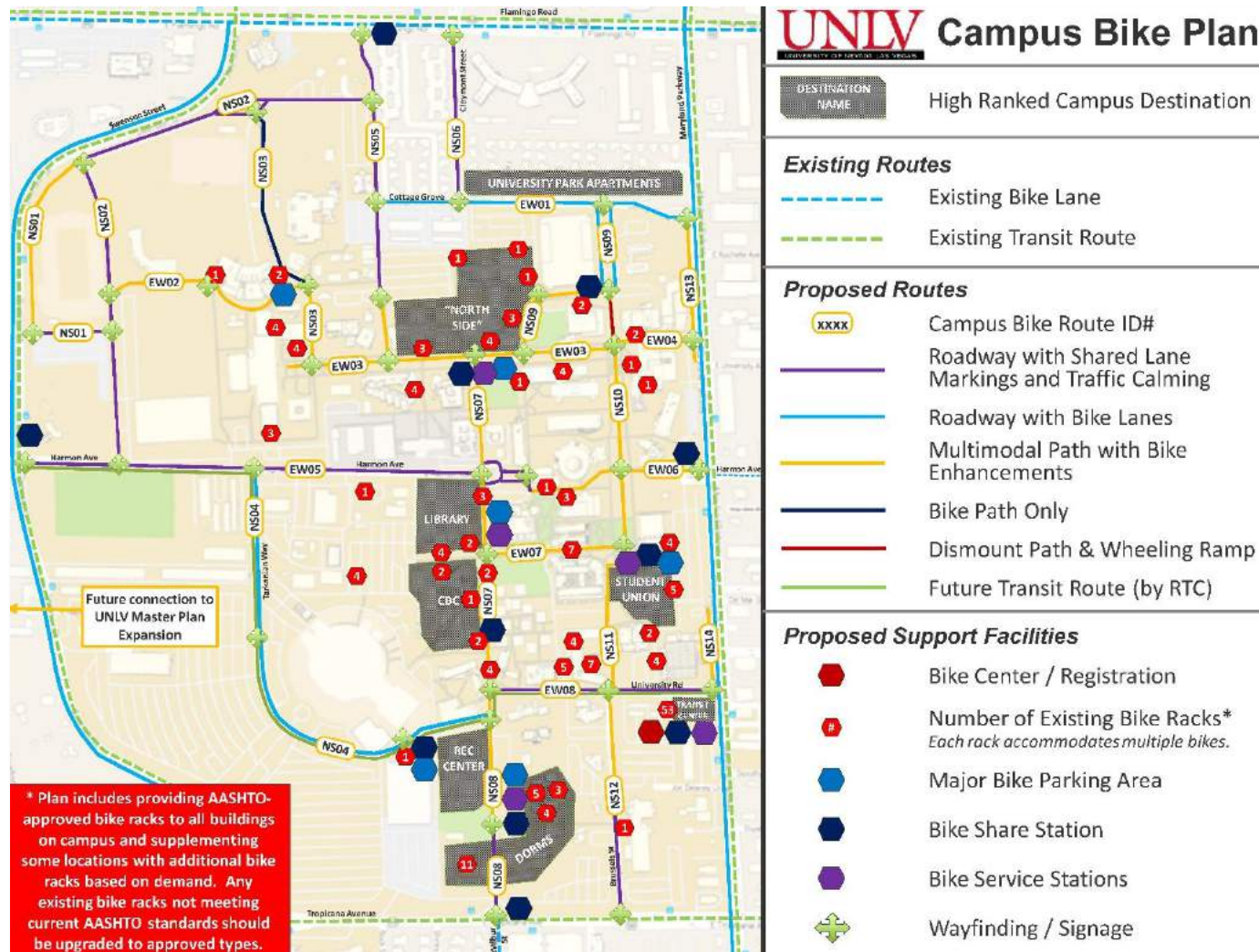
An example program could include the following requirements and benefits:

- Discounted parking permit (20% off regular annual permit, for example) along with priority parking areas for students, faculty, and staff willing to purchase a shared carpool parking permit and waive their right to independently purchase either monthly or annual parking permits.
- Receive four (4) free daily parking permits per semester each semester enrolled in the program (for use when two cars are needed).

Campus Bike Plan Implementation

As noted within the 2017 Spencer Greenway Trail & UNLV Campus Bike Plan, “community outreach strongly demonstrated that implementation of the bike plan will increase bike riding directly on campus as well as encourage more people to ride bike when traveling to campus from outside origins.” The UNLV Campus Bike Plan established an implementation plan for making biking to and on campus a safer and more attractive option. Biking incentives and “amenities” (such as repair stations, bike lockers, bike corrals, and showers) are all important components of a robust TDM program that encourages biking, but to be truly successful, potential bicyclists must feel they have safe, pleasant, and reliable options for getting to campus by bike. Investing in enhanced bicycling facilities (greenways, protected bike lanes, etc.) both on and off campus, along with wayfinding and other strategies outlined in the Campus Bike Plan are important to pursue in the near term to improve perceptions of bicycling. Longer-term incentive programs will have the greatest chance for success if the infrastructure is already in place to make students and commuters see biking as a safe and viable alternative to driving.

Transportation Demand Management



Prior to implementation, PTS should explore potential routes, capital costs (bus purchase, bus storage facilities), operations and maintenance costs, and potential operational strategies and partnerships (including an out-sourced option) to reduce costs. Key items to explore include:

- Key destinations to serve (Transit Center, Library, Thomas & Mack, etc.)
- Routing options, including the potential for bus-only roadways or other transit priority options to maintain reliable, on-time service
- Desired frequency of service (10-minute, 15-minute, 20-minute, or 30-minutes headways; “high-frequency” is often considered service at least every 15-minutes).
- Desired span of service (6 a.m. to 11 p.m., for example)
- Vehicle type (standard 40’ buses, articulated buses, or smaller shuttle options)
- Fleet size needed to maintain desired headways (including spare bus(es))
- Operational considerations, including staffing if operated by PTS, or other arrangements such as a contract with RTC (like University of Wisconsin) or student-government partnership with student drivers (like University of Maryland)
- Ridership monitoring (passenger counters, etc.)
- Real-time bus tracking and trip planning tools
- Station amenities (real-time arrival displays, benches, shelters, etc.)
- Rider verification processes (free and open to the public, UNLV ID required for boarding, options for visitors, etc.)
- Communication tools to spread awareness of the shuttle service

A campus shuttle system can start out relatively small and expand over time to make use of outlying lots with park-and-ride service as needed. However, short, medium, and long-term service objectives (with ridership goals) should be established prior to implementation to allow for benchmarking success. The “cost per rider” can often be very high in the first few years of service but can go down with time as service expands and ridership increases. It is often important to build in a “ramp-up” period to ensure the service is not terminated before it has a chance to become a widely known part of the UNLV transportation system.

Bicycle Incentive Program

Like the transit and carpool incentive programs, a bicycle incentive program could allow anyone interested in biking as their primary mode of transportation to receive several benefits in exchange for forgoing the purchase of a parking pass.

An example program could include the following requirements and benefits:

Medium to Long-Term

Campus Shuttle System

The highest priority option for improving transportation on and between campuses expressed by students, faculty, and staff is the implementation of a campus shuttle system to make it easy to get around campus. Improving on-campus transportation can support TDM and reduce vehicle trips to campus over time as perceptions change and the campus community begins to feel that they have several flexible transportation options to get around without a vehicle. High frequency transit/shuttle service, bike share systems, shared mobility services (such as scooter share), rideshare services, and guaranteed ride home programs can all work together to provide users with a wide variety of transportation options that reduce the need to bring a vehicle to campus every day.

- Gift card to a local bike retailer or repair shop (valued at \$50 per semester or similar) plus free bike share membership (120 days through RTC valued at \$60, or \$15 per 30 days) for any student, faculty, or staff member willing to waive the right to purchase either monthly or annual parking permits. Funds can be put towards the purchase of a bike, bike repair services, or any other purchase to make biking a more pleasant option for commuters.
- Exclusive access to showers or locker facilities around campus
- Receive four (4) free daily parking permits per semester each semester enrolled in the program.

Club Ride Incentive Program

RTC's Club Ride program already has the reporting system in place to make it easy to log trips by alternative modes. PTS can further encourage the use of this program by directly incentivizing the use of alternative modes.

One key drawback of a prepaid parking permit programs is that there is no perceived cost of driving to campus each day after a permit has been purchased. PTS can directly incentivize the use of alternative modes by refunding students and employees a fixed amount (such as \$1.50 per day) for each day they use an alternative mode to get to campus.

An example program could include the following requirements and benefits:

- Receive a refund of up to \$1.50 per day (or other amount) for each trip made by an alternative mode logged within the Club Ride program and submitted to PTS at the end of the semester.

- Value can be applied towards transit fare, a bike shop gift card, or as a discount to a parking permit purchase.
- Benefits offered by PTS are *in addition* to the standard benefits offered through RTC (monthly gift card drawings and discounts).
- Program may need to be limited to parking permit holders with a vehicle license plate to allow for verification that the vehicle was not parked on campus (*optional*; only if needed to minimize program abuse).

TDM Summary

The TDM strategies presented in this section represent a framework for how PTS can begin to invest more heavily in TDM programs that help to reduce vehicle trips to campus. Actual amounts invested per person will need to be subject to a review of department revenues and fund availability. However, over time, incentivizing the use of alternative modes in a manner that measurably reduces the percentage of vehicle trips made to campus can save costs in the long term and delay or eliminate the need to construct parking to accommodate growing demand.

XII. Funding and Financing Strategies



XII. Funding and Financing Strategies

Background and Introduction

Study Purpose

Kimley Horn contracted with Paceline Consulting to conduct a review of potential funding/financing parking revenue sources to support the facilities development of the UNLV Parking Master Plan. The primary goal of this report is to identify those funding sources that will allow UNLV’s Parking and Transportation Services (PTS) staff to generate the revenue needed to meet future growth in parking from increasing student enrollment and the expansion of the University.

Paceline Consulting has worked collaboratively with Kimley Horn and the UNLV Parking and Transportation Services (PTS) staff to identify, review and recommend potential funding sources and strategies on how best to secure them.

Approach

Paceline Consulting staff conducted several site visits of the parking infrastructure at UNLV Maryland and Shadow Lane Campuses over the course of the past year and a half. Paceline also conducted a review of existing PTS reports and data, including an extensive peer review of other major universities’ parking programs, to see how UNLV compares with generated parking revenues.

Paceline researched the standard funding sources that universities use for parking as well as the innovative sources of funding that universities are pursuing. We also investigated the emerging revenue trends in the private parking industry.

While our research shows there are several emerging funding sources that private, for-profit parking companies are exploring, Paceline focused on non-traditional sources of funding for parking and parking-related services that UNLV’s parking system could likely elect to implement.

According to the CY 2018 Annual PTS Report, “The major threat facing the (PTS) department at this time is the inability to increase (parking) permit fees to the level needed to meet the future parking demand created by increased enrollment and Campus Master Plan projects.” ⁷As such, a review of additional options, including non-traditional revenue sources to support the needed parking and transportation infrastructure at UNLV, was warranted.

Review of Current Funding Sources for Parking

Like most universities, UNLV relies on four sources of revenue to support parking services. These revenues are as follows ranked in order from highest revenue to lowest revenue generated:

1. Parking Permit Revenue

Like most major universities, UNLV charges visitors, faculty, staff and students to park at its more than 14,500 parking spaces on campus. Parking is paid for with permits by the hour, day, week, month, semester, nine-month, or on an annual basis.

Sales of parking permits generated more than \$3,806,741 in revenue during calendar year 2019, which makes permit revenue, by far, the largest source of revenue for parking.

2. Internal Transfer

PTS receives about \$951,327 annually in internal transfers of funds that come partly from the Thomas & Mack Center and partly from UNLV Student Life every year. The Thomas & Mack Center remits \$487,947 annually to PTS for parking reimbursement.

In addition to funds received from the Thomas & Mack Center, PTS has an agreement with UNLV Student Life to fund \$463,380 annually in exchange for the loss of a parking lot due to expansion of the UNLV Student Union Building and the construction of a new building as part of the Student Services Complex. This agreement with UNLV Student Life has been negotiated and is set to expire in FY2026.

3. Parking Citation Revenue from Parking Enforcement

Parking citation revenue from parking enforcement is another important source of revenue for PTS. UNLV anticipates generating \$796,941 in parking enforcement revenue during fiscal year 2020. This revenue source is expected to increase by more than \$25,000 from the previous year.



⁷ UNLV CY 2018 Annual PTS Report

4. Hourly Payment Methods

UNLV has various methods for customers to pay for parking by the hour. These methods include paying at parking meters, paying by smartphone via a parking payment application, and paying at parking stations adjacent to surface and structured lots. These hourly sources of parking revenue generated \$571,726 in calendar year 2019 for UNLV.

Collectively, the total anticipated FY 2020 PTS revenue from the above sources of funding is \$5,972,542. It is noteworthy that this total places UNLV last in parking revenue per parking space when compared with other universities in the western United States as part of a recent peer review analysis. This overall lack of parking revenue for PTS, when compared to so many other peer institutions, underscores the need to raise current permit fees to a level close to peer institutions and to acquire new or additional revenue sources to be able to keep up with current and future growth in parking demand.

Funding Sources to Support the 2020 UNLV Campus Parking and Transportation Master Plan

Obtain External Contributed Capital for Parking Infrastructure

Much has changed in the past year regarding the RTC's plans for transit for Maryland Parkway and the development of the Allegiant Stadium for the Las Vegas Raiders, UNLV football games, special events and concerts. The RTC decided in 2019 to actively pursue and secure more than 350 million dollars to build their proposed Bus Rapid Transit (BRT) project along Maryland Parkway and the Las Vegas Medical District, which includes both the Maryland Parkway and Shadow Lane Campuses of UNLV. Additionally, the RTC has decided to become heavily involved with using their own fixed-route bus fleet to provide special event transit service at Allegiant Stadium. The RTC will need to find park-and-ride locations that are conveniently located to the stadium and to the community.

These changes put UNLV and the RTC in a situation that both could benefit from an expanded parking/Mobility Hub facility on the UNLV campus. UNLV could provide the land and possibly some capital, and the RTC could provide capital in the form of a federal grant that they control, and/or the RTC could use their own sales tax revenue to build a parking and transportation facility that UNLV, the RTC and the public could use for special events and for normal parking activities.

Federal Grant Sources for Parking

Fifteen years ago, individual members of the United States Congress could legally identify specific projects that they wanted funded in their districts and "write" those projects into federal legislation for funding. 80% of the cost was paid for by the federal government—and, if there was some other public, private or not-for-profit entity able to provide the other 20% of the project cost, those projects were completely funded and built.



Source: Allegiant Airlines

There were relatively few limits on this congressional funding process, which was referred to as "earmarking" funds. Congress has since abolished the earmarking process, which has significantly impacted the types of projects that could be funded. Back when earmarks were legal, parking lots and parking structures were federally eligible and were funded in a frequent fashion relative to today. Parking garages are still eligible for federal funding, but the sources of federal parking funding are limited and come with conditions for funding such as the parking garage must be open to the public and, in most cases, must be part of or connected to a specific transit or highway project.

There are also non-transportation federal programs that allow for funding of parking garages, but these programs require the parking to be in conjunction with low-income housing (Housing and Urban Development's HOME program) or are so competitive (Community Development Block Grants) that parking garages are effectively unable to compete with so many other needed social programs. Due to these program's non-applicability to UNLV, we will not discuss them further. Instead, we will focus on the federal programs that are more appropriate to UNLV's context and eligibility.

Currently, the United States Congress is responsible for adopting policy legislation on what the United States Department of Transportation's (USDOT) infrastructure agenda will be, including what the government will fund, how much they will spend doing it, and how it will be carried out. This has typically

been done as part of multiyear transportation authorization legislation. Typically, these authorization bills last for at least six years. However, the last three authorization bills have been shorter in duration.

However, on December 4, 2015, President Obama signed the [Fixing America’s Surface Transportation \(FAST\) Act](#) (Pub. L. No. 114-94) into law—the first federal law in over a decade to provide long-term funding certainty for surface transportation infrastructure planning and investment. The FAST Act authorized \$305 billion over fiscal years 2016 through 2020 for various transportation programs and projects, including parking lots and parking garages that are connected to or part of a transit or roadway project.

The RTC has used various sources of federal funding available to it during the past twenty years to construct three distinct parking facilities: (1) the South Strip Transfer Terminal, (2) the Centennial Hills Transit Center, and (3) the Westcliff Transit Center. All three of these facilities have large, surface parking lots that are used by the RTC as park-and-ride lots.



Table 12 identifies those funding sources that allow for the use of federal funds to be used to build both surface and structured parking, how much funding could be made available to UNLV annually by program, and the required percentage of local funding to match the federal grant.

Table 12. Federal Grant Funds for Parking Infrastructure by Source

Federal Funding Source	Annual Amount Available	% Local Match Required
Surface Transportation Block Grant Program (STP)	\$35,000,000	20%
Congestion Mitigation Air Quality (CMAQ)	\$25,000,000	5%
FTA Urbanized Area Funding Program	\$22,000,000	20%
FTA Bus and Bus Facilities Program	\$15,000,000	20%
FTA Capacity Investment Grant Program	\$50 - \$200 Million	50%
BUILD Grant Program	\$25 - \$75 Million	20%

A more detailed explanation of each funding source, including a discussion of the process for how to obtain those funds from each source, is contained in **Appendix 31**.

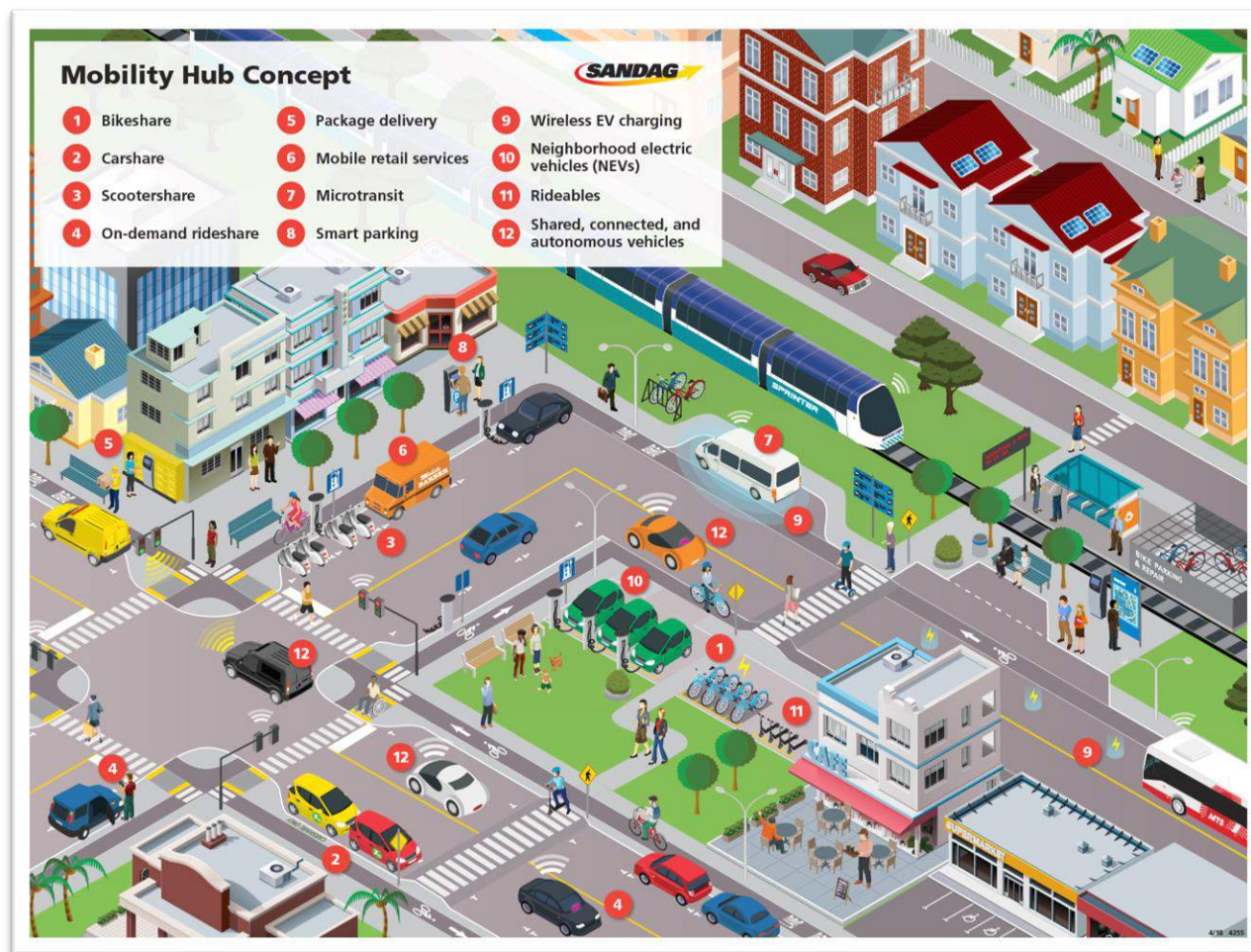
All the above-mentioned federal grant programs for parking are accessed through the RTC. After that, the United States Department of Transportation and/or the Federal Highway Administration (FHWA) or the Federal Transit Administration (FTA) will also have to approve the grant applications and use of funds. None of these applications have a quick process, but for most programs the process is not overly difficult. If the RTC can be convinced that a UNLV and RTC parking garage/Mobility Hub would be of benefit to them, the RTC would typically handle virtually all the application burden and provide ongoing support through the process.

Recommendation: Form a federally funded parking garage/Mobility Hub Partnership with the RTC and other private sector mobility partners.

The RTC is rapidly moving towards becoming a multimodal transportation services provider/broker. The primary reason for this shift in role for the RTC is disruptions in the transportation industry from private mobility service providers such as Uber, Zipcar, Via, private dockless bike share and scooter share companies, etc. As such, we recommend that UNLV recognize that this is not just a parking garage that

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focuses on the sole mode of the automobile. Rather, we recommend that UNLV approach the RTC with the development of a “Mobility Hub” concept where the parking structure houses a number of different travel options, including, but not necessarily limited to, carpool, vanpool, car share, transit, microtransit, electric-vehicle recharging, courier delivery, bike share, bike lockers, bike valet, scooter share, rideshare (TNC), moped share, air taxi, traditional fixed-route and special event bus transit service, etc. UNLV could use all the above-mentioned travel options as sources of concession revenue to support operations and maintenance of the mobility hub. Electrification and charging stations for various types of electric-powered vehicles should also be included in the Mobility Hub as the recharging of electric vehicles could be a very important revenue source.



Source: San Diego Association of Governments

L. Dennis Burns and Leslie Tabor of Kimley Horn define a Mobility Hub as “a place where people can seamlessly connect with multiple modes of transportation in a safe, comfortable, and accessible environment. With their physical presence and clear, prominent branding, these spaces (Mobility Hubs) offer visibility to and connection between public transit and shared mobility services that in turn support multimodal living and reduced dependence on personal cars and solo driving.”⁸

Paceline Consulting recommends that UNLV develop the Mobility Hub concept/parking garage with the following principles in mind:

- Shared park-and-ride opportunities in conjunction with RTC transit services
- Multimodal connections (bicycle, pedestrian, rideshare, etc.) as part of the Mobility Hub complex
- Paid parking available to the public in the garage
- Student housing and retail be incorporated into, or adjacent to, the garage to promote mixed use, a sense of community and excellent pedestrian connections to campus and surrounding services
- Incorporating the Mobility Hub into or on top of the existing RTC intermodal facility
- Provision for electrification and charging stations for various types of electric vehicles
- Plan for future use Mobility Hub’s top level as a platform for use by electric Vertical Take Off and Landing (eVTOL) air taxi aircraft. (This technology is currently receiving extensive capital investment from Boeing, Airbus, and several other smaller aerospace companies around the world. Uber is also investing heavily in this space with its Uber Elevate subsidiary as evidenced by Uber Elevates extensive testing operations in Dallas, Los Angeles and Melbourne, Australia.)

We believe this Mobility Hub approach—which provides seamless multimodal transfers, pedestrian connectivity and the potential for great placemaking—would greatly increase the chances of obtaining RTC support and securing federal agency support for federal funding.

⁸ Dennis Burns & Leslie Tabor, “An article for the International Parking Mobility Institute’s Parking and Mobility Taskforce”, October 29, 2019

Federal Tax Incentive Programs

Federal tax incentive programs are provisions of federal law that provide discounts or tax credits that effectively reduce the price for constructing parking garages and other developments in low-income districts under the New Markets Tax Credit and Opportunity Zones programs. These programs use federal tax credits to significantly discount the total price of a qualifying development, including parking garages.

New Markets Tax Credit Program

The New Markets Tax Credit (NMT) Program was established as part of the [Community Renewal Tax Relief Act of 2000](#). The goal of the program is to spur revitalization efforts of low-income and impoverished communities across the United States and Territories. The NMT Program provides tax credit incentives to investors for equity investments in certified Community Development Entities, which in turn invest in projects in low-income communities. The investment must be coupled with other funding and be the last capital needed to initiate the building/development. If the process is followed correctly, NMTs can effectively reduce the total cost of a parking garage by 20%.

Parking garages that are part of a building/development are considered eligible for use of NMTs. However, NMTs may only be used in areas that are defined as low-income or economically distressed districts. There are areas in the vicinity of the UNLV Maryland Parkway campus and the Shadow Lane Campus that meet the federal and state criteria for low income and economic distress, and therefore would be eligible for use of NMTs.

Process to Award Funds

The Community Development Financial Institutions (CDFI) Fund in the Department of the Treasury has been authorized to administer the NMT program. Community Development Entities (CDE) are essentially a domestic corporation that is an intermediary between the CDFI fund and the low-income community receiving assistance in the form of the New Markets Tax Credits. CDEs apply to the CDFI Fund each year not for tax credits directly, but for an award of "allocation authority"—that is, the authority to raise a certain amount of Qualified Equity Investments (QEIs) from investors to invest in the low-income community.

Annual Allocation of Funds

Historically, the annual allocation has been \$3.5 billion per year for the last seven years.

Opportunity Zones

The Opportunity Zones program was enacted to encourage investment in low-income communities. Created as part of the 2017 federal tax reform package (Tax Cuts and Jobs Act), the program allowed then Nevada Governor Brian Sandoval the ability to nominate up to 61 census tracts defined as low-income communities in Nevada to be part of an "Opportunity Zone," which he did. Those zones were later approved and confirmed by the United States Treasury.

Being part of an Opportunity Zone provides a tax incentive for investors to reinvest unrealized capital gains into low-income urban and rural communities. Figure 10 below indicates that the longer the time that capital gains are invested into an Opportunity Fund, the more capital gains taxes can be eliminated for the investors. After a ten-year investment, all future capital gains from any profit derived from the investment are permanently deferred. Capital costs for development including parking can thus be significantly reduced.

Figure 73. Timeline for Opportunity Zone Investment Deferral/Elimination of Capital Gains Taxes



Many financial experts believe this program has significant potential to encourage the private investment of billions of dollars in low-income communities across the United States. The use of this tool also represents an opportunity, with significantly less time and effort than that associated with New Markets Tax Credits, to realize a large decrease in the overall cost of building a parking garage.

Like the federally designated low-income communities as part of the New Markets Tax Credits program, the federal government has designated the areas around the UNLV Maryland Parkway Campus and the Shadow Lane Campus as Opportunity Zones.

Process to Award Funds

In exchange for investing in Opportunity Zones, investors can access capital gains tax incentives available exclusively through Opportunity Zones. To access these tax benefits, investors must invest in Opportunity

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Zones specifically through Opportunity Funds. A qualified Opportunity Fund is a US partnership or corporation that intends to invest at least 90% of its holdings in one or more qualified Opportunity Zones.

Unlike New Markets Tax Credits, Opportunity Zones can be self-certified by the investors if they abide by IRS rules. This makes the Opportunity Funds process much simpler and easier to use than the difficult process of forming a qualified Community Development Entity and then being lucky enough to obtain an allocation of New Markets Tax Credits.

Annual Allocation of Funds

There is no limit to the amount of investment in Opportunity Funds. This is another reason why Opportunity Zones present a better “opportunity” to attract investors when compared to New Markets Tax Credits.

Recommendation: Create an internal team to identify potential partners and pursue outside capital investment at UNLV’s two major campuses as part of the New Markets Tax Credit and/or Opportunity Zones programs.



Funding and Financing Strategies

User Fee Revenue Programs

Student Transportation Fee

Many colleges and universities have implemented some form of a student transportation fee. Universities typically use the fee to provide transportation services for students, and in some cases, faculty and staff, so that participants have commuting alternatives, intra/inter campus transit services and broader regional mobility connections without needing to go to the expense of owning, maintaining and parking a personal auto.

According to many sources, the average annual cost of owning and operating a car in the United States is about \$10,000. Universities and community colleges have implemented student transportation fees so that less expensive, alternative forms of transportation can be made available to all students, thus making higher education more affordable for all.



Source: Portland State University

The student transportation fee is implemented per student on a per credit hour basis (the University of Central Florida has a mandatory fee of \$9.10 per credit hour) or as a lump sum per student per semester (the University of Akron has a semester transportation fee of \$167). Usually there are no exceptions from the fee. The cost for the student transportation fee is often less than the cost of a student parking permit, so paying the fee is frequently the best economic option for students.

Universities that have student transportation fees usually have sprawling campuses that cover large distances, significant periods of inclement weather that make walking outside difficult or unsafe, have a very high percentage of student commuters by auto, and have limited and or expensive parking, or some combination of the above factors.



Source: KSLTV

The type and variety of services that the student transportation fee funds vary widely between universities. Services run the gamut, depending on the amount of the fee and the kind of services desired, but usually consist of at least one or more of the following:

- Campus shuttle service
- Holiday transportation to surrounding region/major cities
- Bicycle share
- Scooter Share
- Car share
- Carpool & Vanpool services
- Airport shuttles
- Regional transit pass
- Trip and commute planning services
- Guaranteed emergency ride home program (commuters only)
- Parking cash out program (staff only)
- Nighttime on demand group rides via phone app

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It is common for colleges and universities to have some form of an advisory council to obtain input from users on the desired services and how the university delivers those services. Some universities have advisory bodies consisting only of staff and administrators that either provide transportation for the university or that use university transportation services. Most, however, have broader based representation that includes extensive input from system users and representatives from student government.

Some universities utilize the transportation fee to pay their staff to administer a bundled program of free or deeply discounted transportation options to students if they are willing to *not* purchase a parking permit. These bundled programs are often referred to as Transportation Demand Management (TDM) programs because they are focused on reducing individual auto use, thereby reducing transportation demand on congested roadways and limited parking infrastructure.

The RTC has an existing TDM program called Club Ride Commuter Services that provides most of the services that premier university TDM programs provide. UNLV could partner with Club Ride to extend free or deeply discounted transportation alternatives to students, faculty and staff at minimal to no cost, thus greatly benefitting all parties.



Source: University of Kentucky

Student transportation fees and associated university TDM programs provide several benefits to the student body and the university as follows:

- Cost savings – students save monthly on car insurance, maintenance and skip parking permit fees and gas costs; the university saves by not having to build and maintain as much parking infrastructure

- Time savings – it takes time to clean and properly maintain a car
- Safer ride options than solo driving are provided by TDM programs
- Most programs offer students free or discounted transport options beyond the university
- Reduced local and regional traffic congestion
- Improved air quality
- University can better utilize limited land because less parking is required

Recommendations

- Implement a student transportation fee to provide funding for new mobility services to students, faculty and staff
- Form a transportation advisory group made up of staff, students and faculty/administration to advise PTS on the student transportation fee, services to be provided, and how the associated transportation services will be administered
- Partner with RTC to provide a free or discounted regional transit pass to those students, faculty and staff that desire one
- Partner with Club Ride Commuter Services to provide UNLV with an extensive array of no cost or low-cost mobility programs and services to students, faculty and staff
- Utilize the upcoming Bus Rapid Transit service to be provided by RTC along Maryland Parkway to connect the Maryland Campus with the Shadow Lane Campus

Demand-priced Parking

Demand-priced Parking is an innovation in University parking. The idea is to charge more for permit parking where parking demand is the highest. Typically, the high-demand areas are where there is a large amount of parking in a central location, such as a parking structure near the center of campus. These conveniently located parking lots tend to have a higher occupancy throughout the day than the remote lots on the periphery, which is typical of parking at UNLV.

Here is how the system works conceptually: The university, recognizing a difference in parking demand based on location, offers a premium permit, which would include the privilege of parking in the lots with the highest demand as well as the ability to “park down” in any other parking lot available. Since only holders of a premium permit can park in the lots with the highest demand, the university charges a premium price for such a permit. It also limits the number of premium permits, so it can guarantee an open space to permittees who pay the premium price.

The regular permit price continues to be applied to people who do not purchase a premium permit, and those regular permit holders are only allowed to park in lots with lower demand. This demand-priced,

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parking-permit approach is based on validated economic principles and can result in a significant increase in permit revenue if structured properly. Schools like University of California Long Beach, Humboldt State University, University of Alaska at Anchorage, Oregon State University and Kansas State University are just a few examples of major universities that have successfully implemented demand-priced parking.



This contrasts with a common approach used at many universities referred to as the “Hunting Model” where all lots are available to all users on a first come, first served basis. Permit holders may spend a significant amount of time “hunting” for spaces, especially in the high demand lots. It is a frequent occurrence for commuters to report that they spend more time hunting for a parking space than they do in the actual commute to campus.

This “hunting” model is wasteful and inefficient because it:

- Adds to automobile congestion
- Is less safe because there are often stressed drivers hunting, sometimes desperately and recklessly, for a parking space
- Adds significantly to greenhouse gas generation from all the cars circulating to find parking
- It results in less parking revenue for parking than the demand-based permit model
- Customer satisfaction suffers when increased parking demand results in difficulty or inability to find parking

Parking administrators have turned to demand-priced parking-permit pricing because it offers the following advantages:

- It increases the probability of finding a parking space on campus where patrons prefer to park
- It decreases the time required and stress of hunting for a parking space
- It reduces vehicle congestion in high-demand areas
- It increases parking revenue when structured properly
- It reduces campus-related parking impacts in nearby neighborhoods
- It provides for better overall utilization of campus parking thus decreasing the need for adding additional parking infrastructure

Private utility companies, airlines, telecommunications providers and toll lane operators on roadways use dynamic, demand-based pricing where and when there is a peak demand for a product. The higher the demand, the higher the price during peak hours. Because of the difference in price, users gravitate to the permit price that represents the best value for them and thus there is greater utilization of a limited resource as well as generation of additional revenue if the lowest parking permit prices are not reduced.

Recommendations

- PTS should evaluate the merits and advisability of transitioning to a Demand-priced Parking program
- Involve students, staff, faculty and administration in the development of any demand-priced parking program
- Select a pilot project to test the concept at UNLV

Transportation Network Company Fee

Many cities, counties and states across the country are dealing with the negative impacts (loss of parking and transit revenue, increased automobile congestion, air quality degradation, deteriorating roadways, etc.) from transportation network companies (TNCs) such as Uber and Lyft. Uber and Lyft traffic now constitute more than 50% of vehicle traffic during peak hours in the cities of New York, NY, and San Francisco, CA. Bruce Schaller and others have also shown that Uber and Lyft create significant congestion impacts in other cities around the country including Boston, Chicago, Seattle, Portland, Los Angeles, Oakland, Philadelphia as well as Las Vegas.⁹



The rapid spread of TNC operations is not only having an adverse impact on congestion in dense, urban areas (the best market for TNCs), but other more efficient forms of transportation such as trains, buses, bikes, scooters and walking are also now forced to compete with TNCs, and they are losing significant market share. For example, in Los Angeles, transit ridership over the past decade has gone down by more than 20%, despite the construction of miles of new rail and bus systems. This pattern of rapid growth in TNC operations and subsequent decline in mass transit ridership has

been repeated in almost every major city around the country.

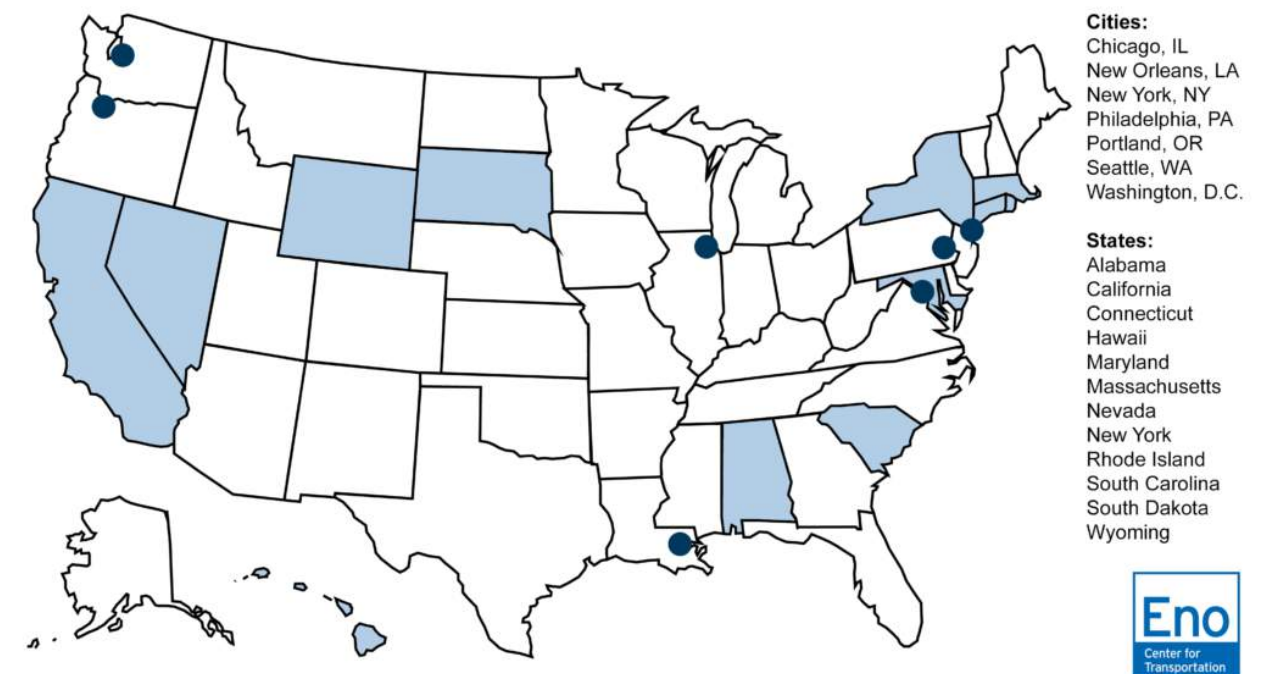
Here in southern Nevada, Uber and Lyft have taken a heavy toll on transit ridership. The RTC of Southern Nevada (RTC) estimates that growth in TNC trips in the Las Vegas Resort Corridor (Las Vegas Strip and Downtown Las Vegas including McCarran Airport and the UNLV Maryland campus) has caused their Deuce and SDX service to no longer be profitable. This represents a cumulative revenue loss of more than \$26,000,000 to the RTC since 2016, and the RTC has been forced to delay new service expansions because of the revenue impact.

It is not just transit authorities that are seeing their revenues dry up from the proliferation of TNCs. Airport authorities depend on parking revenues for a significant amount of their budget. There is a general trend of reduction in parking revenues at most major commercial airports in the United States. The world's busiest airport, Atlanta Hartsfield International, has seen its parking revenues plunge by over \$1,000,000 in the 2nd quarter of 2019 because of the increases in TNC trips.

Some airports, including McCarran International Airport, have responded by securing statutory authority to charge their own drop off and pick up fees for every TNC trip. This imposition of fees on TNCs at commercial airports has since helped to balance out the loss of airport parking revenues at airports across the country. Airports in the Los Angeles area are now exceeding their ground transportation revenue budgets because of the TNCs fees. Increasingly, airports are pursuing their own statutory authority to charge per trip TNC fees because of the negative financial impact TNCs are having on their parking revenue.

Cities and counties across the country have also responded by instituting their own TNC fees to deal with their drops in municipal parking revenue, the increased congestion from TNCs and the fact that TNCs generate significant revenue for their companies but pay nothing for the impacts of their operations on crowded and deteriorating streets.

Cities and States with TNC Taxes or Fees (as of July 2018)



Source: Eno Center for Transportation

⁹ Bruce Schaller, The New Automobility: Lyft, Uber & the Future of American Cities, July 2018

Funding and Financing Strategies

These government entities are experiencing a significant drop in their parking revenue because Uber and Lyft do not pay for parking. Bruce Schaller has demonstrated that the primary reason customers hire a TNC is to avoid paying for parking.¹⁰

Because they need to deal with the negative impacts of TNC operations as described above, many cities, counties, states and airport authorities have already implemented, or are considering implementing, per-trip fees or excise taxes based on a specified percentage of the revenue from trips on TNC operators.

These governments are using the TNC fees for a wide variety of purposes. Some governments place the TNC fee revenue into their general fund—most states and some cities that have TNC fees do this. Some entities earmark the money for education. Others, such as here in the state of Nevada, have directed the TNC fee revenue to the state general fund, and every two years the state highway fund gets \$5,000,000. Others, such as Seattle, are proposing to use a second TNC fee to construct affordable housing and to pay for an expansion of their streetcar transit system. Many of the TNC fees are used to subsidize transit agencies (New York City, Seattle, Chicago and Boston), others are used to fund transportation infrastructure such as building and maintaining roads (San Francisco, Oakland). Of note, Philadelphia uses a portion of their TNC fee to subsidize their local parking authority to compensate for lost parking revenue.

At the local and regional level here in southern Nevada, there has been some discussion among various state, regional and local governments as well as private entities to propose an expansion of the existing state TNC fees. One idea that has been discussed at several levels is instituting a TNC per-trip fee for all TNC trips that originate or terminate in the Las Vegas Resort Corridor. UNLV, due to its proximity to the resort corridor, could easily be added into such a proposal.

Recommendation: Pursue and support an effort to establish a TNC fee for every pickup and drop-off at UNLV, like the fee utilized by McCarran International Airport

State law would have to be changed to allow either a separate TNC fee or an extension of an existing one to apply to a different geographical area outside of McCarran Airport. Discussions have already begun on organizing a coalition to build consensus at the state legislature to add a new TNC fee. UNLV should prepare by doing an analysis of the impact of TNCs on their parking revenue and infrastructure. Although there are no analyses or studies that document this, based on our observed use of TNC operations at both authorized and unauthorized locations on UNLV's campus, Uber and Lyft operations have already had a negative financial impact on UNLV parking permit purchases, mobile payments and parking citation revenue. It would be desirable to begin documenting the negative impacts from TNCs on the university. This trend will likely continue as TNC operations and drivers continue to expand throughout Clark County.

One way that UNLV could begin to explore this issue would be to participate in future meetings of the Las Vegas Resort Corridor Mobility Association (RCMA), a resort-corridor based Transportation Management Association made up of private resort gaming operators and local and state government regulators who are focused on improving mobility into and out of the Las Vegas Resort Corridor. The RCMA has been discussing the impacts of TNCs on the existing infrastructure in the Las Vegas Resort Corridor and is contemplating action. Similar action is being contemplated by the Transportation Resource Advisory Committee (TRAC) of the RTC. UNLV should continue to participate in the TRAC process and explore participation in discussions with the RCMA.



Source: Uber Elevate

¹⁰ Bruce Schaller, The New Automobility: Lyft, Uber & the Future of American Cities, July 2018

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Concession Based Revenue

Pursue A Jointly Developed Parking Garage in Cooperation with the Clark County Department of Aviation

UNLV is in a unique situation since its location is almost directly adjacent to McCarran International Airport. McCarran is under parked at Terminal 1 and, to a lesser extent, at Terminal 3, which results in peak periods where patrons have no choice but to use economy parking, assuming there is availability there. During major holidays and many weekends, economy parking is no longer readily available. According to the Clark County Department of Aviation Deputy Director, James Chrisley, “Parking and ground transportation concerns have become the major issue of capacity concern at McCarran.”¹¹

Many universities have turned to either private partners or municipal partners to pursue joint funding arrangements to add parking capacity. In the past 25 years, there have been cooperative agreements between McCarran International Airport and UNLV for parking. In the 1990s, the Clark County Department of Aviation leased land from UNLV near the Thomas & Mack Center for parking overflow. Clark County subsequently purchased this land from the University and is now using it for staging operations for TNCs. Now that the airport is growing again at record rates, there is a need for the airport to find additional parking capacity.

There is considerable precedent for universities to partner with municipal, county, regional and/or state governments to jointly build parking facilities that both partners will share. The various partners pool capital resources to fund parking infrastructure, and they also share operating revenues from parking and ancillary uses. Finding a partner to contribute capital as well as operating and maintenance funds could significantly reduce the cost to UNLV of providing new parking facilities.

Recommendation: Explore forming a strategic parking partnership with the Clark County Department of Aviation



¹¹ James Chrisley, Statement at Resort Corridor Mobility Association Meeting, September 2019

Funding and Financing Strategies

Use Value Capture to Facilitate a Public Private Partnership (P3) for University Parking

If Clark County DOA is not interested in a parking partnership, the University could pursue a public-private partnership to add parking capacity. There may be several advantages to doing so including:

- Capturing the value of the land assets that UNLV already owns
- A private entity assumes the risk of future parking revenue instead of the University
- A private party provides the necessary capital, operations and maintenance funds and/or provides an up-front lump-sum payment to the University for the privilege of charging for parking and/or the leasing of related commercial facilities
- The University can structure the P3 agreement to maintain control of parking operations, pricing and level of service, if desired

Other universities have also experienced success jointly developing parking with other commercial and academic needs into the same development. Northwestern University, in Evanston, IL, has built two mixed-use garages in recent years as part of a plan to move parking to the periphery of campus and free up more interior land for other campus uses.

A 1,125-space garage at the north end of Northwestern's campus houses an entrepreneurship incubator known as the Garage, as well as a speech and hearing clinic open to the community. At the south end, a 435-space garage is home to the Segal Visitors Center.

"We believe that it doesn't really make sense to have space that is just for cars," said Alan K. Cubbage, the vice president for Northwestern University relations. "You want to use the space in a thoughtful way."¹²

Recommendation: Set up an internal task force to identify mixed-use parking garage development opportunities

Parking facilities are valuable for the faculty, student and visitor experience at every university, but they are also valuable real estate assets. UNLV does have land that it has identified for parking expansion, and that land has tremendous value. UNLV could capture the value of that land (value that has been added by virtue of the prime location next to a major metropolitan airport and proximate to an existing market for campus services) by wrapping a parking garage with commercial uses such as retail and office space or developing another vertical, mixed-use development that includes parking on the lower levels. UNLV could capture the value of that land by leasing the commercial facilities, including parking, from the new development.

A properly structured deal with a private partner could also result in premium parking services, such as valet parking, which could be introduced into the parking structure. Premium parking services result in premium parking revenues. Private parking operations also could be structured where parking rate increases would not have to be approved by the University Board of Regents, which would remove a major obstacle to raising needed parking revenue as UNLV continues to grow. Additionally, the proximity to McCarran Airport could also attract private capital to capture a portion of McCarran International Airport's parking market.

Structured thoughtfully, a parking P3 could allow UNLV to capture the market and revenue potential of their existing vacant land as well as access the expertise, capital, innovation and efficiency of the private sector to provide some or all aspects of design, construction, financing and operations of a collection of various needed campus facilities, including parking, for a specified term.

UNLV has prior experience working with private providers to build parking assets as well as commercial and student housing (mixed use) on the eastside of Maryland Parkway and north of campus. As mentioned above in the section on existing parking revenue sources, there is an existing financial relationship between PTS and the UNLV Student Union where the UNLV Student Union displaced a large surface parking lot and has compensated PTS for the use of those lost parking spaces going forward. A similar financial relationship could be duplicated if PTS could find the right business deal with either a private partner or some other University department that needs land for a building and was willing to compensate PTS for use of their development rights as part of a joint parking garage and campus building development.



¹² Lisa Prevost, On the College Campus of the Future, Parking May Be a Relic, The New York Times, September 5, 2017

XIII. Recommendations and Implementation



XIII. Recommendations and Implementation

The following is a summation of the findings from the previous sections of this report. The findings represent the opportunities and constraints for various components of the parking and transportation system on campus. This section also presents the recommendations for improving the parking and transportation system on campus.

Summary of Findings

Below is a compiled list of findings from the previous sections of this report:

- The campus is approaching the effective capacity threshold of 90% of spaces being occupied. Current observed occupancy during the peak hour of Thursday at 1pm is 76%. with the 83%. Many facilities on campus are at or above the 90% occupied effective capacity threshold. There is one large lot (White Lot) that is underutilized during normal conditions, which is what is driving overall campus occupancy lower. It is important to the campus and community to maintain underutilization in this lot because it serves as the primary parking for the Thomas and Mack arena and it acts as an overflow lot when there are temporary changes on campus and an event lot for many large campus and city events. If the White Lot is assumed to be not part of the overall campus typical supply, the peak occupancy becomes 83%.
- UNLV has lower parking permits rates for all users than most of its peers. The low permit rates inadvertently encourage use of a personal vehicle rather than other modes of transportation. As reported in the community survey, nearly 93% of trips to the campus are made using a personal vehicle.
- The community survey reported that some people, primarily faculty and staff, use a motorized vehicle to move around campus. They typically use their personal vehicle or a motorized golf cart. The lack of a campus shuttle drives this need to re-park once on campus to reach multiple campus destinations.
- The surrounding community is also lacking in connectivity, particularly for bicycles and pedestrians. The lack of safe and connected pathways or routes discourages these modes as a means of getting to campus and encourages the use of a personal vehicle.
- The hot weather and lack of inner-campus parking are contributors to people wanting to park close to their destinations. However, a typical trend on campuses is to reduce inner-campus parking to create inviting and attractive campus with bike and pedestrian connectivity. Along these lines, the Campus Master Plan is going to further reduce the amount of inner-campus parking, so soon, students, faculty, and staff will become accustomed to parking on the periphery and walking to their destinations.

- Communication of program goals, accomplishments, measurable outcomes and metrics, and future actions is important. Proper communication will not only help with compliance of regulations but can also build a positive image and gain support for the parking program.
- A variety of TDM measures will be instrumental in mitigating parking demands while also allowing the campus to grow and develop.

From permits, to available amenities, to physical barriers, there are many ways that the campus can improve to discourage the use of a personal vehicle and improve overall access and mobility while accommodating the projected future growth. The following section provides recommendations for how this can be achieved.

These findings provide the basis for many of the recommendations presented in the following section.

Recommendations and Implementation

Recommendations

The following are recommendations based on the various analyses, best practices, and input received during the development of this report. Each recommendation is divided into high, medium, or low priority. Priorities were determined based on the data and input provided throughout this process. Recommendations with high priorities are those that should be implemented immediately to address an immediate concern. The issues being resolved are summarized for each recommendation.



In addition to prioritization, included with each recommendation is an estimation of relative cost and relative impact on the parking demand. These metrics are included to help indicate how impactful each recommendation will be at resolving the overall issues. A recommendation with a low relative cost but a high impact on reducing parking demand will be more effective and efficient for the campus.

There are several key metrics that need to be monitored and used as a basis for data-driven management decisions. These metrics can be used to determine when a threshold for change has been met and therefore when a new strategy or phase should be implemented. Key performance metrics are summarized in **Table 13**.

Lastly, the priorities are organized according to the priorities previously mentioned, where the high priority recommendations are listed first since they are to be completed in the short-term.

Table 13. Performance Metrics and Thresholds

Performance Metric	Description
Parking Inventory and Campus Population	Provides a baseline for analysis and allows the University to track changes to the parking system over time and the impacts of those changes
Parking Occupancy	Indicates how well the system is being used and when parking strategies need to be implemented or adjusted. 90% occupancy during the peak hour is the industry standard for when the parking system has reached its effectiveness and needs to be managed differently.
Citation Information	Number, type, and location of citations indicates whether violations are occurring in isolated areas or for specific reasons
Permit Usage	Number of permits sold each year and the type of permits allows the University to track and adjust permit allocations
Alternative Transportation Usage	Indicates how well these programs are doing in relation to other changes on campus over time
Transit Ridership	Allows the University to determine the impacts of changes on campus to the transit system
User Feedback	Provides context so that any adjustments are meeting both the real and perceived situations
Revenue	Track revenue from permit sales, pay-by-phone transactions and citations. Along with usage data, revenue is useful to indicate which strategies are successful







Recommendations and Implementation

High Priority Recommendations







Below is a summation of the high priority recommendations, which should be initiated in the first one to three years of this plan. Following the summation are more details on each recommendation.

1. Increase Parking Permit Rates
2. On-Going Parking and TDM Program Utilization Monitoring
3. Implement Student Transportation Fee
4. Establish TDM Goals and Objectives
5. Establish Transit Pass Subsidy Program
6. Establish Carpool Incentive Program
7. Campus Bike Plan Implementation
8. Promote and Communicate
9. Request Funding to Build More Parking

Recommendation #1 - Increase Parking Permit Rates







	Description	Parking permits are necessary to park on the campus. The allow access to various parking facilities for all users on the campus. Proper allocation and pricing of permits can help to redistribute and mitigate parking demands.
	Issue Being Resolved	The low parking permit rates on the campus encourage the use of the personal vehicle, which results in highly occupied parking facilities. As more people drive to campus, it becomes increasingly difficult to find a place to park. Permits are the first step in encouraging or discouraging parking a personal vehicle on campus.
	Considerations	<ul style="list-style-type: none"> • Rates should be evaluated annually with the parking occupancy and other TDM usage data to determine amount of increase • Conduct parking occupancy and TDM usage analyses annually to track how changes to the parking and transportation system impact the parking demand
	Priority	High
	Relative Cost	Low
	Relative Impact on Parking Demand	High

Recommendation #2 - On-Going Parking and TDM Program Utilization Monitoring






	Description	Collection of parking inventory, occupancy, and TDM usage data allows the university to make informed decisions. Over time, the university will accumulate historical data so that trends can be realized. As changes occur on the campus (e.g., more development, implementation of parking strategies or TDM strategies), the university can be prepared to predict changes and proactively manage the parking system.
	Issue Being Resolved	Having historical knowledge of parking inventory, occupancy, and multimodal usage will allow the university to make informed decisions on how influential changes are year over year.
	Considerations	<ul style="list-style-type: none"> • These collection periods should be consistent year over year to better define changes in parking and TDM on the campus. • Conduct parking occupancy and TDM usage analyses annually to track how changes to the parking and transportation system impact the parking demand.
	Priority	High
	Relative Cost	Medium - staff time and procedural adjustments
	Relative Impact on Parking Demand	High

Recommendations and Implementation







Recommendation #3 - Implement a Student Transportation Fee

	Description	A transportation fee is a portion of the cost that all students attending UNLV will pay to help fund various transportation related projects on the campus.
	Issue Being Resolved	The fee will allow for investment into improvements for various modes of transportation on campus.
	Considerations	<ul style="list-style-type: none"> Continuous communication with student representatives will be necessary to obtain their input and gain their support. Conduct parking occupancy and TDM usage analyses annually to track how changes to the parking and transportation system impact the parking demand.
	Priority	High
	Relative Cost	Medium - staff time and procedural adjustments
	Relative Impact on Parking Demand	High







Recommendation #4 - Establish TDM Goals & Objectives

	Description	A key part of any TDM program requires establishing goals and objectives to help determine where investments should be prioritized and/or reallocated when not achieving the intended outcomes. TDM goals and objectives included in the 2020 UNLV Campus Parking and Transportation Master Plan <i>and</i> the 2020 UNLV Campus Master Plan include potential TDM strategies to be considered and implemented.
	Issue Being Resolved	Prioritizing University parking and mobility goals to determine where to allocate investments/changes and when to gain desired outcomes.
	Priority	High
	Relative Cost	Low - staff time
	Relative Impact on Parking Demand	Medium

Recommendation #5 - Establish Transit Pass Subsidy Program







	Description	The current U-Pass program offered by RTC represents a good start, but even a discounted semester transit pass (\$104.00) is more expensive than parking on campus (5 monthly student passes would cost \$68.75). Most students and University employees with access to a car would likely find it more cost effective to drive rather than take transit under the current pricing structure.
	Issue Being Resolved	Given that the cost to PTS per vehicle trip to campus (including costs to construct and maintain parking) is much greater than the cost per transit trip (made using existing RTC routes), subsidizing the purchase of transit passes for any student, faculty, or staff member willing to forgo the purchase of a parking pass has the potential to reduce PTS costs in the long term.
	Considerations	<ul style="list-style-type: none"> University’s willingness and ability to subsidize transit passes
	Priority	High
	Relative Cost	Medium - staff time and procedural adjustments
	Relative Impact on Parking Demand	High

Recommendation #6 - Establish Carpool Incentive Program







	Description	While some campus students and employees may already carpool or share parking permit costs, the low parking permit costs and lack of incentives to carpool likely keep carpooling to a relative minimum. A clearly defined carpool program could help to increase the rate of carpooling, while making it a more convenient option that simply sharing a single permit.
	Issue Being Resolved	Reduction of single occupancy vehicle use across campus
	Considerations	<ul style="list-style-type: none"> Incentives to ensure program success Marketing and communication of enhanced program
	Priority	High
	Relative Cost	Medium - staff time, procedural adjustments, marketing
	Relative Impact on Parking Demand	Medium

Recommendations and Implementation

Recommendation #7 - Campus Bike Plan Implementation





	Description	The 2017 UNLV Campus Bike Plan established an implementation plan for making biking to and on campus a safer and more attractive option. Biking incentives and “amenities” (such as repair stations, bike lockers, bike corrals, and showers) are all important components of a robust TDM program that encourages biking, but to be truly successful, potential bicyclists must feel they have safe, pleasant, and reliable options for getting to campus by bike. Investing in enhanced bicycling facilities (greenways, protected bike lanes, etc.) both on and off campus, along with wayfinding and other strategies outlined in the Campus Bike Plan are important to pursue in the near term to improve perceptions of bicycling. Longer-term incentive programs will have the greatest chance for success if the infrastructure is already in place to make students and commuters see biking as a safe and viable alternative to driving.
	Issue Being Resolved	Enhancing mobility and reducing single occupancy vehicle use by making biking on campus safer and more attractive
	Considerations	<ul style="list-style-type: none"> • Campus Bike Plan goals and objectives • Area bike and recreation integration
	Priority	High
	Relative Cost	Medium - staff time, some infrastructure costs
	Relative Impact on Parking Demand	Medium

Recommendation #8 - Promote and Communicate

	Description	A transportation fee is a portion of the cost that all students attending UNLV will pay to help fund various transportation related projects on the campus.
	Issue Being Resolved	The fee will allow for investment into improvements for various modes of transportation on campus.
	Considerations	<ul style="list-style-type: none"> • Continuous communication with student representatives will be necessary to obtain their input and gain their support • Conduct parking occupancy and TDM usage analyses annually to track how changes to the parking and transportation system impact the parking demand
	Priority	Medium
	Relative Cost	Low - staff time and materials
	Relative Impact on Parking Demand	Medium

Recommendations and Implementation

Recommendation #9 - Request Funding to Build More Parking





	Description	Build new parking garages on the campus to help accommodate the parking demand. The construction of new parking should be conducted in phases so as not to provide an overabundance of parking. The Tropicana garage is already slated for construction, so this will be an initial phase. A second garage should focus on being a mobility hub, connecting many forms of transportation at one location to encourage and improve multimodal transportation on the campus. Construction of any other garages should be vetted against the parking occupancy data to determine the need and appropriate sizing.
	Issue Being Resolved	The campus master plan anticipates adding an additional 41,228 people to the campus over the next 10 years. Additionally, 1,433 spaces will be removed due to new development. New parking supply will ensure that there are enough spaces to meet demands.
	Considerations	<ul style="list-style-type: none"> • New parking supply should be moved to the peripheral parts of campus • Phase construction of garages so that a situation of oversupply is not created. Only build new parking when all other resources are exhausted due to the unsustainable nature of continuously adding new supply • Conduct parking occupancy and TDM usage analyses annually to track how changes to the parking and transportation system impact the parking demand.
	Priority	High
	Relative Cost	High
	Relative Impact on Parking Demand	Low - will not reduce parking demand, but will redistribute it on the campus
	Key Performance Metrics Threshold	

Medium Priority Projects

Below is a summation of the medium priority recommendations, which should be initiated after the high priority recommendations, potentially in the next three to five years of this plan and beyond. Following the summation are more details on each recommendation.





10. Explore Funding Options to Create a Campus Mobility Hub
11. Increase the Number of Transit Routes to Campus
12. Implement a Campus Shuttle System
13. Incentivize Club Ride Program

Recommendation #10 - Explore Funding Options to Create a Campus Mobility Hub





	Description	Mobility hubs are a location where various modes of transportation connect. The types and sizes will vary depending on the area and the need, but these can connect parking facilities, transit stops, bike share, e-scooters, rideshare and TNCs. The mobility hub is typically a mixed-mode parking garage with adequate space to accommodate all these other necessary modes. A partnership with RTC for the mobility hub should be considered and explored.
	Issue Being Resolved	The campus would like to establish a campus culture where people can travel to the campus in a personal vehicle, park once, and then travel around the campus using other modes of transportation. A mobility hub will help to facilitate this type of park once culture by providing connectivity to various modes of transportation in one location. The hub will improve overall access and mobility to and around campus.
	Considerations	<ul style="list-style-type: none"> • The location and size of the hub should be determined based on transit route options and locations, parking demand, and the types of alternative mode choices offered at the school. • Allow for flexibility in the hub so that as mode choices shift, the hub can keep up with the changes. • Conduct parking occupancy and TDM usage analyses annually to track how changes to the parking and transportation system impact the parking demand.
	Priority	Medium
	Relative Cost	High
	Relative Impact on Parking Demand	Medium - transit and other mode options will impact the parking demand; however, it is anticipated that people will park at the hub and then travel through campus using these other modes.

Recommendations and Implementation





Recommendation #11 - Increase the Number of Transit Routes to Campus

	Description	Increasing the number of transit routes to the campus provides a viable alternative to the personal vehicle. More routes mean more people can take the bus to get where they need to go. Transit is an extremely valuable and effective way to improve mobility.
	Issue Being Resolved	The campus is currently vehicle-centric, meaning most people drive their personal vehicle to and around the campus. Improved transit connectivity to the campus provides people with alternative options for getting to campus.
	Considerations	<ul style="list-style-type: none"> The timing of transit routes must be coordinated with class schedules so that people are able to use transit to get to the campus and be on time to attend or teach class. Route options and timing will be reliant on cooperation with the local transit provider. Conduct parking occupancy and TDM usage analyses annually to track how changes to the parking and transportation system impact the parking demand.
	Priority	Medium
	Relative Cost	High
	Relative Impact on Parking Demand	High

Recommendation #12 - Implement a Campus Shuttle System

	Description	The highest priority option for improving transportation on and between campuses expressed by students, faculty, and staff is the implementation of a campus shuttle system to make it easy to get around campus. Improving on-campus transportation can support TDM and reduce vehicle trips to campus over time as perceptions change and the campus community begins to feel that they have several flexible transportation options to get around without a vehicle. High frequency transit/shuttle service, bike share systems, shared mobility services (such as scooter share), rideshare services, and guaranteed ride home programs can all work together to provide users with a wide variety of transportation options that reduce the need to bring a vehicle to campus every day.
	Issue Being Resolved	Like the transit and carpool incentive programs, a bicycle incentive program could allow anyone interested in biking as their primary mode of transportation to receive several benefits in exchange for forgoing the purchase of a parking pass.
	Considerations	<ul style="list-style-type: none"> Prior to implementation, PTS should explore potential routes, capital costs (bus purchase, bus storage facilities), operations and maintenance costs, and potential operational strategies and partnerships to reduce costs
	Priority	Medium
	Relative Cost	High
	Relative Impact on Parking Demand	High

Recommendation #13 - Incentivize Club Ride Program

	Description	RTC's Club Ride program already has the reporting system in place to make it easy to log trips by alternative modes.
	Issue Being Resolved	PTS can further encourage the use of this program by directly incentivizing the use of alternative modes.
	Considerations	<ul style="list-style-type: none"> Could be rolled out as part of a suite of enhancements including other recommendations from this plan
	Priority	Medium
	Relative Cost	Low
	Relative Impact on Parking Demand	Medium

Recommendations and Implementation

Lower Priority Projects

Below is a summation of the lower priority recommendations, which should be initiated after the high and medium priority recommendations, potentially in the five to ten years of this plan and beyond. Following the summation are more details on each recommendation.

- 14. Improve parking facility maintenance
- 15. Creation of TNC drop off sites
- 16. New Parking Count Technology Acquisition

Recommendation #14 - Improve Parking Facility Maintenance		
<div> <div></div> <div></div> <div></div> <div></div> <div></div> </div>	Description	Maintenance for parking garages and lots should be done on a consistent and frequent basis.
	Issue Being Resolved	Clean and well-maintained facilities encourage use of those facilities because they feel safer to use. Regular upkeep also means that problems are found early, saving costs in the long run.
	Priority	Low
	Relative Cost	Low to High - depending on the types of repairs
	Relative Impact on Parking Demand	Low

Recommendation #15 - Creation of TNC Drop-Off Sites		
<div> <div></div> <div></div> <div></div> <div></div> <div></div> </div>	Description	Work with companies like Uber and Lyft to identify ideal locations for drop-off and pick-up zones on the campus.
	Issue Being Resolved	Focusing these services can reduce parking demand by providing a service that is highly utilized.
	Considerations	<ul style="list-style-type: none"> Ongoing parking occupancy, TDM usage, and data from TNCs will help inform decisions on improvements Work with vendors to identify locations, geofence boundaries, and data sharing Consideration should be made for traffic volumes. Monitor traffic volumes to make sure TNCs are not contributing to campus congestion
	Priority	Low
	Relative Cost	Low to High - depending on the types of repairs
<div> <div></div> <div></div> </div>	Relative Impact on Parking Demand	Medium

Recommendation #16 - New Parking Count Technology Acquisition		
<div> <div></div> <div></div> <div></div> <div></div> <div></div> </div>	Description	Parking count technology allows managers of the university parking system to monitor the parking occupancy data. The technology also benefits users by directing them to available parking spaces in facilities.
	Issue Being Resolved	Parking technology will allow for streamlined management on the backend and distribution of parking demand by indicating where users should park.
	Considerations	<ul style="list-style-type: none"> Pilot test vendors prior to purchasing a system to test capabilities and alignment with parking management goals
	Priority	Low
	Relative Cost	High
<div> <div></div> <div></div> </div>	Relative Impact on Parking Demand	Medium

XIV. Appendices



XIV. Appendices

Appendix 1 - Parking Supply/Demand Analysis Data

Detailed utilization tables from data collection subconsultant Silver State.

Appendix 2 - Traffic Count Data Sheets

Existing University peak-period turning movement counts were conducted at the key intersections on Wednesday September 25, 2019 at the beginning of fall term. The traffic count data sheets are provided in this appendix.

Appendix 3 - Clark County DDI Report

A detailed study on the impacts of the Tropicana Parking Garage Expansion and the Naples Garage as well as the integration of the Clark County DDI option are included in this appendix.

Appendix 4 - Transit Center Parking Garage Impact Study

A detailed study on the impacts of Transit Center Parking Garage is included in this appendix.

Appendix 5 - Key Intersection LOS Reports

Calculations for the LOS at the key intersections for the existing 2020 volume analysis and the 2040 background plus parking demand volumes are included in this appendix.

Appendices 6 through 30 - Traffic Illustrations

Traffic figures from Chapter VI:

- Appendix 06 - Figure 22 - Study Area
- Appendix 07 - Figure 23 - Key Intersections and Parking Lot Accesses
- Appendix 08 - Figure 24 - 2020 Existing Lane Configurations
- Appendix 09 - Figure 25 - 2020 Existing Vehicle Traffic Volumes
- Appendix 10 - Figure 26 - 2020 Existing Bicycle Traffic Volumes
- Appendix 11 - Figure 27 - 2020 Existing Pedestrian Traffic Volumes
- Appendix 12 - Figure 28 - 2020 Existing Traffic Scooter Traffic Volumes
- Appendix 13 - Figure 30 - Peak Hour Vehicle Arrival
- Appendix 14 - Figure 31 - Peak Hour Bicycle Arrival and Departure
- Appendix 15 - Figure 32 - Peak Hour Pedestrian Arrival and Departure
- Appendix 16 - Figure 33 - Peak Hour Scooter Arrival and Departure
- Appendix 17 - Figure 34 - Peak Hour Vehicle Departure
- Appendix 18 - Figure 35 - County DDI Option and UNLV 2030 Master Plan
- Appendix 19 - Figure 36 - 2040 Background Volumes
- Appendix 20 - Figure 37 - Future Parking Garages
- Appendix 21 - Figure 38 - Tropicana Parking Garage Expansion Trip Assignment

- Appendix 22 - Figure 39 - Naples Parking Garage Trip Assignment
- Appendix 23 - Figure 40 - Transit Center Parking Garage Trip Assignment
- Appendix 24 - Figure 41 - North Parking Garage Trip Assignment
- Appendix 25 - Figure 42 - Future Lane Configuration and Control
- Appendix 26 - Figure 43 - 2040 Total Volumes
- Appendix 27 - Figure 44 - 2020 Existing Morning Level of Service
- Appendix 28 - Figure 45 - 2020 Existing Afternoon Level of Service
- Appendix 29 - Figure 46 - 2040 Total Morning Traffic Level of Service
- Appendix 30 - Figure 47 - 2040 Total Afternoon Level of Service

Appendix 31 - Federal Grant Programs for Parking

A detailed explanation of each federal funding source, including a discussion of the process for how to obtain those funds from each source.

Appendix 32 - Codification of Parking Eligibility as Part of US DOT Programs

Copy of code pertaining to federal parking eligibility as part of United States Department of Transportation Programs.

Appendix 33 - Recommended Reading List for Parking Professionals

An annual publication developed by Kimley-Horn for its clients, it provides a rich library of parking and transportation related books and websites for parking professionals.

Appendix 34 - Assessing an Uncertain Transportation Future

This document explores key areas that experts warn are likely to produce significant disruptions to the parking and transportation industries in the coming years.

Appendix 35 - Mobility Hubs Strategy Paper

A summary of mobility hubs and transit strategies from the Rhode Island 2040 Transit Master Plan.

Appendix 36 - Parking Garage Design Guidelines

This set of parking garage design guidelines provides the University with a tool to help with the planning and development of future parking facilities to ensure that fundamental garage planning elements are effectively addressed in the early planning phases so that staff are better acquainted with garage design and planning elements going forward.

Appendix 37 - Parking Management and Design Best Practices Toolbox

This document contains well over 300 parking management best practices. This document serves as a tool to provide UNLV with a wealth of ideas to stimulate program development as they tackle parking issues as a key transformative strategy within the context of downtown development and parking program enhancement plans.

Appendix 38- Put a Lid On It

A presentation detailing the concepts of parking lids, their benefits, and using them as an approach to future demand reduction.

Appendix 39 - Parking Count Technology Overview

Research from a recent parking count technology project that provides an overview and vendor details for several count technologies currently available on the market.

Appendix 40 - Distracted Parking

A presentation about addressing and enhancing pedestrian safety in parking environments.

Appendix 41 - Sample Parking Enforcement Operations Manual

In evaluating municipal parking programs from around the country, we have found that the development of a comprehensive Parking Enforcement Handbook or Manual can be a very effective tool to improve operations, consistency of performance, and staff training. We recommend that the University customize this generic manual for its program.

Appendix 42 - IPMI Emergency Preparedness Manual

An often-overlooked element of parking system management is the development of an Emergency Preparedness Manual. IPMI recently published an excellent template for such a manual and we provide this copy for the University's team to review and use as a guide for developing a customized manual for their needs.