PREPARED FOR:

Colorado State University

PREPARED BY:

Kimley-Horn and Associates, Inc.

WITH SUPPORT FROM:

the solesbee group | Standard Parking®

Colorado State University

PARKING AND TRANSPORTATION MASTER PLAN

APRIL 2014

Acknowledgements

The following parties were involved in the development of this document.

CSU Team

Dave Bradford - University Parking Services

Shelly Carroll - Facilities Management

Fred Haberecht - Facilities Management

David Hansen - Facilities Management

Doug Mayhew - University Parking Services

Megan Miller - Facilities Management

Kimley-Horn and Associates, Inc.
Consultants Team

L. Dennis Burns, CAPP - Project Manager

J. Brett Wood, P.E. - Assistant Project Manager

Kevin Kimm, P.E. - Assistant Project Manager

Curtis Rowe, P.E. PTOE - Transportation/Traffic Engineer

Brian Valentine, P.E., LEED®AP - Cordon Study Lead

Jeffrey Smith, P.E., LEED®AP - Transportation/TDM

H. Dean Penny, P.E. - Quality Control

Sandra Syntax - Analyst

Subconsultants

Vanessa Solesbee, The Solesbee Group - Community Engagement and Strategic Communications

Casey Jones, CAPP, Standard Parking - Parking Operations Assessment

Table of Contents

LIST OF TABLES

LIST OF FIGURES

EXECUTIVE SUMMARY

PROJECT OVERVIEW & SUMMARY OF KEY RECOMMENDATIONS

Project Overview

Colorado State University (CSU) is taking aggressive steps to enhance its viability and competitive position in marketplace as well as ensuring its ongoing sustainability in every sense of the word. A broad range of campus development initiatives as well as significant community investments (such as the MAX Bus-Rapid Transit line) and private development projects (this includes a variety of off-campus student-oriented housing projects) are combining to change the character of the area in and around the CSU campus. The CSU campus master plan, updated in the spring of 2012, addresses plans to grow the campus by approximately 8,000 students and 1,000 staff by the year 2024. This growth will result in an additional 1.8 million square feet of development on the main campuses, eliminating many hundreds of existing surface parking spaces and ultimately creating a denser, more urbanized campus environment. This Parking and Transportation Master Plan will provide strategies to improve overall campus access, develop a more sustainable program of transportation alternatives, and improve customer service for the CSU community going forward.

Integration with 2020 Campus Master Plan

One of the most important elements of this Parking and Transportation Plan is the degree to which it aligns and supports key elements of the 2020 Campus Master Plan. Key 2020 Campus Master Plan elements related to campus access and development include:

- A significant increase in structured parking to free up land for future campus academic and housing development
- The location of new structured parking assets to the campus perimeter and the development of more robust transit and transportation demand management (TDM) programs to support the densification of the CSU campus.
- These actions will be accomplished while maintaining the three campus planning pillars of:
  - Protecting campus green space
  - Preserving a pedestrian focus for the academic core and
  - A strong commitment to sustainability
- Access and Transit Guiding Principles
  - Make campus permeable to the community
  - Maintain vehicle access
  - Provide parking at campus edges + key internal locations
  - Establish mass transit centers
  - Develop internal campus transit
  - Maximize alternative modes of transportation
- Overall Campus Guiding Principles
  - Restrict development in 100-year floodplain
  - Maintain + reinforce green quads + open spaces
  - Establish green setbacks at campus edges
  - Expand + reinforce pedestrian core/plaza
  - Preserve + reinforce view corridors

Project Approach and Report Organization

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

- Project Introduction and Overview
  - This section provides a summary of the planning context and background that is important to understanding the dynamic and fast-moving environment in which this analysis was conducted.
  - It also highlights the excellent in-house planning work done to date and applauds the effective collaboration between various campus departments to develop the high-level campus planning work that this study has critiqued and refined.
- Current Parking Management Program Review
  - The current program management review confirmed that CSU's parking and transportation management (PTS) team is highly effective, well-organized, connected, and engaged with larger campus planning and development activities. The CSU PTS department has made incredible progress in the past decade and is poised to become one of the premier university parking and transportation programs in the country.
  - The CSU PTS department has invested wisely in appropriate technologies including the T-2 System as their primary permit management software system, Cale multi-space meters, Genetec license plate recognition software, and a variety of other advanced parking management tools.
  - A specific focus on parking allocation strategies and the impacts of recent changes to ADA parking regulations were reviewed with staff and an example of our recommended approach to assessment campus accessibility issues was provided.
  - Recent parking management initiatives including the engagement of a program-specific communications specialist and the recent recruitment and hiring of a new TDM professional are very positive signs of a program that is evolving to meet the significant challenges and opportunities ahead.
  - The parking management offices, program offerings/communication tools, and customer service approach meet or exceed industry norms.
  - This report section also involved the development of peer institutions survey which looked at both "academic peer institutions" as well as "parking and transportation peers". Detailed survey results are provided in the report appendices.
  - Kimley-Horn and Associates, Inc. also provided CSU with its extensive collection of "Parking Management and Design Best Practices" document. With over 300 identified best practices, this document provides CSU with many potential strategies that it may choose to further investigate and implement in the coming years. It should be noted that CSU PTS, being a well-managed department, have already implemented many of these industry best practices.

- Transportation Demand Management (TDM) Existing Conditions Review
  - This section assessed the current state of the CSU campus TDM programs and other transportation alternatives.
  - Special meetings were held with City of Fort Collins, the North Front Range Metropolitan Planning Organization, and Transfort staff to better understand plans for future local and regional transit options.
- Transportation Demand Management: Best Practices
  - The growth and development of a best-in-class TDM program is a critical departmental priority moving forward, if the campus is to effectively implement this plan and achieve the desired results related to mitigating the growth of campus parking demand, providing enhanced campus access and increasing the utilization of alternative transportation elements in alignment with larger campus master plan and sustainability goals.
  - This forward=looking section provides a range of TDM best practices and numerous short- and long-term program recommendations for this important program development area.
- Community Engagement and Strategic Communication Plan
  - An extensive community outreach and campus stakeholder engagement process was conducted including an electronic survey of the campus community, which elicited over 2,600 survey responses with an overall 84% survey completion rate. Key areas of focus for the campus survey included identifying:
  - Commuter perceptions and habits related to parking and transportation
  - Identification of preferred transportation modes and viable alternatives
  - Perceived challenges and areas of opportunity
  - Beyond the survey effort and specific focus group interviews, the key goals of this section included:
    - Identification of current commuter behavior, as well as existing and future campus access management challenges and opportunities
    - Development of a comprehensive strategic communication plan to effectively educate the campus community (and key external audiences) on how parking and transportation investment and development are critical to the growth and sustainability of the entire institution,
    - Explore traditional and non-traditional marketing channels, public relations, and social media strategies.
  - An overall "strategic communication plan" was developed that includes a variety of potential communication strategies and tools designed to keep the campus community informed, while simultaneously building greater understanding of the key issues and excitement about the future.
- Traffic Impact Assessment, Campus Cordon Study and Traffic Simulation Model
  - This extensive and important section of the report documents traffic conditions at 37 key intersections across the campus. In addition to documenting vehicular traffic, data was also collected for pedestrian, bus, and bicycle traffic as part of a comprehensive campus "cordon study."
  - Based on campus planning data provided by CSU, future traffic conditions were projected for all key intersections.
  - A detailed campus traffic simulation model was created using Vissum software. This tool will be of ongoing value to campus planners for years to come and will be especially useful in planning for upcoming major projects such as the proposed new football stadium.
- PARK+ and Campus Parking and Multimodal Demand Modeling
  - The last piece of work to be completed for this project was the development of a Park+ GIS-based parking demand and campus access model. This new planning tool integrates all of the campus parking supply, utilization, land-use and modal split data into one integrated database.
  - This tool, now owned by CSU, provides the PTS department with the ability to keep the campus parking database up to date themselves on an on-going basis.
  - Equally important, given the dynamic and changing nature of the CSU development and planning environment, this tool allows CSU to run a variety of PTS scenarios. This tool, combined with the campus traffic simulation model, gives CSU parking and transportation many new planning capabilities to more effectively interface with campus Facilities Management, the campus architect, and other departments going forward.

Parking Development – Next Steps

This project has been executed in a dynamic and evolving environment. Planned campus building projects continue to move forward, generating new campus parking demands. Existing parking capacity is being lost. Community projects such as the MAX BRT and a host of off-campus student housing projects are quickly becoming a reality. The basic plan for addressing new parking demands and short-term replacement parking are supported by this study and the first of the proposed parking development projects are moving forward. Kimley-Horn assisted the PTS Management teams in the development of two parking facility "program plans."

- Shields Street Parking Garage – Program Plan
  - The first of these facility-specific program plans was developed for the proposed parking structure near the Moby Arena. While a large garage (approximately 1,400 spaces), this facility will be located on an existing large surface lot. As a result, the net space gained is less than 400 spaces. However, this project is located in an area of campus that has seen the greatest loss of surface parking to date.
  - Kimley-Horn assisted Facilities Management staff with the development of the proposed parking garage program plan in the following areas:
    - Main Campus parking adequacy analysis
    - Programmatic alternatives
    - Equipment and technology requirements
    - Functional design
    - Accessible parking
    - Parking control equipment
    - Structural design
    - Site, civil and landscape design
    - Plumbing and mechanical systems
    - Lighting and electrical systems
    - New utilities

Bay Farms Parking Garages – Program Plan

- In anticipation of a greater loss of existing surface parking to come and in conformance with campus master plan goals to both relocate structured parking assets to the periphery of campus and to better connect the Main Campus to the South Campus, the second major parking development project will be located in what is known as the Bay Farms area.
- Being developed on currently undeveloped land, this project will add a significant amount of new parking. The challenges related to this site are its distance from the campus core (necessitating an on-campus shuttle program) and its physical location in the 100-year floodplain.
- This development is seen as important to providing replacement parking capacity in general: however, should the proposed new football stadium project move forward, this project becomes a critical element in the overall campus development process.
- Kimley-Horn is assisting Facilities staff with the development of the proposed parking garage program plan in the following areas:
  - Programmatic alternatives
  - FEMA floodplain impacts
  - Equipment and technology requirements
  - Functional design
  - Accessible parking
  - Parking control equipment
  - Structural design
  - Site, civil and landscape design
  - Plumbing and mechanical systems
  - Lighting and electrical systems
  - New utilities

Key Parking and Transportation Master Plan Recommendations

This section summarizes the major recommendations either supported from the original planning concepts or modified as part of this study.

ITEM 1

Parking Supply Assumptions Adjustments – Adopt a lower parking space to population ratio as the key parking planning benchmark moving forward.

Our analysis of the proposed parking development program identified a subtle assumption that the proposed amount of planned parking going forward was designed to maintain or during certain timeframes actually increase the ratio of parking spaces to overall campus population. We believe a policy that aggressively pursues a wide range of TDM strategies, enhanced transit, combined with increased parking rates and a reduction in parking supply, targeting a parking space/student and staff ratio in the range of 0.28 – 0.32 would be better aligned with the campus' overall master plan and sustainability goals. This would equate to a recommended targeted parking supply at the 2024 campus build out (assuming 42,000 student/staff population) in the range of 11,760 – 13,440 spaces.

Over time, depending on the success of new alternative transportation programming and infrastructure development, this targeted parking to student demand ratio could potentially be reduced as low as 0.28 – 0.32.

With the assumption that the university campus population will grow from the current 33,000 (students/faculty and staff) to approximately 42,000 by the year 2024, a range of parking spaces to campus population ratios could be applied to the projected campus population figures to provide some comparisons.

CSU currently has a parking space to campus population ratio of 0.34. A straight linear extrapolation of this current ratio would suggest that if this ratio was maintained that CSU would need a parking supply of 14,280 spaces in 2024.

If the lower end of the recommended ratio of parking spaces to population range (0.28) was applied, CSU would need approximately 11,760 spaces.

Of the other universities that we are familiar with that are similar in size, composition, and community setting, the University of Oregon has the lowest parking space to campus population ratio with a parking space to campus population ratio of 0.19. While many on campus (especially students) complain that parking is inadequate, the campus functions reasonably well and campus planners consider the low ratio a key element of their overall campus sustainability program.

Interestingly, Eugene is a similarly sized community to Fort Collins and one that received federal funding to implement a Bus Rapid Transit system very similar to the MAX several years ago. If CSU adopted a 0.19 ratio of parking spaces to population as a goal, CSU would only need approximately 7,980 parking spaces to accommodate the projected 2024 campus population of 42,000. However, significant investments in a range of transportation alternatives would be required and there would likely be significant impacts to campus customer satisfaction rates related to parking. There would also likely be significant impacts to surrounding neighborhoods.

Key Partners: Parking and Transportation Services, Facilities Management, Campus Architect, CSU Planning and Administration, the City of Fort Collins and Transfort.

Timeframe: 2013 – 2024

Supportive Documents/Tools Provided:

- Park + Model
- Peer Institution Survey

PRIMARY ACTION ITEM # 1:

Adopt a parking space to student ratio in the 0.28 – 0.32 range as the key parking planning benchmark moving forward.

This change in parking planning strategy, combined with increased strategic investments in transit and transportation alternatives, better aligns with overall campus master plan and sustainability goals.

Funds saved from the decrease in overall parking to be provided should instead be invested in alternative transportation program development, implementation, and tracking.

ITEM 2:

Prioritize Short-term Parking Development Projects

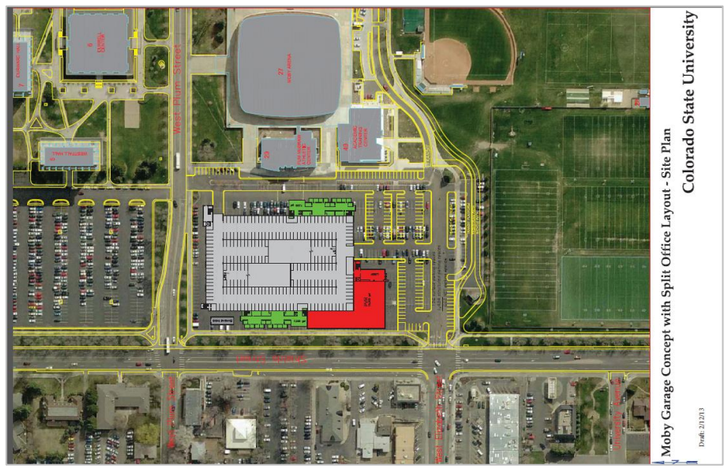
- In the short-term (2014 – 2019), there is an immediate need to proceed with the development of new parking assets to help off-set the loss of surface parking resources over the past several years.
- The plans to move forward with the proposed parking structure near the Moby Arena and the two proposed garages in the Bay Farms area will be critical to keeping parking operating smoothly during the coming five-year period, which will involve significant non-parking development activity resulting in even more reductions to existing surface parking.
- If the proposed on-campus football stadium project moves forward, the importance of these two key infrastructure projects will be even more pronounced.

Key Partners: Parking and Transportation Services, Facilities Management, Campus Architect, CSU Planning and Administration and Athletics.

Timeframe: 2013 – 2016

Supportive Documents/Tools Provided:

- Moby Arena (Shields and Plum) Parking Garage Program Plan
- Bay Farms Parking Garages Program Document Plan



PRIMARY ACTION ITEM # 2:

There is an immediate need to proceed with the development of new parking assets to help off-set the loss of surface parking resources over the past several years.

The plans to move forward with the proposed parking structure near the Moby Arena and the two proposed garages in the Bay Farms area will be critical to keeping parking operating smoothly during the coming five-year period, which will involve significant non-parking development activity resulting in even more reductions to existing surface parking.

PRIMARY ACTION ITEM # 3:

The importance of these TDM investments going forward must be appreciated and funded as they will provide the framework and support systems that will help bring to fruition many of the larger campus master plan goals. This new direction and change in policy will propel and define the PTS department well into the future.

This fee should provide an ongoing and dedicated funding source that will support both the larger campus development and sustainability goals as well as the campus' long-term parking and access management goals.

ITEM 3:

Development of an Aggressive TDM and Transportation Alternatives Program

- One of the most positive and important program development activities that occurred during the course of this study was the approval of a new transportation manager position within the PTS department.
- The recruitment and ultimate hiring of Aaron Fodge is even more positive. Given Mr. Fodge's depth of understanding of TDM issues, strategies, and resources, we are optimistic about the future of this critical management initiative.
- As stated elsewhere in the study, the level of funding of this important program dimension will be critical to ultimate success of the strategies envisioned in the overall campus master plan as well as the campus access management strategies.
- While it is assumed that some of the funding for TDM and transportation alternatives will come from traditional parking revenues (including increased parking rates), we recommend that a special transportation fund be developed specifically to address the development of this fundamental and essential campus infrastructure going forward. This proposed "Transportation Infrastructure Fund" could be created in several ways. One simple option would be to take the proposed bond funding that would have been applied to a future parking structure and dedicate that amount instead to the transportation fund. Another alternative, used by many campuses around the country is to create a "Student Transportation Fee."

Key Partners: Parking and Transportation Services, Facilities Management, Campus Architect, CSU Planning and Administration and collaboration with Transfort.

Timeframe: 2013 – 2016 will be critical program development years during which appropriate funding will be essential. This area of program development, monitoring, benchmarking, and refinement will be ongoing.

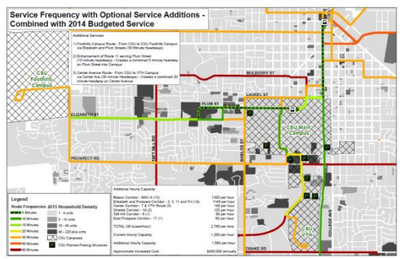
Supportive Documents/Tools Provided:

- TDM Best Practices and Program Recommendations Sections
- Parking Management and TDM Best Practices Document

ITEM 4:

Successful Integration of a new Internal Campus Circulator Shuttle Program in Conjunction with the Inauguration of the MAX Bus-Rapid-Transit Service and Transit Route Enhancements by Transfort

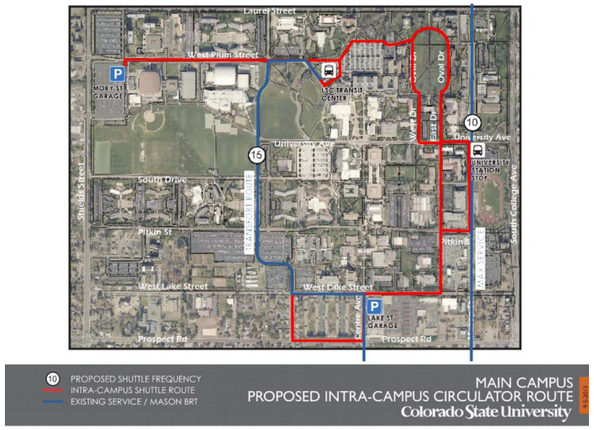
- Investments in enhanced transit service, leveraging the community investment in the MAX BRT and creating an integrated on-campus circulator system are all interrelated and critical for the improved campus mobility and access plan envisioned for the campus.
- It is important that the campus circulator shuttle program be rolled-out concurrently with the MAX BRT opening (tentatively scheduled for August 2014. The campus circulator shuttle program, currently envisioned to include two 40-passenger shuttles with 10-minute headways on a fixed route, includes an infrastructure component estimated at between $338,000 and $667,000, a vehicle purchase component valued at $250,000, and an annual operating cost estimated at approximately $528,000.
- Transfort presented a proposed plan to enhance the current transit capacity for the CSU campus. The plan incorporates projected off-campus housing density increases (primarily to the West of campus) and includes the following additional service enhancements:
  a. **Foothills Campus Route** – From CSU to CSU Foothills Campus via Elizabeth and Plum Streets (30-Minute headways)
  b. **Enhancement of Route 11 serving Plum Street (10-minute headways)** - Creates a combined 5-minute headway on Plum Street into Campus
  c. **Center Avenue Route** - From CSU to VTH Campus via Center Ave (30-minute headways)
- Overall transit system capacity increases are estimated below:
  - Additional Hourly Capacity:
    - Mason Corridor - MAX A (12) 1200 per hour
    - Elizabeth and Prospect Corridor - 2, 3, 11 and FH (19) 1140 per hour
    - Center Corridor - 7 & VTH Route (3) 180 per hour
    - Shields Corridor - 19 (2) 120 per hour
    - Taft Hill Corridor - 6 (1) 60 per hour
    - East Prospect Corridor - 17 (1) 60 per hour
    - TOTAL (38 buses/hour) 2,760 per hour
    - Current Hourly Capacity 1,200 per hour
    - Additional Hourly Capacity 1,560 per hour
    - Approximate Increased Cost $380,000 annually



- One of the campus master plan guiding principles is related to increasing the "permeability" of the campus. This objective must be balanced with the goal of creating a safer, more pedestrian-oriented campus core. One of the issues related to these key principles is the future operational status of Meridian Avenue. We recommend that Meridian Avenue remain closed to through traffic except for service, emergency, and transit vehicles.
- If the proposed on-campus football stadium project moves forward, additional analysis related to vehicle ingress and egress distribution on game days is recommended.
- Prior to enactment of new transit system enhancements, we recommend that a focused parking utilization and transit utilization be performed to create a specific baseline against which to assess the impacts of the new parking and transportation options provided.

Key Partners: Parking and Transportation Services, Facilities Management, Campus Architect, CSU Planning and Administration and collaboration with Transfort.

Timeframe: 2014 will be a critical year for transit system enhancements and new shuttle program implementation.



PRIMARY ACTION ITEM # 4:

Transit system enhancements, both on-campus and off, will be critical to achieving the more balanced parking and transportation system envisioned in the study as well as the overall campus master plan.

The establishment of an internal campus circulator, launched to coincide with the initiation of the MAX BRT service, should be a milestone event for the new PTS department.

Advanced planning, staffing, training, and publicity will all be extremely important to ensure that this new infrastructure and services get launched on a positive note.

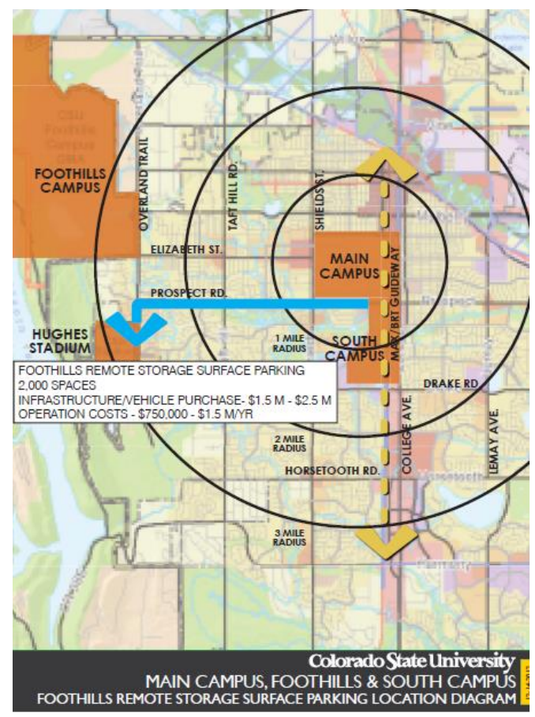
ITEM 5:

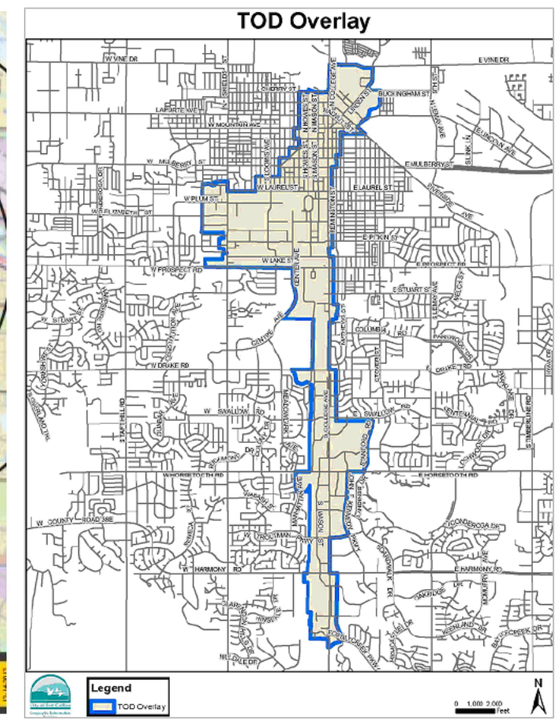
Parking Pricing Options and Mobility Management Support

- There is an important relationship between parking pricing, the need to provide a range of parking options (at multiple price points), and the successful implementation of transportation alternatives. This can be a tricky area to negotiate and one where having a set of strongly supported "Guiding Principles" is essential.
- Parking pricing must increase to cover enterprise fund costs associated with both the capital funds required to construct new structured parking assets as well as the increased operating and maintenance costs of the structured facilities.
- Increased parking costs are also one of the more effective disincentives to single occupant vehicle usage and therefore an important tool in the promotion of transportation alternatives.
- As noted in the larger report, one of the key challenges for CSU as it begins its transformation to a denser, more urbanized campus is its recent legacy of plentiful and relatively inexpensive parking. A phased strategy beginning with a new proximity-based parking permit system will be an important first step.
- To continue to provide a range of parking options at multiple price points, we also support the investment in off-site "storage."
- The proposed Remote Storage Surface Parking option includes the development of approximately 2,000 spaces, with infrastructure/vehicle purchases estimated at $1.5 M – $2.5 M and annual operating costs in the $750,000 – $1.5 M/Year range.
- This option also provides some flexibility as it relates to creating temporary parking strategies for a range of upcoming construction projects.
- The City of Fort Collins has active plans to create "Residential Parking Permit Programs" in the neighborhoods surrounding the CSU campus. This should be given serious attention. There are several important elements to be considered including:
  - Increased on-campus demand from those currently parking in the unregulated neighborhoods (this is both a potential positive from a parking revenue perspective, and a negative from the perspective of a loss of "unofficial parking supply."
  - The loss of a low-cost parking option for lower-wage staff.

Key Partners: Parking and Transportation Services, Facilities Management, Campus Architect, CSU Planning and Administration and collaboration with Transfort.

Timeframe: 2013 – 2016





PRIMARY ACTION ITEM # 5:

Parking pricing will increase.

Sensitivity to parking pricing will be important and should include the development and implementation of a new proximity-based parking permit policy.

Embrace the importance of increased parking pricing as one of the most effective demand management tools.

Provide a range of parking price points and services, including remote storage parking.

Create temporary parking strategies specific to each new campus development project.

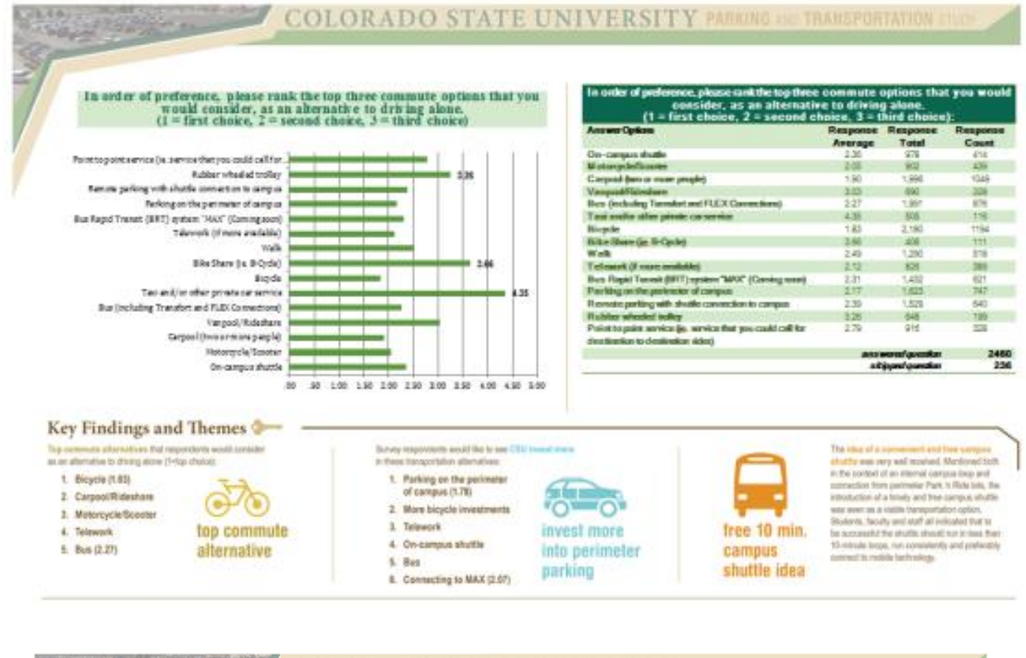
ITEM 6:

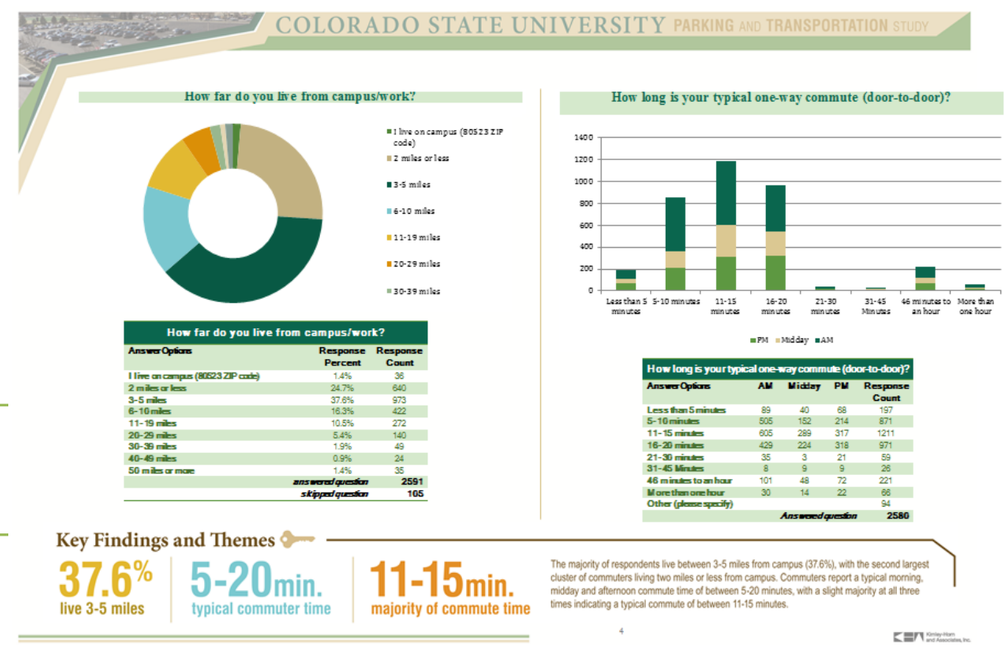
Strategic Communications, Campus Parking and Mobility Program Branding and Marketing and On-Going Program Monitoring and Benchmarking

- One of the other very positive and important program development activities that occurred during the course of this study was the assignment of a strong communications specialist as a key member of the PTS department staff.
- Another very positive move is the creation of a new program identity and website.
- The successful campus outreach and community engagement work performed as part of this study process has provided a good base of information regarding parking and commuter preferences and suggestions for new services. This work also underscored a range of potential challenges related to certain workforce elements.
- A strong and comprehensive "strategic communication plan" is highly recommended to continue to educate the campus community on the positive aspects of the new parking and transportation master plan and the many ways that it is designed to support the larger campus master plan goals.
- A range of recommended communication strategies, tools, and templates have been provided for the department to consider moving forward. An 18-month communication plan with underlying core messages and specific new program announcements to be released on a periodic basis is recommended to keep the campus community informed, engaged, and educated. The enhanced use of social media options is also highly encouraged.
- A set of internal parking and transportation benchmarks have also been provided to the PTS department for use in an ongoing performance monitoring program designed to monitor and track a new set of program performance metrics based on the new program's goals and objectives.

Key Partners: Parking and Transportation Services, Facilities Management, Campus Architect, CSU Planning and Administration and collaboration with Transfort.

Timeframe: 2013 – 2016





PRIMARY ACTION ITEM # 6:

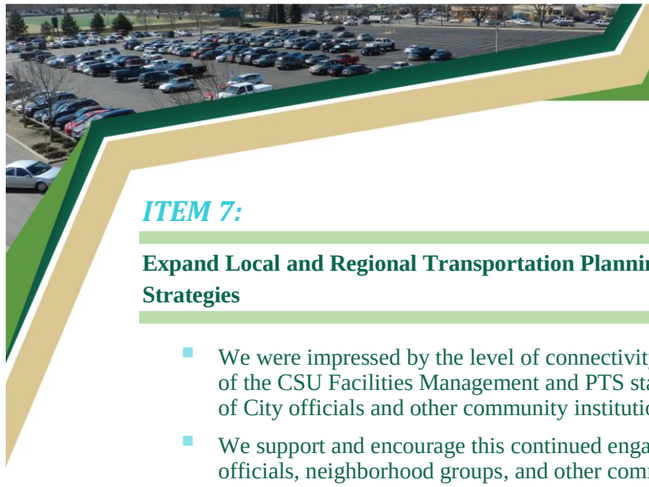
Enhance program communications.

Develop a well-defined departmental "Strategic Communication Plan."

Leverage the extensive data collection effort from this study to create a baseline of commuter preferences and behaviors.

Develop an 18-month messaging strategy designed to inform and educate the campus community of the changing nature of campus mobility management strategies.

Utilize these new departmental communications tools and strategies to reinforce the connections to the larger campus master plan goals and vision.



ITEM 7:

Expand Local and Regional Transportation Planning and Funding Strategies

- We were impressed by the level of connectivity and engagement of the CSU Facilities Management and PTS staff with a variety of City officials and other community institutions.
- We support and encourage this continued engagement with local officials, neighborhood groups, and other community and economic development professionals.
- As a community partner and civic leader, CSU is in a strong position to take on an advocacy and leadership role in promoting smart growth and sustainable parking and transportation policies not just locally but on a regional basis. This level of leadership and engagement can have substantial benefits for both CSU and the larger community.
- Benefits include potential project funding through the local Metropolitan Planning Organization (North Front Range MPO) and other organizations. The opportunities to secure funds for sustainable parking and transportation projects are enhanced when approached collaboratively with local governmental partners and other related agencies.
- Broadening the vision of potential transportation solutions to a regional level could help create solutions that would benefit the campus commuting population as well as improve transportation options on a broader regional basis. Such regional coalition could potentially develop a range of creative services and options to reduce traffic congestion; reduce overall vehicle miles traveled regionally; save fuel, time, and other resources, and provide valued new services to CSU customers.

Key Partners: Parking and Transportation Services, Facilities Management, City of Fort Collins, Transfort, Downtown Fort Collins

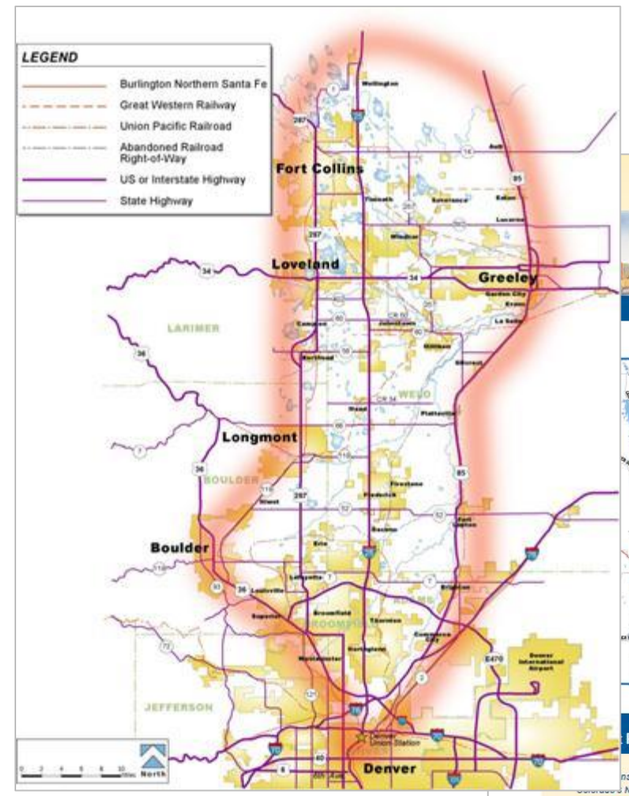
Timeframe: 2013 – 2016

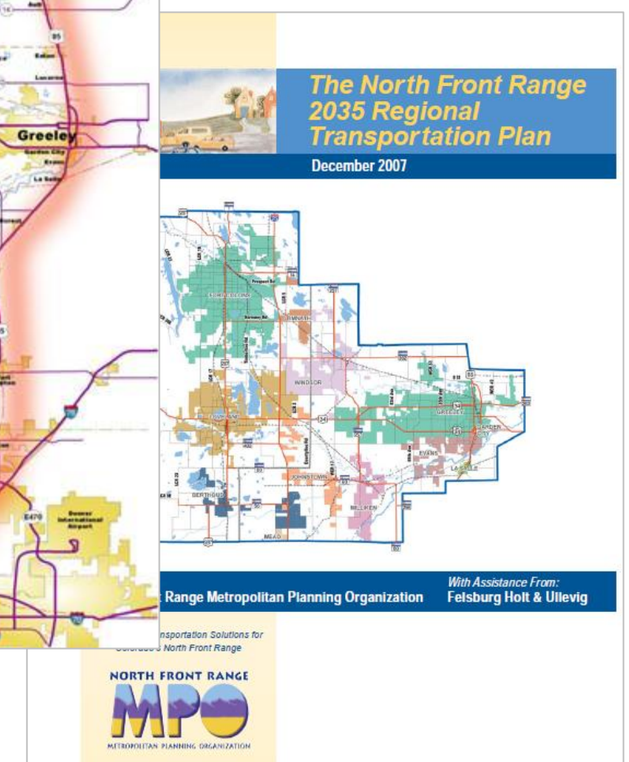
PRIMARY ACTION ITEM # 7:

Support and encourage continued engagement with local officials, neighborhood groups, and other community and economic development professionals.

Take on an advocacy and leadership role in promoting smart growth and sustainable parking and transportation policies, not just locally, but on a regional basis.

Pursue potential project funding through the local Metropolitan Planning Organization (North Front Range MPO) and other organizations.





ITEM 8:

Adopt a Range of New Parking and Planning Technologies

- CSU already has good base of effective parking technologies to support their current programs. The T-2 parking permit software system, Cale Pay-By-Space meters, and Genetec mobile license plate recognition software are just a few examples.
- The recent investment in the Park+ campus access and demand modeling software and the development of a comprehensive campus traffic simulation model are good examples of parking planning tool investments.
- Technology in the area of parking and transportation, even more than many other areas, is accelerating at an incredible pace. This surge in technology is offering programs new opportunities to enhance overall management effectiveness and efficiency as well as to improve customer service.
- CSU is considering incorporating several new technology applications including single-space monitoring systems in new garages, LED lighting to reduce energy consumption, solar panels on the garage rooftops, etc. We strongly encourage this approach to leveraging the benefits of new technology applications.
- Additional technology opportunities to enhance customer service might include adding pay-by-cell phone as a payment option for visitor parking, the use of "in-car meters" for special parking programs and control of loading zone areas, etc.
- Parking guidance and campus wayfinding systems, mobile apps that provide real-time parking availability information, electric vehicle charging stations.
- Campus car-share programs are another effective strategy for removing barriers to using transportation alternatives.

Key Partners: Parking and Transportation Services, Facilities Management, Various other departments with special service needs

Timeframe: 2014 – Ongoing

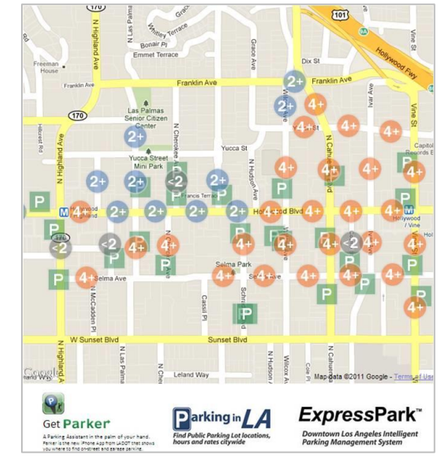
PRIMARY ACTION ITEM # 8:

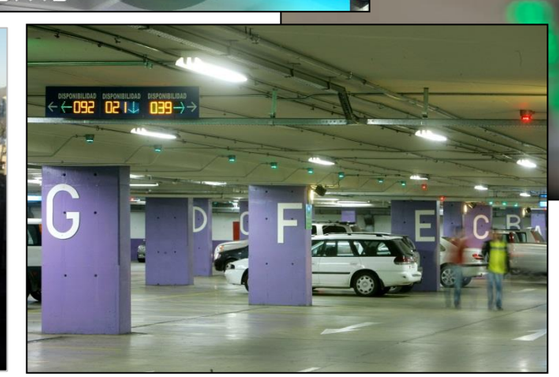
Support and encourage the active pursuit and evaluation of new parking and transportation technologies to improve program efficiency and effectiveness, while also enhancing customer services.

New technologies can also support campus sustainability and climate commitment goals.

Specific recommended technologies include:

- Garage space monitoring systems
- Pay-By-Cell Phone and In-Car Meters
- Photovoltaic panels on parking garages
- Campus-wide parking guidance systems
- Mobile Apps for disseminating parking availability and transit location data





ITEM 9:

Leverage Parking and Transportation to Support Campus Sustainability and Climate Commitment Goals

- It is generally accepted that, nationally, transportation elements equate to approximately 30% of our annual greenhouse gas emissions. This makes parking and transportation a potentially serious contributor to campus sustainability programs going forward.
- The overall structure and goals of this Parking and Transportation Master Plan, with its emphasis on parking demand reduction, modal split enhancements, etc. is intentionally in alignment with overall campus sustainability goals.
- Technology enhancements are a related area where progress toward campus sustainability goals can be enhanced. As mentioned in the previous action item, CSU is already considering incorporating several new technology applications including single-space monitoring systems in new garages, LED lighting to reduce energy consumption, solar panels on the garage rooftops, etc.
- Additional options to enhance campus sustainability might include development of parking guidance and campus wayfinding systems, mobile apps that provide real-time parking availability information, electric vehicle charging stations, etc.
- For surface parking lot projects such as potential off-campus parking at Hughes Stadium, the introduction of options such as pervious pavement, bio-swales and other more environmentally friendly design options should be evaluated.
- A specific section of the report provides direction on the development of a structured program approach for sustainable parking operations and management.
- PTS program support for a community-wide bike share program is also encouraged.

Key Partners: Parking and Transportation Services, Facilities Management, Campus Sustainability Groups.

Timeframe: 2014 – Ongoing

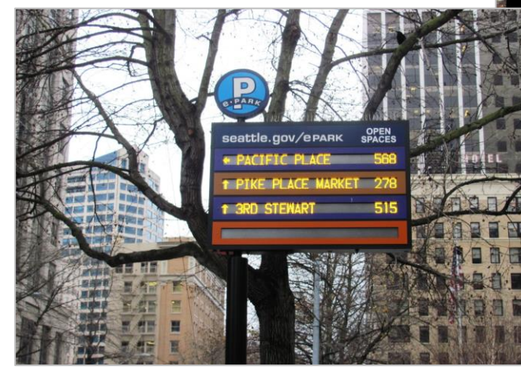
PRIMARY ACTION ITEM # 9:

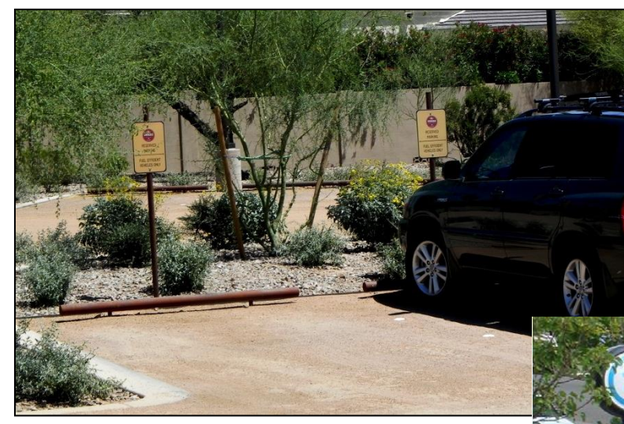
Nationally transportation equates to approximately 30% of our overall carbon footprint.

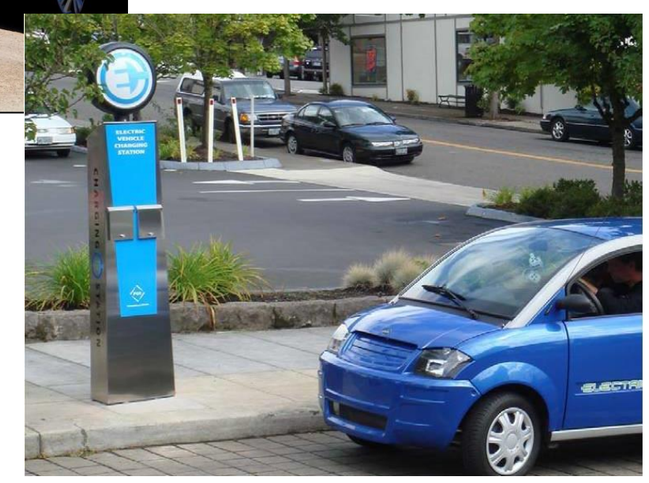
The overall structure and goals of this Parking and Transportation Master Plan, with its emphasis on parking demand reduction, modal split enhancements, etc. is intentionally in alignment with overall campus sustainability goals.

Certain specific recommended technology investments that could advance campus sustainability goals include:

- Garage space monitoring systems
- Energy efficient lighting
- Photovoltaic panels on parking garages
- Campus-wide parking guidance systems
- Electric vehicle charging stations
- Use of pervious pavements, bio-swales, etc.
- Community bike share program support



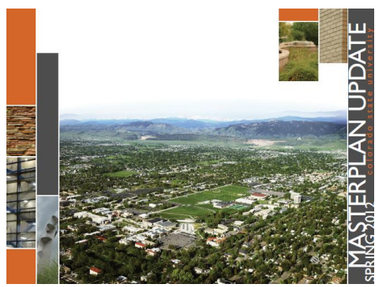




INTRODUCTION

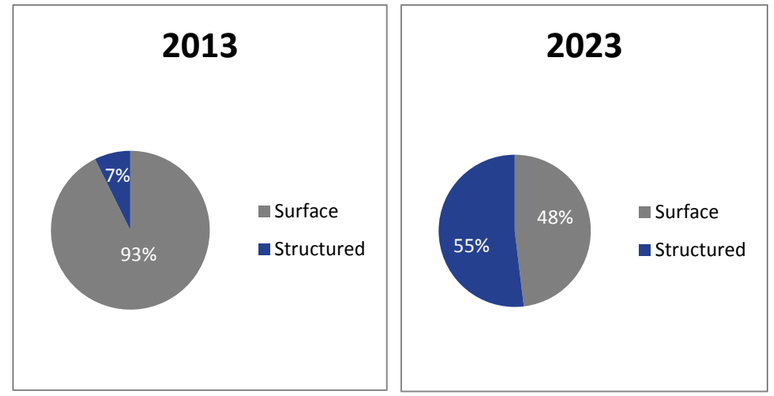
Project Background and Overview

This project differed from many campus parking and transportation master plans in several ways. The most significant element which made this project different is the degree to which a very solid overall campus master planning process, including parking and transportation elements, was already in place. Our assignment was less to create a "new plan and vision" for the campus but to "truth" a significant set of assumptions and add depth and detail as needed to support and justify the parking- and transportation-related elements of the campus master plan. We were also encouraged to challenge assumptions and supplement prior planning work with new concepts, industry best practices, and comparative benchmarking where appropriate.

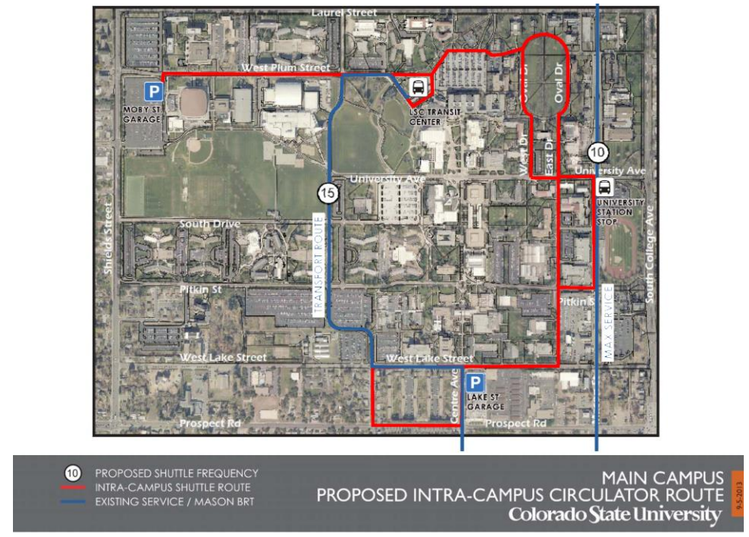


The campus master plan, updated in the spring of 2012, addressed plans to grow the campus by approximately 8,000 students and 1,000 staff by the year 2024. This growth will result in an additional 1.8 million square feet of development on the main campuses. Although still in the assessment phase, plans for a new on-campus football stadium were also factored in as a significant variable moving forward.

From a parking perspective, there is the potential for the loss of approximately 4,049 existing surface parking spaces from the current inventory of 11,382 spaces. The master plan did an excellent job of identifying both a replacement plan for parking lost to new campus development as well as new parking assets to meet the student and staff growth projections. This plan will help transform the CSU campus from what is essentially a suburban model campus that has been able to satisfy most of it parking requirements with surface parking resources to an increasingly dense, more urbanized campus environment. This transformation will require structured parking meeting a significant portion of its parking needs in the future. The following two graphics illustrate this dramatic change.



The proposed campus build-out framework from the Campus 2020 Master Plan is summarized in the following diagram:



Several of the master plan guiding principles are also noted on the diagram above, including:

- Make the campus permeable to the community
- Maintain vehicle access
- Provide parking at the campus edges and key internal locations
- Establish mass transit centers
- Develop internal campus transit
- Maximize use of alternative modes of transportation

The following are some observations and commentary on the overall campus master plan.

Master Plan Observations

A review of the Campus Master Plan goals and objectives yields a number of points that relate directly or indirectly to traffic and parking on campus. These observations include:

Goal: All facilities should support the University's Academic Master Plan and Strategic Plan.

- Every facility should contribute. At many campuses around the country, the trend is that parking structures increasingly have an academic, office, or commercial element that faces the campus core and contributes to the academic life of the campus. New parking structures on campuses are rarely just places to store cars. We encourage CSU to consider the benefits of incorporating mixed uses in conjunction with parking infrastructure development going forward.

Goal: Strengthen the physical organization of the campus environment.

- Establish a land use and urban design structure that leads to the optimal selection of sites for new buildings or functions.
  - On many campuses, placement of the garages is based more on site availability rather than creating a strategic contribution to the campus. CSU has done a good job with aligning future garage site with larger campus planning goals, however thinking critically, there may be alternatives garage siting options that CSU should consider.
  - Options might include increasing parking capacity in high-demand areas such as near the library or student center (a one-level structure over the current parking lot was discussed; however, such a structure would have to be cognizant of floodplain restrictions).
  - Leverage the proposed Bay Farms development site to be a true intermodal parking and transportation hub to service both the Main and South campuses in the future.
  - As opposed to a single parking structure to serve the proposed new football stadium and to provide for some

replacement parking due to lost surface lots, two properly sited parking structures, would improve traffic distribution and minimize potential parking egress issues following games and other events. This approach would also offer more convenient campus parking options for several campus constituent groups that could generate higher annual revenues per space due to their proximity and convenience. It is also recommended that bike parking resources be expanded at the stadium.

- Develop strong transportation connections among the various local campuses and fully integrate into the City's plans.
  - Should every new parking structure, in effect, be a mini-transit center, supporting all multimodal means of circulation (cars, bikes, shuttles, city or regional transit)? If so, this could have siting implications, especially in terms of the town/gown connection.
  - The City's active plans to create "Residential Parking Permit Programs" in the neighborhoods surrounding the CSU campus should be given serious attention. There are several important elements to be considered including:
    - Increased on-campus demand from those currently parking in the unregulated neighborhoods (this is both a potential positive from a parking revenue perspective, and a negative from the perspective of a loss of "unofficial parking supply" and the loss of a low-cost parking option for lower-wage staff.
- Strengthen the "sense of place" at CSU by retaining and enhancing existing, memorable campus settings (e.g., the Oval, "Sherwood Forest"), and develop new ones in the future developments.
- Beautify the campus through continued planting of appropriate trees, shrubs, and ground covers; enhanced pavements; site furnishings; art features; and attractive campus buildings.
  - This relates again to the potential contributions of parking structures in terms of their own inherent aesthetic qualities, their contribution to a seamless pedestrian experience, both in the use of the garage and in a garage's capacity to free up land for infill development or general campus "greening."
    - Suggests the need to take care in the siting of garages and parking to limit the intrusion of roads and traffic so as not to diminish the memorable qualities of the campus – both current and future.
    - Could run-off from garages be effectively collected and stored to augment campus irrigation of trees, shrubs, and ground covers?
- Maintain and strengthen campus accessibility.
  - While this is stated specifically in reference to persons with disabilities, it also has universal relevance and could be a factor in siting new parking and parking structures.

Goal: Maintain the health, safety and well-being of all users

- Develop a circulation system that minimizes conflicts between pedestrians, cyclists, and motorists. In particular, facilitate pedestrian movement and discourage the use of automobiles through the central core.
  - This objective is fairly self-evident in terms of siting garages, parking, and the roads that serve them. However, it also has implications for shuttle and transit routes: is 10 minutes too far to walk? Or in terms of maintaining "health and well-being", should walks this long- or even longer- be encouraged by design?

Goal: Demonstrate the University's leadership role in society and wise stewardship of the land.

- Set an example by demonstrating best practices in environmental sustainability, energy, water, and transportation management.
  - One potential policy recommendation is to establish a funding strategy that allocates up to 1/3 of any parking construction funding to support TDM strategies. This very bold initiative would potentially save money in the long run (funding alternatives to single occupant vehicles is less expensive that accommodating all parking needs in structured facilities) and may be preferable from a variety of other perspectives (environmental, sustainability, economic, and quality of campus life), compared to overbuilding of structures that once in place will never move and will always be relatively impervious to adaptive reuse. Changing attitudes by younger generations that are less auto dependent should also be considered from a long-term perspective.
- Provide an environment that promotes the use of alternative modes of transportation and reduces dependency on single-occupant motor vehicles.
  - A specific recommendation to target a more aggressive "parking spaces to overall campus population ratio" is discussed later in this report.
- Conserve land resources by building at appropriate densities and avoiding sprawl.
  - Structured parking can certainly in achieve this goal as long as the parking resources themselves are not over-built.
- Conserve water resources by demonstrating best practices in landscape design and maintenance.
  - Note the comment regarding supplementing irrigation by repurposing and treating potential garage storm water run-off as noted above.
- Minimize utility costs and support campus sustainability goals by more aggressively incorporating solar roof panels on parking structures as has been done on other campuses such as Arizona State University (ASU).

Goal: Establish land use, urban design, architectural, and landscape design guidelines that are appropriate to the unique settings of each of the CSU campuses.

- Establish Main Campus design guidelines to reinforce the Oval, the Campus Green, Academic Spine, dense Academic Core with perimeter parking and vehicular circulation, and secondary outdoor spaces shaped and framed by campus buildings.
- Establish South Campus design guidelines to reinforce development of a pedestrian-oriented Veterinary Medical Center campus, strong physical and visual linkages to the Main Campus, and preservation of the Spring Creek Floodplain.
  - How the proposed two to three garages between the Veterinary Medical Center and Main campuses are sited could go a long way in supporting (or thwarting) this objective.
  - The volume of parking proposed for this area (the Bay Farms area) is recommended to be reduced. This recommendation is partly due to a concern regarding over building parking supply, but more so based on the practical and financial considerations related to roadway capacity and required roadway infrastructure improvements to make three potential garages in this area feasible.
  - A concept of connecting the two proposed garages in this area by a common "Multimodal Transportation Center

Plaza" with an elevated roadway connection to address potential floodplain issues is one potential option for consideration.

General Parking Observations

1) In 2012, the existing CSU parking ratio was approximately 34 spaces/person (faculty, staff and students).

2) In 2024, the desired parking ratio would be in the 0.28 – 0.32 range.

3) Scale comparisons with other campuses suggest that the entire distance from the eastern edge of the Main Campus along College Avenue to existing and future campus housing to the west is not so great as to discourage strong pedestrian (as well as bicycle) links to and within the core campus. This would seem to have implications for shuttle routes to/from/and through the core campus.

4) Considering the expense and permanence of structured parking, CSU's economic, social, and environmental – that is to say, all three "pillars" of sustainability – would be better served by limiting the growth of new structured parking.

- On other campuses that have adopted more sustainable parking and transportation policies (Arizona State University, University of Washington, etc.), parking ratios in the 0.29 - 0.33 spaces/student have proven to be viable. Adopting a more aggressive parking to campus population ratio would appear to be a worthy goal for CSU, a goal that is consistent with the objectives of the campus master plan.
- The recommended ratio of 0.28 – 0.32 spaces per population could represent a reduction of 3,568 parking spaces (22.6%) versus the 15,789 spaces currently projected by CSU as a function of the projected 2024 campus population.
  - 3,568 spaces = approximately 36 acres of surface parking
  - 3,568 spaces = approximately 1,213,000 sf of parking structure at a cost in today's dollars of about $60 million.
  - 3,568 spaces = 80% of the currently proposed 4,441-car increase in parking spaces by 2014. This would be consistent with a carbon-neutral approach to constructing new facilities and renovating the old – the goal being increasingly energy-efficient buildings in order to avoid increased utility bills or a need to expand central plant capacity.
- With the assumption that the university campus population will grow from the current 33,000 (students/faculty and staff) to approximately 42,000 by the year 2024, a range of parking spaces to campus population ratios could be applied to the projected campus population figures to provide some comparisons.

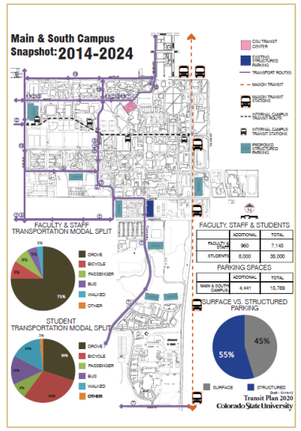
  CSU currently has a parking space to campus population ratio of 0.34. A straight linear extrapolation of this current ratio would suggest that if this ratio was maintained, CSU would need a parking supply of 14,280 spaces in 2024.

  If the lower end of the recommended ratio of parking spaces to population range (0.28) was applied, CSU would need approximately 11,760 spaces.

  Of the other universities that we are familiar with that are similar in size, composition, and community setting, the University of Oregon has the lowest parking space to campus population ratio with a parking space to campus population ratio of 0.19. While many on campus (especially students) complain that parking is inadequate, the campus still functions reasonably well and campus planners consider the low ratio a key element of their overall campus sustainability program.

  Interestingly, Eugene is a similarly sized community to Fort Collins and one that received federal funding to implement a Bus Rapid Transit system very similar to the MAX several years ago. If CSU adopted a 0.19 ratio of parking spaces to population as a goal, CSU would only need approximately 7,980 parking spaces to accommodate the projected 2024 campus population of 42,000. However, significant investments in a range of transportation alternatives would be required and there would likely be significant impacts to campus customer satisfaction rates related to parking. There would also likely be significant impacts to surrounding neighborhoods.
- Having proposed the above ratios, it is important to acknowledge several other factors related to parking supply/development:
  - Such a change in policy would need to be phased in over time. With a long history of relatively plentiful and low-cost parking on the CSU campus, any changes to either supply and/or cost will be met with considerable resistance. However, it should be noted that the planned shift from the traditional suburban campus model to a more densely developed urban campus model (with the required shift to more structured parking) will necessitate an increase in parking costs.
  - This increase in the cost of parking needs to be both a focus of ongoing campus community education and should be supplemented with positive messaging about the increase in transportation alternatives related to overall campus access.
  - The increased price of parking, while perceived as a negative to many on campus, can actually be an important element in terms of achieving higher transportation modal split goals and a more balanced transportation equation for campus and the community at large.
  - While an overall increase in parking rates is inevitable going forward, the parking program will need to balance parking pricing with the reality of providing a range of parking options for those that cannot afford the higher rates, such as subsidized transit passes, lower-priced remote parking options, campus car-sharing or U-Car type programs, employee bike programs, etc. A comprehensive program of options is highly recommended.

Campus Mode Split and Parking Ratio Observations



The CSU Campus Master Plan (the 2020 Plan) effectively utilized a series of "Campus Snapshots" as a tool for projecting future parking and alternative access modes to the CSU campus. From 2012 – 2024, the campus modal split was projected based on two primary groups – faculty/staff and students. This breakdown is logical and appropriate given the different utilization patterns of each group. The following tables summarize these modal split projections.

These "campus snapshot" documents also illustrate several other key transportation and parking elements including:

- Proposed new campus developments
- Parking losses or additions
- Staff and student increases
- Percent of structured parking vs. surface parking
- Proposed new parking structures
- Transit proposed internal campus circulation routes
- Projected modal split percentages by faculty/staff and student categories

CSU Students

Modal Split Projections 2012 - 2024

	Drove	Bicycle	Passenger	Bus	Walked	Other	
2012	42.0%	23.3%	7.6%	11.3%	14.3%	1.3%	100%
2013	41.0%	23.9%	7.6%	11.6%	14.4%	1.3%	100%
2014	40.0%	24.4%	7.6%	11.8%	14.6%	1.4%	100%
2015	39.0%	24.9%	7.7%	12.1%	14.7%	1.4%	100%
2016	38.0%	25.5%	7.7%	12.4%	14.8%	1.4%	100%
2017	37.0%	26.0%	7.7%	12.6%	14.9%	1.5%	100%
2018	36.0%	26.6%	7.8%	12.9%	15.0%	1.5%	100%
2019	35.0%	27.1%	7.8%	13.2%	15.1%	1.5%	100%
2020	34.0%	27.7%	7.8%	13.4%	15.2%	1.5%	100%
2021	33.0%	28.2%	7.9%	13.7%	15.3%	1.6%	100%
2022	32.0%	28.7%	7.9%	13.9%	15.4%	1.6%	100%
2023	31.0%	29.3%	7.9%	14.2%	15.5%	1.6%	100%
2024	30.0%	29.8%	7.9%	14.5%	15.6%	1.7%	100%

CSU Faculty and Staff

Modal Split Projections 2012 - 2024

	Drove	Bicycle	Passenger	Bus	Walked	
2012 FS	90.00%	4.000%	3.000%	2.000%	1.000%	100%
2013 FS	88.75%	4.417%	3.417%	2.250%	1.167%	100%
2014 FS	87.50%	4.833%	3.833%	2.500%	1.333%	100%
2015 FS	86.25%	5.250%	4.250%	2.750%	1.500%	100%
2016 FS	85.00%	5.667%	4.667%	3.000%	1.667%	100%
2017 FS	83.75%	6.083%	5.083%	3.250%	1.833%	100%
2018 FS	82.50%	6.500%	5.500%	3.500%	2.000%	100%
2019 FS	81.25%	6.917%	5.917%	3.750%	2.167%	100%
2020 FS	80.00%	7.333%	6.333%	4.000%	2.333%	100%
2021 FS	78.75%	7.750%	6.750%	4.250%	2.500%	100%
2022 FS	77.50%	8.17%	7.17%	4.50%	2.67%	100%
2023 FS	76.25%	8.58%	7.58%	4.75%	2.83%	100%
2024 FS	75.0%	9.00%	8.00%	5.00%	3.00%	100%

In our opinion these "campus snapshots" are excellent tools for summarizing a number of important and interrelated parking and transportation factors. However, we found one issue that seemed somewhat inconsistent.

The spreadsheet below summarizes several data points from the annual "campus snapshots" and calculates the ratios of "parking spaces per total campus headcount" (faculty/staff and students) and also "parking spaces per student" (as both metrics are used at various campuses around the country). Over time, with the projected modal split percentages increasing, one would expect the ratio of parking spaces to population to drop. Instead, the ratios actually increase.

CSU Main and South Campus Snapshots

Parking Spaces to Population Ratios

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Faculty and Staff	6,183	6,183	6,209	6,267	6,357	6,479	6,608	6,736	6,864	6,982	7,068	7,121	7,143
Students	27,000	27,000	27,217	27,701	28,452	29,470	30,538	31,606	32,674	33,656	34,371	34,819	35,000
Total Campus Headcount	33,183	33,183	33,426	33,968	34,809	35,949	37,146	38,342	39,538	40,638	41,439	41,940	42,143
Total Parking Spaces	11,348	10,592	9,724	13,103	132,013	15,284	15,939	15,643	15,470	15,297	16,135	15,962	15,789
Net Add or Loss of Spaces		-401	-868	3,379	100	2,081	655	-296	-173	-173	838	-173	-173
Ratio of Parking Spaces to Overall Headcount	0.34	0.319	0.29	0.385	0.379	0.421	0.429	0.407	0.391	0.376	0.389	0.38	0.374
Ratio of Parking Spaces to Students	0.42	0.392	0.357	0.473	0.464	0.518	0.521	0.494	0.473	0.454	0.469	0.458	0.451

Notes:

2014 In 2014 the MAX line will commence operations
2014 In August 2014, 2 on-campus 40 passenger shuttles with 10 minute headways are planned to commence operations
2015 In 2015 2 parking structures in the Bay Farm area are projected to come on-line (1,200 spaces each)
2015 Also in 2015, the Moby Arena Parking Structure and 40K SF of new offices are project to come on-line. (1,300 spaces gross/392 net spaces)
2016 Planned addition of Parking Structure # 4 to come on line (800 spaces)
2017 Foothills remote storage surface parking (2,000 spaces) and shuttles projected to come on line
2017 Also in 2017, Parking Structure # 5 is projected to come on-line. (800 spaces gross/300 net spaces)
2018 Planned addition of Parking Structure # 6 to come on line (1,350 gross spaces/804 net spaces)
2022 Planned addition of Parking Structure # 7 to come on line (1,200 gross spaces)

Conclusions

Policies that aggressively pursue a wide range of TDM strategies, and enhanced transit, combined with increased parking rates and a reduction in parking supply (targeting a parking space/student ratio in the range of 0.28 – 0.32) would better align CSU's transportation strategies with the overall campus master plan and sustainability goals. This would equate to a recommended targeted parking supply at the 2024 campus build-out in the range of 11,760 – 13,440 spaces (assuming a 43,000 campus population).

This general recommendation relative to overall parking supply is supported by the Park+ parking demand modeling scenarios generated as part of this planning effort. In all of the parking modeling scenarios, the Park+ model predicted significant surpluses of parking in the future years (see Section X-Parking Demand later in this report). One of the great benefits of having invested in this advanced GIS-based modeling tool relates to the challenges associated with planning in such a dynamic and progressive environment. Other more refined modeling scenarios may be developed going forward as specific campus development plans and programs are refined and further evolve.

It is critically important to highlight that recommendations supporting a lower "parking space to student ratio" have a flip side. While reducing the costs to CSU by requiring less than the projected parking infrastructure, additional investment in transit, transportation infrastructure and transportation alternatives program development must not be overlooked. In fact, this area should be given substantial financial investment going forward. We recommend that a special transportation fund be developed specifically to address the development of this fundamental and essential campus infrastructure going forward. The importance of these investments going forward must be appreciated as they will provide the framework and support systems that will help bring to fruition many of the larger campus master plan goals. This is the new direction and change in policy that will propel and define the PTS into the future.

This proposed "Transportation Infrastructure Fund" could be created in several ways. One simple option is to take the proposed bond funding that would have been applied to a future parking structure and dedicate that amount instead to the transportation fund. Another alternative used by many campuses around the country is to create a "Student Transportation Fee." This fee would provide an ongoing and dedicated funding source that would support the larger campus development and sustainability goals. It should be noted that increased parking fees are also an assumed funding resource. Without a dedicated funding source and a serious and sustained effort to support the growth of alternative transportation programs going forward, the campus will not be able to meet its long-term parking/access or larger campus development goals.

Parking Program Management Review

Introduction

This parking program management review is based on the evaluation of documentation provided by Colorado State University (CSU), in-person interviews and observations, and through comparative analysis against selected peer institutions.

Selection of Peer Institutions

Two types of peer institutions were identified for this project — transportation peers and academic peers. Transportation peers are institutions with comparable transportation systems. Factors taken into account when determining appropriate transportation peers include: 1) size of campus, 2) enrollment, 3) adjacent land uses, 4) regional transportation system, 5) internal transit/shuttle system, 6) development form (urban, suburban, small town), 7) topography, and 8) climate.

Like most other institutions of higher education, CSU has an identified set of academic peers that it uses for various comparative efforts. These institutions may also be used for transportation-related comparisons and have been included in this evaluation where appropriate. Some transportation peers are also identified academic peers as indicated below.

A survey was sent to all peers for this study and the results follow. While conditions are unique at CSU, benchmarking various aspects of the parking and transportation system against peers is a useful exercise and can shed light on potential areas of improvement or system adjustments.

A. Transportation Peers

- University of New Mexico
- Northern Arizona University
- University of Colorado Boulder
- Oregon State University*
- Washington State University*
- Arizona State University

B. Academic Peers

- Iowa State University
- Kansas State University
- Michigan State University
- North Carolina State University
- Oklahoma State University
- Oregon State University*
- Purdue University
- Texas A & M University
- University of California, Davis
- University of Illinois, Urbana-Champaign
- University of Tennessee
- Virginia Polytechnic Institute and State University
- Washington State University*

*Academic and transportation peer

See Appendix for peer organization information and data.

Characteristics Framework Assessment

Through extensive work with parking and transportation organizations, Kimley-Horn has developed a framework in which to evaluate program effectiveness, benchmark success, and guide organizational improvement. The framework provides a rationalized and structured approach to program evaluation based on best practices characteristics that include:

1) Mission, vision and philosophy
2) Strategic planning
3) Reporting structure, organizational structure, and human resources and development
4) Connection with public, communication, service orientation, and promotion
5) Use of technology

MISSION, VISION, AND PHILOSOPHY

It is the mission of CSU Parking and Transportation Services (PTS) to manage parking resources in a manner that supports campus activities and enhances life in the university community. Rather than focus on the management of parking regulations – which is often found to be the mission statement and orientation of many university peer organizations – CSU's parking organization has appropriately aligned itself to the university's overall mission in a supportive and complementary way. Contemporary university parking and transportation services departments that see their mission as providing access to the campus community in support of the broader university mission of education, research, and service typically take on a customer-centered attitude and approach. This is evident throughout Colorado State University and this alignment allows the PTS to pursue initiatives that enhance convenience and access.

Though it is clear that CSU's PTS department sees its role as broader than simply providing for and managing parking resources, the current form of the mission statement could be strengthened by replacing "parking" with "transportation." As access managers PTS provides not only automobile accommodations but also services and programs promoting alternatives to driving alone (bicycle, bus, carpool, carshare, etc.). This minor change to the mission statement would indicate to the campus community that many alternatives to driving alone exist and that the PTS department is the responsible campus entity to deliver those important resources. This change would also support what has already been internalized by PTS staff in that the department clearly sees its role as providing access to the campus community.

CSU's vision statement is to "run our parking system efficiently. Our system is designed to resourcefully use a limited amount of parking spaces for a large number of faculty/staff, students and visitors to our campus." Similar to the mission statement comments above, this vision statement could be improved upon by adding language that focuses more broadly on transportation services and programs. The mention of efficiency and limited resources for growing demands is useful and supports the reality found on the CSU campus – that there is a growing need for access to the campus, which requires active and progressive management of the transportation and parking resources to accommodate the campus' needs today and in the future.

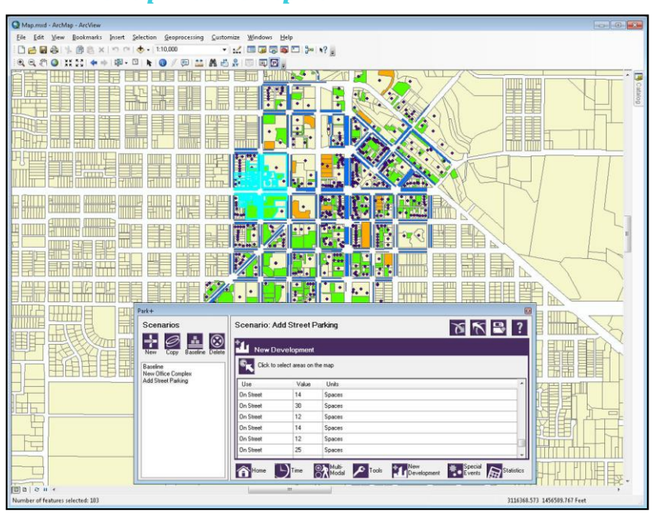
The recent name change to Parking and Transportation Services reinforces the role PTS plays in providing comprehensive access management services to the campus. This name change helps customers understand that there is more to gaining access to the campus than by parking alone. This is especially important as PTS adds alternative transportation staffing and resources.

STRATEGIC PLANNING

PTS and its campus partners do an exceptional job of planning for the future. For example, PTS and CSU Facilities partnered to create the Transportation 2020 Plan (2012), which attempts to forecast parking demand and mode split changes by year from 2013 to 2020. This plan has been especially effective in helping campus leaders understand the growing nature of the campus from an access management perspective. The plan also initiated critical capital planning for parking structures as well as identified human resource and programmatic needs and strategies aimed at addressing long-term access needs.

Another key step that CSU has taken is to invest in the Kimley-Horn Park+ parking modeling system. This system in an analytic tool that allows for the evaluation of various development decisions to quickly understand the true impacts on parking and transportation, such as the parking demand impacts brought about as a result of major campus events. Park+ effectively analyzes transportation demand management (TDM) strategies and how these strategies impact parking demand and determines the impacts of alternative forms of transportation by factoring in walking, biking, and transit usage up or down within the model. Most importantly, Park+ considers demand variables unique to CSU. The university owns the model, thus allowing analysis based on the university's needs and time considerations.

Park+ Graphical Output



Other related planning efforts such as the Main Campus/South Campus Bike Infrastructure Master Plan (2012) further inform the campus leadership and are actively used to guide development in a meaningful and thoughtful way. These more contemporary plans follow other significant planning efforts that produced such studies as the Strategic Transport Study (2000), the Surrounding Residential Neighborhood Parking Study (1996), and the Circulation System & Access Master Plan (1991).

Key findings from these various studies that remain relevant today include:

1) Circulation of people within the core will be primarily pedestrian; bicycle and pedestrian circulation will be effectively separated. Peripheral parking will discourage major through traffic on all roadways within the academic core.[1]

2) Parking pricing is generally acceptable, but motorists have concerns about service quality[2]

3) Campus commuters parking in the surrounding neighborhoods is a serious problem for local residents and business[3]

REPORTING STRUCTURE

CSU's PST department reports to the Vice President for Campus Operations. In addition to PTS, the VP for Campus Operations oversees such administrative departments as the CSU Police Department, the University Policy Office, Contracting Services, Purchasing, Office of Budgets, Business and Financial Services, Facilities Management, Environmental Health Services, Central Receiving and Mail Services, Human Resources, the Office of the Ombuds and Employees Assistance Program, Risk Management and Insurance, Training and Organizational Development, and the Office of Equal Opportunity. Prior to this alignment PTS reported to the CSU Police Department.

Several common alignments of parking and transportation organizations are found at institutions of higher education. Some parking departments are found in police or public safety departments similar to CSU's past approach. This alignment is a carryover from the early days of parking management on college and university campuses where parking enforcement was the main task of staff. As more emphasis has been placed on managing parking and transportation facilities, this model is losing popularity and is not normally recommended as a best practice.

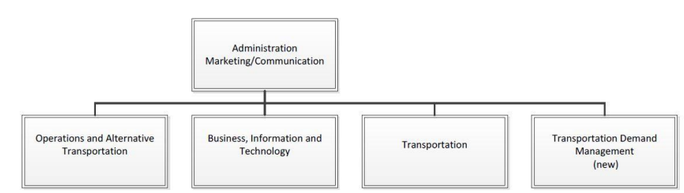
Other alignments include housing parking and transportation departments among business or auxiliary services because of the business nature of most parking and transportation departments. Grouping enterprise units together to focus on administering common business strategies is seen as the reason for including parking and transportation services departments with business minded units.

Another general approach — and the one CSU currently employs — has the parking and transportation group aligned with more operational type units, in particular those responsible for facilities operations. Affinities with units that plan development for the campus or maintain facilities can result in economies of scale (such as sharing janitorial functions, shop space, or equipment) and better coordination of transportation and land use planning, as evidenced by the work taking place between PTS and Facilities Management concerning transportation and parking planning. This alignment is considered a best-practice and will continue to serve CSU well.

ORGANIZATIONAL STRUCTURE AND HUMAN RESOURCES

PTS currently employs 35 FTE and numerous student employees in four discrete functional units: Administration/Leadership; Operations and Alternative Transportation; Business, Information and Technology; and Transportation. While there are many organizational structures within university parking and transportation organizations, this particular approach is common and effective.

Current Functional Organization Chart



[1] Circulation System & Access Master Plan (1991)
[2] Strategic Transport Study (2000)
[3] Strategic Transport Study (2000)

Administration/Leadership consists of the PTS director and administrative assistant and a marketing and communications staff person. The three subunits (Operations and Alternative Transportation; Business, Information and Technology; and Transportation) are staffed with an associate director as in the case of Operations and Alternative Transportation; and Business, Information and Technology; and a manager overseeing Transportation.

PTS has recently added marketing and communications expertise to the department and is in the process of hiring an associate-director-level transportation demand management (TDM) position. Departments that include these two functions are seen as superior than those without, given the changing nature of the business and the function that parking and transportation organizations serve at colleges and universities. Communications and marketing are essential to helping the campus community understand and take advantage of the programs and services offered and for communicating changes that impact the transportation network serving the campus.

TDM is the application of strategies and policies to reduce travel demand of single occupancy vehicle travel or to redistribute travel demand so that congestion is less pronounced. As campus parking and transportation departments assume greater responsibility for access management, it is critical that TDM strategies are deployed. TDM expertise on campus is the most effective way to meet this objective.

PEER COMPARISONS

Some PTS staff indicated that there may be a need to update job descriptions for existing positions to more accurately reflect current position expectations and duties. A periodic review and updating of job descriptions on a prescribed schedule is recommended.

Professional Development

PTS leadership appears to invest appropriately in professional development through regional and industry-sponsored conferences and training opportunities. This includes participation in distance learning opportunities such as webinars and networking. PTS actively participates on industry-specific list-serves focused on parking, transportation, and transportation demand management.

Considering the ever-changing nature of the parking and transportation sector, it is critical that PTS continue to invest in these professional development endeavors at every level of the organization.

PTS leadership must ensure that staff, regardless of their function, build a peer network of their own to keep current on best practices, have problem-solving resources, and keep an outside orientation to avoid becoming stagnant.

In the near term, PTS should reinforce their very strong skill base by providing training in the following areas:

1) Customer service for parking and transportation organizations
2) Active transportation
3) TDM
4) Payment card industry standards
5) Incident command system/special event management
6) Sustainability for parking and transportation organizations
7) Parking technology, data collection, and utilization

CONNECTION WITH PUBLIC, COMMUNICATIONS, SERVICE ORIENTATION, AND PROMOTION

University parking departments are typically oriented in one of two general ways. With the traditional orientation, these departments see their primary role as enforcing rules and regulations. Success is often measured in terms of compliance which is often compelled through aggressive enforcement. This orientation can establish and reinforce an "us-them" dynamic where customers are viewed as violators and parking staff are seen as enforcers. The mode of communications is primarily "tell and direct" and is one-way in direction from the parking department to the user of parking facilities.

The more contemporary orientation exists when the parking department sees itself as a service delivery organization and success is measured in terms of customer satisfaction. While parking rules and regulation compliance is important, the department takes on a problem-solving role with consumers and works to satisfy customer needs through less rigid enforcement. Education of the parking public is seen as critical to the success of the parking program and communication between staff and customers is open, collaborative, and two-way in nature. Customer satisfaction is measured and goals are set to improve the parker's experience.

PTS appears to be firmly grounded in the contemporary orientation, as it sees itself as a service organization with the primary focus of meeting customer needs. As mentioned previously, this is articulated in the mission of the department but also appears in practice on a daily basis. Examples include:

- PTS has recently added a communications and marketing position with the primary purpose of improving how it communicates its programs and services to the campus community.
- The customer service areas of the Lake & Center Parking Garage were designed to enhance opportunities to improve customer service and offer patrons a comfortable, inviting, and non-intimidating environment in which to interact with PTS staff. The space is built more like a bank branch than a police station where separation and security are key design attributes.
- PTS supports an advisory committee that includes campus representatives and appears willing to respond earnestly to the committee's feedback.
- In addition to adding communications and marketing expertise to the organization, PTS is also adding a TDM professional. This signals that PTS is invested in responding to the changing needs of the campus community by offering a growing array of programs and services and not just accommodating auto access to and from campus.
- Enforcement stats

Further progress can be made in terms of customer service through the following efforts:

1) Conduct annual customer service survey and developing measurable goals and objectives focused on improving customer satisfaction.
2) Offer feedback mechanisms in a variety of mediums for all programs and services, especially new offerings. Customers appreciate being asked their opinion and customer-oriented organizations ask for feedback and act on it.
3) Evaluate enforcement practices to ensure that enforcement activities support customer service goals.

Website

The current PTS website seems to adequately provide parking and transportation customers with program and service information. Key service areas are called out in the main horizontal masthead and links are

provided to customers purchase parking credentials, pay or appeal a citation, and locate parking on campus.

A vertical navigation tree accompanies the horizontal bar and includes similar information found on the horizontally oriented navigation bar and includes additional information regarding alternatives to driving and links to other relevant organizations.

The website appears easy to navigate; it is not overly cluttered and presents the most important services in an easy to find presentation. The ability to post timely information in a dynamic format such as a scrolling text line may improve the existing website. As additional technologies are introduced, real-time information – such as shuttle locator and parking availability information – will be useful to provide.

ENFORCEMENT PRACTICES AND OUTCOMES

- Evaluate how enforcement FTE/students and FTE/spaces compare to peers
- Day/night inconsistencies
- Summer free
- Evaluation by lot/citation to identify recommended adjustments

Advisory Group Evaluation

CSU currently has in place a Parking Services Advisory Committee. According to their website, "Changes to the regulations and to the parking program begin at the local level where proposals are heard by the Parking Services Committee (PSC). The PSC's membership include twelve persons: six students (four undergrads and two graduates), and two seats each from faculty, administrative professional, and state classified areas. In addition, the PSC has advisory positions that include representatives from Housing and the Police Department. This group reviews all proposals for program and policy changes, approves or denies special requests, and makes recommendations to the Provost for changes to the University parking regulations."

In practice, the current PSC comprises 20 members. Though representative, the PSC may be underutilized and could be more useful to CSU and PTS.

Advisory Committee Best Practices

There are three main considerations with respect to parking and transportation advisory bodies: 1) responsibilities; 2) composition; and 3) reporting structure.

Advisory Committee Responsibilities

Broad responsibilities for advisory committees typically include the following:

- Review/provide input on departmental budget
- Review/provide input on parking fee/fine review and approval
- Review/provide input on administrative policies, procedures, and regulations
- Serve as liaison between parking and transportation department and campus stakeholder groups
- Review/input of long-range parking and transportation planning efforts

Less common duties found on other campuses include:

- Review/provide recommend site locations for new parking facilities and parking lot enhancements
- Assist the Department of Parking and Transportation Services with public relations programs and promote community interaction through informational exchanges
- Support of the Parking and Traffic Appeals Committee that reviews and acts upon appeals of parking citations from students, faculty, staff, and visitors
- Review transit agreements and make recommendations as to continuation, costs, and possible routes
- Interpret policies related to transportation and parking adopted by governance bodies
- Ensure appropriate consultation of governance bodies regarding proposed changes in any policies

With respect to duties, the most successful advisory bodies understand the programs and services delivered by the parking and transportation department and grasp the challenges faced by the department. It is not enough to meet yearly to review parking permit rates. Instead, the complexities of the department must be understood so that informed recommendations can be made.

Effective advisory bodies also understand and accept their role as liaison between the parking and transportation department and the campus community. These bodies must be representative of the campus community, and it is reasonable to expect members of the committee to reach out to their constituent groups to ensure effective communication occurs.

Much like a board of directors of a corporation, it is best for the advisory group to operate within the strategic realm. Operational issues should be left to parking and transportation program administrators.

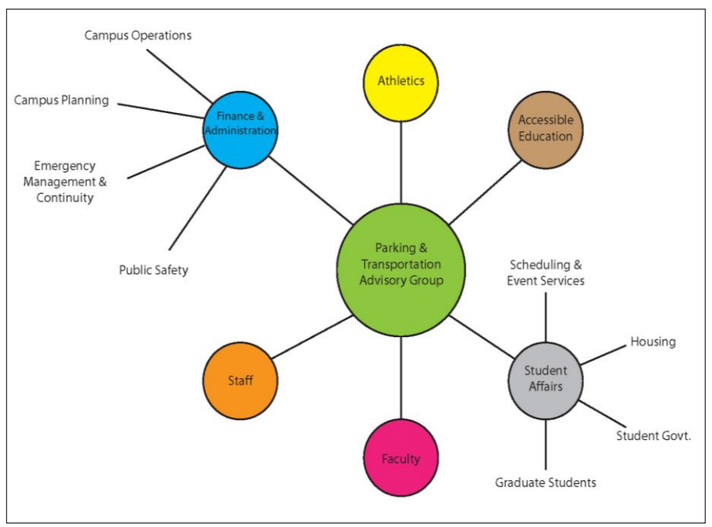
In summary, the most successful parking advisory committees:

- Serve like corporate boards of directors
- Have well-constructed and university-understood purposes
- Look at the big picture, not just their area of expertise or concern
- Focus on strategic issues
- Invest in understanding contemporary parking management strategies
- Have a well-constructed action plan and use it
- Understand the need for and support parking management strategies
- Are constituted thoughtfully
- Have an informed and active chair
- Have a succession plan and staggered terms
- Are viewed as integral to the university's success

Sample parking advisory committee mission statement

The purpose of the Parking and Transportation Advisory Committee is to assist the Vice President responsible for parking and transportation in the formulation of policies and procedures related to overall transportation and parking programs at the University and all its facilities. This includes, but is not limited to, vehicles, bicycles, pedestrian traffic, as well as the operations and services provided by the Regional/City transportation authority directly impacting the campus and its constituents; to provide a communication link between users of the University's parking and transportation programs and services and those responsible for providing such programs and enforcing the regulations governing them.

Advisory Committee Relationship Diagram



CURRENT TECHNOLOGY

Over the past decade technology has been introduced into the parking industry to advance revenue control, customer service, and data collection analysis objectives not possible before. And while it is important to remember that technology is a means to meeting various objectives and not an end in and of itself, the most progressive parking and transportation organizations are implementing common technologies.

Parking Kiosks

CSU is implementing parking kiosks; for example, PTS currently uses parking kiosks that allow the use of multiple forms of payment, the reduction of some labor costs (compared to attended facilities), and a more secure means of revenue collection and control. These kiosks also communicate to PTS staff when certain alarm conditions are met, such as low receipt paper, the cash/coin vault is reaching capacity, or the coin chute is jammed. This allows PTS to maximize equipment uptime (and customer satisfaction) and increase operational efficiencies.

Contemporary revenue control equipment also allows the collection of data important for understanding parking demand and facility-specific utilization. Information available includes:

- **Turnover** – the number of times in a given period of time that a parking space is used by a unique parker
- **Length of stay** – the amount of time a parker stays in a particular parking space
- **Transaction amount** – the fee charged for a parking stay
- **Occupancy** – the percent of occupied spaces for a given facility. This can be expressed for a single point in time or average. Most important is the peak occupancy, which is the highest occupancy for a 24-hour period.

Revenue Control Equipment Utilization Data Output

Permit System and e-commerce

PTS has also invested in a back-of-house customer management system that manages permit sales and citation adjudication. This system allows for the sale of permits via the Internet, thus responding to customer demand for systems that allow for self-service, personal management, and reduced need for in-person visits to the PTS office.

Parking Space Locator System

PTS is in the process of introducing a vehicle locator and parking finder app for the campus community.

OTHER TECHNOLOGIES TO CONSIDER

Advanced Single-Head Meters

The same kind of customer convenience and operational efficiencies can be found in various new single-head parking meters. These also offer multiple forms of payment and provide alarm communications to parking departments. Some also include a sensor that can be imbedded into the parking space that senses when a vehicle is parked in the space. This information can be provided to the parking public so that they have real-time information about space availability.

Credit Card Capable/ Communicating Single Head Parking Meter

Mobile License Plate Recognition

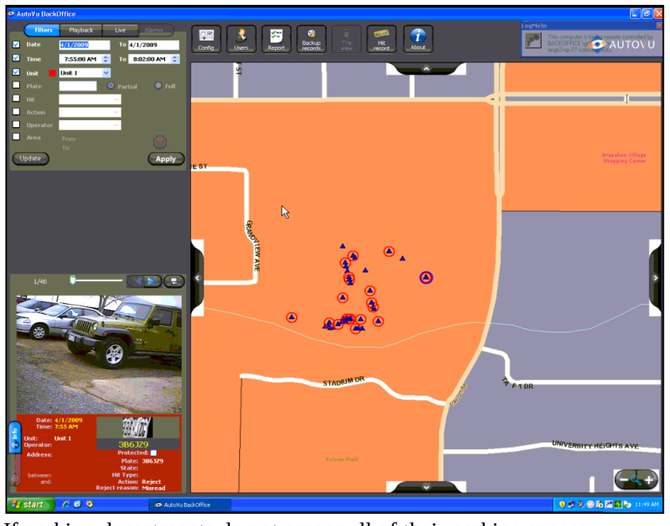
Mobile License Plate Recognition (LPR) systems includes a vehicle-mounted camera system and on-board computer that scans and records license plate numbers and matches unique license plate numbers against allowed plate numbers. In this way, LPR can be used to manage permit parking where a hang-tag, sticker or decal is currently used. Permitless parking is seen by many as superior to systems that rely on hang-tag/decal credentials and eliminates the need for the patron to obtain a physical credential.

LPR is also used to efficiently identify and resolve citation issues with repeat violators. Scofflaw lists are loaded into the LPR's on-board database and the parking officer is notified when a license plate on the list is located, at which time the parking officer then follows the established department protocol.

Mobile Vehicle-Mounted Camera

LPR effectively collects occupancy data while simultaneously conducting enforcement operations. As pictures of registration plates are taken, the photo is location- and time-stamped allowing for improved asset utilization, reduced costs over typical enforcement, and greater data accuracy.

LPR Output Graphic Showing Occupancy



If parking departments do not sensor all of their parking spaces, occupancy count information from LPR and other sources can be used to develop sophisticated analytics and predictive modeling that provides information to parking consumers about where they might reasonably find an open parking space at any given hour of the day. This may be an acceptable alternative to installing sensors to all parking spaces since adding hundreds of sensors may be cost prohibitive.

Pay by Phone

Consumers want various ways to pay for parking. Traditionally, parking meters were only able to accept coins, which caused considerable dissatisfaction as consumers were often forced to look in the seats of their cars to find change to pay for a parking session.

Parking kiosks accept coin, cash, credit/debit, parker loyalty card, and validation coupon. Recently, pay by cellular phone, or pay by cell, has been introduced as an additional form of payment.

Advanced Single-Head Meter with Pay-by-Phone Graphics

In typical applications, parkers are required to become members of a third-party vendor that the university has entered into agreement with. Parkers can become members before a parking session or at the time the parking session begins by calling a number located near one of the parking meters. QR codes are also used to guide parkers to a sign-in or sign-up page. The patron enters some basic contact information, their vehicle license plate number, and a credit or debit card for billing.

Once a patron has become a member and they are ready to begin their parking session, they simply call the number and enter the parking area and how long they wish to stay.

Near the end of the parking session, the system will text the parker to inform them that their session is about to expire. If additional time is allowed, the parker will be asked if they wish to extend their stay and for how long. A convenience charge typically between $.25-.$.40 is charged for each parking session. Pay-by-phone systems are typically offered with smartphone applications that make profile management including vehicle information, payment information, and extending time particularly convenient for parkers.

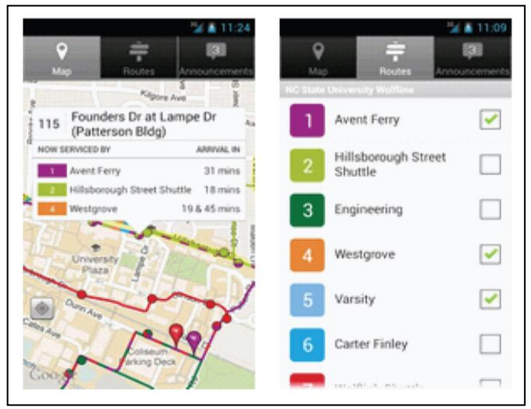
Pay-by-Smart Phone Interface

GPS Shuttle/Bus Locator System

Technology that improves customer service by providing real-time information is not limited to parking environments. Transit operations are incorporating GPS tracking systems on their buses and shuttles to provide riders with location and arrival information. These are offered on web platforms as well as mobile devices.

In addition to customer convenience, GPS locator systems can provide management with valuable information about driver performance. Some are also equipped with on-board systems for recording ridership, conducting pre- and post-trip inspections, and other driver-related activities such as report writing and incident documentation.

Smartphone Shuttle Locator Rider Interface



Parking Resource Allocations

Current System – Hunting License

Parking resource allocations refer to the system by which parking permits are issued to a campus or institution. CSU currently utilizes a simple "hunting license" system based on category of affiliation. A parker may purchase a permit based on their affiliation with the university and park in any lot on campus matching their affiliation.

Table 1 – CSU Permit System

Permit Code	Type	Current Cost
A, B	Faculty/Staff Permit	$261
AD	Admin. Reserved Permit	$1300
D	Physician Permit	$261
F	Federal Permit	$261
H	Handicapped Commuter Student	$234
H	Handicapped Faculty/Staff	$261
H	Handicapped Resident	$303
I	International House Housing	$0
J	Service Permit	$316
M	Motorcycle Permit	$124
Q	Resident Student Permit	$303
S	University Village Housing	$0
T	Aggie Village Housing	$0
W,X	Resident Student Permit	$303
Z	Commuter Student Permit	$234

This approach is commonly how parking organizations first managed parking resources when demand was relatively low and parking management and systems were less sophisticated compared to today. In hunting license systems it is also common for there to be no limit to the number of permits sold. In other words, a permit provides the opportunity to park but does not guarantee a space will be available. CSU currently follows this approach.

Hunting License Approach Advantages

- Relatively simple to understand once a parker learns where their lots are located.
- Often allows for multiple parking options. A person can park in one lot in the morning and then move in the afternoon using the same permit.
- Relatively easy to use with a color-coded system. Permit colors match lot colors.
- When demand is relatively low, this approach is easy to administer and does not require facility-specific demand and occupancy information.

Hunting License Approach Disadvantages

- Relatively inefficient because parkers can and typically do use more than one space per day.
- As demand for parking increases the competition for a parking space increases.
- Increases in congestion and driving on campus can result as parkers hunt for open spaces. This "cruising for an open space" increases pollution and unnecessary vehicle miles traveled.[4]
- Customer satisfaction suffers as parkers become increasingly frustrated when demand for parking increases.

Tiered Parking

Contemporary, high-demand parking programs at universities require a more sophisticated system of allocating scarce parking resources. This system is grounded in supply/demand economics that utilizes pricing strategies that help consumers with convenience/cost tradeoffs.

In a tiered parking scheme parking lots and garages are typically treated as discrete facilities. A finite number of parking permits are sold for the facility with an established oversell ratio based on documented occupancy data for the facility.

Parking facilities can be designated for a particular user or affiliate group, or there can be no restriction placed on who can park where. A variation of this approach is to provide a portion of the permits for a lot to students and the remaining portion to faculty and staff.

Table 2 – Sample Permit Allocation System

Lot	Spaces	Oversell	Permits	% F/S	% Students	F/S Permits	Student Permits
10	150	2	300	100%	0%	300	0
20	200	1.5	300	90%	10%	270	30
30	350	1.9	665	75%	25%	499	166
40	75	1.2	90	50%	50%	45	45

[4] Donald Shoup, "Cruising for Parking." *Access*, No. 30, Spring 2007.

Parkers do not hunt for parking spaces between lots but are assigned specific facilities. Cross-parking, or allowing parkers with one permit type to park in another parking area, is often a part of this allocation scheme so that after a certain time (low demand) or on weekends more flexibility in parking is provided.

Who Gets to Park Where?

Typically, faculty and staff are assigned to core parking areas of high demand and commuter students are provided accommodations in perimeter parking facilities. Resident students often park near residence halls but if these are in the core of campus, storage parking can be provided in remote or peripheral parking areas so that high-demand parking areas are available for short-term parkers.

Graduate students may be provided similar access compared to faculty and staff or they may be included in the commuter student group depending on demand. Perimeter parking typically requires shuttle services depending on the size of campus and class change time allowances. Coordination between parking and shuttle operations is critical.

There are three general approaches to determining how permits are distributed: the egalitarian model; the first come, first served model; and the seniority model.

EGALITARIAN MODEL:
In the egalitarian model a portion of each lot is set aside for each affiliate group. While the percent of each lot set aside for each group may differ, everyone has a reasonable chance of gaining access to each lot. This provides for a measure of choice for everyone.

FIRST COME, FIRST SERVED MODEL:
This model follows a similar system compared to the sale of other goods and services where the early bird gets the worm. The permit sale opens and permits are sold in order regardless of who purchases them. When the sales limit is reached, the sale for that lot closes.

SENIORITY MODEL:
Under this model faculty and staff typically receive priority over students and upper classmen receive priority over underclassman or priority is given to full-time over part-time students. If parking demand is high enough, freshman, for example, may not be allowed to purchase a permit. In some cases permits are not allowed for students living within a given distance to the campus.

How Are Permit Prices Based?

Normally price is based on proximity to the campus core or convenience to the primary demand generator. This provides for a mechanism to push demand away from the campus core and to more evenly distribute parking utilization.

A relatively simple way to determine which parking facilities should be priced highest is to use peak occupancy with the highest-peak-occupancy facilities having the highest value, therefore, the highest permit price.

Table 3 – Utilization and Price Under Price-Based Model

Utilization		Price
85% – 100%	High	High
50% – 84%	Medium	Medium
Below 50%	Low	Low

On an annual basis peak occupancy data are updated and lots are moved from one demand group to another if necessary. This establishes a dynamic and responsive way to allocate parking permits based on the changing nature of the campus.

At some institutions permit prices are based on salaries so that those who make more pay more. This system is not recommended because it is not typically how goods and services are priced. This may also force those who have higher means to subsidize parking for those of lesser means and may inadvertently deter more price-sensitive customers from using less expensive alternatives to driving alone.

Another feature of this model that is considered a best practice is that all parking is assigned a value and therefore carries a fee for use. Higher demand areas require more management and also require more frequent maintenance, which justifies the higher price. If CSU were to adopt this model, it is recommended that no-charge parking would discontinue (such as with University Village and Aggie Housing). This is called unbundling parking and housing.

Unpriced parking is often "bundled" with building costs, which means that a certain number of spaces are automatically included with building purchases or leases. *Unbundling Parking* means that parking is sold or rented separately. For example, rather than renting an apartment for $1,000 per month with two parking spaces at no extra cost, each apartment can be rented for $850 per month, plus $75 per month for each parking space. Occupants only pay for the parking spaces they actually need. This is more efficient and fair, since occupants save money when they reduce parking demand, are not forced to pay for parking they do not need, and can adjust their parking supply as their needs change.[5]

The base tiered parking system can offer features that expand customer convenience and facility efficiency based on the university's needs. These include:

- The ability for parkers to purchase additional convenience.
- To maximize facility utilization and offer additional convenience, parkers can be allowed to "park down" meaning that higher- priced permits allow for parking in lower demand parking areas.
- Parking related to official business can be accommodated with a companion permit. Under this arrangement a parker must have a business-related need based on criteria the university determines. The parker must typically also possess a permit purchased by their own funds. The two permits are then used in combination for certain parking access. This may be time and location limited.
- Parkers with accessibility needs can be accommodated easily and in a manner that offers them convenience and price choice. For example, they may wish to purchase a low-cost permit and this allows them to park in a low-cost lot or lots in any space including accessible parking spaces. They may also park in any accessible space in any priced lot without an additional charge on a space available basis.
- Service vehicles can be accommodated in a tiered reserved system in dedicated spaces, allowed to park in any lot, or they may be restricted to certain lots. Normally, service vehicles are prohibited from parking at meters.
- Contractor permits work in a similar manner as service vehicles with the exception that there would not normally be dedicated spaces provided for this group of parkers, and that special accommodations even in the highest demand areas may be required to support certain projects. Normally, contractors would be restricted to certain lots. In all cases the contractor should have a permit.
- Vendors also require permits but since they normally do not occupy a space as long as a contractor, they may be allowed access to parking meters. They may also use service spaces designated for university vehicles given their short stay durations.
- While salary-based pricing is not recommended, some exceptions may be warranted. At some universities the lowest paid employees are offered discounted parking permits but in peripheral parking facilities including underutilized upper levels of parking garages. This offers price-sensitive access but without jeopardizing the entire system.

The Hybrid Model

In most cases when universities consider moving from hunting to tiered parking systems, demand is not high enough across the entire parking system to warrant a wholesale change. Instead, it is possible to marry the two systems and realize the advantages of both systems simultaneously. Under this arrangement medium- and high-demand lots are moved to the tiered, reserved system while low-demand lots are offered under the hunting license system. Only when demand grows beyond a predetermined threshold are lots moved from hunting to tier reserved parking.

A Path Forward for CSU

The following steps may help CSU move from its current system to one more responsive to its contemporary needs and more able to meet future needs.

1) Determine peak occupancy levels for all parking facilities on campus. Break these facilities into groups of high, medium, and low occupancy with the key break between high and medium being somewhere between 80-90%.

2) Establish price groupings based on department revenue needs, market and peer pricing, and local price sensitivity. National research from the Transportation Research Board, the academic authority on transportation research nationally, identifies in a manual on transportation elasticities a national "meta-elasticity" for parking price between -.1 and -.3.[6] This means that for every 1% increase in permit price, demand should reduce by between .1%-.3%.

[5] Victoria Transport Policy Institute, "Parking Management." *Vtpi.com,* September 10, 2012, http://vtpi.org/tdm/tdm28.htm#_Toc128220488 (Cited May 5, 2013)

[6] Vaca, E. and Kuzmyak, J.R. Chapter 13—Parking Pricing and Fees. In, *TCRP Report 95 Traveler Response to Transportation System Changes*. Washington, D.C.: Transit Cooperative Research Program, Transportation Research Board. Retrieved May 1, 2013: http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp_rpt_95c13.pdf.

3) For medium- and high-demand parking facilities establish lot-specific oversell ratios. This is done making daily and sometimes hourly observations of facility occupancy around the highest demand times of the year – typically within the first weeks of the fall semester.

4) Determine if a hybrid model is appropriate for CSU. If so, identify lots that will be offered with a hunting license.

5) Develop a communications and marketing plan to roll out the new system.

6) Make necessary adjustments to the parking management system.

7) Develop new signage.

8) Roll out new system following extensive communication to the campus community.

9) Staff lots at implementation to help parkers adjust.

10) Implement a long grace period for possible infractions. Full implementation may take an entire semester or longer.

11) Collaborate with the City of Fort Collins to monitor impact on adjacent neighborhoods and make necessary adjustments to neighborhood parking permit program.

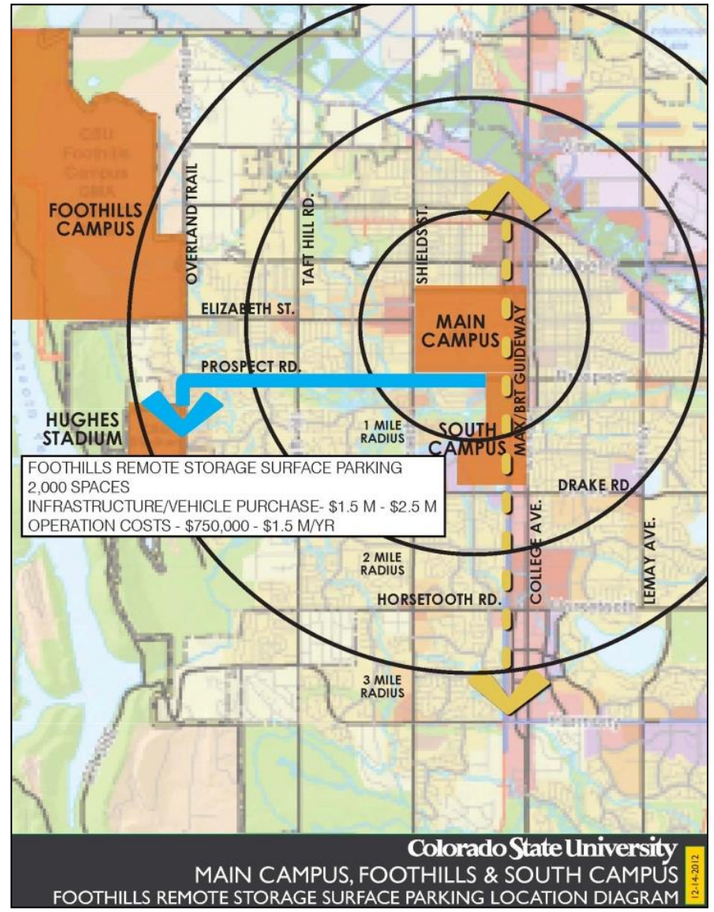
Parking Facility Efficiency

PTS currently adheres to a contemporary design standard for parking stall widths that maximizes facility efficiency without degrading customer service. Surface parking lots are striped at 8.5'x17' and garages 9'x17'. Currently every space on campus meets these standard dimensions as PTS reseals and restripes each facility every three years. In cases where the geometry of a particular facility does not allow for a full space to be striped, the extra space is used to expand adjacent spaces as opposed to making them smaller. This is also an industry best practice and results in better customer service than if spaces were made smaller than the standard.

Remote Parking Facility Options

As development occurs on campus and parking demand grows, remote parking facilities may be a good option to explore. Some work has already been done in this area on land already owned by CSU. There may also be opportunities to partner with the City of Fort Collins and the North Front Range MPO in the development of park-and-ride facilities.

CSU Park-and-Ride Facility Planning Graphic



Design Considerations

Research suggests that there are three major siting/modeling concerns that need to be addressed when siting park-and-ride facilities: covering as much potential demand as possible, locating park-and-ride facilities as close as possible to major roadways, and siting such facilities in the context of an existing system.[7]

Further, park-and-ride facilities need to be safe, comfortable places that accommodate not just auto to transit transfers but also bike and pedestrian to transit transfers. Consideration for future electric charging stations for autos should be made and adequate revenue control equipment should be designed into the project. It may also be advantageous to site shuttle storage and cleaning facilities at a park-and-ride location.

Funding Opportunities

There may be opportunities to jointly build park-and-ride facilities using Federal Transit Administration funding or partner with private interests in a public-private development arrangement.

Federal funding opportunities exist through the Federal Transit Administration and Federal Highway Administration and eligibility and acceptable project types vary as does the method of accessing the funding. Partnering with the local MPO and transit authority is likely to gain access to the broadest range of funding opportunities and provide the means of collaborating on projects that serve the broader community.

[7] Bilal Farhan, Alan T. Murray, "**Siting park-and-ride facilities using a multi-objective spatial optimization model.**" ***Computers and Operations Research,*** Volume 35 Issue 2, February, 2008, pp. 445-456.

Federal Transportation Grant Programs

Table 4 – Federal Transportation Grant Programs

Section	FTA 5339
Program Name	Bus and Bus Facilities
Description	Provides capital funding to replace, rehabilitate and purchase buses and related equipment and to construct bus-related facilities.
Eligibility	Designated recipients and states that operate or allocate funding to fixed-route bus operators. Subrecipients: public agencies or private nonprofit organizations engaged in public transportation, including those providing services open to a segment of the general public, as defined by age, disability, or low income.
Eligible Activities	Capital projects to replace, rehabilitate and purchase buses, vans, and related equipment, and to construct bus-related facilities.

Section	FTA 5307
Program Name	Urbanized Area Formula Grants
Description	This program provides grants to Urbanized Areas (UZA) for public transportation capital, planning, job access and reverse commute projects, as well as operating expenses in certain circumstances. These funds constitute a core investment in the enhancement and revitalization of public transportation systems in the nation's urbanized areas, which depend on public transportation to improve mobility and reduce congestion.
Eligibility	FTA apportions funds to designated recipients, which then suballocate funds to state and local governmental authorities, including public transportation providers.
Eligible Activities	Capital projects; planning, job access and reverse commute projects that provide transportation to jobs and employment opportunities for welfare recipients and low-income workers; Operating costs in areas with fewer than 200,000 in population; Operating costs, up to certain limits, for grantees in areas with populations greater than 200,000, and which operate a maximum of 100 buses in fixed-route service during peak hours (rail fixed guideway excluded).

Section	FHWA CMAQ
Program Name	Congestion Mitigation, Air Quality
Description	Funding for transportation projects or programs that will contribute to attainment or maintenance of the national ambient air quality standards (NAAQS) for ozone, carbon monoxide (CO), and particulate matter (PM).
Eligibility	To be eligible for CMAQ funds, a project must be included in the MPO's current transportation plan and TIP (or the current STIP in areas without an MPO).
Eligible Activities	Capital and operating assistance

SUMMARY: PARKING PROGRAM MANAGEMENT REVIEW

PTS is a well-run, well-organized department that is taking steps to add necessary resources to deliver high-quality services and programs to CSU in support of the broader university mission. The department is working collaboratively with those on campus responsible for long-range planning and this planning is paying off as the university looks to take steps now to address access needs of the future based on aggressive capital and enrollment growth.

Outside of a few key areas such as its current permit allocation model and use of technology, the department appears to be following many industry best practices. By implementing a tier reserve permit system (and possible a hybrid approach allowing hunting on low-demand facilities) and exploring the introduction of new customer-oriented technologies, the department will further its ability to meet the transportation and access needs of the campus community today and into the future.

Recognizing that all parking facilities cannot be accommodated on campus, the department should take steps to identify potential remote parking facilities and gain capacity and expertise to utilize federal and state grant sources to fund important infrastructure and operational improvements. This may also include public-private partnerships.

Transportation Demand Management Existing Conditions

Campus communities have tended to support walking and biking above vehicle circulation and have been ahead of the curve employing (TDM) strategies to mitigate the numerous daily peak hours created by academic activities.

Understanding TDM

TDM traditionally took the form of employer incentives to encourage commuters to consider commute-alternatives to single-occupant vehicle (SOV) commutes during the peak hour and on peak-utilized routes. Preliminary goals were to reduce congestion and mitigate air quality concerns. As the TDM discussion matures, SOV trips are still discouraged, but TDM strategies are shifting to include non-commute trips. TDM is beginning to address land-use and how residential, retail, and work locations can play a large role with the number of miles an individual needs to travel, and the travel options available when trips are shorter.

University Context of TDM

Walking, biking, and the infrastructure and land use that support these modes have long been major components of campus master planning. Student residences, campus buildings, and classrooms create a dense, mixed-use environment with little space left-over for vehicle storage. Unlike standard morning and evening commute peaks, campus trips tend to be numerous and cover short distances, as students, staff, and faculty pass from one classroom or building to the next to fulfill daily course schedules.

Walking and biking are major modes for the campus community at CSU in Fort Collins. Fort Collins is a great place to be a pedestrian and/or a bicyclist. The city has generally flat terrain, easy for pedestrians and cyclists to traverse, and weather patterns that include "296 sunny days a year,"[8] on average, with winters that tend to be moderate and have little precipitation.

While CSU started as a commuter campus, in 2012, 70% of CSU students lived within two miles of the main campus.[9] In December 2012,

approximately 50% of the student body walked, took the bus, or rode a bicycle to and from school. Bicycling was the most popular non-driving option with 23% of the student body reporting the use of a bicycle for their transportation. Bicycling is also the most popular non-vehicular option for faculty and staff, even though 90% of faculty and staff drive to work.[10]

Not only do students use alternative transportation frequently, but they also recognize the importance of proximity to a variety of mode choices. In the 2013 Housing Survey students indicated that an important factor for residential location choice was walking or biking proximity to campus. Close to 45% of respondents indicated that walking or biking proximity from campus was "extremely important," while nearly 90% of respondents indicated it was at least "moderately important."[11]

By 2020, the number of students who live very close to or on campus is likely to increase. The CSU 2020 Plan proposes a large amount of additional student housing on campus, increasing from 5,250 beds in 2012 to 7,432 beds in 2020.[12] While the campus is also planning to increase the student body during this time, it is likely that students who begin college living on campus will want to continue living close to campus, even as proximity is already an important factor for housing choice among CSU students.

It is clear that CSU is moving away from its roots as a commuter campus and into a new era of a complete campus community, which will have new and different transportation demands and needs. TDM will become a necessary discussion to ensure that the needs of future students, faculty, and staff are met. However, CSU already has a solid foundation to build upon and is poised to meet the challenge.

TDM Snapshot

The following highlights note the infrastructure in place today and TDM programs that help support the CSU campus community:

Walking

- Campus core closed to motorized vehicles
- Bicycle 'Dismount Zone' on campus for pedestrian-only traffic (i.e., cyclists and skateboarders must dismount and walk)
- Off-street trails and paths throughout the City of Fort Collins and CSU Campus

Biking

- League of American Bicyclists has designated CSU as a Bicycle Friendly University (Silver)
- Fort Collins is a designated League of American Bicyclists, Bicycle Friendly Community (Platinum)
- FC Bike Library (community bike share program) with 36 bikes at a CSU station (235 total in the system as of February 2013)[13]
- Campus core closed to motorized vehicles
- Off-street trails and paths throughout Fort Collins and CSU Campus
- Bicycle Education and Enforcement Program (BEEP) requires students, faculty, and staff to register bicycles on campus; the program provides enforcement and educational outreach
- *Smart*Trips (www.smarttrips.org) Bike Program distributes brochures and operates Freewheels program for employees of Parking Services to provide transportation for errands or meetings across campus
- Transfort buses are all equipped with racks that can carry two bicycles
- FLEX regional buses are equipped with racks that can carry three bicycles

Local Transit – City of Fort Collins Transfort

- Students: Student Fees go towards Transfort – Ram Card allows unlimited access to Transfort and transfers to FLEX

[8] University Area Strategic Transportation Study, 2000

[9] NFRMPO Regional Bicycle Plan

[10] CSU Transportation Plan 2020 Snapshot: December 2012 for Main & South Campus

[11] 2013 Housing Survey Results – Question 29

[12] Colorado State University 2020 Plan

[13] Fort Collins Bicycle Friendly Community Application

- Faculty/Staff: steep discounts on PassFort ($50 for an annual pass instead of regular adult rate of $154[14])

Regional Transit – FLEX

- FLEX is a single route that operates between Fort Collins and the surrounding communities of Loveland, Berthoud, and Longmont; it also connects to Denver's RTD Transit system
- FLEX and Transfort allow for free transfers between the two systems

Parking

- Preferential parking spots are reserved for carpool permit holders

Commute Options

- Zipcar for Universities has four vehicles on the CSU campus; students, faculty, and staff are eligible for a reduced rate membership and the opportunity for rental credit
- *Smart*Trips Ride Matching and Incentives Programs[15]
- GreenRide allows commuters to find carpool and vanpool matches, calculate commute savings (including cost savings as well as calories burned), receive information on commute options, and earn incentives
- VanGo™ provides vanpool matching services to assist travelers to find vanpools that meet their origin and destination needs
- CarGo provides personalized carpool matching based on criteria input by the user, based on participants willing to carpool who live near each other and are traveling in the same direction and during the same times

Detailed Assessment

The following sections offer a detailed account of existing infrastructure, programs, and activities that are in place today within the CSU campus and just outside in the surrounding community of Fort Collins. Some proposed projects are also noted in order to provide detail of potential future transportation enhancements.

WALKING

University cultures tend to support walking. The distance between origins and destinations on campuses tend to be short, allowing students, faculty, and staff to have the convenient option of taking trips on foot. CSU's Main Campus has a web of pedestrian walkways, and even some pedestrian-only areas to support the numerous individual daily trips made on foot to pass between classes, offices, residences, and labs.

In addition to on-campus trips on foot, a large number of students make the commute to and from campus and their residences on foot as well. For students residing on campus or very close by, there is the unique benefit of already being connected to the University's extensive pedestrian infrastructure. An extensive trail network through Fort Collins includes off-road trails that pedestrians and bicyclists alike can enjoy. However, even with a great network of multi-use trails throughout the community, Fort Collins' pedestrian infrastructure is not always continuous or accommodating to the high volumes of pedestrian traffic, particularly in the areas immediately surrounding campus. At one point, sidewalks were not required to be added with new development and the widths of sidewalks built during that time were not regulated.

Noted in the *2000 University Area Strategic Transportation Study*, some sidewalks (generally older) around CSU and the City of Fort Collins were built so narrow that they were considered non-conforming under the Americans with Disabilities Act. Other areas lacked continuity with sidewalks, forcing pedestrians to walk in the trafficway where significant gaps were present. Sidewalks throughout the city continue to be discontinuous and too narrow for the amount of daily pedestrian traffic. Even the network of off-street trails and paths are often too narrow to accommodate the growing number of pedestrians, cyclists, and those on skates.

The North Front Range MPO Regional Bicycle Plan has proposed a number of routes that will positively impact the campus and surrounding areas. The Mason Street Trail is proposed to connect the campus via Mason Street to the existing Poudre River trail north of campus to the Spring Creek and existing Mason Street trail alignments south of campus. The short segment proposed for the Mason Street Trail would immediately connect the campus community directly to the Fort Collins multi-use path network, but also has the potentially to connect the campus community to the greater region, including the communities of Loveland and Greeley if additional proposed multi-use paths are also built.

Meridian Avenue is closed to vehicular travel from South Drive to Laurel Street, but Pedestrians have to contend with vehicular traffic where Meridian Avenue crosses Plum Street and South Drive. Additionally, Pitkin Street is closed to vehicular travel from Aylesworth Hall to the Stock Judging Pavilion. There are numerous pedestrian walkways throughout the campus as well.

BIKING

Biking is another major form of transportation for the CSU campus community. Students overwhelmingly consider bicycling as an option at CSU. In fact, there are so many students who cycle on campus that a designated "Dismount Zone" has been created in order to ensure that pedestrians are still able to safely traverse the campus core. The University estimates that there are 15,000 bicycles on campus every day.[16] The League of American Bicyclists has recognized CSU as a "Silver" level Bicycle Friendly University.

When considering a location to rent an apartment, over 42% of students in the 2013 Housing Survey indicated that bicycle storage or parking availability was "very important" or "extremely important;" nearly 70% of students indicated that bicycle storage and parking was at least "moderately important."[17]

CSU has several bicycle routes through campus, with two-way traffic markings as well as a unique decal that features the school's mascot, a ram, riding the bike rather than the traditional person. Bicycle routes are separated from pedestrian sidewalks. An east-west multi-use path connects Elizabeth Street on the west side of campus to the central campus area. A north-south multi-use path connects Meridian Street north of the campus past the Lagoon and campus core to Center Avenue bicycle lanes in the south. Just south of campus, students can access Fort

[14] Transfort Rider Guide and System Route Map, January 2012

[15] 2010 Long Range TDM Plan through NFRMPO

[16] www.bikeleague.org – Profile of Colorado State University, retrieved 4/22/2013

[17] 2013 Housing Survey Results – Question 26

Collins' extensive trail system. Center Avenue connects directly to the Spring Creek Bicycle trail, which in turn connects to the Mason Street Trail. As noted previously, the Mason Street Trail is proposed to connect to the Poudre and Spring Creek trails to the north and south via Mason Street on CSU's campus. This addition to the multi-use trail network will connect the campus immediately to the greater network and, potentially in the future, to surrounding communities. Some shorter segments connect these main pathways to additional building clusters, core areas of the campus, and on-road bicycle lanes within and surrounding the campus.

The League of American Bicyclists noted that the one most compelling recent accomplishment of CSU was its $100,000 investment in the installation of new bicycle racks throughout campus.[18] CSU currently has 1,389 bicycle racks for both short-term and long-term parking across its campus, which can accommodate 14,613 bicycles.[19] Some covered parking spots are provided parking garages on campus, as well as a bike locker for longer-term storage.

Previously, bicycle racks have been installed on a case-by-case basis when the rack was asked for; as of 2013, plans for each new building being constructed include provisions for additional bicycle parking. Bicycle racks are funded through the Parking office budget.

An on-campus bicycle shop called Recycled Cycles, includes a service center along with seven Dero Fix-It stations across the campus.

The Bicycle Education and Enforcement Program (BEEP) is a unit of the CSU Police Department (CSUPD). The program is meant to educate bicyclists as well as enforce rules and regulations pertaining to bicycles and skateboards in order to provide a safe traffic environment on campus. Educational information through BEEP notes that motor vehicle traffic laws apply and that CSUPD will enforce these laws regularly on campus. The Dismount Zone is a strictly enforced area where bicyclists and skateboarders must get off bicycles and skateboards in order to ensure safe and efficient passage for the masses of pedestrians, particularly during passing periods.

[18] www.bikeleague.org - Profile of Colorado State University, retrieved 4/22/2013

[19] Information provided through RFI phase from CSU

All bicycles ridden or parked on the CSU campus are required to be registered with the CSUPD, although some exceptions are made for visitors to the campus. Registration costs $10 and is monitored through a decal that must be displayed on the bicycle. Registration is valid as long as the decal numbers are still readable, or until the bicycle transfers ownership, at which point the new owner must re-register.

Fort Collins Bicycle Infrastructure and Programs

Along with CSU, the community of Fort Collins is very supportive of bicycling. The community has also been recognized by the League of American Bicyclists as a "Platinum" level Bicycle Friendly Community.

As of March 2013, the *North Front Range Metropolitan Planning Organization (NFRMPO) Regional Bicycle Plan* noted that the MPO had 421 centerline miles of bike routes and bike lanes in the region. Additionally, the document noted 208 centerline miles of shared-use paths throughout the North Front Range MPO, distributed among the nine municipalities and unincorporated areas. Fort Collins led the region for bike lanes and routes with 142 total centerline miles of bike lanes, and a half-mile stretch of shared lane markings, called sharrows, on Mountain Avenue between Mason Street and Riverside Drive just north of CSU's campus. The community is also home to 31 miles of off-street shared-use paths as well.[20]

Fort Collins and its neighboring community Loveland have bike detectors at some signalized intersections. The Fort Collins detection system utilizes video detection at nearly 50% of their signalized intersections. There is a single bike box near the CSU campus on Plum Street at its intersection with Shields Street.

The **FC Bike Library**, a bike share program, is hosted by Fort Collins. As of February 2013, the program had 235 total bicycles across the community including 36 bikes at a CSU station.[21] Due to strong interest, CSU is also working on a bike share program, but have not yet had the opportunity to look at options.

[20] NFRMPO Regional Bicycle Plan

TRANSIT

Existing Service

Transfort is Fort Collins' local transit system. Transfort has three main transit centers, with the CSU Transit Center (CTC) located in the northeast corner of CSU's campus, just outside the bicycle dismount zone.

Transfort buses are equipped with bicycle racks that accommodate up to two bicycles at a time. There were just over 100,000 bike boardings on Transfort buses in 2010. Each FLEX bus can accommodate up to three bicycles at a time.

Transfort currently operates 14 daytime routes year-round, with four additional routes that operate specifically when school is in session. Seven routes serve the CTC, with one additional route serving the campus via College Avenue on the eastern edge of the campus. Two of the four school-in-session routes operate specifically to serve CSU; Route 11 serves CSU and Campus West, while Route 3 serves the campus and West Fort Collins, both via the Transit Center at CSU. Nighttime service is also offered from 10:30 pm to 2:30 am year-round.

[21] Fort Collins Bicycle Friendly Community Application

Table 5 – Transfort Routes

Route[22]	Weekday Service		Saturday Service NT	
	Service Hours	Frequency (mins)	Service Hours	Frequency (mins)
1	6:18 AM - 7:26 PM	20	6:18 AM - 7:26 PM	20
2 L	6:22 AM - 6:30 PM	30	6:22 AM - 6:30 PM	30
3 L, N, *	6:50 AM - 10:02 PM	30		
6 N	6:15 AM - 10:05 PM	60	6:15 AM - 10:05 PM	60
7	6:15 AM - 7:03 PM	60	6:15 AM - 7:03 PM	60
11 L, *	6:58 AM - 6:20 PM	20	6:58 AM - 6:20 PM	20
15	6:15 AM - 6:52 PM	20	6:15 AM - 6:52 PM	20
19 S	6:40 AM - 7:26 PM	60		
Green NT			10:30 PM – 2:30 AM	15
Gold NT			10:30 PM – 2:30 AM	15
FLEX F	5:24 AM - 8:00 PM	60	6:17 AM - 8:23 PM	60
(L) - single direction loop service				
(N) - Weekday night service when CSU is in Session				
(NT) – Late night service through the Green and Gold lines run on both Friday and Saturday				
(S) - Additional weekday service, 30 minute headways, during AM and PM peak hours when Poudre School District or CSU is in session				
(F) - Generally 60 minute headways, but some additional service during peak hours				
(*) Runs only when CSU is in session				

Fares for Transfort are highly subsidized for CSU students, faculty, and staff. Students simply need to show their Ram Card to board any Transfort bus. Student fees include a negotiated amount that is paid directly to Transfort to provide resources and transit service to the campus as well as the broader Fort Collins community. Currently, the Transfort fee CSU students pay is $50 per year. Faculty and staff are eligible to get a discounted annual pass through CSU as well. This pass is steeply discounted to $50 rather than the standard $154 Adult Annual Pass rate.

[22] Transfort website: www.fcgov.com/transfort

FLEX is a regional route that connects Fort Collins with Loveland, Berthoud, and Longmont. In Longmont, FLEX connects with RTD, the transit service that operates in the Denver metro area. FLEX has a total of 21 stops in the four communities, including one just south of the campus on College Avenue and Prospect Rd, and operates Monday through Friday from 5:30 am to 8:00 pm, and on Saturday from 6:00 am to 8:30 pm.

Fares for FLEX are the same as for Transfort, $1.25 for a single ride. Passengers may transfer to and from FLEX on to the COLT and Transfort Systems. Transfer to the RTD system requires an additional fare.

Proposed Routes

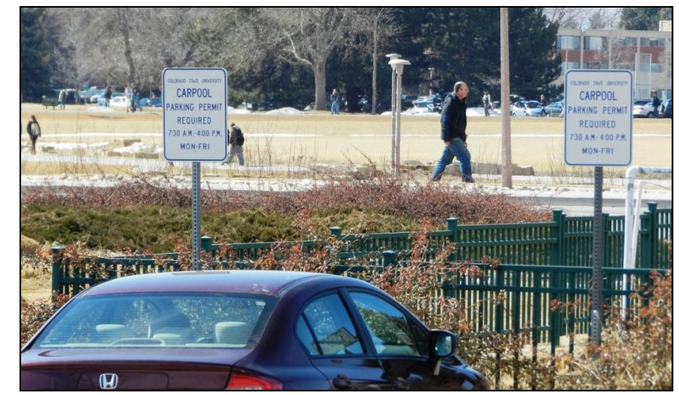
Several proposed routes are noted in the *2012 Colorado State University Transit & Parking Special Considerations* report. The proposed routes would include the following:

- Bus Rapid Transit (BRT) route along Mason Street
- Inner-loop campus shuttle that would circumnavigate Meridian Avenue and Mason Street from Lake Street to north of the oval
- East-west shuttle that would connect University Avenue to Elizabeth Street
- South Campus shuttle connecting from Lake Street down Central Avenue and Research Boulevard
- Foothills Route from Plum Street to Shields Street to Elizabeth Street to Overland to the Foothills Campus

The BRT line would serve the north-south corridor of Mason Street through Fort Collins. The additional shuttles would primarily serve the campus community, although the east-west shuttle has the potential to also serve the neighborhood west of CSU's main campus.

PARKING

Other sections of this report will provide a much more detailed account of the parking conditions in and around campus. It is important to note, however, that parking strategies and policies are directly tied with TDM. Creating TDM approaches in conjunction with parking policies and plans will ensure a cohesive overall transportation program.



Of note currently on CSU's campus, is that there are limited preferential parking spots reserved for carpool permits to encourage ridesharing to and from campus.

COMMUTE OPTIONS

In many ways academic institutions, and particularly university campuses, have been ahead of the TDM discussion. Campus communities tend to have the density, paired with well-planned residential and 'work' locations tightly knit together, that enables a walkable and bikeable environment. The broader discussions for livability, sustainability, and healthy communities tie in directly with traditional TDM strategies and help expand them to include considerations for transit, walking and biking, systems operations, land-use planning, and economic development.

As campus communities have grown, they have tended to keep ahead of pedestrian demand with extensive walkways and paths to accommodate the numerous short trips made throughout the day. Many universities, including CSU, have also discovered the unique potential college campuses have for both using and supporting transit. Numerous peak hour trips, when students and faculty traverse campus from one

classroom or building to the next, can provide a great volume of passengers to support short headways between buses, and student fees can assist with tight public transportation budgets.

Still, vehicle trips are the most predominant mode in America today, and CSU, as well as other universities, must accommodate this mode as well. Fortunately, there are some strategies, options, and programs that can help reduce the number of total person miles traveled, as well as reduce parking needs. As noted previously, preferential parking for carpools provide positive encouragement to consider ridesharing, as can any assistance to find someone to share a ride with. The following programs, Zipcar and *Smart*Trips, provide options to help reduce the need for individual ownership and use of vehicles.

Zipcar

Zipcar is a car-sharing program that has vehicles at designated parking spots across the US. It has found particular success on university campuses where vehicle located at designated parking spots are available for hourly or daily rental for members of the program. Members can search for nearby vehicles and view their availability to reserve and use a vehicle for as little as an hour at a time, or up to four days. Membership includes gas, insurance, and up to 180 free miles per day.

Zipcar has been on CSU's campus for two years. The program started with two vehicles, but due to high demand, it has added additional vehicles, bringing the total to four. It has been noted that much of the Zipcar usage has come from students living at University housing.

SmartTrips

The North Front Range Metropolitan Planning Organization (NFRMPO) administers *Smart*Trips, an alternative transportation program supported throughout Larimer and Weld counties and the cities of Fort Collins, Loveland, and Greeley to "help preserve air quality, decrease traffic congestion, conserve fuel, and promote better health."[23]

The *2010 University Area Strategic Transportation Study* noted that CSU students and faculty had not been a target market for ridesharing due to their irregular commute patterns. This is likely still the case, although some faculty and staff could take advantage of carpooling or vanpooling.

VanGo™ provides vanpool-matching services to assist travelers to find vanpools that meet their origin and destination needs. Likewise, CarGo provides personalized carpool matching based on criteria input by the user, based on participants willing to carpool who live near each other and are traveling in the same direction and during the same times. The NFRMPO noted the operation of 85 total vanpooling routes throughout the MPO in the spring of 2013. Of these routes, 21 vans are equipped with bicycle racks.[24]

*Smart*Trips, in addition to ridematching services, assists with personalized bus route assistance to help commuters determine their best transit options and provides a forum to assist pedestrians and bicyclists with choosing routes that have pedestrian and bicycle friendly environments.

Telework and alternative work schedule information and guidance is provided by *Smart*Trips to businesses, supervisors, and employees wishing to telecommute or use flexible work schedules. For commuters who use alternative transportation, *Smart*Trips offers a Guaranteed Ride Home program for unexpected events; the program allows a free taxi ride up to 100 miles to employees that have unexpected overtime or have a family emergency through participating employers.

[23] www.SMARTtrips.org
[24] NFRMPO Regional Bicycle Plan

NEEDS ASSESSMENT

WALKING

On campus impacts of the increasing student body can already be seen on major pedestrian paths. During peak periods, many core sidewalks and paths are too narrow to accommodate the demand of pedestrians. Furthermore, both bicyclists and pedestrians share some paths. Lack of breadth and separation of pedestrians and the faster moving bicycles create the concern for conflicts. It will be necessary to increase pedestrian and bicycle capacity in order to prepare for the increase in enrollment anticipated in the near future.

Although Meridian Avenue and Pitkin Streets are closed to vehicular traffic, there are some safety and circulation concerns surrounding the closed areas. The intersections of Meridian Avenue with both Plum Street and South Drive contend with high pedestrian volumes as well as vehicular volumes, and may be locations where a pedestrian underpass or overpass may be appropriate.

BIKING

As bicycling continues to increase on campus and throughout the surrounding community, separation of pedestrians and cyclists is a growing concern due to the incompatibility of these two modes, including the potential for dramatic speed differences.

While CSU has provided a few bicycle routes separated from pedestrian travel, there still remains a need to create more bicycle facilities that are separated from pedestrian and vehicle facilities to reduce conflict. Both the *1991 Circulation and Access Master Plan*[25] and the *2000 University Area Strategic Transportation Study*[26] call out safety concerns for

[25] Circulation System and Access Master Plan, 1991 (Campus Traffic Committee, Engineering Service Group Facilities Services), pdf pg 16
[26] University Area Strategic Transportation Study, 2000, p. 8-1

cyclists on roads, and concerns for pedestrians where high-speed cycling could cause conflicts.

Although CSU has partnered with Fort Collins to increase connectivity with multi-use trails and facilities throughout the community, on-campus bicycle circulation has room to improve.

TRANSIT

The proposed inner-campus shuttles and additional routes could provide the additional circulation and frequency that could greatly improve the transit experience on campus. Circulation patterns currently are not efficient for students and faculty.

PARKING

Parking needs will be discussed in other sections.

COMMUTE OPTIONS

Commute options are successful when infrastructure, programs, and activities tie into an overall TDM strategy. Currently CSU does not have a formal TDM program complete with education, promotion, and program management. However, CSU has recently approved a position for a TDM manager position, and is well underway to formalize a program. This program may include some of the following:

- Criteria/proactivity for new bicycle and pedestrian facilities (including bike rack installation)
- More on-campus commute options such as:
  - On-campus transit circulators/shuttles
  - Additional rental options to enable students to engage in weekend recreational activities
- Parking pricing policies/changes:
  - On campus
  - Around campus in adjacent Fort Collins residential communities

There will also be opportunities to partner with Fort Collins and the NFRMPO to better serve the internal campus community, the city, and the region. For example, with the NFRMPO Regional Bicycle Plan underway, ample opportunities exist to augment multi-use paths and trails that can be accessed from the campus.

Additionally, while it has been noted that students and faculty are not ideal candidates for ridesharing due to irregular schedules, many employees of the campus community do have more typical commute schedules for whom *Smart*Trips could be better marketed and potentially utilized. Furthermore, the campus community could be targeted for other TDM activities in order to introduce students and faculty alike to a lifestyle that includes alternative modes and promotes active living.

TRANSPORTATION DEMAND MANAGEMENT: BEST PRACTICES

As noted in the Existing Conditions portion of this document, traditionally TDM has been narrowly defined as commuter ridesharing and its planning application has been focused primarily on air quality mitigation (conformity analysis), development mitigation (reducing trip generation rates and parking needs), or efforts to increase multimodalism in transportation plans.[27] Also, TDM has been focused primarily on employers and employees, without touching other areas of the population such as the aging population and, more pertinent, university student populations. The FHWA considers methods that maximize travel choices as contemporary TDM:

> *Managing demand is about providing travelers, regardless of whether they drive alone, with travel choices, such as work location, route, time of travel and mode. In the broadest sense, demand management is defined as providing travelers with effective choices to improve travel reliability.*[28]

While traditional TDM will continue to play a significant role in the contemporary view of TDM, the list of strategies and opportunities to influence travel at the most congested places and times are ever expanding. TDM is applicable in a variety of places, including university campuses. Best practices for contemporary TDM have been compiled for this document. To be successful, any TDM plan must consider the following:

- How to reduce the need/dependence on a personal vehicle for daily commute access to the workplace facility or university;
- How to reduce the need/dependence on a personal vehicle for use during the workday/while at the facility or university;
- How to make sure that commuters are aware of the travel, or non-travel, options that are available to them.

Reducing the need or dependence on a personal vehicle can be viable for a large portion of the population if there is a sufficient array of alternatives and infrastructure in place to replace or provide choices for trips traditionally made by personal automobile. Beyond considering transportation and travel by itself, land-use and a human-scale environment that is supportive of pedestrian, bicycle, and transit trip-making can provide many more opportunities to ditch the car and go by foot, bicycle, or transit.

The link between land use and transportation is part of ongoing research, but it appears as if the presence of a work place or university in an attractive setting with good walkability, access to transit, and convenient access to nearby attractions and services would be easier to entice commuters to experiment with alternative commutes.[29] Likewise, the Complete Community concept offers residential, office and retail locations, as well as lecture halls and laboratories in the university setting, within a compact area that satisfy most of the needs of the community within a walkable environment. Office complexes and university campuses do not need to be located specifically in urban areas, but can be formed to create small complete communities in locations where a mix of land-uses could benefit the intended commuters, residents, and surrounding populations too.

Best Practices: Types of TDM Strategies[30]

This section compiles TDM strategies and programs from a variety of sources. Throughout, items that the CSU community has available through the University, MPO, or city are identified with the symbols noted below:

Colorado State University North Front Range MPO City of Fort Collins

EMPLOYER OR UNIVERSITY SUPPORT ACTIONS

- **Employee/Student Transportation Coordinators** – professionals located at transportation management associations (TMAs), employment sites, or university campuses that provide personalized trip planning and assistance to commuters.
- **Transportation Management Associations (TMA)** – an association of public and private entities concerned with traffic congestion and transportation issues in specific geographic areas. TMAs allow businesses to pool resources to execute commuter support strategies. TMAs may also act as in advocacy role with local government on behalf of its membership.
- **Guaranteed Ride Home** – programs back up transportation to employees/students who rideshare or use transit. Sudden needs to return home or work late can be a concern for those who do not drive alone, since they may feel stranded. Providing this service allows for the potential emergency ride home, typically through vouchers and/or reimbursement up to a designated number of times per period of commuting. Various organizations provide this service including MPOs as well as individual employers, for example.
- **On-site Transit Information and Pass Sales** – providing on-site can lower many of the barriers that prevent individuals from trying transit for the first time. Convenient purchase of passes may also facilitate transit use. On-site sales could also assist with the support of pass discounts, particularly if they can be acquired in bulk.
- **Transit Pass Program** – can provide an opportunity to partner with the local transit authority to provide a low-cost annual pass to all students, employees, and/or faculty with unlimited rides. Partnering with the transit authority may include provisions for service enhancements on or near campus in exchange for the revenue provided through the mandatory program (that could bundle into student fees). Transit passes can be sold individually after purchasing at a discounted group rate, or can become a mandatory student fee that provides access to the entire campus community.
- **Rideshare Matching Services** – put compatible commuters in touch with one another to enable commute-related ridesharing. Employers/universities are at a particular advantage to encourage and match commuter carpools and vanpools, since the work destination is a commonality.

Transfort, the transit agency of Fort Collins, partners with CSU to provide every student with unlimited access to the transit system. CSU also participates in the Passfort program, an employer-based bus pass program that provides bulk-rates for employer-purchased passes.

Transit Pass Program Benefits: There are certain advantages to requiring the transit pass as a student fee. The guaranteed large number of passes sold can provide a stable platform for negotiations with the transit agency, while providing an incentive to use the system since the cost of using transit has been paid up-front. Experiences at institutions in Canada have shown significant increases in transit ridership since charging the mandatory transit pass fee and negotiating unlimited transit rides for students. As much as a 53% increase in transit ridership was found at the University of British Columbia (UBC) in its first year.[31]

[27] USDOT, Volpe Center, Ridesharing Option Analysis and Practitioner's Toolkit, prepared for FHWA, 2010. http://www.planning.dot.gov/documents/RidesharingOptions_Toolkit.pdf.

[28] FHWA, Mitigating Traffic Congestion—The Role of Demand-Side Strategies, prepared by ACT, Report No. FHWA-HOP-05-001, October 2004.

[29] TCRP Report 95, Chapter 19, pg. 9-98

[30] Loosely based on list from TCRP Report 95, Chapter 19

[31] Integrated Transportation Demand Management Strategy: Vancouver Island University, p. 34

***Smart*Trips™** is a division of the NFRMPO that has the objective to help people travel as often as possible by means other than driving alone in a car. CarGO™ and VanGo™ programs assist interested commuters with finding carpooling and vanpool partners, and ***Smart*Trips™** provides additional outreach and assistance to employers/commuters that wish to consider other non-SOV options.

- **On-Demand Ridesharing** – is emerging through the use of social networking and telecommunications. Applications such as Zimride,[32] SideCar,[33] Lyft,[34] and Jitney[35] provide a platform for drivers to connect with people who need a ride. Unlike taxi service, drivers do not need any special license, rides are pre-arranged through the mobile app, and fares are based on donations (although donation amounts are often suggested through the application). Most applications require verification of identify for both drivers and riders by requiring linked email accounts or linking with social networking sites such as Facebook. Some even provide a platform to rate riders and drivers, and even remove users from the application if they receive low ratings. Many require an extensive background check for drivers and a vehicle check for safety.

Preferential Parking – can be a great incentive to carpool or vanpool, particularly in areas where parking is tight, or where having a reserved spot close to the entrance can be a great advantage over other available parking.

CSU provides preferential parking spots to carpool permit holders in limited locations.

- **Vehicle Restrictions –** some college campuses use vehicle restrictions and regulations to limit the use of autos. For example, some colleges do not provide parking permits to freshmen who live on campus.

Car-Free Planning – pedestrian-oriented streets are paramount on college campuses. Strategies to reduce or eliminate automobile travel at particular times and/or places to create a safe and friendly pedestrian environment can greatly assist in campus circulation.

Pedestrian Infrastructure/Supportive Facilities – improving pedestrian infrastructure and environments in and around a campus community can greatly improve perception and participation in pedestrian commutes.

CSU has closed its campus core to automobiles, and has gone so far as to designate a Bicycle 'Dismount Zone' for pedestrian only traffic.

Bicycle Infrastructure/Storage, Lockers/Changing Facilities – are key features for an employer or university that wishes to encourage bicycling as a commute mode.

Bicycle Education and Enforcement (BEEP) program requires students, faculty, and staff to register all bicycles on campus, and provides enforcement, educational support, and outreach.

- **Safewalk Programs** – can help address concerns over safety for members of the campus community who may not otherwise feel comfortable walking alone between buildings, buildings and a vehicle, etc. within the confines of a campus. A Safewalk program, available to the campus community, can be a great way to boost confidence and comfort.[36] The University of Victoria, British Colombia and the University of Illinois, Urbana-Champaign, are examples of campus communities that offer Safewalk programs.

PROVISION OF TRANSPORTATION SERVICES

- **Contract Transit Service** – can operate special transit routes or supplement existing service to provide convenience to a particular campus or employer site. For example, urban hospitals or medical centers as well as some universities have made arrangements for additional bus service in exchange for direct payment, or with financial assurances that a given level of ridership will occur.

Photo Credit: Kimley-Horn and Associates, Inc.

- **Shuttle Bus Services** – can be helpful to provide easy connections with nearby transit services or other important facilities. They can also provide an alternative mode for short midday trips, and can help alleviate on-campus congestion by providing access to an off-site parking facility.
- **Access to Company Vehicle Use** – can be an additional way to encourage commuters to use alternative modes. The need to travel off-site or across a large campus can be complicated if a worker does not have access to a personal vehicle or other mode of convenient transportation. Many companies providing access to daytime use of company vehicles can provide some flexibility for midday business travel, as well as provide an option for occasional personal errands or emergencies. Depending on needs, a fleet could include employee vanpool vehicles, highway-worthy vehicles, low-speed electric vehicles (e.g., golf carts), as well as bicycles and other vehicles for specialized transport uses.

Car Sharing – does not have to include company-owned vehicles. Several car-sharing enterprises are available today including ZipCar,[37] Enterprise CarShare,[38] Hertz 24/7,[39] U Car Share by Uhaul,[40] etc. Consider working with these companies to coordinate or provide access to these rent-by-the-hour vehicles.

CSU currently is home to four ZipCar vehicles, which provide opportunities for reduced rate memberships and rental credits for students, faculty, and staff.

Vanpool Formation Assistance/Cost Sharing – when a large number of employees/students live a substantial distance from the worksite, and where transit service is limited, vanpooling can be a great option. Employers/universities can support vanpools in a variety of ways from the purchasing and leasing of vehicles to underwriting insurance and maintenance costs, or even providing and maintaining the vehicles themselves. Fare subsidies can also be used as forms to assist with vanpool formation.

Photo Credit: www.commuterinfo.net

[32] http://www.zimride.com/
[33] http://www.side.cr/
[34] http://www.lyft.me/
[35] https://jitney.co/

[36] A Survey of Transportation Demand Management at Colleges and Universities in British Colombia, 2009, pg. 14

[37] http://www.zipcar.com/
[38] http://www.enterprisecarshare.com/
[39] http://www.hertzondemand.com/
[40] http://www.ucarshare.com/

Bicycle Share/Loan Programs – having bicycles available on the site can allow employees/students to reduce the need for certain midday trips via vehicle. Easy access to a bicycle can aid trip-making to other on-site locations or nearby commercial/retail opportunities by alternative mode. Bicycle share programs are popping up all over the country in urban and university settings. For example, the City of Fort Collins has started a bicycle share program called the Fort Collins Bicycle Library.

Photo Credit: The Street – 10 Best Bicycle Cities in the U.S.

FINANCIAL INCENTIVES OR DISINCENTIVES

- **Transit Subsidies** – can help reduce the cost of taking transit by offering prepaid or discounted transit passes to employees who agree to commute by transit. Cost sharing can be moderate, and Federal tax law allows employees to receive a transit subsidy of up to $130 per month without incurring tax liability for that benefit. Some states offer the employer a tax credit for paying for said subsidies. Some governments or transit agencies supplement these subsidies through additional programs to reward large customers or employers/universities who provide substantial subsides.
- **Vanpool Subsidies** – can be provided by employers/universities through several avenues. Federal tax law has extended the transit $130 per month tax-free subsidy to vanpoolers as well. Employers/universities can consider a start-up (empty seat) subsidy to support a vanpool during its formative stage to keep costs down for initial riders. They can additionally offer short-term promotional or long-term fare subsidies, as well as driver subsidies to help promote and maintain vanpool ridership. Indirect incentives can include preferential parking, financing for the vehicle, fuel or maintenance, and/or underwriting insurance.
- **Transportation Allowances** – provide a sum of money that can be used at the employee's discretion toward the cost of his/her chosen commute option. The amount is not necessarily related to the employer's cost for parking.[41]
- **In-Kind Incentives** – can be provided instead of cash. Free or discounted products or services may be given in lieu of cash. For example, carpoolers and vanpoolers might receive gas or oil changes, transit riders might receive transit passes, walkers could be provided with shoes, and bicyclists might receive bicycle accessories or mechanical services.
- **Short-Term Incentives** – such as The Clean Air Campaign's (CAC) Atlanta, GA program Cash for Commuters (CFC), can promote experimentation with alternative modes by providing a short-term incentive for commuters to alter commute behavior. CFC provided $3 per day for commuting by a commute alternative, up to $180 cash over a 90-day period, for commuters who signed up for the program and who had previously only driven alone.
- **Parking Supply and Pricing** – can be major leverage available to employers and universities interested in reducing SOV use to access the campus or facility. Imposing parking constraints or parking pricing can be a powerful determinant of travel behavior. Parking components can be instrumental in TDM programs.
- **Parking Cash-Out** – gives employees and/or students the option of exchanging the privilege of a free parking space for the cash equivalent, which they may then use flexibly to defray the cost of other transportation options including transit, walking, or biking.[42]

Photo Credits: CSU Parking and Transportation Services

[41] TCRP Report 95, Chapter 19, p. 19-58

[42] TCRP Report 95, Chapter 19, p. 19-52

ALTERNATIVE WORK ARRANGEMENTS

- **Flexible Work Hours** – can allow employees a degree of freedom to choose their clock-in/clock-out times. Core hours can be set in order to maintain a certain amount of the workday when face-to-face interactions, collaborations, and meetings can be scheduled without conflicting with flexible start and end times. However, an employee can have the flexibility to choose times to travel that avoid peak-hour traffic, as well as the flexibility to coordinate schedules with home-life needs. Employers can restrict how much daily flexibility workers have, depending on the needs of the company. This can be challenging in a university setting, but may be possible for certain faculty and/or staff.
- **Staggered Work Hours** – can be employed at large facilities, where work schedules are otherwise very regular and can cause long lines to arrive and depart from the facility. Individual groups may be assigned to fixed times that they arrive and depart, typically over a 1-3 hour period with individual groups arriving at 15-30 minute intervals. Universities have found success with staggered work hours, partially due to widely differing class schedules. An effort can be made to modify scheduling in order to alleviate some of the peak-hour parking and congestion.
- **Compressed Work Week** – allows employees to work fewer days per week, or two-week period, by increasing the number of hours worked per day. Emergency rooms sometimes employ a three-day workweek with 12-hour shifts and a supplemental 4-hour training and/or paperwork shift. Another popular option is the 9/80 schedule in which employees work 9 hours per day as opposed to the standard 8-hour day, and get the 10th day off. Still another option is four 10-hour days rather than five 8-hour days. Compressed work week schedules are generally negotiated between the employee and employer on a fixed schedule in order to maintain consistency.
- **Telecommuting (or Telework)** – is an arrangement for employees to work at remote locations one or more days per week rather than commuting to the work site. Technology plays an important role in telecommuting, since many employees will need to maintain a virtual connection with the worksite in order to access necessary information and/or people. Others may be able to work from home without the need for technology, while still others may be able to commute a much shorter distance to a "telework center" in order to have access to necessary equipment. Telework is also typically negotiated between the employee and employer in order to maintain a standard schedule. Similar to flexible work hours, telework can be a challenge in a university setting, but may be an option for certain members of the faculty or staff.
- **Distance-Based Learning** – is an opportunity for students to access courses and materials from home or a facility other than the main campus. Online-based interactions have the opportunity to provide students with the convenience of location choice, while providing some opportunities that traditional classrooms may not be able to offer.

Photo Credit: http://www.telework.gov

Universal Access considers the accommodation of all individuals with an array of mobility concerns. For example, designing for ADA accessibility standards, such as including ramps or curb cuts, not only benefits an individual in a wheelchair, but also provides a better option for an individual riding a bicycle, pushing a stroller, or for an individual who may have difficulty with stairs.

INFRASTRUCTURE AND TRAFFIC IMPROVEMENTS & POLICIES

- **Universal Design** – means the design of products that can be used by as many people as possible.[43] Designing for the individual with the most limitations often produces helpful improvements for inefficiencies that exist with current design, benefitting more than the individual with limitations.
- **Transit Oriented Development (TOD) Policy Guidelines** – or a Transit Supportive Design Guide is necessary to provide infrastructure that makes transit an attractive and viable option. For example, transit stops that provide some shelter from the elements make access to transit more comfortable and less onerous.
- **Transit Improvements** – can really change the way that the public thinks about and considers the option of using transit. Some options include:
  - Reduced congestion delays by using bus-only lanes and/or bus priority signals
  - Operational improvements such as more direct routes and/or shorter headways
  - Real-time trip information to help travelers identify the time they need to arrive in order to catch the bus and/or train
  - Improved land-use around transit stations
- **Fixed-Guideway/Limited-Access Transit Service** – transit can compete most effectively with the automobile when it is not subjected to the delays caused by congestion on public roadways. Transitways, or bus/train-only roadways, can provide exceptional alternatives to personal vehicle travel.[44]
- **Intelligent Transportation Systems (ITS)** – the use of ITS methods to alert motorists of disruptions to the transportation system can be helpful to the users of the system, and are highly effective tools for managing demand.[45] City-wide access to real-time travel information can make a huge impact on the ease of travel. The choice to use transit is much easier when the rider has real-time information about arrivals, departures, and delay.[46] This can be achieved through telephone-based internet access, but can also be provided with variable message signs.
- **High Occupancy Vehicle (HOV) Lanes** – if the purpose of managed lanes is to provide a more reliable trip, then the provisions of HOV lanes can promote non-SOV modes by enabling a more reliable trip for specifically those who share their commutes with others.
- **Traffic Calming** – includes various roadway design features that are intended to reduce speed and volume in order to alter and/or deter driving characteristics and provide an environment that is more friendly and focused toward alternative modes such as walking, biking, and/or transit. Traffic-calming measures can be an effective TDM strategy along a corridor, or for a short segment of roadway that is intended to attract more pedestrian, bicycle, and transit use, while still allowing vehicles, but at lower vehicular level of service.[47]

Smart Growth emphasizes accessibility – meaning that origins and destinations are easy to get to and close together. University campuses should consider community needs that may not be met by current or traditional campus facilities. Can the campus operate as a self-contained community, or are there services that the campus community must seek elsewhere? For example, many campuses have places to dine, but not all have grocery stores.

- **Smart Growth/Land-Use Policy Plans** – managing the demand of travel often aligns well with managing development and growth to support sustainable development or livable communities and healthy environments. Designing for compact growth that is accessible by multiple modes or could be connected to existing services can be beneficial for managing transportation demand.

Best Practices: Integrating TDM Strategies and Programs

INTEGRATE TDM INTO THE PLANNING PROCESS

Why Plan for TDM?

Planning for TDM can ensure that employees/students and employers/universities are aware of programs, incentives, and other benefits that are available to them. Planning for TDM can ensure that strategies and programs form a cohesive program that integrates smoothly and provides the best array of options.

TDM maximizes the return on investment for infrastructure, can help reduce the need for new or widened roads, and can reduce the space allocation and need for parking. TDM can help meet environmental and air quality goals, while setting the precedent for active living and improving public health. TDM is adaptable and dynamic and can provide time and cost-saving benefits to both commuters and businesses. TDM encourages sustainable development and has the potential to increase safety.[48]

Short-Term TDM Planning

Smaller-scale TDM planning can consider a single event, or an event with a shorter duration. Planning for a surge of traffic, such as a special event, or the construction of a major travelway can be meaningful ways to affect the way people travel for a short period of time. Short-term strategies may also provide an opportunity for workers/students to consider alternatives to their typical commutes.

- **Special Event TDM Plans** – can greatly assist with the access and egress of an event that is hosting more people than existing facilities are designed to handle efficiently. Planning for the influx and outflow may include coordination with a local or private transit agency to provide additional transit service such as a special event route or shuttle, as well as promoting ridesharing, walking, or biking to the event.
- **Emergency and/or Poor-Weather TDM Planning** – can help businesses and universities avoid loss of man-hours due to

[43] Oxo Universal Design <http://www.oxo.com/UniversalDesign.aspx>

[44] Best Practices Review – Regional Municipality of York; TMP Best Practices p. 25

[45] Hamilton ~ Ch. 7: Transportation Demand Management Strategies, p. 7-6

[46] Southern California Association of Governments/LADOT: Transportation Demand Management Strategies, p. 17

[47] Hamilton ~ Ch. 7: Transportation Demand Management Strategies, p. 7-6

[48] Integrating Transportation Demand Management into the Planning and Development Process: A Reference for Cities, (Sandag, 511, HNTB, 2012), p. 3

emergencies and/or poor weather. Preparing for alternative work arrangements can mitigate some of the time lost to weather-related and emergency situations. For example, teleworking can allow business to proceed as usual, even if the office is difficult to access.

- **Construction TDM** – can prepare for and provide alternatives to mitigate the effects of major construction projects. While it is unlikely that the entire workplace/student population will be affected by construction, employers/universities can work with those whose commutes will be most affected to determine if telework, alternative work schedules, using transit, carpooling, walking or biking may be viable options.
- **Promotional Events or Challenges** – can provide a short-term incentive for employees/students to test commute alternatives. Employers may pair these events with an alternative transportation fair or similar educational and promotional outreach activity. Free transit day-passes, vehicle miles traveled (VMT)-reduction challenges across offices or divisions, Dump the Pump challenge, or a Bike to Work Week Challenge could all be great ways to entice employees/students to try an alternative commute.

Every June the North Front Range MPO works with CDOT and local governments to promote Bike Month and Bike to Work Day.

Mid- to Long-Range TDM Planning

While short-term plans can change travel patterns for short time and single-events, travel behavior will likely not be changed without more comprehensive planning strategies. Integrating TDM planning as adopted guidelines or policies will ensure that TDM strategies will last beyond present efforts and have the potential to provide long-term effects. Long-range planning can consider areas as small as a corridor, or as large as the region defined by a Metropolitan Planning Organization. Either way, the plans set in place will determine how infrastructure and programs are implemented in the future.

- **Corridor Planning** – can incorporate TDM by ensuring that the vision of the roadway balances the needs of all modes.[49] Complete Streets policies are emerging as widely accepted standards to ensure that roadways are a place for all users, enabling pedestrians, bicyclists, and motorists to safely share the road. Complete Streets can be adopted for a single corridor or incorporated into a city or regional master plan.
- **Parking Management Plans** – can be extremely effective at influencing travel. Parking availability, location, and pricing can be strong incentives (if widely available and cheap) or disincentives (if sparse and expensive) to drive alone or choose other options. Providing premier parking spaces to carpools or vanpools may be one portion of the parking management plan. Some pricing strategies may include permit buy-back, tiered pricing, and unbundling parking.
- **Centralized TDM Program Management** – can help focus marketing and outreach efforts for a multimodal solution and provide one-stop-shop for comparing alternative commute options. An established service provider, such as the local or regional transit agency or university parking and transportation department, can be an effective place to house the program.[50]
- **Community TDM Plans** (or Campus Community TDM Plans) – can facilitate the process for the community to solve problems, protect important community features, and guide how the community will grow and change in the future. Community Plans can incorporate TDM by outlining specific goals and/or strategies to ensure that future growth and redevelopment will provide opportunities for all modes.
- **Master Plans** – are comprehensive long-range plans intended to guide the growth and development of a community or region. Master Plans include analysis of existing conditions and recommendations for future populations regarding housing, transportation, community facilities, and land use. Master Plans are based on existing conditions such as social and economic conditions as well as physical characteristics, along with input from the public and stakeholders. Master Plans may incorporate recommendations that either specifically target or simply favor TDM including traffic mitigation, parking, and other impacts associated with anticipated future development.
- **Climate Action Plans** – may be mandated by the Clean Air Act based on National Ambient Air Quality Standards (NAAQS) set by the Environmental Protection Agency. If a community falls within a nonattainment area (NAA), it will be subject to mandated reductions of six common air pollutants that are a concern for health and environmental effects. Climate Action Plans favor TDM, which can assist with meeting NAAQS limits by reducing VMT and related emissions.

PUBLIC AWARENESS

Education is the first step. If employees/students and employers/universities do not know about commute options or how TDM can benefit them, they are unable to take advantage of programs, incentives, and opportunities that they are unaware of. Persuading employees/students to choose transportation alternatives requires a few conditions to ensure success:

- CSU Administration actively acknowledge the importance of TDM to support the growth needs of the campus;
- Employees/students must be convinced of the inherent value of changing their behavior;
- They also must have access to information that helps them to understand their options, which also may include awareness that their employer offers particular options;
- Employees/students must be motivated to test and ultimately continue using the recommended options.[51]

Marketing and promotion play a huge role in the success of TDM programs. The following strategies note some best practices for promoting TDM programs.

- **Develop a Recognizable Brand** – a well-known and recognized brand, particularly if TDM strategies and programs are housed under the same institution or as part of a collaborative, can heighten awareness and provide opportunities to educate residents and commuters about travel options.[52]

Bike Vanpool Carpool Walk Bus

Image Credits: NFRMPO SmartTrips™, www.smarttrips.org

- **Public Awareness Campaigns** – such as 'Escape the Rush'[53] can illustrate the advantages of various strategies that encourage travel options.
- **Alternative Transportation Fairs** – are designed to give commuters options other than driving alone, including informational displays on travel options and their benefits.
- **Targeted Educational Campaigns** – can use market research strategies to work with a specific subset of the population to encourage TDM. For example, 'Kids on the Move'[54] is a program designed to familiarize young people with road safety as well as to encourage walking, cycling, and public transit usage for the up and coming generation.
- **Use an Employee/Student Transportation Coordinator** – as a liaison with outside programs and agencies, such as regional or local transit, MPOs, TMAs, or cities, and to help with the promotion of alternative commutes.
- **Integrate the Message of TDM with Public Health, Environmental, and Recreational Programs** – in order to appeal to a variety of sensibilities and help link the reduction of single-occupant trips with active living and environmental sustainability.

CSU is in the process of hiring a new TDM Coordinator.

[49] Integrating Transportation Demand Management into the Planning and Development Process: A Reference for Cities, (Sandag, 511, HNTB, 2012), p. 6

[50] University of Virginia Transportation Demand Management Plan, 2007

[51] TCRP Report 95, Chapter 19, p. 19-22

[52] Lincoln TDM Strategy http://www.lincoln.ne.gov/city/plan/mpo/mporpts/tdm/bestpractices.pdf

[53] Best Practices Review – Regional Municipality of York; TMP Best Practices p. 21

[54] Best Practices Review – Regional Municipality of York; TMP Best Practices p. 41

Transportation Demand Management: Program Recommendations

TDM Currently Available/Offered to the CSU Community

As noted in the Transportation Demand Management Existing Conditions section of this report, CSU already offers a variety of TDM programs and strategies. The City of Fort Collins is geographically located in an excellent area for walking and biking, with generally flat terrain and pleasant weather. Not surprisingly, many students walk or bike to campus along several existing multiuse paths and bicycle routes on campus.

The campus is connected to community and regional multiuse trails as well, and has recently installed new bicycle racks throughout campus, bringing the total number of bicycle parking spaces to nearly 15,000, including some covered spots and bicycle lockers. CSU holds one of three transit centers that operate as hubs for the local transit agency Transfort that connects with regional FLEX bus service, which connects Fort Collins with the surrounding communities of Berthoud, Longmont, and Loveland. Through Longmont, FLEX service provides additional connections with the Regional Transportation District transit to Denver.

CSU already offers a variety of TDM strategies and opportunities, detailed in the previous section. Paired with the additional programs available through the NFRMPO, members of the CSU community have many options to participate in TDM. A summary of TDM strategies currently in place is featured below.

Table 6 – TDM Strategies Currently in Place

Employer/University Support Actions	Provider
On-Site Transit Information and Pass Sales	CSU
Transit Pass Program	CSU
Rideshare Matching Services	NFRMPO
Guaranteed Ride Home	NFRMPO
Preferential Parking	CSU
Car-Free Planning	CSU
Pedestrian Infrastructure/Supportive Facilities	CSU
Bicycle Infrastructure/Storage Lockers/Changing Facilities	CSU, NFRMPO
Provision of Transportation Services	**Provider**
Vanpool Formation Assistance/ Cost Sharing	NFRMPO
Car Sharing	CSU
Bicycle Share/Loan Program	Fort Collins
Financial Incentives or Disincentives	**Provider**
Parking Supply and Pricing	CSU
Alternative Work Arrangements	**Provider**
Distance-Based Learning	CSU

CSU has a history of incorporating TDM into the planning process, which is an excellent step towards an effective TDM system. Documented TDM measures include the following studies that CSU previously conducted along with this document, the most current Parking and Transportation Study:

- Colorado State University 2020 Plan
- 2000 University Strategic Transportation Study
- 1996 Colorado State University – Surrounding Residential Neighborhood Parking Study
- 1991 Circulation System and Access Master Plan

CSU is additionally looking to expand its TDM resources and outreach by adding a TDM Coordinator to assist with programs and marketing on campus.

Additional Opportunities to Grow TDM at CSU

Of the strategies and programs noted in the prior sections, CSU is best positioned to improve TDM in the following areas: improvements to walking and biking infrastructure and supportive facilities, potential for transit expansion such as a campus shuttle or circulator, and additional carshare and rideshare opportunities.

While already proposed for the near future, filling the **TDM Coordinator** position will be instrumental to prepare for TDM strategy implementation. While the new TDM staff person will add cost up-front, this cost could be off-set in the long-term through savings on parking infrastructure and by benefits for the environment and for the health and well-being of faculty and staff.

Sidewalk upgrades could greatly improve pedestrian and bicyclist traffic through campus. As noted in the Existing Conditions section of this report, many core sidewalks and paths throughout and immediately adjacent to the campus are often too narrow to accommodate the current numbers of pedestrians and cyclists. With the CSU planning to grow, it will be essential to ensure that the breadth of pedestrian and bicycle infrastructure is sufficient to carry additional traffic. CSU may also consider separated facilities for pedestrians and bicyclists since the dramatic difference in speed can create concern for conflicts and safety.

A **campus shuttle/circulator** could greatly benefit the students, faculty, and staff by providing motorized access throughout the campus. CSU has a fantastic partnership with Transfort and should consider the opportunity to negotiate an on-campus circulator system operated through Transfort. This could include the proposed routes from the *2012 Colorado State University Transit and Parking Special Report*:

- BRT route along Mason Street
- Inner-loop campus shuttle that would circumnavigate Meridian Avenue and Mason Street from Lake Street to north of The Oval
- East-west shuttle that would connect University Avenue to Elizabeth Street
- South Campus shuttle connecting from Lake Street down Central Avenue and Research Boulevard

Carpooling/vanpooling is currently a relatively untapped resource for the campus community. While commuter rideshare may not be functional for all campus community members since hours and daily schedules tend to vary much more than a traditional workplace, some members of the community would likely benefit from carpooling or vanpooling. CSU should consider partnering with the NFRMPO, who already have established carpool and vanpool programs, to help market and promote these opportunities on campus.

Carshare opportunities could be very beneficial for the CSU community. Many students are interested in exploring the natural resources around Fort Collins and could benefit from easy access to additional rental vehicles. The four available ZipCars on campus have been highly utilized, but tend to be valued for short excursions, rather than several-day rental. CSU should consider additional carshare, rideshare, or dynamic rideshare opportunities such as those mentioned in the Best Practices section to help promote additional alternatives to personal vehicle ownership and use, and to accommodate short-term and longer-term rental needs.

Community Engagement and Strategic Communication Plan

A critical part of developing a successful parking and transportation strategy is proactive and authentic stakeholder engagement.

Intentional and targeted outreach to the campus communities helps provide insight into the real and perceived parking and transportation challenges that students, faculty, and staff face during their daily commute to campus.

Stakeholder Engagement Overview

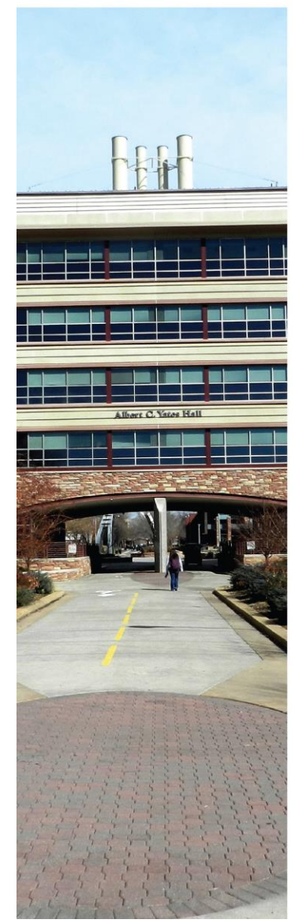
In the spring of 2013, stakeholder outreach was conducted on the CSU campus using focus groups, individual interviews, and a "Commuter Behavior and User Perception" survey tool developed specifically for CSU. This report provides an overview of the Commuter Perception and User Behavior survey results, as well as highlights from focus group meetings that were attended by over 50 individuals representing the following campus and non-campus stakeholder groups:

- CSU Police Department
- CSU Department of Athletics
- CSU Faculty Council
- Bicycle Advisory Committee
- Associated Students of CSU
- State Classified Employees
- Housing and Dining Services (Leadership and Staff)
- GenFac
- Nearby neighborhood residents and property owners
- CSU Parking Transportation Services
- City of Fort Collins
  - Parking Services
  - Transfort
  - UniverCity
  - Advance Planning
  - Bicycle Advisory

The survey was provided in English and Spanish and was made available both online and in paper format. CSU PTS assisted with marketing and distribution of the survey, which covered a wide range of topics, including:

- Commuter perceptions and habits
- Preferred methods of transportation and viable alternatives
- Perceived challenges and areas of opportunity

Proactive engagement of CSU's diverse stakeholder groups – administration, faculty, students, and surrounding neighborhoods – will provide important context for the recommendations outlined in the larger Colorado State University Parking and Transportation Study.



Community Outreach, Education and Stakeholder Engagement Task Goals

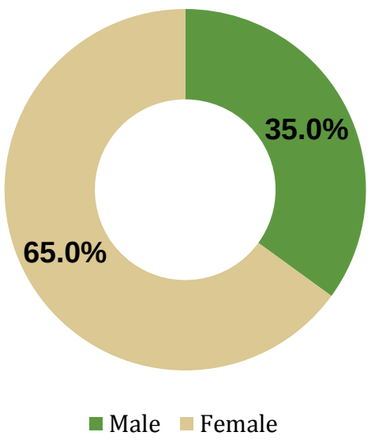
1. Identify current commuter behavior, as well as existing and future campus access management opportunities and challenges
2. Develop a comprehensive Strategic Communication Plan to effectively educate the campus community (and key external audiences) on how parking and transportation investment and development is critical to the growth and sustainability of the entire institution
3. Explore traditional and non-traditional marketing channels, public relations strategies, and communication vehicles that will keep the campus community informed while simultaneously building excitement for the future

Report Layout

Each page in this report includes a particular line of questioning from the Commuter Behavior and User Perception Survey. Graphs have been included to provide a more visual representation of survey findings. Each page also contains a table that provides additional detail on a particular question's response rate and a breakdown of answers by percentage.

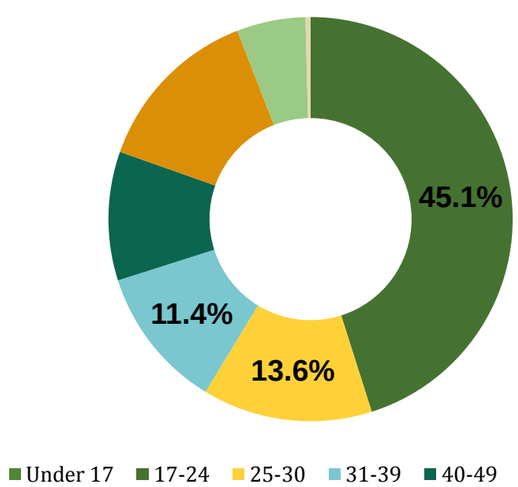
Some pages include a breakout box that provides a more in-depth analysis of a particular set of data or point of interest from qualitative information gathered during the in-person focus group sessions.

WHICH OF THE FOLLOWING BEST DESCRIBES YOU?



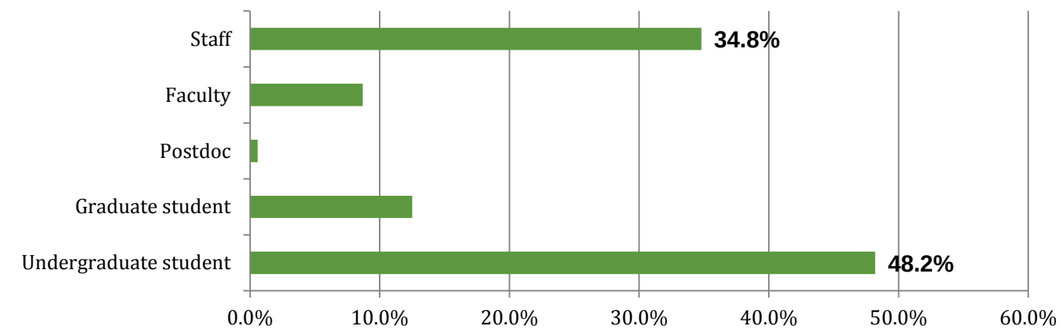
Which of the following best describes you?		
Answer Options	Response Percent	Response Count
Male	35.0%	911
Female	65.0%	1690
Other (please specify)		6
answered question		2601
skipped question		95

WHICH OF THE FOLLOWING BEST REPRESENTS YOUR AGE?



Which of the following best represents your age?		
Answer Options	Response Percent	Response Count
Under 17	0.0%	1
17-24	45.1%	1173
25-30	13.6%	354
31-39	11.4%	296
40-49	10.3%	267
50-59	13.7%	357
60-69	5.5%	143
70 and Older	0.4%	10
answered question		2601
skipped question		95

WHAT IS YOUR CURRENT AFFILIATION WITH COLORADO STATE UNIVERSITY? (PLEASE SELECT ALL THAT APPLY.)



What is your current affiliation with Colorado State University? (Please select all that apply.)		
Answer Options	Response Percent	Response Count
Undergraduate student	48.2%	1253
Graduate student	12.5%	326
Postdoc	0.6%	15
Faculty	8.7%	227
Staff	34.8%	905
Other (please specify)		78
answered question		2601
skipped question		95

Demographic Snapshot

65% of respondents were female

48.2% were undergraduate students

34.8% were staff

86.2% reported commuting to campus daily

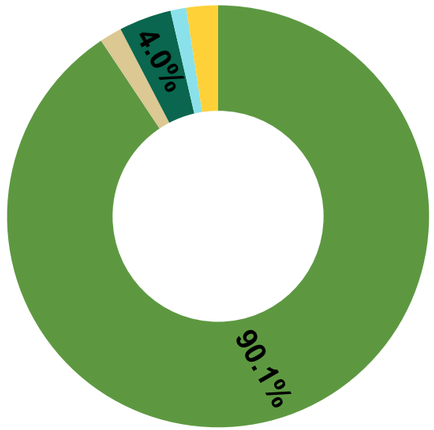
Survey Response Rate

2,697 Total Started the Survey

2,274 Total Completed the Survey

84% Survey Completion Percentage

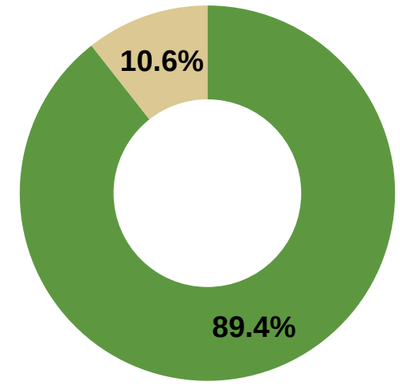
Which of the following most accurately describes the CSU campus that you commute to most often?



Which of the following most accurately describes the CSU campus that you commute to most often?		
Answer Options	Response Percent	Response Count
CSU Main Campus	90.1%	2426
CSU Foothills Campus	1.7%	47
CSU South Campus	4.0%	109
I live on campus	1.2%	33
None of the above	2.4%	65
Other (please specify)		58
answered question		2692
skipped question		4

■ CSU Main Campus ■ CSU Foothills Campus ■ CSU South Campus
■ I live on campus ■ None of the above

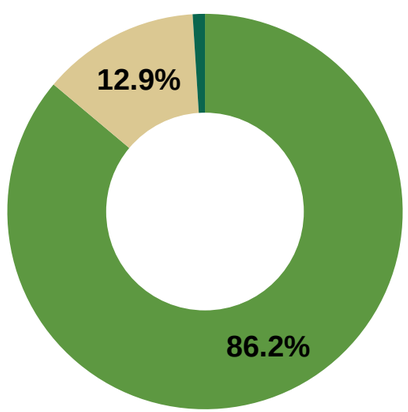
Which of the following most accurately describes your typical weekly commute to the CSU Foothills Campus?



Which of the following most accurately describes your typical weekly commute to the CSU Foothills Campus?		
Answer Options	Response Percent	Response Count
Daily	89.4%	42
2-4 times per week	10.6%	5
At least one time per week	0.0%	0
Other (please specify)		0
answered question		47
skipped question		2649

■ Daily ■ 2-4 times per week ■ At least one time per week

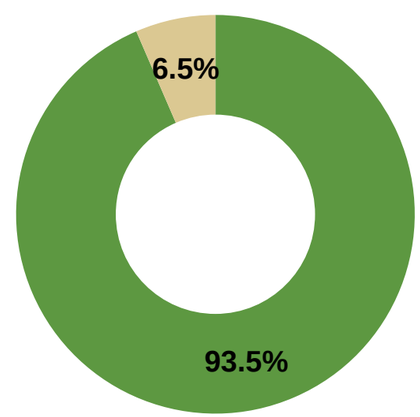
Which of the following most accurately describes your typical weekly commute to the CSU Main Campus?



Which of the following most accurately describes your typical weekly commute to the CSU Main Campus?		
Answer Options	Response Percent	Response Count
I commute daily	86.2%	2086
I commute 2-4 times per week	12.9%	312
I commute 1 time per week	1.0%	23
Other (please specify)		14
answered question		2421
skipped question		275

■ I commute daily ■ I commute 2-4 times per week ■ I commute 1 time per week

Which of the following most accurately describes your typical weekly commute to the CSU South Campus?



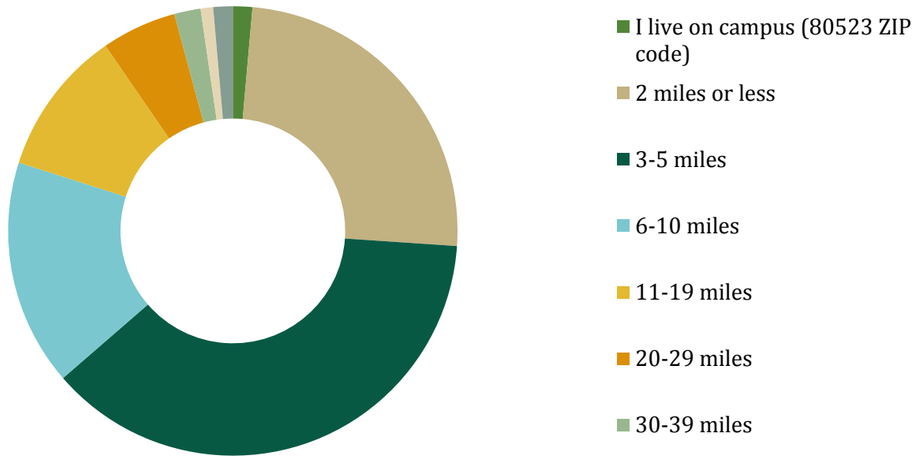
Which of the following most accurately describes your typical weekly commute to the CSU South Campus?		
Answer Options	Response Percent	Response Count
Daily	93.5%	100
2-4 times per week	6.5%	7
At least one time per week	0.0%	0
Other (please specify)		2
answered question		107
skipped question		2589

■ Daily ■ 2-4 times per week ■ At least one time per week

Key Findings and Themes

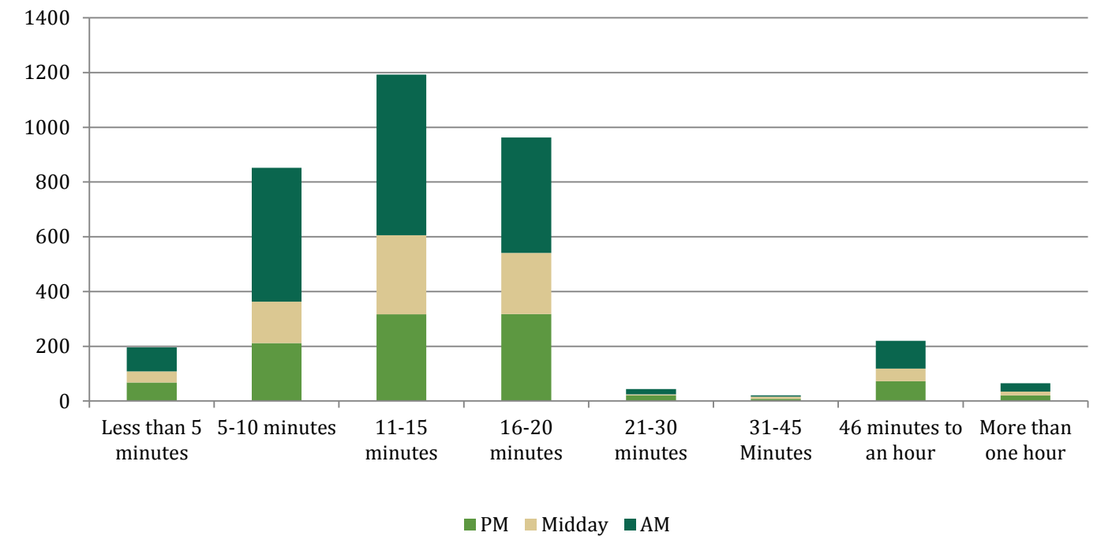
90% of survey respondents reported commuting to **Colorado State University's (CSU's)** main campus most often. The majority of commuters, regardless of whether they are traveling to the Main, Foothills or South campuses, indicated that they commute daily.

How far do you live from campus/work?



How far do you live from campus/work?		
Answer Options	Response Percent	Response Count
I live on campus (80523 ZIP code)	1.4%	36
2 miles or less	24.7%	640
3-5 miles	37.6%	973
6-10 miles	16.3%	422
11-19 miles	10.5%	272
20-29 miles	5.4%	140
30-39 miles	1.9%	49
40-49 miles	0.9%	24
50 miles or more	1.4%	35
	answered question	2591
	skipped question	105

How long is your typical one-way commute (door-to-door)?



How long is your typical one-way commute (door-to-door)?				
Answer Options	AM	Midday	PM	Response Count
Less than 5 minutes	89	40	68	197
5-10 minutes	505	152	214	871
11-15 minutes	605	289	317	1211
16-20 minutes	429	224	318	971
21-30 minutes	35	3	21	59
31-45 Minutes	8	9	9	26
46 minutes to an hour	101	48	72	221
More than one hour	30	14	22	66
Other (please specify)				94
		Answered question		2580
		Skipped question		116

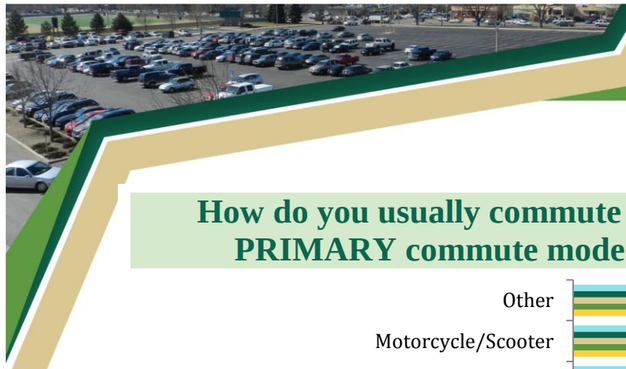
Key Findings and Themes

37.6% live 3-5 miles

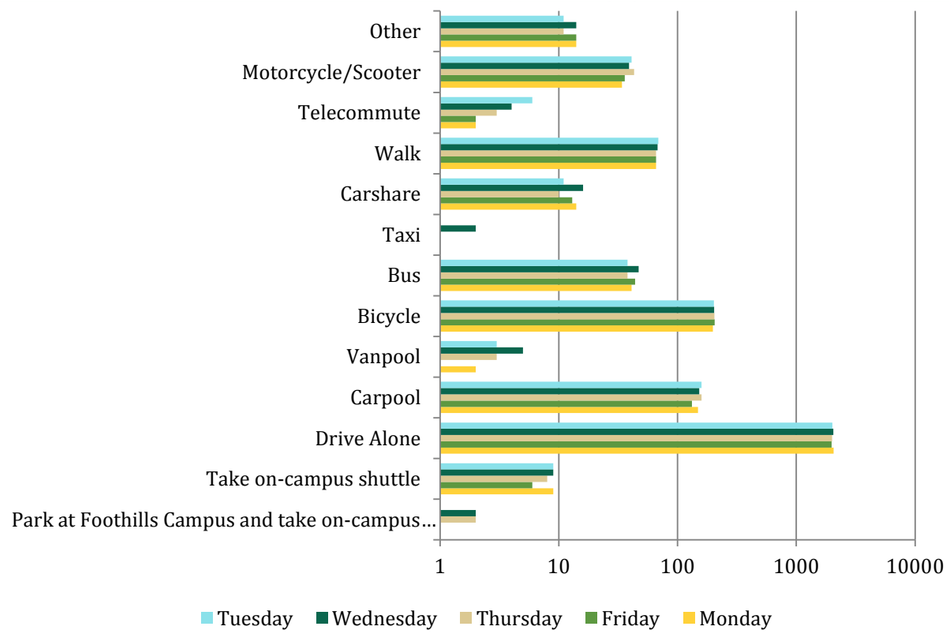
5-20min. typical commuter time

11-15min. majority of commute time

The majority of respondents live between 3-5 miles from campus (37.6%), with the second largest cluster of commuters living two miles or less from campus. Commuters report a typical morning, midday and afternoon commute time of between 5-20 minutes, with a slight majority at all three times indicating a typical commute of between 11-15 minutes.



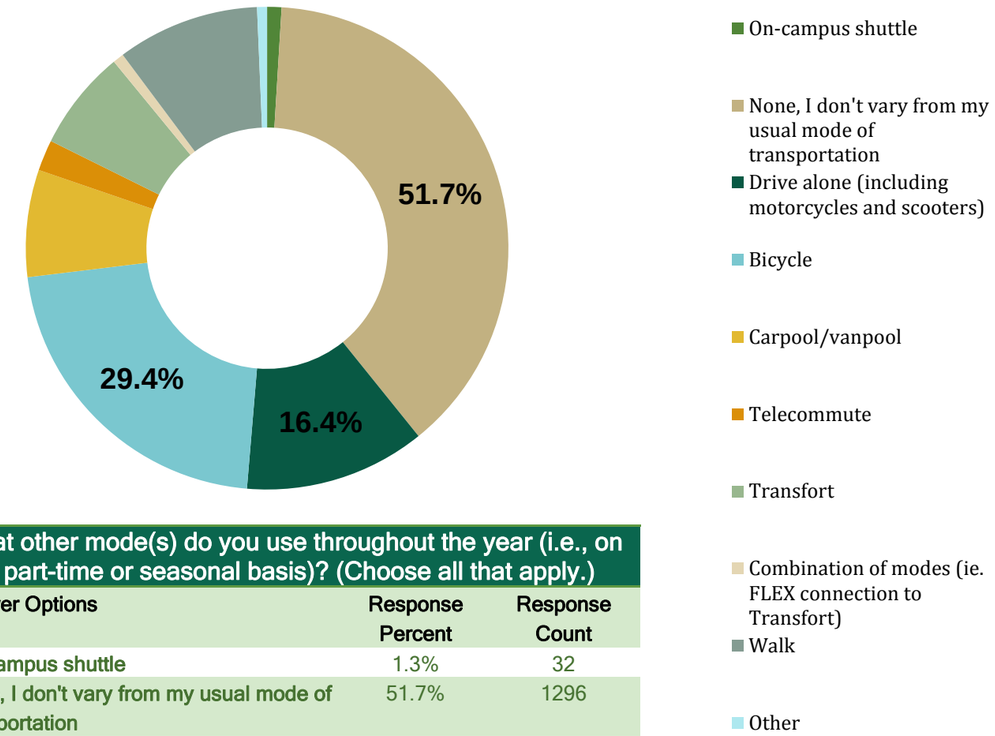
How do you usually commute to campus/work? Please indicate your PRIMARY commute mode (the way you commute most often).



How do you usually commute to campus/work? Please indicate your PRIMARY commute mode (the way you commute most often).

Answer Options	Mon	Tues	Wed	Thurs	Fri	Response Count
Park at Foothills Campus and take on-campus shuttle	1	1	2	2	1	3
Take on-campus shuttle	9	9	9	8	6	13
Drive Alone	2057	2011	2047	2002	1978	2234
Carpool	149	159	152	159	132	238
Vanpool	2	3	5	3	1	5
Bicycle	198	202	203	204	205	273
Bus	41	38	47	38	44	65
Taxi	1	1	2	1	0	2
Carshare	14	11	16	10	13	19
Walk	66	69	68	66	66	89
Telecommute	2	6	4	3	2	12
Motorcycle/Scooter	34	41	39	43	36	48
Other	14	11	14	11	14	16
					answered question	2544
					skipped question	152

What other mode(s) do you use throughout the year (i.e., on a part-time or seasonal basis)? (Choose all that apply.)



What other mode(s) do you use throughout the year (i.e., on a part-time or seasonal basis)? (Choose all that apply.)

Answer Options	Response Percent	Response Count
On-campus shuttle	1.3%	32
None, I don't vary from my usual mode of transportation	51.7%	1296
Drive alone (including motorcycles and scooters)	16.4%	410
Bicycle	29.4%	736
Carpool/vanpool	9.7%	244
Telecommute	2.8%	71
Transfort	9.1%	227
Combination of modes (ie., FLEX connection to Transfort)	1.0%	25
Walk	12.9%	324
Other	0.9%	22
	answered question	2507
	skipped question	189

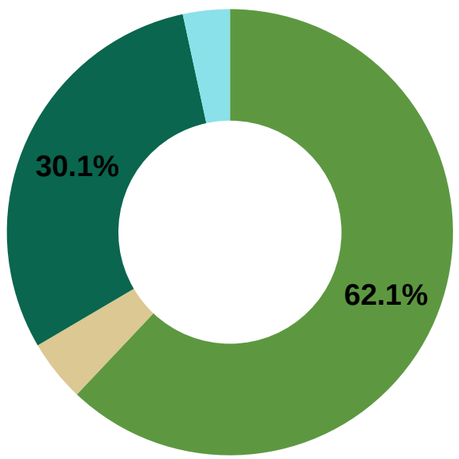
Key Findings and Themes

89% to 94% drive alone

Driving alone is by far the top method of accessing campus. Between **89% and 94%** of survey respondents reported driving alone as their typical form of transportation to and from campus (the range encompasses commuters from all three campuses, Main, Foothills and South Campus). Nearly **52%** of commuters said that they do not typically vary from their usual mode of transportation; however, when choosing other modes, either on a part-time or seasonal basis, commuters indicated a preference for the following alternatives:

- Bicycle (29%)
- Driving alone, including motorcycles and scooters (16%)
- Carpool/vanpool (10%)
- Transport (9%)

Why have you chosen your current method of transportation to and from campus?



Why have you chosen your current method of transportation to and from campus?		
Answer Options	Response Percent	Response Count
Convenience	62.1%	1576
Cost	4.5%	113
No other viable option	30.1%	763
Other	3.4%	85
	answered question	2537
	skipped question	159

Key Findings and Themes

62% convenience drives commuting behavior

30.1% no other viable alternative

4.5% cost ranked last

Convenience, rather than cost, drives commuting behavior. 62% of respondents selected convenience as the reason they choose their current method of commuting, with 30.1% respondents indicating that there was "no other viable alternative". Cost ranked last at 4.5%. Incentives, amenities, programs that would encourage survey respondents to choose alternate forms of transportation, rather than driving alone (answers really divided; no real consensus):

1. **Financial incentives (parking cash out, transit subsidies): 40.4%**
2. **Safe, convenient bike paths: 34.7%**
3. **Availability of cross-campus shuttle: 32%**
4. **Guaranteed emergency ride home: 32.4%**
5. **Flexible work schedule: 31%**

40.4% Financial incentives

34.7% Bike paths

32% Campus shuttle

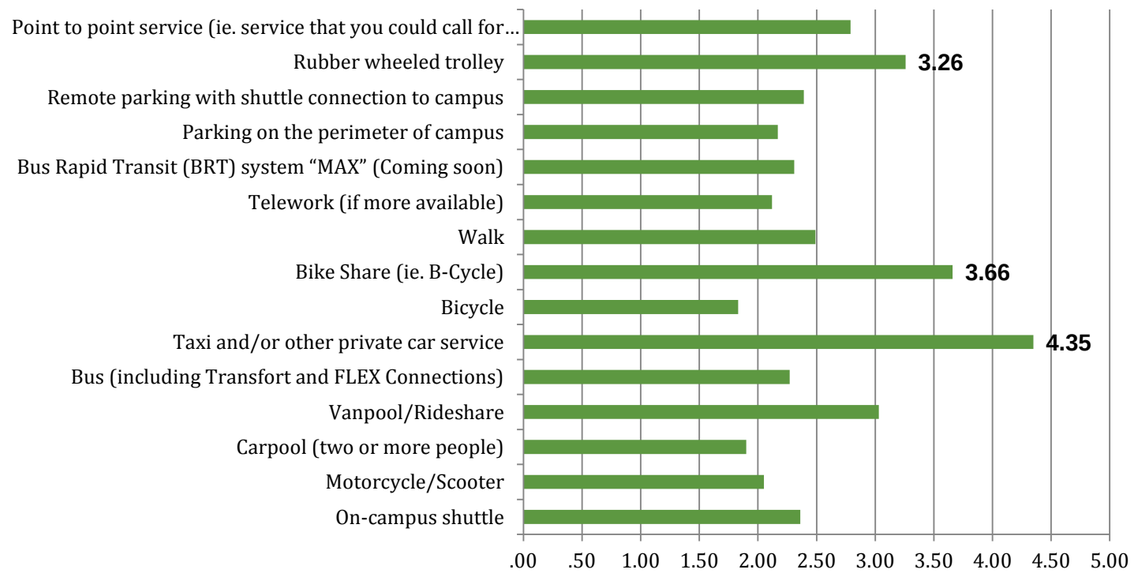
32.4% ride home

31% flexible schedule

86% not interested in program interacting with social media

When asked about paid programs that could possibly interact with social media sites like Facebook, survey responses showed very little interest in either a **ride-sharing** program that interacts with social media (86% indicated that they would not be interested). While considerable interest was expressed for more bike parking, including covered, secure, overnight and bike concierge options, 83% of respondents said that they would not be willing to pay for these amenities.

In order of preference, please rank the top three commute options that you would consider, as an alternative to driving alone. (1 = first choice, 2 = second choice, 3 = third choice)



In order of preference, please rank the top three commute options that you would consider, as an alternative to driving alone. (1 = first choice, 2 = second choice, 3 = third choice):			
Answer Options	Response Average	Response Total	Response Count
On-campus shuttle	2.36	978	414
Motorcycle/Scooter	2.05	902	439
Carpool (two or more people)	1.90	1,996	1049
Vanpool/Rideshare	3.03	690	228
Bus (including Transfort and FLEX Connections)	2.27	1,991	876
Taxi and/or other private car service	4.35	505	116
Bicycle	1.83	2,180	1194
Bike Share (ie. B-Cycle)	3.66	406	111
Walk	2.49	1,290	518
Telework (if more available)	2.12	826	389
Bus Rapid Transit (BRT) system "MAX" (Coming soon)	2.31	1,432	621
Parking on the perimeter of campus	2.17	1,623	747
Remote parking with shuttle connection to campus	2.39	1,529	640
Rubber wheeled trolley	3.26	648	199
Point to point service (ie. service that you could call for destination to destination rides)	2.79	916	328
		answered question	2460
		skipped question	236

Key Findings and Themes

Top commute alternatives that respondents would consider as an alternative to driving alone (1=top choice):

1. Bicycle (1.83)
2. Carpool/Rideshare
3. Motorcycle/Scooter
4. Telework
5. Bus (2.27)

top commute alternative

Survey respondents would like to see **CSU invest more** in these transportation alternatives:

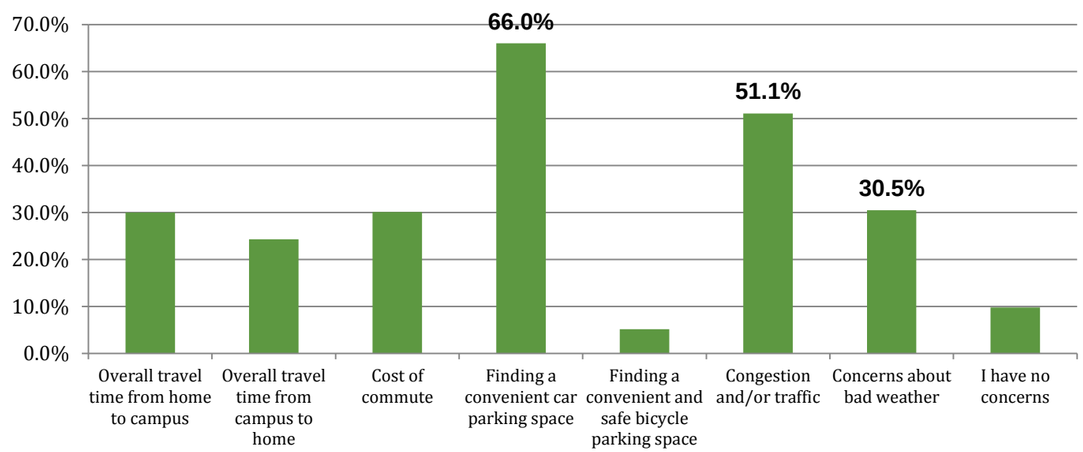
1. Parking on the perimeter of campus (1.78)
2. More bicycle investments
3. Telework
4. On-campus shuttle
5. Bus
6. Connecting to MAX (2.07)

invest more into perimeter parking

free 10 min. campus shuttle idea

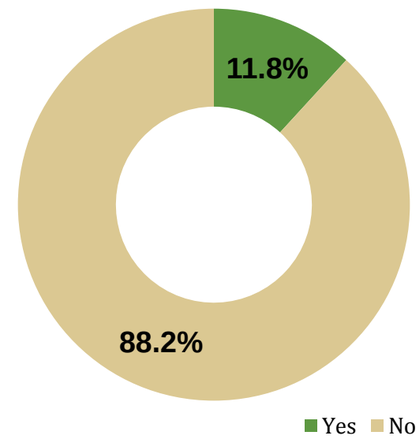
The **idea of a convenient and free campus shuttle** was very well received. Mentioned both in the context of an internal campus loop and connection from perimeter Park 'n Ride lots, the introduction of a timely and free campus shuttle was seen as a viable transportation option. Students, faculty, and staff all indicated that to be successful the shuttle should run in less than 10-minute loops, run consistently, and preferably connect to mobile technology.

What concerns you most about your current commute? (Please select all that apply.)



What concerns you most about your current commute? (Please select all that apply.)		
Answer Options	Response Percent	Response Count
Overall travel time from home to campus	30.0%	727
Overall travel time from campus to home	24.3%	589
Cost of commute	30.1%	731
Finding a convenient car parking space	66.0%	1602
Finding a convenient and safe bicycle parking space	5.2%	126
Congestion and/or traffic	51.1%	1240
Concerns about bad weather	30.5%	741
I have no concerns	9.8%	238
	answered question	2426
	skipped question	270

Did parking and/or transportation options impact your decision to attend, seek employment or work at Colorado State University?



Did parking and/or transportation options impact your decision to attend, seek employment or work at Colorado State University?		
Answer Options	Response Percent	Response Count
Yes	11.8%	266
No	88.2%	1990
	answered question	2256
	skipped question	440

Key Findings and Themes

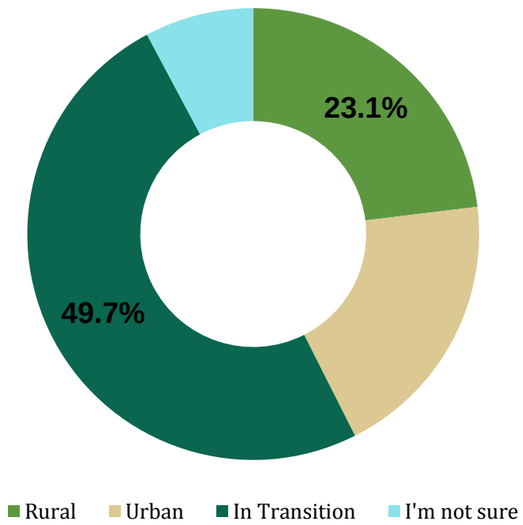
Top responses for what is most challenging about an individual's current parking transportation experience at CSU:

- Difficulty finding a space (especially when leaving during the day and need to come back to campus)
- Cost/pricing
- Pedestrian/bike/auto conflicts
- Too many faculty/staff spaces; faculty/staff (A permits) get the most convenient spaces
- Bad weather impacting parking/commute

Bike/pedestrian/auto conflicts were frequently reported as a significant problem on the CSU campus. Both focus group participants and survey respondents mentioned concerns regarding bike/pedestrian/auto conflicts. Increasing the number and safety of bike/pedestrian paths, better lighting, and intentional design elements, like grade separation, were most frequently suggested as areas of improvement.

There were no negative reactions or comments about structured versus surface parking; in fact, there were a number of positive write-in comments in the survey about the new parking garage.

Do you consider the Colorado State University rural, urban or in transition?



Do you consider the Colorado State University rural, urban or in transition?		
Answer Options	Response Percent	Response Count
Rural	23.1%	520
Urban	19.5%	438
In Transition	49.7%	1118
I'm not sure	7.8%	175
answered question		2251
skipped question		445

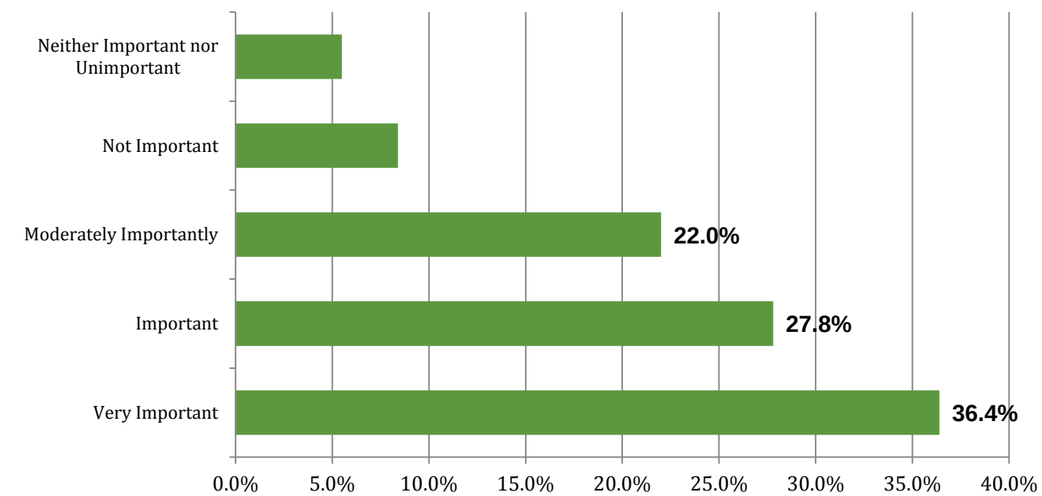
Key Findings and Themes

87% environmentally sustainable parking

While the campus was described slightly more often as **"rural"** than **"urban,"** survey respondents and focus group participants described Colorado State University as largely "**in transition**."

87% of survey respondents considered investment in environmentally sustainable parking and transportation options important, with 36% of respondents selecting "Very Important."

How important is it that Colorado State University actively invest in efforts that are environmentally friendly?



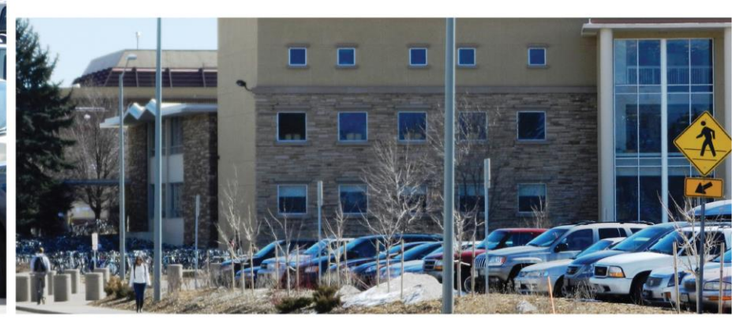
How important is it that Colorado State University actively invest in efforts that are environmentally friendly and undertake efforts to increase sustainability and/or reduce waste/pollution?		
Answer Options	Response Percent	Response Count
Very Important	36.4%	819
Important	27.8%	626
Moderately Importantly	22.0%	495
Not Important	8.4%	188
Neither Important nor Unimportant	5.5%	123
answered question		2251
skipped question		445

Conclusion

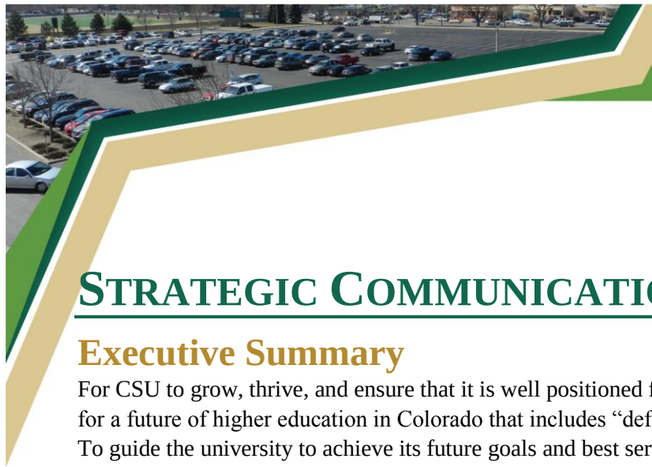
The observations and findings included in this report provide important context for the creation of a ***CSU Parking and Transportation Strategic Communication Plan*** that will guide PTS as they strive to support the campus community's access management needs.

The Strategic Communication Plan will explore traditional and non-traditional marketing channels, campus education/engagement strategies, and communication vehicles that will effectively keep the campus community informed and engaged.

Identification of targeted audience segments and use of reoccurring annual, targeted seasonal and campaign-based messaging strategies will serve to both educate the campus community about upcoming parking and transportation changes that will impact their daily commute and build excitement for future campus development.



CSU Parking and Transportation Strategic Communication Plan Key Elements



STRATEGIC COMMUNICATION PLAN

Executive Summary

For CSU to grow, thrive, and ensure that it is well positioned for the future, the university must proactively prepare for a future of higher education in Colorado that includes "defunding" or the privatization of educational institutions. To guide the university to achieve its future goals and best serve its diverse constituencies, CSU leadership developed "CSU 2020."

CSU 2020 is a growth plan focused on:

- Growing student enrollment to 35,000 by the year 2024
- Maintaining CSU's position as the school of choice within Colorado
- Pushing for excellence in every aspect of the university's mission

As a collaborative partner focused on achieving the 2020 Plan, CSU PTS initiated a Parking and Transportation Study with Phoenix-based firm Kimley-Horn, in the spring of 2013. The purpose of the study is to create a Parking and Transportation Action Plan that will support the university's larger growth goals through:

1) Strategic parking resource allocation and realignment
2) Streamlined management structures
3) Access to alternative transportation options that will improve Main Campus access
4) Development of parking and transportation sustainability goals

A critical part of developing a successful parking and transportation plan is clear and concise communication with various user groups, coupled with proactive and authentic stakeholder engagement. Intentional and targeted outreach to the CSU campus community provided both the CSU PTS staff and the consultant team with valuable insight into the real and perceived parking and transportation challenges that students, faculty, and staff face during their daily commute to campus. The observations and recommendations included in this report provide important context that will guide the CSU PTS department as they strive to support the campus community's access management needs.

This Strategic Communication Plan explores traditional and non-traditional marketing channels, campus education/engagement strategies, and communication vehicles designed to keep the campus community informed and engaged during this time of growth and change on the CSU campus.

Identification of targeted audience segments and use of reoccurring annual, targeted seasonal and campaign-based messaging strategies will serve to both educate the campus community about upcoming parking and transportation changes that will impact their daily commute and build excitement for future campus development efforts.

Task Goals

From the outset, the main goal of the Community Education, Outreach and Strategic Communication Task was to place parking and transportation planning within the larger context of campus development through active engagement of CSU's various stakeholder groups – administration, faculty, staff, and students. Keeping the campus community informed about changes to the campus landscape and asking for feedback about the impact of parking and transportation initiatives, prior to implementing a new policy or program, can lead to increased user understanding and buy-in.

To best achieve these key task goals, the consultant team undertook a thorough existing conditions analysis and stakeholder engagement process to:

1) Identify current commuter behavior, as well as existing and future campus access management opportunities and challenges
2) Develop a comprehensive Strategic Communication Plan that will effectively educate the campus community (and key external audiences) on how parking and transportation investment and development is critical to the growth and sustainability of the entire institution
3) Explore traditional and non-traditional marketing channels, public relations strategies, and communication vehicles that will effectively keep the campus community engaged and informed while simultaneously building excitement for the future

Stakeholder Engagement

From late March through early April 2013, stakeholder outreach was conducted using both in-person focus-group-style interviews and a survey tool developed specifically for CSU. Over 50 individuals participated in focus group meetings that were held March 26-29, 2013, including representatives from the following campus and non-campus groups:

CSU

- Police Department
- Department of Athletics
- Faculty Council
- Bicycle Advisory Committee
- Associated Students of CSU
- State Classified Employees
- Housing and Dining Services (Leadership and Staff)
- GenFac
- Nearby neighborhood residents and property owners
- PTS

CITY OF FORT COLLINS

- Parking Services
- Transfort
- UniverCity
- Advance Planning
- Bicycle Advisory Committee

Additionally, feedback from 2,273 students, faculty, and staff was collected by survey, offered in both online and hard copy. The survey had an 84.3% completion rate; 65% of survey respondents were female, 48.2% were undergraduate students, 34.8% were staff, and 86.2% reported commuting to campus daily.

The survey was provided in English and Spanish and was made available both online and in paper format. CSU PTS assisted with marketing and distribution of the survey, which covered a wide range of topics, including:

- Commuter perceptions and habits
- Preferred methods of transportation and viable alternatives
- Perceived challenges and areas of opportunity

KEY THEMES

Several strong themes emerged from both the stakeholder interviews and the survey responses collected:

- **DRIVING ALONE IS BY FAR THE TOP METHOD OF ACCESSING CAMPUS.** Between 89% and 94% of survey respondents reported driving alone as their typical form of transportation to and from campus, and 51.7% report not using any another form of alternate transportation.
- **CONVENIENCE, RATHER THAN COST, DRIVES COMMUTING BEHAVIOR.** 62% of respondents selected convenience as the reason they choose their current method of commuting, with 30.1% respondents indicating that there was "no other viable alternative." Cost ranked last at 4.5%.
- **BIKE/PEDESTRIAN/AUTO CONFLICTS ARE WIDELY SEEN AS A SIGNIFICANT PROBLEM.** Both focus group participants and survey respondents mentioned bike/pedestrian/auto conflicts repeatedly. Increasing the number and safety of bike/pedestrian paths, better lighting and intentional design elements, such as grade separation, were most frequently suggested as areas of improvement.
- **THE IDEA OF A CONVENIENT AND FREE CAMPUS SHUTTLE WAS VERY WELL RECEIVED.** Mentioned both in the context of an internal campus loop and connection from perimeter park-and-ride lots, the introduction of a timely and free campus shuttle was seen as a viable transportation option. Students, faculty, and staff all indicated that to be successful, the shuttle should run in less than 10-minute loops, run consistently, and preferably connect to mobile technology.
- **PROACTIVE AND FREQUENT COMMUNICATION IS KEY.** Representatives from every focus group expressed appreciation that their opinions were being solicited as part of the planning process. It was strongly suggested that campus community education and outreach continue, increasing in format and frequency as additional parking assets are removed for new development.

Additional highlights from stakeholder engagement efforts can be found in the Commuter Behavior and User Perception section of the CSU Parking and Transportation Master Plan.

Communication Plan Components

Regardless of whether an organization is budgeting for dollars, staff time, and/or scarce resources, strategic investment in marketing and communications often slide to the bottom of the list. However, thinking strategically about your communications, public education, and media relations decisions can support every other aspect of a parking and transportation system's operations.

The following elements should be carefully considered as CSU PTS begins implementation of its larger Master Plan. This section also highlights new opportunities to proactively engage key user groups in policy and programmatic decisions that will impact their experience accessing CSU campuses.

The strategies have been divided into three categories:

1) **PROGRAM BRAND DEVELOPMENT, MESSAGING, AND KEY AUDIENCES:** Ways to build connection, pride, and ownership among staff and users.
2) **MEDIA TOOLS AND PLATFORMS:** Strategies to build the organization's narrative via consistent and creative communications utilizing the most effective tools.
3) **IMPLEMENTATION FRAMEWORK:** How to organize the various elements of your plan for practical implementation and progress tracking.

PROGRAM BRAND DEVELOPMENT, MESSAGING AND KEY AUDIENCES

Intentional promotion and positioning of CSU PTS will provide opportunities for increased user recognition and engagement, as well as increased understanding about existing and future service areas.

Organizational Brand and Messaging

An organizational brand goes beyond an organization's name, logo, and visual identity. A brand represents an unspoken promise, or commitment – of quality, value, professionalism, and fiscal stewardship – about the consistent experience your patrons can expect when interacting with CSU PTS. Over time, your brand becomes synonymous with your organization. When members of the campus community see your signage, communication pieces or uniforms with your brand, an emotional connection is created that evokes the memories and feelings that a person associates with your organization.

Branding creates value and starts with truth. It identifies shared values and areas of expertise; what campus community needs **are** and **are not** being met by the organization? What story is your current brand telling about the organization? What story do you want to tell? Your organizational brand provides the foundation for the creation of content and tone for marketing efforts, customer relations efforts, and organizational culture.

Key Definitions

- **BRAND POSITION:** A brand position is a simple statement that conveys the essence of an organization and provides a promise to both patrons and investors about the type of environment that can be expected. The brand position helps create an image or identity in the mind of the visitor, donor, partnering organizations, students, and other target audiences. It also sets the tone for the development of the actual brand, which will only resonate with patrons and investors if it reflects the true character of the organization it represents.
- **MESSAGING:** A messaging strategy is the foundation for all of your marketing efforts. Put simply, a messaging strategy tells the audiences that you are trying to reach why they should visit your organization, what they will find when they do, and why they should care. For your brand to resonate with patrons and investors, your messaging strategy needs to inspire confidence that you understand your patrons' needs and have something relevant and unique to offer.
- **VISION:** This statement should be very aspirational and speak to the organization's ultimate point of success.

- **MISSION:** This statement defines what an organization is, why it exists, and its reason for being.

It is strongly recommended that CSU PTS leadership and senior staff create: 1) an organizational brand position statement, 2) vision statement, 3) mission statement, and 4) identify core shared values of the organization that complement the university's larger core values as an institution. A sample template for developing these brand foundation statements and values can be found in Appendix A.

Messaging

Messaging provides a foundation for the creation of content and tone for marketing, advertising, and outreach. Messaging for CSU PTS should focus heavily on how the department is working to align parking and transportation initiatives with the university's strategic development and growth goals. Messaging should have a constant call to action–from a simple browse onto the website to exploring the latest programs and exhibits.

The three key elements to effective brand messaging include:

1) **CONSISTENCY:** Keeping similar tone/feeling when communicating to your audience.
2) **FREQUENCY:** The driving force – keeping the message in front of the audience as often as possible. Not just focused on providing "must have" information about construction, special events, and programs, but updates that reinforce the goals of the organization and remind users of the bigger picture.
3) **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.

Utilizing the brand approach/positioning strategy effectively will help to create an image or identity in the mind of the customer, visitor, and resident by clearly differentiating the organization from the competition and helping to create a connection between the person and the organization.

Key Audiences

This section will address the importance of tailoring communication and outreach to each of the key audience segments that make up the CSU campus community.

The following groups have been identified as primary audience segments for CSU PTS:

- **PRE-MATRICULATION UNDERGRADUATE STUDENTS AND TRANSFERS:** This audience is one of your most important to educate effectively because this is one of the department's first "touches" with this user group. Positioning CSU PTS as a resource, not an enforcer, will help the relationship with your newest customers begin on a positive note.
- **UNDERGRADUATE STUDENTS:** This is one of your most difficult audiences to reach because their attention is being drawn in so many different directions. It will be vital to understand the (ever-changing) habits of this group and take your message to where the students are actually listening. A good place to start is by identifying what messaging students have to listen to (e.g., Resident Advisor communications) and finding creative ways to incorporate your message in a concise way.
- **GRADUATE STUDENTS:** Graduate students are typically very connected to their departments, often through a central department administrator that distributes important information. This audience is often more sophisticated than the undergraduate audiences and messaging should be similar in tone to faculty/administration communication.
- **SPECIALTY STUDENT GROUPS (E.G., STUDENT GOVERNMENT):** Organized student groups are an excellent way to disseminate information in a "peer-to-peer" format that is likely to be better received. Engaging with key student leaders to assist with department messaging can be a useful tactic.
- **BIKING COMMUNITY:** Departmental messaging should be specifically tailored for the audience and should be proactively disseminated using a few key "friends" of the department. Similar to the "peer-to-peer" information dissemination tactic with students, information shared between sympathetic parties (i.e., from biker to biker) can prove effective.
- **FACULTY:** Similar to graduate students, faculty are typically very connected to their departments, often through a central department chair that distributes important information.
- **STAFF:** This audience will also be one of your hardest to reach due to their varying levels of access to/use of online communication tools. This audience is also likely the most challenging to address because overall they face more financial challenges in paying for and finding parking than staff. Communication should be funneled through trusted supervisors if possible and should be presented in hard copy/written formats as well as digital formats.

Secondary audiences include:

- Administration/leadership
- Commuters (from outside Fort Collins)
- Adjacent neighborhoods, businesses and property
- City of Fort Collins, specifically the Parking Department, Transfort, Advance Planning, UniverCity, and Bicycle Advisory Council
- NFRMPO; other local transportation planning authorities
- Media/press
- Peer campuses

MEDIA TOOLS AND PLATFORMS

Campus stakeholders consistently expressed a desire for more proactive and timely information about parking and transportation happenings, in terms of current projects, changes in policies, and upcoming development plans. Specific areas to consider include:

1. UPDATED/ENHANCED CSU PTS WEBSITE**. The site should be an amenity for students, faculty, staff, and visitors alike and should be a one-stop shop for all critical information about parking and transportation services on the CSU campus.**

An update of the existing web page is recommended and should take into consideration the following:

- Ideally the website will be created in distinct sections correlating to the target audience categories, with information neatly sorted and organized based upon the type of user accessing the site.
- The site must be well managed with a plan to keep content fresh and new. Users returning to the site and finding nothing new are likely to stop utilizing it as a resource.
- In addition to hosting some static content, this site should include tools to allow users to select how they want to communicate with/receive information about upcoming changes that will impact parking and transportation on campus.
- This site and the content on it should also feed into other local transportation resources, like the Transfort page, etc.
- Introducing a regular electronic newsletter, similar to the City of Fort Collins' MAX updates would be a useful.
- The creation of a mobile application should be considered as a way to extend the reach of the information hosted here for highly mobile audience segments.
- See the Implementation Framework section for more specific recommendations.

2. EFFECTIVELY USING SOCIAL/NEW MEDIA TOOLS. **Social media is a free medium that is changing the way people communicate, how stories are told, and how information gets distributed. Strategic use of social media tools can be an effective way to build buzz and grow diverse audiences. The social media tools CSU PTS should utilize include:**

- **E-BLAST:** An electronic newsletter will assist in segmenting the parking and transportation information to specific audiences/users of the organization, keeping messaging timely and relevant.. E-Blast should go out at minimum twice per month.
- **FACEBOOK:** Facebook allows communities to host a page that can feature photos, videos, stories, blogs, comments, and more. Individual users can "fan" the page and add content to it, making it a multi-dimensional user-site. Both the administrator of the site and the "fans" can participate in creating a conversation about timely topics, and can inform, educate, and share information about the community. This could also be a great go-to site for people looking for information on events and the latest news and stories about the community.
- **TWITTER:** Twitter is a social networking tool that allows users to provide short 140-character updates that are directed to other Twitter subscribers' accounts (or cell phones!) in the form of a "tweet." Tweets can be used by the campus community to provide information to inform the campus about upcoming closures, construction interruptions, and/or to provide time-sensitive updates. Parking and transportation organizations have increasingly begun using Twitter and have found it a cost- and time-effective way to distribute information to mass audiences.
- **YOUTUBE:** YouTube is a video-sharing site in which users can create, upload, and share videos. Organizations can create 'channels' that users can subscribe to. This channel could be utilized for guerrilla marketing...videos taken at events, video competitions about parking on campus, etc.
- **INSTAGRAM:** Instagram is a free photo-sharing program that allows users to take a photo, apply a digital filter to it, if desired, and then share it on a variety of social networking services (e.g., Facebook and Twitter). It's a great way to show the visual changes happening to campus and share fun pictures in a way that puts a human face on the department and its services. Instagram easily and automatically posts updates to Facebook and/or Twitter accounts so one doesn't need to repost the same image multiple times.

The effective use of social media means making a commitment to keeping it updated and fresh with content. The most successful communities and organizations using social media are creative in their messaging and approach, using the site not just for information, but for contests and fun interactions as well. Social media gives the brand a personable and down-to-earth accessibility. The user needs to have a continuous reason to keep coming back. In the short-term, an effective social media campaign for CSU PTS could be managed by an intern or administrative professional with supervision by senior communication staff.

All the social media tools implemented in the community should ultimately tie back and feed live updates to the updated CSU PTS website.

3. ADDITIONAL COMMUNICATION TOOLS AND TACTICS. **In addition to an update website, e-blast, and active engagement with social/new media strategies, the following communication tools can be very useful for sharing information and engaging diverse user groups:**

- Annual report (layout and content suggestions included in the Appendix)
- Issue-specific white papers, for example:
  - Information on new parking technology
  - "Year in Review"
  - Focus on Sustainability
- Master plan integration
- Sustainability vision for parking and transportation services
- Online data portal
  - On-demand parking data
  - Ongoing parking management data resource
- Media/press resources
  - Press packet
  - Issue white papers
- Staff integration and training
  - FTE/PT/Seasonal
  - Train enforcement staff as parking ambassadors rather than "enforcers"

- Conflict management
- Take your "show on the road" by engaging campus groups with regular presentations
- Frequent user focus groups
  - Customers interact with technologies, react to policy proposals
  - Include diverse user groups

4. PUBLIC AND MEDIA RELATIONS. **The importance of a well-thought-out public relations plan cannot be overstated because in the absence of information, the general public will make up their own answers and/or rumors will be given more "legs" than when an organization proactively pushes out their desired message. CSU PTS has a tremendous opportunity in the recent addition of a full-time staff member with deep experience in campus stakeholder and media relations.**

Communicating about parking requires both technical savvy and an understanding of the often-intense emotions that are experienced when dealing with access management concerns and issues. Relationship and trust building can be slow and a "show me, don't tell me" kind of process; however, a few strategic first steps can be taken to begin developing productive and reciprocal relationships with the public and media:

- **FORM STRONG, RECIPROCAL RELATIONSHIPS WITH LOCAL MEDIA:** This is especially important during times of crisis and should be implemented with both on- and off-campus media outlets (locally, regionally, statewide, and university specific).
- **BE OUT IN FRONT OF STORIES:** Management and communications staff should meet weekly to discuss potential public relations issues and make a joint and informed decision about what communication is needed and the best angle to take.
- **DEVELOP A CRISIS COMMUNICATION PLAN:** It is absolutely critical to have a written crisis communication plan in place and to know the chain of command protocols for addressing the issue publicly before control of messaging is lost.
- **FEED INFORMATION TO MEDIA:** This may run counter to the operating norm for many parking systems who try to fly under the media's radar
- **RAMP UP COMMUNICATION DURING TIMES OF TRANSITION:** People and organizations often stop communicating during times of transition (e.g., construction, program building) because they feel that they "aren't there yet" and need to have everything completed before bringing their constituencies along. This is exactly the opposite of what should be done, especially since parking and transportation changes and/or "inconveniences" can lead to intense frustration and fuel complaint volumes. During times of transition, communication should be:
  1. Clear and understandable
  2. Tailored to your key audiences
  3. Repetitive and simple

IMPLEMENTATION FRAMEWORK

This section includes a high-level implementation framework that has been developed to guide CSU PTS staff through implementation of the elements outlined in the Strategic Communication Plan.

Key areas to consider during plan implementation include:

Recommendations

A. Staffing and Staff Development: The organization should have a qualified individual or individuals who are properly trained to provide the marketing and communication expertise needed to meet the organization's strategic goals and effectively serve its patrons.

Establish and document job description(s) with specific marketing and communication duties. Job descriptions are an integral part of initial training, evaluation, and promotion opportunities.

Develop position-specific training that is well organized, effective, and ongoing. The extent and depth of training should be tailored to the skill level of the employee and should be well documented.

Establish employee performance measures specific to marketing and communication are as part of the employee onboarding process. Performance evaluations should occur regularly and be well documented.

- Perform formal evaluations at least once a year.
- Support the evaluation process by an appropriate written evaluation instrument that includes both scored criteria and relevant comments from the evaluator.
- Develop evaluation criteria specific to the marketing and communications functions and responsibilities of the employee being evaluated.
- Produce the evaluation documentation and have the evaluation interview conducted by the supervisor who is in the best position to evaluate that employee's performance.

Suggested Documentation

- Job description(s) with specific marketing and communications duties
- Marketing and communications training program outline, materials, and records
- Ongoing development program for marketing and communications staff member(s)
  - Schedule and materials
  - History of participation and completion
- Marketing and communications specific evaluation forms, criteria, and evidence of evaluation completion (minimum annually)

B. Annual Communications, Marketing and Outreach Planning: The organization should have a marketing and community outreach plan and dedicated budget that supports the overall organization's strategic goals. The plan should be reviewed regularly and include reporting and evaluation metrics.

Recommendations

- Establish plan at the beginning of the organization's fiscal year that is aligned with the organization's overall strategic goals. Plan is assessed bi-annually by the marketing and communications staff member(s) and the appropriate supervisor.
- Develop marketing and community outreach budget.
  - Budget priorities are established at the beginning of the organization's fiscal year and are aligned with the organization's overall strategic goals. Budget is assessed quarterly by the marketing and communications staff member(s) and the appropriate supervisor.
  - Metrics for evaluating the effectiveness of marketing and community outreach tactics, campaign, and strategies.
  - Metrics are assessed annually. These evaluation processes are supported by appropriate written documentation.
  - Evaluation methods should include, but are not limited to, the following: outreach to internal and external audiences through targeted surveys and/or focus groups, vendors, sponsors, partnering organizations, and web and social media analytics.

Suggested Documentation

- Organizational marketing and community outreach plan
- Process description and notes/minutes from annual meeting where proposed marketing and community outreach plan is reviewed and approved
- Notes/minutes from quarterly meetings where marketing and community outreach budget is reviewed and discussed
- Process description and notes/minutes from annual meeting where evaluation metrics are reviewed and approved
- Written documentation of evaluation metrics, processes, and data

C. Media and Public Relations Planning. The organization should have an established media and public relations plan that includes specific crisis/emergency communication protocols.

Recommendations

- Develop a Public and Media Relations Plan.
  - Plan includes specific sub-sections outlining approved policies and procedures for addressing reoccurring annual, seasonal, campaign, and event-specific communications functions (e.g., special events, service disruption, and construction).
  - Plan is established at the beginning of the organization's fiscal year and is aligned with the organization's overall strategic goals. Plan is assessed bi-annually by the marketing and communications staff member(s) and the appropriate supervisor.
  - The organization has a designated individual or individuals who are properly trained to communicate with the media.
  - The plan includes specific protocols for crisis/emergency communication protocols.
  - The organization has one or more designated spokespeople who have specific experience and/or have received training on how to communicate effectively with the media.

Suggested Documentation

- Description of crisis/emergency communication protocols, including names and titles of key contacts and areas of responsibility
- Names and titles of designated media spokespeople
- Documentation of media/public relations training program for all designated spokespeople
- Records of past media and public relations campaigns and/or notification materials and documentation (e.g., press releases, collateral material, talking points)

D. Organizational Brand and Visual Identity. The organization should have a clear organizational brand and visual identity. The organization has the dedicated resources and tools needed to effectively market to and communicate with its parking patrons.

Recommendations

- Develop a clearly defined brand, including mission and vision, messaging platform, and clearly identified target audiences.
- Develop consistent visual identity across all mediums, including logo, fonts, letterhead and presentation templates, web and social media presence, signage, uniforms, collateral material, enforcement, and informational documentation, etc.
- Produce an annual report.
- Enhance website to include the following, at a minimum:

- Marketplace functionality (e.g., ability to pay citations, sign up for parking online)
- Map of facilities with pricing, hours, and payment options
- Contact information, including email and phone number
- Complaint, maintenance issue, and general inquiry forms
- Information/tutorials on use of parking equipment/technologies (e.g., multi-space meters, PARCs, pay by phone/app)
- Organization demonstrates understanding of and proper use of social and new media (e.g., Facebook, Twitter, Linkedin)

Suggested Documentation:

- Organizational brand identity standards
- Marketing collateral for current year and selection of collateral material for past three years (e.g., brochures, print ad campaigns, billboards)
- Annual report
- Website URL and written description of current functions and process for maintaining and updating web materials
- Social media policy, including written description of which social/new media sites are currently being utilized

METRICS TO MEASURE SUCCESS

A strategic and proactive communications and campus engagement plan can lead to tremendous progress, but how do you truly know which tactics and campaigns are making the difference and when you've achieved "success"? Metrics and benchmarks are an important aspect of instituting any program. For each initiative embarked upon, specific metrics will have to be established. However, the following general metrics are commonly used in measuring success.

- **SURVEYS:** Surveys are by far the most commonly used tool for organizations looking to track consumer and investor perceptions towards an organization or initiatives. Surveys should probe how well the organization is serving its constituents and identify what improvements and/or additional services they'd like to see.
- **ESTABLISH DATA BENCHMARKS:** Benchmarking data is an excellent way to measure the success of both annual and project/initiative-specific strategic planning efforts. We recommend that the following data and indicators be benchmarked and tracked as the communications and campus outreach strategy is implemented:
  - **MEDIA IMPRESSIONS:** Number of news clips in newspaper, magazine, television, and radio. Using advertising costs, average the value of free mentions from public relations efforts.
  - **SOCIAL MEDIA METRICS:** Tracking social media analytics can be time-consuming, expensive, and/or seem like an exercise in futility, but there are a few free tools that can be used to track your growing social media presence:
    - **TWITTER:** "GetTweets" is a simple and fast Google tool that lets you quickly export Twitter search results into a spreadsheet.
    - **FACEBOOK:** Facebook tracks the number of people who view a particular post and displays that number for account administrators just below the post.
    - **WEBSITE METRICS/GOOGLE ANALYTICS:** Google Analytics is a free tool provided by Google that is constantly being updated and improved. It will not only show you valuable data about your website visitors, how they got there (Google search keywords, referral or direct entry), and their location, but you can also monitor and view reports on their experience on the site – where they stayed the longest, what they were looking for, where they left, etc. This tool allows you to produce a variety of reports that can be measured for specific online campaigns, for overall usage over periods of time, and to help provide a basis for further improvements and/or to fix functions that may not be working as intended for the end users.
    - **CUSTOMER SERVICE METRICS:** Keep track and monitor email feedback into different categories (i.e., positive, negative, neutral)

Traffic Impact Assessment, Campus Cordon Study, and Traffic Simulation Model

Introduction

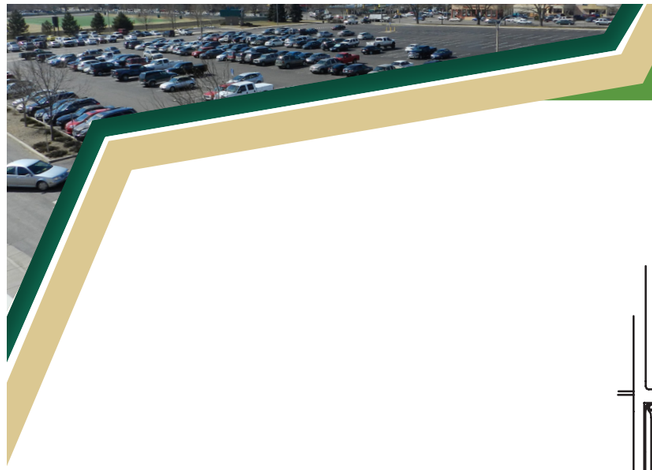
Kimley-Horn prepared this report to document the results of a traffic study of future traffic conditions associated with CSU 2020 Transit Plan prepared by the CSU PTS. The Transit Plan includes construction of seven new parking structures, which would allow for a net increase of 5,896 parking spaces available for use by faculty, staff, and students of CSU. Future parking structures will be constructed in both the Main and South Campus and will be located in existing surface parking lots as well as currently undeveloped areas. In addition, two bus transit transportation options will begin service in 2014. MAX, a Bus Rapid Transit system operated by the City of Fort Collins, is anticipated to begin operating along a route on Mason Street. CSU is also planning a new bus transit system that will include an internal campus route along University Avenue. A vicinity map illustrating the CSU main campus and the study area is shown in

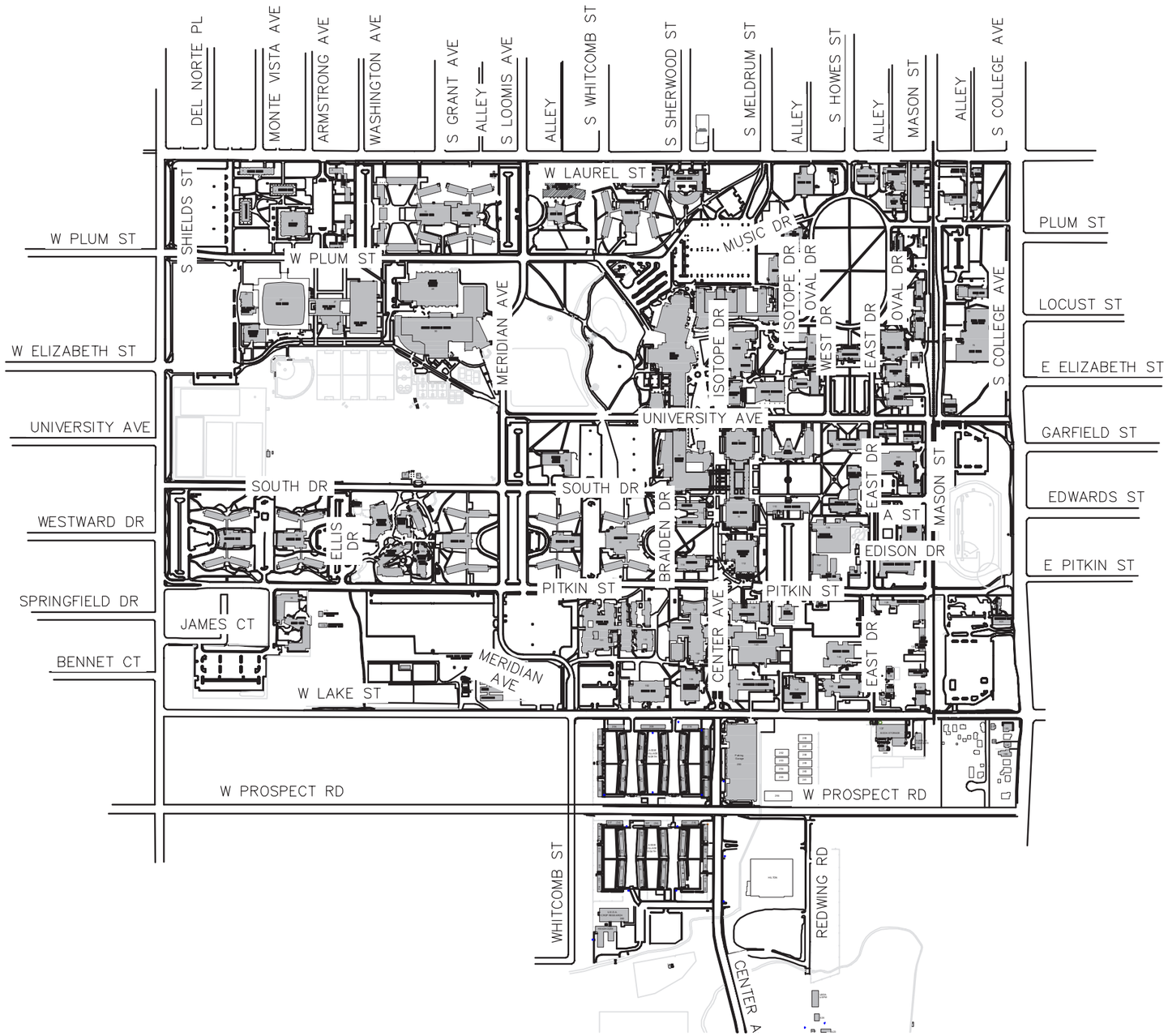
Figure 1.

The proposed parking additions and transit options have been included in the 2020 Transit Plan because of a current need for additional parking resources based on projected increases in student admissions. During the 2012-2013 school year, approximately 27,000 students attended CSU. The student enrollment for the ten-year planning horizon of 2024 is 35,000 total students, an 8,000 student increase. In addition, CSU anticipates an increase of 960 faculty and staff members may also occur.

The purposes of this study include the following:

- Determine the existing vehicle, bicycle, and pedestrian volumes accessing campus
- Evaluate the major directions of arrival and departure for each transportation mode
- Identify future vehicle, bicycle, and pedestrian volumes based on CSU student population growth and new proposed parking structures
- Analyze existing and future traffic volumes to determine intersection lane and control improvements needed to adequately accommodate all modes of traffic





STUDY AREA

FIGURE 1

EXISTING CONDITIONS

The following sections outline existing conditions in the vicinity of CSU.

Study Area and Roadway Network

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

Working with the City of Fort Collins and CSU PTS Kimley-Horn and the project team identified 40 key intersections and parking lot access points for evaluation in this study. The key intersections were chosen because they are along major commuter routes. The location for each of the following key intersections and parking lot accesses is listed below in **Table 7** and shown in **Figure 2.**

Table 7 – Key Intersections

1. Laurel St. & Shields St.	**2.** Plum St. & Meldrum St.
3. Plum St. & Shields St.	**4.** Music Dr. & Oval Dr.
5. Plum St. & Meridian Ave.	**6.** Oval Dr. & Howes St.
7. Elizabeth St. & Shields St.	**8.** Old Main Dr. & Mason St.
9. Meridian Ave. & University Ave.	**10.** Old Main Dr. & College Ave.
11. South Dr. & Shields St.	**12.** University Ave. & West Dr.
13. South Dr. & Meridian Ave.	**14.** University Ave. & East Dr.
15. Pitkin St. & Shields St.	**16.** University Ave. & Mason St.
17. Pitkin St. & Meridian Ave.	**18.** University Ave. & College Ave.
19. James Ct. & Shields St.	**20.** Pitkin St. & East Dr.
21. Lake St. & Shields St.	**22.** Pitkin St. & Mason St.
23. Lake St. & Whitcomb St.	**24.** Pitkin St. & College Ave.
25. Lake St. & Center Ave.	**26.** RIRO Access & College Ave.
27. Prospect Rd. &Whitcomb St.	**28.** Lake St. & East Dr.
29. Prospect Rd. & Center Ave.	**30.** Lake St. & College Ave.
31. Bay Dr. & Center Ave.	**32.** Laurel St. & Loomis Ave.
33. Laurel St. & Meldrum St.	**34.** Prospect Rd. & Shields St.
35. Laurel St. & Howes St.	**36.** Prospect Rd. & College Ave.
37. Laurel St. & Mason St.	**38.** Laurel St. & Access
39. Laurel St. & College Ave.	**40.** Plum St. & Access

Existing Roadway and Intersection Configurations

The study of roadways surrounding and within the CSU Main Campus providing access to the university are described within the following paragraphs.

LAUREL STREET

Laurel Street is the northern boundary of the CSU Main Campus. It provides two through lanes eastbound and one through lane westbound west of Meldrum Street; and one through lane eastbound and two through lanes westbound between Meldrum Street and College Avenue. Laurel Street has a posted 30 mile per hour speed limit. A continuous two way left turn lane has been designated for much of the length adjacent to campus. Striped left-turn lanes have been designated at the major intersections and access points. Several signalized intersections exist along Laurel Street: Shields Street, Loomis Avenue/Meridian Avenue, Meldrum Street, Howes Street, Mason Street, and College Avenue.

PLUM STREET

Plum Street primarily provides a single lane in each direction with a 20-mile-per-hour speed limit. The intersection of Plum Street with Shields Street is signalized. The intersection of Plum Street/Meridian Avenue operates with all-way-stop control.

SOUTH DRIVE

South Drive is a one-way street providing access eastbound into CSU between Shields Street and Meridian Avenue. Angle parking has been designated along this section of roadway. East of Meridian Avenue, South Drive is a two-way street providing access to various parking lots. The intersection of South Drive/Meridian Avenue operates with all-way stop control.

PITKIN STREET

Pitkin Street provides a single lane in each direction, eastbound and westbound, with a speed limit of 20 miles per hour. The Pitkin Street approach to Shields Street operates with stop control and allows only a right-turn movement onto northbound Shields Street. The Pitkin Street intersection with Meridian Avenue operates with all-way-stop control. Pitkin Street is not continuous through campus as it terminates in the core due to the Central Avenue Pedestrian Mall, but it also is a roadway on the east side of campus. The intersection of Pitkin Street with East Drive operates with all-way-stop control. The intersection of Pitkin Street and College Avenue is signalized. The Pitkin Avenue approach to College Avenue includes separate left- and right-turn lanes.

LAKE STREET

Lake Street is continuous through campus and provides a single through lane eastbound and westbound. Parallel parking exists along Lake Street in both directions. Lake Street has a posted speed limit of 25 miles per hour. The T-intersection of Lake Street with Shields Street operates with a traffic signal. The Lake Street westbound approach to the Shields Street intersection includes separate left- and right-turn lanes. The intersections of Lake Street with Whitcomb Street and Center Avenue operate with all-way-stop control. The Lake Street approach to College Avenue operates with stop control and provides a right-turn exit only onto southbound College Avenue.

PROSPECT ROAD

Prospect Road is an arterial roadway at the southern end of the Main Campus of CSU. It provides two through lanes in each direction, eastbound and westbound, with a posted speed limit of 35 miles per hour. Separate left- and right-turn lanes have been constructed and designated at the major

intersections along Prospect Road. The intersections of Prospect Road with Shields Street, Whitcomb Street, Center Avenue, and College Avenue all operate with traffic signals.

SHIELDS STREET

The western boundary of the CSU Main Campus is Shields Street. It provides two through lanes in each direction (northbound and southbound) with a posted speed limit of 30 miles per hour. Left-turn lanes exist for all major intersections and access points. The intersections with Laurel Street, Plum Street, Elizabeth Street, Lake Street, and Prospect Road are all signalized.

MERIDIAN AVENUE

Meridian Avenue is a north-south roadway through the middle of the CSU main campus. It provides a single lane in each direction with a posted speed limit of 20 miles per hour. The section of Meridian Avenue between Plum Street and South Drive is closed to public traffic. It is open to transit and construction vehicles.

CENTER AVENUE

Center Avenue provides access between the Main Campus and the South Campus. It provides a single northbound and southbound through lane with a posted speed limit of 35 miles per hour. The Center Avenue intersection with Prospect Road is signalized.

EAST DRIVE

East Drive, on the eastern portion of the Main Campus, is a one-way street northbound, north of University Avenue, and one way southbound between University Avenue and Pitkin Street. The one-way street northbound ties into the one way street network around The Oval. East Drive at the intersection of Pitkin Street is misaligned. However, the intersection operates with all-way-stop control, so it is believed that it functions acceptably. The East Drive approach to Lake Street operates with stop control, while Lake Street is the major street without STOP signs.

MASON STREET

The Mason Street right-of-way will provide the new MAX bus rapid transit system through campus. The roadway street section of Mason Street provides a single through lane in each direction, northbound and southbound, between Laurel Street and University Avenue. South of University Avenue, Mason Street is one-way northbound with a single through lane.

COLLEGE AVENUE

College Avenue is a north-south arterial on the east side of campus, owned and maintained by the State of Colorado Department of Transportation (CDOT). It carries the US-287 highway designation. College Avenue provides primarily three through lanes in each direction with a speed limit of 35 miles per hour adjacent to CSU. Separate left- turn lanes exist at the major intersections. The intersections of College Avenue with Laurel Street, Pitkin Street, and Prospect Road all operate with traffic signals.

The intersection lane configurations and control for the study area are shown in **Figure 2**.

Existing Traffic Volumes

Existing peak-hour turning movement counts were conducted at the study key intersections between the dates of Tuesday, February 19, 2013 and Thursday, February 21, 2013. The counts were obtained during the AM and PM peak hours of adjacent street traffic in 15-minute intervals from 7:30 AM to 9:30 AM and 3:00 PM to 5:00 PM respectively, which is anticipated to coincide with morning and afternoon peaks of university traffic. Traffic count sheets are provided in **Appendix A**. Weather observations made during the traffic counts were recorded and are provided in **Table 8**.

Table 8 – Recorded Weather Observations Made During the Traffic Counts

	Date	Average Temperature	Meteorological Observations
AM	February 19, 2013	30's	Partly cloudy
	February 20, 2013	30's	Overcast turned partly sunny
	February 21, 2013	20's	Snow accumulation, snow stops $^1/_2$ way through count
PM	February 19, 2013	30's	Partly cloudy
	February 20, 2013	30's	Partly cloudy
	February 21, 2013	20's	Sunny, but starts snowing between 4:15 and 4:30

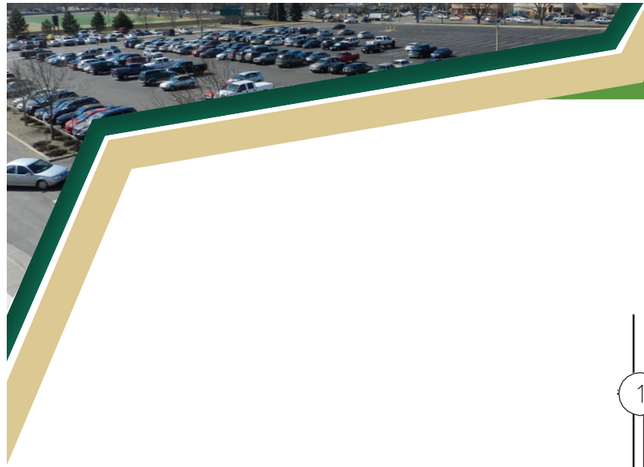
The existing turning movement counts for automobile, bicycle, and pedestrian volumes are shown in **Figures 5 – 10.**

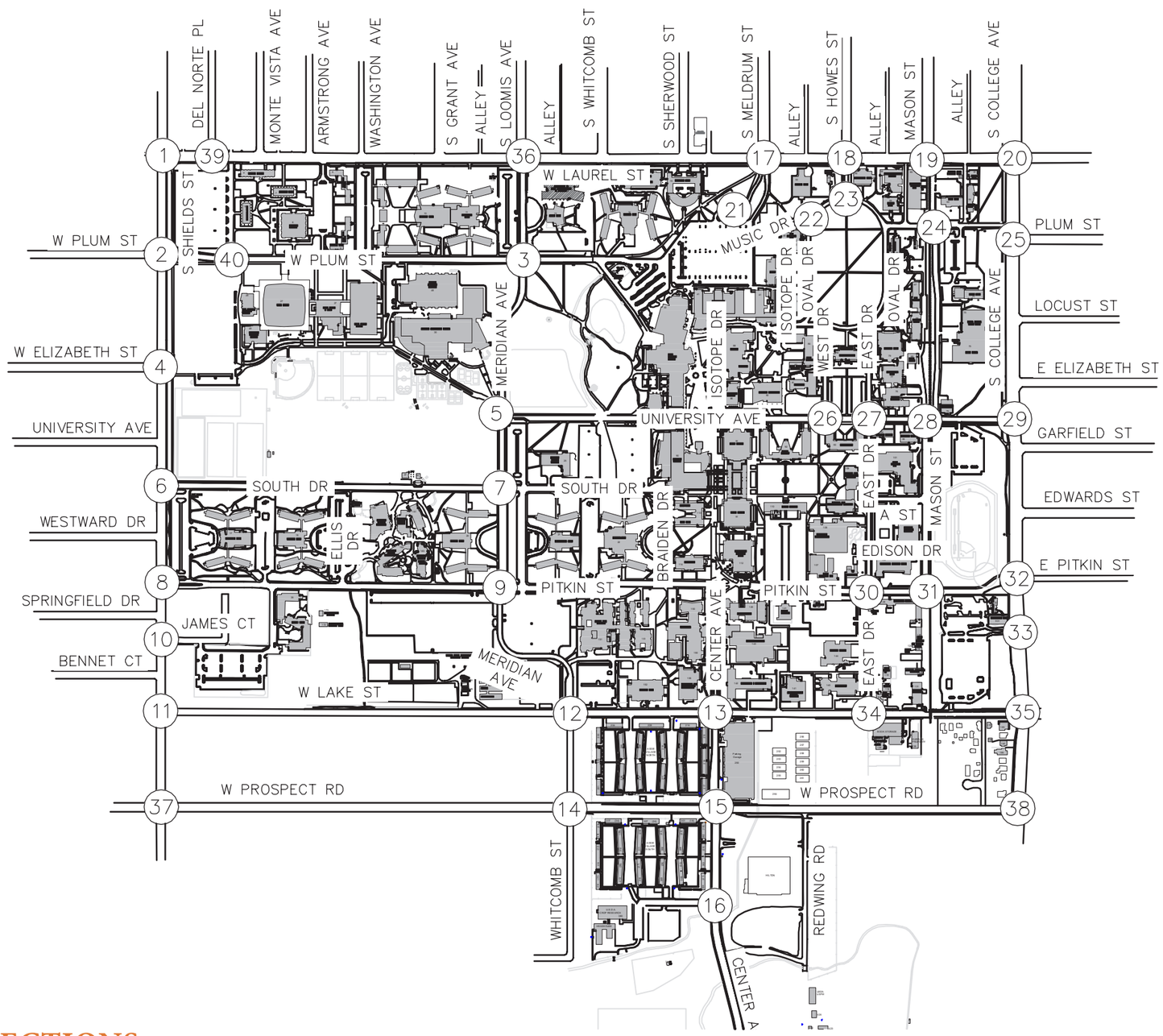
In addition, event traffic counts were obtained at five key intersections and accesses around Moby Events Center during the peak hours before and after the March 9, 2013 CSU basketball game against the University of Nevada. The game started at 6:30 pm and ended at approximately 8:45 pm. Counts were conducted between 5:00 to 7:00 pm for arriving traffic and 8:00 to 10:00 pm for departing traffic. The entering peak hour occurred between 5:30 and 6:30 pm, while the exiting peak hour occurred between 8:45 and 9:45 pm. This game was senior night and it was sold out. The attendance at the game was reported as 8,475 people. The counts were obtained at the five intersections surrounding Moby Arena providing access to the parking areas. The results include the following:

- No turn restrictions at the intersections or police directing traffic for the arrival peak hour. It was traffic as usual.
- For departing traffic, there were several traffic modifications/restrictions:
  - **Laurel Street Parking Lot Access –** A van parked in the outside eastbound lane of Laurel Street with cones to direct through traffic to the inside eastbound through lane between 8:39 and 9:47 pm. Entering traffic was restricted and exiting traffic was only allowed to turn right onto eastbound Laurel Street in the free outside eastbound lane protected by the van and cones.
  - **Plum Street/Shields Street –** A police vehicle was parked in the eastbound lanes of Plum Street of the east leg, so that no traffic entered Plum Street eastbound from the Shields Street intersection between 8:38 and 9:35 pm. Police directed traffic.
  - **Plum Street Parking Lot Access –** Two people set up cones through the intersection to direct/restrict traffic. From the southern parking lot, only northbound left and right turns were allowed. No southbound exiting access onto Plum Street was allowed from the north parking lot. Eastbound Plum was blocked by a police vehicle at Plum/Shields intersection (see previous). Westbound movements on Plum Street approaching the intersection were forced to turn right into the northern parking lot. Only movements occurring at this access intersection along Plum Street are northbound left, northbound right, and westbound right, all of which operated as free movements.
  - **Elizabeth Street/Shields Street –** Person at traffic signal controller modifying signal timing for manual operation between 8:40 and 9:40 pm.

- The total traffic volume into the parking lots between 5:00 and 7:00 pm was 1,414 vehicles.
- The peak hour volume into the parking lots was 982 vehicles per hour (vph).
- The peak 15-minute volume into the parking lots was 247 vehicles, which shows a fairly uniform arrival during the peak hour.
- 65 percent of the traffic entered through the northern accesses while 35 percent entered through the Elizabeth/Shields access.
- The total traffic volume out of the parking lots between 8:00 and 9:45 pm (when they were empty) was 1,173 vehicles.
- The peak hour volume out of the parking lots was 1,039 vph.
- The peak 15-minute volume out of the parking lots was 550 vehicles, which is approximately half of the entire hour.
- 55 percent of the traffic exited through the northern access and 45 percent out through the Elizabeth/Shields access.

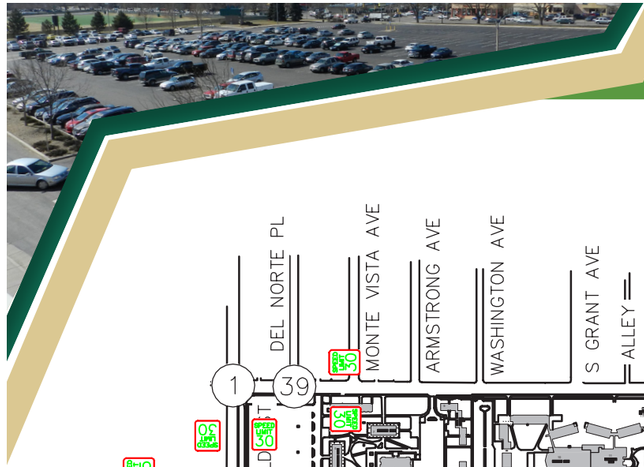
The event traffic count locations and volumes are shown in **Figure 11**.

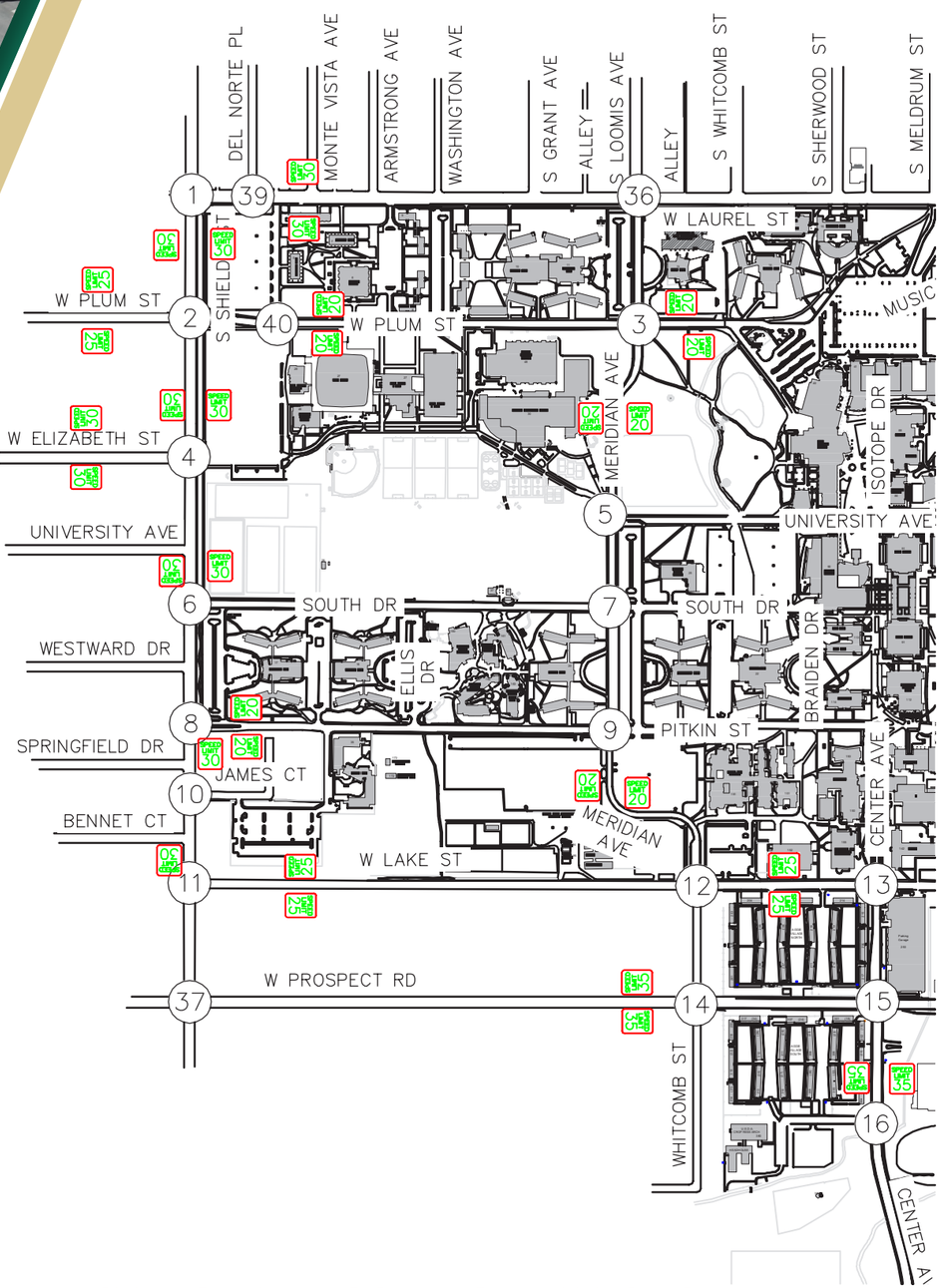


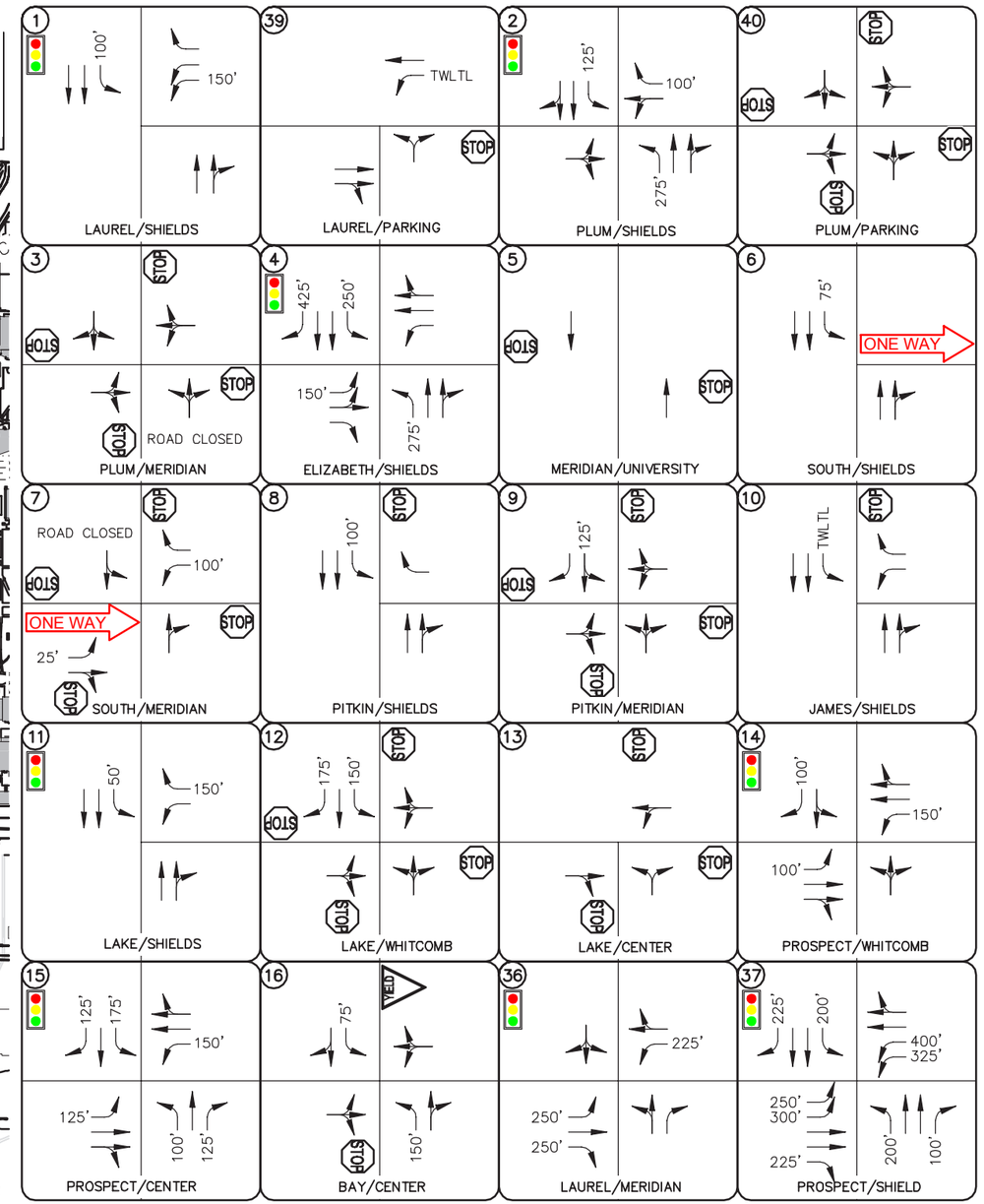


STUDY KEY INTERSECTIONS AND PARKING LOT ACCESSES

FIGURE 2





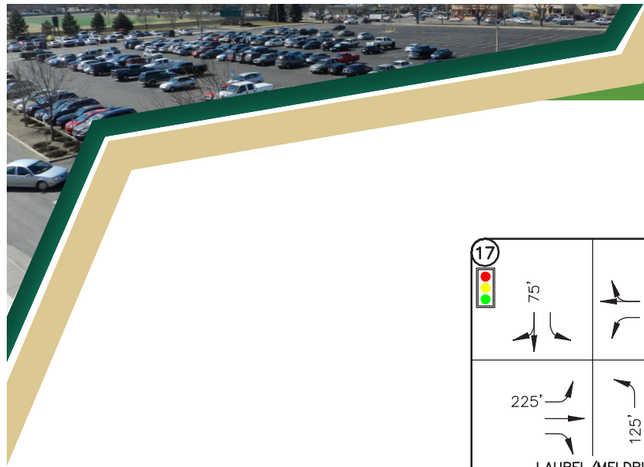


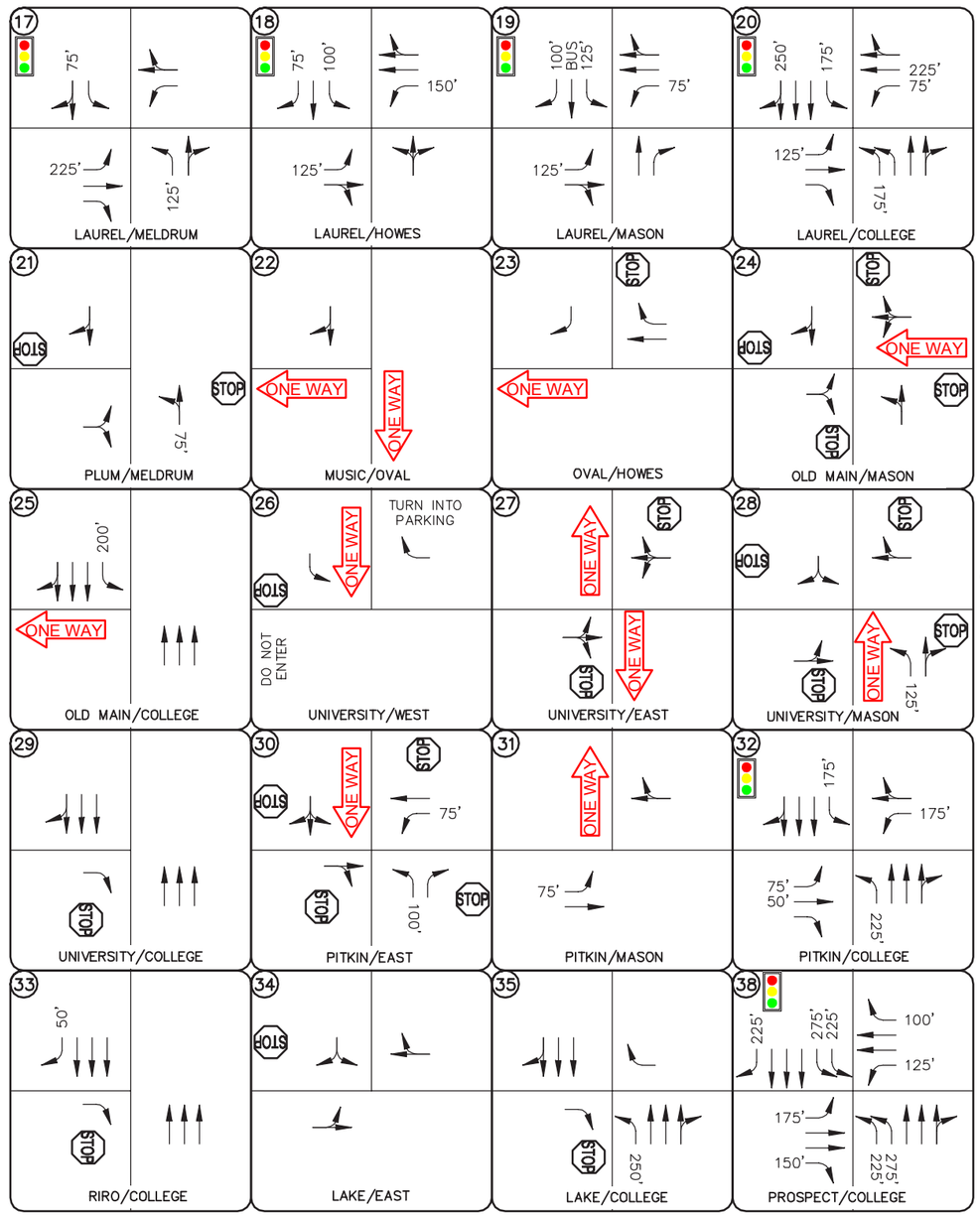
LEGEND:

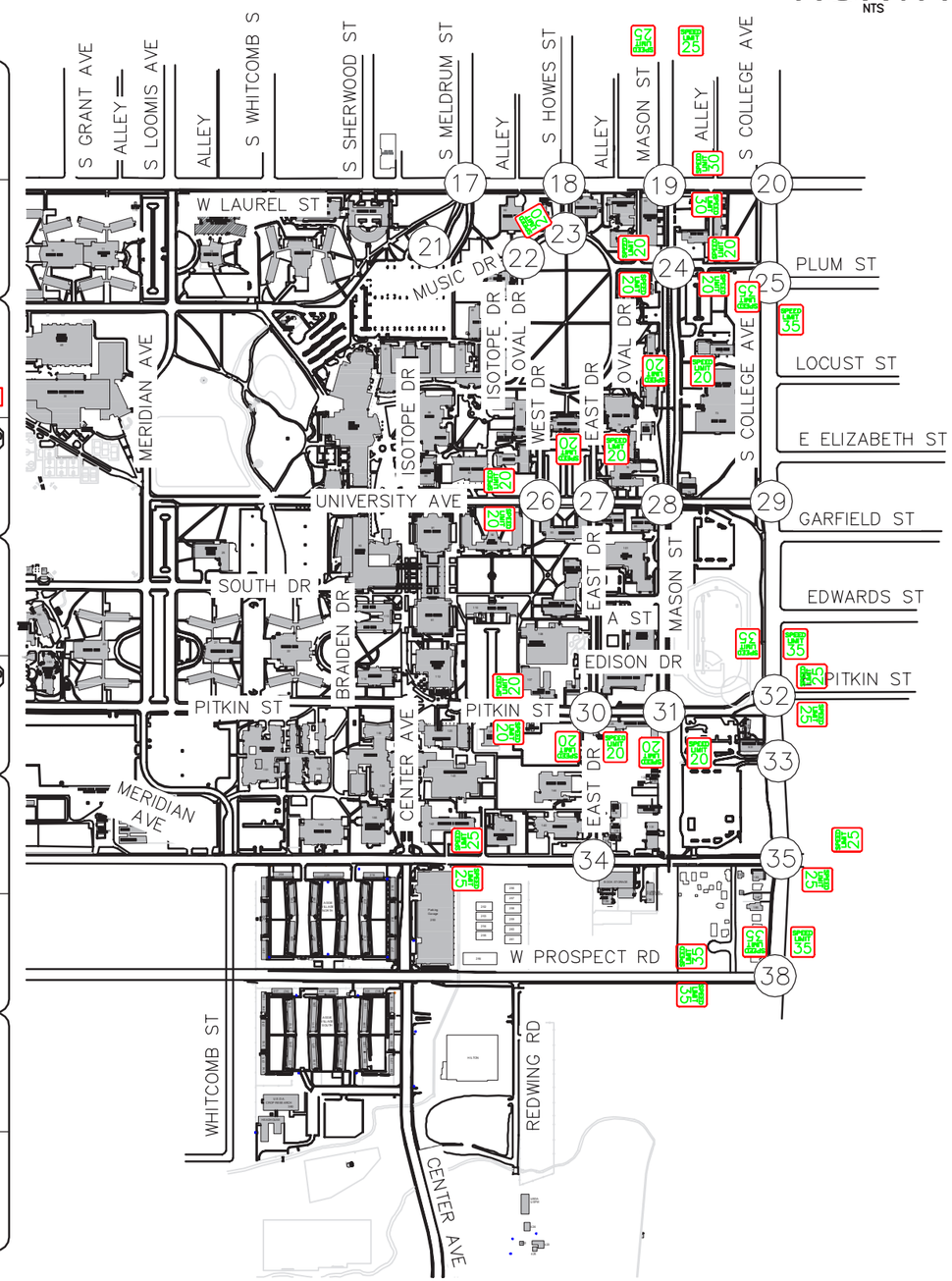
- (1) Study Area Key Intersection
- Roadway Speed Limit
- STOP Stop Controlled Approach
- Signalized Intersection

EXISTING LANE CONFIGURATIONS AND CONTROL – (WEST)

FIGURE 3





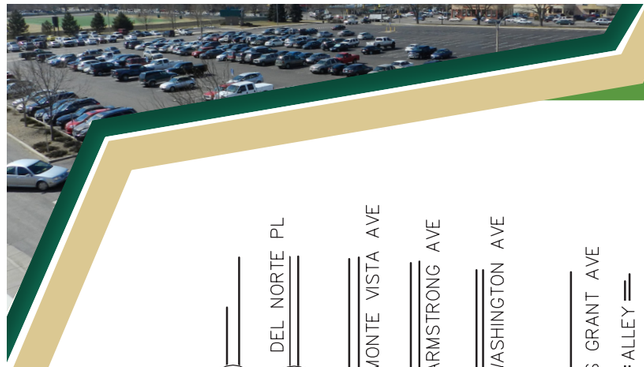


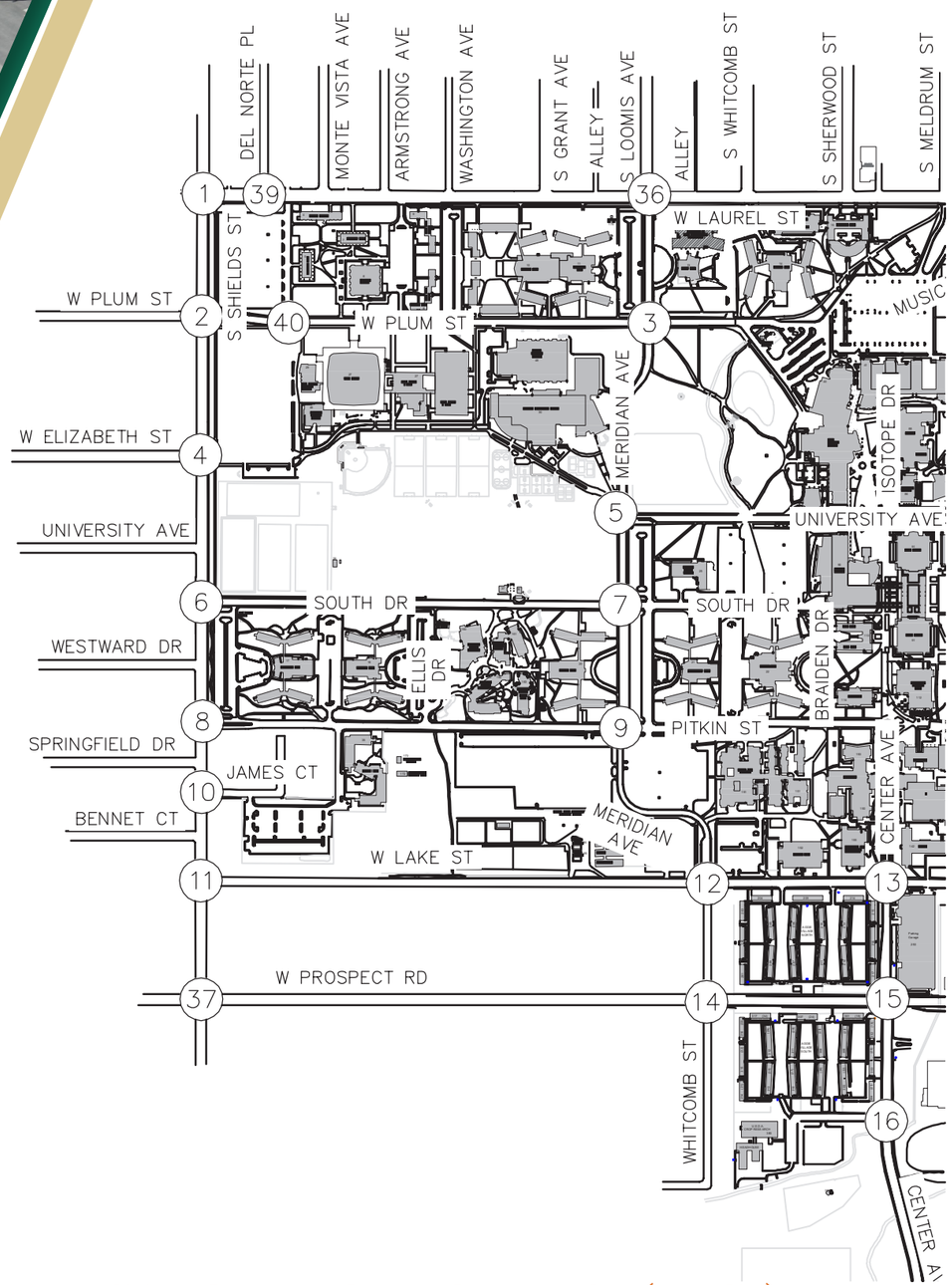
LEGEND:

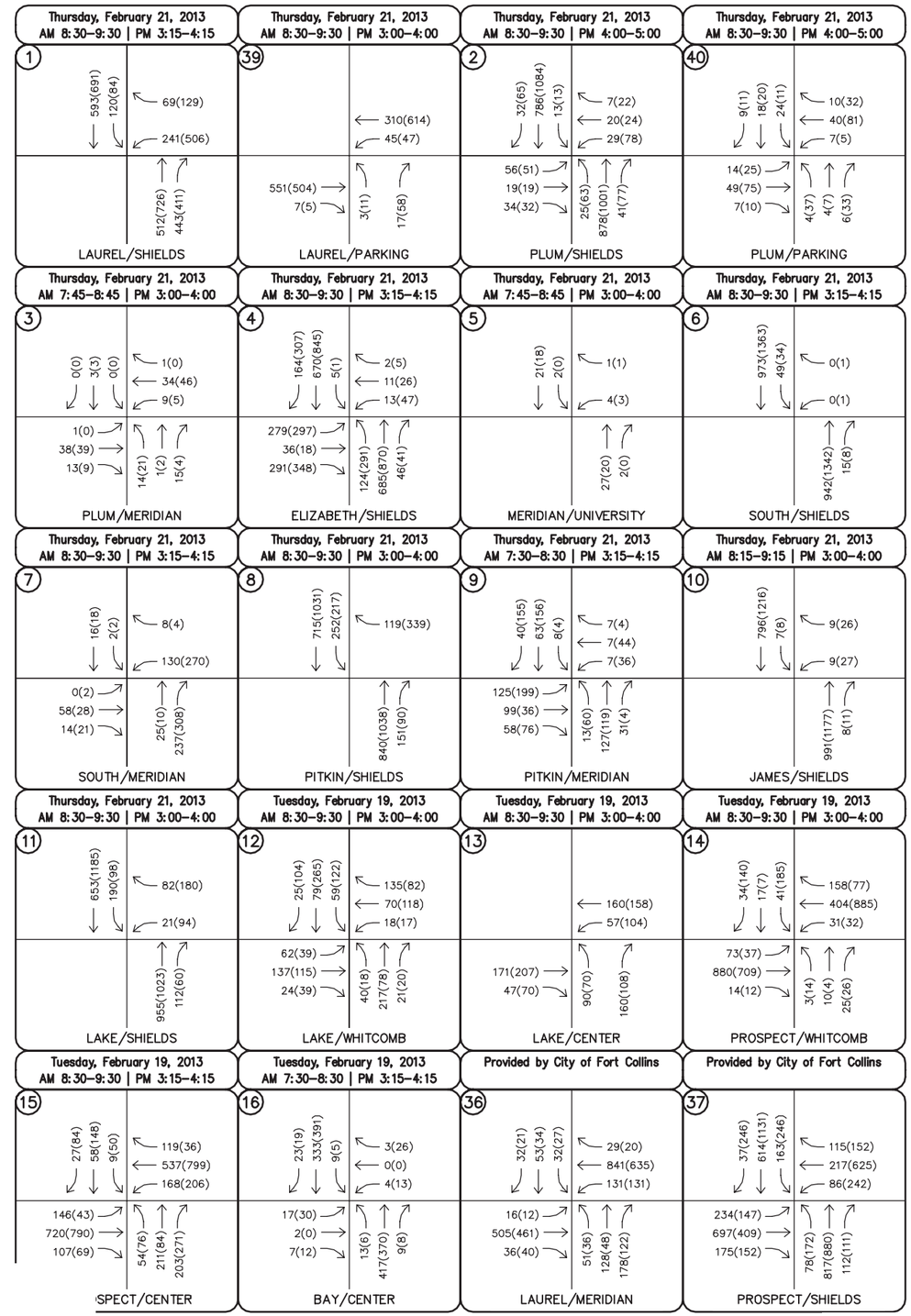
- (1) Study Area Key Intersection
- Roadway Speed Limit
- STOP Stop Controlled Approach
- Signalized Intersection

EXISTING LANE CONFIGURATIONS AND CONTROL – (EAST)

FIGURE 4







NORTH
NTS

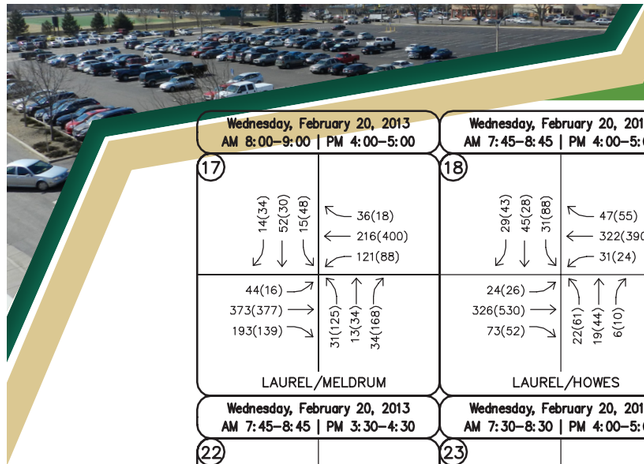
LEGEND:

(1) Study Area Key Intersection

← XX (XX) AM(PM) Peak Hour Traffic Volume

EXISTING VEHICLE VOLUMES – (WEST)

FIGURE 5



17 — LAUREL/MELDRUM
Wednesday, February 20, 2013
AM 8:00–9:00 | PM 4:00–5:00
14(34) 52(30) 15(48) — 36(18) 216(400) 121(88)
44(16) 373(377) 193(139) — 31(125) 13(34) 34(168)

18 — LAUREL/HOWES
Wednesday, February 20, 2013
AM 7:45–8:45 | PM 4:00–5:00
29(43) 45(28) 31(88) — 47(55) 322(390) 31(24)
24(26) 326(530) 73(52) — 22(61) 19(44) 6(10)

19 — LAUREL/MASON
Wednesday, February 20, 2013
AM 8:30–9:30 | PM 4:00–5:00
11(21) 4(5) 14(24) — 60(75) 335(428) 14(12)
24(36) 297(570) 56(15) — 2(1) 10(23) 25(49)

20 — LAUREL/COLLEGE
Wednesday, February 20, 2013
AM 8:30–9:30 | PM 3:45–4:45
51(93) 838(1161) 13(29) — 29(28) 90(109) 68(92)
43(120) 73(116) 213(341) — 308(427) 962(1149) 43(38)

21 — PLUM/MELDRUM
Wednesday, February 20, 2013
AM 8:30–9:30 | PM 4:00–5:00
223(180) 105(76)
80(188) 5(1) — 12(8) 42(146)

22 — MUSIC/OVAL
Wednesday, February 20, 2013
AM 7:45–8:45 | PM 3:30–4:30
60(44) 133(123)

23 — OVAL/HOWES
Wednesday, February 20, 2013
AM 7:30–8:30 | PM 4:00–5:00
148(111) — 54(115) 45(55)

24 — OLD MAIN/MASON
Wednesday, February 20, 2013
AM 8:30–9:30 | PM 4:00–5:00
7(4) 56(31) — 14(12) 8(10) 17(7)
8(10) 0(1) 7(15) — 13(17) 27(39)

25 — OLD MAIN/COLLEGE
Wednesday, February 20, 2013
AM 8:30–9:30 | PM 3:45–4:45
33(2) 1086(1592) — 1313(1614)

26 — UNIVERSITY/WEST
Wednesday, February 20, 2013
AM 8:15–9:15 | PM 4:00–5:00
4(2) 107(107) — 19(10)
22(15)

27 — UNIVERSITY/EAST
Wednesday, February 20, 2013
AM 7:30–8:30 | PM 4:00–5:00
79(88) 55(39) 52(43)
9(33) 26(58) 82(75)

28 — UNIVERSITY/MASON
Wednesday, February 20, 2013
AM 7:30–8:30 | PM 3:45–4:45
23(23) 27(50) — 5(7) 31(42)
4(4) 20(50) — 133(106) 60(32) 63(26)

29 — UNIVERSITY/COLLEGE
Wednesday, February 20, 2013
AM 8:30–9:30 | PM 4:00–5:00
39(31) 1025(1708)
58(155) — 1313(1372)

30 — PITKIN/EAST
Tuesday, February 19, 2013
AM 7:30–8:30 | PM 4:00–5:00
10(13) 53(97) 15(39) — 106(60) 47(37)
26(87) 28(32) — 48(32) 176(141)

31 — PITKIN/MASON
Tuesday, February 19, 2013
AM 7:30–8:30 | PM 3:00–4:00
194(50) 142(89)
155(99) 48(188) — 3(2)

32 — PITKIN/COLLEGE
Tuesday, February 19, 2013
AM 8:00–9:00 | PM 3:00–4:00
54(32) 949(1667) 25(29) — 16(24) 55(31) 41(83)
21(78) 23(54) 14(96) — 195(75) 1298(1359) 33(25)

33 — RIRO/COLLEGE
Tuesday, February 19, 2013
AM 7:45–8:45 | PM 3:00–4:00
5(1) 952(1711)
0(23) — 1567(1544)

34 — LAKE/EAST
Tuesday, February 19, 2013
AM 8:30–9:30 | PM 3:00–4:00
118(133) 10(18) — 19(11) 185(102)
186(191) 111(214)

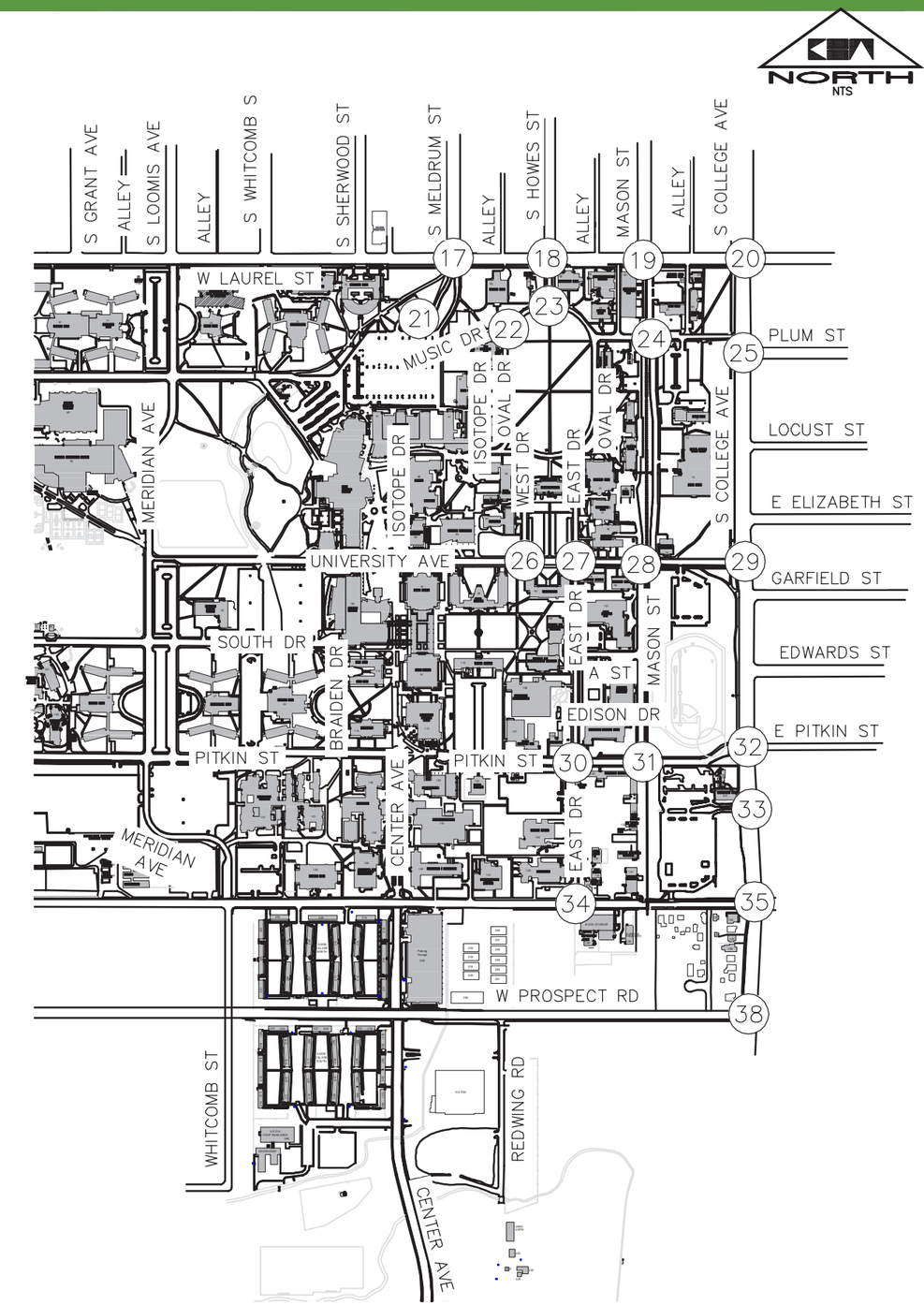
35 — LAKE/COLLEGE
Tuesday, February 19, 2013
AM 7:45–8:45 | PM 3:15–4:15
65(49) 856(1625) — 11(41)
27(216) — 152(49) 1538(1335) 61(52)

38 — PROSPECT/COLLEGE
Provided by City of Fort Collins
132(247) 646(1677) 64(212) — 139(61) 420(634) 136(186)
199(195) 583(557) 168(345) — 200(331) 1213(1137) 105(116)

LEGEND:

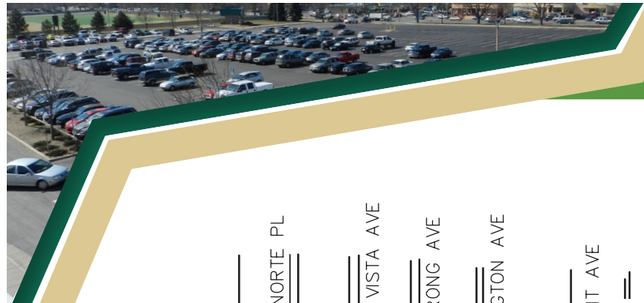
(1) Study Area Key Intersection

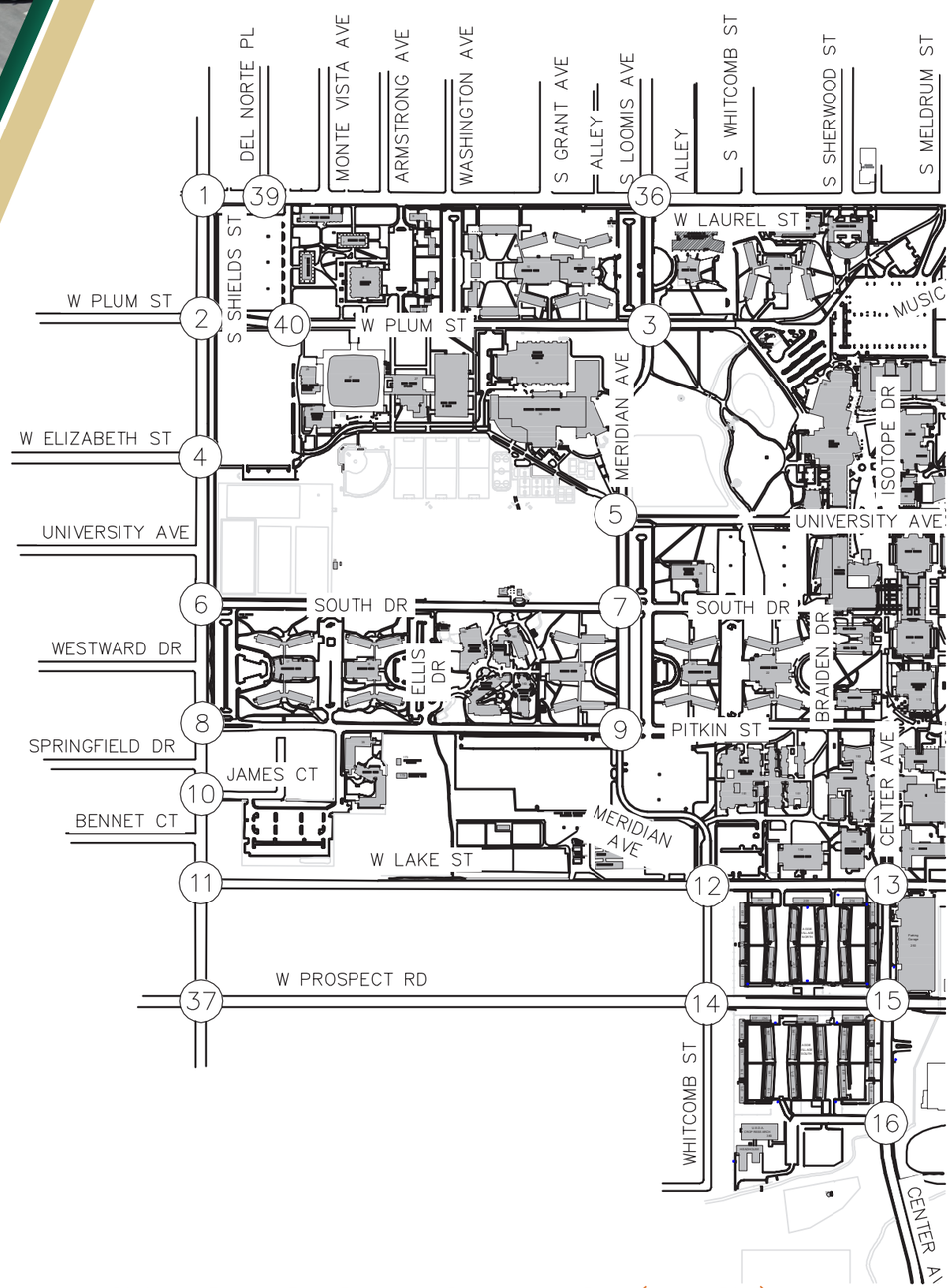
⟵ XX (XX) AM(PM) Peak Hour Traffic Volume

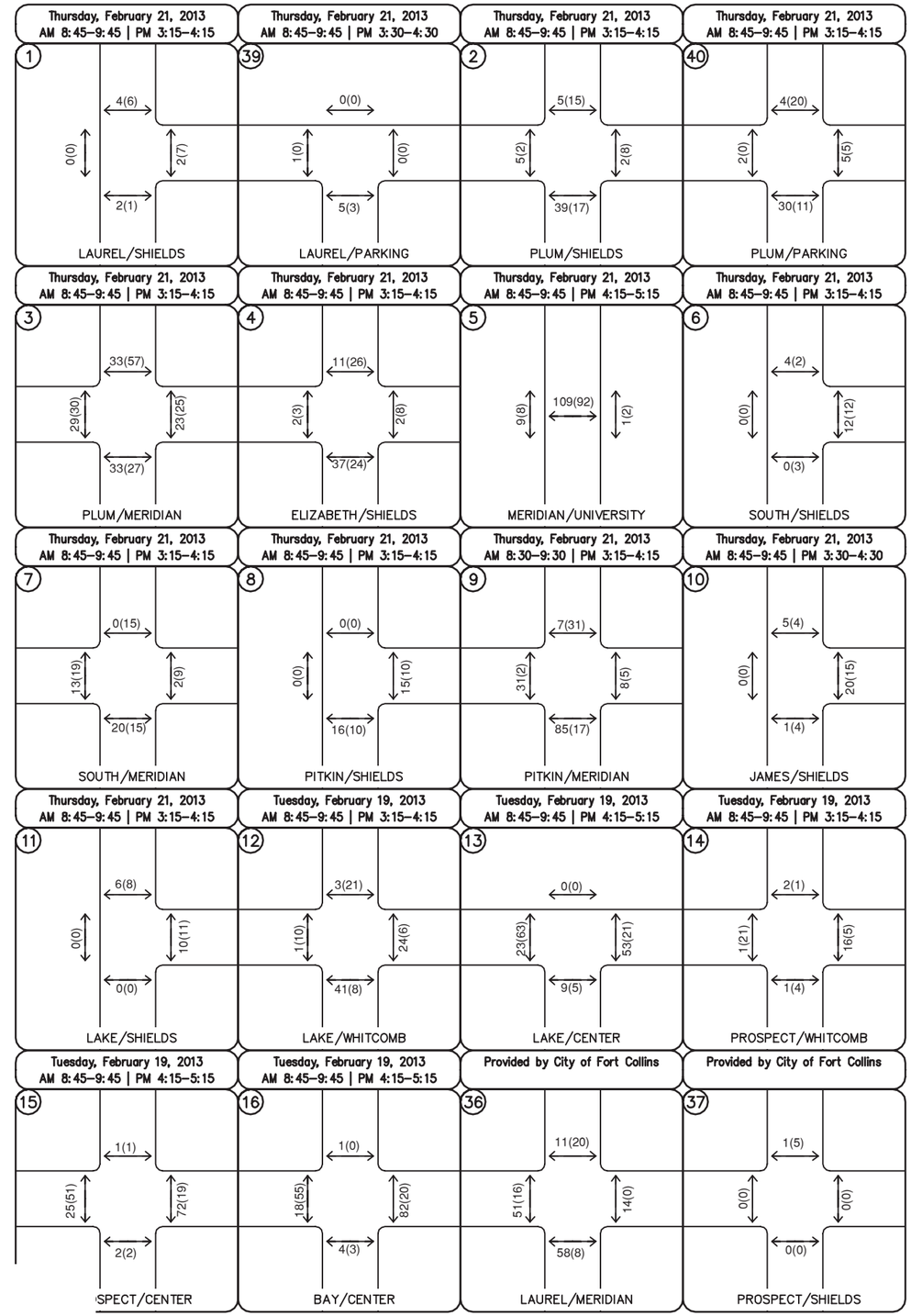


EXISTING VEHICLE VOLUMES – (EAST)

FIGURE 6







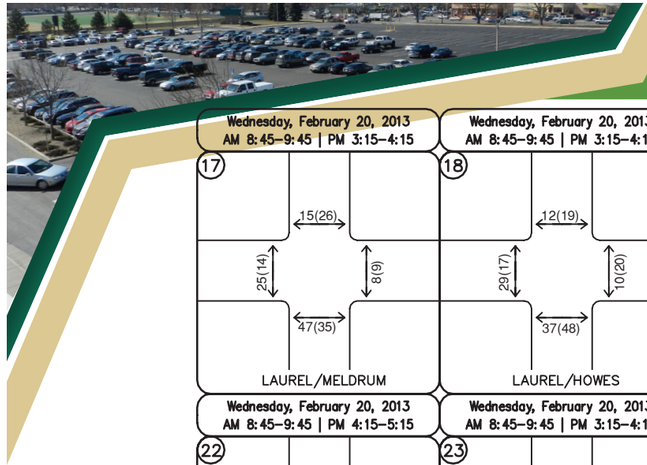
NORTH
NTS

LEGEND:

(1)	Study Area Key Intersection
⟷ XX (XX)	AM(PM) Peak Hour Traffic Volume

EXISTING BICYCLE VOLUMES – (WEST)

FIGURE 7



17 — LAUREL/MELDRUM
Wednesday, February 20, 2013
AM 8:45–9:45 | PM 3:15–4:15
15(26) | 25(14) | 8(9) | 47(35)

18 — LAUREL/HOWES
Wednesday, February 20, 2013
AM 8:45–9:45 | PM 3:15–4:15
12(19) | 29(17) | 10(20) | 37(48)

19 — LAUREL/MASON
Wednesday, February 20, 2013
AM 8:45–9:45 | PM 3:15–4:15
28(14) | 11(4) | 1(10) | 7(18)

20 — LAUREL/COLLEGE
Wednesday, February 20, 2013
AM 8:30–9:30 | PM 3:30–4:30
25(22) | 5(8) | 4(6) | 20(33)

21 — PLUM/MELDRUM
Wednesday, February 20, 2013
AM 8:15–9:15 | PM 3:30–4:30
13(18) | 13(3) | 23(21) | 14(10)

22 — MUSIC/OVAL
Wednesday, February 20, 2013
AM 8:45–9:45 | PM 4:15–5:15
2(6) | 42(8) | 0(0) | 0(0)

23 — OVAL/HOWES
Wednesday, February 20, 2013
AM 8:45–9:45 | PM 3:15–4:15
11(5) | 9(9) | 9(7) | 0(0)

24 — OLD MAIN/MASON
Wednesday, February 20, 2013
AM 8:45–9:45 | PM 4:00–5:00
23(8) | 5(2) | 4(13) | 2(29)

25 — OLD MAIN/COLLEGE
Wednesday, February 20, 2013
AM 7:45–8:45 | PM 3:15–4:15
0(0) | 5(14) | 0(0) | 1(1)

26 — UNIVERSITY/WEST
Wednesday, February 20, 2013
AM 8:45–9:45 | PM 4:00–5:00
58(34) | 22(14) | 9(16) | 0(0)

27 — UNIVERSITY/EAST
Wednesday, February 20, 2013
AM 8:45–9:45 | PM 4:00–5:00
60(28) | 5(14) | 12(11) | 13(32)

28 — UNIVERSITY/MASON
Wednesday, February 20, 2013
AM 8:15–9:15 | PM 4:00–5:00
53(29) | 30(9) | 8(14) | 8(34)

29 — UNIVERSITY/COLLEGE
Wednesday, February 20, 2013
AM 8:45–9:45 | PM 3:30–4:30
0(0) | 7(9) | 0(0) | 0(0)

30 — PITKIN/EAST
Tuesday, February 19, 2013
AM 8:45–9:45 | PM 3:15–4:15
67(37) | 12(12) | 8(22) | 30(42)

31 — PITKIN/MASON
Tuesday, February 19, 2013
AM 8:45–9:45 | PM 3:15–4:15
69(35) | 3(2) | 69(31) | 30(71)

32 — PITKIN/COLLEGE
Tuesday, February 19, 2013
AM 8:45–9:45 | PM 3:15–4:15
26(7) | 4(12) | 0(3) | 6(21)

33 — RIRO/COLLEGE
Tuesday, February 19, 2013
AM 8:00–9:00 | PM 3:30–4:30
0(0) | 3(13) | 0(0) | 0(0)

34 — LAKE/EAST
Tuesday, February 19, 2013
AM 8:45–9:45 | PM 3:15–4:15
8(4) | 0(3) | 10(6) | 0(0)

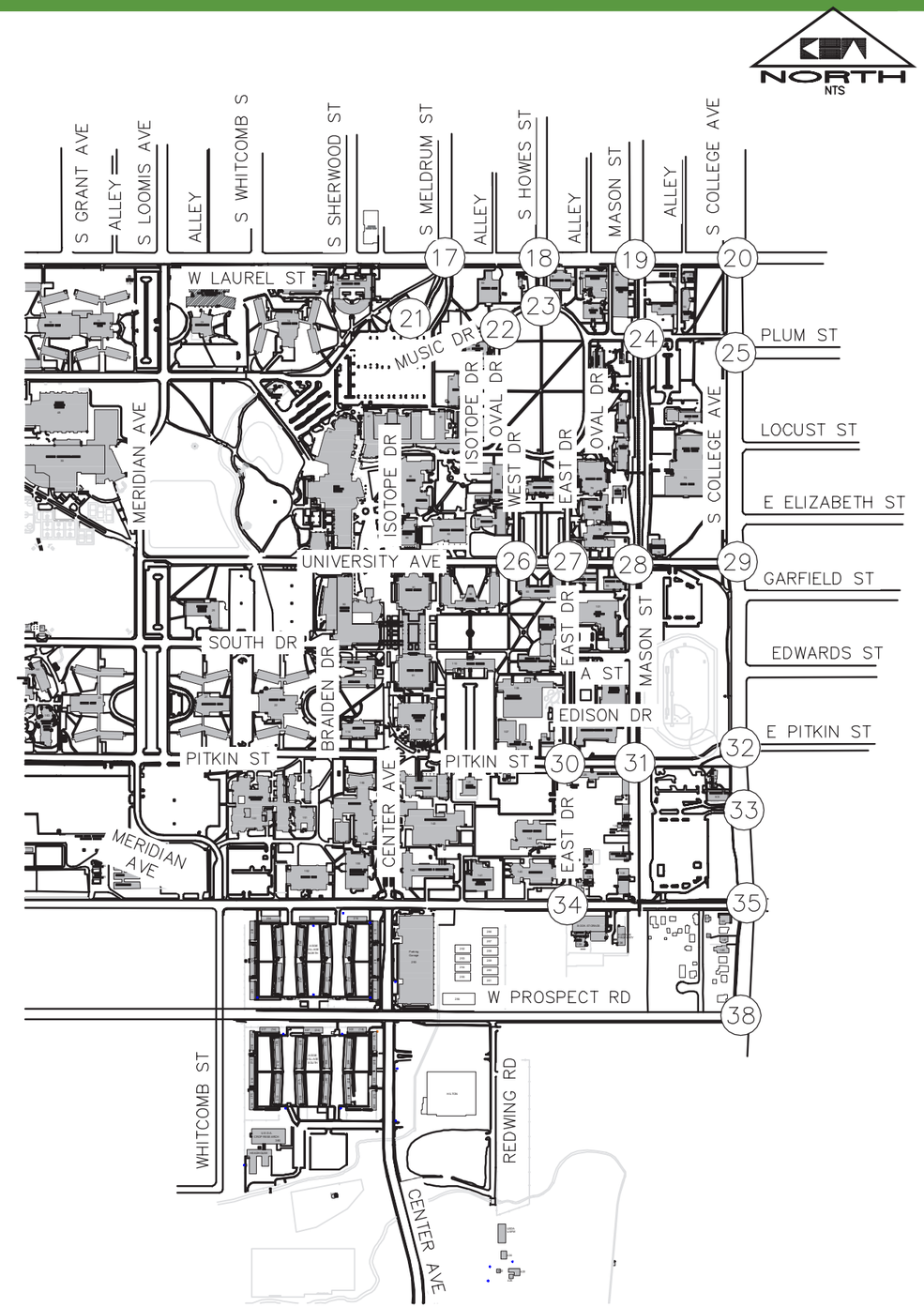
35 — LAKE/COLLEGE
Tuesday, February 19, 2013
AM 7:45–8:45 | PM 3:15–4:15
0(0) | 2(9) | 2(5) | 0(1)

38 — PROSPECT/COLLEGE
No Data Available for Bicycle Volume

LEGEND:

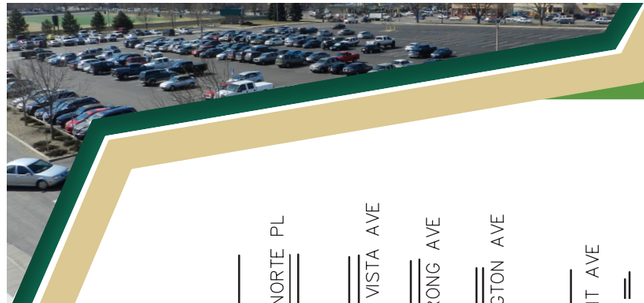
(1) Study Area Key Intersection

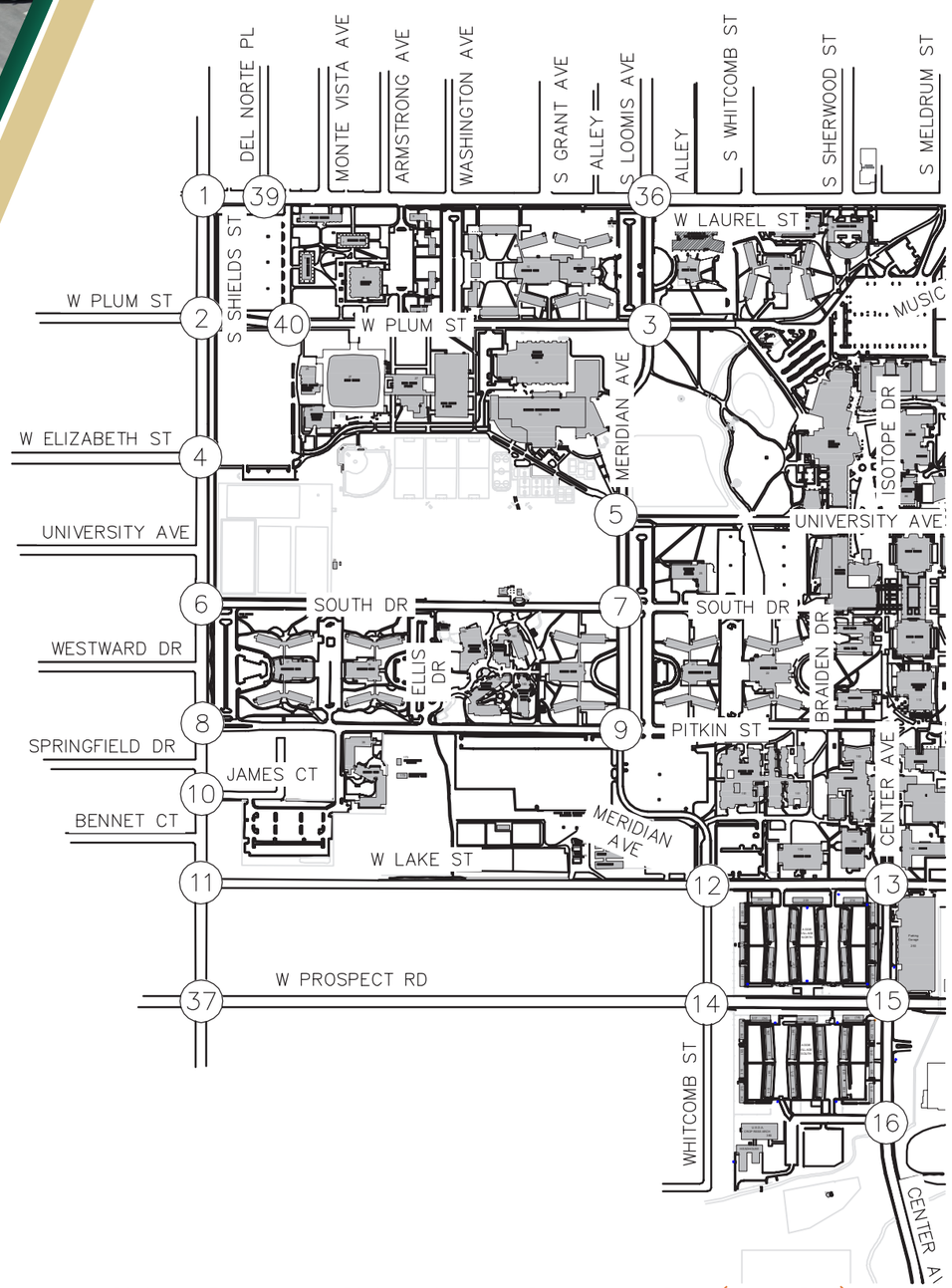
⟷ XX (XX) AM(PM) Peak Hour Traffic Volume

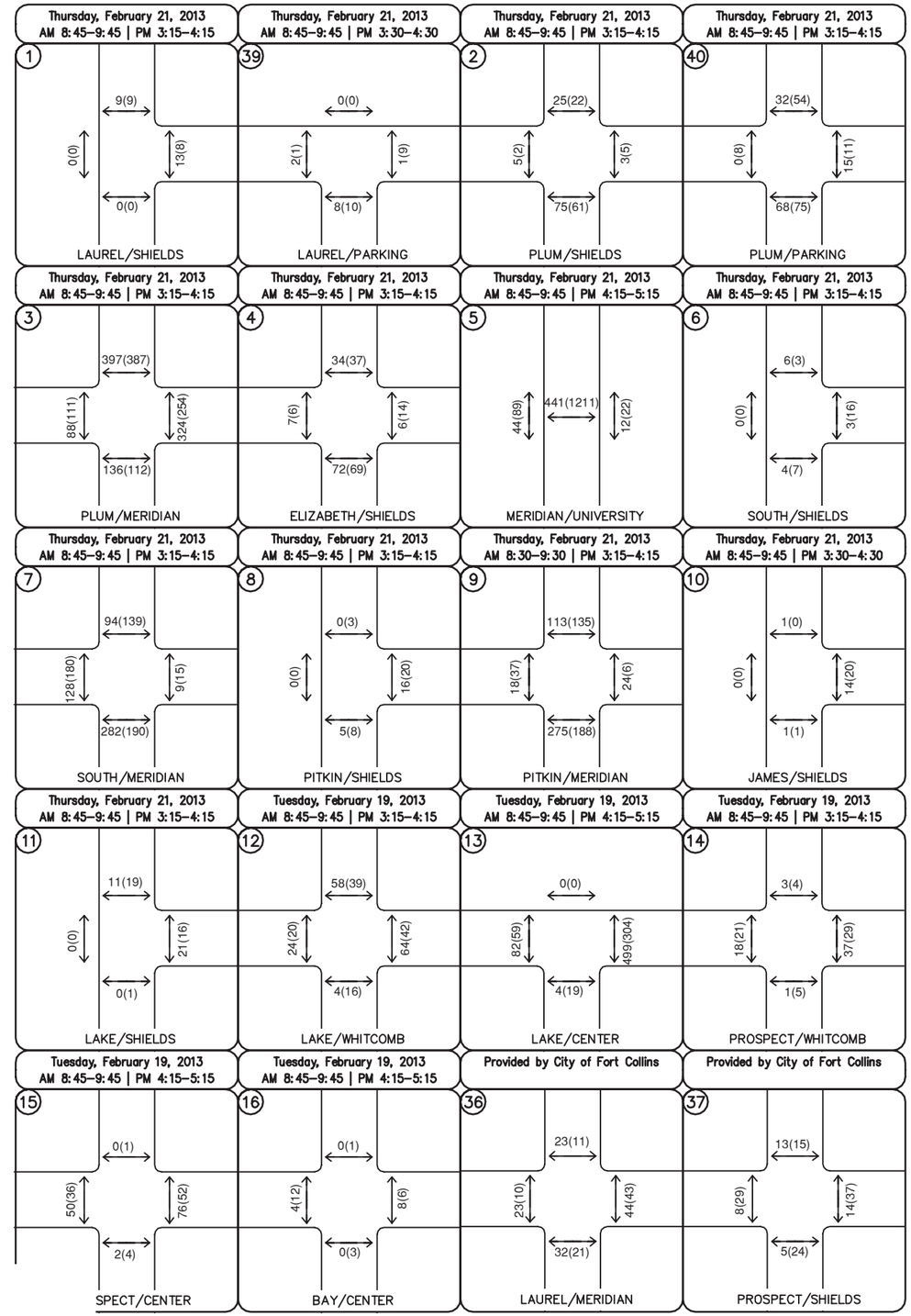


EXISTING BICYCLE VOLUMES – (EAST)

FIGURE 8







NORTH
NTS

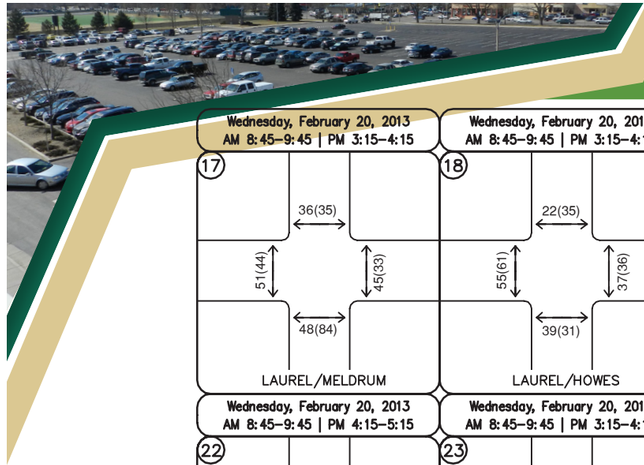
LEGEND:

(1) Study Area Key Intersection

⟷ XX (XX) AM(PM) Peak Hour Traffic Volume

EXISTING PEDESTRIAN VOLUMES – (WEST)

FIGURE 9



17 — LAUREL/MELDRUM
Wednesday, February 20, 2013
AM 8:45–9:45 | PM 3:15–4:15
36(35) | 51(44) | 45(33) | 48(84)

18 — LAUREL/HOWES
Wednesday, February 20, 2013
AM 8:45–9:45 | PM 3:15–4:15
22(35) | 55(61) | 37(36) | 39(31)

19 — LAUREL/MASON
Wednesday, February 20, 2013
AM 8:45–9:45 | PM 3:15–4:15
29(41) | 31(20) | 11(29) | 28(75)

20 — LAUREL/COLLEGE
Wednesday, February 20, 2013
AM 8:30–9:30 | PM 3:30–4:30
8(36) | 3(10) | 5(30) | 31(37)

21 — PLUM/MELDRUM
Wednesday, February 20, 2013
AM 8:15–9:15 | PM 3:30–4:30
16(30) | 18(20) | 17(34) | 7(16)

22 — MUSIC/OVAL
Wednesday, February 20, 2013
AM 8:45–9:45 | PM 4:15–5:15
21(15) | 42(70) | 0(0) | 0(0)

23 — OVAL/HOWES
Wednesday, February 20, 2013
AM 8:45–9:45 | PM 3:15–4:15
32(35) | 16(22) | 38(39) | 0(0)

24 — OLD MAIN/MASON
Wednesday, February 20, 2013
AM 8:45–9:45 | PM 4:00–5:00
23(19) | 22(11) | 9(14) | 64(74)

25 — OLD MAIN/COLLEGE
Wednesday, February 20, 2013
AM 7:45–8:45 | PM 3:15–4:15
0(0) | 7(55) | 0(0) | 26(21)

26 — UNIVERSITY/WEST
Wednesday, February 20, 2013
AM 8:45–9:45 | PM 4:00–5:00
130(109) | 45(31) | 12(19) | 0(0)

27 — UNIVERSITY/EAST
Wednesday, February 20, 2013
AM 8:45–9:45 | PM 4:00–5:00
115(88) | 22(16) | 27(31) | 132(110)

28 — UNIVERSITY/MASON
Wednesday, February 20, 2013
AM 8:15–9:15 | PM 4:00–5:00
87(65) | 23(13) | 10(23) | 81(105)

29 — UNIVERSITY/COLLEGE
Wednesday, February 20, 2013
AM 8:45–9:45 | PM 3:30–4:30
2(1) | 4(11) | 0(0) | 0(1)

30 — PITKIN/EAST
Tuesday, February 19, 2013
AM 8:45–9:45 | PM 3:15–4:15
96(72) | 31(23) | 9(2) | 104(105)

31 — PITKIN/MASON
Tuesday, February 19, 2013
AM 8:45–9:45 | PM 3:15–4:15
69(54) | 56(33) | 42(20) | 167(110)

32 — PITKIN/COLLEGE
Tuesday, February 19, 2013
AM 8:45–9:45 | PM 3:15–4:15
31(21) | 1(5) | 0(5) | 3(5)

33 — RIRO/COLLEGE
Tuesday, February 19, 2013
AM 8:00–9:00 | PM 3:30–4:30
0(0) | 1(6) | 0(0) | 0(0)

34 — LAKE/EAST
Tuesday, February 19, 2013
AM 8:45–9:45 | PM 3:15–4:15
70(39) | 2(5) | 0(0) | 0(0)

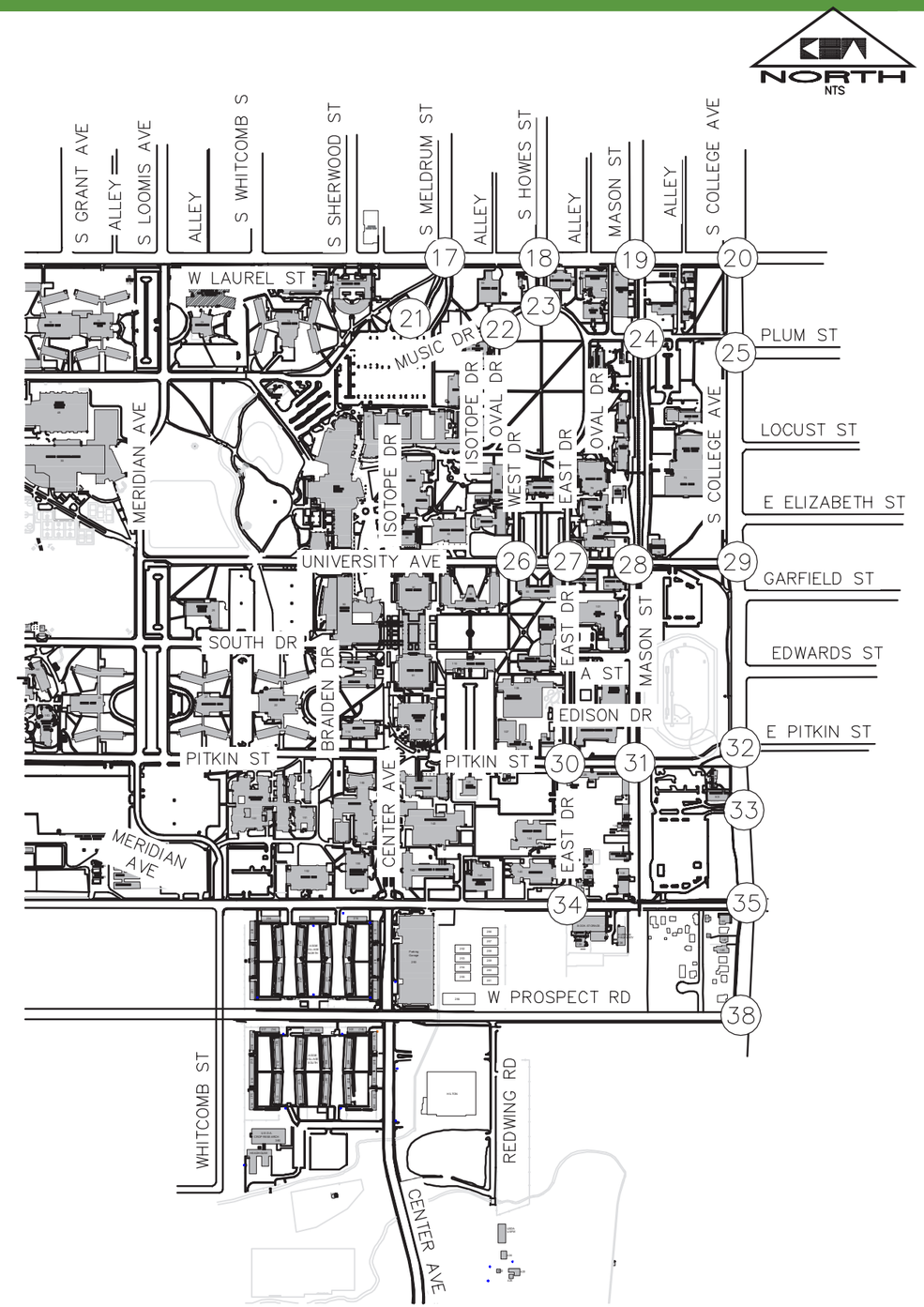
35 — LAKE/COLLEGE
Tuesday, February 19, 2013
AM 7:45–8:45 | PM 3:15–4:15
5(1) | 7(2) | 7(9) | 6(1)

38 — PROSPECT/COLLEGE
Provided by City of Fort Collins
3(7) | 3(20) | 5(2) | 4(3)

LEGEND:

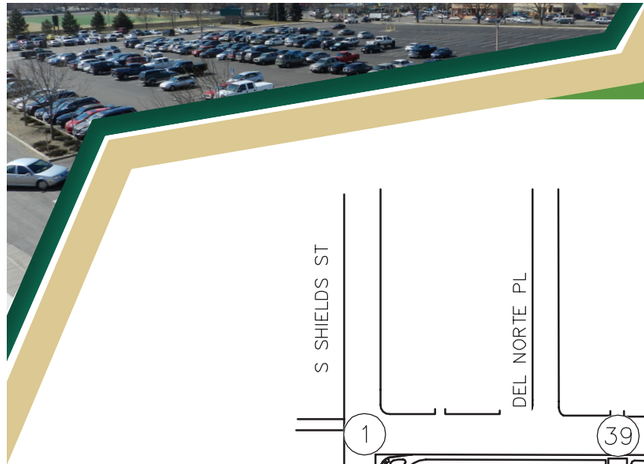
(1) Study Area Key Intersection

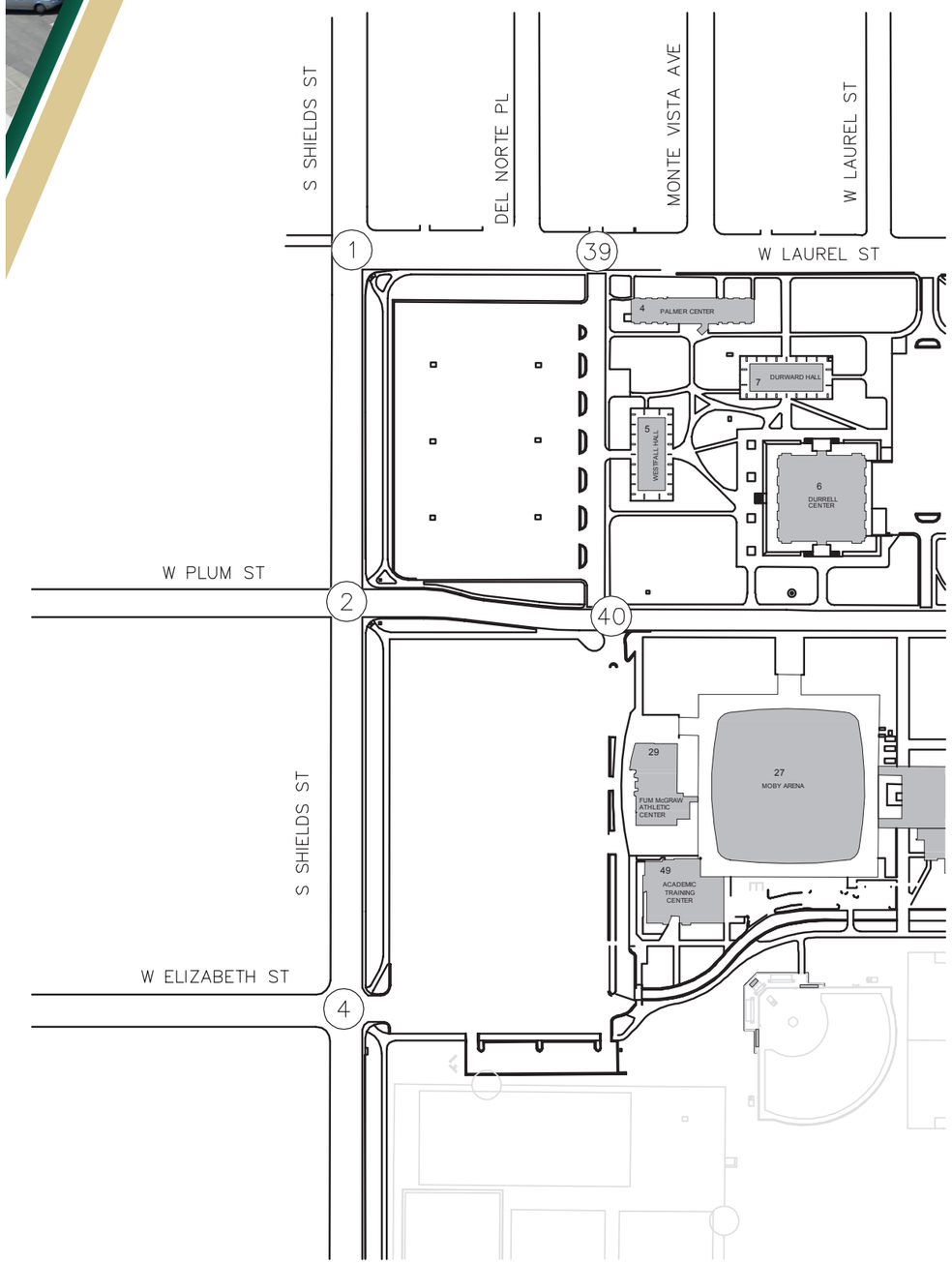
⟷ XX (XX) AM(PM) Peak Hour Traffic Volume

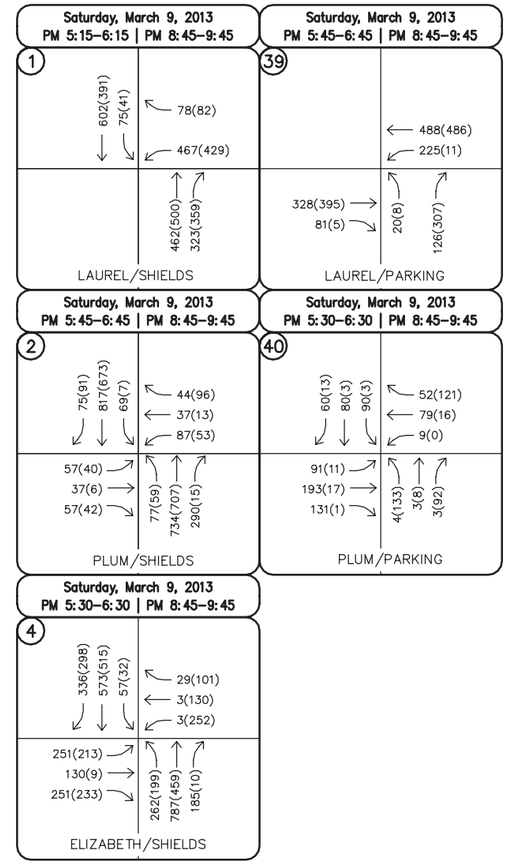


EXISTING PEDESTRIAN VOLUMES – (EAST)

FIGURE 10







NORTH
NTS

LEGEND:

(1) Study Area Key Intersection

⟵ XX (XX) Before(After) Peak Hour Traffic Volume

EVENT TRAFFIC – BEFORE AND AFTER A BASKETBALL GAME

FIGURE 11

Kimley-Horn and Associates, Inc.

Cordon Study Assessment

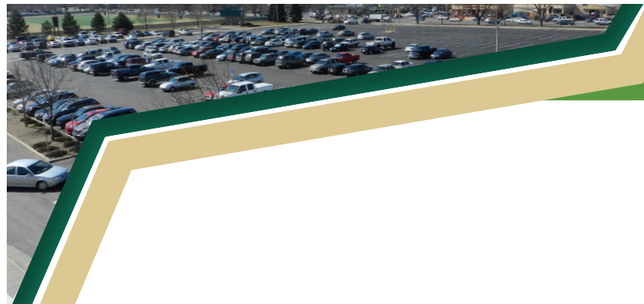
This section of the study identifies the cordon assessment requested by CSU. The cordon study identified the arrival and departure directions of traffic to and from campus for the three modes studied: vehicles, bicycles, and pedestrians.

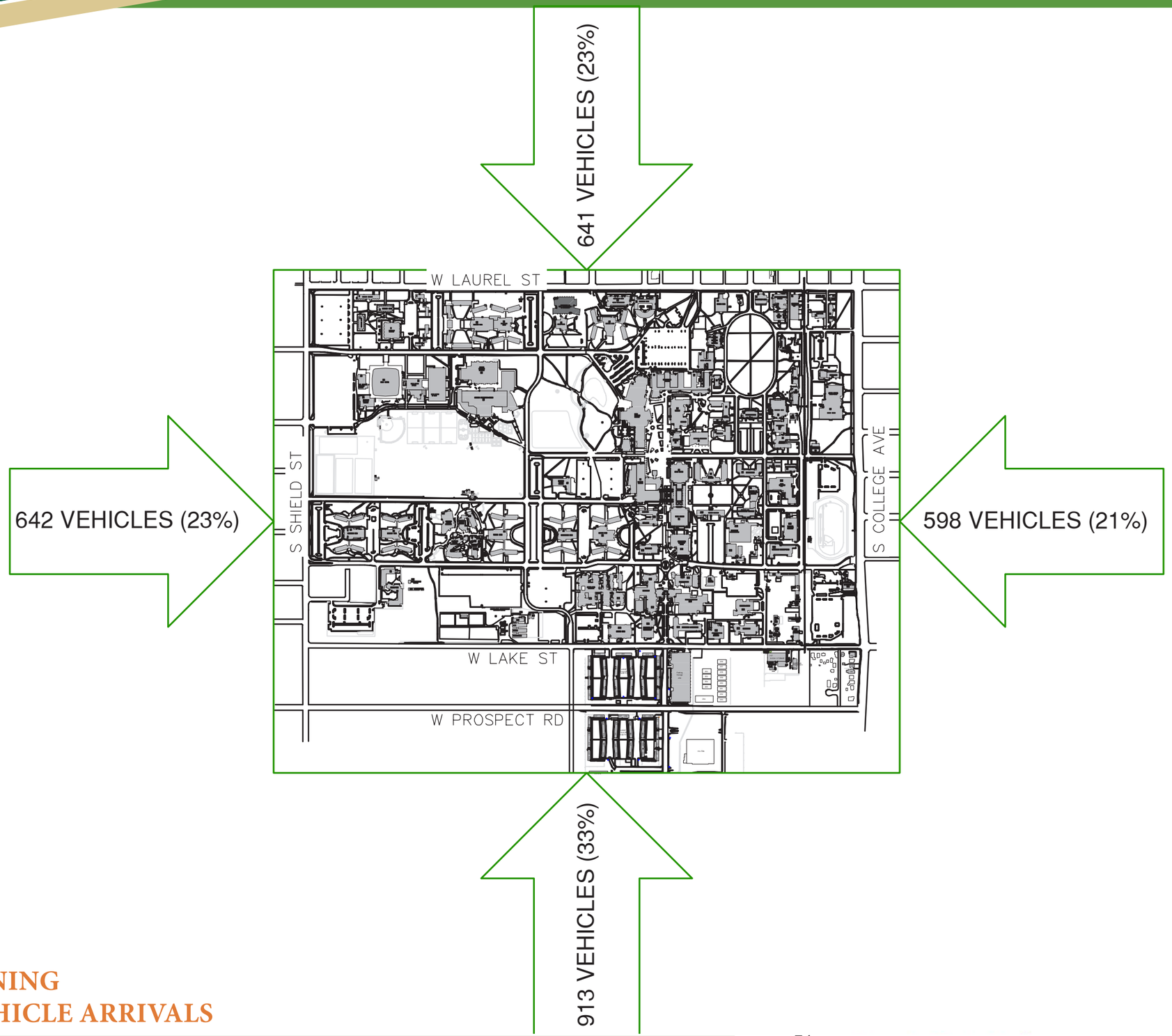
Existing Traffic Arrivals to Campus

After the existing traffic count data had been analyzed, counts were assigned a direction from which the traffic accessed the CSU campus. As seen in **Figures 12** and **13**, the largest amount of vehicle and bicycle traffic during the morning peak hour arrived from the south. For both modes of transportation, each direction contained 15 to 34 percent of the traffic, thus indicating a relatively even distribution between all directions. The pedestrian morning peak arrivals, as seen in **Figure 14**, are not as evenly distributed. One-half of students and staff traveling to campus have been shown to approach the university from the north. This high proportion of pedestrian traffic coming from the north side of campus may be due to the increasing amount of students who commute to and park in the residential areas bordering CSU before walking onto campus.

Existing Traffic Departures from Campus

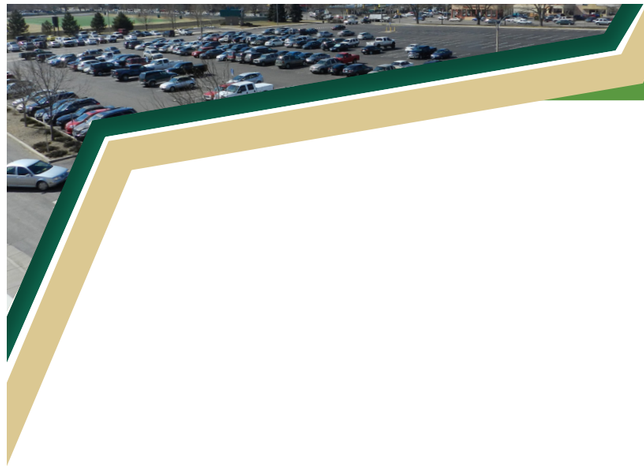
Afternoon peak hour departures for vehicles leaving the CSU campus are shown in **Figure 15**. The percentage of vehicles departing campus in each direction was consistent with the morning arrival percentages, with the exception of a slightly larger amount of traffic leaving campus travelling east. **Figures 16** and **17** demonstrate that the bicycle and pedestrian afternoon peak hour departures were similarly consistent with morning arrivals. The data indicates a small shift of bicycle and pedestrian traffic, with more students and staff departing campus traveling north and east than in the morning peak period.

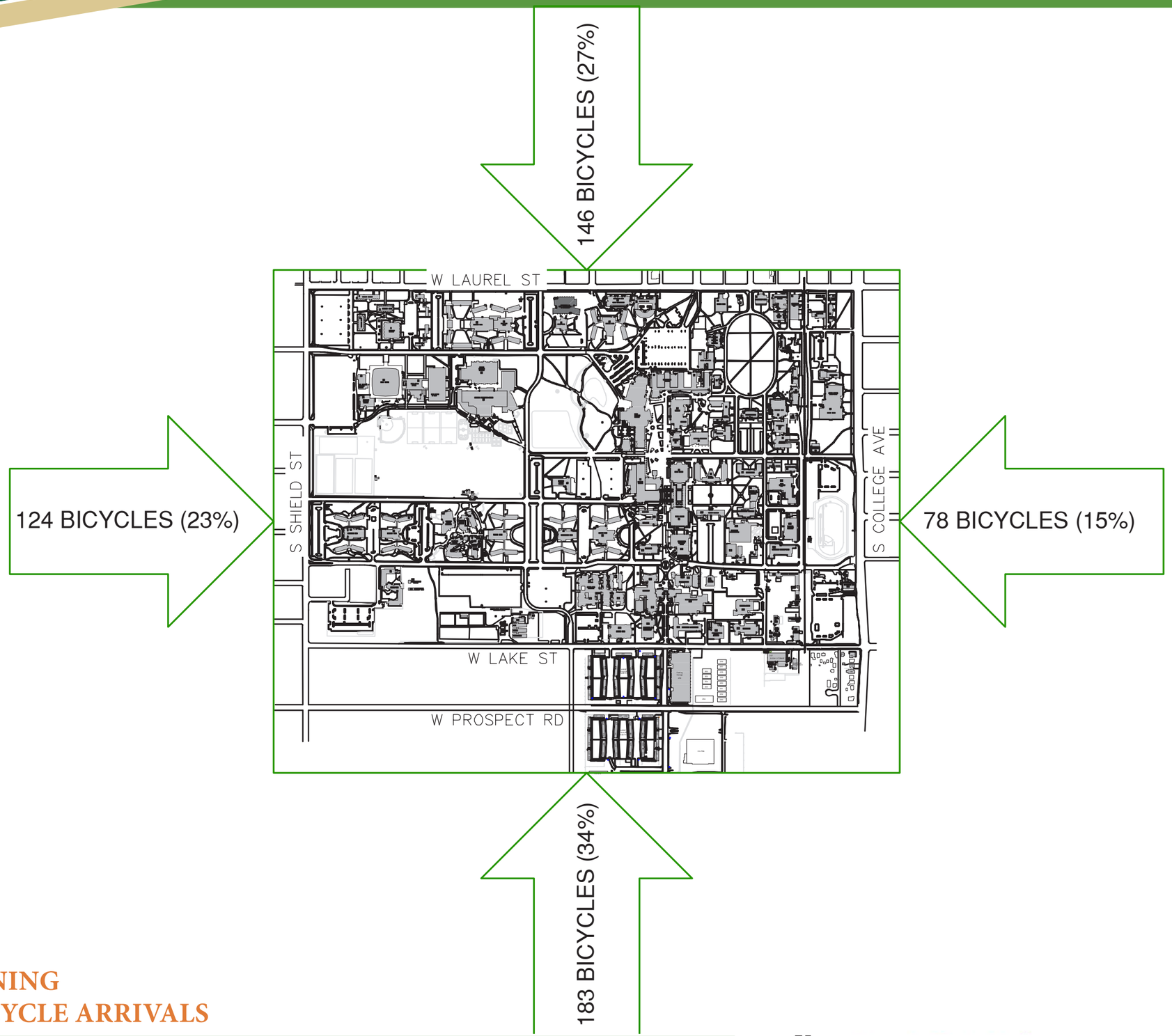




EXISTING MORNING PEAK HOUR VEHICLE ARRIVALS

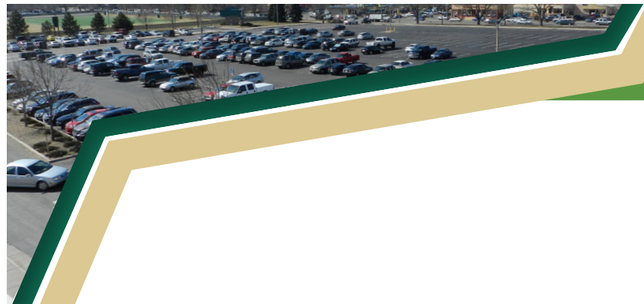
FIGURE 12

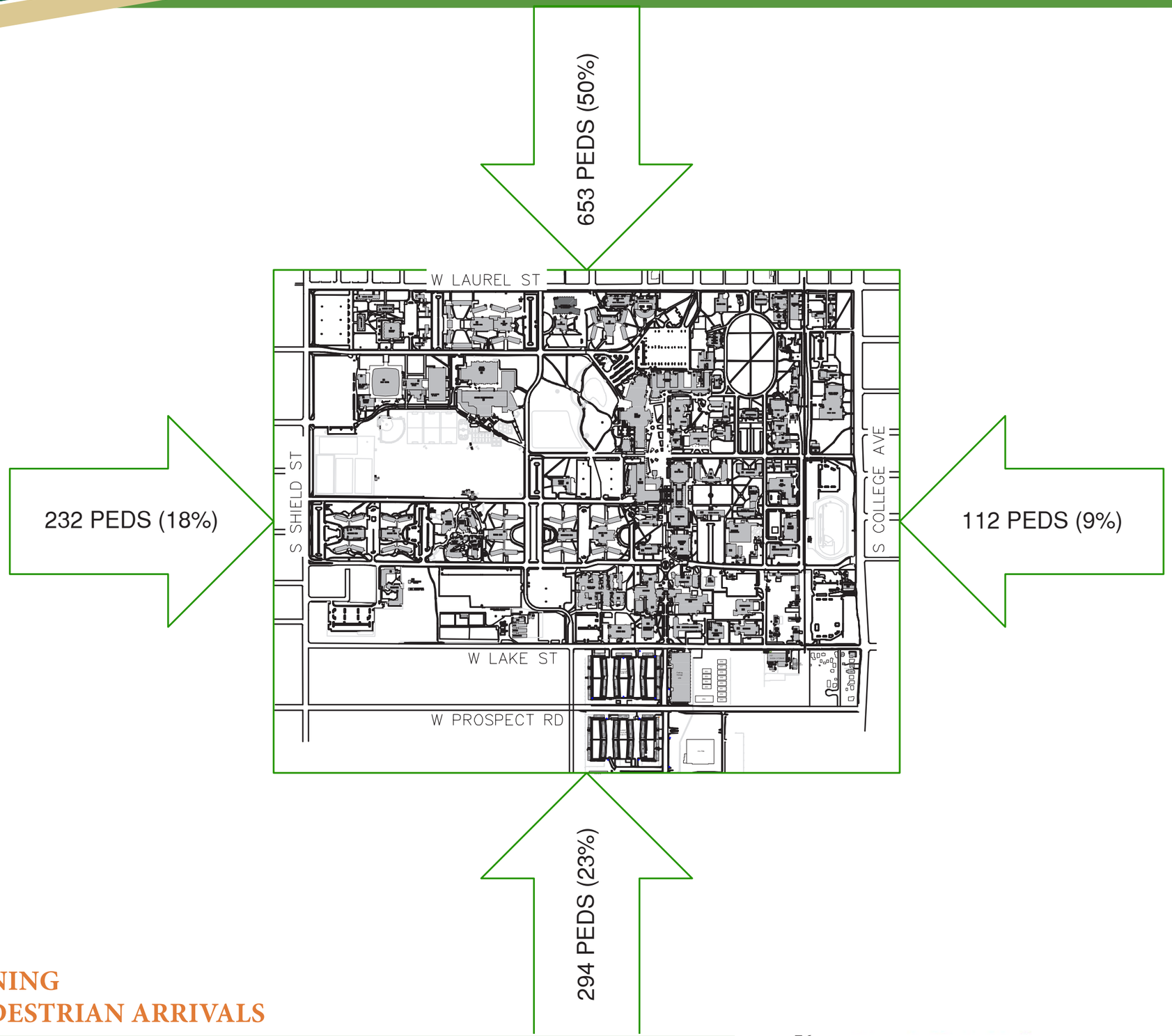




EXISTING MORNING PEAK HOUR BICYCLE ARRIVALS

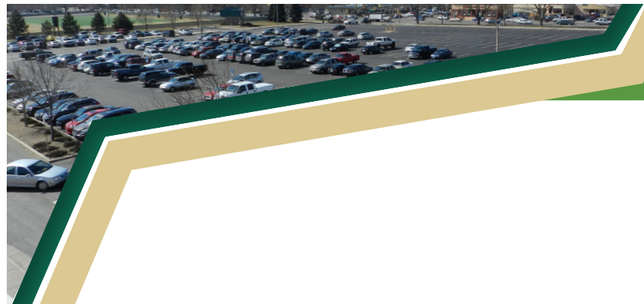
FIGURE 13

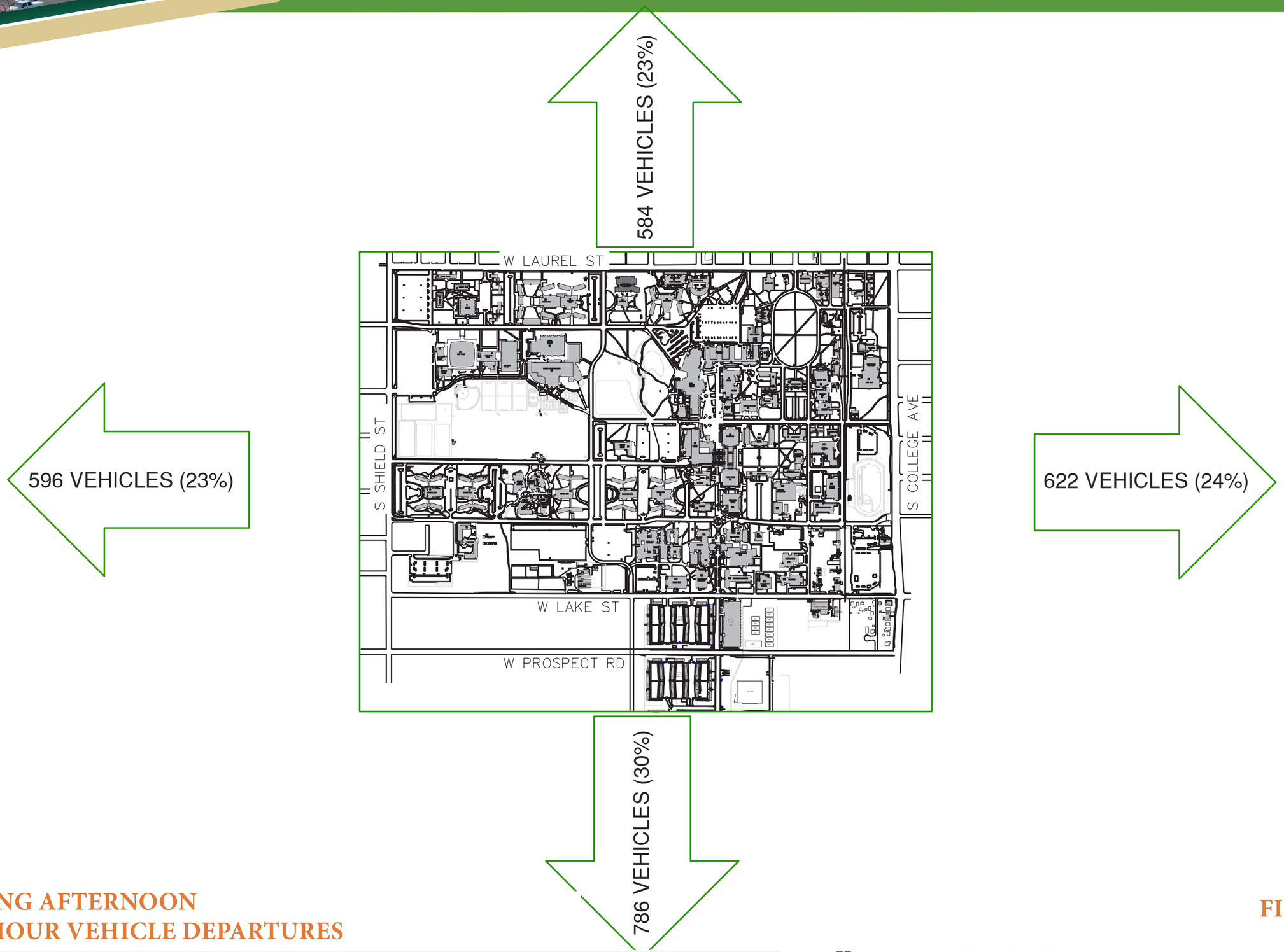




EXISTING MORNING PEAK HOUR PEDESTRIAN ARRIVALS

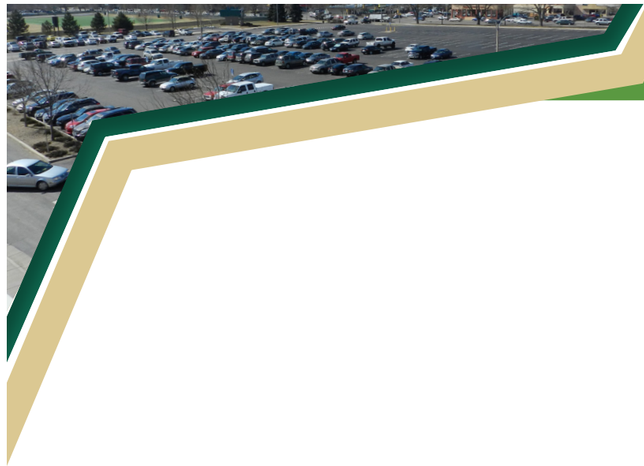
FIGURE 14

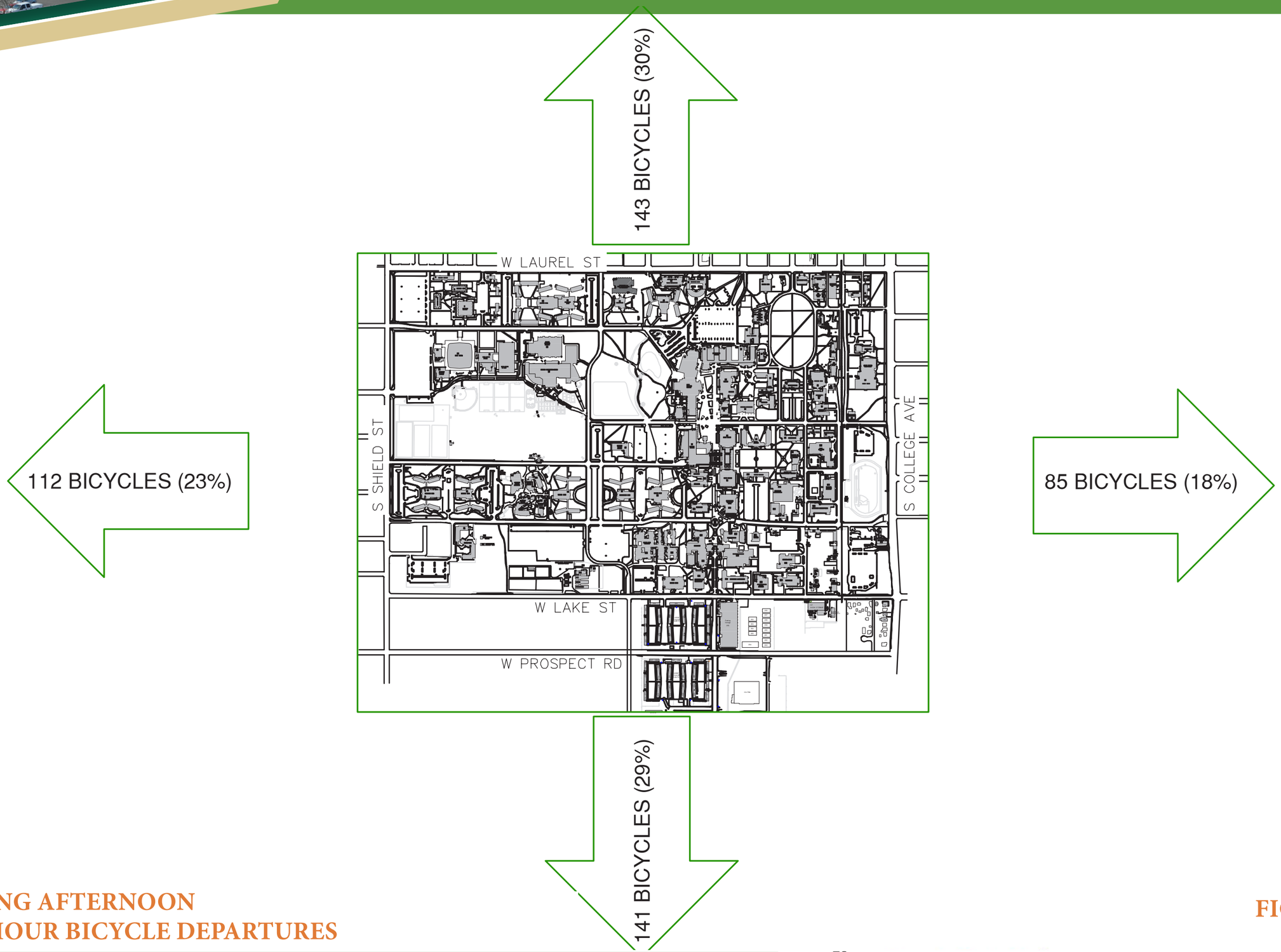




EXISTING AFTERNOON PEAK HOUR VEHICLE DEPARTURES

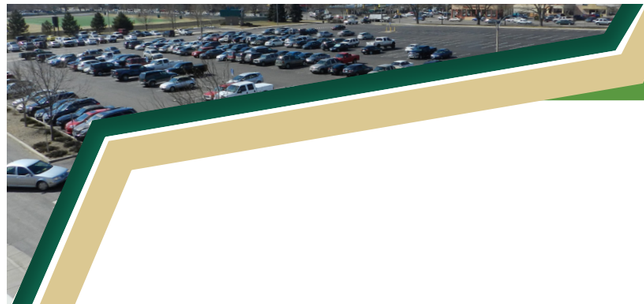
FIGURE 15

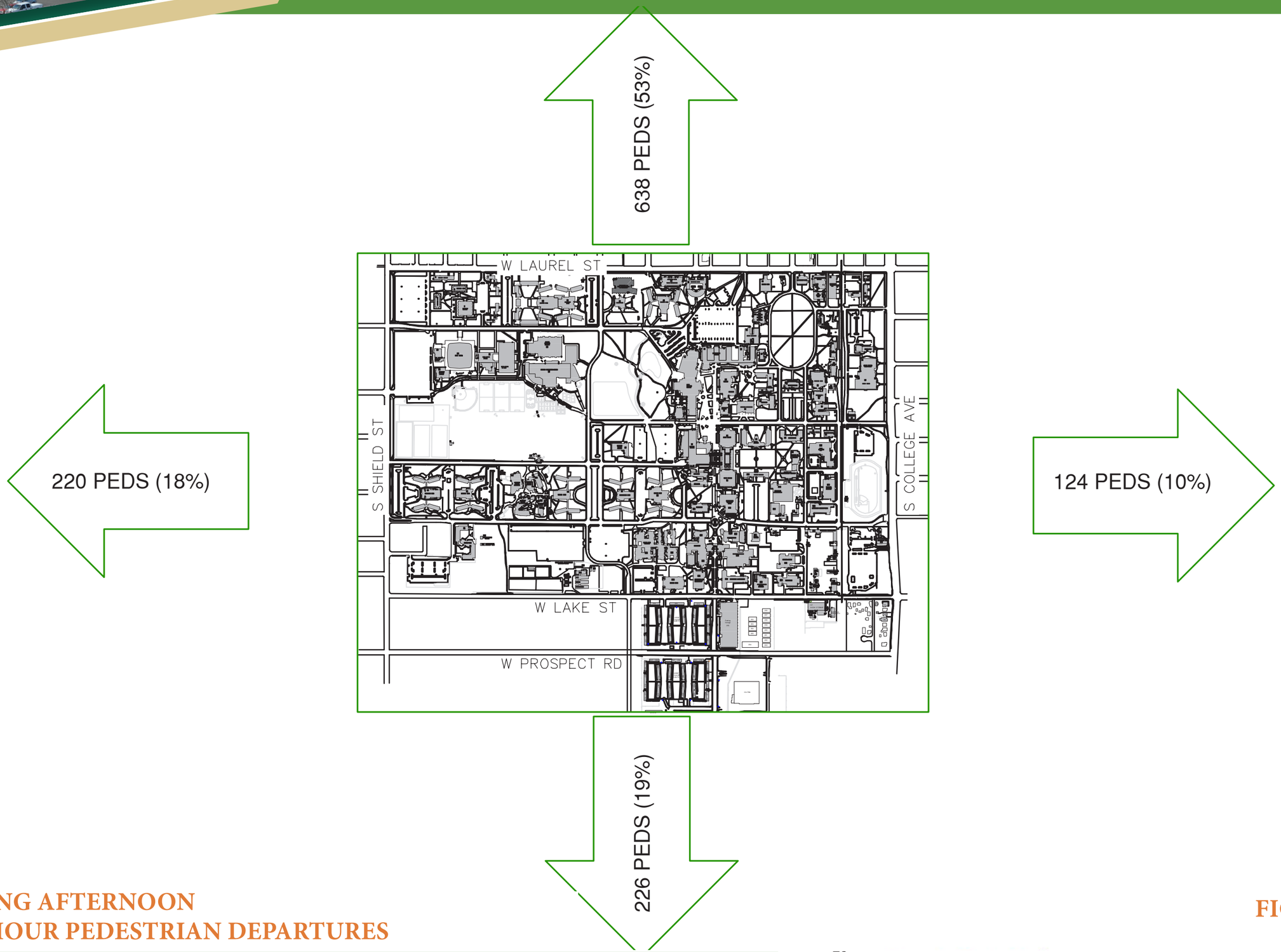




EXISTING AFTERNOON PEAK HOUR BICYCLE DEPARTURES

FIGURE 16





EXISTING AFTERNOON PEAK HOUR PEDESTRIAN DEPARTURES

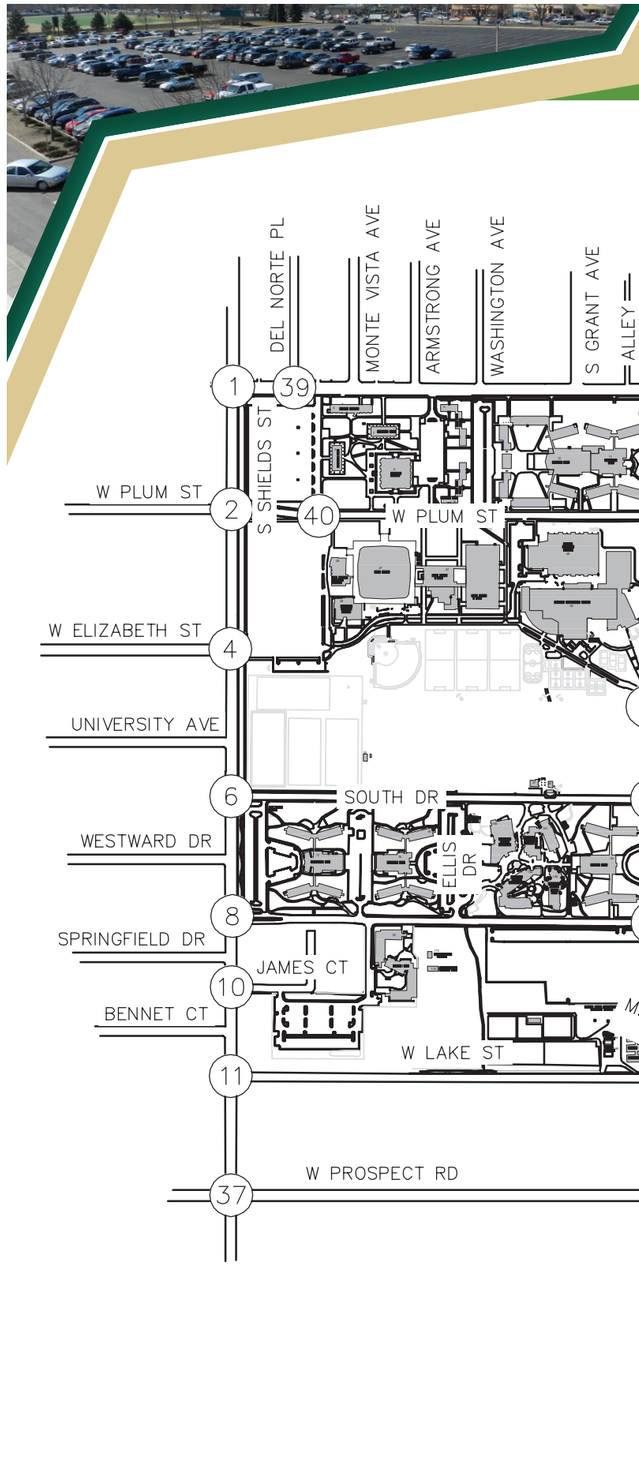
FIGURE 17

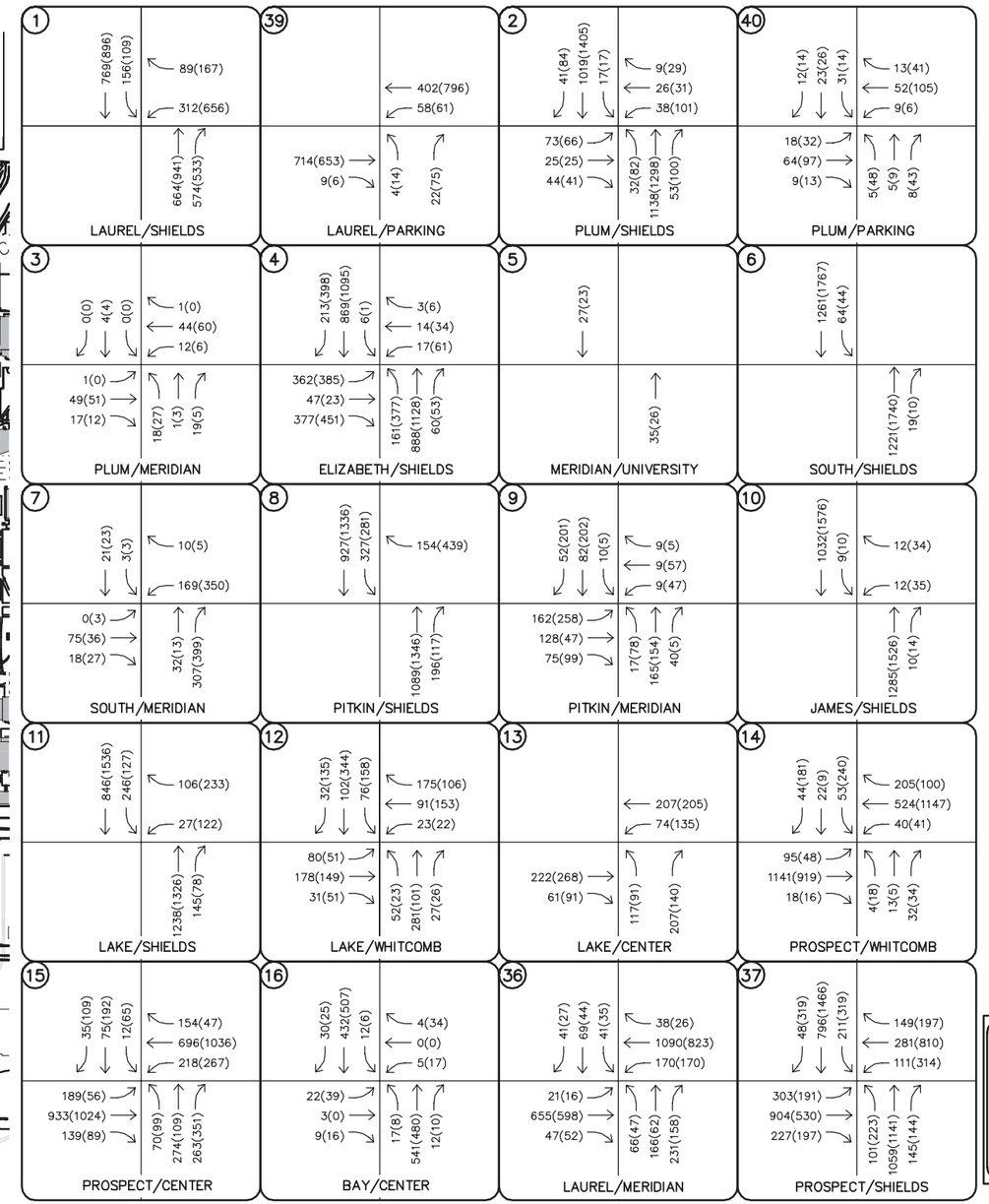
FUTURE CONDITIONS

This section of the study details the future traffic conditions expected in the future planning horizon (2024) of the Colorado State University 2020 Transit Plan.

Unspecified Development Traffic Growth

According to the Colorado State University 2020 Transit Plan, the CSU student population may grow by approximately 8,000 students, from 27,000 to 35,000 students, which equates to a 29.6 percent increase between the years of 2013 and 2024. The total campus population (including increased faculty and staff) will increase to approximately 42,143 by 2024. This equates to an annual growth rate of approximately 2.4 percent per year. Based on this growth factor, the projected vehicle, bicycle, and pedestrian 2024 background values for the study's key intersections have been calculated and are provided in **Figures 18 through 23**.



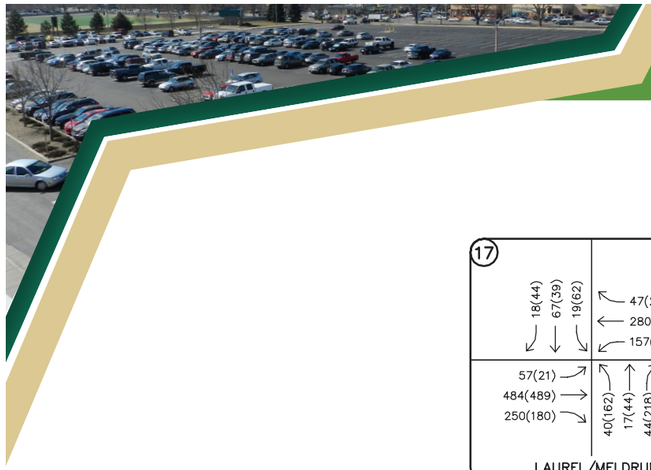


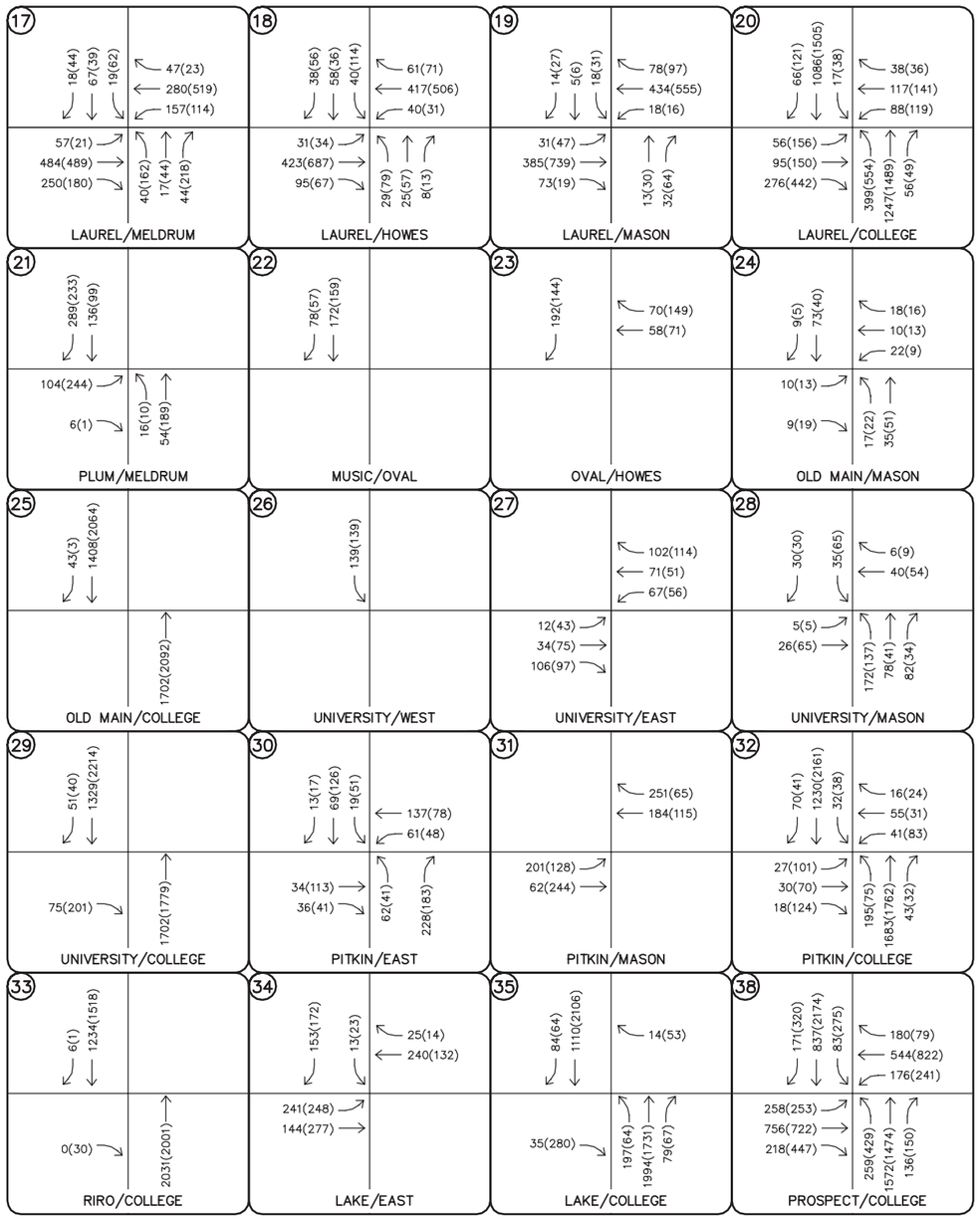
LEGEND:

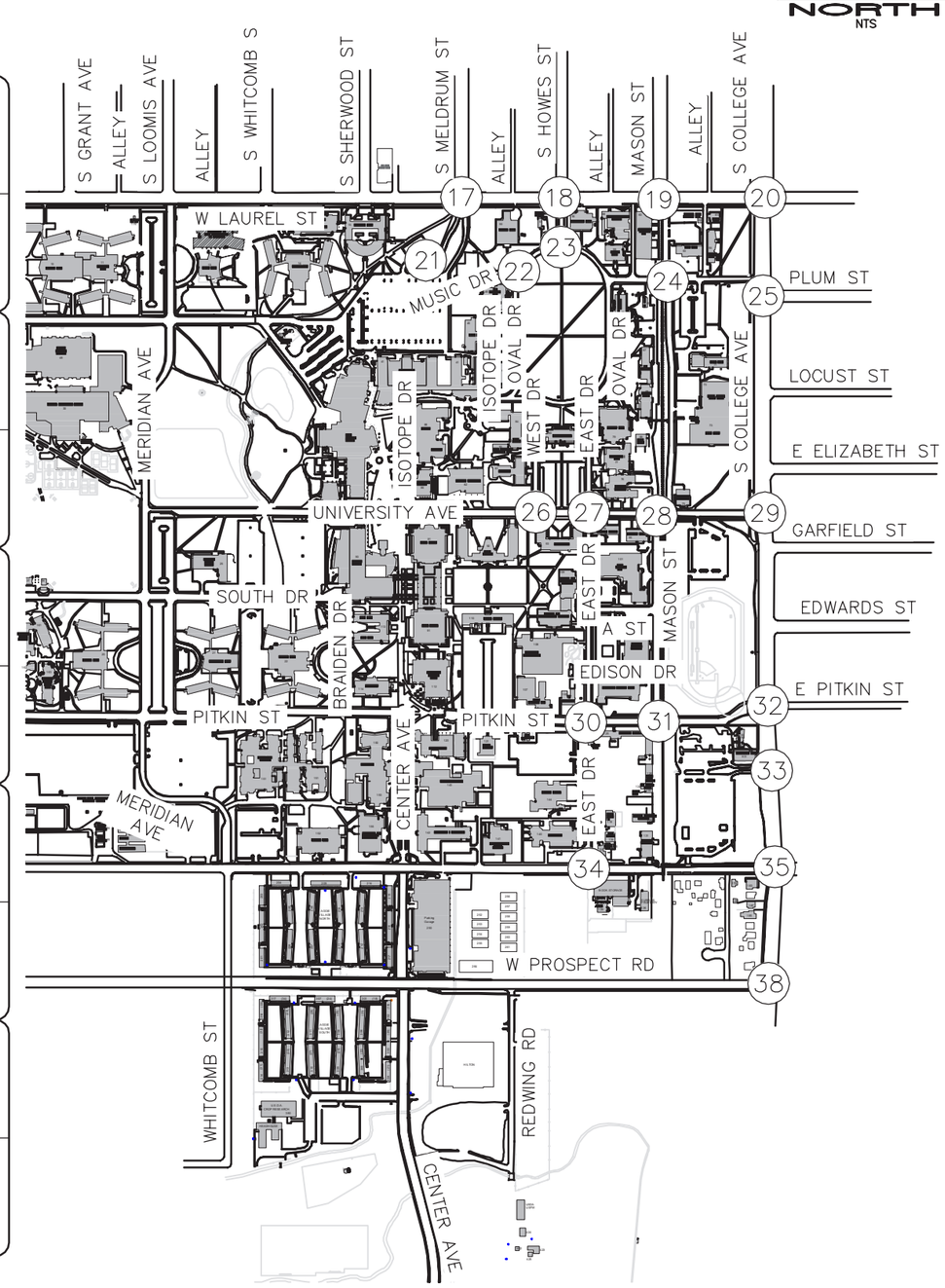
(1)	Study Area Key Intersection
← XX (XX)	AM(PM) Peak Hour Traffic Volume

2024 BACKGROUND VEHICLE VOLUMES - (WEST)

FIGURE 18







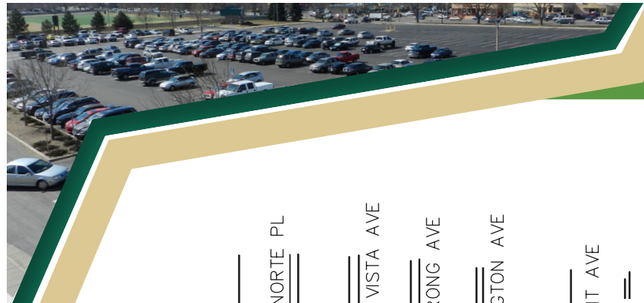
LEGEND:

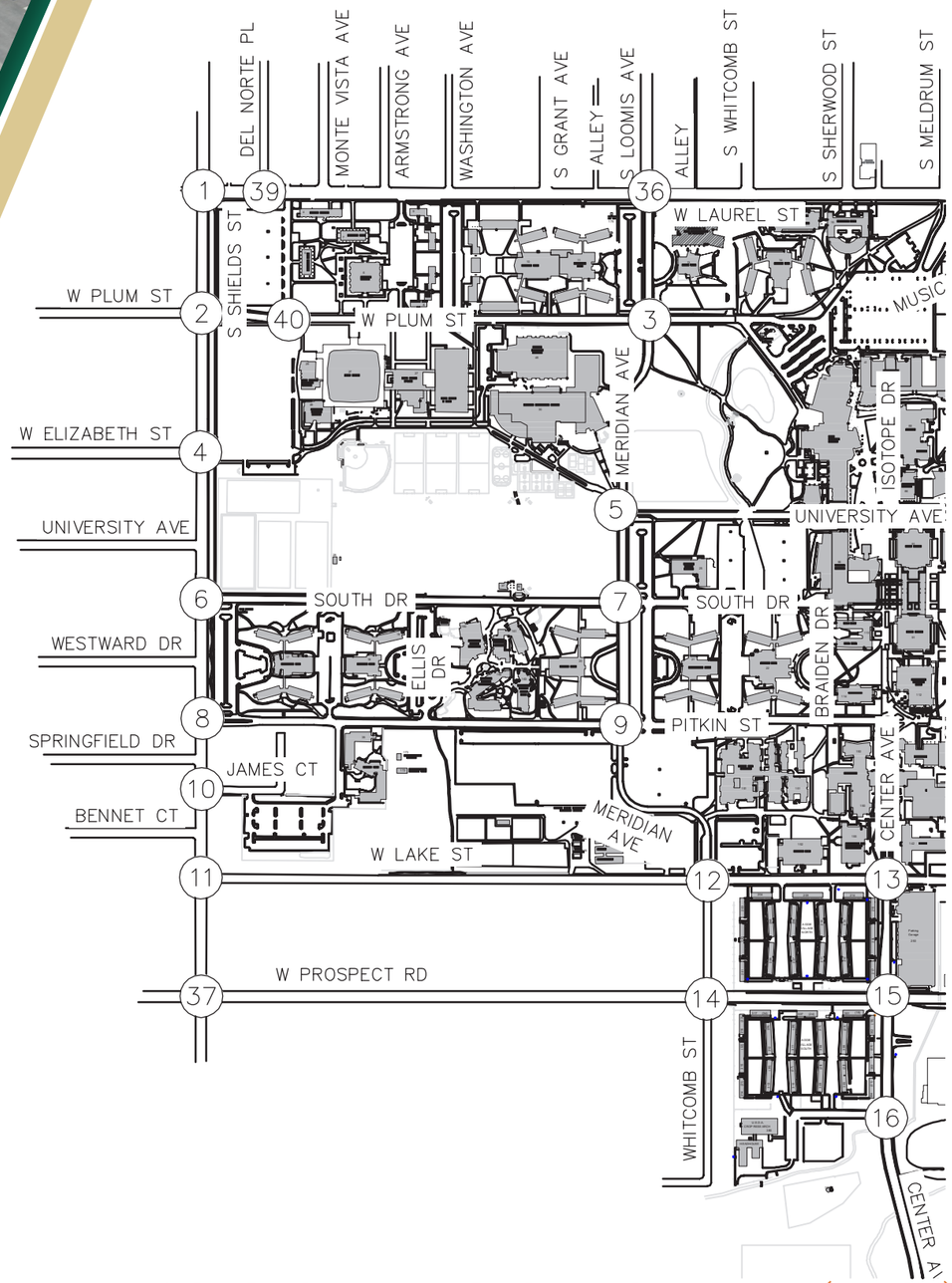
(1) Study Area Key Intersection

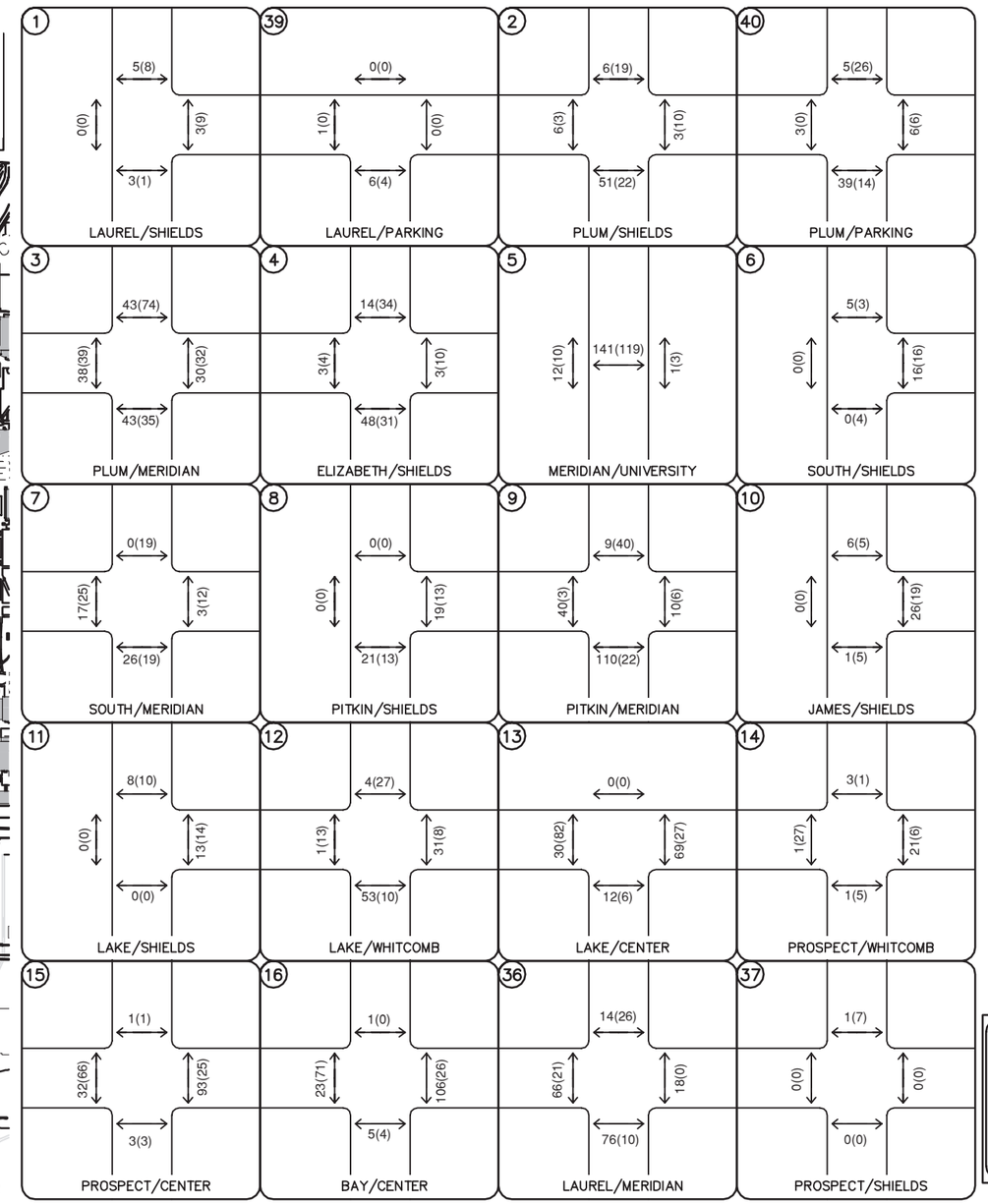
← XX (XX) AM(PM) Peak Hour Traffic Volume

2024 BACKGROUND VEHICLE VOLUMES – (EAST)

FIGURE 19

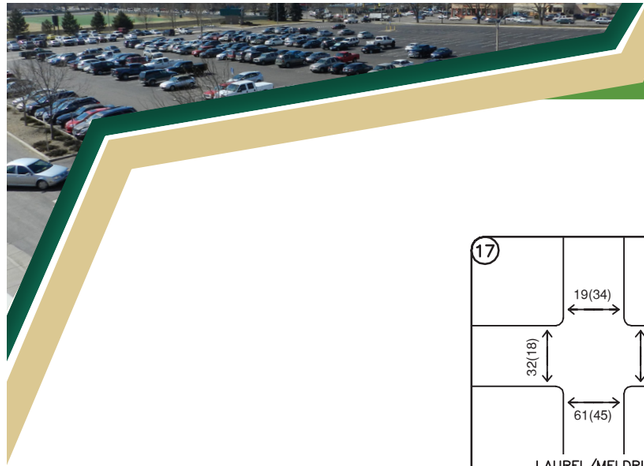


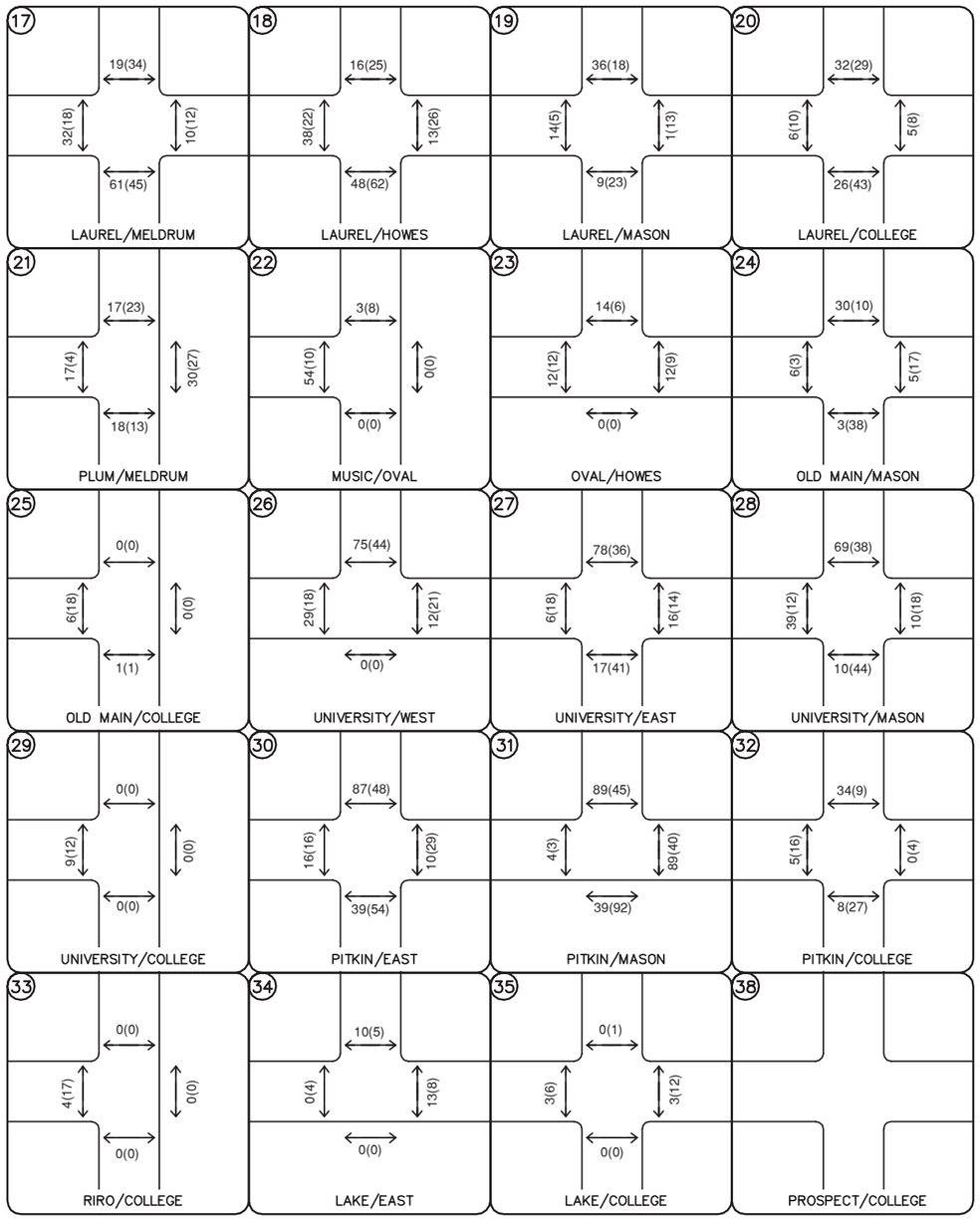


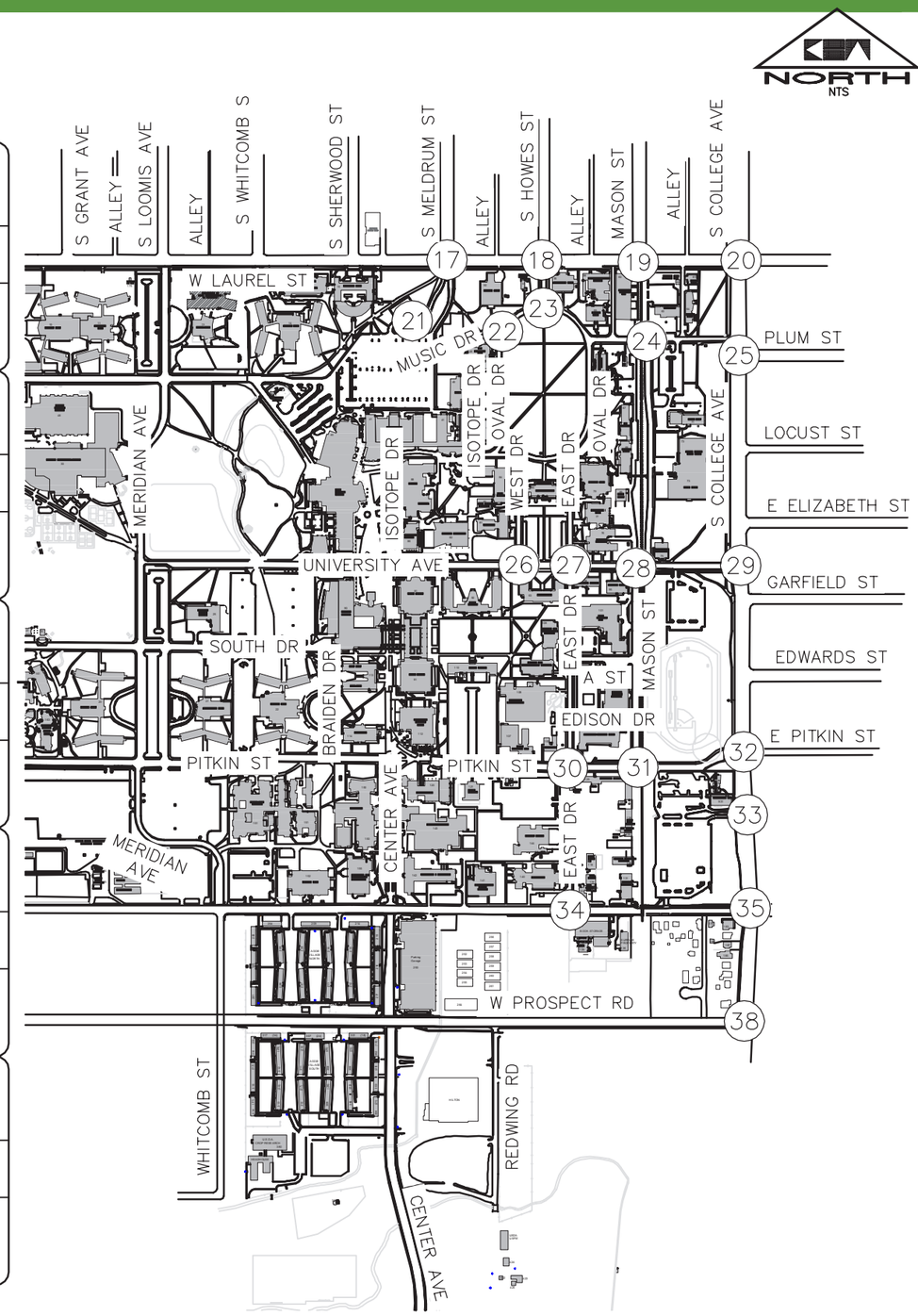


2024 BACKGROUND BICYCLE VOLUMES – (WEST)

FIGURE 20





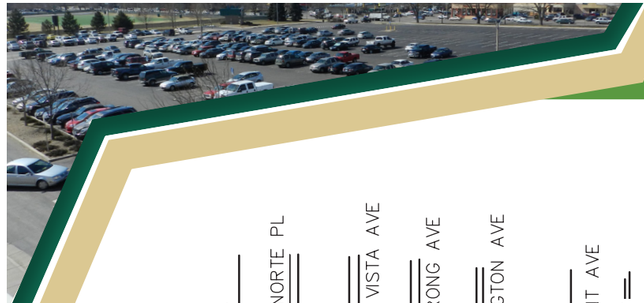


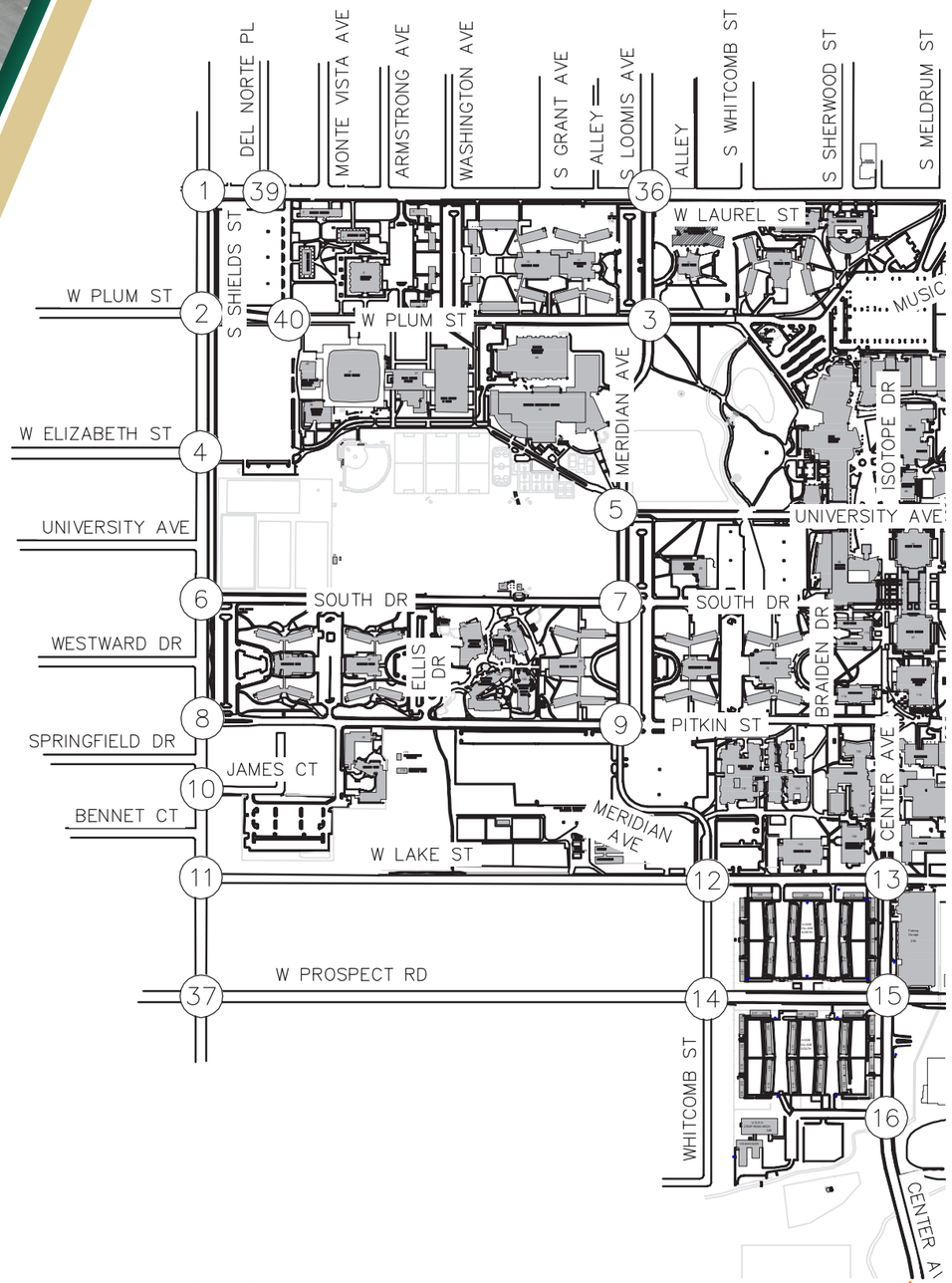
LEGEND:

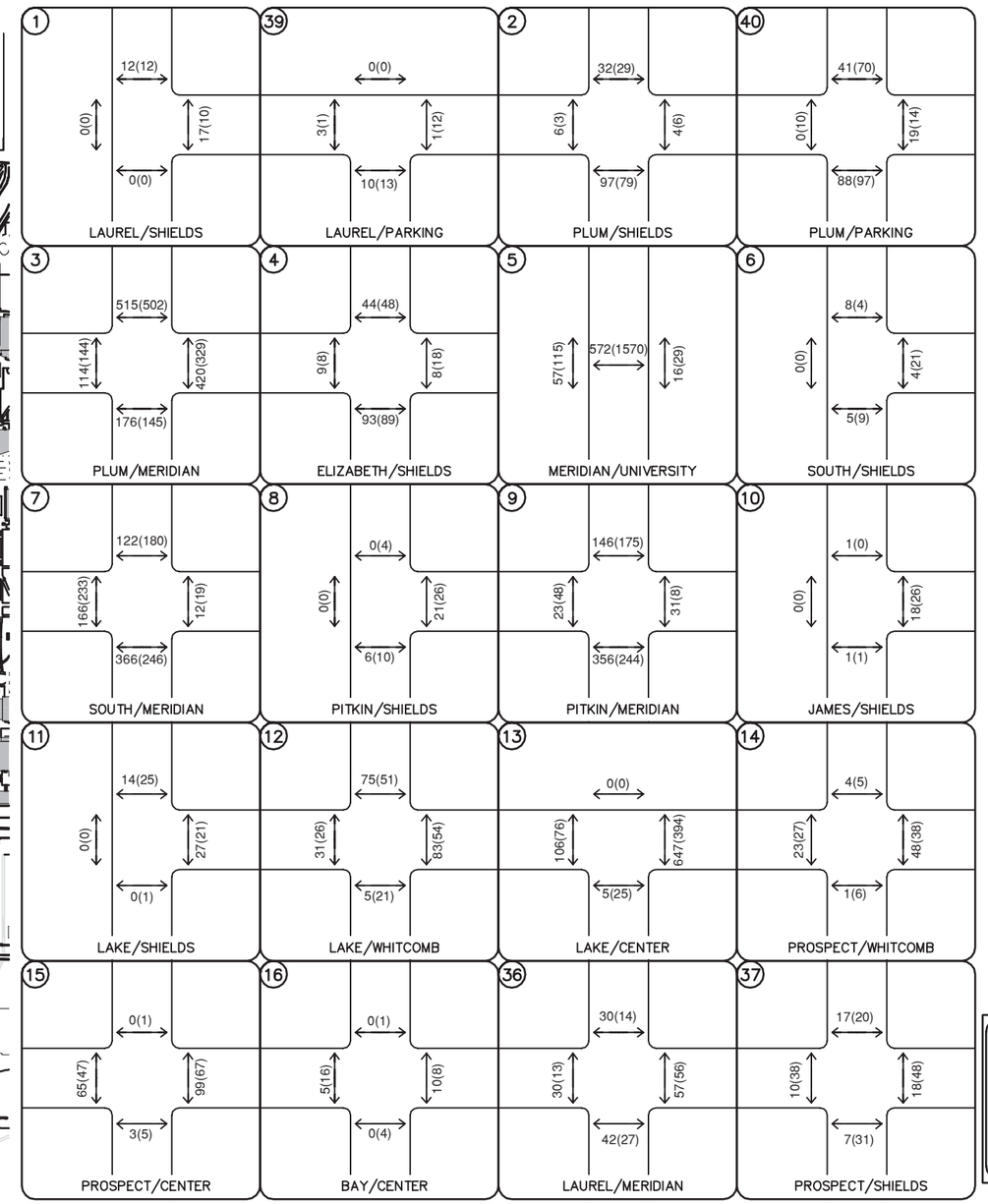
(1)	Study Area Key Intersection
⟷ XX (XX)	AM(PM) Peak Hour Traffic Volume

2024 BACKGROUND BICYCLE VOLUMES – (EAST)

FIGURE 21

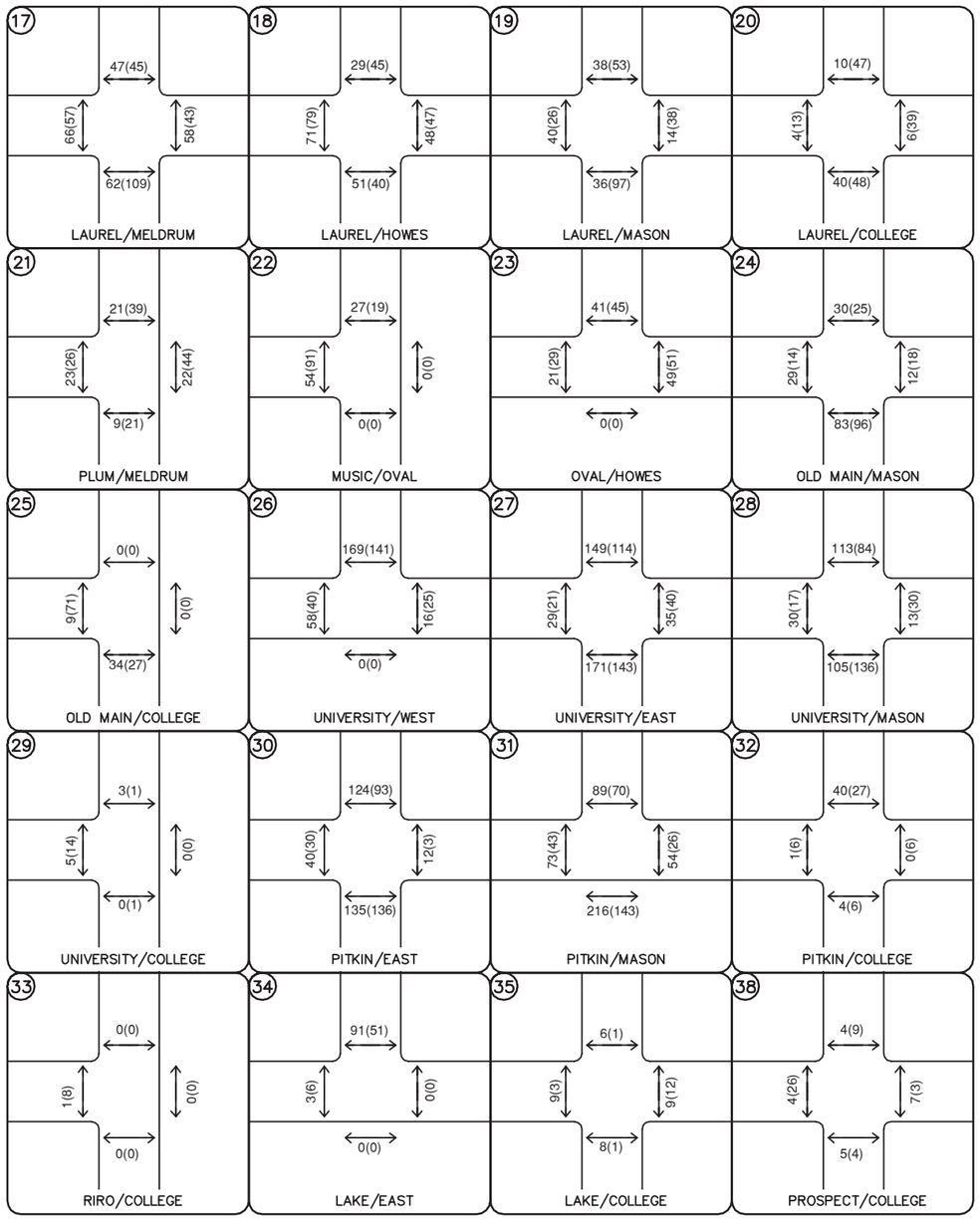


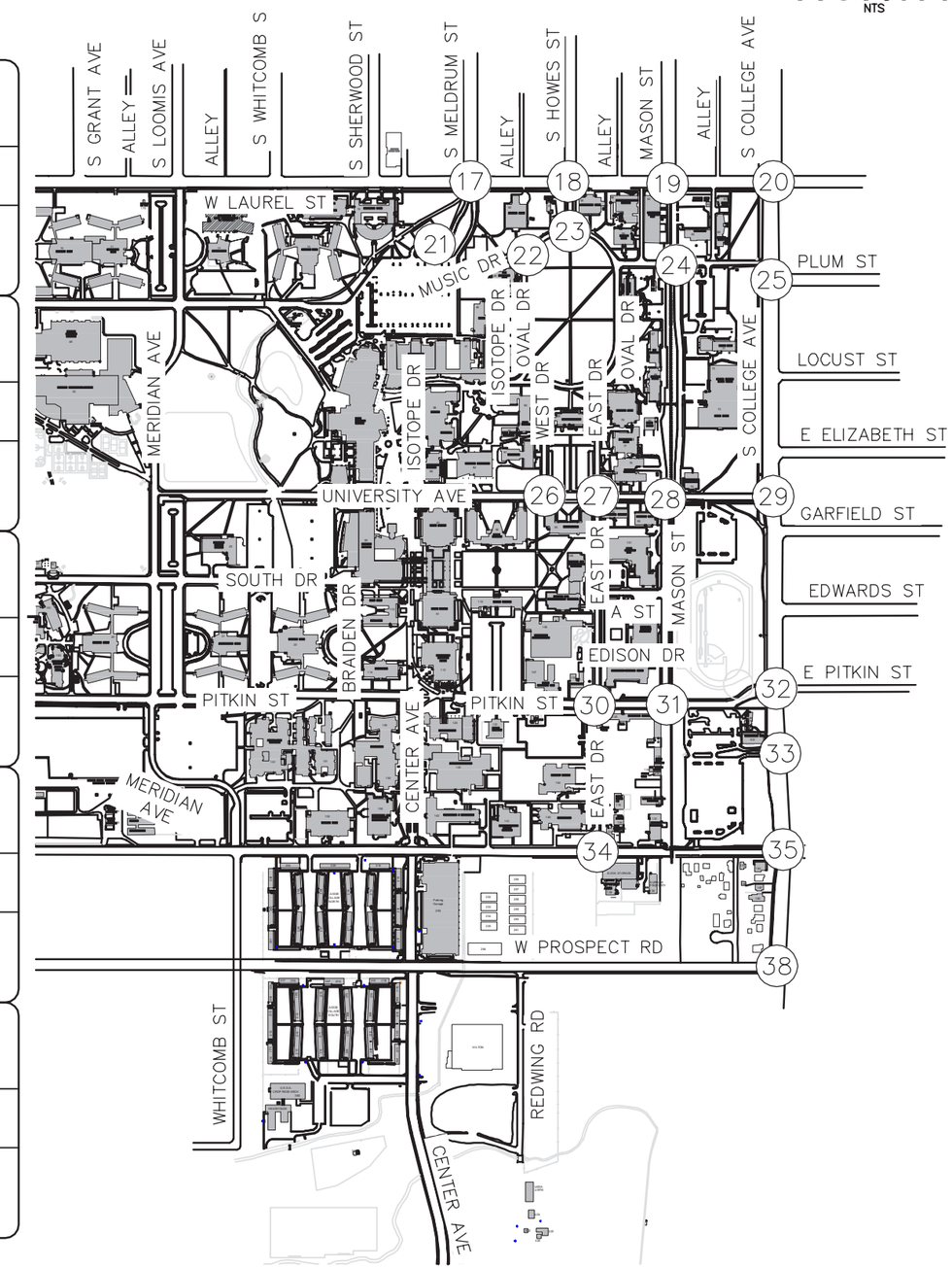




2024 BACKGROUND PEDESTRIAN VOLUMES – (WEST)

FIGURE 22





LEGEND:

(1) Study Area Key Intersection

⟷ XX (XX) AM(PM) Peak Hour Traffic Volume

2024 BACKGROUND PEDESTRIAN VOLUMES – (EAST)

FIGURE 23

Parking Garage Redistributed Traffic

Parking Garage Trip Redistribution

As part of the CSU master plan, additional parking facilities are anticipated to be needed to serve increased student populations. CSU is planning to provide seven new parking garages around campus. The anticipated locations of the seven future parking garages are shown in **Figure 24**.

Using data obtained from traffic counts conducted at existing parking lots of CSU as well as the number of total existing parking spaces, average rates of traffic generated per parking space was determined. It was determined that the existing average morning and afternoon total trips per parking space was found to be 0.192 and 0.306 trips per parking space, respectively.

Based on the anticipated CSU population increase of 29.6 percent from 2012 to 2024, it is expected that the average trips per parking space will also increase over the same time frame. Future parking garage trip generation rates were determined by multiplying the percent population increase by the existing averages for trips per parking space. As shown in **Table 9**, the 2024 total peak hour trips per parking space for the morning and afternoon were calculated to be 0.249 and 0.396 trips per parking space respectively. In other words, 25 percent of the parking spaces generate a vehicle trip during the morning peak hour and 40 percent of the parking spaces generate a vehicle trip during the afternoon peak hour. **Table 9** provides the predicted trip generation by each proposed parking garage and the respective increase of trips by cars entering and exiting the garages during the morning and afternoon peak hours.

Table 9 – Colorado State University New Parking Garage Trip Generation

Parking Garage	Number of Parking Spaces	Existing Spaces Removed	Net New Parking Spaces	Increase in AM Peak Hour Trips			Increase in PM Peak Hour Trips		
				Enter	**Exit**	**Total**	**Enter**	**Exit**	**Total**
				0.166 trips/ space	0.083 trips/ space	0.249 trips/ space	0.172 trips/ space	0.224 trips/ space	0.396 trips/ space
1	1200	0	1200	199	100	299	207	268	475
2	1200	0	1200	199	100	299	207	268	475
3	1300	908	392	65	33	98	68	88	155
4	800	0	800	133	67	199	138	179	317
5	800	500	300	50	25	75	52	67	119
6	1350	546	804	133	67	200	138	180	318
7	1200	0	1200	199	100	299	207	268	475
			Total	**977**	**491**	**1,468**	**1,015**	**1,319**	**2,334**

Trip Distribution

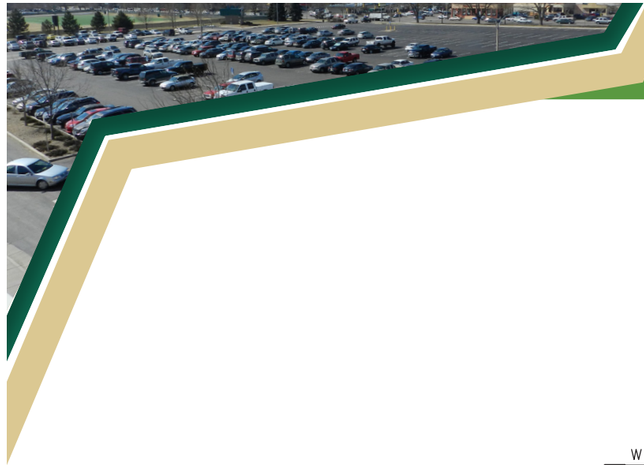
The redistribution of CSU traffic using proposed parking garages was based on the area street network characteristics, the existing traffic patterns and volumes, and the proposed access systems for the parking structures. The directional distribution of traffic is a means to quantify the percentage of traffic that approaches the garage from a given direction and departs the garage in the original source direction. **Figures 25 - 29** illustrate the expected trip distribution with the seven proposed parking garages.

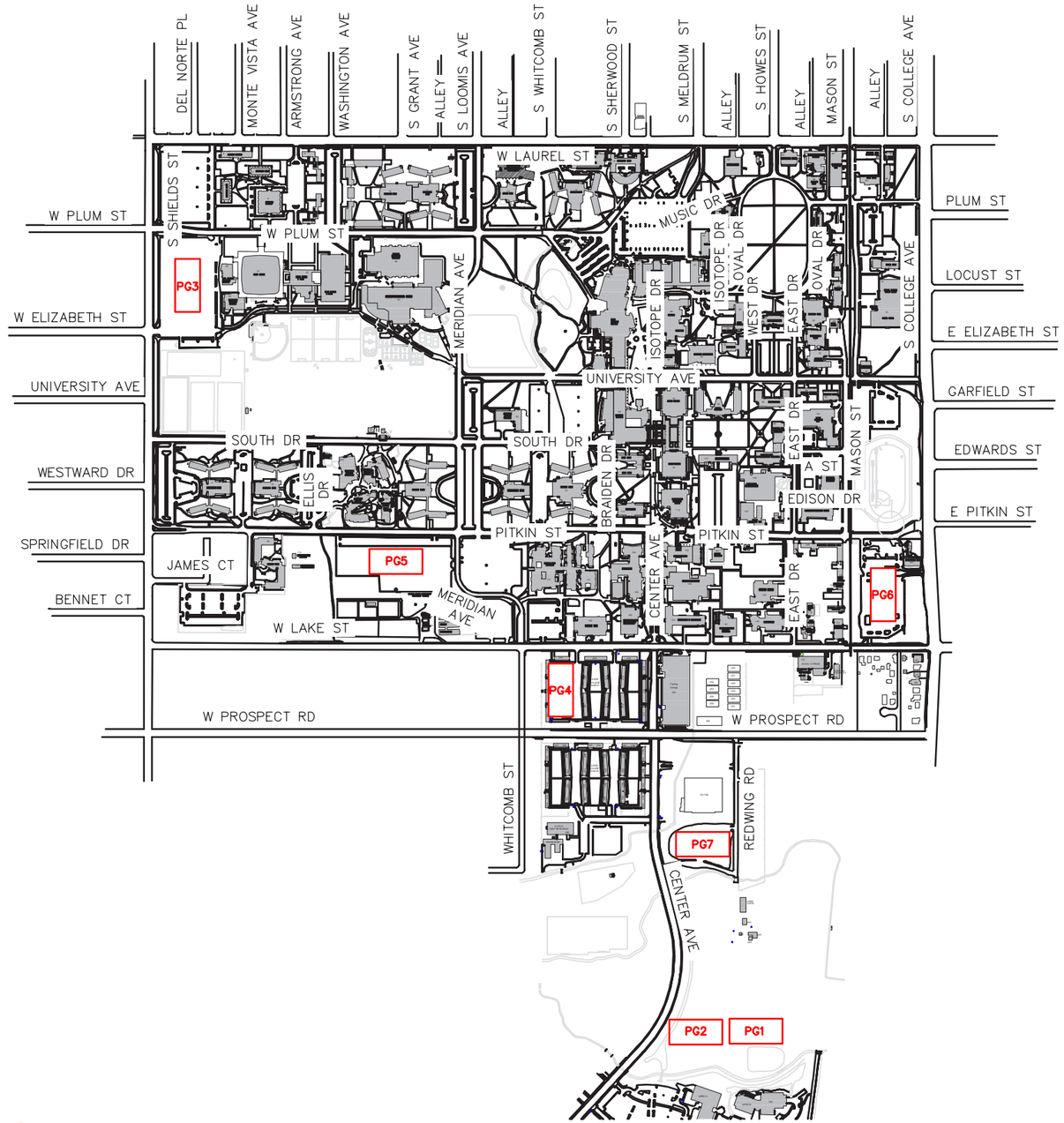
Traffic Assignment

The 2024 parking garage traffic assignment volumes were obtained by applying the trip distributions shown in **Figures 25 - 29** to the projected parking structure traffic generation figures shown in **Table 3.** The resultant 2024 parking garage traffic assignment volumes are provided in **Figures 30 - 34** for each of the Study key intersections and parking lot accesses.

2024 Total Traffic Volumes

The 2024 parking garage traffic assignment volumes were then added to the 2024 background volumes to find the projected 2024 total traffic volumes. **Figures 35 and 36** illustrate the projected total traffic volumes for the 2024 horizon year.



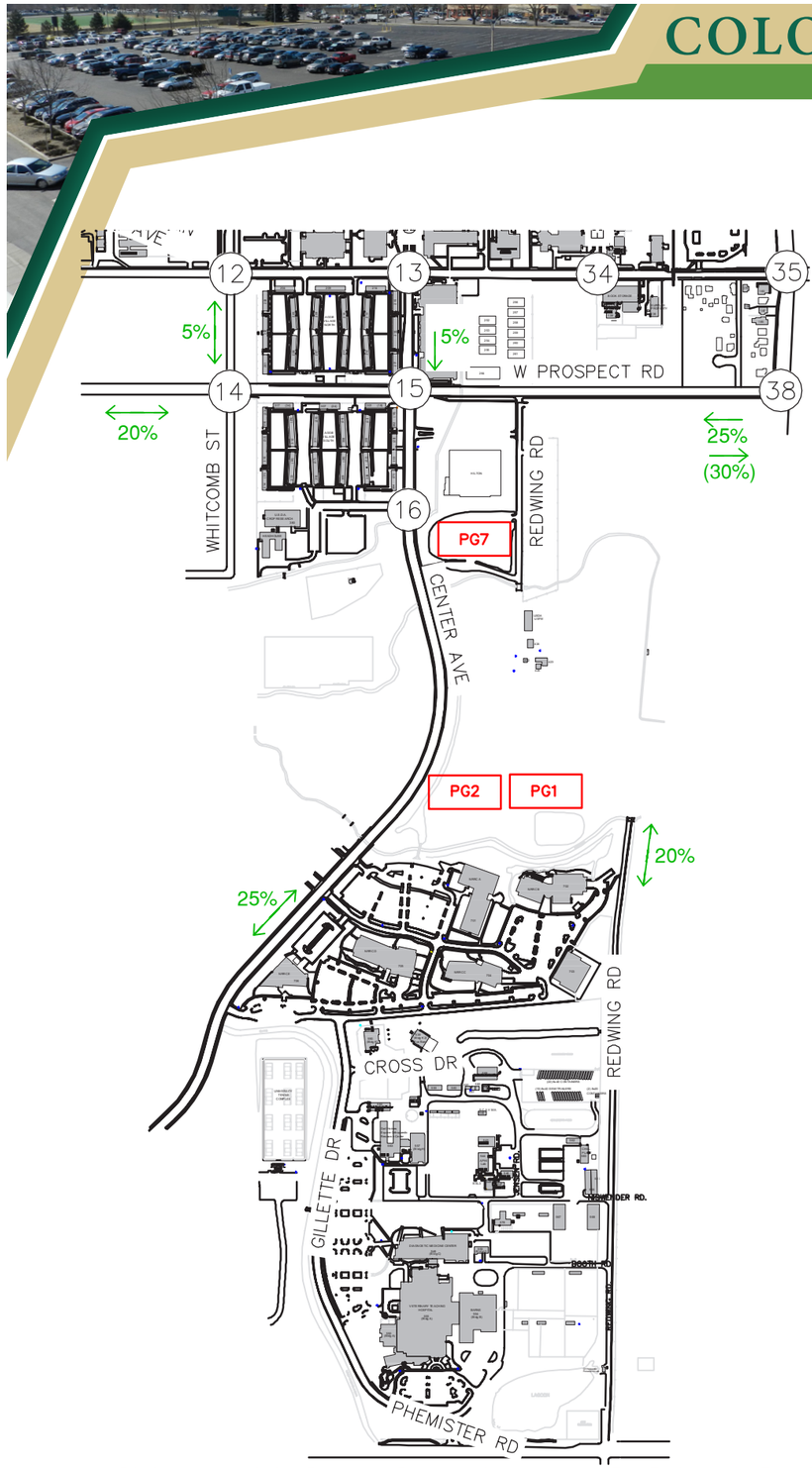


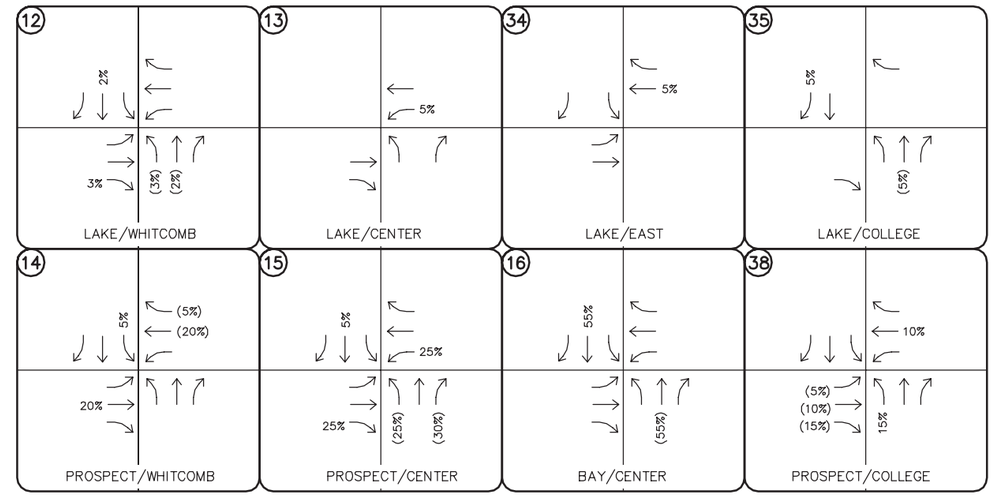
LEGEND:

PG1 FUTURE PARKING GARAGE LOCATION

FUTURE PARKING GARAGES

FIGURE 24



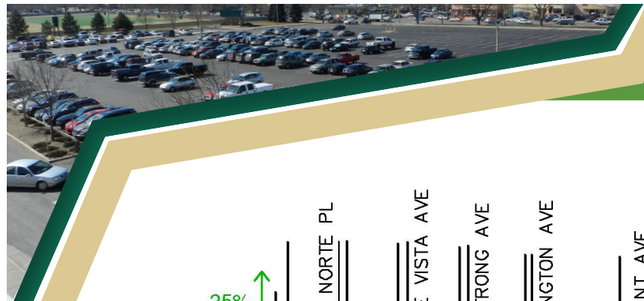


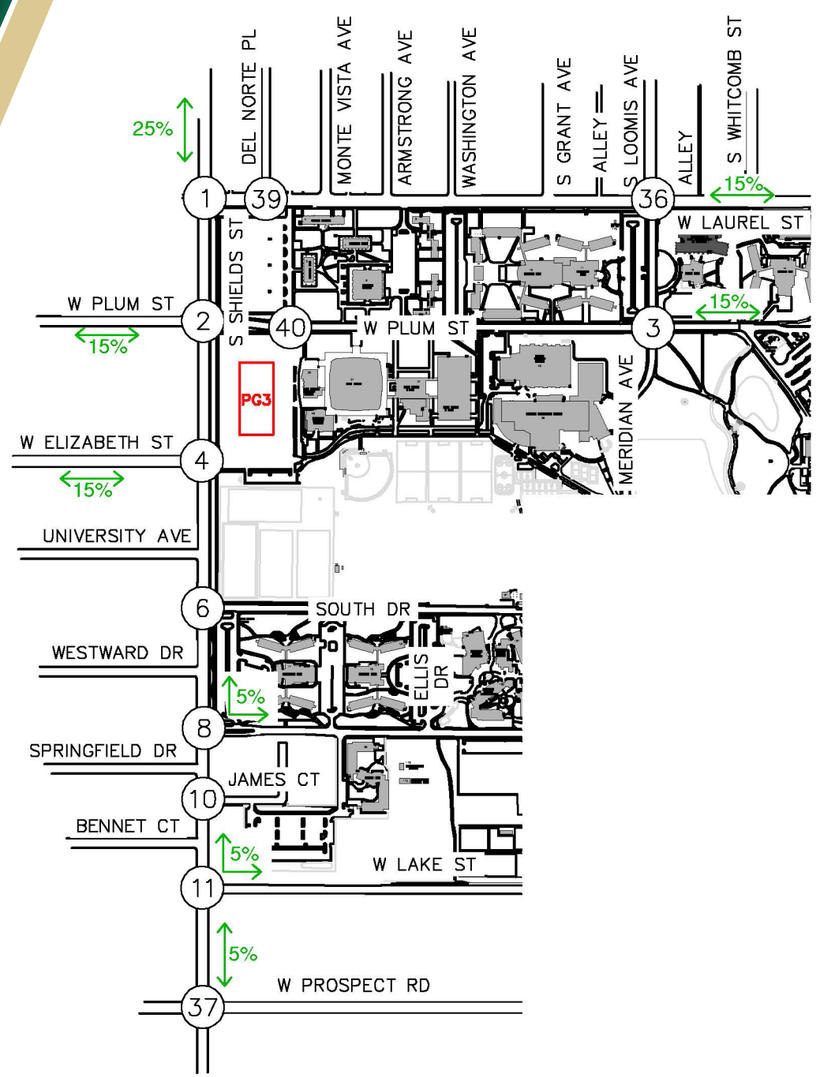
LEGEND:

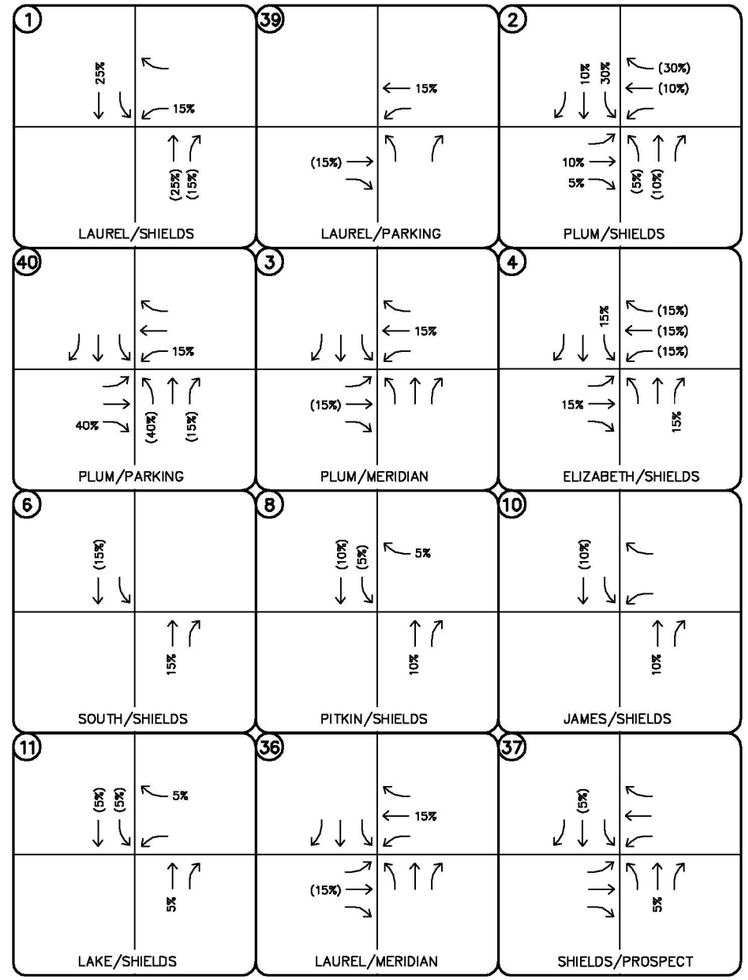
(1)	Study Area Key Intersection
⟵ XX%(XX%)	Enter(Exit) Traffic Distribution
PG1	Future Parking Garage Location

DISTRIBUTION FOR PARKING GARAGES #1, #2, AND #7

FIGURE 25





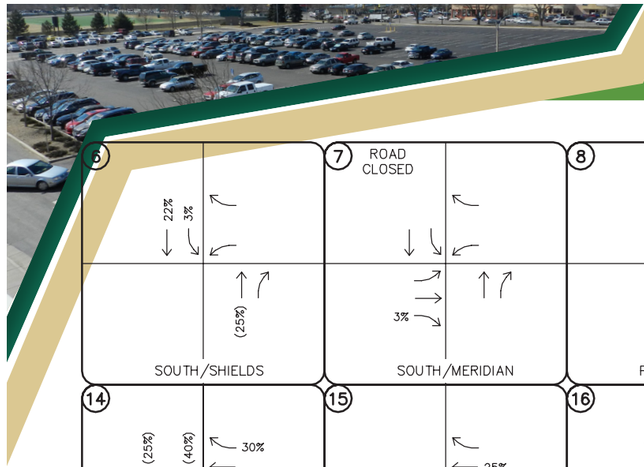


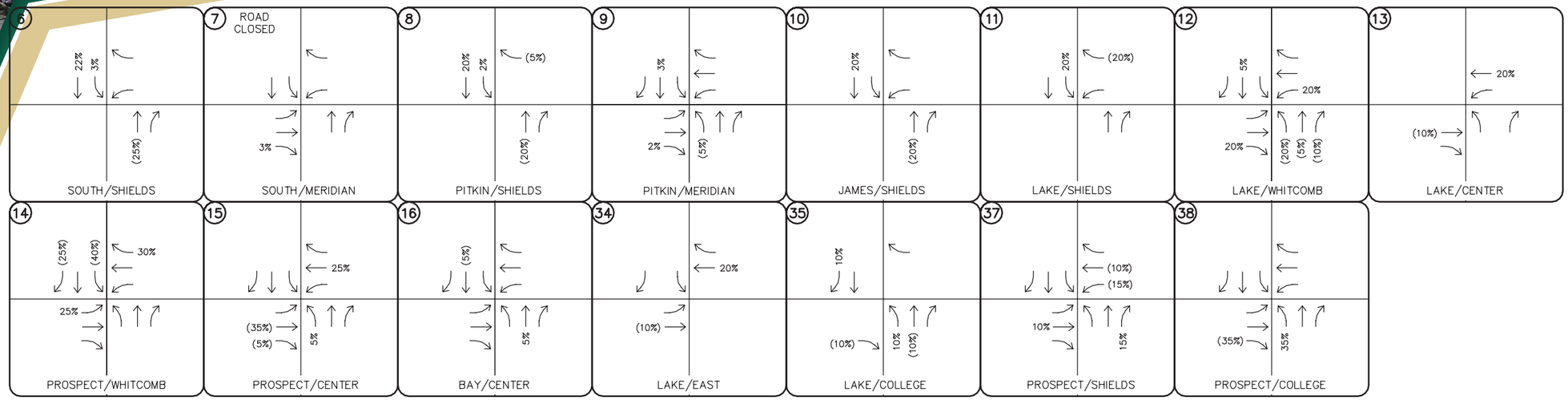
LEGEND:

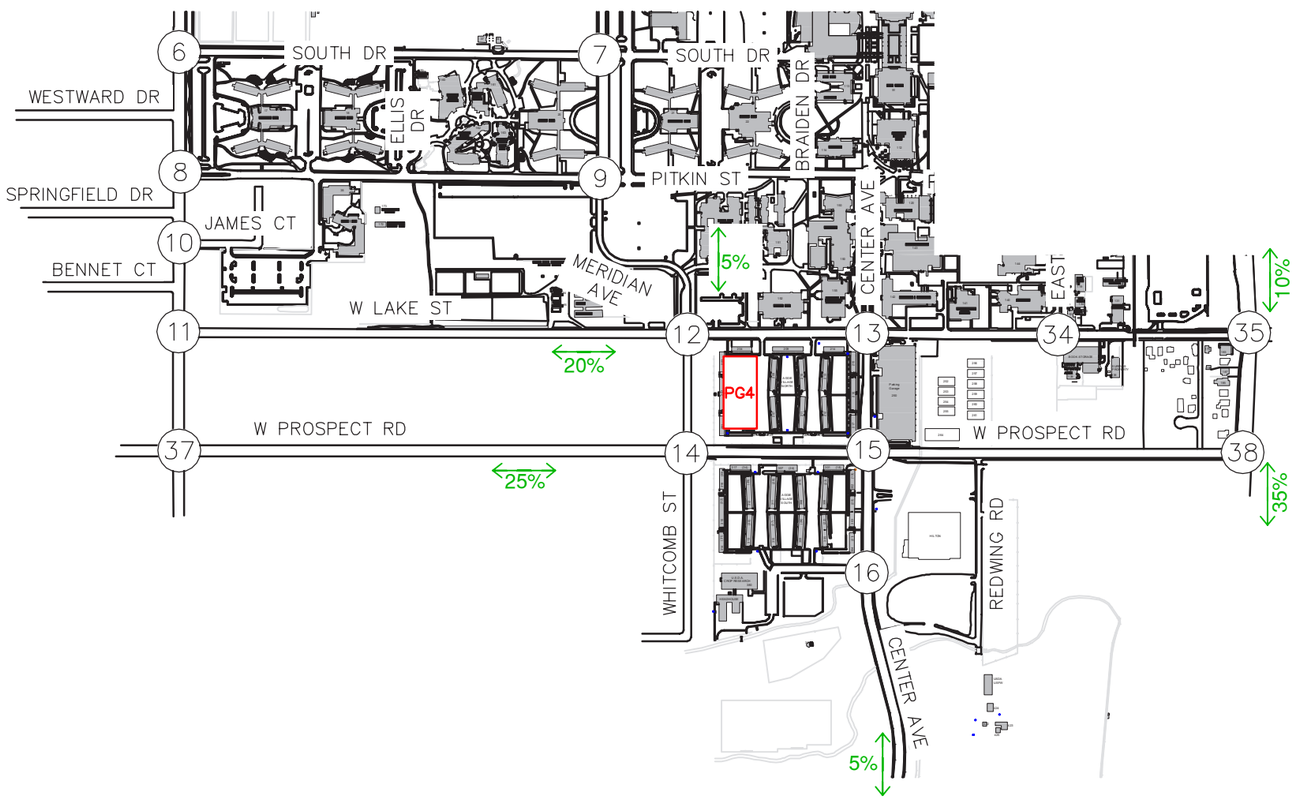
(1)	Study Area Key Intersection
← XX%(XX%)	Enter(Exit) Traffic Distribution
PG1	Future Parking Garage Location

DISTRIBUTION FOR PARKING GARAGE #3

FIGURE 26





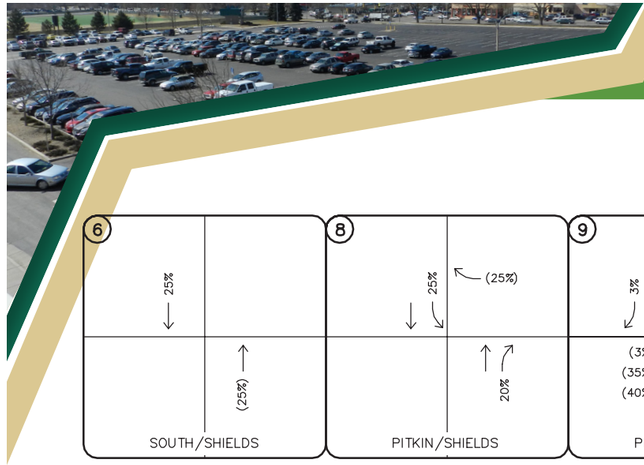


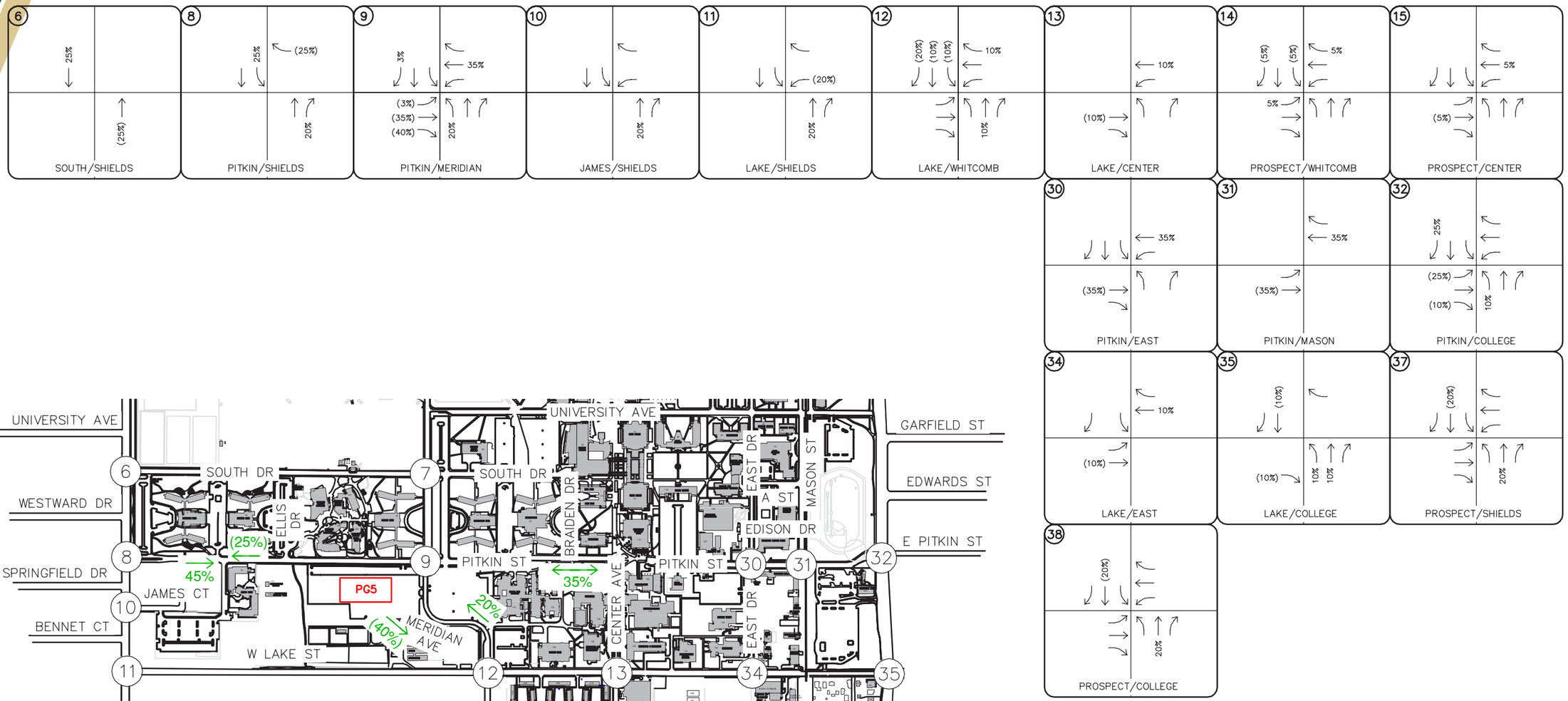
LEGEND:

(1)	Study Area Key Intersection
⟵ XX%(XX%)	Enter(Exit) Traffic Distribution
PG1	Future Parking Garage Location

DISTRIBUTION FOR PARKING GARAGE #4

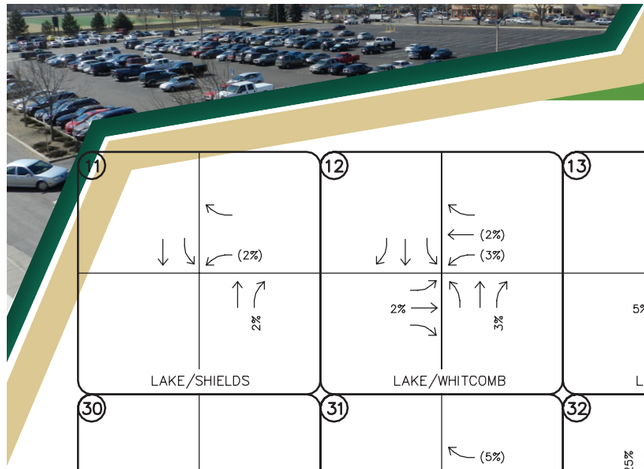
FIGURE 27

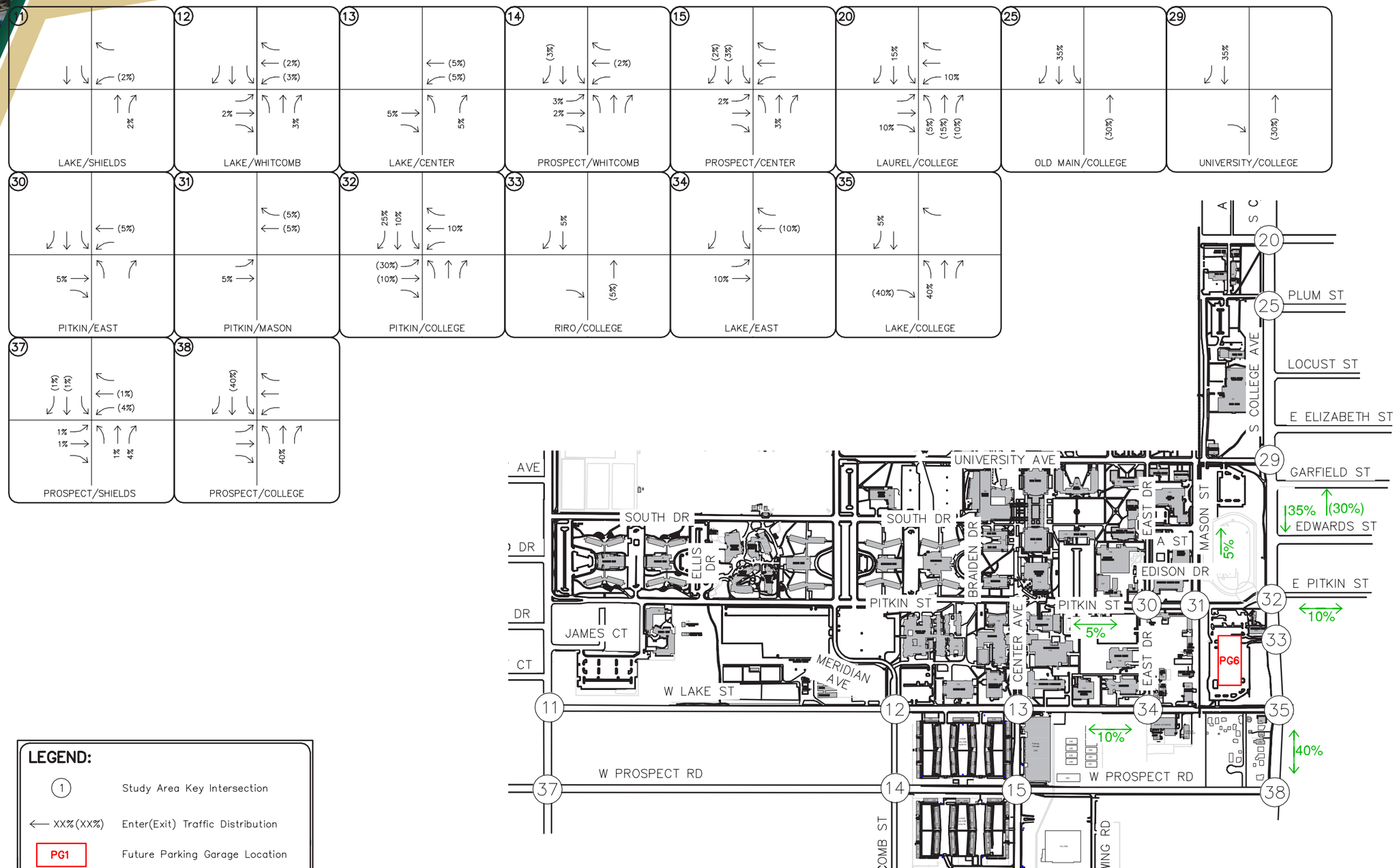




DISTRIBUTION FOR PARKING GARAGE #5

FIGURE 28



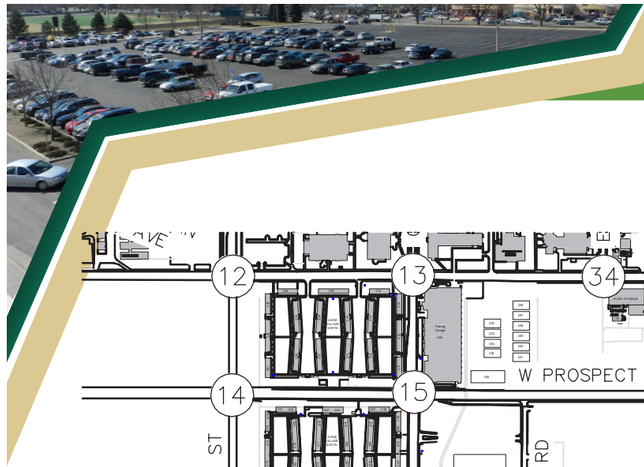


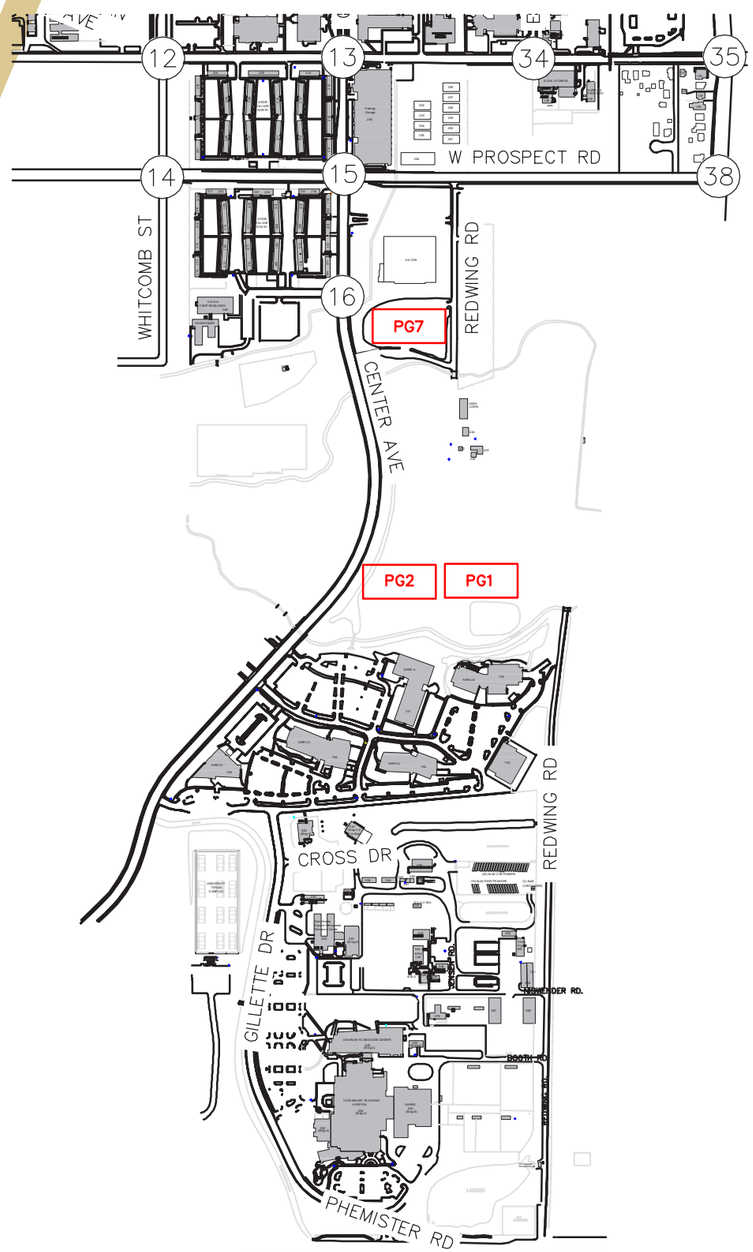
LEGEND:

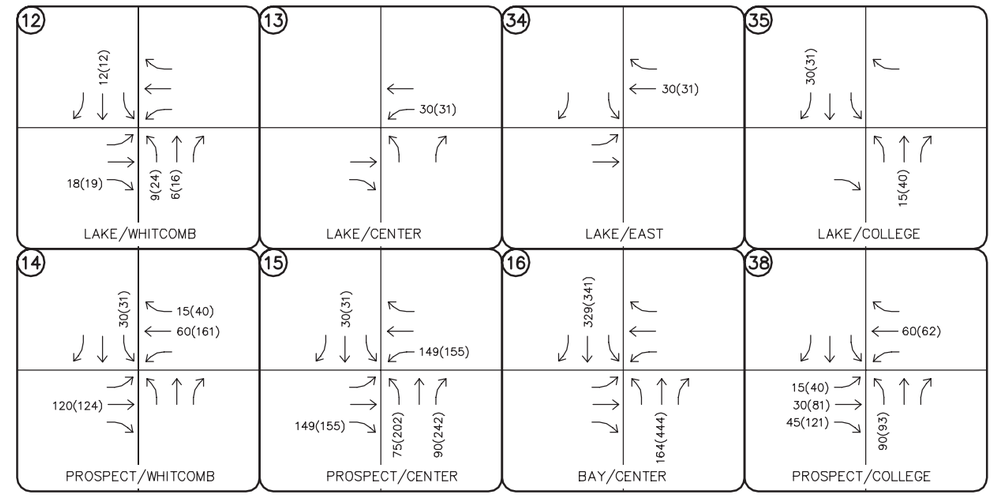
(1)	Study Area Key Intersection
← XX%(XX%)	Enter(Exit) Traffic Distribution
PG1	Future Parking Garage Location

DISTRIBUTION FOR PARKING GARAGE #6

FIGURE 29







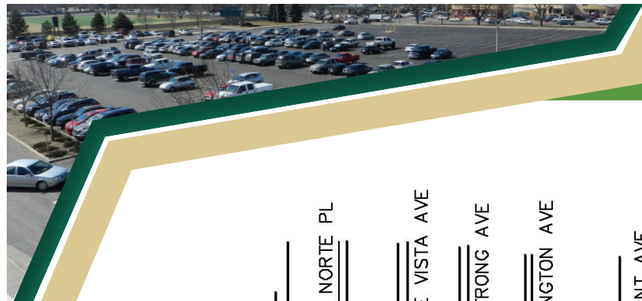
NORTH
NTS

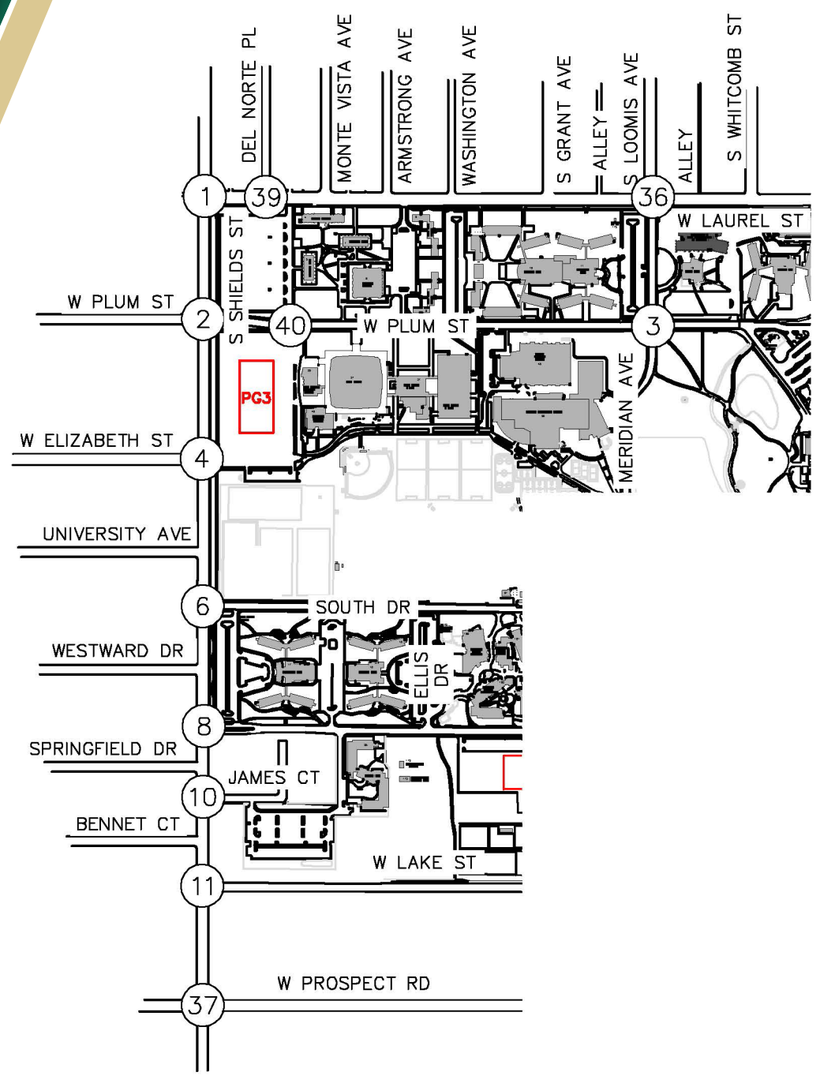
LEGEND:

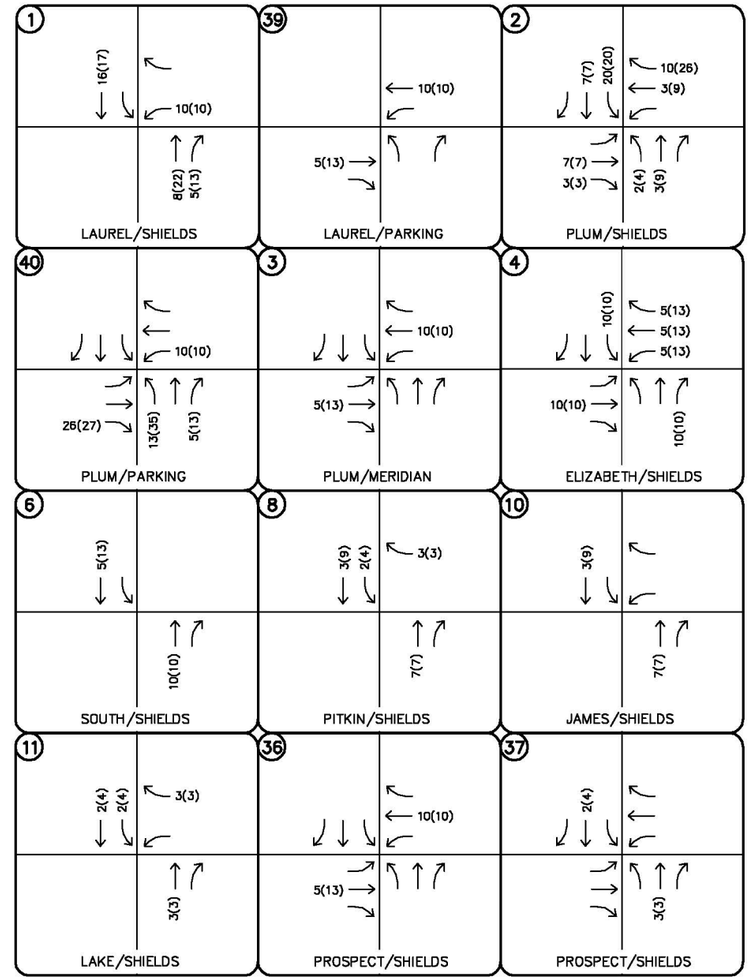
(1)	Study Area Key Intersection
← XX (XX)	Enter(Exit) Traffic Assignment
PG1	Future Parking Garage Location

ASSIGNMENT FOR PARKING GARAGES #1, #2, AND #7

FIGURE 30





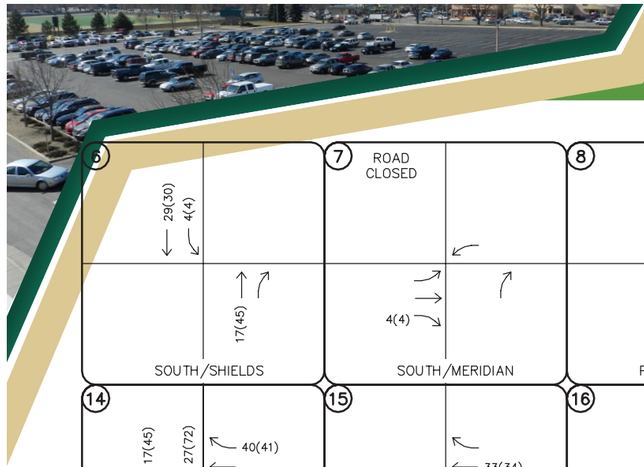


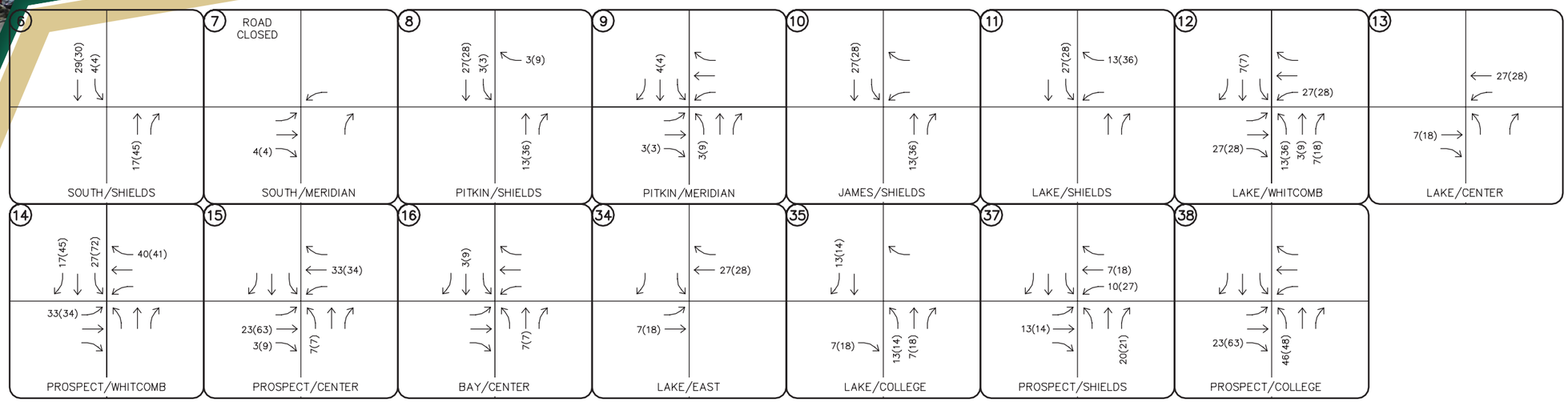
LEGEND:

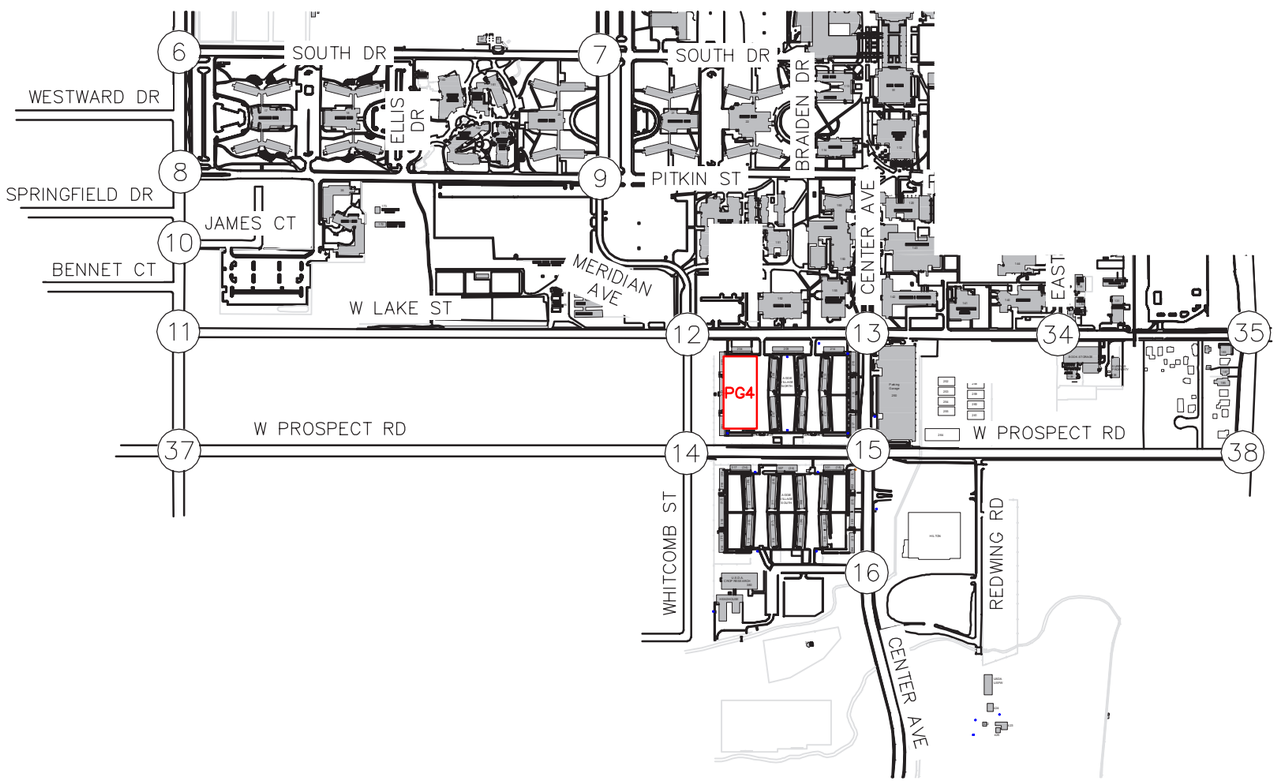
(1)	Study Area Key Intersection
← XX (XX)	Enter(Exit) Traffic Assignment
PG1	Future Parking Garage Location

ASSIGNMENT FOR PARKING GARAGE #3

FIGURE 31





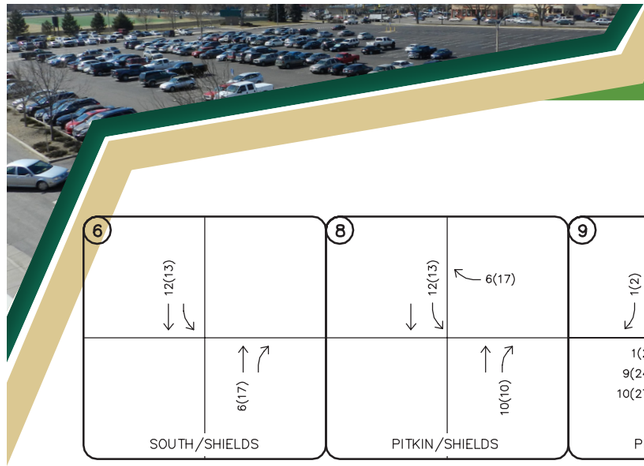


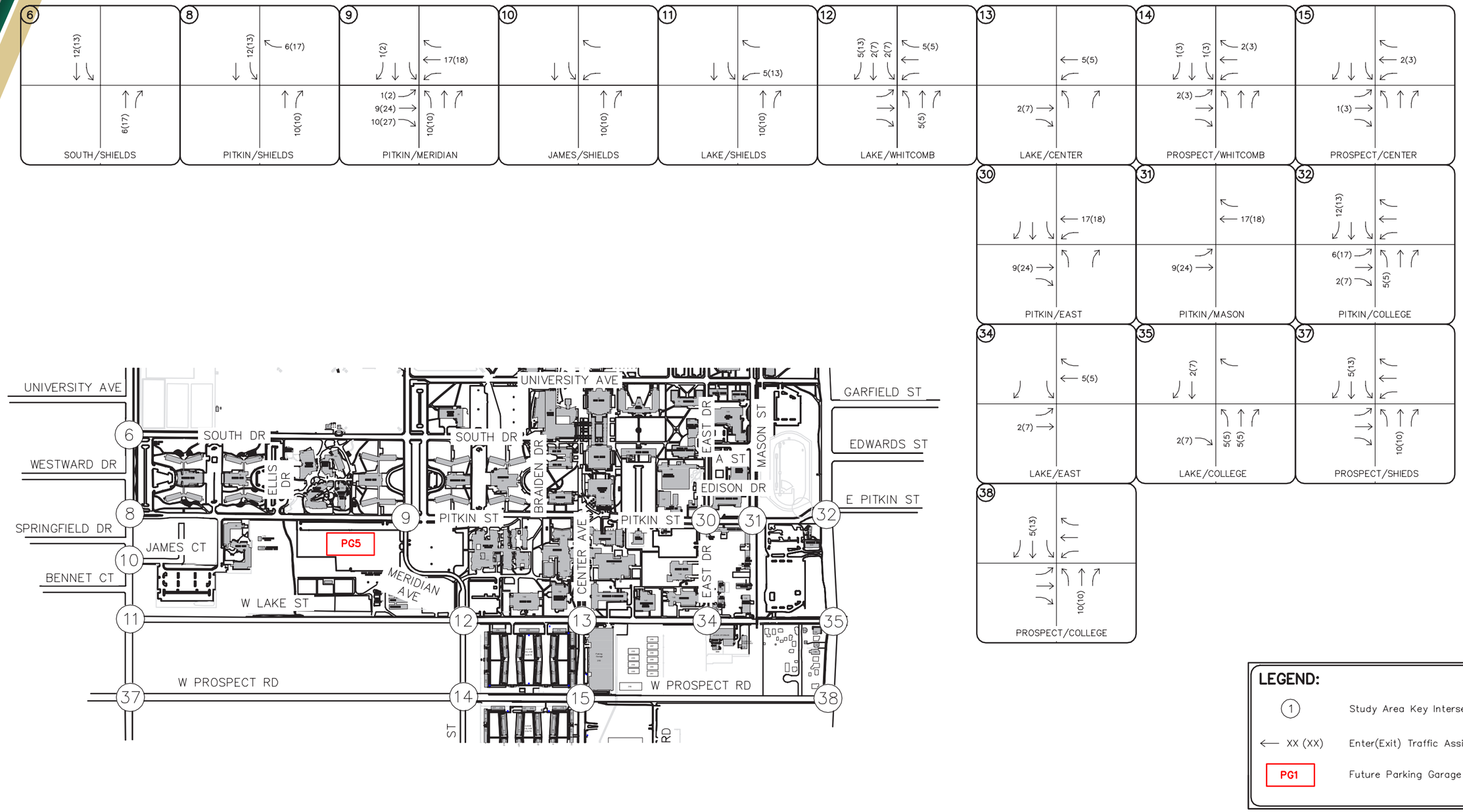
LEGEND:

(1)	Study Area Key Intersection
← XX (XX)	Enter(Exit) Traffic Assignment
PG1	Future Parking Garage Location

ASSIGNMENT FOR PARKING GARAGE #4

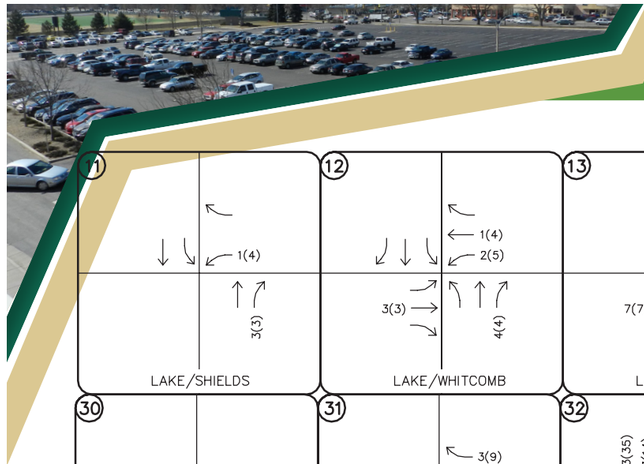
FIGURE 32

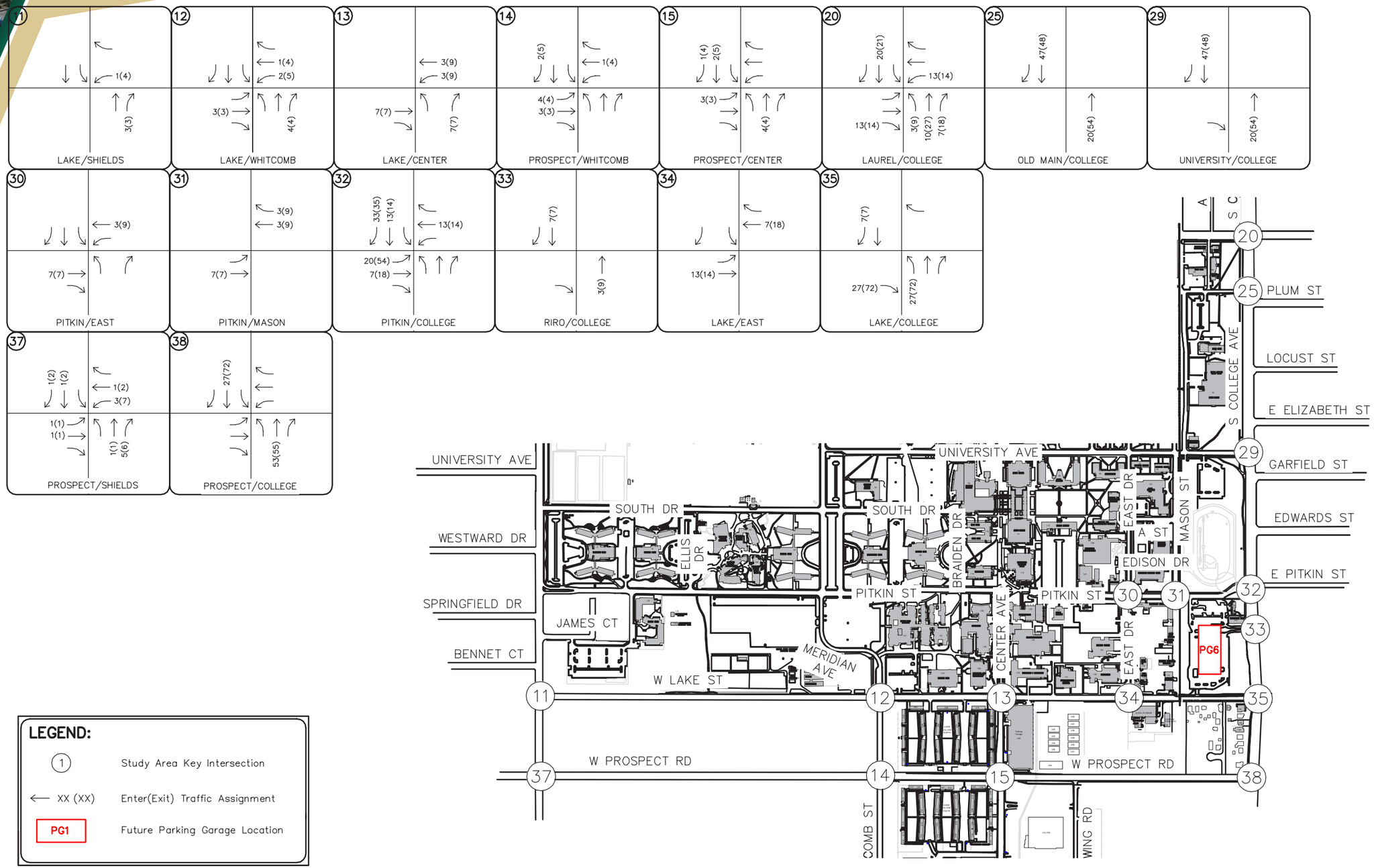




ASSIGNMENT FOR PARKING GARAGE #5

FIGURE 33



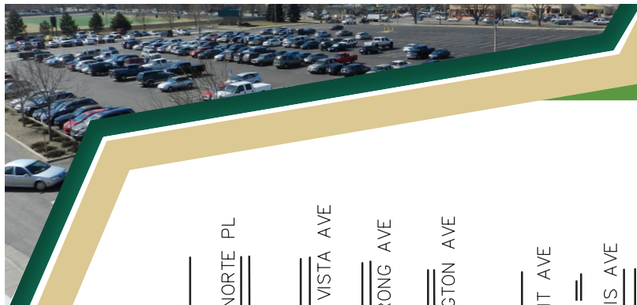


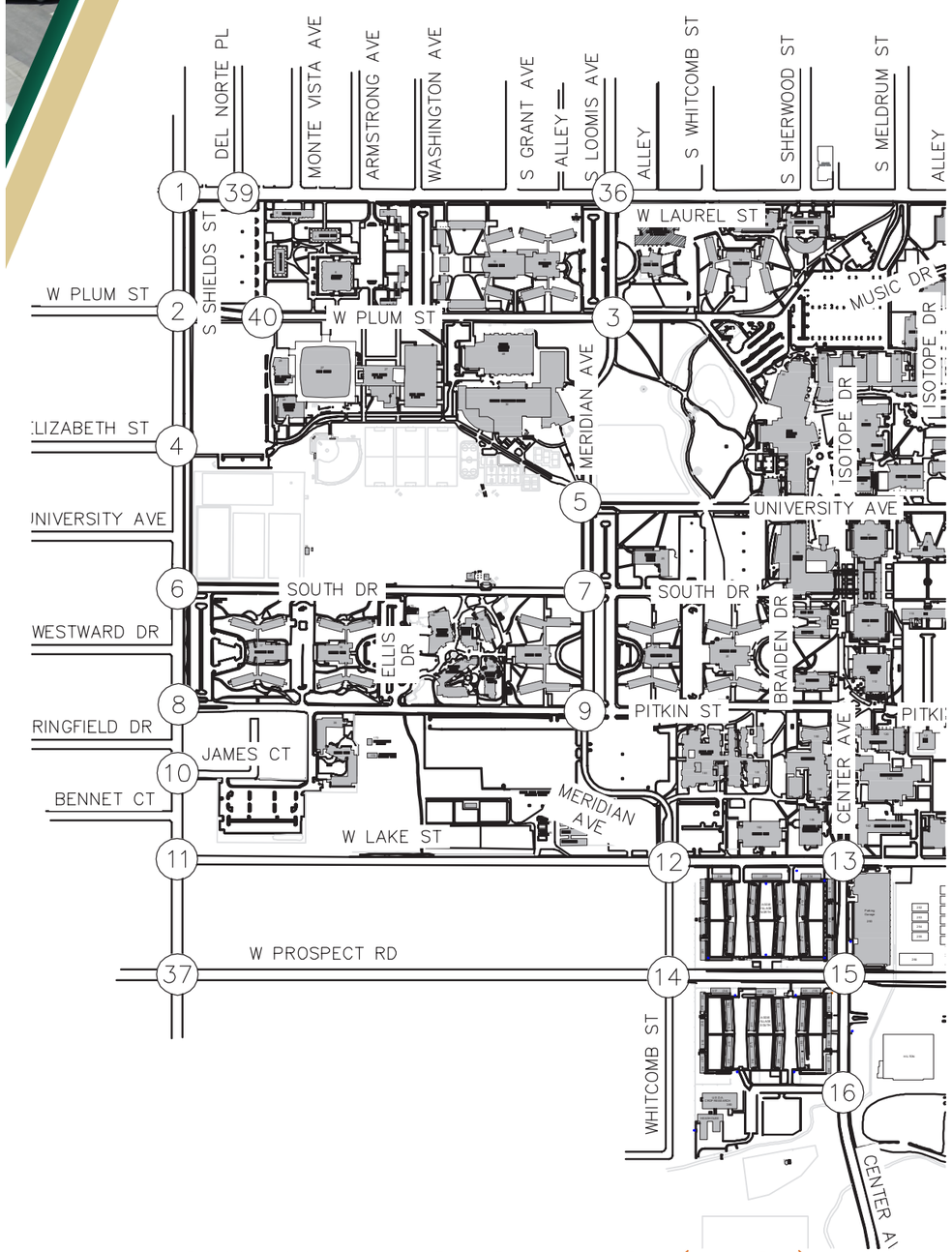
LEGEND:

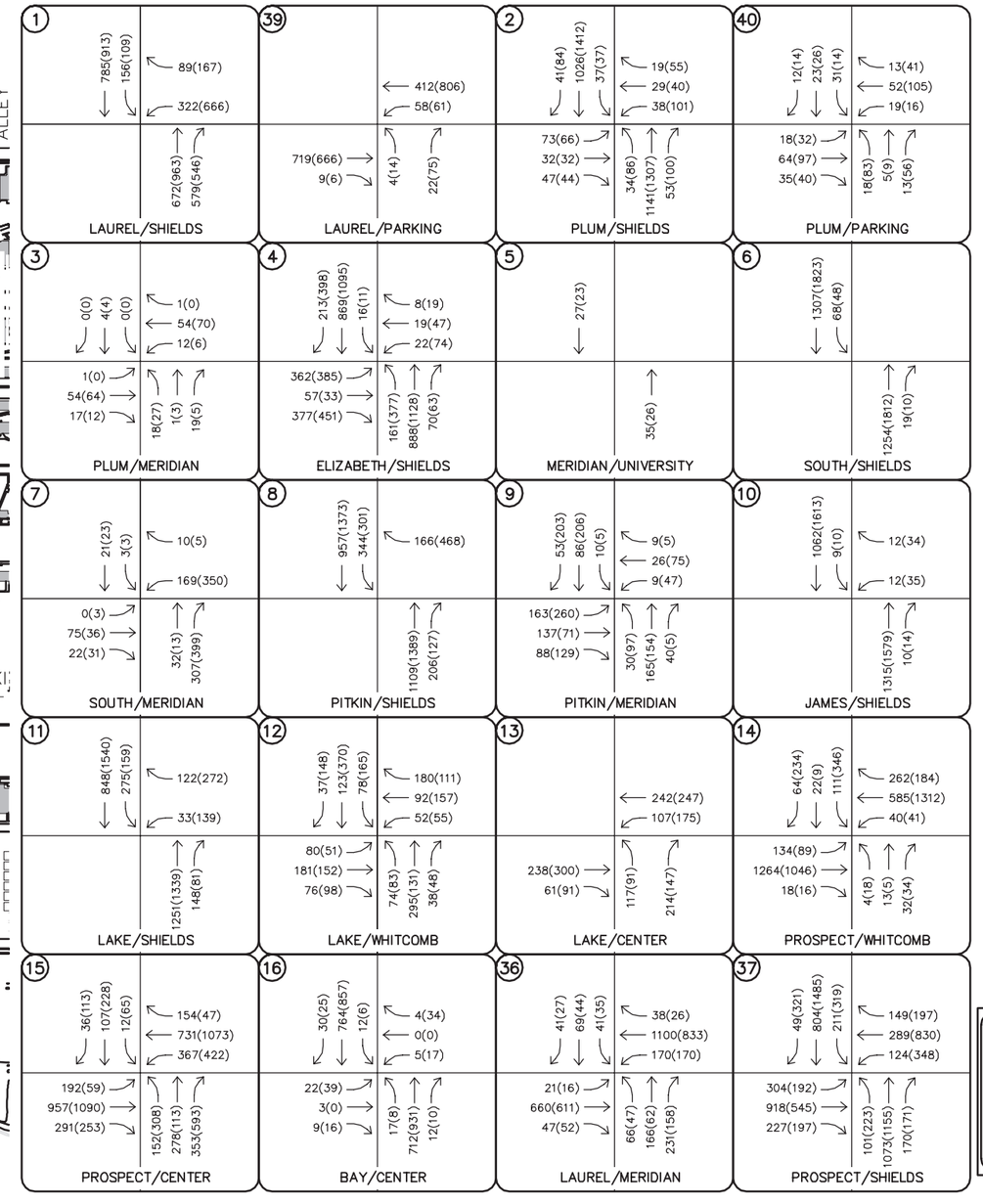
(1)	Study Area Key Intersection
← XX (XX)	Enter(Exit) Traffic Assignment
PG1	Future Parking Garage Location

ASSIGNMENT FOR PARKING GARAGE #6

FIGURE 34

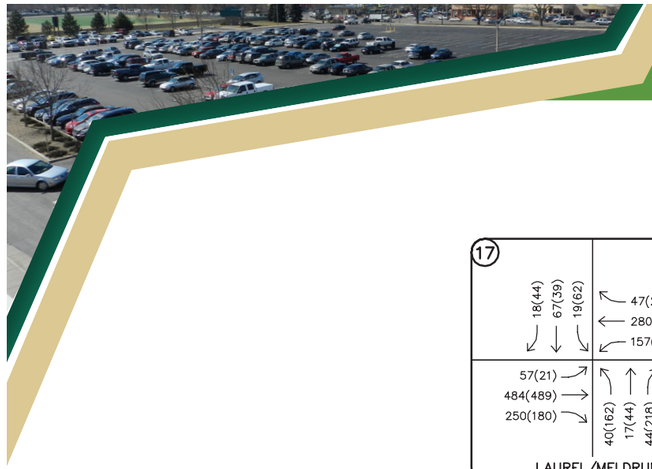


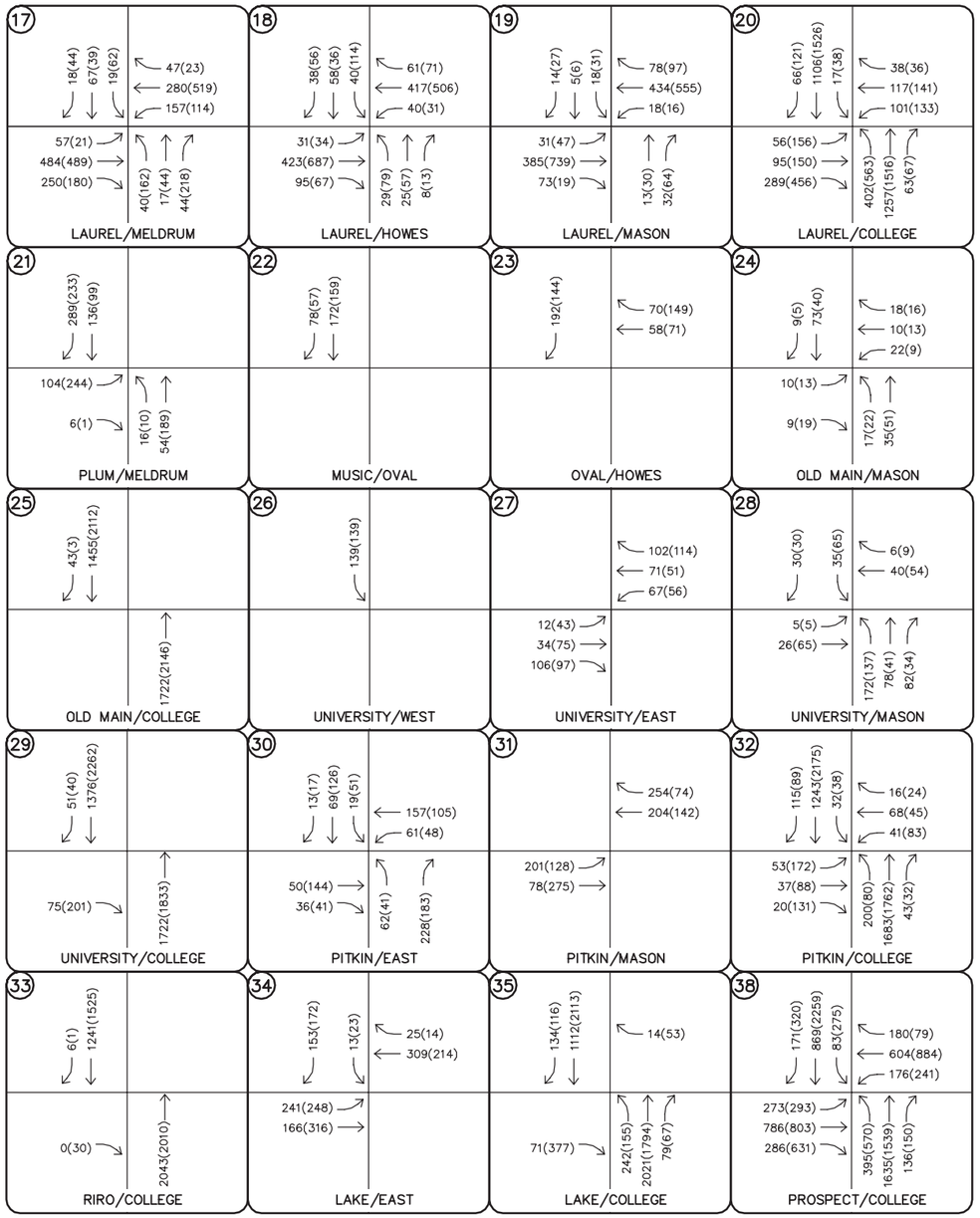




2024 TOTAL TRAFFIC VOLUMES – (WEST)

FIGURE 35

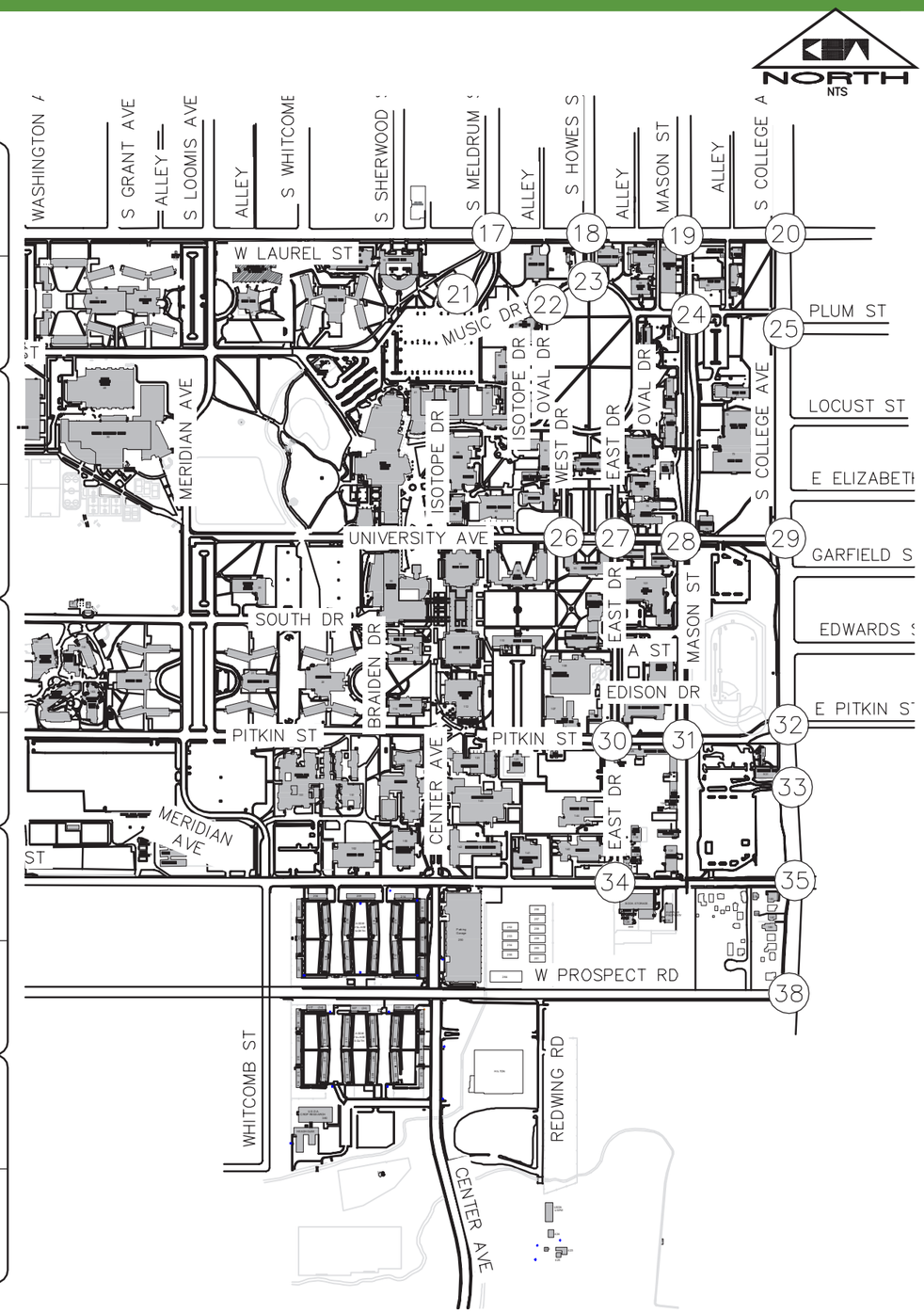




LEGEND:

(1) Study Area Key Intersection

← XX (XX) AM(PM) Peak Hour Traffic Volume



2024 TOTAL TRAFFIC VOLUMES – (EAST)

FIGURE 36

Traffic Operations Analysis

Kimley-Horn's analysis of traffic operations was conducted to determine potential capacity deficiencies in the 2024 development horizon at the identified study key intersections. The acknowledged source for determining overall capacity is the *Highway Capacity Manual*.

Analysis Methodology

Capacity analysis results are listed in terms of Level of Service (LOS). LOS is a qualitative term describing operating conditions a driver will experience while traveling on a particular street or highway during a specific time interval. It ranges from A (very little delay) to F (long delays and congestion). For intersections and roadways in this study area, Kimley-Horn recommends intersection LOS D as the minimum threshold for acceptable operations. **Table 10** shows the definition of LOS for signalized and unsignalized intersections.

Table 10 – 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

The study key intersections were evaluated based on an average total delay analysis for unsignalized and signalized intersections. Under the unsignalized analysis, the 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 as a whole. LOS for a signalized, roundabout, and four-way stop-controlled intersection is defined for each approach and for the intersection as a whole.

Key Intersection Operational Analysis

LOS calculations for each of the study key intersections for the existing 2013 horizon are provided in **Appendix B**. The LOS analyses are based on the lane geometry and intersection control shown in **Figures 3** and **4**. A summary of the existing intersection delay and level of service is provided in **Table 11** and summarized graphically in **Figures 37** and **38.**

Table 11 – 2013 Existing Intersection Delay and Level of Service

Intersection		AM Peak Hour		PM Peak Hour	
		Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
1	Laurel/Shields	10.8	B	21.2	C
2	Plum/Shields	8.3	A	9.0	A
3	Plum/Meridian	7.2	A	7.3	A
	Eastbound Approach	*7.3*	*A*	*7.3*	*A*
	Westbound Approach	*7.5*	*A*	*7.5*	*A*
	Northbound Approach	*6.6*	*A*	*7.0*	*A*
	Southbound Approach	*6.7*	*A*	*6.7*	*A*
4	Elizabeth/Shields	19.7	B	39.7	D
5	Meridian/University	7.1	A	7.1	A
	Northbound Approach	*7.1*	*A*	*7.1*	*A*
	Southbound Approach	*7.1*	*A*	*7.1*	*A*
6	South/Shields				
	Southbound Left	*11.4*	*B*	*14.9*	*B*
7	South/Meridian	10.4	B	17.1	C
	Eastbound Approach	*9.2*	*A*	*8.7*	*A*
	Westbound Approach	*10.5*	*B*	*22.6*	*C*
	Northbound Approach	*10.9*	*B*	*13.4*	*B*
	Southbound Approach	*8.6*	*A*	*9.5*	*A*
8	Pitkin/Shields				
	Westbound Approach	*12.1*	*B*	*23.6*	*C*
	Southbound Left	*14.9*	*B*	*18.2*	*C*
9	Pitkin/Meridian	13.8	B	18.0	C
	Eastbound Approach	*16.8*	*C*	*24.8*	*C*
	Westbound Approach	*8.9*	*A*	*14.0*	*B*
	Northbound Approach	*11.7*	*B*	*17.4*	*C*
	Southbound Approach	*9.0*	*A*	*14.2*	*B*
10	James/Shields				

Table 11 – 2013 Existing Intersection Delay and Level of Service (Cont.)

Intersection		AM Peak Hour		PM Peak Hour	
		Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
	Westbound Left	*17.9*	*C*	*27.2*	*D*
	Westbound Right	*10.4*	*B*	*11.4*	*B*
	Southbound Left	*10.5*	*B*	*12.0*	*B*
11	Lake/Shields	6.9	A	8.9	A
12	Lake/Whitcomb	14.9	B	15.5	C
	Eastbound Approach	*14.6*	*B*	*15.4*	*C*
	Westbound Approach	*14.5*	*B*	*15.9*	*C*
	Northbound Approach	*18.9*	*C*	*12.8*	*B*
	Southbound Approach	*9.7*	*A*	*16.1*	*C*
13	Lake/Center	11.0	B	12.3	B
	Eastbound Approach	*10.8*	*B*	*12.0*	*B*
	Westbound Approach	*11.1*	*B*	*13.2*	*B*
	Northbound Approach	*11.1*	*B*	*11.6*	*B*
14	Prospect/Whitcomb	7.3	A	13.7	B
15	Prospect/Center	18.8	B	19.5	B
16	Bay/Center				
	Eastbound Approach	*20.9*	*C*	*24.4*	*C*
	Westbound Approach	*19.9*	*C*	*15.5*	*C*
	Northbound Left	*8.2*	*A*	*8.4*	*A*
	Southbound Left	*8.6*	*A*	*8.3*	*A*
17	Laurel/Meldrum	8.5	A	11.6	B
18	Laurel/Howes	9.6	A	8.7	A
19	Laurel/Mason	16.4	B	14.4	B
20	Laurel/College	28.0	C	30.6	C
21	Plum/Meldrum				
	Eastbound Left	*6.9*	*A*	*7.6*	*A*
	Northbound Approach	*26.2*	*D*	*27.0*	*D*
	Southbound Approach	*21.2*	*C*	*18.1*	*C*
22	Music/Oval	No Movements Experience Delay			
23	Oval/Howes	7.2	A	7.1	A
	Westbound Approach	*6.8*	*A*	*6.8*	*A*
	Southbound Approach	*7.5*	*A*	*7.5*	*A*
24	Old Main/Mason	7.7	A	7.5	A

Table 11 – 2013 Existing Intersection Delay and Level of Service (Cont.)

Intersection		AM Peak Hour		PM Peak Hour	
		Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
	Eastbound Approach	*6.7*	*A*	*6.6*	*A*
	Westbound Approach	*7.7*	*A*	*7.5*	*A*
	Northbound Approach	*7.8*	*A*	*7.8*	*A*
	Southbound Approach	*7.8*	*A*	*7.4*	*A*
25	Old Main/College	No Movements Experience Delay			
26	University/West				
	Southbound Approach	*12.2*	*B*	*10.9*	*B*
27	University/East				
	Eastbound Approach	*10.7*	*B*	*11.4*	*B*
	Westbound Approach	*13.7*	*B*	*12.3*	*B*
28	University/Mason	8.2	A	8.2	A
	Eastbound Approach	*8.3*	*A*	*8.5*	*A*
	Westbound Approach	*8.2*	*A*	*8.3*	*A*
	Northbound Approach	*8.4*	*A*	*8.2*	*A*
	Southbound Approach	*7.1*	*A*	*7.8*	*A*
29	University/College				
	Eastbound Approach	*10.6*	*B*	*10.0*	*B*
30	Pitkin/East	9.2	A	10.2	B
	Eastbound Approach	*9.5*	*A*	*11.4*	*B*
	Westbound Approach	*9.0*	*A*	*8.9*	*A*
	Northbound Approach	*8.6*	*A*	*8.8*	*A*
	Southbound Approach	*10.2*	*B*	*11.6*	*B*
31	Pitkin/Mason				
	Eastbound Left	*9.4*	*A*	*7.9*	*A*
32	Pitkin/College	9.6	A	14.4	B
33	RIRO Access/College				
	Eastbound Approach	*8.7*	*A*	*9.5*	*A*
34	Lake/East				
	Eastbound Through	*6.0*	*A*	*4.5*	*A*
	Southbound Approach	*13.6*	*B*	*13.3*	*B*

Table 11 – 2013 Existing Intersection Delay and Level of Service (Cont.)

Intersection		AM Peak Hour		PM Peak Hour	
		Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
35	Lake/College				
	Eastbound Approach	*9.2*	*A*	*11.0*	*B*
	Westbound Approach	*9.4*	*A*	*9.4*	*A*
	Northbound Left	*11.3*	*B*	*13.2*	*B*
36	Laurel/Meridian	12.3	B	9.2	A
37	Prospect/Shields	33.0	C	37.0	D
38	Prospect/College	39.6	D	40.6	D
39	Laurel/Parking				
	Westbound Left	*9.1*	*A*	*9.0*	*A*
	Northbound Approach	*11.8*	*B*	*13.8*	*B*
40	Plum/Parking	7.6	A	8.3	A
	Eastbound Approach	*7.7*	*A*	*8.5*	*A*
	Westbound Approach	*7.6*	*A*	*8.4*	*A*
	Northbound Approach	*7.5*	*A*	*8.2*	*A*
	Southbound Approach	*7.7*	*A*	*8.1*	*A*

As shown in **Table 11** and **Figures 37** and **38**, all signalized and all-way stop controlled intersections currently operate with acceptable level of service during the weekday morning and afternoon peak hours. In addition, all movements at the unsignalized two-way stop controlled intersections operate acceptably during both study peak hours. Although, not as much a priority, the approach level of service was identified for the approaches of the signalized and all-way stop control intersections as shown in **Figures 37** and **38**. Considering the approaches, it was found that the following currently operate at LOS E during the existing weekday peak hours:

- Plum Street/Shields Street signalized intersection eastbound approach
- Elizabeth Street/Shields Street signalized intersection eastbound approach
- Prospect Road/Shields Street signalized intersection westbound approach
- Prospect Road/College Avenue signalized intersection EB and WB approaches

These are the intersections that may experience delay issues in the near future.

Based on the anticipated CSU growth and the addition of seven (7) parking structures on campus, the future 2024 predicted intersection delay and LOS for each key intersection can be found in **Table 12** and **Figures 39** and **40,** with calculations provided in **Appendix C**.

Table 12 – 2024 Expected Future Intersection Delay and Level of Service

Intersection		AM Peak Hour		PM Peak Hour	
		Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
1	Laurel/Shields	15.3	B	35.6	D
2	Plum/Shields	10.5	B	16.4	B
3	Plum/Meridian	7.4	A	7.6	A
	Eastbound Approach	*7.6*	*A*	*7.7*	*A*
	Westbound Approach	*7.7*	*A*	*7.8*	*A*
	Northbound Approach	*6.8*	*A*	*7.3*	*A*
	Southbound Approach	*6.8*	*A*	*6.9*	*A*
4	Elizabeth/Shields	28.7	C	96.4	F
5	Meridian/University	7.1	A	7.1	A
	Northbound Approach	*7.2*	*A*	*7.2*	*A*
	Southbound Approach	*7.1*	*A*	*7.1*	*A*
6	South/Shields				
	Southbound Left	*15.1*	*C*	*24.3*	*C*
7	South/Meridian	13.8	B	44.7	E
	Eastbound Approach	*11.2*	*B*	*10.3*	*B*
	Westbound Approach	*13.2*	*B*	*72.0*	*F*
	Northbound Approach	*15.5*	*C*	*24.9*	*C*
	Southbound Approach	*9.5*	*A*	*10.7*	*B*
8	Pitkin/Shields				
	Westbound Right	*11.5*	*B*	*26.1*	*D*
	Southbound Left	*32.4*	*D*	*86.0*	*F*
9	Pitkin/Meridian	40.2	E	90.5	F
	Eastbound Approach	*64.4*	*F*	*205.8*	*F*
	Westbound Approach	*11.0*	*B*	*26.9*	*D*
	Northbound Approach	*18.1*	*C*	*52.4*	*F*
	Southbound Approach	*11.4*	*B*	*31.9*	*D*
10	James/Shields				

Table 12 – 2024 Expected Future Intersection Delay and Level of Service (Cont.)

Intersection		AM Peak Hour		PM Peak Hour	
		Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
	Westbound Left	*22.4*	*C*	*51.9*	*F*
	Westbound Right	*10.0*	*A*	*10.6*	*B*
	Southbound Left	*12.1*	*B*	*15.6*	*C*
11	Lake/Shields	12.8	B	16.6	B
12	Lake/Whitcomb	89.4	F	105.0	F
	Eastbound Approach	*63.1*	*F*	*88.1*	*F*
	Westbound Approach	*67.0*	*F*	*114.9*	*F*
	Northbound Approach	*174.0*	*F*	*65.4*	*F*
	Southbound Approach	*15.6*	*C*	*121.6*	*F*
13	Lake/Center	18.1	C	31.9	D
	Eastbound Approach	*16.6*	*C*	*25.4*	*D*
	Westbound Approach	*20.1*	*C*	*45.1*	*E*
	Northbound Approach	*17.4*	*C*	*19.9*	*C*
14	Prospect/Whitcomb	14.2	B	44.4	D
15	Prospect/Center	79.5	E	128.2	F
16	Bay/Center				
	Eastbound Approach	*370.6*	*F*	*54.9*	*F*
	Westbound Approach	*161.5*	*F*	*33.9*	*D*
	Northbound Left	*10.7*	*B*	*11.7*	*B*
	Southbound Left	*10.1*	*B*	*11.0*	*B*
17	Laurel/Meldrum	9.7	A	15.5	B
18	Laurel/Howes	9.6	A	18.6	B
19	Laurel/Mason	14.7	B	11.0	B
20	Laurel/College	30.7	C	66.1	E
21	Plum/Meldrum				
	Eastbound Left	*7.1*	*A*	*7.8*	*A*
	Northbound Approach	*144.4*	*F*	*108.4*	*F*
	Southbound Approach	*68.1*	*F*	*43.3*	*E*
22	Music/Oval	No Movements Experience Delay			

Table 12 – 2024 Expected Future Intersection Delay and Level of Service (Cont.)

Intersection		AM Peak Hour		PM Peak Hour	
		Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
23	Oval/Howes	7.6	A	7.6	A
	Westbound Approach	*7.1*	*A*	*7.2*	*A*
	Southbound Approach	*8.0*	*A*	*8.0*	*A*
24	Old Main/Mason	8.0	A	7.7	A
	Eastbound Approach	*6.9*	*A*	*6.8*	*A*
	Westbound Approach	*8.1*	*A*	*7.7*	*A*
	Northbound Approach	*8.1*	*A*	*8.2*	*A*
	Southbound Approach	*8.1*	*A*	*7.6*	*A*
25	Old Main/College	No Movements Experience Delay			
26	University/West				
	Southbound Approach	*13.7*	*B*	*12.2*	*B*
27	University/East				
	Eastbound Approach	*12.0*	*B*	*13.4*	*B*
	Westbound Approach	*19.7*	*C*	*15.5*	*B*
28	University/Mason	9.0	A	8.8	A
	Eastbound Approach	*8.7*	*A*	*9.2*	*A*
	Westbound Approach	*8.6*	*A*	*8.8*	*A*
	Northbound Approach	*9.4*	*A*	*9.0*	*A*
	Southbound Approach	*7.5*	*A*	*8.3*	*A*
29	University/College				
	Eastbound Approach	*11.5*	*B*	*11.7*	*B*
30	Pitkin/East	11.3	B	14.4	B
	Eastbound Approach	*11.4*	*B*	*17.5*	*C*
	Westbound Approach	*11.2*	*B*	*11.3*	*B*
	Northbound Approach	*10.9*	*B*	*11.9*	*B*
	Southbound Approach	*12.3*	*B*	*16.4*	*C*
31	Pitkin/Mason				
	Eastbound Left	*10.9*	*B*	*8.4*	*A*
32	Pitkin/College	12.2	B	25.9	C

Table 12 – 2024 Expected Future Intersection Delay and Level of Service (Cont.)

Intersection		AM Peak Hour		PM Peak Hour	
		Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
33	RIRA Access/College				
	Eastbound Approach	*9.1*	*A*	*13.3*	*B*
34	Lake/East				
	Eastbound Through	*7.3*	*A*	*5.6*	*A*
	Southbound Approach	*23.4*	*C*	*27.4*	*D*
35	Lake/College				
	Eastbound Approach	*9.5*	*A*	*295.6*	*F*
	Westbound Approach	*10.4*	*B*	*10.3*	*B*
	Northbound Left	*14.4*	*B*	*97.1*	*F*
36	Laurel/Meridian	21.3	C	12.0	B
37	Prospect/Shield	53.3	D	73.3	E
38	Prospect/College	40.7	D	82.9	F
39	Laurel/Parking				
	Westbound Left	*10.0*	*B*	*9.9*	*A*
	Northbound Approach	*13.6*	*B*	*18.7*	*C*
40	Plum/Parking	8.5	A	9.8	A
	Eastbound Approach	*8.6*	*A*	*9.8*	*A*
	Westbound Approach	*8.4*	*A*	*9.9*	*A*
	Northbound Approach	*8.4*	*A*	*10.0*	*A*
	Southbound Approach	*8.3*	*A*	*8.9*	*A*

Because of traffic volume growth and an anticipated redistribution related to the proposed parking garages, the intersections with LOS values of E or below were analyzed in further detail. These analyses provide recommendations for what improvements may be needed at the intersections to improve the LOS, allowing them to better handle the anticipated 2024 traffic volumes. The following provides a description of these possible improvements for consideration by Colorado State University and the City of Fort Collins:

2 PLUM STREET AND SHIELDS STREET

To improve the eastbound approach to the Plum Street/Shields Street signalized intersection, the Plum Street approaches would benefit from separate left turn lanes eastbound and westbound. Right-of-way is limited along Shields Street at this intersection for the west leg. Possibly the bike lane could be incorporated within the through lane with the use of "sharrow" striping to obtain roadway width to provide a left turn lane.

4 ELIZABETH STREET AND SHIELDS STREET

To improve the overall operation of the Elizabeth Street/Shields Street intersection, it would be beneficial to remove the eastbound and westbound split phase operation of the existing traffic signal. To do so, separate dual left turn lanes would be needed eastbound. Right-of-way is restricted on the west leg of this intersection as well. Therefore, it is recommended that the City of Fort Collins consider allowing only a single westbound through lane along Elizabeth Street from the Shields Street intersection. The northbound left turn is a single left and the westbound through from the CSU parking lot only needs a single lane. Then the eastbound dual left turn lanes could be shifted one lane north and shadowed on the westbound approach. The westbound approach is recommended to include a separate right turn lane. In addition, it was found that a northbound right turn lane would improve operations of the intersection.

7 SOUTH DRIVE AND MERIDIAN AVENUE

It is recommended that Meridian Avenue be closed to public traffic at the north leg of this South Drive intersection.

8 PITKIN STREET AND SHIELDS STREET

Although the southbound left turn movement at the Pitkin Street/Shields Street intersection may operate with longer delays and level of service F, this movement is not able to be improved, unless the intersection were signalized. A full movement signalized intersection would likely be beneficial for CSU at this intersection and this could be explored further with the City of Fort Collins. Otherwise, as delay increases for southbound left turn entering traffic at this intersection, drivers will reroute on the street network and enter the campus from other intersections and roadways to get to their desired destination.

9 PITKIN STREET AND MERIDIAN AVENUE

This Pitkin Street/Meridian Avenue intersection would benefit from the addition of separate left turn lanes on each approach. Northbound, eastbound, and westbound would contain a left turn lane and a shared through/right turn lane. Southbound is recommended to include a separate left turn, through lane, and separate right turn lane. Otherwise an alternate control improvement instead would be to construct a single lane roundabout at the intersection.

10 JAMES COURT AND SHIELDS STREET

The intersection of James Court/Shields Street would benefit from restricting westbound movements at James Court to right turns only for vehicles exiting onto Shields Street or allowing a portion of the two-way left turn lane to function as an acceleration lane for those drivers exiting James Court heading south. A signal is not warranted nor recommended at this intersection due to the westbound approach volume. It is recommended that the intersection remain in its current configuration as it likely operates acceptably during most hours of the day.

12 LAKE STREET AND WHITCOMB STREET

The Lake Street/Whitcomb Street intersection would benefit from signalization. With a new traffic signal, the northbound approach should also include a separate left-turn lane. An alternate improvement to signalization could include a single-lane roundabout instead. If a roundabout is considered at this intersection, it is recommended that a second southbound approach lane be constructed for right-turn movements onto westbound Lake Street.

13 LAKE STREET AND CENTER AVENUE

The westbound Lake Street approach to the Center Avenue intersection is recommended to include a separate left-turn lane. To construct this turn lane, on-street parking along Lake Street may need to be restricted adjacent to the intersection.

14 PROSPECT ROAD AND WHITCOMB STREET

This existing signalized intersection of Prospect Road/Whitcomb Street may need improvements. It is recommended that the southbound approach consider dual left turn lanes. A shorter designated northbound left turn lane from the residential area would also be beneficial to improve traffic operations.

15 PROSPECT ROAD AND CENTER AVENUE

The northbound approach to the Prospect Road and Center Avenue intersection may require dual left-turn lanes.

16 BAY DRIVE AND CENTER AVENUE

Center Avenue may need to be improved to a four-lane cross section between the proposed parking garages and Prospect Road, which will extend both northbound and southbound through the Bay Drive intersection. Widening of Center Avenue will require two bridge widenings or culvert extensions south of Bay Drive.

20 LAUREL STREET AND COLLEGE AVENUE

The Laurel Street/College Avenue intersection is currently limited by right-of-way (ROW) constraints surrounding the intersection. Necessary improvements to the intersection would require substantial ROW acquisitions and would likely only be possible with a larger overall improvement plan for the area along College Avenue. Due to these circumstances, no improvements are recommended at this time.

21 PLUM STREET AND MELDRUM STREET – PARKING LOT

The entrance of Meldrum Street to the CSU parking lot is recommended to be considered for reconfiguration. To improve operations, the street movements from eastbound and westbound Plum Street should curve directly into Meldrum Street. This will remove the stop control on the entering approach of Meldrum Street to the parking lot. All parking aisles to this roadway should continue to operate with stop control.

32 PITKIN STREET AND COLLEGE AVENUE

It is recommended that the eastbound left turn lane at the signalized Pitkin Street/College Avenue intersection be extended to a length of at least 100 feet. Today, left turning vehicles block the through and right turn movements by extending out of the existing 50-foot left turn bay.

35 LAKE STREET AND COLLEGE AVENUE

It is recommended that a southbound acceleration lane be constructed along College Avenue for the eastbound right turn movement from Lake Street. It is believed that right-of-way would need to be acquired from five lots along this section of College Avenue to construct this additional southbound acceleration lane.

37 PROSPECT ROAD AND SHIELDS STREET

To improve operations of the Prospect Road and Shields Street intersection, it is recommended that a westbound right turn lane be constructed. However, this improvement may not be feasible due to homes that exist directly on the north side of Prospect Road at this intersection.

38 PROSPECT ROAD AND COLLEGE AVENUE

The Prospect Road/College Avenue intersection would benefit from the addition of dual left turn lanes for the eastbound and westbound left turning movements. It is also recommended that a separate right turn lane be installed for the northbound right turning movements. The intersection is constrained on the south edge by the gas station, but may be expanded to the north allowing the suggested improvements to be installed.

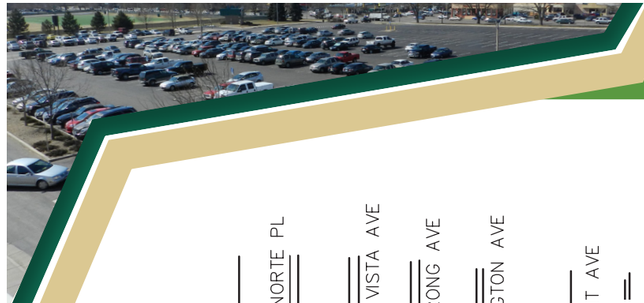
Table 13 summarizes the intersection improvements and the achievable delay and LOS associated with the proposed improvements. The recommended improvements and corresponding LOS values are also illustrated in **Figures 41** and **42**.

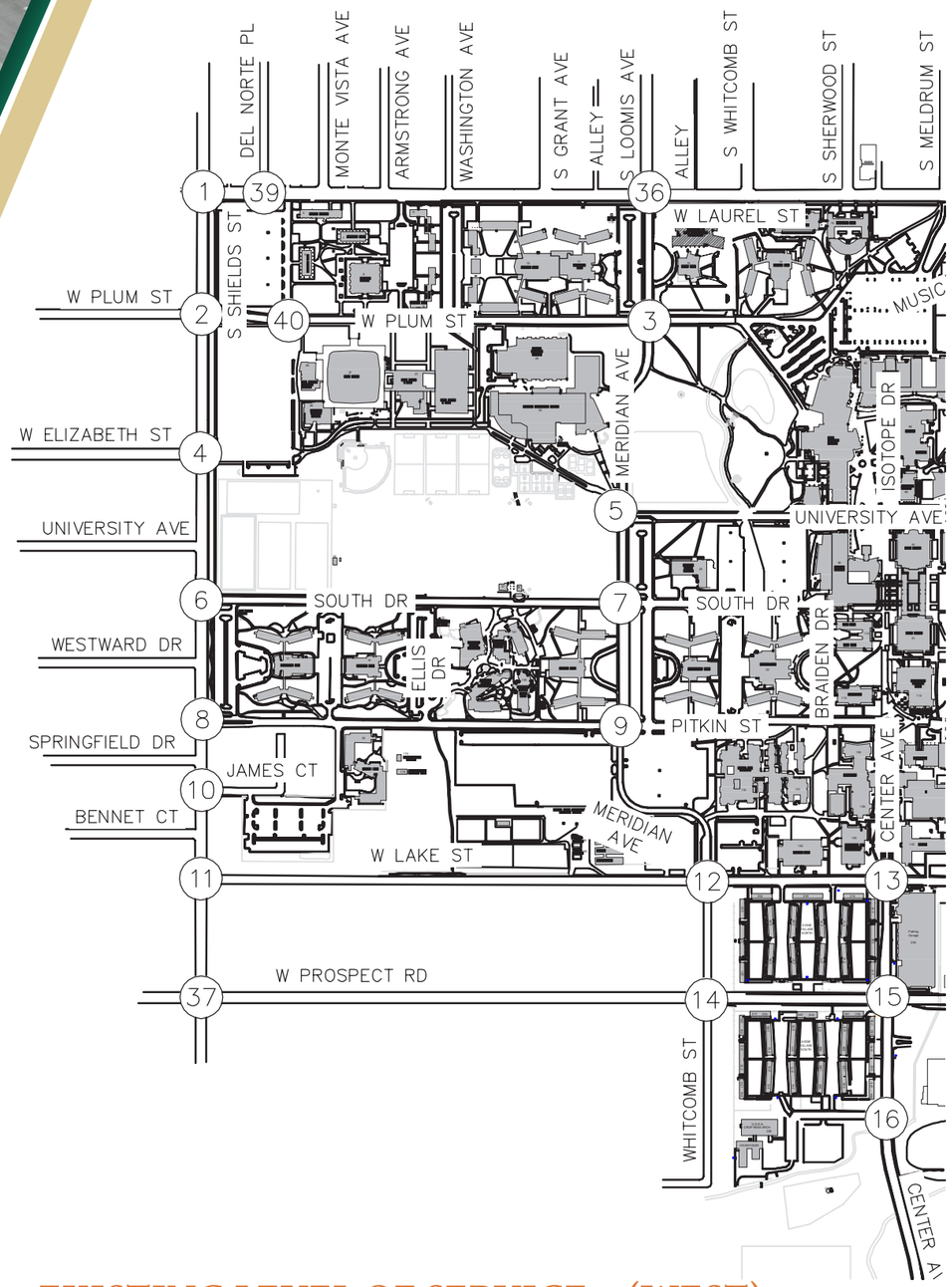
Table 13 – 2024 Expected Intersection Delay and Level of Service with Recommended Intersection Improvements

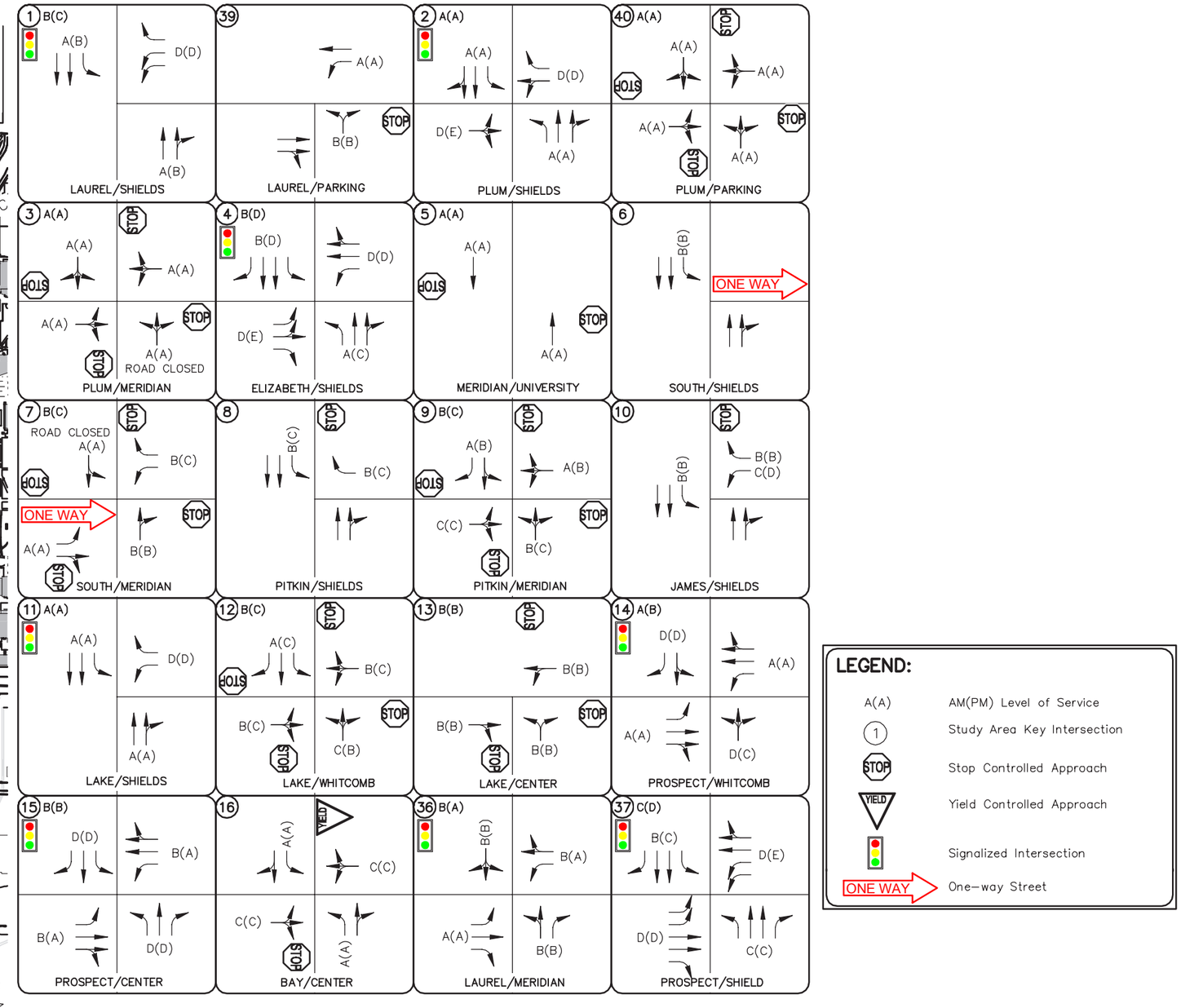
Intersection		AM Peak Hour		PM Peak Hour	
		Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
2	Plum/Shields	18.1	B	26.4	C
4	Elizabeth/Shields	26.9	C	79.4	E
7	South/Meridian	11.5	B	23.9	C
	Eastbound Approach	*10.4*	*B*	*10.1*	*B*
	Westbound Approach	*11.4*	*B*	*31.5*	*D*
	Northbound Approach	*12.1*	*B*	*18.2*	*C*
9	Pitkin/Meridian – Stop Signs	13.3	B	16.0	C
	Eastbound Approach	*15.1*	*C*	*21.1*	*C*
	Westbound Approach	*9.3*	*A*	*13.0*	*B*
	Northbound Approach	*13.7*	*B*	*15.0*	*B*
	Southbound Approach	*8.9*	*A*	*13.0*	*B*
9	Pitkin/Meridian – Roundabout	8.1	A	8.9	A

Table 13 – 2024 Expected Intersection Delay and Level of Service with Recommended Intersection Improvements (Cont.)

Intersection		AM Peak Hour		PM Peak Hour	
		Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
	Eastbound Approach	*8.2*	*A*	*9.6*	*A*
	Westbound Approach	*5.2*	*A*	*7.9*	*A*
	Northbound Approach	*10.2*	*B*	*9.9*	*A*
	Southbound Approach	*5.0*	*A*	*6.2*	*A*
12	Lake/Whitcomb - Signal	15.9	B	16.6	B
12	Lake/Whitcomb - Roundabout	9.1	A	11.4	B
	Eastbound Approach	*7.0*	*A*	*12.9*	*B*
	Westbound Approach	*10.5*	*B*	*7.8*	*A*
	Northbound Approach	*10.8*	*B*	*7.4*	*A*
	Southbound Approach	*6.4*	*A*	*13.4*	*B*
13	Lake/Center	15.5	C	18.7	C
	Eastbound Approach	*16.8*	*C*	*23.6*	*C*
	Westbound Approach	*13.3*	*B*	*15.1*	*C*
	Northbound Approach	*16.8*	*C*	*18.0*	*C*
14	Prospect/Whitcomb	15.4	B	29.7	C
15	Prospect/Center	57.7	E	58.8	E
16	Bay/Center				
	Eastbound Approach	*20.2*	*C*	*26.6*	*D*
	Westbound Approach	*18.8*	*C*	*19.8*	*C*
	Northbound Left	*10.1*	*B*	*10.6*	*B*
	Southbound Left	*10.2*	*B*	*11.1*	*B*
21	Plum/Meldrum				
	Westbound Through	*4.0*	*A*	*4.2*	*A*
	Northbound Approach	*20.6*	*C*	*16.3*	*C*
32	Pitkin/College	12.0	B	21.2	C
37	Prospect/Shields	48.4	D	48.6	D
38	Prospect/College	35.3	D	76.0	E

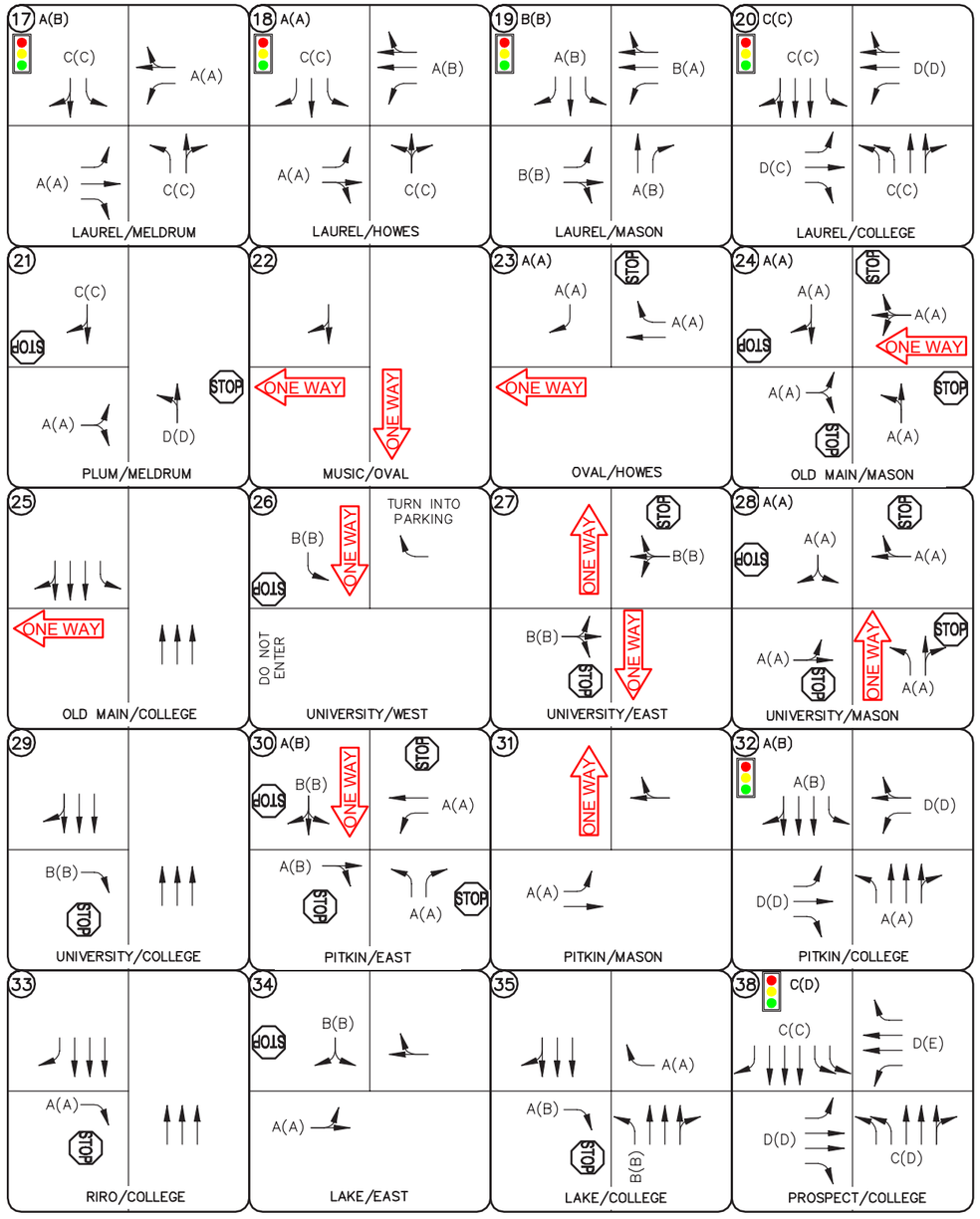


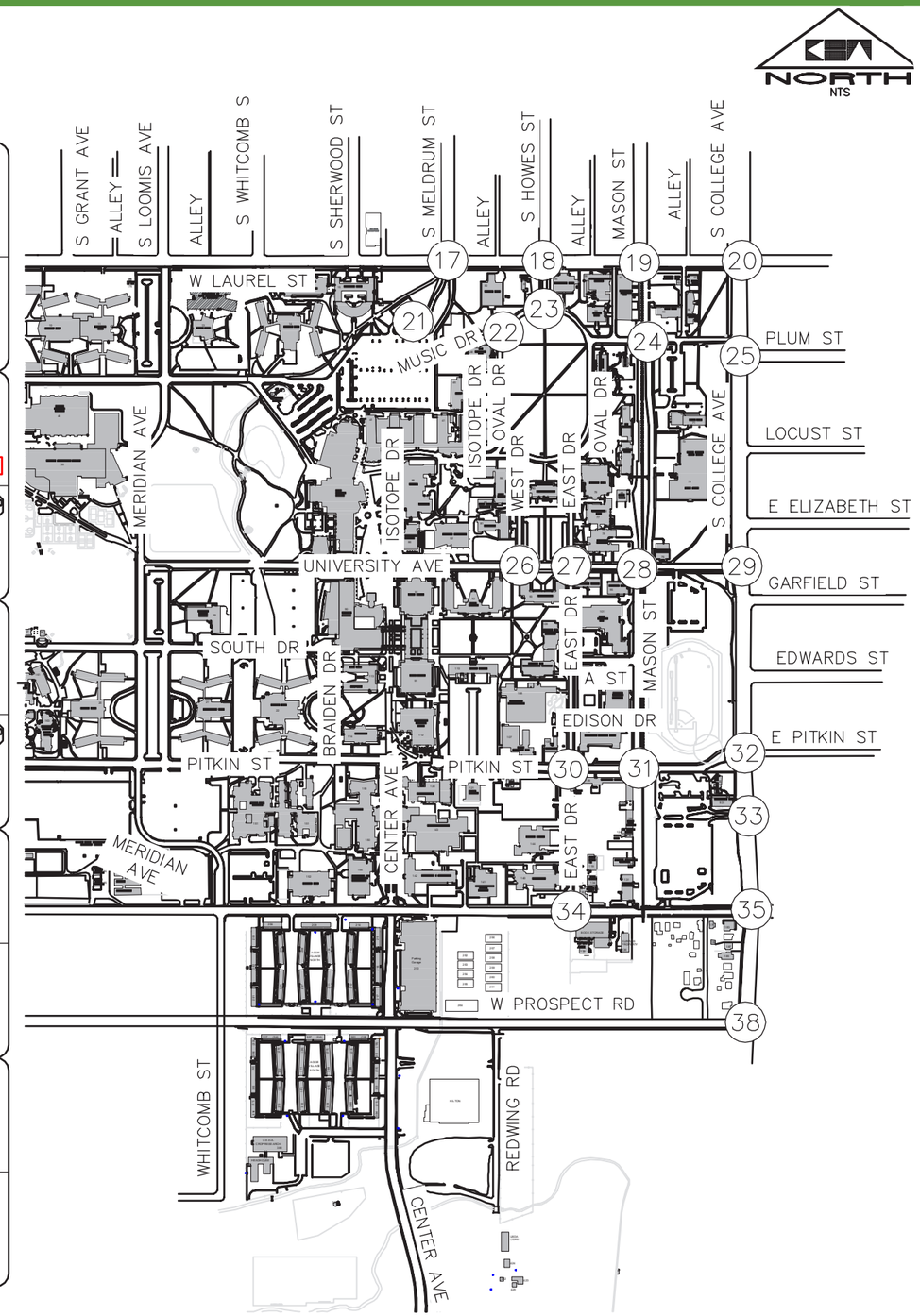




EXISTING LEVEL OF SERVICE – (WEST)

FIGURE 37



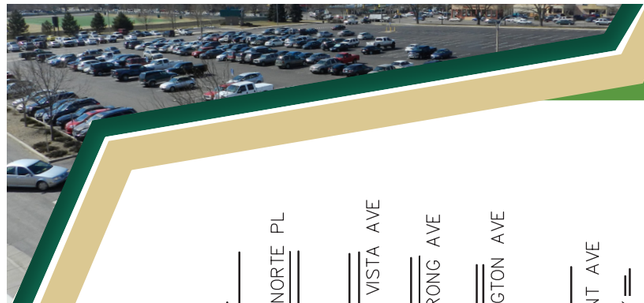


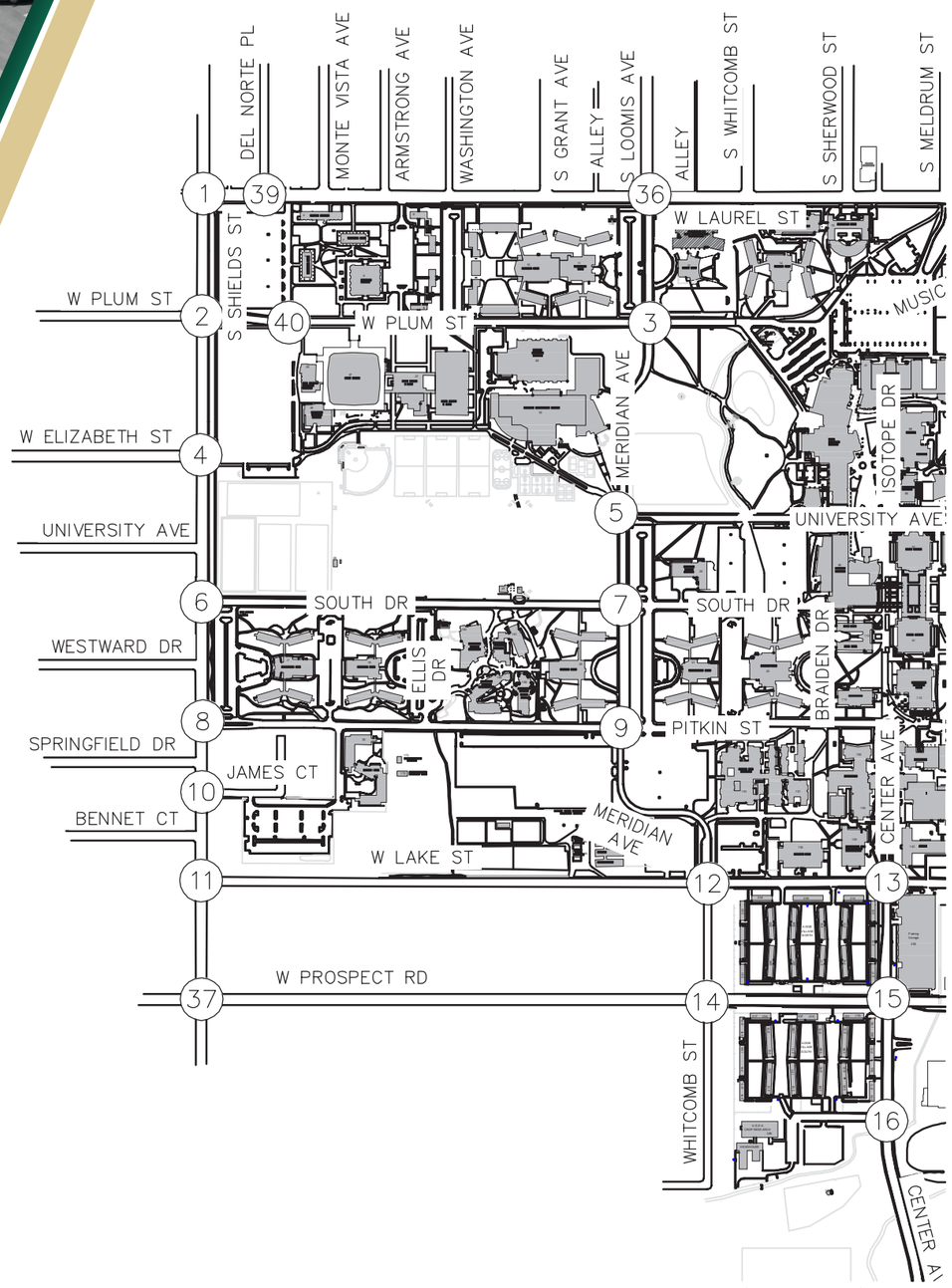
LEGEND:

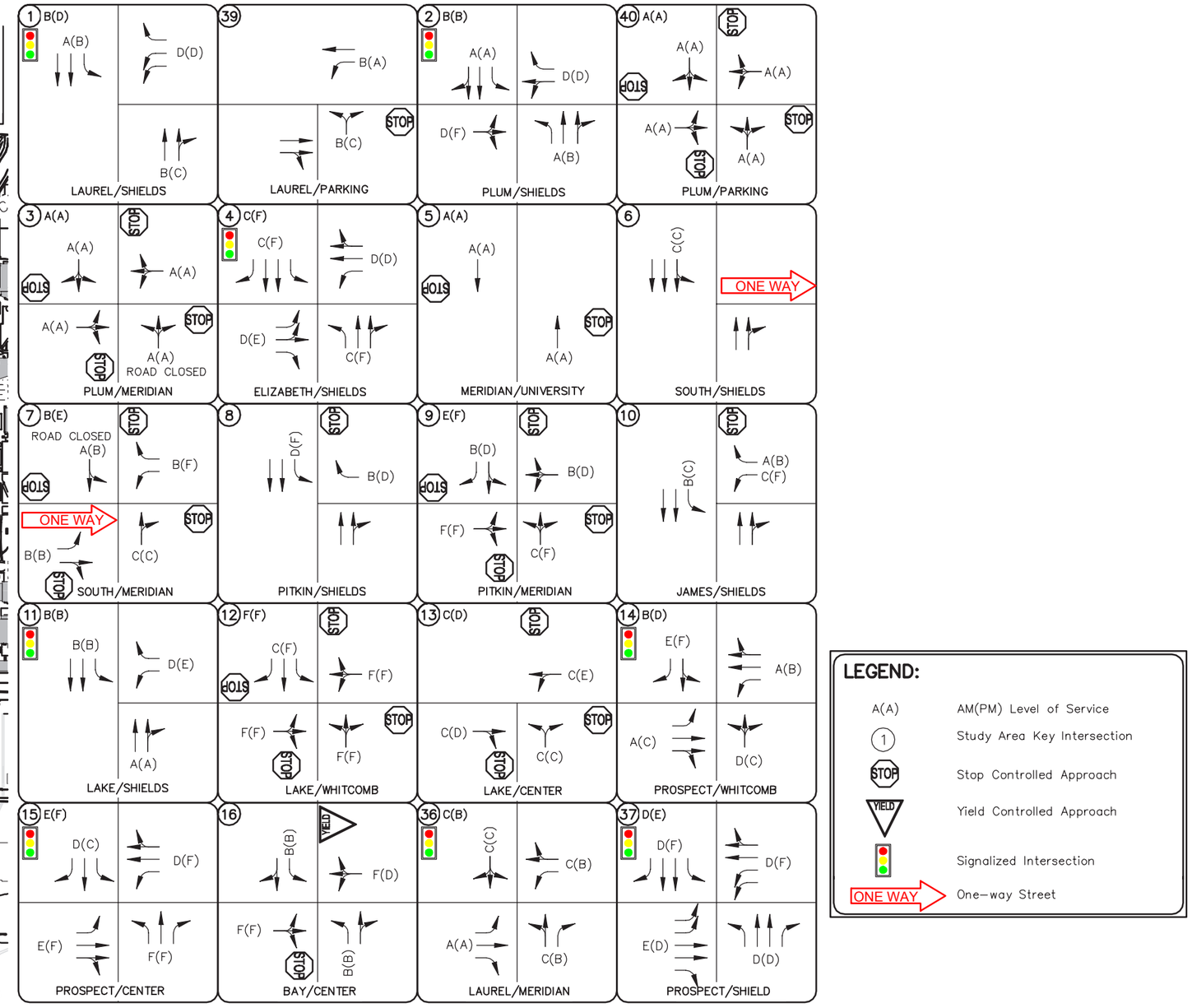
A(A)	AM(PM) Level of Service
1	Study Area Key Intersection
STOP	Stop Controlled Approach
YIELD	Yield Controlled Approach
	Signalized Intersection
ONE WAY	One-way Street

EXISTING LEVEL OF SERVICE – (EAST)

FIGURE 38

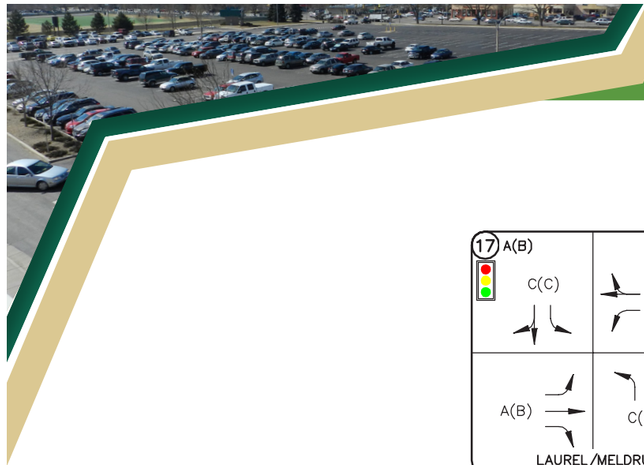


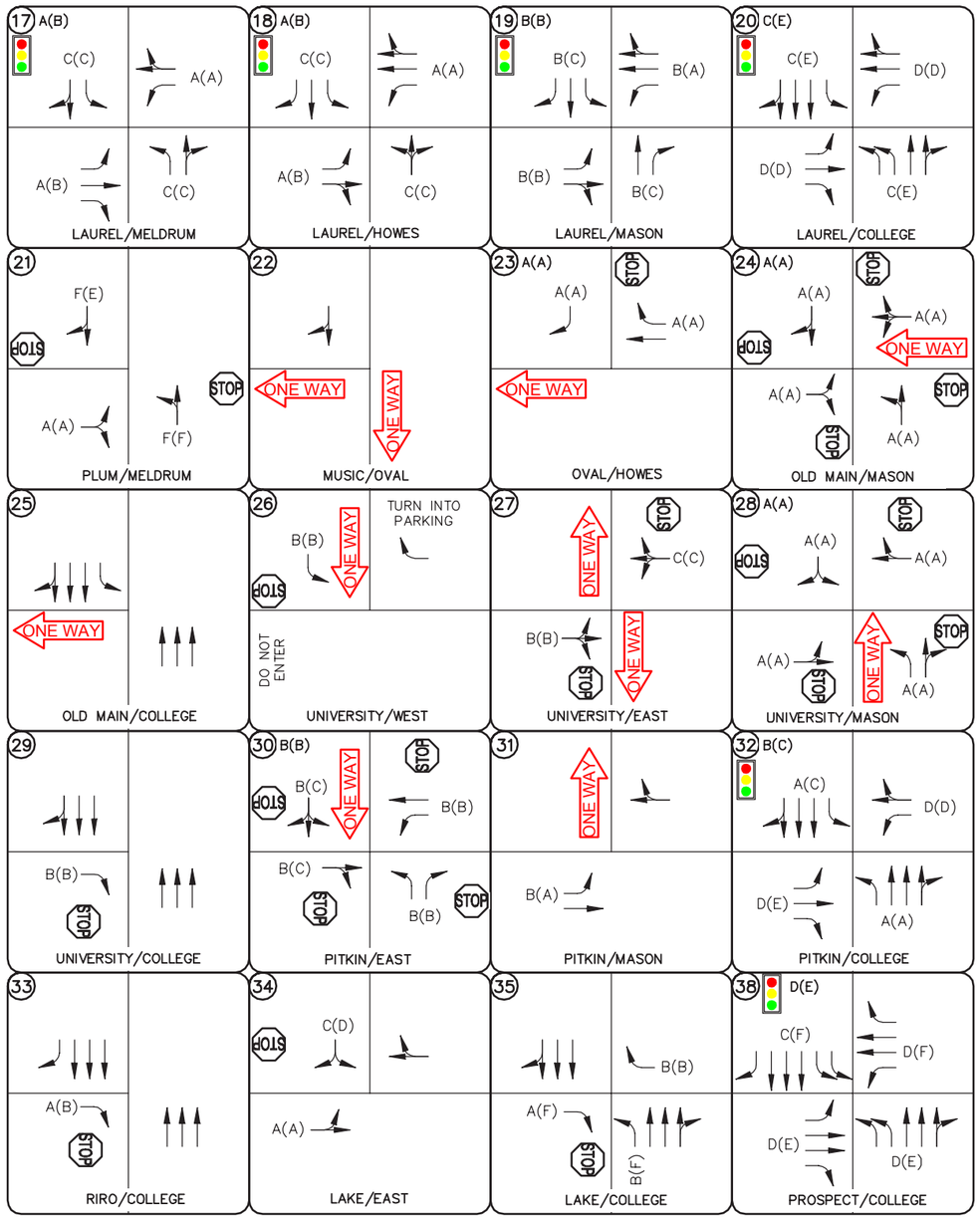


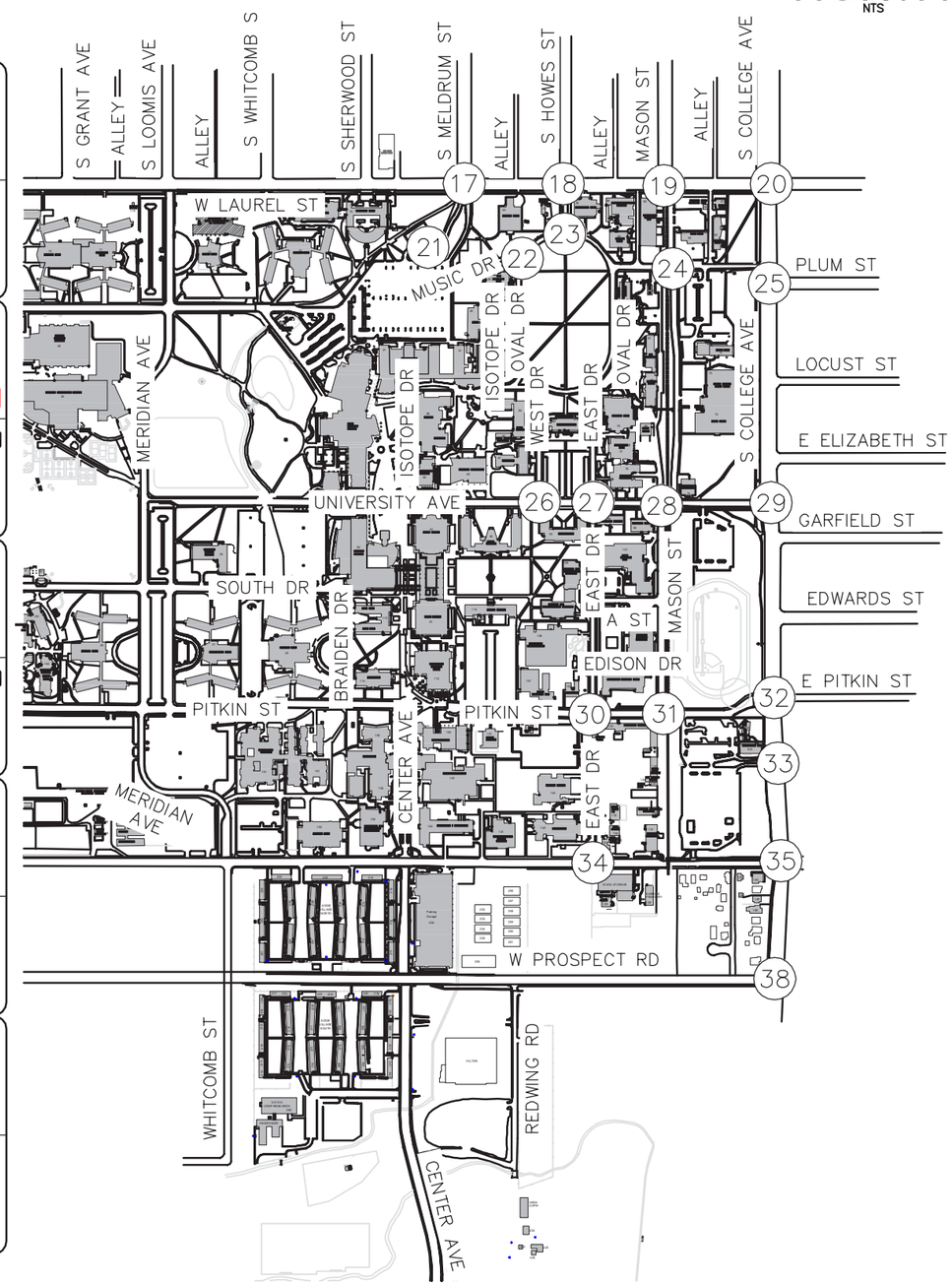


2024 EXPECTED LEVEL OF SERVICE – (WEST)

FIGURE 39





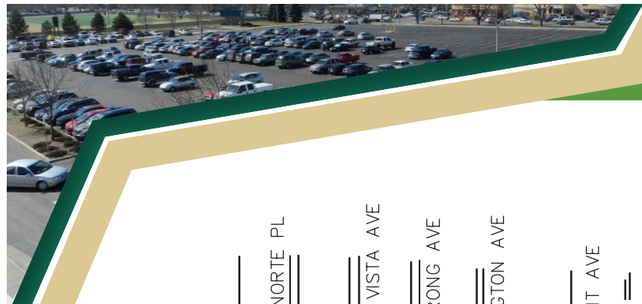


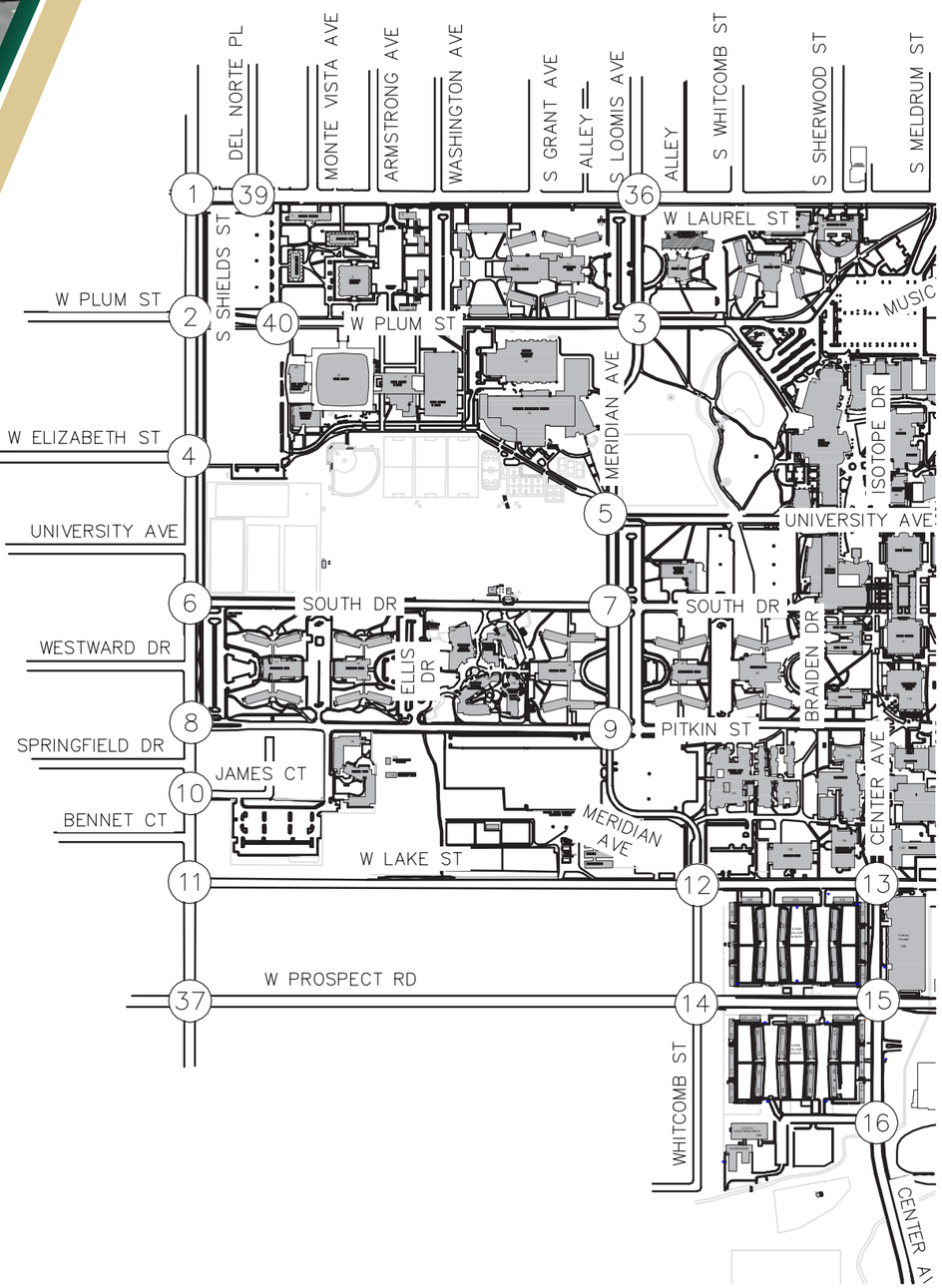
LEGEND:

A(A)	AM(PM) Level of Service
1	Study Area Key Intersection
STOP	Stop Controlled Approach
YIELD	Yield Controlled Approach
	Signalized Intersection
ONE WAY	One-way Street

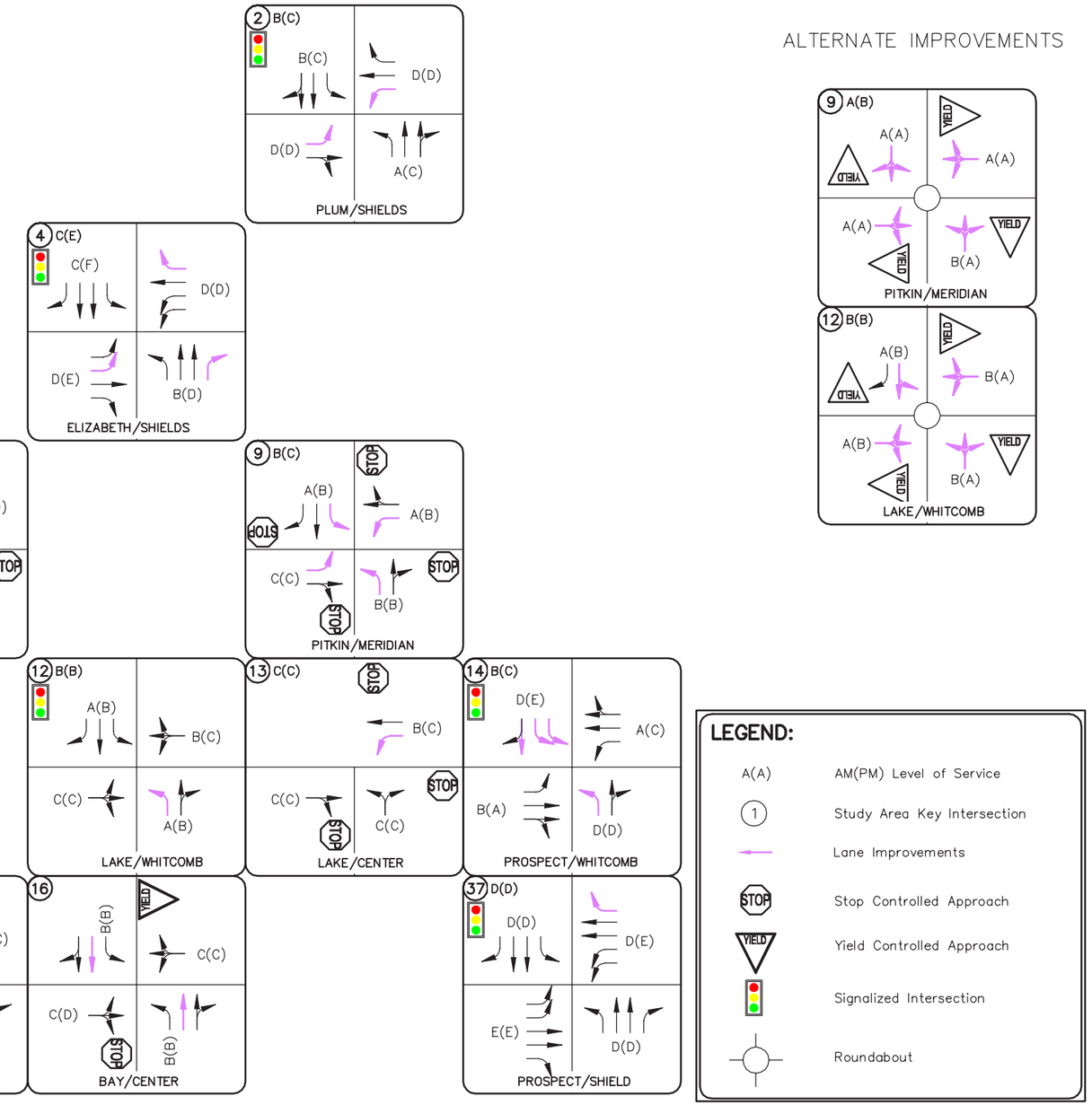
2024 EXPECTED LEVEL OF SERVICE - (EAST)

FIGURE 40



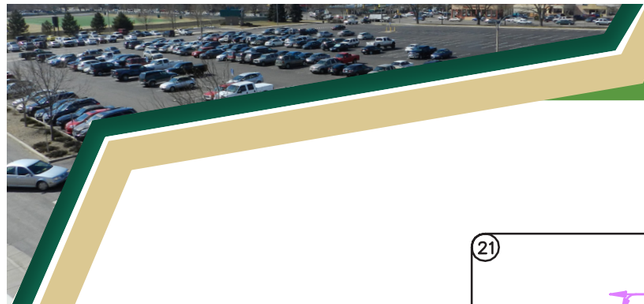


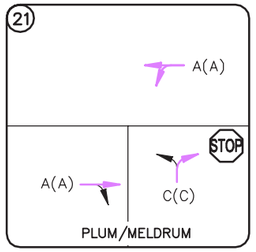
ALTERNATE IMPROVEMENTS

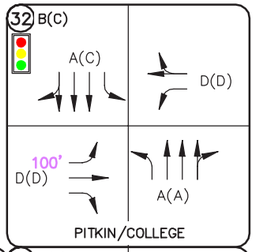


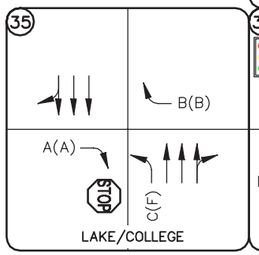
2024 RECOMMENDED IMPROVEMENTS AND CORRESPONDING LEVEL OF SERVICE – (WEST)

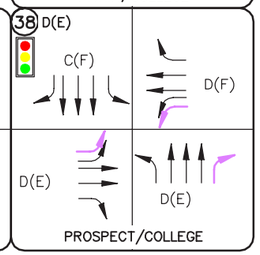
FIGURE 41

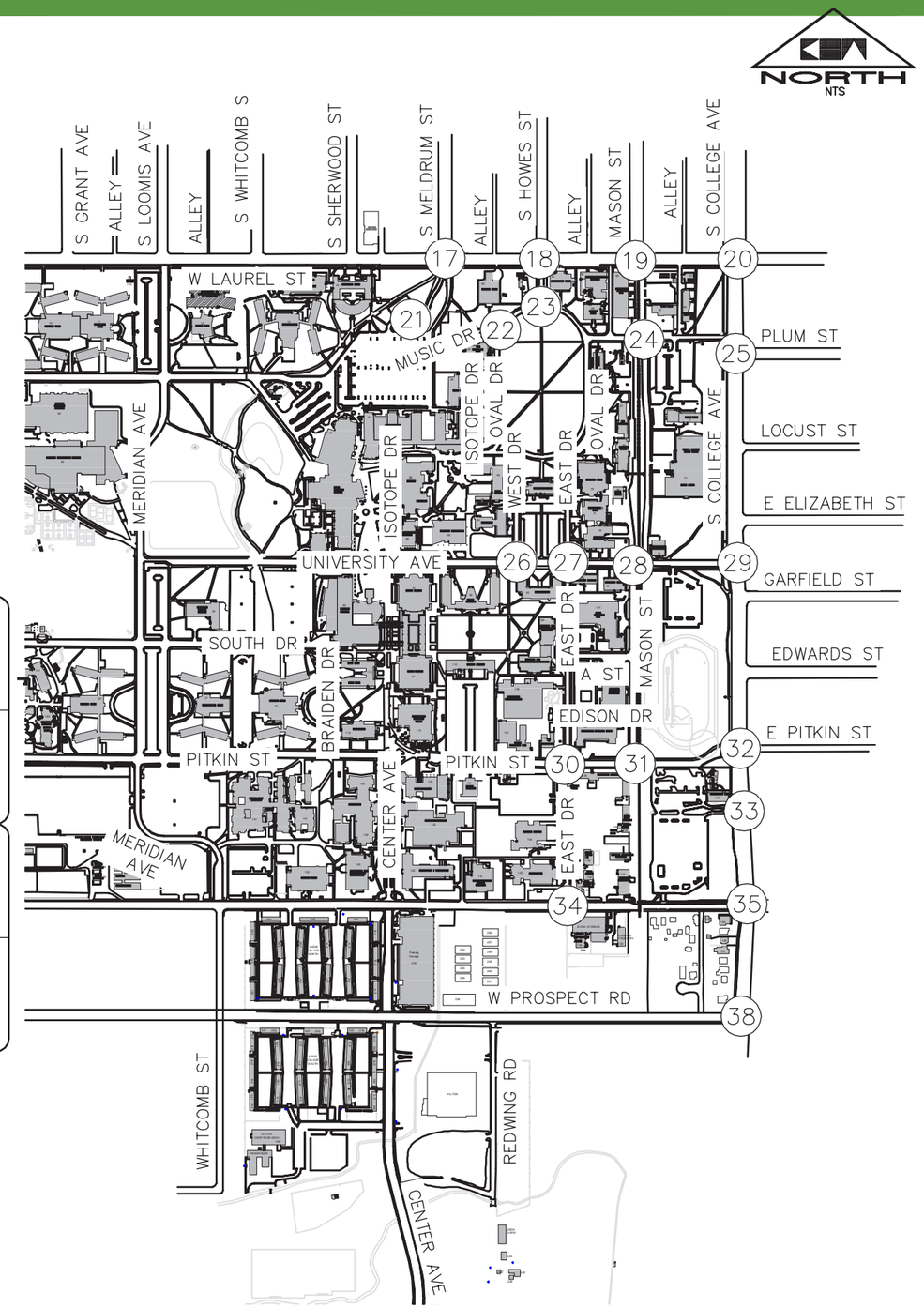












LEGEND:

A(A)	AM(PM) Level of Service
1	Study Area Key Intersection
	Lane Improvements
STOP	Stop Controlled Approach
YIELD	Yield Controlled Approach
	Signalized Intersection
	Roundabout

2024 RECOMMENDED IMPROVEMENTS AND CORRESPONDING LEVEL OF SERVICE – (EAST)

FIGURE 42

Parking Supply/Demand Modeling – Park +

As part of the Colorado State University Parking and Transportation Study, Kimley-Horn developed a unique parking analysis tool, Park+, which is intended to allow CSU to measure how changes in land use, parking, trip distribution, parking price, and management strategies affect the demands of parking. The following section describes the Park+ modeling application for CSU.

Introduction

The Park+ model is largely modeled after traditional supply and demand evaluations, which includes a multi-step process for evaluating parking demand conditions for a development, community, or campus. The multi-step process typically includes gathering data, defining assumptions or characteristics, selecting generation rates, applying reduction factors, creating scenarios, and evaluating results.

The Park+ model allows the user to consolidate gathered data, define assumptions and characteristics through a user-friendly interface, develop unique generation factors through the Park+ Proximity Parking Approach, apply reduction factors related to multimodal and demand management assumptions, create and run scenarios using the model's predictive gravity modeling algorithm, and evaluate the results on multiple levels using Park+ selection sets that can drill down from the study area level to a specific block, node, or intersection.

The Park+ model is built on the principle of proximity parking, which assumes that parking demands are generally handled within a specific walking radius (as defined by the individual user) of a demand generator. This methodology is founded on the relationship between walking distance, price, attractiveness of facility, and general user decision making. The result of this methodology is localized parking generation rates that are predictive of actual demand conditions, which are representative of realistic parking generation characteristics for individual land uses throughout the specified study area.

This principle of proximity parking is used in both the initial calibration process as well as the predictive allocation process, which defines how many people need to park and where they want to park. While the general methodology of the Park+ model follows traditional shared-use parking generation concepts, it differs from how generation rates are calculated.

The Park+ model includes a predictive gravity demand modeling algorithm that allocates projected parking demand to adjacent parking facilities based on walking distance, price, and general attractiveness of each facility. The gravity modeling algorithm used in this model was developed specifically for the applications found in Park+. The algorithm uses the range of walking distances, price, and facility types in the model to define localized scores related to each facility and land use pair. These scores are then used to define the percentage of parking demand allocated to each parking facility, up to a user-specified maximum occupancy percentage, which is defined as one of the user inputs to reflect the perceived effective capacity conditions within each Park+ community or campus.

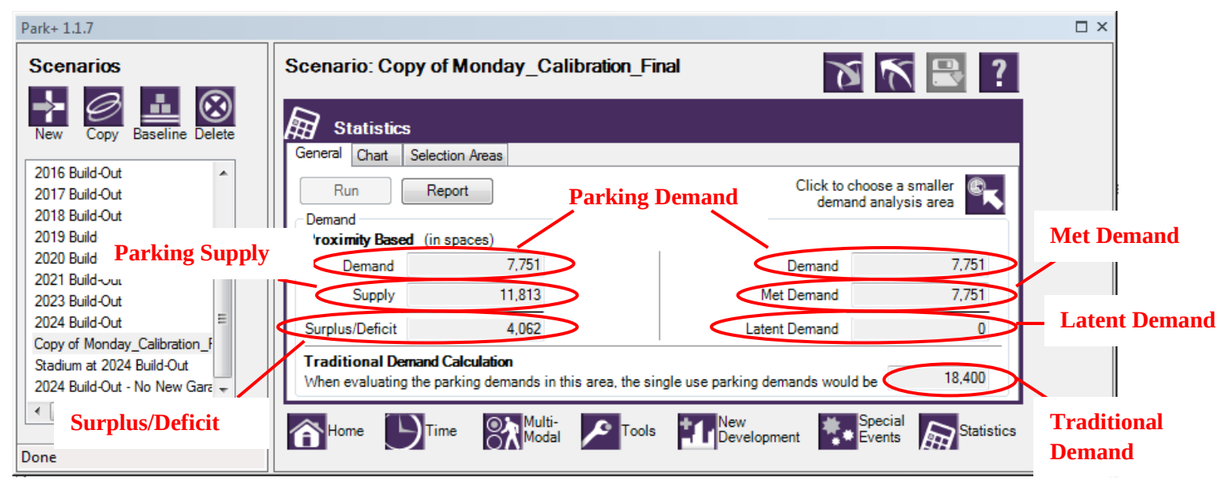
The outputs of the Park+ model include parking demand, parking supply, general surplus or deficit, met demand, latent (unmet) demand, and traditional parking demand required. The parking demand metric is a summary of the demand generated for the entire study area (or for the selection area). The parking supply metric is a summary of the parking capacity for the entire study area (or the selection area). The surplus or deficit metric is simply the difference between the demand and supply metrics for the given area. The met demand metric describes the amount of parking demand that is actually allocated using the proximity parking methodology, within the study area or for a given selection area. The latent demand represents the amount of demand that is not met within each localized walking radius defined within the model. While the overall supply and demand may be met within a given scenario, there may still be localized deficiencies within specific areas of the model – latent demand captures and identifies these areas.

The outputs from Park+ can be evaluated for the entire study area or for a smaller subset, which can define localized demands at the zone, block, node, or intersection level. The benefit of this analysis tool is that it allows the Park+ model to be free from zonal boundaries, allowing the user to define analysis areas as various development plans or master planned scenarios are evaluated.

Study Area

The study area for the CSU Park+ modeling efforts is shown on the following page. The model includes the main campus area, as well as the south campus area. The study area includes[55]:

- 5,060 student residential units (on-campus housing and off-campus apartments and townhomes)
- 2,080,000 square feet of student uses (classrooms, meeting/study spaces, and recreation spaces)
- 1,840,000 square feet of faculty/staff space (office, research, medical, and maintenance spaces)
- 563,654 square feet in the South Campus area
- 11,382 parking spaces
- 33,183 staff, faculty, and students



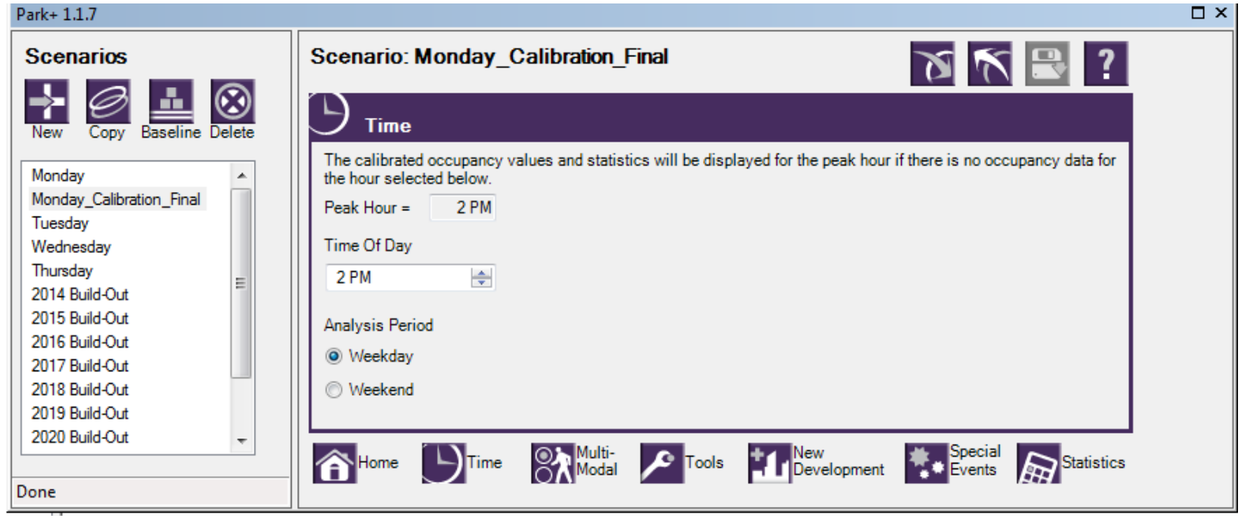
descriptive information. Parking inventory was based on field collected data, also provided by the University.

Calibration Settings

The Park+ calibration process utilizes existing parking demands (collected by the project team) to calibrate parking generation rates for each individual land use within the study area. The result is a more accurate depiction of parking generation characteristics for the study area, rather than depending on city/county code or outdated national parking generation rates reported by the Institute of Transportation Engineers (ITE) or the Urban Land Institute (ULI). The calibration process uses the previously described parking occupancy data, land use characteristics, multimodal characteristics, parking relationships, and area-specific walking tolerances to define the adjusted generation rates. The CSU specific inputs are as follows:

PEAK TIME INPUTS

The following graphic provides the time-of-day inputs, which were taken directly from the data provided by CSU. Based on the data collected, the peak hour for parking demands on the CSU campus is 2:00 PM.



Park+ Demand Analysis Study Area

MULTIMODAL INPUTS

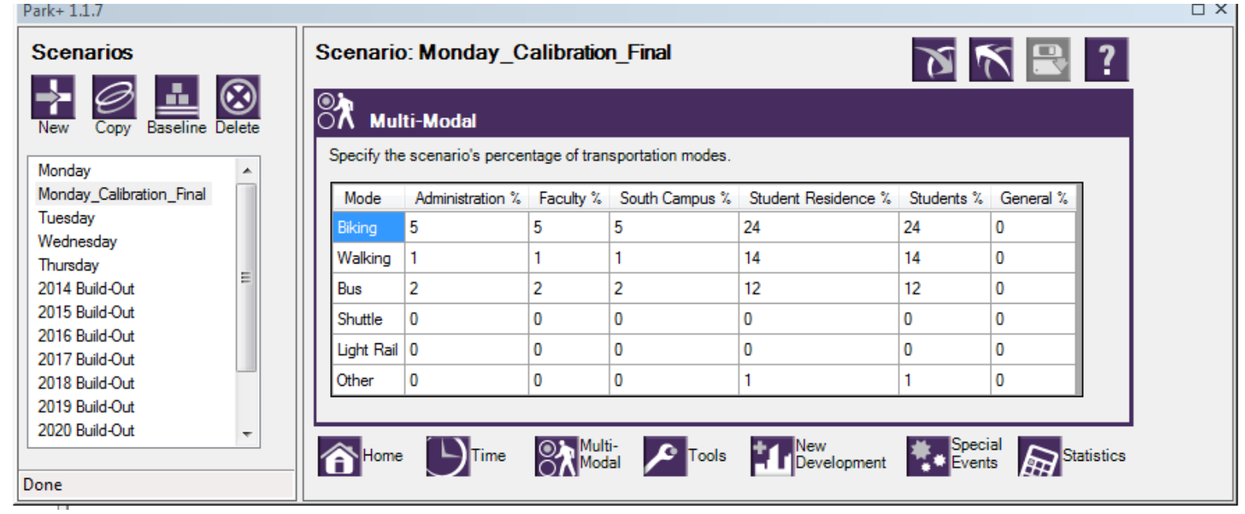
The graphic in the upper right side of the page provides the model-specific multimodal inputs, which were pulled from the Colorado State University Transit Plan 2020 for year 2013.

PUBLIC-PRIVATE RELATIONSHIPS

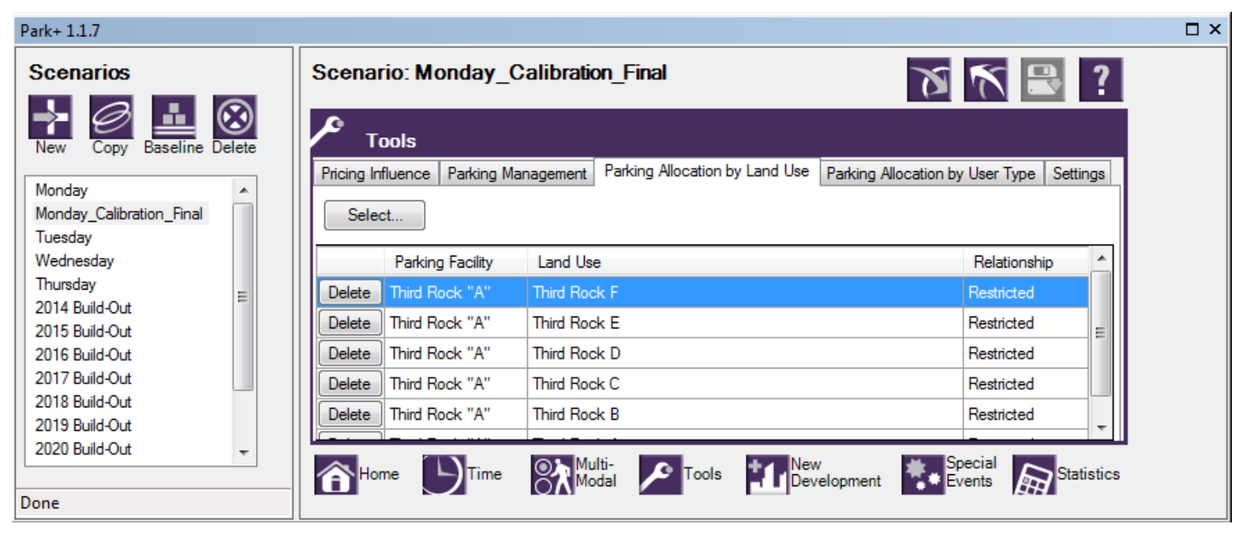
The graphic in the lower right side of the page provides a representation of some of the public-private parking relationships implemented in the model calibration process. These relationships represent parking that is provided solely for the benefit of a singular or small set of land uses. These specific relationships restrict the use of the parking spaces in the selected facilities to the associated land uses and their predicted demand. By setting these relationships, the model can accurately relate observed parking demands to specific uses in the study area, creating more realistic parking generation calculations during the calibration process.

WALKING TOLERANCES

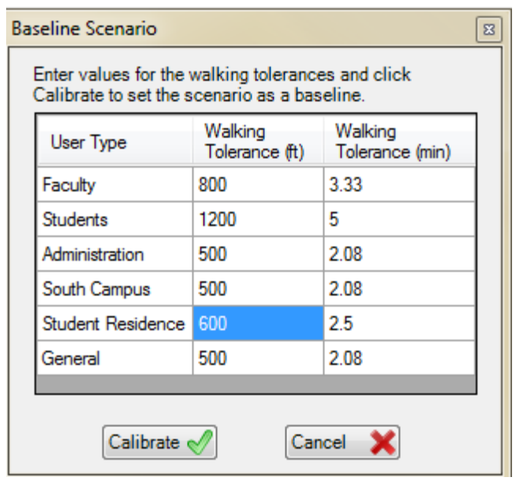
The walking tolerances within the model represent how far a parker is willing to walk from their parking space to their destination. The Park+ model defines walking tolerances for several user types, including students, faculty and administrative staff, student residents, the South Campus area, and general users. The graphic below provides the CSU specific walking tolerances, which are based on a general understanding of the area user characteristics.



Mode	Administration %	Faculty %	South Campus %	Student Residence %	Students %	General %
Biking	5	5	5	24	24	0
Walking	1	1	1	14	14	0
Bus	2	2	2	12	12	0
Shuttle	0	0	0	0	0	0
Light Rail	0	0	0	0	0	0
Other	0	0	0	1	1	0



	Parking Facility	Land Use	Relationship
Delete	Third Rock "A"	Third Rock F	Restricted
Delete	Third Rock "A"	Third Rock E	Restricted
Delete	Third Rock "A"	Third Rock D	Restricted
Delete	Third Rock "A"	Third Rock C	Restricted
Delete	Third Rock "A"	Third Rock B	Restricted



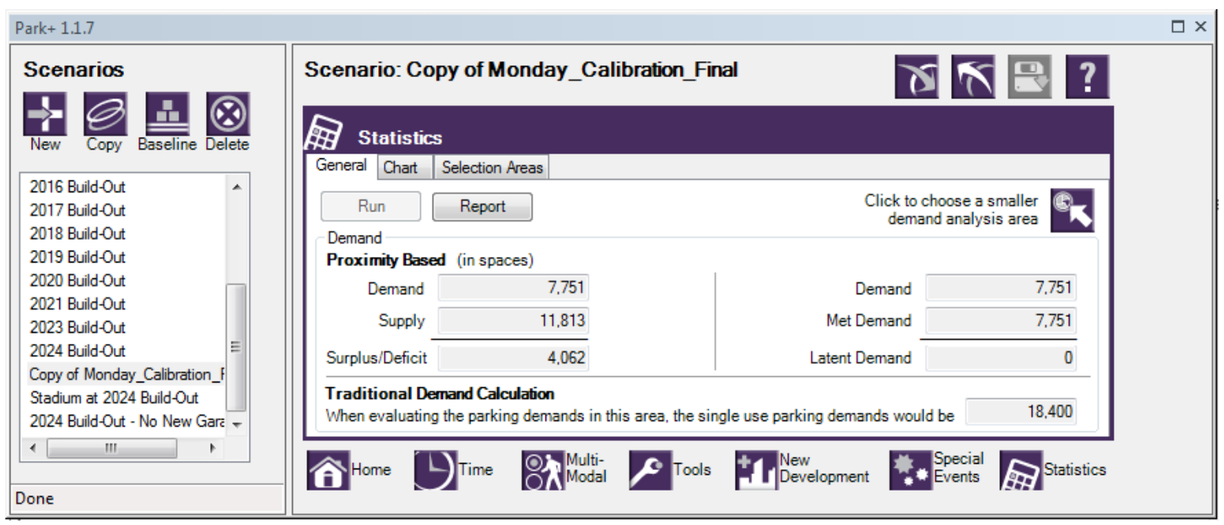
User Type	Walking Tolerance (ft)	Walking Tolerance (min)
Faculty	800	3.33
Students	1200	5
Administration	500	2.08
South Campus	500	2.08
Student Residence	600	2.5
General	500	2.08

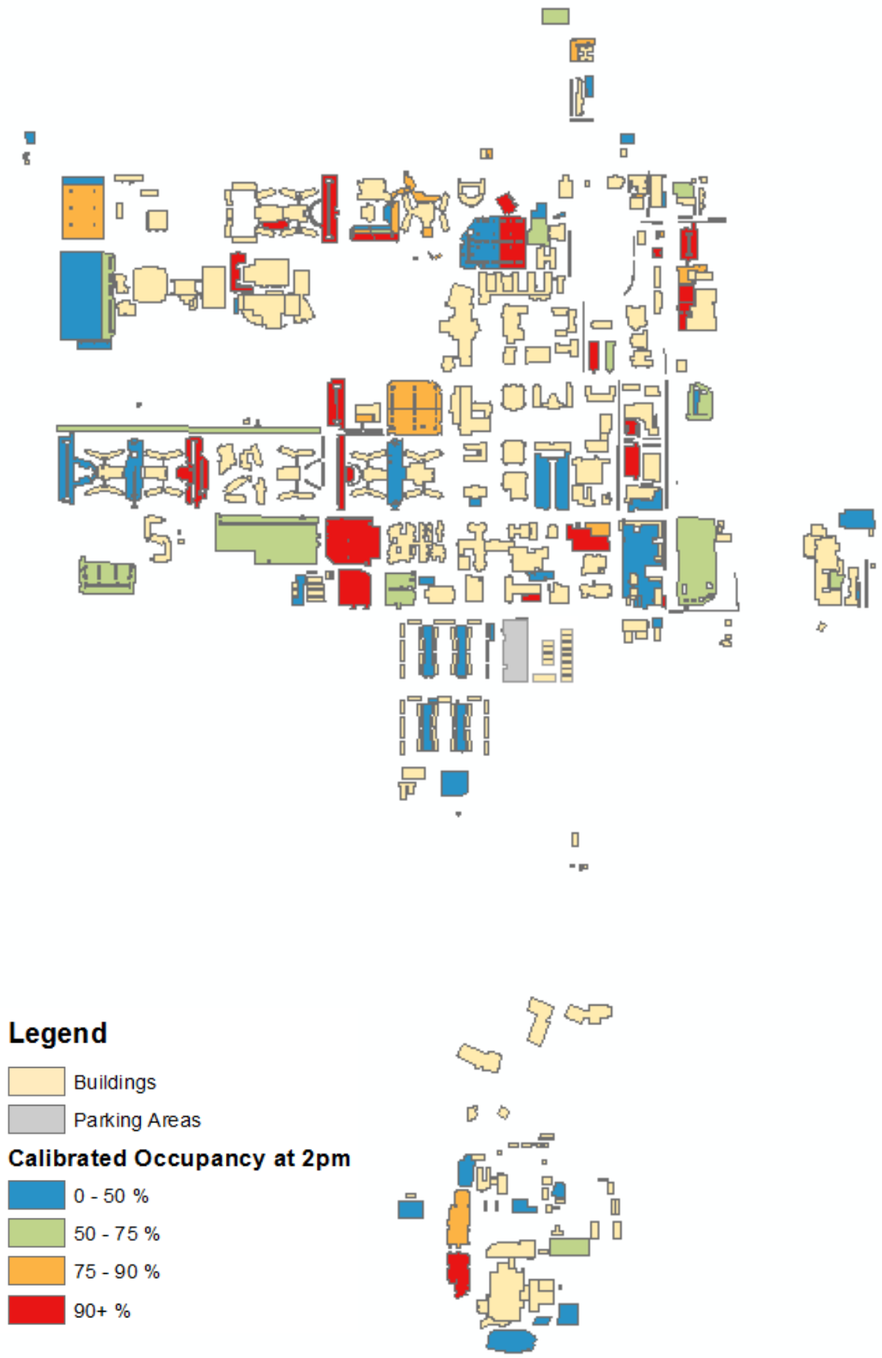
Calibration Results

Based on the inputs described in the previous section, the following results were developed for the Park+ calibration process:

These results indicate that there is a 7,751 space demand for parking versus a 11,813 space supply within the study area, indicating that the study area is operating at approximately 66 percent of total supply. Additionally, the output indicates that the latent demand is 0 spaces. Finally, the model indicates that the demand when modeling within traditional demand metrics is 18,400 spaces, meaning that the actual demand is approximately 60 percent less than demand predicted by traditional measures (in this case ITE or ULI).

The map to the right shows the actual occupancy of each of the parking facilities within the study area at the peak hour at 2:00 PM.





Park+ Calibrated Parking & Land Use Dataset
(2:00 PM, approximate peak hour)

Projection Characteristics and Results

In addition to the calibration settings, the Park+ model is able to run projected conditions for the existing scenario, as well as additional scenarios. The projected conditions differ from calibration because they adjust for design-day conditions and predict where parkers would prefer to park if given the choice – based on the relationship between walking distance, price, and attractiveness of parking.

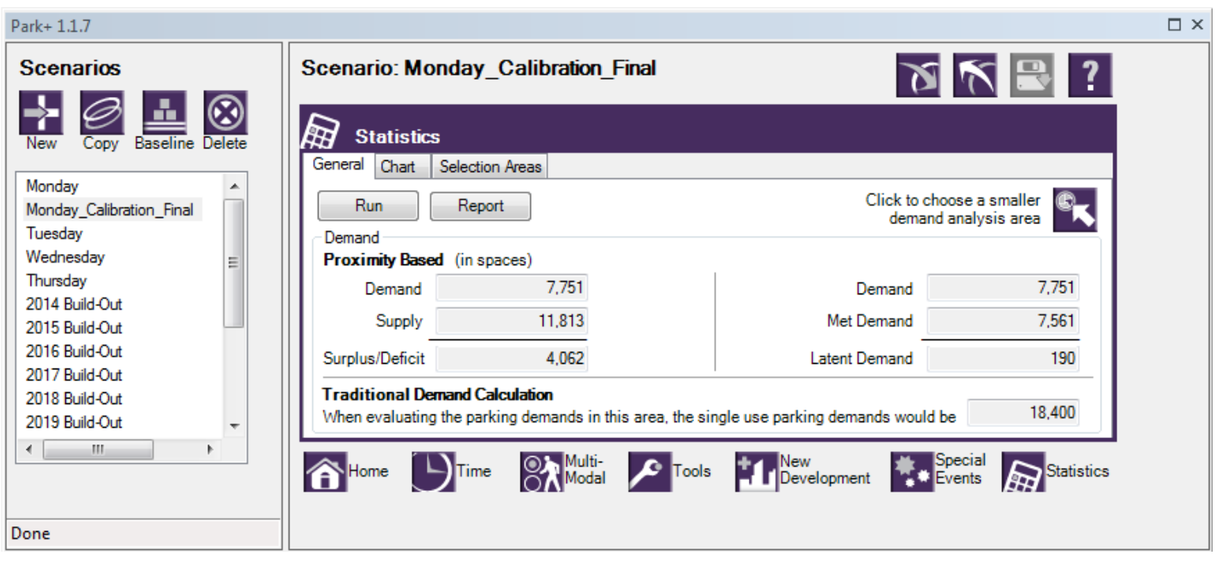
PROJECTION RESULTS – EXISTING CONDITIONS

The output below provides the initial existing conditions projection from the model. The results do not differ from the calibration process, because none of the inputs were changed.

Just as in the calibration condition, the results indicate that there is a 7,751 space demand for parking versus a 11,813 space supply within the study area. However, unlike the calibration setting, which is based on observed demands, projected parking demands were allocated based on the Park+ principles of proximity parking, using price, distance, and attractiveness to determine the overall allocation of parking. This change in operation results in a different geographic distribution of parking (within the parameters of the public-private relationships we originally set up) and the creation of a new category of latent demand.

For this scenario, the output indicates that the latent demand is 190 spaces, meaning that the study area is not able to meet all of the demand within the walking characteristics identified within the model. As shown in the figure to the right, there are no specific land uses with latent demand attributed to them, indicating that the latent demand is incrementally spread throughout the study area.

Finally, the model indicates that the demand when modeling within traditional demand metrics is 18,400 spaces, meaning that the actual demand is approximately 60 percent less than demand predicted by traditional measures (in this case ITE or ULI).



Park+ Demand Projections: Existing Conditions

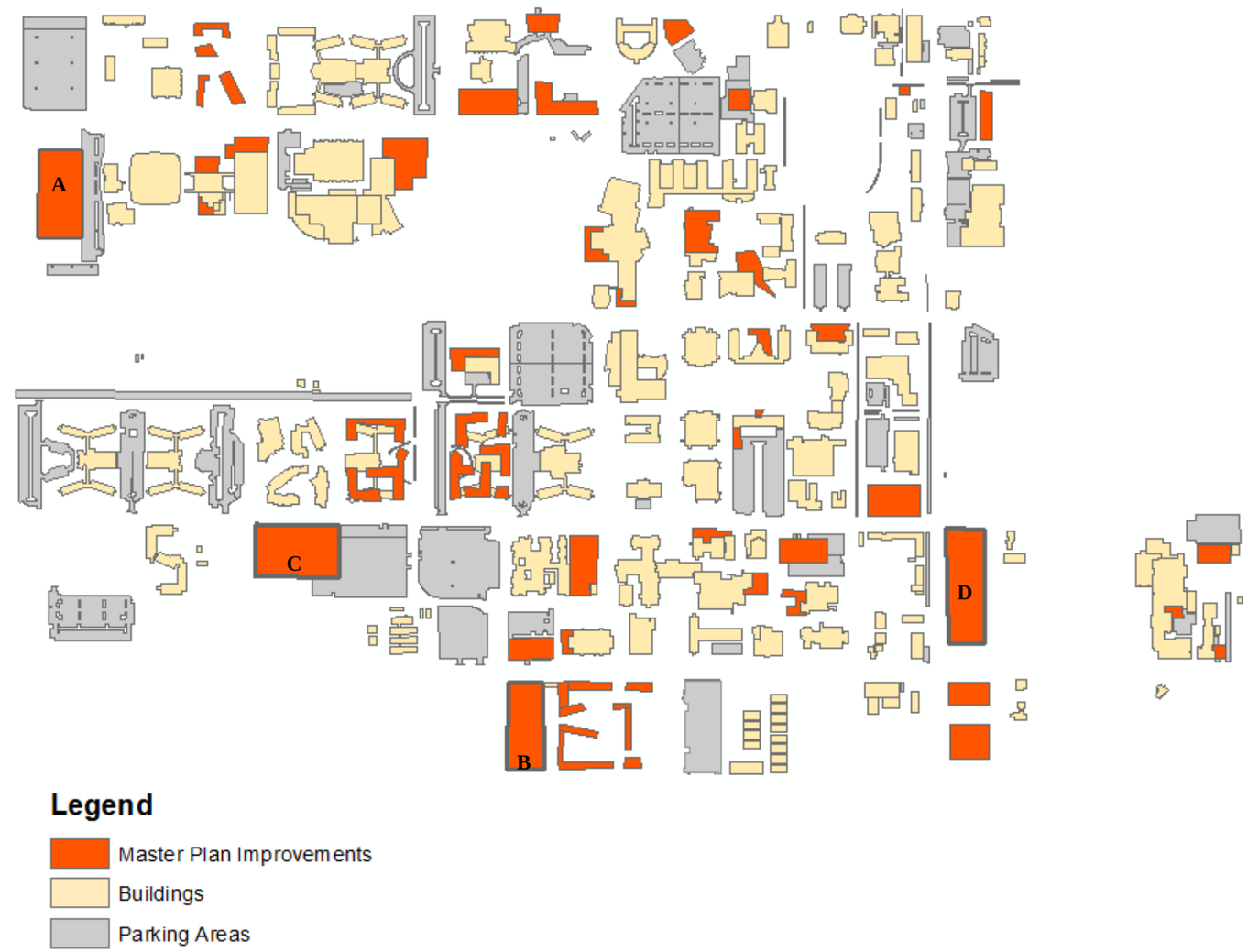
(2:00 PM, approximate peak hour)

PROJECTED CONDITIONS – FINAL BUILD-OUT

The Park+ model is able to analyze the impacts on parking demand as a result of master planned development on the CSU campus. This scenario looks at the developments that would occur on campus by the year 2024 according to the Colorado State University Plan 2020. The additional land uses and intensities are provided below.

- New Student Housing 1 – 2,062 beds
- New Research, Office, and Classroom uses – 1,190,890 square feet
- New General uses – 102,300 square feet
- New Parking Facilities – 4 new parking structures were added
  - 1,300 spaces
  - 800 spaces
  - 800 spaces
  - 1,350 spaces

The results for the build-out analysis are shown on the following pages.

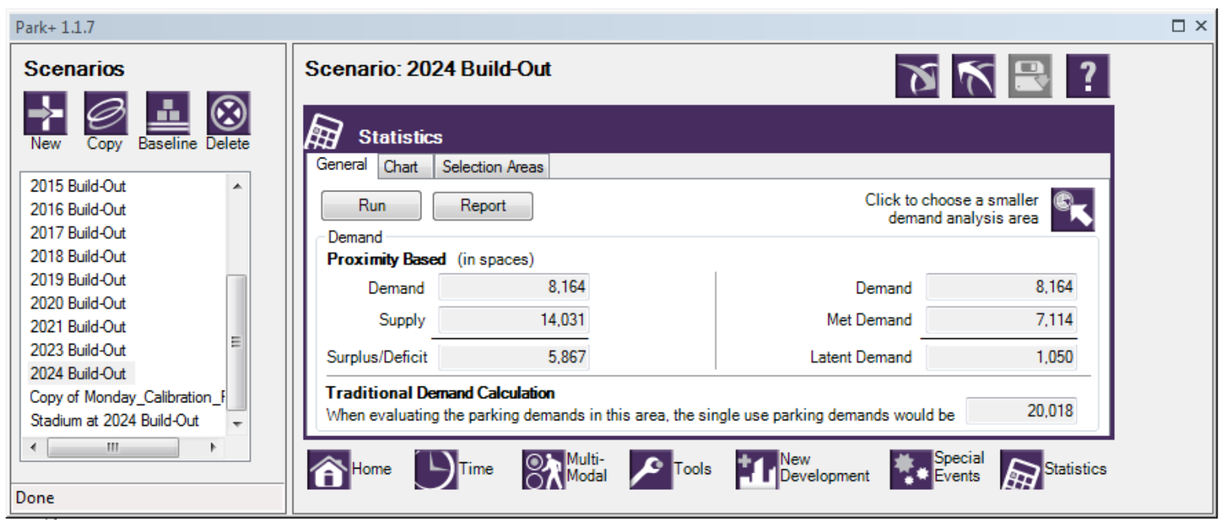


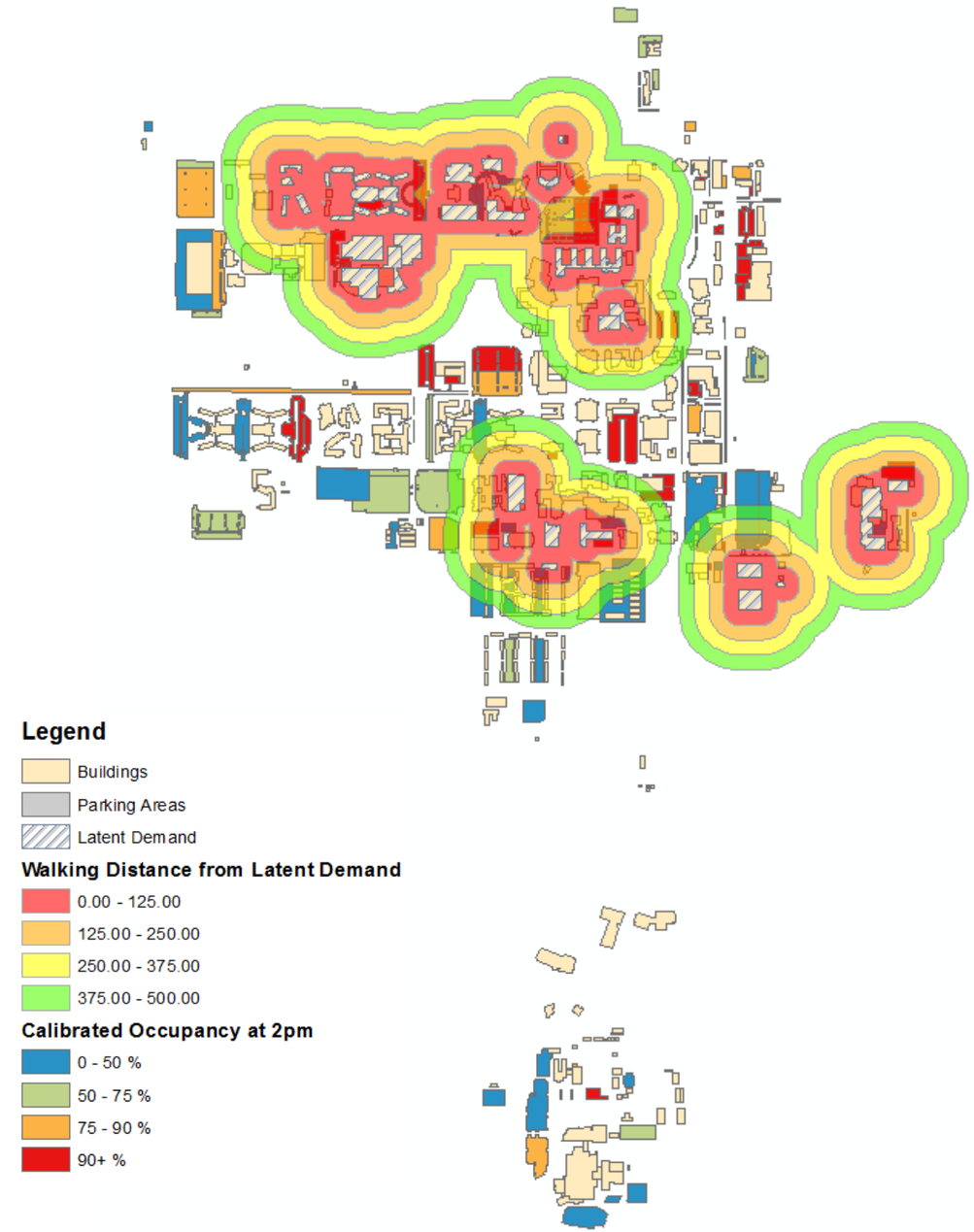
New Developments at 2024 Build-Out

The results indicate that there is a 8,164 space demand for parking versus a 14,031 space supply within the study area. The total demand represents the demand generated by all land uses, including the existing land uses and the projects associated with the final campus build-out defined on the previous pages. The total supply represents the the entirety of the parking spaces found on the CSU campus, including the existing spaces and those new spaces associated with new development.

For this scenario, the output indicates that the latent demand is 1,050 spaces. Additionally, the latent demand results indicate that 7,114 spaces of the demand in the area is met by parking facilities on the campus. This met demand represents the actual occupied spaces within the campus parking facilities. The met demand is less than the actual demand because a number of people that wish to park in various campus parking facilities are not able to based on defined parking restrictions and the user-specified walking distances. The remaining spaces are either reserved or are not within an acceptable walking tolerance for the demand generators. The resulting value is the specific latent demand (1,050 spaces), which is either met outside of the area, within the acceptable user walking tolerances, or not met at all.

Finally, the model indicates that the demand when modeling within traditional demand metrics is 20,018 spaces, meaning that the actual demand is approximately 60 percent less than demand predicted by traditional measures (in this case ITE or ULI).





Park+ Demand Projections: 2024 Build-Out

(2:00 PM, approximate peak hour)

PROJECTED CONDITIONS – FINAL BUILD-OUT – MAINTAIN EXISTING PARKING SUPPLY

As improvements are made to the campus over the next 10 years, the student enrollment is also expected to increase. In this scenario, the planned improvements are evaluated without the inclusion of additional parking facilities. Currently, there are approximately 33,183 students and 11,382 spaces, resulting in 0.34 spaces per student. According to the Plan 2020, campus population is expected to be approximately 42,000 by 2024. With the projected loss of 4,049 parking spaces, the total parking supply would drop to 7,333 spaces. Combined with an increase in students and staff up to 42,000, this would result in a parking spaces to population ratio of 0.17. The additional land uses and intensities are provided below.

- New Student Housing 1 – 2,062 beds
- New Research, Office, and Classroom uses – 1,150,890 square feet (40,000 square feet of office space was removed from this scenario since it was part of one of the garage facilities)
- New General uses – 102,300 square feet

The results for the build-out analysis are shown on the following pages.

Legend

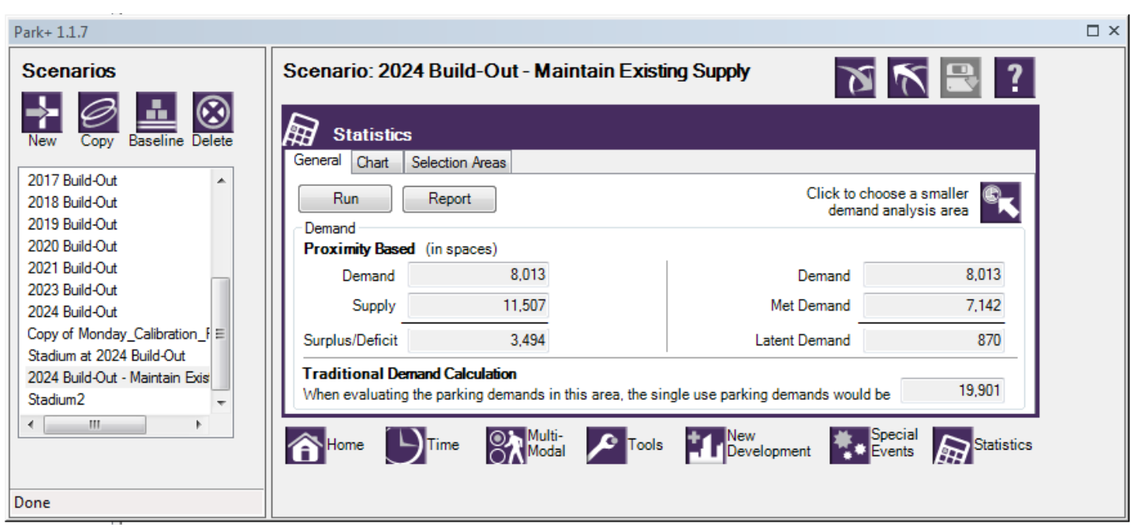
- Master Plan Improvements
- Buildings
- Parking Areas

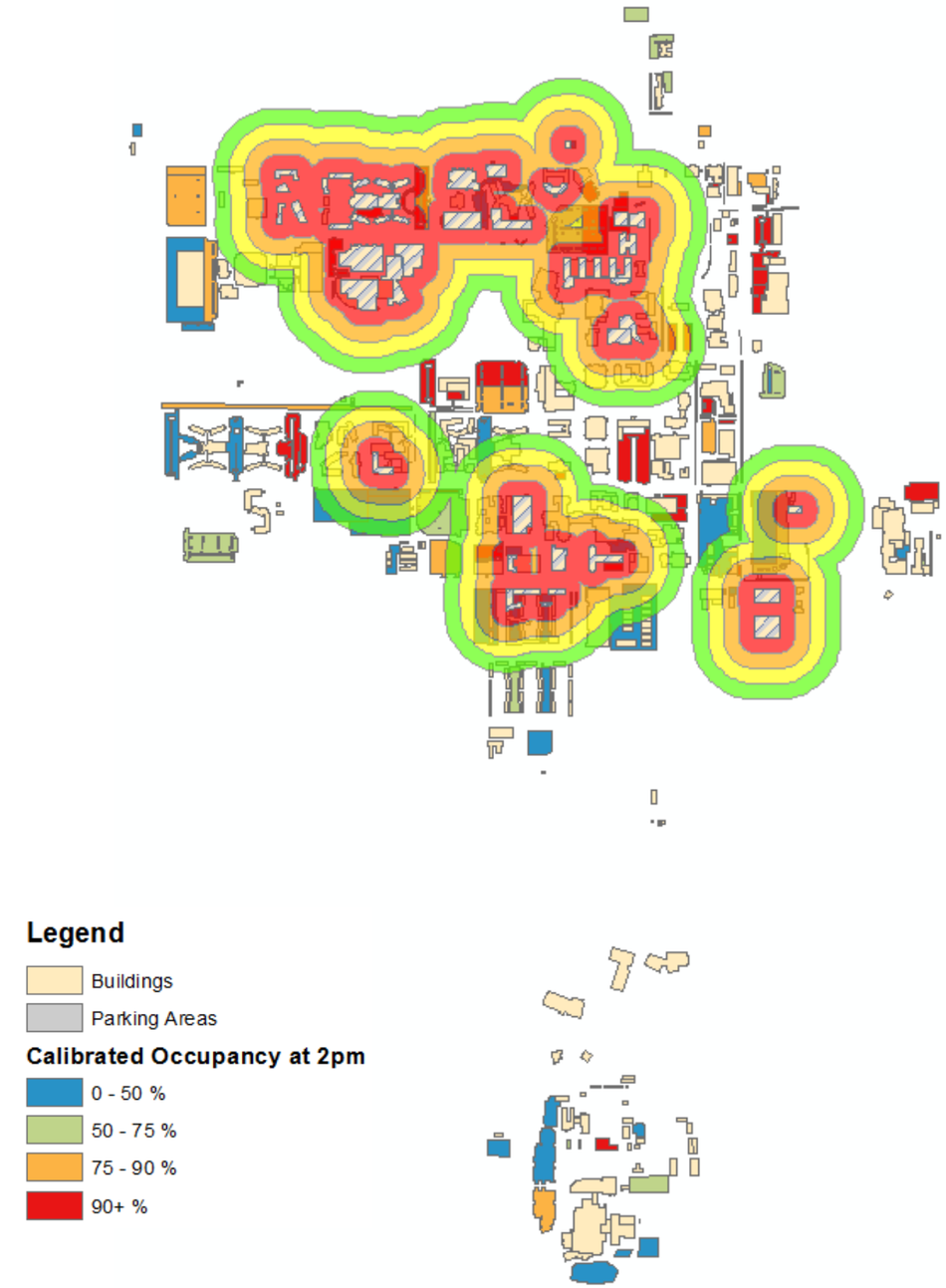
New Developments at Build-Out Excluding New Parking Garages

The results indicate that there is a 8,013 space demand for parking versus a 11,507 space supply within the study area. The parking supply differs slightly from the existing parking supply because the planned improvements will remove some parking spaces. The total demand represents the demand generated by all land uses, including the existing land uses and the projects associated with the final campus build-out defined on the previous pages. The total supply represents the the entirety of the parking spaces found on the CSU campus, including the existing spaces and those new spaces associated with new development.

For this scenario, the output indicates that the latent demand is 870 spaces. Additionally, the latent demand results indicate that 7,142 spaces of the demand in the area is met by parking facilities on the campus. This met demand represents the actual occupied spaces within the campus parking facilities. The met demand is less than the actual demand because a number of people that wish to park in various campus parking facilities are not able to based on defined parking restrictions and the user-specified walking distances. The remaining spaces are either reserved or are not within an acceptable walking tolerance for the demand generators. The resulting value is the specific latent demand (870 spaces), which is either met outside of the area, within the acceptable user walking tolerances, or not met at all.

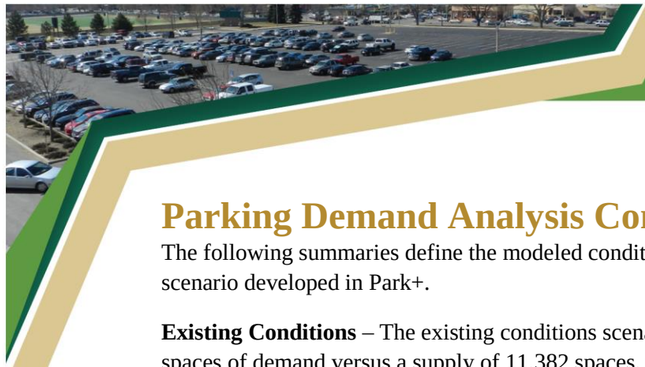
Finally, the model indicates that the demand when modeling within traditional demand metrics is 19,901 spaces, meaning that the actual demand is approximately 60 percent less than demand predicted by traditional measures (in this case ITE or ULI).





Park+ Demand Projections: 2024 Build-Out – Maintain Existing Parking Supply

(2:00 PM, approximate peak hour)



Parking Demand Analysis Conclusions

The following summaries define the modeled conditions for each scenario developed in Park+.

Existing Conditions – The existing conditions scenario includes 7,751 spaces of demand versus a supply of 11,382 spaces, resulting in a surplus of 3,631 spaces overall. Despite this large surplus, there are still some localized areas of deficiency, particularly for those lots that are reserved for faculty and administrative staff and a few student residence lots.

Final Build-Out – By the year 2024 CSU has identified numerous improvements to the campus. The results projected a demand of 8,164 spaces, an increase of 413 spaces attributed to the improvements. With the projected loss of 4,049 parking spaces, the parking supply would decrease to 7,333 spaces. If no additional parking assets are provided and the campus population increases to the projected 42,000 number, the resulting ratio of parking spaces to population would be approximately 0. 17. This equates to a parking deficit of approximately 4,620 spaces compared to the recommended ratio of 0.28 spaces/population.

Final Build-Out – Maintaining Existing Parking Supply – This scenario examines the impacts of parking demand at build-out without the four new parking garage facilities. Combined, those facilities contribute approximately 4,000 spaces to the overall parking supply. Under this scenario the demand for parking remained relatively consistent at 8,013. The cause of the change in demand is due to the loss of 40,000 square feet of office space that was associated with one of the parking facilities. The overall supply is 11,507, creating a surplus of 3,494 spaces. Consistent with the other scenarios, there is a surplus of parking; however, there remain localized deficiencies.

Throughout all of the scenarios, there is a surplus of parking of approximately 4,000 spaces; however, there are areas of localized deficiency in the lots reserved for faculty and staff. These deficiencies can be mitigated with the promotion of multimodal transportation and the implementation of TDM strategies discussed in this report.

Emerging Trends in Parking System Monetization

Issues and Impacts

Introduction

As we near the end of this planning study focused on integrating parking and transportation issues into the larger campus master planning process on the CSU campus in Fort Collins, CO, a new element was added to the discussion.

A financial firm has approached the CSU with a proposal to "monetize" its parking operation. CSU, in doing its proper due diligence, put out a Request for Proposal (RFP) for firms to conduct an independent "parking system valuation study." Kimley-Horn was asked to participate in this RFP, but declined to submit. The successful firm was Walker Parking Consultants and their study is currently underway. However, this is a significant turn of events that could have a long-term impact on the course and direction of the PTS program at CSU and we felt an obligation to provide some feedback based on our experience working in this relatively new area.

A Limited History

With a limited history in the parking arena, parking system privatization, or more appropriately termed "parking system monetization," is gaining attention and interest on a national basis. Initially, this trend emerged in the municipal environment as the economic downturn beginning in 2008 put many municipal governments into difficult financial situations. More recently this trend has expanded to the realm of university systems. The questions we will explore in this article relative to parking system monetization are: What are the emerging trends in this area and what are the potential impacts to the communities and institutions that are served by these parking programs?

Background

Leonard T. Bier wrote perhaps the best article on this topic to date in the January 2010 edition of the *Parking Professional* entitled: "Privatization Revisited." Mr. Bier framed his discussion with the following introduction:

"As more cities, counties, and states face deep budget deficits, many municipalities are looking toward public-private partnerships (PPPs) to generate much-needed revenue. Among those looking at privatization deals, either for parking, airports, or roads, are Los Angeles, Pittsburgh, Miami, Milwaukee, and Allegheny counties, and the states of Pennsylvania, New Jersey, and Florida. As these partnerships become more popular, we should look at best practices of PPPs and discuss how governments can ensure that the citizens and taxpayers are best served in the long run."

"In the last few years, PPPs have been the subject of extensive study and commentary. The U.S. Government Accountability Office (GAO), the Public Interest Research Group (PIRG) and state legislatures have issued comprehensive reports on the subject. The Texas State Legislature recently released an extensive report on PPPs in toll road projects, and the Federal Highway Administration examined PPPs in other countries. The various reports and studies illuminate some basics of best practices for PPPs."

In the past few years, several more parking programs have be added to the list of those investigating this option including Indianapolis, IN; Long Beach, CA; and Las Vegas, NV. A monetization plan for the City of Pittsburgh parking program is moving forward propelled by a looming deadline imposed by the State of Pennsylvania regarding a potential takeover of the City's pension fund. We will talk more about Pittsburgh later in this article.

What to Think About Chicago

It is widely known Chicago was the first major city to fully monetize their parking program. The opinions about Chicago's ground-breaking experiment run the gamut.

- "Chicago Pays the Price for Parking Privatization"
- "It appears Chicago politicians who privatized city parking meter operations traded short-term political gain for long-term fiscal pain."
- "It's Official: Chicago Parking Privatization a Massive Rip-Off"
- "We have followed the Chicago parking privatization closely because it is the poster child for all that can go wrong with Public Private Partnerships."
- "The Chicago deal will cost taxpayers several hundred million to even a billion dollars in foregone parking revenue."
- "Successful 'Fiasco': Chicago's Parking Meter Mishap"
- Critics call Chicago's privatization of parking meters an epic failure, but could it be it's an epic success?
- "Chicago's Parking Meter Lease: A Win-Win-Win for Motorists, Taxpayers and the City"
- Asset concession brings fiscal, operational, environmental benefits.

From a pure parking perspective, despite a rocky start, credit should be given to LAZ Parking for a dramatic improvement in the overall parking system. This includes new technology introduction, improved service and equipment maintenance, and parking facility environment enhancements.

The most insightful analysis of these event and issues, in my opinion, has come from Stephen Goldsmith. Mr. Goldsmith, a former mayor of Indianapolis, is director of the Innovations in American Government Program at the Harvard Kennedy School. He is author of the book The Power of Social Innovation: How Civic Entrepreneurs Ignite Community Networks for Good. Many of his insights are included in the summary below.

Examples of Good Privatization Goals & Key Issues to Consider

- Identifying non-core functions and areas that are not core competencies
- If parking management is not a core competency of the City, then it is a candidate for privatization; however, if you are lucky enough to have a high-function parking system that is providing excellent service and is contributing to community growth and development, think twice about what you may be giving up.
- Establishing a long-term reserve fund to:
  - Enhance City credit rating and thus lower interest rates
    - Chicago did this and enjoyed its highest credit rating since 1978
  - Retire Debt
  - Eliminate interest payments and thereby create more money for community reinvestment
    - Chicago retired $925 million in debt
  - Community Reinvestment

- Identify and fund a well-defined set of community desired or essential infrastructure projects
- Programs that serve the public good
  - Example: Neighborhood parks and programs
    - Chicago invested more than $325 million in this area
- Infrastructure investments that will stimulate additional private sector investments
  - Example: Parking structures as part of a public/private partnership

- Shifting Risk
  - Consider the potential risks of managing on-street metered parking for the next 75 years (imagine bidding on the City's horseshoeing concession in 1890, or the public pay phone concession in 1975)
  - Changing technologies
    - Utilization
    - Costs
    - Rising labor costs
    - Rising fuel costs
    - Equipment replacement
      - In Chicago, the cost of replacing the multi-space meters every seven years is estimated at $40 - $50 million dollars.

- Carefully analyze the term of any potential concession
  - Both the Chicago Inspector General's analysis and financial experts who have analyzed the deal indicate that Chicago should have negotiated a shorter lease period.
  - Under their analysis, Chicago left significant future earnings on the table when it agreed to a 75 year concession term (estimated at $1.3 to $2.1 billion).
- Look at Alternative Solutions to Budget Problems
  - Chicago is the poster child for using the proceeds of PPP asset leases to plug a budget operating deficit and selling its residents' futures.
  - In 2006 the City sold the Chicago Skyway for $1.83 billion, of which $460 million was used to pay off debt, $375 million was used to close the 2006 operating budget gap, and $500 million was placed in a rainy day fund. The $500 million rainy day fund was exhausted to close operating budget gaps in years 2007 and 2008.

- Key elements of a PPP deal are transparency, expertise, and setting controls over rates and "windfall profits."
  - Allow elected officials to approve the terms of any proposed agreement before it is put out to bid
  - Do not let the market/bidders solely dictate the terms of the PPP through a RFP process. Elected officials should have the power to alter the terms of the proposed deal as they see fit and drive the process through negotiation rather than have a fait accompli handed to them.
  - The Texas State Legislature's recent report on PPPs advocated revenue sharing over single, upfront payments as a better way to protect the public interest. The report also noted that key elements of a PPP deal are transparency, expertise, and setting controls over rates and "windfall profits."
- Do not include lease proceeds in a government budget before the leases are finalized
  - Having a budget balanced on the back of lease proceeds makes it extremely difficult for officials to reject an asset lease or concession deal. Consider adopting an ordinance prohibiting a city's budget from including revenue from PPP proceeds before commissioners have approved the deal.
- Consider the creation of a concession management review board
  - The impact of these deals will affect a broad array of citizens, civic, and cultural organizations; religious and educational institutions; and corporations. These are individuals and businesses that are invested in their communities and deserve a voice as well as an open and transparent process.
- Consider the creation of a downtown Parking Management Commission
  - The Parking Management Commission could be made up of city, parking authority and downtown stakeholders and should require the concessioner to be engaged with Parking Commission. The Parking Commission would provide an annual program assessment to City Council.

- Term of the agreement
  - Limit to 30 – 50 years
  - Build in a mechanism to address changes in annual expectations
  - Establish a defined monitoring process
  - Create a process to generate an Annual Stakeholder Report Card
  - If the deal were to "go sour," have a plan for "how to get out?" Who pays what to whom?
- Consider alternatives to a one-time only payment
  - Consider a lesser up-front payment with annual incremental payments to a dedicated parking reinvestment fund.
  - For cities with a parking tax, could the parking tax constitute the annual incremental payment?
- Maintaining and improve service levels to users of the parking system
  - From the perspective of parking customers and those invested in the downtown, a strong, well-managed parking system is critical to their success. The concessioner should ideally be a "partner for the success of the downtown" and implement programs and policies to effectively address the following:
    - Greater availability of parking spaces
    - More convenient, state-of-the-art equipment
    - Multiple payment options
    - Quicker service of broken equipment
      - In Chicago meters are now repaired within a couple of hours on average, compared to 2.5 days under the City-run system
    - Retail parking, employee parking, event parking, etc.
    - Special programs to meet the needs of cultural, religious, and civic institutions, as well as customized neighborhood programs
  - Building on the "Partnership for Downtown Success" concept requires an understanding of the needs of the business community, downtown residents, and religious and cultural institutions. Once these needs are understood,

implementation of parking program enhancements should be introduced. This is where the special expertise of a parking professional is needed.

- Programs to meet identified community needs might include:
  - Extended time limits near theaters, concert halls, schools, and churches where parker needs more than two hours
  - Free or reduced rate parking for churches on Sunday mornings
  - Automatic ticket dismissal for inoperable meters, based on meter malfunction reports generated by the system
  - Ability to pay citations online or even at a meter
  - Improved parking access and convenient parking for hourly parkers to support downtown retail
  - Discounted monthly parking in certain lots
  - Donated single-space meters to protect bicycle parking or as vehicles for charitable donations

- Promote sustainable and innovative parking technologies and interior parking facility environment enhancements
  - Improved customer service features
  - Adopt "retail friendly" parking management best practices
  - Create safe, clean, and friendly parking environments
  - Invest in sustainable design and management practices

- Other issues to consider…
  - Who will develop and manage new parking facilities?
  - Will the concessioner be allowed to manage competing facilities?
  - Where will rate setting authority reside?
  - How will Transportation Demand Management programs be integrated?
  - Will the community have input on issues such as the user mix/facility diversity factors (i.e., mix of monthly vs. hourly parking)?

In Summary

Parking is an important part of our civic or institutional infrastructure.

- Who will be responsible for planning and funding future parking needs?
- Think how many individual "customer touches" parking represents each day.
- It is often your customer's first and last impression of your campus.
- Well managed parking is both a responsibility and an opportunity. IT MATTERS THAT WE DO IT WELL!

Research References

1) Privatization Revisited, Leonard T. Bier, The Parking Professional, January, 2010
2) Successful 'Fiasco': Chicago's Parking Meter Mishap, Stephen Goldsmith, January 20, 2010
3) More Thoughts on the Chicago Meter Privatization, Steve Goldsmith
4) Chicago's Parking Meter Lease: A Win-Win-Win for Motorists, Taxpayers and the City, Gene Saffold, January 29, 2010
5) Chicago Official Warns Pittsburgh Against Parking Leases, Thursday, March 11, 2010, Joe Smydo, Pittsburgh Post-Gazette
6) "An Elegant Solution": A Parking Public-Private Partnership In Chicago, Charlie Munn, December 2007, Parking Today Magazine

APPENDICES

APPENDIX A

Intersection Count Sheets

APPENDIX B

2013 Intersection Analysis Worksheets

APPENDIX C

2024 Intersection Analysis Worksheets

APPENDIX D

CSU Parking and Access Management Best Practices Toolbox

APPENDIX E

CSU Peer University Survey