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CSU Channel Islands Parking and Transportation Demand Management Plan

Final Report

April 2017

NELSON
NYGAARD

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1 INTRODUCTION

WHY A PTDM PLAN?

Cal State University Channel Islands (CI) is in a period of significant change. It is one of the fastest growing campuses in the CSU system, as the campus population has been growing by about 10% each year. Amidst this growth there is an opportunity to reposition CI from a commuter campus to a full-service one. Located over four miles from the nearest urban area, the isolation of the campus provides a beautiful setting, but is a major factor in how people are able to access the access – today, that is primarily by driving.

This Parking and Transportation Demand Management (PTDM) Plan is an opportunity to think anew about the business of transportation and how it can help CI realize its position as a larger, full-service, compact, walkable, and historic campus. The plan aims to shape a strategic set of multimodal investments to support the University's long-term vision. It pursues ways to invest in cost-effective strategies for improving travel experiences, reducing vehicle trips, lowering greenhouse gas (GHG) emissions, managing parking demand, and increasing the use of transit, bicycling, and walking at CI. The plan is intended to reorient the campus transportation system into an effective, future-looking system, with a multimodal and environmentally-sustainable focus. Finally, it intends to create a financially sound program for both the university and its affiliates.

The isolation and high drive-alone rate (82% for all affiliates, ranging from 80% for students to 94% for faculty) are primary challenges. CI will likely remain heavily a drive-alone campus, yet even changing a small portion of trips to and from campus can yield significant results, and help reduce the need to build expensive parking. Transportation and campus development strategies must respond to the isolated setting and limited commute options.

CI's walkable core is a notable advantage. However, while the campus core is largely pedestrian-friendly, green, and comfortable, crossing campus from one side to the other requires walking through parking lots, or routing slightly indirectly to go around obstructing buildings. Campus development and transportation efforts should build on the natural organization and hierarchy of this growing and adaptive-reuse campus, adding bike facilities and retrofitting its streets and walkways to maximize pedestrian legibility and encourage biking, walking, and skateboarding in the campus core.

As with many institutional settings, there is a tension between parking supply and demand. This is compounded by ambitious growth plans. At almost $5,000 per space, parking is expensive to both build and maintain. There is opportunity to use CI's parking supply more efficiently. Of the 2,682 parking spaces in the total supply, peak demand occurs during weekday midday, when occupancy can hover around 90 percent full. The A3 overflow lot, not counted in these figures, does act as an outlet. Restructuring the pricing system based on convenience will help

distribute parking demand more evenly across campus. Those who use vehicles only occasionally will be financially incentivized to park remotely, freeing up spaces for those that want to park as close as possible to the campus core.

Over time, as enrollment increases and surface parking lots are replaced by new buildings, it will be necessary to build additional parking supply in strategic locations outside of the campus core. It is worth noting that mobility technology, such as automation, and changing mobility behavior, such as decreasing ownership trends, will begin to significantly impact our lives within the time horizon of this planning effort. Beyond the short-term parking needs identified in this plan, the University should carefully consider further investments in parking supply given its significant financial costs.

This plan incorporates parking management measures to make efficient use of parking resources for motorists, especially in the near future, and will manage current and projected future campus population growth by reducing vehicle trips through incentivizing walking, biking, transit use, and ridesharing. Overnight change to address campus transportation conditions is not realistic, but a phased transportation plan that starts by introducing demand-responsive pricing and adding a system of transportation demand management services will inevitably shift travel habits by providing real, better commuter choices.

PREFERRED PARKING AND TDM PACKAGE

The preferred package includes funding for the comprehensive package of TDM strategies listed in the Recommendations chapter of this report – not including those listed separately as future, long-term options. The preferred package emphasizes ensuring adequate administrate and policy infrastructure, including staffing, to implement key low-cost programs in the short-term, and supporting longer-term investments as the campus grows. This recommended package includes funding for 500 additional parking spaces, to be funded by an increase in permit prices. These prices are structured to minimize affiliate costs, better distribute demand, and to offer more choice in the campus' transportation system.

PROJECT GOALS

To guide development of the project, the project team identified the following core goals for the project and overall transportation system. Goals are high-level and meant to articulate how the transportation system should develop in both the near and long term. Ensuring continued consensus around these goals will help the university to make decisions in a fair and transparent manner. CI's transportation system should be:

1. **Supportive**, allowing CI to achieve broader campus goals
2. **Safe and Healthy**, prioritizing the safety of all users
3. **Multimodal**, reducing single-occupant vehicle trips
4. **Cost-effective**, prioritizing fiscally sustainable investments
5. **Intuitive**, facilitating easy travel for regular and occasional users
6. **Accessible**, providing all users with a diversity of travel options
7. **Adaptive**, ensuring the ability to quickly evolve as the campus changes
8. **Efficient**, maximizing utilization of existing resources

In Figure 4-2 these goals are correlated to the previously defined goals of the 2025 Vision Plan to demonstrate that they also support previously adopted goals for all aspects of the university's development and growth.

PROJECT PROCESS

This report is the culmination of a series of tasks including an in-depth transportation and parking existing conditions analysis, the development of a financial and parking demand model, a development process for potential transportation demand management (TDM) strategies, and the development of a realistic package and implementation plan. Figure 1-1 provides an overview of the process.

Figure 1-1 Project Steps and Timeline

Developed through an iterative and data-driven process, key steps included:

- Data, field observations, and information from campus constituents were collected and used to identify challenges and opportunities for campus access. This included evaluation of current statistical and observed travel patterns seen in existing data, newly collected data, site reconnaissance, interviews, and a robust campus transportation survey. Newly collected parking data from multiple time periods and days was collected and analyzed. Existing transportation programs were reviewed and documented. Multimodal infrastructure was assessed, including vehicle traffic, pedestrian and bicycle, parking, and transit.
- Any recommendations and findings set forth in applicable CI, CSU, local, and state government plans and policies were reviewed, to build off existing policies, and identify any opportunities or constraints.
- Best practices currently in place at other relevant CSUs, UCs, and universities outside the state were reviewed, and their effectiveness documented, with an eye toward applicability at CI.
- A travel demand survey was conducted and analyzed, to learn more about affiliates' travel behaviors.
- Oversight and consultation helped shape the review of existing conditions, and establishing project goals, and strategy development, via regular and ongoing participation from internal and external stakeholders, CI staff, and the campus at large (described further in the next section).
- Initial and preferred policies and strategies were developed, based on previous steps. The toolbox of potential investments was reviewed for potential effectiveness, in terms of improving the quality of campus access and mobility.

- Public outreach was a key component of strategy development. That process and outcome is described in greater detail below.
- The financial impacts of TDM strategies, coupled with parking operations, were used to analyze current trends and parking demand and develop future-demand projections across the planning horizon (10 years), taking into account anticipated growth.
- Policies and strategies were tested, validated, and documented, shaping an action-oriented policy document.

Implementation, described later in this document, is clearly broken down into detailed phasing periods, with action steps specified. Ongoing performance monitoring is essential to determining the effectiveness of various approaches, and is also described in detail in this plan.

Public Outreach Summary

Public input was received during a series of three outreach meetings on Wednesday, October 5, 2016. Feedback was provided by staff, student government members, and members of the Residential Housing Association (RHA). These participants engaged in three different activities to provide their input on parking and transportation improvements on campus. The activities and their respective findings are briefly described below. (Refer to Appendix A for the full Public Outreach Memorandum.)

The Transportation Improvement Preferences activity required each of the participants to prioritize eight of the 26 transportation improvements by placing a marker on their preferred improvements. The findings of this activity pointed to the overall highest preferences placed on charging different prices for parking based on geography, a campus circulator, real-time parking information technology, and free transit passes for school affiliates.

The Parking Tradeoffs Activity asked participants to choose between two tradeoff scenarios for each of the seven transportation strategies. The activity highlighted that each of the participating groups generally had similar outlooks on the tradeoffs including preferences for a walkable campus with less parking, less expensive parking located further away from the campus core, and the desire for more electric vehicle charging stations, designated parking, and reduced parking rates for carpool vehicles.

The third activity, Hotspot Mapping, gave the participants the opportunity to highlight areas on the CI campus where it is difficult to get around and easy to get around. They also identified areas where they spend the most time. The areas selected as difficult to get around were generally selected because of a lack of pedestrian sidewalks and crosswalks. Other areas of concern included places where parking was difficult to navigate or streets where pedestrians feel isolated or unsafe. Areas that are easy to get around coincide with areas where the participants spend the most time. Many of these locations are located within core areas of the campus and include student amenities.

The preferences and information provided by the campus participants informed the project team in the development of this Draft Plan. Response to the proposed strategies was overall positive and supportive of the efforts of the project team.

Additional meetings were held by CI staff using materials prepared by Nelson\Nygaard throughout October 2016. The outcomes of the meetings were shared with Nelson\Nygaard to further inform final recommendations. Participants in these additional meetings included faculty and residents of University Glen.

2 SUMMARY OF EXISTING CONDITIONS

This chapter provides a high-level summary of the Existing Conditions Report and Case Studies prepared for staff in preparation of the development of this Parking and Transportation Demand Management Plan. The full Existing Conditions Report and Case Studies can be found in Appendix B. The key findings of the existing conditions assessment are summarized below.

CAMPUS OVERVIEW

Community Context, Campus Composition, and Housing

The CI campus is isolated, located over four miles away from the nearest urban area, making it a primarily commuter campus since its inception. The CI campus is anticipated to grow and transition into a full-service campus, but slow-growth ordinances in the county ensure the surrounding area will remain largely undeveloped. Transportation and campus development strategies must respond to the isolated setting and its limited commute options.

The desired growth and evolution from a commuter campus to a full-service campus make student housing availability a top priority. CI had over 1,200 students in University housing during the 2015-2016 school year, including some students in off-site student housing in Camarillo. The completion of Santa Rosa Village will bring 600 additional beds to campus for the 2016-2017 school year. This will allow CI to transition out of off-campus housing, with 1,450 beds available on campus and approximately 100 students housed in the Town Center.

Campus Population and Growth

The campus currently has approximately 5,200 FTE students and is expected to enroll 5,660 FTE students for the 2016-2017 school year. CI is one of the CSU campuses identified for significant growth. For the last few years, the campus population has been growing by about 10% annually, an aggressive rate, and currently projects a less aggressive growth rate over the next 15 years as seen in Figure 2-1.

Until recently, an assumption of 10,000 FTE students by 2025, and 15,000 FTE students by approximately 2035 had been identified as goals for growth. Due to the availability of funding and opportunities for development, the pace of growth may be slower than projected in campus plans.

Figure 2-1 CI Projected Growth as of July 2015

	FTE Target	% FTE Change
2016-17	5,660	2%
2017-18	5,773	2%
2018-19	5,889	2%
2019-20	6,006	2%
2020-21	6,127	2%
2021-22	6,249	2%
2022-23	6,374	2%
2023-24	6,502	2%
2024-25	6,632	2%
2025-26	6,764	2%
2026-27	6,900	2%
2027-28	7,037	2%
2028-29	7,178	2%
2029-30	7,322	2%

As the campus grows, vehicles and parking are proposed to incrementally shift away from the campus core. This will allow both development opportunities and safer campus circulation patterns as the campus densifies. The campus used to have a significant amount of parking around nearly every campus facility, much of which has already been moved away from the core. The goal of removing parking from the center to the periphery of campus will help support a larger, denser campus.

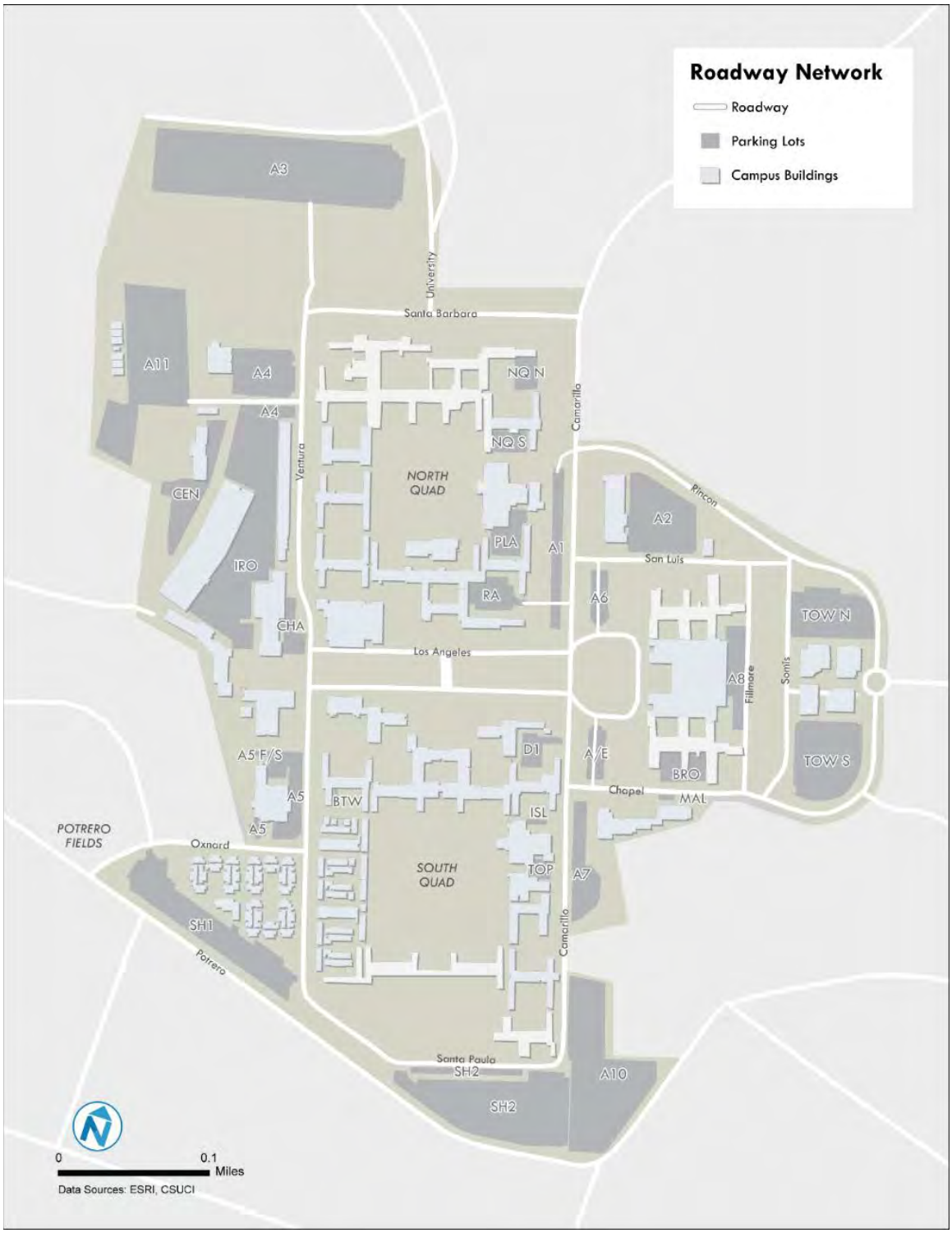
The planned growth rate will also influence transportation needs and campus circulation. At the current mode share, it will mean a significant increase in the number of cars travel to and around campus. The campus's pointed transition from a commuter campus to a full-service campus will help reduce some traffic. However, the isolated nature of the campus and limited transit access are key limitations to increasing use of non-auto modes.

TRANSPORTATION FACILITIES AND SERVICES

Roadway System

On campus, streets are narrow and a roughly symmetrical roadway system provides on-campus circulation. Santa Barbara Avenue, Camarillo Street, Santa Paula Street, and Ventura Street form the primary loop around campus, an easily-decipherable, symmetrical loop. The two-way loop forms the core of the campus roadway system. These small roads and forced turns generally seem to minimize vehicle speeds on campus.

Figure 2-2 Roadway Network



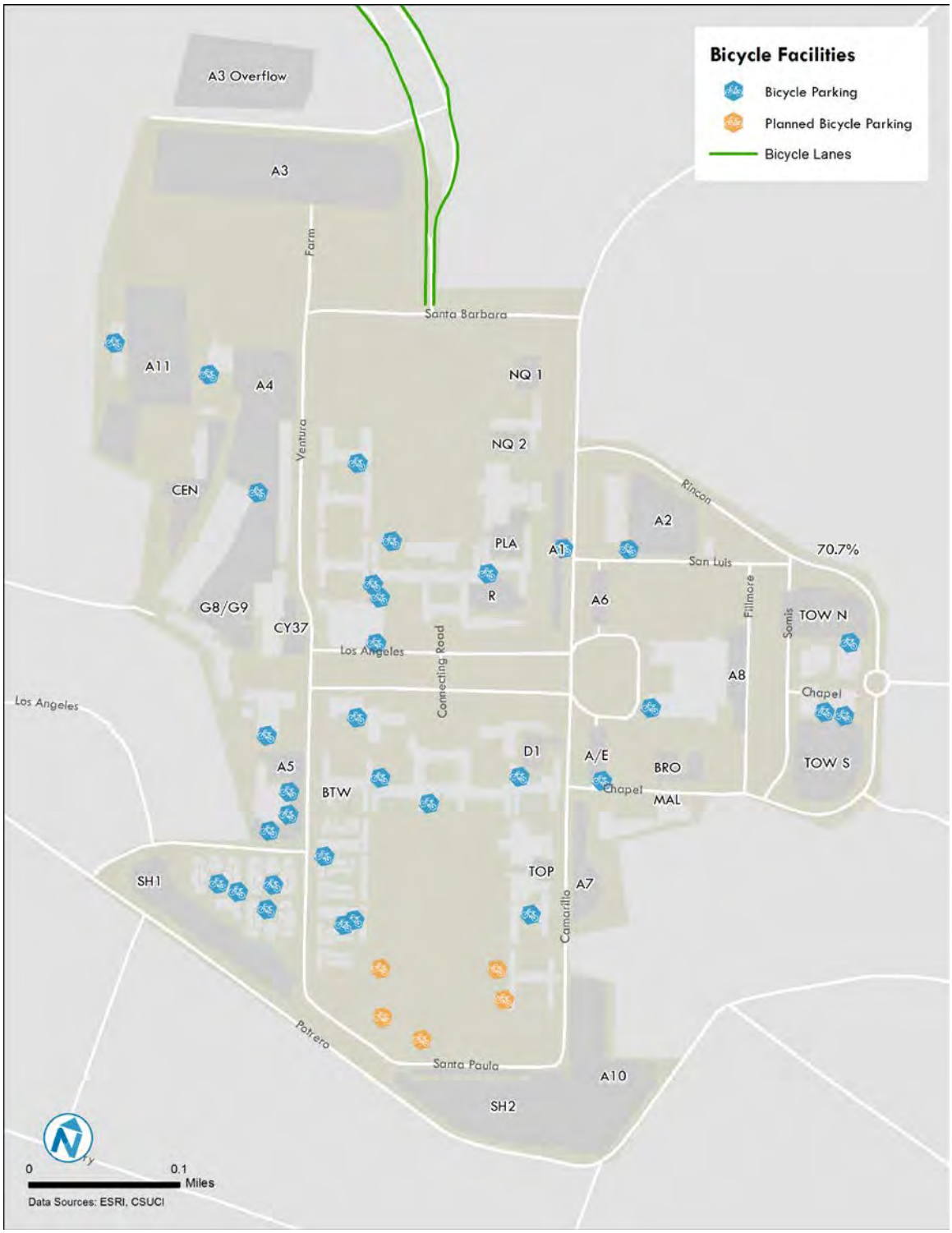
Bicycle and Pedestrian Facilities

Bicycle Infrastructure

Bicycle infrastructure on and around the CI campus is somewhat limited. Bicycle lanes on University Drive, from Santa Barbara Avenue to Lewis Road, connect bicyclists from campus to the regional network via the Lewis Road bicycle lane. Although it is the only piece of bicycle infrastructure connecting CI to Camarillo, the Lewis Road bicycle lane is not particularly inviting for bicyclists due to the high speed of traffic.

On campus, the roadways are relatively narrow and the low traffic speeds on campus make for an inviting environment for bicycling. Currently, there is no signage on campus to encourage motorists and bicyclists to share the road, or to direct bicycle traffic through campus. Bicycle parking facilities are spread over 32 locations on campus, as seen in Figure 2-3. Many bicycle racks were observed to be empty, which may be a result of bicycle racks that are not easily visible, rather than low demand. The campus is currently in the process of updating bicycle parking facilities.

Figure 2-3 Existing Bicycle Facilities



Pedestrian Infrastructure

CI is a highly walkable campus as a result of its size and infrastructure. The farthest distance from opposite ends on campus is about 0.6 miles, which means that most trips within campus can be completed in a 10- to 15-minute walk. In addition, midblock crossings and ADA accessible ramps throughout the campus provide ample opportunities to cross safely. Overall, the pedestrian environment at CI is welcoming and active, yet opportunities for improvement exist, as shown in Figure 2-4.

Safety and Collisions

Since 2014, 62 collisions have occurred on-campus. Of these collisions, only one collision involved bicyclists, and none involved pedestrians. The majority of collisions (90%) occurred in parking lots.

Figure 2-4 Existing Pedestrian and ADA Facilities

Transit

Transit service to the CI campus is provided by the Ventura County Transportation Commission (VCTC). Shown in Figure 2-5, VCTC operates two shuttle routes, CI-Camarillo and CI-Oxnard. Shuttle riders can board either shuttle at the CI campus shuttle stop located on Santa Barbara Avenue between University Drive and Camarillo Street. CI Shuttle Service operating times and frequency are show in Figure 2-6 below. It should be noted that the VCTC shuttles only stop once on campus, and do not provide access deeper into campus. The CI campus website has limited and outdated information about CI shuttle services.

Figure 2-5 VCTC Transit Service Accessible from CSU Channel Islands

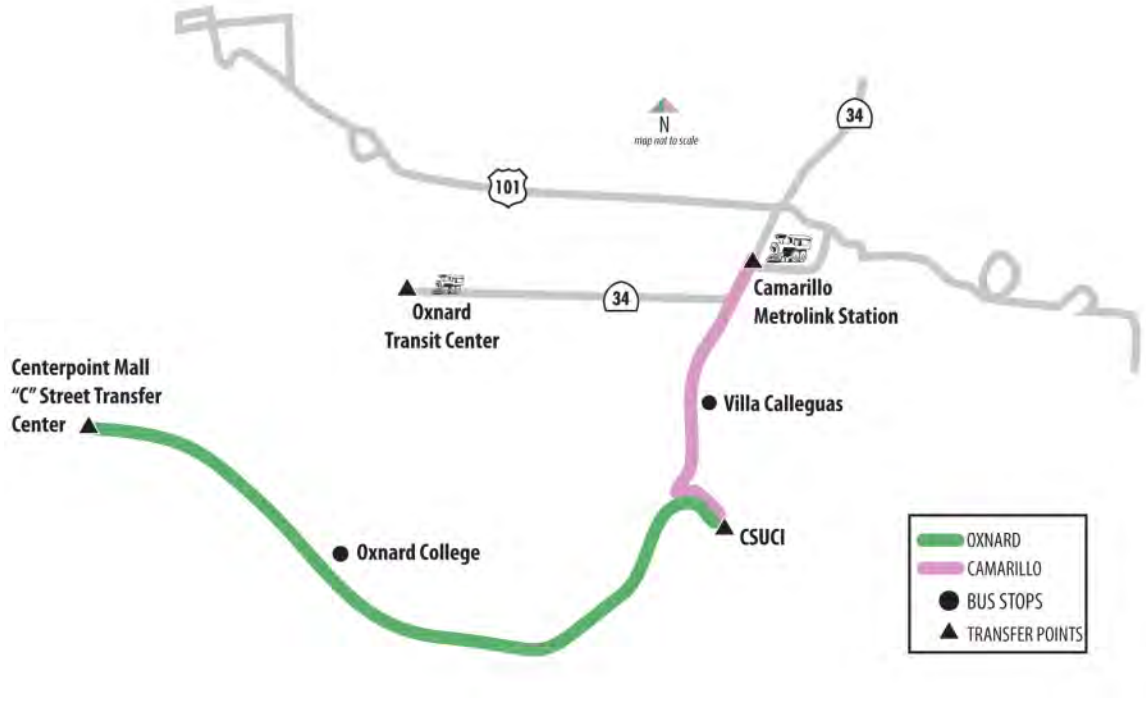


Figure 2-6 CI Shuttle Service

Route	Span of Service	Frequency
CI Camarillo	Monday – Friday (7:00 a.m. – 10:40 p.m.)	30 min
CI Camarillo	Saturday (7:30 a.m. – 5:30 p.m.)	30 min
CI Oxnard	Monday – Friday (7:00 a.m. – 10:35 p.m.)	60 min
CI Oxnard	Saturday (7:45 a.m. – 5:40 p.m.)	60 min

Electric Vehicle Charging Stations

A total of nine electric vehicle (EV) charging spaces are located on the CI campus, which are made available to commuters and visitors. In addition, about 40 stations are designated for the on-campus fleet of small electric vehicles used by campus staff. These stations are not compatible with commercial EV's.

Existing TDM Programs

With about 5,600 students now and a goal of adding 5,000 more in 10 years, the campus is at a critical juncture at which to consider transportation investments. The campus does have several transportation programs in place:

- Car sharing. There are two Zipcars available on campus - one on each side of the academic core. As of spring 2016, there were 515 total members and 286 active members. During core academic months over the last two years, the Zipcars were used about 20% of the time, around 300 hours per month across an average of 80 reservations per month.
- Transit passes. Reduced cost bus passes are available to students and sold on campus. The student shuttle pass is sold on-campus and is $25 per academic semester for students, faculty, and staff, and $21.87 during summer session. This compares to the normal monthly fare of $50 for travel within Ventura County, and $105 for travel on the extended system.
- On-campus housing. The past and current plans to add additional housing to the campus, along with other amenities, will impact transportation behavior, reducing commuting to and from campus.
- Carpooling is encouraged, however without an internal system in place, carpoolers are instead encouraged to identify potential rider partners, and organize their own meeting locations. Regional rideshare service is provided by RideMatching, a Ventura, Los Angeles, and Orange County Transportation Authority (commission) service.
- Marketing and communications. CI promotes alternative transportation options via its website. However, the overall website and marketing presence is limited and can be difficult to navigate. For example, there is no real-time information about transportation options and no social media platform for transportation programs.

PARKING

Parking Supply

According to data collected in March of 2016, a total of 3,421 parking spaces are available on the CI campus and adjacent Town Center, which includes spaces currently designated for maintenance and other users. Figure 2-7 shows the CI campus parking supply, while Figure 2-8 provides a detailed summary of parking inventory. However, many of these parking spaces are not currently operated by the University nor are they accessible to the general public, as they serve the specific needs of the Town Center or Police Department, as noted in the inventory. In addition, gravel overflow lots are not considered part of the official parking supply of the University.

A total of 2,682 vehicle parking spaces are officially managed by the campus, of which 2,453 are available for commuter, resident, and visitor parking, and 233 are designated for faculty, staff, and maintenance/loading purposes spaces.

Figure 2-7 Campus Parking Supply by Category

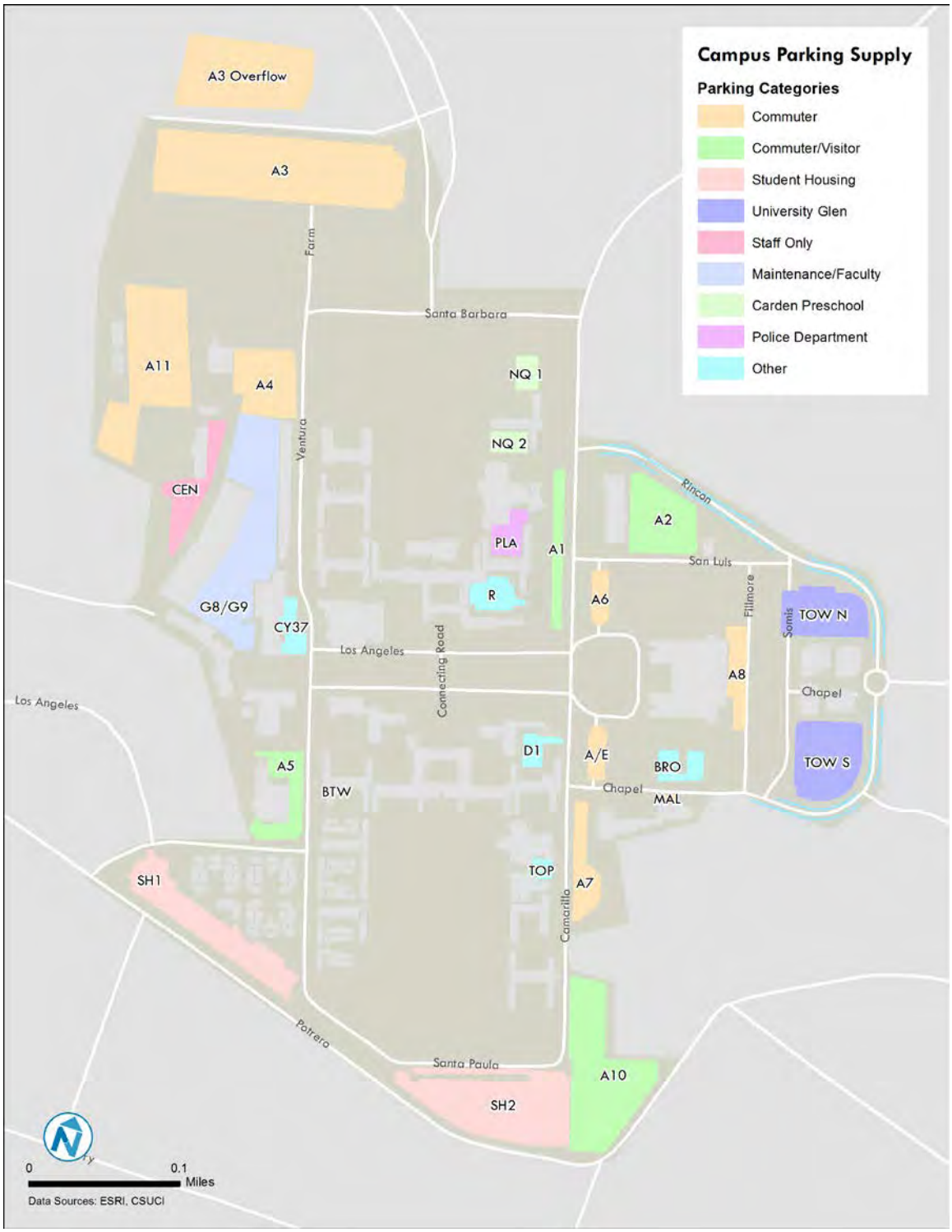


Figure 2-8 Campus Parking Inventory

Parking Facility	General / Students	Faculty	Staff	Disabled	Visitor	Housing	Loading	Maintenance	Metered	Reserved	Electric Vehicles	Carpool / Vanpool/LEV	Restricted Visitor	Restricted Permit	Total as of 7.8.16	Motorcycle	Electric Carts
A1 Lot	36			2	2				6		2				48		
A2 Lot	105	5		5			1		2	4				3	125		4
A3 Lot	525			2							5				532		
A4 Lot	83			12	2					5					102	4	
A5 Lot	23	8	9	4	3		1	6	4					3	61		6
A6 Lot	30			2											32		
A7 Lot	27	8		11				1	2						49	18	
A8 Lot	49			2			3	3							57		3
A10 Lot	323			2	1					2				1	329		
A11 Lot	261			1			1								263		
R Lot		3	20	4	2		1	1					2	7	40		3
A/ E Lot	31													2	33		
D-1 Lot				13				2							15		
SH-1 Lot				11		194		2		2				13	222	4	2
SH-2 Lot				8		305						20		20	353	2	3
Courtyard 37 Lot	7	2		2	1		2							6	20	2	5
G8 Lot			46	1	2		3	20							72		7
G9 Lot		6	34	1			5	16			2				64		12
Central Plant Lot*			18	1			3	5		1					28		12
25 Chapel Court			18												18		
SH-UG Lot						96									96	2	
Street Parking (Rincon/Chapel)	123														123		
Total	1,623	32	145	84	13	595	20	56	14	14	9	20	2	55	2,682	32	57

*Since the date of data collection, approximately 15 spaces have been added (with paint) to the CEN lot.

Parking Signage

Signage directing vehicular traffic on campus is relatively limited. Two larger signs are visible to drivers upon entry to campus from University Drive at Santa Barbara Avenue, and on Camarillo Street before Rincon. These signs offer little directional information for motorists to available parking, and direct drivers to parking lots at the center of campus. Once circling campus, clearly identifying parking lot signs can be difficult. No real-time parking availability signage is provided on campus.

Parking Permit Program

With the exception of metered or visitor (time-limited) spaces, all parking on campus requires a valid permit. Day permit dispensers are located at most parking lots to make the purchase of temporary/daily permits easy to obtain for occasional campus visitors. There are also some parking meters located across campus for short-term visits. The existing parking meters are old and not in line with industry best practices for parking payment technology (Figure 2-9).

Figure 2-9 CI Parking Pay Station

For long-term permits, CI offers a variety of options for students, staff, and faculty. Figure 2-10 shows parking permit types and costs on the CI campus. According to the campus-wide travel survey, 81% of survey respondents purchased one of these long-term permits.

Figure 2-10 Parking Permit Types and Costs (2015-2016 Academic Year)

Permit Type	Cost
Vehicle	
Student– Fall/Spring Semester	$190
On Campus Student Resident – Fall/Spring Semester	$190
Faculty - Fall/Spring Semester	$95.45
Student– Summer	$161.88
Faculty- Summer	$84.45
Motorcycle	
Student – Fall/Spring Semester	$34
Faculty – Fall/Spring Semester	$24.19
Student– Summer	$29.75
Faculty- Summer	$20.75
Employee Monthly Permits	
MPP & Non-represented employees/Tenants Only	$45.82
Employees (Represented Bargaining Unit 4, 6, 8)	$25.00
Employees (Represented Bargaining Unit 2, 5, 7, 9)	$26.89
Other	
Parking Meters (45 minute max)	$.50/15 minutes
Daily Permit	$6

Parking Demand

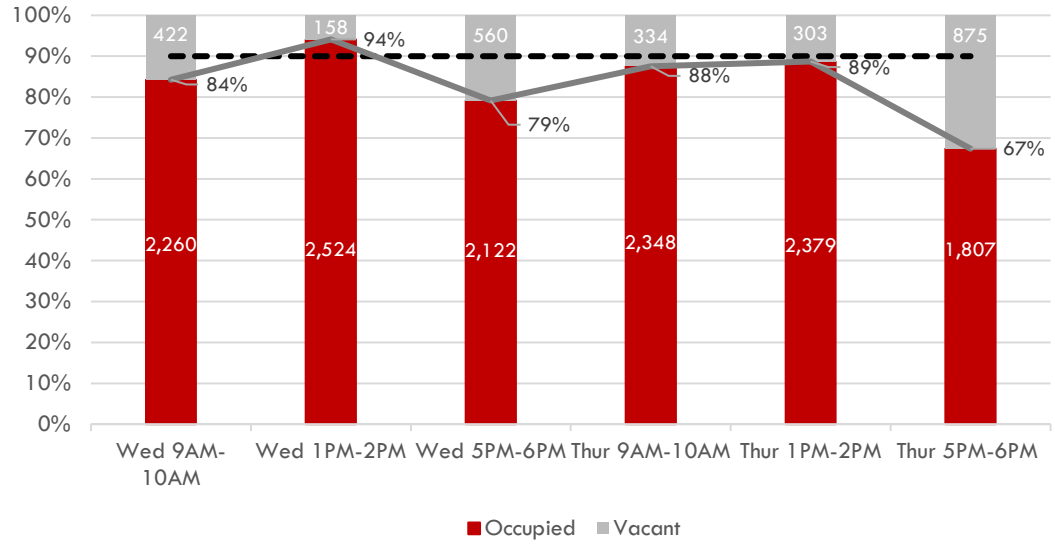
Parking data was collected on two consecutive days (Wednesday and Thursday) in March 2016 to better understand the demand for parking at CI. The observation periods during the morning (9 a.m. – 10 a.m.), midday (1 p.m. – 2 p.m.), and late afternoon (5 p.m. – 6 p.m.) provide a baseline of existing parking behavior and demand.

The highest parking demand was observed on Wednesday at midday, when the parking supply was at 94% occupancy. During this observation period, there were 158 spaces available on paved parking lots. During this observation period, 189 vehicles were parked on the gravel lot north of lot A3, which suggests that there would have been a shortage of parking capacity without the availability of the gravel lot. Vehicles parked on the gravel lot were not considered in the parking demand analysis as per CI's request. It should also be noted that there was no other observed period where the number of vehicles parked on the gravel lot exceeded the amount of available spaces on paved lots. During these other periods, if vehicles parked on the gravel lot would have parked in paved spaces, there would still be an excess of 193 to 839 paved spaces on campus.

In order to understand the functional capacity available to the public, vacancies observed should be compared to a measure of "effective capacity." Effective capacity is an industry-standard occupancy rate measure of 90%, at which point a parking facility feels "full" to a user

due to the delay in finding a vacant space. This measure is reflected in Figure 2-11 by the dashed line.

Figure 2-11 Parking Occupancy (March 2016)[1]



Applying this measure to the capacity of 2,682 spaces managed by the CI campus, the effective supply is calculated to be 2,414. That means 2,414 parked vehicles is the functional parking threshold above which parking capacity is constrained. Figure 2-11 summarizes the excess capacity during each observation period. It should be noted that at the highest observed peak, 110 spaces over functional capacity were occupied, creating a condition where it is very difficult for visitors to identify a vacant parking space (Figure 2-12). During this time period, 189 vehicles were observed parked in the A3 overflow lot, yet not incorporated into this analysis. In its current unpaved condition, it is estimated that the overflow lot could park about 366 vehicles in unmarked spaces (based on 300 square feet per parking space, including drive aisles).

Figure 2-12 Overall Excess Capacity (Based on 90% of Total Supply)

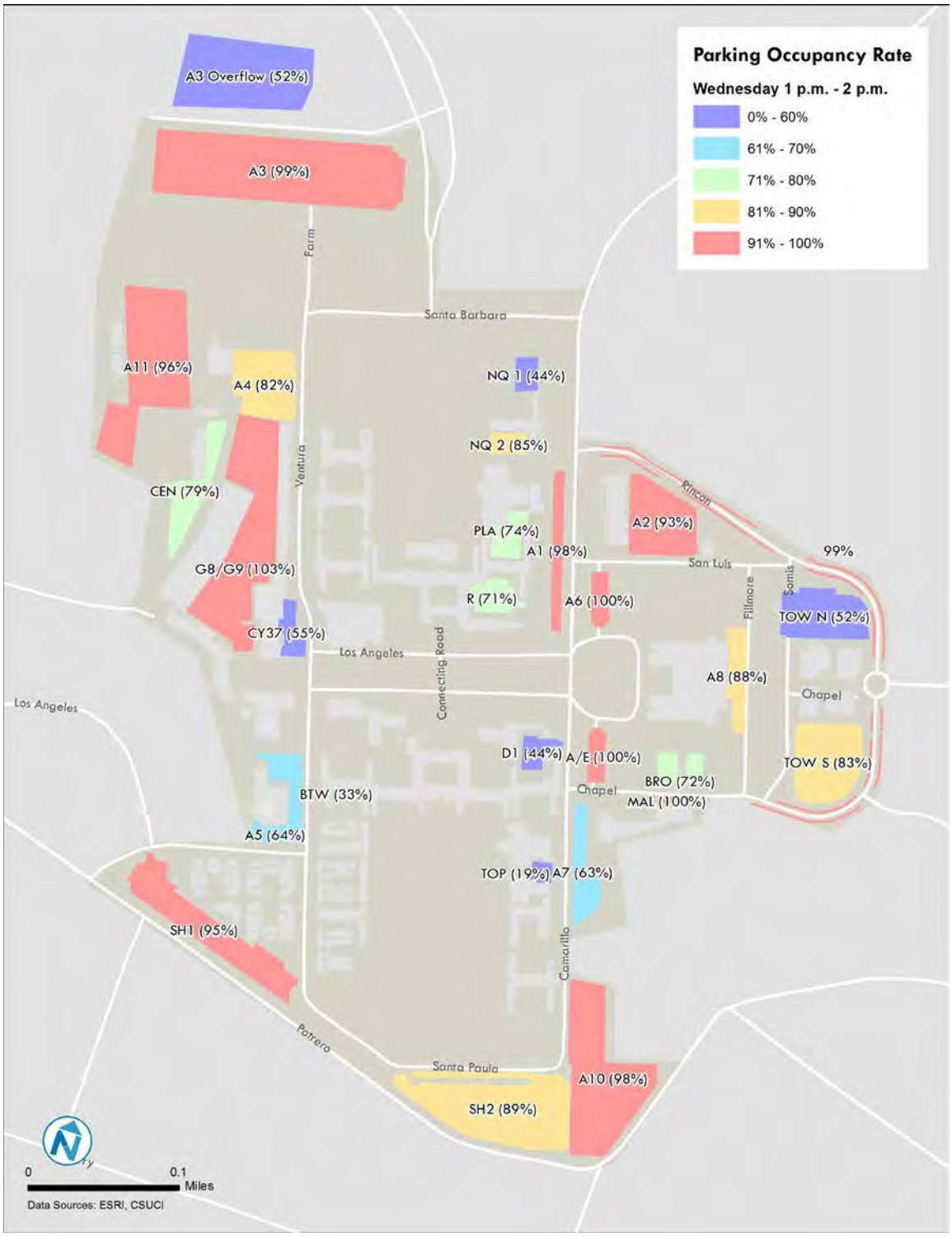
	Wednesday			Thursday		
	9 a.m. – 10 a.m.	1 p.m. – 2 p.m.	5 p.m. – 6 p.m.	9 a.m. – 10 a.m.	1 p.m. – 2 p.m.	5 p.m. – 6 p.m.
Excess Capacity	154	-110	292	66	35	607

Figure 2-13 shows how parking demand varies geographically across campus, on all lots, including overflow lots and those facilities that are not managed by the University at this time. On both observed days, during the morning data collection, parking facilities near the center of campus were near or at capacity and did not experience significant availability until the afternoon.

[1] Analysis does not include parking inventory and observed vehicles parked in the A3 and A11 overflow lots.

These observations are consistent with what one would expect. The most convenient parking spaces are taken earlier in the morning, while the parking outside the campus center is seen as a last resort for commuters.

Figure 2-13 Campus Parking Peak Occupancy: Wednesday 1 p.m. to 2 p.m.



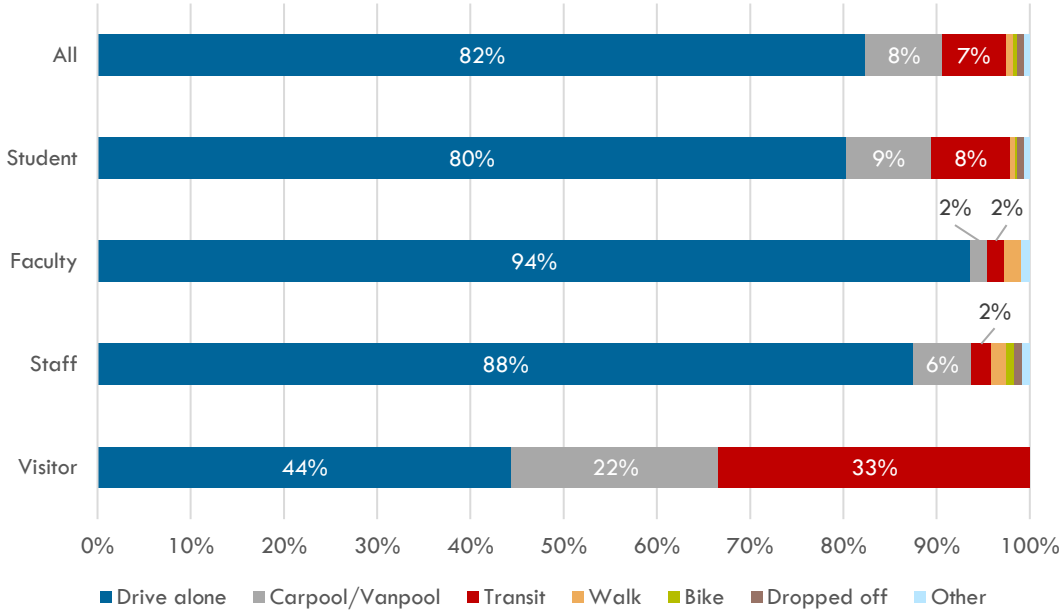
TRAVEL SURVEY RESULTS

A campus-wide travel survey was distributed to faculty, staff, and students in spring 2016. The survey included a series of questions about commute behaviors and preferences of CI affiliates. The survey provides response rates of 26% for students and 52% for faculty and staff, which provide an adequate snapshot of the campus community based on previous experience.

Mode Split

Roughly 82% of all off-campus affiliates drive alone to commute to campus. Due to the CI's remote location, the drive alone mode share is significant amongst students, faculty, and staff, which poses a challenge to parking supply. Overall, carpool/vanpool is the second highest mode at eight percent of responses, and transit is the third at seven percent of responses.

Figure 2-14 Mode Share to Campus, by Off-Campus Affiliate Status



Vehicle Access and Use

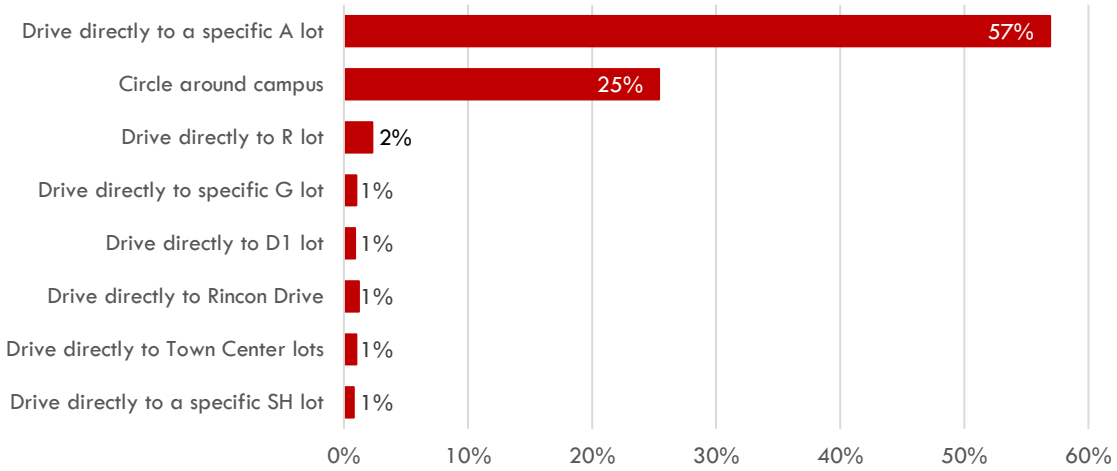
The majority of all affiliate groups have access to a car on a daily basis, while on-campus affiliates have lower rates of vehicle access than off-campus affiliates. 73% of on-campus students have access to a car compared to 97% of off-campus students. Roughly 83% of on-campus faculty have access to a car compared to 94% of off-campus faculty. Nearly all staff regardless of residency have access to a car on a daily basis.

Vehicle usage is highest amongst students, with 93% using their vehicle more than once a week, compared to faculty (80%) and staff (90%). However, 33% of faculty who live on campus use their car more than five times per week compared to students (15%) and staff (20%).

Driving and Parking on Campus

The most common reason for driving to campus across all affiliate groups was irregular hours. The large share of commuters who drive to campus leads to a high demand for parking on campus. The majority of on- and off-campus affiliates have parking permits (81% for both). As shown in Figure 2-15, when driving to CI, the majority (57%) of commuters drive to a specific parking lot, while roughly 25% of respondents circle around the campus to look for the most convenient space.

Figure 2-15 Parking Patterns



When asked if they would be willing to pay more if they could park closer to their final destination, 25% of faculty strongly agreed while 28% of students disagreed (Figure 2-16). When drivers were asked if they would be willing to park further if it meant they could pay less, responses were generally split amongst staff and students (Figure 2-17). Faculty respondents, however, were less willing to park farther away, with 56% disagreeing.

Figure 2-16 Willingness to Pay More for Parking, Affiliate Status

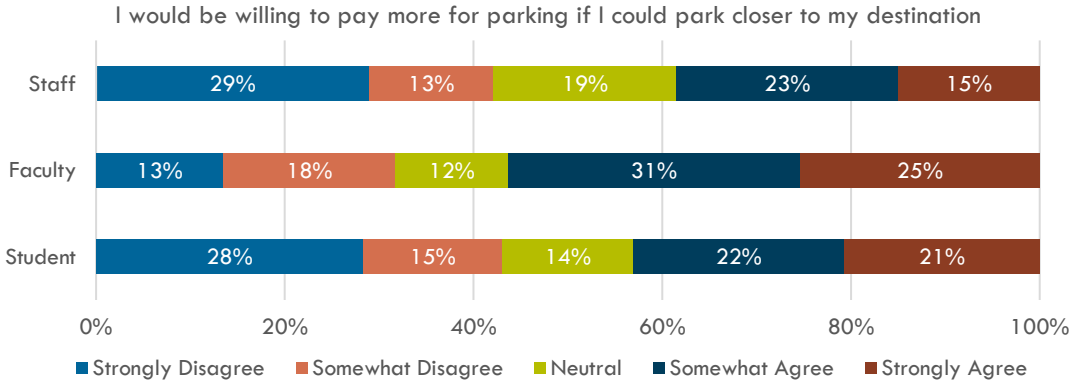
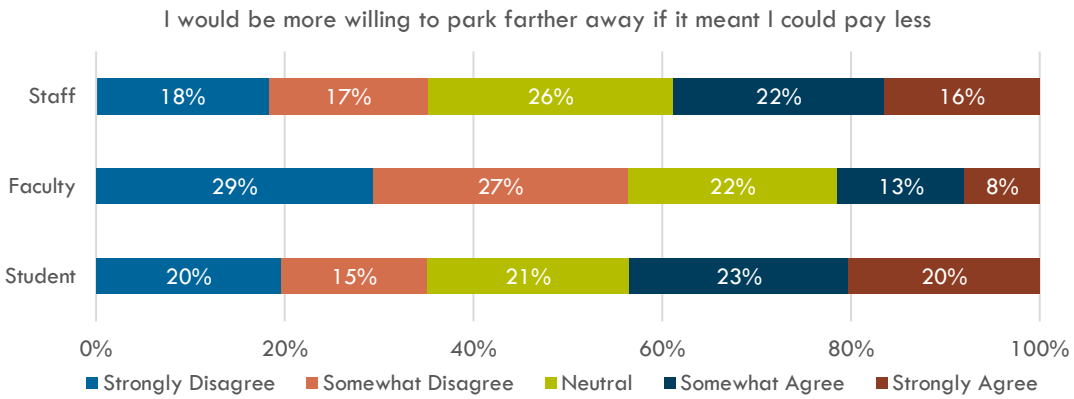


Figure 2-17 Willingness to Park Farther, by Affiliate Status



Taking the Bus

Overall, only 7% of survey respondents use public transit to get to campus. Many CI affiliates (56%) do not take transit because it is slower than their current mode of travel. Another common theme is the inconvenience of transit. Respondents find bus stops to be located far from their desired destination. CI affiliates express a desire to take transit service to additional locations in Camarillo, Los Angeles, and Ventura. Students would also like for transit service to be extended to Oxnard, Santa Barbara, and Thousand Oaks.

3 BEST PRACTICES

Many colleges and universities have recognized the economic, social, and environmental advantages of enhanced parking management, multimodal policies and programs, and investment in non-auto commute programs. This section highlights selected campus parking and TDM programs and strategies that have successfully contributed to shifts in campus access trips from single-occupant vehicles to carpooling, transit, walking, cycling, and other non-auto modes.

STRATEGY OVERVIEW

Land Use Mix

Locating different types of land uses in close proximity on campus reduces travel distances and helps increase walking and bicycling trips. An example land use map for Cal Poly SLO is shown below in Figure 3-1. Universities with a strong mix of attractive housing options, as well as gyms, outdoor activities, food, markets, entertainment, and study spaces, are far more likely to have lower drive-alone rates than universities that have predominantly academic uses.

Figure 3-1 Cal Poly SLO 20-Year Master Plan Land Use Mix

Transit Access and Subsidized Transit

Many CSUs and UCs are served by regional transit, and many also offer campus-specific transit service. Some universities provide this service themselves, like the University of New Hampshire. Others partner with regional transit authorities, like Cal Poly SLO, to ensure that there is a route that serves the university.

In order to have high ridership and productivity these services must go where students want to go, arrive and depart regularly during class period breaks, have no out-of-pocket cost to students, and have high quality station amenities on campus located in a highly central, visible, and convenient location.

Many universities also offer free or discounted regional transit passes, which has become a standard university TDM strategy. Subsidized transit is often paid for by a student fee that is included in tuition costs. This distributes the cost per student and reduces the cost per trip.

Parking Management

Real-time Guidance and Wayfinding

Wayfinding and guidance strategies improve the perceived availability of parking, and enhance the efficiency of how parking resources are used. Uneven parking distribution leads to perceptions of a parking shortage while ample supply is available in nearby underutilized facilities. Wayfinding and intelligent guidance systems help to alleviate this problem by making people aware of their parking options and the availability of parking across an entire campus or sub-area (Figure 3-2).

Figure 3-2 Parking Guidance and Wayfinding Technology

Tiered Parking Pricing

Tiered parking pricing bases price on location and level of demand, with the highest fees in the most convenient/desirable parking facilities and the lowest fees in the least desirable locations. An occupancy target of 85% in short-term parking and an occupancy target of 95% in long-term parking are commonly used.

Elimination of Semester/Annual Permits

Eliminating quarterly and annual parking permits in favor of a daily pricing system highlights the marginal cost of parking and encourages motorists to consider using an alternative mode one or more days per week or month. Long-term permits are a sunk cost, eliminating the financial incentive to use alternative modes of transportation.

Parking Cash-Out

Parking cash-out programs give those commuters the cash equivalent of the parking subsidy if transit, biking, or walking is used. Parking cash-out highlights the sunk cost of free or subsidized parking provision. In exchange for relinquishing subsidized parking, commuters who utilize alternative modes are rewarded with a cash allowance equivalent to what the employer would otherwise pay to provide subsidized parking.

Campus Bike Share

Campus bike share programs, which are prevalent across the country, allow for the shared use of bicycles for short-term trips by allowing registered users to retrieve and return bikes at stations positioned strategically at key destinations and transit centers.

There has been more thorough research on city bike share systems than university systems, but many of the key lessons learned from this research are universal. As research from NACTO and others has shown, people — of all races and at all income levels — use bike share when it is convenient. Figure 3-3 shows an example of a campus bike share service at the University of Chicago.

Figure 3-3 Campus Bikeshare at the University of Chicago

Emergency Ride Home

Universities that encourage transit use often offer emergency rides as an incentive to reduce concerns around traveling to and from campus without a car. These help address unplanned trips: unexpected personal or family illness, carpool or vanpool driver emergencies, or unexpected overtime, providing peace of mind for a car-free commute.

EXEMPLAR CAMPUSES

This section highlights universities with comprehensive and "best practice" TDM packages. Cal Poly SLO and Tufts University are highlighted here, but more examples are provided in the Existing Conditions report.

Cal Poly SLO

Cal Poly SLO has a population of just over 19,000 students in a relatively isolated section of the Central Coast. Cal Poly students make up 40% of the City of San Luis Obispo's population. Cal Poly SLO's TDM program includes an ambitious outreach program and a solid mix of basic TDM programs.

Land Use Mix

The university has an increasingly diverse mix of uses on campus: housing, a bowling alley, a large gym, climbing wall, four pools, hiking/biking trails, athletics facilities, a medical center, dining facilities, markets, and a performing arts center. The campus will even be opening a bar on campus – the first time that alcohol will be provided on campus outside of special events. Cal Poly is working to increase on-campus housing and is in the process of dramatically increasing the number of housing units.

The core of campus has also been designated as primarily pedestrian and bicycle oriented by design and access regulations, which helps to reduce vehicle trips on campus and improve safety.

Regional Transit Connections

The university has partnered with local and regional transit providers to offer students and staff free and/or reduced cost transit service. Cal Poly affiliates receive free access to the city bus system (Figure 3-4) and reduced prices for the regional bus service. The reduced and free transit services are paid for by on-campus parking fees and parking ticket revenue.

Figure 3-4 San Luis Obispo Transit to Cal Poly SLO

Source: City of San Luis Obispo

SLO Council of Governments Rideshare division provides additional programs and services, which can be accessed on their website, rideshare.org. For anyone that is traveling late at night, the rideshare website lists three potential services: SLO Safe Ride, taxi providers, and Uber. Dial-A-Ride (Demand Response Transit) services are also provided by the Regional Transit Authority. They offer curb-to-curb transportation within local communities.

Parking Guidance and Wayfinding

Cal Poly currently offers a fairly standard mix of campus parking options, but is poised to integrate "smart" parking management systems. Parking payment options currently include meters with hourly rates, daily temporary permits, and quarterly and annual permits. Under its new Master Plan, Blueprint 2035, campus parking will evolve to reduce the need for spaces through real-time information about space locations and availability, variable time-pricing, and other ITS practices.

Major parking facilities will be located to "intercept" cars outside the academic core. The goal of this strategy is to provide drivers with the ability to conveniently transition to other active modes or intra-campus shuttles upon arriving to campus. The university is also currently considering the removal of quarterly and annual parking permits and transitioning to daily pricing.

Campus Bicycle Resources

Cal Poly is partnering with the City of San Luis Obispo to help develop off-campus bicycle improvements as prescribed in the city's bike plan. The primary goal is to improve connections between the campus and the broader community. The university and the city have a long-standing effort to ensure campus and city bicycle routes connect as they cross over the

university property lines. The university also provides both long-term and short-term bicycle parking. According to the master plan update, the university is in the process of replacing all bicycle parking that does not comply with the Association of Pedestrian and Bicycle Professionals "Essentials of Bike Parking" manual. Cal Poly also has a bicycle repair station located in their student union.

Figure 3-5 Cal Poly SLO Campus Bicycle Repair Station

Source: Mustang News, Cal State University, San Luis Obispo

Staff Vanpool/Carpool Program

Cal Poly has a vanpool/carpool program that serves staff and faculty, however it is mostly used by staff. Staff have more regular work schedules, generally 8 a.m.-5 p.m., making the program a better fit than for students or faculty. The vanpool provides service to four main cities: Paso Robles, Atascadero, Santa Maria, and Arroyo Grande. These connections travel in the peak commute direction only.

Intercity Ridesharing

Cal Poly SLO has an unofficial Cal Poly Ride Share Facebook page. Students use this page to post trips they are taking and whether they need a ride or are offering a ride to others. This page led to the creation of a phone app called PolyRides, which provides the same resource in a more organized fashion. These resources were created by students that saw a need not being fulfilled by the university.

Zipcar

In order to reduce the need for car ownership on campus, Cal Poly has contracted an agreement with Zipcar to provide eight vehicles around the campus.

Outreach and Marketing Programs

Cal Poly offers one of the top rated freshmen orientation programs in the nation, during which students are exposed to all of the transportation options and programs. Orientation includes a guided trip on the bus and information on how to access online resources.

Campus Circulation Shuttle

Cal Poly University Police Department provides an escort van service through the Community Service Officer Division. The service provides a ride from three designated pick up points to anywhere on campus or up to a half-mile off campus, primarily available during evening hours when school is in session.

Tufts University

Tufts University is a private university in Medford, Massachusetts, a suburban city of 58,000. Tufts has an enrollment of 7,337 students. Tufts has a well-rounded TDM program, which includes bike share, and has successfully integrated parking technologies, such as license plate recognition.

Campus Shuttle and Transit Service

A campus shuttle system connects the campus core with remote campus properties (shown in Figure 3-6). One shuttle travels 18 miles each direction to link the Medford and Boston campuses.

Figure 3-6 Tufts Campus Shuttle

Source: Tufts Daily, Tufts University

Bike Share

Tufts has its own bike share program, called Tufts Bikes, funded by a $47,450 startup grant from the student assembly. The program includes 30 bikes and 30 helmets that are stored at the library. It is largely popular and has an annual maintenance and operation cost of $1,655. In the summer the bikes are checked out anywhere from 200 to over 530 times.

Car Share

Tufts has five Zipcar locations directly on campus and many more in the area just off campus. Students pay a discounted $15 registration versus the normal $25. Faculty receive discounted weekday driving rates. As of 2014, 2,750 students and 99 faculty were registered.

Rideshare and Carpool

To incentivize carpooling, the university offers prime reserved parking spaces for carpoolers. Each carpool group receives a single shared parking placard.

Parking Technology

License Plate Recognition (LPR) technology is used to eliminate the need for access cards, tickets, tokens, paper receipts, and decal stickers. The university will be adding mobile phone payment options and dynamic pricing, replacing flat rates with fees based on length of stay.

PEER CAMPUSES

This section describes universities that have similar attributes to CSU Channel Islands, whether it be a more isolated location, an adaptive reuse campus, similar size, or an aggressive growth rate and campus transition.

UC Merced

UC Merced is a rural campus located about five miles northeast of Merced, CA. The university has a student population of 6,000, but has an aggressive growth plan and is moving toward becoming a 25,000 student campus in the coming decades. To support its growth plan, the university has begun to develop robust transportation and land use strategies.

The long-term campus vision describes a compact, car-free academic core served by transit; a 10-minute walking radius within the academic core; student neighborhoods that wrap the perimeter (12,500 beds); two mixed-use “Main Streets” with housing within the academic core, which will provide connections to other town center and neighborhood uses; open space and recreation embedded throughout the campus; and a Research and Development Park district.

TDM strategies include:

- Regional transit services are subsidized to provide free transit access
- Ridesharing
- Carpool and vanpool incentives
- Carsharing vehicles
- Vanpool program
- Hertz 24/7

- Zimride rideshare matching program
- The university offers bicycle incentives and a bicycle program is under development

The university's strategy for reaching its goal of reduced Single Occupancy Vehicle (SOV) and Vehicle Miles Traveled (VMT) rates includes aggressive marketing, educational campaigns, and development of incentives to participate in alternative transportation programs.

The university also has a robust clean air agenda that includes increasing the number of clean air commuter permits for eligible carpools to promote ridesharing, purchasing a fuel efficient and low emission fleet, adding electric charging stations, expanding hybrid and/or battery-operated fleet, adopting a clean-fleet procurement policy, standardizing fleet ordering processes, and creating zero-emission vehicle incentives.

Many of the campus' TDM strategies are recently implemented or proposed, so their success is yet to be determined.

University of New Hampshire

Although in a very different region of the country, the University of New Hampshire (UNH) has a similarly isolated setting as CI. UNH has made impressive strides with its TDM program. The university lobbied to get more regular stops on the Amtrak train that runs near campus, has created a well-functioning shuttle system that uses real-time vehicle tracking, and has added bike infrastructure, Zipcars, and carpool parking discounts. The campus also created a Transportation Policy Committee to continue to prioritize and organize implementation of transportation improvements on campus.

Additional highlights include:

- UNH has established a target of providing parking for 35% of the campus population
- The campus shuttle service, Wildcat Transit, is owned and operated by the university and is considered highly effective. All routes originate at the campus transit center and connect with the local communities and regional transit services, as well as multiple Campus Connector buses that provide circulation between campus facilities. Wildcat Transit is open to the public. It is free for students, faculty, and staff and costs $1.50 for those not affiliated with the University.
- The campus carpool program includes conveniently located reserved parking for carpooling employees. Any carpool can use the reserved spaces if at least two people in the carpool have previously purchased parking permits
- UNH does not directly provide rideshare services but they do direct users to a UNH Wildcat Rides Facebook page to arrange rides

CSU Monterey Bay

CSU Monterey Bay is a rural campus located approximately eight miles north of the City of Monterey, CA. The university has around 7,000 students and a drive-alone rate of about 43%. The school's newly-minted 2016 Master Plan lays out a vision for a pedestrian-, bicycle-, and transit-prioritized campus, and establishes a goal of reducing the drive alone rate by 10% (to 33%) by 2020.

Similar to CI, this campus is transitioning the location of parking areas as the campus develops. Most buildings used to have parking adjacent to them, but those lots are slowly being closed in

order to create a denser, more pedestrian-friendly campus core. The benefits of this transition have been challenging to communicate to students, who now must park further away.

Land Use Mix

All freshmen at CSUMB live on campus. The university offers housing, a movie theater, gym, pool, ropes course, hiking/biking trails, athletics facilities, a medical center, and dining facilities.

Regional Transit

The CSUMB Identification Card provides students free access to all Monterey-Salinas Transit (MST) bus routes. This universal transit pass is included in student tuition/fees and all students automatically receive this benefit. MST also provides demand-responsive transit for the area around CSUMB. This mini-bus service accommodates trips not served by fixed transit routes and schedules.

Campus Bicycle Resources

CSUMB has an on-campus bicycle station known as the Otter Cycle Center. The Otter Cycle Center is a bike shop and service that provides bike rentals, repairs, storage, fitting, accessories, classes, clinics, trip planning, and organized rides. The university recently added bike rental options to allow students, faculty, and staff to move around campus more easily. Figure 3-7 is an example of some the campus bicycle resources provided to students by the Otter Cycle Center.

Figure 3-7 CSUMB Bicycle Resources

Campus Carpool and Rideshare Tools

The campus' Transportation Resources webpage provides links to various suggested rideshare, taxi, and carpool options. For ridesharing, the university suggests cruz511.org, a service provided by the Santa Cruz County Regional Transportation Commission. They also recommend taxi services such as Lyft, Uber, and Rapidride, which is an app that allows you to hail a local Monterey Yellow Cab.

Intercity Ridesharing

CSUMB has an official CSUMB Carpool Facebook page. Students use this page to post trips they are taking and whether they need a ride or are offering a ride to others.

Campus Circulation Shuttle

Another new planning effort involves implementing a shuttle service to increase connectivity on campus. The campus used to have a campus shuttle system operated by student employees, but it did not operate effectively and was discontinued. The campus is now coordinating with MST to provide this operation. The system is currently being planned so limited details are available.

4 RECOMMENDATIONS

GENERAL OVERVIEW

The information and data collected for the Parking and Transportation Demand Management (PTDM) Plan are the basis for the broad menu of recommended physical and programmatic improvements to CI's transportation system. An initial list of strategies was evaluated and refined according to their specific implementation potential as informed by the campus staff and participants during campus outreach in Fall 2016. The strategies in this section form a "preferred package," that a financial estimation model (Chapter 5) shows to be a fiscally-responsible package. Several other concepts were explored during strategy development but were not included in the package, as their cost could not be absorbed in a reasonable manner without identifying new funding sources. Those are listed as future, long-term options at the end of this Chapter. This core set of 49 strategies, plus the seven future, optional strategies, are intended to address three major identified issues:

Growing campus but limited space and funding for adding parking. Established only in 2002 as an adaptive re-use campus, making it the youngest in the CSU system, the school is quickly growing from a commuter school to full-service campus. Core-area parking is being, and will be, replaced by academic buildings. At peak periods, the campus is experiencing a parking crunch, and the University's enrollment is expected to grow aggressively. Programming is expanding, so there is growing variety to the types of parking needs on campus, perhaps most notably for student housing. The increasing number of campus residents will potentially reduce the need to own a vehicle and travel off-campus for basic errands. University parking policies are shifting the parking footprint to the outer edges of campus, and aim to add a few hundred additional spaces in upcoming years. Even when parking is expanded, it may not be where people ideally want to park, so general perception that there is not enough parking is likely to continue without the overall approach for parking and transportation.

Challenging regional connections. Due to CI's remote location, about four miles from the nearest urban area, and surrounded by rural land at the base of the Santa Monica Mountains, the vast majority of off-campus affiliates commute to campus by driving alone. Among commuting affiliates, many travel significant distance, but Camarillo and Oxnard are the most common origins. As previously noted, the campus' status as a commuter campus is changing. The isolated nature of the campus limits multimodal commute options, most noteworthy being the inadequate transit service.

Lack of coordination and communication hindering transportation programs. The University is providing a number of alternative transportation options, such as regional transit service and Zipcar, and there is some customer service presence and occasional student group activities around transportation and sustainability topics. However, there is limited coordination of

programming, no significant orientation presence, and the overall website and marketing system is limited and can be difficult to navigate. As a result, many of the University's transportation programs and associated technology investments are not fully-realized or used by affiliates. With little promotion of CI's existing transportation programs – especially its benefits for traveling without a car – the University will be reactively solving problems instead of proactively managing affiliates' expectations. Today's sparse availability of travel information, a lack of messaging, and insufficient branding limit the appropriate use of all travel options by daily commuters and visitors.

Goals

The following eight goals guided this project and the development of the recommendations. CI's transportation system should be:

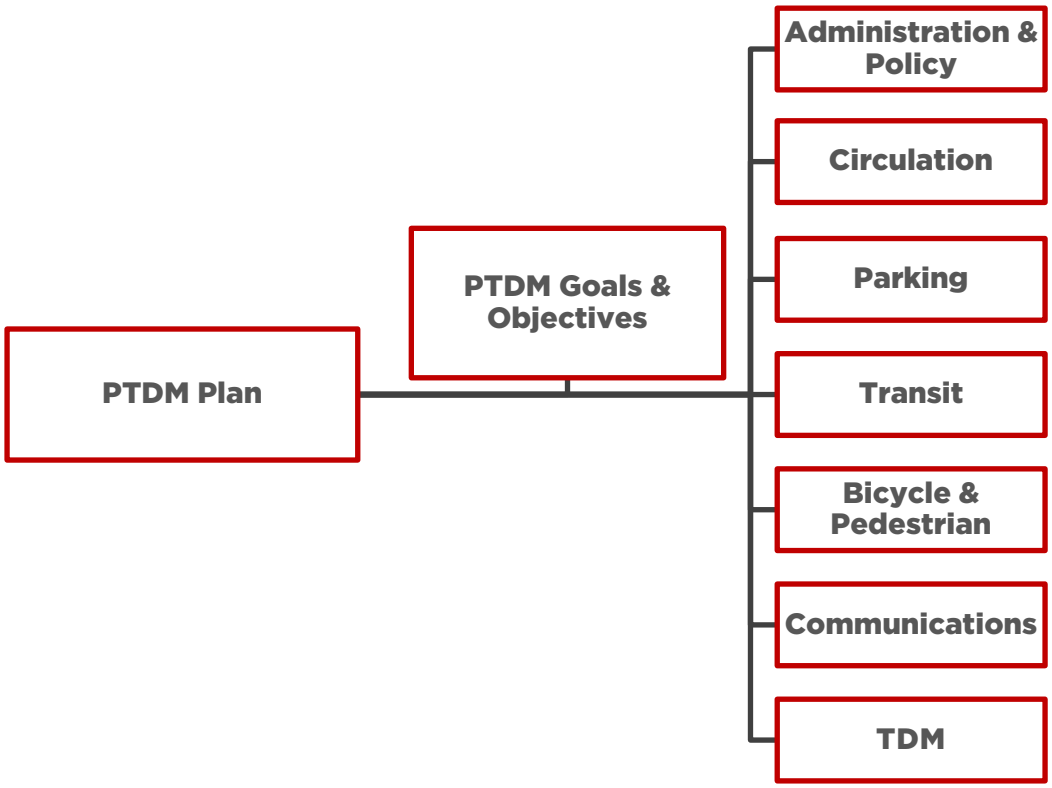
1. **Supportive**, allowing CI to achieve broader campus goals
2. **Safe and Healthy**, prioritizing the safety of all users
3. **Multimodal**, reducing single occupant vehicle trips
4. **Cost-effective**, prioritizing fiscally sustainable investments
5. **Intuitive**, facilitating easy travel for regular and occasional users
6. **Accessible**, providing all users a diversity of travel options
7. **Adaptive**, ensuring the ability to quickly evolve as the campus changes
8. **Efficient**, maximizing utilization of existing resources

These goals are translated into specific objectives and performance metrics, described in Strategy AP.2.

Strategy Framework

Several key topics emerged during strategy development, which form the sections of the recommended strategies listed below. The specific strategies listed for each strategy category shape a comprehensive, realistic campus TDM plan, and relate to the project goals listed above.

Figure 4-1 Strategy and Implementation Framework



ADMINISTRATION AND POLICY

Administration and Policy strategies establish a framework for the broader PTDM recommendation portfolio. The campus already has several transportation programs and efforts in place, and they will be consolidated, added to, and leveraged into a comprehensive program. This category involves formalizing goals and processes, aligning efforts, and assigning responsibility for strategically finding funding and moving implementation forward across the short-, mid-, and long-term horizons. Many of these recommendations build the foundation for the other strategy categories discussed in this chapter.

AP.1. Adopt formal campus transportation goals and objectives

Description: CI should formally adopt campus transportation goals and objectives to enable campus stakeholders to implement recommendations, monitor progress, and ensure continuity of policy as decision-making authority is transferred over time. For goals and objectives to be effective, they should be paired with performance benchmarks or metrics.

Action Steps: The campus goal-setting process can leverage this PTDM Plan, and should incorporate feedback from major stakeholders to ensure that the resulting goals and objectives are inclusive and appropriate to the campus context. Once adopted, these goals and objectives should be publicly available and tracked for progress in coordination with their associated policies and performance metrics.

AP.2. Adopt formal policy and metrics for system tracking and reporting

Description: An effective campus transportation plan needs concrete performance metrics and reporting systems. Metrics help with monitoring and tracking of progress towards goals, while also ensuring transparency in decision making. For each goal and set of objectives, a set of quantifiable metrics is proposed in Figure 4-2. As CI moves forward with implementation of this plan, it is recommended that the university tracks some or all of these specific items on a consistent basis and publish them annually.

Action Steps: The policies and performance metrics associated with each campus transportation goal/objective should incorporate feedback from major stakeholders to ensure that they are inclusive and appropriate to the campus context. Once adopted, the policies and performance metrics should be reported on annually, starting with a “Year One” baseline report and made publicly available. Policies and metrics will also be flexible, allowing for updates and adjustments to reflect annual performance.

Figure 4-2 includes a proposed set of goals and objectives for CI, which were developed as part of this study. These goals, objectives, and metrics are a starting point for adopting a formal framework.

Figure 4-2 Draft Goals, Objectives, and Performance Metrics

Goal	Relationship to CI's 2025 Goals	Objectives	Performance Metrics
Supportive	Accommodate Growth	• Develop and foster a transportation system that supports the vision for an integrated, innovative, intimate, and sustainable campus. • Develop and foster a transportation system that supports a long-term transition from a "commuter" campus to student-first, "24/7" campus. • Develop and foster a transportation system that can support short- and long-term growth of CI campus.	• # of FTEs • # of beds • Commuter vs. non-commuter students • Parking spaces per FTE
Safe & Healthy	Reflect Character and Intimacy of the Core Campus	• Improve vehicle, bicycle, and pedestrian safety to, from, and within campus. • Reduce transportation-related greenhouse gas emissions.	• # of collisions by mode by location • MMT of CO_2
Multimodal	Accommodate Growth/Embrace Sustainability/Reflect Character and Intimacy of the Core Campus	• Reduce the share of single-occupancy vehicle (SOV) trips to campus and increase the share of rideshare, transit, biking, and walking trips. • Minimize vehicle congestion and prioritize a walkable and bikeable campus core. • Expand and improve bicycle infrastructure. • Expand and improve pedestrian infrastructure. • Ensure travel by transit and ridesharing are attractive, efficient, and convenient options.	• Mode share to campus • # of miles of bike lanes • # of bike parking spaces • # of pedestrian facilities • Average monthly transit ridership • # of vehicle trips within campus core • Average vehicle ridership
Cost-effective	Enhance CI's Precepts of Integrative and Innovative	• Prioritize investments in the transportation system that offer the greatest cost efficiencies. • Manage transportation revenues and expenditures with a goal of continued long-term financial sustainability.	• Annual revenue by mode/program • Annual expenditures by mode/program • Cost per trip per mode

Goal	Relationship to CI's 2025 Goals	Objectives	Performance Metrics
Intuitive	Accommodate Growth/Enhance CI's precepts of Integrative and Innovative	• Create a transportation system that is easy to understand and navigate for regular affiliates and visitors. • Clearly communicate and promote information about travel options, programs, and improvements. • Utilize technology appropriately and strategically to communicate travel and parking information across multiple platforms.	• Transportation website utilization • goCI app downloads and utilization • User awareness and satisfaction by affiliate group • # of campus transportation and marketing events
Accessible	Accommodate Growth/Embrace Sustainability	• Provide a diversity of travel choices for all user groups. • Proactively encourage and incentivize non-SOV travel through a robust and comprehensive transportation demand management (TDM) program.	• Participation in TDM programs by affiliate group • User satisfaction of TDM programs by affiliate group
Adaptive	Embrace Sustainability	• Prioritize a flexible transportation system and TDM program, allowing staff to respond to campus growth and changing travel behaviors. • Implement investments and programs at appropriate times based upon key demand/growth thresholds. • Monitor the transportation system on a consistent basis. Collect data consistently to inform system investments and adjustments. • Ensure adequate staffing to effectively implement, operate, and manage projects and programs.	• Mode share to campus • User awareness and satisfaction by affiliate group • % of available parking by facility type • Participation in TDM programs by affiliate group • Staff members per FTE
Efficient	Reflect Character and Intimacy of the Core Campus/ Embrace Sustainability	• Create a parking management plan that maximizes use of existing parking. • Manage parking with the primary goals of consistent availability and user-friendliness in mind. • Add new parking supply in the most strategic and cost-effective manner possible. • Enforce parking rules and regulations fairly and consistently.	• % of available parking by facility type • # of parking citations by type • User satisfaction of parking system by affiliate group

AP.3. Establish a Parking & Transportation Working Group

Description: A transportation advisory committee or working group, coordinates all of the various transportation reviews for the implementation of the PTDM Plan's polices, programs and services, and performance monitoring. Typically, such groups are composed of members representing key internal or external campus stakeholders, who may be nominated or appointed by campus leadership. The group's primary purpose should be to support CI's existing transportation services and assist with future planning efforts.

The group will help facilitate greater and clearer public involvement, ensure a transparent and thorough review process, and foster collective action across multiple bodies to resolve and address existing transportation obstacles. The group is not envisioned to replace the functions of other organizations, but help to ensure consistent policy direction.

Action Steps: CI should identify the composition of the membership and its scope of work. It is anticipated that the group would begin meetings in the 2017-2018 school year.

AP.4. Conduct an annual review and approval of rules and regulations

Description: It is essential that transportation policies and procedures are updated regularly to ensure ongoing buy-in and policy alignment across departments. An annual review process will be necessary to realize the PTDM Plan's vision and get support for incorporating investments in transportation infrastructure as part of the capital planning process. Formalized processes will set expectations for changes and provide greater opportunity for leadership to help improve campus operations. Potential areas of review include: parking prices and regulations, citation rates, enforcement policies, transit policies and programs, financial incentives, development and access standards, among others.

Action Steps: Dates and protocol for this process should be formalized in the administrative calendar of the transportation working group (AP.3). As parking rates are restructured and parking demand is re-assessed based on new pricing (P.1), a regular, annual review should set up the means by which the parking system can be adjusted. This includes audits of parking facilities during high-demand periods to track citation rates, compliance levels and overall effectiveness of the citations system. CI should also publish its parking rules and regulations annually and update policies as needed in tandem with annual policy and metrics reporting (AP.2.).

AP.5. Establish parking and transportation design standards

Description: CI should establish parking and transportation design guidelines for pedestrian infrastructure and sidewalks, landscaping, lighting, street/intersection design, parking facility design, traffic calming solutions, bikeways, and installation of technology and real-time information. A set of parking and transportation design standards will ensure that as the campus expands, campus transportation infrastructure – particularly for non-driving modes – is improved concurrently.

For example, Princeton University's Facilities Department has produced a Design Standard Manual that provides guidance on ways to incorporate parking and transportation goals into campus infrastructure. These include site planning and design principles such as "maintain a pedestrian-oriented campus," "preserve the park-like character of the campus," and "build in an

environmentally-responsible manner." The University of Wisconsin-Madison includes specific design standards for active transportation elements of campus.

Action Steps: Campus transportation, planning, and design staff should collaborate to develop precise design standards applicable for parking and transportation infrastructure on campus. Administrators may consider making compliance with these design standards a contractual obligation for outside contractors, as Princeton's Design Standard Manual makes clear.

This strategy would cost approximately $15,000 one-time cost to help establish design standards and establish an internal design guidelines manual.

Relevant Local Design Policies

Excerpts from City of Camarillo General Plan, Community Design Element (2012):[2]

- Policy RA-3.1.3 Create pedestrian- and bicycle-oriented design.
- Policy GSC-1.2.3 Encourage use of "complete street" strategies for new streets and redesign of older, existing streets. Complete streets are roadways designed and operated to enable safe, attractive, and comfortable access and travel for all users, including pedestrians, bicyclists, motorists, and public transport users of all ages and abilities.
- Policy S-1.4 Design parking to increase the pedestrian orientation of projects and minimize the adverse environmental effects of parking facilities (locate parking at the side or rear of buildings leaving building frontages and streetscapes free of parking facilities where feasible).
- Policy S-2.5 Preserve community livability, transportation efficiency and walkability.
- Policy S-2.6 Provide appealing and comfortable pedestrian street environments in order to promote pedestrian activity.
- Policy S-2.7 Promote bicycling and transportation efficiency.
- 10.10.4. Permeable paving should be used in parking lanes, alleys and paving surfaces in plazas where feasible.
- 10.8.3. Sidewalks shall have a "through pedestrian zone" that is kept clear of any fixtures and/or obstructions. A minimum of four feet shall be reserved to allow for two people to walk comfortably side by side and in accordance with the Americans with Disabilities Act (ADA) requirements.

From the City of Camarillo General Plan, Circulation Element (2014):[3]

- Policy 2.1.2 Streetscapes shall be improved to enhance access, lighting, safety, and the overall experience for pedestrians, bicyclists, transit users, and vehicles.
- Policy 2.1.3 The City's street design standards shall support public transit, bicycles, and walking where appropriate and feasible based on street types.
- Policy 5.1.2 The City shall support pedestrian and bicycle connectivity by providing a network of streets with landscaping and amenities for transit, bicycles, pedestrians, and people with disabilities
- Policy 5.1.4 The City should plan for providing "Complete Streets" where appropriate and feasible with bikeways, sidewalks, transit facilities, and enhanced parkway landscaping, with consideration for emergency vehicle operations. Make safety and convenience of bicycle riders a primary concern when planning for bicycle facilities.

City of Camarillo Code of Ordinances:

- Off-Street parking design standards[4]
- TDM facilities standards[5]

[2] City of Camarillo. 2012. *General Plan, Community Design Element*. Retrieved from http://www.ci.camarillo.ca.us/docs/Circulation%20Element.pdf

[3] City of Camarillo. 2014. *General Plan, Circulation Element*. Retrieved from http://www.ci.camarillo.ca.us/docs/Circulation%20Element.pdf

[4] https://www.municode.com/library/ca/camarillo/codes/code_of_ordinances?nodeId=TIT19ZO_IIIGEPR_CH19.44OREPA

[5]https://www.municode.com/library/ca/camarillo/codes/code_of_ordinances?nodeId=TIT19ZO_IIIGEPR_CH19.44OREPA_19.44.190TRDEMAFA

AP.6. Strategically identify and plan for transportation funding

Description: In the current context, transportation funding is a major uncertainty as there is greater competition for increasingly scarce local, regional, state, and federal dollars. CI stakeholders will have to balance their desire for improvements with the financial costs of program implementation. The three most common sources of funding for parking and TDM strategies are parking revenues (from permits, fines, and fees), student transportation fees, and State or regional capital grant programs.

Many universities across the country dedicate portions of their parking revenue to fund their transportation programs, and have found that the use of parking revenue to finance demand management efforts to be far more cost-effective than typical supply-side strategies (i.e. building new parking facilities). Furthermore, by using the revenue they generate from parking, these universities do not need to rely on general fund revenue for their transportation programs. Student fees are a common funding source for university transportation programs throughout the country, however they are likely to be controversial amidst rising tuition costs and often require a formal student vote to approve.

Action Steps: It is recommended that CI seek opportunities to collaborate with the City of Camarillo and Ventura County, if applicable, to fund capital projects, such as bicycle, pedestrian, and transit improvements. Because universities tend to generate high numbers of bicyclists, pedestrians, and transit riders, other cities and counties have been very successful in bolstering their regional and state funding applications and securing grant funding through such partnerships.

CI could also seek county, state, or federal grants through partnerships with the local MPO, Ventura County Transportation Commission (VCTC). Because CI is not itself a governmental agency, it is ineligible as a grantee for most state and federal grant programs that typically award funding to municipalities, counties, MPOs, and other similar entities. However, for certain programs, CI is eligible as a co-applicant provided that VCTC is the sponsoring grantee. Through creative partnerships with VCTC, CI could position itself as a sub-contractor for larger regional projects for which CI campus transportation projects play a prominent role. Potential State and regional grant programs in which such opportunities for a CI-VCTC partnership may exist are shown in Figure 4-3.

Figure 4-3 Transportation Funding Sources for California Universities

Funding Entity	Funding Source	Description
Federal	Congestion Management & Air Quality Act (CMAQ)	Funding for projects that will relieve congestion and reduce pollution levels to help states and metro regions meet federal air quality standards. Projects must meet three basic criteria: transportation project, reduce emissions, and located in or benefit an air quality nonattainment or maintenance area.
Federal	Transportation Alternatives Program	Eligible projects include: construction, planning, and design of on-road and off-road trail facilities for pedestrians, bicyclists, and other non-motorized forms of transportation, including sidewalks, bicycle infrastructure, pedestrian and bicycle signals, traffic calming techniques, lighting and other safety-related infrastructure, and transportation projects to achieve compliance with the Americans with Disabilities Act of 1990.
State	California Office of Traffic Safety (OTS)	Grants to establish new traffic safety programs (included pedestrian safety), expand ongoing programs or address deficiencies in current programs to governmental agencies, state colleges, state universities, local city and county government agencies, school districts, fire departments, and public emergency services providers. Funding cannot replace existing program expenditures, and cannot be used for program maintenance, research, rehabilitation, or construction. Evaluation criteria include: potential traffic safety impact, collision statistics and rankings, seriousness of problems, and performance on previous OTS grants.
State	California Lending for Energy and Environmental Needs (CLEEN) Center through IBank	Direct public financing to Municipalities, Universities, Schools and Hospitals (MUSH) to help meet the State's goals for greenhouse gas emissions reduction, water conservation and environmental conservation. Financing can be funded via a combination of a direct loan from IBank or public market tax-exempt bonds in amounts from $50 thousand to $30 million (or higher with board approval). Typical projects funded include energy efficiency, renewable energy, alternative fuels, and electric vehicles and charging stations.
Regional	Regional Surface Transportation Programs (RSTP)	A block grant program that provides funding for bicycle and pedestrian projects, among many other transportation projects, prioritized and approved by Metropolitan planning organizations. Universities may apply as co-applicants in partnership with MPOs.
Regional	Regional Transportation Improvement Program	A five-year list of capital improvement projects funded with Ventura County's share of state transportation funds, based on the priorities established in the long-range Comprehensive Transportation Plan and with input from Caltrans, local jurisdictions, stakeholders, and the public. Universities may apply as co-applicants in partnership with MPO's, cities, counties, and transit operators.
Regional	Community Based Transportation Planning Demonstration Grant Program	Grant support for demonstration planning projects that provide an example of livable community concepts, have local support, incorporate broad participation from community stakeholders, induce additional community benefits, provide a more multi-modal transportation system, coordinate land uses and transportation, compliment Caltrans projects within the study area, provide regional or interregional benefits, demonstrate cost effectiveness and provide benefits to disadvantaged areas. Each project may not exceed $300,000. A 20 percent local match is required. Universities may apply as co-applicants in partnership with MPO's, cities, and counties.

Source: Safe Transportation Research and Education Center (SafeTREC), University of California, Berkeley

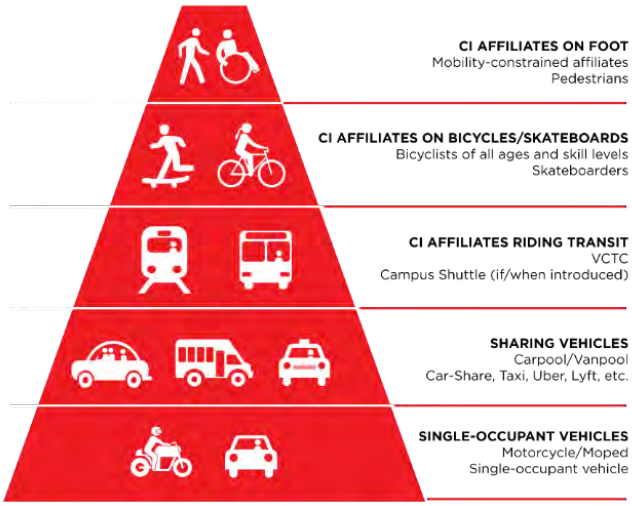
CIRCULATION

CI recognizes the importance of creating a safe and comfortable campus core and has made strides in relocating parking facilities away from the core to support future growth. As the campus continues to grow as expected, the campus' transition from a commuter campus to a full-service campus will influence campus circulation. To adapt to the changing transportation needs and patterns of the campus, CI should establish a circulation network based on the following principles: the pedestrian network should be safe, accessible to all, easy to use, and contribute to the health and quality of life of those using it, with a focused eye on most vulnerable users, such as those traveling on foot, bike, wheelchair, or skateboard.

CI.1. Adopt a formal campus circulation hierarchy which prioritizes a walkable and bikeable campus core

Description: Formalizing circulation priorities will help guide future circulation decisions in the campus core, creating a legible circulation system over time. The hierarchy would prioritize pedestrians, bicyclists/skateboarders, transit, sharing vehicles, and single-occupancy vehicles within the campus core. It would not, however, suggest that the campus limit vehicle access to/from campus – it is and will likely be the most frequent mode – but rather speaks to circulation design within the core of the campus. Pedestrian prioritization is most important: the walkability of the campus represents the biggest circulation opportunity.

Figure 4-4 Draft Circulation Hierarchy



In a campus setting, the circulation system often struggles to balance the mobility needs of all users and all modes. In a suburban/rural context, where the campus is isolated, there is a need to accommodate many people arriving all at once in private vehicles, while also providing a safe, visually-appealing, and comfortable circulation network for other non-motorized modes. For some time, many campuses have prioritized vehicle access over other modes, resulting in a circulation system heavily oriented towards private cars and surface parking lots with only incomplete and partial networks for bicyclists, pedestrians, and other modes.

By creating an established circulation hierarchy, CI will provide a solution to this challenge without penalizing one mode over another. A hierarchy helps to shape investment and prioritize access. At CI, vehicular traffic flow is maintained on the campus perimeter, limiting circulation in the campus core to biking, walking, and service vehicles only. The campus core should be an environment that is supportive of academia, new learning facilities, welcoming green spaces, and safe accommodations for walking and biking between classes. A formally adopted circulation hierarchy is an essential step in realizing the goals of the PTDM Plan. A circulation system based on the principles described above will influence travel behavior almost more than

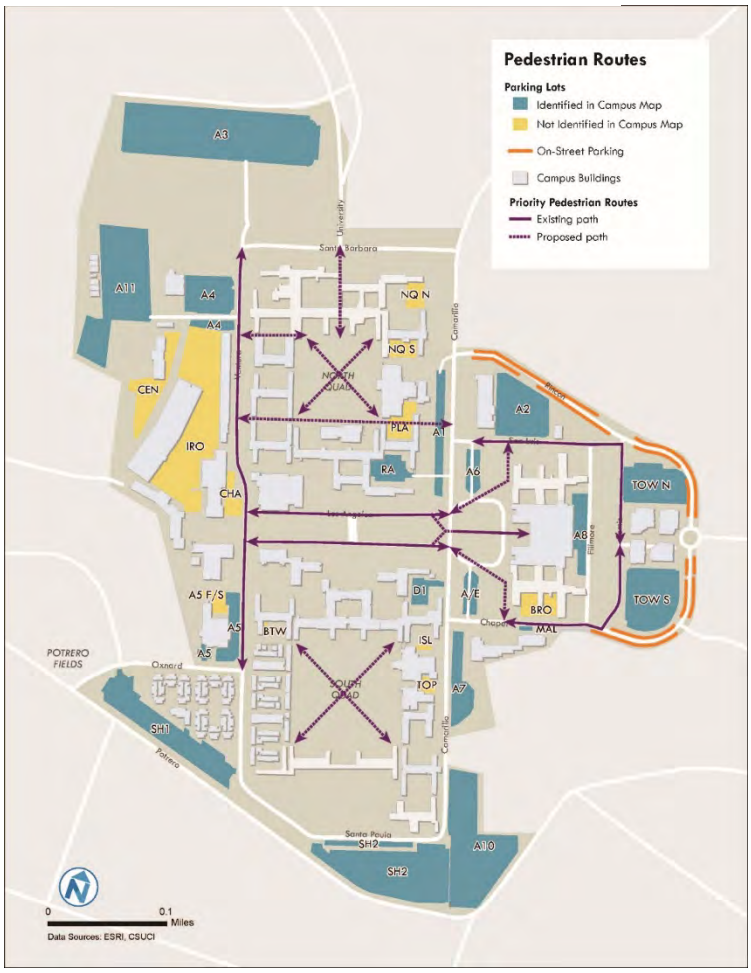
all the other incentives and programs combined. To adopt such a policy, staff should develop a working group which could help lead this strategy. This is also a chance for the campus to clarify circulation policies, such as which paths allow bicycle travel.

Action Steps: Working with newly created Transportation Working Group (AP.3) staff should review the proposed campus circulation hierarchy (Figure 4-4), and together forward a proposal for a formal policy on campus circulation hierarchy to be adopted by campus leadership. The hierarchy should be shared and marketed with all appropriate staff and students to ensure operations entities respond to the policy, and it should reflect design and programming efforts accordingly.

CI.2 Identify opportunities for an enhanced pedestrian network which provides key, legible cross-campus access

Description: Making the campus legible, comfortable, and safe for the additional pedestrian demand is one of the primary project goals. While the campus is highly walkable in general, there is room for improving some travel paths, especially on east-west routes, which are somewhat bisected, and connections to University Glen. The campus has highly walkable distances, yet the campus is not very connected. Walkability is a key strength to leverage, and creating clear, direct paths between the campus core, Town Center, and University Glen can help knit the campus together.

Figure 4-5 Draft Campus Pedestrian Network



Additionally, improvements can be made to make the quads more traversable by people traveling on foot. Currently, there are poorly lit and maintained paths behind buildings on campus which are obscure and raise safety concerns. CI supports the campus' development of clearly defined primary and secondary pedestrian routes, especially those which intersect with the two campus quadrangles, the main areas of campus pedestrian traffic.

Some development plans already acknowledge the need to open up some more intuitive pedestrian pathways. Creating a systematic review of pedestrian opportunities, and then creating a master plan that focuses on identifying primary and secondary pedestrian routes with an emphasis on creating new cross-campus primary walkways, will help organize and execute this effort, allowing all campus development plans, small and large, to reflect this network as development occurs.

Formalizing the current ad hoc pedestrian routes running through service roads, vegetated lawns, and interstitial spaces is critical in making the CI campus pedestrian environment legible and dignified. For instance, new pedestrian facilities would follow observed desire lines connecting opposite corners of the two quads. Internal campus walking circulation could be made more direct and legible with a visible, simple, clear, and attractive system of wayfinding signage (see Strategy CO.5), consistent with the new CSCUI's Transportation Services branding (see Strategy CO.1), formalizing any existing, renovated, or new pedestrian connections.

CI should create a Pedestrian Master Plan that works to improve pedestrian network, put walkability at top of the hierarchy, improve intuitive). The pedestrian master plan should incorporate the following:

- Prioritization of pedestrians in the campus core, and designing growth plans to account for reasonable walking distances around campus.
- Intuitive design of direct cross-campus pathways, and long-term plan for how to intersect with buildings that currently block key pedestrian throughputs, including a North-South spine from front entrance into campus core, and East-West pedestrian connections reaching from the campus core to Town Center to University Glen. These spines should pass through the entirety of campus in a cohesive and intuitive design that values the interior of the campus. The pedestrian paths should line up with where roadways meet the bounds of the campus core. In the greens in the campus core, find opportunities to create more cut-through options so pedestrians can move more directly.
- In addition to planning for overcoming current blocks in the physical environment, the pedestrian plan should ensure that when new buildings are created, they do not negatively affect the current and future pedestrian pathway and bicycle network.
- Increased dominance and legibility to the pedestrian hierarchy throughout campus, so pedestrians do not lose their visual path of travel, especially near the main road loop.
- Long-term vision for connectivity with the street network.
- Reconnection of the occasional sidewalk dead-ends (some of which are already in process of being fixed).
- A grand entrance for pedestrians, and a plan for accommodating their legible path of travel upon entry when crossing the pedestrian bridge from the parking lot, which will continue to grow as the premier pedestrian entrance to campus. The legibility of that corner is of high importance.
- Welcome University Glen pedestrians into the campus core in a straight shot. The Glen has a nice walking environment, a strength that can be leveraged to connect with the broader nice campus walking environment.
- As the parking lots are large and will grow larger, address pedestrian circulation. People should not walk more than 150 ft. to get to a pedestrian path in the lots, or at very least should be able to see a pathway from every parking space in the lots. A pedestrian path should be added to the west side of the bio swale. Simply put, pedestrians should *not* have to walk through a parking lot to get to campus – very much a risk as the parking strategies create continuous sprawling lots in single area.

Action Steps: A systematic review of pedestrian network facilities and planned developed should occur, and opportunities for implementation of a clear pedestrian hierarchy established. Identify pedestrian desire lines and hierarchy needs, and in close coordination with the Campus

Architect, review long-term possibilities, identifying pedestrian spines that pass through the whole campus. These opportunities should be formalized in a master pedestrian plan. All campus development plans should reflect this network as development occurs.

This strategy may involve an approximately $50,000 one-time fee to aid in developing a master plan for pedestrian networks.

CI.3. Design and complete two-way to one-way conversion with two-way cycle tracks or buffered bicycle lanes

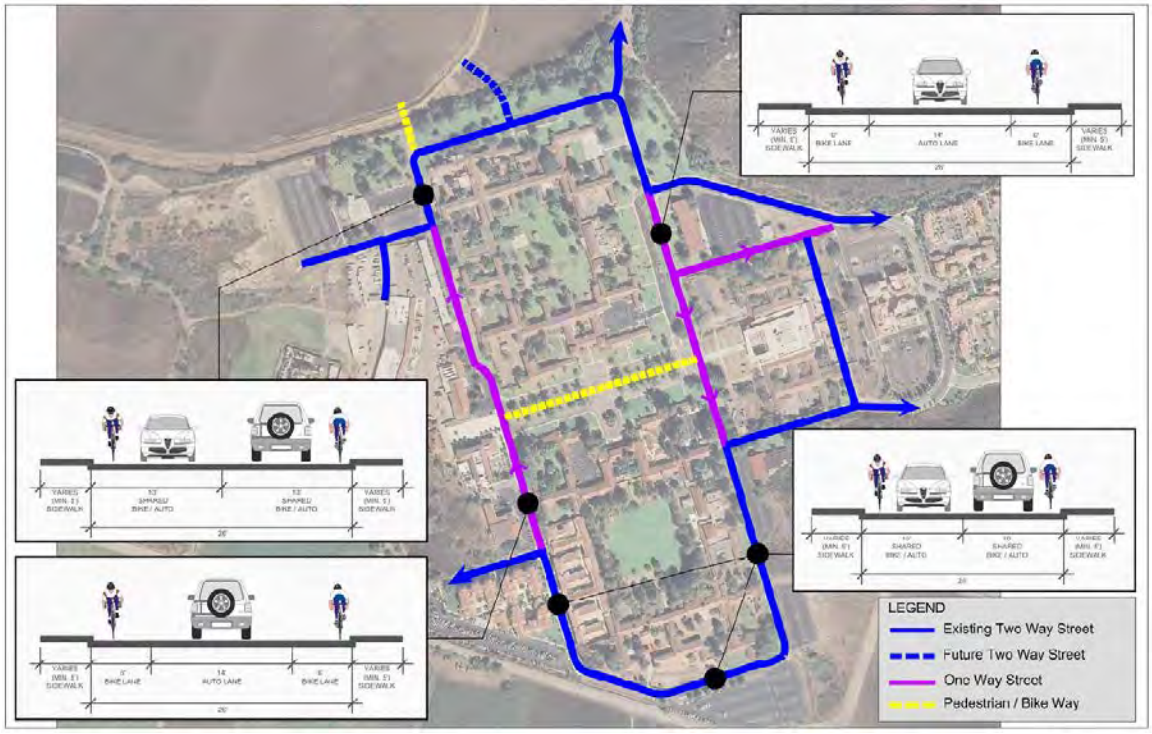
Description: A one-way street conversion around the primary campus loop is recommended, in order to create the opportunity for a bicycle network. The conversion will create space to add a cycle track or buffered bike lane.

The conversion of two-way streets to one-way streets is not typically recommended because it can lead to speeding, but is appropriate in this unique setting, where a bicycle facility and traffic calming measures would be implemented. This bicycle facility should either be protected or buffered, and can be contraflow ready or a two-way cycle track on the outside lane. This recommendation also provides the opportunity to slow traffic and avoid the negative impacts of one-way streets. Narrowing traffic lanes can reduce speed and reduce the risk of speeding up traffic on a one-way street.

Another drawback to the one-way conversion is that vehicle trips are longer within the system, as one can no longer take the shortest trip in and out of campus, requiring slightly more driving. However, visitors already intuitively tend to travel clockwise through the primary campus loop, and campus plans do call for a “park-once” parking system, in which most people park near the entrance of campus and travel in on foot.

There is an important caveat to this strategy: its success is predicated on assumption that parking is transition out of the core, as discussed in long-range campus plans.

Figure 4-6 Proposed Interim Campus Circulator Diagram, Fehr and Peers Memorandum regarding potential one-way circulation



Source: Fehr and Peers, Near-Term One-Way Circulation Study, Dec 20, 2011

Figure 4-7 Bicycle Facility Concepts of One-Way Street Conversion

Action Steps: Conduct design and construction design work. Time implementation to align with the next repaving, for maximum cost-effectiveness. It is essential to implement the one-way system at the same time as the bicycle facility improvement. Coordinate design with traffic-calming efforts on Ventura and Camarillo, which likely will already be in place, as traffic-calming designs, including the bicycle facility, are critical partners to the one-way conversion to remove the potential negative side effects of a one-way conversion.

This strategy would cost approximately $700,000 in design fees and construction costs. The cost of redesigning this loop will be most efficient if it is coordinated with future repaving plans.

CI.4. Transition to limited vehicle access in campus core

Description: Campus plans call for an ambitious, phased transition of parking outside of the campus core, creating a pedestrian- and bicycle-focused campus core. Following the conversion of the campus loop from two- to one-way, CI should prioritize non-motorized transportation in the campus core by limiting vehicle access. The conversion of the campus loop involves relocating parking to periphery lots, thereby shifting vehicular traffic away from the core and allowing for CI to restrict vehicle access. Restricted access can consist of limiting particular vehicle types or the number of vehicles during different times of day. For example, at UC-Davis, the restricted-core area uses traffic control gates with flashing lights to prohibit general vehicle traffic from the area during class break times.

Typically, campus cores with limited vehicle access maintain a speed limit of 15 miles per hour, a policy intended to limit vehicular traffic, discourage drivers from using these streets as a shortcut to other destinations, and minimize vehicle/pedestrian and vehicle/cyclist collisions.

CI should transition from more auto-oriented streets on the campus periphery to limited vehicular access in the campus core. This involves designating a central core area of campus in which vehicle traffic is limited by traffic control barrier gates and/or retractable bollards. Vehicle access to this restricted campus core area – identified through clear, consistent wayfinding and signage leading to each barrier gate (see Strategy CO.5) – would be limited to emergency response vehicles, campus shuttles, transit vehicles, and service and delivery vehicles. Enforcement of the restricted vehicle area at the campus core is particularly important during class breaks, when pedestrian traffic is highest.

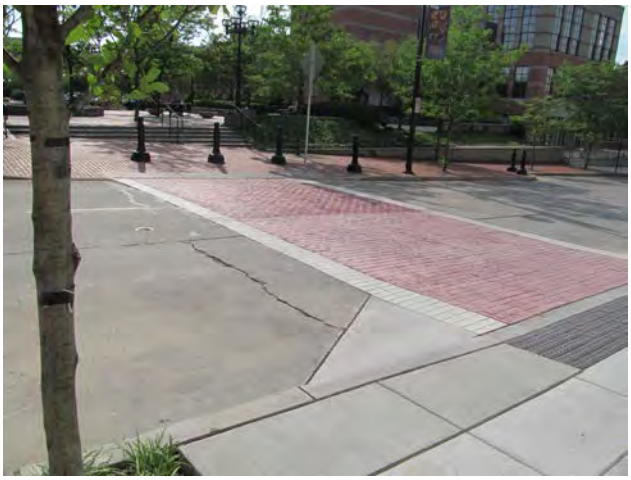
Action Steps: As the campus grows, new facilities are created, existing facilities are renovated, and parking is removed from the campus core, CI can take steps to systematically reduce vehicle access, formalizing a pedestrian-centered core. Implementation should be coordinated with ongoing development plans, which should support this long-term goal.

Figure 4-8 Campus Core Area of UC-Davis Restricted to General Vehicle Traffic

CI.5. In the short term, add traffic-calming features to Ventura and Camarillo Streets

Description: Ventura and Camarillo Streets would both benefit from the addition of traffic-calming features, both in the short-term and as the street design evolves as discussed in other strategies. Temporary materials may be beneficial, due to the evolving nature of the street, since the placement of calming features would be affected by broader streets changes. Ideally they would be planned and implemented in coordination in the short or mid-term planning horizon. In the long term, if the shared street concept is implemented (not currently included in the cost-effective set of recommendations), this type of traditional traffic-calming on these two streets will no longer be necessary, as the concept involves systematically and holistically calming the street. CI previously considered creating an elevated crossing platform at the ends of the central mall as a first step in traffic calming, which can be considered as part of this package.

Figure 4-9 Traffic-Calming Features: Raised and Visible Crossing and Narrower Street with Bicycle Lane



Action Steps: Identify temporary/inexpensive traffic-calming measures to be implemented in the short term. Build traffic-calming design into the development of the one-way and bikeway street design described in Strategy CI.3.

C6: This strategy would cost approximately $100,000, depending on type and quantity of treatments included – a combination of crossing improvements, chicanes, minor gateway treatments, street furniture, and curb extensions.

PARKING

The following parking strategies allow for a more efficient use of parking resources, while ensuring that CI can accommodate its desired growth in a sustainable manner.

At the core of the proposed parking approach is performance-based management, which seeks to price parking according to the level of demand. The idea is to charge the lowest possible rate to achieve an availability target – typically 5-15% of total spaces – and better align price and demand to ensure there is always an open parking space. Many of the other parking strategies are complementary and serve to support the operations, maintenance, and infrastructure for performance-based pricing.

Parking Overview

- Year 1: Implement rational price system reflecting demand
- Ongoing rate adjustment process
- Routinely measure occupancy
- Annual review of parking pricing
- Adjust rates annually based on pre-determined protocol
- Remove reserved parking over time if possible, focusing on pricing tiers

By monitoring occupancy trends and adjusting pricing to meet parking behaviors, the demand for parking can be managed in a way that encourages affiliates to consider the costs of parking closer to their destination, or walking longer to save money. Under this strategy, parking in or near the center of campus would be more expensive than parking along the periphery.

While the primary goal of demand-based parking is to improve user convenience, pricing of parking has also been shown to be one of the most effective ways to reduce vehicle trips, cruising for parking, emissions, and the demand for parking. Because motorists are sensitive to pricing changes, parking fees often have the greatest impact on travel behavior because they are a direct and conspicuous user fee. Numerous studies have been conducted analyzing the effects of parking pricing on demand.

In terms of allocating and permitting spaces, the simple rule of thumb is that spaces accessible to a larger number of users' experience better efficiency (i.e. are occupied more frequently). As such, to the degree possible, effective parking management encourages spaces to be open to as many users as possible. Similarly, if a space type (e.g. hourly parking) is not being used effectively, it may be prudent to convert that space to a different type that is in higher demand.

P.1. Adopt a formal policy of performance-based management

Description: Performance-based pricing is central to an improved parking system, involving moving from a static pricing system to one in which rates reflect demand, and rates are adjusted over time based on data, with the goal of setting prices so that 5-15% of spaces are unoccupied at any time. Systems can range from simple to sophisticated, and will likely require some updates to equipment and operations over time.

At CI, driving is the predominant mode of commuting. For many, off-campus work commitments, irregular hours, lack of convenient public transportation, and overall preference and privacy are key motivators to driving. However, parking is expensive to build, operate, and maintain. Furthermore, as CI continues to grow, the availability and feasibility of providing ample parking will decline, placing further pressure on the status quo and challenging goals for

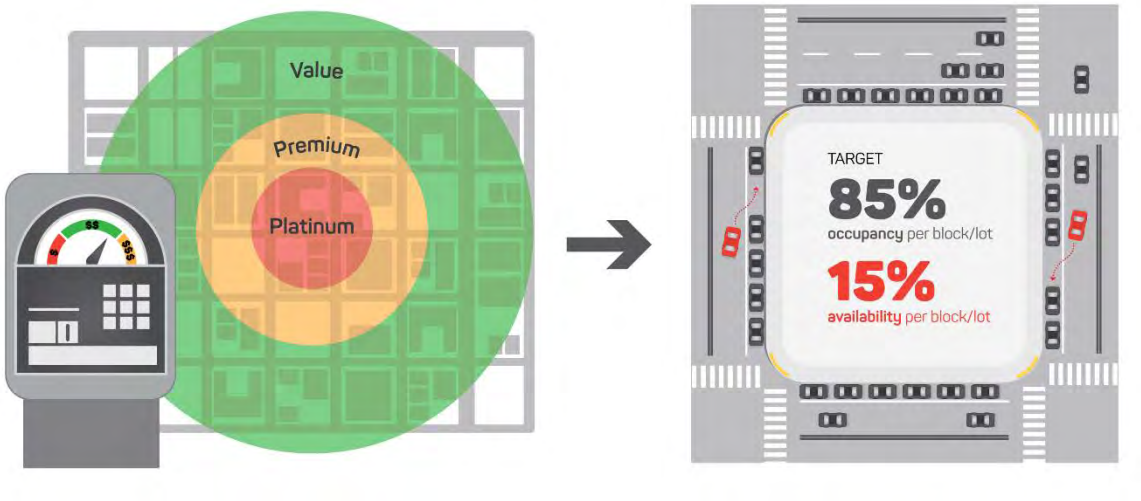
a walkable campus. Parking policies are needed that not only manage supply to better meet demand, but also set clear priorities for how limited on-campus parking supply should be used.

Therefore, it is recommended that CI use performance-based management to set and adjust parking rates based on an availability target and the level of observed demand. **The "right price" is the lowest price that will achieve the availability target**. Therefore, prices go up when and where demand is high and go down when and where demand is low. By setting specific targets and adjusting pricing/regulations, the primary goals of performance-based management are to:

- Make it easier to find a parking space and reduce the time searching for parking
- Better distribute demand and maximize use of its parking facilities
- Provides additional choice to affiliates, especially students who are particularly sensitive to price

Affiliates with union bargained parking prices could expect to maintain their rates. However, these lower, bargained prices will be consistent with costs for parking in "value" parking spaces. As with other affiliates, individuals will have the choice to pay more for "premium" or "platinum" level parking. The rate options do not guarantee a specific parking location, but rather a price option that reflects bargaining agreements.

Figure 4-10 Performance-based pricing concept



Action Steps: The first step to moving towards a performance-based system is to adopt an official policy establishing a performance-based program for CI. The policy would establish basic parameters for the program including:

- Set specific goals and targets for on- and off-street parking should be set. An initial starting point would be 90-95% of spaces occupied for off-street lots and 85% of spaces occupied for on-street parking (e.g. Rincon Drive)
- Grant staff the authority to change rates, fees, and regulations on an annual basis, as necessary to meet the adopted occupancy/availability targets
- Establish monitoring program (see P.4 below)

- Set policies around price adjustment processes, including minimum/maximum prices and maximum amount of increase or decrease per adjustment
- It is important to acknowledge that best practices would dictate that parking prices for faculty and staff also be priced dynamically. However, collective bargaining agreements likely preclude the prices for faculty/staff parking permits from being dynamically adjusted at this time. CI should further explore how performance-based pricing can be implemented with faculty and staff permits.

P.2. Adopt official policy to allocate "net" parking revenue to mobility and TDM programs

Description: This plan includes financial modeling of parking costs and revenues. In reviewing the financial modeling of parking costs and revenues, the initial goal is to ensure parking is net revenue neutral, but an ultimate goal is to reach a point at which parking revenue can help pay for other transportation programs.

CI already uses parking revenue to support not only its parking system, but the transportation program overall. The recommendation would formalize this practice with an official university policy to allocate "net" parking revenues to fund transit, biking, walking, and TDM programs. Adopting such a policy would further reinforce how parking is one piece of CI's overall access strategy and support its long-term vision for enhanced multimodal travel to, from, and within campus.

Many universities across the country dedicate portions of their parking revenue to fund their TDM and transportation programs, and have found that the use of parking revenue to finance TDM efforts has proven to be far more cost-effective than typical supply-side strategies (i.e. building new parking facilities). Furthermore, by using the revenue they generate from parking, these universities do not need to rely solely on general fund revenue for their transportation programs.

Actions Steps: Adopt specific policy, informed by the transportation working group (AP. 3), to allocate net parking revenue to mobility and TDM programs to improve parking management and reduce parking demand. CI should identify specific improvement categories that qualify to be funded.

P.3. Adjust permit pricing and regulations to meet availability goals

Description: Based on the policy adopted under Strategy P.1, implement the performance-based system and an annual adjustment protocol so that parking availability targets are reached over time, and adjusted appropriately, as the campus evolves.

Performance-based management uses the cost of parking to achieve an availability goal across the campus. The primary outcomes of such a program are to maximize use of the existing supply, better distribute demand across campus, make it easy to find an available space, and provide more affordable options.

Parking permits are a primary source of revenue, and they help recoup much of the cost of providing parking and transportation facilities and services. In addition to generating revenue, the current parking permit program serves to partially ration the finite space available for

vehicle storage and to allocate parking spaces among different segments of the campus community.

However, permit systems must be intuitive and easily understood to send effective price signals. Communications about such systems must be clear to ensure members of the campus community understand its rationale. The current permit system is quite complex, and permit names do not intuitively communicate the quality or convenience of associated parking facilities. For CI, it is recommended that the future pricing system be simplified into pricing tiers, with the most convenient spaces on campus priced at a higher rate, while those farther away would be priced at a lower rate.

The specific tiers include:

- Tier 1: Platinum (Core) Zone: Permit holders would pay the highest rate to park close to the campus core. Faculty and staff members should be offered these permits before selling to other affiliates.
- Tier 2: Premium (Outer Core) Zone: Permit holders would pay a moderate rate to park in the facilities located on the periphery of the campus core, near student resident halls. Resident students should be offered these permits before selling to faculty and staff, then others.
- Tier 3: Value (Periphery) Zone: Permit holders can pay much less than the other tiers to park in more remote lots, with longer walks or shuttles connecting to the campus core. Commuter students should be offered these permits before selling to other affiliates.
- Student Housing: Parking facilities in which resident students would be given first priority before selling to other affiliates.
- Visitor Parking: Visitors would be eligible to park in unrestricted space in any Tier 1-3 lot, subject to a daily or hourly rate by tier. To support visitor parking, it is recommended that time limits at metered spaces in Tier 1 and 2 spaces be removed, allowing visitors to easily stay more than 45 minutes, but not pay a full daily rate if they are staying for only a few hours.

Figure 4-11 Proposed Initial Pricing Tiers for Students and Visitors

Pricing Tier	Facilities	Rates (for students, visitors)	Spaces Affected
Tier 1: Platinum (Core)	A1, A5, A6, AE, BRO*, CY37, R	▪ Daily: $9 / day ▪ Metered: $2 / hr (A1) ▪ $275 / semester	252 spaces
Tier 2: Premium (Outer Core)	A2, A7, A4, A8, A10, Rincon Dr./Chapel Dr. (123 spaces)	▪ Daily: $7 / day ▪ $1 / hr (Rincon Dr./Chapel Dr.) ▪ $230 / semester	785 spaces
Tier 3: Value (Periphery)	A3, A11, CEN, G8/G9, D (currently ADA only)**	▪ Daily: $6 / day ▪ $195 / semester ▪ (Collective bargaining employee permits work in this Tier)	974 spaces

Student Housing	SH1, SH2	▪ $250 / semester ▪ (goal: slightly higher than commuters, at least similar to Tier 1 rates)	575 spaces;

*BRO lot is planned to be used primarily by maintenance vehicles in the future, reducing the need for maintenance spaces throughout campus.

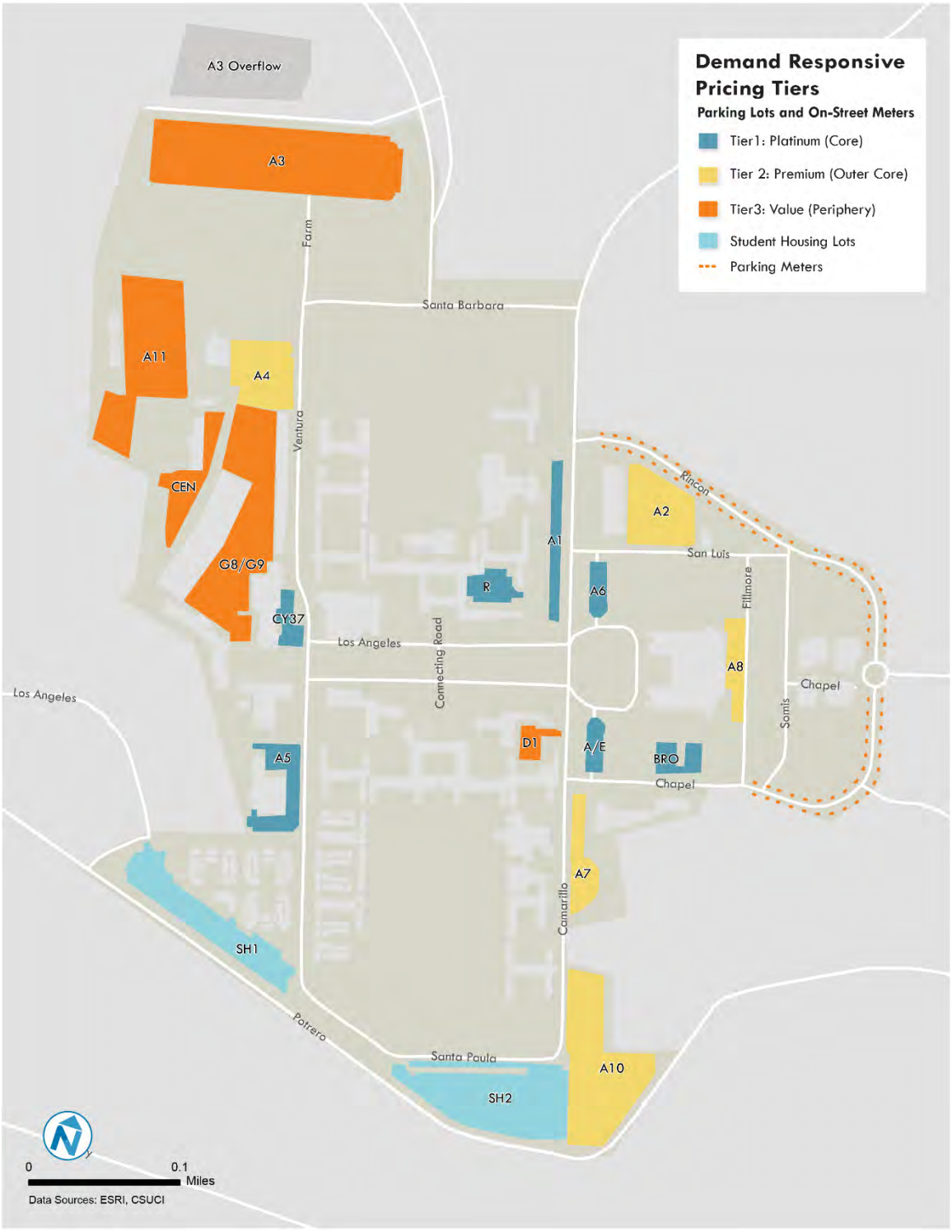
**Though D lot currently only serves ADA spaces, future campus wide allocations of ADA spaces must meet supply requirements, and be distributed in a way that provides access to all campus destinations.

The tiered pricing approach is necessary to achieve an average 14.7% price increase in 2017 (i.e. the first necessary modeled price increase). To meet staff's negotiated terms, the cheap periphery lot prices must be maintained at $195. Due to the price differential between core and periphery zones, the university cannot oversell periphery permits too much at risk of frustrating motorists who cannot find parking.

It should be noted that due to shared jurisdiction over Rincon Dr. and Chapel Dr. between CI and the Site Authority of the University Glen Apartments, an agreement would need to be reached between the parties regarding management, enforcement, cost-sharing, and revenue-sharing.

Actions Steps: Boundaries will need to be established for each demand-based parking management tier. Specific target availability targets should be set to determine the "right price" of parking. Minimum and maximum hourly rates and thresholds for rate adjustments should also be set to guide the pricing structure. Price tiers and rates may be subject to change on an annual basis, based on evidence of changes in parking demand.

Figure 4-12 Parking Facilities by Proposed Parking Tiers Term



Case Study: University of Colorado-Boulder

The University of Colorado-Boulder's parking pricing structure is based on the distance from the core of the main campus and frequency of use. There are four parking tiers with the main campus providing highest cost parking, peripheral lots being mid-priced, unpaved lots being low-priced, and remote lots with shuttles being the most discounted option—costing only one-quarter of the central parking option for both students and staff. Shuttles serve the remote parking lots on weekdays from 6 a.m. to 7 p.m. Student parking permits are available at each distance rate and can be purchased for a semester term, the academic year, or for 5, 8, or 10 week periods in the summer. Figure 4-13 shows the student permit rates for 2016-2017.[1]

Figure 4-13 University of Colorado, Boulder: Student Permit Prices, 2016-2017

2016 2017 Rates	Remote/Shuttle Rate	Low Rate	Mid Rate	High Rate (in Central Locations)
Semester Rate	$49.00	$131.00	$168.00	$198.00
Academic Year Rate	$98.00	$262.00	$336.00	$396.00
Summer Semester Rate				
5 Week		$33.75	$42.50	$51.25
8 Week	N/A	$54.00	$68.00	$82.00
10 Week		$67.50	$85.00	$102.50

P.4. Conduct ongoing parking inventory and occupancy counts by facility and regulation

Description: Good parking information is the foundation for a well-managed system. A performance-based system requires ongoing data collection to inform pricing decisions. Data on parking occupancy levels by facility and permit type should be gathered on an ongoing basis (often monthly) and permit prices adjusted (up or down) on an annual basis to maintain optimal levels of occupancy across campus facilities.

Occupancy counts are fundamental to monitoring occupancy across CI's parking portfolio, and they should be performed for every facility and regulation type. The counts should be conducted on peak usage days to ensure that the highest points of parking demand are accurately reflected in the data. It is ideal that counts be conducted every hour, but it is also possible to select particular times of the day (e.g. 11 a.m., 2 p.m., 6 p.m.) to obtain a representative sample of parking patterns at various times.

It is important, though, that parking counts be conducted during the same weeks, days, and times each year to allow for annual comparisons. In addition, occupancy space counts should distinguish by space type (e.g. faculty/staff, disabled). In addition to tracking parking inventory, occupancy, and utilization, CI should also track permit sales activity. Together, these data on parking demand would inform price adjustments and improvements to parking, especially based on the location and user group.

Actions Steps: CI should monitor and evaluate parking availability on a regular basis, at least twice per year. Initial counts would likely be done manually by parking enforcement officers, but

data could eventually be provided automatically. Ongoing counts are essential in ensuring rates are adjusted based on demand. The monitoring effort should include collecting parking occupancy and vehicle duration of stay on an hourly basis especially during peak times of day. Parking data should be reported annually to staff.

P.5. Install parking meters on Rincon Drive. Adjust pricing to meet availability goals.

Description: A consistent paid parking system across the campus will help distribute demand. All on- and off-street parking supply should be managed consistently.

While on-street parking is not permitted on major arterials around campus and adjacent neighborhoods, several area streets currently have few or no parking regulations, notably Rincon Drive. As a result, many motorists, including those from University Glen will drive and park all day on Rincon Drive for free. Rincon Drive, given its proximity to campus and the Town Center, should facilitate more short-term visitors and not support long-term parking. Long-term parkers should be utilizing the paid lots.

Therefore, CI should install parking meters on Rincon Drive to ensure this parking is utilized efficiently and fairly, while encouraging long-term parking in surface lots. Pricing this parking is key, as holes in the parking system erode the ability to manage the parking supply with performance-based pricing. Within the performance-based framework described above, prices on Rincon Drive would be adjusted to achieve a target occupancy rate, such as 85%. As shown in Figure 4-11, an initial rate of $1 per hour is proposed.

Given the nature of Rincon Drive, it is recommended that multi-space meters that require pay-by-plate be installed. Meters should be spaced appropriately to ensure that motorists do not have to walk too far. All meters should allow for multiple payment options, such as credit card and pay-by-phone. Additional information on parking technology is provided below in P6.

Action Steps: CI should install parking meters on Rincon Drive. An occupancy target should be set and prices adjusted on a regular basis to adequately meet the optimal level of occupancy. Furthermore, net revenues generated should be used to fund mobility and TDM programs. Revenue and costs from these parking meters must be shared appropriately among the two jurisdictions that operate sections of Rincon Drive. Comprehensive management of the Rincon Drive parking supply across these jurisdictional boundaries is aligned with the overall goal of comprehensively managing the campus parking supply.

P.6. Upgrade parking communications, payment, and enforcement systems

Description: Policy changes should be paired with customer improvements to the underlying parking systems, and upgrades to these systems will enable implementation of the other parking strategies listed in this section. Parking technology greatly enhances the user experience and can be utilized to enhance parking operations and enforcement.

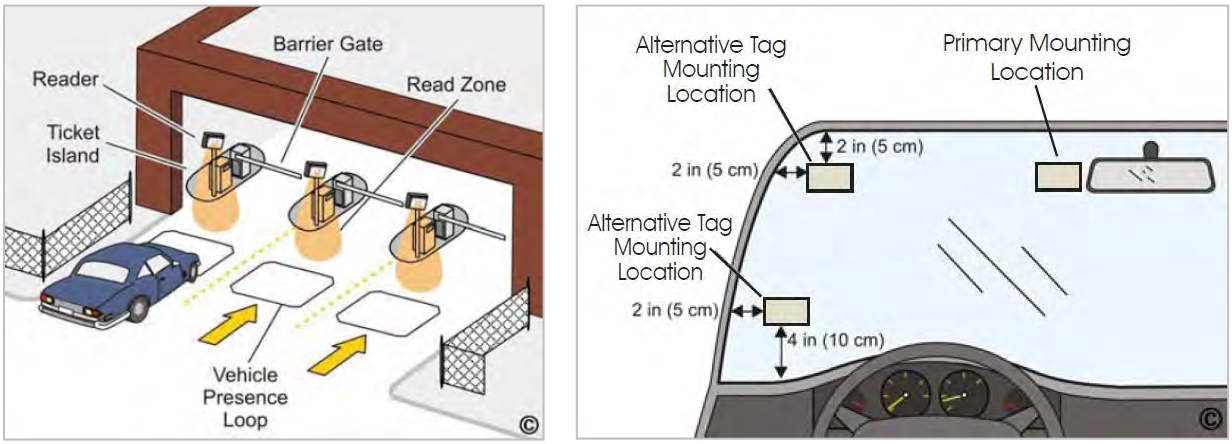
Necessary upgrades include:

1. Upgrading payment systems to support online purchase of permits and citation payment by affiliates. Parking policy changes that are recommended in this section should be paired with user experience improvements. Making it easier to purchase

permits and pay for citations via an online payment dashboard allows more flexibility for users and ultimately for administrators as well.

2. Upgrading meter technology to support pay-by-plate and multiple forms of payment. Making it easier to pay to park helps improve convenience for those who drive and park, reduces scofflaw citations, and reduces the long-term need for equipment. Mobile payment is most important, and is best facilitates by a pay-by-plate system. This type of system requires License Plate Recognition (LPR) technology for enforcement.

Figure 4-14 Illustration of License Plate Recognition (LPR) System



Source: University of Rochester, www.rochester.edu/parking/assets/pdf/avitagbrochure1.pdf

3. Upgrade parking communications via a) real-time availability signage, b) online/mobile info. Providing clear and legible parking direction to CI affiliates and visitors is crucial to keep traffic flowing safety and efficiently. This strategy requires gates and/or "virtual" access control at each lot (see CO.5). Real- time availability signs can make use of an access control data feed to display parking occupancy information at key driving decision points. The primary goal is to get incoming drivers to go directly to a particular area, and avoid circling. This same data feed should provide online and mobile info, in coordination with strategies CO.2 and CO.3. In addition to using real-time parking occupancy information for a campus transportation app and campus transportation websites, the data feed should be publicly available, so as to be usable by navigation systems and similar tools, existing and future, that may help reduce cruising.

Figure 4-15 Real-Time Parking Display at University of Texas - Dallas

4. Upgrade enforcement capabilities to LPR to allow easy check of plates/permits. Enforcement technology solutions on-campus will improve revenue collection and streamline operations. Improvements to parking technology should include integrating

and upgrading the permit system from paper permits to license plate registrations. This type of integration will create a more streamlined process for permit enforcement and reduce the need for printing and distributing hang tags. Handheld License Plate Recognition (LPR) devices create efficiencies for enforcement and collections by University staff. License plates are quickly scanned with the device instead of looking for hang tags. Enforcement officers can also easily track down expired meters and issue tickets as necessary. This type of system minimizes enforcement costs and maximizes efficiency. RFID-based access systems generally involve installing gates at each facility entrance. A gate system eliminates the vast majority of enforcement costs, as drivers would have to pay to either enter or exit the facility. Without a gated facility, ongoing enforcement would be required, though costs could be reduced through the use of handheld units linked to a central database

Action Steps: CI should plan for the upgrade of parking signage, wayfinding, enforcement, and payment systems. A study will need to be developed to determine short- and long-term improvement strategies. Short-term upgrades should be identified and prioritized at key locations. Clear signage and wayfinding is needed to communicate when and where higher and lower rates and different parking regulations apply, which should be coordinated with the Campus Exterior Wayfinding Master Plan (December 2014) and Strategy CO5. Payment and access control technology will also need to be researched to facilitate data collection, rate adjustments, convenient payment, and proper enforcement.

If feasible, CI should release a Request for Proposals (RFP) on technology that combines real-time space availability display and a license-plate recognition (LPR) gate system. When a vendor is identified, real-time space availability displays should be installed at major campus gateways and at the entrance of large surface lots and garages. In the long term, this parking availability information should also be provided on a user-facing mobile application to further help motorists navigate. This data platform can also include functions that help drivers locate where they parked their vehicle, either at kiosks near pedestrian entrances to garages or on the smartphone app.

In the short-term it is recommended that automated license plate recognition (LPR) devices are installed incrementally at the entrance of parking facilities, starting with the larger facilities. This approach is essentially a gradual roll out of the capital investments needed to support transitioning to upgrading the entire system to a “pay-by-day” pricing system. In the long-term, the campus parking system should be upgraded to a daily-pricing (“pay-by-day”), pay-as-you-go permit system, managed through automated license plate recognition (LPR) technologies. LPR technology can eliminate the need for paper parking permits by utilizing a camera and laptop computer that uses software to read images of license plates and then verify the image against a list of authorized plates. This data is then loaded into the LPR system, which is mounted on a parking patrol vehicle. As the patrol vehicle is patrolling through the given area, the system will issue an alert whenever it identifies a vehicle that has no “virtual permit” to park in the area, or that has exceeded the time limit for free parking in the area. There a number of advantages to using the “permit-less” parking system. Staff time needed to manage paper parking permits is reduced, issues surrounding forged, lost or forgotten permits greatly decrease, unwarranted citations are reduced, and the time needed to verify a vehicle is lessened. Additionally, an online interface can allow permit holders to manage their accounts online.

LPR records license plate information as a vehicle enters a parking facility and matches the information to a user account. This will streamline operations, enforcement and provide a

system for tracking parking patterns. Adding license plate recognition will allow enforcement officers to use handheld device units to easily and quickly scan license plates and reconcile whether or not payment is valid. When the vehicle exits the facility, the parking fee is deducted from the owner's account. This will streamline operations, enforcement and provide a system for tracking parking patterns. This would allow employees and students the cost savings of choosing to bike or take transit to campus some days, while driving and paying to park on other days. In conjunction with LPR, pay by plate technology can also replace the permit program hangtag system. Users would not need to display a hangtag, but instead their license. Fixed license plate recognition (LPR) devices – typically, radio frequency identification (RFID)-based automatic access gates – can be installed at the entrance of parking facilities to validate each permit holder, warn permit holders of balance or upcoming expiration and alert enforcement about permit violations. Parking facilities with a higher demand should be prioritized in the pilot phase.

P.7. Provide priority and discounted parking for carpool and vanpool customers

Description: The parking system should encourage carpooling, which can be accommodated by priority parking locations and discounted parking fees. Ridesharing is a proven and effective means of reducing the number of commute trips and VMT. Ridesharing is attractive to commuters because it can save both time (use of HOV lanes) and money (shared travel costs).

CI has a ridesharing program in place and maintains a ride-matching database to assign interested students, faculty, and staff into carpools/vanpools. The Parking Services website markets the ridesharing program as a means of sharing the cost of a parking permit between multiple riders. While this is undoubtedly an incentive for some participants, CI should further encourage ridesharing by providing preferential and discounted parking for registered carpoolers/vanpoolers.

There is currently no discount on permits for carpool vehicles. More developed carpool and vanpool programs will often supplement ride-matching services with additional incentives such as **preferential parking** in locations closer to destinations (platinum or premier parking spaces) and **financial incentives** such as promotional gas cards or additional discounts on parking permits for validated carpoolers. Carpool and vanpool parking spaces should be designated in the most convenient parking spots on campus to improve visibility and encourage use.

The most robust programs for dedicated carpool parking require 5-10% of all off-street spaces to be reserved for vehicles with active carpool permits, a share commensurate with carpoolers' typical overall mode share of campus trips. To assuage concerns that registered carpoolers may abuse the carpool parking permit program – parking in carpool spots even if they don't carpool every day that month – spot checks should be conducted using a license plate recognition system (see Strategy P.6) to ensure cars with an active carpool permit are parked in the spaces.

Action Steps: Provide carpool and vanpool incentives to complement its ridesharing program. CI should set up a carpool program, requiring carpools to register to get a discounted parking permit. Establish discounted rate for carpool/vanpools, perhaps starting around a 50% discount. Designate preferential parking spaces in off-street parking facilities should be designated for carpool and vanpool users, comprising about 3-5% of total spaces initially, ideally in the most accessible and proximate spaces near pedestrian paths. Staff should also implement financial incentives, such as discounted parking permits, as feasible.

P.8. Allow University Glen residents to park in campus core, subject to daily visitor rate

Description: Easy movement between the University Glen and campus core should be retained, but University Glen residents who choose to drive and park on campus should pay the same permit or daily visitor rate as other drivers, so as not to encourage short vehicle trips within the campus. Other strategies in this Plan aim to better link University Glen and the campus core with pedestrian and bicycle infrastructure, to leverage the high potential for walkability on campus.

Action Steps: This strategy can be implemented relatively quickly, as there is reasonable coverage of daily parking options already in the campus core. As equipment is upgraded, the integration of daily parking options throughout is a high priority. As with many of the strategies, it is best implemented at the beginning of a school year when there is most turn-over, and should be explained far in advance of implementation.

P.9. Collaborate with the Town Center and University Glen to improve parking management

Description: While the parking supplies may have different managing bodies, it is essential to coordinate parking policies between the campus, Town Center, and University Glen to meet the campus' long-term transportation goals.

Action Steps: CI executive leadership should clarify this goal/policy with managing entities of the Town Center and University Glen. It may be helpful to have representatives from the Town Center and University Glen management on the TDM Advisory Committee so as to coordinate this Strategy and others across the campus over time, to knit together parking policies and the broader transportation system. To the extent possible, and phased in over time as contracts and arrangements allow, the Town Center and University Glen parking management details should be adjusted to match the parking management principles discussed in this report.

P.10. Expand and improve EV parking infrastructure

Description: The campus' existing EV infrastructure may be expanded and upgraded over time to continue to encourage EVs.

Electric vehicles (EV) are an important means for CI to reduce the carbon footprint of its campus transportation system. However, a general lack of charging infrastructure in many locations is a significant barrier to the widespread adoption of EVs, as users must charge their vehicles routinely.

Access to on-campus charging provides the opportunity to expand the number of people that may choose to adopt EVs. Guaranteed on-campus access may be a promising option for many users of garage orphan EVs. Figure 4-16 shows the different types of charging stations.

Figure 4-16 Electric Vehicle Charging Equipment Overview

Charging Station Level	Typical Charging Time	Likely Location
Level 1 (110 V)	10–20 hours (0-100%)	Household, workplace charging, parking garages, long-term and overnight lots
Level 2 (220 V)	3–6 hours (0-100%)	Household, shopping centers, parking garages, third places, institutions
DC/Fast Charge (480+ V)	20–40 minutes (0-80%); about 1 hour to 100%	Commercial: shopping centers, publicly accessible locations with high customer turnover

Based on a 24 kWh battery and charged from empty to full charge

CalGreen Tier 1 requires 3% of total spaces to be designated for EV, but given the differences between a university setting and a standard green office development in California, the recommendation was lowered slightly. Therefore, a 1% of total space allocation for EV is recommended. The University should monitor use of the spaces over time and adjust as needed, based on demand patterns. The EV charging stations should have convenient, proximate locations whenever possible, to encourage use.

Given the current expense of EVs, the team assumed that most EV users would be faculty or staff. As such, the proposed allocation has most spaces concentrated in the center of campus, near major academic and administrative buildings. When placing EV spaces, consideration should be given to the ease of accessing required electrical infrastructure. To encourage EV use, EV spaces should also be placed in convenient and prominent locations (premium, or platinum lots), though rideshare and car share spaces should take precedence over EV spaces.

As CI brings additional parking infrastructure online, CI will need to abide by the CAGreen Code's requirements for 8-12% of new parking stalls to be allocated for EVs. Since new parking infrastructure is anticipated to be developed along the periphery of campus, CI may consider locating some or all of the new EV spaces in more central locations to incentivize the use of EV's.

Action Steps: CI should confirm the remaining life cycle of existing EV stations and research and identify appropriate technology for improvements. Prioritized locations for installation should be identified, including off-street lots/garages and on-street blocks. Net parking revenues can be used to fund the expansion and improvement of EV infrastructure (see Strategy P.2).

P.11. Transition parking to outside of core as campus develops

Description: The CI Vision plan calls for a campus core that prioritizes non-motorized transportation by limiting the parking supply in the campus core. In order to accomplish this vision, the parking supply currently located within the campus core will need to be replaced by parking north of the campus core, adjacent to the University Drive entrance. This vision also allows for current parking lots to be used to expand University facilities.

As noted by strategy CI.4, prioritizing non-motorized transportation by limiting automobile access in the campus core elevates the propensity of walking and bicycling as modes for campus circulation. By locating parking in the campus periphery, affiliates will be unlikely to drive from one part of campus to the other, limiting congestion and opportunities for vehicle and pedestrian/bicyclist conflicts.

In order to facilitate this transition of parking to the periphery of campus, CI should adopt policies that guide the development of parking in that fashion. One such policy employed by UC Davis, limits the obligation to replace parking resources to those structures that have been improved within the last thirty years or less, and no replacement obligation where interim surface parking occurs, ensuring that older parking resources identified in the core of campus are not viewed as primary sources for parking supply.

Additionally, a policy to guide the expansion of off-street supply only when parking revenues are sufficient to self-fund the full cost of the expansion. Such a policy makes it clear that the campus parking program operate as a fee-based service, and therefore the costs of capital and operating expenses of the parking system shall be recovered from the users of the parking system. Requiring parking supply expansion projects to self-finance has the consequence of increasing pressure to raise parking rates, especially in areas of highest demand (see Strategy P.1). Charging demand-based parking rates is an effective means of reducing parking demand overall, which in turn reduces the need to expand parking capacity. Articulating the specifics of and the rationale for such an approach can be effective in broadening popular and political understanding of the implications of supply expansion proposals. Most importantly, it makes clear that parking will not be subsidized by student tuition/fees or general taxpayers.

Action Steps: CI should adopt a policy that limits the growth and location of parking facilities. The core campus should give priority to core campus facilities such as housing or classrooms rather than parking facilities. Furthermore, a formal supply expansion policy should stipulate that new parking facilities should only be constructed if parking revenues can make it self-sufficient.

P.12. Add new parking supply in the short term to meet needs of the growing campus

Description: While the implementation of the package of TDM strategies will reduce per-FTE parking needs in the long-term, there is a need for additional parking supply in the near-term, as the campus grows quickly. The new supply should be added in accordance with the campus' long-term strategies, and investments in management equipment should align with the parking system's policy and operation's needs, as noted in the other parking strategies in this section. In the short-term, the A3 overflow lot, currently gravel, should be paved to provide create access to these approximately 500 spaces. During project development, there was discussion about whether or not the campus should create an additional 500 spaces in upcoming years, adjacent to the initial 500 spaces recommended in this strategy. This was a topic explored in the financial analysis effort, described in Chapter 5. That work concluded that the full 1,000 spaces would be unnecessary and costly, requiring aggressive increases in permit rates, and diminishing the ability to invest in multimodal options.

Action Steps: Pave the A3 overflow lot to create 500 spaces and monitor usage. Create an overlay pedestrian network so that people exiting vehicles do not need to walk across vast parking lots to enter campus.

P.13. Eliminate annual permits for commuter students and transition to a "pay-by-day" system

Description: In the long-term, annual permits for commuter students should be eliminated and the parking system should transition to a "pay-by-day" system. The smaller the time unit of a

parking purchase, the more that the parking price can serve to encourage use of other modes and eliminate the sunk cost of an annual pass. The pay-by-day system should be easy to use, so as to reduce any inconvenience associated with increased permit purchases.

Moving from an annual permit system (with monthly parking payroll deduction) to a daily based/ no volume discount system provides an opportunity for affiliates to more closely consider their options while becoming more aware of the cost of parking, in contrast to long term parking permits that commit a permit holder to driving.

Currently, the daily visitor price for parking is higher than the annual permit price, adding an additional incentive to drive. However, a parking system that prices daily parking more competitively supports occasional parkers that may choose to use different modes periodically. Daily parking charges are an effective tool for reducing overall parking demand if implemented across all facilities.

An up-front administrative investment could create a system where affiliates establish a parking account, receive a university-issued transponder that tallies as vehicles enter and exit parking facilities, and are billed for their use of parking over a given period by mail, online, or through the payroll system. Additionally, commuters can receive a financial benefit to encourage the use of alternatives to driving. Pay-as-you-go balances the pricing system to reward those who choose to take alternatives and drive less, which will help CI reduce parking demand, avoid supply expansion and support sustainability goals.

Several universities have applied this thinking to their parking permit programs, most notably the University of Oregon and the University of Wisconsin-Milwaukee.[2] Seattle Children's Hospital also charges for employee parking on a daily basis[3]. Using in-vehicle meters or transponders (such as FasTrak), the universities actually charge permit users by the hour, not just by the day. These programs require additional investments in technology, but such costs could be offset by the capital investments it could help make unnecessary by reducing demand. In addition, the technology and administrative costs associated with such an approach will likely decrease over time.

Action Steps: Daily pricing should replace annual permits for commuters. Commuter rates would be significantly discounted and managed via enhanced payment technology and daily pricing will incentivize fewer drive-alone trips. This should be coordinated with the development of the carpool and vanpool incentive program and the evaluation of parking payment and access control infrastructure.

This program would likely require an up-front investment in infrastructure, administrative processes, and communications amounting to approximately $10,000 per entrance/exit lane. There would likely also be additional costs for software, though there is potential to leverage existing technology and payment systems. On a per-facility basis, the total technology upgrades required to facilitate daily parking systems have estimated cost of $50,000 - $250,000 depending on configuration, number of application lanes, campus layout and many other considerations.

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[2] Shoup, Donald. "Parking on a Smart Campus." *California Policy Options 2005*.UCLA School of Public Affairs, 2005, pp 117-149, March 14, 2005. Retrieved from http://www.researchgate.net/profile/Donald_Shoup/publication/228387091_Parking_On_A_Smart_Campus/links/00b7d53c67e5b08adc000000.pdf on 3/4/15.

[3] http://usa.streetsblog.org/2015/05/08/how-seattle-childrens-hospital-took-the-lead-on-healthy-transpo

TRANSIT

Transit is an essential component of CI's mobility program. Today, transit plays a relatively small role given the location and size of the campus. CI currently contributes to VCTC to provide bus service between the campus and Oxnard and Camarillo. Transit can play a larger role, especially as the campus grows, but additional investment would be required to significantly boost ridership levels. Outlined below are a set of recommendations that can further enhance transit connectivity and access.

T.1. Improve passenger amenities at transit stop on Santa Barbara Avenue

Description: Multiple studies have shown that the time spent waiting for a transit vehicle (especially when transferring) is subconsciously valued higher by riders than time spent on a transit vehicle. In short, people do not enjoy waiting. In order to improve the environment for transit riders at the Santa Barbara Avenue stop, simple improvements including lighting, real-time arrival information, and a transit map and schedule should be added. These improvements would make the space feel safer, and provide riders with basic information so that they can plan their trip to and from campus accordingly.

Action Steps: Noted improvements to the Santa Barbara Avenue VCTC station should be implemented as possible by the TDM manager. Signage developed for the transit stop should be consistent with wayfinding guidance developed by the campus Wayfinding Plan (2014), and recommendation CO.5. Ideally, signage would be visible from approximately 100 feet away, and would be placed perpendicular to the street so that pedestrians can read it. Station lighting should be aimed at serving a pedestrian scale, rather than the standard, auto-oriented "cobra" lights that illuminate the roadway, focusing visibility atop the stop to ensure space is illuminated for easy boardings and alightings. As the campus grows, there may be a need for additional bus stops throughout the campus. Potential bus stops should be planned to incorporate the same amenities discussed here.

A one-time cost of $25,000 is estimated to provide improved passenger amenities at this bus stop.

Figure 4-17 Example of a Transit Stop serving University of Missouri, Kansas City

T.2. Provide real-time transit information via website and mobile applications

Description: Real-time travel information is increasingly incorporated into transit systems to provide users with up-to-the-minute information on arrival times and/or delays. Real-time travel information is a recent development as Global Positioning Systems (GPS) has become more widespread in electronic and mobile devices. Frequently, real-time transit information systems provide arrival times, vehicle location (live mapping), and service disruption and delays, among other information.

With real-time travel information, users are informed of service and travel information through both interactive and non-interactive media. Non-interactive media includes electronic displays at transit stops, as well as automated telephone hotlines. Interactive media for transportation users can be provided through internet portals or interactive voice response via telephone as well as mobile applications available on users' smartphones.

Real-time travel time information can improve the effectiveness of campus circulators and public transit service by improving the passenger experience. Surveys of transit riders suggest that real-time information can lead to increases in both ridership and rider satisfaction by enabling riders to better plan their trips. One study from the Transportation Research Board found that real-time information decreases passengers' perceived wait time for the bus by about 13% and reduces the real wait time by less than two minutes.[4] These time savings are especially valuable to customers where bus service frequencies are relatively low. Transit technology companies such as Transloc[5] and Roadify[6] specialize in creating real-time traveler information applications for campus environments.

[4] Watkins, Kari. 2011. "Where Is My Bus? Impact of Mobile Real-Time Information on the Perceived and Actual Wait Time of Transit Riders." *Transportation Research Part A: Policy and Practice.*

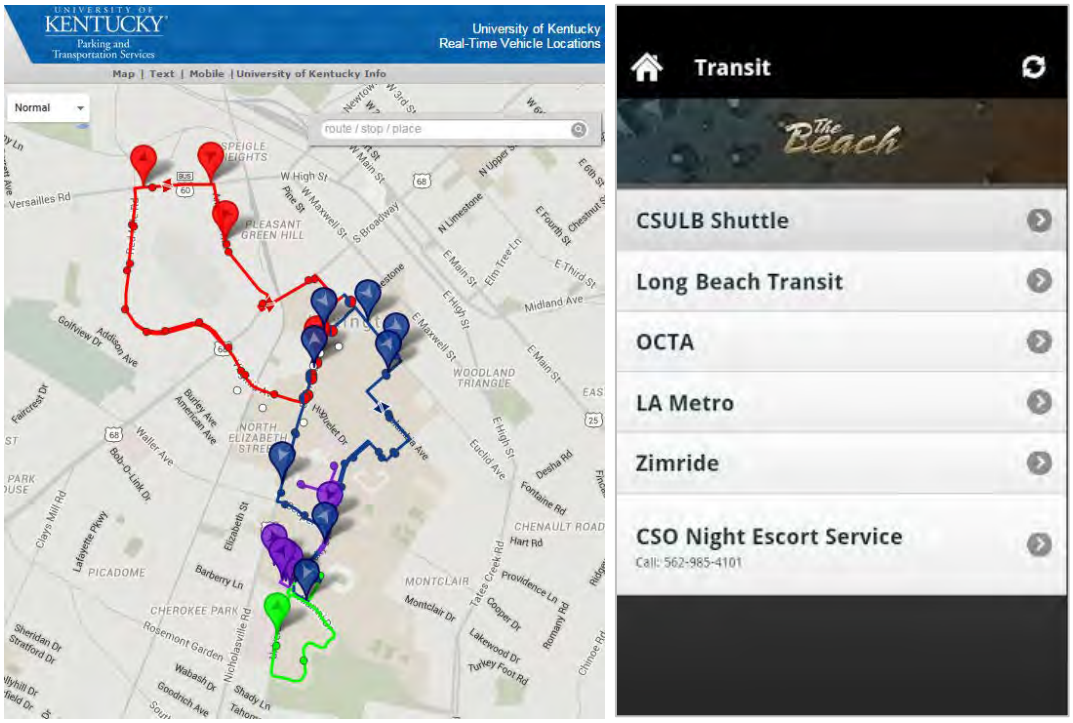
[5] http://transloc.com/

[6] http://www.roadify.com/

Action Steps: The CI TDM manager will be tasked with collaborating with VCTC to bring real-time information availability for the two routes serving the campus. CI will need to understand VCTC's current capabilities and determine how the real-time data will be managed and maintained between the two organizations. Once established, CI should consider linking real-time arrival information to the goCI app (discussed as part of Recommendation CO.3) to make this information as broadly available and user-friendly as possible.

The cost of this improvement is estimated to be $7,000 for initial set up, and $5,000 annually for maintenance. In addition, real-time transit screens in the future will cost approximately $6,000.

Figure 4-18 Campus Shuttle Real-Time Information (University of Kentucky) and Real-Time Transit Information in Campus Mobile App (CSU-Long Beach)



Several vendors, including NextBus, TransLoc, and DoubleMap, offer real-time tracking services. Prices for these services vary, but generally fall within the following ranges:

- $600 - $700 per vehicle for hardware (one time cost)
- $200 per vehicle for installation (one time cost)
- $6,000 - $7,000 for system set-up and programming (one time cost)
- $100 per vehicle service fee (monthly)

The cost of developing and releasing a smartphone app would likely amount to $30,000, though costs could be lower if CI released all data to a third-party contracted to develop the app. Because CI already maintains its own campus information app, goCI, it is likely that costs would be even lower because real-time transit information could be added to the app's existing framework.

Figure 4-19 Real-Time Arrival Information (Boston, MA)

T.3. Partner with VCTC to allow for online transit pass purchases or renewals

Description: Currently, VCTC student shuttle passes are only available for purchase on weekdays and in person at Transportation and Parking Services customer service. In order to purchase passes, affiliates must complete an in-person application and have their photo taken, and then wait at least 15 minutes for the application to be processed. Adding a simple online process would limit the time spent to obtain a transit pass, eliminating a barrier of inconvenience for affiliates.

Action Steps: CI should collaborate with VCTC to develop an online shuttle pass application process. Online pass applications improve the convenience and accessibility of the existing services and establish a framework for long-term ridership growth as campus expands and more affiliates use the service. A simple web-based form, similar to what is already used to process CI parking permit applications, could be designed for transit pass applications. It is likely that this measure would boost transit ridership among the small but significant segment of campus affiliates who were interested in taking transit but were dissuaded by the inconvenience of the in-person application process. Furthermore, this measure would reduce the long-term administrative burden on CI staff to facilitate pass purchases.

VCTC currently uses paper passes, but as VCTC transitions into electronic transit media in the future, there will be an opportunity to further simplify the process. In many university settings, transit passes can be loaded onto a university ID, limiting the need to carry multiple cards and passes. This process could be hosted on the goCI website, creating an easy opportunity to affiliates to make their ID a transit pass as well.

Figure 4-20 UCLA Online Transit Pass Purchase Program

BRUINGO! TRANSIT PROGRAM

Home | Getting to UCLA | Public Transit | BruinGO! Transit Program

BruinTAP for Transit

Our new BruinTAP for Transit program makes it even easier for you to ride transit! You can now purchase or renew BruinGO! Flash Passes and/or Go Metro passes online and load both onto one TAP card!

Go Metro transit passes give UCLA riders the convenience of an unlimited quarterly pass at a significantly reduced fare. Metro bus and rail lines are always around the corner at UCLA, making it easy to get from campus to museums, nightlife, restaurants and more.

This fall, buy a Go Metro pass and automatically get a free BruinGO! Flash Pass loaded onto your TAP card!

PURCHASE PASS HERE

BICYCLE AND PEDESTRIAN

The campus already benefits from a walkable core, and existing development plans aim to build on that over time. As a geographically isolated campus, CI has great potential to reduce driving within campus by investing in bicycle and pedestrian improvements. Cross-campus legibility, safety upgrades, and parking lot pedestrian circulation can help increase walking. Biking will become a more competitive option as the campus grows, and has potential to knit together the eastern span of campus (Town Center, University Glen) to the campus core, reducing short, internal driving trips.

BP.1. Install new bicycle facilities on campus

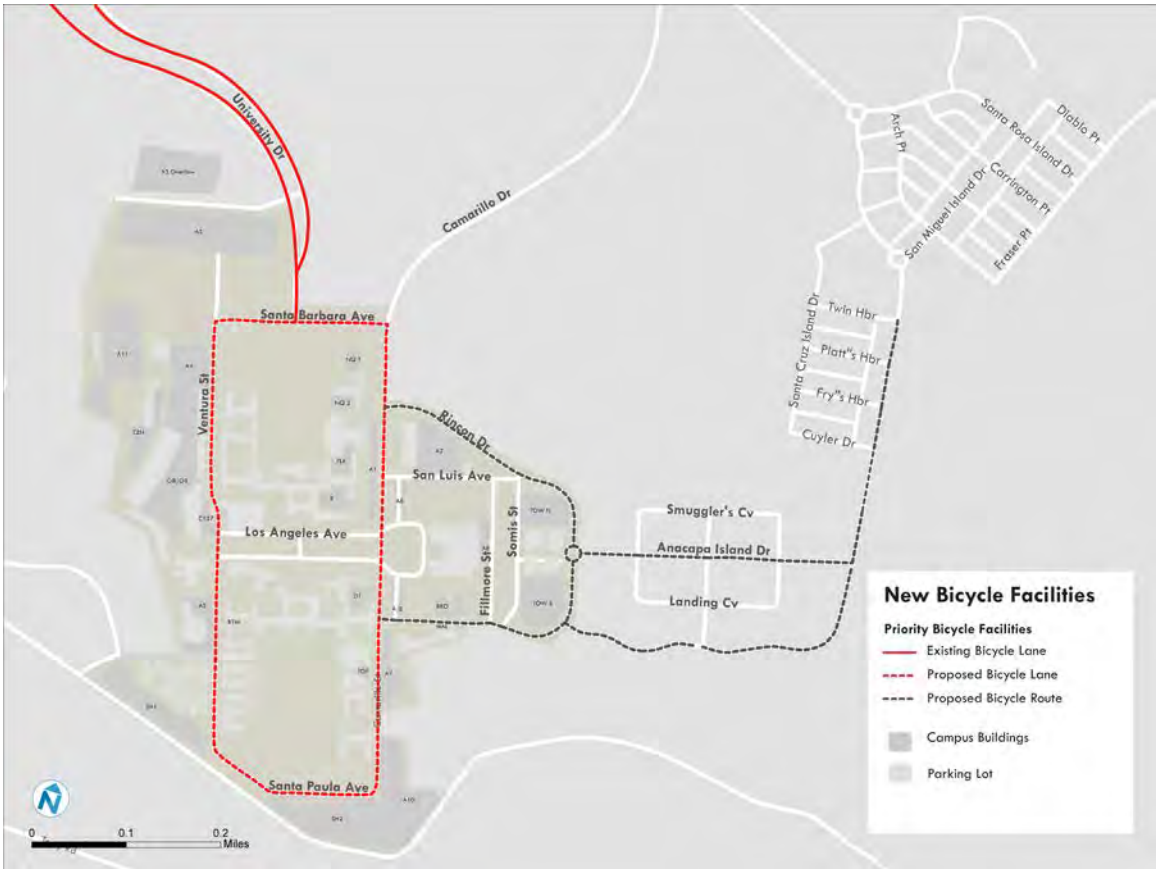
Description: The installation of new bicycle facilities on campus, such as bicycle lanes and secure bicycle parking, are simple and cost-effective improvements to increase the amount of bicyclists on campus through the creation of safer conditions. A bike-friendly campus is a marketable campus, equating to a high quality of life and a healthier lifestyle. Creating a simple network of bikeways, secured parking, and bicycle repair facilities on campus, creates an environment where affiliates will look at bicycling as an option to accomplish short internal trips, instead of driving from one parking lot to another.

Action Steps: The TDM manager will work closely with departments responsible for the design and maintenance of roadways on the CI campus in order to evaluate, design, and eventually roll out such facilities. When evaluating bicycle facility designs, considerations should be made associated with the role the facility will serve to connect students, the level of safety offered to bicyclists and motorists in relatively narrow roadways, and the cost of implementation. CI should look to best practices in bicycle infrastructure design to guide the design and implementation of bicycle facilities on campus.

Figure 4-21 shows high-level recommendation of the type of bicycle facilities that should be considered at CI. The primary recommendation is to continue the bicycle lanes from University Drive onto the main campus loop. In order to connect affiliates to the Town Center and the Glen residences, bicycle route signage would be appropriate along Rincon Drive, Chapel Drive, Anacapa Island Drive, and Channel Islands Drive. This relatively simple network would provide the opportunity for bicyclists to accomplish short trips on the CI campus, and would create an alternative for residences of the Glen commuting to the core campus.

It is estimated that the campus bicycle network could be developed for approximately $300,200. This does not include the cost of creating the core campus bike lane loop, which is covered by the costing estimates in the one-way street conversion item. Similarly, bicycle parking costs are covered in Strategy BP.3. The cost estimate for this item includes bike route connections, intersection improvements, pavement parking, and the cost of opening or converting a shower facility for bicycle commuter.

Figure 4-21 Proposed Bicycle Connections at CI Campus



BP.2. Replace and expand bicycle parking. Provide appropriate mix of short- and long-term parking

Description: Safe, effective, and visible bicycle parking is necessary to provide bicyclists with options to store their bicycles. A mix of short-term and long-term bicycle parking is ideal to serve as storage for trips throughout campus, and to store bicycles over long breaks. Bicycle parking is a low cost way to encourage bicycling on campus by making it a convenience. Across the country, campuses are taking steps to invest in modern bicycle parking technology to encourage its use. CI has the potential to increase the number of trips taken on bicycle within the campus by making these amenities accessible.

Action Steps: CI should establish standards for bicycle parking to guide the purchase of appropriate parking amenities. Once internal guidance is established, a bicycle parking procurement process can take place to supply the campus with necessary short term and long term parking infrastructure. The new bicycle parking should be prioritized in areas that experience the highest demand, and bicycle parking that does not meet standards should be passed out.

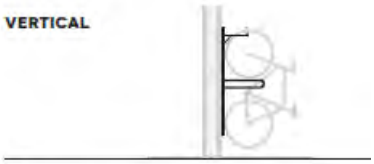
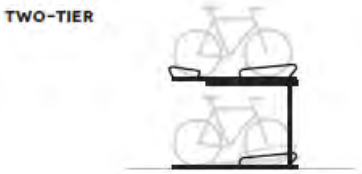
When establishing standards for short-term bicycle racks, racks should be able to support the bike frame from two points of contact and allow sufficient space for both the frame and lock. Inverted U-racks accomplish these needs effectively, and are recommended as the preferred short term bicycle option. Long-term bicycle parking is typically enclosed, as individual bike

lockers, or locked bicycle parking rooms with rack systems. Long-term bike parking facilities are generally intended for affiliates accessing buildings for more than two hours. Additionally, such spaces can be used be an effective option for student residents while away from campus for long breaks.

Approximately $53,200 will fund the replacement of defunct bicycle parking and addition of amenities to provide the appropriate mix of short- and long-term bicycle parking.

Figure 4-22 Secure, Indoor Bike Parking at Portland State University

Figure 4-23 Bike Racks to Replace/Expand

Recommended Bike Racks by Type		Racks to Avoid/Replace
Recommended Short-Term Bike Rack		
Recommended Long-Term/Secure/High Capacity Bike Racks	  	     

Source: Essentials of Bike Parking, Association of Pedestrian and Bicycle Professionals, 2015

BP.3. Conduct ongoing occupancy counts and maintenance assessments of bicycle parking

Description: Monitoring and evaluating bicycle activity trends is important to assess how the campus is accommodating demand, but also a reflection of how the campus is effectively promoting more bicycling. Generally, bicycle parking utilization counts are performed systematically, at least once a year, to confirm the adequacy of bicycle parking infrastructure. Utilization data should be analyzed to see how factors like weather, time of day, and variations in normal school schedules can influence bicycle travel behavior.

Action Steps: The TDM Manager should arrange for an annual bicycle parking supply and utilization program to track bicycle parking supply as it relates to bicycle parking demand. The intent of regular bike parking counts is to see whether certain bicycle parking locations or exhibit concentrations that make it difficult for affiliates to park their bicycle. Understanding where bicycle parking demand is high will enable CI to efficiently distribute bicycle parking resources to meet and address those locations.

This task would require about $5,000 worth of staff time.

BP.4. Provide do-it-yourself bicycle fix-it stations on campus

Description: A bicycle fix-it station provides basic bicycle repair and maintenance tools in a publicly visible place on campus. Fix-it stations are equipped with tools such as a floor pump, puncture repair kit, spare tubes and a set of Allen keys, spanners, and screwdrivers to keep bicycles in good working order. These amenities should be located in visible locations near popular bicycle parking locations, key entry points to campus, student residences, recreation centers and campus destinations with the highest cycling demand. Alternatively, a bicycle fix-it station can fit in a small space in a parking garage or on the ground floor of a building.

Action Steps: The CI TDM manager may use ongoing bicycle parking counts to help identify high demand locations where a fix-it station would be appropriate. Once the specific location(s) for the stations are identified, CI will need to solicit a provider to produce and install the station. Ideally, the station will contain branding that is consistent with the general CI Transportation program as per CO.1.

A fix-it station is estimated to cost about $5,000.

Figure 4-24 Fix-it Station for On-Campus Bike Repair, University of Kentucky

BP.5. Prioritize pedestrian safety upgrades, with a focus on high-volume corridors, crossings, and parking lots

Description: Campus streets and shared pathways are not just conduits that move people between buildings and other major destinations. Streets and pathways are public spaces that engender social life, academic dialogue, and that create first impressions well before the quality of classrooms, dorms and recreational facilities can be assessed. High levels of walking and pedestrian flows are indicators of successful, competitive, and well-designed campuses. Campuses should be comfortable to cross on foot, easily navigated – even without signage - and that leave a lasting impression. A campus environment that supports walking is fundamental to achieving the social, experiential, and positive mental elements that supports CI's mission to offer students a world-class education and a supportive learning environment.

Successful campuses recognize this by providing more space for people to walk and gather and by reducing opportunities for vehicular and pedestrian traffic to mix. Every affiliate walks along CI's network of paths and sidewalks at some point during the day, whether they arrive to on campus by car, bus, or bicycle. However, the quality and extent of walking supportive infrastructure varies throughout the campus, resulting in gaps and barriers that affect safety and comfort.

Specifically:

- Add missing sidewalk segments (some already underway).
- Widen and enhance the main North-South entrance spine of the northern half of Ventura Street. As more parking is moved to the northwest corner of campus, this entrance (the pedestrian bridge branching off from Ventura Street) and the continuing sidewalk down Ventura Street become the most heavily used pedestrian infrastructure on campus.
- Add raised crosswalks where the central mall crosses Camarillo and Ventura, and where the pedestrian bridge pathway meets the intersection of Ventura Street and Santa Barbara Avenue
- Add crossing locations where significant pedestrian traffic is observed.
- Fill out any missing sidewalk gaps.
- Add curb extensions at key crossings.
- Calm traffic on the main campus loop, as described in CI.6.
- Overlay the large and growing parking lot area with pedestrian circulation network (see CI.2 for detail)

Parking lot pedestrian safety will increase in importance as the contiguous lots grow larger. Parking lots at CI are primarily designed for automobile circulation, without consideration for pedestrian access, streetscape, or stormwater facilities. All affiliates that arrive on campus via car need safe walking infrastructure to connect to their final destination. Where there are conflicting movements between people walking and vehicles (e.g., parking aisle crossings and driveways), marked crossings and pavement treatments should be applied to indicate pedestrian priority. To that end, high quality walking infrastructure should extend from the campus shared pathways and sidewalks into surface parking lots.

Figure 4-25 Pedestrian Safety Features: Curb Ramp, Pedestrian Refuge, Rapid Flashing Beacons

Action Items: Where CI can provide funding, pedestrian connections should be strengthened between campus edges, peripheral parking lots, residential parking streets, and residential developments. Pedestrians on all college campuses (and even in dense urban districts) tend to walk along the path of least resistance when walking between destinations. Affiliates use desire lines that limit walking distance and time. However, campus pathways and street crossings on the CI campus often do not accommodate these desire lines. Likewise, walking conditions can be improved throughout the campus. Safety countermeasures, such as pedestrian refuges, curb extensions, traffic calming features, high visibility crossing enhancements, and rapid flashing beacons, should be pursued to maximize affiliate safety while walking at CI.

The following key action steps should be taken to provide better off-campus connections where CI does not have jurisdiction to make changes to the right-of-way:

- Identify priority off-campus locations based on collision/safety data, pedestrian counts, and residential densities (among other demand factors)
- Work with City of Camarillo to prioritize pedestrian and safety upgrades at key locations based on CI affiliate demand (taking into account street reconstruction projects that may be able to implement key pedestrian gap closure projects)

COMMUNICATIONS

No parking or TDM program can operate effectively without consistent and clear information about policies, programs, and mobility options. CI should expand and enhance its communications efforts to ensure affiliates are aware of existing and future programs, and continually making the case for transit, biking, walking, and TDM programs to help the university meet its sustainability goals. The travel survey found that a substantial portion of campus affiliates were not aware of one or more of the existing transportation programs. While much of this information is available, it is not always easy to find. This category of strategies identifies opportunities to consolidate, streamline, and improve communication and messaging around the transportation system.

CO.1. Adopt and implement a formal brand for transportation and TDM programs

Description: CI's recently launched "goCI" mobile application is an important first step in establishing a cohesive brand for campus transportation and TDM programs.[7] Currently, the goCI application features links to transit schedules, campus maps, directories, event listings, and library information. However, goCI is not utilized as a transportation resource *per se*, nor does it provide complete information on existing transportation programs and services.

goCI presents an excellent opportunity to re-brand the transportation, parking, and TDM programs, and more directly connect to the campus population. A unified branding strategy can help bring together everything from parking garages to bicycle amenities into one coherent program in the eyes of students, faculty, staff, and visitors, unifying otherwise disparate elements of the transportation system and create recognition and integration between modes. The brand also facilitates direct marketing of the transit, biking, walking, and TDM programs.

Information and branding improvements should be guided by the following principles:

- **Keep it Intuitive.** Travel information should be organized and categorized in a graphical, easy-to-understand format.
- **Make it Recognizable.** A transportation brand, building off existing materials, helps market less well known transportation programs.
- **Keep it Fun.** Many do not expect that paying for parking or riding the bus can be fun, but if the information and communications have personality, the transportation programs can more easily capture the attention of the student population.

Once a brand has been formalized, it should be utilized to create a comprehensive marketing package for parking and transportation services. A package would include both digital information resources, such as the website or social media, but also physical materials. These materials could include:

- Parking, transit, shuttle, and bike maps
- Informational flyers on TDM programs
- Discount or promotional materials
- "How To" or "FAQ" brochures

[7] http://www.csuci.edu/tc/mobile/

- Orientation packets for new students and faculty/staff

The value of easy to understand materials covering transportation options and TDM programs should not be understated as it is one of few opportunities a campus has to influence an entire class of new students and their parents. Information highlighting potential cost savings with not bringing a car to campus and providing tools to use alternatives such as ZipCar may further influence and incentivize a student's transportation decisions prior to beginning at CI.

Action Steps: Using goCI as a starting point, the University will first need to establish and formalize a brand for introduction to the greater campus community, and identify all relevant programs that will don the brand. The initial roll out of the brand and associated programs should be as pervasive as possible. Staff will need to conduct a varied outreach approach to reach as many campus affiliates as possible, using tools including, but not limited to, campus wide emails, printed marketing materials, distribution via various social media accounts, and tabling in the Central Mall to engage students directly. After the initial roll out, continued outreach for consideration should include inclusion of key transportation program materials in orientation materials, presence of a table/booth at major campus events, and continued availability of printed materials in high traffic areas such as the library, residential halls, and the Town Center.

It is expected that the design and web developments associated with recommendations CO.1, CO.2, and CO.3 would be completed in tandem for a cost of approximately $30,000.

CO.2. Create a prominent and user-friendly transportation-specific website

Description: A streamlined, stand-alone, and user-friendly transportation website is essential to communicating policies, programs, and services and creating a welcoming environment. A functional website is also essential to minimizing administrative burden, as common issues can be addressed and simple processes can be accomplished online instead of in person. Finally, websites can help to communicate the benefits of certain programs, such as potential financial savings or ability to reducing emissions.

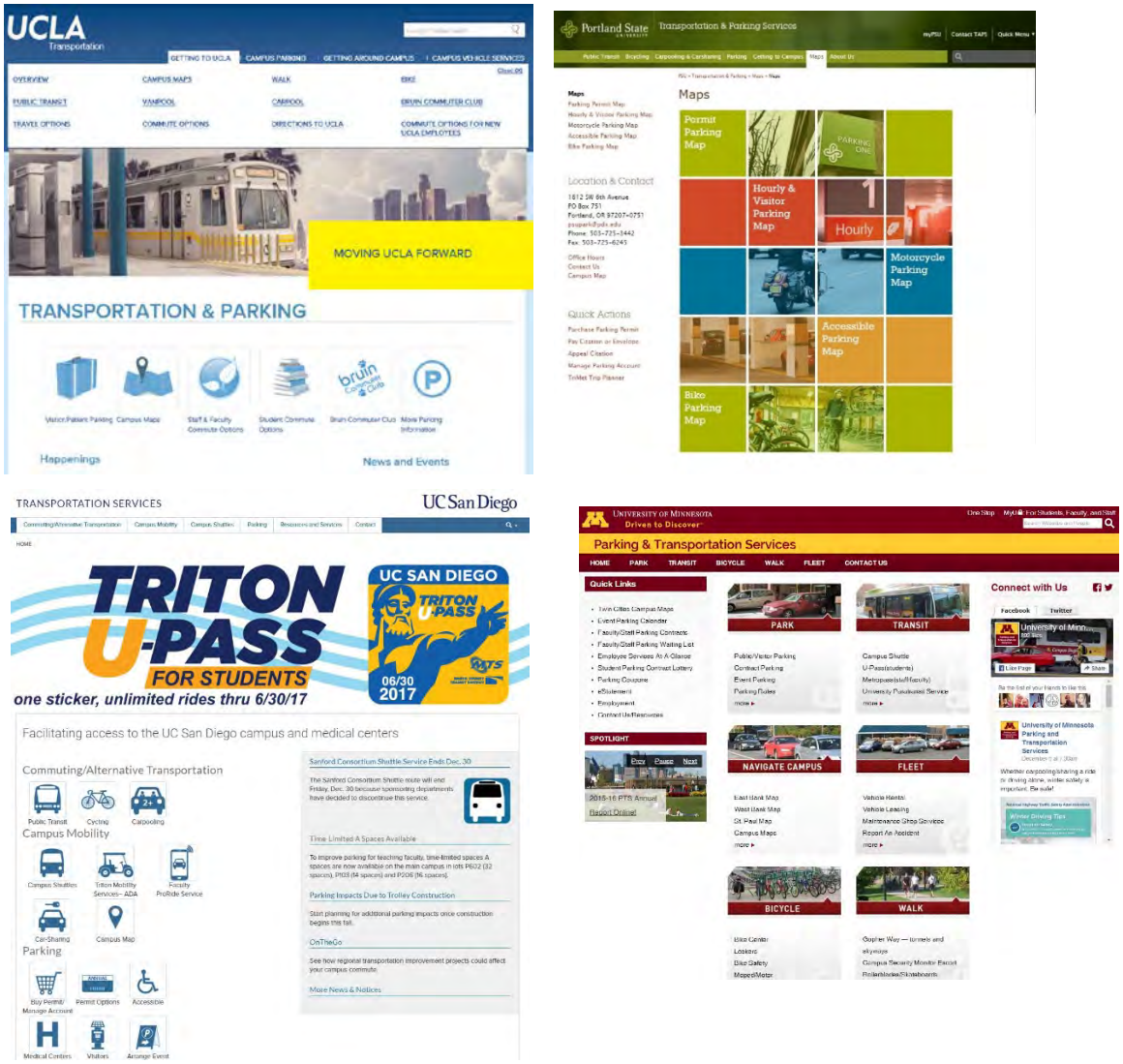
The existing parking and transportation website provides only the most basic information and it can be difficult to find some information, especially related to transit, biking, walking, and TDM programs. Existing website content is heavily geared toward parking permits, with a section labeled "Alternative Transportation Resources" that covers everything else including ridesharing services, Zipcar, bicycles and links to VCTC bus services.

Specific components of a high-quality campus transportation website include:

- Specific sections/pages for each user type (student, faculty, staff, visitor)
- Specific sections/pages for each service/mode, including:
  - Parking: information on permit costs, forms, lot locations, citations, payment options, etc.
  - Shuttles and Transit: information on shuttle/transit services (routes, frequency, costs, etc.), passes, incentives, etc.
  - Bicycling: information on bicycling routes, amenities, incentives, programs, safety tips, etc.
  - Walking: information on walking routes, amenities, incentives, programs, safety tips, etc.

  - Ridesharing/Ride matching/Carpooling/Vanpooling/Car sharing: information on program specifics, incentives, enrollment procedures, etc.
- Ordering function for parking permits
- Payment and appeal function for parking citations
- Easy to read campus maps, including:
  - Parking facilities (separated by type)
  - Transit/shuttle routes
  - Bicycle/pedestrian facilities and access
- Links to non-campus transportation resources, such as local transit agencies and commuter programs
- Real-time parking information (availability)
- Real-time shuttle arrival/departures information and maps
- Car sharing pod locations and reservation services
- Bike sharing pod locations and reservation services

Figure 4-26 Examples of University Transportation Websites



Action steps: The website must incorporate the finalized branding effort developed as a result of recommendation CO.1. The website's design content should reflect new and future programming, and provide all necessary information for affiliates to make use of these programs. The creation of the standalone webpage may be handled internally or outsourced. In either case, coordination with campus IT is necessary to ensure seamless integration of the new website. Furthermore, IT or the web developer should be involved to confirm that the website can incorporate future enhancements, such as real-time information. Once launched, the CSU CI will need to publicize to ensure the webpage can be established as a resource for all affiliates. Website updates, operations, and general marketing should be linked to social media accounts. Lastly, the new TDM Manager will be responsible for updating content as necessary.

It is expected that the design and web developments associated with recommendations CO.1, CO.2, and CO.3 would be completed in unison for a cost of approximately $30,000.

CO.3. Expand goCI and make it one-stop location for all transportation information

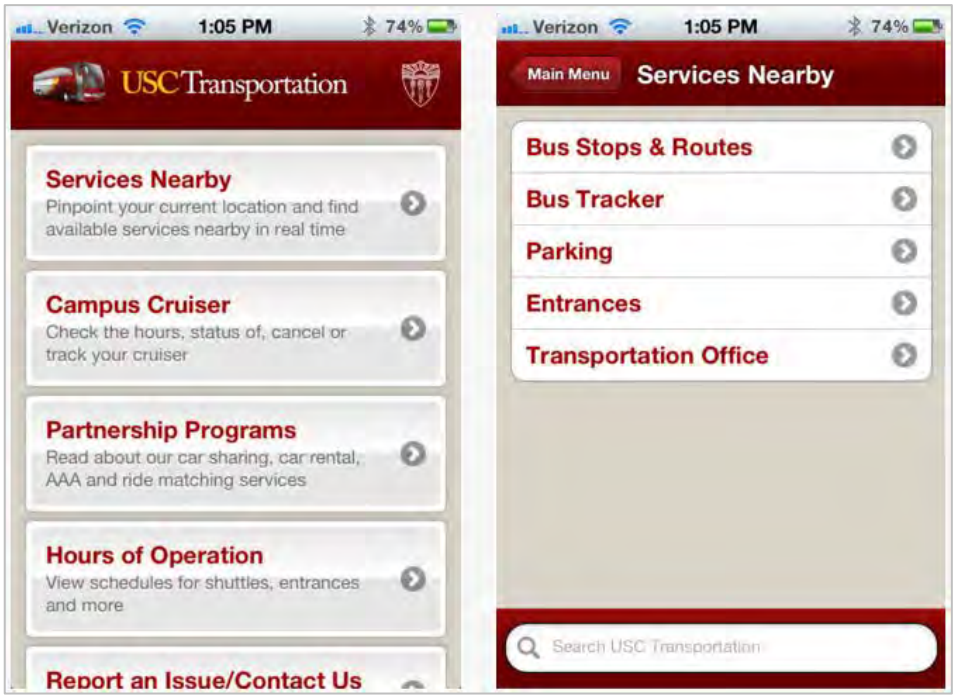
Description: In addition to leveraging the goCI brand to market mobility services (CO.1), the goCI app itself should be substantially enhanced to create a single, integrated smartphone and tablet app that provides information on all travel options on campus. The ubiquity of smartphones and tablets, and the ability of simple software to provide key pieces of information, both static and dynamic, make apps an excellent option for informing students, faculty/staff, and visitors about mobility programs. Potential elements of a goCI transportation app include:

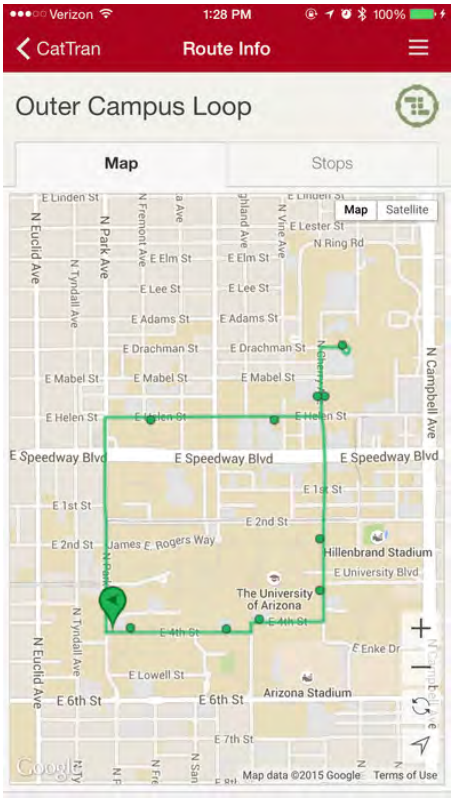
- Parking lot locations with real-time space availability (see Strategy P.6)
- Parking payment portal
- Parking permit applications
- Transit schedules with real-time arrival information (see Strategy T.3)
- Other public transit information, where applicable
- News and service updates
- Customized maps of bike and pedestrian facilities
- All TDM programs and services (e.g. ridesharing and ride-matching services, car-sharing information, Guaranteed Ride Home)

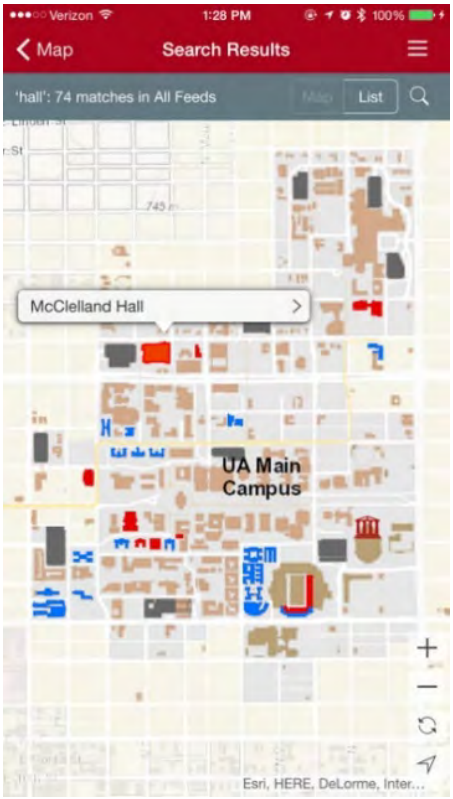
Action Steps: As with the transportation website (CO.2), branding will be a significant component of the app to ensure uniformity across all campus sources of information. App development could be handled internally by IT or contracted to a third party vendor. In order to maximize cost efficiency, it may be beneficial to develop the app alongside development of the updated transportation website. Alternatively, the app could be developed as part of a second phase of the overall transportation website, if deemed appropriate by staff.

It is expected that the design and web developments associated with recommendations CO.1, CO.2, and CO.3 would be completed in unison for a cost of approximately $30,000. In addition, annual maintenance costs for the app is estimated at about $1,000 annually.

Figure 4-27 USC and University of Arizona Transportation Mobile Apps





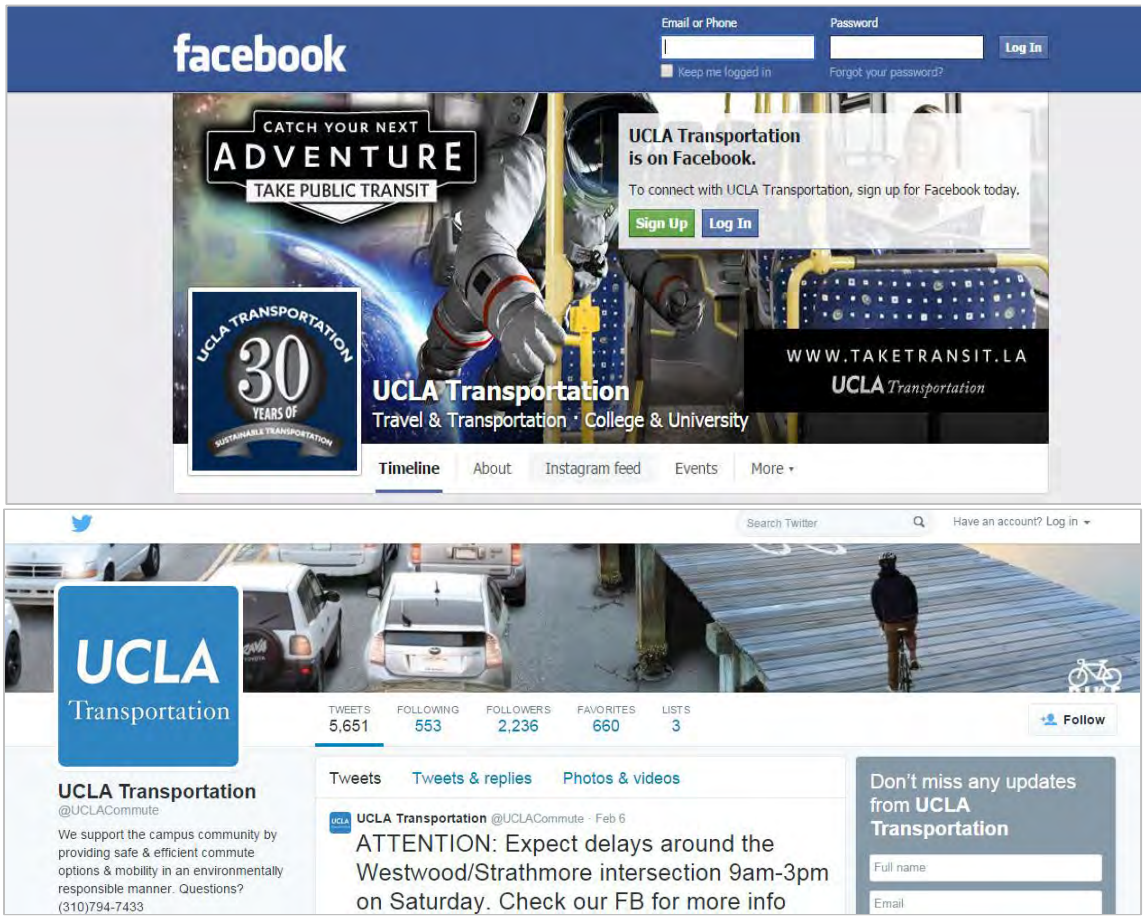


CO.4. Establish social media presence for transportation and TDM programs

Description: Many colleges and universities use social media to disseminate information about travel choices, improve access to services, offer promotional rewards, and generate "buzz" about travel choices among existing and potential client groups. These pages also allow people to post and discuss relevant transportation issues and concerns.

It is highly recommended that CI coordinate with the Associated Students to develop a dedicated social media presence for its current and future transportation and TDM programs. This strategy will be a crucial component to its communication and outreach efforts, especially among students who utilize social media as part of their everyday lives. Any social media efforts should be well-integrated within the new brand, website, and app.

Figure 4-28 Facebook and Twitter Accounts, UCLA Transportation Services



Action Steps: The new TDM manager will be tasked with coordinating social media communications. A framework should be developed for establishing guidelines for the type of information that is posted and frequency. Ideally, social media will be used to disburse information associated with new services, potential disruptions to typical service, and to garner general publicity for TDM programs as necessary. It should be noted that a higher frequency of social media communications will assist in the proliferation of TDM program awareness among students. Additionally, due to the quick and direct nature of social media, the tools can be used

to notify affiliates of full parking lots, bus delays, or other disruptions to the transportation network.

CO.5. Design and implement a comprehensive signage and wayfinding program, including real-time parking information

Description: The importance of signage cannot be understated, as it often serves as the initial point of contact. Well designed and informative signage, in conjunction with the branding effort, can instill confidence as well as assist with navigation. This is essential in establishing a multimodal campus and further demonstrating the campus's commitment to supporting alternative modes of transportation.

The California State University Channel Islands Campus Exterior Wayfinding Master Plan, completed in 2014, provides effective design recommendations for improving wayfinding throughout campus, including a simplified yet visible approach towards identifying parking lots and associated parking permit dispensers. The recommended wayfinding strategies would help visitors navigate upon arrival to campus, and help direct them between campus destinations. In addition to signage identifying parking lots, real-time parking information can be used to inform affiliates about availability at different lots, which would facilitate the direction of drivers to an open parking space. Real-time signage should be located along the main entrance to the University, stating the availability of spaces at key lots, to guide drivers to parking lots in the periphery of campus when lots in the core of campus are full. Such signage would need to be developed in a fashion that matches the aesthetics of the campus wide wayfinding plan. Potential locations for signage reflecting real-time parking availability would be along University Drive, informing drivers which parking lots they should drive to, and at the entrance of lots to limit unnecessary circulation.

Signage associated with identifying transit access locations, and bicycle routes are not noted in the wayfinding study, but also represent opportunities to extend wayfinding aesthetics to improve transportation options at CI.

Action Steps: In possession of a wayfinding master plan, CI must make a determination associated with a timeline for implementation. Once a strategy is in place, the recommended placement of signs and wayfinding developed in 2014 should be reviewed to ensure it will serve the campus effectively considering changes in the campus land scape that have occurred since 2014, and that are expected to occur in the near future.

The development of transportation related signage, and consulting fees to ensure proper placement, is estimated to cost about $50,000.

Figure 4-29 Proposed Parking Identification Pylon

Source: CI Wayfinding Master Plan, 2014

Figure 4-30 Portland State University Real-Time Parking Informational Sign

CO.6. Expand and diversify promotional activities for transportation

Description: The most successful parking and TDM programs look for creative ways to promote mobility options and programs, making them highly accessible to a broad variety of campus affiliates. Promotional activities help build a base of support for the campus' TDM investments, building on the consistent messaging and marketing strategies. These promotional activities also serve as employee benefits and are proving to be increasingly successful and effective at promoting alternative modes of travel. Similar to product advertising, these programs and campaigns aim to attract new users through clubs, services, and incentives that people would want to take advantage of. Campaign components to help commuters identify benefits can include the following:

- Media Campaign: To reach a broad audience, information about programs and services can be spread through University outlets such as the radio or school newspaper.
- Bicycle Safety Campaigns: Organized week long events that promote the benefits of bicycling to the campus wide audience and include events such as fun rides and bike breakfasts.
- Promotional Fair: An on campus event that would provide information on services and incentives for walking, bicycling, and taking transit to campus. This can include the distribution of information on cash incentives, commute challenge events with prizes, and informational documentation such as bicycle maps, transit maps, and information on discounted transit passes.
- Consistent Campus Presence: In addition to standalone campaign components, TDM program information should be as pervasive as possible. This can be accomplished by tabling at all campus events, ensuring program information is included in orientation packets, giveaways of items such as bike helmets and locks, and free transit days where affiliates are provided travel training to experience how to use transit to school.

Figure 4-31 Transportation Promotional Event at College of Marin

Action Steps: Once a TDM coordinator is hired, a key task should be to develop a transportation campaign for CI that can be expanded over time. Initially the focus would be on raising awareness of existing CI transportation programs, promoting web resources, and associated TDM programs available to affiliates. Eventually a comprehensive education and awareness campaign should be established around non-motorized transportation options. The campus can utilize existing design and communications departments to develop advertising campaigns to raise awareness around transportation. The campus should aim to host a minimum of two annual events for transportation awareness that could coincide with other related events.

TRANSPORTATION DEMAND MANAGEMENT (TDM) PROGRAMS

Many elements of a strong TDM program are currently in place, but this group of strategies focuses on formalizing a TDM program, bringing all the pieces under one system, and building on them. Fundamental to success is ensuring there is staffing to initiate, implement, and manage these efforts. Also key is using communications tools to get people interested in all the other programs and initiatives. Measuring results carefully and consistently will help to track progress and refine approaches as travel behavior changes.

TDM.1. Hire a Parking & TDM manager

Description: Implementation of this comprehensive Parking & TDM Plan requires additional staffing to manage the various existing and proposed transportation programs. A dedicated Parking & TDM Manger is essential in running the day-to-day administrative and transportation programs, answering program and service inquires, and initiating and promoting new programs.

Action Steps: Creation of a Parking & TDM Manger role is essential, and the position should be added immediately. As implementation of the program progresses, the Manger will need assistance, and a Program Associate position will also likely need to be filled.

The roles and duties of the position must be clearly defined in the immediate term and expand as the program develops to cover other responsibilities such as new programming, events and promotion, reporting, and data management.

This strategy would cost approximately $180,000 per year, including benefits (with 2% growth annually).

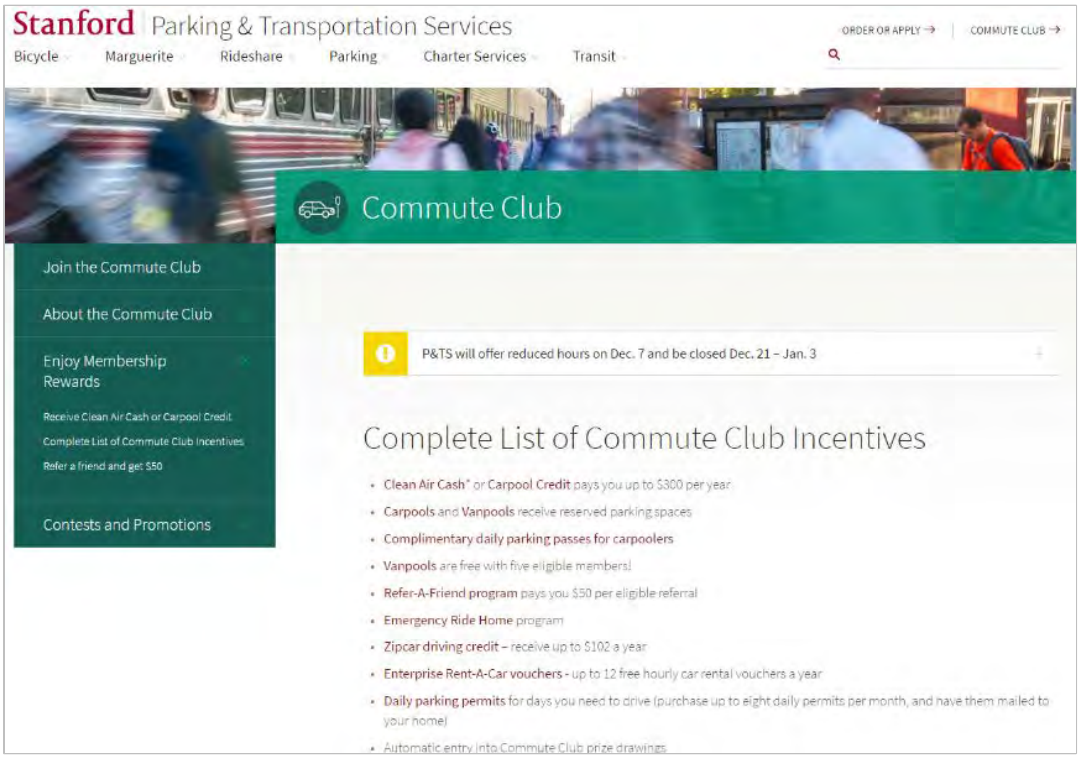
TDM.2. Create a formal rewards or incentive program for all affiliates

Description: The institutions that are most successful at reducing parking demand and encouraging commuting by non-auto modes incorporate direct financial subsidies and incentives into their commuter programs.

The most effective way to encourage people to use non-auto modes is to provide a direct cash payment for use on any expenses, transportation or otherwise, in exchange for committing to use non-auto modes for the term of the “cash-out” program. For example, at Stanford University, participants agree to forego the ability to buy a parking permit for the length of a given academic year in exchange for roughly $300 in cash.

A less direct alternative to this approach is to offer a flexible transportation benefit that community members can use for any transportation-specific expenses, including paying for the portion of a transit pass not covered. “Pay-not-to-drive” programs are one of the most effective means to encourage employees not to drive alone to work. Such programs ease the institutional task of allocating scarce parking or managing a growing demand for more parking. Finally, enhanced and more frequent prize drawings can also serve as an incentive that encourages travel via alternative modes.

Figure 4-32 Stanford University Commute Club Benefits



Action Steps: CI should evaluate the different incentive options within the context of ongoing financial resources. An initial program might focus on simpler rewards programs, such as prize drawings for transit riders or carpoolers. Over time, the rewards program could evolve into a Commuter Club or a points-based rewards system, where users get benefits for various transit, biking, walking, or carpooling activities. More advanced rewards programs are possible in the long-term via smartphone or mobile-based applications, which allow for customized programs by employee.

This strategy is estimated to cost approximately $30,000 per year, with a $40,000 set-up fee.

TDM.3. Ensure that all employees have access to federal payroll deduction programs

Description: Federal payroll deduction programs allow employees to deduct the cost of their sustainable transportation costs from their salary at a pre-taxed price. Providing easy-to-understand access to Commuter Tax Benefits and emphasizing sustainable mode options can help employees realize the existing financial incentives associated with sustainable transportation options, providing a key employment benefit.

Action Steps: Commuter Tax Benefits information should be distributed to all employees through a clear and concise manner. The University should set up an online resource to establish and explain options available to employees and actively promote the program. Example benefit portals include WageWorks (www.wageworks.com) or Commuter Benefit Solutions (www.commutercheckdirect.com).

This strategy is estimated to cost approximately $2,000 (one-time cost).

TDM.4. Evaluate fully subsidized transit passes for students and staff

Description: In recent years, growing numbers of transit agencies have teamed with universities or employers to provide partially or fully subsidized transit passes. The primary objective of this strategy is to eliminate the cost barrier to using transit, and thereby incentivize the use of local and regional transit and reduce vehicle trips. Universities typically contract with a transit provider to allow students, employees, or both to have unlimited free rides. The university pays the transit agency an annual lump sum based on expected student ridership, and campus affiliates simply show their identification to board the bus. As a result of the passes, transit ridership typically increases, and some people shift from driving to riding transit to reach campus.

Action Steps: Coordinate with VCTC to negotiate a cost and strategy for a lump sum payment for a fully-subsidized transit pass, based on expected enrollment figures.

This strategy is estimated to cost approximately $33,000 per year, though the figure requires further analysis and negotiation.

TDM.5. Create an impromptu carpool program

Description: Many universities and large employers offer impromptu carpool parking permits at a discounted rate. Such programs enable infrequent carpools to still enjoy the parking benefits afforded to quarterly/annual carpools while also enjoying the flexibility and convenience of utilizing different alternative modes to access campus. Typically, permits are valid for one day only.

Action Steps: Impromptu carpool permits should be valid for one day only, and be cheaper than a daily visitor permit, which currently costs $6. Permits would be similar to and supplement proposed carpool permits (P. 7). Impromptu carpooling permits would essentially enable the purchase of low-cost daily carpool tickets for those registered with the Green Commuter program. Permits would be available for purchase online via a new website (CO.2) and would only be available to registered carpoolers. Additional carpool parking spaces in certain lots and garages may be necessary as a result of these new permits.

This strategy would cost approximately $12,000 per year.

TDM.6. Create a transportation coordinator position in each student housing complex and for faculty/staff

Description: Existing and future campus housing is an ideal place to encourage students to make sustainable transportation decisions. An in-house transportation coordinator can provide easily accessible information and encouragement to utilize sustainable transportation options available to students in their new environment.

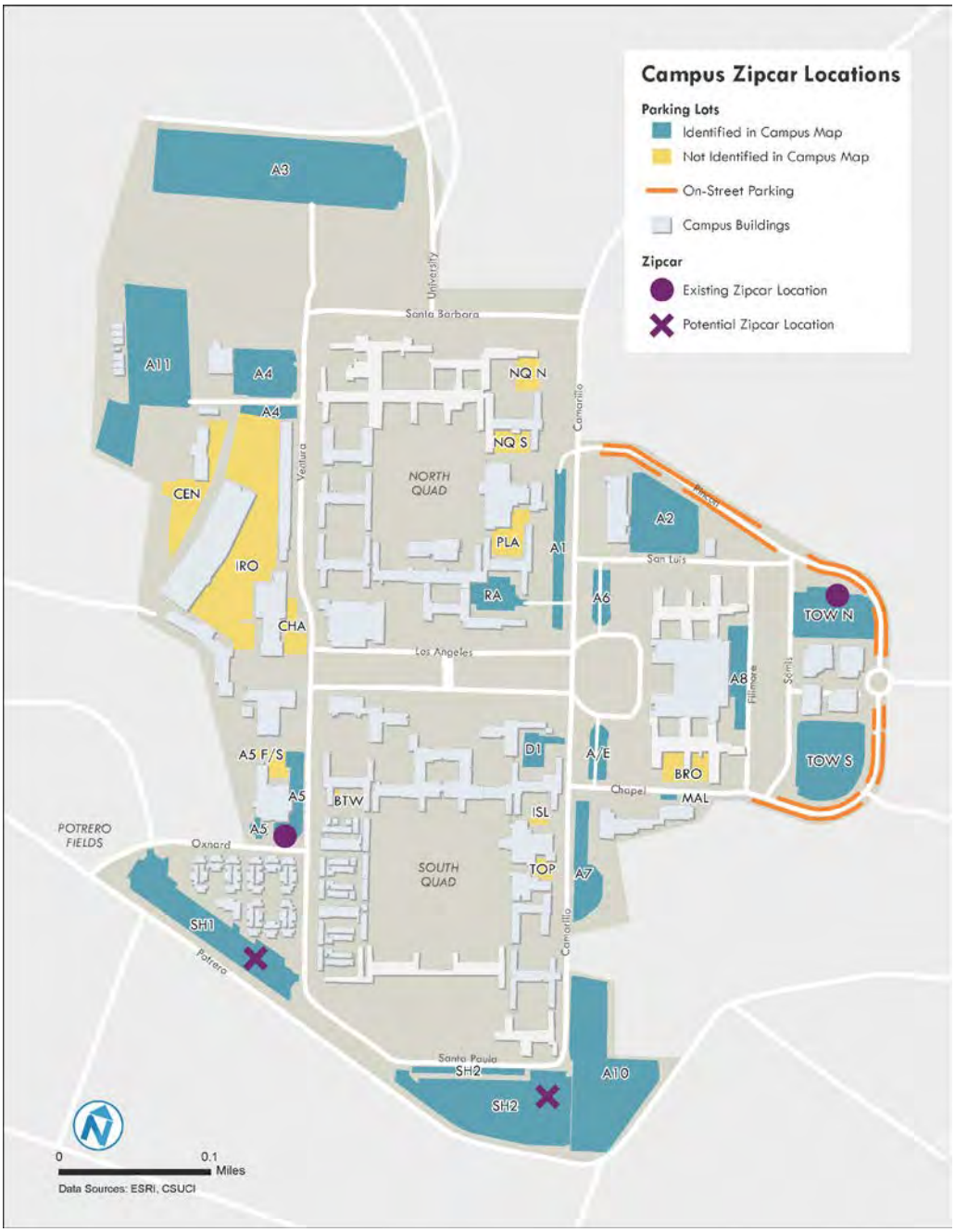
Action Steps: An RA or staff person can be designated as transportation coordinator in each complex and ensure information is consistently and effectively distributed, and act as a liaison between students and transportation services. Although there is less turnover in faculty/staff housing occupants, information should be similarly distributed in those facilities.

This strategy would cost approximately $10,000 per year.

TDM.7. Expand and diversify the car sharing program

Description: Car sharing programs allow people to have on-demand access to a shared fleet of vehicles on an as-needed basis at an hourly or mileage-based rate. Car sharing has become very popular on various university and hospital campuses. Through car sharing, individuals gain the benefits of private vehicle use without the costs and responsibilities of ownership. In addition, research has shown that car sharing reduces vehicle ownership and vehicle trips.

Figure 4-33 Existing Zip Car Locations on Campus



Action Steps: CI currently has two Zipcars available on campus. One option would be to expand the Zipcar fleet as the campus grows, with additional marketing of the service. Many students, via the survey and outreach meetings, stated that they were not aware of the service.

Another option would be to expand the type of car sharing services available, such as working with a peer-to-peer car sharing vendor. Peer-to-peer car sharing services are similar to traditional car sharing services, except individuals rent out their own vehicles, instead of car sharing companies owning a dedicated fleet. Car share services screen drivers, manage insurance, and coordinate the rental process. Meanwhile, car owners post their vehicles on the service's website and determine when they are available to rent and whom they will rent to. All liability is handled by a third party intermediary. Several universities have partnered with companies, facilitating the sharing of vehicles among students.

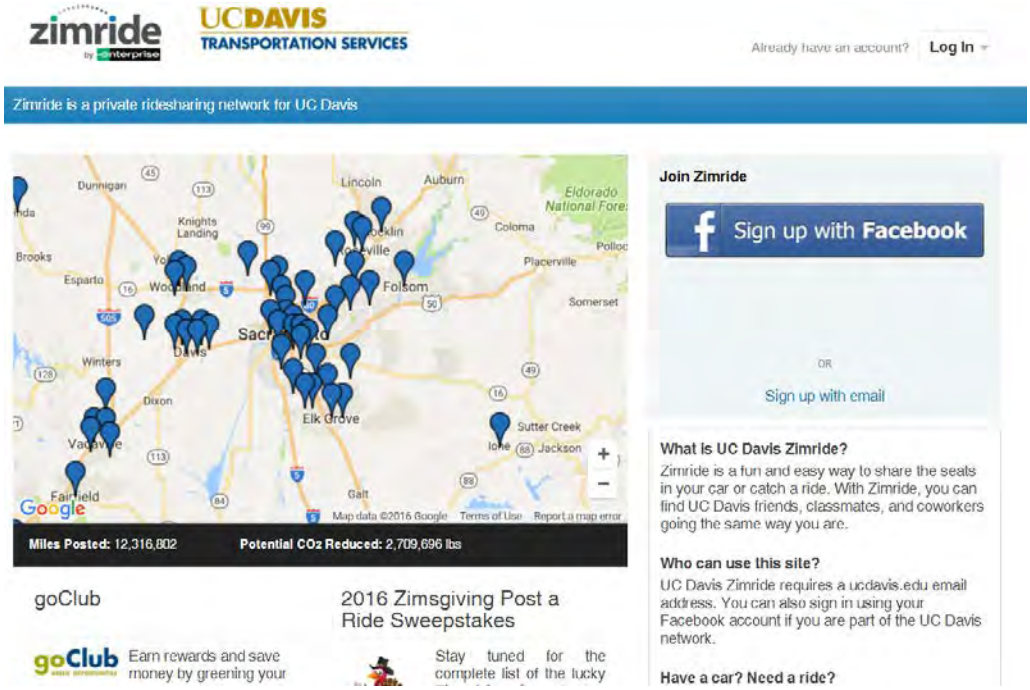
This strategy assumes a cost of approximately $5,000, for any operations and infrastructure adjustments needed, as well as a marketing campaign. Other costs associated with this strategy are covered by staffing and ongoing marketing costs associated with other strategies.

TDM.8. Create an internal ride matching network

Description: Ride matching services facilitate pairing of carpools and vanpools. Typically, programs take the form of an online website platform that allows participants to post either a ride they intend to share or a shared ride request, including timing and origin/destination information.

In the travel survey disseminated to CI affiliates as a part of the existing conditions effort of this plan, 22% of respondents indicated that they would like to carpool, but did not know how to find a passenger or ride. A streamlined, easy-to-use ride matching service could help capture some of these would-be carpool/vanpoolers.

Figure 4-34 Zimride at UC Davis



www.zimride.com

Action Steps: While a public ride matching service is available via the Ventura County Transportation Commission (VCTC)[8], research has found that private "closed" networks are most likely to encourage ride sharing because people feel more comfortable when potential partners are limited to people they know and other coworkers. University campuses are ideal for this type of network because there is an established shared location. Similar to TDM.5 above, options for ride matching can range from simple (e.g. a Facebook page or a physical ride board) to sophisticated (e.g., an app-based network with easy user interface that allows night-before scheduling).

Many universities contract with Zimride to provide online ride matching services. Zimride has a website that combines Facebook and a proprietary route-matching algorithm to allow members to share seats in their cars or catch a ride. With this service, CI students, faculty, and staff can find classmates and colleagues who wish to share a ride to campus. Because Zimride uses the Facebook platform, drivers and riders can view other user profiles for common networks, interests, and friends before deciding to share a ride. Drivers offer rides, listing a price they would like people to pay so they can share costs, while riders can respond or post a request for rides.

Costs vary, but it is estimated that this type of service would cost approximately $25,000 per year.

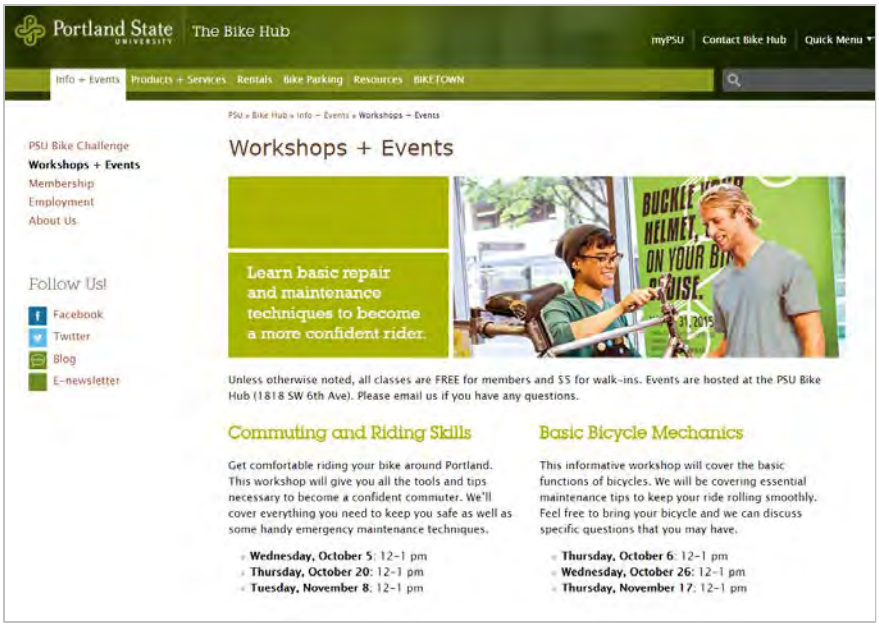
TDM.9. Provide bicycle safety and education classes

Description: Bicycle safety programs promote bicycle safety and remove barriers to bicycle use through education and encouragement. Open to all campus affiliates, a certified bicycle

[8] http://www.goventura.org/rideshare

instructor can volunteer or be hired to teach with the course, ensuring quality information is being provided.

Figure 4-35 Portland State University Bicycle Education Workshops and Events



Action Steps: CI staff would need to establish an ongoing education program taught by certified bicycle instructors, per the League of American Bicyclists. Education programs typically include periodic riding skills classes and bike repair classes. The program should be consistently marketed with other bicycle and TDM strategies, and is a good opportunity to promote other TDM incentives.

This strategy would cost approximately $10,000 per year, and assumes a monthly fee of approximately $200/month.

TDM.10. Conduct annual travel survey and monitoring

Description: Data and tracking are key components of an effective campus transportation system. Ongoing monitoring and surveying should be conducted, and feed into ongoing performance metrics. Annual reporting can improve transparency and inform future decision making. Metrics should be adjusted annually, based on performance and progress. Findings should be documented in a public annual report.

Action Steps: In order to effectively measure the success of the TDM programs, the TDM Manager will need to track student, faculty and staff travel preferences, travel patterns and changes over time as new TDM programs are rolled out. Over time, specific programs can be tracked for effectiveness and determined whether or not adjustments need to be made to meet the TDM goals. Additional details are provided in Chapter 6, but primary components of the CI monitoring plan would include:

- Annual transportation survey, including mode split
- Parking occupancy and system performance
- Collisions

- Inventory of new or enhance transportation infrastructure
- TDM program utilization and satisfaction
- Transit ridership and pass sales
- Average vehicle ridership
- Transportation-related carbon emissions
- Bicycle counts and facility surveys

This strategy would cost approximately $1,000 per year.

TDM.11. Partner with a TNC to enhance guaranteed ride home services

Description: Uber Technologies Inc. is the first Transportation Network Company (TNC) to establish a partnership with universities through Blackboard Inc., allowing students to pay for Uber rides with their student campus cards.

Blackboard Inc. is the world's leading technology company, serving hundreds of universities. The company's payment system, Blackboard Transact, is used by universities to allow students to deposit funds onto their student cards. Student cards are typically used for any student expenses on campus, such as books, campus food, and supply fees. The new service allows students to deposit funds for the specific use of rides with Uber.

Currently, 18 universities across the country have integrated the Uber feature to their Blackboard Transact systems. Students at participating universities can select to use a student card as their form of payment on the Uber application. Once they register their card by selecting their university and logging in using their existing card credentials the application will automatically use the card to pay for rides like a typical Uber transaction.

The intent of this program is to provide university students with an alternative transportation option. By utilizing a student card, it allows for students to streamline their school expenses and allow for funds to be allocated from their student account if they wish.

The Uber campus card program is only available to universities with the Blackboard Inc., Blackboard Transact system. Universities seeking to include this program as part of their transaction system would work directly with Blackboard Inc. to establish the relationship and add the feature to their existing system. At this time anyone can place an inquiry for their university to be included in the Uber campus card program through the Uber website campus card webpage.

Action Steps: CI is currently under contract with Blackboard Inc. as part of the CSU system. The university is in a good position to establish a relationship with Uber through the Blackboard Inc. systems already in place.

This strategy would cost approximately $11,000 per year.

FUTURE, LONG-TERM OPTIONS

Several policies were screened for context and implementation viability, but were not included in the preferred package listed above because of their expense. These options are described below, and could be added depending on actual campus growth and should additional funding opportunities occur.

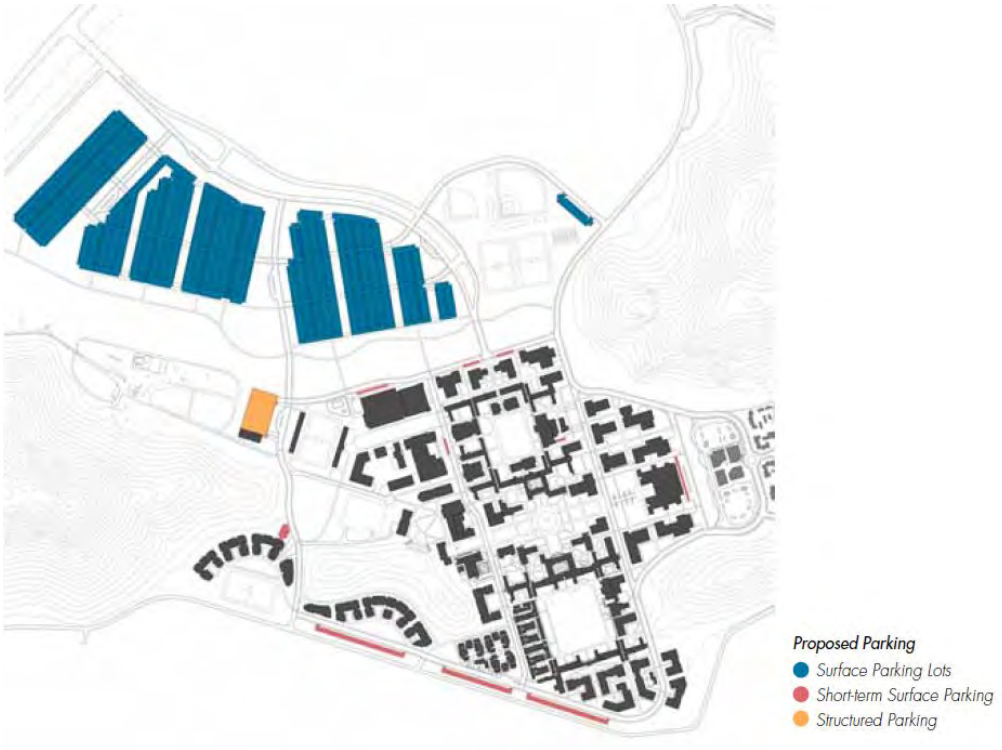
Transition main campus loop to a "shared street"

Description: Traffic levels are currently induced by motorists searching for parking in the campus core. If the campus core is fully converted to limited vehicle access, resulting in low traffic volumes, a shared street design may be appropriate in the long term, in which all modes use shared street space at very slow speeds. A Shared Street is one approach to finalize the transition to limited vehicle access in the campus core (see Strategies CI.3 and CI.4).

Shared streets minimize motorist-pedestrian conflict through the removal of traditional guiding features such as road markings and distinct curb lines. A safer environment for pedestrians and cyclists is created as drivers are likely to reduce their speed when priority in the right-of-way is uncertain. Shared streets are typically free of traffic lights, stop signs, curbs, and painted lines that define separated spaces for road users. Instead, visual and tactile cues distinguish between pedestrian-only and shared zones. A variety of materials, treatments, and objects may be incorporated into creating visual/tactile cues, including:

- Textured material on shared zones that contrast the smoother surfaces at pedestrian–only zones
- Use of detectable warnings for detection by people with visual impairments
- Street furniture, including benches, planters, and bicycle parking to help define a shared space
- Bollards and other architectural elements that define entry into the shared space
- Landscaping and raised planters
- Changes in road geometry to create shortened sight lines
- Signage and tactile warning strips indicating the entrance to a shared street
- Staggered blocks of landscaping and/or parking act as chicanes

Figure 4-36 Peripheral Parking Strategy at Full Build-out



Source: CSUCI Vision Plan

Figure 4-37 Shared Street Example (Portland State University)

Source: Google Street View Imagery

Figure 4-38 Shared Street on Harvard Campus

This strategy would cost approximately $1,200,000 in design and construction fees. If implemented, it would take place in the long-term time horizon, as parking supply is removed from the interior of campus.

Work with VCTC to improve service frequency on CI Serving Routes

Description: Existing transit service currently provides 60-minute frequency to Oxnard and 30-minute frequency to Camarillo. The existing frequencies are commensurate with the existing size of the campus, ridership levels, and available funding. However, 30- and 60-minute frequencies will limit the ability to attract new "choice" riders or shift a portion of CI affiliates to transit. Improving service frequency to 30-minute or 15-/20- minute headways to Oxnard and Camarillo, respectively, would improve the usefulness of the service, making it a more attractive option for those that need to travel to and from campus regularly in a timely manner. Another option is to increase service frequencies at peak commute periods to ensure easy connections when most affiliates are accessing campus. However, improving the frequency will require substantial new resources, which should be evaluated in the context of campus growth and revenues.

In recent years, VCTC completed a service assessment to evaluate the structure and routing of the services. One recommendation was to combine the Camarillo and Oxnard lines, in order to better connect Camarillo and Oxnard. This recommendation was slated for a later phase of implementation of the transit plan, so will likely not be implemented in the short term.

CI should also work with VCTC to evaluate additional service modifications that would potentially adjust routing to serve other desirable locations and minimize transfers and connecting wait times. In the travel survey and workshops, affiliates indicated an interest in using transit, but found its coverage to be limited within Oxnard and Camarillo, and the multiple transfers to the CI lines to be a major barrier. A few modest route and timing adjustments, while requiring additional resources, would potentially expand the ridership base.

As campus grows, evaluate implementation of a campus circulator shuttle.

Description: As the CI campus population grows and the physical footprint of campus expands, intra-campus travel demand is likely to increase. This is due to several factors, including new on-campus housing and expansion of academic uses, a greater mix of 24-hour, residential-supportive uses, and, most importantly, the transition of parking facilities away from the campus core and creation of new parking supply on the northwest edge of campus. The primary objectives of a circulator shuttle system are to:

1. Provide a safe, secure, and convenient travel option for intra-campus trips
2. Complement new parking pricing strategies designed to redistribute parking demand to the more remote, and less convenient, parking facilities
3. Better enable CI to serve demand for intra-campus trips, while also reducing drive-alone vehicle demand on campus roadways as the campus population increases in the coming years
4. Establish a framework for possible future expansion of the shuttle system beyond the immediate vicinity of the CI campus.

The circulator shuttle is not included in the preferred recommendation package of this Plan but may become more viable and necessary over time. For example, if CI proceeds with building a Seniors apartment complex as part of University Glen expansion, they should seriously consider a campus circulator, at minimum to connect these senior apartments with the two VCTC hubs. This need could be reduced if the VCTC service was extended into the campus core.

If this service was implemented it may wish to connect key parking areas, academic and student life buildings, Town Center, University Glen, student housing, and any communities of concern, such as senior housing. These locations are identified in Figure 4-40 represented in blue. Based on campus development plans, it is mostly likely to be useful at full campus build-out.

Figure 4-39 Sample shuttle details

Service Detail	CI Recommendations
Hours of operation	7 a.m. – 6 p.m., Monday-Thursday
Frequency	20 minutes – Due to small size of campus, the shuttle could make fairly frequent stops.
Potential routing/stops	VCTC/regional shuttle stop, primary parking area, senior homes (when/if built), University Glen, Town Center, primary class room stops, dining hall stop, student housing
Vehicle type	Cutaway van 
Cost	~$400,000 initial investment; $206,000 annually moving forward

Figure 4-40 Sample Shuttle Stops (Identified in Blue)

Source: Base map taken from CI 2025 Vision Plan

Example: CSU Long Beach

CSU Long Beach, with an enrollment of 37,430, operates on-campus shuttles, and in 2015 began operating off-campus shuttles, with a system now totaling five lines. The shuttles operate during fall and spring semesters. Most of the services run Monday through Thursday, with limited Friday service. The location and occupancy levels of the shuttles is tracked and shared on CSULB Mobile App or by visiting a campus website. The shuttles run on compressed natural gas, which produces 30% less emissions than standard diesel fuel. The shuttles are free to students, faculty, and staff with a valid campus ID, operating over 18,500 shuttle hours in 2015/2016. The shuttles also provide accessibility service for individuals with disabilities. The five routes, including on and off-campus routes, have impressive ridership figures, with nearly 700,000 rides in 2015/2016. The service is funded by parking permit sales and citation revenue, and is a component of a broader, integrated package of sustainable transportation strategies.

Explore benefits and disadvantages of a CI-operated regional transit service

Description: CI may also wish to consider creating their own transit shuttle system to connect to regional destinations. Currently, the campus helps fund VCTC service. CI could explore the long-term option of replacing or complementing VCTC service – there is certainly no point to replication. To avoid potential resistance from VCTC, CI should need to work closely with VCTC to ID service gaps and who should do what. Having two services is less attractive and convenient, so ensuring that users have an integrated, seamless system is key.

If implemented, this would likely be an expansion of the on-campus shuttle system discussed in the previous Strategy, so further consideration, planning, and implementation of either Strategy should be considered in concert.

There are notable advantages and disadvantages to creation of this type of system.

Pros:

- Ability to better serve specific CI needs and origins/destinations in region
- CI-specific service more likely to attract CI riders
- Could better penetrate campus and serve new housing and University Glen
- Overall improvement to multimodal system

Cons:

- Likely much more expensive – new administrative burden even if contract out service
- Likely many years until have the population density to support

Example: U Mass Transit

U Mass Transit is a student-owned and operated transit system providing 14 bus routes serving eight towns, four colleges and the University of Massachusetts, Amherst (U Mass). The system began in 1969 with a campus shuttle serving U Mass. In the early 1970's U Mass Transit received a demonstration grant to begin serving neighboring student apartment complexes. In the late 1970's, U Mass and the neighboring four colleges began running vans between the schools to facilitate educational exchange. Eventually, the U Mass system became a contract operator for the Pioneer Valley Transportation Authority (PVTA), which serves 23 towns. U Mass Transit has the contract to serve the eight towns in the northern part of the authority's district. U Mass Transit is a university department. They do the majority of transit planning and route design in their service area. The system is financed by a mandatory U Mass student fee ($26 of each student's tuition is earmarked for transit). Most of the remaining operating budget comes from federal and state operating funds passed through the PVTA. The other colleges in the service area also contribute to the system. In addition, the Town of Amherst sponsors three routes, and the U Mass parking system pays about $500,000 for a six-bus shuttle system that runs around campus, to dorms and peripheral parking area.

Partner with County and local jurisdictions to improve regional bicycle facilities

Description: CI can improve bicycle facilities on campus, but partnerships with regional agencies are essential to ensure facilities connect to safe bicycling routes to and from campus. Lewis Road acts as the main access point to CI, running north/south along the western campus edge, connecting CI to Camarillo, Oxnard, and nearby regional highways. Today, Lewis Road has Class II bike lanes, but it is important to emphasize that the heavy vehicle traffic and high speeds along this roadway discourages drivers.

Recently, during the development of the Pleasant Valley Recreation and District Draft Open Space, Trails, and Greenway Planning Study (2012) the idea of a bicycle trail along Lewis Road was discussed, which would have connected CI to Camarillo and the Camarillo Metrolink station with a comfortable and safe piece of bicycle infrastructure. Though regional interest was

recognized, the project was not included in the plan due to restrictions on the study area. Additionally, in the Camarillo Circulation Element, the City expresses interest in working with Caltrans towards the beatification of SR-34 and Lewis Road. These two expressions of regional interest for future improvements along Lewis Road should be revisited, and potential funding sources discussed.

Figure 4-41 Regional Bike Path Along a Highway in Corvallis, OR

Action Steps: CI should coordinate with the cities of Camarillo and Oxnard, VCTC, and Caltrans to improve regional and intercity bicycle connections by creating a facility along Lewis Road. Though regional interest has been expressed, in order for this to be a reality, CI will need to champion the cause and rally support from the regional partners identified. Such an effort would require joint planning and funding effort between the University, VCTC, and other stakeholders. Capital investments in bicycle and pedestrian facilities are only useful to the extent that they are maintained. Keeping track of aging infrastructure and reporting deficiencies to the City can help ensure that facilities are kept in proper working order.

Develop a fully-staffed bicycle center on campus

Description: Full-service bike centers provide valuable support for bicyclists. Bike centers typically consist of bike parking, maintenance and repairs, educational programming, retail shop, showers, lockers, and changing rooms. These facilities often include a small staff to operate the facility and run the maintenance, education, and retail elements of the bike center. As opposed to developing conventional bike rooms, bike cages, or short-term bike racks, these facilities are valuable because of their focus on high-quality, value-added services geared toward new riders.

Action Steps: CI should establish a campus bicycle center to further support and encourage bicycle ridership to, from, and around campus. The Center should be located in a central area that is convenient to the campus major activity centers and bicycle routes. CI could manage the

operation of the facility itself or outsource the work to a contractor like Bike and Park, which operates bike centers in several cities across the U.S.[9]

Figure 4-42 UCLA's student run community bike shop operated in recreation center

Source: UCLA

Implement a phased campus-wide bike share system

Description: Bike share is an increasingly popular program that is successfully improving mobility and access on college campuses. Visitors can use the shared bikes to move about between local destinations much more quickly than they could on foot, without having to carry a lock or their own bicycle. Bike share has been particularly popular and effective in reducing the impact of intra-campus trips on parking demand. Programs are typically designed to support short, frequent rides, making commuters a key market for most programs. Much like car share, bike share offers users a dispersed pool of bicycles for short-term use. Users rent bicycles on an as-needed basis and can return the bicycle to any number of docking stations. In a campus setting, bicycle sharing is particularly attractive because it offers a flexible and inexpensive option for short-distance trips around campus. It can improve accessibility between periphery facilities (such as a parking lot or transit stop) and the campus core. Locations just outside a reasonable walking distance from campus can also now be reached within a 5-10-minute bicycle ride and no longer require a vehicle trip (or a much longer walking trip).

Bike share is a rapidly changing industry, but there are two main types of systems that should be considered for implementation at CI.

Station-based bike share systems: These type of systems are the most widely adopted type of bike share program in the country, providing customers with a network of stations with payment kiosks to rent a bicycle. Bicycles are rented from the docks using payment or a membership card to unlock a bicycle directly from the kiosk. Bicycles can be returned to any dock in the network

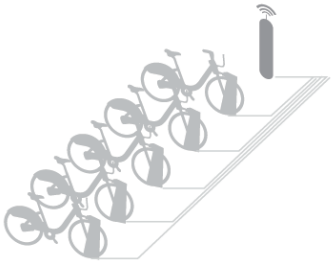
[9] http://bikeandpark.com/

Smart-bike systems: These systems utilize GPS tracking and an integrated fare payment and locking mechanism built into the bicycles frame, which is compatible with standard bicycle racks. These systems are relatively new, but offer the flexibility of not needing to be returned to a specific location, as some systems allow for bicycles to be left in a general area, rather than a specific hub.

Cost: Based on similar systems, it is estimated to cost $200,000 to establish the system, and an annual $90,000 for maintenance.

Figure 4-43 Bike share system options

Scenario 1: A traditional dock-based system with technology built into the docking stations



Scenario 2: An emerging hub-based smart-bike system with technology built into the bicycles themselves

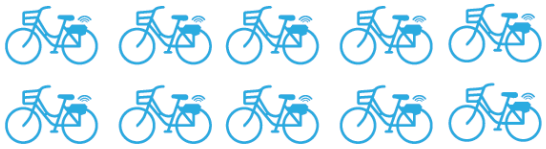


Figure 4-44 Bike share system options

Source: Social Bicycles

Figure 4-45 Bike share system location suggestions

Add a support staff member to assist the PTDM Manager role in expanding TDM programs on campus

The most important staff hire to support implementation of this TDM program is the hiring of a TDM Manager to manage the various existing and proposed programs. As implementation of the program progresses, the Manger may need assistance, and a Program Associate position could enhance the effectiveness of the TDM program.

5 FINANCIAL ANALYSIS

EXECUTIVE SUMMARY

The financial analysis is designed to take into account campus growth, finances, and parking demand to project forward the interplay between TDM investment costs and parking demand and revenue. This analysis helps clarify different investment options, guides TDM package selection, and guides a detailed phasing plan that helps ensure the investment strategy into new parking and transportation services remains revenue neutral.

In this analysis, we modeled a Baseline, Preferred, and Maximum scenarios. The Baseline assumes no change in current pricing or investment strategy. The Preferred represents a package in which the investments and costs are balanced, creating the most ambitious TDM investment program that is financially feasible. Lastly, the Maximum scenario involves incorporating all the TDM and parking investments that were discussed during strategy development, campus outreach, and with the project team – essentially the "whole kitchen sink" approach.

The **Baseline** results show that existing parking facilities are insufficient to meet anticipated parking demand caused by increasing enrollment and growth. The **Preferred** scenario, however, gets ahead of that parking crunch by acknowledging funding necessary for an additional 500 paved parking spaces. It should be noted that that the addition of paved parking should be done with consideration of efficiency. The 500 paved spaces should be considered an approximation, as the actual number will be driven by on the field conditions as construction begins. The final parking space count will be adjusted to ensure efficiencies associated with existing infrastructure, including but not limited to, grading, gravel, lighting, and drainage systems, in order to produce a parking lot with low costs per stall. The assumption of 500 additional paved parking spaces accounts for the parking demand and financial impacts of expanding or creating new transportation programs, while rolling out measures in a phased manner to balance costs over time – including noting when parking fee increases need to occur to match inflation and finance new TDM strategies. The Preferred model results show that through a blend of investment in parking and TDM resources, future parking demand can be accommodated with modest price increases.

By contrast, the **Maximum** scenario represents investment in all of the strategies considered during strategy formation, as well as 1,000 new parking spaces. Maximum scenario model results show that overly-heavy investment in parking and TDM resources leads to both an oversupply of parking spaces and higher permit fees for users necessary to balance the budget. Although there is some benefit of scale in building 1,000 spaces at once, the modeling effort demonstrates that CI likely does not need the full 1,000 spaces, and it will cost too much to build. Additionally, the modeling effort shows that several of the strategies considered during

project development (identified as "Future, Long-term Options," in Chapter 4) cannot be fit into the budget without significant new revenue sources. Those strategies should be evaluated further as new funding become available, but they are not included in the Preferred package due to higher costs.

OVERVIEW

In order to estimate the future parking demand financial implications of new TDM strategies at CI, a multi-stage model was developed as outlined below. The steps in developing the model included:

1. Reviewing current parking supply and demand and current population, by user group (commuter students, resident students, and faculty/staff). These data were obtained via the occupancy study conducted in October 2015, and presented in the Existing Conditions Report (Appendix B).
2. Estimating future population of each user group.
3. Estimating resulting future parking demand for each user group based on existing parking demand ratios (observed parked vehicles per person).
4. Projected parking supply changes based on proposed loss or addition of parking facilities.
5. Measuring the revenue and expenditure impacts of both new TDM strategies and the effects of those measures on parking permit sales.

The following inputs were the major components of the financial model. Many of these inputs were documented and assessed in Appendix B.

- Campus population of commuter students, resident students, and faculty/staff from 2015-2016
- Number of parking spaces available to commuters and managed by CI
- Parking utilization rates, based on the peak demand identified in the March 2016 Parking Occupancy Survey
- Future plans for campus parking supply
- Current and projected revenues and expenditures, including proposed TDM measures and parking permit sales

MODEL ASSUMPTIONS

As with any modeling exercise where information is limited for key inputs, a number of assumptions were made for the financial modeling of the proposed TDM program. In general, a best estimate was used based on existing campus programs and revenues, experience with other cities, and professional judgment. This model used the assumptions listed below:

- Increases in campus population by user group were estimated based on consultation with CI staff. It was assumed that the campus population would grow at an annual rate of 1% through the horizon year of 2027.
- Price elasticity of demand for parking was assumed to be -0.3 (i.e. a 10% increase in parking price reduces parking demand by approximately 3%). This number represents a "midpoint" in values found in the national transportation research literature on parking

demand elasticity with respect to price, which range from -.01 to -0.6, with -0.3 being the most frequently cited value.[10]

- Annual inflation rate was assumed to be 2% given historic inflation rates since 2010.
- For all parking spaces, this study uses an "effective parking supply factor" of 95%. Effective supply is defined as the total number of parking spaces in a lot, less the percentage of spaces that the parking operator wishes to have vacant even at the typical peak hour. Choosing an effective parking supply factor of 95% means that the operator wishes to have 5% of the parking supply vacant at peak hour. For the purposes of this analysis, the effective supply calculation combines commuter, resident student, and faculty/staff spaces.
- Revenue projections from 2016 to 2027 were based on provided parking financial information (Fiscal Year 2014-2015) and projected revenues from a demand based parking pricing structure and parking fee increases described in recommendation P.1. These price changes were recommended to achieve the following goals:
  - Maintain campus-wide parking utilization rate of approximately 95% to improve user-experience in finding available parking spaces
  - Incentivize parking in less convenient parking facilities to improve the productivity of existing parking resources, spread parking demand, reduce congestion, and improve user convenience
  - Sustain financial solvency of the transportation program
  - Achieve broader parking reduction goals

Expenditures were based on existing parking and TDM program expenses extended into 2027 using an annual inflation rate of 3%. Added to existing program expenses were the implementation costs of the immediate and long-term TDM strategy recommendations, as discussed in Chapter 4 of this report.

SCENARIO 1 – BASELINE SCENARIO

Future Parking Supply and Demand

If student enrollment grows as projected and the number of faculty/staff grow to maintain current ratios, overall parking supply will not be able to accommodate parking needs. The Baseline Scenario examines parking demand over time accounting for inflationary effects by incorporating a parking price elasticity of -0.3. Figure 5-1, Figure 5-2, and Figure 5-3 illustrate the effect of a -0.3 parking price elasticity on the demand of spaces per commuter student, spaces per resident student, and space per faculty/staff member. In brief, the figures demonstrate the fundamental principle of demand: as prices increase, demand declines.

[10] Litman, Todd (2012). *Understanding Transport Demands and Elasticities: How Prices and Other Factors Affect Travel Behavior*. VTPI. http://www.vtpi.org/elasticities.pdf

Figure 5-1 Commuter Student Elasticity Curve

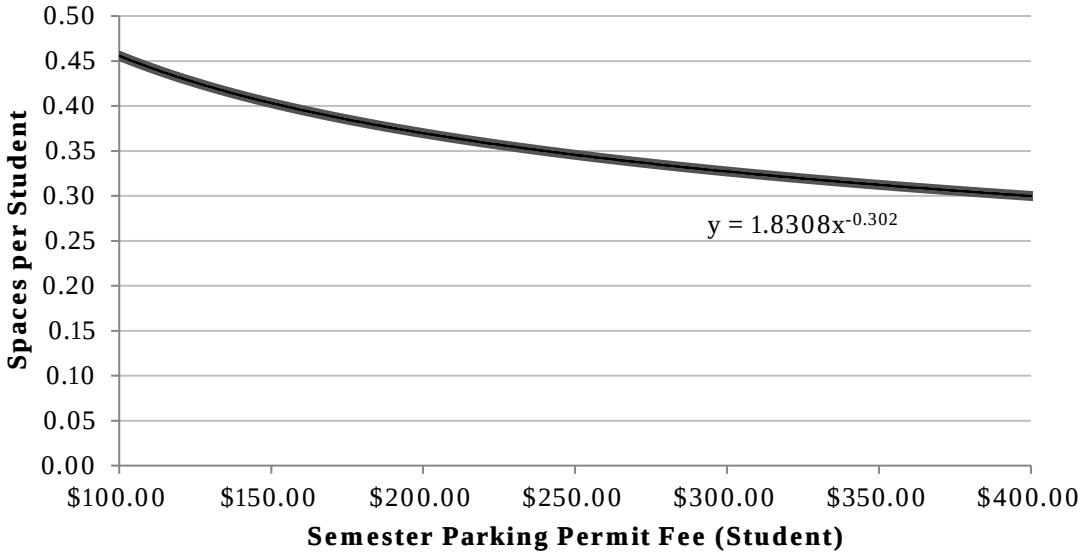


Figure 5-2 Resident Student Elasticity Curve

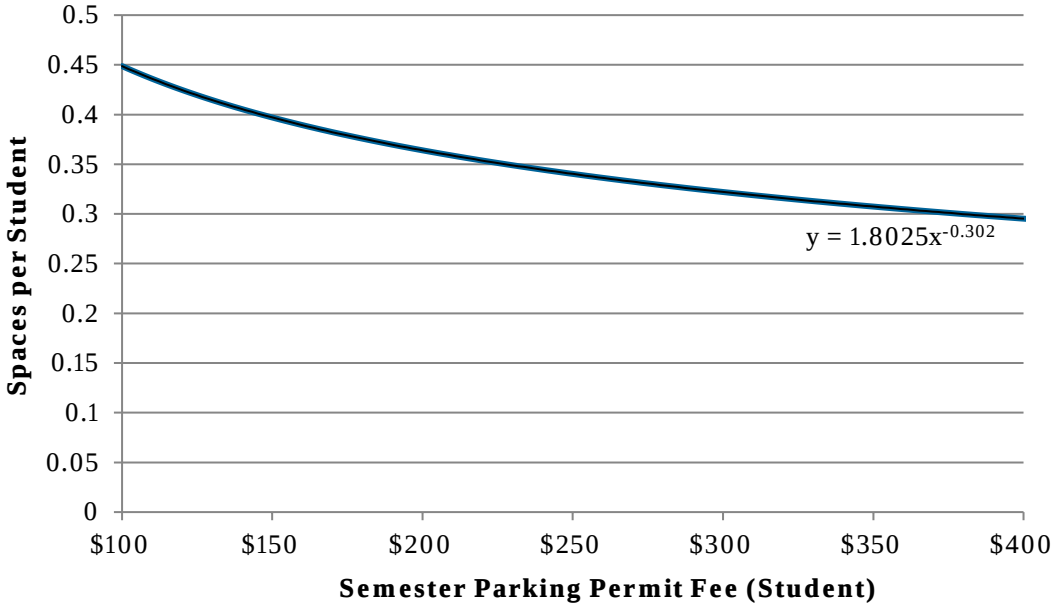
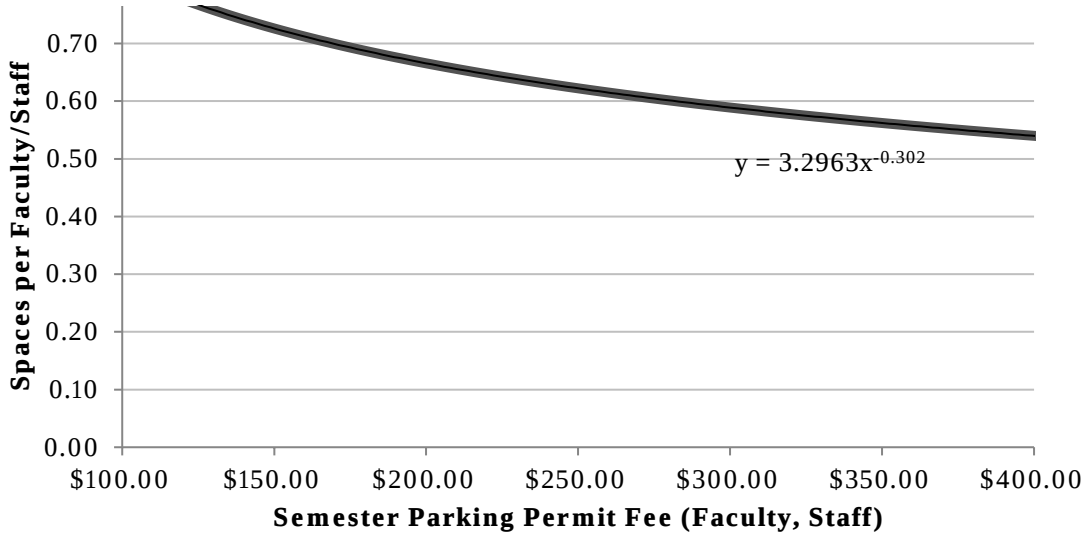


Figure 5-3 Faculty/Staff Elasticity Curve



Given the steady growth projections for CI, and the assumed price elasticities, the Baseline Scenario identifies the existing effective parking deficit of 180 spaces, currently managed by the A3 overflow lot, a dirt lot that was not considered as part of CI's official supply. Under these baseline conditions, the deficit continues to grow through 2017. It is important to note that this estimate assumes no parking price increases.

Figure 5-4 Projected Parking Demand, Baseline Scenario

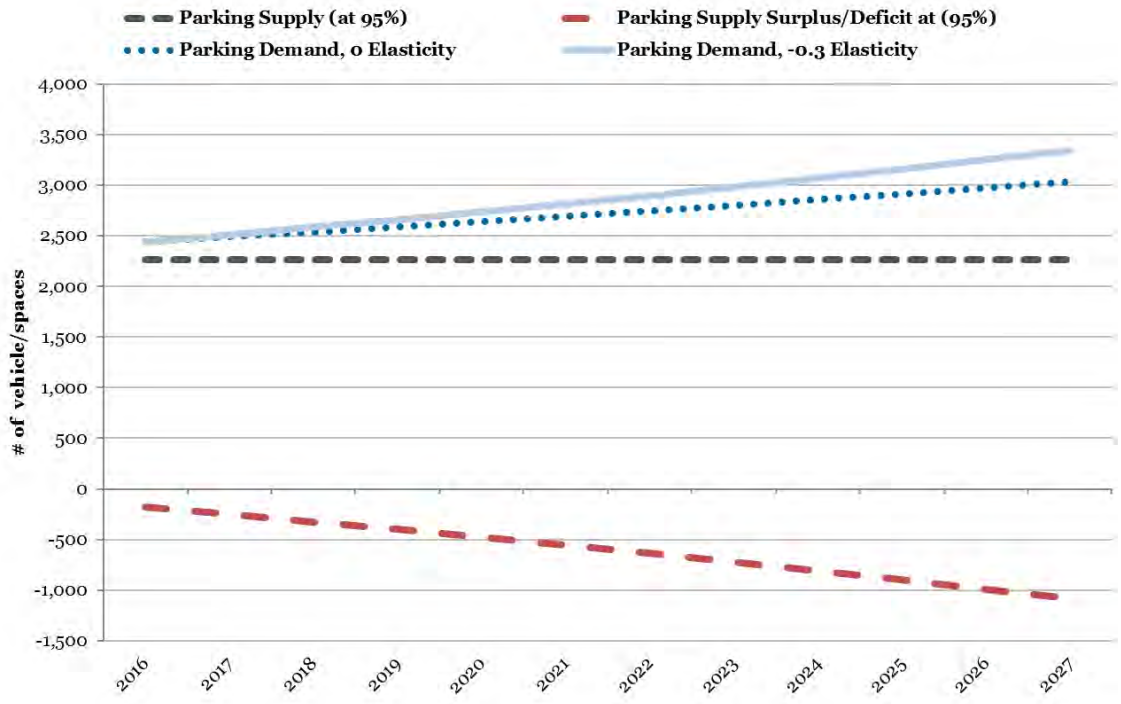


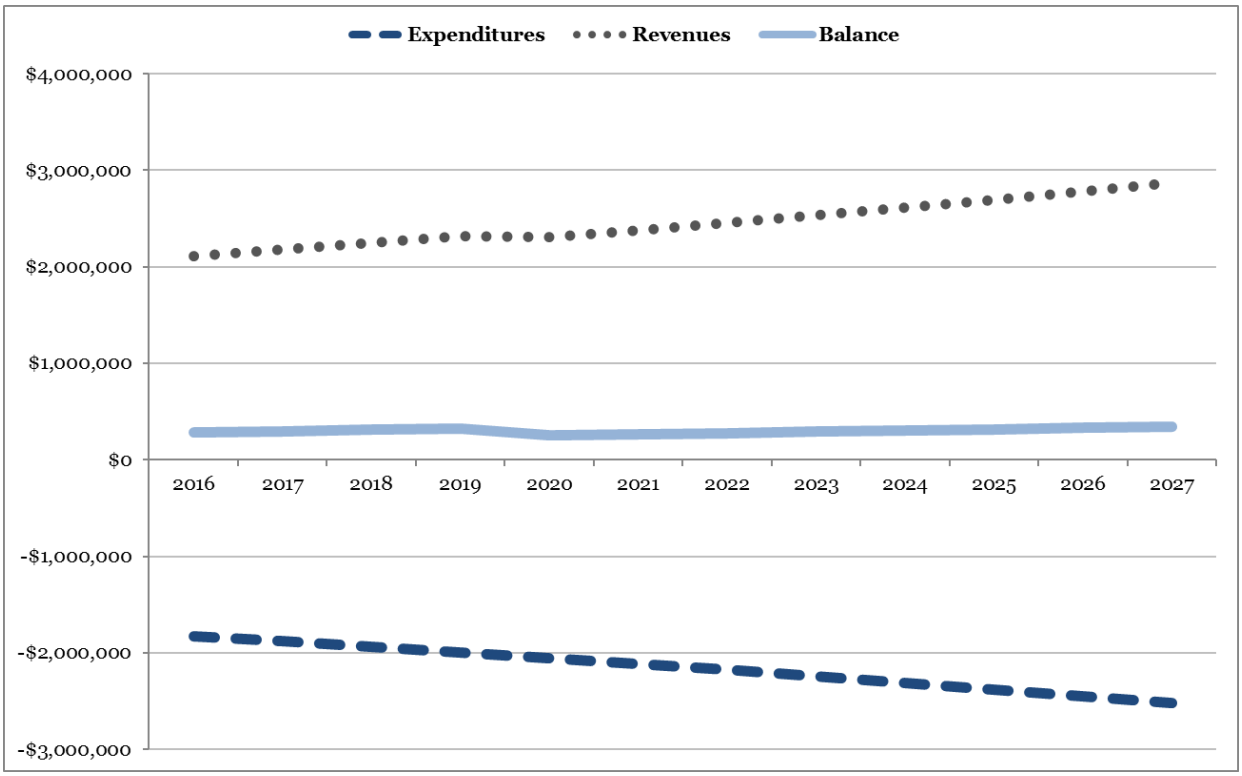
Figure 5-5 Summary of Projected Parking Demand, "Baseline" Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Students (Commuters)	4,210	4,323	4,439	4,556	4,127	4,249	4,374	4,502	4,632	4,764	4,900	5,037
Visitors	0	0	0	0	0	0	0	0	0	0	0	0
Faculty/Staff	431	441	450	459	468	477	487	496	506	516	527	537
Students (Residents)	1,450	1,450	1,450	1,450	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000
Total School Population	**6,091**	**6,214**	**6,338**	**6,465**	**6,594**	**6,726**	**6,861**	**6,998**	**7,138**	**7,281**	**7,426**	**7,575**
Projected Students (Commuters) Parking Demand, Assuming an Elasticity of "0"	1,569	1,611	1,654	1,698	1,538	1,583	1,630	1,678	1,726	1,775	1,826	1,877
Projected Visitors Parking Demand, Assuming an Elasticity of "0"	0	0	0	0	0	0	0	0	0	0	0	0
Projected Faculty/Staff Parking Demand, Assuming an Elasticity of "0"	338	346	353	360	367	374	382	389	397	405	413	421
Projected Students (Residents) Parking Demand, Assuming an Elasticity of "0"	532	532	532	532	734	734	734	734	734	734	734	734
Projected Total Parking Demand, Assuming an Elasticity of "0"	**2,439**	**2,489**	**2,539**	**2,590**	**2,638**	**2,691**	**2,746**	**2,801**	**2,857**	**2,914**	**2,973**	**3,032**
Price Index Assuming 3% Inflation	1.00	1.03	1.06	1.09	1.13	1.16	1.19	1.23	1.27	1.30	1.34	1.38
Students (Commuters) Price Increase Projected	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Students (Commuters) Price, in Current Year Dollars	$ 195.00	$ 195.00	$ 195.00	$ 195.00	$ 195.00	$ 195.00	$ 195.00	$ 195.00	$ 195.00	$ 195.00	$ 195.00	$ 195.00
Students (Commuters) Price in Real Dollars	$ 195.00	$ 189.32	$ 183.81	$ 178.45	$ 173.25	$ 168.21	$ 163.31	$ 158.55	$ 153.93	$ 149.45	$ 145.10	$ 140.87
% Reduction in Student Demand Resulting from the Projected Price Increase, Assuming an Elasticity of -0.3	0%	-1%	-2%	-3%	-4%	-5%	-5%	-6%	-7%	-8%	-9%	-10%
Visitors Price Increase Projected	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Visitors Price, in Current Year Dollars	$ 6.00	$ 6.00	$ 6.00	$ 6.00	$ 6.00	$ 6.00	$ 6.00	$ 6.00	$ 6.00	$ 6.00	$ 6.00	$ 6.00
Visitors Price in Real Dollars	$ 6.00	$ 5.83	$ 5.66	$ 5.49	$ 5.33	$ 5.18	$ 5.02	$ 4.88	$ 4.74	$ 4.60	$ 4.46	$ 4.33
% Reduction in Faculty/Staff Demand Resulting from the Projected Price Increase, Assuming an Elasticity of -0.3	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Faculty/Staff Price Increase Projected	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Faculty/Staff Price, in Current Year Dollars	$ 116.50	$ 116.50	$ 116.50	$ 116.50	$ 116.50	$ 116.50	$ 116.50	$ 116.50	$ 116.50	$ 116.50	$ 116.50	$ 116.50
Faculty/Staff Price in Real Dollars	$ 116.50	$ 113.11	$ 109.81	$ 106.61	$ 103.51	$ 100.49	$ 97.57	$ 94.73	$ 91.97	$ 89.29	$ 86.69	$ 84.16
% Reduction in Visitor Demand Resulting from the Projected Price Increase, Assuming an Elasticity of -0.3	0%	-1%	-2%	-3%	-4%	-4%	-5%	-6%	-7%	-8%	-9%	-10%
Students (Residents) Price Increase Projected	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Students (Residents) Price, in Current Year Dollars	$ 195.0	$ 195.0	$ 195.0	$ 195.0	$ 195.0	$ 195.0	$ 195.0	$ 195.0	$ 195.0	$ 195.0	$ 195.0	$ 195.0
Students (Residents) Price in Real Dollars	$ 195.0	$ 189.3	$ 183.8	$ 178.5	$ 173.3	$ 168.2	$ 163.3	$ 158.6	$ 153.9	$ 149.5	$ 145.1	$ 140.9
% Reduction in Other Demand Resulting from the Projected Price Increase, Assuming an Elasticity of -0.3	0%	-1%	-2%	-3%	-4%	-5%	-5%	-6%	-7%	-8%	-9%	-10%
Adjusted Students Parking Demand (After Adjusting for Elasticity)	1,569	1,625	1,683	1,743	1,593	1,655	1,719	1,785	1,853	1,923	1,995	2,070
Adjusted Visitors Parking Demand (After Adjusting for Elasticity)	0	$ -	0	0	0	0	0	0	0	0	0	0
Adjusted Faculty/Staff Parking Demand (After Adjusting for Elasticity)	338	348	359	369	380	391	402	414	426	438	451	464
Adjusted Students (Residents) Demand (After Adjusting for Elasticity)	532	536	541	546	760	767	774	781	788	795	802	809
Adjusted Total Parking Demand (After Adjusting for Elasticity)	**2,439**	**2,509**	**2,583**	**2,658**	**2,732**	**2,812**	**2,895**	**2,979**	**3,066**	**3,156**	**3,248**	**3,343**
Projected Supply	2,510	2,510	2,510	2,510	2,510	2,510	2,510	2,510	2,510	2,510	2,510	2,510
Projected Effective Supply (at 95%)	2,259	2,259	2,259	2,259	2,259	2,259	2,259	2,259	2,259	2,259	2,259	2,259
Projected Total Campus Surplus or Deficit	71	1	-73	-148	-222	-302	-385	-469	-556	-646	-738	-833
Projected Total Campus Effective Supply Surplus or Deficit (at 95%)	**-180**	**-250**	**-324**	**-399**	**-473**	**-553**	**-636**	**-720**	**-807**	**-897**	**-989**	**-1,084**

Parking System Revenue and Expense Review

CI staff supplied data on recent parking expenses and revenues (FY 2014-2015) including operations and maintenance costs. Using these figures, Nelson\Nygaard projected system revenue and expenditures, assuming increases in expenses and other parking revenues tied to inflation. Student permit fees were not assumed to increase during this time. The result is a marginally revenue-positive outcome, primarily due to the permit revenue increases that are caused by a decline in the real price of permits. Figure 5-6 shows the expenses, revenues, and resulting balances in this scenario.

Figure 5-6 Projected Parking Revenues and Expenses, Baseline Scenario



SCENARIO 2 – PREFERRED TDM SCENARIO

The Baseline Scenario described above assumes that there is no change from the current parking and TDM program utilized by CI. In contrast, the Preferred Scenario projects the parking demand and financial impacts of instituting or expanding measures in a phased manner, while weighing the effects of parking price elasticity.

In the Preferred Scenario, the costs of implementing the recommended TDM strategies are balanced by increased parking revenue in each phase, allowing the program to remain revenue positive. The Preferred Scenario recommends parking fee increases of 14.7% in 2017 and 10% in 2019 and 2021 to both meet inflationary needs and finance new measures. Figure 5-7 illustrates the impact on projected parking demand of an assumed parking price elasticity of -0.3 in conjunction with TDM Plan implementation and parking price increases. The figure shows that the implementation of preferred TDM strategies and pricing increases should balance parking demand through 2027.

Figure 5-7 Projected Parking Demand, Preferred Scenario

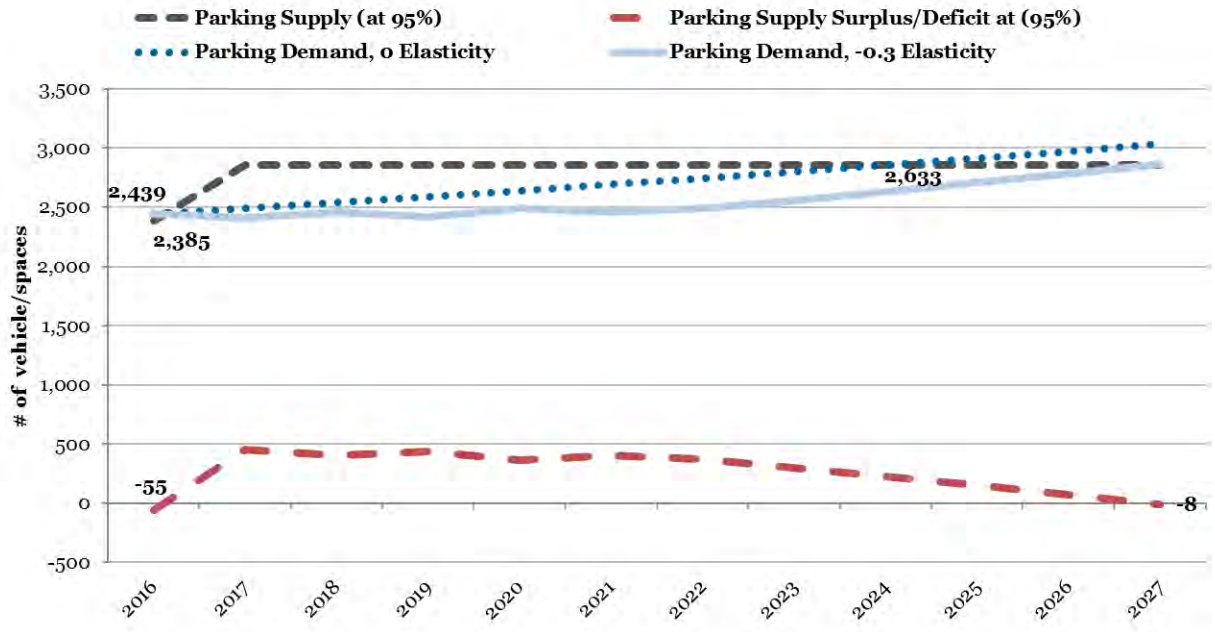


Figure 5-8 shows commuter student, resident student, and faculty/staff parking demand over time when accounting for elasticity and inflation. The table includes permit price increases taking effect at certain points to manage parking demand and guarantee an adequate revenue stream to fund the proposed TDM programs.

It should be noted that immediately after the implementation of parking fee increases in each phase, parking demand experiences minor declines as drivers respond to the fee increase and the number of vacant parking spaces temporarily rises. While this minor surplus will give the University greater flexibility in closing lots in the future within the core of campus, some in the campus community may question why the University is increasing prices when empty spaces are present. Ultimately, parking pricing is one of the most effective tools in promoting sustainability and although more parking spaces may temporarily sit empty due to higher prices, the University will be able to effectively manage enrollment growth, vehicular congestion, GHG emissions (in accordance to CI's sustainability goals), and create greater ease for motorists searching for available parking spaces.

Figure 5-8 Summary of Projected Parking Demand, "Preferred" Scenario

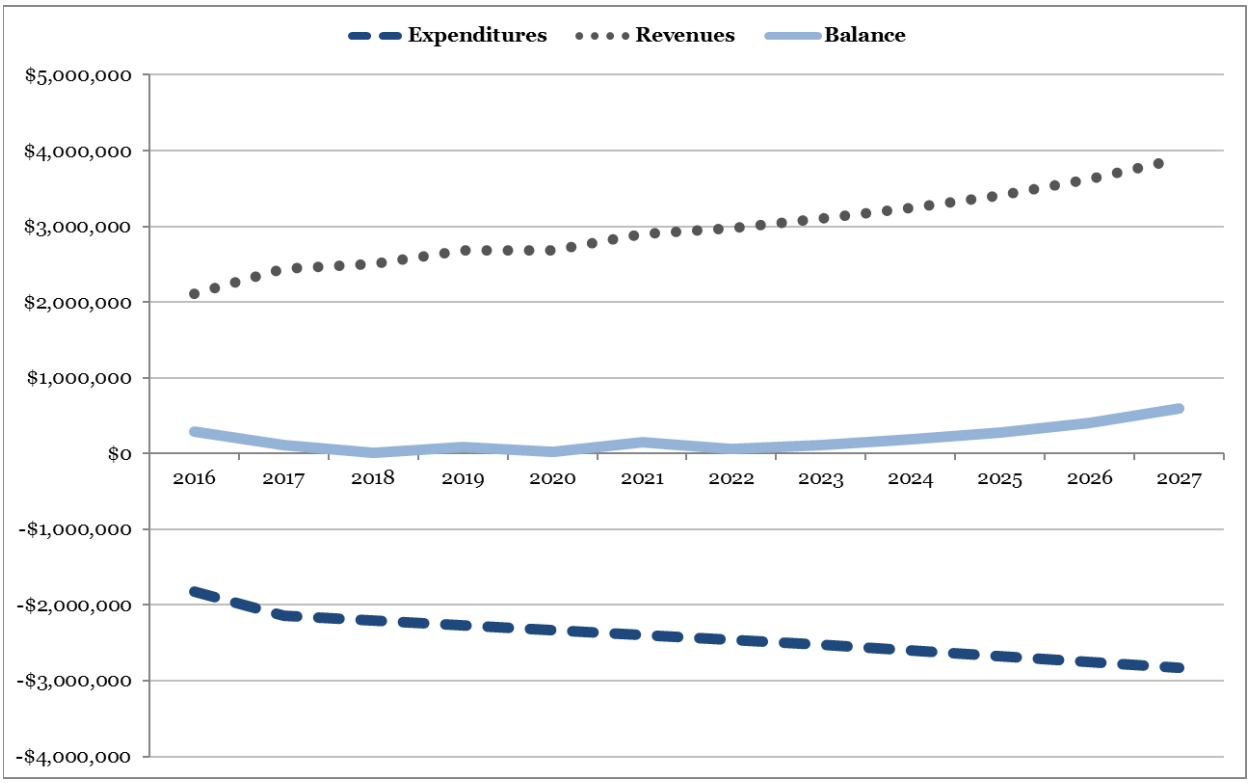
	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Students (Commuters)	4,210	4,323	4,439	4,556	4,127	4,249	4,374	4,502	4,632	4,764	4,900	5,037
Visitors	0	0	0	0	0	0	0	0	0	0	0	0
Faculty/Staff	431	441	450	459	468	477	487	496	506	516	527	537
Students (Residents)	1,450	1,450	1,450	1,450	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000
Total School Population	**6,091**	**6,214**	**6,338**	**6,465**	**6,594**	**6,726**	**6,861**	**6,998**	**7,138**	**7,281**	**7,426**	**7,575**
Projected Students (Commuter) Parking Demand, Assuming an Elasticity of "0"	1,569	1,611	1,654	1,698	1,538	1,583	1,630	1,678	1,726	1,775	1,826	1,877
Projected Visitors Parking Demand, Assuming an Elasticity of "0"	0	0	0	0	0	0	0	0	0	0	0	0
Projected Faculty/Staff Parking Demand, Assuming an Elasticity of "0"	338	346	353	360	367	374	382	389	397	405	413	421
Projected Students (Resident) Parking Demand, Assuming an Elasticity of "0"	532	532	532	532	734	734	734	734	734	734	734	734
Projected Total Parking Demand, Assuming an Elasticity of "0"	**2,439**	**2,489**	**2,539**	**2,590**	**2,638**	**2,691**	**2,746**	**2,801**	**2,857**	**2,914**	**2,973**	**3,032**
Price Index Assuming 3% Inflation	1.00	1.03	1.06	1.09	1.13	1.16	1.19	1.23	1.27	1.30	1.34	1.38
Students (Commuter) Price Increase Projected	0.0%	14.7%	0.0%	10.0%	0.0%	10.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Students (Commuter) Price, in Current Year Dollars	$ 195.00	$ 223.59	$ 223.59	$ 245.95	$ 245.95	$ 270.54	$ 270.54	$ 270.54	$ 270.54	$ 270.54	$ 270.54	$ 270.54
Students (Commuter) Price in Real Dollars	$ 195.00	$ 217.08	$ 210.75	$ 225.08	$ 218.52	$ 233.37	$ 226.58	$ 219.98	$ 213.57	$ 207.35	$ 201.31	$ 195.45
% Reduction in Student Demand Resulting from the Projected Price Increase, Assuming an Elasticity of -0.3	0%	3%	3%	7%	6%	10%	11%	10%	10%	9%	8%	7%
Visitors Price Increase Projected	0.0%	14.7%	0.0%	10.0%	0.0%	10.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Visitors Price, in Current Year Dollars	$ 6.00	$ 6.88	$ 6.88	$ 7.57	$ 7.57	$ 8.32	$ 8.32	$ 8.32	$ 8.32	$ 8.32	$ 8.32	$ 8.32
Visitors Price in Real Dollars	$ 6.00	$ 6.68	$ 6.48	$ 6.93	$ 6.72	$ 7.18	$ 6.97	$ 6.77	$ 6.57	$ 6.38	$ 6.19	$ 6.01
% Reduction in Faculty/Staff Demand Resulting from the Projected Price Increase, Assuming an Elasticity of -0.3	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Faculty/Staff Price Increase Projected	0%	14.7%	0.0%	10.0%	0.0%	10.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Faculty/Staff Price, in Current Year Dollars	$ 116.50	$ 133.58	$ 133.58	$ 146.94	$ 146.94	$ 161.63	$ 161.63	$ 161.63	$ 161.63	$ 161.63	$ 161.63	$ 161.63
Faculty/Staff Price in Real Dollars	$ 116.50	$ 129.69	$ 125.91	$ 134.47	$ 130.55	$ 139.43	$ 135.36	$ 131.42	$ 127.59	$ 123.88	$ 120.27	$ 116.77
% Reduction in Visitor Demand Resulting from the Projected Price Increase, Assuming an Elasticity of -0.3	0%	3%	3%	7%	6%	10%	11%	10%	10%	9%	8%	7%
Students (Resident) Price Increase Projected	0%	14.7%	0.0%	10.0%	0.0%	10.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Students (Resident) Price, in Current Year Dollars	$ 195.0	$ 223.6	$ 223.6	$ 245.9	$ 245.9	$ 270.5	$ 270.5	$ 270.5	$ 270.5	$ 270.5	$ 270.5	$ 270.5
Students (Resident) Price in Real Dollars	$ 195.0	$ 217.1	$ 210.8	$ 225.1	$ 218.5	$ 233.4	$ 226.6	$ 220.0	$ 213.6	$ 207.3	$ 201.3	$ 195.4
% Reduction in Other Demand Resulting from the Projected Price Increase, Assuming an Elasticity of -0.3	0%	3%	2%	4%	3%	5%	4%	4%	3%	2%	1%	0%
Adjusted Students (Commuter) Parking Demand (After Adjusting for Elasticity)	1,569	1,559	1,599	1,576	1,440	1,424	1,448	1,503	1,561	1,620	1,681	1,744
Adjusted Visitors Parking Demand (After Adjusting for Elasticity)	0	-	-	-	-	-	-	-	-	-	-	-
Adjusted Faculty/Staff Parking Demand (After Adjusting for Elasticity)	338	334	341	334	343	336	339	349	359	369	380	391
Adjusted Students (Residents) Demand (After Adjusting for Elasticity)	532	515	519	509	709	695	701	707	713	720	726	733
Adjusted Total Parking Demand (After Adjusting for Elasticity)	**2,439**	**2,408**	**2,459**	**2,419**	**2,492**	**2,455**	**2,488**	**2,559**	**2,633**	**2,709**	**2,787**	**2,868**
Projected Supply	2,510	3,010	3,010	3,010	3,010	3,010	3,010	3,010	3,010	3,010	3,010	3,010
Projected Effective Supply (95%)	2,385	2,860	2,860	2,860	2,860	2,860	2,860	2,860	2,860	2,860	2,860	2,860
Projected Total Campus Surplus/Deficit	71	602	551	591	518	555	522	451	377	301	223	142
Projected Total Campus Effective Supply Surplus/Deficit (95%)	**-55**	**452**	**401**	**440**	**367**	**405**	**372**	**300**	**226**	**150**	**72**	**-8**

Parking System Revenue and Expense Review

In the Preferred Scenario, the tiered parking pricing structure for 2017 of $195 per semester for parking in "Value" facilities (Lots A3, A11, CEN, D, and G8/G9), $230 in "Premium," facilities (Lots A2, A4, A7, A8, A10, and Rincon Drive), and $275 in "Platinum" facilities (Lots A1, A5, A6, AE, BRO, CY37, and R) was calibrated to maximize use of parking facilities in the periphery of campus and maintain revenue neutrality. Prices for all types of lots are modeled to increase an additional 10% in 2019 and 2021 to both keep pace with inflation and meet additional transportation demands. By 2027, real prices will equal those in 2016

Figure 5-9 shows the expenses, revenues, and resulting annual balances from instituting the three phases of the Preferred CI TDM Program. It is projected that the program will have a surplus of revenue neutral effect.

Figure 5-9 Projected Parking Revenues and Expenses, Preferred Scenario



SCENARIO 3 – MAX TDM SCENARIO

This analysis evaluates a scenario under which all of the recommendations identified in Chapter 4 as "Future Options," are implemented. In order to balance revenues and expenses, parking prices are raised on an annual basis at a rate of 5% to 15% until 2022 in this scenario. Under this scenario, the rollout of a TDM plan that includes significant transit improvements, the system would exhibit an effective surplus of 785 parking spaces in 2027. This surplus is an excessive amount and does not represent the most efficient allocation of resources. As such, the preferred scenario implements a comprehensive and cost effective TDM approach.

As in the Preferred Scenario, the costs of implementing the recommended short-term TDM strategies are balanced by increased parking revenue, allowing the program to remain revenue positive. Figure 5-10 illustrates the impact of such an extensive TDM plan, showing that the additional parking supply planned in the coming years may not be necessary if all TDM options were exhausted.

Figure 5-10 Projected Parking Demand, Max TDM Scenario

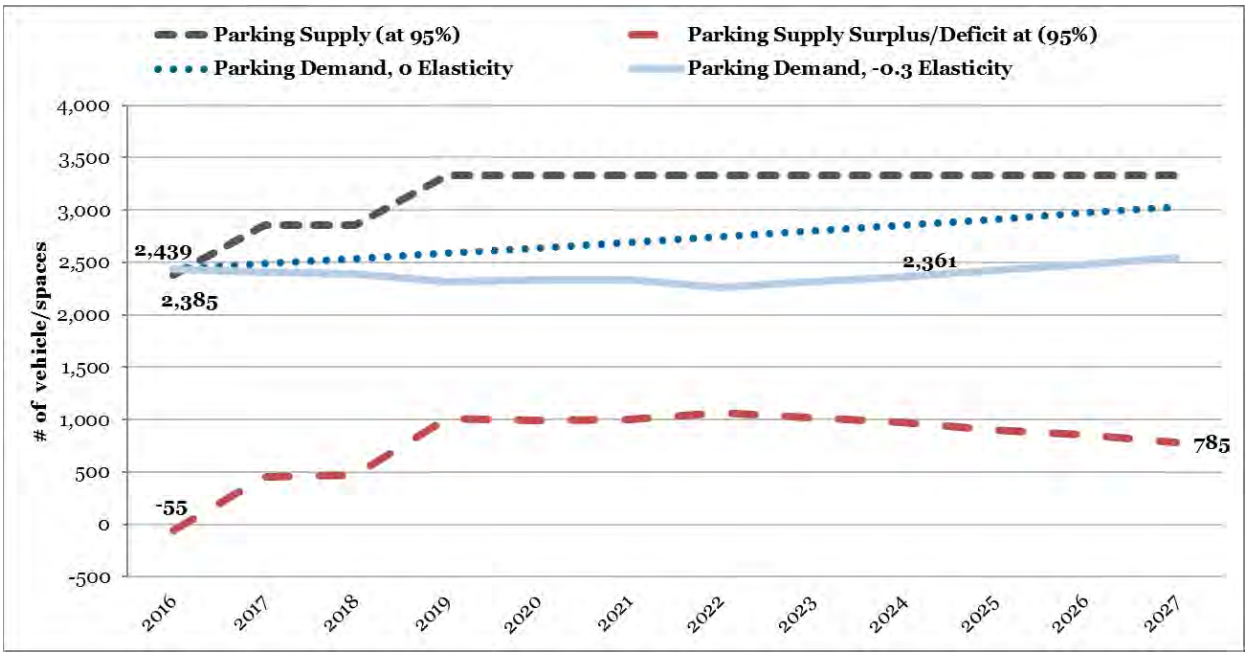


Figure 5-11 shows commuter student, resident student, and faculty/staff parking demand over time when accounting for elasticity and inflation.

Figure 5-11 Summary of Projected Parking Demand, "Growth" Scenario

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Students (Commuters)	4,210	4,323	4,439	4,556	4,127	4,249	4,374	4,502	4,632	4,764	4,900	5,037
Visitors	0	0	0	0	0	0	0	0	0	0	0	0
Faculty/Staff	431	441	450	459	468	477	487	496	506	516	527	537
Students (Residents)	1,450	1,450	1,450	1,450	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000
Total School Population	**6,091**	**6,214**	**6,338**	**6,465**	**6,594**	**6,726**	**6,861**	**6,998**	**7,138**	**7,281**	**7,426**	**7,575**
Projected Students (Commuter) Parking Demand, Assuming an Elasticity of "0"	1,569	1,611	1,654	1,698	1,538	1,583	1,630	1,678	1,726	1,775	1,826	1,877
Projected Visitors Parking Demand, Assuming an Elasticity of "0"	0	0	0	0	0	0	0	0	0	0	0	0
Projected Faculty/Staff Parking Demand, Assuming an Elasticity of "0"	338	346	353	360	367	374	382	389	397	405	413	421
Projected Students (Resident) Parking Demand, Assuming an Elasticity of "0"	532	532	532	532	734	734	734	734	734	734	734	734
Projected Total Parking Demand, Assuming an Elasticity of "0"	**2,439**	**2,489**	**2,539**	**2,590**	**2,638**	**2,691**	**2,746**	**2,801**	**2,857**	**2,914**	**2,973**	**3,032**
Price Index Assuming 3% Inflation	1.00	1.03	1.06	1.09	1.13	1.16	1.19	1.23	1.27	1.30	1.34	1.38
Students (Commuter) Price Increase Projected	0.0%	14.7%	10.0%	15.0%	5.0%	5.0%	15.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Students (Commuter) Price, in Current Year Dollars	$ 195.00	$ 223.59	$ 245.95	$ 282.84	$ 296.98	$ 311.83	$ 358.61	$ 358.61	$ 358.61	$ 358.61	$ 358.61	$ 358.61
Students (Commuter) Price in Real Dollars	$ 195.00	$ 217.08	$ 231.83	$ 258.84	$ 263.87	$ 268.99	$ 300.33	$ 291.58	$ 283.09	$ 274.84	$ 266.84	$ 259.06
% Reduction in Student Demand Resulting from the Projected Price Increase, Assuming an Elasticity of -0.3	0%	3%	6%	11%	12%	15%	19%	19%	20%	19%	19%	18%
Visitors Price Increase Projected	0.0%	14.7%	10.0%	15.0%	5.0%	5.0%	15.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Visitors Price, in Current Year Dollars	$ 6.00	$ 6.88	$ 7.57	$ 8.70	$ 9.14	$ 9.59	$ 11.03	$ 11.03	$ 11.03	$ 11.03	$ 11.03	$ 11.03
Visitors Price in Real Dollars	$ 6.00	$ 6.68	$ 7.13	$ 7.96	$ 8.12	$ 8.28	$ 9.24	$ 8.97	$ 8.71	$ 8.46	$ 8.21	$ 7.97
% Reduction in Faculty/Staff Demand Resulting from the Projected Price Increase, Assuming an Elasticity of -0.3	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Faculty/Staff Price Increase Projected	0%	14.7%	10.0%	15.0%	5.0%	5.0%	15.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Faculty/Staff Price, in Current Year Dollars	$ 116.50	$ 133.58	$ 146.94	$ 168.98	$ 177.43	$ 186.30	$ 214.24	$ 214.24	$ 214.24	$ 214.24	$ 214.24	$ 214.24
Faculty/Staff Price in Real Dollars	$ 116.50	$ 129.69	$ 138.50	$ 154.64	$ 157.64	$ 160.70	$ 179.43	$ 174.20	$ 169.13	$ 164.20	$ 159.42	$ 154.77
% Reduction in Visitor Demand Resulting from the Projected Price Increase, Assuming an Elasticity of -0.3	0%	3%	6%	11%	12%	15%	19%	20%	20%	19%	19%	18%
Students (Resident) Price Increase Projected	0%	14.7%	10.0%	15.0%	5.0%	5.0%	15.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Students (Resident) Price, in Current Year Dollars	$ 195.0	$ 223.6	$ 245.9	$ 282.8	$ 297.0	$ 311.8	$ 358.6	$ 358.6	$ 358.6	$ 358.6	$ 358.6	$ 358.6
Students (Resident) Price in Real Dollars	$ 195.0	$ 217.1	$ 231.8	$ 258.8	$ 263.9	$ 269.0	$ 300.3	$ 291.6	$ 283.1	$ 274.8	$ 266.8	$ 259.1
% Reduction in Other Demand Resulting from the Projected Price Increase, Assuming an Elasticity of -0.3	0%	3%	5%	8%	9%	9%	12%	11%	11%	10%	9%	8%
Adjusted Students (Commuter) Parking Demand (After Adjusting for Elasticity)	1,569	1,559	1,553	1,511	1,347	1,350	1,315	1,351	1,387	1,440	1,477	1,532
Adjusted Visitors Parking Demand (After Adjusting for Elasticity)	0	-	-	-	-	-	-	-	-	-	-	-
Adjusted Faculty/Staff Parking Demand (After Adjusting for Elasticity)	338	334	331	320	321	319	308	313	319	328	334	344
Adjusted Students (Residents) Demand (After Adjusting for Elasticity)	532	515	505	488	669	665	644	649	655	661	667	673
Adjusted Total Parking Demand (After Adjusting for Elasticity)	**2,439**	**2,408**	**2,389**	**2,319**	**2,337**	**2,334**	**2,267**	**2,314**	**2,361**	**2,429**	**2,478**	**2,549**
Projected Supply	2,510	3,010	3,010	3,510	3,510	3,510	3,510	3,510	3,510	3,510	3,510	3,510
Projected Effective Supply (95%)	2,385	2,860	2,860	3,335	3,335	3,335	3,335	3,335	3,335	3,335	3,335	3,335
Projected Total Campus Surplus/Deficit	71	602	621	1,191	1,173	1,176	1,243	1,196	1,149	1,081	1,032	961
Projected Total Campus Effective Supply Surplus/Deficit (95%)	**-55**	**452**	**471**	**1,015**	**998**	**1,000**	**1,068**	**1,021**	**973**	**905**	**856**	**785**

6 IMPLEMENTATION AND MONITORING

This chapter provides a recommended framework for implementing the proposed PTDM strategies. It provides a brief summary of proposed TDM strategies identified in Chapter 4 and identifies a timeline for implementation of these PTDM strategies. Lastly, this chapter proposes a program to monitor the success of the CI PTDM program to ensure staff has the tools to evaluate program successes, and make adjustments over time to ensure overarching goals are met.

APPROACH

The following principles, developed throughout the Plan development process with CI, should guide implementation of recommended TDM strategies:

1. PTDM strategies should be implemented in three phases to improve existing management strategies and introduce new tools to improve access and mobility to the CI campus.
    a. Short-term strategies focus on improving the traveler's user experience, better managing parking, cost-effective incentives, information and branding to guide transportation decisions, initial policy changes, critical staffing, and quickly-implementable infrastructure enhancements.
    b. Mid-term strategies focus on infrastructure enhancements, policy adoption that require further study, and strategies that require greater levels of investment than immediately implementable short-term strategies.
    c. Long-term strategies introduce universal change and transition as the campus grows over a period of more than 10 years upon completion of short- and mid-term strategies.
2. The cost of PTDM strategies should be balanced with parking revenues. When determining which strategies to employ, parking pricing should be set to cover PTDM costs.
3. Establishment of an active monitoring program to track performance and inform effectiveness of strategies in meeting transportation goals, and guide changes as necessary to maximize effectiveness.

Implementation Phasing

The full PTDM program should be launched in order to spur mode shift, reduce SOV travel, and improve campus accessibility and user convenience. However, immediate application of all of the strategies outlined in Chapter 4 of this plan may not be financially or technically feasible. The following section recommends a phased, flexible approach to implementing the PTDM strategies. The phased implementation approach hinges on both funding availability and campus-related travel demand.

The following measures and thresholds for gauging the need for PTDM strategies are recommended to phase in the full PTDM program. While implementation thresholds are provided, building the full "preferred" PTDM strategy can be somewhat flexible and implemented as resources or needs allow. The following phasing plan provides a recommended framework for ramping up the PTDM program.

Short-Term Phase (1-3 years)

Threshold

It is recommended that these strategies be implemented immediately, as resources are available in order to more efficiently manage and assess existing campus parking and traffic demands.

Measures

Administration and Policy

- Adopt formal campus transportation goals and objectives.
- Adopt formal policy and metrics for system tracking and reporting.
- Establish a Parking & Transportation Working Group.
- Conduct an annual review and approval of rules and regulations.
- Establish parking and transportation design standards.
- Strategically identify and plan for transportation funding.

Circulation

- Adopt Formal campus circulation hierarchy which prioritizes a walkable and bikeable campus core.
- Identify opportunities for an enhanced pedestrian network which provides key, legible cross-campus access.

Parking

- Adopt formal policy of performance-based management.
- Adopt official policy to allocate "net" parking revenue to mobility and TDM programs.
- Adjust permit pricing and regulations to meet availability goals.
- Conduct ongoing parking inventory and occupancy counts by facility and regulation.
- Provide priority and discounted parking for carpool and vanpool customers.
- Install parking meters on Rincon Drive. Adjust pricing to meet availability goals.
- Upgrade parking communications, payments, and enforcement systems.
- Allow University Glen residents to park in campus core, subject to daily visitor rates.

- Collaborate with Town Center and University Glen to improve parking management.
- Add new parking supply in the short term to meet needs of the growing campus.

Transit

- Partner with VCTC to allow for online transit pass purchases.

Bicycle & Pedestrian

- Conduct ongoing occupancy counts and maintenance assessments of bicycle parking.
- Provide do-it-yourself bicycle fix-it stations on campus.
- Replace and expand bicycle parking. Provide appropriate mix of short- and long-term parking.
- Prioritize pedestrian safety upgrades, with a focus on high-volume corridors, crossings, and parking lots

Communications

- Establish social media presence for transportation and TDM programs.
- Expand and diversify promotional activities for transportation.
- Adopt and implement a formal brand for transportation and TDM programs.
- Create a prominent and user-friendly transportation-specific website.
- Expand goCI and make it a one-stop location for all transportation information.
- Design and implement a comprehensive signage and wayfinding program, including real-time parking information.

TDM

- Hire a Parking & TDM Manager.
- Create a formal rewards or incentive program for all affiliates.
- Ensure that all employees have access to federal payroll deduction programs.
- Conduct annual travel survey and monitoring.
- Create a transportation coordinator position in each student housing complex and for faculty/staff.
- Create an impromptu carpool program.
- Expand and diversify the car sharing program.
- Partner with a TNC to enhance guaranteed ride home services.
- Create an internal ride matching network.
- Provide bicycle safety and education classes.

Cost

Immediate TDM measures are expected to result in a small revenue surplus, when accounting for the revenues resulting from performance-based pricing adjustments and an increase in permit pricing. It should be noted that these revenues will be necessary to cover the start-up costs of short-term measures.

Mid-Term Phase (4-9 years)

Threshold

Implementation of mid-term strategies shall take place after an initial 3-year period, once all short-term strategies deemed feasible have been implemented or initiated. Some mid-term strategies will build upon the efforts of the short-term phase, while others will be required to implement the widespread changes outlined by long-term strategies.

Measures

Circulation

- Add traffic-calming features to Ventura and Camarillo Streets.
- Design and complete two-way to one-way conversion with two-way cycle tracks or buffered bicycle lanes.

Parking

- Expand and improve EV parking infrastructure.
- Eliminate annual permits for commuter students and transition to a “pay-by-day” system.

Transit

- Provide real-time transit information via website and mobile applications.
- Improve passenger amenities at transit stop on Santa Barbara Avenue.

Bicycle & Pedestrian

- Install new bicycle facilities on campus.

TDM

- Evaluate fully subsidized transit passes for students and staff.

Cost

The costs of medium-term TDM measures and an increase in parking revenues generated by the updated parking pricing scheme are expected to have a revenue neutral outcome.

Long-Term Phase (10+ years)

Threshold

Long-term strategies will take considerably more time to vet with campus stakeholders and identify funding sources. The implementation threshold of these strategies is after an initial 10-year period following the roll out and maturation of short- and medium-term PTDM strategies.

Measures

Circulation

- Transition to limited vehicle access in core.
- Transition main campus loop to a "shared street."

Parking

- Transition parking to outside of core as campus develops.

Transit

- Work with VCTC to improve service frequency on CI serving routes.
- As campus grows, evaluate implementation of a campus circulator shuttle.
- Explore benefits and disadvantages of a CI-operated regional transit service.

Bicycle & Pedestrian

- Partner with County and local jurisdictions to improve regional bicycle facilities.
- Develop a fully-staffed bicycle center on campus.
- Implement a phased campus-wide bike share system.

TDM

- Add a support staff member to assist the PTDM Manager role in expanding TDM programs on campus.

Cost

The multi-million-dollar cost of this implementation phase currently makes the method of financing all of these strategies uncertain. As determined by the model that is detailed in Chapter 5, an annual parking price increase of 5 to 15% through 2022 is necessary in order to pay for all programs. As such, it is recommended that after short-term strategies are adopted, the university explore a blend of financing methods for long-term strategies.

Figure 6-1 Strategy Phasing

PERFORMANCE MONITORING PLAN

One of the most critical elements in developing a PTDM program is monitoring its performance. By observing how travel behavior changes over time, CI will have the tools to determine the proper time within phases to implement various PTDM strategies, gauge their effectiveness, and distribute quantifiable data that will allow a prioritization of the campus's financial and personnel resources. Success of each strategy should be analyzed in accordance with the eight (8) transportation system goals identified in Chapter 1.

Program monitoring should consist of conducting annual transportation surveys among employees and students, and observing and recording parking utilization. CI should conduct a trial of this monitoring program following the first phase of implementation of this plan to test the protocols, refine the procedures, and develop a sound monitoring methodology.

Metrics

Metrics help with monitoring and tracking of progress towards goals, while also ensuring transparency in decision making. As previously discussed in Chapter 1, this plan proposes quantifiable metrics for assessing the achievement of objectives for all eight transportation system goals (see Figure 4-2). As CI moves forward with implementation of this plan, it is recommended that the university track some or all of these specific items on a consistent basis and publish them annually.

Monitoring and Evaluation

Strategy TDM.10 includes the implementation of an annual travel survey and monitoring program. Additionally, Strategy BP.1 calls for ongoing occupancy counts and maintenance assessments of bicycle parking, and Strategy P.4 calls for ongoing parking inventory and occupancy counts by facility and regulation type. This section contains more detail on the specifics of the proposed monitoring program in addition to what is already included as recommendations in Chapter 4.

Transportation Survey

A transportation survey should reveal travel behavior, attitudes toward existing travel options, and propensity to shift transportation mode choice among students, faculty, and staff. In turn, this data can be used to measure mobile source GHG emissions generated from employee commutes.

A survey created specifically for CI would incur a cost, but would provide information better tailored to the campus needs. For example, the survey could collect information related to the PTDM program awareness, utilization, deficiencies, and potential areas for improvement. In addition, the survey could record available transportation alternatives; barriers to walking, bicycling, carpooling and taking transit; parking preferences; and the travel behavior of students. An online survey should be utilized to ensure year-on-year consistency and encourage participation.

Level of Difficulty: Moderate to High

The time required to oversee the survey will depend on its complexity. For a simple survey the time to create, administer, and analyze the results could take as little as 30 hours, depending on the distribution mechanism. An online survey makes data relatively easy to collect and review.

Cost: Low to High

The cost will depend on the complexity of the survey and if the campus administers the survey and conducts the analysis themselves or if an outside consultant is hired. If an outside consultant is hired the cost could range from $5,000 to $15,000.

Key Considerations:

- Mode split data provides a baseline from which CI can measure success
- Data collected as part of this survey will enable tracking of average vehicle ridership (AVR) and GHG emissions
- Surveys can be as simple or as complex as deemed necessary

Conducting a transportation survey is relatively straightforward with the necessary considerations for administering one as follows:

Survey Instrument

The survey can be very basic or more complex depending on the level of detail desired by CI. Listed below are key questions that should be asked as well as additional questions that could be included.

- Primary mode of transportation to campus (i.e. if more than one mode was used, select the mode used for the majority of the trip)
- For those who carpooled or vanpooled, the number of people in the carpool or vanpool, including the driver
- Affiliation (e.g. faculty, staff, commuter/resident student, undergraduate/graduate student)
- Full or part-time
- Home location (on or off-campus, may want to request zip code information for off-campus affiliates)
- Distance traveled to campus
- Arrival and departure times
- Interest levels in using alternative transportation programs

Survey Distribution

There are several options for distributing a survey. Typically, an online survey in which a web link to the survey can be emailed out to all campus affiliates is the easiest way to administer a survey as it eliminates the need to enter the results by hand. However, there may be classifications of staff persons that do not have access to email while at work and may require a paper survey. Free services such as SurveyMonkey can be used for simple online surveys. For more complex online surveys, a pay version of SurveyMonkey can be used. Some campuses have designed their online surveys in-house with the assistance of their information technology department.

To ensure an adequate response rate, a marketing and distribution plan should be developed and implemented. For example, a respondent incentive (free prize or cash) may be necessary to ensure an adequate response rate. Additional distribution considerations are listed below:

- Survey should be administered annually to enable tracking of performance metrics year to year.
- Survey should be administered at the same time each year to eliminate the influence of factors such as weather or holidays.
- Survey should not be administered at the very start of the semester/quarter as campus affiliates may need a few weeks to establish their typical commute pattern.
- The timing of the survey should take into account weather patterns as these will affect travel choices.

Survey Analysis

The data collected from this plan, as well as the first year of responses, will provide the baseline from which the change in travel behavior will be measured to track the effects of the PTDM program over time.

Transportation-Related Carbon Emissions (in GHG Tons)

The transportation sector is typically a large contributor to the overall greenhouse gas emissions generated by a campus. Thus, shifting campus affiliates away from single occupancy vehicle modes can have a significant impact on the number of tons of GHG emissions generated by the transportation sector.

Mode split and distance travelled data are needed in order to calculate GHG emissions, which should be collected as part of the annual transportation survey. Other data that is needed includes:

- Average gas mileage by type of vehicle
- Average number of persons per vehicle for transit vehicles, carpools, vanpools, and shuttles
- Pounds of CO2 per mile by vehicle type or pounds of CO2 per gallon of gasoline

Data regarding average gas mileage by type of vehicle and pounds of CO2 per mile may be obtained from local transit agencies and government agencies such as the Ventura County Air Pollution Control District (VCAPCD) and Environmental Protection Agency (EPA).

Level of Difficulty: Low to Moderate

The time required to conduct the analysis will depend on the ease of gathering the necessary data points. If the necessary data is readily available, the analysis could take as little as 20 hours. In subsequent years once the methodology is established the time required should decrease.

Cost: Low

The cost will depend on if the campus administers the survey and conducts the analysis themselves or if an outside consultant is hired. If a consultant is hired to administer and analyze the survey it may be more cost effective to have them conduct the GHG analysis. If an outside consultant is hired the cost could range from $5,000 to $7,000.

Key Consideration:

The design of the annual transportation survey will influence how easy it is to obtain necessary data such as total mileage travelled on each mode.

There are a number of existing GHG emissions calculators provided by environmental non-profits and agencies such as the EPA. Listed below is one possible method of calculating GHG emissions, using a readily available spreadsheet tool like Excel.

1. Utilizing data from the transportation survey, sum the daily mileage travelled by each mode.
2. Scale the mileage travelled on each mode based on the survey response rate to the campus population to obtain the total daily mileage by mode.
3. Calculate pounds per CO2 per passenger mile if no data for this metric is available. This calculation will vary depending on the mode.
    a. For transit vehicles or shuttles, divide pounds of CO2 per mile by the average number of passengers
    b. For drive alone, divide the average miles per gallon of gas by average pounds of CO2 per mile
    c. For carpools, divide the average miles per gallon of gas by average pounds of CO2 per mile. Divide the result by the average number of persons in a carpool.
4. Total daily mileage by mode **x** pounds per CO2 per passenger mile **=** Total Pounds CO2 per Day
5. Total daily mileage by mode **x** number of regular school days per year = Total Annual Passenger Miles

6. Total pounds CO2 per day **x** number of regular school days per year = Total Tons CO2 Per School Year

Average Vehicle Ridership (AVR)

Average vehicle ridership is the ratio of students and staff to vehicles arriving at the campus.

The higher the AVR, the more students and staff there are in relation to the number of vehicles, which means more measure utilizes mode split data in order to calculate AVR. This measure enables CI to monitor the effect of TDM and parking programs on reducing the number of campus affiliates who are driving alone to campus, even in the presence of campus population growth.

Mode split data collected in the annual transportation survey will enable calculation of AVR. To calculate AVR:

Level of Difficulty: Low

The time required is approximately 8 to 10 hours.

Cost: Low

Given the low level of difficulty it may make most sense for CI to calculate AVR itself to reduce costs. If a consultant is used for the annual transportation survey this calculation could be included in the survey analysis. If an outside consultant is hired the cost could range from $1,000 to $2,000.

Key Consideration:

The design of the transportation survey will influence how easy it is to obtain necessary data such as persons per vehicle.

1. Calculate the total number of survey respondents who drive alone. Calculate the total number of survey respondents who carpooled or vanpooled by the size of their carpool or vanpool (i.e. total number of respondents in two person carpools, etc.)
2. Divide the total number of drive alone responses by one. Divide the total number of carpoolers or vanpoolers for each size category by the size of their carpool or vanpool. For example, if there are a total of 100 survey respondents in a two-person carpool divide 100 by 2.
3. Sum the results from step two. This is the total number of vehicles.
4. Divide the number of survey respondents (all modes) by the number of vehicles to calculate AVR.

Parking Utilization

Parking occupancy counts should be conducted annually to coincide with the timing of the transportation survey. The counts should be conducted on peak usage days (e.g. Tuesday and Wednesday) to ensure that the highest points of parking demand are accurately reflected in the data. It is ideal that counts be conducted every hour, but it is also possible to select particular times of the day (e.g. 11 a.m., 2 p.m., 6 p.m.) to obtain a representative sample of parking patterns at various times. It is important, though, that parking counts be conducted during the same weeks, days, and times each year to allow for annual comparisons. In addition, occupancy space counts should distinguish by space type (e.g. faculty/staff, disabled). Bicycle parking occupancy counts should be conducted in tandem with vehicle parking occupancy counts.

Level of Difficulty: Low

Parking utilization counts are relatively easy to conduct. Ideally, parking or security staff can be used to inventory and count spaces.

Cost: Low to Medium

If CI is able to use available staff, parking counts can be relatively low cost. However, if staff are unavailable, costs can escalate somewhat. Furthermore, analysis of the parking data will require additional staff time.

Key Consideration:

It is essential that count times are uniform year to year to allow for annual comparisons of data.

Bicycle Counts and Bicycle/Pedestrian Facility Surveys

Bicycle counts should be done at major access points during specific and consistent times in order to ensure the ability to measure change in the future. Counts should be volume-based segment counts and capture information about directionality, location in the right-of-way, and gender.

Surveys of all relevant bicycle and pedestrian facilities should be completed on an annual basis, noting condition of facilities, and any hazards or barriers inhibiting safe bicycle and pedestrian travel.

Level of Difficulty: Low

Yearly counts and surveys by staff would necessitate minimal staff time.

Cost: Low

The staff time necessary to collect data is relatively low.

Key Consideration:

Tracking bicycle counts and facility quality is a core responsibility of a TDM coordinator.

FUNDING

Strategy AP.6 calls for strategic identification and planning for funding PTDM strategies. For public institutions, long-term transportation funding can be a major uncertainty given increasing competition for funding sources from all levels of government. The most common funding streams for university PTDM strategies are parking revenues, student transportation fees, and state or regional capital grant programs.

Funding Sources

Parking Revenue

Reinvestment of parking revenues from permit sales, citations, and daily fees is the preferred funding source of PTDM programs at many university campuses. This method is popular as it allows universities to fund transportation programs without relying on general fund revenue. Strategy P.2 calls for adopting official policy to allocate net parking revenues (after operation and maintenance costs) to PTDM programs. Performance-based pricing and targeted enforcement can help to increase these returns.

Government

It is recommended that CI initially seek opportunities with the City of Camarillo, City of Oxnard, and Ventura County to collaborate on the funding of capital projects, such as bicycle, pedestrian, and transit projects. Additional county, state, and federal sources can be sought through partnerships with the Ventura County Transportation Commission (VCTC) and the Southern California Association of Governments (SCAG). As CI is not a government agency, it is ineligible as a grantee for many state and federal grant programs that award transportation funding. However, for some programs CI would be eligible as a co-applicant as long as VCTC is the sponsoring grantee. Through a partnership with VCTC, CI could operate as a sub-contractor on larger regional investments, for which CI campus transportation is a focus.

Transportation Fees

As is done at university campuses across the nation, CI may consider exploration of student transportation fees as a long-term option for evaluation. Many schools charge a small semester fee (in the range of $5 to $50) to all students, faculty, and staff to generate revenue to maintain a financially sustainable PTDM program. The fee could be assessed on a sliding scale based on an individual's affiliate type and/or income and would pay for benefits directly returned to the affiliate in the form of general transportation infrastructure improvements and PTDM programming.