Chapter 3 Transportation

This chapter outlines goals and objectives for sustainable transportation, followed by an overview of how the Nishi development can achieve those objectives through design, location, and committed programs, as well as through an expanded menu of Transportation Demand Management (TDM) programs and infrastructure improvements. This chapter also includes an evaluation and monitoring program to ensure implementation of the actions pursuant to the project's overall timeline and occupancy, and proposes a set of performance metrics to monitor the transportation sustainability program into the future.

The Nishi development exists in a policy environment that places a strong emphasis on future reductions in vehicle trips, vehicle miles traveled (VMT), and associated greenhouse gas (GHG) emissions and energy consumption; as well as an emphasis on safety for users of all transportation modes and the creation of livable street design.

Both statewide and at the local level in the city of Davis, transportation is the single largest source of GHG emissions. Transportation accounted for about 38 percent of statewide GHG emissions in 2014[1], and approximately 53 percent of community emissions in Davis in 2006[2]. Key statewide policies that address transportation GHG emissions include the following:

- AB 32 (California Global Warming Solutions Act of 2006) mandated a reduction in statewide GHG emissions to 1990 levels by 2020.
- Executive Order B-30-15 set a statewide goal to reduce GHG emissions 40 percent below 1990 levels by 2030.
- Executive Order S-3-05 set a statewide goal to reduce GHG emissions 80 percent below 1990 levels by 2050.
- SB 375 (Sustainable Communities and Climate Protection Act of 2008) set regional VMT and associated GHG emissions reduction targets for light duty passenger vehicles through an integrated approach to regional transportation and land use planning. In 2012, the Sacramento Area Council of Governments (SACOG) adopted a new Metropolitan

[1] ARB, First Update to the Climate Change Scoping Plan, May 2014, Appendix C.
[2] Davis Climate Action and Adaptation Plan, 2010, p. 3.

Transportation Plan and Sustainable Communities Strategy (MTP/SCS) designed to achieve regional SB 375 VMT reduction targets of 7 percent by 2020 and 16 percent by 2035, compared to 2008 levels. The MTP/SCS identified the Nishi property as a "mixed-use development with high-density housing and light industrial and office uses" and partially located within the Center and Corridor Community designation in Davis, due to its location within 1/2-mile of the Amtrak train station.

- Article 22.15 of the Davis Municipal Code established transportation system management requirements for employers located in the city. These requirements "promote alternative commute modes and reduce the total number of vehicle trips." All major employers (100 or more employees) and major projects are required to file a transportation management plan (TMP). The TMP goal is to designate measures that will result in an average vehicle ridership (AVR) of 1.5 for peak period commute trips.

Generally, the project is also subject to the following guiding local policies, in the General Plan Transportation Element and Climate Action and Adaptation Plan, that relate to transportation:

- Provide a comprehensive, integrated, connected transportation system that provides choices between different modes of transportation. (Davis General Plan Transportation Element)
- Improve air quality, reduce carbon emissions, and improve public health by encouraging use of clean, energy-efficient, active (i.e., human powered), and economically sustainable means of travel. (Davis General Plan Transportation Element)
- Strive for carbon neutral transportation from new residential developments. (Davis General Plan Transportation Element)
- Promote the use of electric vehicles and other low-polluting vehicles. (Davis General Plan Transportation Element)
- Develop and maintain a work trip-reduction program designed to reduce carbon emissions, criteria pollutants, and local traffic congestion. (Davis General Plan Transportation Element)
- Apply best practices in designing sustainable/green streets or "Complete Streets", transit oriented development, and other circulation improvements to minimize travel. (Davis General Plan Transportation Element, Davis Climate Action and Adaptation Plan, UC Davis Climate Action Plan, SACOG Sustainable Communities Strategy)
- Provide incentives and facilities for car and bike sharing programs. (Davis Climate Action and Adaptation Plan)
- Provide incentives for fuel efficient or alternative fuel vehicles (e.g., parking incentives). (Davis Climate Action and Adaptation Plan)

- Consider establishing biofuels production facility. (Davis Climate Action and Adaptation Plan)
- Reduce VMT as follows:
    - 10 percent below 2010 by 2015 from households. (Davis Climate Action and Adaptation Plan)
    - 39 percent below 2010 by 2035 city wide. (Davis General Plan Transportation Element)
- Achieve at least the following mode share distribution for all trips by 2035. (Davis General Plan Transportation Element)
    - 10 percent of trips by walking.
    - 10 percent of trips by public transportation.
    - 30 percent of trips by bicycle.

Typically, transportation infrastructure and programs can contribute to GHG emissions reductions in one of two ways:

1. Improving the GHG emissions profile of the vehicle fleet (by promotion of plug-in electric vehicles, hybrids, higher levels of fuel efficiency, and use of alternative fuels, for instance).
2. Reducing the total number of VMT by the fleet (by encouraging and providing infrastructure for alternative modes of transportation).

Accordingly, this chapter is intended to serve as a TMP for the project as a whole, and includes implementing actions designed to target both of these methods to reduce GHG emissions, with a primary focus on reducing VMT among project residents, employees, and visitors.

This approach also aligns with the policy environment described above for the Nishi development, which calls for reducing the number of single-occupant vehicle (SOV) trips and VMT, while increasing the percentage of trips made by walking, bicycling, transit, or carpooling. While reducing GHG emissions is an important objective, these actions can also achieve additional objectives that are also important aspects of sustainability, such as improving air quality and public health, increasing recreation opportunities, ensuring connectivity and diversity in the transportation network, and other co-benefits. Achieving all of these co-equal objectives is important to creating a sustainable Nishi development, and ultimately the community of Davis.

3.1 Goals and Objectives

This section describes transportation-related goals and associated objectives for the Nishi development that are a subset of those identified for the project as a whole in Chapter 1, and reflect the policies described above. This includes a goal for serving as a model of low-carbon, climate-resilient development and working towards carbon neutrality for the transportation-related components of the project.

- **Goal 1:** Serve as a model for low-carbon, climate-resilient development that also enhances the fiscal and equitable sustainability of the broader community.
    - **Objective 1.1:** Achieve substantially lower GHG emissions per capita for both residents and employees of the District compared to baseline levels, in support of the City of Davis' and UC Davis' long-term goals to achieve carbon neutrality.
    - **Objective 1.2:** Encourage innovative site and building design that encourages a healthy and interconnected natural and built environment, conserves natural resources, and promotes equitable and efficient communities.
    - **Objective 1.4:** Promote and demonstrate resiliency to the effects of climate change and other challenges through project design.
- **Goal 2:** Strive for carbon neutral transportation through the use of innovative designs, infrastructure, technologies, and programs.
    - **Objective 2.1:** Reduce automobile dependency and reduce vehicle trips generated within the District by 10 percent compared to original project trip generation forecasts [3], working towards the communitywide goal of achieving 50 percent non-single-occupancy-vehicle (SOV) mode share for residential and commercial development by 2035.
    - **Objective 2.2:** Achieve a 20 percent reduction in project-related vehicle miles traveled (VMT), compared to original project VMT forecasts[3].
    - **Objective 2.3:** Achieve maximum connectivity and safety for pedestrians, bicyclists, and transit users.
    - **Objective 2.4:** Incentivize the use of clean, energy-efficient, active (i.e., human powered), and economically sustainable means of travel.
    - **Objective 2.5:** Achieve an average vehicle ridership (AVR)[4] of 1.5 for peak period commute trips by employees of the project office uses.

3.2 Implementing Actions

The implementing actions for transportation sustainability are organized within two separate "layers" of programs and project characteristics to achieve the goals and objectives listed above.

[3] Original project-related trip and VMT forecasts are based on the traffic and transportation analysis for the project prepared by Fehr and Peers. These forecasts do reflect the locational and mixed-use advantages of the site, but do not assume any of the TDM measures or related actions in this chapter. Refer to the remaining sections of this chapter, as well as Appendix B, for additional information.

[4] Average Vehicle Ridership (AVR) shall be determined by dividing the employee population at the work site, that report to work during the AM peak period, by the number of single-occupant autos (that have not dropped off employees at other work sites en route) driven by these employees commuting from home to the work site during these hours. Zero emission vehicles will be excluded from the count.

First, it considers the site location characteristics and proposed land use program and site design elements that will result in fewer vehicle trips than will be generated by typical office and multi-family residential uses in the Sacramento region. The second layer of programs consists of an expanded TDM program designed to further reduce dependence on automobiles for residents and employees at the project site. This expanded program is designed to provide innovative infrastructure and programs to accomplish the project's transportation sustainability objectives.

Each subsection below includes a brief introduction and description of the implementing actions included. VMT reductions generated by the expanded TDM program are summarized in Tables 3-2 and 3-3 and discussed in further detail in Section 3.3.1, "Program Evaluation."

3.2.1 Project Design & Location

The Nishi development includes several characteristics with respect to site location, planned land uses, and design elements that will lead to reduced auto trip generation and VMT, when compared to projects of similar size and intensity in other parts of the Sacramento region.

These land use characteristics are further supplemented by a variety of programs already included in the project description or committed, such as end-of-trip bicycle parking facilities, direct transit service to campus, and a pedestrian-centered design within the site.

Project Location

Nishi Gateway is unique in its location directly adjacent to UC Davis, a major research university. The UC Davis Campus Travel Survey shows that UC Davis students who live a similar distance to the core of the UC Davis campus make about 90 percent of their trips to campus by bicycle, transit, or walk modes.[5]

The project's location in Davis – in close proximity to campus, downtown, the City-wide bicycle route system, and the train station – will incentivize a high level of travel by bicycle, particularly by students living in the multi-family rental housing. Davis, with 60 miles of separated bicycle paths, and over 55 miles of on-street bicycle lanes has a 22 percent bicycle mode share for commute trips, a rate that not only substantially outpaces the rest of California, but is the highest of any city in the US according to a recent study conducted by the League of American Bicyclists[6].

[5] Popovich, Natalie (2014) Results of the 2013-14 Campus Travel Survey. Institute of Transportation Studies, University of California, Davis, Research Report UCD-ITS-RR-14-14

[6] The League of American Bicyclists (2013), Where We Ride: Analysis of bicycling in American cities."

Project Mix of Uses & Student Housing

The Nishi development is designed at a fairly high residential and employment density, and incorporates multiple uses in a single site. Current methods of traffic impact analysis, which rely on rates and adjustments from the Institute of Transportation Engineers, are believed to understate the traffic benefits of mixed-use developments, leading to exaggerated trip generation estimates than should be the case. A 2010 study evaluating household travel surveys from 239 mixed-use developments across the country found that mixed-use developments have reduced auto trip generation, compared to typical generation rates[7].

A Class 1 bicycle path will connect Nishi with the Putah Creek bike path.

The Nishi development includes the following mix of land uses: 650 residential units, 325,000 square feet of R&D uses, 20,000 square feet of ancillary retail uses, and 19.2 acres of public parks and open space on a 46.9-acre site. The proposed residential density is approximately 60 units per acre. (By contrast, a typical suburban single family development ranges in density from 4 to 8 units per acre.) The 650 residential units include 440 multi-family rental units and 210 for-sale condominium units. The multi-family rental units will be designed primarily to serve UC Davis students, and 85 percent of the 1,500 beds in the rental units are assumed to be occupied by college students. Students living in the project's rental units are projected to have travel characteristics similar to students in privately managed campus apartments in West Village or the Colleges at La Rue.

Students in privately managed apartments on the UC Davis campus make most of their trips to campus via active transportation modes such as bicycling and walking (70 percent) or transit (19 percent) based on campus travel surveys.[8] Only about 11 percent of trips made to campus by students living in on-campus housing projects are by auto. Parking is provided at these facilities, and surveys indicated that about 2.16 daily vehicle trips per student are made. Most of the daily vehicle trips made by students are during off-peak hours and are for purposes such as shopping, visiting friends, off-campus work, recreation, etc. These vehicle trips don't tend to raise congestion levels, but do generate GHG emissions.

It is also projected that a number of the 210 for-sale condominium units will be occupied by UC Davis faculty and staff, given the proximity of the project site to campus. A comparison of the current number of faculty and staff who live in Davis to the housing inventory indicates that approximately one in five Davis households is occupied by a campus employee. This citywide

[7] Walters, Jerry, Reid Ewing, and John Thomas Eary. 2013. "Getting Trip Generation Right -- How to Accurately Account for Impact Reduction Attributable to Mixed-Use and Related Forms of Sustainable Development." National Association of Environmental Professionals Conference Proceedings, April.

[8] Castilian Redevelopment Project Traffic Impact Study, UC Davis, June 2012.

average was used to assess the project's baseline travel characteristics; but actual number of UC Davis faculty and staff may be higher because of proximity to the core campus and downtown.

Parking

For the multi-family rental housing, an average of approximately 1.8 vehicle parking spaces per unit (or approximately 0.5 space per student/bed) are proposed, which is lower than the 0.75 per student parking ratio provided in on-campus housing projects such as West Village, Colleges at La Rue Apartments, Orchard Park, and the Castilian Redevelopment Project (graduate student housing).

The for-sale condominium units will provide 1.5 parking spaces per unit, which is below the Davis Municipal Code rate of one and three-fourths spaces per unit for multi-family housing consisting of two bedrooms. The project will provide a total of 1,300 bicycle parking spaces for the rental and for-sale residents. The Davis Municipal Code for multi-family housing requires one bicycle parking space per bedroom, with 25% for short-term use and 75% for long-term use. The project will have 420 bedrooms in the for-sale units (2 bedrooms per unit) and 880 bedrooms in the rental units (2 bedrooms per unit), requiring a total of 1,300 bicycle parking spaces (325 short-term and 975 long-term spaces). As such, the project will meet the Code requirement for bicycle parking.

The 325,000 square feet of R&D will provide a total of 818 vehicle parking spaces, or 2.5 spaces per 1,000 sf, which conforms to the Davis Municipal Code's required rate of 2.5 spaces per 1,000 square feet. The R&D portion of the development will provide 650 bicycle parking spaces, compared to the 163 spaces required by the Code. It is assumed that the 1,412 estimated R&D employees will have a similar residence profile as current Davis employees, 55 percent of whom also live in Davis.

Transit Service

Unitrans has indicated that they can provide transit service through the project site if a new connection is made to campus (i.e., to Old Davis Road) and if the proposed underpass of the Union Pacific rail line provides sufficient vertical clearance for their tallest buses. Currently, approximately 19 percent of students travel to UC Davis via public transit, and 95 percent of all Unitrans riders are UC Davis students.

Unitrans buses running through the Nishi property will be able to connect South Davis with UC Davis.

In addition to Unitrans service, the proximity of the project site to the Amtrak Station also presents an opportunity to capture commute trips, both to in-bound commuters to R&D buildings and from on-site residents in the multi-family units to outside Davis. The Amtrak Station provides service via Capitol Corridor trains that connect the Sacramento region with the San Francisco Bay Area with 32 round trips per day.

END-OF-TRIP AMENITIES FOR BICYCLISTS

Other aspects of the project's design and description that will help to reduce trips and VMT include the provision of end-of-trip facilities for bicyclists, including a prominent bicycle station on the main floor of a centralized building providing secure bicycle parking as well as bicycle repair.

Travel Characteristics

Table 3-1 provides an estimate of the number of external vehicle trips compared to total person-trips generated by the project[9], without implementation of additional TDM actions beyond those already incorporated in the project description and summarized above.

Table 3-1 Estimated Project Trips, without TDM Program

Time Period	Total Person Trips	External Vehicle Trips	Percent Non-Auto Trips
Daily	7,223	4,869	33%
AM Peak Hour	610	423	31%
PM Peak Hour	702	463	34%

Source: Appendix B, Fehr & Peers 2015

The project is forecast to generate a total of 45,200 daily VMT, without the implementation of additional TDM actions. This includes approximately 24,900 daily VMT from employment uses and 20,300 daily VMT from residential uses.

3.2.2 Transportation Demand Management Program

To achieve the project goals and objectives, the project will need to implement a comprehensive set of design features and TDM strategies intended to further reduce vehicle trips and VMT (and therefore GHG emissions), encourage the use of alternative modes, build safe infrastructure, and provide initial incentives and infrastructure for using electric vehicles.

Research conducted for the California Air Pollution Control Officers Association (CAPCOA)[10] of the overall benefit of TDM programs indicates that there is an effective maximum benefit that can be achieved when combining strategies. The CAPCOA methodology generally indicates that all combined TDM strategies will not reduce VMT more than 35 percent below the baseline in "compact infill" areas and not more than 15 percent below the baseline in "suburban center"

[9] "External Vehicle Trips" refers to trips made in an automobile that either begin or end outside of the Nishi development. Person trips refer to all trips made, including those made entirely within the development.

[10] CAPCOA (2010). *Quantifying Greenhouse Gas Mitigation Measures.* Available at http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf. The findings in this report will be discussed in further detail later in this report.

areas. While the Nishi property best fits the CAPCOA definition of a suburban center, its unique location near UC Davis and mix of land uses with relatively high densities indicates a higher potential for VMT reduction, especially if future tenants are students or otherwise have affiliations with the University. Additionally, the Nishi development has already integrated a number of the candidate land use and transportation strategies related to site location, mix of uses, and design elements, as described above under Section 3.2.1.

The following TDM program components – listed in order from least to most intensive from an implementation standpoint - have the highest potential to further reduce peak hour vehicle trips, VMT, and associated GHG emissions.

Bicycle Infrastructure and Incentives

Davis's success at encouraging bicycle commuting has led to a bicycle mode share for commute trips of around 20 percent. Figure 3-1 shows where the site is located in the larger context of the city's bicycle infrastructure. As noted in Table 3-1, daily combined walk/bicycle mode share rates will be 33 percent, and peak hour mode share will range from approximately 31 to 34 percent for the project without additional TDM strategies.

In order to further increase these numbers, and to maintain them in the future, a strong focus on the project's interface with local bicycle infrastructure will be required. Key actions include the provision of a bike share station (linked to the planned regional bike share system), an on-site bike repair facility, showers and lockers in the R&D buildings, and enhanced connections to the UC Davis campus, downtown Davis and the Amtrak Station such as the proposed Arch project. This includes building a strong interface with transit, by locating the bike share station and new bus stop facilities at a common central location. Subsidized memberships in the future regional bike share program can further encourage the use of active transportation modes.

Specific bicycle infrastructure & incentive actions shall include the following:

Bicycle racks at the Amtrak station help commuters park and ride.

Action 3.1: Bike Share Stations

Dedicate land, provide funding for construction, and sponsor one bikeshare station centrally located among the residential uses and the R&D uses).

Action 3.2: Bike Route Enhancements

The project applicant shall contribute to funding for enhancements to existing or planned bicycle routes to UC Davis and the Davis Amtrak Station, where appropriate, in order to accommodate increases in bicycle traffic related to the project.

Action 3.3: Bike Repair Facility

Provide a community bicycle repair facility (potentially co-located with bike share station, end-of-use facilities, bicycle retailer, or bicycle parking).

Action 3.4: End-of-Trip Bike Support Facilities

Provide end-of-trip facilities for office uses, including showers, lockers, and changing rooms.

Action 3.5: Bike Parking

Provide a convenient location for bicycle parking, bike share, and connecting facilities near transit stops.

Action 3.6: Bike Storage Rooms

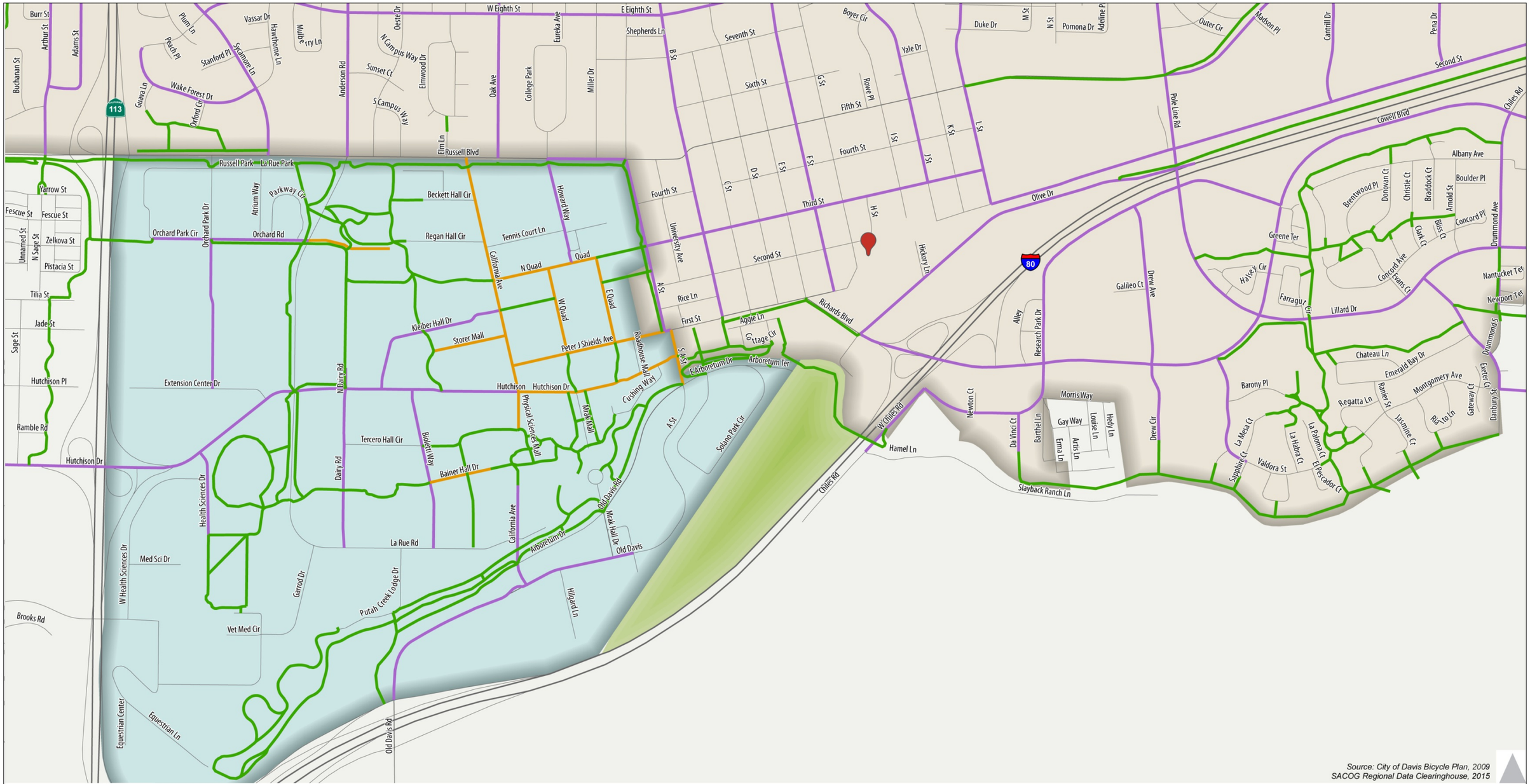
Provide internal and secure bicycle storage rooms and/or bike lockers of sufficient capacity to accommodate minimum required long-term bicycle parking spaces near each residential building so tenants will be encouraged to ride their bikes as a primary means of transportation. These rooms and/or lockers should be located on the ground floor so they can provide easy access to the multi-use trail.

Indoor bike rooms provide a safe space for residents to store their bikes out of the weather.

Transit Infrastructure and Incentives

Currently, Unitrans ridership is heavily dominated by the student population (95 percent of all riders on Unitrans), due to free fares for students and a transit network and schedule centered on the University. The project represents an opportunity to increase transit usage among both students and non-students, including both future residents and employees on the Nishi property. Figure 3-2 shows where the site is located in the larger context of the nearby transit lines. By providing a centrally located bus stop with state-of-the-practice amenities, as well as potential incentives such as transit subsidies, the development has the opportunity to build ridership numbers and encourage mode shift away from SOVs. Unitrans has indicated they can provide direct transit service through the site if a new connection to campus is provided.

The proximity of the project site to the Amtrak Station also presents an opportunity to capture commute trips, both to the R&D buildings and from the multi-family residential units, via the Capitol Corridor.



Source: City of Davis Bicycle Plan, 2009
SACOG Regional Data Clearinghouse, 2015

Class I Bike Path
Class II Bike Lane
Class III Bike Route
Project Nishi Gateway
City of Davis
University of California Davis Campus
Amtrak Station

Source: Fehr & Peers 2015

X14010097 02 023

Figure 3-1 Existing Bicycle Infrastructure

ASCENT ENVIRONMENTAL

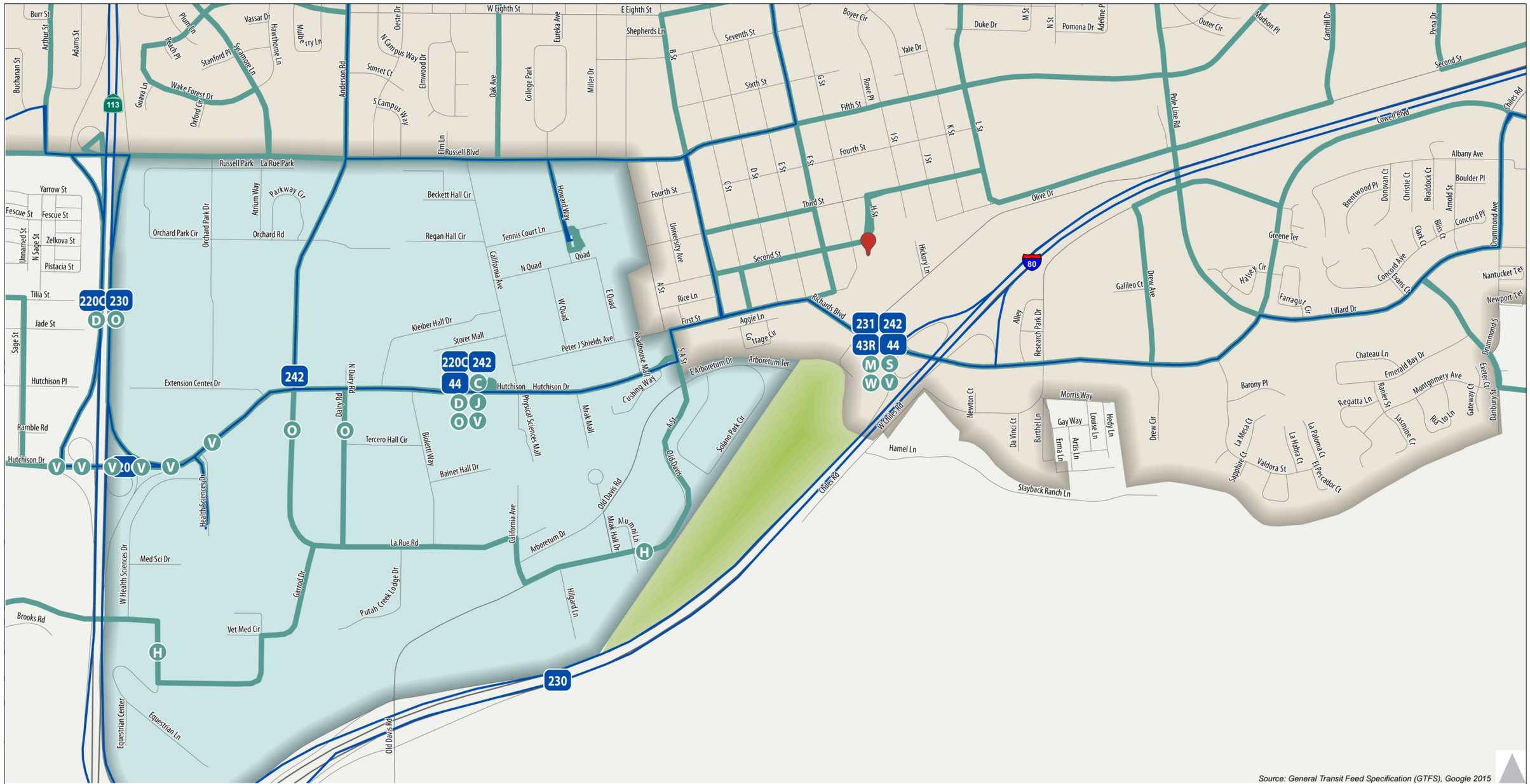


Figure 3-2 Existing Transit Infrastructure

Transit infrastructure & incentive actions shall include the following:

Action 3.7: Extend Transit Service

Partner with Unitrans to provide direct transit service to the Nishi property via new or realigned route(s) that connect the Nishi property to UC Davis via the proposed new railroad undercrossing to Old Davis Road, and to South Davis via the proposed new connection to West Olive Drive and Richards Blvd.

Action 3.8: Construct Bus Stops

Construct project bus transit stops with high-quality amenities, including benches, shelters, bike racks, and real-time passenger information displays.

Action 3.9: Trip Planning Assistance

Require residential property managers and future employer tenants to join the Yolo TMA and designate a Transportation Coordinator to assist residents and employees with trip planning.

Action 3.10: Improve Amtrak Station Connections

Coordinate with the City of Davis to provide fair-share funding for improved connections with Davis Amtrak Station. These improved connections may include a shuttle bus, improvements to the Richards Boulevard intersection with West Olive Drive for bicycles and pedestrians, or other similar improvements.

The Nishi property will be connected to Amtrak via existing city streets, and new and expanded trails and bike lanes.

Action 3.11: Transit Subsidies

Provide transit subsidies for long-distance commute trips by employees and residents, with a focus on travel via Amtrak/Capitol Corridor. Subsidies will be provided by either the residential property manager or future employer tenants, and financed through tenant rents and/or HOA/COA dues.

Work Force Housing

The greatest number of projected vehicle trips will be made by individuals who work at the R&D facilities or live in the for-sale condominium housing, with the highest auto mode share among employees working on site but living outside of Davis. By working to help employees find housing on-site or near-site, work trip lengths will be shortened, thus making walk, bike, and transit trips more attractive.

Increasing the number of UC Davis faculty and staff who live in the for-sale condominium housing, will significantly reduce VMT. Designating a portion of the project for-sale

condominium housing for occupancy by project R&D and/or UC Davis employees will accomplish similar reductions.

Work force housing actions may include the following:

Action 3.12: Dedicated Workforce Housing

Partner with the City and UC Davis to designate up to 60 percent of for-sale project housing to UC Davis faculty and staff and/or employees of future businesses in the R&D uses.

Parking Pricing and Supply Management

Parking pricing has been shown to be one of the most effective means of reducing vehicle trips. While market forces may require provision of enough parking for residents to store their cars, several pricing actions can create disincentives to drive for shorter trips or commute trips. The purpose of parking pricing and supply management isn't to completely eliminate vehicle trips. It is to provide an economic incentive to use active transportation or transit modes, particularly for short trips.

First, unbundling of parking pricing from the terms of the mortgage or lease requires residents and employers to consider whether having a dedicated parking space is worth the cost. A higher cost to park will typically reduce demand for parking by reducing car ownership among residents, and reducing driving among employees.

Second, establishment of a parking access fee that charge a variable rate based on either the number of trips and/or the time of day that trips are made has the greatest potential of all the TDM strategies to reduce peak hour vehicle trips. In addition to a baseline monthly parking fee, residents and employees will also pay each time they access the parking lot. The access fee will be variably priced, with higher fees charged during weekday peak travel periods and lower fees charged during off-peak periods and weekends. Gates will be provided at each parking facility access point to monitor trips and assign parking costs based on arrival and departure times. Electronic signs will be posted at each access point indicating the current fee that is being charged, and this information will be provided to employees, residents, and visitors. San Francisco and Los Angeles currently employ variable parking pricing for on-street meters in their downtown districts. SF Park also applies variable hourly pricing at public off-street garages. There is little experience with applying variable pricing at private off-street parking facilities in the U.S.; however, the technology is available to make implementation feasible. Revenue generated by the variable pricing can be used for multiple purposes, including funding an on-site transportation coordinator as well as providing incentives for transit and bicycle use. Since the gates will be located at access points for the parking garage and surface lots, parking pricing will not impact traffic using West Olive Drive and/or the new connection to the UC Davis campus (should that project access alternative be implemented).

Another action will involve a reduction in the proposed parking supply. The project proposes to provide 2.5 spaces per 1,000 sf of office, which is comparable to the existing City code requirement, despite its central and transit-accessible location. A reduction in the parking supply of 10 percent will promote the use of alternative modes. This can be accomplished by deferring the construction of a portion of a proposed parking facility and/or constructing deferred/overflow parking areas with permeable pavement materials such as turf grid or grassy pavers.

Parking actions shall include the following:

Action 3.13: Unbundle Parking Costs

Unbundle cost of parking from leases for residential and R&D units. All tenants, residential and R&D, will pay an additional cost for reserved parking based on market rates (discussed below).

Action 3.14: Market Rate Employee Parking Fees

Charge market rate for monthly parking for employees. It is recommended that the market rate for parking be benchmarked for employees to the UC Davis A Permit (i.e., currently at $51 per month for long-term and $56 per month for short-term permits). Note that the campus permit rates are significantly higher than the City's X Commuter Permit for downtown Davis, which costs $96 annually (i.e., an average of $8 per month). In the event that employers offer a parking subsidy benefit to employees, require participation in a "parking cash-out" program for those not accepting the subsidy. [11]

Action 3.15: Market Rate Residential Parking Fees

Charge market rate for monthly parking for rental residents. It is recommended that the market rate for parking be benchmarked for residents to the West Village monthly parking fee (i.e., currently $65 per month).

Action 3.16: Reduced Parking Supply

Reduce the proposed parking supply for R&D by 10 percent. If appropriate, defer the construction of a portion of a proposed parking facility and/or construct deferred/overflow parking areas with permeable pavement materials such as a turf grid or grassy pavers.

Action 3.17: Variable Parking Access Pricing

Implement variable parking access pricing, by either time of day or time of entrance/exit, to promote off-peak trips. This variable fee will be in addition to any monthly or daily parking fees.

[11] Comparable developments and employment areas have parking rates ranging from $40 per month for employee parking in downtown Davis up to $185 per month for a monthly permit in downtown Sacramento. UC Davis employees may obtain a monthly parking permit for $42 - $51.

Transportation Management Association Membership and Program Management

The designation of an on-site Transportation Coordinator and ongoing membership in a Transportation Management Association (TMA) are typically among the initial strategies employed in TDM Plans as they provide a mechanism for ongoing implementation and collaboration with other organizations.

The mission of Yolo Commute (formerly Yolo TMA) is to reduce single-occupant (drive alone) commutes throughout Yolo County. They are a nonprofit partnership of public and private employers, providing a range of services including the following:

- transportation resource center providing commute travel information,
- Rideshare Incentive Program,
- Emergency Ride Home Program, and
- information on commuter tax incentives.

Thus, membership in Yolo Commute and designation of an on-site Transportation Coordinator for all employers/employees in the Nishi development will be essential.

TMA membership and program management actions shall include the following:

Action 3.18: On-Site Transportation Coordinator

The property manager will appoint and fund a Transportation Coordinator to manage implementation of the TDM Plan, provide information to employees and residents, and collaborate with Yolo Commute. The property manager will appoint and fund a Transportation Coordinator.

Action 3.19: Prepare Final TMP

Submit a TMP with base year AVR and strategies to achieve an AVR of 1.5.

Action 3.20: Join Yolo Commute

Require the residential property manager and employer tenants to join Yolo Commute.

Action 3.21: UC Davis Coordination

Require the Transportation Coordinator to actively work with UC Davis Transportation & Parking Services to coordinate and integrate transportation management programs for University students and employees;

Action 3.22: Marketing

Require the Transportation Coordinator to produce ongoing materials and events that market alternative transportation to residents and R&D employees.

Action 3.23: Annual Surveys and Monitoring

Conduct annual surveys, monitor project AVR, and revise TMP as needed. Comply with annual monitoring plans, including data collection, analysis, and necessary updates to the project's TDM plan (see Section 3.3 of this chapter).

Innovative Electric Vehicle Infrastructure and Shared Fleet

The project's location and emphasis on reducing GHG emissions creates an opportunity for state-of-the-practice electric vehicle (EV) infrastructure, including a potential shared EV fleet. In addition to providing charging stations for private EVs, a shared EV fleet can provide several benefits.

Providing dedicated parking spaces and infrastructure for electric vehicles to charge is essential sustainability infrastructure.

First, an internal car share fleet composed of compact EVs will also lead to a reduction in parking costs as each vehicle will require less space. Second, these vehicles are more efficient and more environmentally friendly than gasoline-powered vehicles, and provide an easy alternative for performing local errands among those populations who are less likely to bicycle.

Third, car sharing programs reduce total VMT by allowing more households to opt to go without a car; if car sharing subsidies are provided (see *Other Suggested Actions*), the combined benefit can be an up to 5 percent reduction in VMT. The shared EV fleet can be provided by an existing car share company or provided and maintained specifically for the project by the on-site transportation coordinator, building managers, and/or a homeowners association (HOA). It is anticipated that these vehicles will be housed in the parking structure.

EV infrastructure and car-sharing actions shall include:

Action 3.24: EV Parking

Provide parking spaces equipped with EV charging stations for residents and employees, per CALGreen Tier 1 minimum requirements (5 percent of total parking required for residential construction and 4 percent of total parking required for nonresidential construction).

Action 3.25: EV Car Sharing

Provide an on-site zero-emission electric vehicle car-sharing program, either through private fleet or through contract with an existing car-sharing provider.

3.2.3 Additional Implementing Actions

The following actions are designed to fill in key gaps in the primary actions, or to increase the efficacy of the primary actions through additional subsidies. In most cases, they can be administered by either the Transportation Coordinator or by a TMA, and their effectiveness can be increased through marketing actions. They include:

Action 3.26: Subsidized Bike Share Memberships

Bike share memberships may be offered at reduced cost to project residents and/or employees. The Sacramento Bikeshare Business Plan identifies an estimated annual membership of $65. Memberships should be developed and coordinated with implementation of the Sacramento Bike Share program, and should be offered after planned bike share stations in Davis have been completed. Likely participants in this program are employees as well as international or out-of-state students. This action will help to incentivize local residents and employees to utilize the regional bike share system and will further promote cycling, especially as a "last mile" method of transportation.

Action 3.27: Subsidized Car Share Membership

Car share memberships may be offered at reduced cost to project residents and employees, so that residents will be encouraged to own fewer vehicles. For employees, car share memberships provide a way to run errands or travel to meetings from the office, particularly for those who take transit or bike to work.

Action 3.28: Ride Sharing Program

Ride sharing programs may be implemented to help match potential carpool drivers and participants to reduce the number of individuals driving alone. Most highly utilized in an office/commercial context, these programs generally consist of a website or bulletin board allowing people with similar commutes to find each other and coordinate a carpool. Once the project reaches a critical mass in size, a project "app" can be developed to link project employees and residents who wish to carpool.

Action 3.29: Vanpool Program

In combination with Action 3.28 Ride Sharing Program, ride matching should identify potential vanpools where appropriate. Vanpools are similar to carpools in that they allow multiple people to share a ride; however, they are typically implemented for commuters traveling long distances. In the case of R&D employees, if clusters of employees are commuting long distances from similar locations, vanpools may be an appropriate ride sharing mechanism. This will reduce VMT by consolidating and avoiding some of the longest commute trips.

3.3 Evaluation and Monitoring

In addition to the general goal and objectives listed above, the proposed project and TDM program underwent evidence-based quantitative analysis to evaluate its potential to reduce VMT and GHG emissions. This evaluation process used the methodology developed by the California Air Pollution Control Officers Association (CAPCOA) in its 2010 report *Quantifying Greenhouse Gas Mitigation Measures*. Once fully implemented and fully occupied, the CAPCOA methodology estimates a 20.3 percent reduction in VMT for residential uses, and a 16.2 percent reduction in VMT for office uses assuming implementation of all TDM actions in Section 2.2.2. Further implementation of the additional suggested actions in Section 2.2.3 will increase the reduction to 24.0 percent less residential VMT, and 23.1 percent less office VMT.

Detailed evaluation is provided below, along with a monitoring plan to provide information on the project's transportation-based emissions and other transportation-based sustainability metrics in future years.

3.3.1 Program Evaluation

The CAPCOA evaluation results (shown by TDM actions in Table 3-2 and Table 3-3) is based on a comprehensive literature review of quantitatively proven VMT reduction methods. This requires both a certain level of translation, in examining how the recommended TDM plan fits into the body of research, as well as some caveats. The CAPCOA methodology does not provide trip reduction credit for several key transportation best practices, including certain bicycle infrastructure investments, innovative strategies, and workforce housing. The Nishi property's unique context and location may result in additional VMT reductions, even for actions not supported by the CAPCOA methodology. The difficulty in forecasting exact VMT reductions achievable through a menu of programs is why it is recommended that the Nishi development set a trip cap for program monitoring purposes. The trip cap will be a maximum of 415 PM peak hour vehicle trips from the Nishi development, which is a 10 percent reduction in project trip generation as described in Objective 1.1. The Management Entity for the Nishi development will collect annual counts during the weekday AM and PM peak hours at the project driveways to monitor the project's vehicle trip generation. Should the peak hour trip cap be exceeded, additional TDM measures shall be implemented by the project management entity to reduce peak hour vehicle trips. These additional measures may include transit service and/or subsidizing existing transit service, constructing bicycle facilities, and/or making multi-modal street improvements to be selected by the City of Davis from the list of area-wide improvements identified in the City's CIP.

In Table 3-2 and Table 3-3 each estimated reduction can be treated as a reasonable starting point. Below, specific details on the assumptions behind each calculation are provided.

Table 3-2 Estimated VMT Reductions from Primary Actions

Residential Actions	
Action Name	**%VMT Reduction[1]**
Bike Infrastructure and Incentives	0.2%
Transit Infrastructure and Incentives	no additional benefit[2]
Parking Pricing (Unbundled)	7.3%
Parking Pricing (Variable Pricing)	2.2%
Parking Supply Limits	6.8%
TMA Membership and Program Management	4.0%
Carshare	1.5%
RESIDENTIAL TOTAL	**20.3%**
Office Actions	
Action Name	**%VMT Reduction**
Bike Infrastructure and Incentives	0.2%
Transit Infrastructure and Incentives	no additional benefit[2]
Parking Pricing (Unbundled)	7.4%
Parking Supply Limits (10% Reduction)	4.1%
TMA Membership and Program Management	4.0%
Carshare	1.5%
OFFICE TOTAL	**16.2%**

Source: Appendix B, Fehr & Peers 2015

[1] The percentage reduction in this column refers to an estimated reduction to total vehicle miles travelled, as well as to total trips in comparison to the plan without any of these actions.

[2] Transit infrastructure as proposed is largely included in the project description. Expanded transit infrastructure and additional routes will likely have some effect, but that effect is not quantifiable without additional details on routing and demographics.

Table 3-3 Estimated VMT Reductions from Supporting Actions

Residential Additional Suggested Actions	
Action Name	**%VMT Reduction[1]**
Bike Share Membership	0.9%
Car Share Membership	1.4%
Ride Sharing Program	1.0%
Subsidized Transit	1.4%
Vanpool	0.1%
SUBTOTAL	**4.7%**
RESIDENTIAL TOTAL	**24.0%**

Table 3-3 Estimated VMT Reductions from Supporting Actions	
Office Additional Suggested Actions	
Action Name	**%VMT Reduction**
Bike Share Membership	0.9%
Car Share Membership	1.4%
Ride Sharing Program	2.1%
Subsidized Transit	3.0%
Vanpool	1.1%
SUBTOTAL	**8.2%**
OFFICE TOTAL	**23.1%**

Source: Appendix B, Fehr & Peers 2015

[1] The percentage reduction in this column refers to an estimated reduction to total VMT, as well as to total trips in comparison to the plan without any of either the primary TDM actions or the additional actions.

3.3.2 Monitoring

The project shall undertake annual monitoring of the following TDM evaluation metrics:

- 1.5 minimum AVR, which translates into a maximum daily single-occupant auto share of 66 percent.
- 415 maximum peak hour auto trips, total entering and exiting all project parking facilities, during a weekday pm peak hour.
- 36,000 maximum daily VMT, or approximately 8.5 daily VMT per service population (i.e., combined residents and employees), for all on-site employees and residents.

These metrics, which can also be referred to as "trip caps," will be monitored by the on-site Transportation Coordinator in cooperation with City staff. Implementation of advanced parking management strategies can assist with monitoring, by providing both a way to monitor peak hour auto trips, as well as the necessary infrastructure to price parking according to demand at certain times of day. Since the parking gates will be located at facility access points, parking pricing will not impact traffic using West Olive Drive and/or the new connection to the UC Davis campus (should that project access alternative be approved).

Trip caps have been successfully used to reduce both total vehicle trips and SOV mode share in multiple jurisdictions in the Bay Area, especially in Silicon Valley. Facebook, for example, has committed to reducing SOV mode share to its campuses to 51 percent. These commitments focus on the results of a TDM program, rather than on specific elements of it; this allows for developers and employers to take a flexible approach in meeting their goals.

The project's performance in meeting its VMT and vehicle trip projections will be evaluated and monitored through annual parking facility counts and travel surveys. Parking facility counts will provide information on trip generation during a typical day, which can be compared to the project's goals regarding overall trip reductions. Travel surveys provide additional information by isolating travel patterns of different groups: student residents, non-student residents, employees, and visitors, for instance.

Figure 3-3 shows the general process for conducting the annual monitoring process. In general, each year, vehicle counts and other data will be collected and compared to both a baseline year and the previous year. If total vehicle trip generation does not meet the goals of this SIP, the TDM plan should be reviewed and revised. Finally, the entire process will be recorded via annual monitoring reports.

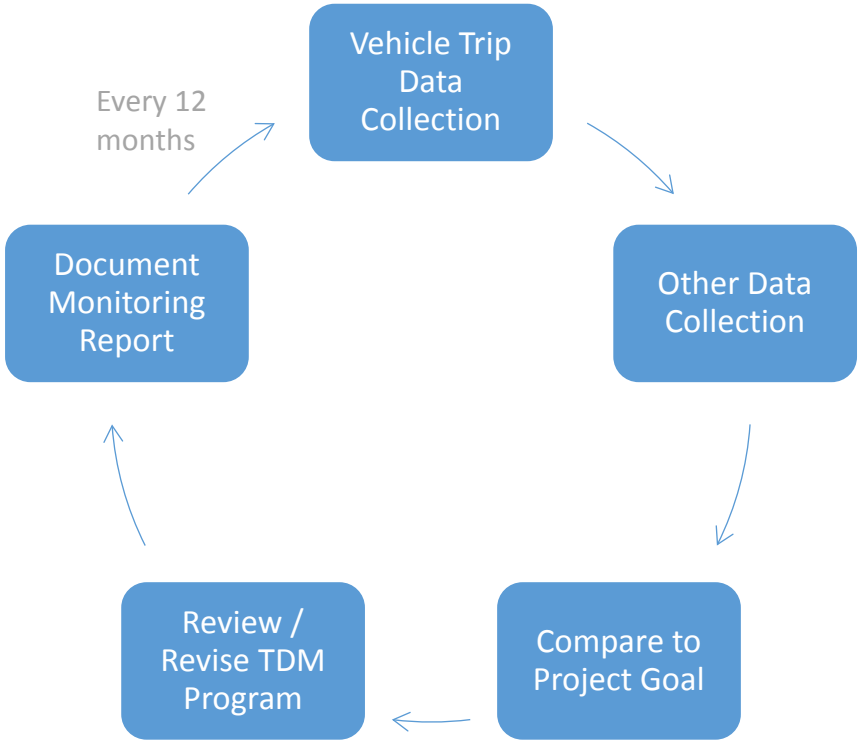


Figure 3-3 TDM Plan Monitoring Process

Auto Trip Data Collection

The primary way of gathering information about trips specific to the project is a driveway count that records the total number of trips in and out of each parking facility.

The on-site Transportation Coordinator should collect this data, using a methodology approved by the City. The data collection efforts should include:

- Data collection in late October or early November, if possible.
- Mode choice data collection for AM and PM peak periods (7:00 – 10:00 AM and 4:00 – 7:00 PM) on two consecutive mid-week days by:
- Manual vehicle counts identifying:
  - Private passenger vehicle – 1, 2, 3, or 4+ occupants
  - Truck
  - Motorcycle
- Manual pedestrian and bicycle counts at project parking and pedestrian access points during the same peak periods.
- Unitrans bus boardings and alightings at the project bus stop during the same peak periods.

Employee and Resident Surveys

Conducting annual employee and resident surveys will provide insight into the success of various TDM programs. Employees and residents should be surveyed annually to understand how they commute, identify barriers and opportunities to increasing rates of carpooling, transit use, and bicycling, and to identify any secondary travel modes (e.g., cyclists who sometimes use transit). The survey should be accessible via an online platform if possible, and promoted through individual employers, homeowner's associations, and/or residence associations. Incentives for completion, such as small-denomination gift cards or entries into prize drawings, should be provided. The survey will provide guidance on how to change ineffective strategies and expand upon successful ones.

24-hour Vehicle Counts

24-hour vehicle counts should be conducted annually and will be used to determine daily VMT. Daily VMT will be determined by multiplying the daily vehicle trips (i.e., obtained from the driveway counts) and an average trip length determined either from the employee and resident surveys or other data sources. These counts are inexpensive and can be conducted by machine at the same time as the mode share driveway counts. 24-hour counts show peak arrival and departure times, which can vary considerably even across driveways at the same site, and can influence the effectiveness of commute alternatives such as transit and carpooling. These counts will provide a total number of vehicle trips generated by all uses.

Parking Occupancy Counts

Parking occupancy counts identify individual facilities where parking demand is high and where TDM can be used to manage parking supply. If the project incorporates a parking management program, long-term data on parking occupancy will be important to deciding how that program should be implemented or updated.

Annual Interviews with Company Representatives

In addition to ongoing informal conversations, the on-site Transportation Coordinator should conduct annual formal interviews with employer representatives and resident groups. This also provides an opportunity to gather updated employee headcounts for each tenant.

Review and Revise TDM Program

On at least an annual basis, the on-site Transportation Coordinator should review and revise its TDM program based on the results of the vehicle trip data collection, employee and resident surveys, and other data collected during the annual monitoring period, such as data from online platforms and feedback received from program participants. Ongoing evaluation will help the on-site Transportation Coordinator identify ways to improve current strategies and identify new strategies. The revised plan is subject to City of Davis review and approval.

Annual Report

An annual monitoring report will be developed by the on-site Transportation Coordinator. The report should include the following elements:

- status of all existing TDM programs, including any data on participation rates;
- status of all recommended TDM programs from prior monitoring report, if applicable, including any available data on participation rates;
- documentation of trip reduction methodology and results;
- data collection methodology;
- details of data collection (including AM, PM, and daily counts);
- employee and resident survey results;
- evaluation of performance compared to TDM goals and evaluation metrics; and
- next steps, if needed: future modifications and enhancements of TDM program, including time frame for implementation.