



Office of the City Manager

INFORMATION CALENDAR

December 16, 2014

To: Honorable Mayor and Members of the City Council

From:  Christine Daniel, City Manager

Submitted by: Andrew Clough, Director, Public Works

Subject: goBerkeley Pilot Program Results and Next Steps

SUMMARY

The goBerkeley Pilot Program was launched in Downtown Berkeley, the Elmwood, and Southside/Telegraph in July 2013 with 3 overarching goals: to support economic vitality, to reduce congestion and emissions and to assess the feasibility of expanding the program beyond the 2-year pilot period. Council authorized the Pilot Program to test the extent to which a combination of free bus passes for employees, carshare discounts for businesses, and demand-based parking management could achieve these goals. The goBerkeley Pilot Program worked closely with businesses and residents, conducted visitors, resident and employee surveys, and collected transit usage and parking data before and during the pilot period. The program also tested automated parking data collection methods to ascertain the most accurate and cost-effective program design going forward.

This report presents the draft Final Project Report on the goBerkeley Pilot Program and presents initial options for next steps. Additional information for the Final Report will be presented to Council at a Worksession tentatively scheduled for January 27, 2015.

Results

The goBerkeley Transportation Demand Management (TDM) Program resulted in an overall reduction in automobile use, as participants chose alternatives to driving alone largely as a result of the 1,000 free employee AC Transit EasyPasses and deeply discounted carsharing benefits.

The goBerkeley Parking Program improved parking availability and customer satisfaction by adjusting parking rates and time limits.

- Drivers can now find a parking space more easily.
- On-street parking availability in the most congested areas has improved.
- Parking availability for visitors improved at Center Street and Oxford Garages.
- More drivers are using the Telegraph Channing Garage, a previously under-utilized facility.
- Increases to parking time limits and improved parking signage significantly improved the customer experience.
- Drivers have shifted from parking in neighborhoods to metered parking spaces.

These results were presented to the goBerkeley Community Advisory Group (CAG) on November 6, 2014 and to the Transportation Commission on November 20, 2014. The CAG includes representatives of the Transportation Commission, Elmwood Business Improvement District, Telegraph Business Improvement District and Downtown Berkeley Association. This information will also be presented to the general public at community meetings in January prior to the Council Worksession tentatively scheduled for January 27, 2015.

CURRENT SITUATION AND ITS EFFECTS

The goBerkeley Pilot Program was designed to test the degree to which transportation demand management (TDM) and parking management (primarily demand-based variable parking fees) could effectively work together to influence travel choice, increase the use of travel alternatives; decrease Single Occupancy Vehicle (SOV) travel; reduce congestion and vehicle miles traveled (VMT) searching for parking; and reduce greenhouse gas emissions.

The goBerkeley Pilot Program began program planning in 2011, hired staff and consultants and began collecting pre-project data in 2012, and launched publically in 2013 in 3 study areas: the Elmwood, Telegraph/Southside, and Downtown Berkeley.

The City received three grants to support the Pilot Program. The MTC Climate Initiatives grant period expires in June 2015, the BAAQMD grant expires on March 1, 2015, and the FHWA grant is currently scheduled to end in June 2015.¹ Per the grant funding agreements, staff is now preparing to complete the project, compile measurable results, and produce a Final Report.

Draft Final Report Summary

goBerkeley TDM Program

The goBerkeley TDM Program sought to decrease SOV use, increase the use of travel alternatives and reduce traffic congestion in the three pilot business districts. The main focus was to remove or reduce the pay barrier to the use of transit and carsharing, and significant financial incentives were offered in the pilot areas:

- 1,000 free 6-month AC Transit “TravelChoice Berkeley” passes for residents;
- 1,000 free 1-year AC Transit EasyPasses for employees; and
- Deeply discounted City CarShare fees (up to 90% off) for businesses and their employees.

The goBerkeley TDM Program survey results show an overall reduction in automobile use, which indicates that some people did choose travel alternatives for some trips instead of driving alone. Details of the TDM Program are attached in Exhibit A. Notable employee survey results include:

- Increase in regular transit use – more people stating they use transit 1-3 days a week (23% to 33%)

¹ The City has requested an extension until June 2016 to accommodate delays in UC Berkeley’s project, which is part of the FHWA grant. Caltrans is currently reviewing the extension request.

- Increase in bicycle use across the board, notably in 1-3 days a week (+5%)
- Increase in more regular walking (1-5 days per week)
- Decrease in exclusive drive alone use (6-7 days a week)
- Increase in lower frequency car use (1-5 days per week or less)
- Significant increase in occasional carpool use (5% - 12%)
- Significant increase in occasional carshare use (4% - 16%)

These results are not surprising; people who commute alone commonly only switch to alternatives gradually. The goBerkeley TDM Program observed a notable increase in participants who use AC Transit 1-3 days per week and in participants who use the bus 1-3 days per month. This indicates that having the AC Transit EasyPass supported a gradual switch to travel alternatives for some trips.

More surprisingly, program participants also reported an increase in occasional carpooling and regular bicycling, even though the program didn't provide direct incentives for these changes. The goBerkeley TDM program participants increased their use of multiple travel modes. This openness to multiple travel modes is a very valuable foundation for continuing efforts to encourage the use of more sustainable travel options.

Results: Free One-Year AC Transit EasyPass for Residents

The TravelChoice residential outreach was completed in 2012, before the other goBerkeley program elements were established. This program was led by TransForm, the City's partner agency. A team of TravelChoice staff contacted 5,460 households in the goBerkeley project area, had conversations with 1,800 people, and provided customized travel information to nearly 900.

1,000 6-month AC Transit "TravelChoice Berkeley" passes were offered to households living in multi-family housing sites in the Elmwood, Southside/Telegraph and Downtown neighborhoods. A total of 651 passes were distributed (passes weren't fully distributed largely because of the high number of UC students in the project area who already have UC EasyPasses).

The post-project travel diary surveys found an overall 3.1% reduction in automobile use, with 94% of participants reporting that they were walking on more trips, 90% reporting using transit more, and 19% reporting biking more.

Results: Free One-Year AC Transit EasyPass

The goBerkeley EasyPasses for employees in the pilot areas began to be distributed in July 2013. Distribution was complete within the first month, as 38 businesses with 1,000 employees signed up. Nearly half (494) of the 1,000 eligible employees used their EasyPasses 6,000-7,000 times each month.

Based on a follow-up survey of users, the goBerkeley TDM Program increased transit usage among program participants. Among those who activated their EasyPass:

- 99% used their EasyPass at least once during the 1 year program
- 48% used their EasyPass at least twice per week

- 82% reported that they used transit more often because of the EasyPass
- 83% said would not have otherwise purchased a transit pass (which indicates that most program participants were regular transit users previously)

EasyPass users provided very positive feedback in follow-up surveys such as, “If it weren't for the program, I probably never would have ridden the bus”, and “I had never really used AC Transit before, and this turned me into a regular commuter.” Notably, EasyPass use increased steadily over the 1 year program period, a promising trend as people slowly discover their travel options and change their behavior. (See additional information in Appendix A.)

Challenges & Lessons Learned: EasyPass

Approximately half of the 1,000 eligible employees activated and used their AC Transit EasyPass. This is a very high usage rate for universal transit pass programs, and is approximately twice the rate of the City of Berkeley's own employee EasyPass usage.

However, participating business managers and employees expressed some frustrations with the program. The most common reasons given for not using the EasyPass included:

- Living outside of AC Transit's service area.
- Commuting by AC Transit would take longer than driving.
- Employers did not participate in the EasyPass because they felt that filling out the necessary paperwork was cumbersome.
- Employers did not promote the EasyPass to their employees because they did not think they could notify all their employees adequately (such as with shift work).
- Enrollment after the in-person enrollment period was difficult. Language barriers and/or access to computer/phone made it difficult to submit enrollment forms.

These obstacles contributed to a low rate of EasyPass activation and usage at the beginning of the project. Intensive project staff outreach and technical assistance nearly doubled the usage rate, but this extra program support was only possible because of the program's grant funding.

If the City or another agency, such as a dedicated Transportation Management Association, Chamber of Commerce or Business Improvements Districts, were to re-establish an employee transit pass program, the benefits would be significant, but the administrative challenges and the resources required for pass distribution should not be underestimated.

City CarShare Business Memberships and New Pods

Two battery-electric vehicles and chargers were installed in Telegraph/Channing Garage for public use, and three hybrid City CarShare vehicles were placed in the Telegraph and Elmwood study areas. The five vehicles added by the goBerkeley program were well utilized; used at about the same rate as the other City CarShare vehicles in Berkeley. The additional vehicles and goBerkeley outreach attracted new members, as 200 more Berkeley residents became City CarShare members. Business membership is a much smaller piece of the carshare market, but City CarShare did sign up 10 new businesses

through the goBerkeley program, and now has 15 Berkeley businesses and 62 employee members.

A quarter of employee members who responded to the survey report using carshare services at least 1-2 times per month over the past 6 months, and employees using carsharing occasionally (1-3 times per month) increased four-fold, from 4% to 16%, over the program period.

Challenges & Lessons Learned: Carsharing

Despite significant financial incentives and intensive marketing efforts, the Carshare Program only enrolled 10 new businesses in Berkeley. Business owners, managers and employees were surveyed to understand the obstacles to businesses use of carsharing. Some common reasons were:

- Many businesses found it hard to understand how carsharing could help them within their retail/business operations.
- Most small- to medium-sized businesses reported that they use their personal vehicles for both commuting and business travel, and want to continue to do so.
- The program required an initial membership fee, after which City CarShare waived sign-up fees and offered up to \$200 in driving credits. Many businesses did not see the value in paying the membership fee.
- Some businesses expressed interested in joining, but were unable to obtain the internal company approvals to make the membership payment

These obstacles greatly limited the size of the business carshare program. Nevertheless, non-business members benefitted from the addition of hybrid and electric vehicles in Elmwood and the Telegraph area, and business usage rose over the program period. It seems that, when the value of carsharing is understood and initial barriers are overcome, carsharing can be a new business travel option for at least a small segment of local business.

goBerkeley Parking Program

Following a series of community meetings and a Council Worksession, Council authorized the adjustment of parking rates and time limits at parking meters, parking lots and parking garages on July 16, 2013 (Ordinance 7,305-N.S., Resolution 66,245-N.S.). The new policies called for parking rates and time limits in the Pilot Areas to be adjusted to achieve parking occupancy rates of 65-85% per block, and that changes would follow the rules below.

Where the majority of parking spaces on blocks experience average occupancy:

- Under 65%: Rates are lowered and time limits raised to incentivize parking
- 65-85% (target occupancy): No adjustments are made
- Over 85%: Rates are increased to increase turnover and/or shift parking to other areas

On this basis, rate and time limits were adjusted in fall 2013 and spring 2014. (See Appendix B for a table of base rates and time limits, and changes within each pilot area.)

Results: Demand-Based Parking Rate and Time Limits

The results of the goBerkeley Parking pilot were measured using observed parking availability, meter transaction data, and community surveys. Detailed results, including tables, graphs and maps, are provided in Appendix B. Major findings include:

- Changes to parking rates and time limits succeeded in changing driver behavior and shifting parking demand to metered areas with available parking.
- Visitors report that finding a parking space is easier. The majority of drivers report that finding parking is easy - 78% of drivers surveyed now feel that finding parking in the study areas is “Very Easy”, “Somewhat Easy” or “Neutral”, an increase of 41%. The percentage who feels that finding parking is difficult fell by nearly half – just 22% now feel that finding a parking space is “Very Difficult” or “Somewhat Difficult”, a decrease of 41%.
- Parking at meters in Value Zones increased by 38% during the pilot, while only 5% fewer cars are parking in the Premium Zones. While this may be the result of more people driving overall, it implements City General Plan Policy T-35 which calls for “better utilization of existing parking.”
- On-street parking remains full in the evening after meter enforcement ends on almost all of the metered blocks in all three pilot areas. Nearly one-third (27%) of the on-street parking at night is used by employees and residents.
- Employees and residents report spending \$23 per parked vehicle on average, while visitors spend \$54 per parked vehicle.
- A majority of parkers continue to rank “Proximity to Location” as the most important factor in seeking a parking space. This underscores the importance of on-street parking availability over all other factors, including parking price.

Area-Specific Results: Downtown

- Parking availability improved significantly in the Downtown Premium area. The percentage of “full” blocks dropped from 37% to 25%. However, parking availability is still not in the target range; 37 blocks still have parking occupancy above 85%.
- Although some parkers shifted from premium rate on-street meters around Berkeley Way into the value rate Berkeley Way Parking Lot, there is still a surprising amount of available parking in the lot while the more expensive on-street meters next to the lot are heavily used.
- The program made visitor parking available at the Center Street and Oxford Garage. The commuter parking rate increases and other changes achieved the target occupancy of 70-80% at the City’s two downtown parking garages.
- On-street parking remains full in the evening after meter enforcement ends at the majority of metered blocks. Nearly one-third (29%) of the on-street parking at night is used by employees and residents in the Downtown.
- Downtown employees/residents report spending an average of \$26 per vehicle while Downtown visitors report spending \$56 per vehicle.

Area-Specific Results: Southside/Telegraph

- Parking occupancy in the Premium Area did not change significantly, but occupancy increased dramatically at meters in the Value Area. The number of blocks that are over-utilized increased from 1 to 12.
- Short-term visitor parking at Telegraph/Channing Garage rose 22%, and reached the target occupancy range of 75%, during the pilot.
- On-street parking remains full in the evening after meter enforcement ends at almost all of the metered blocks. Nearly one-quarter (26%) of the on-street parking at night is used by employees and residents in the area.
- On average, employees/residents report spending \$14 per vehicle while visitors report spending \$38 per vehicle.

Area-Specific Results: Elmwood

- Parking occupancy increased on weekdays and was unchanged on Saturdays. Half of all of blocks are now within the target 65%-85% occupancy, and the remaining half are too full.
- The goBerkeley project added 3 more parking spaces in the Elmwood Lot through re-striping. The lot is now in the target occupancy on weekday afternoons, but still becomes full at other times.
- On-street parking remains full in the evening after meter enforcement ends at almost all of the metered blocks. Nearly one-fifth (17%) of the on-street parking at night is used by employees and residents in the area.
- On average, employees/residents report spending \$10 per vehicle while visitors report spending \$72 per vehicle.

The data and survey results indicate that demand-based parking management has improved parking conditions and customer satisfaction where it has been implemented. It also illustrates the need for continued parking management where targets have not been reached, and as conditions continue to change.

Results: Automated Data Collection and Parking Enforcement

One of the goals of the goBerkeley Pilot Program was to assess the long-term feasibility of demand-responsive parking management. One of the key issues is that demand-responsive parking management requires extensive and regular data collection in order to accurately track changes in parking demand and travel behavior. The cost of collecting and analyzing this data will be one of the challenges to sustaining a long-term demand-based program.

To assess a variety of options, goBerkeley carried out an Automated Data Collection and Enforcement Pilot to test new technologies to assess their capabilities to:

1. Collect parking data in a cost-effective and sufficiently accurate manner to serve a feasible parking management system in the long-term; and
2. Improve the efficiency of parking enforcement operations.

In July 2014, goBerkeley issued a Request for Qualifications for a system/equipment that can provide one or both of these functions. Two vendors responded and participated in an on-site test of License Plate Recognition (LPR) technology in September 2014. Details on the procurement and on-site test results of the Automated Data Collection and Enforcement Pilot can be found in Appendix C.

It should be noted that for this on-site test, license plate records and all other vehicle information was protected by confidentiality agreements. When analysis of the 2 vendors is complete, all data collected will be discarded and only a completely anonymized summary of performance will be retained by the City.

In summary, vehicle-mounted camera technology that collects parking data and identifies parking violations has proven to be accurate and its use would reduce parking data collection costs and improve parking enforcement. These results promise a viable option if the City decides to continue adjusting parking rates and time limits based on observed parking performance. Staff will submit detailed results and a vendor recommendation based on the test results, plus ease of use, and price to City Council in January 2015.

BACKGROUND

In 2011, Berkeley was awarded 3 grants to carry out the goBerkeley Pilot Program:

1. \$2,000,000 Climate Initiatives Innovative Grant by the Metropolitan Transportation Commission;
2. \$900,000 Value Pricing Pilot Program grant from the U.S. Federal Highway Administration (FHWA)²; and
3. \$100,000 Transportation Fund for Clean Air grant from the Bay Area Air Quality Management District.

The 3 grantors selected the City of Berkeley based on its existing transportation policies, readiness and the likely value of our pilot program to other cities of similar size and resources.

Consistency with the City's General Plan

The goBerkeley Pilot Program is governed by a set of guiding principles, which were based on the City's General Plan Transportation policies and informed by the stakeholders in the three pilot areas, the Transportation Commission and City Council.

Policy Goals

- Congestion related to searching for a parking space should be minimized to reduce emissions and vehicle miles traveled.
- The City is willing to test the effects of parking rate and time limit changes on parking supply and demand (General Plan T-40).

² UC Berkeley received \$900,000 of the FHWA grant for a parking management pilot program which has been managed separately from the City's program. The overall grant total for the City of Berkeley and UC Berkeley is \$1,800,000.

- The City's parking resources should be managed as a connected system of on-street metered spaces and off-street parking garage and lot spaces.

Guiding Principles for Managing the Parking Supply

Metered parking spaces should be:

- for customers and visitors (General Plan T-34, T-35)
- available as close as possible to drivers' destinations
- clear about parking rates and regulations
- set to allow enough time for customer needs

Metered parking spaces should not be:

- for commuters or employees - unless there is ample available capacity (General Plan Policy T-35F)
- guided by a goal of generating citation revenue
- over-used, which generates circling and frustration
- under-used, which may indicate that the regulations don't match customer needs

City garage and lot spaces should be:

- for medium and long-term parkers
- prioritized for non-commuters (General Plan Policy T-34C, T-35D)
- available at a reasonable distance from destinations

City garage and lot spaces should not be:

- over-used so that there is no access or cause frustrating search
- under-used

All pilot adjustments have been implemented based on these City-wide policies.

goBerkeley and the Overall Parking Program

The goBerkeley Parking Pilot is one part of a larger parking improvement program being undertaken by the City through several separate but coordinated efforts. These include the reconstruction and expansion of the Center Street Garage, reforms to the Residential Preferential Parking program, upgrades to "smart" credit-card enabled meters and the consideration of Pay-by-Phone parking payment. Staff will provide an analysis of how goBerkeley's next steps would fit into an overall parking management program at the Council Worksession tentatively scheduled for January 27, 2015.

ENVIRONMENTAL SUSTAINABILITY

The goBerkeley Pilot Program achieved its goal of reducing emissions resulting from vehicle use by promoting alternative modes of travel and by managing parking to reduce traffic congestion from drivers searching for an available parking space.

The preliminary analysis found that the goBerkeley program has reduced Vehicle Miles Traveled (VMT) by 1,649 miles per day. This equates to the following reductions in daily air pollution and greenhouse gas emissions:

Pollutant	Reduction (grams/day)
Volatile Organic Compounds (VOC)	123
Nitrogen Oxides (NO _x):	279
Carbon Dioxide (CO ₂):	3,002
Particulate Matter (PM ₁₀):	78
Particulate Matter (PM _{2.5}):	33

The Metropolitan Transportation Commission will conduct a more thorough evaluation of the goBerkeley program's effect on greenhouse gas emissions as part of their Climate Initiatives program evaluation. When available, a summary of that evaluation will be provided to Council and will be published on the City's website.

POSSIBLE FUTURE ACTION

Based on the results presented in this Information Report and feedback from the community, staff is preparing to present Council with several options for future actions at the Worksession tentatively scheduled for January 27. Based on Council's direction, staff will further develop a preferred option or several options. Depending on the direction Council selects, staff is hoping to bring the implementing Ordinance and Resolution for Council consideration in March. Some elements may take longer to develop.

Parking

There are essentially 4 paths the City could take in 2015 to respond to the end of the goBerkeley Pilot Program:

1. **Terminate demand-responsive parking management and revert to pre-pilot conditions.** If no action is taken, the current BMC includes a sunset clause that is 24-months from implementation for the goBerkeley parking program, meaning that parking rates and time limits must revert to pre-pilot conditions in October 2015. (Council could end the program at any time.) If the program is terminated and no amendments to the BMC adopted, parking rates and time limits would revert to the September 2013 conditions, and parking signs and meter decals would be removed.
2. **Terminate demand-responsive parking management but keep current parking rate and time limit conditions.** Given the positive impacts achieved, Council could "freeze" these conditions in place, but not enable any future data collection, public engagement, or demand-responsive rate and time limit adjustments. This option would require the current rates to be adopted by Council Ordinance & Resolution before October 2015. Future changes to parking would have to be made by Ordinance & Resolution, as they were prior to the Pilot Program.
3. **Continue demand-responsive parking management in the Pilot Areas only.** Given the success experienced in the Pilot Areas, Council could authorize staff to continue the program as it is currently constructed. Staff would continue to collect data, consult with the public, and make incremental price changes in response to parking occupancy, according to the parameters set by City Council. This

approach would continue the program in Downtown, Southside/Telegraph and Elmwood, but would not be available to other parts of Berkeley.

4. Enable demand-responsive parking management for all areas of the City.

This option would recognize the success of the demand-responsive approach and allow other areas in Berkeley to evaluate their parking data and craft the parking rates and time limits most appropriate for their local conditions. As with the pilot program, City Council and the public would always be involved in development of any changes.

This would be the most geographically equitable approach. However, it also requires the highest level of staff resources for on-going data collection, public engagement, sign clarity, etc. A full Citywide conversion to demand-responsive parking management could take several years, since analysis, public involvement and implementation would be time-intensive for each new area.

Action by the Transportation Commission

On November 20, 2014 Public Works staff made a presentation to the Transportation Commission on the goBerkeley Pilot Results and the 4 options discussed above. The Commission passed a motion to support Option 4, requesting that staff conduct a financial analysis and collect community feedback in order to continue demand-responsive parking management in pilot areas and analyze an expansion to meters Citywide; and that staff provide the public with financial information indicating whether the program is, or can be, self-supporting. (M/S Zander/Gerhardstein; Ayes: Gerhardstein, Humbert, McCaughrin, Roberts, Thomas, Zander; Noes: None; Abstain: None; Absent: None)

TDM

The goBerkeley Business TDM Program ended on June 30, 2014, after one year of operations. Because the TDM program was entirely grant funded and the funds have been fully expended, no Council action is needed at this time. Based on the results, Council could consider a number of options for future TDM programs. Staff will provide additional results and several proposals to Council in the goBerkeley Worksession.

FISCAL IMPACTS OF POSSIBLE FUTURE ACTION

This section summarizes the net fiscal results of the program, including the grant revenue, parking revenue and the expenditures of the goBerkeley Pilot Program to date. It also discusses the restrictions on expenditures of the goBerkeley net revenue per the terms of the federal funding agreement. Staff is developing initial draft estimates of the costs for the 4 options discussed, as well as TDM options to present in the next report.

Grant Revenue and Expenditures: June 2012 to September 2014

The following table shows grant funds and expenditures from the beginning of the goBerkeley pilot program to the end of FY 2015 Q1.

Grant Funding and Expenditures (as of FY 2015 Q1)

Grant Funding (FHWA*, MTC, BAAQMD) *\$1.8 million grant includes \$900K to UC Berkeley)	\$3,900,000
Grant Expenditures-to-Date* (Funds 613, 614, 674) *Includes UC Berkeley FHWA grant expenditures	\$2,241,208
City Match Expenditures-to-Date (Funds 010, 610, 840)	\$119,340
Remaining Grant Expenditures* (Funds 614, 674) *Includes UC Berkeley FHWA grant expenditures	\$1,658,792

FHWA Restricted Revenue and Eligible ExpendituresRestricted Revenue

As stipulated by the Cooperative Agreement between FHWA, Caltrans and the City of Berkeley which governs the federal grant funding, and pursuant to Section 14.52.110(G) of the Berkeley Municipal Code, additional revenue generated by the goBerkeley Pilot must be used to fund eligible parking and TDM improvements. The goBerkeley revenue calculation methodology was established by the FHWA, Caltrans and the City. Revenue is calculated by comparing baseline and post-implementation meter and garage revenues. Control areas are used to adjust for external economic factors.

Eligible Expenditures

goBerkeley eligible expenditure categories were established by the FHWA, Caltrans and the City to support the pilot program. The 4 eligible expenditure categories are:

- Mitigate goBerkeley Effects and Optimize Parking System Operations (60%)
- Expand Demand Responsive Parking Pricing (25%)
- Improve Parking Customer Service (5%)
- Transportation Demand Management (10%)

The current term of the Cooperative Agreement is June 1, 2012 to June 30, 2015. However, UC Berkeley requested that the City request a one-year extension, to June 30, 2016, due to delays in the campus project (which is ½ of the FHWA grant Scope of Work). If FHWA and Caltrans approve the extension request, the terms of the Cooperative Agreement would continue for the duration of the grant term, which means that the expenditure restrictions would continue until June 30, 2016. FHWA and Caltrans will inform the City of its decision no later than March 2015.

Parking Improvement Program

The eligible expenditure categories led Public Works to assess the state of the City's parking system to determine the effects of the goBerkeley program and ways to improve operations and customer service. Based on this assessment, the parking system is in need of significant investments, and FHWA Restricted Revenue is being directed to those investments, including:

- Completion of upgrade to credit-card enabled meters Citywide

- Wayfinding signage to direct drivers to available City garages and lots
- Improvements to parking enforcement
- Surveys to provide staff better information on parker needs
- Upgrade notification system to achieve faster response for repair of broken/inoperable meters
- Upgrading of Berkeley Way Lot
- Improvements to the security and monitoring of meter coin collection

In addition, the City is required to direct 10% of goBerkeley expenditures to the Transportation Demand Management, which will include spending on bicycle, pedestrian and transit. Recommended TDM expenditures will be included in the FY15 AAO #2.

Financial Report

The following table shows the goBerkeley revenue from the beginning of the goBerkeley Pilot Program to the end of FY 2015 Q1, as well as past and planned expenditures for the Parking Improvement Program.

FHWA Restricted Revenue and Expenditures (as of FY 2015 Q1)

FHWA goBerkeley Restricted Revenue (FY 2014 Q2 – FY 2015 Q1)	
Fund 840 (on-street parking)	\$1,632,259
Fund 835 (off-street parking)	(\$263,563)
Net FHWA goBerkeley Restricted Revenue	\$1,368,696
FHWA Eligible Expenditures – Parking Improvement Program	
Fund 840 (FY 2015 Budget) Meter upgrades, Wayfinding, Meter Maintenance, goBerkeley Personnel	\$401,500
Fund 840 (FY 2015) Berkeley Way Lot improvements, Parking Enforcement, Meter Maintenance, Wayfinding, Data Collection	\$625,000
Fund 840 (FY 2015) (to be included in AAO#2) Customer Service improvements, TDM	\$328,196
Audit Contingency	\$14,000
FHWA Restricted Revenue Balance	\$0

Fiscal analysis of Options A-D will be provided in the upcoming Worksession report tentatively scheduled for January 27, 2015.

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Attachments:

- 1: Appendix A: Results of goBerkeley TDM Pilot
- 2: Appendix B: Results of goBerkeley Demand-Responsive Parking Management Pilot
- 3: Appendix C: Results of goBerkeley Automated Data Collection and Enforcement Pilot

goBerkeley Transportation Demand Management Pilot

(Submitted by Steer Davies Gleave, consultant to the City of Berkeley)

Overview

The goBerkeley pilot aimed to decrease single-occupancy vehicle (SOV) use, increase drive alone alternatives, and reduce local congestion in key Berkeley business districts. Two key TDM initiatives were offered to employees to complement the variable parking pricing program, including up to 1,000 free 1-year AC Transit EasyPasses and significant City CarShare discounts for businesses and employees. The transit program had almost 500 participants and the carshare program included 15 businesses and over 60 participants. Among EasyPass program participants, 82% said they used AC Transit more because they had the pass and almost half said they used their pass at least twice a week. While the carshare program did not achieve the targeted participation levels, survey results showed that a quarter of respondents used carsharing at least once a month and occasional carshare usage significantly increased over the program period, illustrating that for over 10% of participants, carsharing became a new travel option for them.

Overall, the goBerkeley TDM pilot program did not have a significant effect on decreasing SOV use for commute trips, though survey results did show that general car use became less frequent, which is a sign that people did start choosing alternatives for some trips instead of driving alone. For many people who usually drive alone, switching to alternatives is a gradual process; goBerkeley survey results showed a noticeable increase in participants who use AC Transit 1-3 days per week or 1-3 days per month, proving that having an AC Transit EasyPass provided another travel option for some of their trips. An additional effect of promoting all travel modes alongside specific AC Transit and City CarShare incentives was an increase in occasional carpooling and regular cycling. Also, the influence of the AC Transit incentive was clearly seen in the significant decrease in BART use. The main impact of the program from survey results was that participants became more multi-modal, using several different modes on a monthly basis, a key step in enabling the use of more sustainable travel options.

Program Goals, Objectives, & Approaches

The goBerkeley program was developed in order to test how transportation demand management (TDM) and parking management (specifically variable parking fees) could effectively work together to influence travel choice and the use of drive-alone alternatives; decrease SOV travel; reduce congestion, idling, and unnecessary vehicle miles traveled (VMT) searching for parking; and reduce greenhouse gas emissions process.

One of the key approaches to the TDM portion of goBerkeley was removing the pay barrier to both transit and carshare access. Through partnerships with AC Transit and City CarShare, up to 1,000 employees of businesses in Downtown, the Elmwood and Telegraph/Southside were given free one-year AC Transit EasyPasses and an unlimited number of businesses and employees were given significant discounts (up to 90% off) on City CarShare business and personal memberships.

Through direct outreach, stakeholder partnerships, the development of a project website, and email communications, businesses were informed about the goBerkeley program and invited to join in order to receive the transit and carshare benefits for their employees.

Survey Results

After completion of the 1-year goBerkeley AC Transit EasyPass program, a web-based survey was carried out to gauge the effectiveness of the program. The survey also asked several general questions about participants' experience with goBerkeley and invited non-participants to provide input. Overall, 162 responses were received, including 104 from program participants (22% of total) and 49 from non-participants.

The characteristics of survey participants were primarily full-time workers, living 1-5 miles from work, under 40 years of age, with computer and smart phone access, but across a wide range of incomes.

Transit

Transit usage from goBerkeley EasyPass participants steadily increased over the program period, likely as more participants registered for passes. Overall, 494 participants registered for passes and, on average, about 65% of all EasyPass participants used their pass each month, generating 6,000-7,000 monthly transit trips, with 2/3rd on weekdays and 1/3rd on weekends. Anecdotal evidence from survey participant comments shows that some goBerkeley EasyPass participants only used their passes occasionally, but stated they rode transit more than they would have without the pass. Key results from the survey include:

- 99% said they used their EasyPass at least once during the program period

- 48% used their EasyPass at least twice per week
- 82% said they used transit more because they had the pass
- 83% said would not have bought a transit pass otherwise, illustrating that many participants were not already regular transit users purchasing monthly passes

Carshare

City CarShare reported that 15 businesses within the target area signed up for the goBerkeley carshare incentive, including 10 new members, and had a total of 62 unique member accounts. Despite significant direct outreach by both goBerkeley and City CarShare staff, many businesses found it hard to understand how carshare could help them within the retail/business context. Interestingly, City CarShare's data showed that of participating businesses and members, over 95% of reservations occurred using vehicles outside of the program target area.

Positively, a quarter of survey participants have used carshare services at least 1-2 times per month over the past 6 months and participants using carsharing 1-3 times a month increased four-fold over the program period (from 4% to 16%)

Parking

Parking changes in the target areas were initiated as part of the goBerkeley program and were administered by the City. The outreach and communications efforts, improvements to the visibility of parking through goBerkeley signage, and promotion of parking choice (on-street/off-street and cheaper/more expensive) have been largely well-received by the public. In terms of public awareness, of the survey participants that have paid for parking in the past 6 months, 75% said they were aware of the price changes, which illustrates the methods of communication have been successful at informing the public of the changes.

Program Impacts

The survey also provided some general information about the impacts of the goBerkeley program, including:

- 51% felt their employer was slightly or much more aware of drive alone alternatives because of goBerkeley
- 94% said promoting alternatives is an effective way to free up more parking
- 77% definitely support a coordinated transit pass program (an additional 18% said they might support it)
- Interest in drive alone alternatives if incentives were provided:
 - BART – 79%
 - AC Transit – 73%
 - Bicycling – 51%

- Bike Station – 33%
 - Telework – 32%
 - Carsharing – 16%
 - Carpool (13%); vanpool (6%)
- Of those that received goBerkeley emails, 48% said they were useful or very useful
 - 24% visited the goBerkeley website; 49% said transit info was the most useful, 12% said parking info.

These results show that participating goBerkeley businesses and employees , as well as others, became more aware of drive alone alternatives, found the transportation information valuable, and felt the program was effective in working towards its goals of reducing parking demand and encouraging the use of alternatives. The results, along with participant comments and other anecdotal evidence, show that participants would be highly interested in BART incentives being included to encourage those employees living further away from work to be enticed to use transit. The high interest in bicycling shows this mode could also be something that the City could invest in incentives for.

Mode Shift

For commute trips to work, the impact of the goBerkeley program was minimal. AC Transit, walking, carpooling, and drive alone use largely stayed the same throughout the program period, though a slight increase in cycling (possibly a result of the summertime survey) and a significant decrease in BART use (due to EasyPasses only applying to AC Transit) were seen.

Survey results for all trips show more interesting impacts of goBerkeley, including:

- Increase in more regular transit use – more people stating they use transit 1-3 days a week (23% to 33%)
- Much less frequency of BART use – decrease in 1-7 days a week, increase in less than once per week
- Increase in bicycle use across the board, notably in 1-3 days a week (+5%)
- Increase in more regular walking (1-5 days per week)
- Decrease in exclusive drive alone use (6-7 days a week) and increase in less frequency of car use (1-5 days per week or less)
- Significant increase in occasional carpool use (5% to 12%)
- Significant increase in occasional carshare use (4% - 16%)
- Clear indication participants have become more multi-modal

While it is disappointing that employees did not significantly change their commute habits as a result of the program, it was very encouraging that many drive alone alternatives became viable options for people for other trips or occasional commute trips. The EasyPass program clearly impacted participants' BART use which dropped significantly since BART was not included on the EasyPass.

It was clear from the initial EasyPass enrollment survey that many employees already used drive alone alternatives while others traveled long distances to get to work. Many employees refused to accept their free passes because they stated they would never use them. For these people, the only real alternatives are BART or carpooling, neither of which came with goBerkeley incentives.

Another positive impact of goBerkeley was the increase in other drive alone alternatives such as bicycling, walking, and carpooling. Though incentives were not provided for these modes, their use is often a knock-on effect of increased transit use, improved knowledge of alternatives, and increased consciousness about trip planning and mode choice. The latter is one of the most important characteristics of travel behavior change—once people have the knowledge and skills to make educated travel choices, incentives and information are much more effective at influencing travel behavior. This is a great achievement for goBerkeley and shows that Berkeley employees are receptive to changing their travel habits and trying new ways to get around. As participants use their experience with drive alone alternatives for non-work trips, continued promotion, education and incentives via goBerkeley may begin to impact work-related trips more significantly. With existing incentives, it would still be a challenge to encourage the participation of longer-distance commuters.

Participant Quotes

Over 50 survey participants wrote comments thanking the City for the program, expressing the positive value of the program, or asking for it to be continued. Other notable comments included:

- “It was a very good pilot program, and I think businesses would really benefit from its continuation.”
- “If it weren't for the program, I probably never would have ridden the bus.”
- “Having a subsidized BART pass would make a MUCH bigger difference for most of the commuters in our company, because most employees who drive live outside the AC Transit region (Vallejo, Walnut Creek, etc.)”
- “Some of us who live in the AC Transit area only use it occasionally (like when it's raining), so the cost of a pass needs to be reasonable for infrequent riders.”
- “I feel like the program was very beneficial in allowing me to explore the AC Transit service without having to worry about transfers expiring or using too much money. If anything, I feel much more comfortable and confident using the AC Transit when I need to. By having the free pass provided to me by my employer, I feel like I am more likely to use the AC Transit service as a opposed to a private auto whenever possible. Thank you.”
- “I got the EasyPass, and enjoyed not paying for bus fare so much that when the program ended, I bought a bike to ride to work. The economic benefits of the pass are extremely effective.”

- “I loved having the goBerkeley EasyPass so much I used it daily to go to work and school. I even used it on the weekends to explore and enjoy new areas that I otherwise would have never visited in the East Bay area. Additionally I was more encouraged to make trips to SF on AC Transit than I would have been without the EasyPass. THANKS!”
- “I loved it!!! I had never really used AC Transit before, and this turned me into a regular commuter. Sadly, without the pass, I'm down to only using it once or twice a week, but that's still more than I ever did before.”
- “I loved the program. I used the pass to get to and from work daily before I moved to my current place. Since I don't own a car, it helped me delay purchasing a car and/or joining a car sharing program even after my move.”
- “I have spoken to a number of Berkeley workers who would like the pass, but their business owners are not inclined to pay for the Chamber fee.”
- “I was a teaching artist for Berkeley Rep this past year- meaning that I was traveling to different schools around the East Bay each day. The goBerkeley EasyPass (in addition to my bike) made my life so much easier and reduced my travel costs enormously. Thank you so much!”
- “I wish it would have lasted so much longer! I had almost exclusively used the BART system to get to and from work because I thought the bus system was too difficult to figure out. But the pass gave me an incentive to look into different routes, cut down on my travel time since BART took me a little out of the way, and really experience the landscape and start learning streets on the different bus routes. It was extremely helpful with cutting down cost of travel as well.”
- “The best thing about the pass program was knowing that I would always be able to take the bus -- I didn't have to remember how much money (if any) was on my clipper. I took the bus so much more often, transferred lines, and took multi-modal trips. When all goes well and you're not in a hurry, taking the bus is definitely the least stressful way to get around the Bay Area. No parking to worry about, no hills to walk/bike up, no cars to harass you while biking... for me, it's often door to door service.”
- “What about Berkeley residents? Can't we all get together and design a program for Berkeley residents?”

goBerkeley Demand-responsive Parking Management Pilot

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Overview

This Appendix presents results from the parking portion of the goBerkeley Pilot Program due to changes to parking rates and time limits, including:

- Parking availability at on-street meters, parking lots and garages; and
- Driver behavior.

Parking Availability

Parking occupancy surveys were performed at metered blocks and the City's off-street facilities for Baseline conditions (June 2013), Adjustment Conditions (February 2014) and Post-implementation Conditions (September 2014). This survey (See Exhibit 1 - Parking Demand Maps) collected occupancy data for blocks in time bands (AM, Midday, PM, and Evening). Manual data was collected for two representative weekdays and two representative Saturdays for on-street meters and lots. Garage data is collected on a daily basis from the automatic counting of the Parking Access Revenue Control System (PARCS).

The parking occupancy results have been categorized into one of three conditions:

High Demand (>85%): When the parking spaces on a blockface are more than 85% occupied, the chances of a driver finding a parking space are low and cruising, or searching for a parking space, increase.

Low Demand (<65%): Low-demand blocks, which are less than 65% occupied, may indicate that there is not demand or that the parking regulations and time limits do not match the needs of drivers.

Target Demand (65 – 85%): When parking spaces on a blockface are between 65 and 85% occupied, spaces are readily available for any driver searching for a space, and parking spaces are meeting the needs of the surrounding area.

Summary of Parking Availability Changes

The following section provides a summary of parking availability changes. Tables and maps can be found in the section "Detailed Parking Availability Data". Further detail or specifics can be provided upon request.

The results of the goBerkeley Parking pilot were measured using observed parking availability, meter transaction data, and community surveys. Detailed results, including tables, graphs and maps, are provided in Appendix B. Major findings include:

- Changes to parking rates and time limits succeeded in changing driver behavior and shifting parking demand to metered areas with available parking.
- Visitors report that finding a parking space is easier. The majority of drivers report that finding parking is easy - 78% of drivers surveyed now feel that finding parking in the study areas is “Very Easy”, “Somewhat Easy” or “Neutral”, an increase of 41%. The percentage who feels that finding parking is difficult fell by nearly half – just 22% now feel that finding a parking space is “Very Difficult” or “Somewhat Difficult”, a decrease of 41%.
- Parking at meters in Value Zones increased by 38% during the pilot, while only 5% fewer cars are parking in the Premium Zones. While this may be the result of more people driving overall, it implements City General Plan Policy T-35 which calls for “better utilization of existing parking.”
- On-street parking remains full in the evening after meter enforcement ends on almost all of the metered blocks in all three pilot areas. Nearly one-third (27%) of the on-street parking at night is used by employees and residents.
- Employees and residents report spending \$23 per parked vehicle on average, while visitors spend \$54 per parked vehicle.
- A majority of parkers continue to rank “Proximity to Location” as the most important factor in seeking a parking space. This underscores the importance of on-street parking availability over all other factors, including parking price.

Area-Specific Results: Downtown

- Parking availability improved significantly in the Downtown Premium area. The percentage of “full” blocks dropped from 37% to 25%. However, parking availability is still not in the target range; 37 blocks still have parking occupancy above 85%.
- Although some parkers shifted from premium-priced on-street meters around Berkeley Way into the value-priced Berkeley Way Parking Lot, there is still a surprising amount of available parking in the lot while the more expensive on-street meters next to the lot are heavily used.
- The program made visitor parking available at the Center Street and Oxford Garage. The commuter parking rate increases and other changes achieved the target occupancy of 70-80% at the City’s two downtown parking garages.
- On-street parking remains full in the evening after meter enforcement ends at the majority of metered blocks. Nearly one-third (29%) of the on-street parking at night is used by employees and residents in the Downtown.
- Downtown employees/residents report spending an average of \$26 per vehicle while Downtown visitors report spending \$56 per vehicle.

Area-Specific Results: Southside/Telegraph

- Parking occupancy in the Premium Area did not change significantly, but occupancy increased dramatically at meters in the Value Area. The number of blocks that are over-utilized increased from 1 to 12.
- Short-term visitor parking at Telegraph/Channing Garage rose 22%, and reached the target occupancy range of 75%, during the pilot.
- On-street parking remains full in the evening after meter enforcement ends at almost all of the metered blocks. Nearly one-quarter (26%) of the on-street parking at night is used by employees and residents in the area.
- On average, employees/residents report spending \$14 per vehicle while visitors report spending \$38 per vehicle.

Area-Specific Results: Elmwood

- Parking occupancy increased on weekdays and was unchanged on Saturdays. Half of all of blocks are now within the target 65%-85% occupancy, and the remaining half are too full.
- The goBerkeley project managed to add 3 more parking spaces through re-striping. The Elmwood Lot is now in the target occupancy on weekday afternoons, but still becomes full at other times.
- On-street parking remains full in the evening after meter enforcement ends at almost all of the metered blocks. Nearly one-fifth (17%) of the on-street parking at night is used by employees and residents in the area.
- On average, employees/residents report spending \$10 per vehicle while visitors report spending \$72 per vehicle.

The data and survey results indicate that demand-based parking management has improved parking conditions and customer satisfaction where it has been implemented.

Detailed Parking Availability Data

The following section provides details on the rate and time limit changes that occurred in each pilot area and resulting changes in parking conditions.

On-street Meters – Summary of Rate and Time Limit Changes

		Baseline	Launch (Fall 2013)	Adjustment (Spring 2014)
Elmwood	Parking Rates	\$1.50/hr	1 hr - \$1.50 2 hrs - \$3.50 3 hrs - \$6.00	Same as Launch
	Time Limits	1 hr	3 hrs	Same as Launch

Southside	Parking Rates	\$1.50/hr	Premium - \$2.25/hr Value - \$1.00/hr	Premium - \$2.75/hour Value - \$1.50/hr
	Time Limits	30 min – 2 hr	Premium – 2 hr Value – 8 hr	Premium – 2 hr Value – 8 hr
Downtown	Parking Rates	\$1.50/hr (\$1.75/hr Premium)	Premium - \$2.25/hr Value - \$1.25/hr	Premium - \$2.75/hour Value - \$1.50/hr
	Time Limits	30 min – 2 hr	Premium – 2 hr Value – 4 hr	Premium – 2 hr Value – 8 hr

Parking Lot and Garage – Summary of Rate and Time Limit Changes

		Baseline	Launch (Fall 2013)	Adjustment (Spring 2014)
Elmwood (Elmwood Lot)	Parking Rates	\$1.50/hr	\$1.50/hr	Same as Launch
	Time Limits	2 hr	3 hrs	Same as Launch
Southside (Telegraph Channing Garage)	Parking Rates (non-validated)	Hourly - \$3/hr (avg) 4+ hrs - \$18 Early bird - \$8 Monthly - \$150	Hourly - \$1/hr First hour free 4+ hrs - \$15 Early bird - \$9 Monthly - \$150	Same as Launch
Downtown (Center Street Garage)	Parking Rates	Hourly - \$2.50/hr (avg) 4+ hrs - \$15 Early bird - \$8 Monthly - \$150	Hourly - \$2/hr 4+ hrs - \$17 Early bird - \$9 Monthly - \$170	Hourly - \$2/hr 4+ hrs - \$20 Early bird - \$10 Monthly - \$190
Downtown (Oxford Garage)	Parking Rates	Hourly - \$2.50/hr 4+ hrs - \$15 Monthly - \$150	Hourly - \$2/hr 4+ hrs - \$17 Monthly - \$170	Same as Launch
Downtown (Berkeley Way Lot)	Parking Rates	First 2 hrs - \$1.50/hr Next 4 hrs - \$2.50/hr	No change	\$1.50/hr
	Time Limits	6 hr	No change	8 hr

Parking Conditions

1. Downtown

A. On-Street Meters

At the start of the pilot, metered blocks in the “core” of Downtown, bounded by Hearst Avenue to the north, Bancroft Way to the South, Milvia Street to the West and Oxford Street to the East were full, while metered blocks in the periphery of the “core” had plenty of available parking. In addition, time limits varied block-to-block (and occasionally on the same block) between 30 minutes and 2 hours, which the community responded was confusing and inconsistent. In Fall 2013, two zones were established –

Premium Rate (\$2.25/hr) and 2 Hr in the “core” and Value Rate (\$1.25/hr) and 4 Hr in the periphery to encourage some drivers to shift to where more parking was available. Data collected in Winter 2014 indicated that a shift had occurred, but that many “core” blocks still exhibited High Demand. As a result, Premium Rates were adjusted in Spring 2014 and time limits were extended from 4 hr to 8 hr in the Value Rate areas.

Results

On the whole, blocks that are over 85% occupied in the Premium Areas (the zones that contain the most congested blocks) has decreased by 12% while blocks that are over 85% occupied in the previously under-utilized Value Areas has increased by 20%. These improvements show that parking rate and time limit changes have shifted parkers from high demand to low demand area. However, additional adjustments are necessary to reach target conditions.

A summary of changes in the number of blocks exhibiting Low Demand (<65%), Target Demand (65-85%) and High Demand (>85%) is shown below. Detailed parking occupancy maps for each of weekday and Saturday time periods (AM, Midday, PM and Evening) is shown in Exhibit 1 of this Appendix.

Downtown

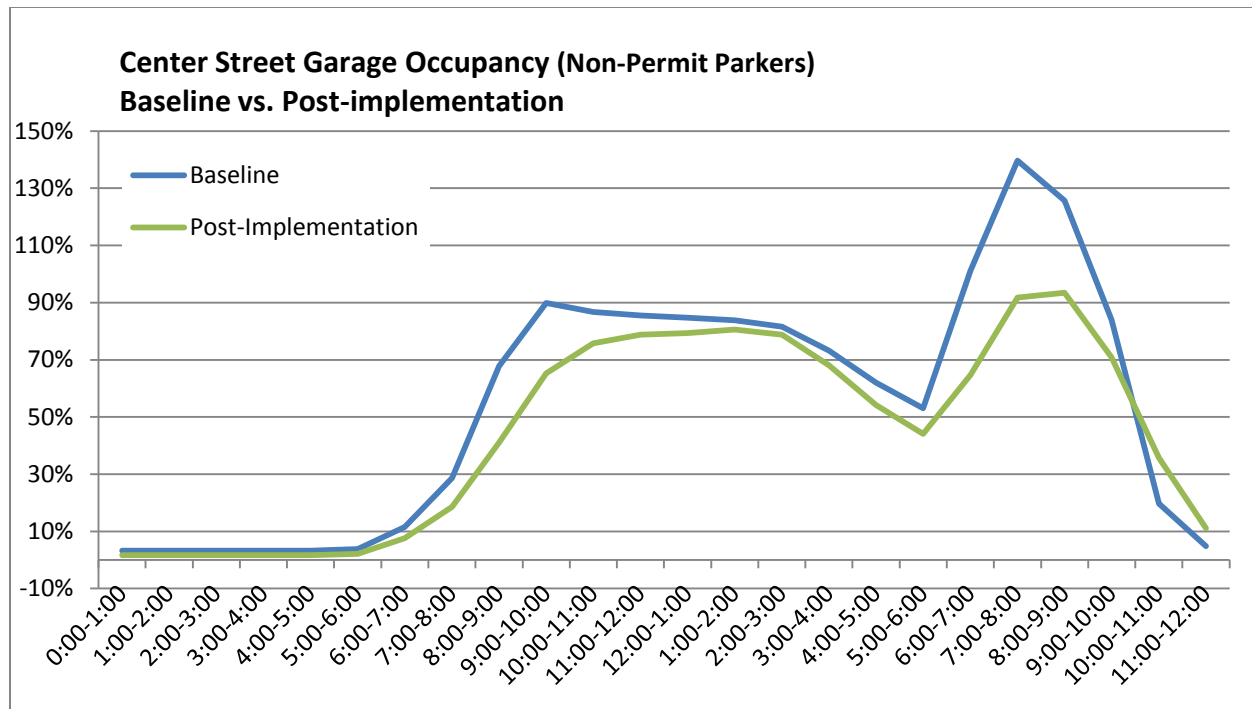
Zone	Total Blockfaces	Occupancy	Weekday Before		Weekday After		Saturday Before		Saturday After		Weekday Change		Saturday Change	
			#	%	#	%	#	%	#	%	#	%	#	%
Premium 2 Hr	89	<65%	18	20%	35	39%	26	29%	39	44%	17	94%	13	50%
		65%-85%	38	43%	32	36%	32	36%	25	28%	-6	-16%	-7	-
		>85%	33	37%	22	25%	31	35%	25	28%	-11	-33%	-6	19%
Value 8 Hr	20	<65%	9	45%	2	10%	10	50%	7	35%	-7	-78%	-3	-
		65%-85%	7	35%	10	50%	4	20%	6	30%	3	43%	2	50%
		>85%	4	20%	8	40%	6	30%	7	35%	4	100%	1	17%

B. Center Street Garage

At the start of the pilot, Center Street Garage routinely displayed the “FULL” sign on weekdays when the number of spaces allocated to hourly parkers was completely occupied. This posed a problem since the hourly rate in the garage was set below the hourly rate on-street to encourage more people to park in the garage. To address this, the rates for commuter parking (All Day Rate, Early Bird Rate and Monthly Permit Rate) were increased twice.

Results

Parking availability for short-term (visitor) parkers has improved in Center Street Garage. As shown in the following graph, the average weekday occupancy in the garage has decreased from Baseline to Post-implementation Conditions. **The average decrease in occupancy (and associated improvement in availability) from 9 am – 5 pm is 8%.**



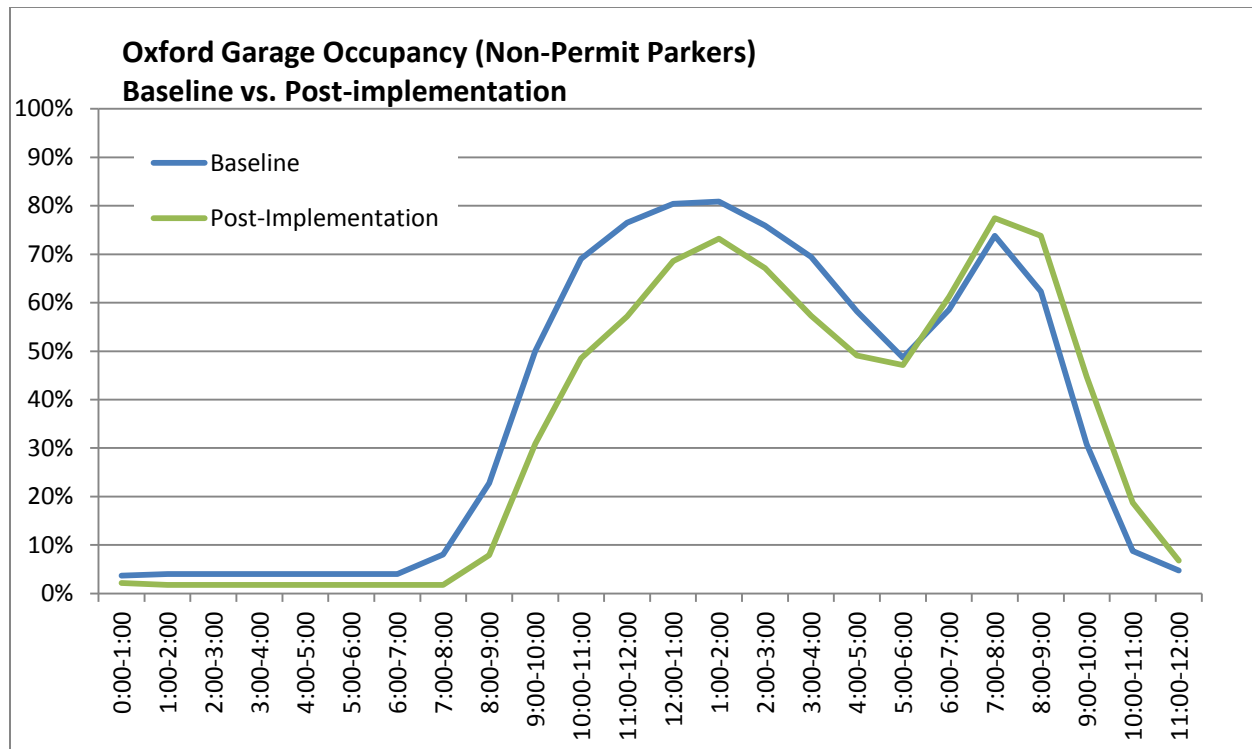
Oxford Garage

Background

At the start of the pilot, Oxford Garage displayed Target Demand (~80%). The hourly rate in the garage was set below the hourly rate on-street to encourage more people to park in the garage. To hedge against the garage becoming over-occupied due to the decrease in hourly rates, the rates for commuter parking (All Day Rate, Early Bird Rate and Monthly Permit Rate) were increased in Fall 2013.

Results

Parking availability remains at Target Demand (~70%) in Oxford Garage. In fact, more short-term (visitor) parking is available to absorb shifts from adjacent metered blocks into the garage.



C. Berkeley Way Lot

At the start of the pilot, Berkeley Way Lot was often underutilized (~50%occupied), and the initial rate changes (Fall 2013) on-street were intended to shift parkers from parking meters in the vicinity of the lot into Berkeley Way Lot. Data collection in Winter 2014 indicated that some parkers did shift into Berkeley Way Lot, but plenty of parking spaces remained available. In Spring 2014, time limits were extended from 6 hrs to 8 hrs and overall parking rates were lowered to a flat \$1.50/hr.

Results

Parking Availability

Parking occupancy at Berkeley Way Lot continues to be less than 65%, while on-street metered spaces exhibit high demand. Potential reasons for this are 1) drivers are unaware of the lot's existence or that is a public lot, 2) drivers avoid Berkeley Way Lot due to its pavement conditions or perceptions about safety. To address this, the goBerkeley program funded a re-paving of the Berkeley Way Lot and is developing wayfinding and driver information improvements.

2. Elmwood

A. On-Street Meters

At the start of the pilot, metered blocks in the Elmwood commercial area (College Avenue between Russell Street and Webster Street plus cross streets) exhibited target demand. However, many merchants and community members indicated that the 1 hr time limit at the meters was too low. However, raising the time limit risked longer parking durations that could have increased occupancy to an undesirable level. In Fall 2013, a 3 hr Progressive Premium Rate was established. This would allow some drivers to park up to 3 hrs, but the escalating rate (\$1.50 for 1 hour, \$2.50 for 2 hours and \$6.00 for 3 hours) would discourage parking longer than necessary and preserve turnover. Data collected in Winter 2014 indicated that the 3 hr time limit and progressive rates had produced ideal parking conditions and no adjustments were made in Spring 2014. The program continued monitoring conditions and data was collected again in September 2014.

Results

Half of the blocks in the Premium 3 hour zone are now above target occupancy.

A summary of changes in the number of blocks exhibiting Low Demand (<65%), Target Demand (65-85%) and High Demand (>85%) is shown below. Detailed parking occupancy maps for each of weekday and Saturday time periods (AM, Midday, PM and Evening) is shown in Exhibit 1 of this Appendix.

Elmwood

Zone	Total Blockfaces	Occupancy	Weekday Before		Weekday After		Saturday Before		Saturday After		Weekday Change		Saturday Change	
			#	%	#	%	#	%	#	%	#	%	#	%
Premium 3 Hr	8	<65%	0	0%	0	0%	2	25%	0	0%	0	0%	2	100%
		65%-85%	6	75%	4	50%	3	38%	5	63%	-2	-33%	2	67%
		>85%	2	25%	4	50%	3	38%	3	38%	2	100%	0	0%

B. Elmwood Lot

At the start of the pilot, Elmwood Lot was at or near capacity. However, to encourage parking in the lot instead of on-street meters in Elmwood, rates were kept flat at

\$1.50/hr while the time limit was increased from 2 hr to 3 hr. No adjustments were made in Spring 2014.

Results

Parking Availability

Parking occupancy at Elmwood Lot is 73% occupied on weekdays at 12 pm, which is within target while on-street metered spaces exhibit high demand.

3. Southside / Telegraph

A. On-Street Meters

At the start of the pilot, metered blocks closest to the UC Berkeley campus, bounded by Bancroft Way to the north, Channing Way to the South, Oxford/Fulton Street to the West and College Avenue to the East were full, while metered blocks to the south had plenty of available parking. In addition, time limits varied block-to-block (and occasionally on the same block) between 30 minutes and 2 hours, which the community responded was confusing and inconsistent. In Fall 2013, two zones were established – Premium Rate (\$2.25/hr) and 2 Hr in the “core” and Value Rate (\$1.50/hr) and 8 Hr in the periphery to encourage some drivers to shift to where more parking was available. Data collected in Winter 2014 indicated that a shift had occurred, but that the blocks near UC Berkeley blocks still exhibited High Demand. As a result, Premium Rates were adjusted in Spring 2014 and the Value Rate area was expanded to encourage additional parkers. The Value Rate area exhibited High Demand (>85%). As a result, rates were increased from \$1/hr to \$1.50/hr to encourage turnover.

Results

On the whole, the number of blocks that are over 85% occupied in the Premium Areas (the zones that contain the most congested blocks) has remained about the same while blocks that are over 85% occupied in the previously under-utilized Value Areas has increased from 1 to 12. These improvements show that parking rate and time limit changes have shifted parkers from high demand to low demand area. However, additional adjustments are necessary to reach target conditions.

A summary of changes in the number of blocks exhibiting Low Demand (<65%), Target Demand (65-85%) and High Demand (>85%) is shown below. Detailed parking occupancy maps for each of weekday and Saturday time periods (AM, Midday, PM and Evening) is shown in Exhibit 1 of this Appendix.

Telegraph / SS

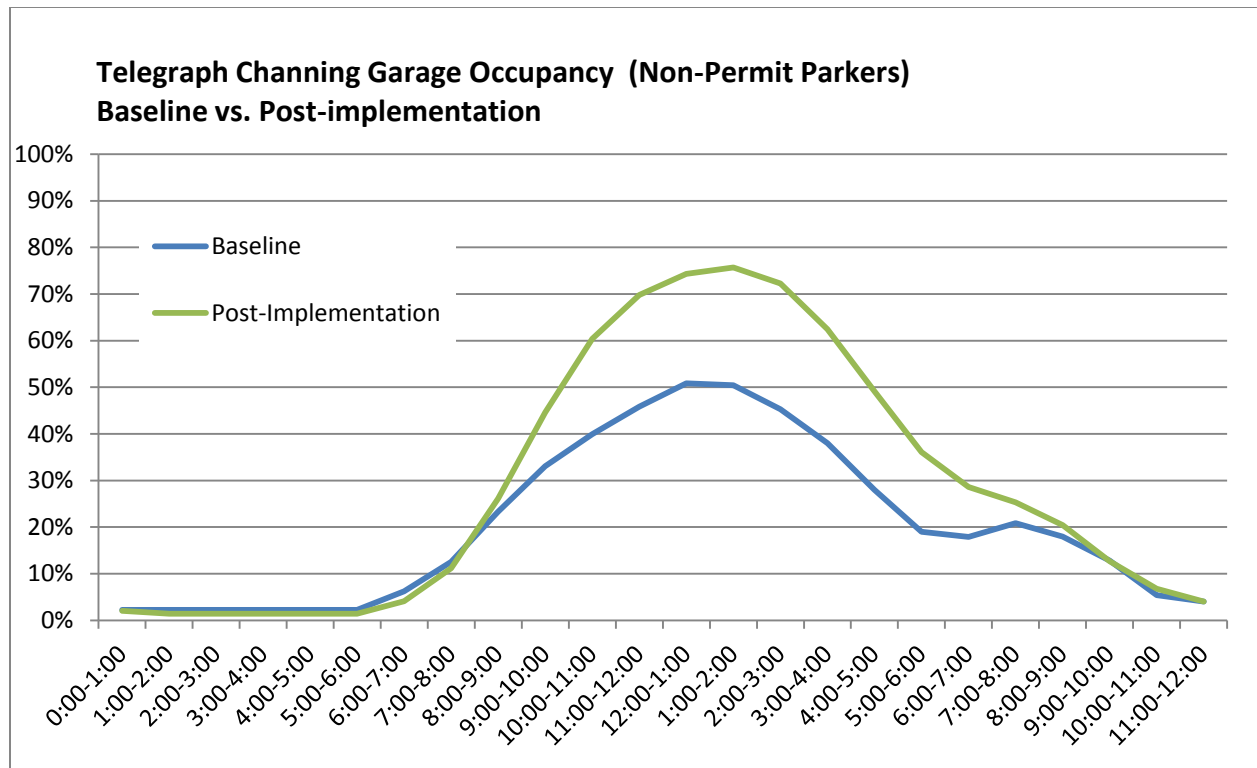
Zone	Blockfaces	Occupancy	Weekday Before		Weekday After		Saturday Before		Saturday After		Weekday Change		Saturday Change	
			#	%	#	%	#	%	#	%	#	%	#	%
Premium 2 Hr	31	<65%	11	35%	9	29%	14	45%	14	45%	-2	18%	0	0%
		65%-85%	10	32%	11	35%	10	32%	8	26%	1	10%	2	-20%
		>85%	10	32%	11	35%	7	23%	9	29%	1	10%	2	29%
Value 8 Hr	21	<65%	12	57%	1	5%	12	57%	4	19%	-11	92%	8	-67%
		65%-85%	8	38%	7	33%	4	19%	7	33%	-1	13%	3	75%
		>85%	1	5%	13	62%	5	24%	10	48%	12	1200%	5	100%

Telegraph Channing Garage**Background**

At the start of the pilot, Telegraph Channing Garage was routinely under-utilized, exhibiting, with 50% of its short-term (visitor) spaces empty, while metered blocks in the vicinity were often over-utilized. To address this, hourly rates for the Telegraph Channing Garage were decreased to \$1/hour for short-term parkers, with the first hour offered for free.

Results

More drivers are now parking in Telegraph Channing Garage. As shown in the following graph, the average weekday occupancy in the garage has increased from Baseline to Post-implementation Conditions. **The average increase in occupancy from 9 am – 5 pm is 22%.**



Driver Behavior

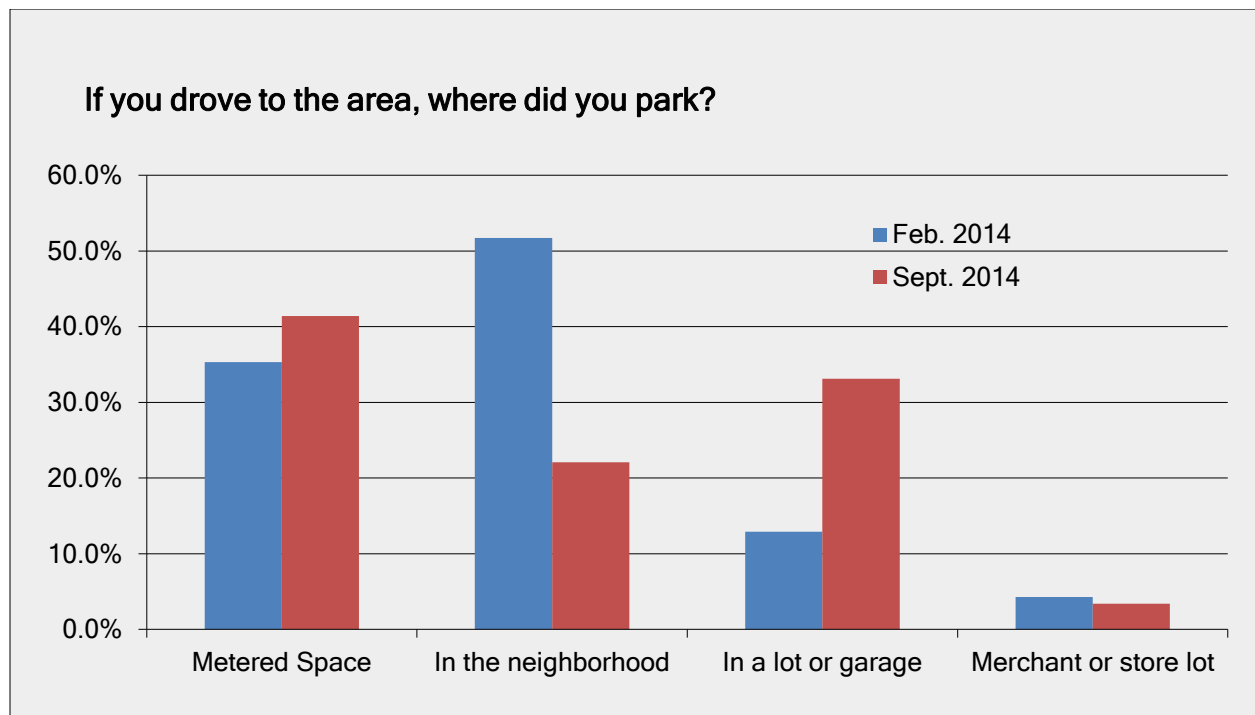
Driver behavior and preferences were measured via two types of questionnaire surveys:

- **Daytime driver survey** (February 2014, September 2014): Surveyors intercepted passersby and handed out mail-back surveys between the hours of 9 am and 5 pm, Monday - Saturday.
- **Evening driver survey** (May 2014, September 2014): Surveyors placed mail-back surveys on parked vehicles between the hours of 6 pm and 9 pm, Monday – Saturday.

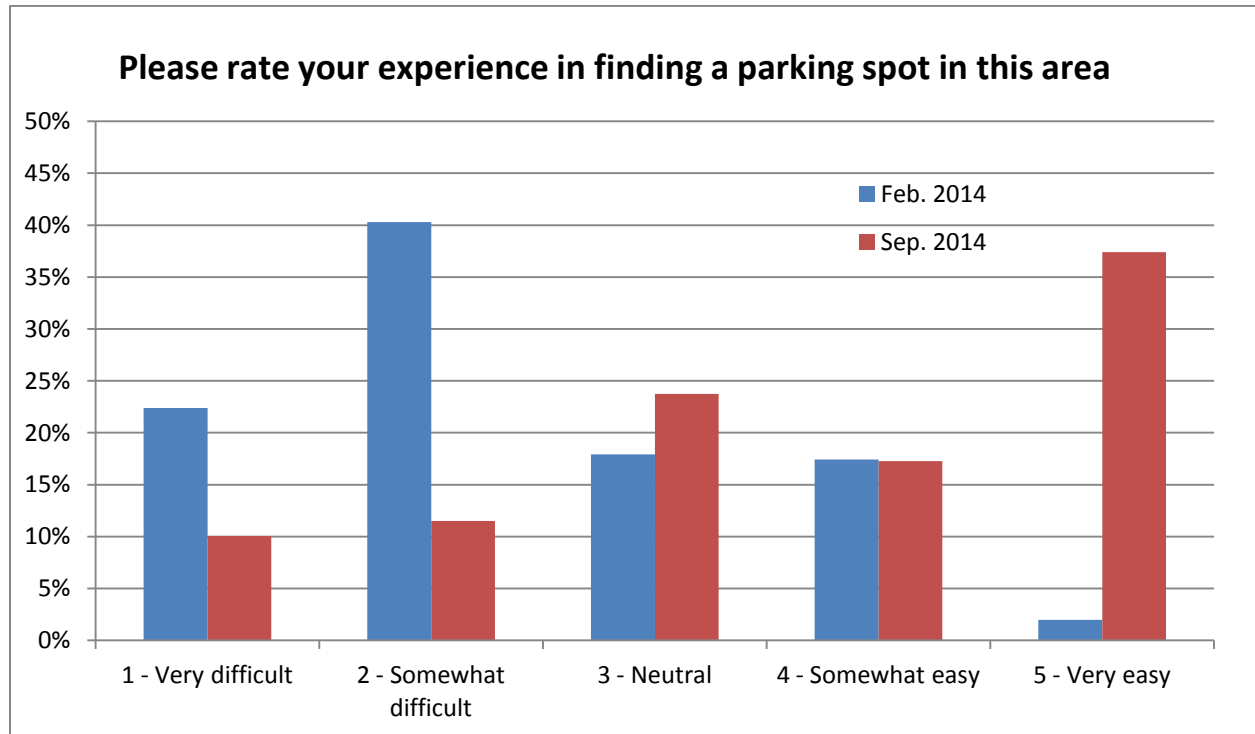
At this time, surveying for the goBerkeley program is not complete. While the response rate for drivers in the Daytime Driver and Evening Driver surveys is sufficient to draw conclusions, additional surveying is needed to determine overall mode shift of visitors. In addition, the program will conduct a survey of merchants. Results for all surveys will be available in the final report that is submitted to the Metropolitan Transportation Commission and the Federal Highway Administration.

Summary of Daytime Driver Survey (February - September 2014)

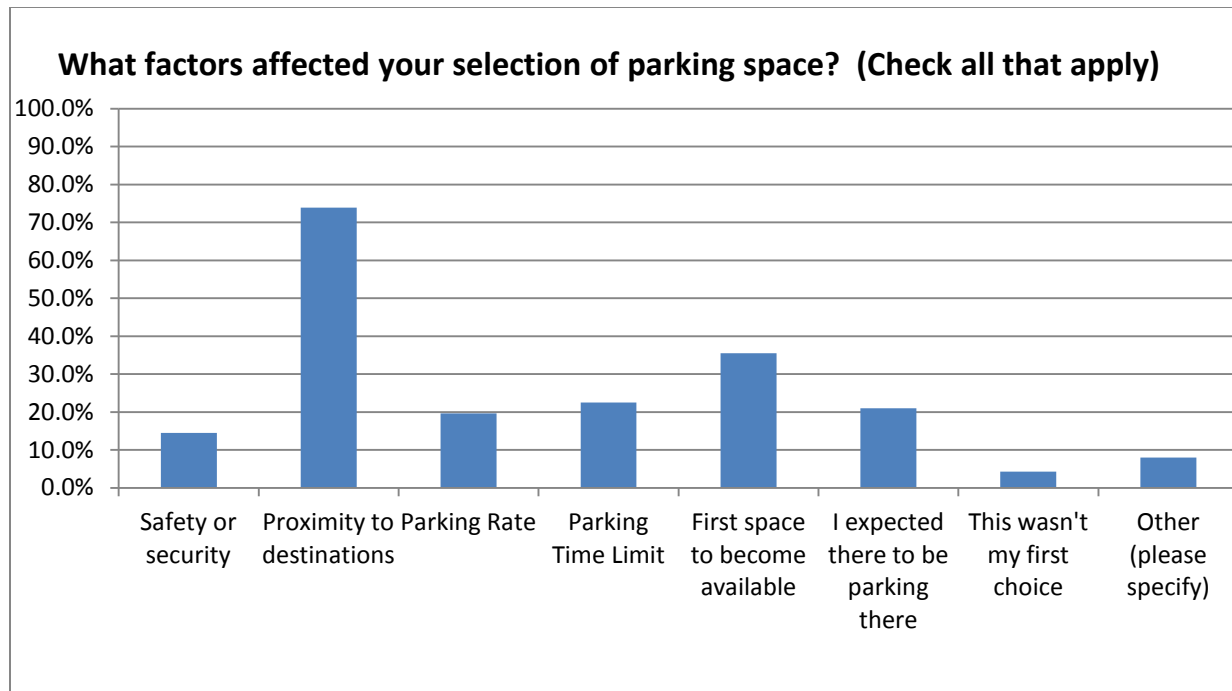
Drivers shifted from parking in neighborhood, or unmetered spaces, to parking at metered spaces and lots/garages. **Drivers parking in the neighborhood decreased by 30%** from 52% of drivers surveyed to 22%.



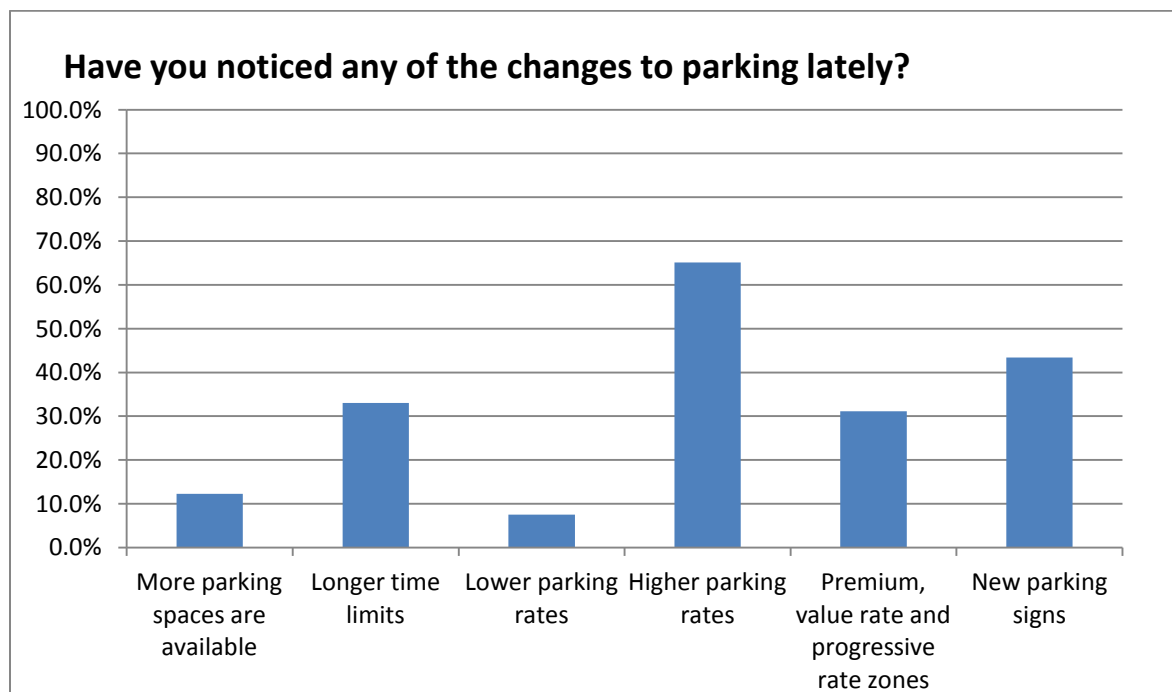
Drivers found it easier to locate a parking space in the pilot areas. Overall, drivers who responded that finding a parking space was “Very difficult” or “Somewhat difficult” declined by 41%. **Drivers who said that finding their parking space was “Very easy” or “Somewhat easy” increased by 35%.** Drivers who were neutral about their experience increased by 6%.



Drivers want to be close to their destination. **Of all drivers responding, 74% chose a parking space because of its “Proximity to Destination”,** an increase from 50% in February 2014. 20% of drivers responded that “Parking Rate” was a factor in selecting their parking space.



Awareness of the goBerkeley pilot program has increased, with 65% of drivers responding they were aware of higher rates, and 43% aware of the new parking signs.



On average, **drivers spend 6.2 minutes looking for a parking space** in the pilot areas.

Summary of Evening Driver Survey (May - September 2014)

During each round of data collection, on-street metered parking spaces are full after 6 pm, coinciding with evening activities such as theatre and movie performances and dining at restaurants and bars. To provide more insight into which drivers were occupying metered parking spaces, a windshield survey was performed between May and September 2014. Mail-back surveys were left on the windshield of parked vehicles at metered spaces in the pilot areas.

Approximately **27% of vehicles parked at metered spaces belong to employees or residents** of the pilot areas. On average, these vehicles spend ~\$23 in those areas. 73% of vehicles parked belong to visitors to the areas. On average, these vehicles each spend \$54 in the areas.

Results for each area are presented in the table below.

	% of vehicles		\$ spent per vehicle	
	Employees/Residents	Visitors	Employees/Residents	Visitors
Downtown	29%	71%	\$ 25.96	\$ 55.70
Elmwood	17%	83%	\$ 10.00	\$ 72.11
Southside	26%	74%	\$ 13.81	\$ 37.96
Overall	27%	73%	\$ 22.62	\$ 53.62

Exhibit 1:

Parking Occupancy per Blockface September 2014 Conditions

Downtown Berkeley

Average Weekday (Thursday)

- AM
- Midday
- PM
- Evening

Average Saturday

- AM
- Midday
- PM
- Evening

Southside / Telegraph

Average Weekday (Thursday)

- AM
- Midday
- PM
- Evening

Average Saturday

- AM
- Midday
- PM
- Evening

Elmwood

Average Weekday (Thursday)

- AM
- Midday
- PM
- Evening

Average Saturday

- AM
- Midday
- PM
- Evening

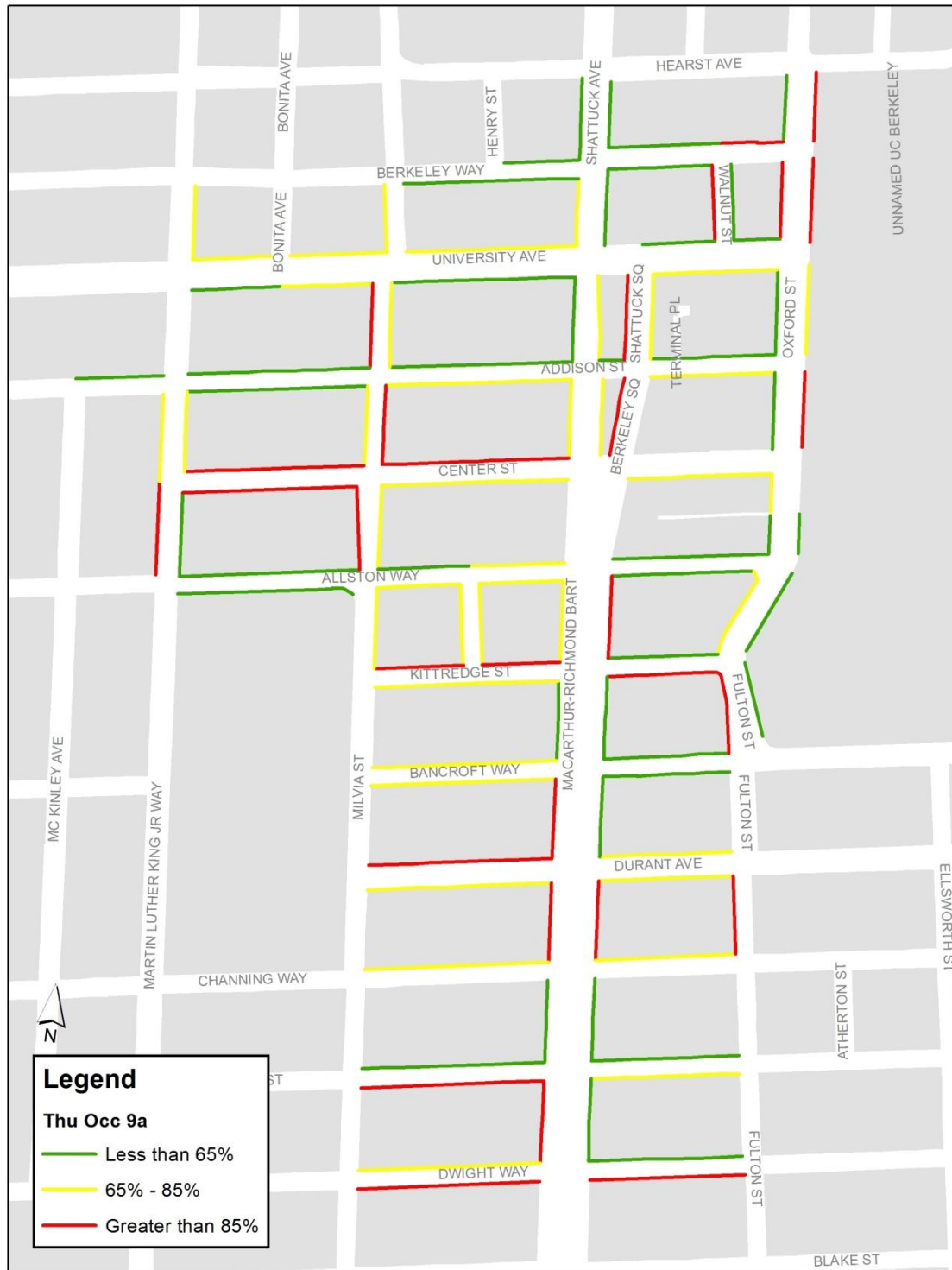


Figure 1 - Downtown Weekday Occupancy - 9 AM

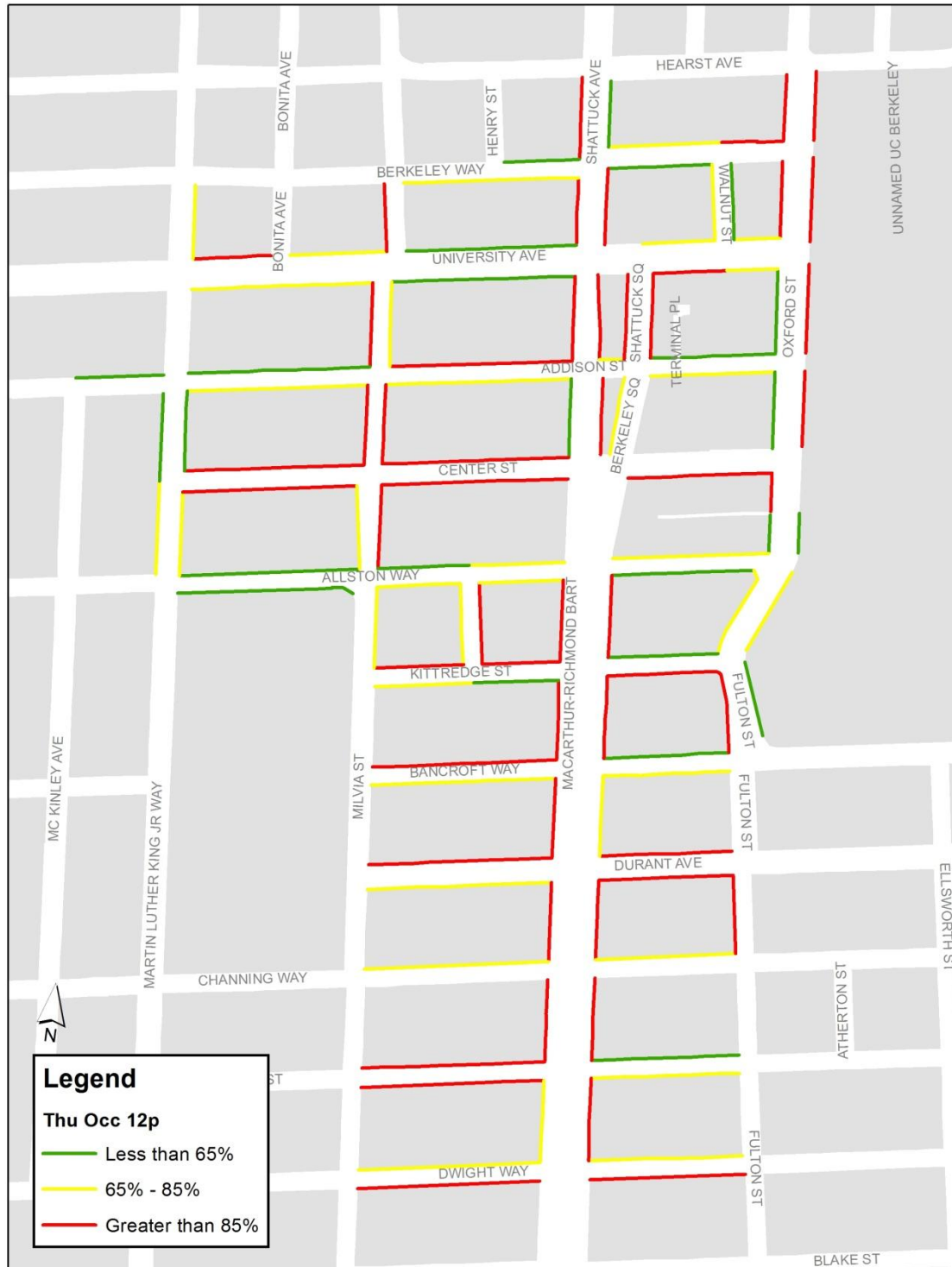


Figure 2 - Downtown Weekday Occupancy - 12 PM

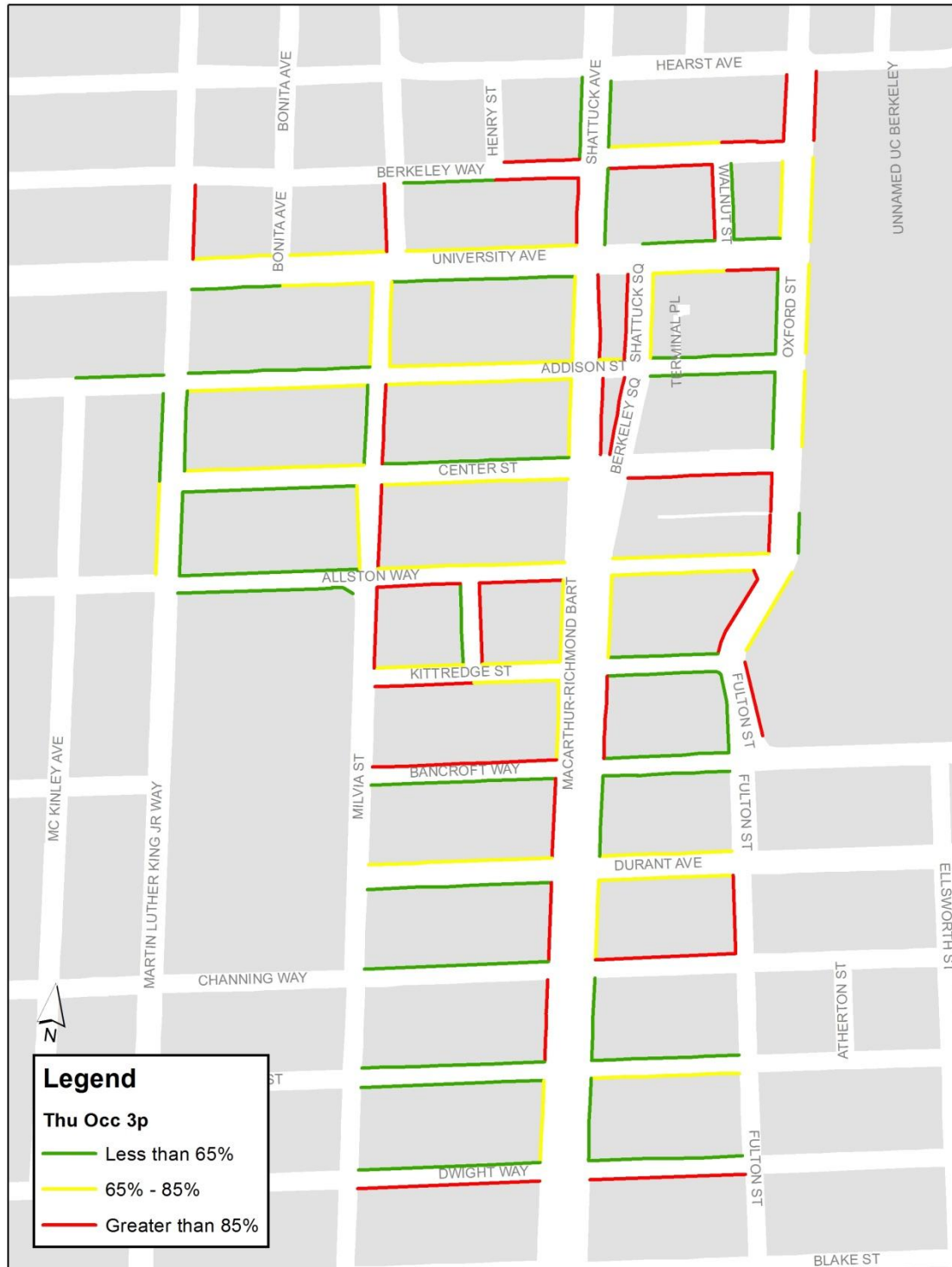


Figure 3 - Downtown Weekday Occupancy - 3 PM

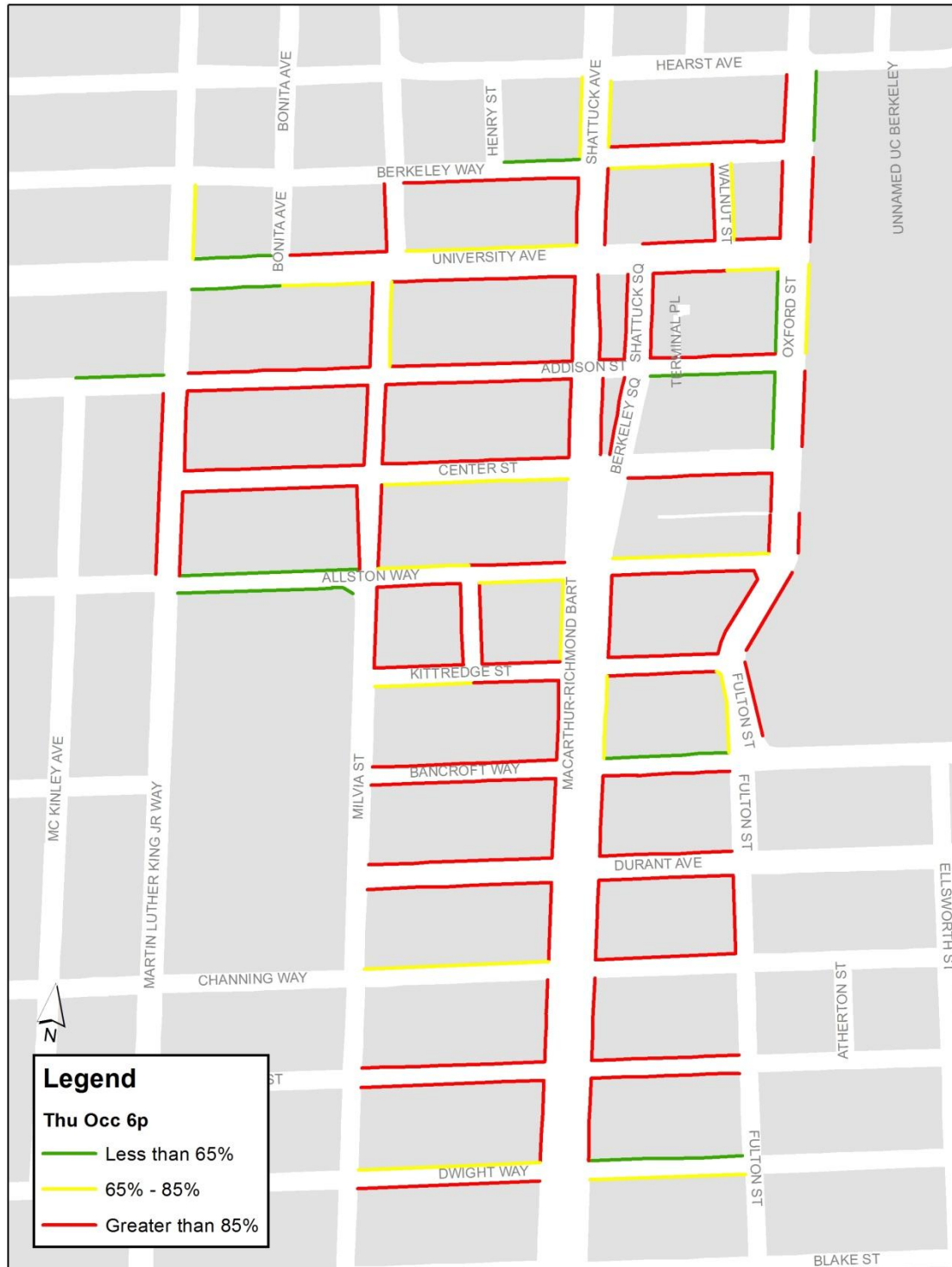


Figure 4 - Downtown Weekday Occupancy - 6 PM

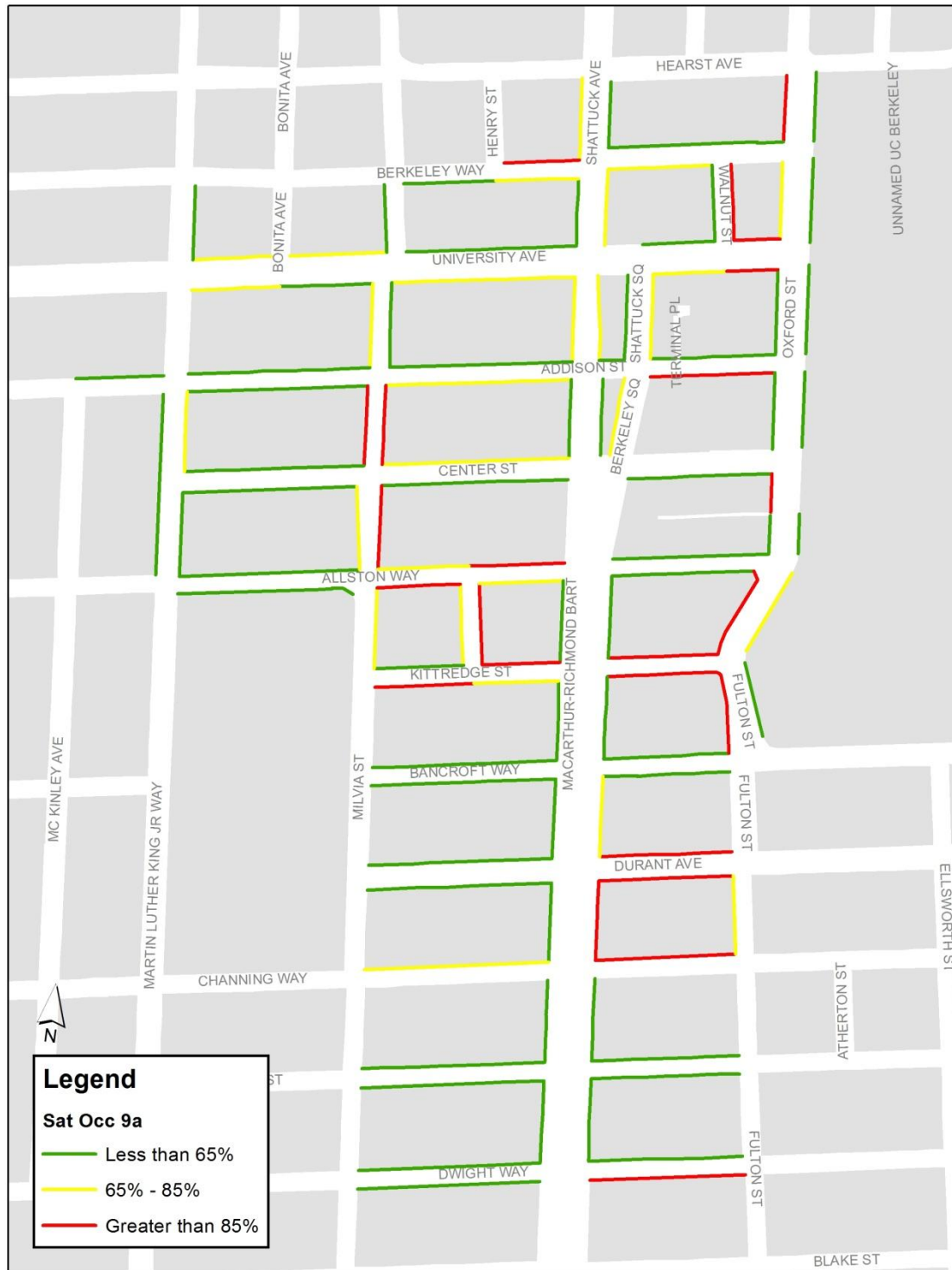


Figure 5 - Downtown Saturday Occupancy - 9 AM

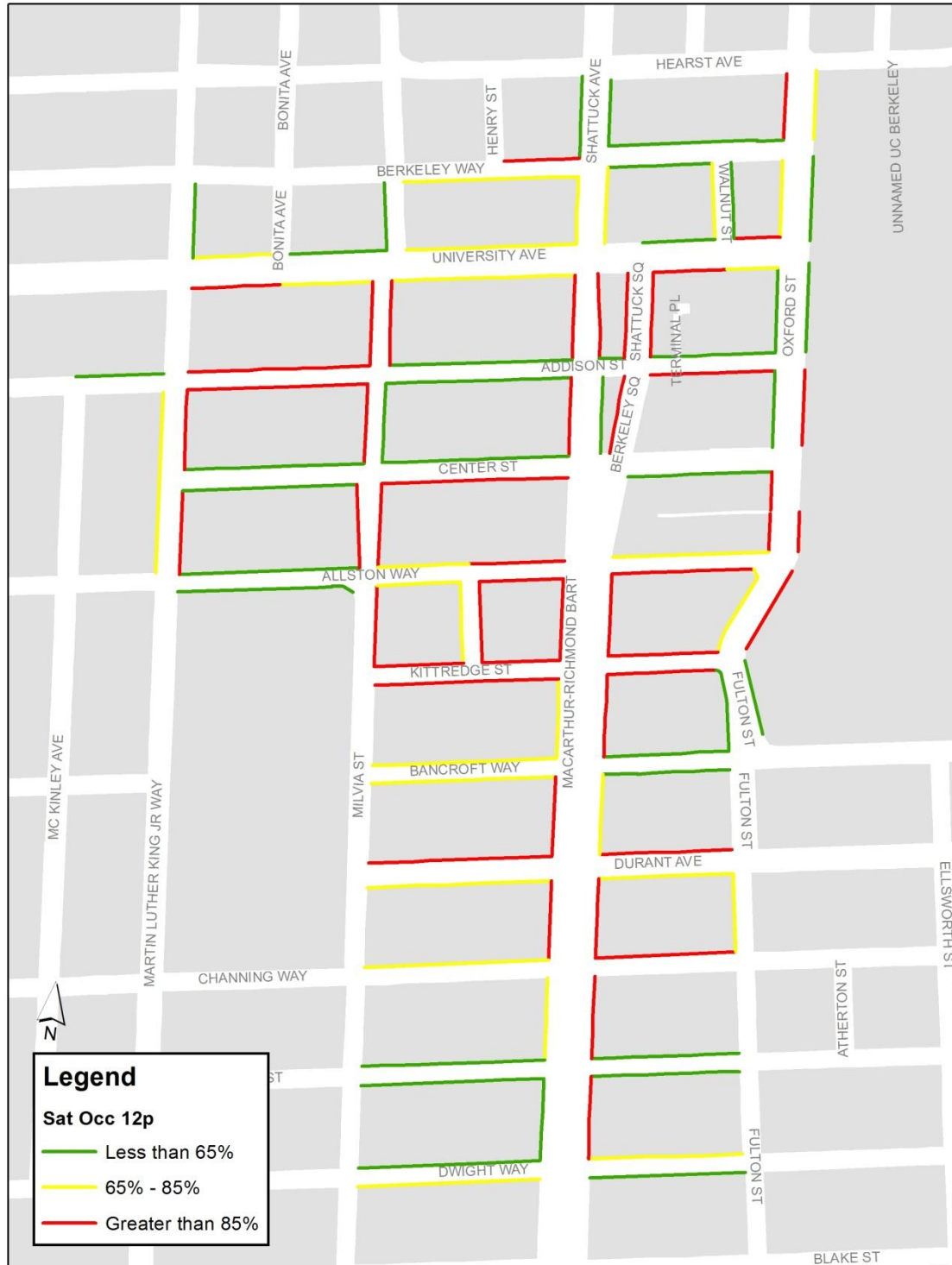


Figure 6 - Downtown Saturday Occupancy - 12 PM

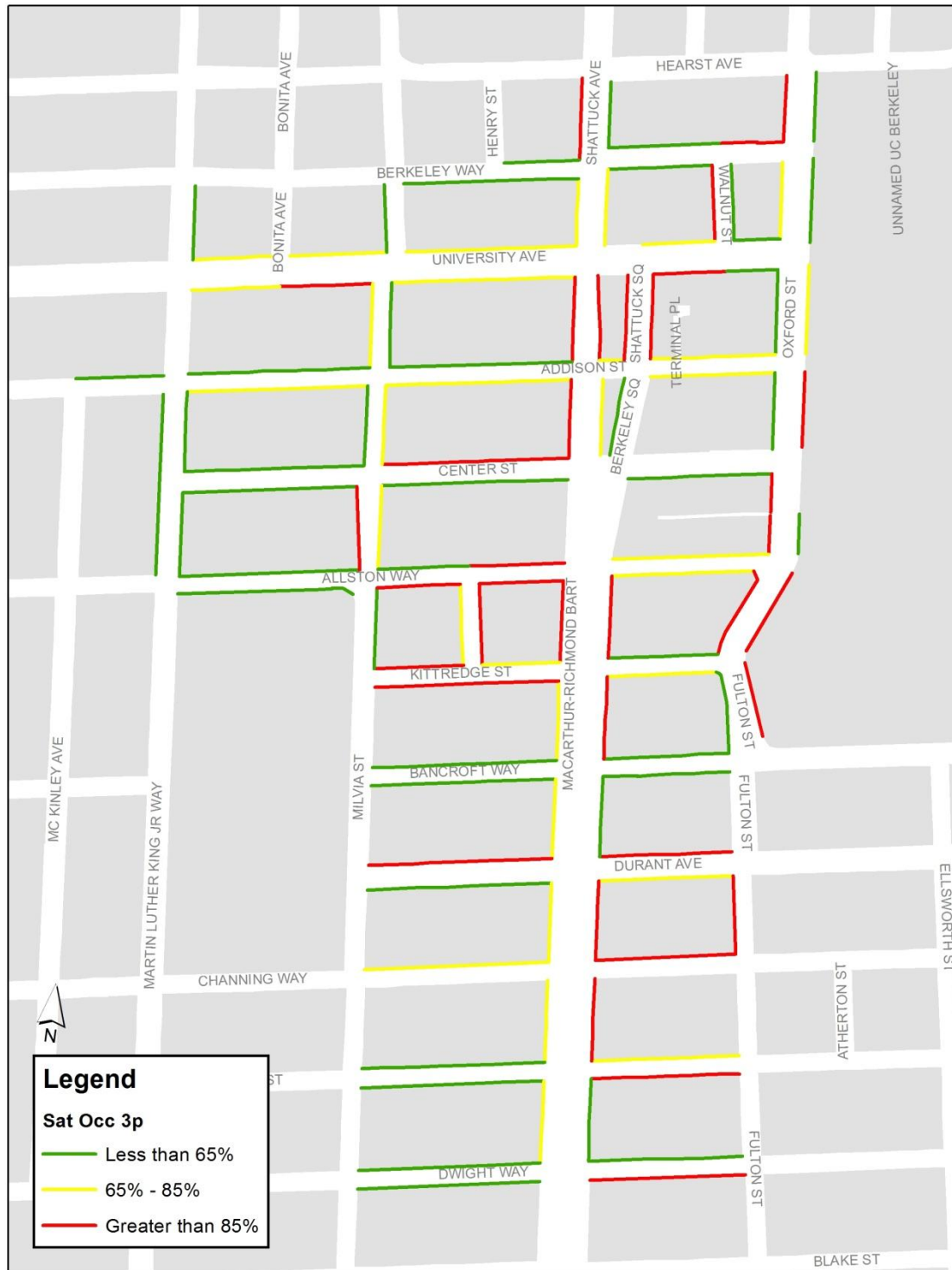


Figure 7 - Downtown Saturday Occupancy - 3 PM

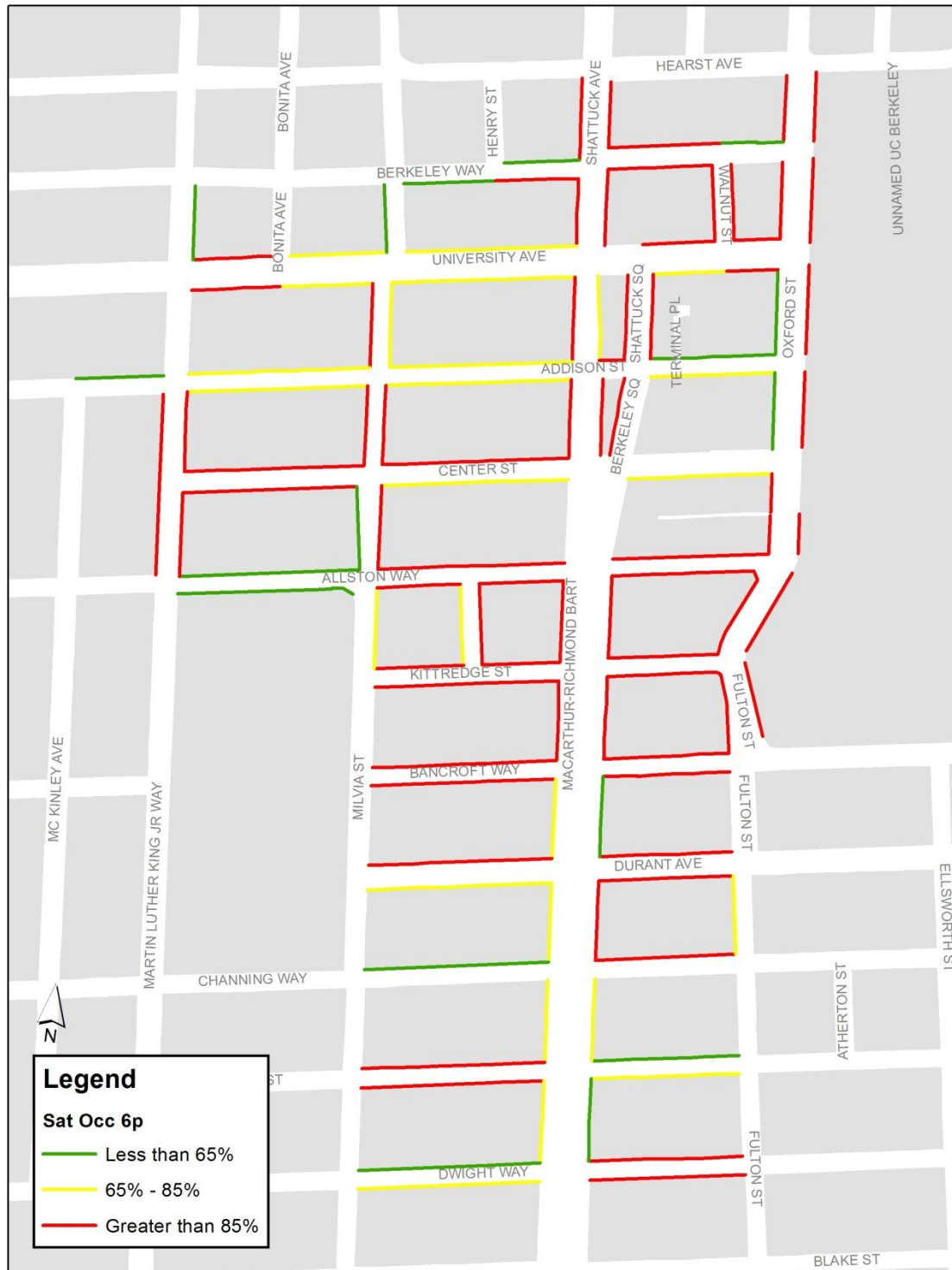


Figure 8 - Downtown Saturday Occupancy - 6 PM



Figure 9 - Southside Weekday Occupancy - 9 AM



Figure 10 - Southside Weekday Occupancy - 12 PM



Figure 11 - Southside Weekday Occupancy - 3 PM



Figure 12 - Southside Weekday Occupancy - 6 PM



Figure 13 - Southside Saturday Occupancy - 9 AM



Figure 14 - Southside Saturday Occupancy - 12 PM

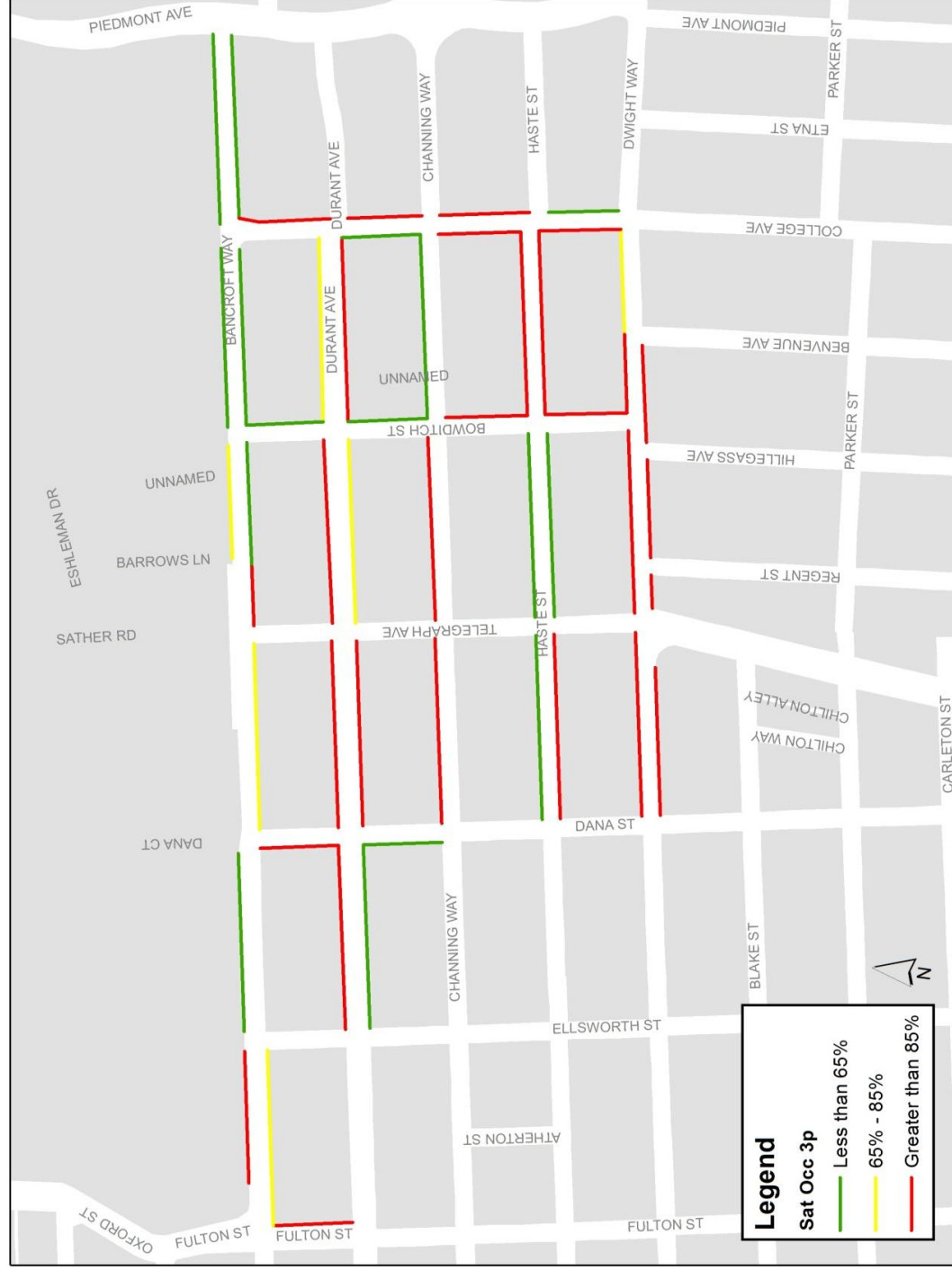


Figure 15 - Southside Saturday Occupancy - 3 PM

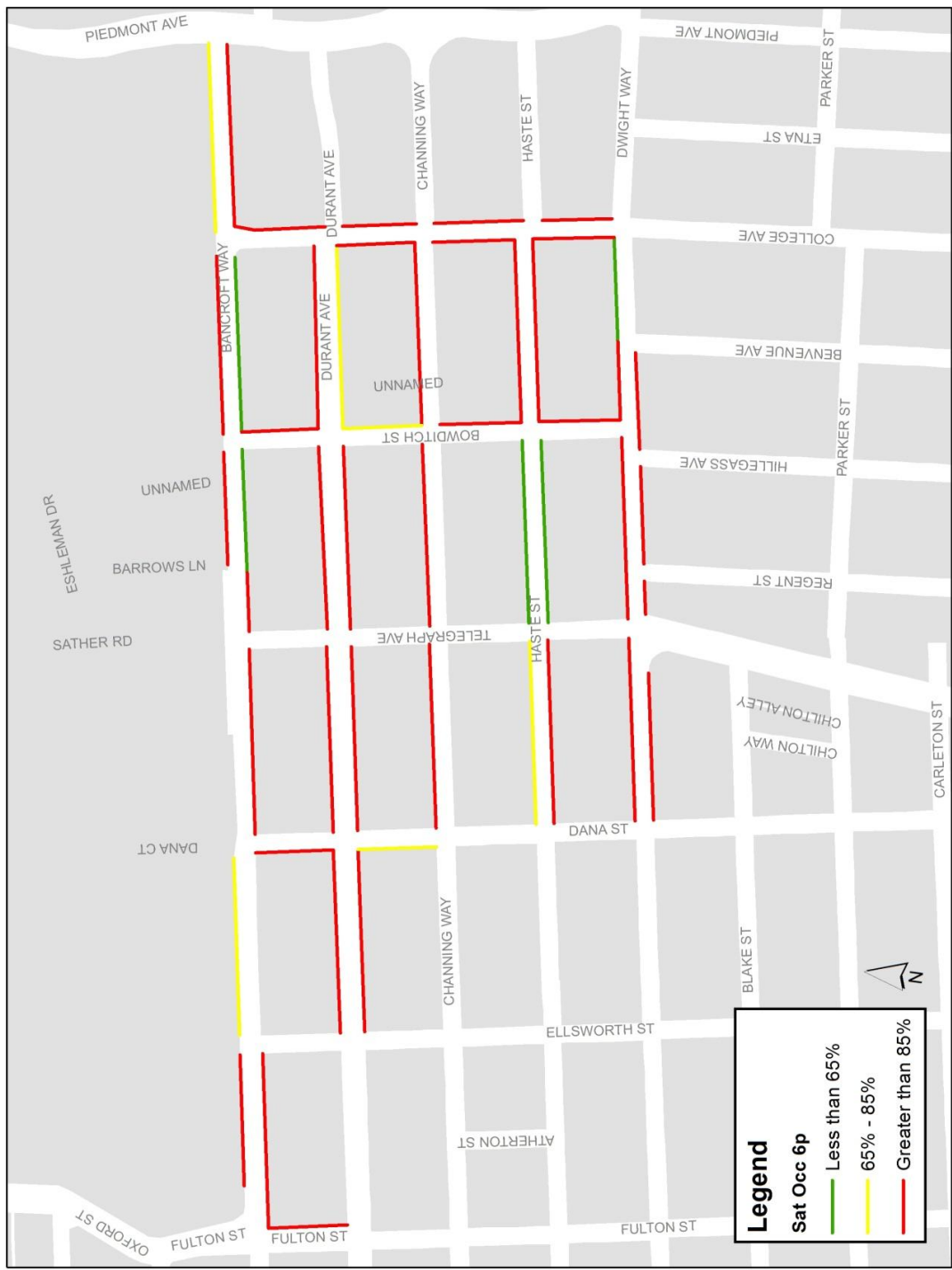


Figure 16 - Southside Saturday Occupancy - 6 PM

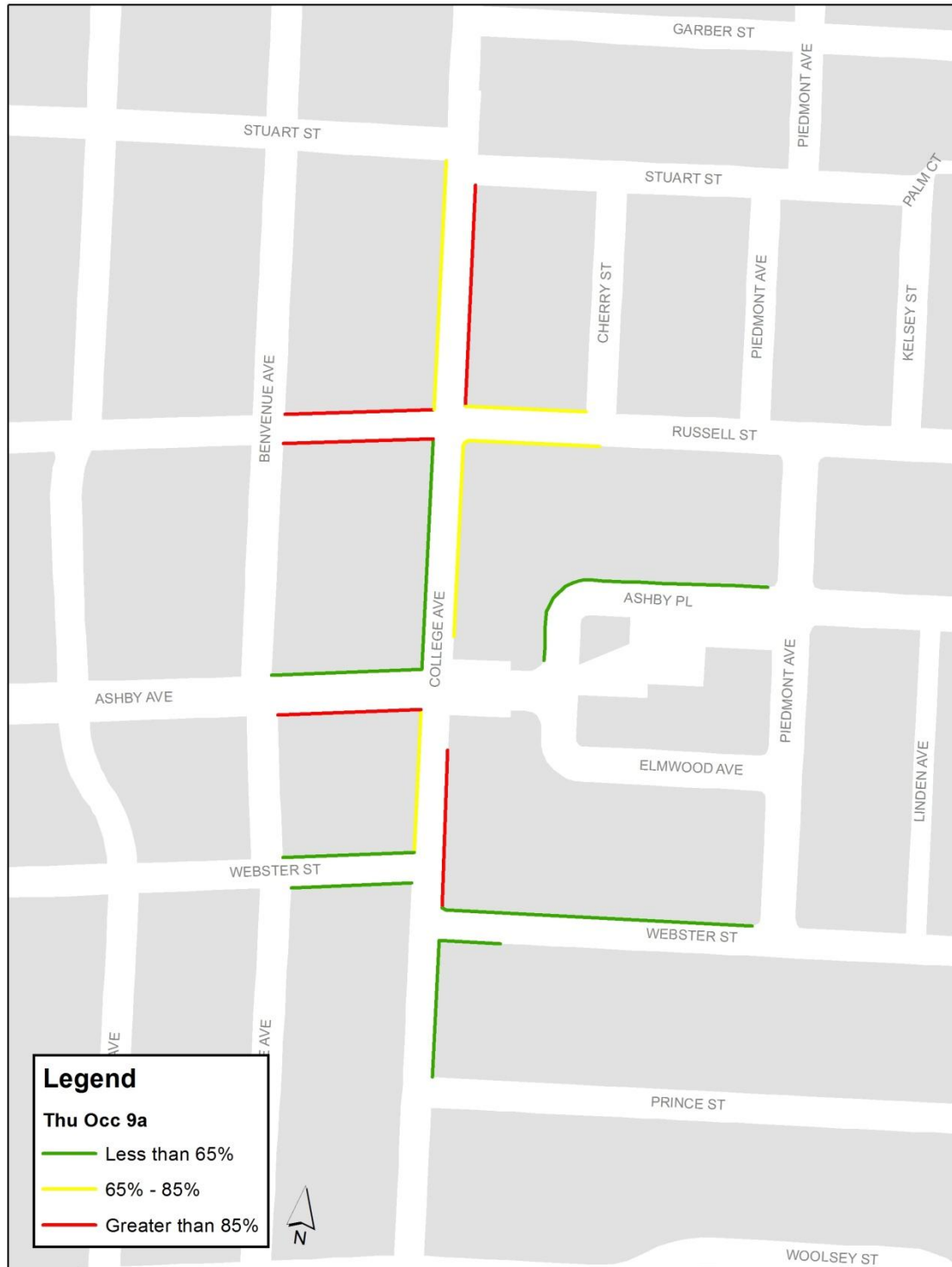


Figure 17 - Elmwood Weekday Occupancy - 9 AM

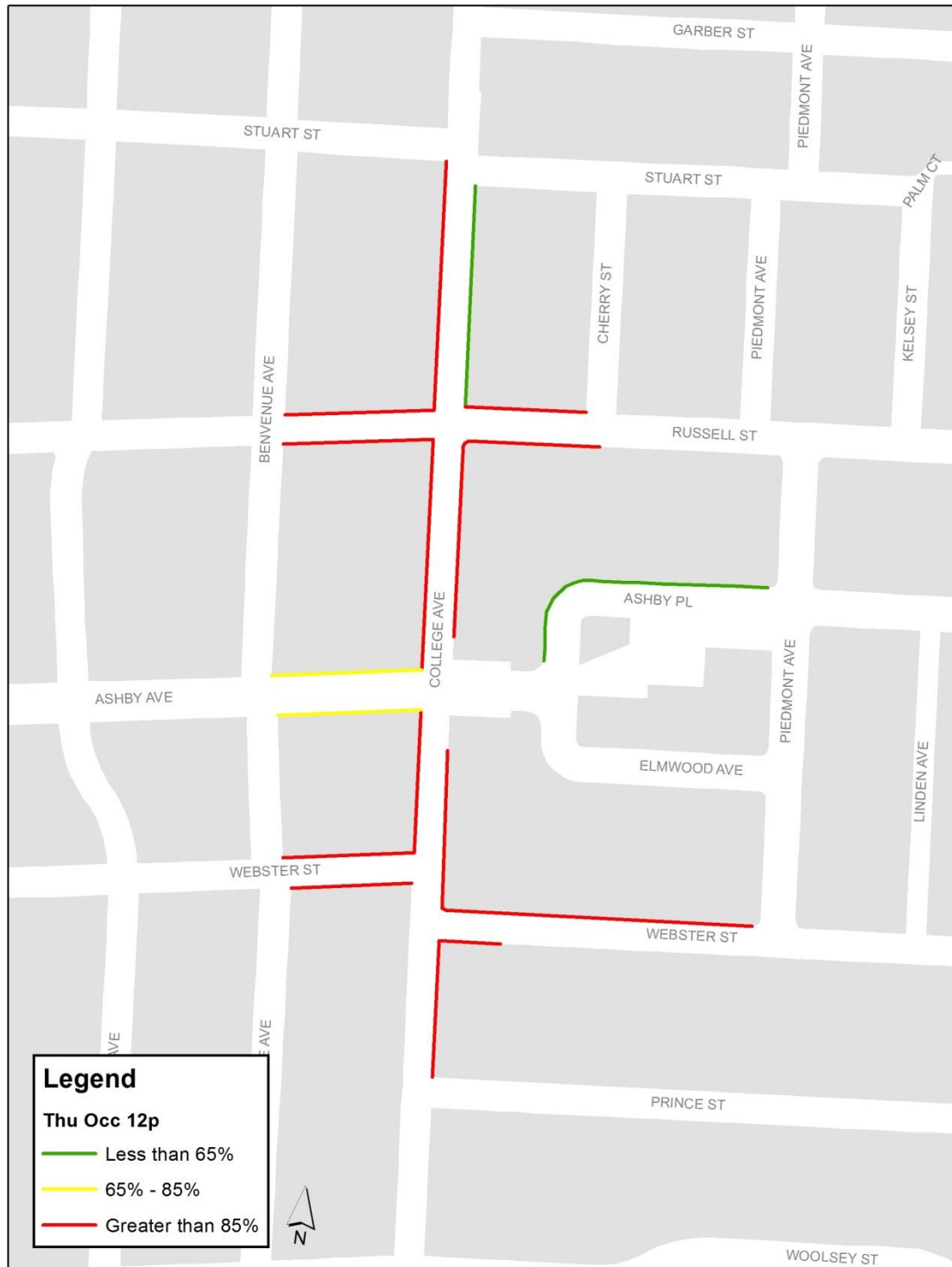


Figure 18 - - Elmwood Weekday Occupancy - 12 PM

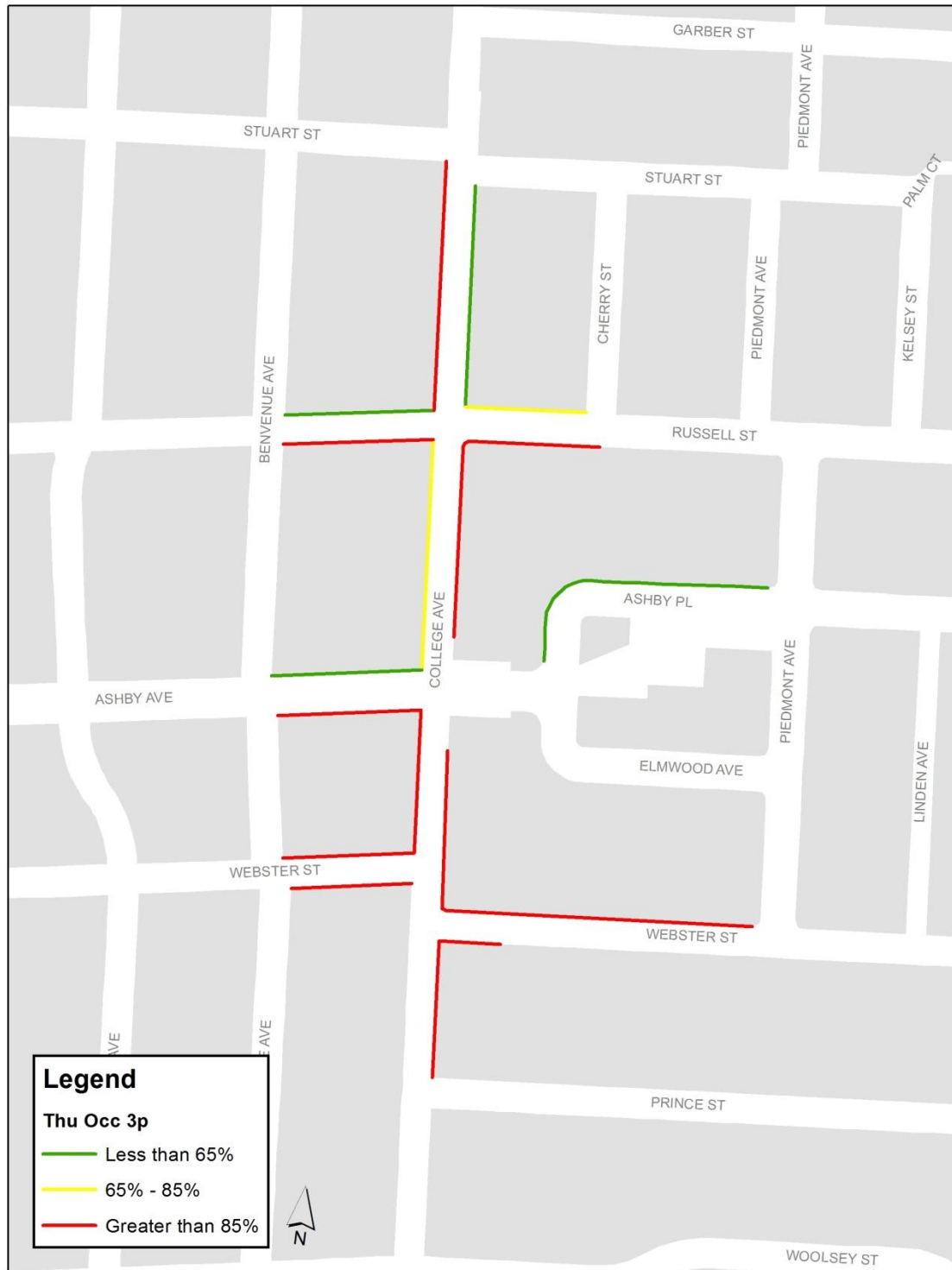


Figure 19 -- Elmwood Weekday Occupancy - 3 PM

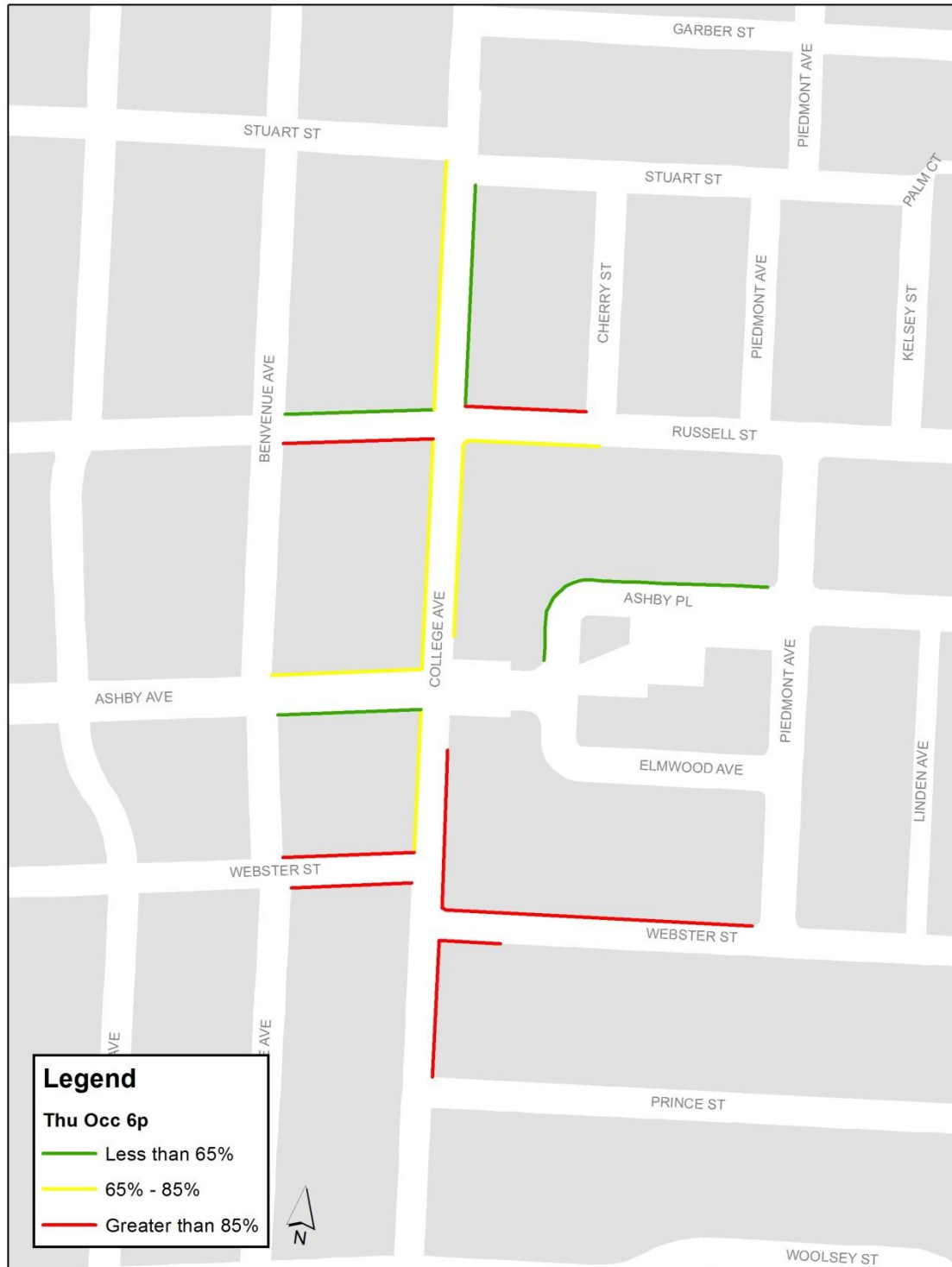


Figure 20 -- Elmwood Weekday Occupancy - 6 PM

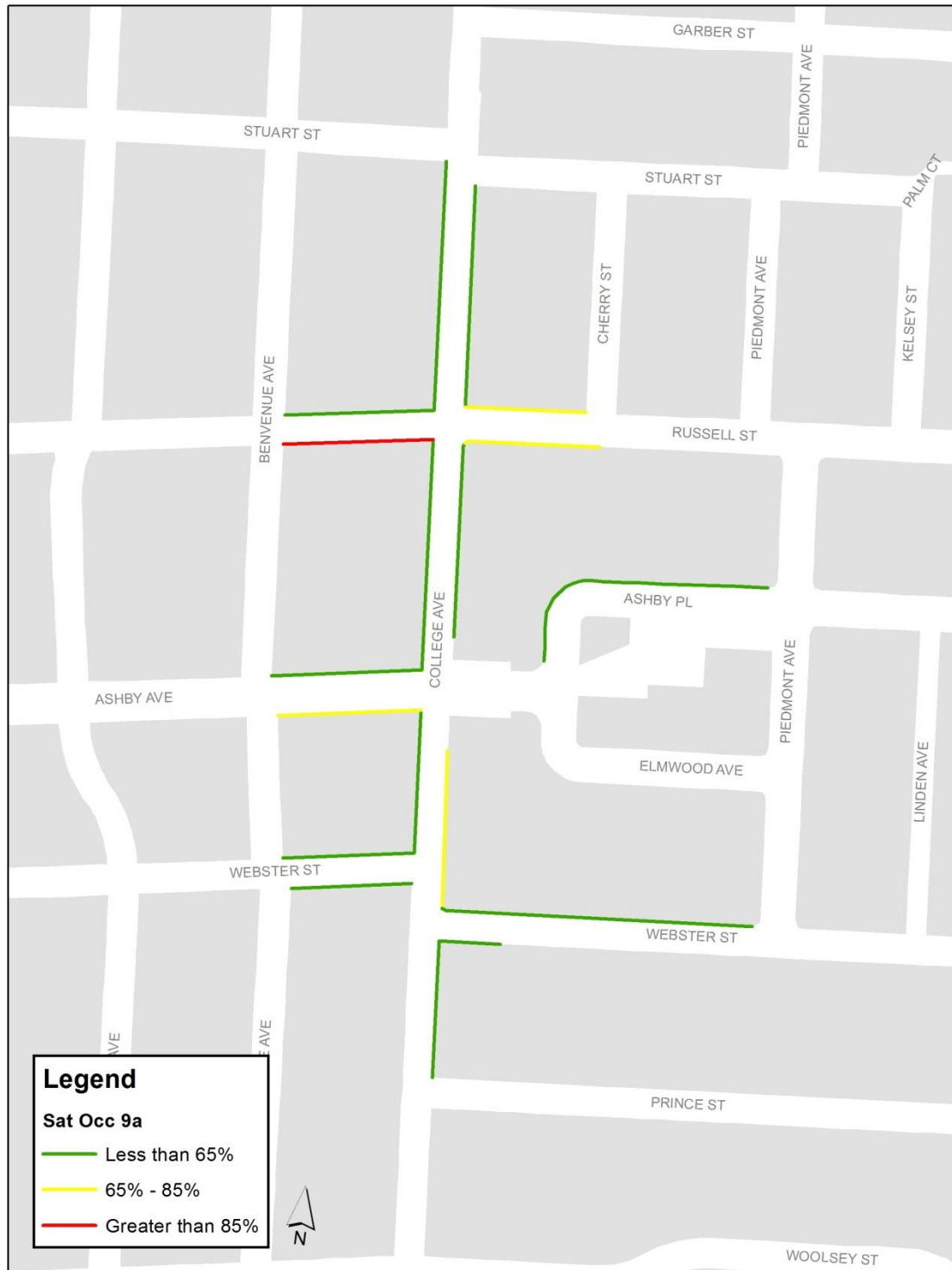


Figure 21 - Elmwood Saturday Occupancy - 9 AM

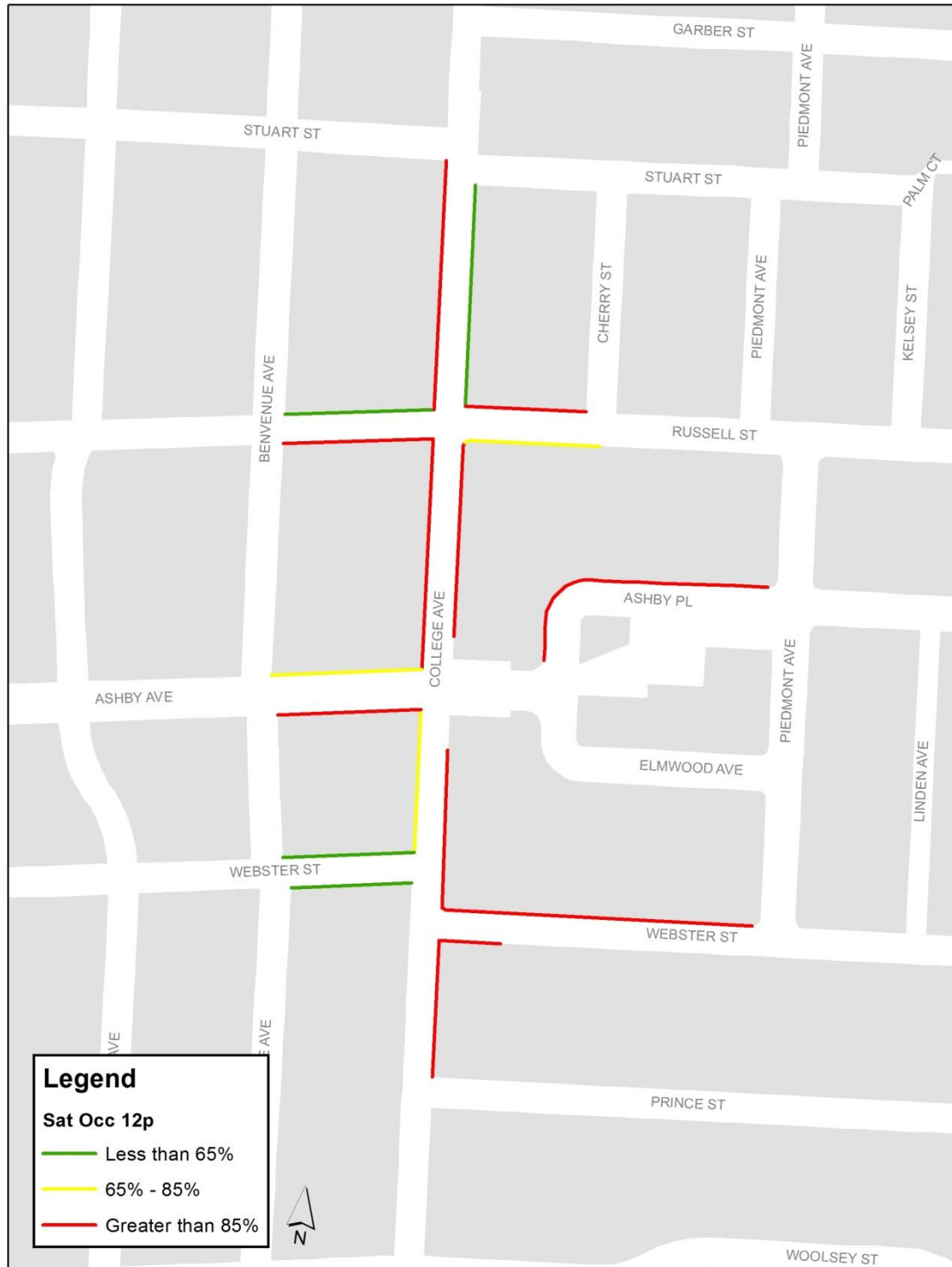


Figure 22 - Elmwood Saturday Occupancy - 12 PM

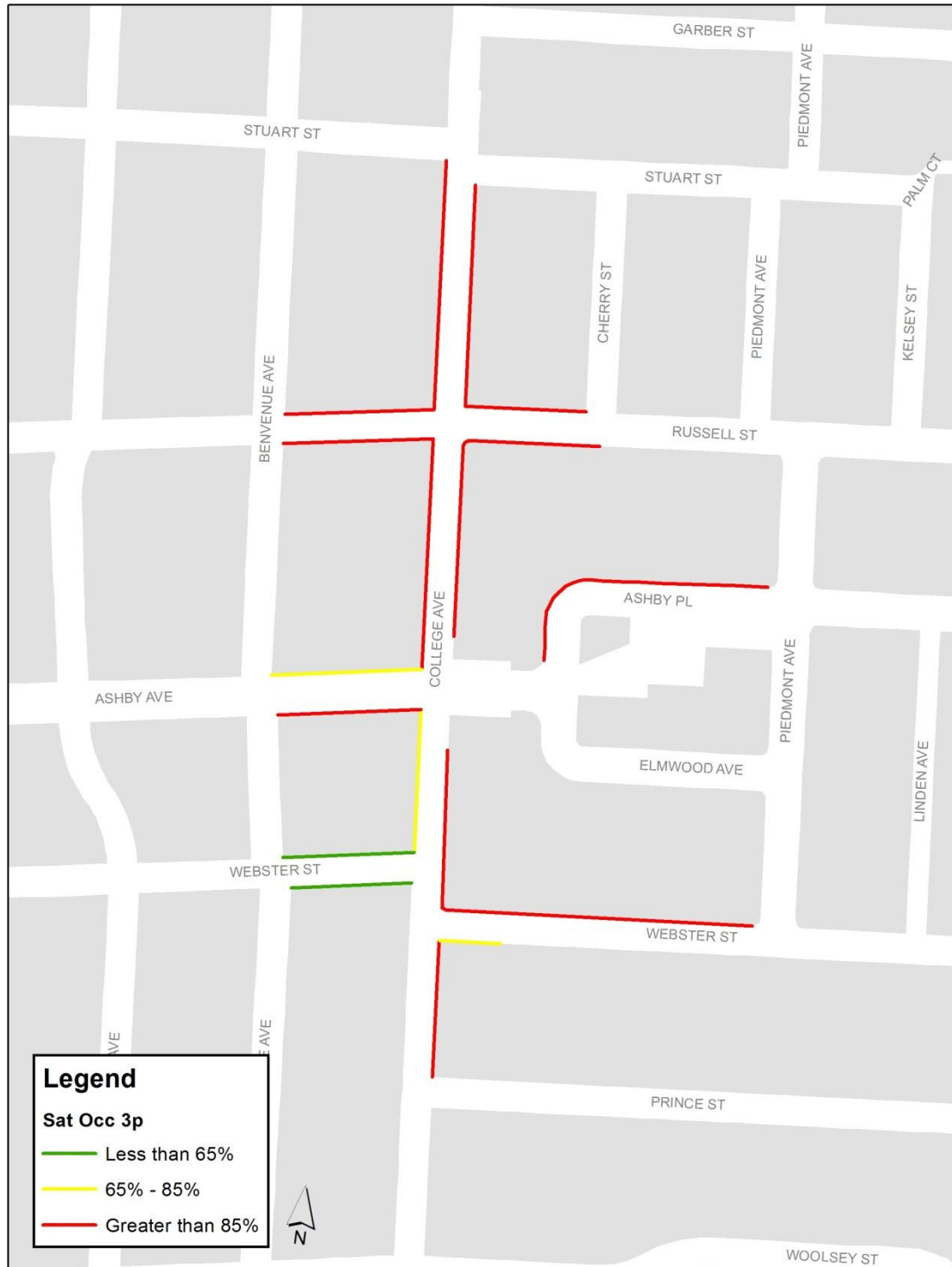


Figure 23 - Elmwood Saturday Occupancy - 3 PM

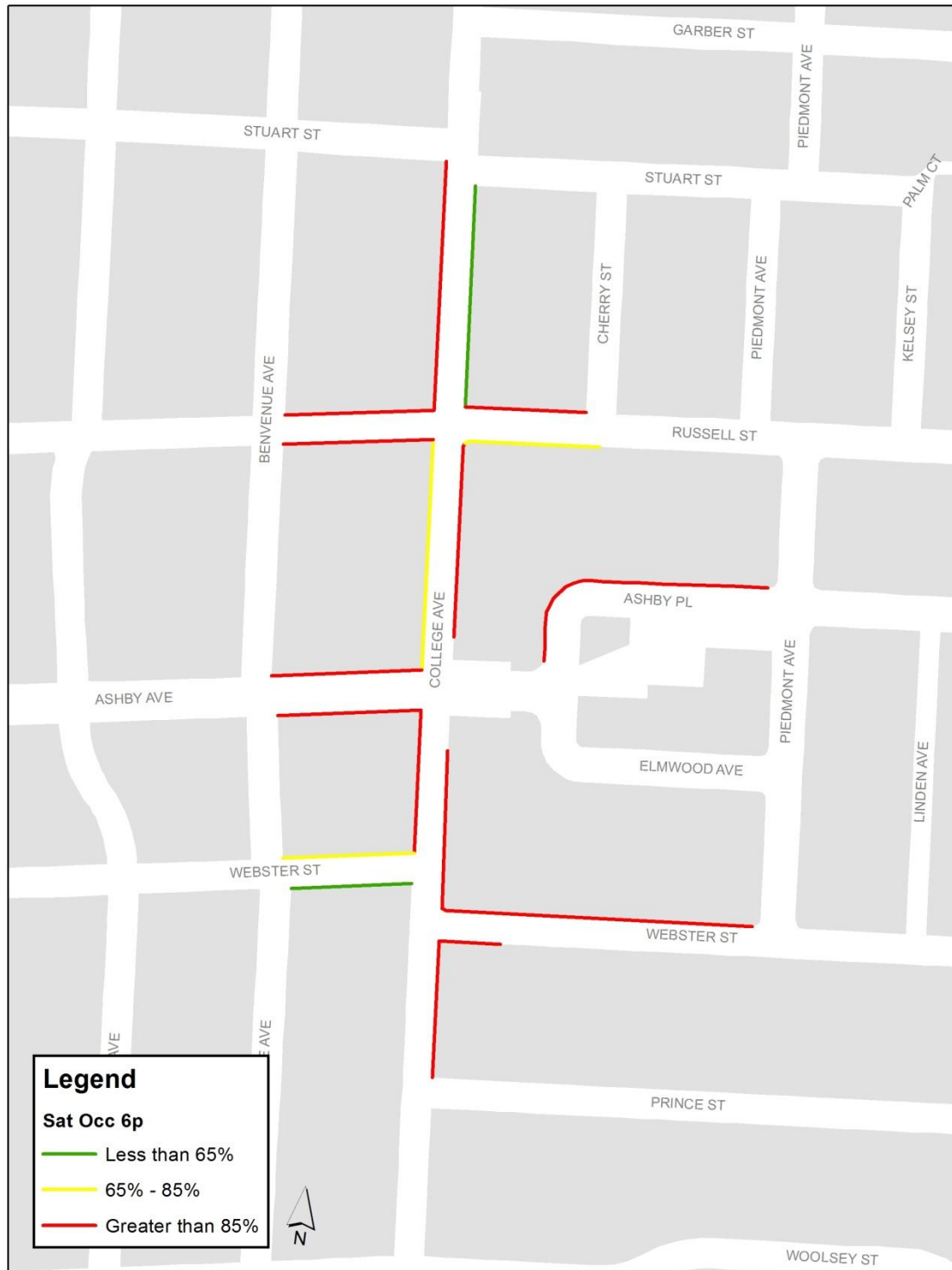


Figure 24 - Elmwood Saturday Occupancy - 6 PM

goBerkeley Automated Data Collection and Enforcement Pilot

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Overview

This Appendix presents results from the Automated Data Collection and Enforcement portion of the goBerkeley pilot program.

Three rounds of data collection have shown that the demand-based parking pilot is working. Parking availability is improving in the City's commercial areas and many blocks are approaching the pilot's target of 1-2 available parking spaces per block. However, all parking changes have been based on manually collected data - a process that is labor-intensive, expensive, requires error-checking and still provides a snap-shot of conditions instead of comprehensive data.

If the City is to continue with demand-based parking pricing, it must develop a long-term method of data collection that is affordable, flexible and accurate.

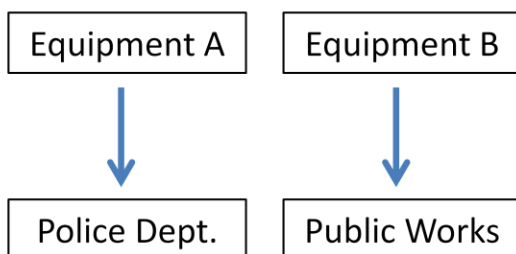
Equipment for Lean-Demand Management

As such, the City of Berkeley, and its federal funders, are exploring ways to collect parking data that is:

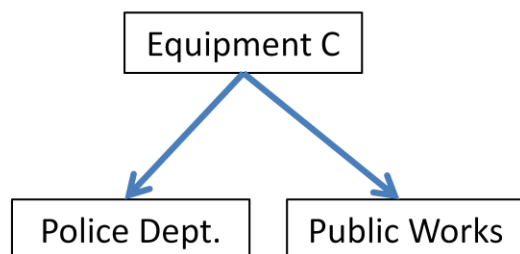
- Accurate
- Cost-efficient
- Operated by existing City staff.

To meet these three criteria, the City pursued a shared system between the Department of Public Works (parking management) and the Police Department (parking enforcement). The City was seeking equipment that meets the operational needs of both departments – either separately or as one type of equipment.

Acceptable



Ideal



In July 2014, the City released a Request for Qualifications (RFQ) to find a vendor to provide equipment that meets the needs of Public Works and the Police Department. In

addition to providing hardware and software, the equipment vendor would integrate with the City's systems, both existing and under development. The City has a System Integrator under contract, who assisted the City with a demonstration of potential vendors and the integration of the selected vendor into the City's existing systems, as well as the parking data collection system that is being developed.

Equipment Demonstration and Testing

Following the release of the RFQ, two qualified vendors were invited to an on-site test of equipment in the City of Berkeley. Testing occurred in a controlled environment between September 22nd and 26th, 2014.

The purpose of the on-site test was to show that the equipment met the City's basic requirements including the ability to collect parking occupancy data and perform parking enforcement.

It should be noted that for this on-site test, license plate records and all other vehicle information was protected by confidentiality agreements. When analysis of the two vendors is complete, all data collected will be discarded and only a completely anonymized summary of performance will be retained by the City.

The City provided two Toyota Prius vehicles for the demonstration – one for each vendor's system. A third vehicle was used by the manual survey team which shadowed the Prius on the test route. The three vehicles drove in a platoon so as to capture the same data (vehicles parked on the street) between them.

The vehicles were driven by parking enforcement officers who were trained by the vendors on their respective ALPR systems' operations.

During the test runs, data was collected by the ALPR systems for the following applications:

- Parking occupancy detection – number of vehicles parked on a block face
- Parking enforcement
 - Time limit enforcement in RPP and non-RPP zones
 - Scofflaw enforcement

Test Run Scenarios

The parking occupancy and enforcement demonstration test runs were conducted on the streets for the following scenario combinations:

	Scenarios	Day	Night
1	Parallel parked –right side (demarcated spaces)	X	X
2	Parallel parked – right side (non- demarcated spaces)	X	X
3	Parallel parked – left side (non-demarcated spaces)	X	X
4	Angled parking(between 45 and 90 degrees)	X	X

Test Area

A test route for the ALPR demonstration is shown in the figure below. It included:

- 77 on-street block faces and
- 2 parking lots

The test route was selected such that it included:

- Parallel and angled parking
- Demarcated and non-demarcated parking
- Left and right hand side parking
- Different parking regulations
- Varying building heights

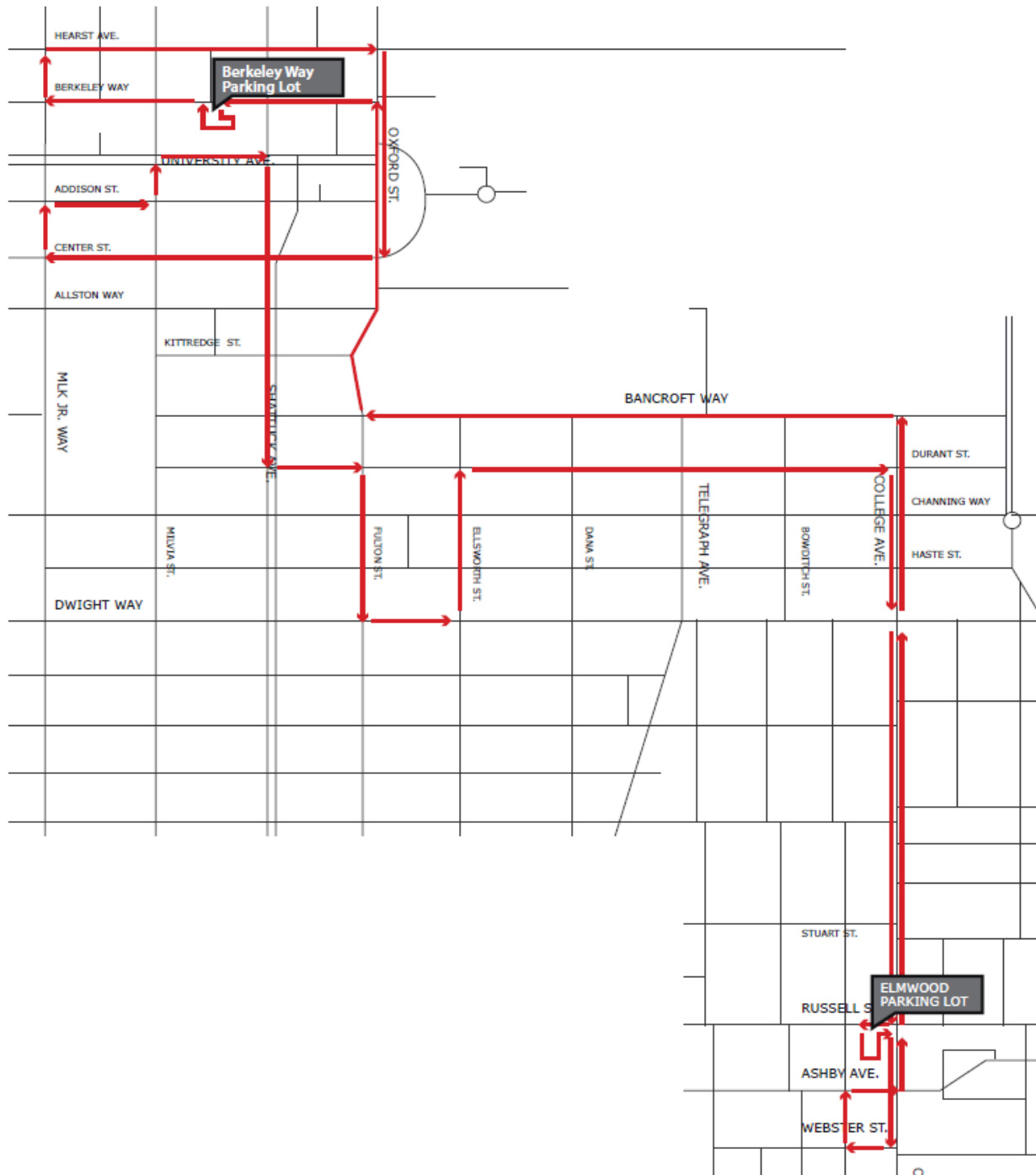


Figure 1 - Test Route

System Requirements and Performance Standards

System and Functional Requirements

While the City enumerated a number of requirements, and desirable elements, which the proposed system should meet, there are some elements and capabilities that are of the highest importance. These include:

- High read rates
- Determining and reporting parking occupancy
- Determining and reporting violations for time limit and RPP violations
- Interface with enforcement handheld computers
- Interface with citation database
- Interface with the City's GIS database

A full list of System and functional requirements ("Requirements") is available upon request.

Potential Methods for Evaluation of Performance Standards

The following is a list of parameters for evaluation of the potential new equipment:

- a) **PERFORMANCE:** Measured using the City's stated requirements and performance standards for automated parking data collection and enforcement for three City departments: Public Works, Transportation; Police Department, Parking Enforcement; and IT. **Equipment shall be evaluated based on its ability to meet the requirements of the City overall as well as for each of the three departments, individually.**
- b) **COST:** A comparison of short-term costs (1-2 yrs) and life-cycle costs (10-15 yrs), including the potential for renting, leasing, lease-to-own or purchase.
- c) **ACCESSIBILITY / USABILITY:** An assessment of the resources, training, labor, ancillary information and existing equipment/infrastructure necessary to support the continued use of the equipment.
- d) **SCALABILITY / FLEXIBILITY:** An assessment of the versatility of the method to accommodate reasonable changes to the City's requirements, including the extension of automated data collection / enforcement to City-wide use.

Pilot Results

Data Analysis

At the conclusion of each day of testing, both vendors transferred occupancy and enforcement data collected throughout the run to the system integrator, who then evaluated the data for accuracy. *It should be noted that for this on-site test, license plate records and all other vehicle information was protected by confidentiality agreements. When analysis of the two vendors is complete, all data collected will be discarded and only a completely anonymized summary of performance will be retained by the City.*

The following guidelines were used to evaluate the data from both the vendor systems:

- a) Only vehicle that were parked on the street and in parking lots were counted
- b) Do not count the vehicles parked on driveways or at intersections
- c) Only vehicles with “4 or more”-wheeled vehicles were counted. Motor cycles and trucks were not counted.
- d) For time-limit enforcement
 - a. For vehicles flagged in the report, OCR license plate reads were compared for subsequent runs.
 - b. Vehicles designated with RPP permits were checked against City RPP records
- e) For Scofflaw enforcement, license plate OCR reads of flagged vehicles were checked against Scofflaw data provided by the City

Data Analysis Metrics

Data analysis was done for the following metrics

- **Occupancy Accuracy** (per block face and total) as a percentage compared to manual survey data
- **Accuracy of latitude/longitude** data recorded and associated with each detected vehicle, measured against reference vehicles positioned with prerecorded latitude/longitude data at multiple points along the test streets and lots. (This analysis is not yet complete.)
- **License plate read accuracy:** The license plate information captured through Optical Character Recognition (OCR) compared to the license plate images
- **Time-Limit enforcement Hits:** Number of true positive hits out of the total hits. (It was not feasible to ascertain any false negatives)
- **Scofflaw enforcement Hits:** Number of true positive hits out of the total hits

Data Analysis Results

The Automated Data Collection and Enforcement Pilot test was conducted by the Police Department, Parking Enforcement Division (PD) and the Department of Public Works, Transportation Division (PW).



Vendors were tested on their ability to collect parking occupancy data (the number of vehicles parked per block) including accuracy in all light conditions (daytime, dusk, nighttime), parking configurations (angled vs. parallel parking spaces) and parking regulations (2, 3 and 8 hr metered parking, 2 hr residential parking and un-regulated). Results were compared against a manual count of vehicles that was performed concurrently with the LPR testing.

- Based on the test, **LPR technology is viable for collecting parking occupancy data**. Vendors 1 and 2 were 86% and 92% accurate, respectively, when compared to manually collected data.

For PD, vendors were tested on their ability to detect time limit violations for various parking regulations (2,3 and 8 hr metered parking, 2 hr residential parking and un-regulated), check for Residential Preferential Parking(RPP) permits, accurately report license plate information and detect scofflaw vehicles.

- Based on the test, **LPR technology is viable for enhancing parking enforcement activities in the City**. In particular, Vendor 1 was able to detect scofflaw vehicles and accurately reported time limit violations for all parking regulations.

The next step for the Automated Data Collection and Enforcement pilot is to recommend a vendor to the City Council based on the test results, staff feedback, usability and price. A recommendation will be submitted to the City Council in February 2015.

Detailed data analysis metrics are available upon request.

