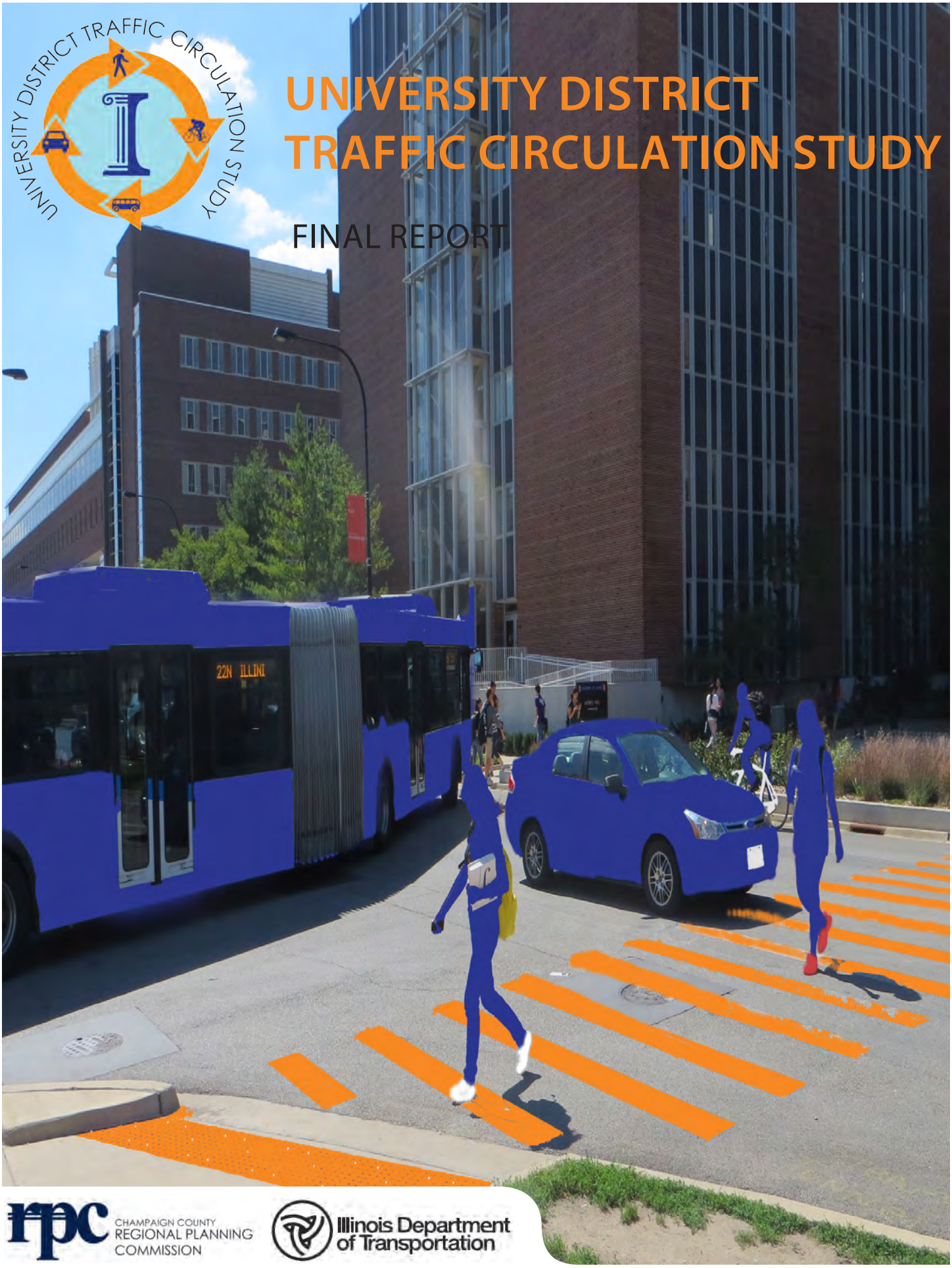


UNIVERSITY DISTRICT TRAFFIC CIRCULATION STUDY

FINAL REPORT

rpc CHAMPAIGN COUNTY REGIONAL PLANNING COMMISSION

Illinois Department of Transportation

EXECUTIVE SUMMARY

The University of Illinois at Urbana-Champaign is the largest public university in Illinois with more than 50,000 students, faculty, and staff. Uniquely situated between Champaign and Urbana, the University is the region's economic, cultural, and geographic center. Currently, the University is facing tremendous challenges associated with growth, land use, travel, and public access to the University campus area. The essence of the challenge is finding ways to facilitate travel to, on, and around campus as safely and efficiently as possible without compromising personal safety, quality of campus life, environmental settings, or the academic mission of the University.

The University of Illinois Traffic Circulation Study aims to develop transportation systems which foster a pleasing environment for individuals who attend, work at and visit the University, as well as those who live in adjacent neighborhoods. This study also aims to enhance pedestrian and bicyclist safety on and around campus as per the first priority established by the Campus Area Transportation Study (CATS) Committee, followed by buses and automobiles. The study also recommends helping maintain a balance of travel modes, while providing a sense of order and convenient access on and around the University District. The study objectives are:

- To identify improvements needed to the existing traffic circulation system within the University District
- To create a pedestrian-, bicycle-, and transit-oriented circulation system in the University District while maintaining necessary access for emergency and service vehicles
- To recommend traffic management (including parking consolidation) and control strategies for University-related traffic to ensure a safer and smoother operation of the University District's transportation network and the surrounding areas

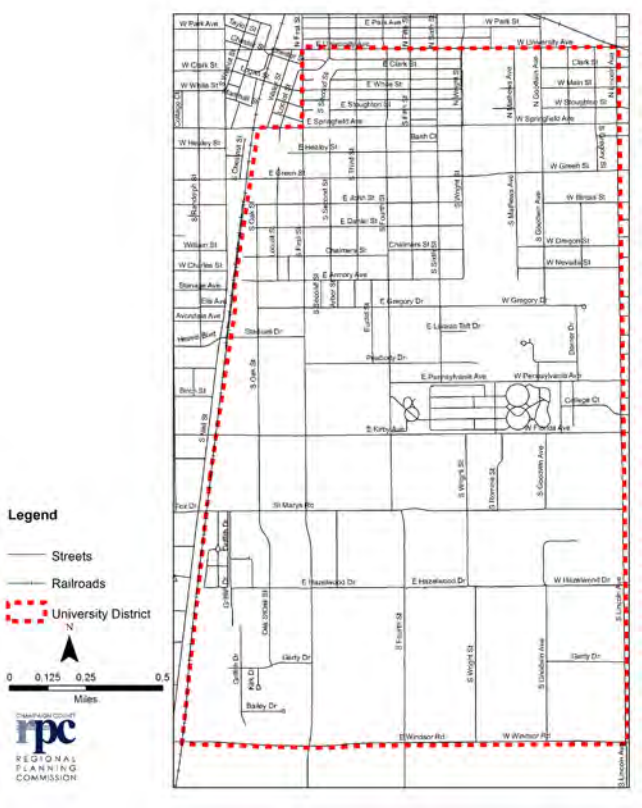


Figure E.1: Study Area

The study was fully funded by the Illinois Department of Transportation (IDOT). An advisory committee was created for this study which includes representatives from the IDOT, University of Illinois, City of Champaign, City of Urbana, and Champaign-Urbana Mass Transit District. Staffing for the study was provided by the Champaign County Regional Planning Commission.

The study area is bounded by University Avenue, Lincoln Avenue, Windsor Road, Neil Street, Springfield Avenue and First Street (Figure E.1). The study area is located within the cities of Champaign and Urbana. The University of Illinois' main campus is located within this area, officially known as the University District.

A comprehensive existing conditions analysis was performed for the study area which included evaluation of existing land use; transportation infrastructure; traffic operations; safety of road users, pedestrians and bicyclists; and transit services. Major findings from the existing conditions analysis include:

- **Vehicular Flow:** Major corridors within the University District are experiencing an overall reduction of vehicular traffic flow based on comparison of average daily traffic data collected in 2006 and 2011. The Fourth Street corridor experienced the highest percent reduction of vehicular traffic flow (36%).
- **Traffic Crashes:** There were four fatalities related to traffic crashes within the University District between 2006 and 2010 with traffic crashes declining beginning in 2007. Bicycle crashes, however, exhibited an increasing crash trend between 2007 and 2009. In light of this, the Green Street corridor experienced the highest number of transit, pedestrian, and bicycle crashes. Inversely, the number of crashes along the major corridors showed a declining trend with the exception of the First Street corridor where the number of crashes increased in 2010.
- **US Routes within the University District:** Two roadway segments within the University District are designated US routes: the Springfield Avenue segment from the west end of the University District boundary to Wright Street and Wright Street between Springfield and University Avenues (marked as US 45 and US 150 respectively). Alterations to these roads by local entities are more circuitous due to presiding state jurisdiction by the Illinois Department of Transportation (IDOT).
- **Roads with Poor Pavement Conditions:** A pavement condition analysis for University District roadways identified the Green Street segment from the west end of the University District boundary to First Street as being in very poor condition.
- **Speed Issues:** The University District posted speed limit is 25 mph. However, major corridors within the University District have posted speed limits higher than 25 mph. Furthermore, the 85th percentile of vehicular speed values on some roadway segments within the University District was at least more than 10 mph higher than the posted speed limits.
- **Traffic Congestion:** Several intersections at the periphery of the University District experienced congested conditions during peak hours. During the PM peak hours, there were eight intersections with at least one congested approach. The Kirby Avenue segment between Oak and Neil Streets was congested during AM and PM peak hours.
- **CATS Zones:** Two of the most pedestrian-heavy intersections are located outside CATS Zone 1, and four of the most bicyclist-heavy intersections are located outside CATS Zone 1.

Alternatives for creating a preferred traffic circulation plan for the University District were carefully selected and evaluated considering the study objectives, member agency input and findings from the existing condition analysis. Alternatives evaluated for the University District's traffic circulation were evaluated for the corresponding Campus Area Transportation Study (CATS) zones and each alternative received evaluation scores based on different weighing factors selected for each CATS zone. Figure E.2 shows the evaluation process for alternatives for this study.

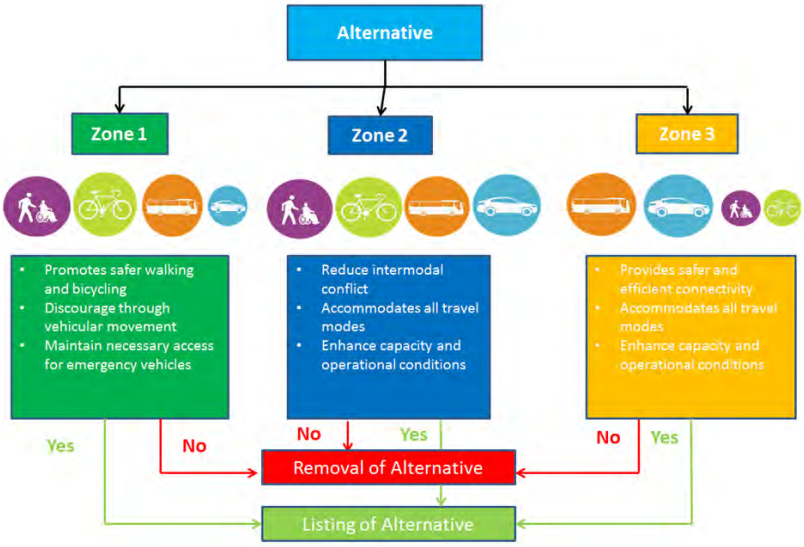


Figure E.2: Evaluation Process for CATS Zone Alternatives

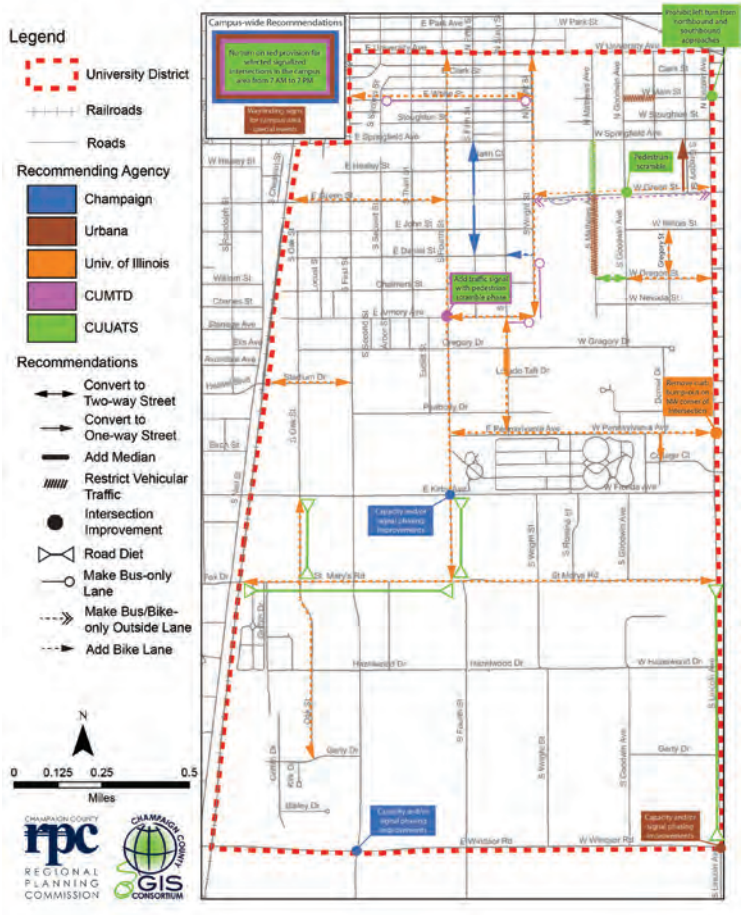


Figure E.3: Recommended Alternatives

The recommended alternatives for each CATS zone were prepared based on the outcomes of evaluation results. Public input on recommended alternatives was received during the public engagement process of the study and a list of recommended alternatives for each CATS zone was finalized. Figure E.3 shows recommended alternatives for the University District.

A detailed implementation plan for the recommended alternatives has been created. Step by step implementation of the recommendations will take place incrementally over a long period of time. In order for these improvements to happen in a timely and cost effective manner, it is necessary for the University of Illinois and the cities of Champaign and Urbana to maintain a high level of cooperation.

The study implementation tables show the recommended alternatives broken out by CATS zones. Information is provided for each recommended alternative in terms of:

- Project Location: Location of the proposed improvements/alternatives
- Recommended Alternative: Description of the recommended alternative
- Cumulative Score: Scores received based on the evaluation factors specified for each zone
- Priority: Priority level based on cumulative score
- Estimated Cost: Estimated implementation cost in 2013 dollars
- Ease of Implementation: Relative ease in going through the approval process of the recommendation
- Agencies Responsible: Responsible agencies in charge of implementing the alternative

TABLE OF CONTENTS

Chapter 1. Introduction

Chapter 2. Literature Review

Chapter 3. Existing Conditions

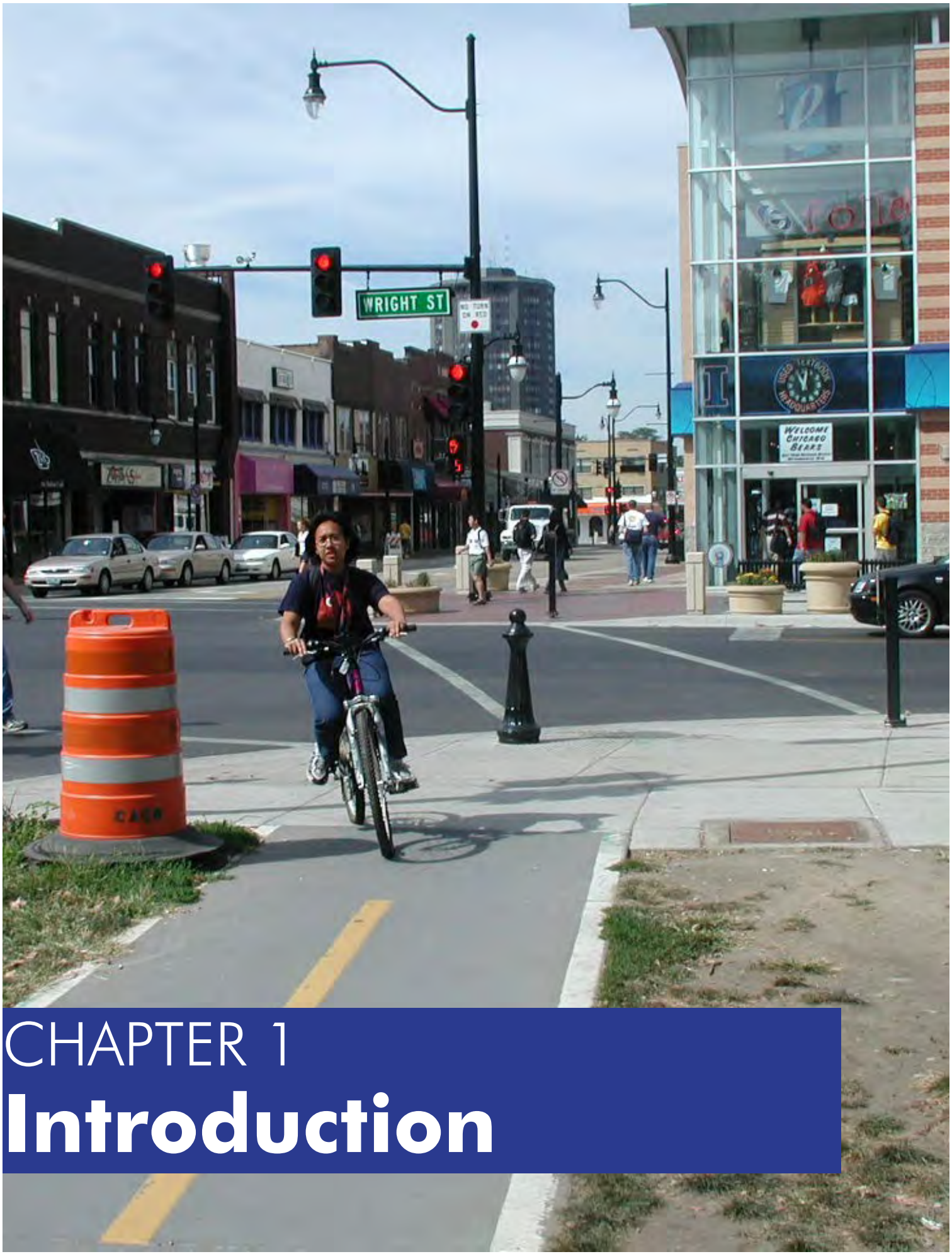
Chapter 4. Selection & Analysis of Alternatives

Chapter 5. Public Engagement

Chapter 6. Implementation Plan

LIST OF TABLES

LIST OF FIGURES



CHAPTER 1
Introduction

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1. Introduction

1.0 Introduction

This chapter presents an overview of the University District Traffic Circulation Study.

1.1 Background

The University of Illinois at Urbana-Champaign is the largest public university in Illinois with more than 50,000 students, faculty, and staff. Uniquely situated between Champaign and Urbana, the University is the region's economic, cultural, and geographic center. Currently, the University is facing tremendous challenges associated with growth, land use, travel, and public access to the University campus area. The essence of the challenge is finding ways to facilitate travel to, on, and around campus as safely and efficiently as possible without compromising personal safety, quality of campus life, environmental settings, or the academic mission of the University.

The University District Traffic Circulation Study aims to develop transportation systems which foster a pleasing environment for individuals who attend, work at, and visit the University, as well as those who live in adjacent neighborhoods. This study also aims to enhance pedestrian and bicyclist safety on and around campus as per the first priority established by the Campus Area Transportation Study (CATS) Committee, followed by buses and automobiles. The study also recommends helping maintain a balance of travel modes, while providing a sense of order and convenient access on and around the University District.

The study was fully funded by the Illinois Department of Transportation (IDOT). An advisory committee was created for this study which includes representatives from the IDOT, University of Illinois, City of Champaign, City of Urbana, and Champaign-Urbana Mass Transit District. Staffing for the study was provided by the Champaign County Regional Planning Commission.

1.2 Study Objectives

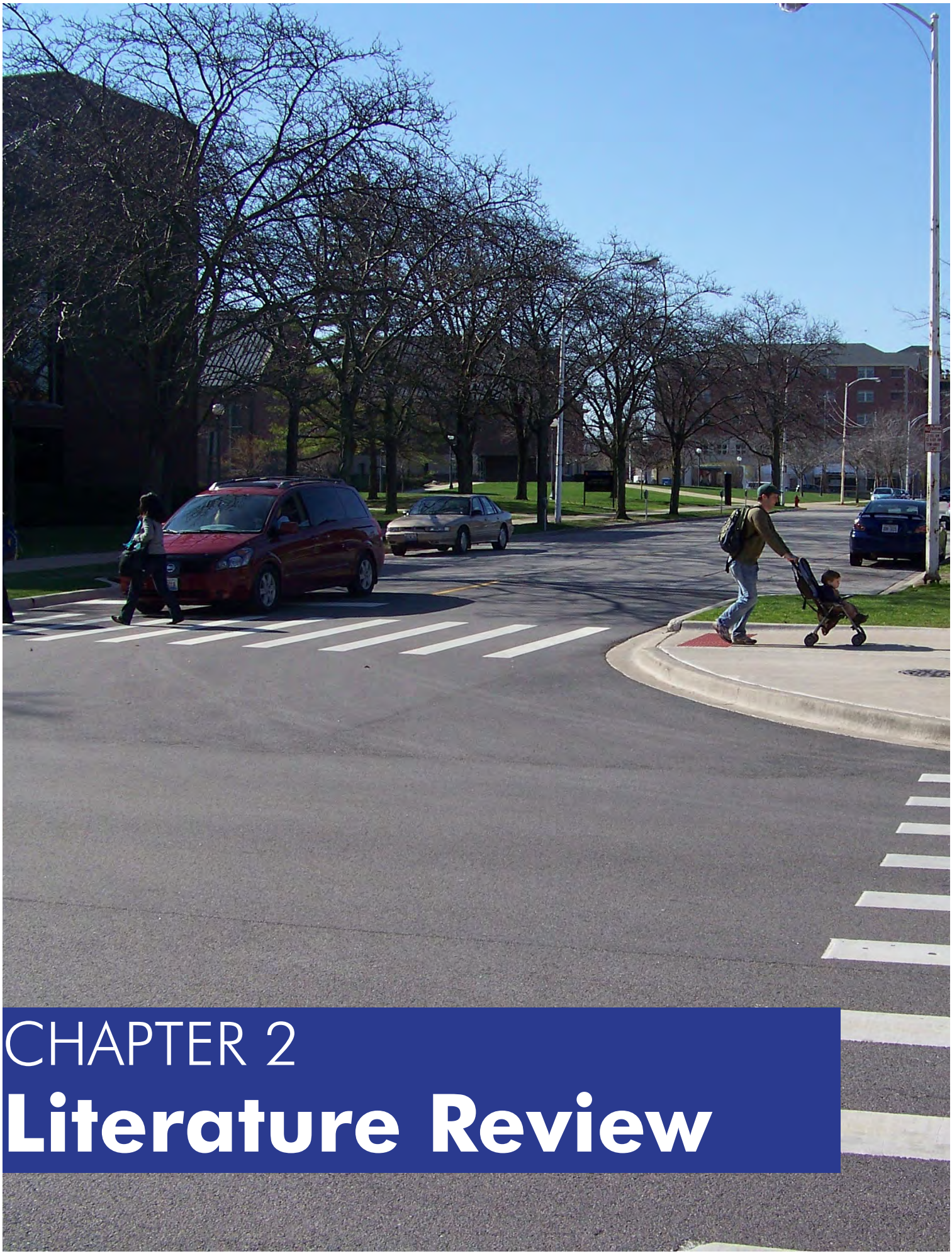
The objectives of the study were:

- To identify improvements needed to the existing traffic circulation system in the University District.
- To create a pedestrian, bicycle, and transit-oriented circulation system in the University District, while maintaining necessary access for emergency and service vehicles.
- To recommend traffic management (including parking consolidation) and control strategies for University related traffic to ensure a safer and smoother operation of the University District's transportation network and the surrounding areas.

1.3 Report Organization

This report is organized into the following chapters:

- **Chapter 1** – Introduction: Provides an introduction to the study and highlights the study objectives
- **Chapter 2** – Literature Review: Provides a general overview of the previous plans and projects aimed to address transportation issues within the University of Illinois campus
- **Chapter 3** – Existing Conditions Analysis: Contains a comprehensive analysis of existing transportation systems including safety within the University District
- **Chapter 4** – Selection and Evaluation of Alternatives: Describes the selection and analysis process of different improvement alternatives for CATS zones. Also lists recommended alternatives for each CATS zone based on analysis outcome.
- **Chapter 5** – Public Engagement: Details two public open house sessions organized for sharing objectives, findings, and recommendations of the study and getting input from the public regarding recommended alternatives for each CATS zone
- **Chapter 6** – Implementation Plan: Provides implementation tables for recommended alternatives for each CATS zone



CHAPTER 2
Literature Review

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2. Literature Review

2.0 Introduction

The purpose of this review is to provide an overview of the previous plans and projects that address transportation issues within the University of Illinois campus from 1999 to the present. Table 2.1 lists major projects and plans related to campus transportation and the agencies that sponsored or completed them.

Table 2.1: List of Major Projects/Plans Related to Campus Transportation Issues

Project/Plan Title	Sponsoring Agency	Completing Agency	Completion Year
Campustown Action Plan	City of Champaign	City of Champaign Planning Department	April 1999
University of Illinois Campus Area Traffic Circulation Study	Cities of Champaign and Urbana, Illinois Department of Transportation, University of Illinois, Mass Transit District	Butcher, Willis & Ratliff Corporation	June 1999
Sixth Street Corridor Study	Champaign-Urbana Urbanized Area Transportation Study	Champaign-Urbana Urbanized Area Transportation Study	July 2004
Campus Area Transportation Study Phase II	University of Illinois, Cities of Champaign and Urbana, Mass Transit District	Clark-Dietz, Inc.	July 2005
University of Illinois Research Park Traffic Study	University of Illinois	Champaign-Urbana Urbanized Area Transportation Study	September 2005
Campus Intersections Study: Oak St. & Stadium Dr., First St. & Stadium Dr.	University of Illinois	Champaign-Urbana Urbanized Area Transportation Study	January 2007
Crosswalk Signing and Marking Effects on Conflicts and Pedestrian Safety on the UIUC Campus	University of Illinois	Traffic Operations Laboratory, University of Illinois	February 2007
Analysis of Pedestrians and Drivers Opinions on Crosswalk Safety on the UIUC Campus	University of Illinois	Traffic Operations Laboratory, University of Illinois	February 2007
Multi-Modal Transportation Study	University of Illinois	Martin Alexiou Bryson	March 2007
University of Illinois Campus Master Plan Update	University of Illinois	Sasaki Associates, University Office for Facilities, Planning and Program, UIUC	March 2007
Transit Analysis	University of Illinois	Martin Alexiou Bryson	May 2008
St. Mary's Road Corridor Study	University of Illinois	Champaign Urbana Urbanized Area Transportation Study	December 2008
Parking System Review Committee	University of Illinois	University of Illinois	January 2009
Wright Street Bike Path Feasibility Study	University of Illinois	Crawford, Murphy & Tilly, Inc.	June 2009
University Avenue Corridor Study	Illinois Department of Transportation, City of Urbana	Champaign-Urbana Urbanized Area Transportation Study	May 2010

Project/Plan Title	Sponsoring Agency	Completing Agency	Completion Year
University District Crosswalk Markings and Signage 2011	Campus Area Transportation Study	Champaign-Urbana Urbanized Area Transportation Study	April 2011
University District Bike/Transit Safety Study	Champaign Urbana Mass Transit District	T.Y. Lin International	August 2011
Campus Bike Plan	University of Illinois	University of Illinois	Incomplete
Sixth Street Corridor Study	University of Illinois	Champaign-Urbana Urbanized Area Transportation Study	Incomplete

2.1 Campustown Action Plan, City of Champaign, Completed April 1999

This plan was completed in response to the Champaign City Council's goal to "work with the University of Illinois and Campustown representatives to develop a plan to address issues related to the campus area." In 1997, a group of key community leaders completed the Campustown 2000 Task Force report, which formed the basis for the Campustown Action Plan. This plan was updated by the University District Action Plan completed by the City of Champaign in 2008. Table 2.2 shows recommended strategies of the Campustown Action Plan related to campus transportation and their implementation status as of 2011.

Table 2.2: Recommended Strategies Related to Transportation in the Campustown Action Plan

Recommended Strategies	Responsible Agencies	Implementation Status (as of 2011)	Comments
Investigating park and ride system to include parking areas along commuter routes	UIUC/CUMTD	No information	
Providing additional incentives to student, faculty and staff to use buses	UIUC/CUMTD	Implemented	Small fee per semester for students, faculty & staff to ride buses
Adding bicycle lockers in key areas in the campus	Cities of Champaign & Urbana, & UIUC	Not implemented	
Developing partnerships with student and community wide bicycling organizations	Cycling groups/UIUC	Ongoing	
Add bike racks to buses	CUMTD	Implemented	
Providing additional information in Campustown regarding use of buses	CUMTD	Implemented	
Reevaluating parking provisions and pricing in Campustown	UIUC, Cities of Champaign & Urbana	Implemented	Parking prices evaluated & adjusted to $1/hr. by City of Champaign & UIUC
Identifying under used parking areas	UIUC, Cities of Champaign & Urbana	No information	
Determine types of parking users (i.e. long-term, short-term, visitors)	UIUC, Cities of Champaign & Urbana	No information	
Add additional parking on right-of-way where possible	Cities of Champaign & Urbana, & UIUC	No information	
Construct new parking deck(s)	Private sector/Public Works	Implemented	Parking deck constructed at Goodwin/University intersection

2.2 Campus Area Transportation Study (CATS), Bucher, Willis & Ratcliff Corp., Completed June 1999

The CATS is the first transportation study which included participation of all the municipal and transit agencies and the University of Illinois to address transportation problems in the campus area. The CATS addresses the following issues:

- Pedestrian safety
- Community traffic flow needs
- University-oriented traffic
- Interaction among travel modes
- The role of non-auto travel modes including pedestrian, bus, bike and travel by persons with disabilities
- Truck traffic, freight deliveries and loading issues
- Traffic calming
- Interaction between parking supply and traffic circulation
- Identifying projects, priorities, and cost estimates

Figure 2.1: Wright Street and Green Street Intersection in the University District

The CATS divides the campus area into three different zones based on assigning priorities for different travel modes. In Zone 1, pedestrians, bicycle, and transit modes were prioritized. In Zone 2, all modes were accommodated in a balanced approach to maximize safety. In Zone 3, vehicular traffic was prioritized to facilitate traffic crossing through the area. Figure 2.2 shows the Zone boundaries for the campus area.

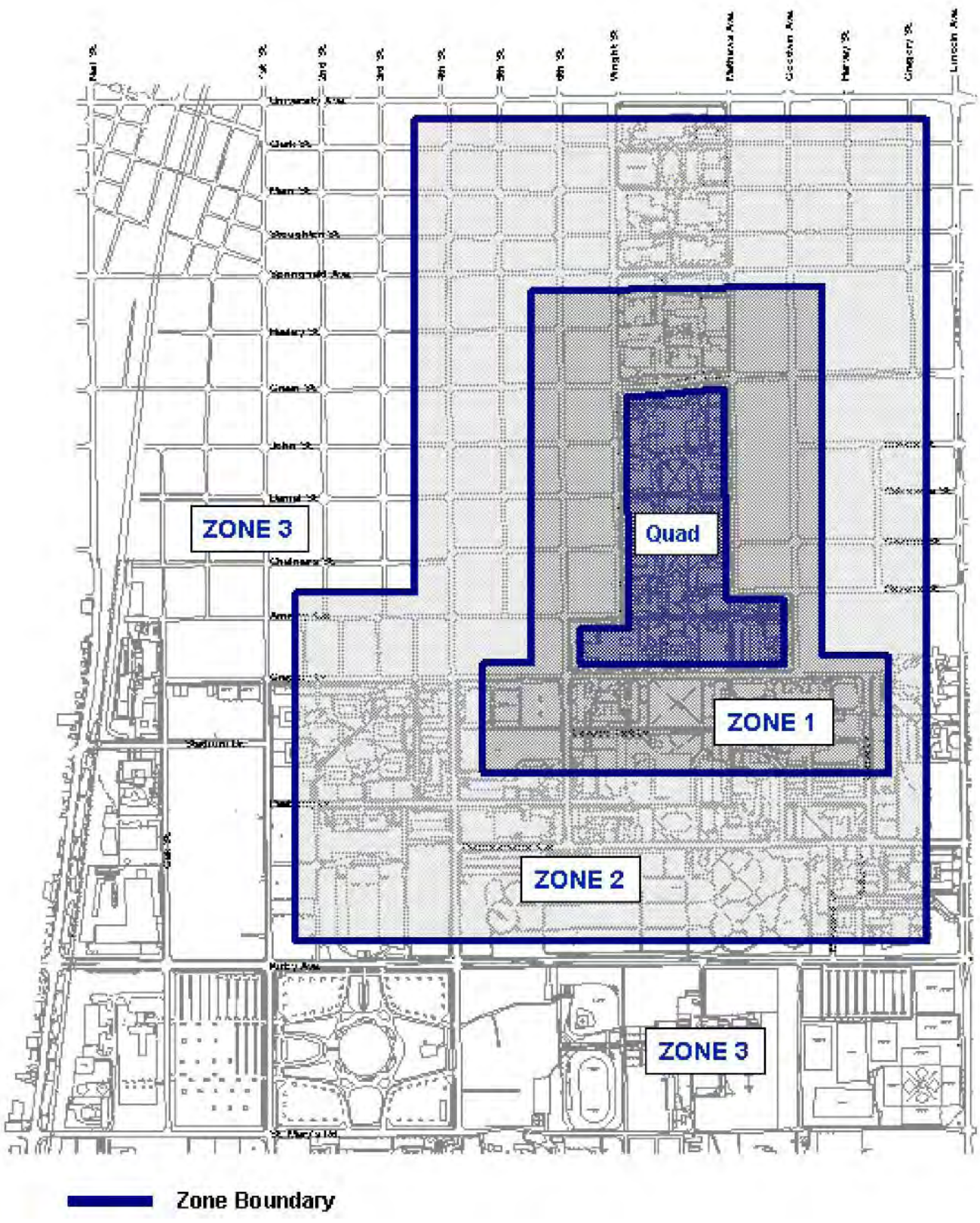


Figure 2.2: Campus Area Zone Boundary (Source: CATS, Butcher, Willis, and Ratcliff, 1999)

The CATS provides specific recommendations for different zones within the campus area. Figure 2.3 shows CATS recommendations for the campus area.

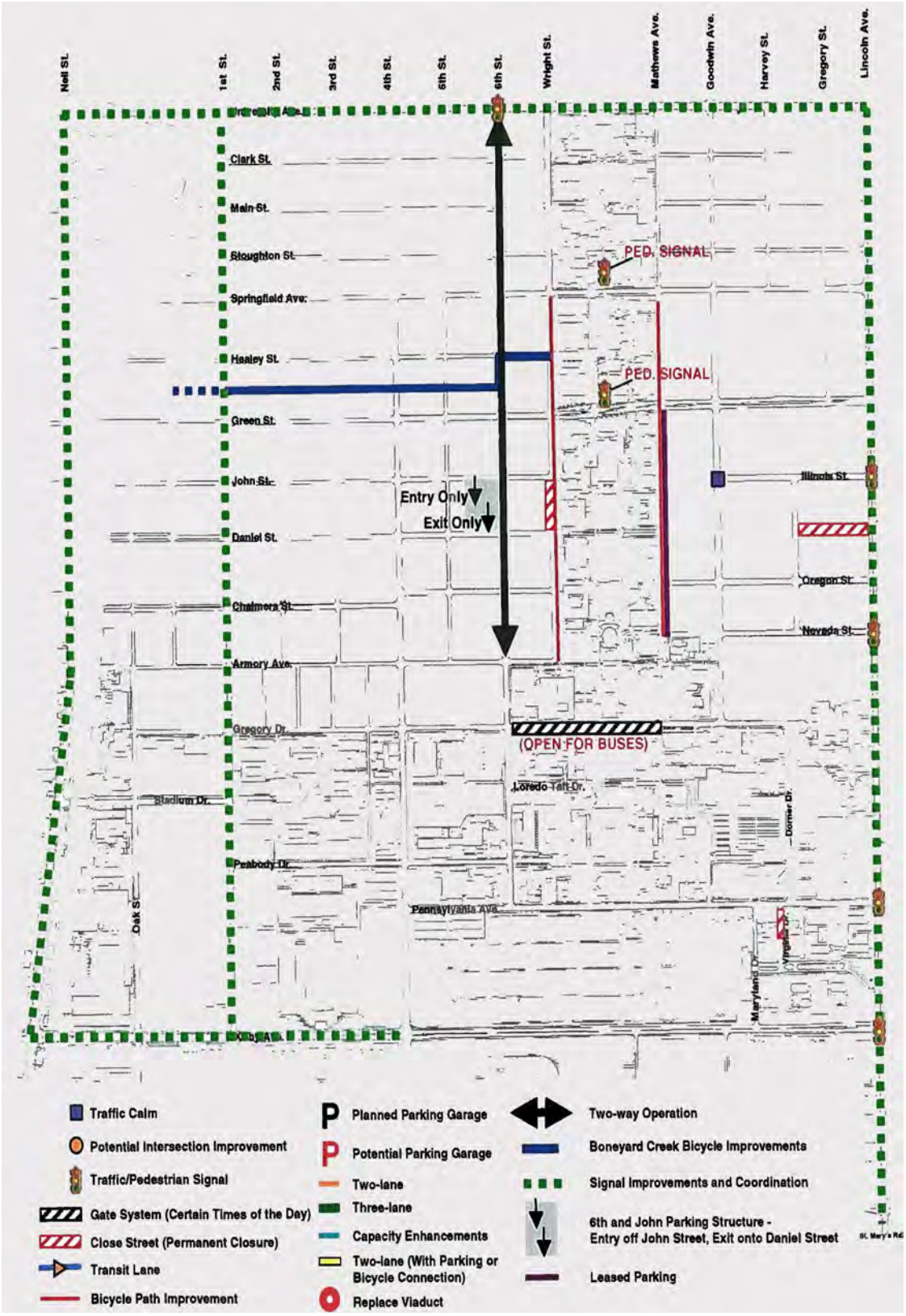


Figure 2.3: CATS Recommendations (Source: CATS, Butcher, Willis, and Ratcliff, 1999)

Table 2.3 shows the recommended strategies of the Campus Area Transportation Study related to campus transportation and the implementation status as of 2011.

Table 2.3: Recommendations Related to Campus Area Transportation Study (CATS)

Recommendations	Responsible Agencies	Implementation Status (as of 2011)	Comments
Install pedestrian signals for Springfield Ave. at Grainger Library and Greet St. at the Illini Union	UIUC	Not implemented	
Install traffic signal for the following intersections: Sixth St. & University Ave., Lincoln Ave. & Illinois St., Lincoln Ave. & Nevada St., Lincoln Ave. & Pennsylvania Ave., and Lincoln Ave. & Florida Ave.	Cities of Champaign & Urbana	Implemented, 2007	Traffic signal was not installed at Sixth St. & University Ave.
Open Gregory Dr. between Sixth and Mathews for buses only during certain times of the day	UIUC, CUMTD	Implemented	Traffic movements are restricted
Permanently close Wright St. between John St. & Daniel St., California St. between Lincoln Ave. & Gregory St., and Virginia Dr.	UIUC, Cities of Champaign & Urbana	Partially Implemented	California St. segment is closed
Implement a traffic calming strategy for Goodwin Ave. & Illinois St.	City of Urbana	Implemented, 2009	
Operate Sixth St. as a two-way street from University Ave. to Armory Ave.	City of Champaign, UIUC	Not implemented	
Boneyard Creek bicycle improvements from First St. to Wright St.	City of Champaign	Implemented	
Perform signal improvements and coordination for corridors of Lincoln Ave., University Ave., Neil St., First St., and W. Kirby Ave.	Cities of Champaign & Urbana	Implemented	
Improve the bicycle path along Wright St. & Mathews Ave. between Springfield Ave. & Armory Ave.	UIUC, Cities of Champaign & Urbana	Not implemented	
Change Sixth St. and John St. parking structure (entry off John St., exit onto Daniel St.)	UIUC	Not implemented	

2.3 Sixth Street Corridor Study, CUUATS, Completed July 2004

In 2004, CUUATS completed an analysis of the Sixth Street corridor from Chalmers Street to Pennsylvania Avenue and analyzed the Sixth Street/Peabody Drive intersection for signal warrants and all-way stop sign warrants. The Sixth Street corridor road segment analysis included traffic volume delay and queue analysis. The 2003 MUTCD guidelines were followed for signal warrants and all-way stop control sign installation evaluation for the Sixth Street/Peabody Drive intersection. The study recommends not installing a traffic signal or all-way stop control at the Sixth Street/Peabody Drive intersection.

However, additional stop signs were installed on the Sixth Street approaches at the intersection of Sixth Street/Peabody Drive in 2005 and this intersection now operates as an all-way stop controlled intersection. Table 2.4 shows the implementation status of the study recommendations.

Table 2.4: Recommendations Related to the Sixth Street Corridor Study

Recommendations	Responsible Agencies	Implementation Status (as of 2011)	Comments
Do not install a traffic signal or all-way stop control at the intersection of Sixth St./ Peabody Dr.	UIUC	Not implemented	Additional stop signs were installed on the Sixth St. approaches at the intersection of Sixth St./Peabody Dr. in 2005. This intersection is now all-way stop controlled.

2.4 Campus Area Transportation Study (CATS) Phase II, Clark-Dietz, Completed July 2005

This study was conducted as a follow up of the original CATS plan (April 1999). Thus, many of its recommendations were in line with the recommendations made in CATS. CATS II recommendations on campus traffic circulation are outlined in Figure 2.5.

It is noteworthy to mention that CATS II recommends keeping one-way traffic operation on Sixth Street from University Avenue to Armory Avenue. Table 2.5 shows the implementation status of the CATS II recommendations.

Table 2.5: Recommendations Related to the Campus Area Transportation Study (CATS) Phase II

Recommendations	Responsible Agencies	Implementation Status (as of 2011)	Comments
Reduce a lane (road diet) on Lincoln Ave. from Pennsylvania Ave. to Nevada St.	City of Urbana	Implemented	
Modify vehicular traffic circulation on John St., Daniel St., and Chalmers St. between Sixth St. and Wright St.	City of Champaign	Implemented	

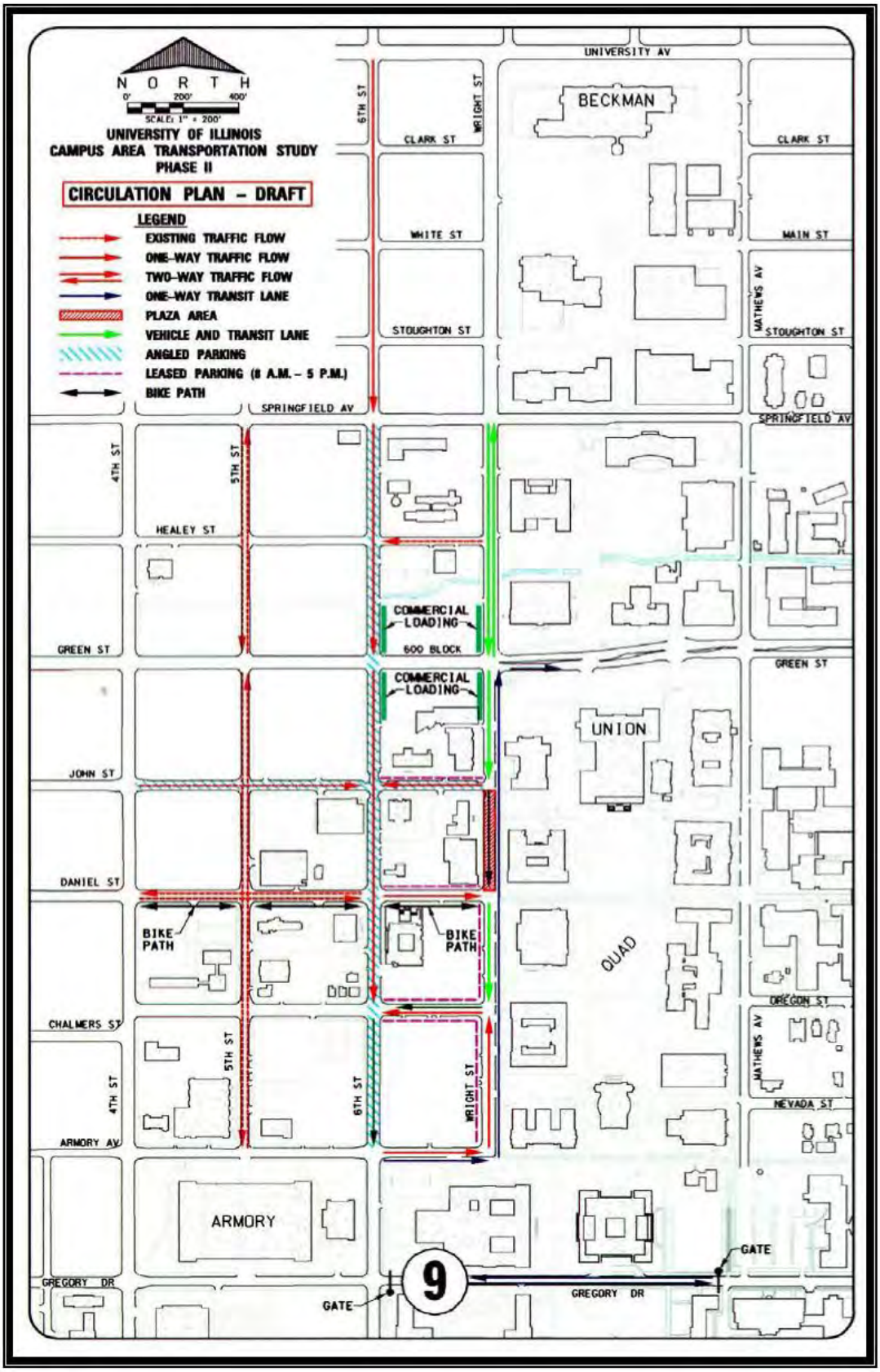


Figure 2.4: Campus Traffic Circulation Plan (Source: CATS II, Clark-Dietz, 2005)

2.5 University of Illinois Research Park Traffic Study, CUUATS, Completed September 2005

This study focuses on the potential impacts of a fully built research park in the southwest corner of the University of Illinois in the Curtis Road corridor from US Route 45 to First Street and the First Street corridor from Old Church Road to Kirby Avenue.

The research park has welcomed a few new tenants including the I Hotel, but one of the major tenants, Motorola, has since left the research park facility. The research park roadway network was expanded through extension of Oak Street to the south to Gerty Drive. The Fourth Street extension project between St. Mary's Road and Windsor Road is currently underway. Table 2.6 shows the implementation status of the study recommendations as of 2011.

Table 2.6: Recommendations Related to the University of Illinois Research Park Traffic Study

Recommendations	Responsible Agencies	Implementation Status (as of 2011)	Comments
Intersection improvements at: First St. & Curtis Rd., First St. & Windsor Rd., Fourth St. & Windsor Rd., First St. & Gerty Dr., and First St. & Hazelwood Dr.	City of Champaign	Partially implemented	First St. & Windsor Rd. intersection underwent capacity improvements in 2010.
Add bike lanes/shared-use path on First St. & Curtis Rd.	City of Champaign, Village of Savoy, UIUC	Partially implemented	
Eliminate conflict points in the First St. corridor between Windsor Rd. & St. Mary's Rd. by imposing left turn restrictions from some of the proposed new roads in the Research Park area.	City of Champaign, UIUC	Not implemented	No new road connecting First St. was built in the Research Park.
Establish a one-way couple in the Research Park road network	City of Champaign, UIUC	Not implemented	
Traffic signal coordination and signal timing optimization	City of Champaign, UIUC	Not implemented	Traffic signal at Fourth St. & Windsor Rd. intersection to be built.

2.6 Campus Intersections Study: Oak St./Stadium Dr., First St./Stadium Dr., CUUATS, Completed January 2007

This study evaluated traffic operation and safety features at two intersections within the University of Illinois campus. The two study intersections include: Oak Street and Stadium Drive and First Street and Stadium Drive.

The study found that these intersections do not warrant traffic signal or all-way stop control and recommends a few traffic operational and safety measures at these two intersections. However, all-way stop signs were installed at both intersections in 2008 and currently, both intersections operate as all-way stop controlled intersections. Table 2.7 shows the implementation status of the study recommendations as of 2011.

Table 2.7: Recommendations Related to the Campus Intersections Study

Recommendations	Responsible Agencies	Implementation Status (as of 2011)	Comments
The study found that these intersections do not warrant a traffic signal or all-way stop control and recommended a few traffic operational and safety measures instead.	UIUC	Not implemented	All-way stop signs were installed at both intersections in 2008 and currently, both intersections operate as all-way stop controlled intersections

2.7 Crosswalk Signing and Marking Effects on Conflicts and Pedestrian Safety on the UIUC Campus, Traffic Operation Laboratory, University of Illinois, Completed February 2007

This study analyzes pedestrian-vehicle interactions and conflicts at 24 crosswalks within the University of Illinois campus. The objective of the study was to evaluate the effects of different types of crosswalk signing and marking treatments on pedestrian safety. Important findings of the study include:

- Drivers yielded least at unmarked crosswalks and the most at crosswalks with in-street pedestrian crossing signs.
- Approximately 2.8% of vehicles did not yield right of way to pedestrians at locations with a stop sign with an in-street stop-for-pedestrian sign. The highest number of motorists not yielding were at
- Green Street at Fifth Street (27.7 motorists/hour), Green Street in front of the Union (19.2 motorists/hour) and Fourth Street at Armory Avenue (17.3 motorists/hour).
- Unmarked crosswalks had a higher average percentage of pedestrians in conflicts than the other treatments.

Table 2.8 shows the implementation status of the study recommendations as of 2011.

Table 2.8: Recommendations Related to the Crosswalk Signing and Marking Effects on Conflicts and Pedestrian Safety on the UIUC Campus

Recommendations	Responsible Agencies	Implementation Status (as of 2011)	Comments
Consider installing yield-here-to-pedestrian signs (on the curb) along with pedestrian activated in-roadway flashing lights, only at mid-block crosswalks with a very large number of pedestrian-vehicle conflicts	UIUC, Cities of Champaign & Urbana	Partially implemented	Yield-here-to-pedestrian signs were installed and later replaced with stop-here-for-pedestrian signs
Do not install in-street pedestrian crossing signs (yield-to-pedestrian or stop-for-pedestrian) at mid-block and intersection crosswalks, other than in exceptional conditions, due to a false sense of pedestrian security from the misinterpretation of these signs	UIUC, Cities of Champaign & Urbana	Implemented	
Provide mid-block crosswalks at locations that pedestrians have gradually transformed into de facto crosswalks, unless corrective measures are taken to prevent crossing at these locations	UIUC, Cities of Champaign & Urbana	Not implemented	No new mid-block crosswalks were installed within the Campus District.
Channelize pedestrians to crosswalks by median or sidewalk barriers that are visually appealing and improve aesthetics of the area. Also coordinate building entrances and pedestrian paths with crosswalk locations to reduce crossing at unmarked locations	UIUC, Cities of Champaign & Urbana	Partially implemented	UIUC Building Design Reviews now include the coordination of doors with paths, bike parking and transit stops.
Install pedestrian activated signals at busy mid-block crossings to allow pedestrians to cross when vehicles are stopped	UIUC, Cities of Champaign & Urbana	Not implemented	
Coordinate the location of bus stops while considering the location of crosswalks, bike paths, pedestrian flow, vehicular flow and visibility for both motorists and pedestrians	CUMTD, UIUC	Ongoing	CUMTD is in the process of consolidating bus stops.

2.8 Analysis of Pedestrians and Drivers Opinions on Crosswalk Safety on the UIUC Campus, Traffic Operation Laboratory, University of Illinois, Completed February 2007

This study highlights the findings of pedestrian and driver opinion surveys and several focus group meetings on pedestrian safety in the University of Illinois campus crosswalks. Approximately 12,000 pedestrians and motorists were surveyed. The report identifies the least safe intersections and mid-block locations based on the survey. Table 2.9 shows the top 10 intersections with near pedestrian crashes based on the frequency with which participants cited the intersection in the Driver Survey performed in December.

Table 2.9: Top 10 Intersections with Near Pedestrian Crashes

Drivers Nearly Hit Pedestrians			
Rank	Intersection		Frequency
1	Green St.	Wright St.	96
2	Illinois St.	Goodwin Ave.	91
3	Green St.	Sixth St.	84
4	Armory Ave	Fourth St.	72
5	Chalmers St.	Fourth St.	60
6	Armory Ave.	Sixth St.	54
7	Green St.	Goodwin Ave.	53
8	John St.	Sixth St.	50
9	Gregory Dr.	Fourth St.	43
10	Chalmers St.	Sixth St.	42

Table 2.10 shows the top 10 mid-block crosswalk locations with near pedestrian crashes based on the frequency with which participants cited the intersection in the Driver Survey performed in December 2005.

Table 2.10: Top 10 Mid-Block Crosswalk Locations with Near Pedestrian Crashes

Drivers Nearly Hit Pedestrians				
Rank	Street	Between		Frequency
1	Green St.	Wright St.	Mathews Ave.	66
1	Springfield Ave.	Wright St.	Mathews Ave.	66
3	Fourth St.	Chalmers St.	Armory Ave.	36
4	Green St.	Fifth St.	Sixth St.	35
5	Fourth St.	Daniel St.	Chalmers St.	34
6	Green St.	Sixth St.	Wright St.	31
6	Green St.	Fourth St.	Fifth St.	31
8	Fourth St.	Armory Ave.	Gregory Dr.	27
9	Fourth St.	Gregory Dr.	Peabody Dr.	26
9	Fourth St.	John St.	Daniel St.	26

Table 2.11 shows the implementation status of the study recommendations as of 2011.

Table 2.11: Recommendations Related to the Analysis of Pedestrians' and Drivers' Opinions on Crosswalk

Recommendations	Responsible Agencies	Implementation Status (as of 2011)	Comments
Consider the least safe and most avoided intersections and mid-block locations as candidates for future pedestrian safety improvements	Cities of Champaign & Urbana, UIUC	Ongoing	Lists of these locations were utilized during project selection for pavement/safety improvements on campus (e.g. Fourth St. 2013 Project).
Conduct an educational campaign on campus traffic safety involving all campus users	Cities of Champaign & Urbana, UIUC, CUMTD	Ongoing	
Do not install in-street pedestrian signs (yield-to-pedestrian or stop-for-pedestrian) at mid-block and intersection crosswalks, other than in exceptional conditions, due to a false sense of security from the misinterpretation of these signs	Cities of Champaign & Urbana, UIUC	Implemented	
Study the feasibility of closing some streets to vehicular traffic in the core Campus area	Cities of Champaign & Urbana, UIUC	Ongoing	UIUC initiated a study about this on Sixth Street from Gregory Dr. to Peabody Dr.; results are still pending.
Place signs on the perimeter of Campus alerting motorists to be more careful and to watch for pedestrians	Cities of Champaign & Urbana, UIUC	Implemented	Signs were placed on the campus perimeter along major east-west and north-south corridors.
Make crosswalks more visible to both pedestrians and motorists	Cities of Champaign & Urbana, UIUC	Implemented	
Mid-block crosswalks should be located where walkways cross streets and pedestrians regularly use walkways	Cities of Champaign & Urbana, UIUC	Ongoing	
Provide continuous and improved bike paths	Cities of Champaign & Urbana, UIUC	Partially implemented	Bike lanes were added along some corridors on campus.
Provide lighting at or near crosswalks to improve visibility at night	Cities of Champaign & Urbana, UIUC	Partially implemented	
Restrict on-street parking that is too close to the intersection or mid-block crosswalks to improve pedestrian and motorist visibility	Cities of Champaign & Urbana, UIUC	Partially implemented	This was performed at relevant locations by Champaign; UIUC as well, with additional work planned

2.9 Multi-Modal Transportation Study, Martin Alexiou Bryson, Completed March 2007

This study aims to enhance pedestrian safety on and around the University of Illinois campus through a two-pronged approach:

1 A series of system-level improvements to promote the use of alternative modes and reduce modal conflicts.
2. Street-level improvements specifically targeted at improving pedestrian safety at intersections and street crossings.

As of 2011, the following major study recommendations were implemented:

- A draft bicycle plan for the campus was prepared.
- The University hired a full time transportation planner/ Travel Demand Management (TDM) coordinator.
- One MTD city route that does not primarily serve campus has been moved to the periphery of campus.
- Some campus bus stops have been consolidated.

Table 2.12 shows the implementation status of the study recommendations as of 2011.

Figure 2.5: CUMTD Bus at Sixth Street and Gregory Drive

Table 2.12: Recommendations Related to the Multi-Modal Transportation Study

Recommendations	Responsible Agencies	Implementation Status (as of 2011)	Comments
Concentrate future parking on the periphery of campus in transit/parking hubs and park-and-ride lots	UIUC, Cities of Champaign & Urbana, CUMTD	Not implemented	See Figure 2.7
Minimize the development of new surface parking lots in the campus core	UIUC, Cities of Champaign & Urbana	Implemented	
Move MTD city routes that do not primarily serve campus to the periphery	CUMTD	Implemented	
Reduce the number of buses passing through the heart of campus, especially on Wright Street	CUMTD	Partially implemented	CUMTD is continuously evaluating its bus routes throughout the campus.
Develop a transit/parking hub system	CUMTD	Not implemented	
Consolidate bus stops on campus	CUMTD	Ongoing	Some transit stops were consolidated in 2009 and there are plans to continue to consolidate bus stops.
Accommodate multiple modes on-street in a safe and efficient manner (I.e. Complete Streets that successfully and safely integrate multiple modes in the same right-of-way)	UIUC, Cities of Champaign & Urbana, CUMTD	Implemented	Several roadway segments were converted to Complete Streets, including Gregory Dr., Goodwin Ave. and First St.
Limit large delivery trucks on campus by enforcing a central receiving system and restricting hours of delivery	UIUC, Cities of Champaign & Urbana	Partially implemented	Champaign created a system of loading zones to avoid delivery double parking and improve traffic safety.
Commission a comprehensive bicycle plan	UIUC	Ongoing	A draft bicycle plan for the campus has been prepared.
Install bike lanes	UIUC, Cities of Champaign & Urbana	Ongoing	Bike lanes were added on several street segments.
Hire a full-time transportation planner/ TDM coordinator	UIUC	Implemented	
Develop and promote a comprehensive TDM program	UIUC	Not implemented	
Develop a comprehensive program for intersection and crossing improvements on campus	UIUC, Cities of Champaign & Urbana	Not implemented	
Channelize pedestrian flow through the use of medians, landscaping and barriers	UIUC, Cities of Champaign & Urbana	Ongoing	Champaign created barriers and landscape features locations including Green St. and Fourth & Chalmers.
Upgrade traffic signals on campus to enhance pedestrian safety, including the use of pedestrian countdown signal heads	UIUC, Cities of Champaign & Urbana	Ongoing	

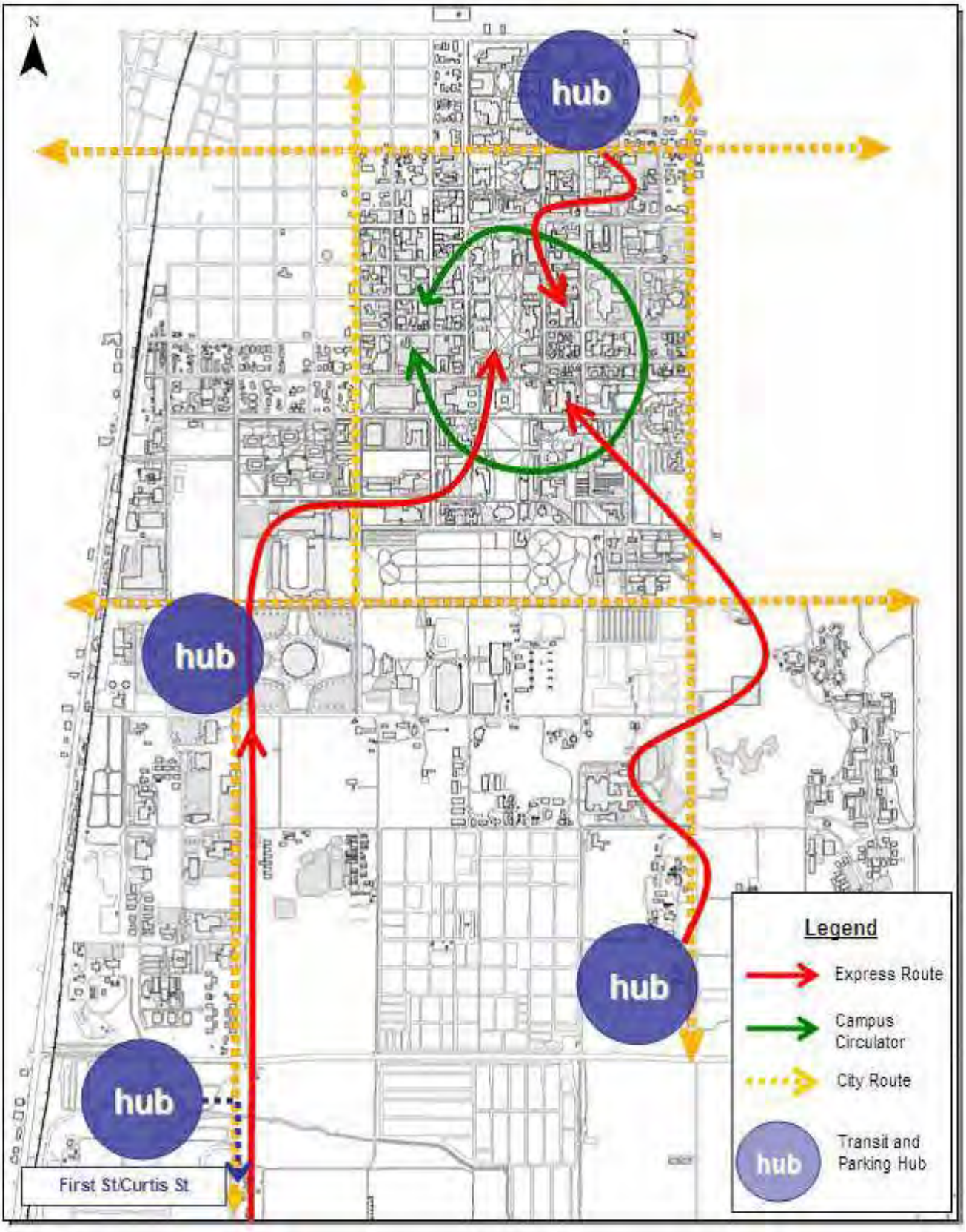


Figure 2.6: Transit/Parking Hubs for the Campus Area
(Source: Multi Modal Transportation Study, 2007)

2.10 University of Illinois Campus Master Plan Update, Sasaki Associates, University Office of FP&P, Completed March 2007

The Campus Master Plan is a composite of area plans and updates approved by the University of Illinois Board of Trustees since 1986. This update addresses the prevalent campus facility program and land use needs through minor plan adjustments. Table 2.13 shows the implementation status of key recommendations of the study as of 2011.

Table 2.13: Recommendations Related to the University of Illinois Campus Master Plan Update

Recommendations	Responsible Agencies	Implementation Status (as of 2011)	Comments
Adopt as part of the Campus Master Plan, the principles set forth in the 1999 Campus Area Transportation Study	UIUC	Implemented	
Establish a University District in which uniform transportation policy and design standards will apply	UIUC, Cities of Champaign & Urbana	Implemented	
De-emphasize automobile traffic and emphasize separation of vehicles, bicycles & pedestrians within the District giving the highest priority to transportation strategies that emphasize pedestrian, bicycle & transit movement	UIUC, Cities of Champaign & Urbana	Ongoing	Complete Streets concept was implemented for several roadway segments within the Campus District

2.11 Transit Analysis, Martin Alexiou Bryson, Completed May 2008

This study was initiated to address the following key concerns:

1. What can the University do today to reduce the number of buses using Wright Street, between the Library and Green Street?
2. What else can the University do today to improve pedestrian travel on Wright Street?
3. How else can transit help to make the campus more pedestrian friendly in the future?
4. What other transit needs will the campus have in the future?
5. Should the University operate a stand-alone bus transit system for the campus?
6. What other changes to City routes could be made to improve transit links within the campus?

Table 2.14 shows the implementation status of the key study recommendations.

In Fall 2009, CUMTD introduced updated bus routes for the campus area as part of its "Extreme Makeover." They also introduced hybrid buses, and removed and/or revamped some routes with consolidated stops within the campus area. However, 4 Blue, 9 Brown, 13 Silver, 22 Illini, and 27 Airbus routes are still using Wright Street between Green Street and Armory Avenue.

Table 2.14: Recommendations Related to Transit Analysis

Recommendations	Responsible Agencies	Implementation Status (as of 2011)	Comments
Detour six bus routes from Wright St. during the day time on weekends	CUMTD	Not implemented	4 Blue; 9 Brown; 13 Silver; 22 Illini; and 27 Airbus routes are still using Wright St. between Green St. & Armory Ave.
The University should press for the implementation of the "Complete Streets" plan for Wright St.*	UIUC, CUMTD, City of Champaign	Ongoing	This is part of the University's Small Starts process to help accommodate transit and cyclists.* CUMTD asked that CATS approve the design for Wright St.
The University should continue to support the consolidation of bus stops	CUMTD; UIUC	Implemented	
Collaborate to establish a successful park-and-ride service	UIUC, CUMTD	Ongoing	

*Complete Streets policies have been created for the State of Illinois, City of Champaign, City of Urbana, Campus Area Transportation Study and the Champaign-Urbana Urbanized Area Transportation Study agencies. Please refer to the appendix for a copy of these documents.

2.12 St. Mary's Road Corridor Study, CUUATS, Completed December 2008

This study was funded by the Illinois Department of Transportation and focuses primarily on a multi-modal, system-wide approach to solving transportation issues throughout the corridor. The study goals are to:

- Identify operation and safety challenges
- Improve mobility
- Improve safety

Table 2.15 shows the implementation status of the study recommendations.

The City of Champaign has recently initiated the Fourth Street extension project from St. Mary's Road to Windsor Road. A traffic signal instead of a roundabout is now being considered for the Fourth Street/St. Mary's Road intersection. Also, St. Mary's Road from Fourth Street to Lincoln Avenue is closed to regular traffic since 2010 due to poor road surface and drainage conditions and will be repaved in the summer of 2012.

Table 2.15: Recommendations Related to the St. Mary's Corridor Study

Recommendations	Responsible Agencies	Implementation Status (as of 2011)	Comments
Implement a road-diet (from a 4-lane to a 2-lane with a center turning lane/ median for a portion) between Neil St. & Fourth St. with two (5 ft.) bike lanes	City of Champaign, UIUC	Not implemented	
Construct a 6 ft. sidewalk on the north side of St. Mary's Rd. between Neil St. & Oak St. and install detectable warnings	UIUC	Partially implemented	The sidewalk is installed near the Petascale Building.
Install a traffic signal (by 2015) at the First St. & St. Mary's Rd. intersection and provide one left-turn lane, one through lane and right-turn lane at all approaches	UIUC	Not implemented	A signal is not warranted at this time.
Install a single-lane roundabout at the Fourth St. & St. Mary's Rd. intersection (by 2015)	UIUC, City of Champaign	Not implemented	A roundabout is not warranted at this time.
Reconstruct St. Mary's Rd. between Fourth St. & Lincoln Ave. with a 2-lane cross-section with a curb and gutter (by 2015)	UIUC	Ongoing	This segment is currently under construction.
Construct an 8 ft. side path along the north side and a 6 ft. sidewalk along the south side of St. Mary's Rd. between Fourth St. & Lincoln Ave. (by 2015)	UIUC	Not implemented	
Implement a road diet (from a 4-lane to a 3-lane) on Oak St. and Fourth St. from St. Mary's Rd. to Kirby Ave. and provide bike lanes (by 2015)	City of Champaign, UIUC	Not implemented	
Construct at 3-lane cross-section for Fourth St.	City of Champaign	Ongoing	

2.13 Parking System Review Committee, University of Illinois, Completed January 2009

The Parking System Review Committee was charged with proposing a comprehensive system of parking policies that addresses revenue shortfalls while providing parking alternatives and options that are equitable, convenient and contribute to a more pedestrian and environment-friendly campus.

Table 2.16 shows the implementation status of the study recommendations.

Table 2.16: Recommendations Related to the Parking System Review Committee

Recommendations	Responsible Agencies	Implementation Status (as of 2011)	Comments
Establish a north campus park and ride lot with shuttle service	UIUC, CUMTD	Implemented	Requires high cost upfront
Take over housing lots to help fund parking facilities	UIUC	Implemented	
Move metered parking from streets to lots/garages	UIUC	No information	
Support special event that requires additional accessible parking	UIUC	No information	
Install pay stations that accept credit card	UIUC	Not implemented	
Label and create user-friendly instructions for visitor parking areas	UIUC	Ongoing	
Encourage carpools with carpool permit, ride matching service and vanpool coordination	UIUC	Not Implemented	

2.14 Wright Street Bike Path Feasibility Study, Crawford, Murphy & Tilly Inc., Completed June 2009

This study was undertaken to evaluate (from an engineering design and cost perspective) the implementation of on-street bike lanes along Armory Avenue and Wright Street from Sixth Street to Springfield Avenue for the University of Illinois campus. This study is a follow up study to the Multi Modal Transportation Study (Martin Alexiou Bryson) completed in 2007. Table 2.17 shows the implementation status of the study recommendations as of 2011.

Table 2.17: Recommendations Related to the Wright Street Bike Path Feasibility Study

Recommendations	Responsible Agencies	Implementation Status (as of 2011)	Comments
Relocate the bus stop at Armory Ave. & Wright St. to the north along Wright St.	CUMTD, UIUC	Not implemented	
Relocate the northbound Wright St. bus stop north of Green St. to a location north of Healey St.	CUMTD	Not implemented	
Eliminate the existing north-south crosswalk at Armory Ave. & Wright St.	UIUC	Not implemented	
Convert Wright St. (Armory Ave. to Chalmers St.) to two-way traffic	UIUC, City of Champaign	Not implemented	
Convert Chalmers St. to two-way traffic between Sixth St. and Wright St.	UIUC, City of Champaign	Not implemented	
Convert Sixth St. to two-way traffic between Chalmers St. & Armory Ave.	UIUC	Not implemented	
Make necessary geometric intersection improvements at Armory Ave. and Wright St. to accommodate two-way traffic	UIUC	Not implemented	
Improve traffic signals at Armory Ave. & Sixth St. to accommodate two-way traffic	UIUC	Not implemented	
Widen existing Armory Ave. to accommodate two-way traffic and lane channelization at the intersections of Sixth St. & Wright St.	UIUC	Not implemented	
Remove the existing retaining wall in front of the Graduate Library and re-grade the pedestrian courtyard	UIUC	Not implemented	
Remove raised curb islands separating the existing vehicle lanes from the bike path along Wright St. from Armory Ave. to Green St.	UIUC, City of Champaign	Not implemented	
Relocate the Transit Plaza on Wright St. outside of the Henry Administration Building behind the existing sidewalk area	CUMTD, UIUC	Not implemented	
Eliminate sections of on-street parallel parking and convert diagonal parking along Wright St. north of Green St. to parallel parking	UIUC, City of Champaign	Not implemented	
Remove/relocate existing bike path pavement markings along the south side of Springfield Ave. in front of the Grainger Engineering Library	UIUC	Implemented	

2.15 Campus Bike Plan, University of Illinois, Incomplete

The Campus Bike Plan was prepared in response to the recommendations made in the Multi Modal Transportation Study (2007). This plan outlined the proposed bike network within the University of Illinois campus. As can be seen in Figure 2.8, new cross-campus bikeways are proposed on corridors including Main/White Street, Green Street, and Hazelwood Drive. Table 2.18 shows the implementation status of the plan recommendations as of 2011.

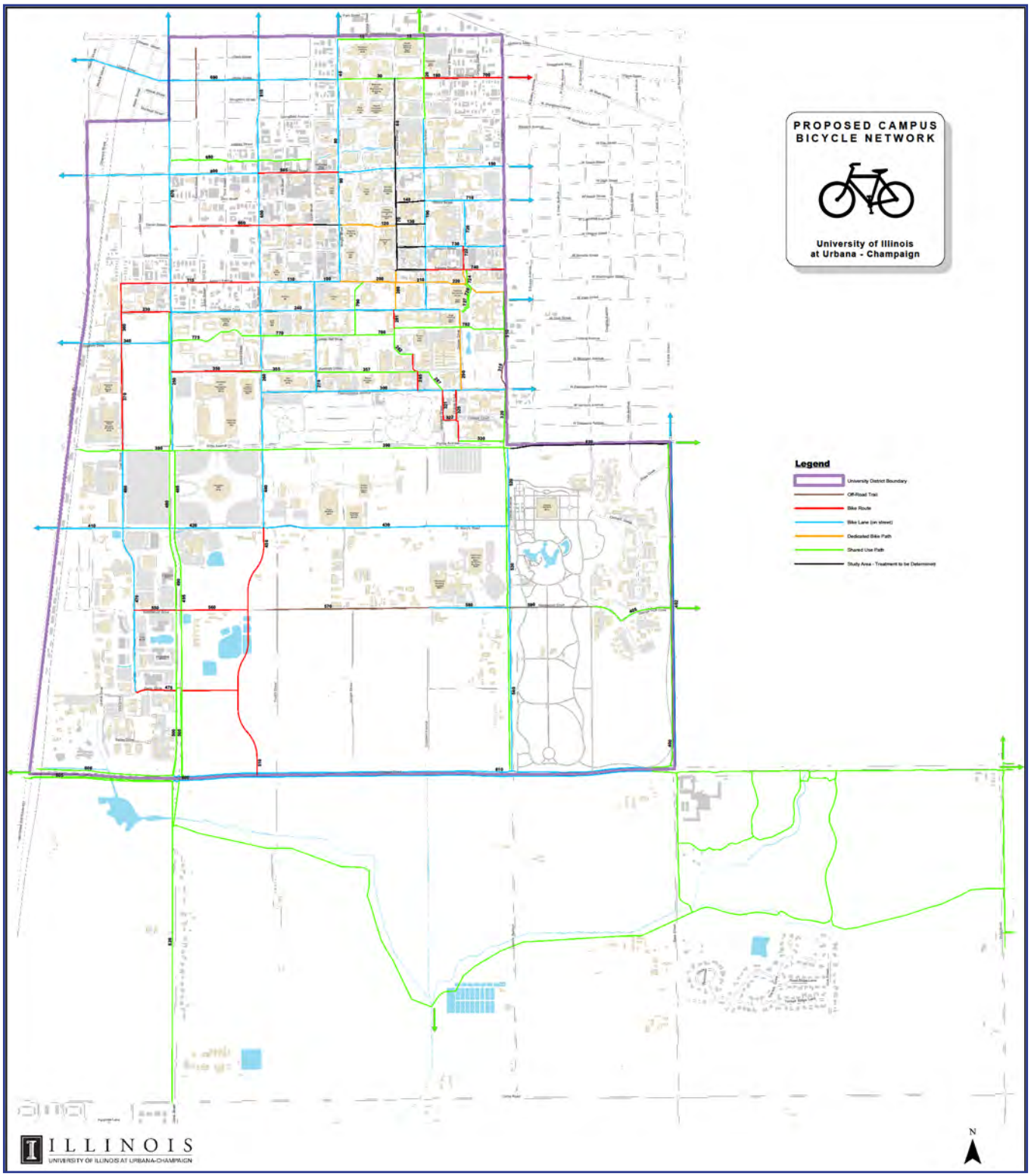


Figure 2.7: Proposed Campus Bicycle Network

Table 2.18: Recommendations Related to the Campus Bike Plan

Recommendations	Responsible Agencies	Implementation Status (as of 2011)	Comments
New bike routes are proposed along Main St., Daniel St., and Chalmers St.	UIUC	Not implemented	

2.16 University Avenue Corridor Study, CUUATS, Completed May 2010

This study analyzes the University Avenue corridor, the busiest east-west corridor in Champaign-Urbana, and includes a transportation plan that evaluates the corridor's strengths and weaknesses. University Avenue is also considered the northern boundary of the University District. Major study goals related to transportation include:

- Maximize the safety and efficiency of the current transportation network throughout the corridor.
- Provide bicycle connections from the corridor to the rest of the community.
- Improve pedestrian facilities, safety and access along the corridor.
- Provide more direct transit service and additional transit facilities throughout the corridor.

Table 2.19 shows the implementation status of the study recommendations as of 2011.

Table 2.19: Recommendations Related to the University Avenue Corridor Study

Recommendations	Responsible Agencies	Implementation Status (as of 2011)	Comments
Install enhanced crosswalks, pedestrian countdown signals, landscaped channelized islands, landscaped medians with a refuge island, etc.	Cities of Champaign & Urbana	Partially implemented	Champaign realigned the Fourth St. and University Ave. intersection and installed new signal equipment and markings.
Construct/improve sidewalks along the corridor	IDOT, Cities of Champaign & Urbana	Partially implemented	Champaign built new sidewalks on both sides of streets with new lighting and street trees.
Consolidate access along the corridor	IDOT, Cities of Champaign & Urbana	Partially implemented	Champaign removed 30 access points during 2009 streetscape project.

2.17 University District Crosswalk Markings and Signage 2011, CUUATS, Completed April 2011

This document serves as the guideline for crosswalk markings and signage within the University of Illinois campus area. It provides crosswalk (both intersection and mid-block) marking specifications for different areas of the campus (e.g., Zone 1, Zone 2). Detailed layouts of crosswalk markings and signage for all major intersections and mid-block crosswalks are included in this document.

Table 2.20 shows the implementation status of the recommendations as of 2011.

Table 2.20: Recommendations Related to the University District Crosswalk Markings and Signage 2011

Recommendations	Responsible Agencies	Implementation Status (as of 2011)	Comments
On major corridors within CATS Zone 1, high visibility crosswalk markings should be used for all controlled and uncontrolled marked crossings	UIUC, Cities of Champaign & Urbana	Implemented	
For mid-block crossings in CATS Zone 1, high visibility continental crosswalk markings with a minimum of 9 ft. wide markings should be provided	UIUC, Cities of Champaign & Urbana	Implemented	
For CATS Zone 2 & 3, CUUATS guidelines for crosswalk markings and signage should be followed. For high pedestrian volume locations within these zones, high visibility crosswalks with a minimum of 9 ft. wide markings should be used	UIUC, Cities of Champaign & Urbana	Ongoing	
Install in-street pedestrian crossing signs only at unsignalized locations where an island is available; it should be placed on the island	UIUC, Cities of Champaign & Urbana	Ongoing	

2.18 University District Bike/Transit Safety Study, T. Y. Lin International, Completed August 2011

This study was sponsored by the Champaign-Urbana Mass Transit District (CUMTD), and focuses on the frequent conflicts between motorists, bicyclists, pedestrians and transit operators within the University District. The study mentions that the existence of three bicycle plans in the University District poses unique challenges to the implementation of a bicycle network. It provides recommendations in the "Five E" categories: Engineering, Enforcement, Education, Encouragement, and Evaluation. Major study recommendations include the following:

- Engineering:
  - Installation of one-way bike lanes on each side of Wright Street between Armory Avenue and Springfield Avenue.
  - Conducting a feasibility study for closing White/Logan Street from Walnut Street to Wright Street to automobile traffic and making this corridor a transit and bicycle corridor.
  - A bus/bike only lane is recommended on Green Street between Wright Street and Lincoln Avenue.
  - Bike lanes or marked shared lanes are recommended on Pennsylvania Avenue between Fourth Street and Lincoln Avenue.
  - MTD bus routes should be revised to reduce the number of turns along the routes.
  - MTD should implement far-side bus stops at feasible locations.
- Enforcement:
  - University bicycle codes should be revised to clarify bicyclist responsibilities.
- Education:
  - Provide on-and-off campus education.
  - Continue to implement bus operator training.
  - Enhance campus facilities website.
- Encouragement:
  - Review class schedules to address student mobility needs.
- Evaluation:
  - Provide anonymous or confidential crash reporting.

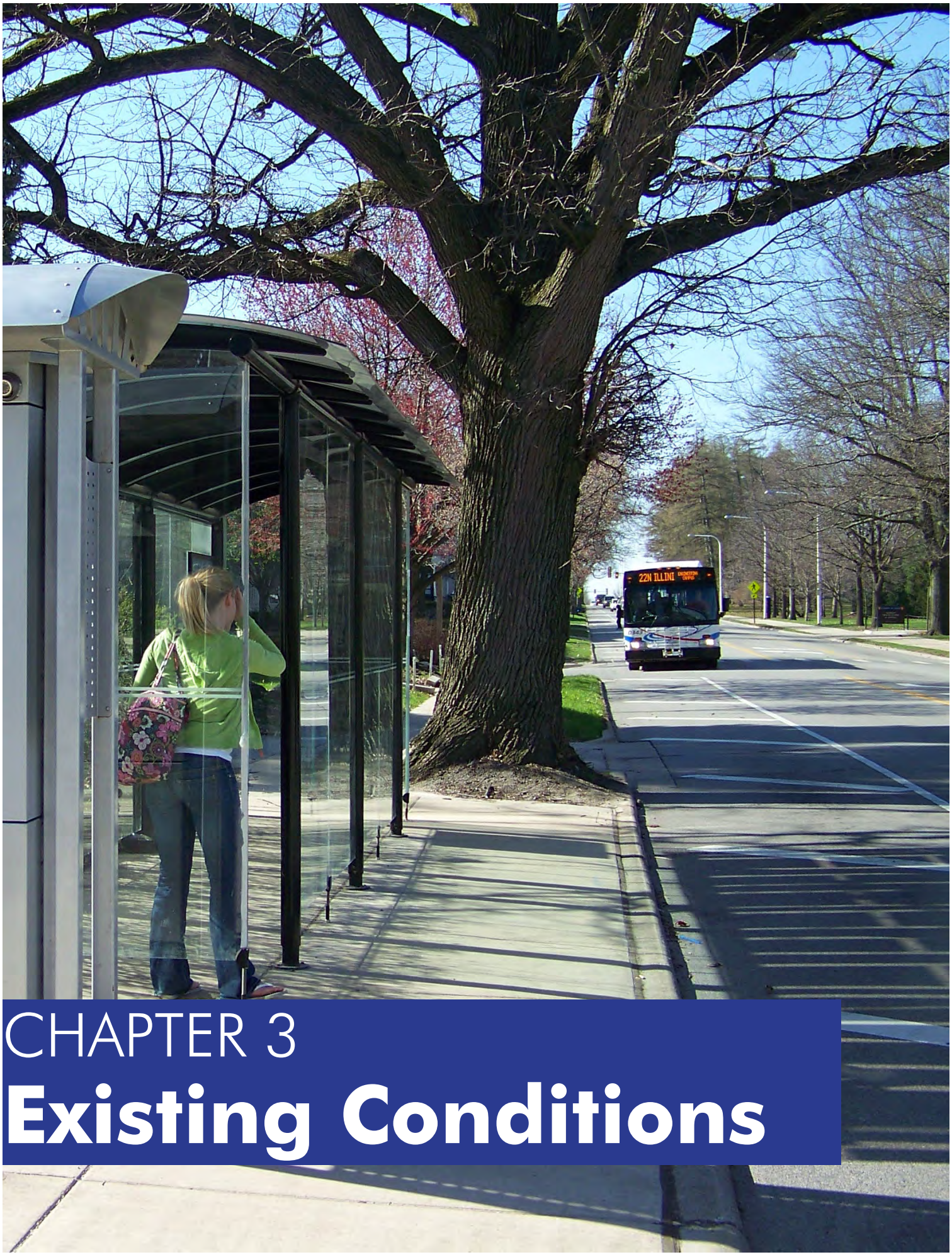
Table 2.21 shows the implementation status of the study recommendations as of 2011.

Table 2.21: Recommendations Related to the University District Bike/Transit Safety Study

Recommendations	Responsible Agencies	Implementation Status (as of 2011)	Comments
Install one-way bike lanes on each side of Wright St. between Armory Ave. & Springfield Ave.	UIUC, City of Champaign	Not implemented	
Conduct a feasibility study for closing White St./Logan St. from Walnut St. to Wright St. for automobile traffic, and make this corridor a transit & bicycle corridor	UIUC, City of Champaign, CUMTD	Ongoing	The Small Starts grant process initiated this feasibility study and further study is planned.
A bus/bike only lane is recommended on Green St. between Wright St. & Lincoln Ave.	UIUC, City of Urbana, CUMTD	Not implemented	The Small Starts grant process initiated this feasibility study and further study is planned.
A marked, shared bus/bike lane is recommended on Pennsylvania Ave. between Fourth St. & Lincoln Ave.	UIUC, Cities of Champaign & Urbana	Not implemented	
MTD bus routes should be revised to reduce the number of turns along the routes	CUMTD	Ongoing	
MTD should implement far-side bus stops at feasible locations	CUMTD	Ongoing	
University bicycle codes should be revised to clarify bicyclist responsibilities	UIUC	Ongoing	
Provide on and off-campus education, continue to implement bus operator training, and enhance campus facilities' website	UIUC, CUMTD, Cities of Champaign & Urbana	Partially implemented	The bus operator training has been implemented by MTD
Review class schedules to address student mobility needs	UIUC, CUMTD	Not implemented	
Provide anonymous or confidential crash reporting	UIUC, Cities of Champaign & Urbana	Not implemented	

2.19 Sixth Street Corridor Study, CUUATS, Incomplete

The Sixth Street Corridor Study project was sponsored by the University of Illinois, and CUUATS began work on the project in 2010. As part of the study, CUUATS evaluated existing and future land use and transportation conditions in the corridor (from Armory Avenue to Pennsylvania Avenue). The study's steering committee decided to evaluate three alternative scenarios for the corridor's traffic operation and management. Those scenarios were evaluated and CUUATS identified and documented the pros and cons of each scenario. The study was postponed in 2011 due to this more comprehensive Circulation Study.



CHAPTER 3
Existing Conditions

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3. Existing Conditions

3.0 Introduction

The existing conditions analysis for the University District include a comprehensive review of the following within the University District:

- Existing land use
- Existing traffic circulation system evaluation
  - Traffic volume trends
  - Geometric features of roadways and intersections
    - Roadway functional classification
    - Pavement surface condition
    - Intersection control type
    - One way lanes and bus only lanes
    - Posted speed limit
  - Traffic operations
    - Intersections
    - Roadway segments
    - Busiest intersections in campus
  - Pedestrians and bicycle facilities
  - Crash analysis
    - Crash trends
    - Crash severity
    - Transit crashes
    - Pedestrian and bicycle crashes
    - Crash types
    - Road surface conditions
    - Roadway lighting conditions
    - Corridor crash analysis
  - Transit facilities
  - Parking facilities

Figure 3.1: Illinois Street and Goodwin Avenue

3.1 Previous Studies

Previous studies were completed including specific corridors, intersections, and the whole study area regarding transportation issues, parking, safety, and other related items. A literature review for the University District Traffic Circulation Study was prepared and distributed among Steering Committee members in December 2011. The report provided a brief description of 18 studies related to the University District and identified the implementation status for the strategies recommended in those studies. These studies are outlined in detail in Chapter 2 of this report as a literature review.

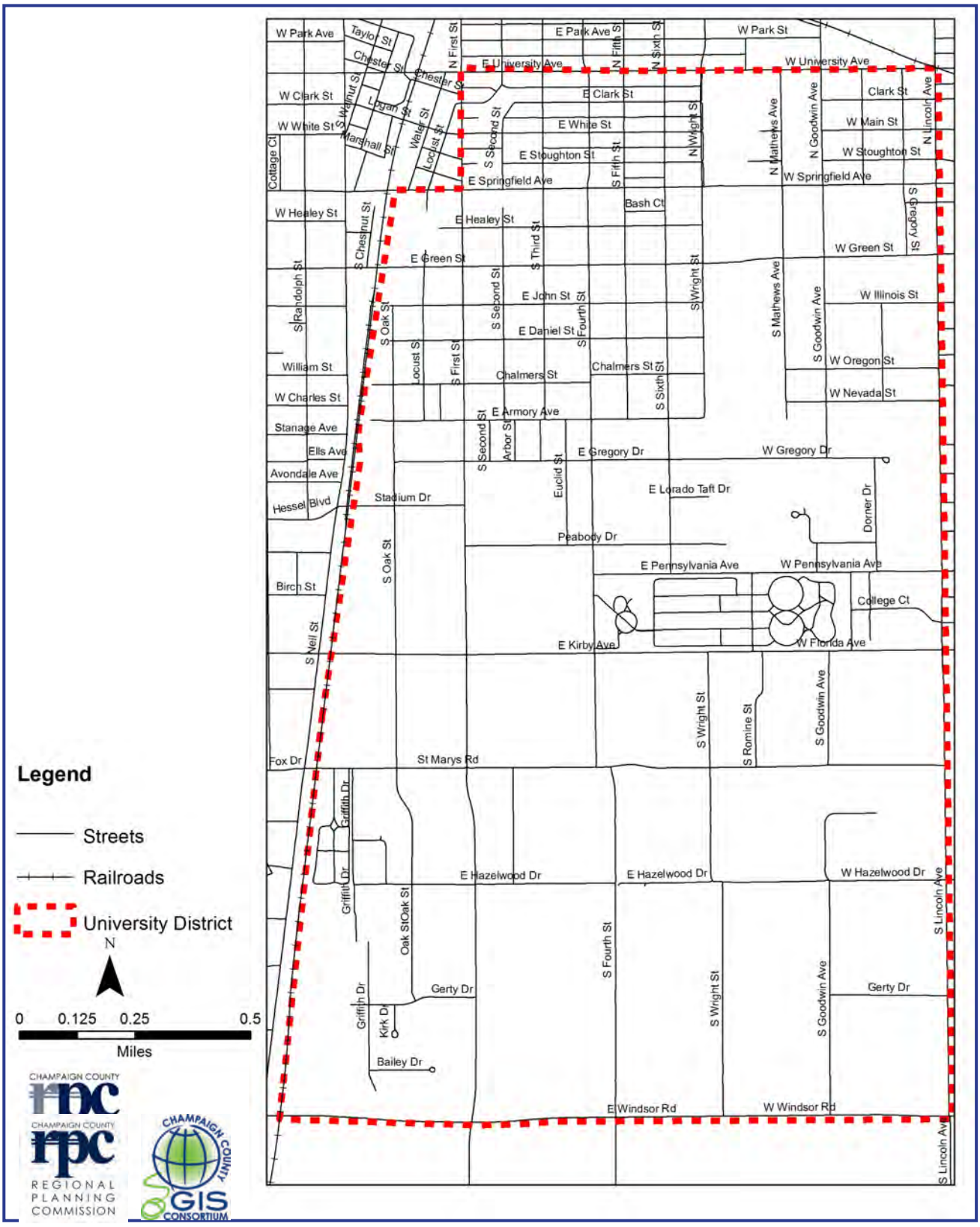


Figure 3.2: Study Area Map

3.2 Existing Land Use and Zoning

The University District encompasses a combination of residential, commercial and institutional buildings totaling 647. These campus buildings and surrounding land uses generate high volumes of automobile, transit, bicycle, and pedestrian traffic within University District.

In this study, the University District area was divided into 4 sub-areas:

- University District North
- University District Central
- University District South Central
- University District South

Figure 3.3 shows the land use map for University District North. A major portion of this part of the study area is covered by University of Illinois academic buildings, between Wright Street and Gregory Street, such as the Grainger Engineering Library, Engineering Hall and other College of Engineering buildings.

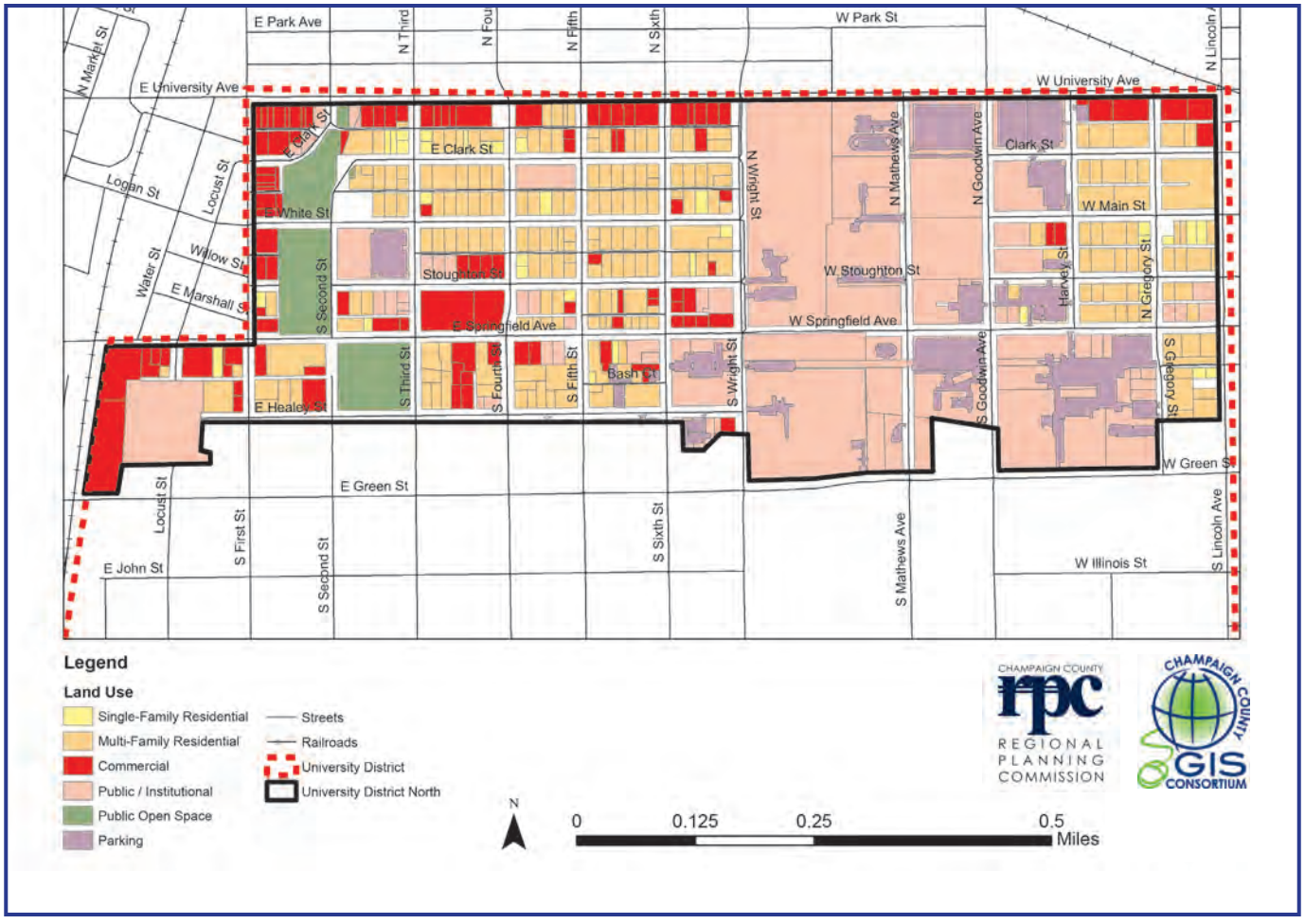


Figure 3.3: University District North Land Use

As can be seen in Figure 3.3, single and multi-family residential and commercial units are located to the west of Wright Street. A majority of these residential units are located near or on the White Street corridor, which is an enhanced transit route. There are also a group of public open spaces (parks) running north to south along Second Street from University Avenue to Healey Street.

The University District Central is shown in Figure 3.4. It includes the Green Street corridor, which is the most vibrant street on campus with numerous popular restaurants, bars, and retail stores. The Illini Union, the campus' home for organizations, meetings, student programs and activities, is located on Green Street east of Wright Street. The Illini Union building serves as a major bus stop location attracting high volumes of pedestrians, bicyclists, and transit riders. Multi-family residential units are the predominant land-use pattern to the west of Fourth Street. Major University structures including the Henry Administration Building, Altgeld Hall, and Foellinger Auditorium are located to the east of Wright Street.

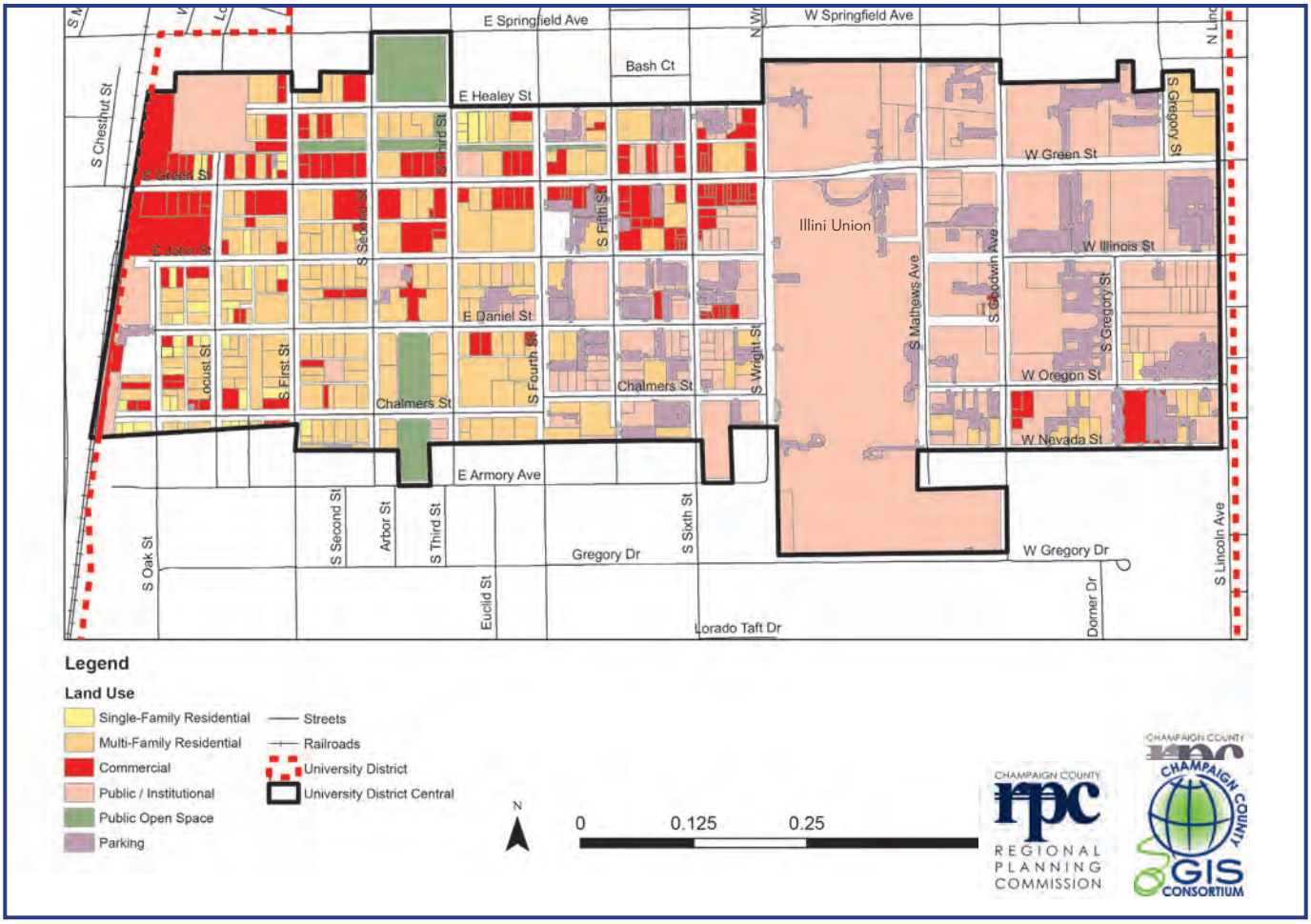


Figure 3.4: University District Central Land Use

The University District South Central includes a number of residence halls, academic buildings, sports fields and recreation centers (Figure 3.5). The Business Instructional Facility (BIF) building, Undergraduate Library, and Wohlers Hall are located on different quadrants of the Sixth Street and Gregory Drive intersection.

These buildings, the nearby residence halls, and the Activities and Recreation Center (ARC) on Gregory Drive create high pedestrian, bicycle, and transit activities along this corridor.

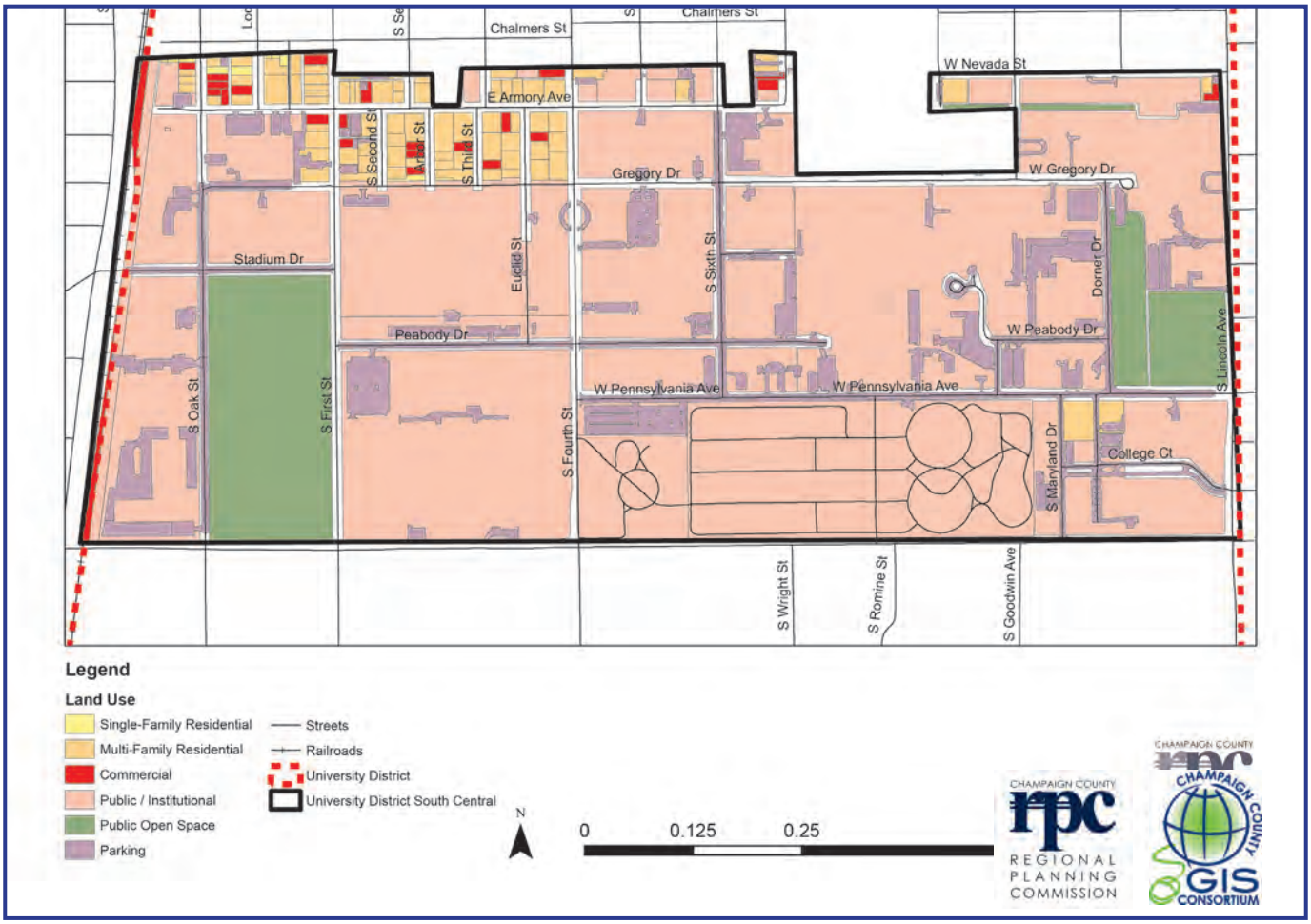


Figure 3.5: University District South Central Land Use

As shown in Figure 3.6, University District South includes predominantly University owned lands and infrastructure. The University of Illinois athletics facilities, including Assembly Hall and tennis, softball, and soccer facilities, are located in this area. The Research Park at the University of Illinois is located at the southwest corner of University District South. The I Hotel and Conference Center, a joint venture establishment by Fox/Atkins Development LLC and the University of Illinois, is located at the southeast quadrant of the First Street/St. Mary's Road intersection.

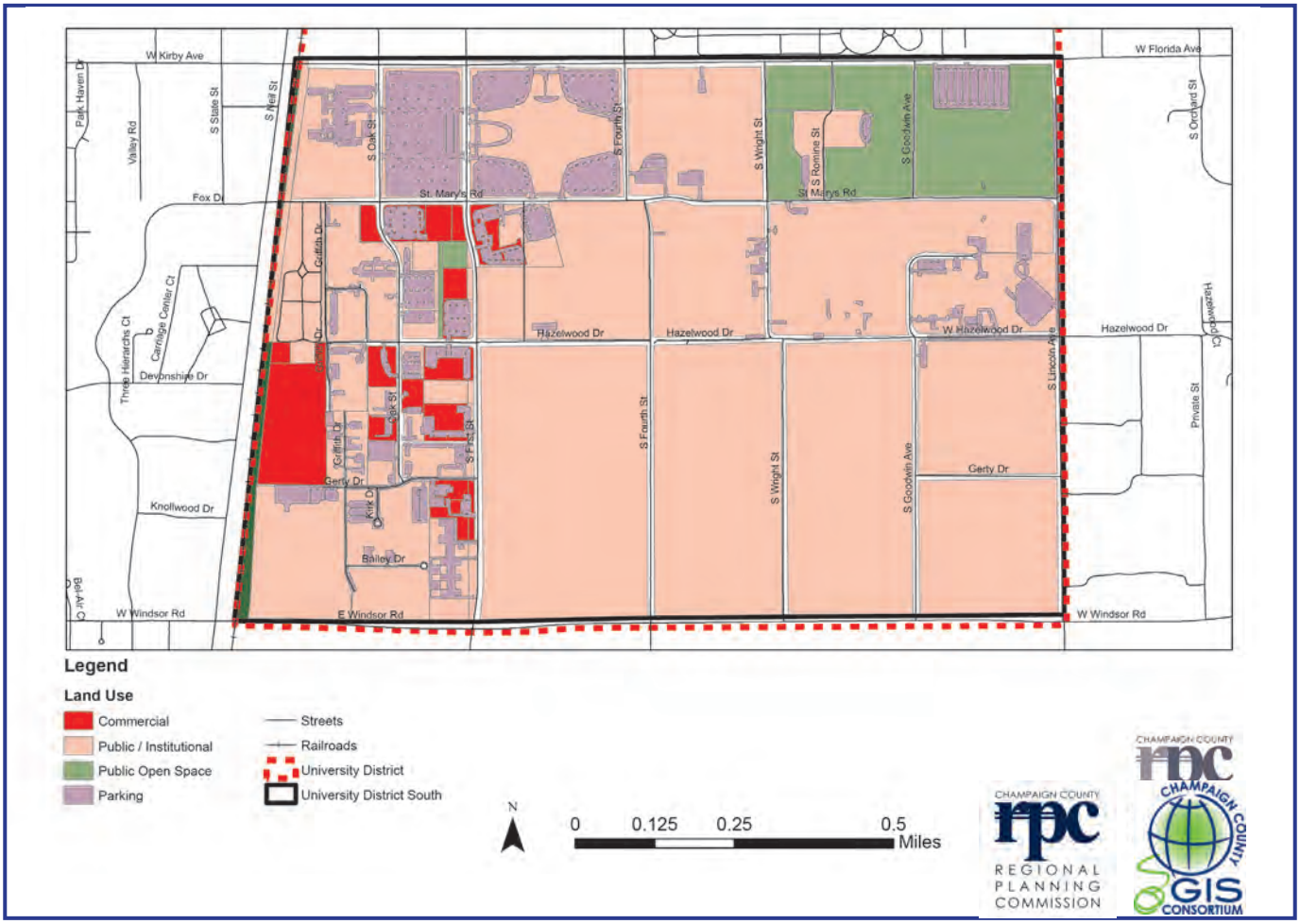


Figure 3.6: University District South Land Use

Table 3.1 shows the percentage of land use types for the subdivided areas of the University District.

Table 3.1: Land Use Type

Section	Total Area		Commercial Land Use		Residential Land Use		Institutional Land Use		Other	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
North	151.80	19.13	25.90	17.06	53.44	35.20	68.64	45.22	3.80	2.50
Central	202.03	25.46	28.54	14.13	59.22	29.31	98.33	48.67	15.93	7.88
South Central	264.49	33.33	6.72	2.54	30.82	11.65	195.19	73.80	31.76	12.01
South	175.32	22.09	34.43	19.64	0.00	0.00	92.58	52.81	48.31	27.56
Total	**793.64**	**100.00**	**95.59**	**12.04**	**143.48**	**18.08**	**454.74**	**57.30**	**99.80**	**12.57**

3.3 Existing Traffic Circulation System Evaluation

An understanding of current transportation conditions is a key part of evaluating the transportation system to identify issues and recommendations for enhancing the safety of road users and improving the efficiency of traffic operations. The following sections contain a compilation of data on existing traffic characteristics, traffic growth trends, travel conditions, traffic crashes, and transportation facilities for the study area.

3.3.1 Traffic Volume Trends

24-hour traffic volume data that were collected by the study team at important roadway segments in 2011 are shown in Figure 3.7.

Figure 3.8 shows 24-hour vehicular traffic volume comparisons along the major roadway corridors within the University District between 2006 and 2011. All the major corridors within the University District experienced a significant reduction in vehicular traffic. The highest reduction of approximately 35% was observed along the Fourth Street corridor.

3.3.2 Existing Geometric Features of Roadways and Intersections

For this study, the geometric features of the roadways and intersections within the campus area were evaluated for the following aspects:

- Roadway functional classification
- Pavement surface condition
- Intersection control type
- One-way lanes and bus-only lanes
- Posted speed limit

I Roadway Functional Classification

Roadway functional classification is the process by which streets and highways are grouped into classes, or systems, based on the function they perform for providing access and mobility. A functional classification system helps in providing logical and efficient traffic movement. Roadway classifications are based upon guidelines prepared by the U.S. Federal Highway Administration (FHWA) and are described beginning on page 42.

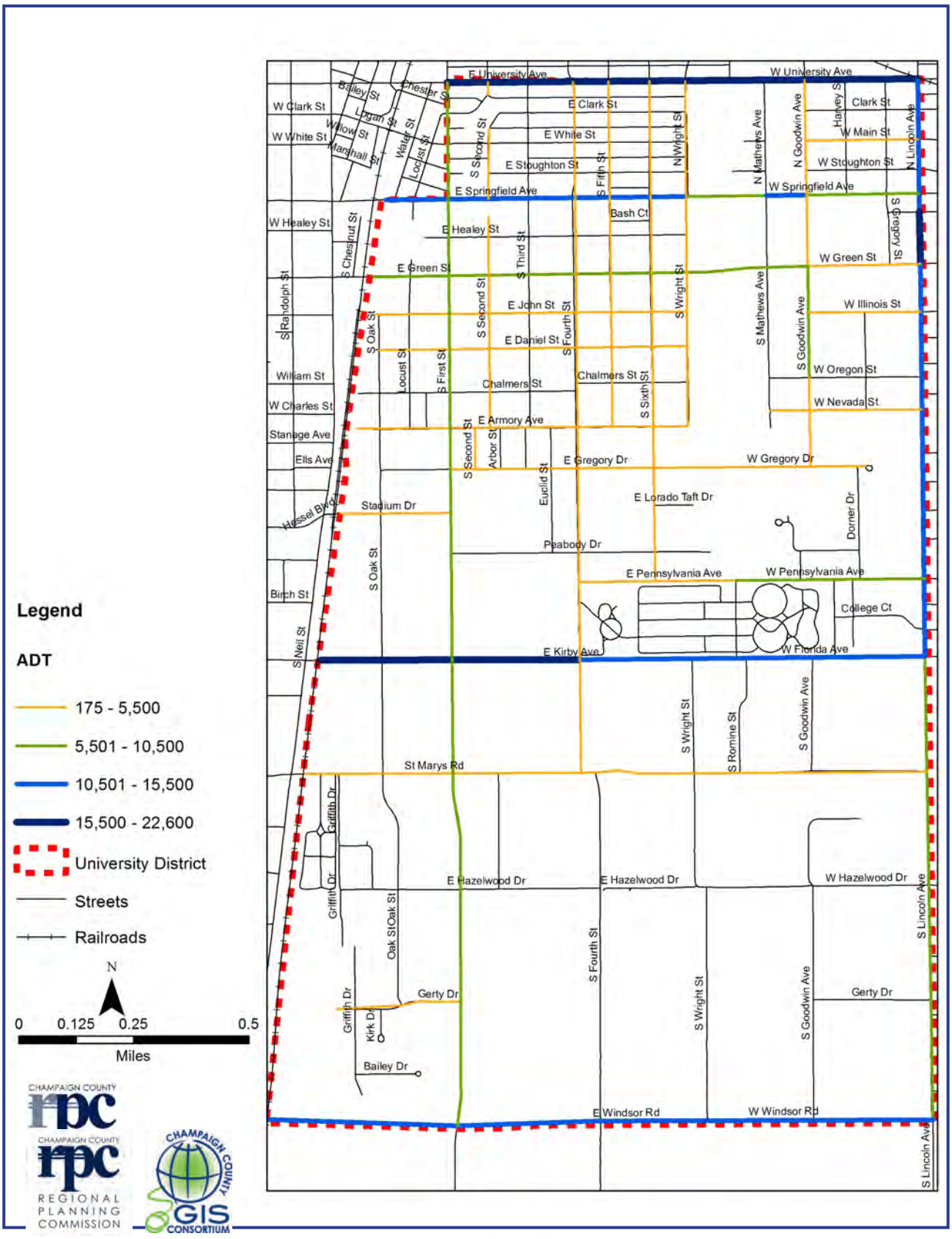


Figure 3.7: ADT Map

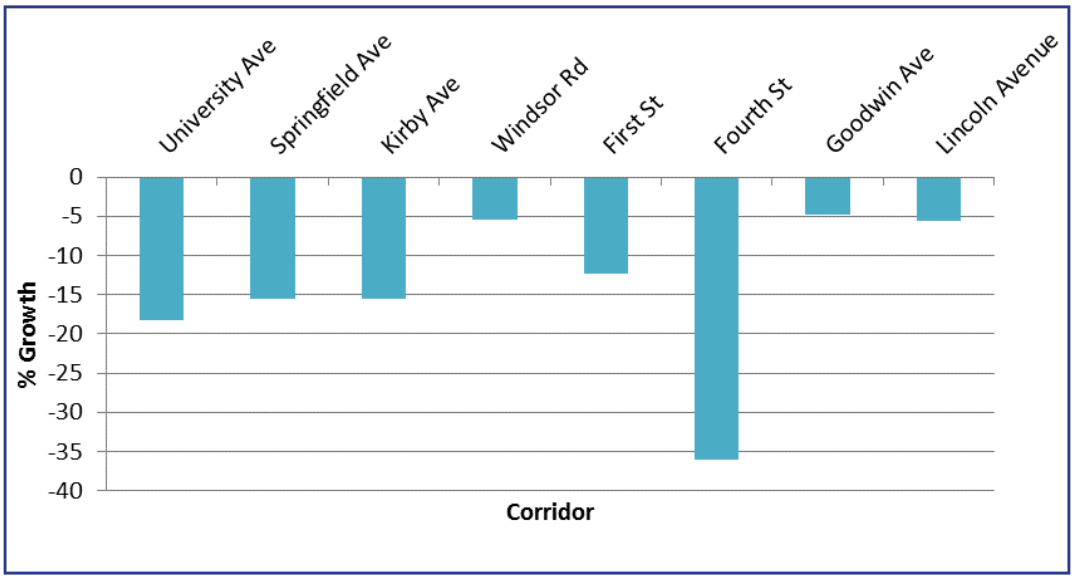


Figure 3.8: Traffic Growth Pattern within the University District (2006-2011)

- **Principal Arterials:** Roads which typically serve the major centers of activity of the metropolitan area have the highest traffic volumes, and serve the longest trips. These routes are not designed to provide direct access to adjacent properties but are designed to accommodate longer trip mobility. Within the University District, part of University Avenue and Springfield Avenue are classified as principal arterials providing major east-west movements in the area. Neil Street and a small portion of Wright Street serve as principal arterials providing north-south movement.
- **Minor Arterials:** These routes form a network that interconnects with the principal arterials to provide service for moderate trip lengths at a somewhat lower level of travel mobility than principal arterials. They are appropriate to handle local bus routes. Part of University and Springfield Avenues, Green Street, Florida/Kirby Avenue, Windsor Road, First Street and Lincoln Avenue serve as minor arterials within the University District.
- **Urban collectors:** These routes provide land access and traffic circulation within residential neighborhoods, commercial and industrial areas. The collectors also accumulate traffic from local streets and channel it into the arterial system. In the study area, Gregory Drive, Stadium Drive, St. Mary's Road, Goodwin Avenue and part of Fourth Street serve as collectors.
- **Local Streets:** These routes consist of all facilities that are not categorized in a higher street classification. A local street serves as direct access to abutting land and provides access to higher order roadways.

Figure 3.9 shows the functional classification of roadways in the University District area.

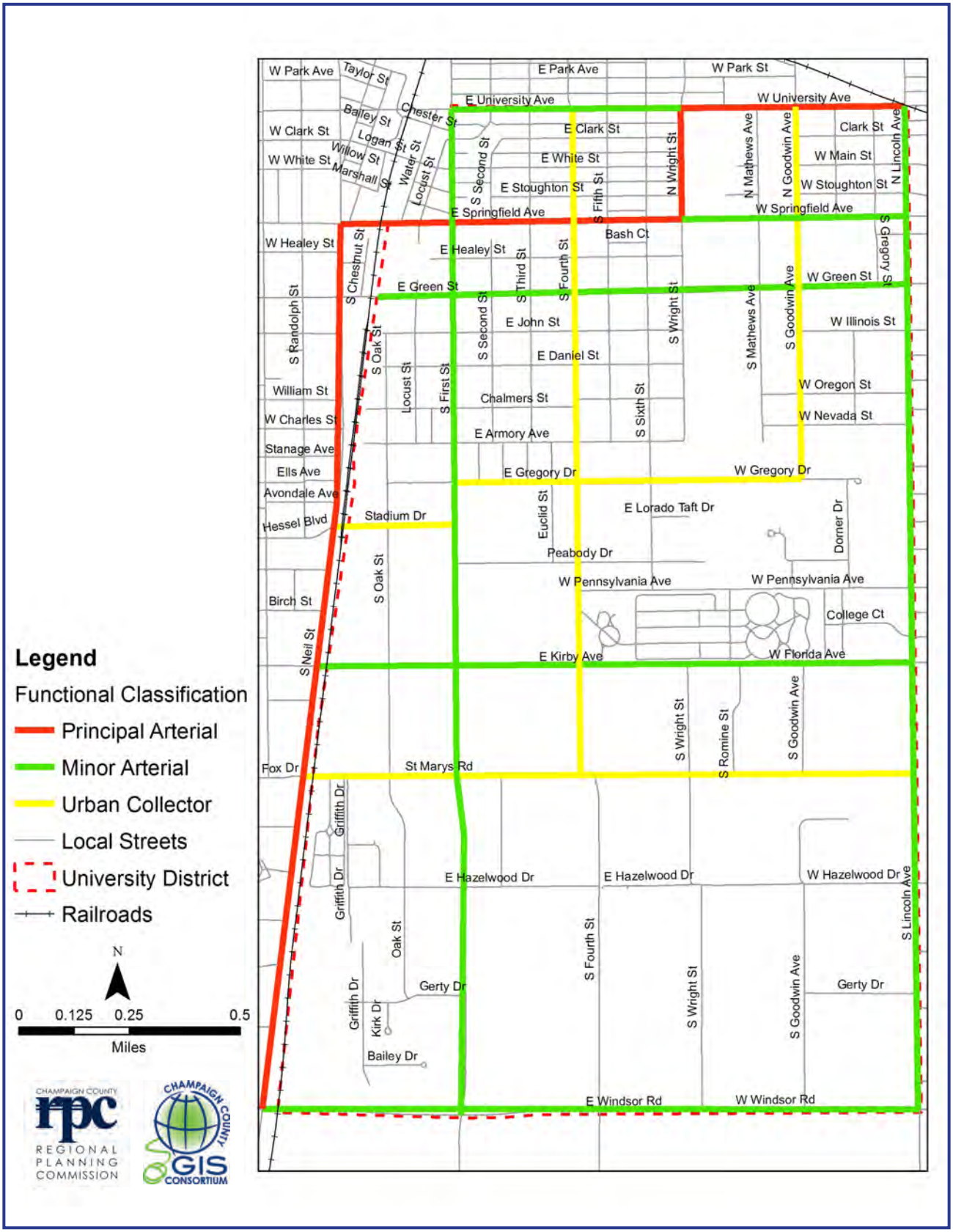


Figure 3.9: Roadway Functional Classification

II Pavement Surface Condition

Pavement surface conditions affect the safety of travelers and the traffic flow to a great extent. Different modes of transportation utilize the road networks in the campus area regularly which leads to the gradual degradation of pavement surface conditions. Thus, it is important to have a pavement condition analysis for the study area. Table 3.2 shows the categories for pavement conditions and the corresponding pavement condition index rating used for the analysis of the pavement conditions. This index and category system is based on a previous similar Pavement Conditions Analysis done for the University.

Table 3.2: Pavement Condition Categories

Pavement Condition Index	Condition
80-100	Excellent
60-79	Good
40-59	Fair
20-39	Poor
0-19	Very Poor

A pavement condition analysis was completed for the University of Illinois in 2011. The results of this study for roadway segments rated pavement conditions from Very Poor to Excellent. Certain segments of Green Street, Gregory Drive, First Street, Goodwin Avenue, Springfield Avenue, and Hazelwood Drive were found to be in Very Poor condition. A major portion of Lincoln Avenue was found to be in Poor condition along with some segments of Fourth Street, Sixth Street, St. Mary's Road, and Stoughton Street.

A considerable proportion of roadways were found to be in Excellent, Good or Fair condition (Figure 3.10).

III Intersection Control Type

The study area has a mix of intersection controls that vary from one-way stop control to fully signalized intersections. Of the 67 major intersections on campus, 37 intersections are signalized, 16 intersections have all-way stop control signs, and 14 intersections have one or more stop signs on at least one minor approach (Figure 3.11). Most of the intersections along the major corridors within the study area are signalized intersections, such as those on Neil Street, University Avenue, Springfield Avenue, Green Street, Florida/Kirby Avenue, and Lincoln Avenue.

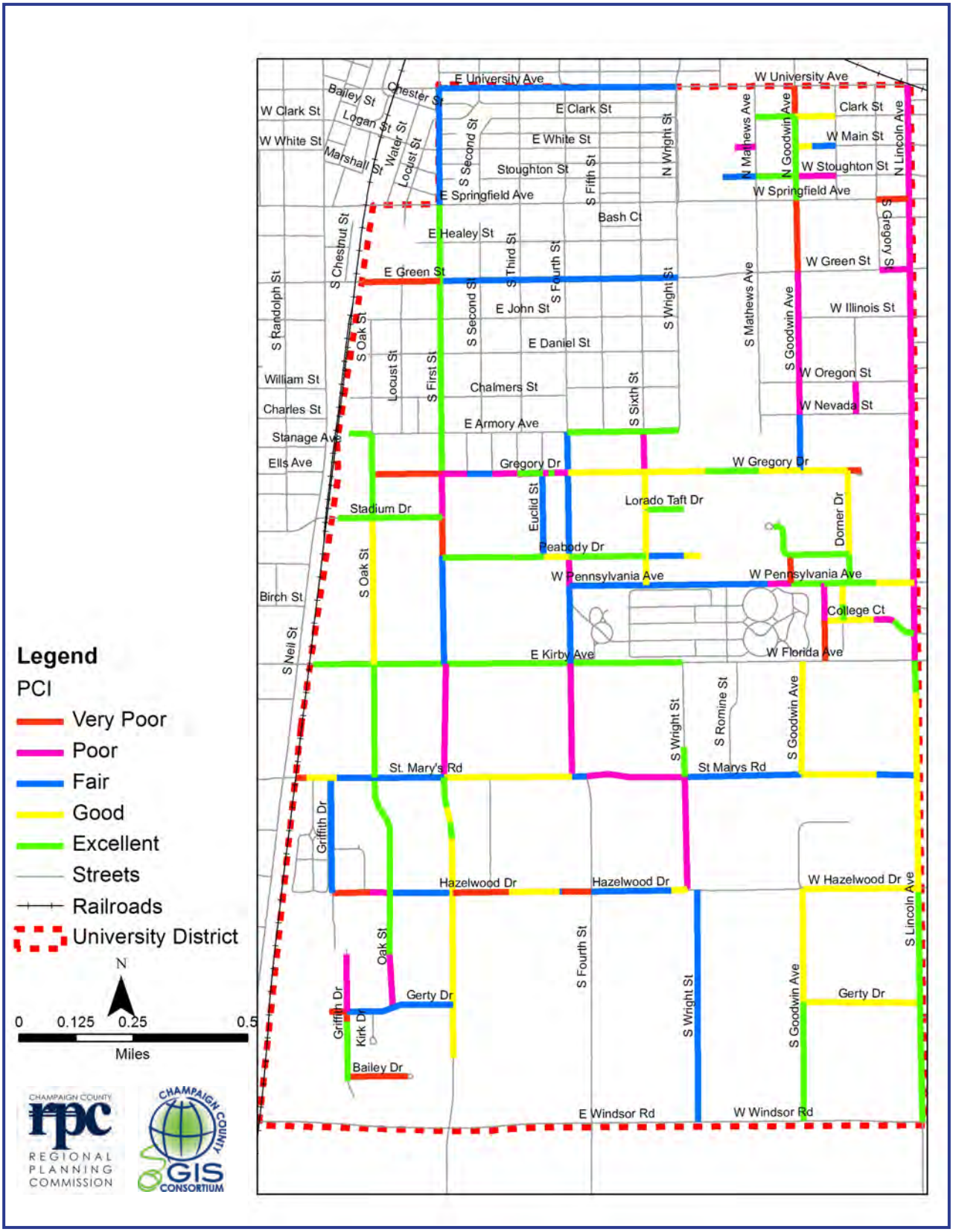


Figure 3.10: Pavement Condition Map

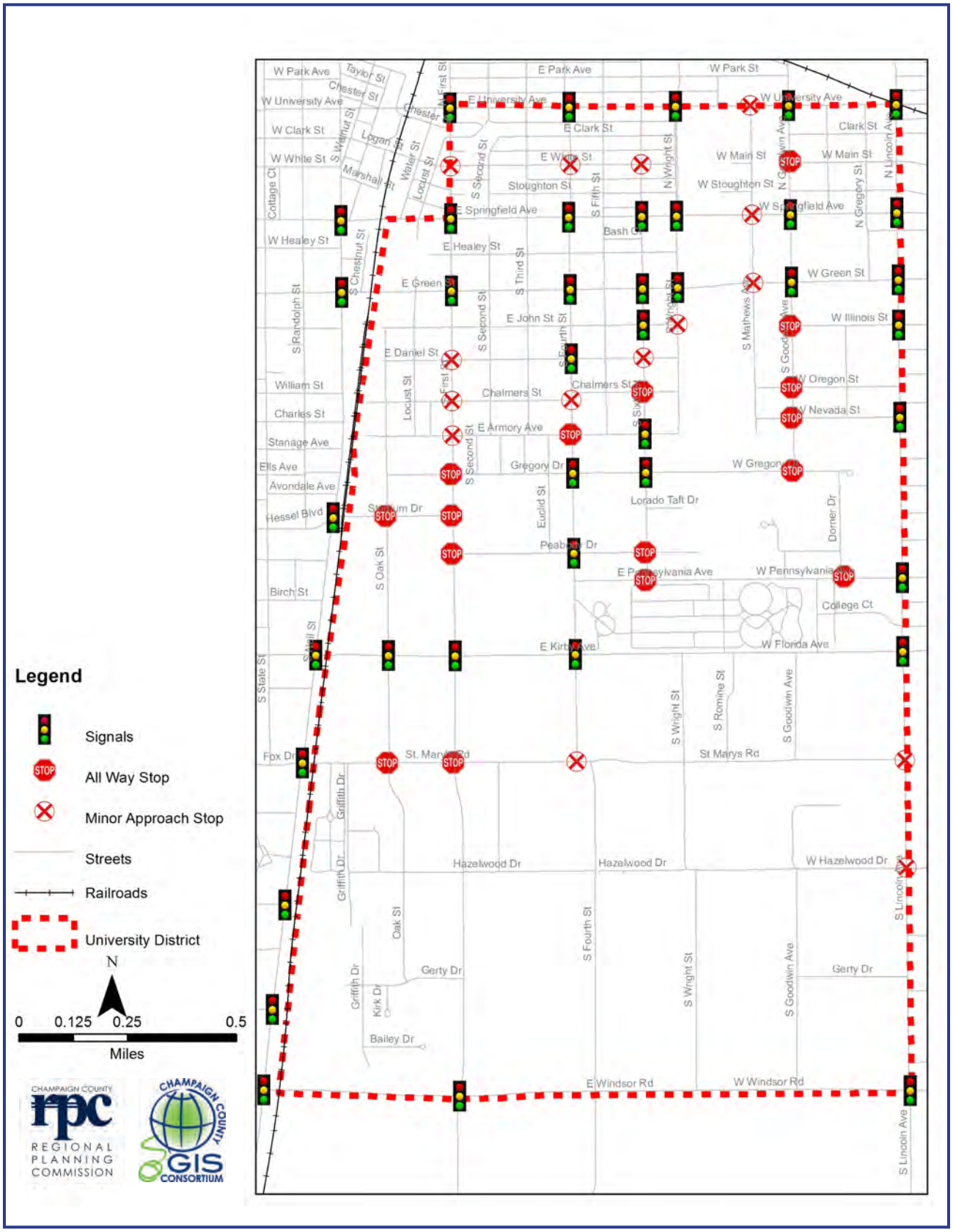


Figure 3.11: Intersection Control Type

IV One-Way and Bus-Only Lanes

A number of roadway segments in the University District are one-way streets to reduce the number of conflicts between motorized and non-motorized travel modes. The segment of Wright Street from Green Street to John Street is a bus-only lane for the northbound direction. The segment of Wright Street from John Street to Daniel Street is a bus-only lane for both directions and serves as a bus-only lane from Daniel Street to Chalmers Street for the northbound direction to enhance efficient travel of the CUMTD buses. The Wright Street segment from Green Street to Armory Avenue serves major CUMTD bus routes such as the 1 Yellow, 4 Blue, 9 Brown, 13 Silver, and 22 Illini. Reducing the automobile traffic in this segment encourages the use of mass transit for faster travel. Figure 3.12 is a pictorial representation of the one-way lanes and the bus-only lane within the University District.

V Posted Speed Limit

The speed limit in the University District is 25 miles per hour. On major corridors, there are exceptions to this speed limit. Springfield Avenue, and a portion of Green Street, Lincoln Avenue and First Street have a speed limit of 30 mph; University Avenue, Kirby Avenue/Florida Avenue, Neil Street, and a part of Lincoln Avenue and First Street have a speed limit of 35 mph; and Windsor Road has a speed limit of 45 mph. On all the other roadways, the speed limit is 25 mph (Figure 3.13).

In 2011, traffic speed data was collected for roadway segments in the University District using HI-STAR counters. A speed analysis was done utilizing speed data from these counters. Figure 3.14 shows a map with the 85th percentile vehicular speed on different roadways within the University District.

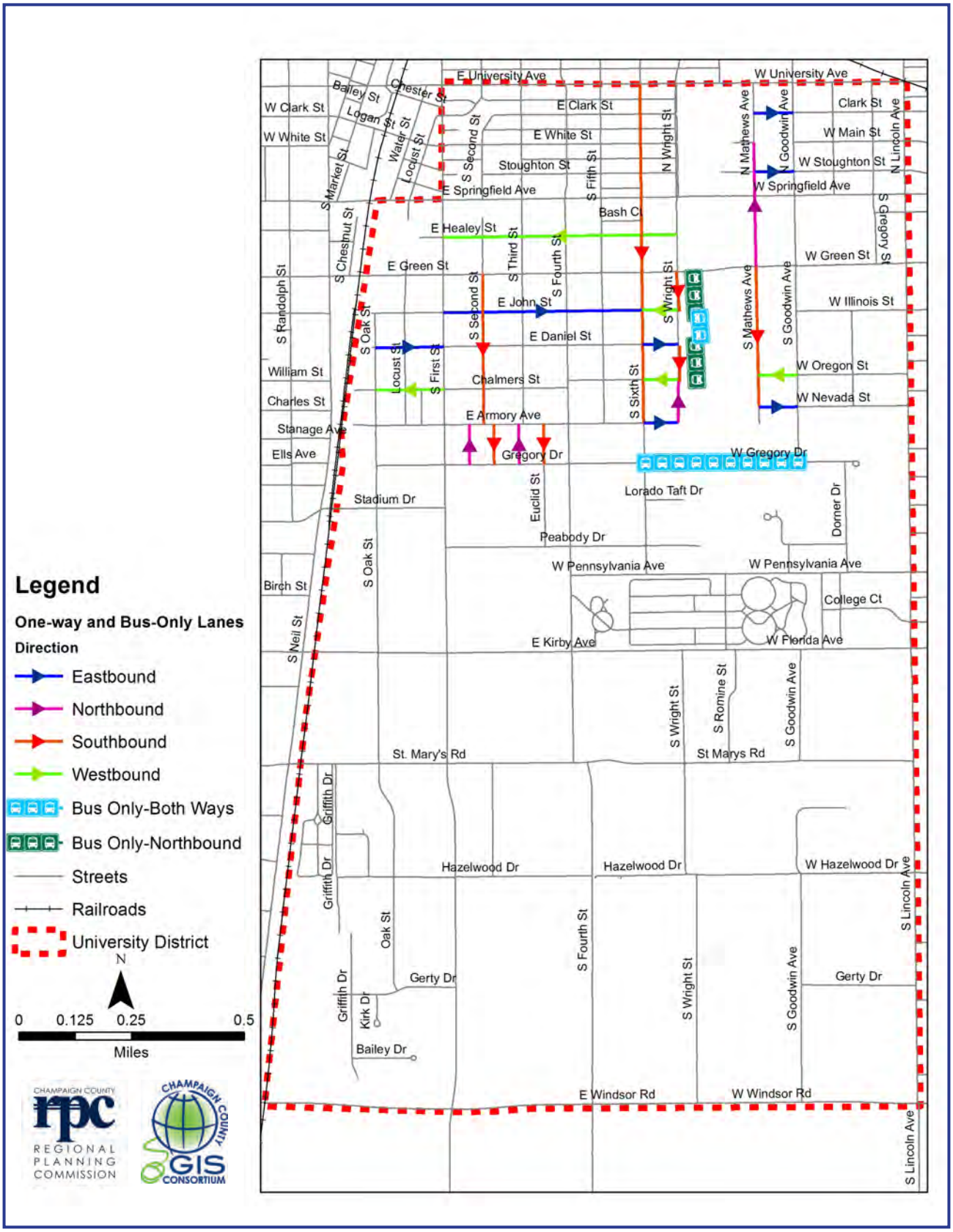


Figure 3.12: One-Way Lanes and Bus-Only Lanes on Campus

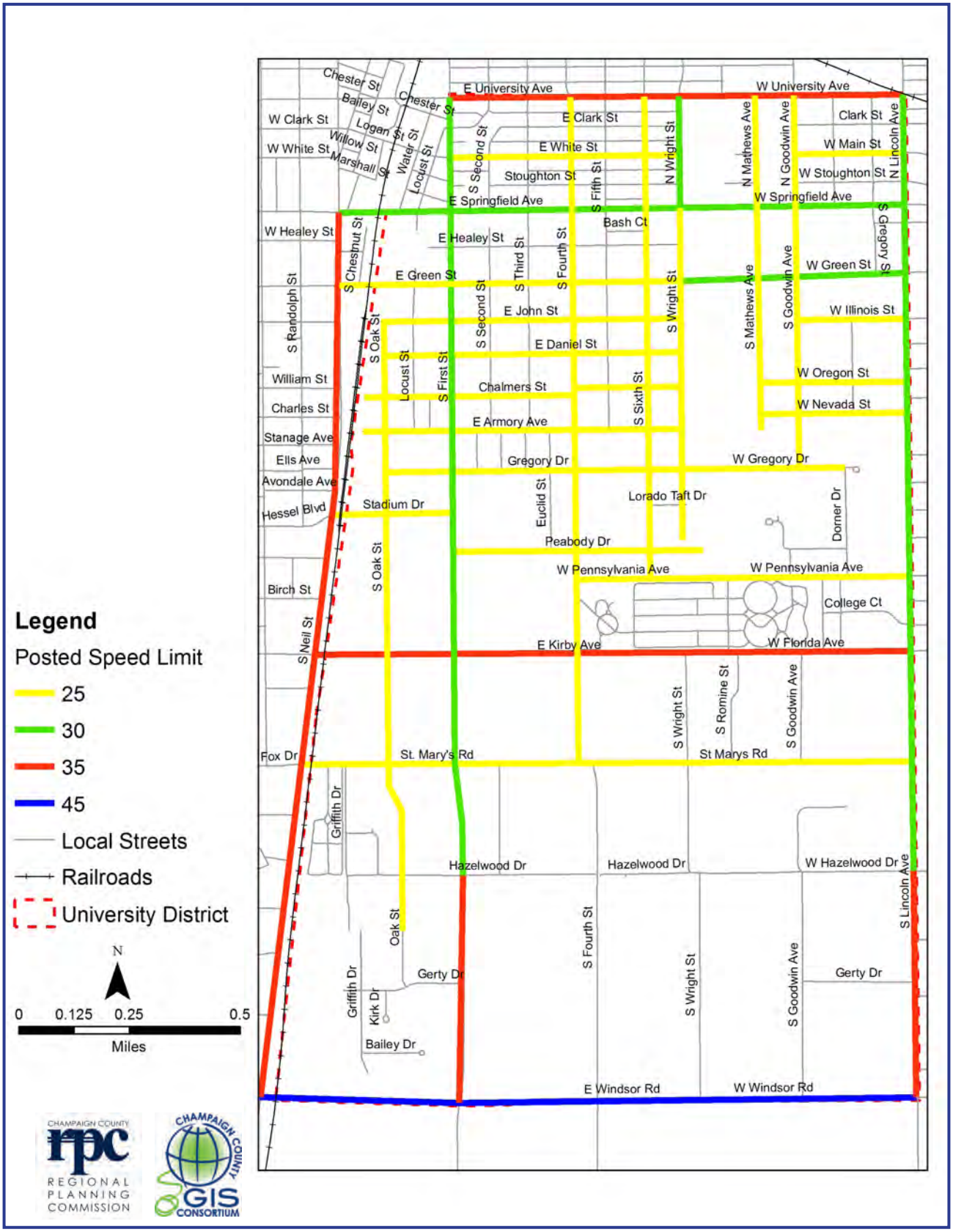


Figure 3.13: Posted Speed Limit Map

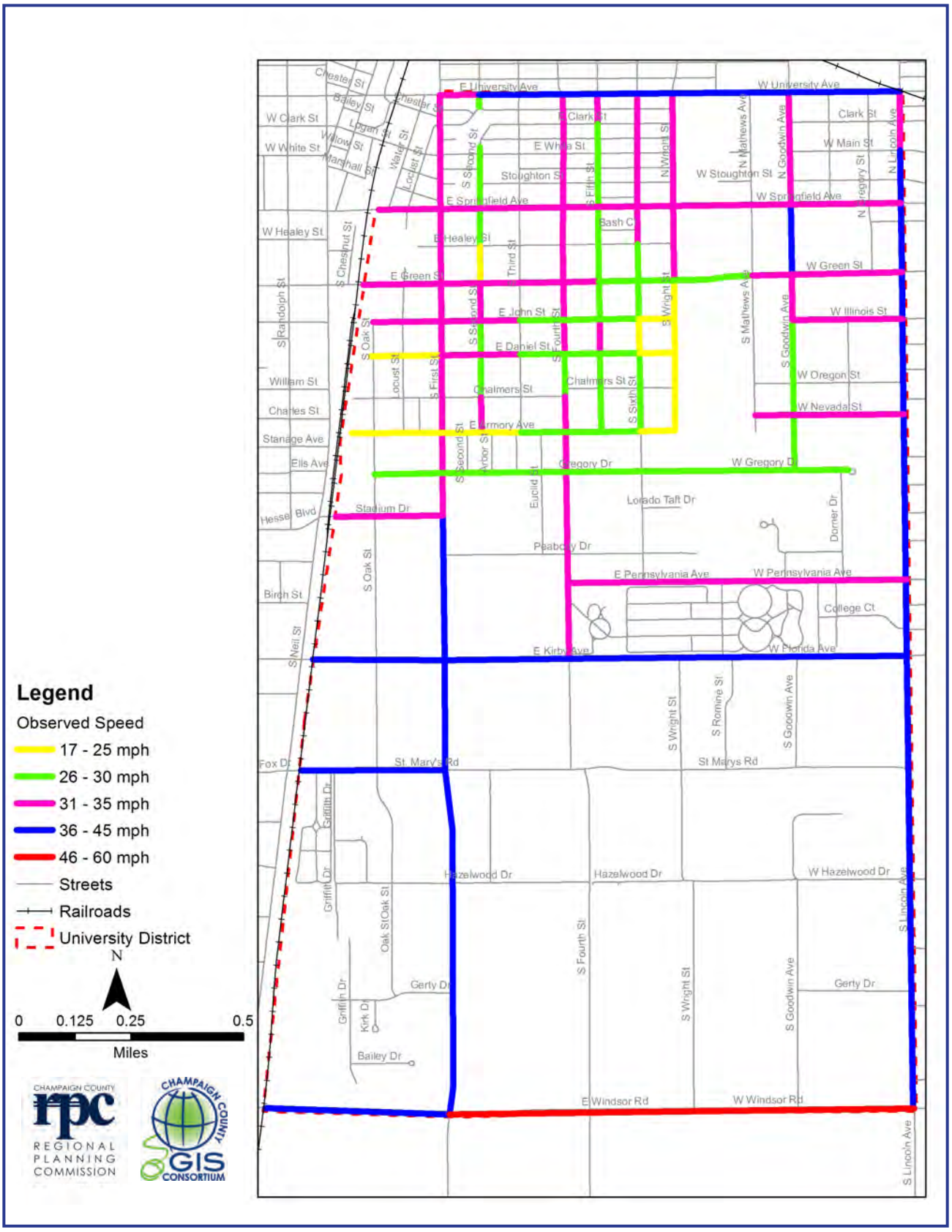


Figure 3.14: Observed Speed Map

As shown in Figure 3.14, the 85th percentile vehicular speed on the majority of the roadway segments was significantly higher than the posted speed limit. Table 3.3 shows roadway segments with higher deviation between the posted speed limit and the observed 85th percentile speed.

Table 3.3: Posted and Observed Speed Limits in the University District

No.	Roadway Segment	Posted Speed Limit (mph)	Observed 85th percentile speed (mph)	Difference (mph)
1	St. Mary's Rd. – East of Neil St.	25	41	16
2	Windsor Rd. – West of Lincoln Ave.	45	60	15
3	Goodwin Ave. – North of Green St.	25	36	11
4	Florida Ave. – West of Lincoln Ave.	35	45	10
5	Daniel St. – East of First St.	25	35	10
6	Lincoln Ave. – South of Main St.	30	40	10
7	First St. – North of Kirby Ave.	30	40	10
8	Fourth St. – North of Kirby Ave.	25	34	9
9	University Ave. – East of Sixth St.	35	44	9
10	Pennsylvania Ave. – East of Sixth St.	25	34	9

As can be seen in Table 3.3, some roadway segments within the core university district exhibited significantly higher vehicular speeds than the posted speed limit (e.g. Goodwin Avenue).

3.4 Traffic Operations

Existing traffic operating conditions were evaluated for intersections and segments in the University District. Vehicular turning movement counts were collected by the study team at 67 intersections within the study area. Among them, 37 intersections are signalized, 16 intersections have all-way stop control signs, and 14 intersections have one or more stop signs on at least one minor approach. The counts were performed during three different, typical weekday peak periods:

- AM (7:30 AM to 9:00 AM)
- Noon (11:30 AM to 1:30 PM)
- PM (4:00 PM to 6:00 PM)

The peak hour volumes were calculated using the turning movement counts for each approach at all the major intersections. The highest hourly volumes for the corresponding approaches were used for analysis purposes. Also, the highest hourly volumes for pedestrians were utilized for evaluating the current pedestrian issues. In order to account for the worst case scenarios, the percentage of heavy vehicles considered for the analysis were also the highest hourly percentages for the corresponding approaches.

The analysis was completed using the Synchro 8 and CORSIM software. Both programs are based upon the methodologies outlined in the Highway Capacity Manual (HCM 2010 and HCM 2000 respectively) published by the Transportation Research Board. Micro simulation analysis was completed using SimTraffic and TSIS software.

3.4.1 Intersections

Selected intersection criteria such as Level of Service (LOS), approach delay and intersection delay were analyzed by the study team to determine the existing operational conditions during the AM, Noon and PM peak hours on typical weekdays.

LOS is a qualitative measure describing operational conditions, from "A" (best) to "F" (worst), within a traffic stream or at an intersection. LOS is quantified for signalized and unsignalized intersections using vehicle control delay. Control delay is the component of delay that results from the type of traffic control at the intersection. It is measured by comparing the controlled condition against the uncontrolled condition. The difference between the travel time that would have occurred in the absence of the intersection control and the travel time that results from the presence of the intersection control is the control delay. Average control delay per vehicle is estimated for each lane group, aggregated for each approach and for the intersection as a whole.

Table 3.4 describes the LOS criteria for signalized intersections. LOS A represents free flow along the intersection with minimal delay, LOS B represents stable flow with slight delays, LOS C indicates stable flow with acceptable delays, LOS D represents an approaching unstable flow with tolerable delay (e.g. occasionally wait through more than one signal cycle before proceeding), LOS E indicates unstable flow with an approaching intolerable delay, and LOS F represents forced or jammed flow.

Table 3.4: LOS Criteria for Signalized Intersections

Control Delay per Vehicle	LOS for Volume to Capacity Ratio ≤1
≤10	A
>10 and ≤20	B
>20 and ≤35	C
>35 and ≤55	D
>55 and ≤80	E
>80	F

(Source: HCM 2010)

Table 3.5 shows the Level of Service criteria for two-way and all-way stop control intersections.

Table 3.5: LOS Criteria for Unsignalized Intersections

Control Delay per Vehicle	LOS for Volume to Capacity Ratio ≤1
≤10	A
>10 and ≤15	B
>15 and ≤25	C
>25 and ≤35	D
>35 and ≤50	E
>50	F

(Source: HCM 2010)

For the LOS analysis, the worst ten intersections based on the Average Control Delay were identified for the AM, Noon and PM Peak periods. Most of the intersections in the study area have an acceptable LOS and stable traffic flow. Table 3.6, Table 3.7, and Table 3.8 show the Level of Service and average control delay values for the worst ten intersections in terms of traffic operational conditions in the study area for the existing AM, Noon and PM peak hours. During the AM peak period, intersection approaches with congested conditions were identified mostly at the University District boundary roadways (e.g. Neil Street, Lincoln Avenue). For the Noon and PM peak periods, the intersections of Sixth Street / Armory Avenue and Wright Street / Green Street were among the worst ten intersections.

Table 3.6: Worst Ten Intersections for AM Peak Periods

No.	Intersection	Approach	AM Peak	
			LOS	Average Control Delay (sec/veh)
1	First St./Windsor Rd.	Eastbound Left/Thru/Right	F	229.8
		Overall	F	118.0
2	Neil St./Kirby Ave.	Northbound Thru/Right	F	90.0
		Southbound Left	E	59.6
		Overall	E	55.7
3	Neil St./Windsor Rd.	Northbound Thru	F	113.9
		Overall	D	50.8
4	Lincoln Ave./University Ave.	Overall	D	37.2
5	Neil St./Springfield Ave.	Overall	C	24.9
6	Lincoln Ave./Florida Ave.	Overall	C	24.2
7	Neil St./Green St.	Overall	C	23.2
8	Lincoln Ave./Springfield Ave.	Overall	C	21.6
9	Lincoln Ave./Windsor Rd.	Overall	C	21.5
10	First St./Springfield Ave.	Overall	C	21.2

For the Noon peak period, only the westbound approach of the Neil Street/Kirby Avenue intersection was congested (Table 3.7).

Table 3.7: Worst Ten Intersections for Noon Peak Periods

No.	Intersection	Approach	Noon Peak	
			LOS	Average Control Delay (sec/veh)
1	Neil St./Kirby Ave.	Westbound Left	F	84.4
		Overall	D	36.9
2	Lincoln Ave./University Ave.	Overall	C	28.8
3	Neil St./Windsor Rd.	Overall	C	27.7
4	First St./Windsor Rd.	Overall	C	27.4
5	First St./Springfield Ave.	Overall	C	25.0
6	Sixth St./Armory Ave.	Overall	C	24.8
7	Lincoln Ave./Pennsylvania Ave.	Overall	C	24.1
8	Lincoln Ave./Florida Ave.	Overall	C	23.0
9	Neil St./Springfield Ave.	Overall	C	22.5
10	Wright St./Green St.	Overall	C	21.5

Table 3.8: Worst Ten Intersections for PM Peak Periods

No.	Intersection	Approach	PM Peak	
			LOS	Average Control Delay (sec/veh)
1	First St./Windsor Rd.	Eastbound Left/Thru/Right	E	71.8
		Westbound Left/Thru/Right	E	75.2
		Overall	D	53.7
2	Neil St./Kirby Ave.	Westbound Thru/Right	F	86.9
		Northbound Left	E	72.5
		Southbound Thru	E	58.3
		Overall	D	53.7
3	Lincoln Ave./Pennsylvania Ave.	Eastbound Left	E	56.6
		Eastbound Thru/Right	E	65.8
		Overall	D	40.1
4	Sixth St./Armory Ave.	Southbound Thru/Right	E	61.8
		Overall	D	38.9
5	Lincoln Ave./University Ave.	Southbound Left	E	65.4
		Overall	D	36.8
6	First St./Springfield Ave.	Southbound Thru/Right	E	59.4
		Overall	C	30.8
7	Neil St./Windsor Rd.	Overall	C	27.8
8	Goodwin Ave./University Ave.	Northbound Left	F	104.2
		Overall	C	27.6
9	Neil St./Springfield Ave.	Overall	C	25.5
10	Lincoln Ave./Nevada St.	Southbound Thru	D	37.9
		Overall	C	25.3

The LOS tables for all intersections in the University District are included in the Appendix. Figures 3.15, 3.16, and 3.17 show the Level of Service for all the intersections within the study area for the AM, Noon, and PM peak periods. The PM peak hour represents the worst vehicular travel conditions within the University District. The center circle at each intersection represents the overall intersection LOS, while the arrows represent the LOS for each approach.

3.4.3 Roadway Segments

Roadway segment Level of Service (LOS) is a term used to indicate the degree of congestion along a given roadway segment. Segment LOS is based on factors like density, speed, volume to capacity ratio, travel time, maneuverability, comfort, convenience, and safety. LOS designation ranges from A to F, with LOS A representing no congestion and LOS F representing full congestion.

The major arterials were analyzed following the procedures outlined in Chapter 17, "Urban Street Segments" of the Highway Capacity Manual (HCM 2010). The vehicular LOS for a given direction of travel along an urban street segment is based on the travel speed for through vehicles and the volume-to-capacity ratio for the through movement at the downstream boundary intersection. The travel speed reflects the factors that influence the running time along the link and the delay incurred at the boundary intersection. The base free-flow speed includes the considerations for the speed limit on the roadway segment, access point density, median type and the presence of curbs. The HCS software was also used to determine the segment running time. The Exhibits referred to for the calculations of the segment LOS are provided in the Appendix.

Table 3.10 shows the urban street segment LOS criteria. Brief descriptions of each Level of Service for urban street segments are provided below:

Table 3.10: LOS Criteria for Urban Street Segements

Travel Speed as a percentage of Base Free Flow Speed (%)	LOS for Volume-to-Capacity Ratio ≤1.0
>85	A
>67-85	B
>50-67	C
>40-50	D
>30-40	E
≤30	F

LOS A – Represents primarily free-flow operations at average travel speeds. Drivers have complete freedom to maneuver within the traffic stream. The travel speed for this LOS exceeds 85% of the base free-flow speed, and the volume-to-capacity ratio is no greater than 1.0.

LOS B – Represents a slightly restricted ability to maneuver within the traffic stream. Control delays at signalized intersections are not significant. The travel speed is between 67% and 85% of the base free-flow speed, and the volume-to-capacity ratio is no greater than 1.0.

LOS C – Represents stable operations. Ability to maneuver and change lanes at mid-block locations turn out to be more complicated than at LOS B. The travel speed for this LOS is between 50% and 67% of the base free-flow speed, and the volume-to-capacity ratio is no greater than 1.0.

LOS D – Represents a range in which small increases in flow may cause substantial increases in delay and decreases in travel speed. This situation may occur due to adverse signal progression, inappropriate signal timing, high volumes, or a combination of these factors. The travel speed for this LOS is between 40% and 50% of the base free-flow speed, and the volume-to-capacity ratio is no greater than 1.0.

LOS E – Represents traffic flow with significant delays. Adverse progression, high signal density and high volumes are main contributing factors to this situation. The travel speed here is between 30% and 40% of the base free-flow speed, and the volume-to-capacity ratio is no greater than 1.0.

LOS F – Represents traffic flow at extremely low speeds. Intersection congestion is expected at critical signalized locations, with high delays, high volumes and extensive queuing. The travel speed for this LOS is 30% or less of the base free-flow speed, and the volume-to-capacity ratio is greater than 1.0.

The analysis performed for selected roadway segments in the corridor is shown in the Appendix. Roadway segment LOS for the AM, Noon, and PM peak periods are shown in Figure 3.18, Figure 3.19 and Figure 3.20. Shorter length roadway segments, i.e., roadway segments that are interrupted by traffic signals, frequently tend to have lower travel speed and hence a lower LOS. Roadway segments of the Neil Street, University Avenue, and Lincoln Avenue corridors experienced higher traffic volumes during the peak periods which resulted in lower travel speeds for some of the segments. Some roadway segments of the Springfield Avenue and Green Street corridors within the University District had congested conditions for vehicular traffic during the noon and PM peak hours. However, poor vehicular LOS values on roadway segments are not a concern within the core University District as pedestrians, bicyclists and transit services are given priority over automobile traffic.

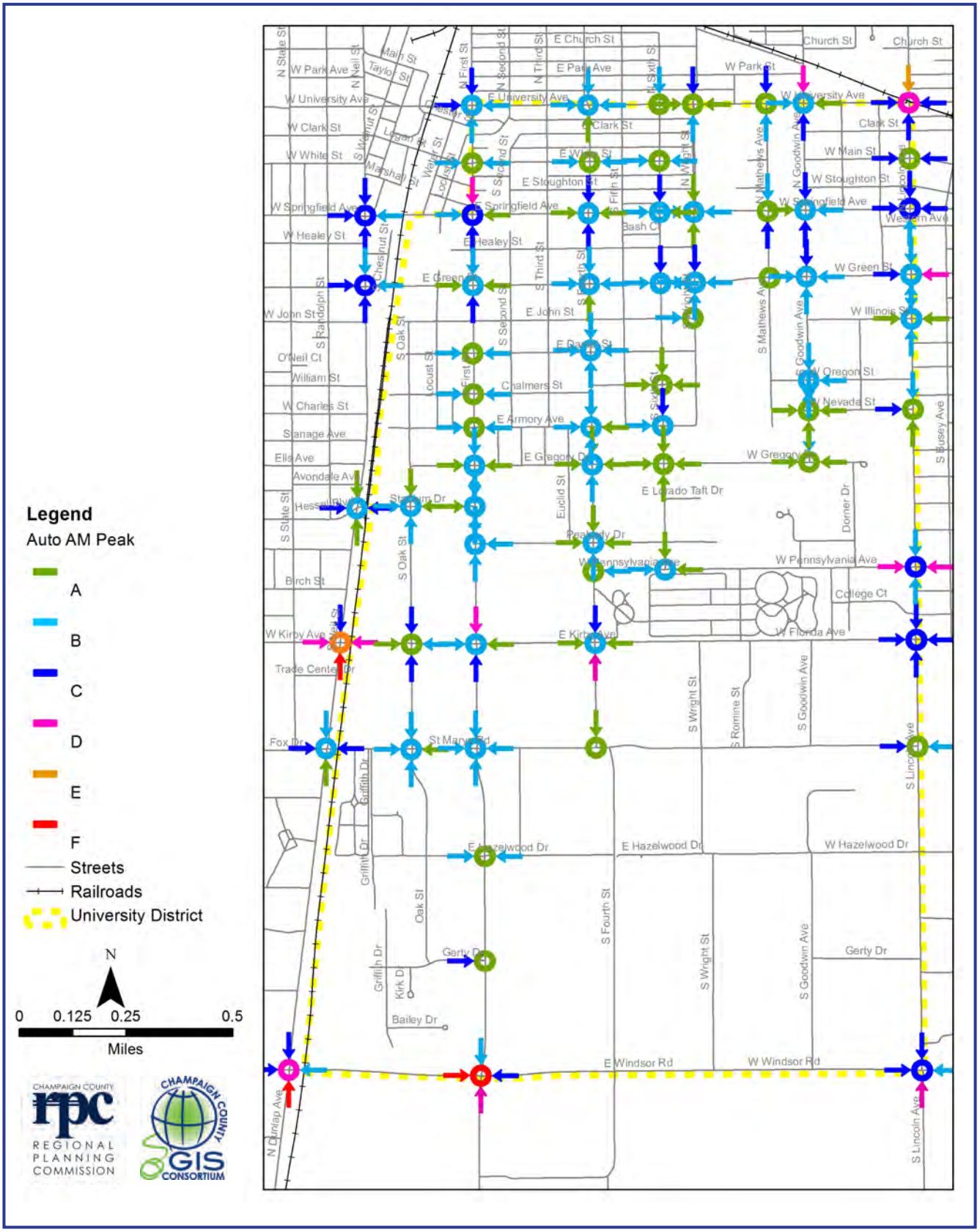


Figure 3.15: Intersection LOS during AM Peak Periods

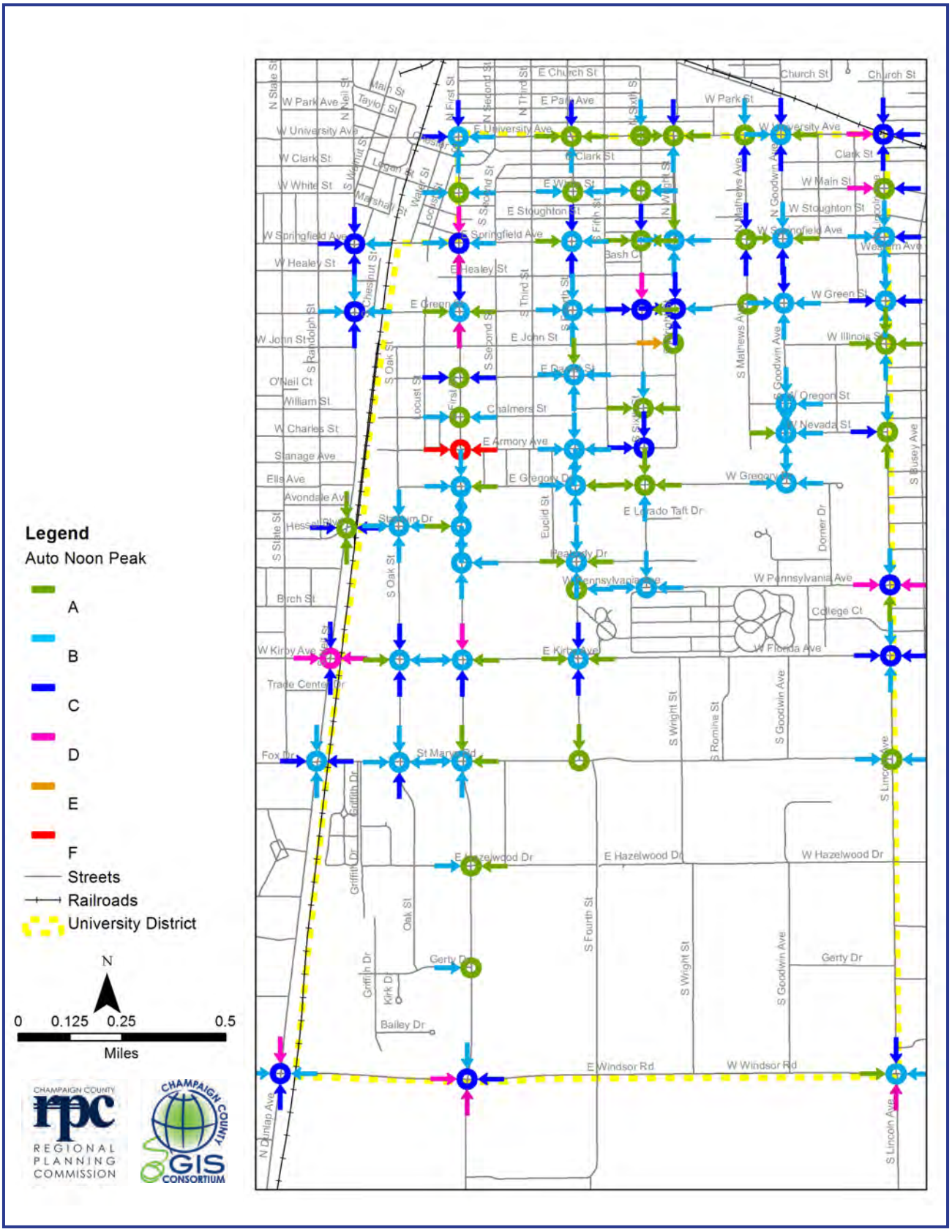


Figure 3.16: Intersection LOS during Noon Peak Periods

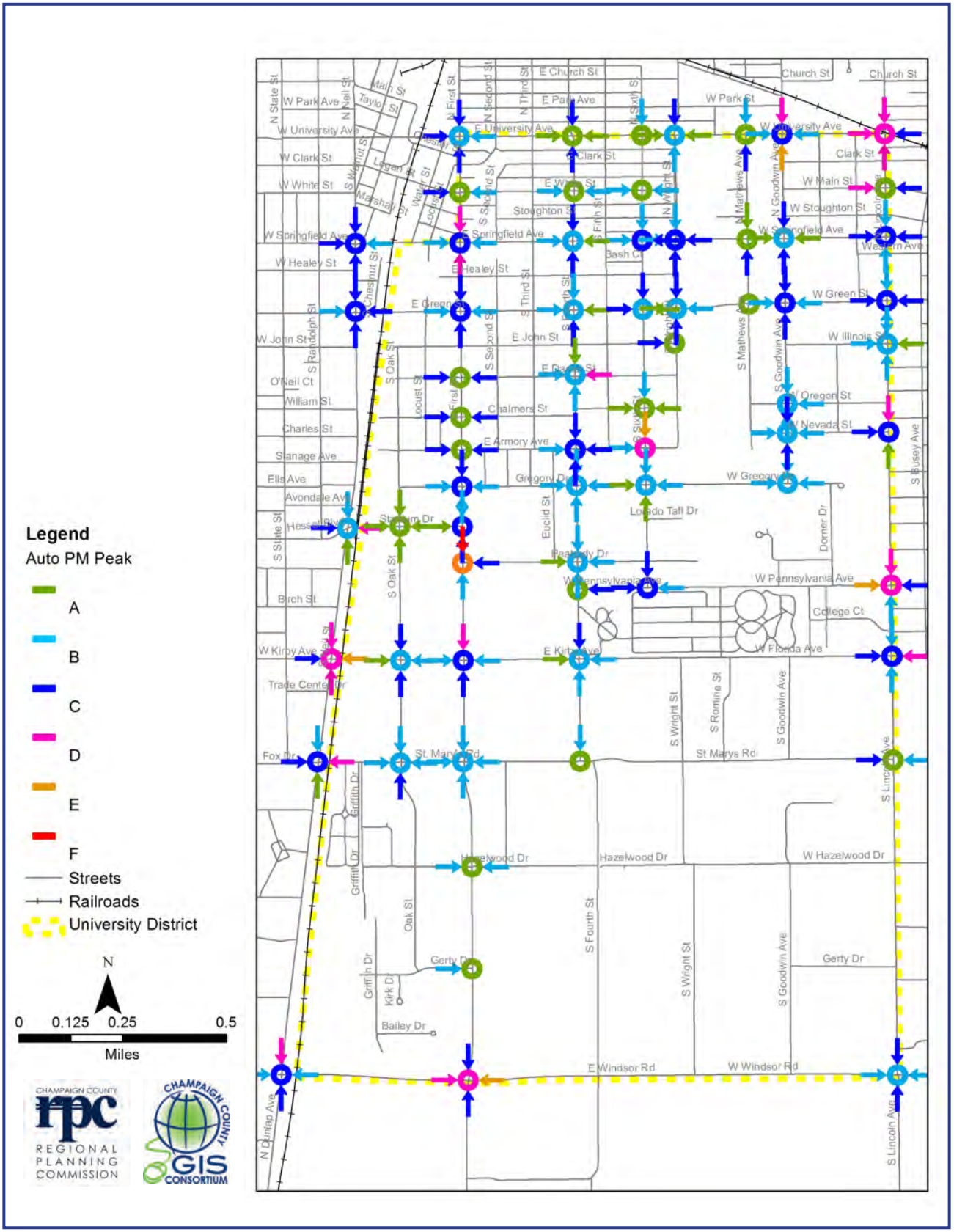


Figure 3.17: Intersection LOS during PM Peak Periods

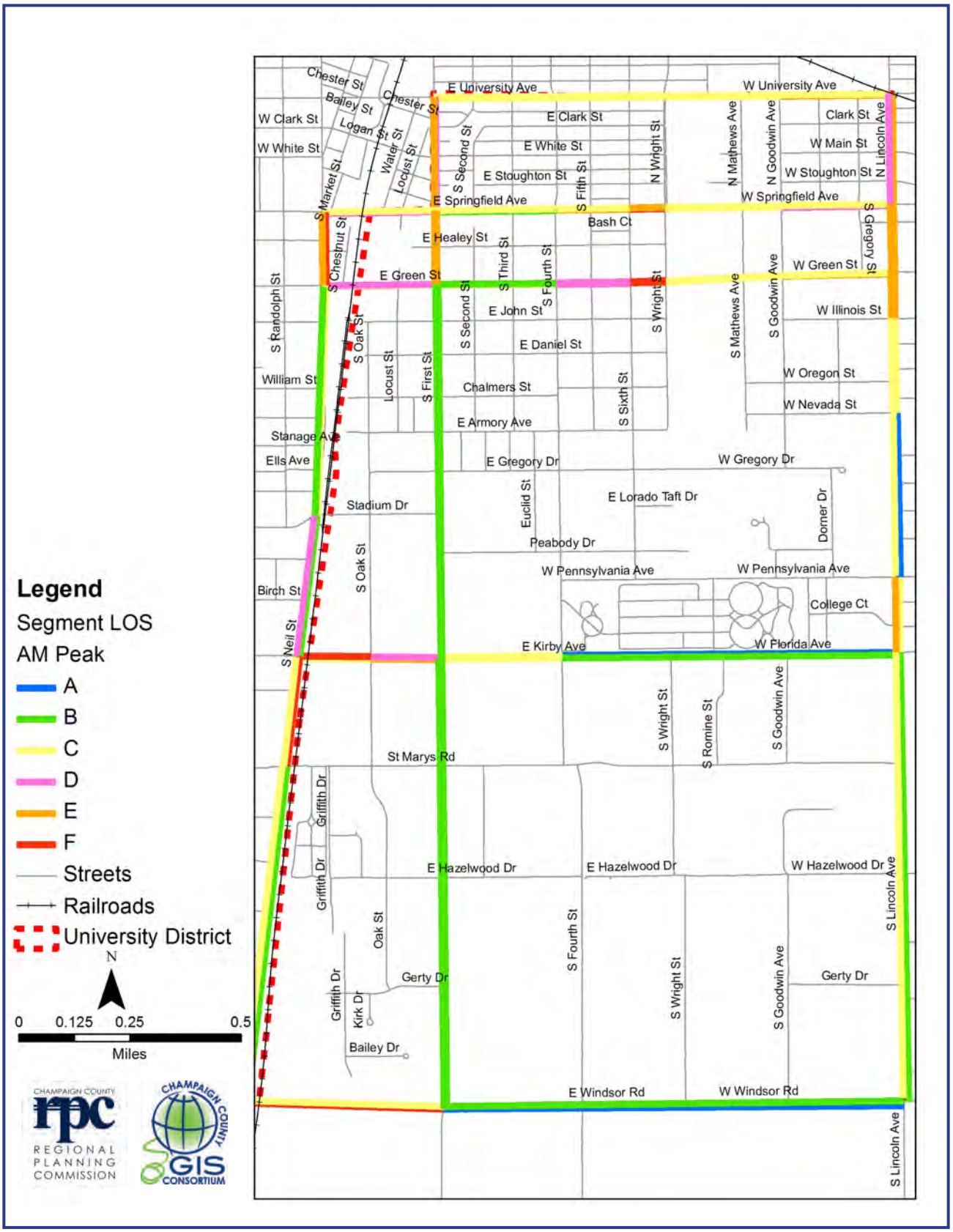


Figure 3.18: Segment LOS during AM Peak Periods

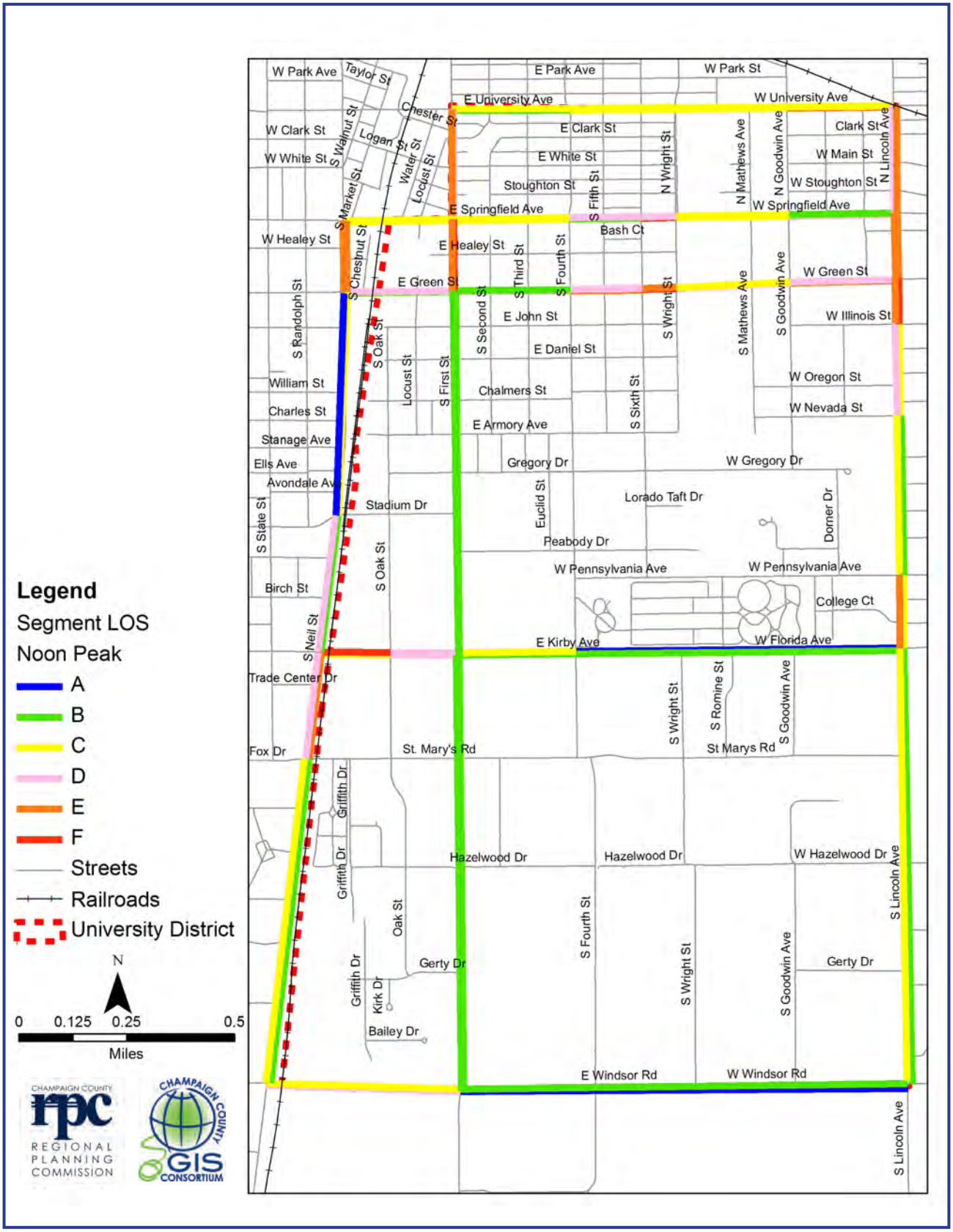


Figure 3.19: Segment LOS during Noon Peak Periods

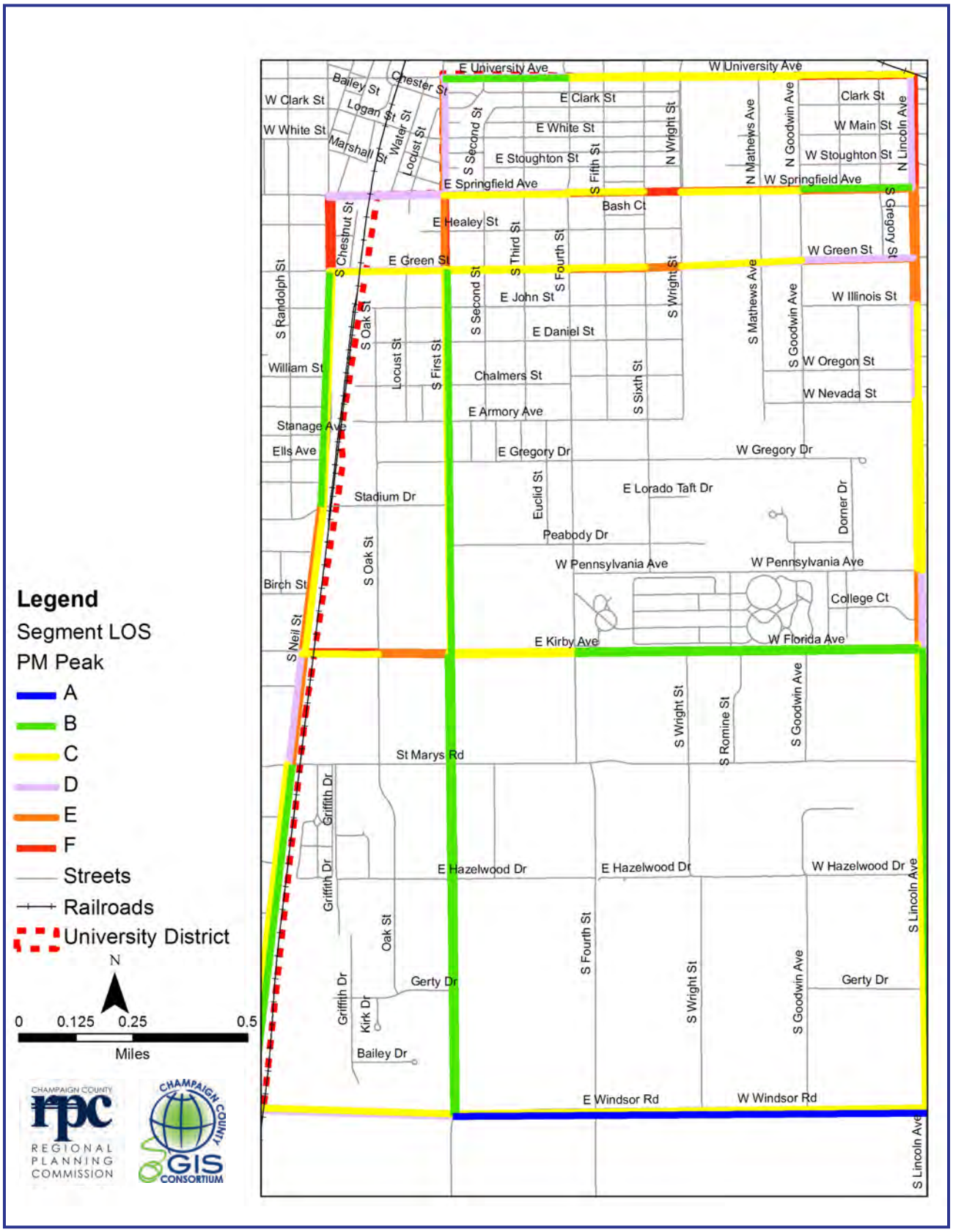


Figure 3.20: Segment LOS during PM Peak Periods

3.5 Pedestrians and Bicycle Facilities

In a campus environment, the mobility and safety of pedestrians and bicyclists is a key concern. As enrollment at the University continues to grow, and parking availability shrinks, the need for direct and efficient connections for pedestrians and bicyclists will increase. Field observations show a high concentration of pedestrians and bicyclists in the University District, and this number is expected to increase over time. These factors make it important to review the existing facilities provided for pedestrians and bicyclists in order to offer recommendations for future improvements.

As can be seen in Figure 3.21 and Figure 3.22, most of the streets within the study area have sidewalks on both sides, which enable safe pedestrian travel. The widths of the sidewalks range from 4′ to 10′. Parkway buffers between the roadway and sidewalk are present along all segments in the study area, and the range of widths is 2′ to 14′. The buffers are made up of grass and/or concrete, and contain parking meters where there is on-street parking. For most segments, the overall quality of sidewalks in the study area is good, with some portions that have cracking.

The majority of campus bike facilities within the University District are UIUC bike paths, with some on-street bike lanes and other shared-use paths (sidepaths). The UIUC bike paths are off-street paved dedicated bike paths with dashed striping down the center to mark bidirectional traffic. The widths of these single-use bike paths range from 5′ to 8′, while the widths of the on-street bike lanes range from 4′ to 6′, and those of the shared-use paths (sidepaths) range from 4′ to 9′. Also, the Boneyard Creek Trail is a 10′ off-street shared-use path between Green Street and Healey Street. Detailed information on the widths of the sidewalks, parkway buffers, bike lanes and the pedestrian and on-street bicycle volumes can be found in the Appendix.

3.6 Crash Analysis

Intersection and segment crashes from 2006 to 2010 were analyzed by the study team to identify existing safety and operational issues within the study area. The crash analysis also involved an examination of crashes involving pedestrians and bicyclists to determine if there are safety issues that cause higher crash frequencies for these modes of transportation. Crash data were obtained from the Illinois Department of Transportation's Division of Traffic Safety.

3.6.1 Crash Trends

Figure 3.23 shows the total number of crashes per year from 2006 to 2010 within the study area. The total crashes reported include both intersection crashes and mid-block crashes. The highest number of crashes occurred in 2007 while the lowest number of crashes occurred in 2010.

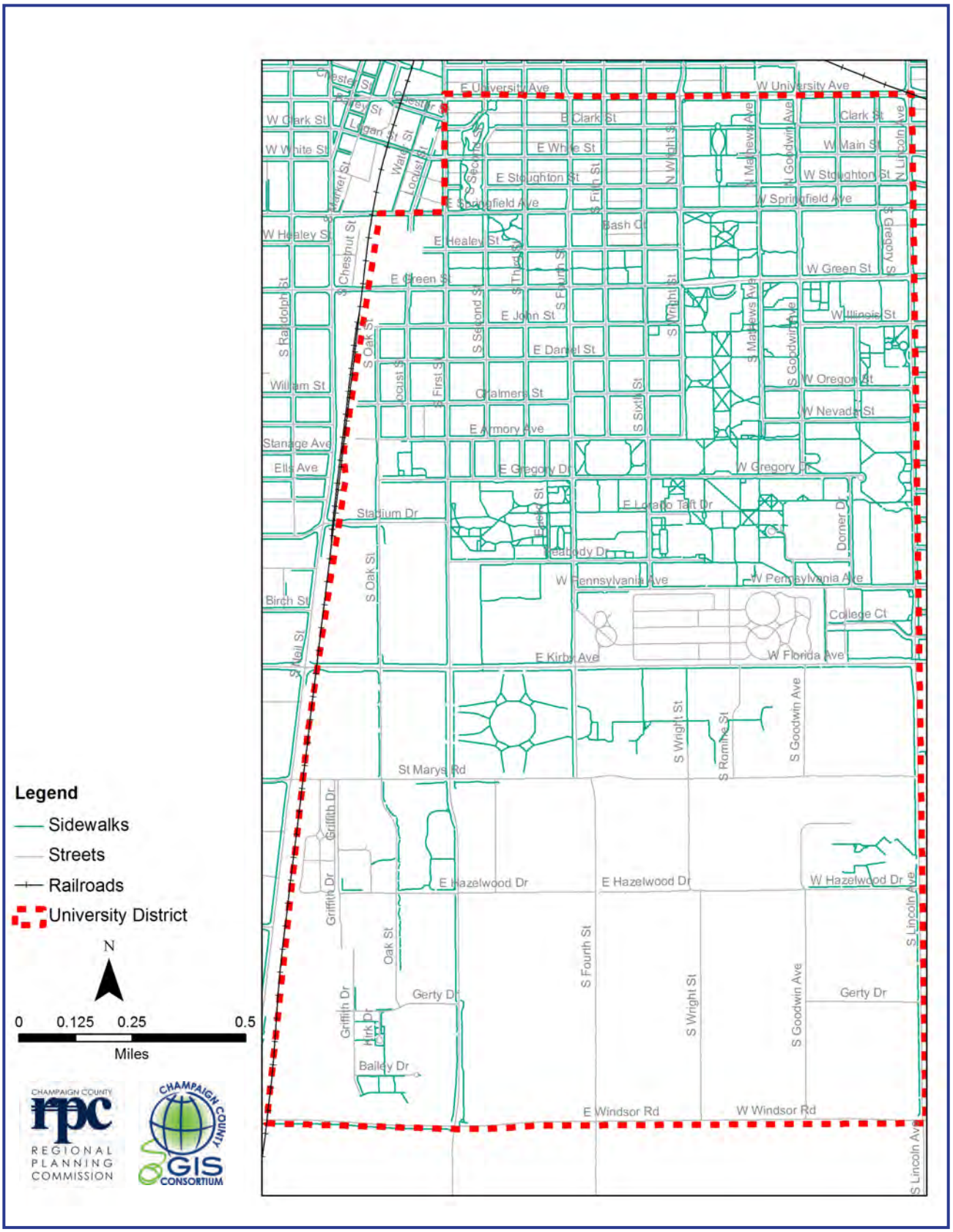


Figure 3.21: Pedestrian Pathways

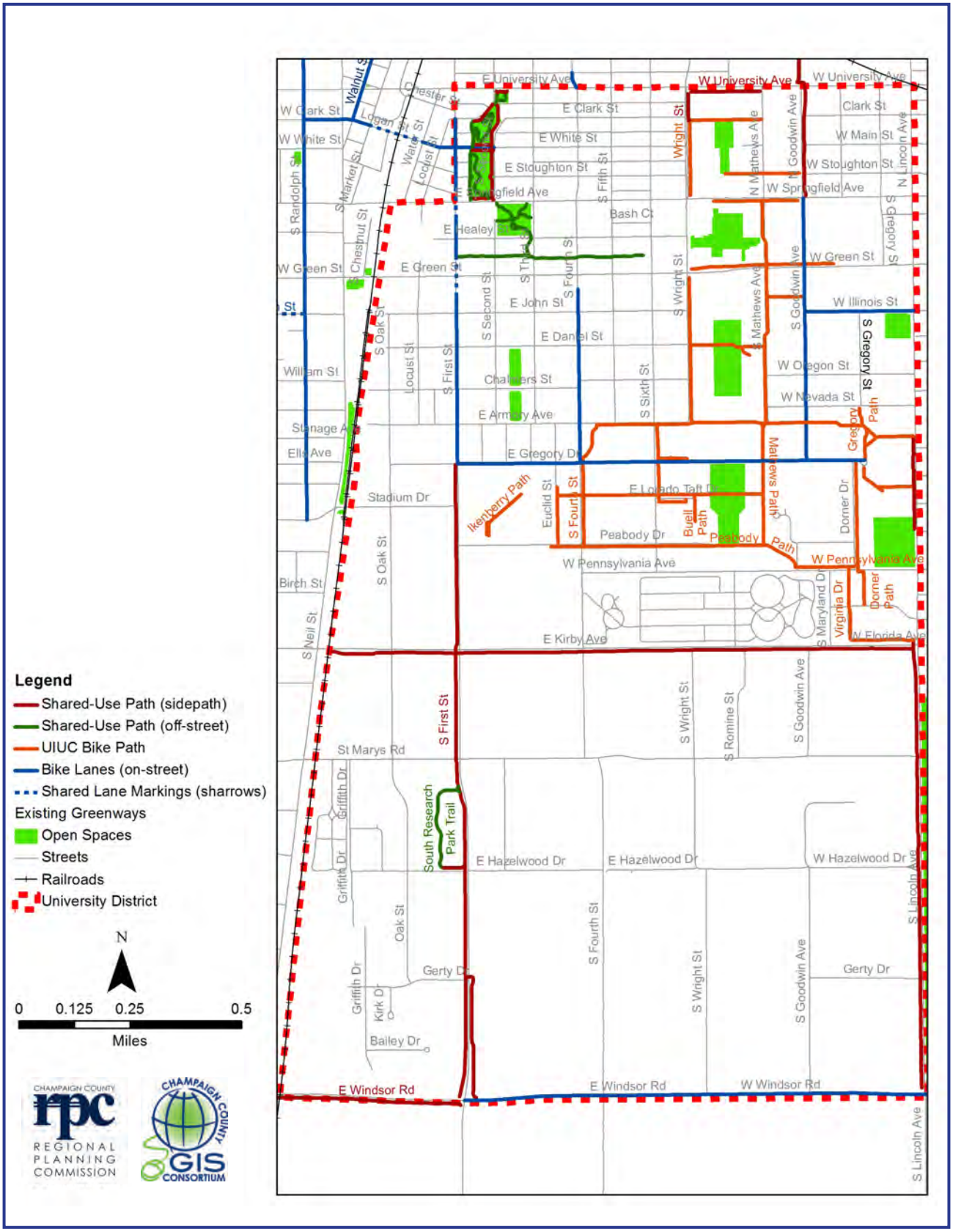


Figure 3.22: Bikeways

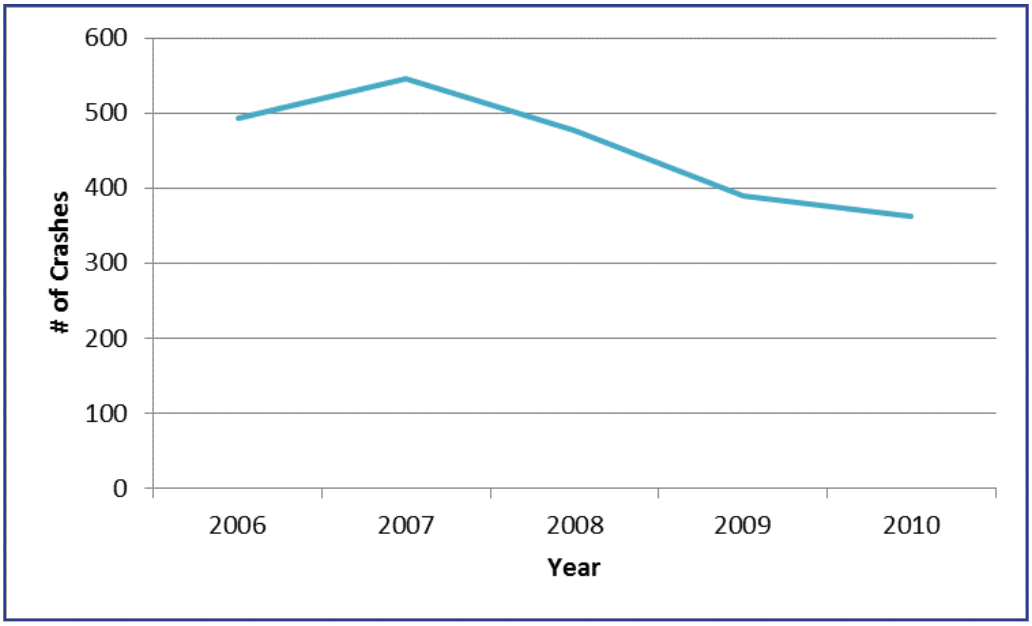


Figure 3.23: Crash Trends 2006 to 2010

3.6.2 Traffic Flow and Crash Frequency

Based on traffic crash data from 2006 to 2010, the study team identified the 30 intersections with the highest crash frequencies (Table 3.10). A regression analysis was performed to identify the role of peak hour entering traffic on the number of crashes at intersections based on the intersection control type and average daily traffic on different approaches of the intersection.

The regression analysis showed a strong correlation (coefficient value of 0.7) between peak hour vehicular traffic at intersections and the number of crashes. Figure 3.24 shows the line fit plot of the regression analysis. As shown in Figure 3.8, vehicular traffic growth within the University District's major corridors were negative and the overall number of traffic crashes within the District experienced a significant drop. The strong relationship established through the regression analysis between peak hour vehicular traffic and crash frequency at intersections helps to explain this trend.

Table 3.11: Top 30 Intersections with the Highest Crash Frequency

No.	Intersection	No. of Crashes (2006 to 2010)
1	Lincoln Ave./University Ave.	86
2	First St./Green St.	59
3	Fourth St./University Ave.	49
4	Lincoln Ave./Green St.	39
5	First St./Springfield Ave.	35
6	Fourth St./Springfield Ave.	33
7	First St./Kirby Ave.	29
8	First St./University Ave.	25
9	Lincoln Ave./Florida Ave.	25
10	Lincoln Ave./Pennsylvania Ave.	24
11	Lincoln Ave./Springfield Ave.	24
12	Fourth St./Green St.	23
13	Fourth St./Kirby Ave.	23
14	Goodwin Ave./Green St.	22
15	Lincoln Ave./Main St.	22
16	Wright St./University Ave.	22
17	Lincoln Ave./Nevada St.	21
18	Sixth St./Springfield Ave.	20
19	Goodwin Ave./Springfield Ave.	19
20	Wright St./Springfield Ave.	18
21	Lincoln Ave./Illinois St.	17
22	Mathews Ave./Springfield Ave.	15
23	Sixth St./Green St.	14
24	First St./Chalmers St.	13
25	Goodwin Ave./University Ave.	13
26	First St./Daniel St.	12
27	Fourth St./Gregory Dr.	11
28	First St./Armory St.	10
29	Fourth St./Peabody Dr.	10
30	Fourth St./White St.	10

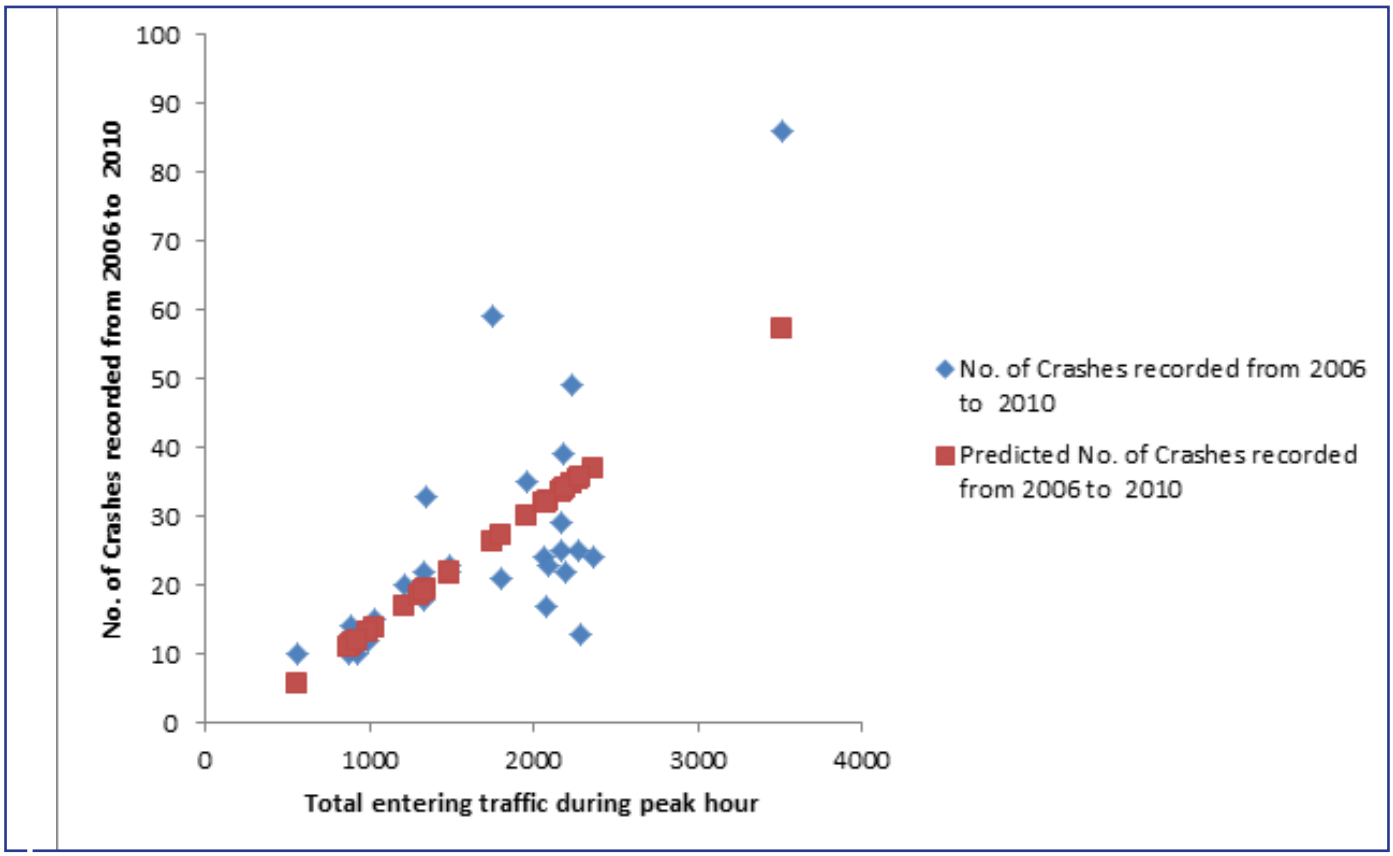


Figure 3.24: Intersection Traffic Crash Regression Analysis Line Fit Plot

3.6.3 Crash Severity

Crash severity levels are generally classified into three different categories:

- Fatal Crash
- Injury Crash
- Property Damage Only (PDO)

The Illinois Department of Transportation's (IDOT) Division of Traffic Safety categorizes injury crashes into three severity categories: A-Injury, B-Injury and C-Injury. A-Injury is the most severe and C-Injury is the least severe. Table 3.11 shows the total number of crashes per year within the University District from 2006 to 2010 with an analysis of severe and fatal crashes.

Table 3.12: Total Crashes and Crash Severity

Year	Crashes				Fatalities	Injuries
	Total	A-Injury	B-Injury	C-Injury		
2006	493	19	48	33	3	124
2007	546	16	54	35	0	131
2008	477	15	31	28	0	93
2009	390	17	37	37	1	100
2010	363	16	33	30	0	95
Total	**2,269**	**83**	**203**	**163**	**4**	**543**

Figure 3.25 is a graphical representation of the severe and fatal crashes within the University area. The locations for fatal and severe crashes from 2006 to 2010 can be seen in Figure 3.26.

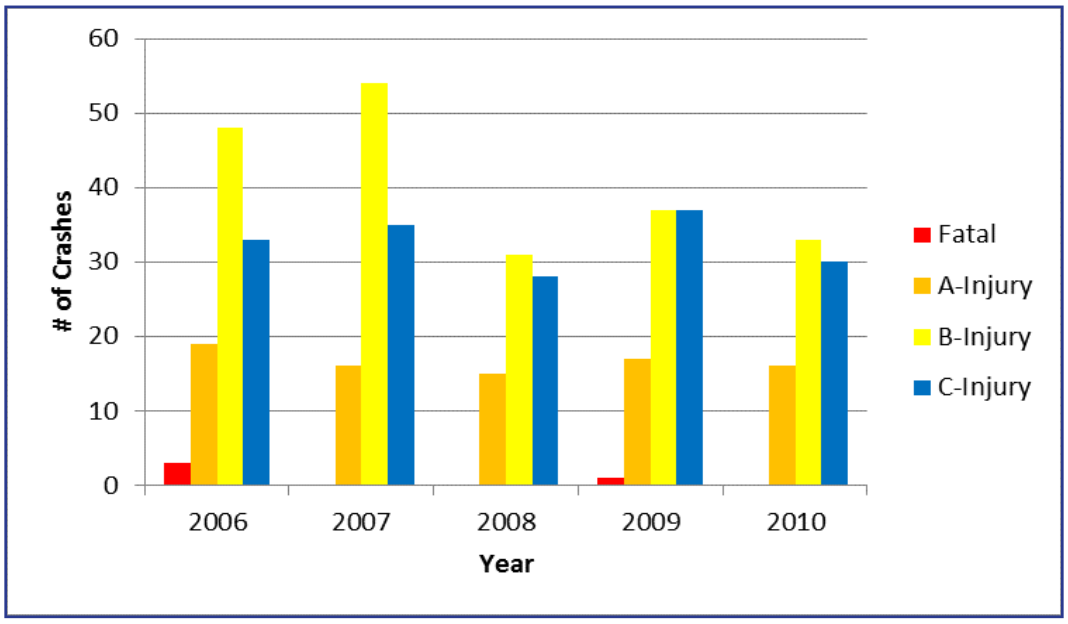


Figure 3.25: Total Fatal and Severe Crashes

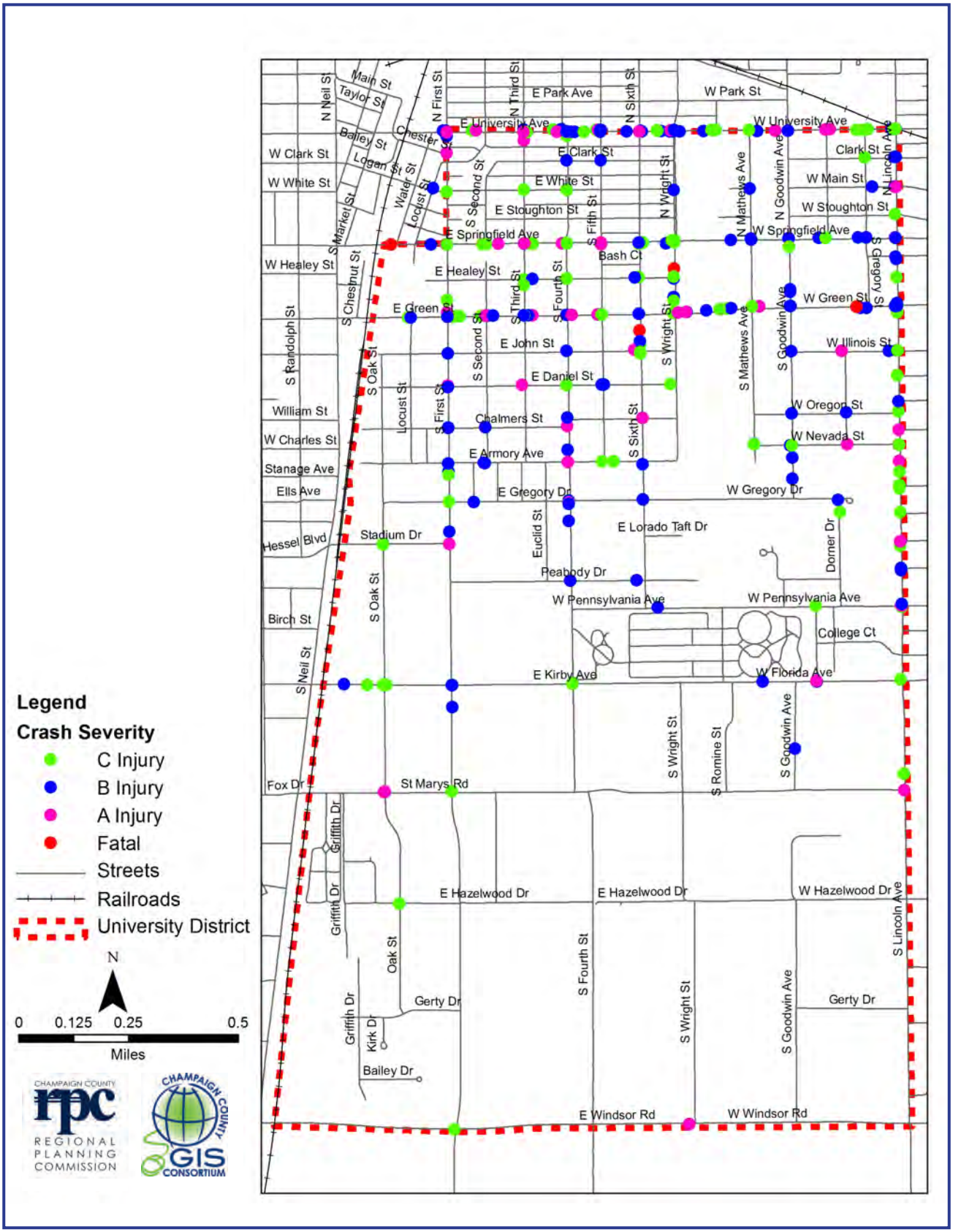


Figure 3.26: Fatal and Severe Crashes within the University District from 2006-2010

Intersections are major points of conflicts and it was noted that a major proportion of the total crashes that occurred within the University District were intersection crashes. 1,317 crashes of the total 2,269 crashes that occurred from 2006 to 2010 within the University District were intersection crashes as shown in Figure 3.27.

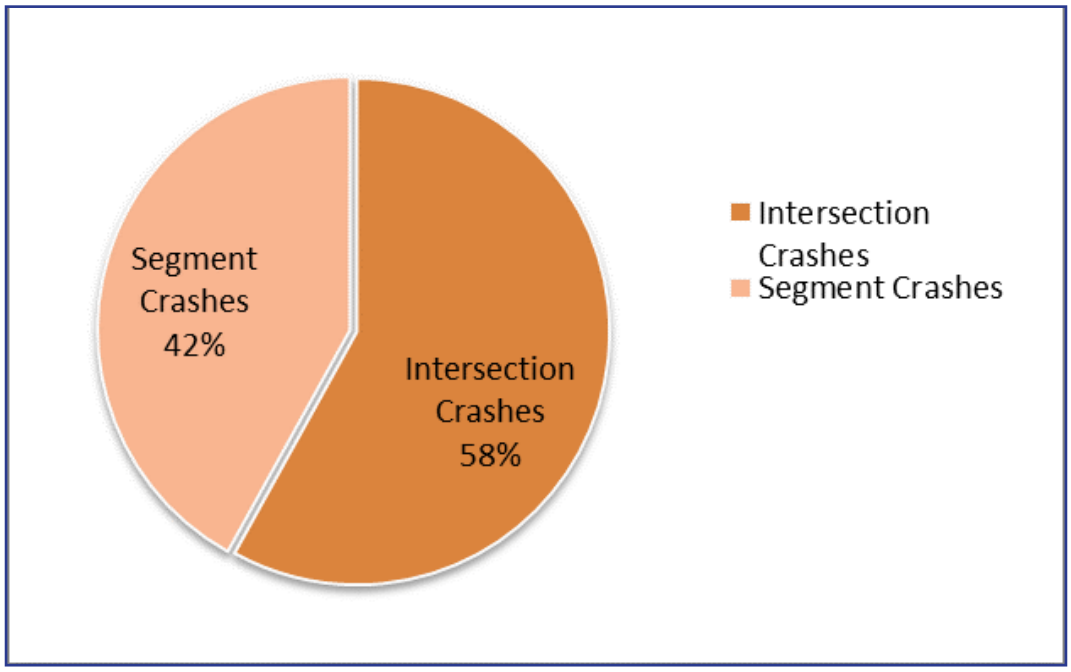


Figure 3.27: Intersection and Segment Crashes

The highest number of crashes from 2006 to 2010 occurred at the intersection of Lincoln Avenue and University Avenue, followed by intersections on the Neil Street corridor, First Street, Lincoln Avenue, Springfield Avenue, and Green Street (Table 3.12 and Figure 3.28).

Table 3.13: Ten Intersections with the Highest Number of Crashes

No.	Intersection Name	No. of Crashes recorded from 2006 to 2010
1	Lincoln Ave./University Ave.	86
2	First St./Green St.	59
3	Fourth St./University Ave.	49
4	Lincoln Ave./Green St.	39
5	First St./Springfield Ave.	35
6	Fourth St./Springfield Ave.	33
7	First St./Kirby Ave.	29
8	First St./University Ave.	25
9	Lincoln Ave./Florida Ave.	25
10	Lincoln Ave./Pennsylvania Ave.	24

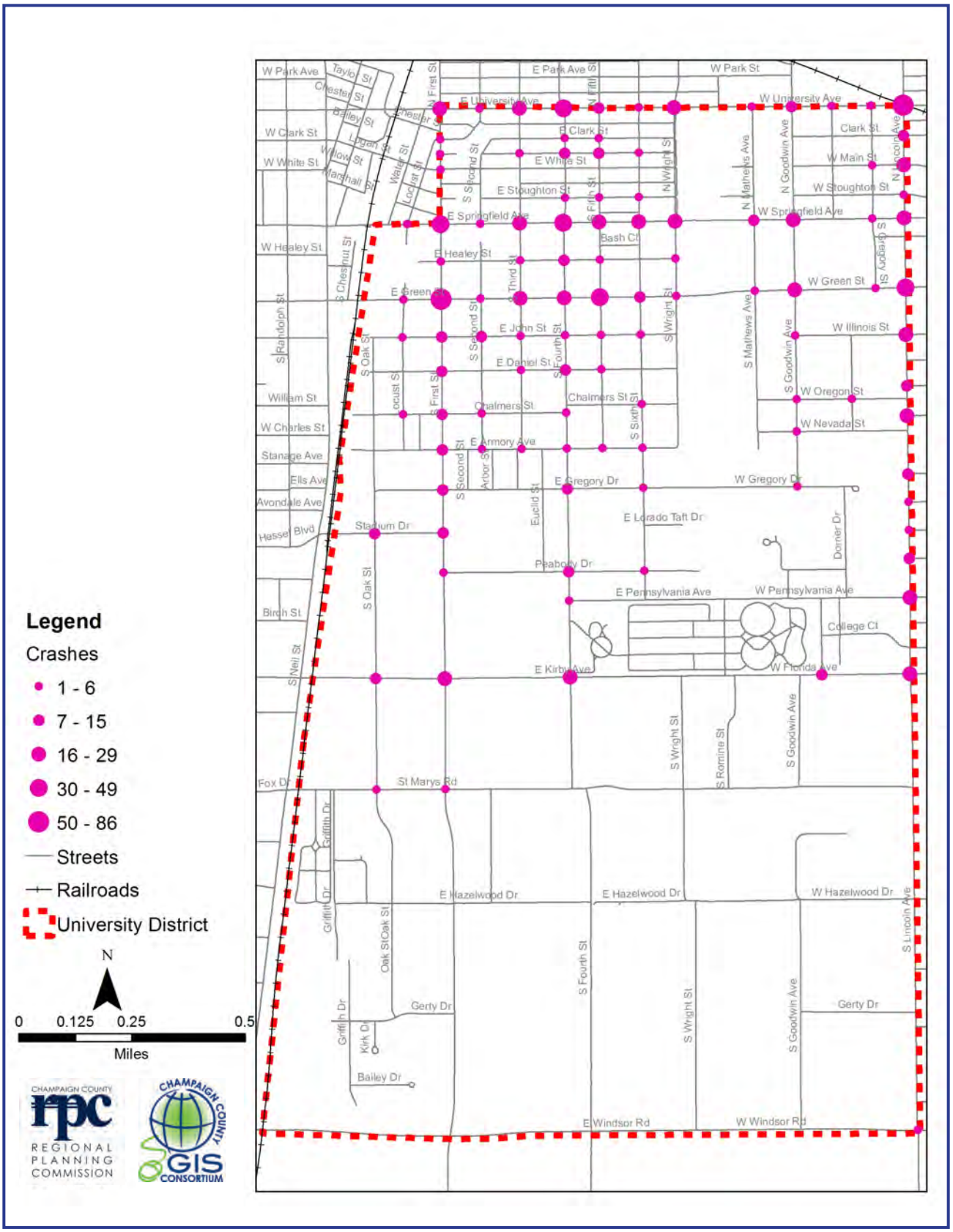


Figure 3.28: Intersection Crash Locations

The locations for the segment crashes that occurred from 2006 to 2010 within the University District can be seen in Figure 3.29. Most crashes occurred along Green Street, which is also the busiest street on campus. Other crashes are clustered along Springfield Avenue, Lincoln Avenue, Sixth Street, Fourth Street and University Avenue.

3.6.4 Transit Crashes

Crash data analysis showed that the majority of the transit crashes were Property Damage Only and caused no fatalities during the 5 year data analysis period. A majority of transit crashes have occurred along the White Street, Sixth Street, and Green Street corridors where there is significant transit bus activity. Figure 3.30 shows the locations and severity of the transit crashes.

3.6.5 Pedestrian and Bicycle Crashes

Between 2006 and 2010, there were 162 crashes involving either a pedestrian or bicyclist. The pedestrian and bicycle crash trends in the University District over the study period are shown in Figure 3.31.

A maximum of 16 pedestrian crashes was recorded in 2006 while 2010 had the least number of crashes. Bicycle crashes exceeded the number of pedestrian crashes each year and the highest number of bicycle crashes was recorded in 2009.

Table 3.13 summarizes the occurrence of pedestrian and bicycle crashes by year along with crash severity information.

Table 3.14: Pedestrian and Bicycle Crash Severity

Year	Crashes				Fatalities	Total Injuries
	Total	A-Injury	B-Injury	C-Injury		
2006	34	8	18	8	0	36
2007	31	4	17	9	0	32
2008	30	6	15	6	0	27
2009	36	8	17	9	1	34
2010	31	5	16	9	0	30
Total	**162**	**31**	**83**	**41**	**1**	**159**

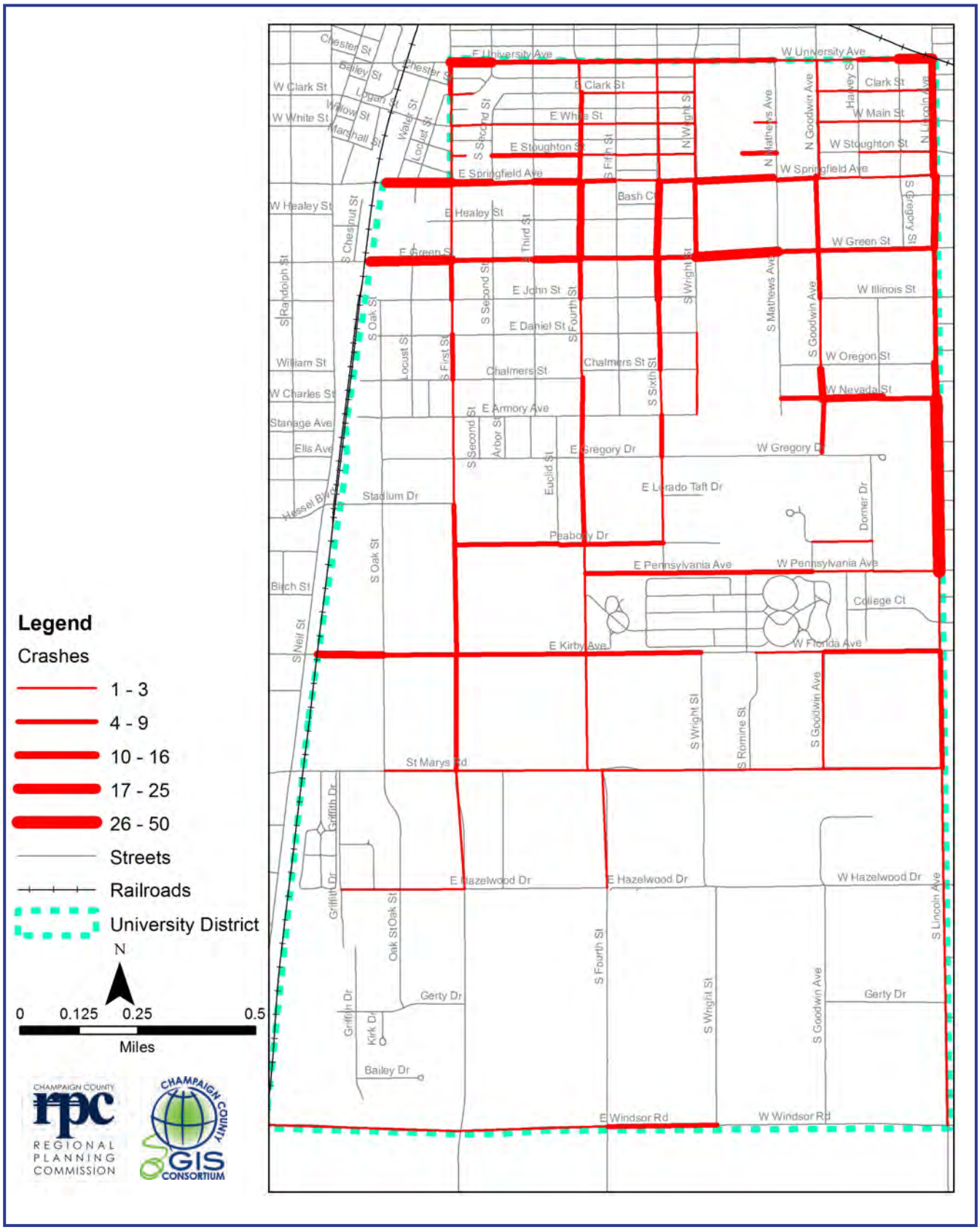


Figure 3.29: Segment Crashes

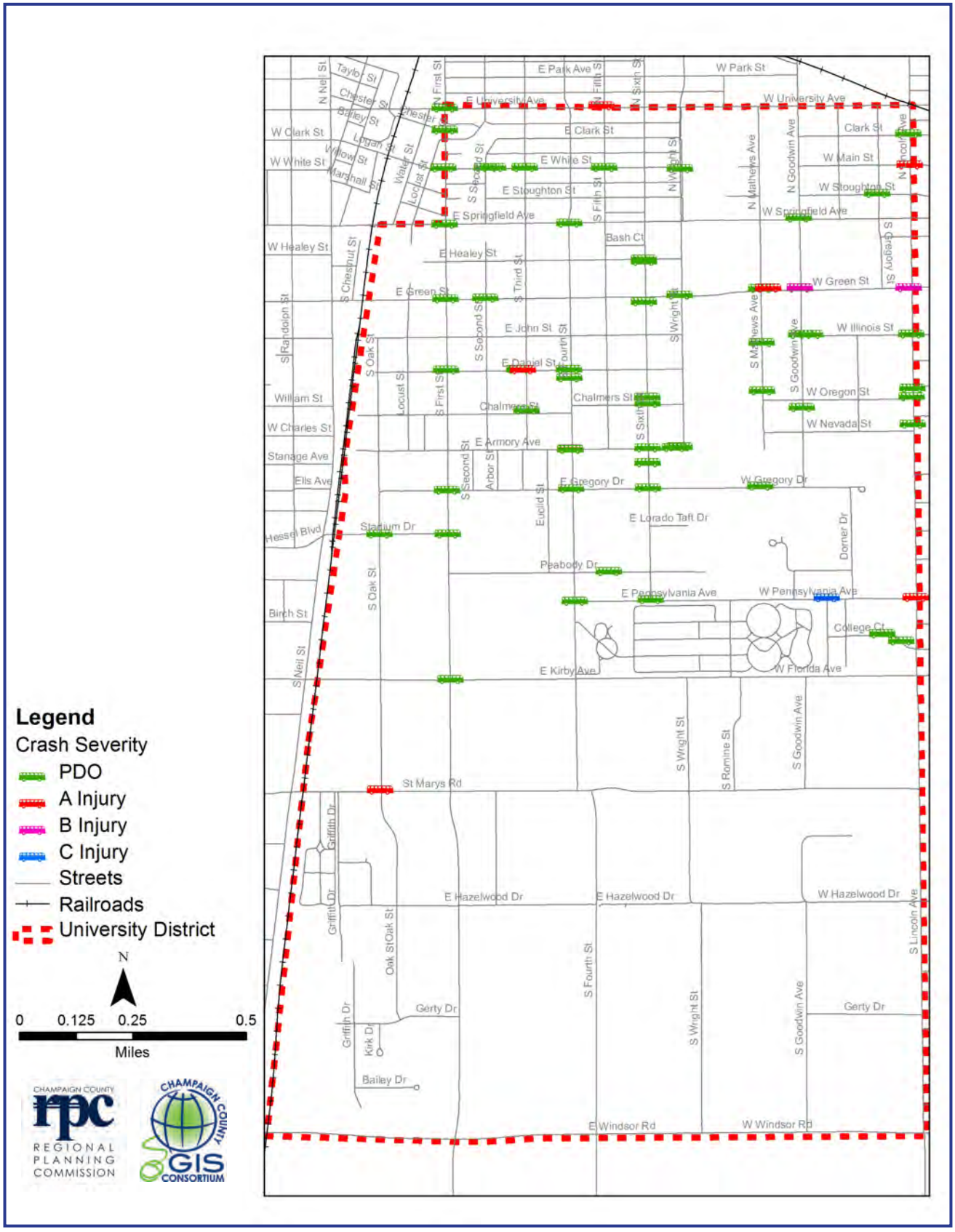


Figure 3.30: Transit Crashes

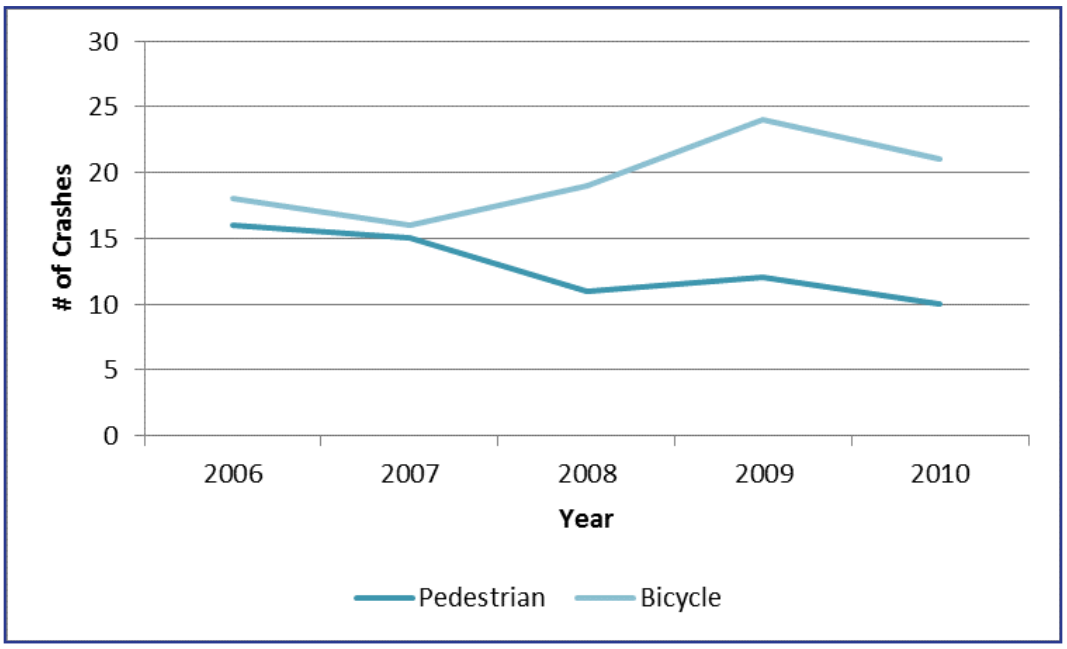


Figure 3.31: Pedestrian and Bicycle Crash Trends

Figure 3.32 is a graphical representation of Table 3.13.

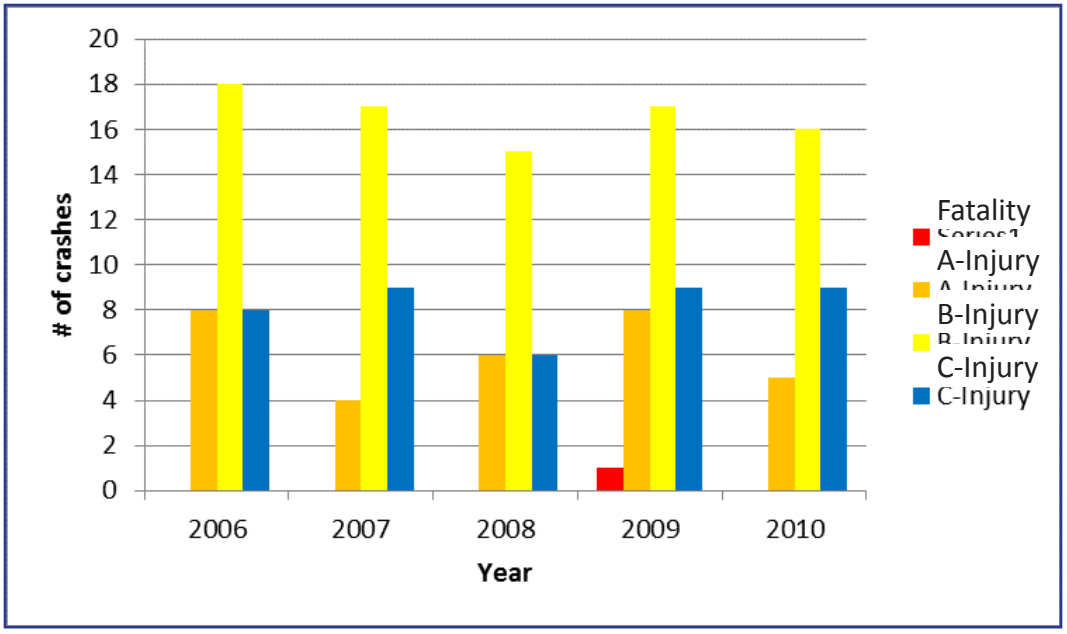


Figure 3.32: Pedestrian and Bicycle Crash Severity

Out of the 162 crashes, 108 crashes occurred at intersections along the Green Street, Springfield Avenue, Sixth Street, Lincoln Avenue and Fourth Street corridors, which is not surprising given the high pedestrian and bicycle crossing volumes at those intersections. The pedestrian and bicycle crash locations from 2006 to 2010 within the University District can be seen in Figure 3.33 and Figure 3.34 respectively.

Figure 3.35 shows all the non-automobile crash locations along with their severity. The majority of the locations are intersections along Green Street, Springfield Avenue, Lincoln Avenue, University Avenue, Fourth Street, and Sixth Street. The Lincoln Avenue corridor had the highest number of crashes between 2006 and 2010.

3.6.6 Crash Types

Many safety concerns are often revealed when examining the details of the intersection and mid-block crash types and patterns. The patterns that arise from the crash data can lead to recommendations that improve the safety of all travelers along the corridor, regardless of mode choice. Crash types at intersections can reveal problem areas in safety resulting from poor sight lines, sight distance, signal timing, or signage. Of the 1,317 crashes that occurred at the study intersections, “turning,” “rear end,” and “angle” crash types were the most prevalent at 26%, 32% and 26%, respectively (Figure 3.36).

Parked motor vehicle and rear end crashes were the predominant crash patterns for mid-block crashes within the study area, making up 27% and 29% of total crashes, respectively (Figure 3.37).

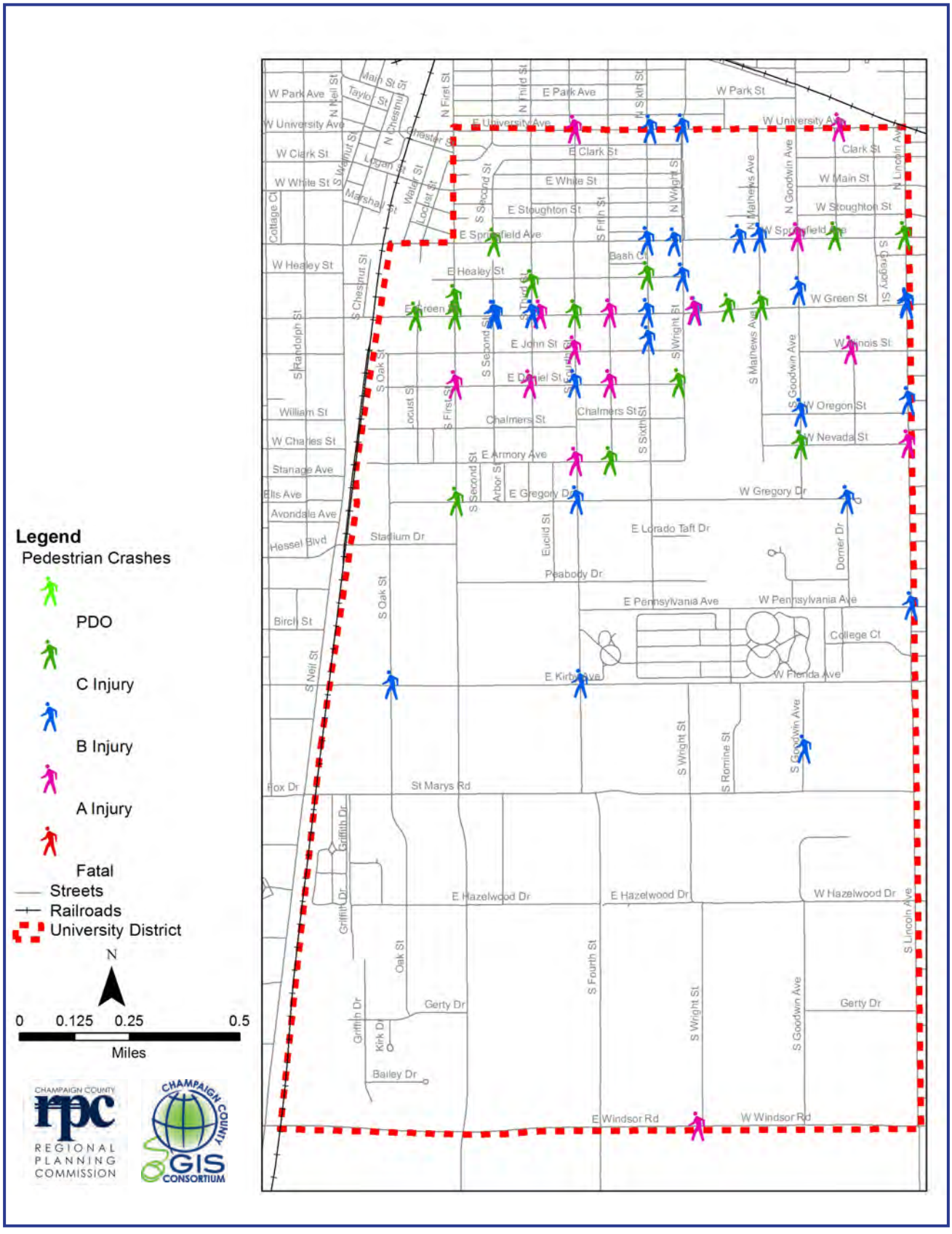


Figure 3.33: Pedestrian Crash Locations

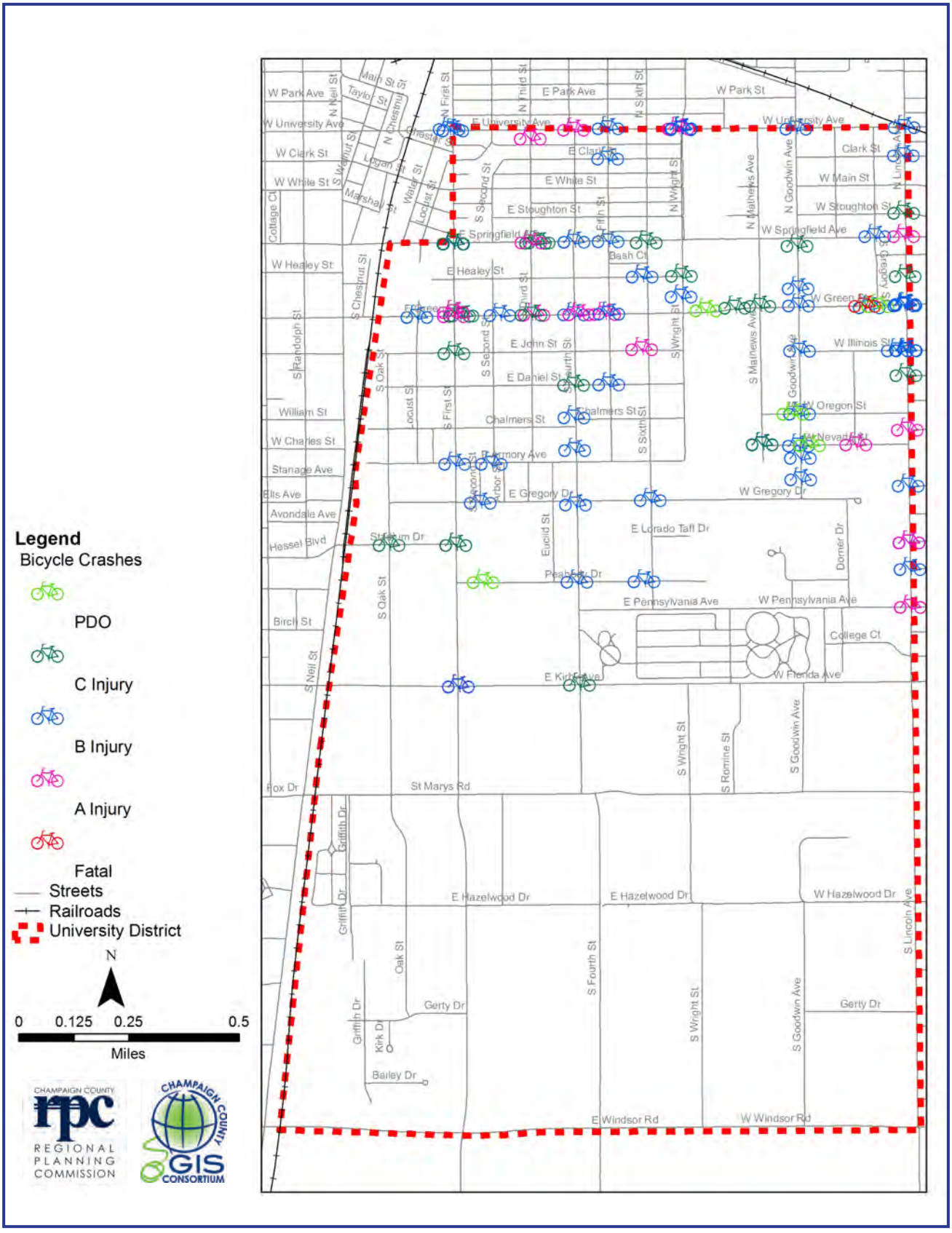


Figure 3.34: Bicycle Crash Locations

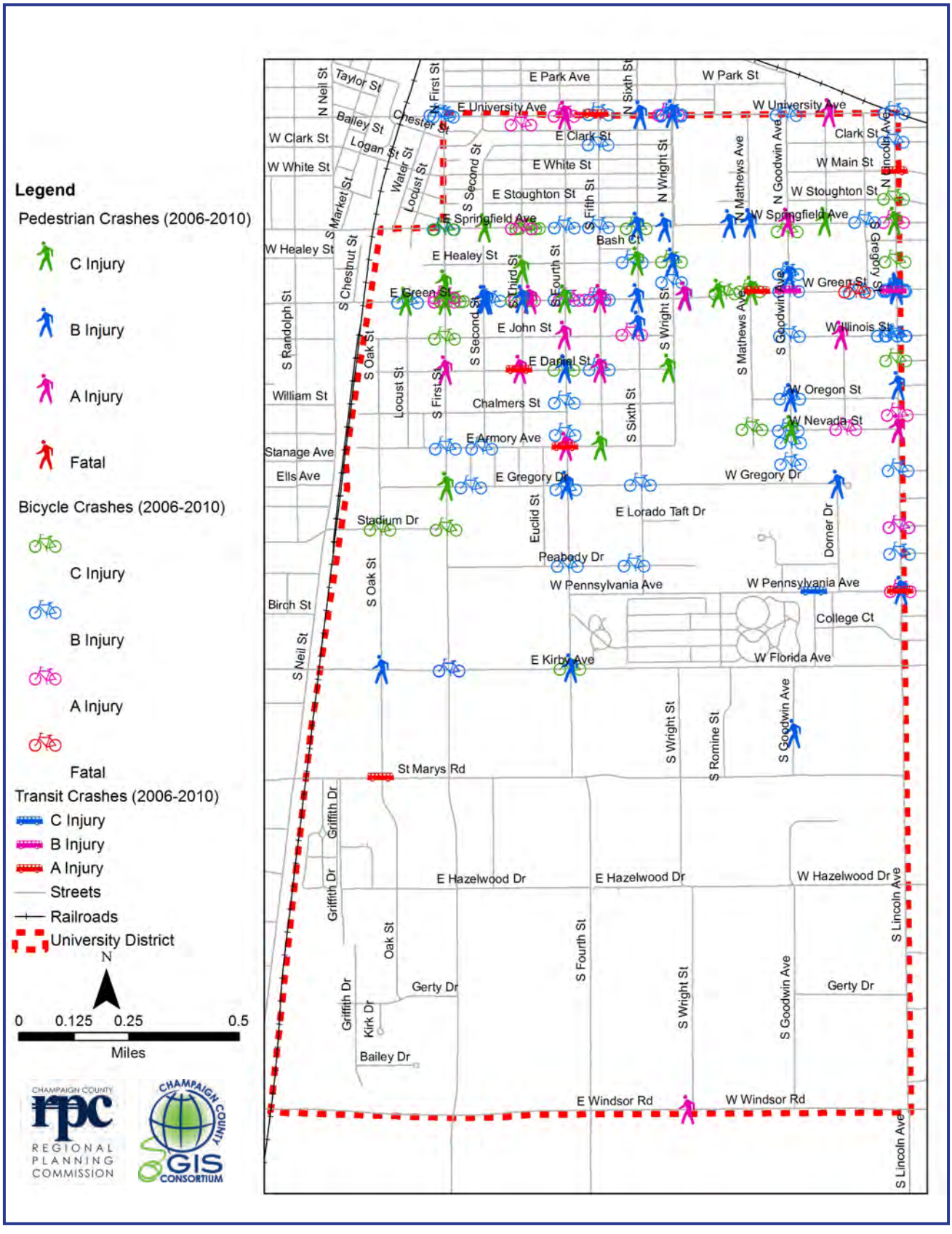


Figure 3.35: Non-Auto Crashes in the Study Area

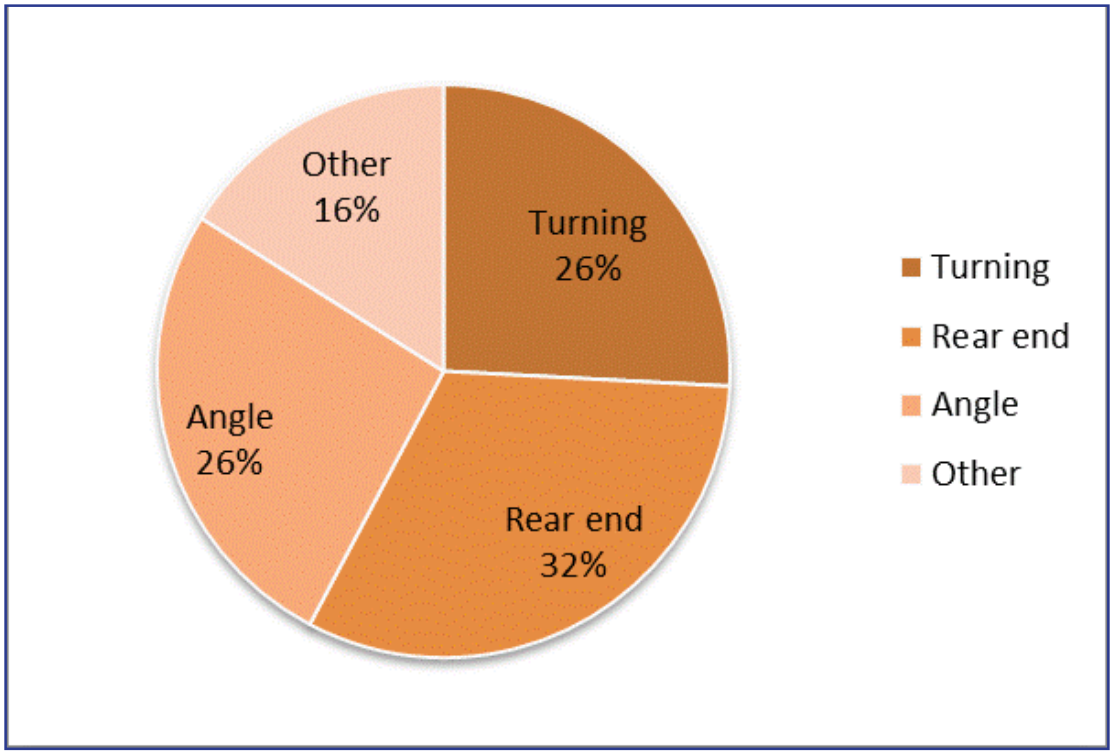


Figure 3.36: Intersection Crash Types

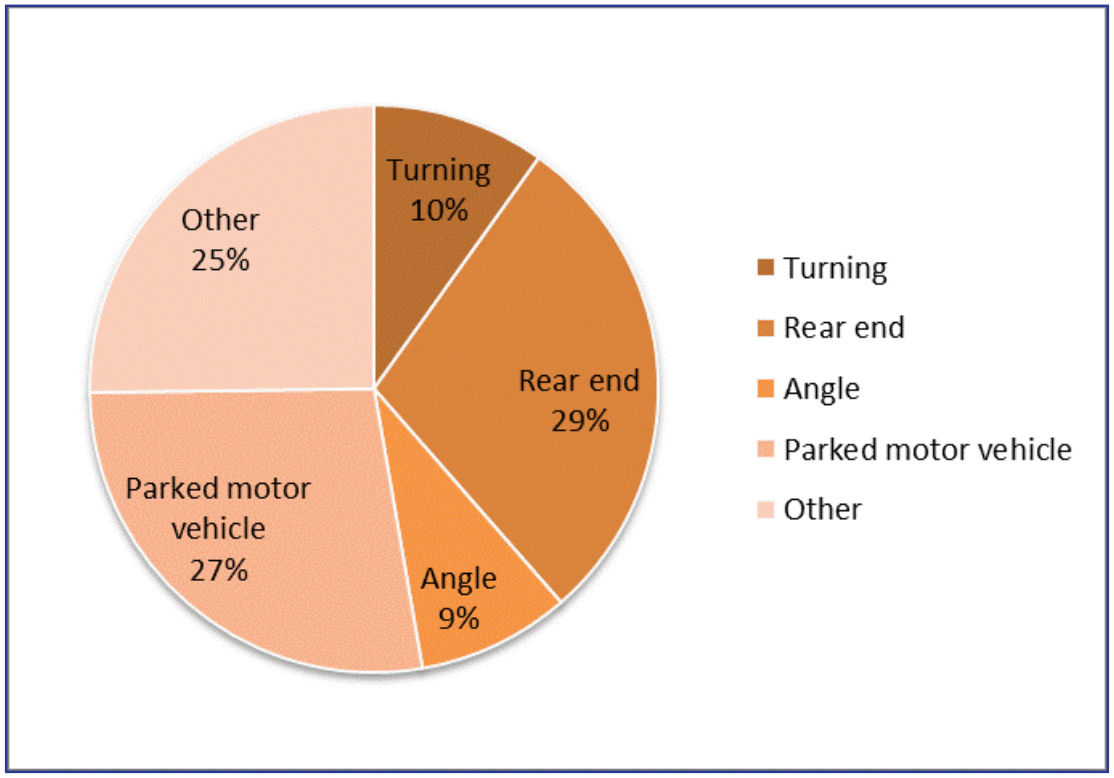


Figure 3.37: Mid-Block Crash Types

3.6.7 Road Surface Conditions

Some crashes, whether at an intersection or along a roadway segment, can be attributed to the road surface conditions. Crash conditions are reported road condition categories of Dry, Wet, Snow/Slush, Ice, Sand/Mud/Dirt or unknown. Table 3.14 and Table 3.15 show the road surface conditions for both intersection and mid-block crashes from 2006 to 2010. More than 70% of all crashes at both intersections and roadway segments occurred during dry pavement surface conditions, which is typical of crash data in the Champaign-Urbana area. Drivers tend to travel at higher speeds when roadway conditions are dry, and more people travel when weather conditions are optimal than during wet, snowy or icy conditions.

Table 3.15: Road Surface Conditions for Intersection Crashes

Year	Pavement Surface					
	Dry		Wet		Snow/Slush	
	Num	%	Num	%	Num	%
2006	205	75	67	25	1	0
2007	201	67	75	25	23	8
2008	192	72	58	22	17	6
2009	166	73	51	23	9	4
2010	156	77	31	15	15	7
Total	**920**	**73**	**282**	**22**	**65**	**5**

Table 3.16: Road Surface Conditions for Mid-block Crashes

Year	Pavement Surface					
	Dry		Wet		Snow/Slush	
	Num	%	Num	%	Num	%
2006	148	82	32	18	1	1
2007	163	75	31	14	23	11
2008	145	76	33	17	12	6
2009	106	68	38	24	13	8
2010	109	74	21	14	17	12
Total	**671**	**75**	**155**	**17**	**66**	**7**

3.6.8 Roadway Lighting Conditions

Roadway lighting conditions and driver visibility can severely affect the number of crashes that occur within an area. Crashes are reported in roadway lighting categories of Daylight, Dawn, Dusk, Darkness, and Darkness with Road Lighting. Figure 3.38 and Figure 3.39 show roadway lighting conditions for both intersection and mid-block crashes within the University District.

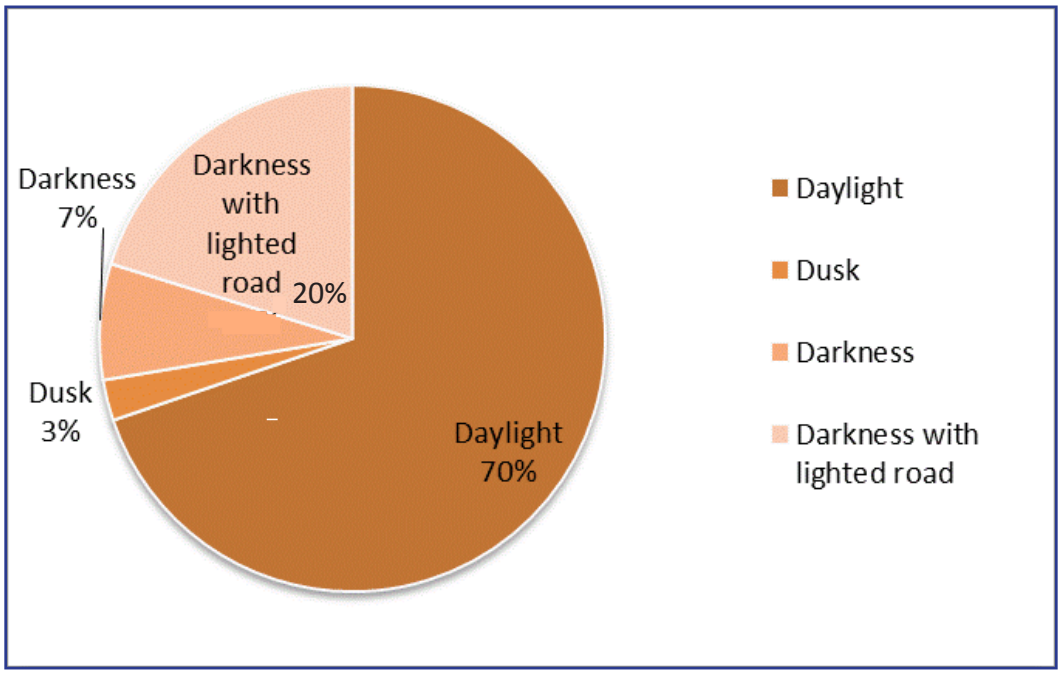


Figure 3.38: Roadway Lighting Conditions at Intersection Crashes

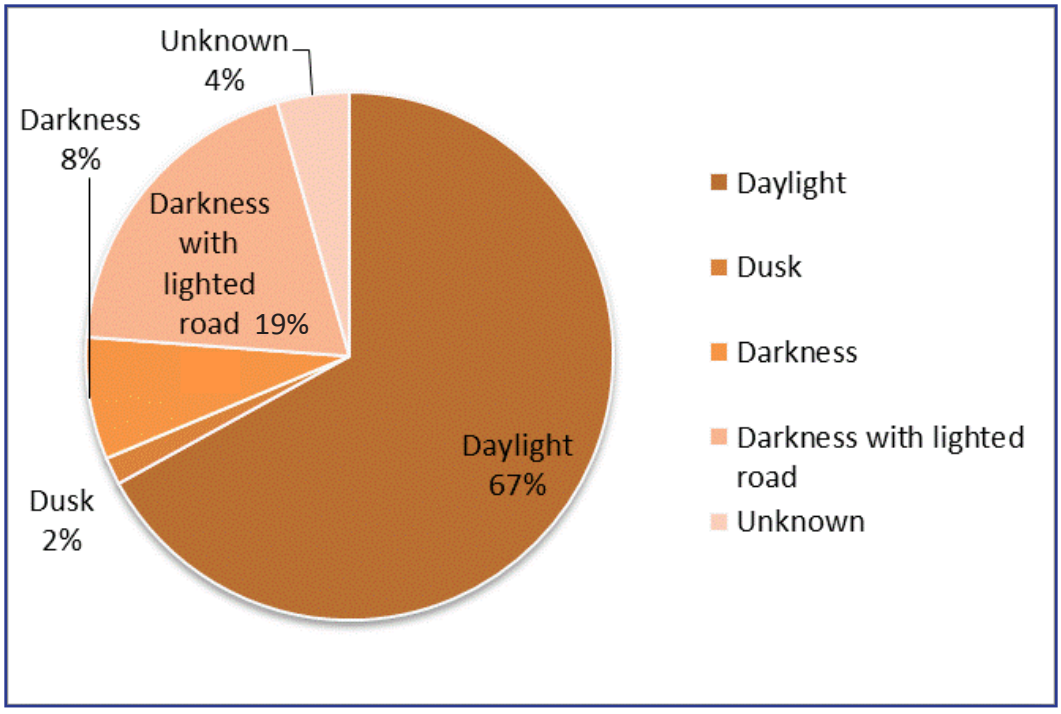


Figure 3.39: Roadway Lighting Conditions at Mid-block Crashes

More than 65% of all crashes in the study area occurred during daylight conditions, which is typical for Champaign-Urbana. Most travel, regardless of mode, takes place during daylight hours and this pattern increases the number of travelers in the corridor, thereby increasing the likelihood of crashes.

3.6.9 Corridor Crash Analysis

For the University District study area, seven major corridors based on daily traffic volumes and the total number of crashes reported have been identified and analyzed for crash trends for the years 2006 to 2011. Driver condition is a chief contributor to roadway crashes and hence an analysis of driver conditions is provided in this report. An analysis of the time of year of crashes also helps in understanding crash patterns. The months of August and September mark the beginning of the academic year, when college students return and new students who are unfamiliar with the campus start driving around the campus. This brings about a lot of traffic chaos and resulting crashes in the campus area. Also, the month of February tends to have a higher number of reported crashes because of the severe winter conditions.

I First Street Corridor Crashes

The First Street corridor is a high traffic volume corridor with Average Daily Traffic ranging from 5,700 to 8,700 for some roadway segments in 2011. First Street serves as a Minor Arterial with a posted speed limit ranging from 30-35 mph. Crash trends for the First Street corridor from 2006 to 2010 are shown in Figure 3.40. There were 86 crashes reported on the First Street corridor in 2007, which was the highest in the 5-year period.

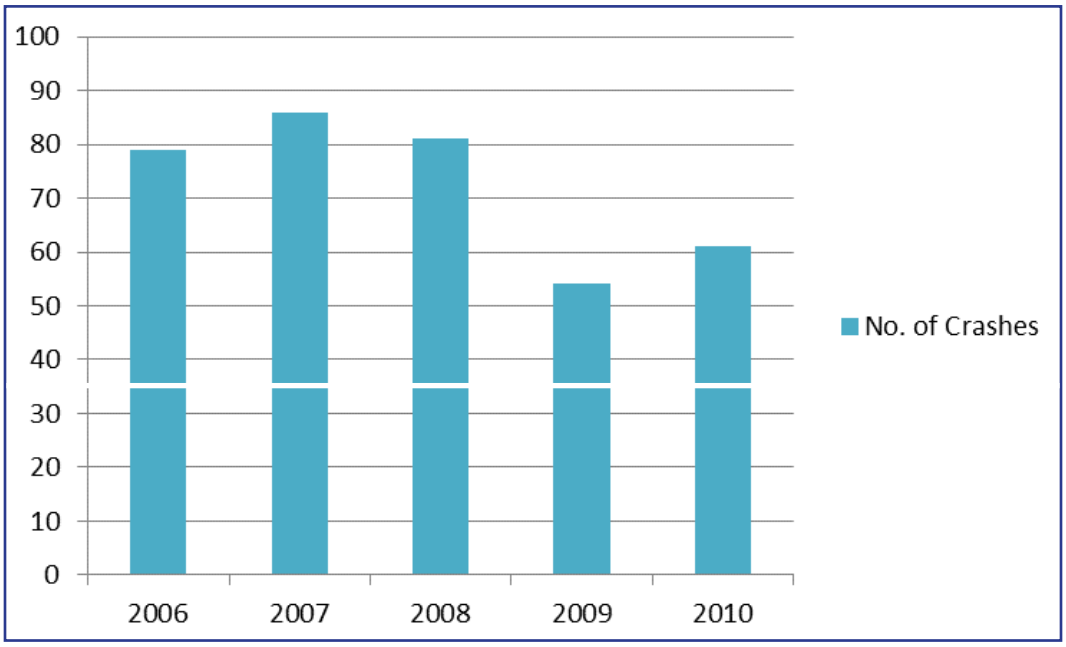


Figure 3.40: First Street Corridor Crashes by Year

Out of the total 196 crashes that occurred between 2008-2010, 4% of crashes were DUI crashes (i.e. when the drivers were driving under influence of alcohol or drugs). Driver condition analysis has been done for the years 2008-2010 (Figure 3.41).

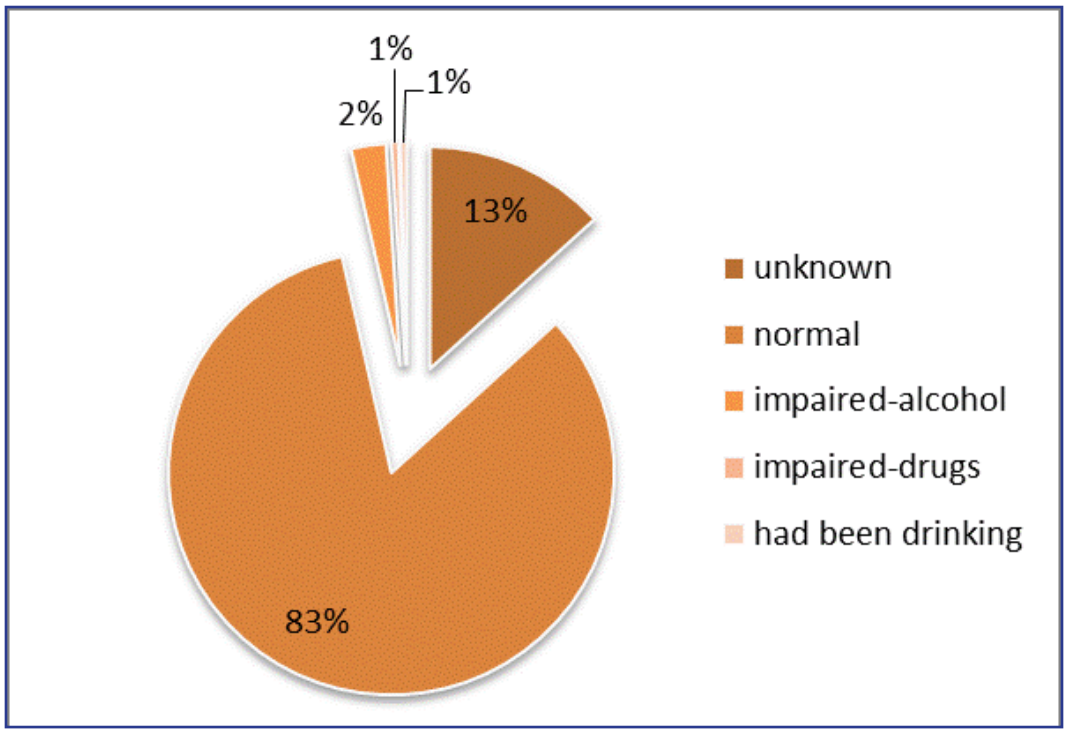


Figure 3.41: Driver Conditions – First Street Corridor Crashes

Out of the total 355 crashes that occurred on the First Street corridor from 2006 to 2010, the highest number of crashes were reported in the months of February (40 crashes) and September (37 crashes) as shown in Figure 3.42.

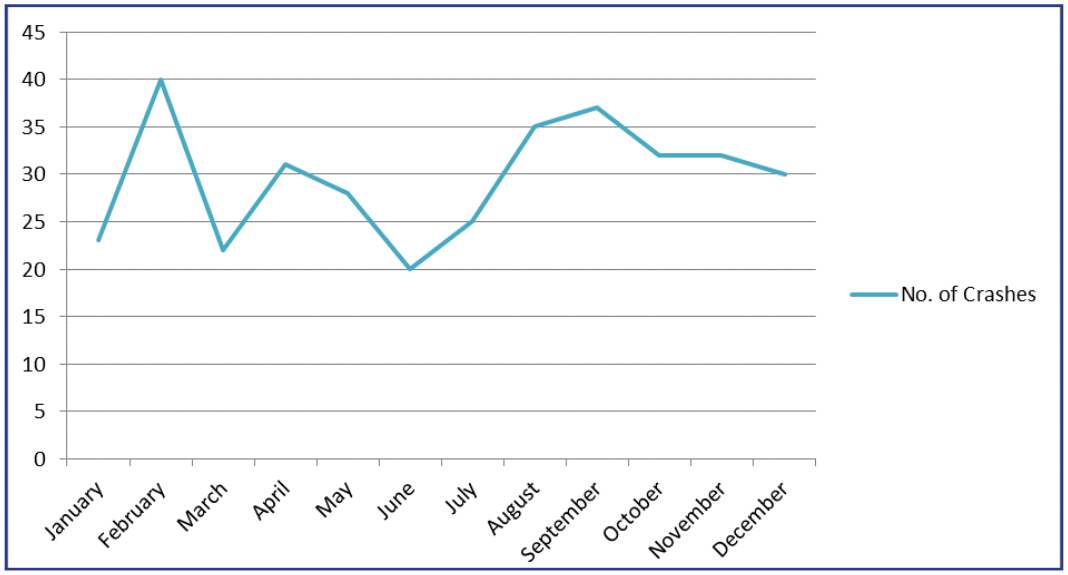


Figure 3.42: First Street Corridor Crashes - Time of Year

II Fourth Street Corridor Crashes

The Fourth Street corridor is surrounded by public and institutional buildings and hence attracts traffic from all modes of transportation. A number of intersections on Fourth Street have the highest pedestrian and bike volumes as will be explained in Section 3.6.9 of this report. Figure 3.43 shows the crash trends for the Fourth Street corridor for the years 2006 to 2010.

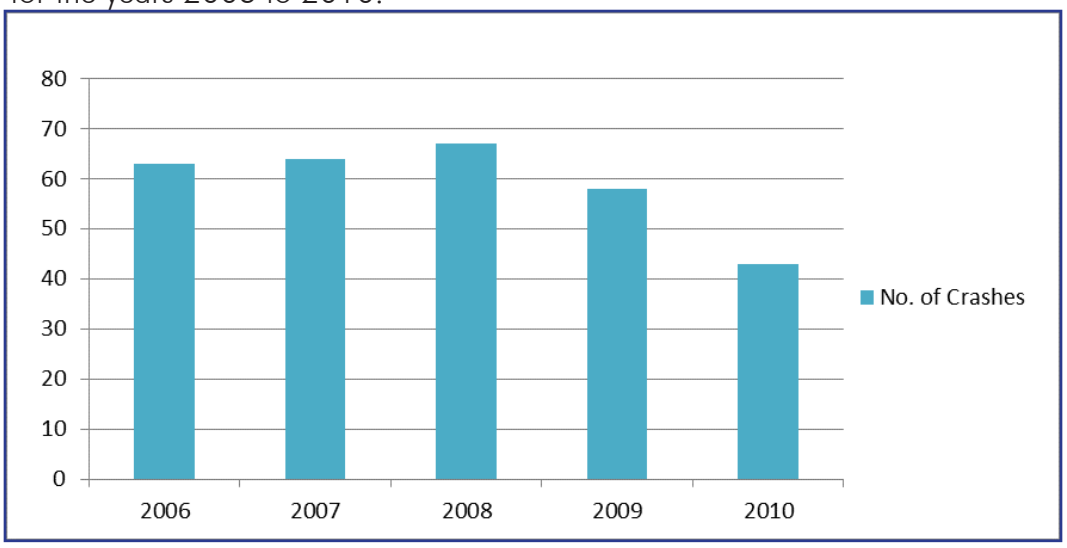


Figure 3.43: Fourth Street Corridor Crashes by Year

From 2008 to 2010, a total of 168 crashes occurred on the Fourth Street corridor. 5% of the total crashes were DUI crashes. Figure 3.44 shows the driver conditions during the crashes:

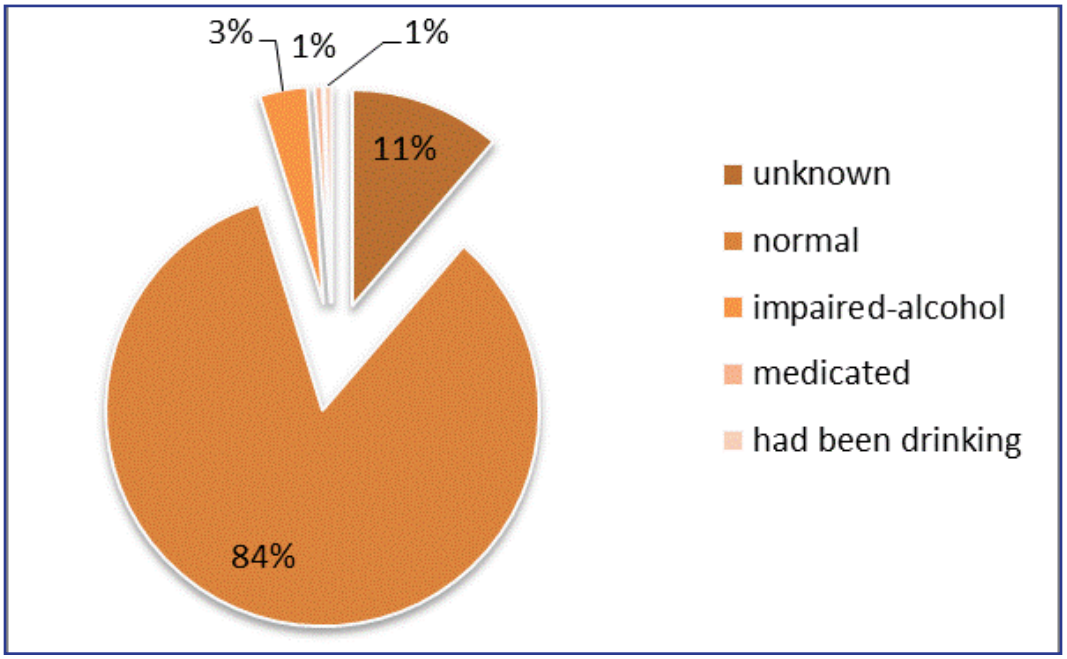


Figure 3.44: Driver Conditions – Fourth Street Corridor Crashes

A total of 295 crashes occurred on Fourth Street from 2006 to 2010, of which the most amount of crashes occurred in the months of October (37 crashes) and February (30 crashes) as shown in Figure 3.45.

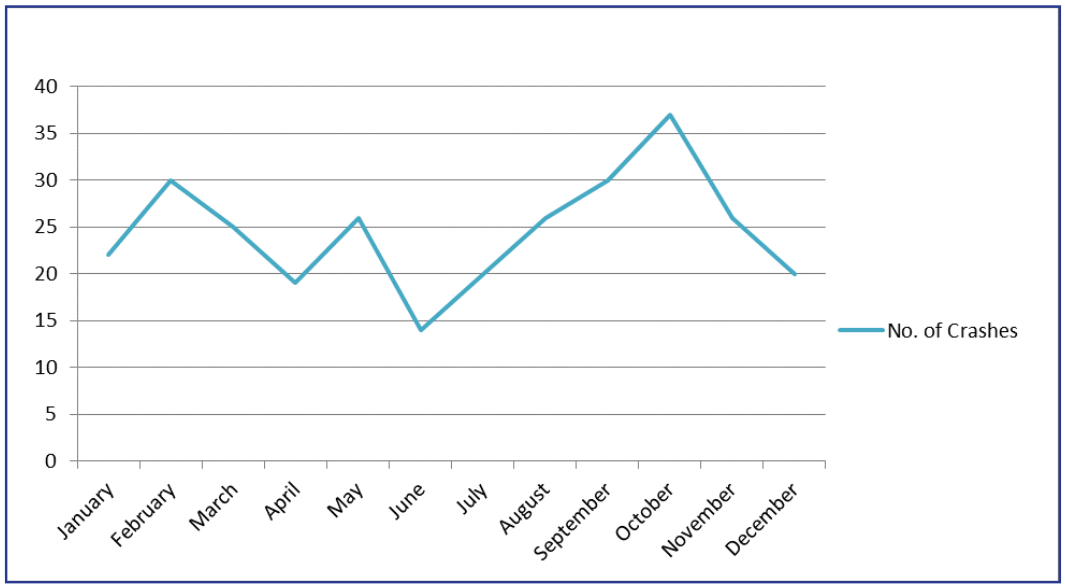


Figure 3.45: Fourth Street Corridor Crashes - Time of Year

III Lincoln Avenue Corridor Crashes

Lincoln Avenue is a major north-south corridor on campus that marks the east boundary of the University District area. Lincoln Avenue falls in the Zone 3 category of CATS Phase II where high priority is given to automobile traffic. Roadway segments and intersections on Lincoln Avenue have the highest number of crashes from 2006 to 2010 as shown in Figure 3.46.

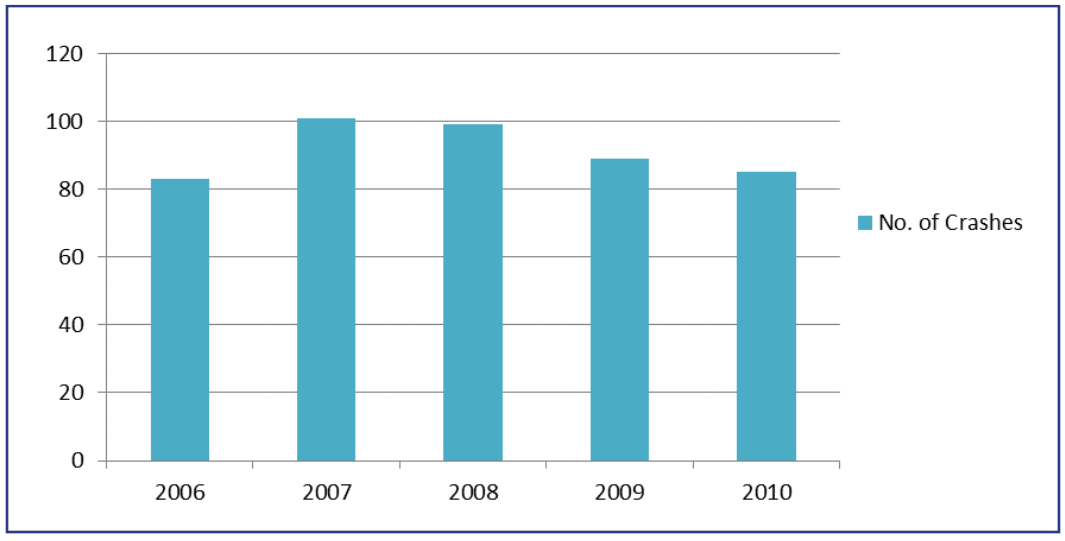


Figure 3.46: Lincoln Avenue Corridor Crashes by Year

Out of the total 273 crashes that occurred between the years 2008-2010, 2% of crashes were DUI crashes, 1% of crashes occurred when the drivers were suffering from illness and 1% when the drivers were fatigued. A driver condition analysis was performed for the years 2008-2010 and is shown in Figure 3.47.

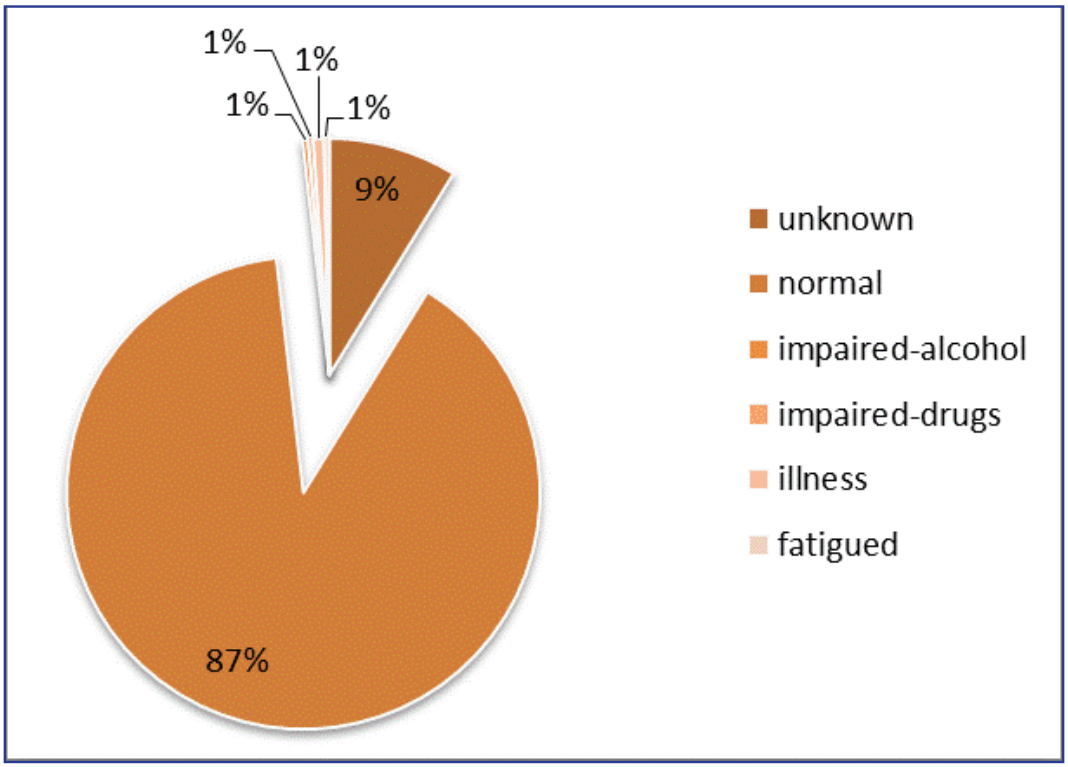


Figure 3.47: Driver Conditions – Lincoln Avenue Corridor Crashes

Out of the total 457 crashes that occurred on the Lincoln Avenue corridor from 2006 to 2010, the highest number of crashes were reported in the months of October (61 crashes), November (46 crashes) and August (45 crashes) as shown in Figure 3.48.

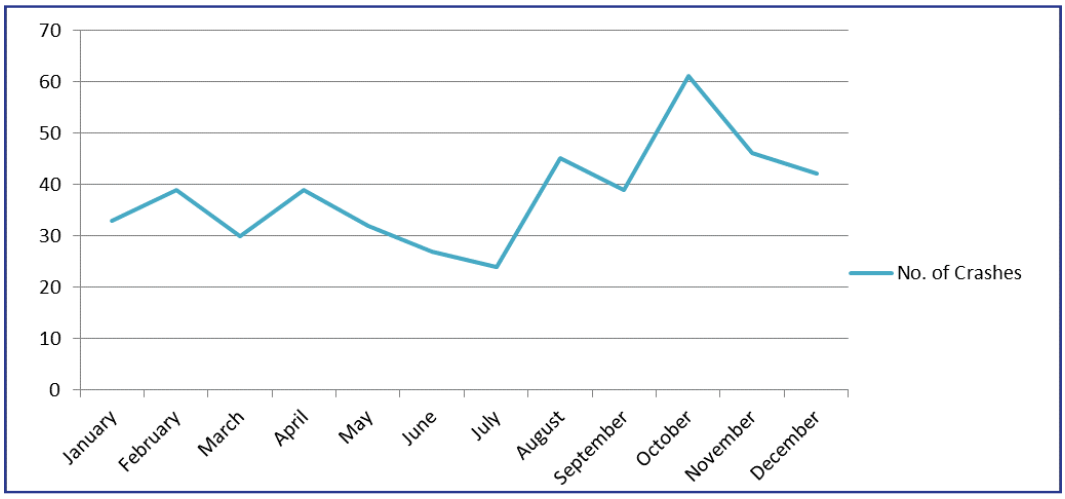


Figure 3.48: Lincoln Avenue Corridor Crashes - Time of Year

IV University Avenue Corridor Crashes

University Avenue is a major east-west corridor on campus that marks the north boundary of the University District area. University Avenue also falls in the Zone 3 category of CATS Phase II where high priority is given to automobile traffic. Roadway segments and intersections on University Avenue have the highest volumes of ADT up to 20,900. The number of crashes on University Avenue from 2006 - 2010 is shown in Figure 3.49.

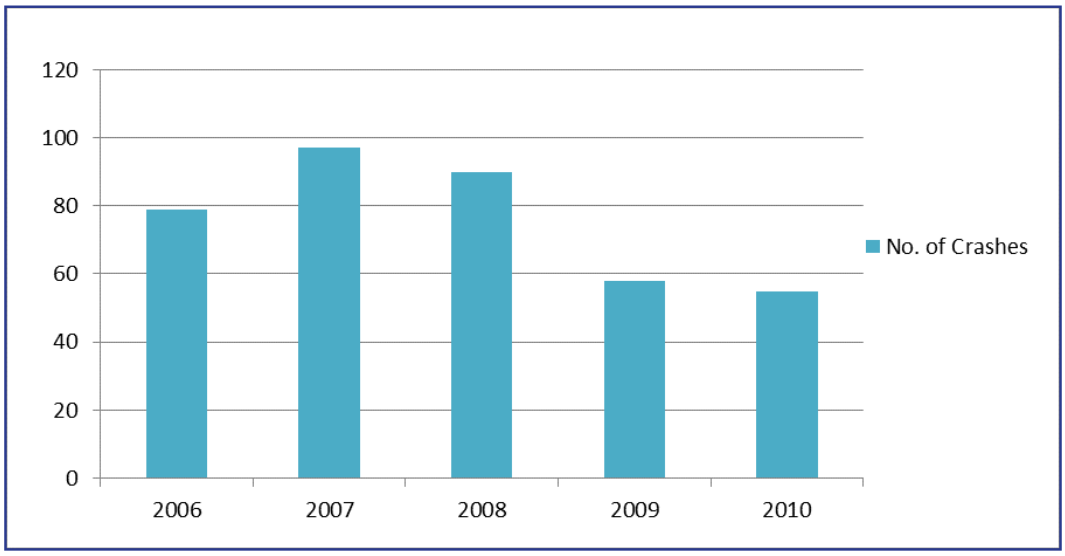


Figure 3.49: University Avenue Corridor Crashes by Year

For 2008 to 2010, a total of 204 crashes were reported on the University Avenue corridor, of which 2% were DUI crashes. Figure 3.50 shows the driver conditions during these crashes:

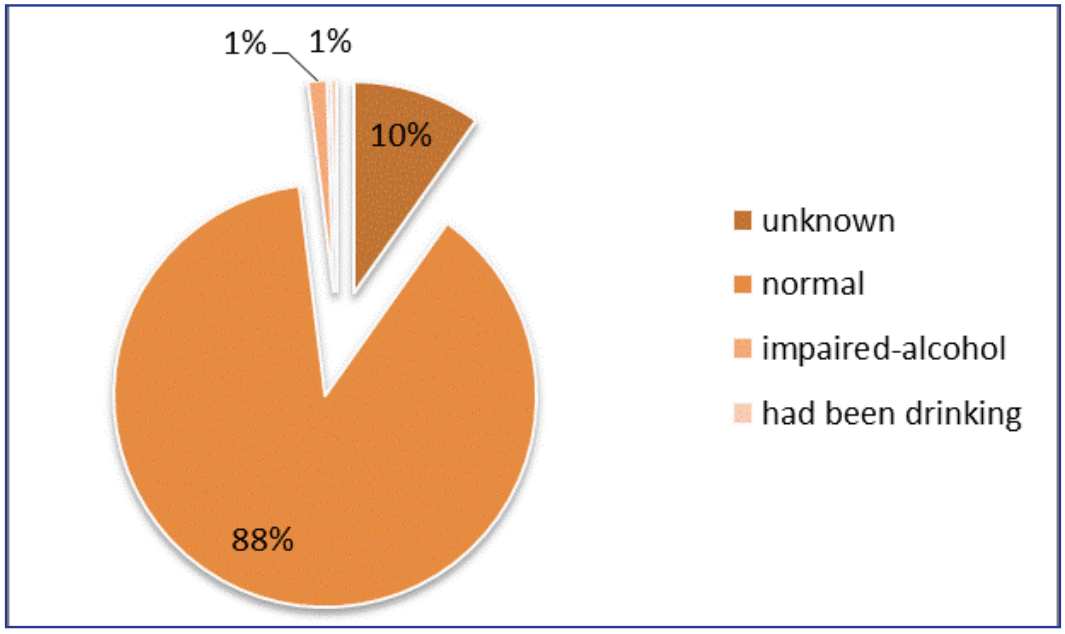


Figure 3.50: Driver Conditions – University Avenue Corridor Crashes

A total of 379 crashes occurred on the University Avenue corridor from 2006 to 2010, of which the highest number of crashes occurred in the months of August (52 crashes) and February (42 crashes) (Figure 3.51)

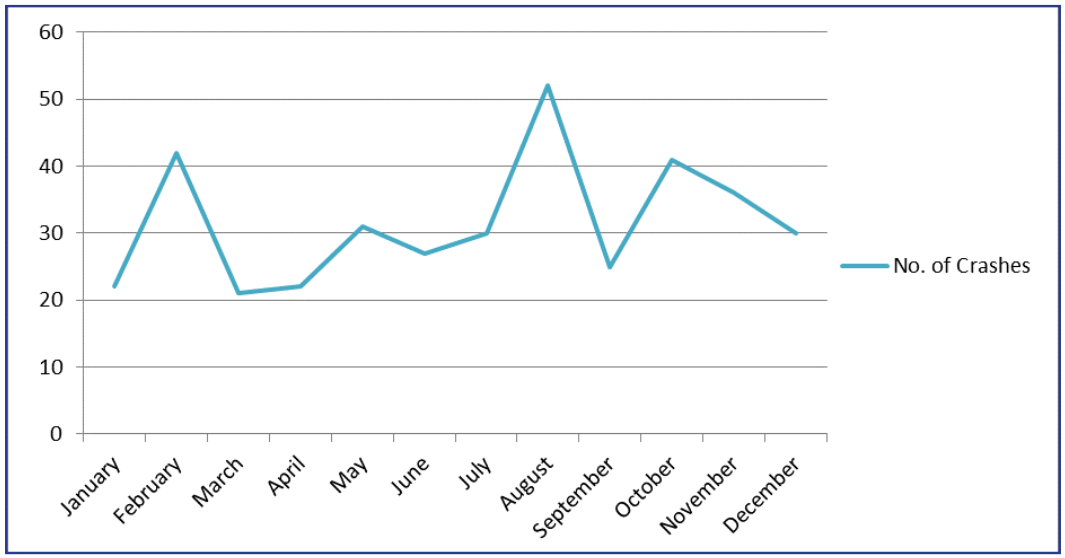


Figure 3.51: University Avenue Corridor Crashes - Time of Year

V Springfield Avenue Corridor Crashes

The east-west corridor of Springfield Avenue is surrounded by a combination of public/institutional, residential, and commercial buildings. Part of Springfield Avenue serves as a principal arterial with some of its segments carrying an ADT of 14,400, which explains why the corridor has a higher speed limit of 30 mph. Grainger Engineering Library is also located on this corridor attracting a majority of pedestrians and bicyclists in the area. Intersections and segments on Springfield Avenue are some of the busiest intersections on campus and major crash locations. The crash data for the corridor for the years 2006 - 2010 are shown in Figure 3.52.

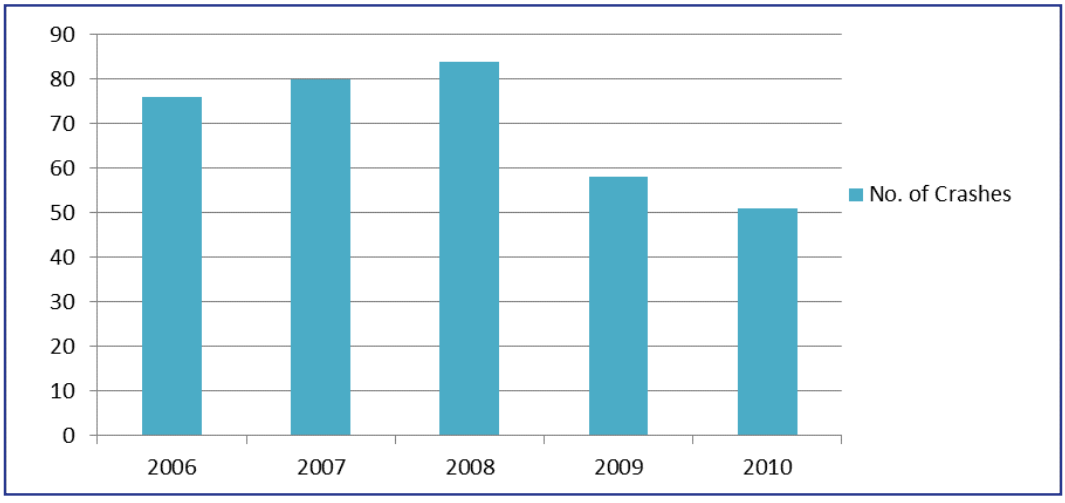


Figure 3.52: Springfield Avenue Corridor Crashes by Year

Driver condition analysis was performed for this corridor for the years 2008 to 2010 and can be seen in Figure 3.53. Of the 191 total crashes that occurred within the three years in the corridor, 3% were caused by DUIs while 1% were caused by drivers who were asleep or fainted.

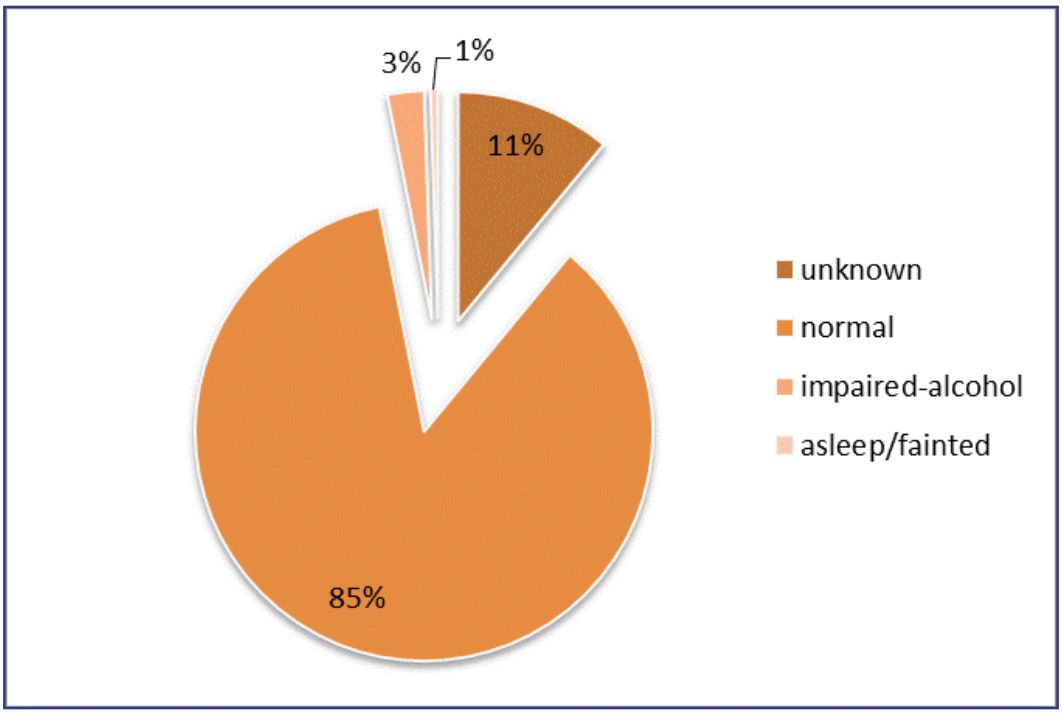


Figure 3.53: Driver Conditions – Springfield Avenue Corridor Crashes

Out of the total 349 crashes that occurred on the Springfield Avenue corridor from 2006 - 2010, the highest number of crashes were reported in the months of August (43 crashes) and October (40 crashes) as shown in Figure 3.54.

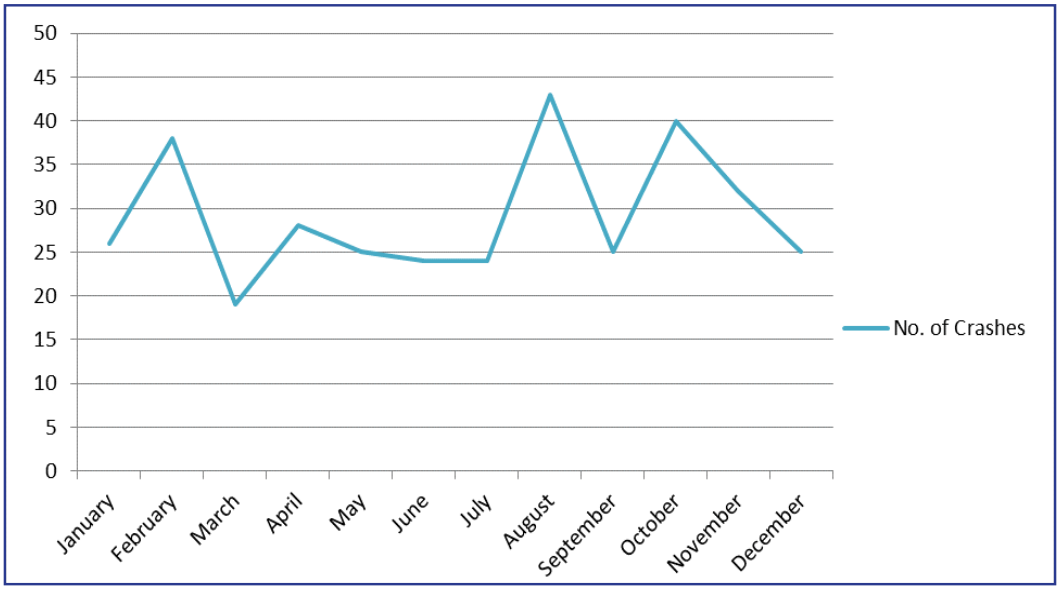


Figure 3.54: Springfield Avenue Corridor Crashes - Time of Year

VI Green Street Corridor Crashes

The Green Street corridor is the busiest street on campus due to the number of restaurants that attracts students there and a major bus route along the corridor. Some intersections on Green Street are the busiest intersections in terms of pedestrian and automobile traffic since they are surrounded by the Illini Union building, which is the campus' home for a majority of activities and meetings. The high conflicts in different modes of travel have resulted in a high number of crashes on this corridor. Figure 3.55 shows the crash trends by year for Green Street.

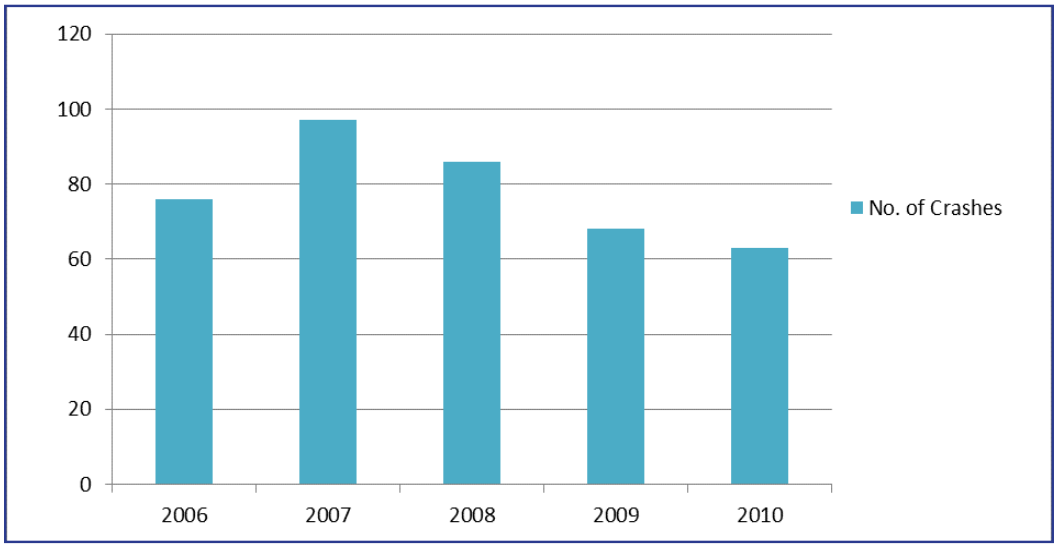


Figure 3.55: Green Street Corridor Crashes by Year

For the years 2008 to 2010, a total of 217 crashes were reported on the Green Street corridor. 4% of the crashes that occurred were DUI crashes and 1% occurred when the driver fell asleep or fainted. Figure 3.56 shows the driver conditions during these crashes.

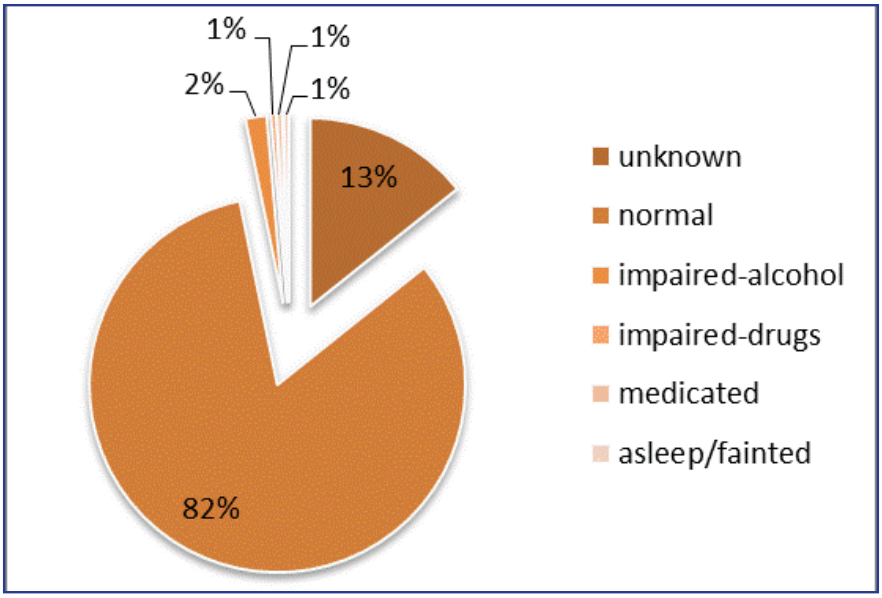


Figure 3.56: Driver Conditions – Green Street Corridor Crashes

A total of 390 crashes occurred on the Green Street corridor from 2006 to 2010, of which the highest number of crashes occurred in the months of October (48 crashes), September (39 crashes) and February (39 crashes) as shown in Figure 3.57.

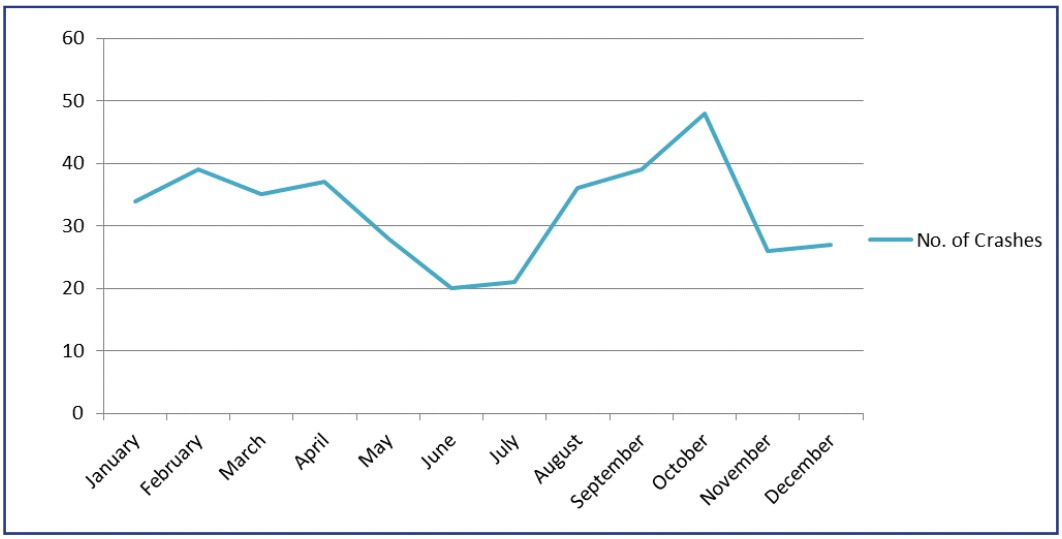


Figure 3.57: Green Street Corridor Crashes - Time of Year

VII Kirby / Florida Avenue Corridor Crashes

The east-west corridor of Kirby / Florida Avenue serves as a minor arterial for the campus area transportation with a speed limit of 35 mph. Certain segments of Kirby Avenue serve an ADT of 16,600. The high traffic volume and speed limit increases the crash frequency in this corridor. Figure 3.58 shows the crash trends for Kirby Avenue.

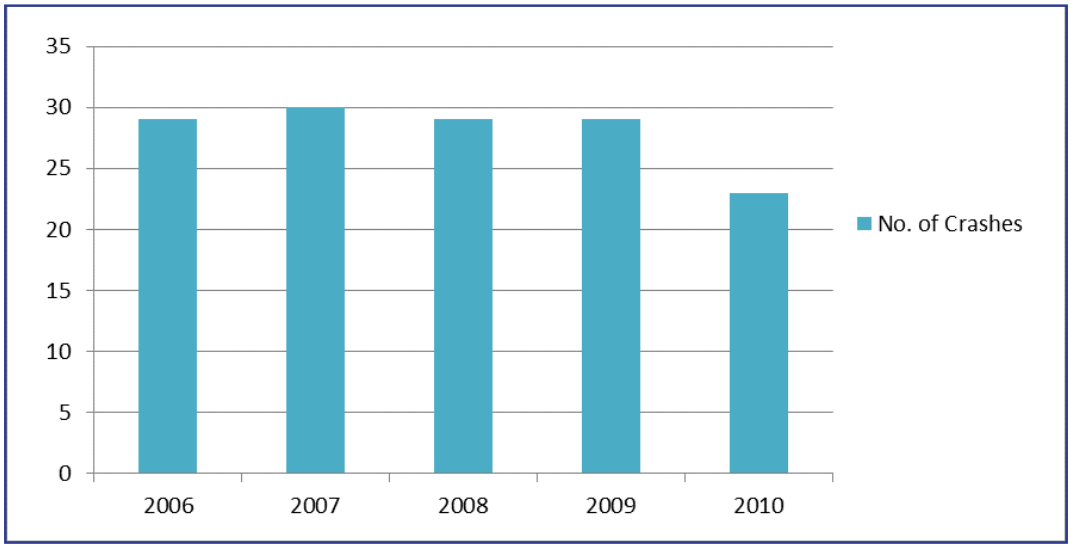


Figure 3.58: Kirby Avenue Corridor Crashes by Year

Driver condition analysis was performed for this corridor for the years 2008 to 2010 and can be seen in Figure 3.59. Of the 81 total crashes that occurred within the three years in the corridor, 2% of the crashes occurred when the driver condition was impaired due to alcohol.

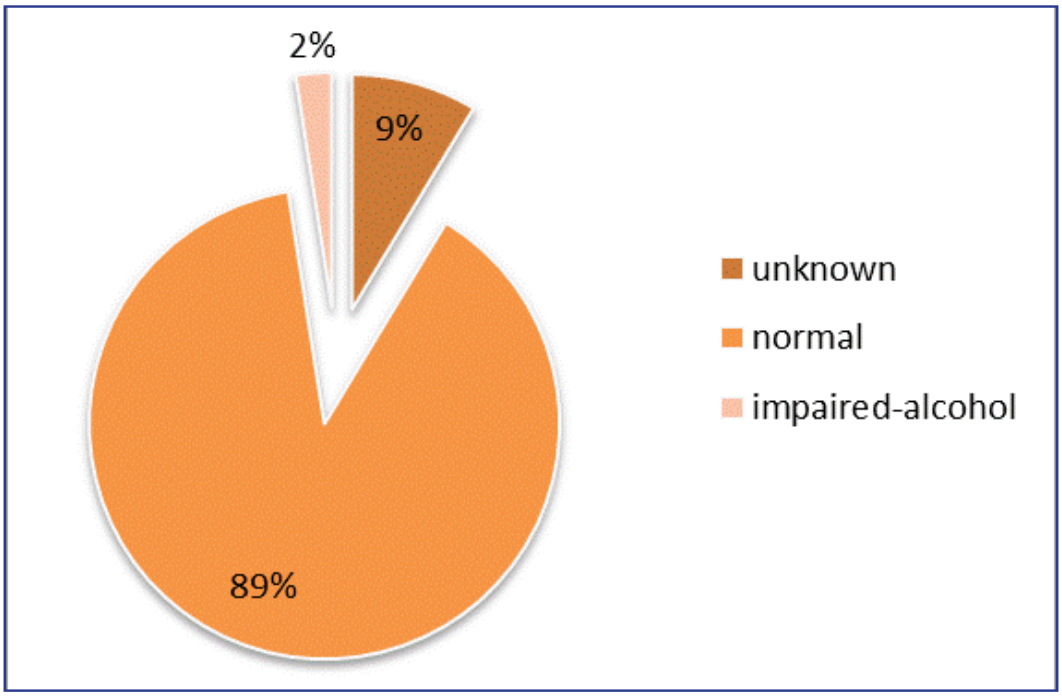


Figure 3.59: Driver Conditions – Kirby Avenue Corridor Crashes

Out of the total 140 crashes that occurred on the Kirby / Florida Avenue corridor from 2006 to 2010, the highest number of crashes were reported in the months of January (16 crashes) and October (15 crashes) as shown in Figure 3.60.

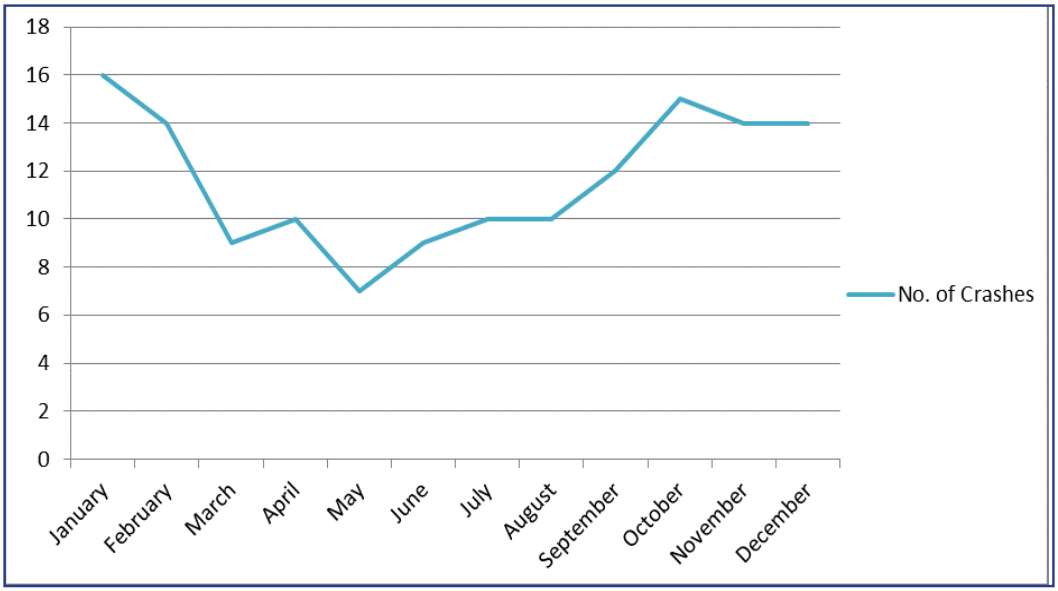


Figure 3.60: Kirby Avenue Corridor Crashes - Time of Year

3.6.10 Busiest Intersections on Campus

The ten busiest intersections in terms of pedestrian, bike, and automobile volumes have been identified to make efficient plans for safety at these intersections. For the busiest intersections for pedestrian and bike traffic, noon peak period volumes were used; for the busiest intersections for automobile traffic, PM peak periods were used for comparison purposes. The ten busiest intersections are described and depicted in Table 3.16, Table 3.17, Table 3.18 and Figure 3.61.

Table 3.17: Busiest Intersections in Terms of Pedestrian Volume

No.	Intersection Name	Pedestrian Volume
1	Sixth St./Armory Ave.	1,994
2	Fourth St./Gregory Dr.	1,681
3	Wright St./Green St.	1,511
4	Fourth St./Armory Ave.	1,370
5	Goodwin Ave./Green St.	1,296
6	Wright St./John St.	1,267
7	Mathews Ave./Green St.	1,205
8	Goodwin Ave./Nevada St.	1,139
9	Sixth St./Chalmers St.	1,057
10	Sixth St./Gregory Dr.	922

Table 3.18: Busiest Intersections in Terms of Bike Volume

No.	Intersection Name	Bike Volume
1	Goodwin Ave./Oregon St.	170
2	Goodwin Ave./Nevada St.	158
3	Goodwin Ave./Gregory Dr.	146
4	Lincoln Ave./Illinois St.	118
5	Goodwin Ave./Green St.	105
6	Sixth St./Gregory Dr.	69
7	Fourth St./Daniel St.	64
8	Sixth St./Chalmers St.	63
9	Fourth St./Gregory Dr.	55
10	First St./Daniel St.	48

Table 3.19: Busiest Intersections in Terms of Automobile Volume

No.	Intersection Name	Traffic Volume
1	First St./Windsor Rd.	2,454
2	First St./Kirby Ave.	2,164
3	Fourth St./Kirby Ave.	2,095
4	First St./Springfield Ave.	1,964
5	First St./Green St.	1,752
6	Oak St./Kirby Ave.	1,718
7	Fourth St./Green St.	1,484
8	Fourth St./Springfield Ave.	1,344
9	Wright St./Springfield Ave.	1,336
10	Goodwin Ave./Green St.	1,326

3.7 Transit Facilities

Transit service plays a major role in the mobility of University students, faculty, and staff both on and off campus. The Champaign-Urbana Mass Transit District (CUMTD) is the agency responsible for providing transit service in the Champaign-Urbana urbanized area. The comprehensive coverage provided by CUMTD helps keep personal vehicle traffic on campus to a minimum, and provides a valuable service to those who cannot or choose not to drive.

Twenty-six different CUMTD routes serve the campus area. The bus service routes can be seen in Figure 3.62. The bus headways are also shown in the Appendix. CUMTD buses stop at all the key intersections within the University District. A good analysis of the past and current ridership trends can help determine the bus frequency necessary to serve the passenger demand in future. Corridors with the highest daily boarding and daily alighting numbers from 2007 to 2011 are shown in Figure 3.63 to Figure 3.67.

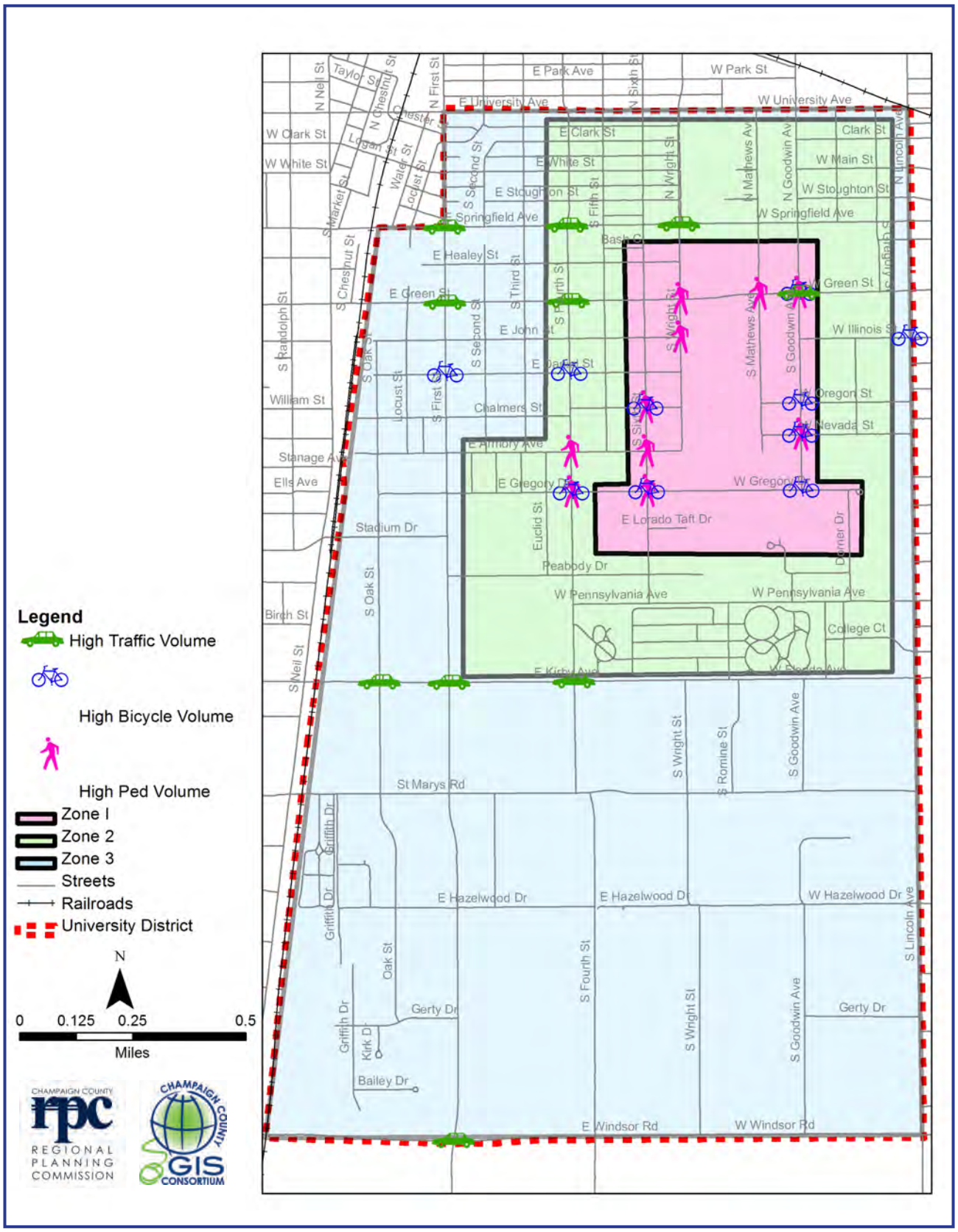


Figure 3.61: Busiest Intersections on the University of Illinois Campus

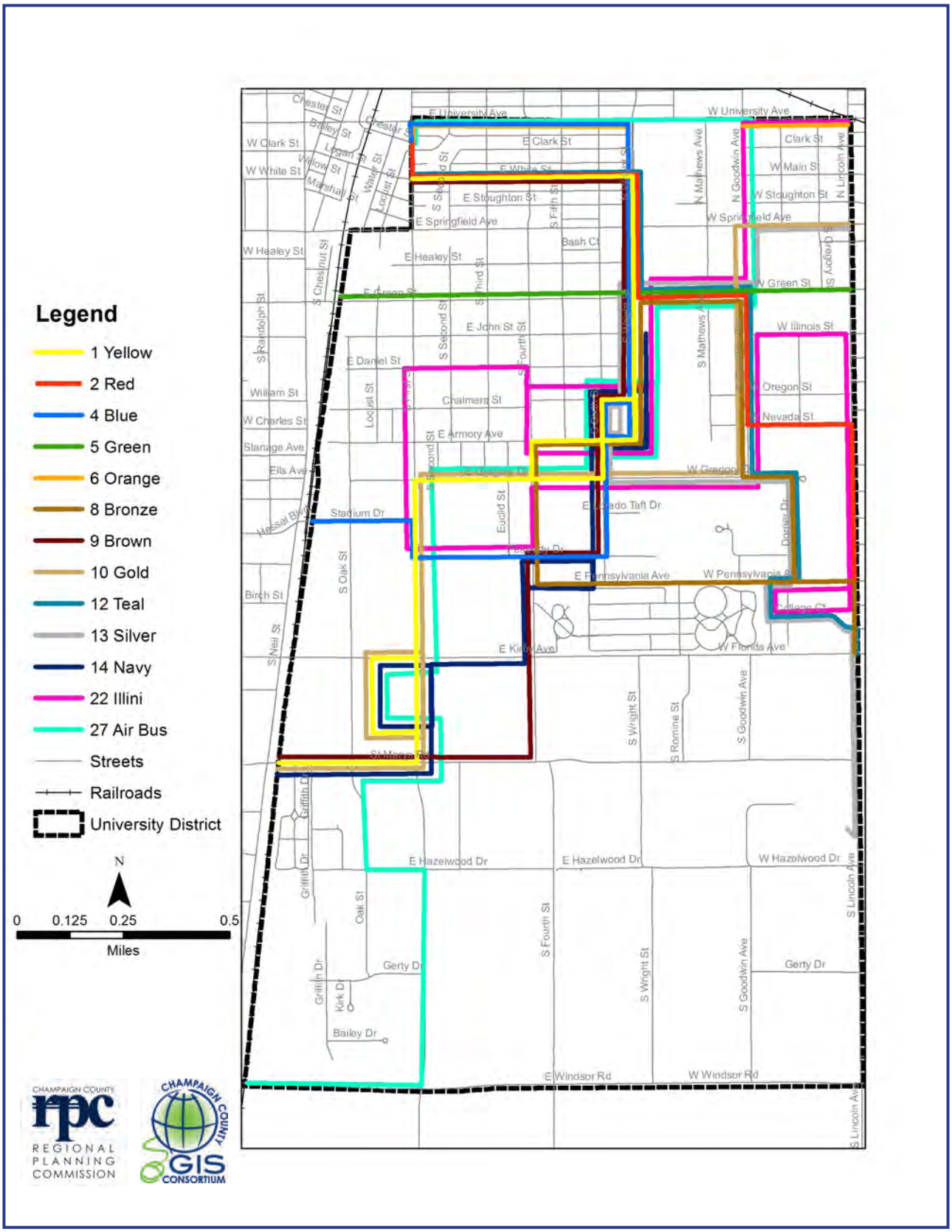


Figure 3.62: CUMTD Bus Routes on Campus

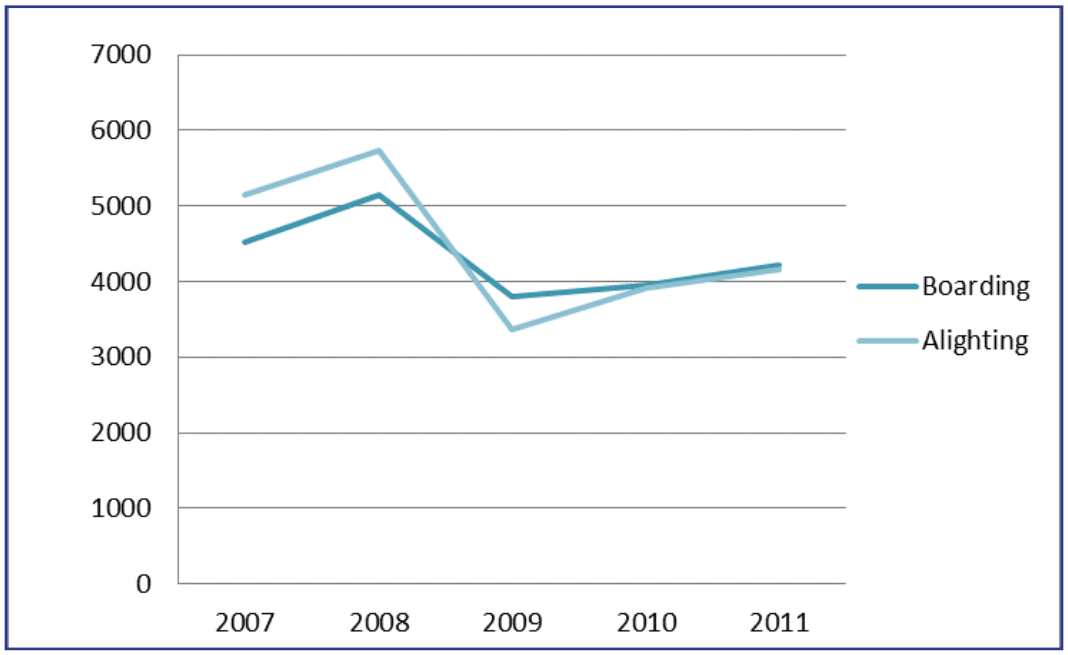


Figure 3.63: Ridership Trends for the Wright Street Corridor

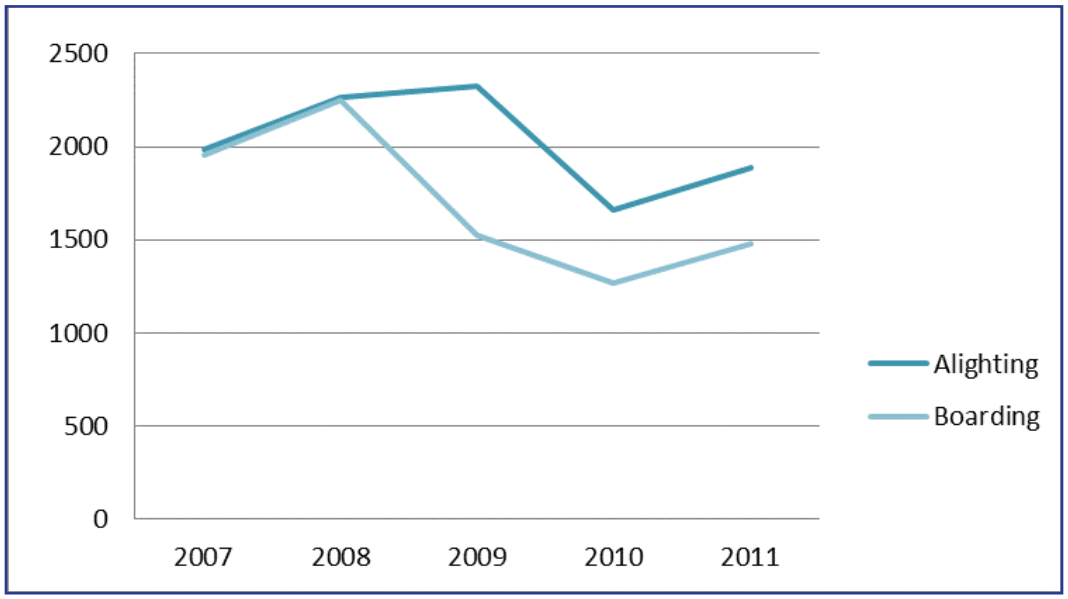


Figure 3.64: Ridership Trends for the Goodwin Avenue Corridor

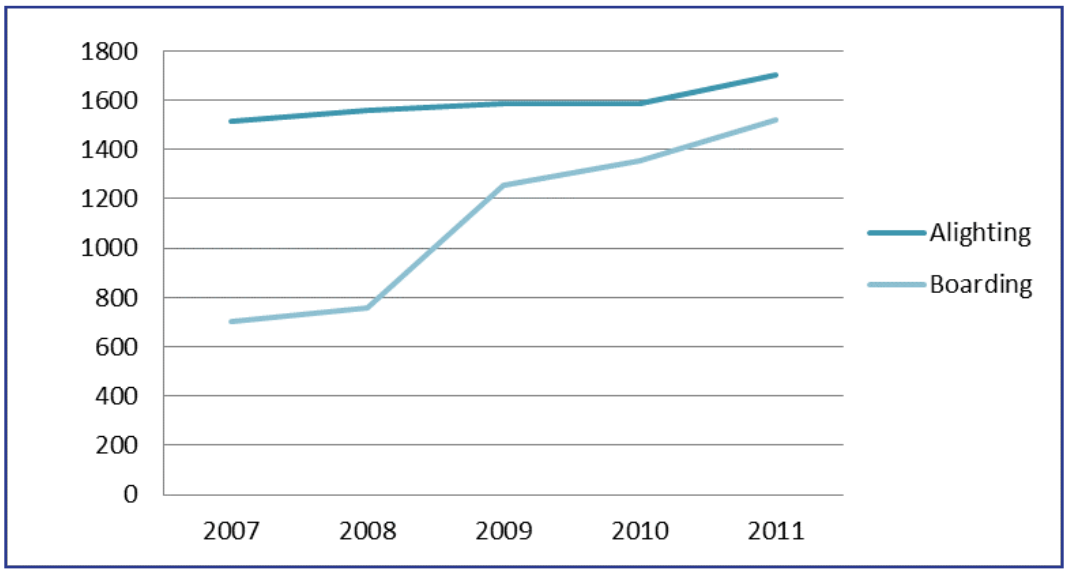


Figure 3.65: Ridership Trends for the Fourth Street Corridor

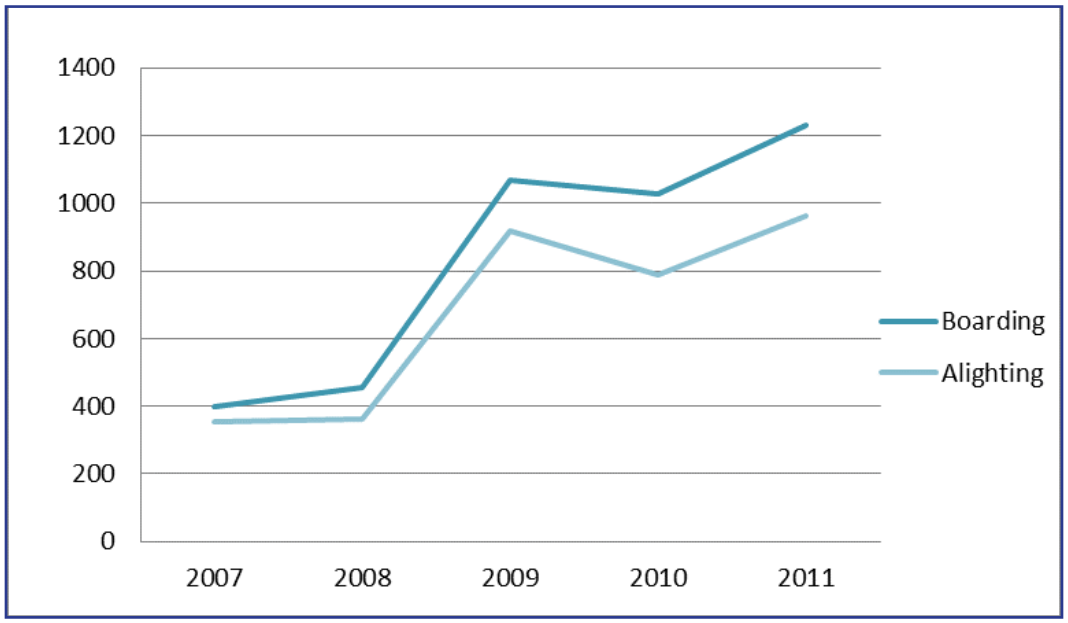


Figure 3.66: Ridership Trends for the White Street Corridor

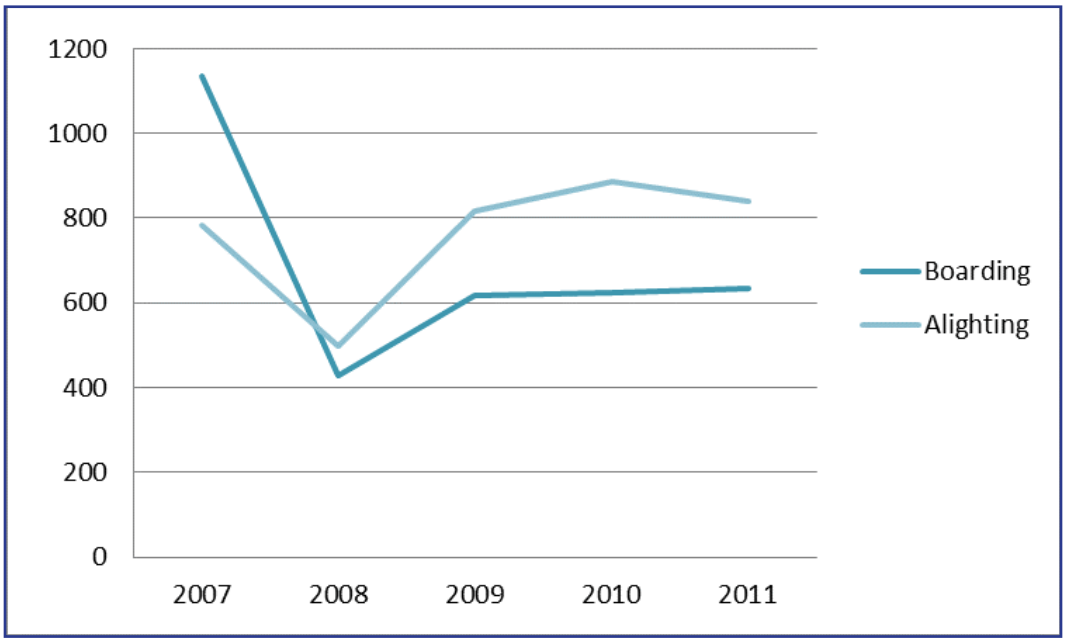


Figure 3.67: Ridership Trends for the Mathews Avenue Corridor

Ridership trends for all other corridors are listed in the Appendix. A number of bus stops along these corridors have very high demands such as the Transit Plaza, Mathews and Green, Sixth and White, and Fourth and Gregory. Figure 2.68 shows the stops within the University District and the stops with the highest daily boarding or alighting averages.

3.8 Parking Facilities

The location and availability of parking, both on-street and off-street, provides an important component to the functionality of campus. The provision of parking is necessary to accommodate students, employees and visitors to the campus area. While providing parking facilities for drivers is necessary, providing too much parking can have negative impacts on campus travel patterns and bring more vehicles into campus. This can increase safety concerns for pedestrians and bicyclists and add congestion to roadways, which are already limited in their capacity to handle large traffic volumes.

The existing parking facilities include 5 parking structures and 130 surface parking lots of various sizes. There is a total parking capacity of 15,750 spaces including metered visitor spaces. The off-street parking facilities within the University District may require a university parking permit or have metered parking spaces for visitors. The existing parking facilities are shown in Figure 3.69.

Metered on-street parking facilities maintained by the respective municipalities are also available within the University District. There are a total of 2,863 on-street parking spaces available along the north-south and east-west corridors. The locations and types of on-street parking can be seen in Figure 3.70.

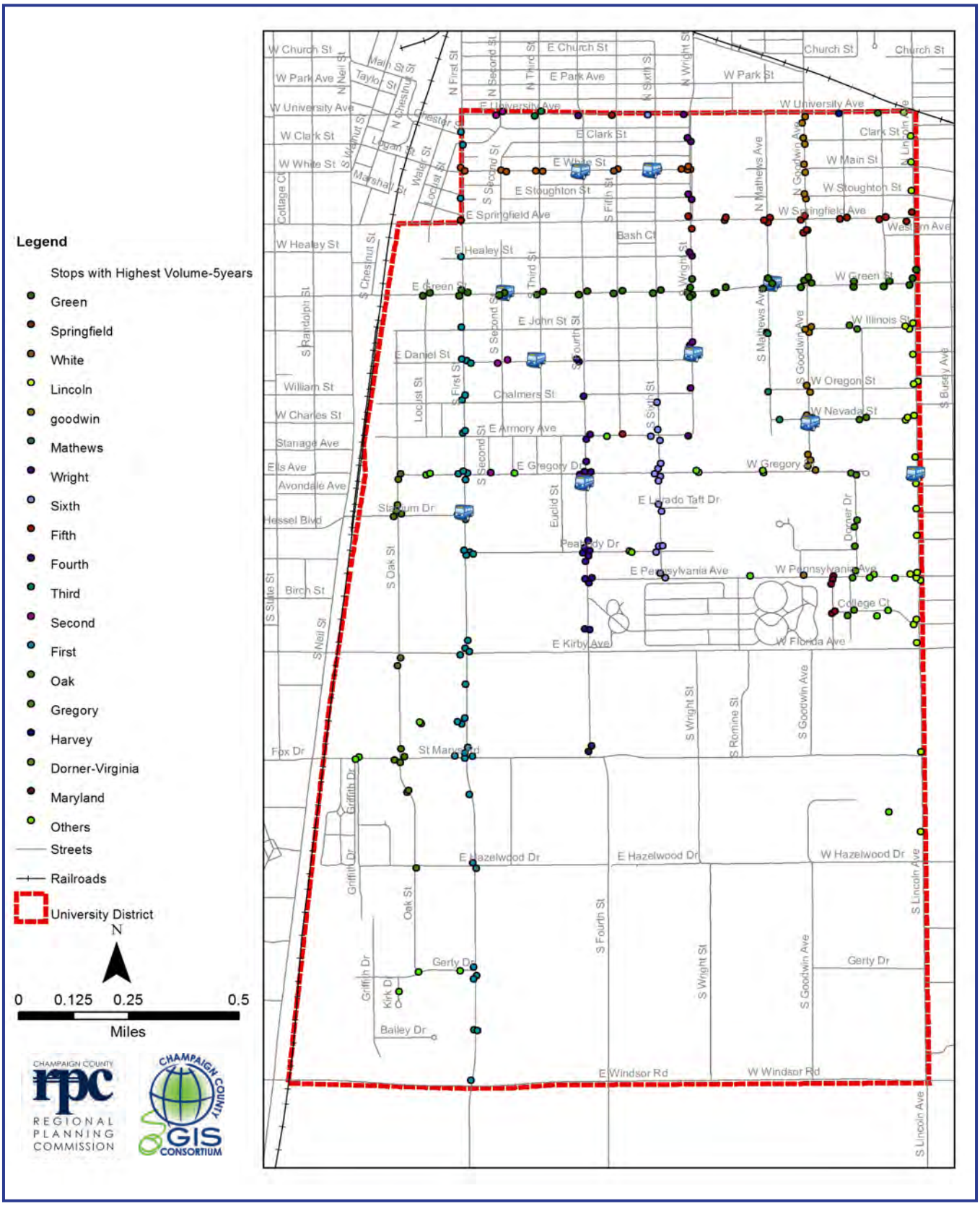


Figure 3.68: CUMTD Bus Stop Locations

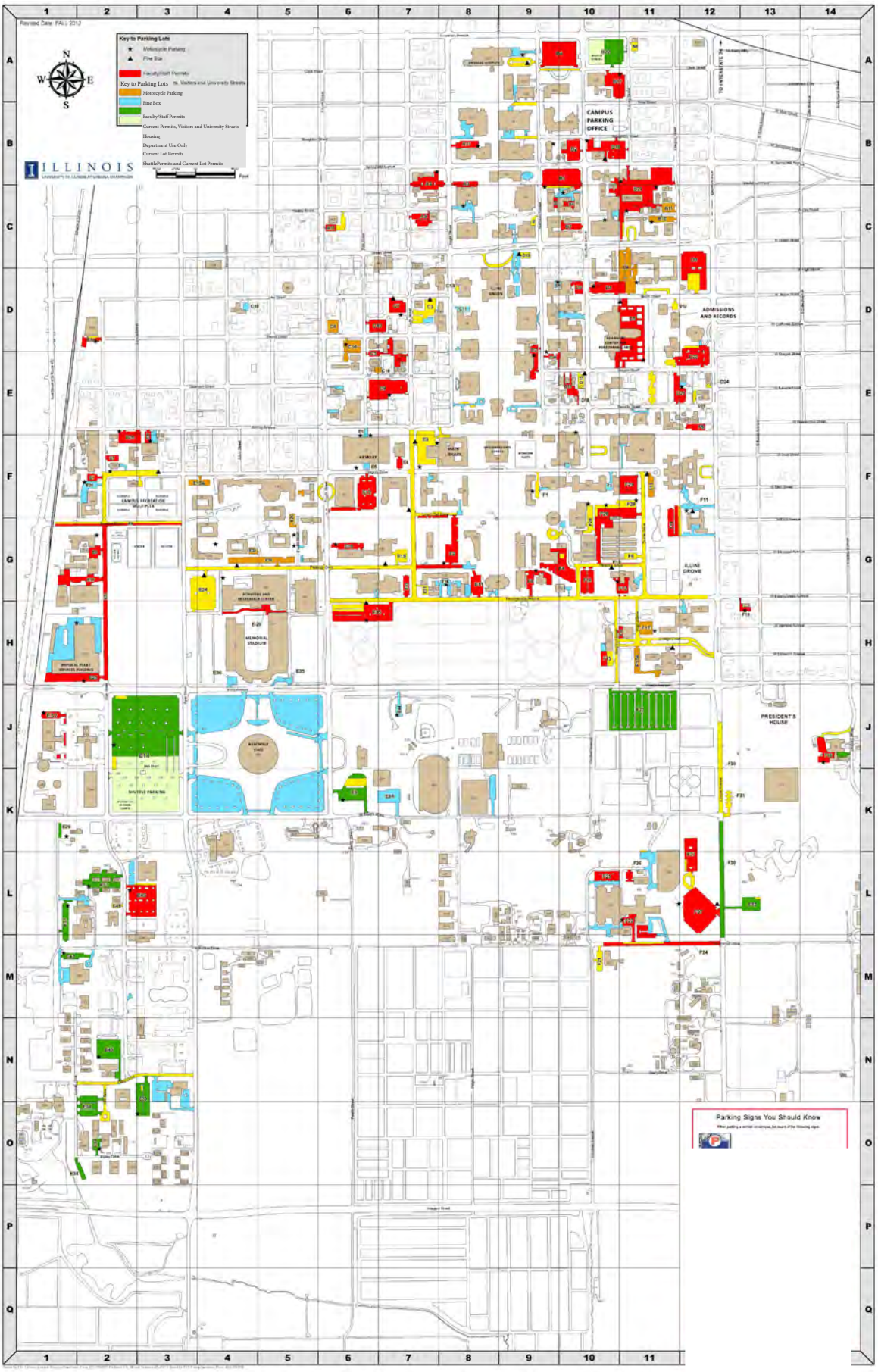


Figure 3.69: U of I Parking Facilities

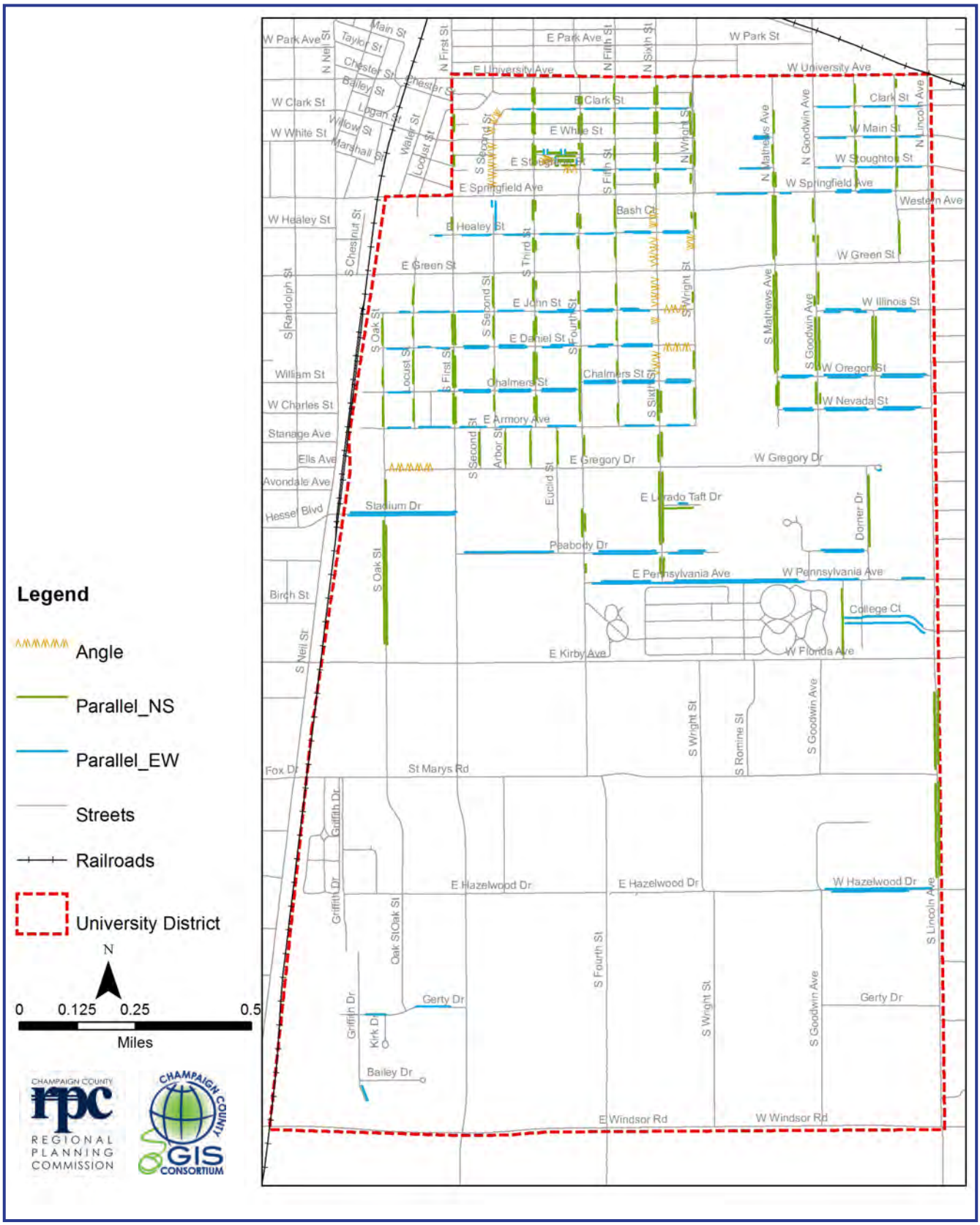


Figure 3.70: On-Street Parking Facilities within the Study Area

As of 2011, the City of Champaign owned 1,167 permit parking spaces within the University District. These spaces are sold to University District residents (mostly students) during the Fall and Spring semesters. Figure 3.71 shows the number of sold permit parking spaces for the academic years 2006 to 2011. As can be seen in this figure, the demand for permit parking spaces on the Champaign side of the University District has declined steadily from 2006 to 2012.

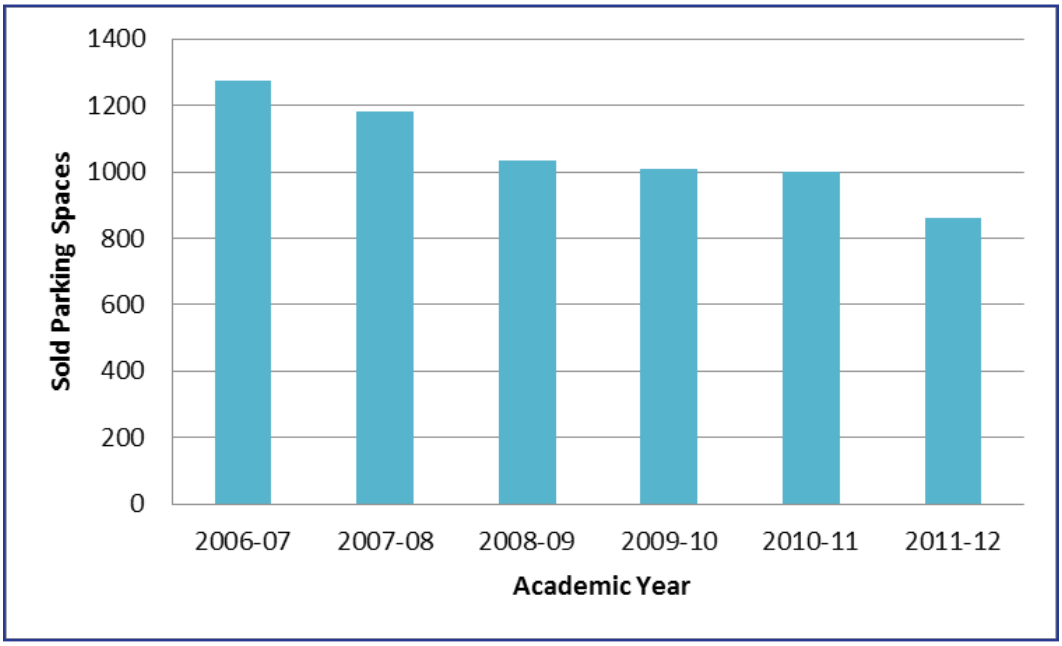


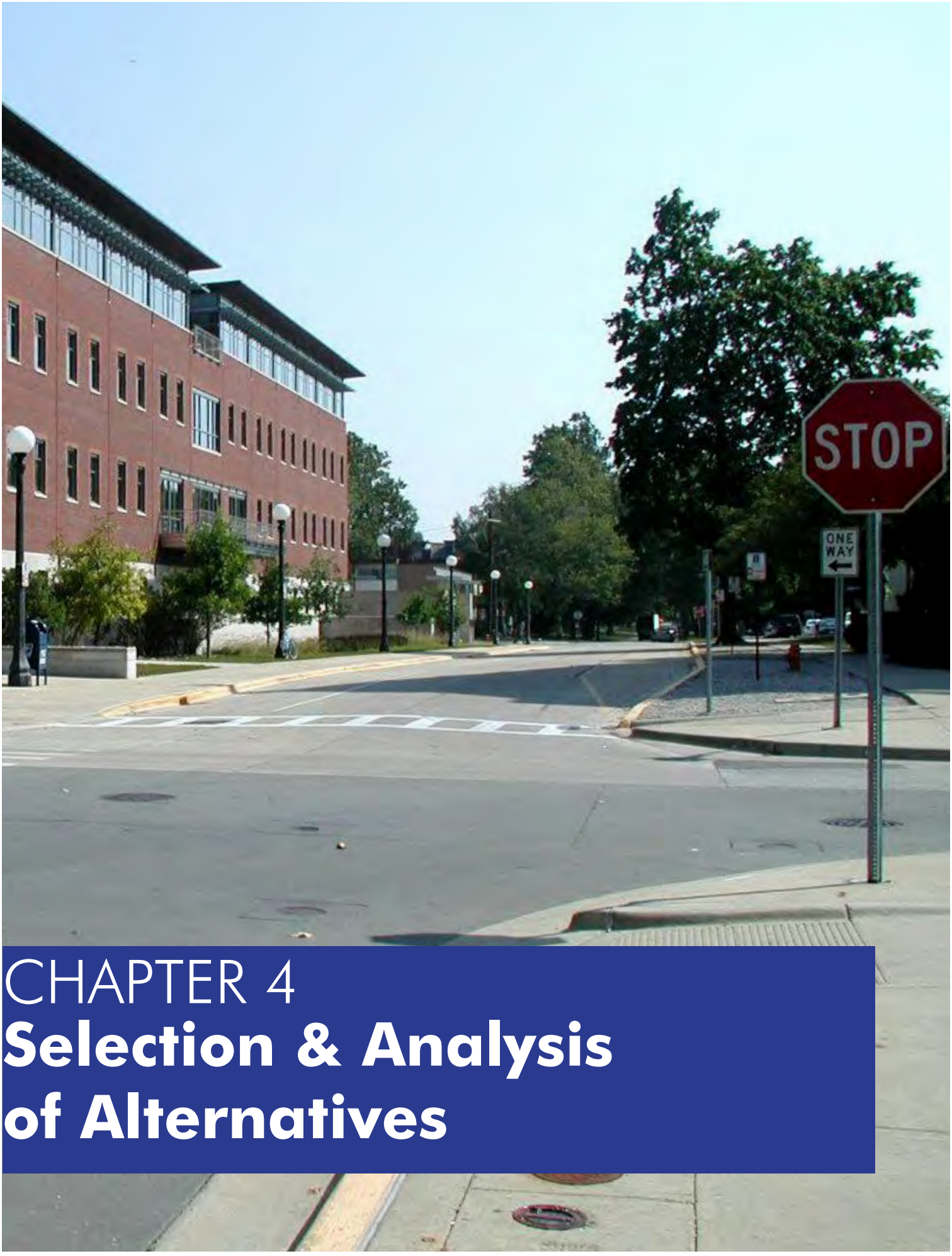
Figure 3.71: Permit Parking Spaces within the University District

3.9 Findings

Major findings of the existing conditions analysis include the following:

- **Traffic Flow:** Major corridors within the University District are experiencing an overall reduction of vehicular traffic flow based on comparison of average daily traffic data collected in 2006 and 2011. The Fourth Street corridor experienced the highest percent reduction of vehicular traffic flow (36%).
- **US Routes within the University District:** Two roadway segments within the University District are designated US routes. The Springfield Avenue segment from the west end of the University District boundary to Wright Street and Wright Street between Springfield and University Avenues are marked as US 45/150. Alterations to these roads by local entities are more circuitous because jurisdiction for them falls under the Illinois Department of Transportation (IDOT).
- **Roads with Poor Pavement Conditions:** Pavement condition analysis for the University District roadways identified the Green Street segment from the west end of the University District boundary to First Street as being in very poor condition.
- **Speed Issues:** The University District posted speed limit is 25 mph. However, major corridors within the University District have posted speed limits higher than 25 mph. As shown in Table 3.3 and Figure 3.14, the 85th percentile vehicular speed values on some roadway segments within the University District was at least more than 10 mph higher than the posted speed limits.

- **Traffic Congestion:** Several intersections at the periphery of the University District experienced congested conditions during peak hours. During the PM peak hours, there were eight intersections with at least one congested approach. The Kirby Avenue segment between Oak and Neil Streets was congested during the AM and PM peak hours.
- **CATS Zones:** Two of the most pedestrian-heavy intersections are located outside CATS Zone 1, and four of the most bicycle heavy intersections are located outside CATS Zone 1.
- **Traffic Crashes:** There were four fatalities related to traffic crashes within the University District, between 2006 and 2010, but traffic crashes within the University District showed a declining trend since 2007. However, bicycle crashes showed an increasing trend between 2007 and 2009. The Green Street corridor experienced the highest number of transit, pedestrian and bicycle crashes. The number of crashes along the major corridors showed declining trends except the First Street corridor, where the number of crashes increased in 2010.



CHAPTER 4
Selection & Analysis of Alternatives

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4. Selection and Analysis of Alternatives

4.0 Introduction

Alternatives for creating a preferred traffic circulation plan for the University District were carefully selected and evaluated considering the above mentioned study objectives and findings from the existing condition analysis.

4.1 Selection of Alternatives

An alternative for evaluation was selected based on the following:

- Study objectives
- Member agency input
- Findings from the existing conditions analysis

4.2 Evaluation of Alternatives

Every alternative was thoroughly evaluated for determining whether it directly or indirectly helps fulfilling study objectives and addresses issues found in the existing conditions analysis. Alternatives for the University District's traffic circulation were evaluated against the corresponding Campus Area Transportation Study (CATS) zone priorities.

Figure 4.1 shows the current boundaries of the CATS Zones. CATS zones prioritized specific transportation mode(s) for each zone by considering safety, efficiency, demand, travel mode usage, and sustainability. A brief description of CATS zones and alternative evaluation criteria for each zone are discussed in the following sections:

4.2.1 Alternatives Evaluation Criteria for CATS Zone 1

CATS Zone 1 prioritizes pedestrian, bicycle, and transit modes while safely accommodating vehicular traffic and freight loading. Alternatives selected for this zone should enhance pedestrian and bicycle safety and help reduce vehicular movements without blocking access for emergency vehicles. Factors and relative weightages considered for alternatives' evaluation for this zone are shown in Table 4.1.

Table 4.1: Factors and Relative Weightages for Alternatives' Evaluation for Zone 1

Factor	Best Practices	Relative Weightage (%)
Promotes Pedestrian Safety	New sidewalk, sidewalk improvements, pedestrian scramble	30
Promotes Bicycle Safety	Bike lanes, multi-use paths	30
Discourage Automobile Movement	Restricting roadways for automobile movements, pedestrian scramble at intersection, increase parking cost	20
Maintains Necessary Access for Emergency Vehicles	Any alternative which would ensure necessary access for emergency vehicles	20

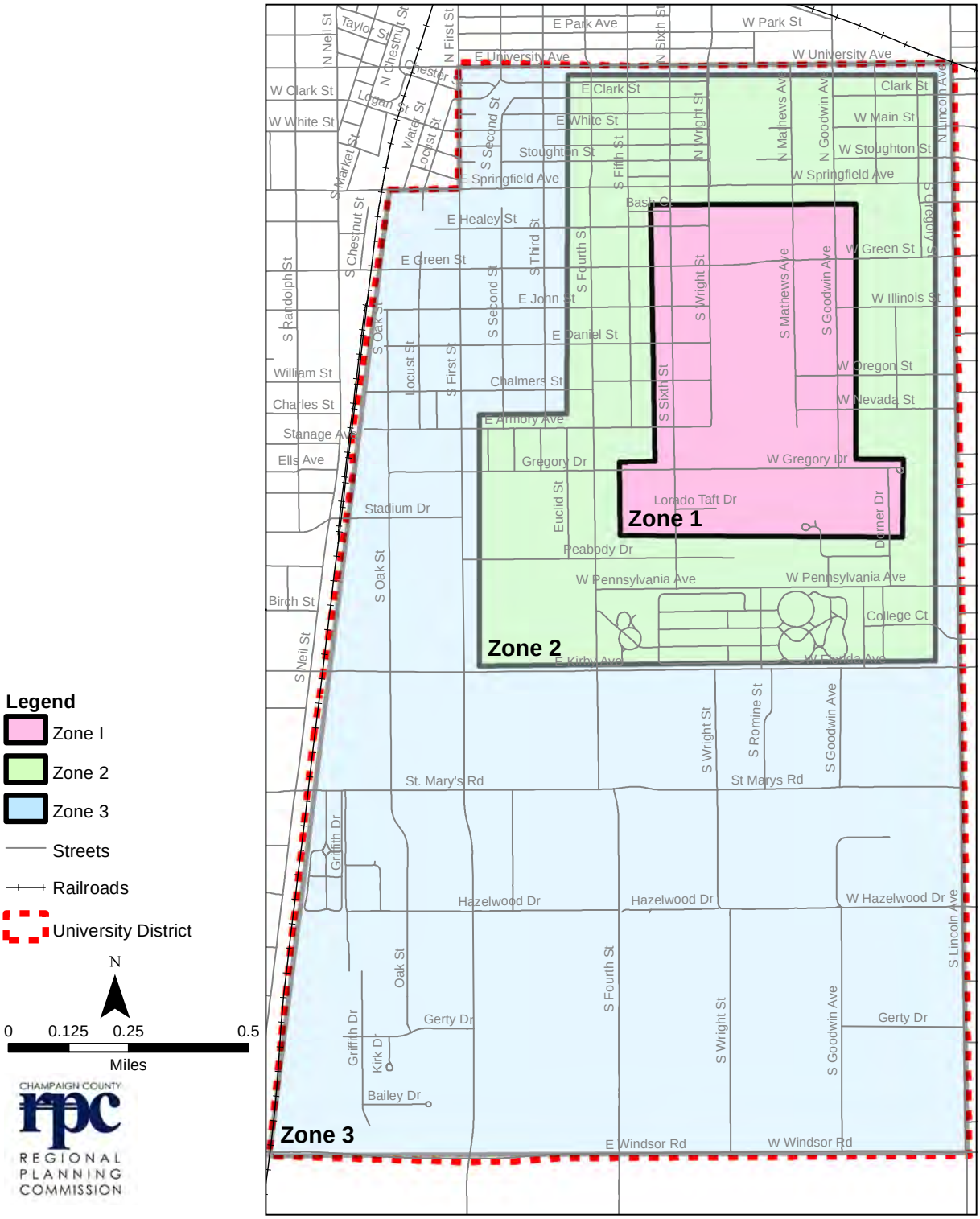


Figure 4.1: CATS Zones

The existing boundary of CATS Zone 1 runs just south of Springfield Avenue on the north; just outside Goodwin Avenue, Gregory Drive and Dorner Drive on the east; north of Peabody Drive on the south; and just east of Fourth Street, north of Gregory Drive, and west of Sixth Street on the west. This core campus zone includes the Bardeen, Main, and South Quads.

4.2.2 Alternatives Evaluation Criteria for CATS Zone 2

CATS Zone 2 aims to balance all major transportation modes (i.e., walking, bicycling, transit, automobiles). The existing boundary of CATS Zone 2 runs just south of University Avenue on the north; west of Lincoln Avenue on the east; north of Kirby Avenue on the south; and just east of First Street, and west of Fourth Street (north of Armory Avenue) on the west. This encompasses many University District traffic generators.

Alternatives selected for this zone should accommodate all travel modes, enhance intermodal safety, and improve and enhance operational conditions of all travel modes. Factors and relative weightages considered for alternatives' evaluation for Zone 2 are shown in Table 4.2.

Table 4.2: Factors and Relative Weightages for Alternatives' Evaluation for Zone 2

Factor	Best Practices	Relative Weightage (%)
Reduction of Intermodal Conflict	New sidewalk, sidewalk improvements, bike lanes	35
Accommodates All Travel Modes	Complete Streets, bike lanes, multi-use paths, traffic calming	35
Enhance Capacity and Operational Conditions	Pedestrian scramble, lead pedestrian interval, bike box, high frequency transit	30

4.2.3 Alternatives Evaluation Criteria for CATS Zone 3

CATS Zone 3 includes roadways within or at the periphery of the University District which are generally classified as arterials or urban collectors where vehicular flow gets higher emphasis. The boundary of CATS Zone 3 matches the University District's boundary. Alternatives selected for this zone should focus on improving vehicular movement capacity and operational conditions, accommodating all travel modes, and providing safer and efficient connectivity. Factors and relative weightages considered for alternatives' evaluation for Zone 3 are shown in Table 4.3.

Table 4.3: Factors and Relative Weightages for Alternatives' Evaluation for Zone 3

Factor	Best Practices	Relative Weightage (%)
Improve Vehicular Capacity and Operational Conditions	Traffic signal retiming, addition of turn lane at intersection	35
Accommodates All Travel Modes	Bike lanes, multi-use paths	35
Provides Safer and Efficient Connectivity	Traffic signal coordination	30

Figure 4.2 shows a flow chart of the alternative evaluation process for this study. An alternative would be removed from the list of recommended alternatives if any of the following emerge:

- Alternative would negatively impact pedestrian and bicycle circulation and safety.
- Alternative fails to address study objectives, issues identified through existing conditions analysis, and priorities set forth for the different zones of the University District.

Tables showing suggested alternatives, their weightages, explanations of scoring and comments can be found in the Appendix.

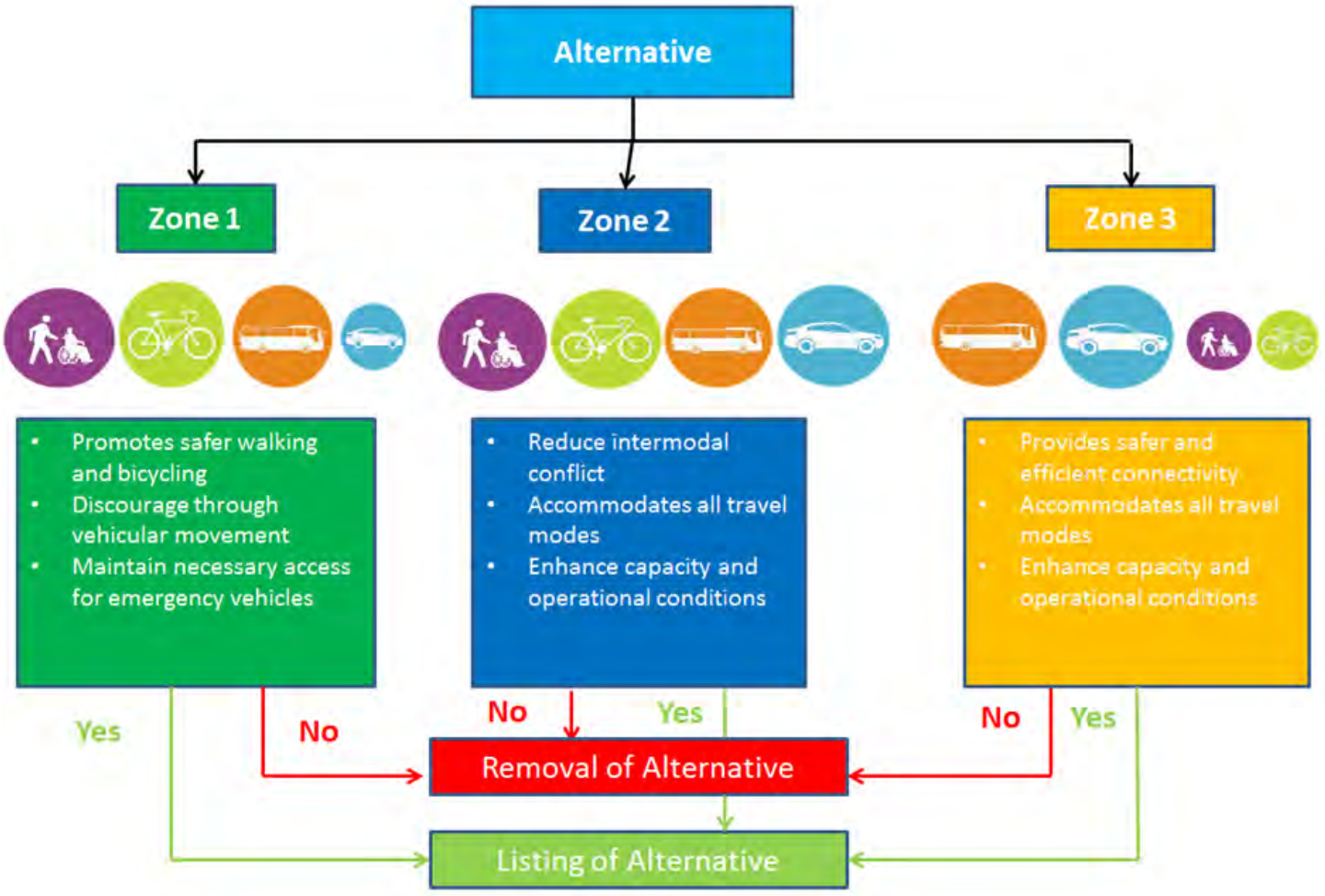


Figure 4.2: Alternative Evaluation Process

4.3 Best Practices

This chapter discusses the best practices in achieving the study objectives and goals set up for each of the CATS zones (as shown in Figure 4.2).

The following sections highlight best practices applicable to different CATS Zones within the University District. These improvements/alternatives would help achieve the overall study objectives by fulfilling the goals set up for different CATS Zones.

4.4 Infrastructure Improvements

Building/improving sidewalks, curb ramps, bike lanes, and multi-use paths provides a safer environment for pedestrians and bicyclists with fewer motor vehicle conflicts. Bike lanes and shared use paths also provide greater connectivity. Sidewalk and curb ramp construction/improvements should be consistent with the guidelines provided in the Americans with Disabilities Act (ADA).

4.5 Intersection Improvements

Intersections are critical locations as conflicts between different travel modes are predominant. Potential treatments best suited for some University District intersections include:

4.5.1 Pedestrian Scramble

A pedestrian scramble phase gives a walk signal to pedestrians in all directions at the same time at a signalized intersection while drivers are stopped in all directions.

Major advantages of incorporating pedestrian scramble within the University District are the following:

- Pedestrians will be able to cross the intersection without any conflicting vehicular movements.
- Pedestrians may also be able to cross the intersection diagonally, thereby, completing two crossings at once.
- For CATS Zones 1 and 2, the implementation of pedestrian scramble at certain intersections would enhance pedestrian and bicycle safety and discourage vehicular movements by adding additional travel delay.
- Pedestrian scramble is a low cost improvement to add at a signalized intersection.
- Some intersections within the University District currently have pedestrian scramble phases and road users are aware of it (e.g. Green/Wright, Green/Sixth, Fourth/Gregory).

Figure 4.3 shows pedestrian movements at an intersection with a pedestrian scramble phase.

Figure 4.3: Example of Pedestrian Scramble

4.5.2 Leading Pedestrian Intervals

A Leading Pedestrian Interval (LPI) allows pedestrians to begin crossing several seconds before the vehicle traffic on the parallel street is given the green light.

Major advantages of incorporating LPIs within the University District would be the following:

- Elimination of vehicle-pedestrian conflicts at the beginning of “walk” signal.
- Increased pedestrian safety and comfort and perceived safety level by increased pedestrian visibility at the crosswalk.
- LPI treatment is relatively inexpensive and easy to implement.

Implementing the LPI is a key component to implementing No Right turn On Red (NROR).

4.5.3 No Right Turn on Red

Addition of No Right Turn On Red (NROR) provision at intersections is generally considered in areas where there are higher pedestrian volumes, or where there is a proven problem (e.g. sight distance) with motorists conflicting with pedestrians.

Major advantages of adding NROR provision at signalized intersections within the University District would be the following:

- Lesser risk of vehicle-pedestrian conflict at signalized intersections with heavy pedestrian volumes within CATS Zones 1 and 2.
- Adding NROR provisions are relatively inexpensive.
- For CATS Zones 1 and 2, NROR would enhance pedestrian and bicycle safety and discourage vehicular movements by adding additional travel delay.
- Road users are already familiar with NROR because seven intersections within the University District currently have this provision.

Additional Issues with NROR Implementation

At present, eight intersections within the University District have NROR provision. Table 4 shows the pedestrian and bicycle crash summary (2006 to 2010) at the intersections with NROR within the University District.

There were no fatal or "A-injury" (most severe) crashes at the intersections that already have the NROR provision.

Table 4.4: Pedestrian and Bicycle Crash Summary at Intersections with NROR Provision

Intersections with Existing NROR	Ped & Bike Crashes		Severity Level			Facilities
	Pedestrian Crashes	Bike Crashes	A-Injury	B-Injury	C-Injury	
Wright St/Green St	0	0	0	0	0	0
Sixth St/Green St	1	0	0	1	0	0
Goodwin Ave/Green St	0	1	0	1	0	0
Lincoln Ave/Green St	3	2	0	4	1	0
Sixth St/John St	0	0	0	0	0	0
Fourth St/Gregory Dr	1	0	0	1	0	0
Oak St/Kirby Ave	1	0	0	1	0	0
Fourth St/Kirby Ave	0	1	0	0	1	0
Total	**6**	**4**	**0**	**8**	**2**	**0**

Twelve additional signalized intersections with heavy pedestrian volumes within the University District were considered for NROR provision. Table 4.5 shows pedestrian and bicycle crash severity details at these twelve intersections.

There were 4 "A-injury" (most severe) crashes at these intersections. Adding NROR provision at these intersections would reduce vehicle-pedestrian conflict and help make these intersections safer.

Table 4.5: Pedestrian and Bicycle Crashes at Signalized Intersections Considered for NROR

Intersections with proposed NROR	Ped & Bike Crashes		Severity Level			Fatalities
	Pedestrian Crashes	Bike Crashes	A-Injury	B-Injury	C-Injury	
Fourth St/Springfield Ave	0	2	0	1	1	0
Sixth St/Springfield Ave	1	1	0	0	0	0
Wright St/Springfield Ave	0	0	0	0	0	0
Goodwin Ave/Springfield Ave	2	0	1	1	0	0
First St/Green St	1	3	1	1	2	0
Fourth St/Green St	1	1	0	1	1	0
Fourth St/Daniel St	1	1	0	1	1	0
Fourth St/Armory Ave	1	0	1	0	0	0
Sixth St/Armory Ave	0	0	0	0	0	0
Sixth St/Gregory Dr	0	1	0	1	0	0
Fourth St/Peabody Dr	0	1	0	1	0	0
First St/Kirby Ave	0	2	1	1	0	0
Total	**7**	**12**	**4**	**8**	**5**	**0**

Note: The intersections of Fourth St/ Springfield Ave, Sixth St/Springfield Ave and Wright St/Springfield Ave fall under the IDOT jurisdiction.

Figure 4.4 shows existing and proposed intersections with NROR provision. As can be seen in Figure 4.4, the Fourth Street and Green Street corridors would have the highest number (six) of signalized intersections with NROR measures. Four of the existing signalized intersections with NROR provision are located along Green Street; whereas, only one signalized intersection along the Fourth Street corridor currently has the NROR provision in place. The addition of the NROR provision at twelve signalized intersections within the University District would contribute to additional control delay and thereby a decline in vehicle operational levels of service at these intersections. Figure 4.5 shows the intersections where capacity reduction and increased control delay would result in a change in level of service (LOS) due to the addition of the NROR during the PM peak hour.

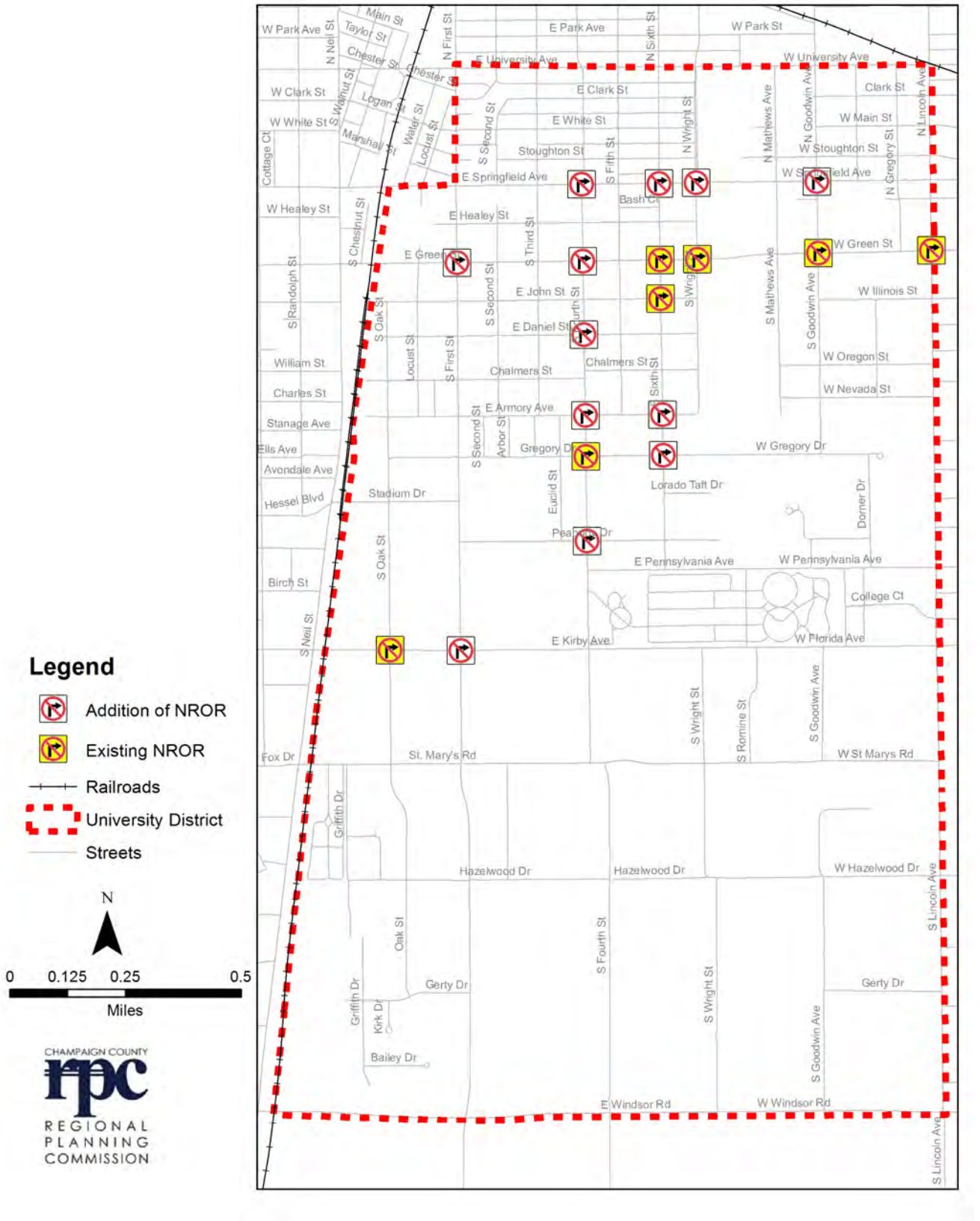


Figure 4.4: Signalized Intersections with NROR Provision (Existing and Proposed)

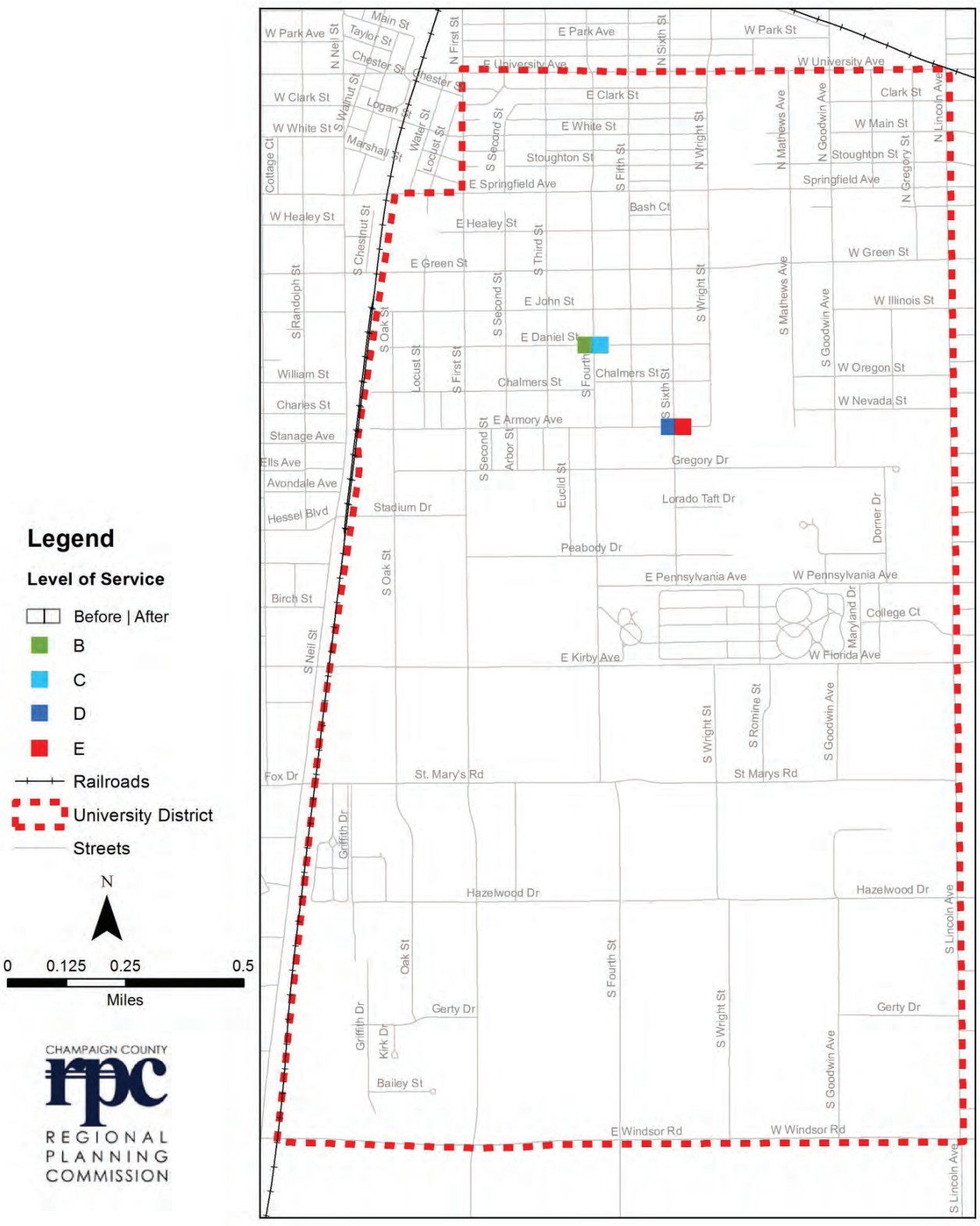


Figure 4.5: Intersections with Capacity Reductions due to NROR Provision

As shown in Figure 4.5, the Sixth Street/Armory Avenue intersection would be congested due to the addition of NROR. However, this intersection is located within CATS Zone 1 where walking and bicycling are prioritized over vehicular movement and additional vehicular delay is considered acceptable. Additional vehicular congestion would also discourage vehicular movement through this intersection.

Table 4.6 shows the increase in travel time along major corridors within the University District for vehicular traffic during the PM peak hour by implementing NROR provision at twelve additional signalized intersections.

Table 4.6: Increase in Travel Time along Different Corridors

Corridor	Increase in delay (sec/veh) with NROR			
	NB	SB	EB	WB
Lincoln Ave.	3.8	17.1	-	-
First St.	11.8	16.1	-	-
Fourth St.	31.2	71.6	-	-
Springfield Ave.	-	-	10.3	6.3
Green St.	-	-	2.4	1.7

As can be seen in Table 4.6, southbound vehicular traffic along the Fourth Street corridor would experience additional travel delay of over a minute during the PM peak hour because of implementing NROR provision at five additional corridor intersections. The addition of vehicle travel delays is not a major concern as reduction of vehicle-pedestrian conflict points and enhancing pedestrian safety at pedestrian heavy intersections are a higher priority for the University District.

4.6 Corridor Improvements

Best practices for corridor level improvements within the University District are as follows:

4.6.1 Roadway Reconfiguration (Road Diet)

Road diets are generally conversions of four lane undivided roads into three lanes (two through lanes and a center turn lane). The fourth lane can be converted into bicycle lanes, sidewalks, and/or on-street parking. Advantages of road diets include the following:

- Road diets help safely accommodate vehicles, pedestrians, and bicyclists.
- Road diets can help reduce vehicle speeds and interactions during lane changes and thereby help to reduce crash potential.
- Pedestrians crossing roadways with road diet would have lesser crash risk as their exposure would be reduced.

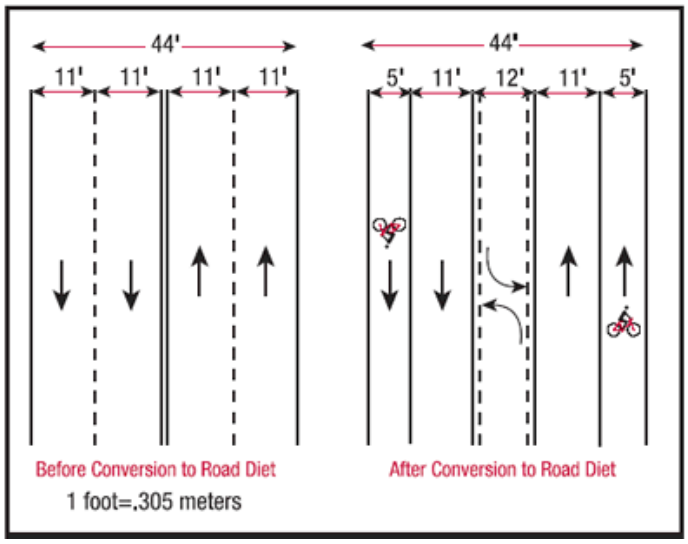


Figure 4.6: Road Diet Conversion Example

4.6.2 One-Way Streets

Conversion of two-way streets into one-way streets can be effectively implemented within the University District. Major advantages of converting a two-way street into a one-way street would include:

- Simplified crossings for pedestrians as they encounter traffic from only one direction.
- Fewer vehicle-vehicle and vehicle-pedestrian/bicyclist conflict points at intersections.
- Additional on-street parking.

One-way street conversion should be carefully designed to prevent an increase in effective lane widths for vehicles. An increase in lane width can lead to an increase in vehicular speed. Also, bicyclists may tend to travel against the vehicular traffic flow on a one-way street. In such cases, contra-flow bike lanes can be considered.

4.6.3 Bus Only Lanes

A bus only lane is a lane restricted to buses full or part time (for a specific period of time on weekdays). Bus only lanes are marked with a "Bus Only" longitudinal pavement marking. Major advantages of bus lanes include:

- Bus lanes prioritize buses and help to reduce transit travel times.
- Less frequent lane changing maneuvers for buses reduces the risk of crashes.
- Promotes transit travel mode.

4.6.4 Bus-Bike Lanes

Bus-bike lanes are roadway travel lanes restricted to buses, bicycles, and vehicles turning right. Bicyclists generally travel on the right side of the lane and buses pass them on the left. The width of a bus-bike lane should be more than the width of a typical roadway lane. Major advantages of bus-bike lanes include:

- Bicyclists would have fewer conflicts with vehicles.
- Bus-bike lane should promote bicycling; bus density on bus-bike lanes is generally lighter than typical vehicular traffic.

It is important to note that bus operators need to be trained on safely operating on bus-bike lanes as bicyclists would tend to pass a stopped bus on the left.

4.7 Recommended Alternatives

Selected alternatives were evaluated based on the procedures mentioned in Section 4.2. Lists of recommended alternatives for each CATS zone were prepared based on outcomes of evaluation results. Recommended alternatives were categorized based on the following implementation timelines:

- Short term (0 to 5 years)
- Medium term (5 to 15 years)
- Long term (15 years+)

4.8 Short and Medium Term Recommended Alternatives for CATS Zone 1

Table 4.7 shows short term recommended alternatives for CATS Zone 1.

Table 4.7: Short Term Recommended Alternatives for CATS Zone 1

Alternative	Responsible Agency(ies)	Evaluation Criteria Score (out of 100)
Mathews Avenue closed for through vehicular traffic between Green Street and Oregon Street (only vehicles with parking permits will be allowed)	City of Urbana	100
Mathews Avenue closed for through vehicular traffic between Green Street and Springfield Avenue (only vehicles with parking permits will be allowed)	City of Urbana	100
Install a pedestrian scramble phase at the intersection of Goodwin Ave./Green St.	City of Urbana	100
Add contraflow bike lane on Daniel Street, and keep vehicular traffic one-way eastbound from Sixth Street to Wright Street	City of Champaign	80
Add bike lanes on Sixth Street from Armory Avenue to Pennsylvania Avenue	University of Illinois	80
Institute a 25 mph speed limit on all roadways in the University District	City of Champaign, City of Urbana, University of Illinois	70

Figure 4.7 shows the existing and recommended alternatives using photosimulation of the Goodwin Avenue/ Green Street intersection with the pedestrian scramble markings.

Existing **Proposed with Pedestrian Scramble**

Figure 4.7: Goodwin Avenue/Green Street Intersection

Figure 4.8 shows existing and recommended lane configurations for Daniel Street between Sixth Street and Wright Street. The addition of a contraflow bike lane would provide a much needed connection between bike facilities east of Wright Street and the heavy bike volumes west of Sixth Street. Moreover, bicycle-vehicle and pedestrian-bicycle conflict potential would also decrease. To accommodate bike lane installation, it is recommended to consolidate on-street parking from both sides of the street to one; specifically, to create back-in angled parking spots on the north side of Daniel Street for customers of the businesses located on the north side the street.

Figure 4.8: Existing and Proposed Lane Configurations for the 600 block of East Daniel Street

Table 4.8 shows medium term recommended alternatives for CATS Zone 1.

Table 4.8: Recommendations Related to the Parking System Review Committee

Alternative	Responsible Agency(ies)	Evaluation Criteria Score (Out of 100)
Consider No Turn On Red (NTOR) provision for some signalized intersections from 7AM to 7PM (See Figure 4)	City of Champaign, City of Urbana, University of Illinois	100
Use Leading Pedestrian Intervals (LPI) at intersections with NTOR provision	City of Champaign, City of Urbana, University of Illinois	100
Make Wright Street northbound a bus only lane from Armory Avenue to Daniel Street	City of Champaign, University of Illinois, CUMTD	80
Add bike lanes on Wright Street from Armory Avenue to Daniel Street	CUMTD, University of Illinois, City of Champaign	80
Add bike lanes on Wright Street from John Street to Springfield Avenue	CUMTD, University of Illinois, City of Champaign	80
Make Armory Avenue eastbound a bus only lane from Sixth Street to Wright Street	University of Illinois, CUMTD	80
Add bike lanes on Armory Avenue from Fourth Street to Wright Street	CUMTD, University of Illinois	80
Add bike lanes on Green Street from Wright Street to Lincoln Avenue	CUMTD, City of Urbana, University of Illinois	80
Convert outside lanes of Green Street to bus only lanes from Wright Street to Lincoln Avenue	CUMTD, City of Urbana	80
Add contraflow bike lanes on Oregon Street from Mathews Avenue to Goodwin Avenue	City of Urbana	80
Place way-finding signs for special events in the University District	City of Urbana, City of Champaign, University of Illinois	N/A

Figure 4.9 shows the existing and proposed typical layout of Wright Street from Armory Avenue to Daniel Street and from John Street to Green Street. Dedicated bus lanes would ensure smoother and quicker transit service, and bike lanes would facilitate the reduction in bicycle-pedestrian and vehicle-bicyclist conflicts.

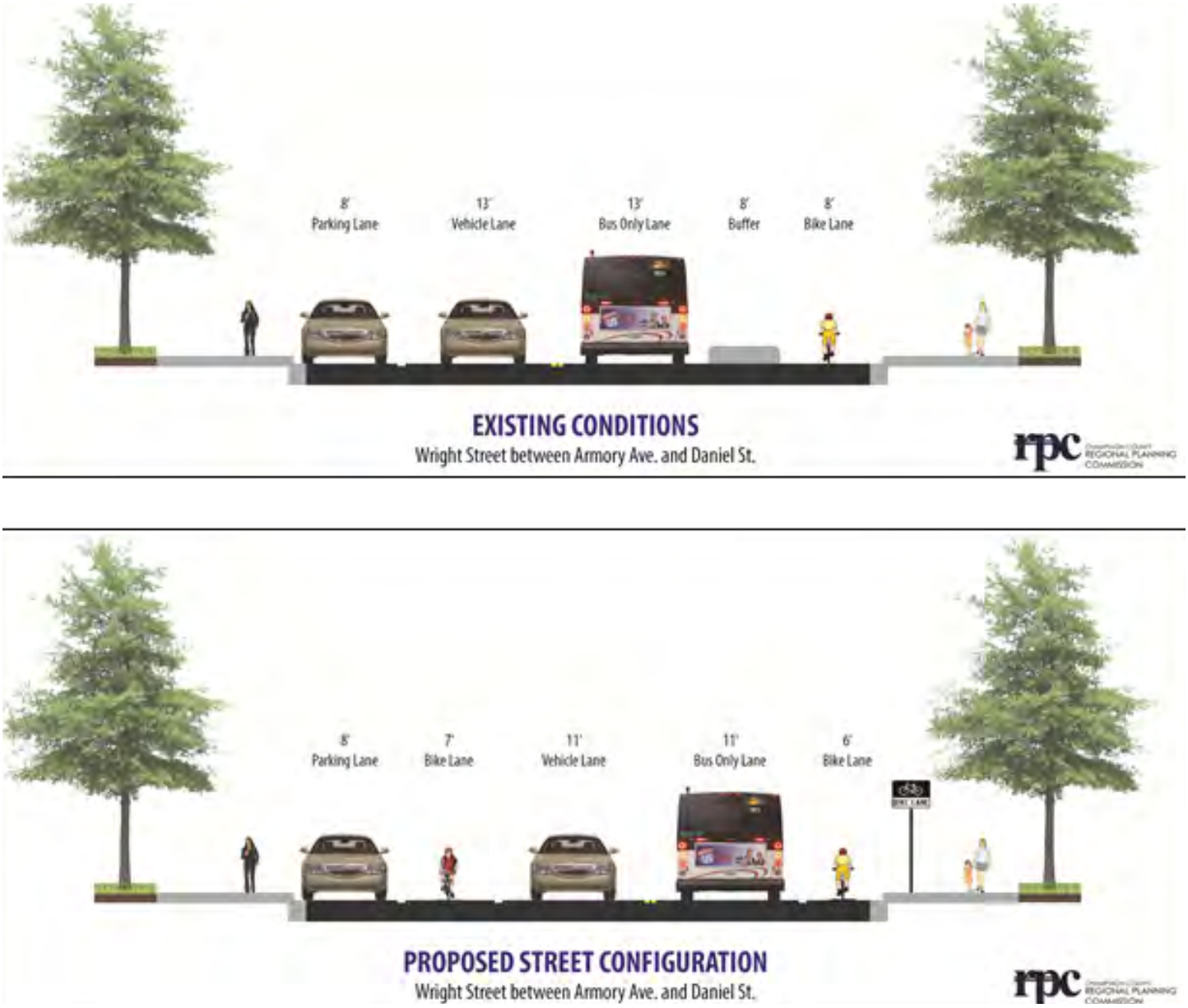


Figure 4.9: Existing and Proposed Lane Configurations for Wright Street

Figure 4.10 shows the existing and proposed typical layout of Green Street from Wright Street to Lincoln Avenue. As can be seen in Figure 10, the rightmost lane in each direction would be converted into a bus only lane. The Green Street corridor east of Wright Street is a busy transit corridor, and bus stops near the Illini Union are some of the busiest bus stops within the University District. A dedicated bus only lane would ensure safer maneuver for buses, safer boarding/alighting at bus stops and efficient transit service with reduced travel time. Bike lanes would reduce the possibility of vehicle-bicycle and bicycle-pedestrian conflict.

Figure 4.10: Existing and Proposed Lane Configurations for Green Street in Urbana

4.9 Short and Medium Term Recommended Alternatives for CATS Zone 2

Table 4.9 shows short term recommended alternatives for CATS Zone 2.

Table 4.9: Recommendations Related to the Campus Bike Plan

Alternative	Responsible Agencies	Evaluation Criteria Score (out of 100)
Make Fifth Street one-way northbound from Green Street to Springfield Avenue and one-way southbound from Green Street to Daniel Street	City of Champaign	85
Convert Virginia Drive into one-way southbound from Pennsylvania Avenue to College Court	University of Illinois	85
Convert Gregory Street into one-way street northbound from Green Street to Springfield Avenue	City of Urbana	85
Institute a 25 mph speed limit on all roadways in the University District	City of Champaign, City of Urbana, University of Illinois	75

Figure 4.11 shows existing and proposed lane configurations for Fifth Street north of Green Street.

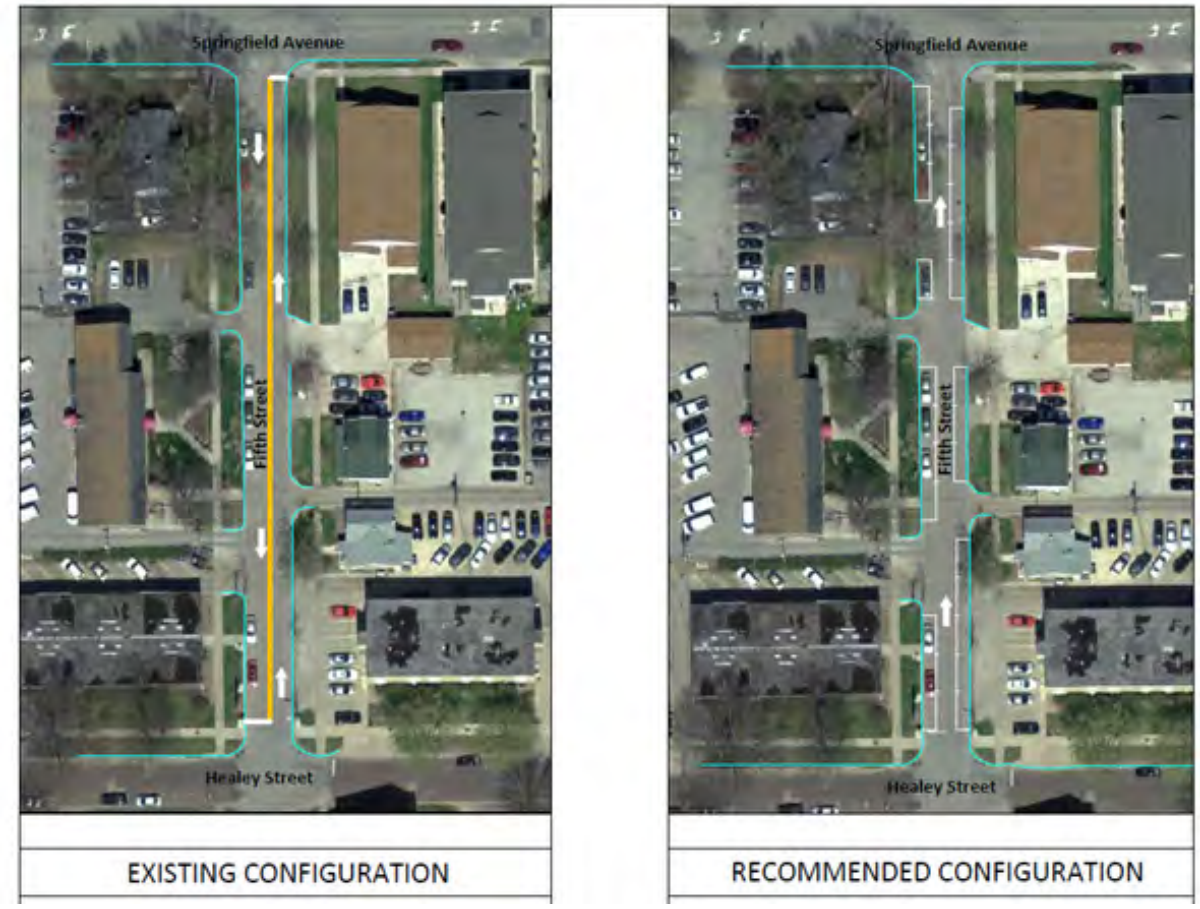


Figure 4.11: Existing and Proposed Lane Configurations for Fifth Street North of Green Street

Table 4.10 shows crash frequency and severity level summary for the Fifth Street/Green Street intersection from 2006 to 2010. As can be seen in Table 4.10, there were a total of 32 crashes at this intersection and 4 of them were A-injury crashes. Approximately 1 in 3 crashes involved some injuries.

Table 4.10: Fifth Street/Green Street Intersection Crashes - Crash Frequency

Year	Crashes				Fatalities	Total Injuries
	Total	A-Injury	B-Injury	C-Injury		
2006	6	0	0	2	0	2
2007	6	1	0	0	0	1
2008	11	2	1	1	0	5
2009	4	0	0	0	0	0
2010	5	1	0	2	0	4
Total	32	4	1	5	0	12

Table 4.11 shows crash types information for the Fifth Street/Green Street intersection. As can be seen in Table 4.11, there was one pedestrian and two bicycle crash at this intersection. Moreover, approximately, 69% of crashes at this intersection were angle crashes.

Table 4.11: Fifth Street/Green Street Intersection Crashes - Crash Type

Year	Crash Type					
	Total	Pedestrian	Bicyclist	Angle	Turning	Rear-end
2006	6	0	1	4	0	1
2007	6	0	0	5	1	0
2008	11	1	1	7	1	1
2009	4	0	0	2	0	2
2010	5	0	0	4	0	1
Total	32	1	2	22	2	5

Converting Fifth Street into one-way northbound from Green Street to Springfield Avenue and one-way southbound from Green Street to Daniel Street would help reduce vehicle-vehicle and vehicle-pedestrian/bicyclist conflict points and hence bring down the angle, turning movement, pedestrian and bicyclist crashes.

The travel lane width of converted one-way streets should be carefully selected not to allow any additional width which could encourage higher vehicular travel speed. A contraflow bike lane and/or additional on-street parking spaces can be added to converted one-way streets to reduce speed and increase safety. Figure 4.12 shows existing and proposed lane configurations for Fifth Street south of Green Street.

Figure 4.12: Existing and Proposed Lane Configurations for Fifth Street South of Green Street

Table 4.12 shows medium term recommended alternatives for CATS Zone 2.

Table 4.12: Medium Term Recommended Alternatives for CATS Zone 2

Alternative	Responsible Agencies	Evaluation Criteria Score (out of 100)
Add bike lanes on Gregory Street from Oregon Street to Illinois Street	University of Illinois, City of Urbana	90
Add bike lanes on Oregon Street from Goodwin Avenue to Lincoln Avenue	City of Urbana	90
Add a traffic signal with pedestrian scramble phase at the Fourth Street/Armory Avenue intersection	University of Illinois, City of Champaign	90
Add bike lanes on Fourth Street from University Avenue to Green Street, and from Armory Avenue to St. Mary's Road	City of Champaign, University of Illinois	90
Consider No Turn On Red (NTOR) provision for all signalized intersections from 7AM to 7PM	City of Champaign, City of Urbana, University of Illinois, IDOT	90
Use Leading Pedestrian Intervals (LPI) at intersections with NTOR provision	City of Champaign, City of Urbana, University of Illinois	90
Widen White Street to accommodate bike lanes from Wright Street to Second Street	CUMTD, City of Champaign	75
Convert White Street to bus-only lanes from Wright Street to Second Street	CUMTD, City of Champaign	65
Close Main Street to vehicular traffic from Goodwin Avenue to Harvey Street	City of Urbana	45
Place way-finding signs for special events in the University District	City of Champaign, City of Urbana, University of Illinois	N/A

Figure 4.13 shows existing and proposed lane configurations for White Street between Second Street and Wright Street. Conversion of vehicle travel lanes into bus only lanes eliminate other vehicles and enhance rapid transit service.

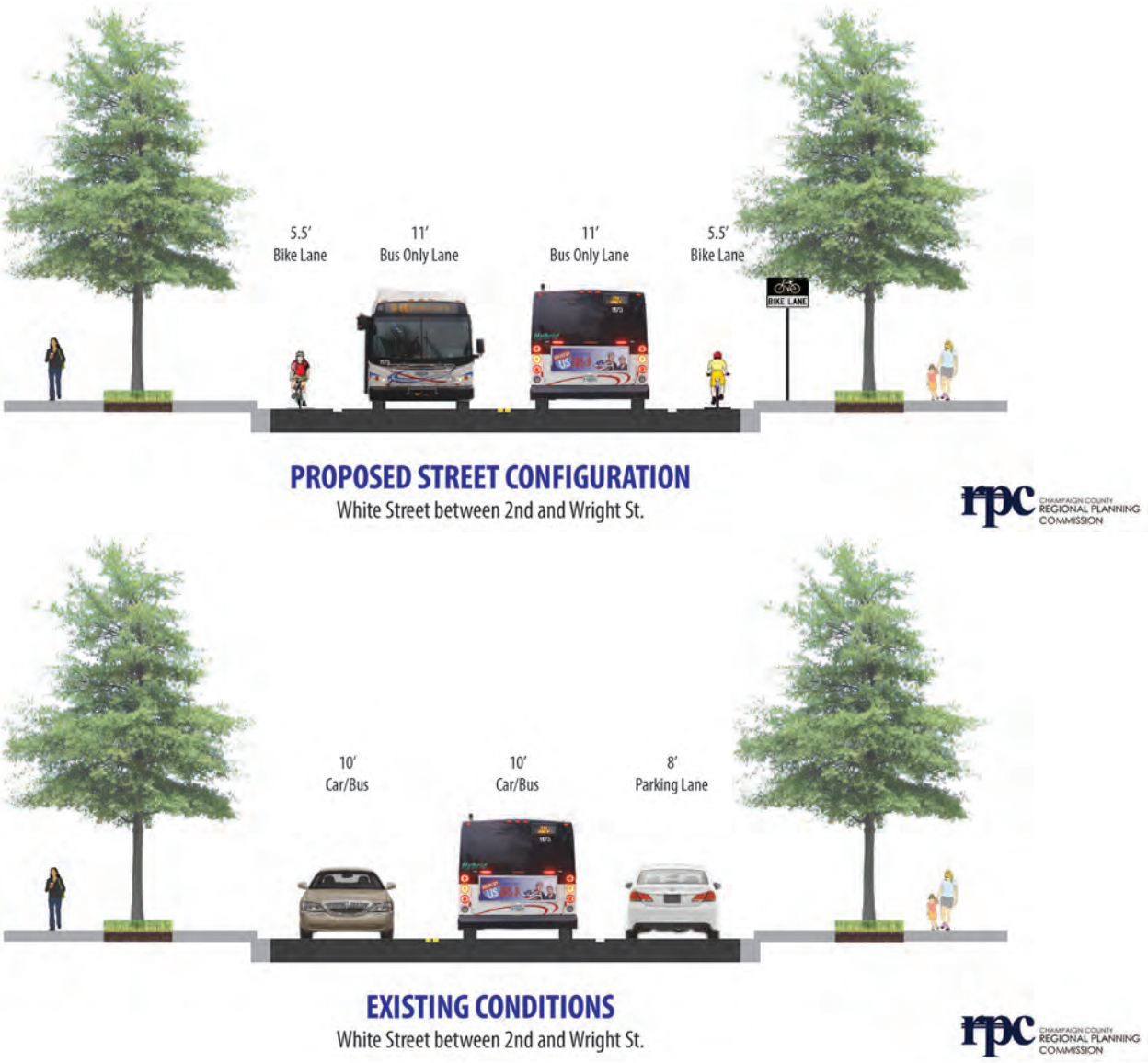


Figure 4.13: Existing and Proposed Lane Configurations for White Street

Figure 4.14 shows existing and proposed traffic controls at the Fourth Street/Armory Avenue intersection. This intersection was identified as one of the top 10 intersections in terms of pedestrian volumes. The addition of a traffic signal with a pedestrian scramble phase would enhance pedestrian safety by reducing the possibility of vehicle-pedestrian conflicts.

Existing

Proposed

Figure 4.14: Existing and Proposed Traffic Controls at the Fourth Street/ Armory Avenue Intersection

4.10 Short and Medium Term Recommended Alternatives for CATS Zone 3

Table 4.13 shows short term recommended alternatives for CATS Zone 3.

Table 4.13: Short Term Recommended Alternatives for CATS Zone 3

Alternatives	Responsible Agencies	Evaluation Criteria Score (out of 100)
Improve capacity and/or signal phasing at Fourth St./Kirby Ave. and Lincoln Ave./Windsor Rd. intersections	Cities of Champaign and Urbana	100
Prohibit left turns from northbound and southbound approaches at the Lincoln Ave./Main St. intersection	City of Urbana	75

Eliminating left turn movements from northbound and southbound approaches at the Lincoln Avenue/Main Street intersection would reduce vehicle-vehicle, vehicle-pedestrian, and vehicle-bicyclist conflict points. This could also provide space to construct a refuge island for bicyclists and pedestrians; Main Street is a recommended bike route in the City of Urbana.

Traffic signal phasing improvements and retiming is a low cost treatment for intersection capacity improvements. The Lincoln Avenue/Windsor Road intersection currently experiences congested condition during the morning peak hour at the eastbound approach due to the high volume of vehicles turning left. Lower control delays and higher traffic operational service can be achieved through optimizing signal cycle time and phase intervals. Table 4.14 shows control delays and Level of Service (LOS) values at different approaches during the morning peak hour at the Lincoln Avenue/Windsor Road intersection before and after the proposed signal phase and

cycle time improvements.

Table 4.14: Control Delays and LOS at the Lincoln Avenue/Windsor Road Intersection

Intersection	Approach	Before		After	
		Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
Lincoln Avenue/ Windsor Road	Eastbound	60.0	E	31.8	C
	Westbound	94.5	F	62.8	E
	Northbound	17.2	B	24.7	C
	Southbound	26.9	C	39.8	D
	Overall	74.4	E	47.7	D

Table 4.15 shows medium term recommended alternatives for CATS Zone 3.

Table 4.15: Medium Term Recommended Alternatives for CATS Zone 3

Alternative	Responsible Agencies	Evaluation Criteria Score (out of 100)
Implement a road diet on Oak Street from St. Mary's Road to Kirby Avenue	University of Illinois	85
Implement a road diet on Lincoln Avenue from Windsor Road to St. Mary's Road	City of Urbana, University of Illinois	85
Implement a road diet on Fourth Street from Kirby Avenue to St. Mary's Road	University of Illinois	85
Implement a road diet on St. Mary's Road from Oak Street to Fourth Street	University of Illinois	85
Add bike lanes on St. Mary's Road from Neil Street to Lincoln Avenue	University of Illinois	75
Consider No Turn On Red (NTOR) provision for the non-periphery signalized intersections (First St./Green St. and First St./Kirby Ave.) from 7AM to 7PM	City of Champaign, University of Illinois	75
Removal of curb bumpout on the northwest corner of Lincoln Avenue/Pennsylvania Avenue intersection	City of Urbana, University of Illinois	65
Add bike lanes on Green Street from Fourth Street to Neil Street	City of Champaign, University of Illinois	65
Add bike lanes on Stadium Drive from Neil Street to First Street	University of Illinois	65
Add bike lanes on Oak Street from Kirby Avenue to Gerty Drive	University of Illinois	65

Figure 4.15 shows the existing and proposed lane configurations using photosimulation for the Fourth Street segment from Kirby Avenue to St. Mary's Road. The proposed roadway reconfiguration would ensure accommodation of all travel modes.

Existing **Proposed**

Figure 4.15: Existing and Proposed Lane Configurations for Fourth Street (Kirby Ave to St. Mary's Rd)

Figure 4.16 shows the existing and proposed lane configurations using photosimulation for the Oak Street segment from Kirby Avenue to St. Mary's Road.

Existing **Proposed**

Figure 4.16: Existing and Proposed Lane Configurations for Oak Street (Kirby Ave to St. Mary's Rd)

Figure 4.17 shows the existing and proposed concept lane layout for the Lincoln Avenue segment from St. Mary's Road to Windsor Road.

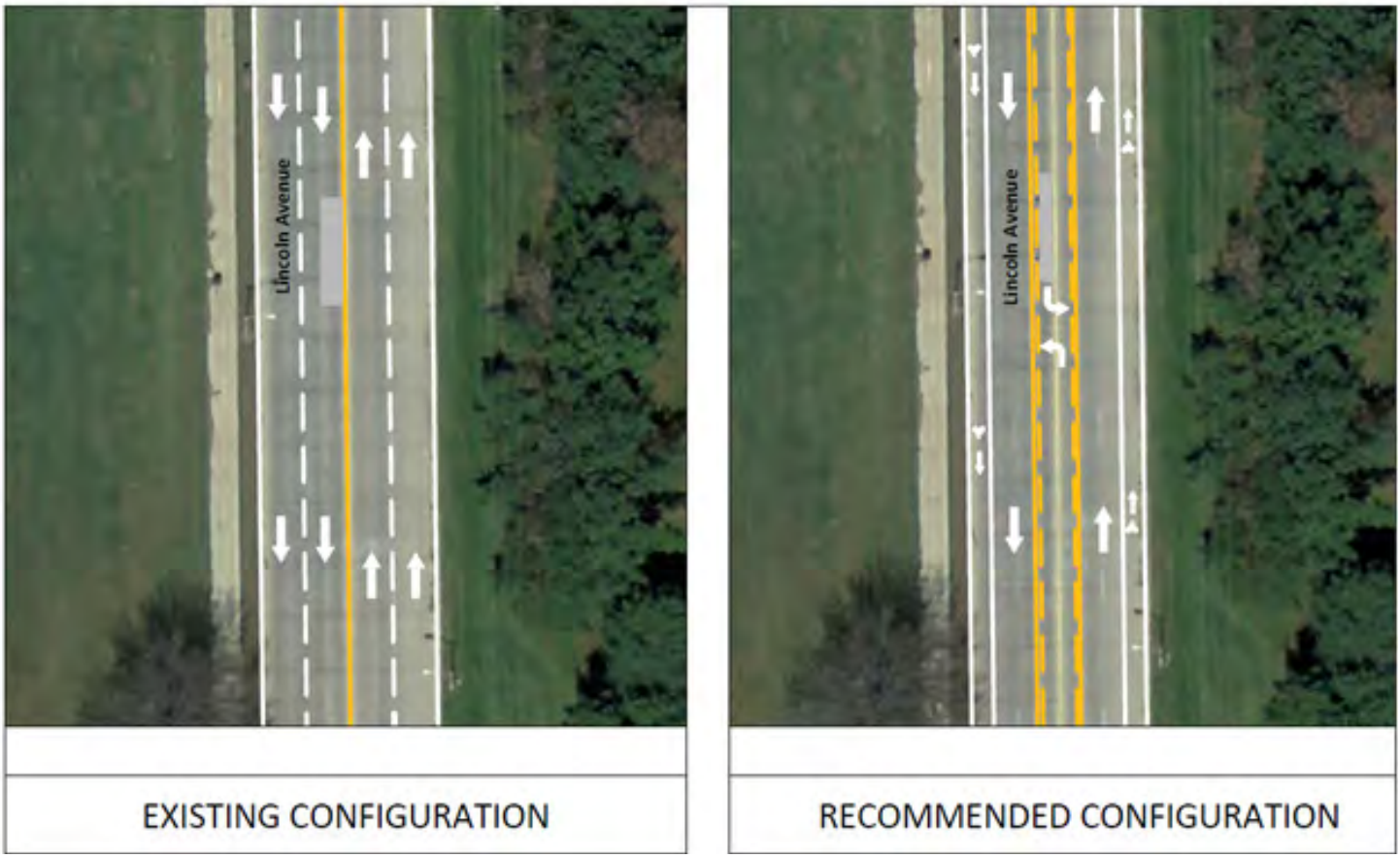


Figure 4.17: Existing and Proposed Lane Layout for Lincoln Avenue (St. Mary's Rd to Windsor Rd)

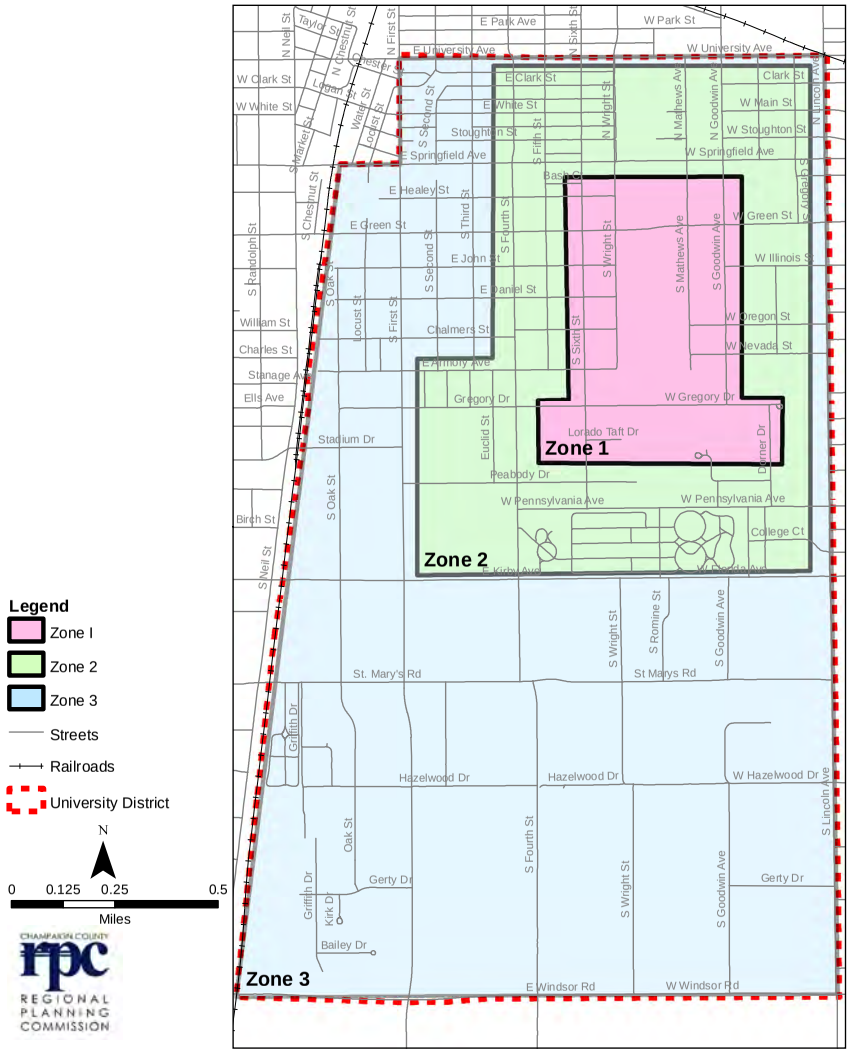
4.11 CATS Zone Boundaries

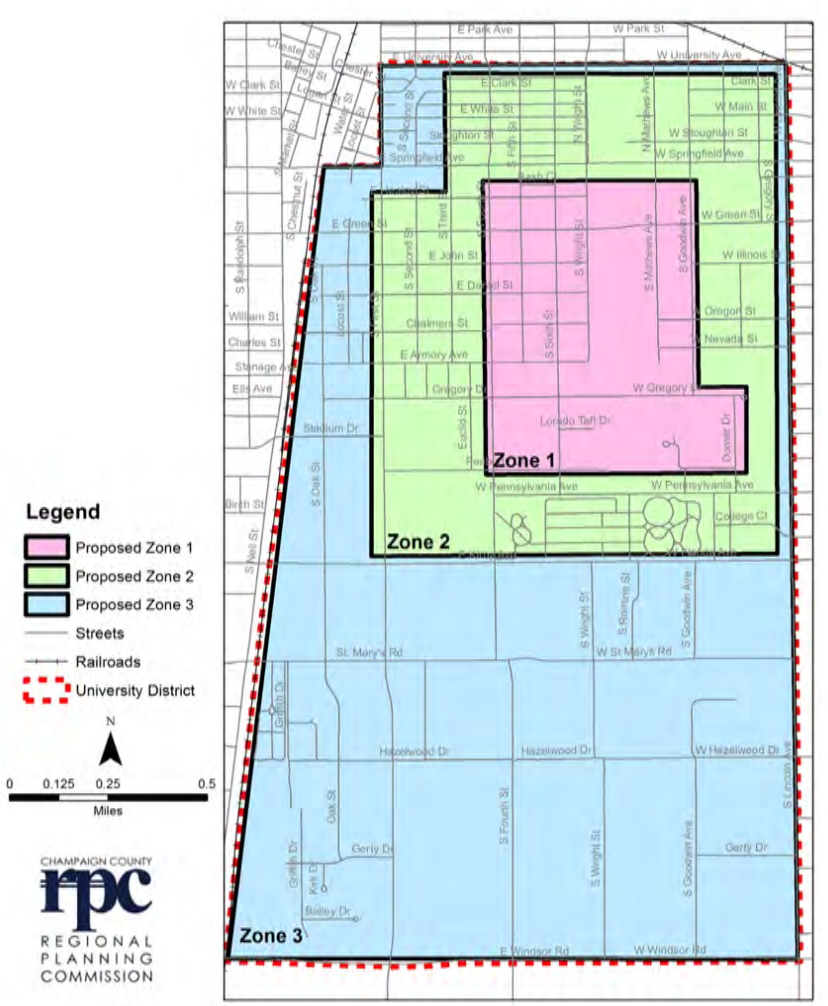
The existing CATS Zones with their corresponding definitions and boundaries were established and approved through previous campuswide transportation studies. CATS Zones were selected considering land use, availability and usage of travel modes, transportation facilities, road users' safety, and sustainability.

CATS Zones play a significant role in establishing priorities for transportation related projects within the University District. The existing conditions analysis of this study identified that pedestrian and bicyclist activities within the entire University District are increasing, and subsequently automobile-oriented travel is decreasing. Two of the most pedestrian-heavy intersections are located outside CATS Zone 1, and four of the most bicyclist-heavy intersections are located outside CATS Zone 1.

Considering the study objectives, existing conditions analysis, and alternatives' evaluation, this study recommends changing the boundaries for CATS Zones 1 and 2. Expanding the boundaries of CATS Zones 1 and 2 would help prioritize pedestrian and bicycle safety and promote pedestrian, bicycle, and transit-oriented traffic circulation for the core area of the University District. Figure 4.18 shows the existing and proposed CATS Zone boundaries.

Figure 4.18: Existing and Proposed CATS Zone Boundaries





Existing **Proposed**

4.12 Long Term Recommended Alternatives

Long term recommended alternatives include university district wide and/or zone specific recommendations which would require policy level changes, significant resources, public and private sector coordination, and longer implementation timelines.

The long term recommended alternatives are termed as the "Dream Scenario". The Dream Scenario includes the following:

- Introduce high capacity transit corridors with improved passenger shelters.
- Use high frequency transit connections with parking decks/lots at the periphery of the University District.
- Prohibit semi-trucks at businesses in CATS Zone 1 for deliveries; use a central receiving facility instead.
- Enforce periodic reduction/discouragement of on-street and off-street parking facilities on weekdays between 7AM and 7PM in CATS Zone 1.
- Introduce natural barriers (e.g. shrubs, green ditches) to channel pedestrian movements.
- Introduce "Green Streets" design practices for University District roadway corridors.

CHAPTER 5
Public Engagement

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5. Public Engagement

5.0 Introduction

This chapter discusses the public engagement process of the study. Two public meetings/workshops were organized by the study team. The first public meeting provided details on study objectives, existing conditions analysis results, and possible preferable alternative scenarios for the University District's traffic circulations, and pros and cons of these alternative scenarios. During the meeting, the study team gathered input from the public on their major traffic circulation related concerns and preferences on possible preferred alternative scenarios.

The second public meeting provided information on the final recommended alternatives for the University District and sought public input on the study as a whole and whether their major concerns regarding campus traffic circulation were adequately addressed through this study.

5.1 First Public Meeting

The first public meeting for the University District Traffic Circulation Study was held at the University of Illinois Activities and Recreation Center (ARC) on Thursday, March 7, 2013 from 4 pm to 7 pm. The venue, date, and duration of the public meeting were chosen in a way that would allow ample opportunities for the interested students, faculties and staff to participate and provide their comments. The meeting was "open house" style where the participants took a look at the presentation boards, provided votes on their preferred alternatives and filled out comment cards at the end. Figure 5.1 shows a few participants at the Open House Meeting. The open house was organized in collaboration with the University of Illinois Facilities & Services (F&S) Department. F&S also had a board regarding the Draft Campus Bike Plan, and a consultant for the Champaign Urbana Mass Transit District (CUMTD) also had boards showing CUMTD's Federal Transit Administration (FTA) Small Starts grant application for several campus streets.

Figure 5.1: Participants at the First Public Open House

5.1.1 Meeting Materials

Information presented to the public during the Open House included presentation boards for the following topics:

- 1 board showing the draft Campus Bicycle Network Master Plan
- 2 boards providing information on Study Objectives, Project Background and the Transportation Zones
- 4 boards outlining the findings from the Existing Condition Analysis
- 6 boards showing the preferred alternative, their advantages, and the proposed locations for their implementation
- 2 boards for public's votes on the proposed alternatives
- 1 board showing the location map for all short and medium term recommendations for the University District
- 8 boards providing details of the roadway reconfiguration for the "Very Small Starts" application recommended for the University District, as presented by CUMTD's consultant Forth Engineering, LLC

The presentation board on the draft Campus Bicycle Network Master Plan was created by the University of Illinois Facilities and Services Department and the consultant for the CUMTD's "Very Small Starts" application prepared eight boards on the proposed improvements included in the application. Also, the micro-simulation network analysis for the existing and proposed traffic circulation in the University District was shown on a big screen TV to for the open house participants. Figures 5.2 and 5.3 show some of the presentation boards and micro-simulation for the University District respectively.

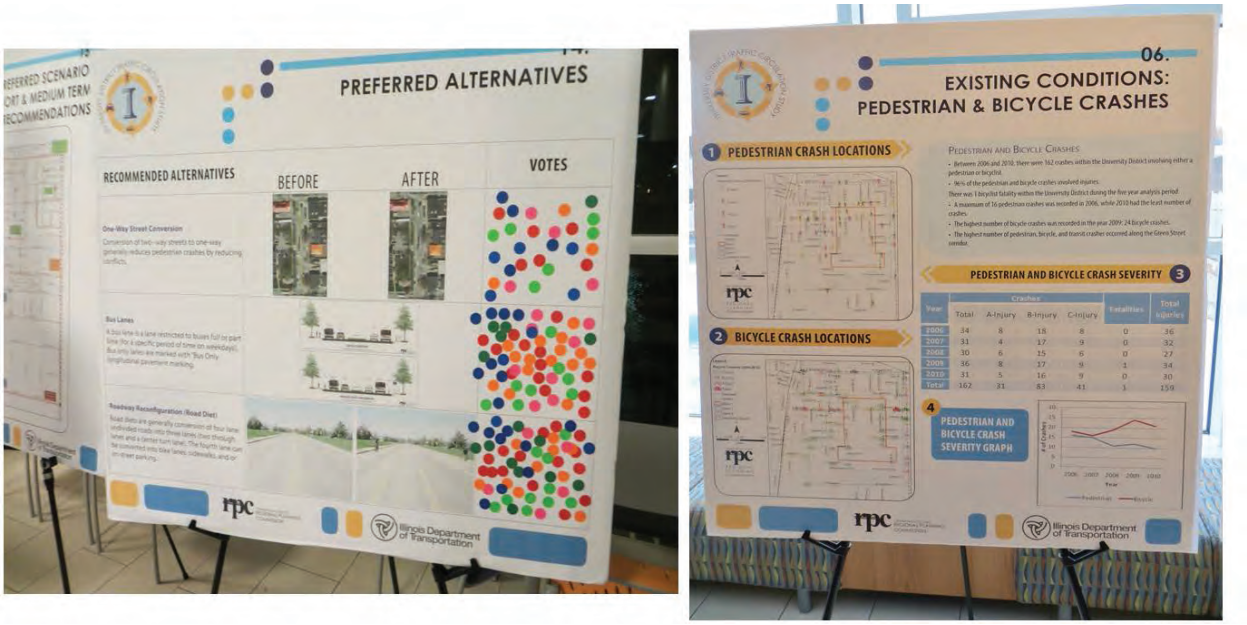

Figure 5.2: Presentation Boards at the First Public Open House

Figure 5.3: Micro-simulation Shown at the Open House

5.1.2 Meeting Input

Table 5.1 shows participants preferences on the preferred alternatives. The proposed corridor improvements of: Road Diets and Bus Lanes and the proposed intersection improvements of: Pedestrian Scrambles and Leading Pedestrian Intervals received very positive responses. The overall response on One-Way Street Conversion and No Right Turn on Red provision was mixed.

Table 5.1: Votes for Preferred Alternatives

Preferred Alternative	Votes
Roadway Reconfiguration (Road Diet)	60
Bus-Lanes	59
Pedestrian Scramble	56
Leading Pedestrian Interval	47
One-Way Street Conversion	29
No Right On Red	26

Participants provided input on existing transportation facilities within the University District and where improvements are needed. Table 5.2 shows their comments.

Table 5.2: Comments about Facility Type

Facility Type	Comments
Bike Lanes	Bike lanes should be kept in better conditions. Many of the bike lanes are full of potholes.
	There are not enough bike lanes. Bike lanes should be expanded.
	Biking on Green Street is dangerous. There needs to be better lanes for bikes.
Roadway Conditions	Green Street has extremely large potholes.
	A lot of streets on campus are poorly lit at night e.g., Fourth Street.
Public Transit	There are not enough bus signs at the stops.
	4 E/W Blue route operation hours are not long enough.
	Buses do not run frequently during breaks (e.g., Summer, Spring).
	Buses get very close to the curb where bikers ride.
	Buses need to be redirected to certain streets where double buses can be accommodated.
Safety	Too many bike crashes.
	The intersection of Lincoln and University Avenue is very dangerous to travel. This intersection is not pedestrian and bicycle friendly.

Open house participants also provided comments on the preferred alternatives considered for the University District. Table 5.3 shows their comments.

Table 5.3: Comments about Alternative

Alternative	Comments
One-Way Street Conversion	Reducing Fifth Street to a one-way will in some ways make the campus more inaccessible to parents and students.
	The University does not need more one-ways. It is already difficult enough to drive here.
	Changing streets into one-ways makes vehicle traffic terrible, and some one-way streets already slow down commuter times.
	One-ways make it more difficult to maneuver around campus.
Bike Lanes	More bike lanes and fewer cars would be preferable.
	Bike lane improvements are very appealing, especially along the Green Street corridor.
Leading Pedestrian Intervals	Letting pedestrians walk before cars get a green light would be safer.
No Right Turn on Red (NROR)	NROR causes congestion of cars.
	NROR would increase travel times on the busier streets.
	NROR would lead to congested traffic.
Pedestrian Scramble	Pedestrian scramble is very effective and makes pedestrians and bicyclists feel safer.
	Some intersections are problematic for both pedestrians and cars. Pedestrian scrambles would be very helpful in such situations.

5.2 Second Public Meeting

The second public meeting for the University District Traffic Circulation Study was held at the University of Illinois Activities and Recreation Center (ARC) on Thursday, September 5, 2013, from 4 pm to 7 pm. The venue, date, and duration of the public meeting were chosen in a way that would allow ample opportunities for the interested students, faculties and staff to participate and provide their comments. The meeting was "open house" style where the participants took a look at the presentation boards and filled out comment cards in the end. The open house was organized in collaboration with the University of Illinois Facilities & Services (F&S) Department.

5.2.1 Meeting Materials

Information presented to the public during the Open House included presentation boards for the following topics:

- 2 boards providing information on Study Objectives, Project Background and the Transportation Zones
- 6 boards showing the recommended alternatives for each CATS zones.
- 3 boards showing implementation tables for each CATS zones.
- 1 board showing existing and proposed boundaries of CATS zones.
- 1 board explaining the "dream scenario" for the University District.

Figure 5.4 shows some of the presentation boards of the second public open house.

Figure 5.4: Presentation Boards at the Second Public Open House

5.2.2 Meeting Input

Participants at the second public open house were requested to provide input on the study recommendations and other concerns regarding University District traffic circulation. Table 5.4 shows participants' comments on recommended alternatives.

Table 5.4: Comments on Facility Types

Facility Type	Comments
Bike Lane	Adding more bike lanes is a great recommended alternative to many of the streets provided.
	Additions of bike lanes on Fourth Street, Oregon Street, and Sixth Street will be very helpful.
	There should be more bike accommodation in CATS zone 3.
Public Transit	Conversion of Armory Street east of Wright Street to bus-only street will be beneficial.
	Promoting more buses and biking are encouraging.
No Right Turn On Red	No Right Turn On Red will not be helpful.
	Liked the No Right Turn On Red for Sixth Street Intersections.

Additional details of the public meetings can be found in the Appendix.

CHAPTER 6

Implementation Plan

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6. Implementation Plan

6.0 Introduction

Implementing the University District's recommended alternatives will help to create a pedestrian, bicycle, and transit-oriented circulation system. It will also ensure a safer and smoother operation of the University District's transportation network with similar benefits to surrounding areas. Step by step implementation of the recommendations will take place incrementally over a long period of time. In order for the improvements to happen in a timely and cost effective manner, it is necessary for the University of Illinois and the cities of Champaign and Urbana to maintain a high level of cooperation.

This chapter includes details on implementation of the recommended alternatives. The majority of the recommendations were CATS zone specific. The study team also categorized the recommended alternatives based on the following implementation periods:

- Short term (0 to 5 years)
- Medium term (6 to 15 years)
- Long term (longer than 15 years)

6.1 Project Prioritization

The recommended transportation improvement projects for the University District's Zones have been given a priority label of High, Medium or Low. Priority levels for the proposed recommended alternatives were selected based on specific factors set for each CATS zones as described in Table 6.1.

Table 6.1: Specific Factors Set for Each CATS Zone

CATS Zone	Factors	Relative Weight (%)
1	Promotes Pedestrian Safety	30
	Promotes Bicycle Safety	30
	Discourages Automobile Movement	20
	Maintains Necessary Access for Emergency Vehicles	20
	Total	**100**
2	Reduce Intermodal Conflict	35
	Accommodates All Travel Modes	35
	Enhances Capacity and Operational Conditions	30
	Total	**100**
3	Improves Vehicular Capacity and Operational Conditions	35
	Accommodates All Travel Modes	35
	Provides Safe and Efficient Connectivity	30
	Total	**100**

The following is a brief description of each priority ranking:

- **High:** Alternatives that fulfill all the factors specified for the corresponding CATS zone and receive a cumulative score of 90 to 100. These projects also have a high benefit to cost ratio. High priority projects should be implemented during the specified implementation timeline.
- **Medium:** Alternatives that either fully or partially fulfill the factors specified for the corresponding CATS zone and receive a cumulative score of 70 to 89. These alternatives may require larger monetary investment for implementation.
- **Low:** Alternatives that partially fulfills the factors specified for the corresponding CATS zone and receive cumulative score of less than 70. Funding for such alternatives may be limited.

6.2 Cost Estimation

The study team based cost estimates for different alternatives on recent transportation improvement projects in the Champaign-Urbana urbanized area and other comparable American cities/municipalities. These estimates are for construction only and do not include design, engineering, right-of-way acquisition, or utility adjustments which can make up a considerable amount of a project's budget. The following resources were used to help estimate the cost of each proposed project:

- City of Champaign Public Works
- City of Urbana Public Works
- Illinois Department of Transportation
- T.Y. Lin International
- Foth Infrastructure & Environment, LLC
- League of Illinois Bicyclists
- Florida Department of Transportation
- Michigan Department of Transportation

6.3 Ease of Implementation

Many of the University District's recommended alternatives require vigorous inter-agency coordination and approval either from the respective City Council boards, the University's Board of Trustees, or both. Often, such approval processes can be challenging since factors not directly related with the University District's traffic circulation goals also need to be addressed (e.g., the agency's Capital Improvement Budget, list of priorities, public opinion etc.).

As a result, every recommended alternative's relative ease of implementation was considered on a scale of 1 to 5, where 1 represents significant difficulties in implementing the recommendation and 5 represents easy implementation potential.

6.4 Implementation Table

The implementation table shows the recommended alternatives broken out by CATS zones. Information is provided for each recommended alternative in terms of:

- **Project Location:** Location of the proposed improvements/alternatives
- **Recommended Alternative:** Description of the recommended alternative
- **Cumulative Score:** Scores received based on factors specified in Table 6.1
- **Priority:** Priority level based on cumulative score
- **Estimated Cost:** Estimated implementation cost in 2013 dollars
- **Ease of Implementation:** Relative ease in going through the approval process of the recommendation
- **Agencies Responsible:** Responsible agencies in charge of implementing the alternative

Table 6.2: Implementation Table for Short-Term Recommended Alternatives for CATS Zone 1

Project Location	Recommended Alternative	Cumulative Score (out of 100)	Priority Level	Estimated Cost	Ease of Implementation	Responsible Agency(ies)
Mathews Avenue	Close Mathews Avenue to vehicular traffic between Green Street and Oregon Street (only vehicles with permit parking will be allowed)	100	High	$2,000	1	City of Urbana
Mathews Avenue	Close Mathews Avenue between Green Street and Springfield Avenue to vehicular traffic (only vehicles with permit parking will be allowed)	100	High	$2,000	1	City of Urbana
Daniel Street	Add contraflow bike lane on Daniel Street, and keep vehicular traffic one-way from Sixth Street to Wright Street	80	Medium	$1,700	3	City of Champaign
Goodwin Avenue/ Green Street Intersection	Install a pedestrian scramble phase	100	High	$3,000	5	City of Urbana
Sixth Street	Add bike lanes on Sixth Street from Armory Avenue to Pennsylvania Avenue	80	Medium	$25,000	5	University of Illinois
Zone 1	Institute a 25 mph speed limit on all University District roadways	80	Medium	$4,000	5	City of Champaign, City of Urbana, University of Illinois

Table 6.3: Implementation Table for Medium-Term Recommended Alternatives for CATS Zone 1

Project Location	Recommended Alternative	Cumulative Score (out of 100)	Priority Level	Estimated Cost	Ease of Implementation	Responsible Agency(ies)
Sixth Street/ Armory Avenue Intersection	Add No-Right Turn On Red (NROR) provision from 7AM to 7PM with Leading Pedestrian Intervals (LPI)	100	High	$1,700	5	University of Illinois
Sixth Street/ Gregory Drive Intersection	Add No-Right Turn On Red (NROR) provision from 7AM to 7PM with Leading Pedestrian Intervals (LPI)	100	High	$1,700	5	University of Illinois
Wright Street	Make northbound Wright Street a bus only lane from Armory Avenue to Daniel Street	80	Medium	$6,400,000	1	CUMTD, University of Illinois, City of Champaign
	Add bike lanes on Wright Street from Armory Avenue to Daniel Street	80	Medium		1	
	Add bike lanes on Wright Street from John Street to Springfield Avenue	80	Medium		1	
Armory Avenue	Make eastbound Armory Avenue a bus only lane from Sixth Street to Wright Street	80	Medium	$1,272,000	1	CUMTD, University of Illinois
	Add bike lanes on Armory Avenue from Fourth Street to Wright Street	80	Medium		1	
Green Street	Add bike lanes on Green Street from Wright Street to Goodwin Avenue	80	Medium	$2,104,500	4	CUMTD, City of Urbana, University of Illinois
	Convert Green Street's outside lanes to bus only lanes from Wright Street to Springfield Avenue	80	Medium		4	
Oregon Street	Add contraflow bike lanes on Oregon Street from Mathews Avenue to Goodwin Avenue	80	Medium	$2,200	1	City of Urbana
CATS Zone 1	Place wayfinding sign for special events	N/A	Medium	$3,000	4	City of Champaign, City of Urbana, University of Illinois

Table 6.4: Implementation Table for Short-Term Recommended Alternatives for CATS Zone 2

Project Location	Recommended Alternative	Cumulative Score (out of 100)	Priority Level	Estimated Cost	Ease of Implementation	Responsible Agency(ies)
Fifth Street	Make northbound Fifth Street one-way from Green Street to Springfield Avenue and one-way southbound from Green Street to Daniel Street	85	Medium	$10,000	2	City of Champaign
Virginia Drive	Convert southbound Virginia Drive into one-way from Pennsylvania Avenue to College Court	85	Medium	$1,500	3	City of Urbana
Gregory Street	Convert northbound Gregory Street into a one-way street from Green Street to Springfield Avenue	85	Medium	$5,000	5	City of Urbana
CATS Zone 2	Institute a 25 mph speed limit on all University District roadways	75	Medium	$4,000	5	City of Champaign, City of Urbana, University of Illinois

Table 6.5: Implementation Table for Medium-Term Recommended Alternatives for CATS Zone 2

Project Location	Recommended Alternative	Cumulative Score (out of 100)	Priority Level	Estimated Cost	Ease of Implementation	Responsible Agency(ies)
Gregory Street	Add bike lanes on Gregory Street from Oregon Street to Illinois Street	90	High	$5,500	5	City of Urbana
Oregon Street	Add bike lanes on Oregon Street from Goodwin Avenue to Lincoln Avenue	90	High	$6,300	5	City of Urbana
Fourth Street/ Armory Avenue Intersection	Add a traffic signal with pedestrian scramble phase	90	High	$250,000	3	University of Illinois, City of Champaign
Fourth Street	Add bike lanes on Fourth Street from University Avenue to Green Street, and from Armory Avenue to St. Mary's Road	90	High	$30,500	3	University of Illinois, City of Champaign
Fourth Street/ Springfield Avenue Intersection	Add No-Right Turn On Red (NROR) provision from 7AM to 7PM with Leading Pedestrian Intervals (LPI)	90	High	$1,700	5	City of Champaign
Goodwin Avenue/ Springfield Avenue Intersection	Add No-Right Turn On Red (NROR) provision from 7AM to 7PM with Leading Pedestrian Intervals (LPI)	90	High	$1,700	5	City of Urbana
Fourth Street/ Green Street Intersection	Add No-Right Turn On Red (NROR) provision from 7AM to 7PM	90	High	$1,700	5	City of Champaign
Fourth Street/ Daniel Street	Add No-Right Turn On Red (NROR) provision from 7AM to 7PM with Leading Pedestrian Intervals (LPI)	90	High	$1,700	5	City of Champaign
Fourth Street/ Peabody Drive	Add No-Right Turn On Red (NROR) provision from 7AM to 7PM with Leading Pedestrian Intervals (LPI)	90	High	$1,700	5	City of Champaign

Table 6.5: Continued

Project Location	Recommended Alternative	Cumulative Score (out of 100)	Priority Level	Estimated Cost	Ease of Implementation	Responsible Agency(ies)
White Street	Widen White Street for bike lanes from Wright Street to Second Street	70	Medium	$4,110,000	1	CUMTD, City of Champaign
	Convert White Street to bus-only lanes from Wright Street to Second Street				1	
Main Street	Close Main Street to vehicular traffic from Goodwin Avenue to Harvey Street	45	Low	$1,200	1	City of Urbana
CATS Zone 2	Place way-finding signs for special events in the University District	N/A	Medium	$3,000	4	City of Champaign, City of Urbana, University of Illinois

Table 6.6: Implementation Plan for Short-Term Recommended Alternatives for CATS Zone 3

Project Location	Recommended Alternative	Cumulative Score (out of 100)	Priority Level	Estimated Cost	Ease of Implementation	Responsible Agency(ies)
Fourth Street/ Kirby Avenue Intersection	Signal phasing update and retiming	100	High	$1,000	3	City of Champaign
Lincoln Avenue/ Windsor Road Intersection	Signal phasing update and retiming	100	High	$1,000	5	City of Urbana

Table 6.7: Implementation Table for Medium-Term Recommended Alternatives for CATS Zone 3

Project Location	Recommended Alternative	Cumulative Score (out of 100)	Priority Level	Estimated Cost	Ease of Implementation	Responsible Agency(ies)
First Street/ Kirby Avenue Intersection	Add No-Right Turn On Red (NROR) provision from 7AM to 7PM with Leading Pedestrian Intervals (LPI)	65	Low	$1,700	5	City of Champaign
First Street/ Green Street Intersection	Add No-Right Turn On Red (NROR) provision from 7AM to 7PM with Leading Pedestrian Intervals (LPI)	65	Low	$1,700	3	City of Champaign
Oak Street	Implementation of road diet and two (5 ft.) bike lanes on Oak Street from St. Mary's Road to Kirby Avenue. Sidewalk on east side with detectable warning.	85	Medium	$140,400	3	University of Illinois
Lincoln Avenue	Implement road diet and two (5 ft.) bike lanes on Lincoln Avenue from Windsor Road to St. Mary's Road	85	Medium	$19,700	4	City of Urbana, University of Illinois
Fourth Street	Implement road diet and two (5 ft.) bike lanes on Fourth Street from St. Mary's Road to Kirby Avenue. Place sidewalk on east side with a detectable warning.	85	Medium	$152,800	3	University of Illinois
St. Mary's Road	Implement road diet and two (5 ft.) bike lanes on St. Mary's Road between Oak Street and Fourth Street. Construct a 6 ft. sidewalk on the north side and half of the south side of the street with a detectable warning.	85	Medium	$345,300	2	University of Illinois

Table 6.7: Continued

Lincoln Avenue/ Pennsylvania Avenue Intersection	Remove curb bumpout on the northwest corner.	65	Low	$5,000	3	City of Urbana, University of Illinois
Green Street	Add bike facilities on Green Street from Fourth Street to Neil Street	65	Low	$13,600	4	City of Champaign, University of Illinois

6.5 Funding Sources

In this section, the study team has outlined federal, state, and regional funding sources for this study's recommended alternatives. However, funding availability and requirement criteria have a tendency to abruptly change.

6.6 Federal Funds

The Moving Ahead for Progress in the 21st Century Act (MAP-21) was signed into law by President Obama on July 6, 2012. MAP-21 is the first multi-year surface transportation and highway authorization since the Safe, Accountable, Flexible, Efficient, Transportation Equity Act, A Legacy for Users (SAFETEA-LU) in 2005. The MAP-21 legislation emphasizes streamlined and performance-based surface transportation programs and builds on many of the highway, transit, bike, and pedestrian programs and policies established in 1991 as part of the Intermodal Surface Transportation Efficiency Act (ISTEA).

MAP-21 has established a new framework for a variety of transportation projects including many that were previously eligible under separately funded programs. MAP-21's Transportation Alternatives Program (TAP) replaces the funding from SAFETEA-LU programs including Transportation Enhancements, Recreational Trails, Safe Routes to School, and several other discretionary programs. Congress reduced overall levels of funding for these programs from $1.2 billion annually under the SAFETEA-LU, to $809 million and $820 million for FY2013 and 2014 respectively for MAP-21's TAP.

State DOTs may transfer up to 50 percent of TAP funds to the National Highway Performance Program (NHPP), Surface Transportation Program (STP), Highway Safety Improvement Program (HSIP), Congestion Management Air Quality (CMAQ) and/or metropolitan planning.

The Federal share for most projects is determined in accordance with 23 USC 120. As per the 23 USC 120 certain safety projects may amount up to 100 percent of the cost of construction of such projects with some exceptions. These projects include traffic control signalization, roundabouts, safety, rest areas, pavement marking, installation of traffic signs, and traffic lights.

6.6.1 Eligible Projects under the TAP

TAP funds can be used for projects and activities which are recommended in this study. For example:

- Construction, planning, and design of on-road and off-road trail facilities for pedestrians, bicyclists, and other non-motorized transportation.
- Construction, planning, and design of infrastructure-related projects and systems that will provide safe routes for non-drivers, including children, senior citizens, and individuals with disabilities to access daily needs.

6.7 Federal Transit Funds

Under the Moving Ahead for Progress in the 21st Century Act (MAP-21), Congress allocated $1.9 billion for New Starts/Small Starts projects for the FY 2013. Under MAP-21, all projects seeking Section 5309 Capital Investment Program funds must be evaluated and rated according to the criteria specified in law either as a New Starts project, a Small Starts project, or a Core Capacity project. Under SAFETEA-LU, projects seeking less than $25 million in Capital Investment Program funds could be exempt from evaluation and rating if they chose to be, but that option was discontinued in MAP-21. Formerly exempt projects that still have remaining funding needs can either choose to be evaluated and rated by FTA to determine if they qualify for funding under the Capital Investment Program, or they may seek funding from other grant programs such as the Urbanized Area Formula grant program and FHWA flexible funds.

SAFETEA-LU required project sponsors to complete an alternatives analysis (AA) before applying to the FTA Capital Investment Grant (i.e., New or Small Starts grant). MAP-21 eliminates the AA requirement under Section 5309, but relies on an evaluation of options. These options may occur during the metropolitan planning process or the review of alternatives necessary for meeting the National Environmental Policy Act (NEPA).

6.7.1 TIGER Grants

The Transportation Investment Generating Economic Recovery, or TIGER Discretionary Grant program is a unique funding source provided by the U.S. Department of Transportation (USDOT) to investment in road, transit, and port projects that promote critical national objectives. For fiscal year 2013, USDOT is authorized to award approximately $474 million.

Projects that are eligible for TIGER Discretionary Grants are:

- Highway or bridge projects eligible under title 23, United States Code
- Public transportation projects eligible under Chapter 53 of Title 49, United States Code;
- Freight rail projects
- High speed and intercity passenger rail projects
- Port infrastructure investment

The study's recommended alternatives involving transit facilities are eligible for TIGER Discretionary Grants. The Champaign-Urbana Mass Transit District (CUMTD) submitted a TIGER grant application for FY 2013 and is currently waiting upon the decision.

6.8 State Funds

The Illinois Department of Transportation (IDOT) has used State Highway Safety Improvement Program (HSIP) and Illinois Transportation Enhancement Program (ITEP) funds to promote bicycle, pedestrian, and transit facilities to enhance traffic safety and efficiency. These grants now fall under MAP-21's TAP funding category. IDOT also leveraged additional Federal funds to make sidewalk construction and/or improvement projects eligible for stand-alone projects under ITEP funding, if these projects bring agencies into compliance with ADA standards.

6.9 Local Funds

The Center for a Sustainable Environment (CSE) at the University of Illinois is actively involved in making the University of Illinois campus more sustainable. They have set ten goals for making the campus "Greener". One of the goals is to promote walking, biking, transit, and carpooling instead of driving alone. Possible funding can be available from the Student Sustainability Committee for implementing projects promoting pedestrian, bicycle, transit, and carpool activities.

Table 6.8 shows the different funding sources and links for additional information.

Table 6.8: Funding Information Sources

Funding Type	Information Source
Federal Funds	http://www.fhwa.dot.gov/map21/ http://www.fta.dot.gov/map21.html
State Funds	http://www.dot.il.gov/opp/itep.html http://www.dot.il.gov/IllinoisSHSP/hsip.html
Local Funds	http://sustainability.illinois.edu/ http://ssc.union.illinois.edu/