3rd Street and Atwater Avenue Corridor Improvement Study
(DRAFT VERSION)

Report Date: January 2006

Prepared For: City of Bloomington
Department of Public Works

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I. INTRODUCTION

A. Background / Study Area

3rd Street and Atwater Avenue from Dunn to High Streets form a one-way pair, and are the critical link between downtown Bloomington and the City's east side. The streets are designated "Primary Arterials" in the City's Thoroughfare Plan.

The corridor borders the main campus of Indiana University, and is heavily used by motor vehicles, bicycles, busses and high numbers of pedestrians.

Five of the 25 most accident prone intersections in the City are here. There have been bicycle and pedestrian accidents, in addition to traditional car crashes.

Bloomington's Top Accident Locations in Study Area (adjusted for traffic)		
Latest Rank (2003 data)	**Previous Rank (2000 data)**	**Location**
8th	7th	3rd Street and Jordan Avenue
10th	5th	Atwater Avenue at Henderson Street
14th	15th	3rd Street and Woodlawn Avenue
17th	23rd	3rd Street and Indiana Avenue
24th	25th	3rd Street and Highland Avenue

The Study Area is shown on **Figure 1***.

HOLDER FOR FIG 1*

In addition to safety related concerns, congestion is a daily problem in certain areas, especially on 3rd Street at the intersection with High Street. A lack of capacity at this location causes several secondary problems, including difficulty in entering 3rd Street from Rose Avenue and Union Streets, and an over-use of streets in the nearby Green Acres neighborhood as travelers attempt to avoid traffic backups. The nearby St. Charles Church and School, which hosts approximately 500 students, contributes to, and suffers from, the daily congestion.

A proposed University parking garage at the corner of Atwater and Fess will create a new focal point within the corridor. This structure, scheduled for construction in 2006, will add 435 parking spaces to that location, and change traffic and pedestrian patterns in the area. The nearby intersection of Atwater and Henderson has been the subject of past studies and debate due to high accidents and the question of whether a traffic signal is the best option to improve safety.

These are a few of the key issues that illustrate the truly unique nature of this corridor within the City, characterized by the dynamic mix of travelers and issues.

The City has engaged in many past efforts to improve conditions. New signals, signage, sidewalks and other improvements have been added in recent years.

The corridor continues to be characterized by issues relating to safety and congestion caused by its complex mix and large number of travelers.

Finding optimal solutions is not always simple, especially in Bloomington with its tradition of valuing stakeholder involvement. Past debate over just one intersection illustrated that a range of perspectives exists. But stakeholders do agree on the overall goal: ***There is a need to identify improvements that can increase both the safety and efficiency of travel through, across, and within the corridor for <u>all</u> of its user groups.***

Because of the area's critical importance to the City and to the University, the City determined that additional study of the corridor was needed. The City wanted to take a more holistic look at the corridor and its many needs, rather than approaching issues individually. A Corridor Improvement Study was determined to be the best way to achieve this. This Study is the result of that initiative.

B. Purpose

The purpose of this Study is to identify and evaluate alternatives for infrastructure improvements that will:

- enhance safety for all corridor users, especially at points of interface between motor vehicles and non-motorized users,

- improve the efficiency of the corridor to support better flow of both east-west and crossing movements,
- support the City's expressed policies of encouraging the increased use of public transit and other non-motorized forms of travel, and
- consider the needs of all users - vehicles, pedestrians, transit riders and bicyclists.

The recommendations made in **Section IV** are the fulfillment of this purpose.

C. Study Approach

This Study Area has a complex set of characteristics that include:

- a mixture of all modes of transportation, especially thousands of motor vehicles and pedestrians, every day;
- a location adjacent to, and essentially within, the University campus;
- the vital importance of both 3rd and Atwater as primary east-west arterials linking downtown to the College Mall area, and;
- a very interested and complex set of stakeholders including public, academic, and private interests, all with varying views on what the corridor should be.

Because of this complexity, the study took a more holistic approach to identifying corridor needs than might typically be followed in a corridor improvement study. It was necessary to understand the corridor from a variety of stakeholder and user-group perspectives. Thus the Study was conducted to draw on the combined knowledge, concerns and vision of the following stakeholders:

- City officials representing 11 departments,
- University representatives from four departments,
- The leadership groups of three bordering Neighborhood Associations,
- Advocacy groups including the MPO's Citizen's Advisory Committee and the Bicycle and Pedestrian Safety Commission,
- Representatives of the St. Charles Catholic Church and School,
- Members of the Bloomington City Council, and
- Transportation and Traffic Engineering professionals

The study was conducted in five phases:

<u>Data Collection Phase</u>

Mr. Ridgway assembled a variety of data about existing conditions in the area. Field observations and pavement measurements were taken during three site walks. Information was obtained from City, University, utility, and Indiana Department of Transportation (INDOT) sources. The City and University were contacted to identify those officials that would act as their representatives. The

result of the Data Collection Phase was the compilation of the **Study Area Base Map (Figures 1-1 thru 1-6)** and the preparation of a Project Stakeholder List.

Needs Identification Phase

Using the Base Map as the primary guide for discussions, Mr. Ridgway met with various stakeholder groups to identify problems and to solicit ideas or desires for the corridor. These meetings were held in small groups to facilitate open discussions. Mr. Ridgway documented the comments made at the meetings.

The results of this phase include the publishing of a list of Needs, which took both narrative and graphic forms **(Figures 2-1 thru 2-6).** Another result was the identification of the stakeholders to be included in a Study Workgroup. Representatives included City staff, University representatives, and private interests such as Neighborhood Associations and St. Charles Church and School. The Workgroup was to participate in later detailed discussions, and included those who will be responsible for implementing the recommendations.

Alternative Development Phase

Using information previously generated, Mr. Ridgway prepared an initial set of potential alternatives **(Figures 3-1 thru 3-6 and 4-1 thru 4-9)**. These alternatives were offered as early ideas which stakeholders then reviewed and made suggestions on ways they might be improved.

Mr. Ridgway facilitated a workshop where the Workgroup members came together to review the list of alternatives and assist in their initial evaluation. The entire corridor was discussed, with special emphasis to those alternatives that focused on safety and capacity improvements at each end of the Study Area.

The results from the Alternative Development Phase included a list of the alternatives that were to be given greater consideration and analysis.

Alternative Evaluation Phase

Because the merging intersections of 3rd and Atwater at each end of the project (Dunn and High Streets) are so critical, alternatives in these areas received additional traffic engineering analyses. Signal Warrant Analyses and Levels of Service analyses were performed using traffic data provided by the City. The analyses of end-areas are referred to as “West-End” or “East-End” in this report.

Alternatives were evaluated based on criteria such as degree to which they might improve safety and capacity, estimated cost, and judgments on their social impact.

Other areas and issues in the Study Area also received detailed evaluation, depending on the degree to which the issues were complex, controversial, or for which the appropriate solution was more subjective. Issues that were simpler were examined and then either adopted as recommendations or deleted from further consideration based on their apparent merits.

Report / Recommendations Phase

This report is the documentation of the study process and concludes with the recommended improvements that the City is encouraged to implement.

Recommendations are presented in narrative form in **Sections 4 and 5** and also in graphic form on **Figures 5-1 thru 5-6.**

NOTE FOR DRAFT VERSION

Feedback from the stakeholders and the Public is encouraged as part of this study effort. A Public Meeting will be held to introduce the study recommendations and solicit feedback. The Draft Report is being submitted to each of the Workgroup members, the City, University and INDOT for comment.

Comments will be compiled and final revisions made. The Final Report will be presented to the City and University and will be available to the public through the City.

Figures 1-1 thru 1-6 on the following pages are the Study Base Map, which is a compilation of the Existing Conditions in the project area.

HOLDING PAGES FOR FIGs 1-1 thru 1-6

II. STUDY PROCEDURES

A. Early Coordination Efforts

The first step in the involvement of potential stakeholders was the mailing of an early coordination letter to a variety of individuals representing a broad spectrum of interests in the area.

These letters were used to introduce the start of the study effort and to identify Eagle Ridge Civil Engineering Services as the lead transportation engineering firm working on behalf of the City's Department of Public Works.

The letter solicited each addressee's concerns or comments about the Study Area, and inquired about which areas or features they felt needed attention in the study.

Each addressee was also asked for specific information relating to his or her known topics of interest, such as accident data from the Police Department, information on historically significant structures from Housing and Neighborhood Development, and so on.

The following individuals were contacted with early coordination letters:

NAME	TITLE	REPRESENTING
City Officials:		
Chris Gaal	Member	City Council
Timothy Mayer	Member	City Council
Andy Ruff	President	City Council
Chris Sturbaum	Member	City Council
Jason Banach	Member	City Council
Michael Diekhoff	Member	City Council
Dave Rollo	Member	City Council
David Sabbagh	Member	City Council
Steve Volan	Member	City Council
Jeff Barlow	Chief	Fire
Mike Hostetler	Chief	Police
Mick Renneisen	Director	Parks
David Williams	Director of Operations	Parks
Lee Huss	Urban Forester	Parks
Rick Dietz	Director	ITS
Tom Micuda	Director	Planning
Joshua Desmond	Assistant Director	Planning
Susie Johnson	Director	H.A.N.D.
Nancy Hiestand	Program Manager	H.A.N.D.
Don Porter	Traffic Control Specialist	Traffic
Lew May	General Manager	Transit

Julio Alonso	Director	Public Works
Justin Wykoff	Manager of Engineering	Public Works
Patrick Murphy	Director	Utilities
Mike Bengtson	Asst. Director of Engr.	Utilities
University Officials:		
Robert Meadows	University Architect	Univ. Architect's Office
Jeff Kaden	Dir. of Engineering	Univ. Architect's Office
Mia Williams	Dir. of Landscape Arch.	Univ. Architect's Office
Lynn Coyne	Asst. V.P. for Admin.	Real Estate
Maggie Whitlow	Executive Director	Campus Bus Service
Keith Cash	Chief	Campus Police
Neighborhood Representatives:		
Virginia Southern	President	Elm Heights Nghbrhd.
Rob Fischman	Resident	Elm Heights Nghbrhd.
Claire Robertson	President	Eastside Nghbrhd.
Jan Sorby	President	Bryan Park Nghbrhd.
Utility Representatives:		
Kerry Ducker		Cinergy/PSI
Scott Templeton		Insight Communications
Brent McCabe		SBC/Ameritech
Raymond Wise		Vectren Energy
Other Contacts:		
Fr. Charles Chesebrough	Clergy	St. Charles Church & School
James Ude	Development Engineer	Indiana Dept. of Transportation

In many cases, these addressees copied the letter to other individuals within his or her organization, broadening the distribution. In the letter, each addressee was asked if he or she wished to be involved with the Study in future meetings.

Sample Letters used for Early Coordination can be found in **Appendix A.**

B. Stakeholder Involvement Activities

1. Preliminary Stakeholder Meetings

The next step in stakeholder involvement was to meet individually with various groups that have a direct involvement with the corridor, or are known to be advocates for motor vehicle, transit, pedestrian and bicycle travel issues and with whom the City typically consults on these issues.

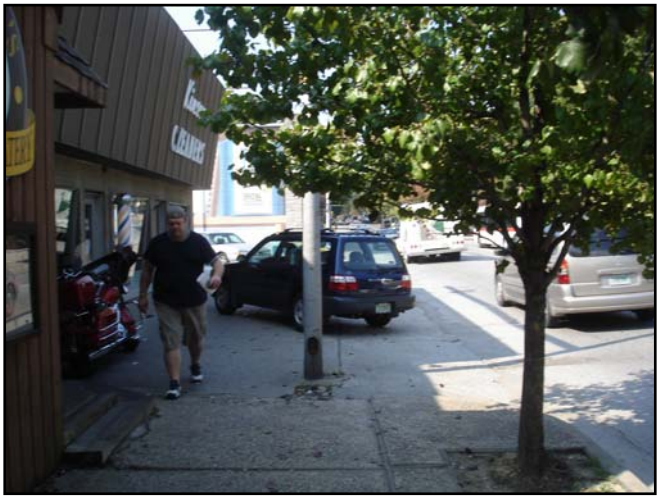
These meetings were held in a variety of locations: meetings with City officials were held at City Hall, but other meetings occurred at that

group's place of business (University and St. Charles) or in private homes in the case of the Neighborhood Associations.

The meetings gave each group the opportunity to voice their comments and concerns they felt were most important. Meeting without other groups present, each group was able to express its views openly. Meetings took as long as two and a half hours.

After each meeting, Mr. Ridgway wrote and distributed a record of the meeting minutes. Each group was given time to review the record and comment, and then Mr. Ridgway made corrections and added any additional comments received prior to publishing a final record for each meeting. The Preliminary Stakeholder meetings were a rich source of ideas, opinions, and observations about how the Study Area works for its various user groups.

The following groups met with Mr. Ridgway:



- City Staff (in two separate meetings due to numbers)
- Indiana University
- Elm Heights Neighborhood Association
- Eastside Neighborhood Association
- Bryan Park Neighborhood Association
- MPO's Citizens Advisory Committee
- Bicycle and Pedestrian Safety Commission
- St. Charles Catholic Church and School
- City Council Members

The Record for each Preliminary Stakeholder Meeting can be found in **Appendix B.**

2. Study Workgroup Meeting

After the completion of the Preliminary Stakeholder Meetings, Mr. Ridgway compiled a listing of the various observations, noting the wide variety of Needs throughout the corridor. These Needs suggested various potential improvements to certain areas, or potential alternatives that could be evaluated in later phases of the Study.

Still, the Study needed the continuing involvement of stakeholders to assist in the review of these alternatives and ideas. In order to continue this involvement, a Study Workgroup was assembled. Mr. Ridgway met with

this Study Workgroup to examine possible alternatives and discuss ideas for corridor improvements.

The Workgroup was a smaller, yet representative group of individuals that brought his or her own perspective to the effort. The size of the group was kept manageable to facilitate a more productive meeting. Workgroup members were selected to create a group that had the following characteristics:

- A cross section of public, academic and private interests
- Participation by those who represent broader constituencies (such as City Council, Neighborhood Associations)
- Participation by those who have a role in deciding how future infrastructure improvement budgets are spent (City and University)
- Representation by key traffic generators (University and St. Charles)
- Participation by advocates for each or all user groups of the corridor (pedestrians, bicyclists, transit riders and drivers of motor vehicles)

The participants in the Study Workgroup were as follows:

PUBLIC OFFICIALS	
Chris Sturbaum City Council	Tim Mayer City Council
Julio Alonso, Director Department of Public Works	Justin Wykoff, Mgr Engr. Services Engineering Department
Joyce Williams, Project Manager Engineering Department	Lew May General Manager, Transit
Patrick Martin Planning Department Senior Transportation Planner	Joshua Desmond Planning Department Asst. Director
UNIVERSITY OFFICIALS	
Robert Meadows, AIA University Architect	Mia Williams, RLA Dir. of Landscape Architecture
Lynne Coyne Real Estate	Maggie Whitlow IU Bus Service
PRIVATE INTERESTS	
Virginia Southern, President Elm Heights Neighborhood Assoc	Teresa Grossi, President Eastside Neighborhood Association
Jeff Baldwin, Facilities Director St. Charles Church and School	

The Record for the Study Workgroup Meeting is in **Appendix C.**

In addition to providing feedback and ideas to the Transportation Engineer during the evaluation process, the Workgroup was also asked to provide

initial review of the Draft Version of this report. Their comments provide needed revisions, corrections, and clarifications to the effort.

3. Public Meeting

NOTE FOR DRAFT VERSION
A public meeting will be held to present the Draft Version of this report and many of its recommendations. Following that meeting, a comment period will be offered to allow anyone the opportunity to comment on this report or the recommendations given.

A Public Meeting summary can be found in **Appendix D.**

C. Identification of Needs

The next major step in the study effort was to identify what deficiencies, or Needs, are present in the Study Area. Needs were considered to be any sort of deficiency ranging from geometric problems in a roadway to narrow or missing sidewalks. Safety concerns and areas of congestion are other examples of Needs.

1. Input from Stakeholders

The identification of Needs in the corridor started with the first involvement activities. Responses to Early Coordination Letters provided the first source of ideas. The Stakeholder Meetings were a rich source of opinions and ideas for what is needed and where problems are felt to exist.

Input from Stakeholders is in the Meeting Records in **Appendices B & C.** Most of the comments offered by Stakeholders were related to Needs.

Needs from Stakeholders were put into **Figure 2 – "Corridor Needs",** when the Needs we specific to a location and could be drawn. More general Needs were kept in a list and are noted below in subsection C.4.

2. Input from Transportation Engineer

Mr. Ridgway identified Needs in a variety of ways, starting with a series of site walks to observe conditions, take measurements, and photograph most of the area. With these walks and also in a car, the Study Area was reviewed from the perspective of its various user groups.

Mr. Ridgway also reviewed City documentation about the Study Area including previous traffic studies, signal warrant analyses, Traffic Commission Meeting Minutes, the City's Alternative Transportation &

Greenways System Plan, the MPO's Year 2025 Transportation Plan and the MPO's 2005-2007 Transportation Improvement Program (TIP). Other useful data was found in the MPO's "Annual Traffic Accident Report Calendar Year 2000", and also the newer "2003" edition.

As the recorder for all Preliminary Stakeholder Meetings and the Study Workgroup Meeting, Mr. Ridgway also added comments when appropriate, noting where those comments were his instead of the group's.

As the author of this Report, Mr. Ridgway provides his best effort to fairly present the variety of perspectives involved and to identify the corridor's "Needs" based upon a well-informed mixture of engineering judgment, experience, respect for stakeholders' ideas and the involvement process itself. His comments are included on **Figure 2** and in the list in subsection C.4 alongside the Needs identified by others.

3. Input from Traffic Engineer

The Traffic Engineers focused their efforts in areas where problems or potential problems had already been identified. Because traffic modeling is an expensive endeavor, the City's resources were best preserved by focusing the modeling to the most important areas.

The input of the Traffic Engineer is found in **Appendices E & F,** and comes in the form of the many analyses and reviews that they conducted on the accident and traffic data that the City provided. Their input is referenced heavily in the evaluation of alternatives, especially the West-End and East-End analyses.

4. Comprehensive List of Needs and Corridor Needs Exhibit

All of the above sources were compiled by Mr. Ridgway into a comprehensive list and exhibit to present the Corridor "Needs". This Needs List is presented in two ways:

Figure 2 shows the Needs on a map where the needs are specific to a site.

Those Needs that are more general in nature are listed on the pages after Figure 2, and are presented with the user group that might most benefit from them if implemented:

<u>It should be noted that these are NOT recommendations, only the compilation of Needs from the effort thus far. The Source of these ideas is listed with each one, as is the initial reaction of the Study Workgroup for those items that were discussed in that meeting.</u>

HOLDER FOR FIGS 2-1 thru 2-6

a. General Pedestrian Needs

- Better Sidewalks (add them where missing, separate them from the curbs with a tree plot, widen them above the minimums as appropriate for heavy pedestrian routes). Make sure North-South routes have them and are adequately wide. *Neighborhood Associations, Planning, University – Study Workgroup noted a general agreement with this Need in the corridor, though specifics were not discussed, and some areas do not have sufficient right-of-way.*

- Narrower crossings for pedestians – *Elm Heights NA, Eastside NA, Bike/Ped Commission*

- Improved crossing markings / warnings – consider warning lights and other means to assist drivers in recognizing hazards, make sure markings are fresh and visible each year. Add Pedestrian crossing Countdown timers at current signalized intersections – *Bike/Ped Commission, Parks, Planning*

- Accessibility – Install ADA-compliant ramps where missing – *Mr. Ridgway*

- Improved Sight Distance – Several locations where sight triangles are obscured by foliage, poles, or structures – *Fire Department, Mr. Ridgway*

- Improved channeling of pedestrians to safer crossing locations. *City Staff*

- Pedestrian-friendly amenities such as benches to make the corridor more comfortable for use by pedestrians. – *Neighborhood Associations*

- Possible Elimination of Right Turns on Red at intersections of 3rd/Jordan, Atwater/Jordan, 3rd/Indiana (also Left on Red Indiana to 3rd) and other locations to improve safety for pedestrians crossing when they are signaled to do so. *City*

Council, Parks – After additional consultation with Key Stakeholders, this Need should include concerns about motorists that do not yield to pedestrians during their shared "green" phase (i.e. traffic cutting in front of or too close to pedestrians during the permissive right turn on green)

b. General Bicyclist Needs

- Improved bike facilities for East-West movements – *Bike/Ped Commission, CAC, Planning – The Study Workgroup voiced opposition to bike facilities along either 3rd or Atwater due to the overriding safety concerns: the traffic, pavement width and volume of busses. Hunter was suggested for improvement in the eastbound direction, and the University is studying the idea of a sidepath north of the limestone walls on the north side of 3rd Street.*

- Additional Bike-friendly crossings of 3rd/Atwater – Possible routes include Woodlawn, Hawthorne, Jordan, Mitchell and Rose. – *Eastside NA, Bike/Ped Commission*

- Education - an Annual Emphasis (each Fall) on Rules of the Road for Bicyclists – *Bike/Ped Commission*

- Enforcement – Police enforcement of basic rules of the road for bicyclists. *Bike/Ped Commission*

c. General Bus and Bus Riders' Needs

- Enforcement of No Parking in Bus Pulloffs – *Transit, University – in the Workgroup Meeting it was noted that this needs to be paired with the elimination of 15-minute parking areas along 3rd so that all pulloffs are only for busses, and any car in a pulloff area is in violation, improving enforceability.*

- Improved Bus Stops – larger, wider with better separation from traffic while waiting, add shelters – *All*

- Improved corner radii at those locations where busses have to turn – *University Transit, City Transit- Workgroup noted*

general support for improvement of critical locations for turning of large vehicles, but also noted the opposition to wider crossings for pedestrians. This Need should be limited to the critical turning locations.

- Add Bus pulloffs, but locate them downstream of traffic control devices to ensure buses can return to traffic flow. - *Transit*

d. General Motor Vehicle Needs

- Improved Sight Distance. In many corners sight triangle is blocked and cars must partially enter traffic lane in order to see. – *Fire Department*
- Enforcement of Speed Limits in areas of greatest safety concern – *All*
- Installed hard-wired interconnect along both 3rd and Atwater to improve synchronization and improve reliability – *ITS, Traffic*
- Reduce congestion due to road constriction at 3rd & High. Examine variety of alternatives to determine most suitable – *All – A variety of Alternatives were discussed in the Workgroup Meeting, discussed later in this Study report.*
- Add "One Way" signs up on the mast arms at existing signalized intersections with one-way streets (3rd/Indiana, 3rd/Dunn) - *Planning*
- Restrict entry/exits at locations with multiple drives to simplify vehicle movements, especially the Village Pantry at 3rd/Jordan, and the BP at 3rd/Indiana, both high pedestrian locations. –*This idea was discussed at the Workgroup Meeting, and was met with general support.*
- For those exiting the Atwater Garage, consider formalizing a route through the alley between Faculty and Hawthorne to permit access to eastbound Atwater, and reduce the need for 3 left turns through heavy pedestrian areas. **–** *This idea was discussed at the Workgroup meeting with no conclusion, other than the Workgroup was opposed to the conversion of Faculty*

to two-way traffic. Later field review by Mr. Ridgway revealed that this alley is really too narrow to support routine traffic, and should not be designated for access to Hawthorne.

e. Mixed Needs

- Add Pedestrian-scale lighting in high pedestrian areas, and other dark, uninviting areas. – *Bike/Ped Commission, Various NAs, Planning*

- Add Opticom receiver equipment to signals to give emergency responders green lights when under alarm. – *Fire Department*

- Eliminate Parking along Jordan between 3rd and Atwater to provide room for turning busses, increase visibility, and provide bike lanes. – *University – this issue was discussed by Workgroup and was supported by the stakeholders.*

- Review layout of 3rd and Dunn Intersection for ways to increase pedestrian safety and decrease driver confusion for eastbound travelers not familiar with the area. *City Council, Bike/Ped Commission, Bryan Park, Elm Heights – this issue was discussed by the Workgroup and was supported*

- Review layout and function of the Atwater and Henderson intersection for ways to improve driver and pedestrian safety along both streets and at the intersection. Consider possible need for new signal. Consider possible impacts of the new garage at Atwater and Fess and infrastructure improvements that may be needed. Consider heavily used pedestrian cross west of Henderson. *Alternatives in this area will receive more detailed evaluation.*

f. Miscellaneous Needs Not Limited to the Corridor

- Additional access to the transit system to reduce commuting trips and to encourage bus riding.

Again, it is important to note that these Needs as listed above are not recommendations. This is a listing of the comments received and are ideas that are to receive further review in the study effort.

Also, this is only a portion of the Needs that were identified. Needs that could be drawn are shown on **Figure 2.**

D. Procedure for Areas with Multiple Alternatives

In areas where multiple alternatives exist, the procedure to identify and evaluate those alternatives was more rigorous. This was the case in the evaluation for each end area of the project.

These areas were discussed in the various Preliminary Stakeholder Meetings and were a primary focus of the Study Workgroup Meeting. Due to the level of detail involved in their analyses, and the additional traffic modeling they received, they comprise a significant portion of the study effort.

This is appropriate. The corridor is lengthy and contains many important areas, but these locations where the traffic splits and comes back together are critical to the performance of the corridor as a primary arterial in this region, and the West-End of the project has been especially noted to be an area of safety concerns.

1. Procedure for West-End (3rd/Dunn Area)

A number of potential alternatives were reviewed for the West-End of the project, which is considered to include the intersections of:

- 3rd/Dunn
- 3rd/Indiana
- 3rd/Fess
- Atwater/Henderson
- Atwater/Fess

Some of the alternatives are exclusive of each other, such as the choice to add a signal at Atwater/Henderson, or not. But most of the potential improvements can be implemented individually without impacting the others. Locations such as 3rd/Dunn and 3rd/Indiana were examined in lesser detail because these decisions can be made without having a major impact on other intersections.

The future parking garage at Atwater/Fess has a strong influence on decisions at the West-End. The potential traffic impacts of the new garage were considered in the evaluation of each bordering intersection.

Signal Warrant Analyses were conducted for each intersection around the new garage except for 3rd/Indiana, which already has a signal. Atwater/ Henderson got the most detailed review because it has been the subject of several past debates and analyses, and has already received several improvement measures intended to reduce crashes at that location.

The analyses performed in the West-End of the Study Area are mostly related to improving safety for all corridor users and reducing motor vehicle confusion. This area was not noted to present significant congestion problems, but is characterized by very heavy pedestrian and vehicle activity, and has experienced many accidents. 3 of the 5 intersections are considered high accident locations.

2. Procedure for East-End (3rd/High Area)

The East-End of the Study Area is considered to include the section of 3rd Street from Jefferson to Union, High Street between 3rd and Atwater, and Atwater Avenue at High Street. Depending on the alternatives under consideration, the East-End could also be viewed to include both 3rd and Atwater as far west as Mitchell Street.

The Alternatives for this area are developed around the basic goal of safely reducing congestion at the intersection of 3rd and High Streets.

With that in mind, alternatives were developed that have the potential to reduce this congestion. These alternatives range from a relatively modest project to correct the offset of High Street with Bryan at 3rd Street, to very large projects that widen 3rd Street from Mitchell to High, or extend the one-way pair of 3rd and Atwater from Mitchell to High Street.

Each of these strategies could be implemented in conjunction with traditional intersections, free-flowing intersections, a roundabout, and with or without offset-corrections. Some combinations are more logical than

others, but the complexity of the issues resulted in nine alternatives being presented to the Study Workgroup. Seven of these alternatives were deemed feasible enough to justify detailed traffic modeling and analysis.

Unlike the West-End where various improvements can be implemented together, the East-End demands the selection of a preferred alterative. Selecting this preferred alternative includes selecting many of its component parts, and will dictate whether that improvement will need to extend as far west as Mitchell Street.

The analyses performed in the East-End of the Study Area are mostly related to reducing congestion while maintaining overall safety. This area was not noted to present significant safety concerns, but is characterized by daily, heavy congestion of motor vehicles at the 3rd/High intersection, with secondary backups on Atwater, High, Bryan, Rose and Union Streets.

E. Development of Evaluation Criteria

1. Identification of Criteria

Mr. Ridgway developed the initial list of evaluation criteria based on his previous experience with planning efforts. To this list was added a criterion for "Neighborhood Integrity" that was offered by the Eastside Neighborhood Association during their Stakeholder Meeting.

This list was presented to the Study Workgroup for their comment. The Workgroup was asked to offer other potential criteria if they felt important issues were missing. The Workgroup did not request any more criteria.

2. Ranking of Criteria

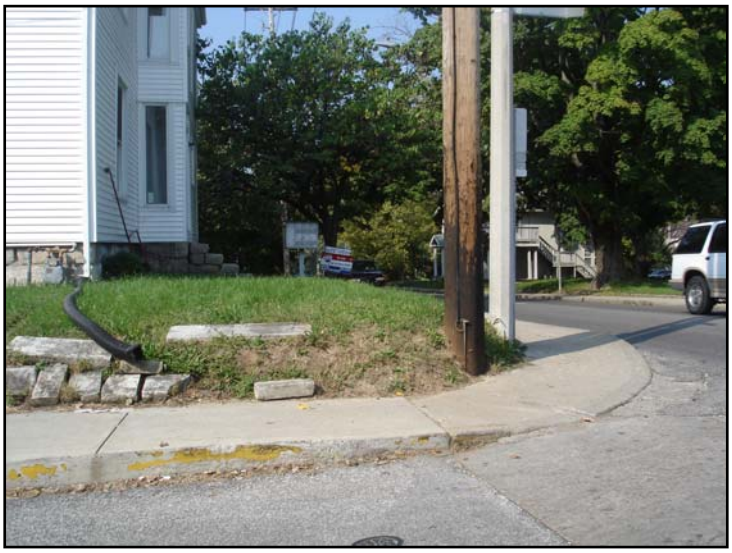
After the list was accepted by the Study Workgroup, they were asked to consider which criteria they felt should be given the greatest "weight" in the evaluation process. The criteria were ranked based on the level of support they received. The following evaluation criteria were accepted by the Study Workgroup, presented in the order from most to least important:

- Net Safety Benefits for all Corridor Users
- Level of Service on 3rd and Atwater
- Number of Houses/Rentals impacted
- Neighborhood Integrity
- Support of Other City Plans (Alt. Transportation, MPO Long Range, GPP, etc.)
- Project Cost - R/W plus construction

F. Procedure for Cost Estimation

The costs of proposed improvements were estimated using cost-history data available from the Indiana Department of Transportation including their Unit Price Averages catalog. The quantities for major work items were estimated and a percentage was added to cover typical administrative, mobilization, engineering and other costs that would be associated with future projects.

Costs to purchase right-of-way were estimated from recent cost history on other City projects. Needs range from small corners of property for sight distance improvements, to larger needs such as entire parcels for roadway realignments which could include the acquisition and removal of houses.



Estimates at this stage should be considered very approximate, and not yet suitable for detailed construction budgeting. Projects must still go through a detailed scoping process to fully define the improvements they are to include. Topographic survey is needed to define project limits and to identify potentially expensive components such as utility relocations that are not obvious on a walkthrough.

III. ALTERNATIVES IDENTIFICATION AND EVALUATION

This section describes the evaluation of many potential improvements, including the detailed analyses of the West-End and East-End areas.

Simpler, non-controversial improvements are not discussed here because their benefits are clearer and there is no expectation of a significant debate. An example of this would be adding Opti-Com receivers to signals to give emergency responders a green light. Such alternatives have obvious benefits and have "cost" as the only apparent drawback.

Other issues, however, require more detailed analyses. There are choices to make, and sometimes the goal is to improve overall (or net) safety. These issues require compromise between different (and sometimes competing) interests. Such issues are discussed here.

A. Potential West-End Alternatives

1. General Issues of the West-End

For this discussion, the "West-End" of the project includes the intersections of 3rd/Dunn, 3rd/Indiana, 3rd/Fess, Atwater/Henderson and Atwater/Fess, and the roadway sections between them.

Many of the West-End alternatives can be implemented together, or separately. Decisions to install signals at intersections are evaluated separately. The West-End received traffic modeling and signal warrant analyses described later in this section and in **Appendix F**.

The dominant issues of the West-End analyses are:

- The need to improve safety for drivers and pedestrians at Atwater/Henderson (a Top Accident Location), including a determination of the need for a signal
- The need to improve safety for drivers and pedestrians at 3rd/Indiana and 3rd/Dunn which are already signalized, (Top Accident Locations).
- A consideration for how the new University parking garage may impact the operation and safety of adjacent intersections due to both vehicles and pedestrians using the garage.

While not presented in this order, these issues have a strong influence on decisions at this end of the Study Area.

2. Identification / Description of West-End Alternatives

Many of the alternatives to be evaluated at the West-End are represented graphically on **Figures 3-1 thru 3-6.** Each is described after the figures.

Holder for Figs 3-1 thru 3-6

Figure 3-1: 3rd /Dunn Intersection Improvements

Improvements shown on this figure were presented to the Study Workgroup. They are intended to enhance intersection safety by improving pedestrian crossings and by reducing driver confusion.

Pedestrian crossings are to be improved. The crossing of the south leg is to be reinstated and narrowed. This crossing is used by pedestrians even though it is signed for no crossing and has no ramps. Raised islands would provide better pedestrian refuge for the longer crossings in 3rd Street.

The need for eastbound traffic to divert to Atwater can be confusing for the thousands of visitors the campus receives each year. Raised islands in 3rd Street would better delineate and channelize vehicle traffic. Signage informing eastbound drivers of the requirement to turn right can be improved. Navigational signage can be added to inform drivers of their choices to go south on Dunn, north on Indiana, or east on Atwater. This signage could be overhead, as shown, or in separate, post mounted signs.

The connection to South Dunn would be shifted south to allow the narrowing of the street, reducing crossing distance for pedestrians. This will also eliminate the problem of drivers rounding the curve and finding themselves in the lane to South Dunn. Cars were noted to stop in apparent confusion, or to swerve to reenter Atwater, causing an unsafe condition.

This Figure was reviewed by the Workgroup and was generally supported. The improvements are not dependent on other alternatives and are recommended in Section IV.

Figure 3-2: 3rd/Indiana Improvements

Improvements shown on **Figure 3-2** were presented to the Workgroup and are intended to improve pedestrian, driver, and bus rider safety.

The sidewalk on the south side of 3rd between Indiana and Dunn is to be replaced and widened due to its poor condition. ADA-compliant curb ramps are needed for the southside crossing of Indiana.

Disallowing left turns on red from Indiana to 3rd was suggested, but is not recommended at this time. This modification is discussed later in this section and can be made in the future if deemed clearly beneficial.

One entry drive into the BP gas station is to be permanently closed. (This will still leave 3 drives to this site). This is proposed because drivers from 3rd Street were noted to be using the drive along Indiana drive for direct entries into the site, which requires they cross the north-side crosswalk during the green light (when pedestrians have the right-of-way to cross Indiana). This conflict is unnecessary and greatly reduces the degree to which the northwest corner of the intersection is and should be a pedestrian refuge.

The bus stop in the northeast corner is heavily used, but no bus pulloff is present. Stopped busses block pedestrians' view of oncoming traffic on 3rd that may be coming through the intersection or turning on Indiana.

A new bus pulloff east of the existing bus stop is part of the improvements. Positioning a pulloff at the existing bus stop would increase pedestrian crossing distance, would not improve sight distance around stopped busses, and would create a right-turning conflict with cars also hoping to turn right. This problem was noted by the Workgroup and a pulloff at the intersection was not recommended. This stop is heavily used and appears to be an appropriate location for a rider shelter.

With the exception of eliminating left turns on red at Indiana to 3rd, these improvements received the general support of the Workgroup and are recommended. Mr. Ridgway acknowledges that City and University transit officials have concerns about the use of bus pulloffs and their ability to reenter traffic flow. The safety benefits of the pulloffs, and the reduction of traffic constrictions on 3rd are deemed important enough advantages. It is believed that the adjacent signal at 3rd and Woodlawn will offer sufficient breaks in traffic to allow busses to reenter 3rd.

Figure 3-3: Atwater/Henderson Improvements without a Signal

This figure shows the types of improvements that may be needed if a new signal is not installed at Atwater and Henderson. If no signal is to be installed, then the need to improve sight distances is paramount at this top accident location. **Figure 3-3** shows proposed improvements that could improve safety conditions by improving visibility. Note that this alternative was presented before the completion of a signal warrant

analysis, and it is questionable whether these improvements would result in the needed crash reduction.

The tree in the island in the intersection would be removed because it blocks the ability of drivers to clearly see pedestrians, and for pedestrians to clearly see oncoming cars. It is a poor location for a tree, and perhaps the worst possible species of tree for this location, given its many small trunks and low canopy. Without a new signal, keeping the crossing distance for pedestrians to a minimum is still a very important issue, and thus the island itself is suggested to remain for the pedestrian refuge it provides. *The Study Workgroup is supportive of a change to this island by removing the tree and changing it to low plantings. The Workgroup noted opposition to "creative hardspace".*

To further improve sight distances, the vegetation on the inside of the Atwater curve (north side) would be thinned. *The Workgroup noted opposition to clearing and regrading this area as shown in the Figure. Instead, it is proposed to thin the vegetation by removing several trees, especially in the areas where several trunks are close together and create blind spots. The University was supportive of this more limited approach. This recommendation is made even if a signal is recommended for the intersection due to the benefits of improved visibility.*

A small right-of-way purchase is suggested for the southwest corner of the intersection of Atwater and Henderson because motor vehicles on Henderson have difficulty seeing what is coming before they are already in the crosswalk. The City could then control the types of vegetation and other features that are placed on this corner.

A large number of pedestrians use an area west of Henderson to cross Atwater. While this location is not an official crossing, it does provide a location where the visibility is modestly better than at the intersection itself. Without a new signal, the use of this crosswalk is likely to continue. Since one could argue this midblock area is roughly as safe as the intersection area, it is NOT recommended that this midblock area be blocked in some fashion.

Due to concerns about drivers who fail to watch for crossing pedestrians while turning right from Henderson to Atwater, a separate right turn lane

that forces drivers to consider the pedestrian crossing prior to completing the right turn is recommended. Unlike a previous City proposal for this corner, the turn lane should be positioned aside from the through lanes of Henderson. This will both avoid the restriction of Henderson to only one through lane and, more importantly, will position the curbed pedestrian refuge area out of the line of Henderson traffic. A pedestrian refuge island has the added benefit of providing a desirable minimum-width crossing of Atwater.

Figure 3-4: Atwater/Henderson Improvements with a Signal

This figure presents improvements that would be made in conjunction with a new signal at Atwater/Henderson. With a signal, visibility is still an important issue, but the signal provides an additional measure to regulate traffic flow. Thus, some visibility improvements may be reduced in scope.

A signal would provide a safer, protected crossing for pedestrians at the intersection. Given this, additional measures to discourage midblock crossings west of Henderson would be appropriate. It is suggested that a low masonry wall be constructed behind the curb on the north side of the curve to encourage pedestrians to cross at the intersection. This wall would be placed far enough behind the curb to permit a safe refuge for a pedestrian determined to cross and climb the wall. An aesthetically-appropriate wall similar to the one farther east on Atwater is proposed.

Some thinning of the trees in the curve on the north side of Atwater is still suggested. Cars approaching the new signal need to see the signal and stopped traffic, and also pedestrians at the intersection.

The separate left turn lane from Atwater to Indiana should be eliminated, and a traditional left turn lane should be added. Pedestrian crossing distance is less of a concern on this upstream side of the intersection when it is under the protection of a signal. There are safety concerns with the existing separated left turn lane due to the difficulty for pedestrians to predict whether an oncoming vehicle may enter that lane, and at higher speeds. Because of the curve of Atwater, pedestrians cannot see this traffic from a suitable distance. It is safer for pedestrians to cross three lanes under the protection of signal than it is for them to contend with the separate turn lane coming off that curve where cars do not stop.

A separate right turn lane is suggested in the southeast corner of the intersection. This contradicts the recommendation in the northwest corner, but in this case the Atwater crossing is on the downstream side of the intersection, subjecting pedestrians to greater numbers of turning vehicles. Henderson is straight allowing pedestrians to see the cars coming from a

greater distance. The radius of this right turn lane would be smaller, designed to require lower speed turns. Under these conditions, the separation of the right turn lane presents a better option than requiring pedestrians to contend with crossing Atwater while vehicles are trying to turn right through the crosswalk. It also keeps the crossing distance of Atwater to a minimum. While this does essentially add one "crossing" for pedestrians, the benefits of a minimum width crossing for both Atwater and Henderson are significant. Also, this area had already been noted to present concerns for pedestrians due to vehicles turning right and not looking for pedestrians. In order to correct this problem, the additional corrective measure is appropriate.

Figure 3-5: Potential Modifications Due to Parking Garage

This figure shows the special concerns to be examined with the anticipated construction of the new University parking garage. The new garage will offer 565 spaces on a site that currently offers 130 (a net increase of 435 parking spaces). This garage will only be available to faculty and staff, and thus will fill and empty during typical rush hours. The garage will affect all of the adjacent intersections, especially those on Fess.

At Fess/Atwater, the possibility that a new signal may be needed is to be considered. Whether or not a signal is required, there may be a need for left turn storage for vehicles turning onto Fess, waiting for queued vehicles entering the garage.

There is a related concern that cars exiting the garage may find travel south on Fess to be attractive, causing undesired additional traffic on Fess in the Elm Heights Neighborhood.

At 3rd/Fess, the possibility that a new signal or left turn lane are needed are also concerns. This intersection differs from Fess/Atwater due to the much higher number of pedestrians that will cross 3rd Street. The numbers of crossing pedestrians is expected to impact the decision at 3rd/Fess.

Figure 3-6: Two-way traffic on Indiana/Henderson between 2nd & 3rd

This alternative was presented to show how traffic that currently uses Dunn Street to access South Henderson might use Henderson in a two-

way pattern. This would shift thru-traffic from Dunn back to the secondary arterial (Henderson). The idea was suggested in a stakeholder meeting.

While this change would keep arterial traffic on the arterials, the traffic patterns would create additional concerns as well. Turning movements at 3rd/Indiana and Atwater/Henderson would take on additional complexity, posing greater safety concerns for pedestrians at these intersections.

The Study Workgroup had no support for the inclusion of this alternative. They were strongly opposed to the changing of patterns and noted that the one-way streets were easier to cross for pedestrians. Also, there was opposition to the widening of Henderson south of Atwater that would be needed to maintain two-way traffic and parking. There is no apparent safety benefit to this change and added safety concerns. This alternative was deleted from further consideration.

3. Evaluation of West-End Alternatives

The nature of the west-end area suggested that the analysis of each intersection should be conducted independently.

At intersections with signals, field review and stakeholder comments resulted in the potential improvements noted on **Figures 3-1 and 3-2** for 3rd/Dunn and 3rd/Indiana, respectively.

At the three intersections without signals, field review and stakeholder comments resulted in several potential improvements, but to these were added the preparation of Signal Warrant Analyses. From the Indiana Manual on Uniform Traffic Control Devices (Indiana MUTCD), the Warrant Analyses that were most applicable to the area were:

Warrant 1 – Eight-Hour Vehicular Volume
Warrant 4 – Pedestrian Volume
Warrant 7 – Crash Experience

To support these analyses, City forces gathered a variety of traffic data. Peak Hour Turning Movement counts were taken at all 5 intersections in the west-end. 48-hour counts were taken along 3rd in multiple locations and on Henderson in order to compile a model of traffic activity at the busiest times of day. Pedestrian and bicycle counts were also noted at these same locations, given the concerns about the number of pedestrians crossing the corridor.

Accident records were reviewed from 1995 to 2005. The MPO's Annual Traffic Accident Report was very helpful in providing statistical

comparisons of intersections. 3rd/Dunn, 3rd/Indiana and Atwater/Henderson are each considered high accident locations.

Information provided by Indiana University provided the basis for the adjustment of noted traffic counts to estimate what conditions may be like after the new parking garage is put in operation.

The results of the signal warrant analyses were as follows:

3rd / Fess - Signal Warrant Analysis Results:	
Warrant 1 (Vehicle Volume)	Anticipated traffic volumes once the parking garage is in operation do NOT appear likely to satisfy Warrant 1 for both the 100% and 80% volume standards.
Warrant 4 (Pedestrian Volume)	It is LIKELY that at least six hours will have at least 100 pedestrians crossing 3rd Street once the garage is in operation. Warrant 4 is likely to be satisfied.
Warrant 7 (Crash Experience)	The location was NOT noted to be a high accident location for the years 1995 – 2000. More recent data was at least partially available. Crash experience for 2003 and 2004 were mixed, with 2003 NOT satisfying the warrant, but 2004 meeting the warrant. 2005 data is incomplete. Warrant 7 was generally NOT satisfied.
Conclusion	Signals should only be implemented after an adequate trial of other alternatives to improve conditions, especially crash reduction, given that a signal can actually increase certain kinds of crashes. Still, the anticipated heavy crossing by pedestrians is a concern and action is needed. Recommended measures at this time include the marking of a designated crosswalk across 3rd on the east side of Fess, along with the placement of crosswalk warning signs equipped with yellow flashers. Conditions and safety records should be reviewed once the garage is in full operation to determine if additional actions are needed.

Atwater/Fess - Signal Warrant Analysis Results:	
Warrant 1 (Vehicle Volume)	Vehicle volumes do NOT satisfy, nor are they expected to satisfy, Warrant 1 for both the 100% and 80% volume standards.
Warrant 4 (Pedestrian Volume)	Pedestrian volumes do NOT satisfy, nor are they expected to satisfy, Warrant 4 for pedestrian crossings.

	New garage patrons are expected to walk to 3rd and cross there, thus the garage is not expected to change pedestrian counts.
Warrant 7 (Crash Experience)	This intersection was NOT noted to be a high accident location.
Conclusion	A new signal is NOT warranted at this time.

Atwater/Henderson - Signal Warrant Analysis Results:	
Warrant 1 (Vehicle Volume)	While traffic counts are high enough to meet some of the conditions of a vehicle volume warrant, only 5 hours meet the criteria, when 8 hours must be met to satisfy Warrant 1. Warrant 1 is NOT satisfied. If traffic were to increase beyond the projections with the new garage, then traffic volume could meet this warrant.
Warrant 4 (Pedestrian Volume)	Of the 6 hours for which pedestrian data was collected, 4 of those hours meet the criteria. 4 hours are required within a 24-hour period to satisfy the warrant, so Warrant 4 IS satisfied. If full counts were available, it is very likely that even more hours would meet the criteria.
Warrant 7 (Crash Experience)	This intersection was determined to be a top accident location. In fact, depending on the review period and the method of analysis, the intersection consistently ranks in the top 5 most accident-prone intersections in Monroe County. A review of crash data shows that this criterion has been met in each of the last 3 years (2003 to 2005). Older crash data, while less detailed, suggests that Warrant 7 has been satisfied in previous years as well.
Conclusion	This intersection has received several past analyses and been the subject of ongoing debate in the City. In the past, the Traffic Commission has approved a new signal for the location but it failed to pass the City Council. Results in this Study are similar to those of the past – pedestrian and crash experience satisfies Warrants 4 and 7, and traffic volumes are significant but not necessarily meeting a Warrant 1. Because signals can actually increase certain types of accidents, it is very appropriate to give improvements such as signage, geometric changes, increasing sight distance and other improvements an "adequate trial" to determine if crash reduction can be brought about by non-signalized measures. The City engaged in just such a strategy in late 2003 and

	early 2004 when several improvements were made to the area in the attempt to reduce crashes. Speed limit reductions, additional flashered signage, and changes to signal timings at 3rd/Dunn were implemented. Unfortunately, 2004 and 2005 crash records indicate that accidents have not decreased. Due to the fact that non-signalized measures have been given an "adequate trial", and accidents have not decreased, a new signal is recommended at Atwater and Henderson. Because the Warrants satisfied are those that are based on past and present conditions, this recommendation is made even without the introduction of the new parking garage. Some additional traffic may result from the presence of the new garage. These impacts are not yet known and may not increase traffic, but will not decrease it.

This summarizes the evaluation efforts for the West-End. Each intersection received a separate evaluation. The combination of engineer's field review, discussions with stakeholders, and the signal warrant analyses provide the basis for the recommendations suggested above.

To review, the evaluation of the West-End resulted in the following combination of recommendations:

- Implement 3rd/Dunn Improvements as described for **Figure 3-1**
- Implement 3rd/Indiana Improvements as described for **Figure 3-2,** except do not eliminate lefts on red from Indiana to 3rd
- Improve the intersection of Atwater/Henderson as shown in **Figure 3-4**, including the installation of a new signal at Atwater and Henderson.
- Work with Indiana University to ensure that needed sidewalk and other site improvements are implemented in conjunction with the construction of the new garage.
- Signal warrants for 3rd/Fess and Atwater/Fess have indicated that signals are not warranted at this time, but both should be reviewed in the future to determine if conditions or crash records indicate need for improvements.

Fully detailed recommendations are presented in **Section IV.**

B. Potential East-End Alternatives

1. General Issues of the East-End

For this discussion, the "East-End" of the project includes the intersections of 3rd/Jefferson, 3rd/Bryan, 3rd/High, Atwater/High and the sections of both 3rd and Atwater between High Street and Mitchell.

The primary need in the East-End is a reduction of congestion. 3rd and Atwater are reduced from two through-lanes to one (for eastbound traffic, this occurs at Mitchell, for westbound traffic, at High Street). Congestion should be relieved by selecting one of the alternatives to provide improved traffic flow in each direction, while still maintaining overall safety. Secondary benefits of this should include a reduction in the use of nearby neighborhood streets by drivers bypassing the 3rd/High congestion.

Unlike the analyses of the West-End, the East-End evaluation is a comparison of mutually exclusive alternatives. Different alternatives share some common features, but each is a different strategy to resolve the area's congestion. Here a choice of a Preferred Alternative must be made.

Alternatives include the widening of 3rd Street to four lanes from Mitchell to High or the extension of the one-way pair between Mitchell and High. The combining of the traffic at 3rd/High can take a variety of forms.

It is for the East-End evaluations that the evaluation criteria were developed and refined by the Study Workgroup. The Evaluation Criteria are used to help determine which is "best".

2. Identification / Description of East-End Alternatives

The alternatives to be evaluated at the East-End are represented graphically on **Figures 4-1 thru 4-9.**

They are described in greater detail on the pages immediately following the figures.

HOLDER FOR FIGS 4-1 thru 4-9

Figure 4-1: Simple Offset correction of High/Bryan

This alternative is perhaps the minimum change to the 3rd/High intersection that might provide some congestion-reducing benefit. The benefit would be gained by connecting High Street with Bryan Avenue. This allows the elimination of the separate signal phase for Bryan and thus the extension of the green phase for High and 3rd.

This alternative includes the reconstruction of the entrance for St. Charles Church and School from High Street. This drive presents problems for the 500 parent-drivers exiting the school property each weekday due to backups on High Street. Atwater Avenue would meet the new school entrance and a signal or part-time signal/flasher would be needed.

It should be noted that Atwater is to be realigned to meet the new school entrance because the house at the end of Atwater, 401 South High Street, is known to be eligible for the National Register of Historic Places. Significant impacts to that property are not likely to be approved.

Additional turn lanes on High would separate turning movements, increasing the efficiency of High Street to move traffic during its green phase.

This Alternative may make Bryan Street more desirable to traffic using Bryan to enter 3rd. Traffic is known to use the Green Acres Neighborhood streets and alleys as an alternative to 3rd until they can get in at Bryan. Thus, this alternative may have an unintended (and undesired) drawback.

This and every figure includes the removal of the first St. Charles' drive east of High on 3rd. The Church suggested this change because the drive is not commonly used. They do not allow left turns due to its proximity to High Street. Moreover, drivers use it to cut through church property to avoid the signal at 3rd; creating a major safety concern to the Church.

Figure 4-2: Additional Travel Lanes on 3rd from Mitchell to High (with Offset Correction of High/Bryan)

This alternative illustrates a portion of the work that would be required to upgrade the current routing of traffic. Eastbound traffic on Atwater would continue to be directed north on Mitchell then east on 3rd. Westbound

traffic would stay on 3rd. The upgrade would involve widening 3rd Street to four lanes so that there would be two in each direction.

This alternative has a lot of property impacts due to the requirement to widen 3rd Street. This alternative is the most favored by the Eastside Neighborhood Association due to their concerns about having the one-way pair extended on Atwater east of Mitchell.

This alternative includes the correction of the offset of High/Bryan, and the modifications to the entrance to St. Charles as shown in Figure 4-1.

Figure 4-3: Additional Travel Lanes on 3rd from Mitchell to High (without Offset Correction of High/Bryan)

This Figure is essentially the same as in Figure 4-2, requiring the widening of 3rd Street to a 4 lane street between Mitchell and High. Unlike Figure 4-2, however, this alternative does NOT include offset corrections and thus their benefits or impacts. The existing offset of High and Bryan would remain.

Under alternatives 4-2 and 4-3, the section of 3rd shown in the picture would be widened to two lanes in each direction.

Figure 4-4: Additional westbound lane on 3rd (High to Mitchell) with a two-lane roundabout at 3rd/High

This Figure shows a possible roundabout treatment for 3rd and High Streets. The roundabout would need to have two lanes to handle the anticipated traffic at this location, especially the westbound traffic.

Because a roundabout already has a significant property impact, the alternative includes a decreased widening of 3rd. Westbound would be widened to two lanes to reduce congestion, while eastbound traffic would still only have one. Traffic on Atwater would continue to use Mitchell, or Atwater, as it currently does.

A new signal would be needed at 3rd/Union. The signal is needed to "platoon" westbound traffic as it enters the University area. This would be the only signal prior to Jordan Street, and gaps must be made in that traffic for pedestrians to more safely cross.

Due to safety concerns at the entry to St. Charles (it would be too close to the roundabout); this alternative would need to include the reconstruction of their drive in a fashion similar to the other alternatives, including the elimination of the offset with Atwater.

Figure 4-5: Extension of 3rd/Atwater One-way pair to High Street (without offset corrections)

This figure is the first to show the extension of the 3rd Street /Atwater Avenue one-way pair, by extending eastbound traffic on Atwater straight at Mitchell all the way to High Street.

The intersection of Atwater with High would continue to be a T-intersection. With the increase in traffic, a new signal at Atwater and High would be required. In this alternative, offset corrections for High/Bryan or Atwater/Church entrance are not included.

It is noted that traffic exiting the church would continue to have problems without the offset corrections because more traffic would be using this section of High Street. The extension of the one-way pair will shift traffic from eastbound 3rd onto the south leg of the High Street / 3rd Street intersection. There will still need to be three phases for the signal, and the High Street phase will be extended. The additional delay at the signal at Atwater/High will not be counterbalanced by a decrease in delay at 3rd/High.

Because the City's resources for the conduct of traffic modeling are limited, and due to the obvious advantages of the next ***Figure (4-6),*** *Mr. Ridgway proposed to the Study Workgroup that this alternative be deleted from further consideration. It did not receive additional evaluation.*

Figure 4-6: Extension of 3rd/Atwater one-way pair to High Street (with Offset Correction of High/Bryan)

This figure shows the extension of eastbound traffic on Atwater to High Street, but with the offset corrections at High /Bryan and for Atwater/church entrance that were missing from **Figure 4-5**. A new signal is needed at the T-intersection of Atwater/High. This figure was kept while **Figure 4-5** was eliminated from further consideration.

Figure 4-7: Extension of 3rd/Atwater One-way pair to High Street (with free-flowing intersections – "Square-about")

This figure combines the extension of the one-way pair with a free-flowing combination of intersections for Atwater/High and 3rd/High.

Eastbound traffic would use Atwater, High and then 3rd without encountering a signal.

Southbound traffic would navigate the area using Clifton as a one-way street southbound between 3rd and Atwater.

Westbound traffic would stay on 3rd street.

Traffic entering from Bryan would be required to turn right only. At the Study Workgroup Meeting, it was noted that this might be a desirable feature to help reduce use of neighborhood streets by through traffic.

One feature of this alternative is that it would require a new signal at 3rd and Union Street. While this seems counterproductive to eliminating the one at 3rd, the signal is needed to "platoon" westbound traffic as it enters the University area. This would be the only signal prior to Jordan Street, and gaps must be made in that traffic for pedestrians to more safely cross. With the additional westbound lane, this signal would not present the same delay the existing one at 3rd/High does.

Additionally, many stakeholders noted the great difficulty there is in exiting from Union Street onto 3rd Street. This has caused traffic to use neighborhood streets and increased the burden at Bryan. A signal will allow traffic to enter 3rd Street more safely, or to connect to Clifton to circulate the one-way pair and then proceed east. A reduction in traffic in the neighborhood would be expected.

A notable impact of this Figure is that it would make some exits from St. Charles more inconvenient. Due to the road geometrics of Atwater where High Street enters, there is no apparent way to safely allow left turns onto High Street from the church. Traffic would be required to turn right, then circulate the area to go south on High Street from Atwater. It is not known what portion of the Church traffic may wish to travel south, though it is estimated at 1/3 of their total traffic.

Figure 4-8: Extension of 3rd/Atwater One-way pair to High Street (with Connection of High to Union from MPO's 2025 Plan)

This Figure illustrates how a future improvement to this area was described in the MPO's Year 2025 Transportation Plan. While it was important that this Study effort include a review of previous work in the area, this alternative reveals obvious and troubling concerns almost as soon as put on paper.

High Street would be realigned to meet Union Street. While the alignment drawn is only one of many possible ways to join these roads, any of these alignments would require most of the homes to be removed between Clifton and High Street between 3rd and Atwater. A new signal would be required where the roads meet, crossing eastbound traffic.

The Study Workgroup agreed immediately that this alternative should not be considered any further due to these extreme impacts to the area.

Figure 4-9: Extension of 3rd/Atwater One-way pair to High Street (with Roundabout at 3rd/High)

This figure illustrates the combination of the extension of the one-way pair with a roundabout at 3rd and High Street. Similar to the roundabout and free-flowing intersection options, a new signal at 3rd/Union would be needed to platoon traffic prior to entering the campus area for the safety of pedestrians.

Atwater would be realigned to meet a reconstructed church entrance at a new signal on High Street because the church entrance must be shifted away from the roundabout.

Other impacts and benefits are similar to other alternatives that include the extension of the one-way pair.

3. Evaluation of East-End Alternatives

The Evaluation Criteria developed earlier in the Study were provided as a means of comparing the alternatives at the East-End. While the various alternatives share many similar features, each represents a choice that, if implemented, will exclude the other alternatives. This is very unlike the West-End, where each intersection could be evaluated independently.

The East-End of the Study Area is unique in that it is the only area where congestion is known to be a daily problem. Stakeholders noted that traffic is worst in the afternoon, and results in backups on 3rd Street in both directions, and also on High Street, Bryan Avenue and Union Street. The congestion along 3rd is believed to be the reason many drivers use streets in the Green Acres neighborhood, and thus cause backups on Bryan Avenue along with unsafe conditions in neighborhood alleys.

Accidents were not noted to be a significant problem at 3rd/High or in the East-End in general. Traffic congestion does not always result in more crashes, because traffic is moving more slowly.

The evaluation of the East-End, then, is designed to determine how "best" to reduce this congestion. All stakeholders agree that thru-traffic should be using arterial streets, not residential streets, so it is important that the use of the arterials is made more convenient.

It is worth noting that the City and MPO had identified the need for an improvement at 3rd/High several years ago. A "project" has been listed for that intersection in the MPO's Transportation Improvement Plan and was described in the 2025 Plan. At discussed earlier, the description in the 2025 plan (Figure 4-8) was deemed inappropriate by the Study Workgroup and is no longer in consideration. Thus the need has been known for a while, but the proposed project has not yet been detailed.

The results of this Study are expected to present the Preferred Alternative for this area. This Preferred Alternative will then be more fully described and is expected to be adopted by the City and MPO as the "project" in those longer range plans. In order to facilitate the future development of the improvements at the East-End, **Appendix G** of this report will be presented to offer a detailed description of the project needs. This will assist the City to begin the next (design) phase of these improvements.

To review, the Alternatives for the East-End were identified as follows:

Alternative 4-1: Offset Correction of High/Bryan

Alternative 4-2: Additional Travel Lanes on 3rd from Mitchell to High (with offset correction of High/Bryan)

Alternative 4-3: Additional Travel Lanes on 3rd from Mitchell to High (without offset correction of High/Bryan)

Alternative 4-4: Additional westbound lane on 3rd from High to Mitchell with a Roundabout at 3rd/High

Alternative 4-5*: Extension of 3rd/Atwater One-Way Pair to High Street (without offset correction)

**This alternative was deleted to reduce modeling requirements. It was deleted due to its obvious inferiority to Alternative 4-6.*

Alternative 4-6: Extension of 3rd/Atwater One-Way Pair to High Street (with offset correction)

Alternative 4-7: Extension of 3rd/Atwater One-Way Pair to High Street (with free-flowing intersections –"Square-about")

Alternative 4-8*: Extension of 3rd/Atwater One-Way Pair to High Street (with connection of High to Union from MPO's 2025 Plan)

**This alternative was deleted by the Study Workgroup for its obvious operational difficulties and excessive impacts.*

Alternative 4-9: Extension of 3rd/Atwater One-Way Pair to High Street (with Roundabout at 3rd/High)

The remaining alternatives were compared to each other on the bases of the evaluation criteria. These criteria are described and measured as follows:

Net Safety Benefits:

Net safety benefits are a judgment on whether the alternative increases overall safety. Some of the following thoughts were part of this judgment:

- Safety is equally important for each corridor user.
- Alternatives which physically separate the various user groups can generally result in safety benefits for the users that are separated.
- Alternatives that provide improved visibility or predictability for the movements of the corridor's fastest-moving users (motor vehicles) are beneficial because they assist corridor users in making safer decisions.
- At locations where there is an unbalanced mixed of users, a benefit for the heaviest user group, all other things being equal, can be expected to provide a net safety benefit.
- Improvements that affect the way in which pedestrians or bicyclists interact with drivers at a crossing are very important, especially given that an accident is much more serious for the pedestrian or cyclist.
- Improvements that can decrease the severity of accidents, even if total accidents do not decrease, still provide a net safety benefit.
- The judgment for increased safety assumes that corridor users are conducting themselves in a "reasonable" and unimpaired manner, obeying basic laws and the rules of the road.
- The best alternative would improve safety for all users; a good alternative would benefit one type of user without significant negative impacts to another. A marginal improvement would grant one group benefits at the expense of another, and must be considered carefully.

This is a subjective criteria and its evaluation is based on stakeholder comments, engineering criteria, and professional judgment. The results of the evaluation for Net Safety Benefits were as follows:

Net Safety Benefit Evaluation	
Alt.	**Comments**
4-1	No significant net change to safety is expected. Drivers to church might be the biggest benefactors, gaining a signal for exits onto High Street. But signals can also increase the number of certain types of crashes. Additional turn lanes on High would help to separate traffic and make it more predictable, but crossing for pedestrians would be longer. **Drivers**: Minor safety gain due to turn lanes, improved exit from church, and elimination of offset intersection **Pedestrians**: Slight negative impact due to crossing distance **Cyclists**: No change **Bus Riders**: Slight gain with bus stop/pulloff at St. Charles **Overall**: No Net Change Expected

4-2	Conversion of 3rd Street from 2-lanes to 4-lanes is the single biggest factor with this alternative. **Drivers**: Moderate negative impact due to more complex traffic on 3rd. Left turns across two lanes of traffic, more conflicting movements. Minor safety gain due to turn lanes on High, improved exit from church, and elimination of offset intersection **Pedestrians**: Significant negative impact primarily due to change in 3rd Street from 2 lanes to 4 lanes, two-way traffic being more difficult to cross, especially in the section without signals. Slight improvement on Atwater due to reduction in traffic, albeit at 3rd Street's expense. **Cyclists**: No change, except for crossings as noted with pedestrians. **Bus Riders**: Slight gain with bus stop/pulloff at St. Charles **Overall**: Net Loss in Safety due to 4-lane, 2-way operation of 3rd Street creating additional vehicle movement conflicts, and making pedestrian crossing much more difficult away from signals.
4-3	Essentially the same as Alternative 4-2, but lacking the minor safety benefits of the offset corrections, the added turn lanes on High Street, and the improved exit from the church. **Drivers**: Moderate negative impact due to more complex traffic on 3rd. Left turns across two lanes of traffic, more conflicting movements. **Pedestrians**: Significant negative impact due to change in 3rd Street from 2 lanes to 4 lanes, two-way traffic being more difficult to cross, especially in the section without signals. Slight improvement on Atwater due to reduction in traffic, albeit at 3rd Street's expense. **Cyclists**: No change except for crossings as noted with pedestrians **Bus Riders**: Slight gain with bus stop/pulloff at St. Charles **Overall**: Net Loss in Safety due to 4-lane, 2-way operation of 3rd Street creating additional vehicle movement conflicts, and making pedestrian crossing much more difficult away from signals
4-4	Roundabouts have excellent safety benefits, especially for drivers. **Drivers**: Roundabouts have been shown to offer significant positive safety benefits through some crash reductions, but more importantly, by reducing personal injury crashes by over 70%. Offers improved church exit and elimination of offset intersection. Entry to 3rd from Union would be better with new signal. **Pedestrians**: Negative impact due to change in 3rd Street from 2 lanes to 3 lanes, but crossing distances only a little wider than existing. Slight gain in safety at 3rd/High, where the roundabout can be expected to offer a slightly safer crossing than a traditional intersection, albeit farther to walk around. **Cyclists**: No change except for crossings as noted with pedestrians **Bus Riders**: Slight gain with bus stop/pulloff at St. Charles **Overall**: Significant Gain for drivers due to roundabout, but a minor negative impact for pedestrians on 3rd. Overall Net Gain.

4-6	Extension of arterial on Atwater will increase traffic on Atwater but also make it one-way. 3rd Street will not gain traffic but will be converted to one-way. **Drivers**: Minor safety gain due to turn lanes on High, improved exit from church, and elimination of offset intersection. A minor safety gain at Atwater and Mitchell where drivers were noted to occasionally proceed eastbound in the north lane before realizing their mistake and getting right. Another safety benefit along 3rd due to simplification of movements and turns with a one-way operation. **Pedestrians**: A minor safety loss along Atwater due to the increased traffic, but less than the traffic itself would create because the street would be one-way and easier to cross than a two-way street carrying the same traffic. A significant gain in safety along 3rd because of the change to one-way, the gain outweighing the loss on Atwater because 3rd has many times the number of pedestrians needing to cross. **Cyclists**: No change except for crossings as noted with pedestrians **Bus Riders**: Slight gain with bus stop/pulloff at St. Charles **Overall**: Significant Net Gain in safety due mostly to safer pedestrian crossings of one-way 3rd Street.
4-7	Free-flowing intersections move traffic out of the corridor with fewer interruptions, but will require sight-distance examination to ensure satisfactory distance available. Extension of arterial on Atwater will increase traffic on Atwater but also make it one-way. 3rd Street will not gain traffic but will be converted to one-way. **Drivers**: Significant benefit for eastbound traffic with elimination of two signals. Entry to 3rd from Union would be better with new signal. Significant safety concern at the church drive, where exits from church would be cumbersome, requiring a right on High and then circulation to South High Street. West-bound traffic would need to cross both lanes. A minor safety gain at Atwater and Mitchell where drivers were noted to occasionally proceed eastbound in the north lane before realizing their mistake and getting right. Minor gain along 3rd due to simplification of movements and turns with the one-way operation. **Pedestrians**: Same as 4-6, but some safety concern with pedestrians needing to cross Atwater near curves. **Cyclists**: No change except for crossings as noted with pedestrians **Bus Riders**: Slight gain with bus stop/pulloff at St. Charles **Overall**: Questionable results. Benefits due to reduction in signals combined with safer pedestrian crossings of 3rd Street as a one-way street, but concerns over church egress and pedestrian crossings in the curves of Atwater. No Net Change deemed likely.

4-9	Combination of extending the one-way pair with a roundabout. **Drivers**: Roundabouts offer significant positive safety benefits with crash reductions and by reducing personal injury crashes by over 70%. Alternative offers improved church exit and elimination of offset intersection. Entry to 3rd from Union would be better. A minor safety gain at Atwater and Mitchell where drivers were noted to occasionally proceed eastbound in the north lane before realizing their mistake and getting right. Minor gain along 3rd due to simplification of movements and turns with the one-way operation. **Pedestrians**: A minor safety loss along Atwater due to the increased traffic, but less than the traffic itself would create because the street would be one-way and easier to cross than a two-way street carrying the same traffic. A significant gain in safety along 3rd because of the change to one-way, the gain outweighing the loss on Atwater because 3rd has many times the number of pedestrians. **Cyclists**: No change except for crossings as noted with pedestrians **Bus Riders**: Slight gain with bus stop/pulloff at St. Charles **Overall**: Significant Net Gain.

Levels of Service:

The Levels of Service (LOS) analyses conducted for this Study provide estimates of the delay which would be experienced by a driver in navigating key intersections if each alternative were put in place. For a major road project, the targeted Level of Service should be A or B.

LOS are determined by a Traffic Engineer using traffic counts, software modeling and other engineering procedures. Levels of Service analyses are fairly detailed, but a simplified way to present them is on an "A-F" scale, similar to grades in school. Levels of Service for Signalized Intersections (most of the intersections analyzed in this Study) are described as follows:

LOS A: Extremely favorable progression with most vehicles arriving during the green phase. Most vehicles do not stop at all. (Control delay 10 seconds or less)

LOS B: Good progression, short cycle length, or both, with more vehicles stopping than with LOS A. Higher level of average delay. (Control delay 10 to 20 seconds)

LOS C: Higher delays resulting from fair progression, longer cycles, or both. The number of cars stopping is significant. Generally the lowest acceptable LOS for routine conditions on an urban arterial. (Control delay 20 to 35 seconds)

LOS D: Congestion more noticeable Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high volume to capacity ratios. Many vehicles stop, (Control delay 35 to 55 seconds)

LOS E: Lengthy delays indicating poor progression. Long cycle lengths, high volume to capacity ratios. Individual cycle failures are frequent. (Control delay 55 to 80 seconds)

LOS F: Considered unacceptable to most drivers. Indicates an oversaturated condition with arrivals exceeding the capacity of the intersection. (Control delay > 80 seconds)

Level of Service is an important criterion because 3rd and Atwater are and must continue to be the primary east-west arterials in this portion of the City. These streets provide critical links within the City itself, and their performance has impacts to the City's street network well beyond the borders of the Study. High Street, while a secondary arterial, is also important to this area and must function at a reasonable LOS. Results of the Levels of Service Analyses were as follows:

Levels of Service Evaluation for All Alternatives (using PM Peak)									
	Intersection of 3rd/High				**Intersection of Atwater/High**				
Alt.	**EB 3rd**	**WB 3rd**	**NB High**	**SB Bryan**	**EB Atw.**	**WB Chr.**	**NB High**	**SB High**	**Comments/Results**
Exst	**D**	**C**	**F**	**F**	**E**	**A**	**A**	**A**	**Existing Condition**
4-1	**C**	**B**	**C**	**C**	**A**	**A**	**B**	**B**	Minor Improvement for 3rd/High
4-2	**B**	**A**	**B**	**C**	**A**	**A**	**A**	**A**	Major Improvement for 3rd/High, not as big as 4-4
4-3	**C**	**B**	**D**	**D**	**C**	**A**	**A**	**A**	Very little improvement
4-4	**A**	**A**	**A**	**A**	**A**	**A**	**A**	**A**	Major improvement for 3rd/High
4-6	**N/A**	**B**	**B**	**B**	**B**	**A**	**B**	**B**	Major improvement, not as big as 4-4
4-7	**N/A**	**A**	**F**	**C**	**B**	**N/A**	**C**	**N/A**	Major Improvement for 3rd, but High fails
4-9	**N/A**	**A**	**A**	**A**	**A**	**A**	**A**	**A**	Major improvement for 3rd/High

Undesirable Values

Alternative 4-1 was intended to show the minimum project that might be effective. Unfortunately, the LOS improvements it provides are also minimal.

Alternative 4-2 provides solid improvement to the LOS on 3rd while maintaining a good LOS at Atwater and High Streets.

The results of **Alternative 4-3** demonstrate that keeping the offset intersection at 3rd/High/Bryan with its split phase signal timing is very detrimental to arterial capacity, even with additional east-west travel lanes. This alternative provides very little improvement to LOS.

Results of **Alternative 4-4** demonstrate the solid LOS benefits of a roundabout, while keeping High Street and Atwater at reasonable levels.

Alternative 4-6, similar to 4-2, provides solid improvement to the LOS on 3rd while providing a desirable LOS for Atwater and High Streets.

Alternative 4-7 provides a good LOS along 3rd and Atwater, but High Street would be backed up and unable to function as an arterial. Drivers attempting to turn left from High to 3rd would be unable to enter free-flowing traffic on 3rd. 3rd and Atwater are more important as the primary arterials, but their benefits cannot outweigh the need for High Street to function at least a reasonable LOS.

Results for **Alternative 4-9** indicate a situation similar to the other roundabout alternative (4-4), but doesn't function quite so well due to its curved alignment.

Alternatives 4-4, 4-6 and 4-9 provide Levels of Service in the targeted range of A's and B's. **Alternative 4-2** is not far behind with one value below target.

Houses/Rentals Impacted:

This is a more straightforward criterion. It was measured by conducting a map review of each alternative and making a count of the number of homes or rental houses that could be impacted by that alternative if constructed.

It MUST be noted to all readers that this is a conceptual level analysis at this stage. Parcels that may be impacted were identified, but without a accurate survey, and detailed mapping of property lines, and a detailed set of design plans, this is little more than an educated guess. Appropriate

and lawful procedures for land acquisition will be conducted at the appropriate time, if needed, and only if the City decides to proceed with a project.

A full purchase of a residential property with its structure was considered to result in an impact of 1.0 "unit". A lesser impact, such as purchasing a portion of a yard, and thus reducing a setback distance was considered to equate to between 0.1 and 0.3 unit, depending on the severity of the purchase to the overall parcel. The purchase of an outbuilding or garage was generally counted as 0.2 units, and added to the measurement for the partial purchase of the yard. Other impacts such as a need to modify a drive or otherwise change access were measured at 0.2.

Church property, while not technically a "house", received additional consideration due to its potential impact to a much larger constituency. Still, the impact would be for open ground and not a structure. Alternatives were considered to be equivalent to 0.5 to 2 units, depending on the size of impact compared to the size of a typical residential parcel.

While a bit more objective than other criteria, Houses/Rentals property Impacted is still a fairly subjective criterion. It does provide a basis for comparison between alternatives, and brings into the evaluation process the necessary consideration for impacts to permanent structures, which many stakeholders felt to be an important concern.

Houses/Rentals Impact Evaluation	
Alternative	**Comments**
4-1	2.6 units, 1 for full house/parcel, 0.1 for setback to another parcel, and 1.5 from Church
4-2	13.2 units, 7 for full house/parcel, 4.7 for setbacks, and 1.5 from Church
4-3	11.1 units, 6 for full house/parcel, 4.6 for setbacks, and 0.5 from Church
4-4	8.4 units, 5 for full house/parcel, 1.4 for setbacks, and 2.0 from Church
4-6	5.6 units, 1 for full house/parcel, 3.1 for setbacks, 1.5 for Church
4-7	6.7 units, 2 for full house/parcel, 3.2 for setbacks, 1.5 for Church
4-9	10.3 units, 5 for full house/parcel, 3.3 for setbacks, 2.0 for Church

Neighborhood Integrity:

Neighborhood Integrity is a criterion intended to judge the impact that an alternative may have to physically isolate a residential area from its overall neighborhood. It is considered on Atwater between Mitchell and

High Streets where Atwater could become the eastbound arterial, and would go through a portion of the Eastside Neighborhood. The issue was raised by the Neighborhood Association based on the perceived "isolation" of the area between Atwater and 3rd if arterial traffic is extended on Atwater (which currently acts as a collector street).

There is no objective basis to determine what constitutes "integrity" except for an increase in traffic on a street in the neighborhood. More traffic will result in increased noise on that street, but it would seem that this criterion is more intended to measure the degree to which casual crossing of that street is made more difficult by the increased traffic. There is no consideration for other roadway improvements such as curbs and sidewalks that could make crossings more comfortable, or that it may be easier or safer to cross more traffic that is traveling one-way, rather than less traffic that is traveling two-way.

For the conduct of this study, it seems most prudent to note whether an improvement will or will not result in Atwater's extension as an arterial street through the residential area. It is left for the overall comparison of results to weigh the relative importance of that.

Neighborhood Integrity Impact Evaluation	
Alt.	**Comments**
4-1	No change to use of Atwater anticipated
4-2	Positive effect - should result in less eastbound traffic on Atwater
4-3	Positive effect - should result in less eastbound traffic on Atwater
4-4	Minor positive effect – some reduction in traffic on Atwater is anticipated
4-6	Negative effect – Atwater would be extended as eastbound arterial
4-7	Negative effect – Atwater would be extended as eastbound arterial
4-9	Negative effect – Atwater would be extended as eastbound arterial

Not surprisingly, only **Alternatives 4-2 and 4-3** have a positive impact because they purposefully route all arterial traffic to 3rd Street. **Alternative 4-4** offers a minor positive impact only because it is believed that drivers may be more willing to use 3rd with a roundabout at 3rd/High.

Support of City Plans:

This criterion is a subjective judgment on the degree to which an alternative supports, or erodes support, for other published City goals, especially the well-documented goal of encouraging the use of alternative transportation. Considerations from the MPO's Transportation Improvement Plan and the 2025 Plan are already built into the evaluation effort in the alternatives process. The City's Growth Policies Plan (GPP)

has limited applicability to the Study…not because the goals of that plan could not be applied to this area, but because the area is heavily owned by the University, and because this Study is infrastructure, not economic-development based. This Study supports the goals of the GPP in general by making the area more attractive to the full variety of corridor users.

The evaluation of Support is based on whether an alternative will make travel by non-motorized means more, less or equally attractive, and is analyzed for each user group: pedestrians, bicyclists, and bus riders. The comfort of street crossings are very important to pedestrian comfort, so this becomes an important characteristic to evaluate these alternatives.

Support of City Plans Evaluation	
Alternative	**Comments**
4-1	**Pedestrians:** No substantial change. Crossing of High would lengthen, but more time could be afforded for the crossing **Bicyclists:** No change to bicycle facilities unique to this alternative **Bus Riders:** No change to bus facilities is unique to this alternative.
4-2	**Pedestrians:** Some Negative impact due to width of 3rd, size of intersections and the need to cross four lanes of two-way traffic. Atwater crossings would benefit, but at expense of 3rd. **Bicyclists:** No change to bicycle facilities unique to this alternative **Bus Riders:** No change to bus facilities is unique to this alternative
4-3	**Pedestrians:** Some Negative impact due to width of 3rd, size of intersections and the need to cross four lanes of two-way traffic. Atwater crossings would benefit, but at expense of 3rd. **Bicyclists:** No change to bicycle facilities unique to this alternative **Bus Riders:** No change to bus facilities is unique to this alternative
4-4	**Pedestrians:** No substantial change due to roundabout. 3rd might be slightly more difficult to cross, but is not widened significantly. While a roundabout makes the walk around a little longer, roundabouts have generally been shown to be safer for pedestrians through their use of pedestrian refuge islands and crossing traffic from each direction separately at narrower crossings. **Bicyclists:** No change to bicycle facilities unique to this alternative **Bus Riders:** No change to bus facilities is unique to this alternative
4-6	**Pedestrians:** Some positive impact due to conversion of 3rd to one-way. Atwater would change from two-way to one way, which is easier to cross, but would have more traffic. 3rd Street would convert to one-way and be easier to cross safely. Crossings at 3rd/High would be longer. **Bicyclists:** No change to bicycle facilities unique to this alternative **Bus Riders:** No change to bus facilities is unique to this alternative
4-7	**Pedestrians:** Some positive impact due to conversion of 3rd to one-way. Atwater would change from two-way to one way, which is

	easier to cross, but would have more traffic. 3rd Street would convert to one-way and be easier to cross safely. Because traffic is free-flowing, pedestrian crossings at High Street would be less comfortable. **Bicyclists:** No change to bicycle facilities unique to this alternative **Bus Riders:** No change to bus facilities is unique to this alternative
4-9	**Pedestrians:** Some positive impact due to conversion of 3rd to one-way. Atwater would change from two-way to one way, which is easier to cross, but would have more traffic. 3rd Street would convert to one-way and be easier to cross safely. No substantial change due to roundabout. While a roundabout makes the walk around a little longer, roundabouts have generally been shown to be safer for pedestrians through their use of pedestrian refuge islands and crossing traffic from each direction separately at narrower crossings **Bicyclists:** No change to bicycle facilities unique to this alternative **Bus Riders:** No change to bus facilities is unique to this alternative

This evaluation revealed very little to favor a particular alternative for either bicyclists or bus riders, but this is not really unexpected. The alternatives themselves are oriented around a reduction in congestion on the arterials. In all cases the future improvements can be expected to include sidewalks, the frequent use of the sidewalks by bicyclists, and some improvement to the bus stop at St. Charles. None of the alternatives as presented would exclude these continued mixed uses.

Because support of bus riding or bicycling are not really much different for the alternatives, the character of the pedestrian crossings emerges as the real difference between alternatives. **Alternatives 4-6, 4-7 and 4-9** provide the strongest support due to their improvements to 3rd Street (one-way operation).

Cost:

The Study Workgroup expressed that at this planning stage, they would prefer that recommendations be based on what is truly deemed the best condition possible, and that cost not exclude expensive alternatives that have other very positive benefits. Still, cost was noted to be a valid concern in the overall process.

For this Study, cost is deemed important in that the recommendations must be financially feasible. The City is willing to engage in large projects and make substantial investments in infrastructure so long as the benefits are also large and substantial.

Construction costs were estimated based on typical cost history data available in INDOT's Unit Cost Averages catalog and from previous City construction experience. Property Costs were estimated using an estimated average value for a "typical" parcel of $150,000. The number of impacted parcels was estimated previously under Property Impacts.

The costs are only estimates, suitable only for general planning, and for comparisons between alternatives.

Estimated Cost Evaluation				
Alt.	**Construction Cost ($)**	**Property Cost ($)**	**Total Cost ($)**	**Comments**
4-1	1,100,000	390,000	1,490,000	Offset correction only
4-2	2,600,000	1,980,000	4,580,000	Widening of 3rd Street
4-3	1,500,000	1,665,000	3,165,000	Widening of 3rd Street
4-4	3,060,000	1,260,000	4,320,000	Roundabout alternative
4-6	2,200,000	840,000	3,040,000	One-way pair extension
4-7	2,250,000	855,000	3,105,000	One-way pair extension
4-9	3,210,000	1,545,000	4,755,000	Roundabout alternative with One-way pair extension

Speaking in general terms, the East-End Alternatives are really different combinations of four primary construction areas. These four areas are:

- Widening of 3rd from Mitchell to High to accommodate 4-lanes, which is estimated at $1,500,000.
- Widening of Atwater from Mitchell to High to accommodate 2-lane arterial traffic, estimated at $1,100,000
- Offset intersection corrections at 3rd/High and Atwater/High/Church, estimated at $1,100,000
- Roundabout at 3rd/High, estimated at $1,100,00

Each of the Alternatives is some combination of these, usually with some small adjustments. This allows for a more balanced side-by-side comparison of the construction costs. For the total project costs, the construction cost is added to the estimated property cost.

The projects that cost the most include more than one of the construction areas. It will cost more to widen 3rd Street for 4 lanes than it will to widen Atwater to 2 lanes of arterial traffic. Roundabouts are more expensive, so **Alternatives 4-4 and 4-9** reflect this higher construction cost. Not unexpectedly, **Alternative 4-1** is relatively inexpensive**.**

4. Summary of East-End Evaluation with All Criteria:

In order to compare the results of all of the alternatives side by side, the results are combined in the following table. Criteria are listed in the order of importance, and ratings are shaded yellow when they rank among the better results for their respective criterion.

Summary of East-End Evaluation						
	Evaluation Criteria listed from Most to Least Important					
Alt.	**Net Safety Benefits**	**Level of Service on Arterials**	**Houses/ Rentals Impacted**	**Neighborhood Integrity**	**Support of City Plans**	**Cost (in $1000s)**
4-1	No change	Minor improvement	2.6 units	No change	No change	1,490
4-2	Net Loss	Major improvement	13.2 units	Positive Effect	Some Negative	4,580
4-3	Net Loss	Very Little improvement	11.1 units	Positive Effect	Some Negative	3,165
4-4	Net Gain	Major improvement	8.4 units	Minor Positive Effect	No change	4,320
4-6	Significant Net Gain	Major improvement	5.6 units	Negative Effect	Some Positive	3,040
4-7	No Net Change	3rd Improved, but High fails	5.7 units	Negative Effect	Some Positive	3,105
4-9	Significant Net Gain	Major Improvement	10.3 units	Negative Effect	Some Positive	4,755
				Better values in yellow		

Conclusions:

These are presented with the easier decisions first.

Alternative 4-1 was presented as the minimal treatment that might have benefits. It does have the lowest estimate cost, but unfortunately the benefits are also minimal. Alternative 4-1 does not improve safety, and does not provide a significant enough improvement to Level of Service on 3rd or Atwater. The Alternative does not achieve the primary goals of this Study nor satisfy the top two evaluation criteria approved by the Study Workgroup. ***Alternative 4-1 is NOT preferred***.

Alternative 4-2 presents a Net Loss in safety due primarily to the widening of 3rd Street to a 4-lane, two-way facility, offering a significant ongoing challenge to crossing pedestrians. It does offer a significant improvement to Level of Service on 3rd and Atwater for drivers. The number of parcels impacted by this Alternative is the highest of all

alternatives. The alternative would support the Eastside Neighborhood's desire to shift all arterial traffic to 3rd, but the crossings of 3rd would prove a significant obstacle and reduce the level of comfort for alternative transportation users. ***Alternative 4-2 is NOT preferred.***

Alternative 4-3 provides all of the impacts of Alternative 4-2 but lacks its biggest benefit. By giving up the offset corrections to reduce property impacts, it gives up most of the Level of Service benefits along 3rd Street at High. ***Alternative 4-3 is NOT preferred.***

Alternative 4-7 provides very mixed results. It provides a benefit to pedestrian safety on 3rd by making crossings even easier than existing, but negatively impacts driver safety especially at St. Charles and at High Street where drivers must enter Atwater on curves. The Alternative provides great benefits for Level of Service to 3rd and Atwater, but has such strong negative impacts to northbound High Street as to make it fail to serve the City as a secondary arterial. Its property impacts are regarded to be fairly light. This Alternative fails to show consistent benefits on the two most important criteria, and it is doubtful that it can achieve the goals of this Study. ***Alternative 4-7 is NOT preferred.***

This leaves **Alternatives 4-4, 4-6, and 4-9**. **Alternatives 4-4 and 4-9** are roundabouts, but each distinctly different in how they would handle traffic on the primary arterials. **Alternative 4-6** provides more traditional signalized intersections.

To weigh the remaining alternatives, it is important to return to the core goals of the study itself:

To identify improvements that can increase both the safety and efficiency of travel through, across, and within the corridor for <u>all</u> of its user groups.

Alternatives 4-4, 4-6 and 4-9 all achieve these goals.

Appropriately, the core goals of the Study are essentially the first two, and highest ranking, evaluation criteria.

Having identified the alternatives that achieve the goals of the Study, the next step is to select the Preferred Alternative among them. <u>To do this, the other evaluation criteria are brought into consideration.</u>

The 3rd criterion is Property Impacts. **<u>Alternative 4-6</u>** <u>ranks best by having the fewest property impacts.</u> **Alternatives 4-4 and 4-9** have much greater impacts because they include a roundabout. **Alternative 4-9** has more

impacts than **4-4** because it includes improvements along Atwater Avenue between Mitchell and High.

The 4th criterion is Neighborhood Integrity. Only **Alternative 4-4** provides some minimal benefit . **Alternatives 4-6 and 4-9** include the extension of the one-way pair and thus have a negative impact.

The 5th criterion is Support of other City goals, in this case, the encouragement of the use of alternative transportation. **Alternatives 4-6 and 4-9** provide some positive support, ranking better than **Alternative 4-4,** which was deemed to offer no change.

The 6th criterion is total project cost. **Alternative 4-6** is estimated at just over $3.0 million, whereas **Alternatives 4-4 and 4-9** are estimated to cost $4.3 and $4.8 million, respectively. **Alternative 4-6** ranks as the 2nd lowest among all of the Alternatives, **4-4** has the 3rd highest cost, and **4-9** has the highest cost.

Preferred Alternative:

While three alternatives will achieve the core goals of the Study, they are not equal in their impacts or costs to the City to implement.

Among the additional evaluation criteria, **Alternative 4-6** scores best on 3 of 4, including having the least property impacts and the lowest overall cost. **Alternative 4-9** ranked best only on the criterion of Neighborhood Integrity. **Alternative 4-4** was equal to **4-6** in supporting other City goals, but was not best in any criterion.

Alternative 4-6 is the Preferred Alternative and is recommended for implementation. This Alternative is incorporated into the overall recommendations for the Study and is reflected on **Figure 5**.

C. Evaluation of Other Potential Improvements inside the Study Area.

Even though a great deal of effort went into the analyses and evaluations of West-End and East-End alternatives, the Study Area is large and includes many other important issues and concerns.

The issues discussed below are those issues that were felt to deserve additional explanation because of their complexity, controversy, or less apparent impacts or benefits. Needs that were simpler, uncontroversial or more obvious were generally adopted directly as recommendations and are presented along with the others in **Section IV**.

1. Elimination of Right on Red at Signalized Intersections

The idea of eliminating "Right on Red" turns at intersections with heavy pedestrian traffic such as 3rd/Jordan, 3rd/Indiana, and Atwater/Henderson (if signalized) was brought up by stakeholders during early coordination. This issue took a twist when the Study Workgroup noted that their concerns were actually greater when vehicles fail to yield right-of-way to pedestrians in the crosswalk during their shared green cycle, rather than during the period when the cars are turning on red.

If turns on red are prohibited, all turning vehicles must turn during the green cycle. Eliminating turns on red might actually increase the problem as cars are more insistent to get through during their green cycle.

Because there are concerns that eliminating turns on red could actually increase the problem, no change to eliminate the turns is recommended at this time.

2. Jordan Avenue Improvements

Jordan Avenue at 3rd and Atwater, and in between, bears the unique distinction of being the area with the greatest degree of "mixed-use" by motorists, pedestrians, bicyclists and busses. 3rd/Jordan appears as #5 in the MPO's Historically Significant Accident Locations 1997 to 2003. Jordan Avenue is an important road providing connections north of 3rd to 7th and 10th Streets as well as to the south to 2nd and Maxwell. Jordan joins Henderson and High Streets as the busiest north-south routes in the Study Area.

While it is not realistic to change the concentration of mixed-use at this location, it is possible to find ways to improve safety conditions. Alternatives include the elimination of on-street parking, the channelization of entry drives at adjacent businesses, the addition of bike

lanes, and addition of missing curbs. The key to improving safety lies in improving the separation between these uses.

Transit authorities have requested that parking be eliminated in this block. With the narrowness of the street, busses have a difficult time avoiding parked cars and their side-mirrors. Stops bars on Jordan at Atwater need to be shifted away from Atwater to assist busses with these tight turns.

It is acknowledged that the elimination of these (estimated) six parking spaces will have an impact to those who frequently use them.

A large number of bicyclists use this corridor, which is the only continuous bike route from north to south in the study area. With busses, heavy traffic and parked cars, the corridor is narrow for bicycles. Bicyclists frequently use the sidewalks. Eliminating parking will provide room for an extension of bike lane markings through this block, which are already present north of 3rd.

The Village Pantry sits on the southwest corner of the intersection of 3rd/Jordan. Its three drives and open access along both Jordan and 3rd make pedestrian movements in this corner more hazardous. The sidewalk area in the southwest corner is notably small for this intersection, providing very little pedestrian storage and forcing walkers to stand very near entry drives and moving vehicles. Pedestrian areas in the other three corners are more generous and able to hold many pedestrians.

Just west of Jordan along 3rd is the Kinser Cleaners. Due to a lack of a barrier curb, patrons are able to park at an angle across the sidewalk area in front of this business. While convenient for this type of drop-in business, an average sized vehicle can completely block the sidewalk, forcing pedestrians and bicyclists to either enter the edge of 3rd Street or slip between the bumper and store front. This is an unacceptable safety hazard, and the angled parking was not intended at this location. No other parking of this type is allowed on 3rd in the Study Area.

Accident records indicate that many of the accidents in this area are actually occurring on 3rd just east of Jordan. The area is notable in that is has many popular student restaurants, and there are no signals to the east until High Street. This means that traffic is poorly platooned in an area with heavy pedestrian crossing activity with no designated crosswalks.

With additional field investigation, Mr. Ridgway concluded that it is possible to make some reasonable changes to this area that will not unduly restrict any of its uses, and still improve the separation of vehicles, busses, pedestrians and bicyclists. Separation and visibility are key issues to improving safety.

Parking should be eliminated in this block to improve visibility and to acknowledge the greater importance of this area as a bus, bike and motor vehicle route. Bike lane markings should be added to Jordan for at least the south half of this block to offer continuity with the roadway to the north, and to provide a designated place for bikes that is not on the sidewalks. There is not adequate roadway width for a bike lane in front of the Village Pantry, but this section can be shared as it currently is.

The entrance drives to the Village Pantry should be modified to provide a better pedestrian area on the southwest corner of Jordan and 3rd. One of the two drives off Jordan should be closed and a barrier curb extended to provide improved separation of pedestrians and vehicles. By rearranging the parking configuration within the Village Pantry's lot, it will be possible to increase the number of parking spaces they have available while changing their drives. Entry should be off of Jordan, while exits can be to both 3rd and Jordan.

The curb and sidewalk at the Kinser Cleaners should be reconstructed to eliminate its use as parking. Pedestrians and bicycles need use of the sidewalk in this area, and parking is available behind the store. The need for safety outweighs the use of this area as parking.

To help address concerns of cars failing to yield the right-of-way to pedestrians, and to improve use of the crosswalks at 3rd and Jordan, the pedestrian walk indicators should be replaced with countdown timer indicators. These have been shown to be an effective way to encourage people to move more quickly through the crosswalk and to discourage entry by those who don't really have enough remaining time to cross. It is hoped that this modification will help provide additional time for cars to make right turns and improve overall safety for pedestrians.

As an added safety measure to the east of Jordan, an additional pedestrian crossing should be added at Swain Avenue, marked with flashered warning signs to alert drivers to the upcoming hazard.

3. Egress from Atwater Garage to eastbound Atwater

This evaluation involved the possible designation of an eastbound route through the alley between Faculty and Hawthorne for east-bound egress

from the Atwater Garage. Patrons of the Garage (Atwater and Faculty) that wish to go east must first go to 3rd, making three left turns to go east on Atwater. This creates many conflicts with pedestrians, including along Woodlawn, and also increase traffic through 3rd/Woodlawn, a noted high accident location in the Study Area.

Upon additional field investigation, Mr. Ridgway concluded that the existing alley is too narrow to be a formal egress route. The alley provides parking access to many spaces where vehicles must back into the alley to exit the space, and would create an unsafe condition. There is too much parking there to consider its elimination. This potential improvement is no longer under consideration.

4. Incorporation of Traffic Calming Related Measures

A discussion of the appropriateness of traffic calming measures resulted from a significant number of stakeholders noting their ongoing concern over speeding vehicles on 3rd and Atwater. The entire Study Area, except for the curve on Atwater, is posted for 25 MPH speed limit. Vehicles commonly travel at 40-45 MPH (estimated). This creates an unsafe condition for all corridor users.

Meetings with City Officials and the Study Workgroup revealed a lack of support for neighborhood-type traffic calming measures such as curb bumpouts, speed humps, and chicanes. Because 3rd and Atwater are the primary arterials in this area, there is strong support to keep traffic moving. It is important to avoid adding significant delay to the east-west movements. The Workgroup did agree, however, that reducing speeds to better match the posted speed limit is a desired outcome.

While more severe traffic calming measures are not appropriate, a simple narrowing of the travel lanes in areas where the travel lanes are extra-wide could be used to help lower motorist speeds, narrow the crossings, and provide space for wider sidewalks and tree plots. It is not a coincidence that the areas most noted for speeding traffic are areas where 3rd and Atwater provide excess width. Such areas include Atwater in front of the School of Optometry and the section east of Highland.

Transit officials expressed some concern with lane narrowing, noting that intersections where the busses must turn need some special consideration to ensure radii are adequate to mitigate the loss of lane width.

Limited roadway narrowing should be implemented in those areas where the roadways are extra wide and vehicle speeds are, not coincidentally,

noted to be excessively high. Again, the goal is to reduce speeds to the posted speed limits, not reduce overall capacity of the corridors.

At intersections where busses and large vehicles must turn, corner radii must be kept large enough to support these turns. Pedestrians will benefit from the wider sidewalks between intersections, but at those few locations where busses must turn safely, the corner radii should be kept larger even though it will increase crosswalk lengths. This is considered a reasonable balance of these competing interests.

5. "Streetscaping" of 3rd and Atwater Corridors

A general discussion point during the Study Workgroup Meeting was the idea of making both corridors more comfortable and more attractive, especially for alternative transportation users. All stakeholders agree that this is a desirable outcome so long as the performance of the arterial streets is preserved. The proximity of the University reinforces this goal.

Portions of the Study Area, especially along 3rd Street, are very attractive, offering a generous tree row with wide, separated sidewalks on each side. These areas are comfortable to pedestrians and bicyclists. Other areas, many of them on Atwater, offer narrow, close sidewalks with no tree row. These areas are much less comfortable and can discourage these forms of transportation.

It was discussed that it should be an overall goal to make all portions of 3rd Street more similar to its most attractive areas.

It should also be a goal to improve Atwater to be more similar to 3rd Street, although Atwater has a much narrower right-of-way and has more topographic challenges like hills and retaining walls. The opportunities to improve Atwater are much more limited without having major property impacts, but in conjunction with street narrowing (above), there are opportunities to find space to accomplish some of this goal.

In areas where pavements are to be narrowed, this space behind the curbs should be reconfigured to offer better sidewalks behind green space. Improvements to both 3rd and Atwater should be made incrementally as sections are narrowed or reconstructed. Because Atwater does not have the quantity of pedestrian activity that 3rd has, and is not expected to, the

treatment of Atwater could be viewed as a "lite" version of conditions on 3rd Street. This would include generally narrower sidewalks and narrower green space.

The possible addition of pedestrian scale lighting was noted, but much of the Study Area already has streetlights, especially the areas with the highest concentrations of pedestrians. It seems appropriate to be open to the possibility of adding benches or bikeracks to the corridor, and it is recommended that the City consider them. However, due to the maintenance and expense, these should only be considered at locations where there is a known need and implemented in a manner that does not obstruct any sidewalks.

6. Improvements to Bus Stops

Indiana University reports that as many as 303 bus trips are made through the 3rd Street corridor each day. With the recent change to "Universal Access", where a rider can board either City or IU busses with the same pass, ridership is reported to have grown by 30%.

Existing bus stops on both 3rd and Atwater demonstrate several operational and safety concerns. Few bus pulloffs are present, requiring that busses block ½ of either 3rd or Atwater when stopped. In those areas that have bus pulloffs, the transit drivers are reluctant, and sometimes are directed not, to use the pulloffs because traffic is too heavy for them to reenter traffic flow. Given their need to maintain reliable schedules it is a reasonable response to the situation.

Bus stops are frequently positioned just prior to an intersection (called "near-side"). This adds to the difficulty of busses to return to traffic flow, and also creates a sight-distance concern. Drivers entering the intersection from the street in front of the bus cannot see oncoming traffic lanes to make a safe crossing. Pedestrians have the same problem, perhaps crossing in front of the bus at a crosswalk.

Some bus stops are very narrow, offering only a 4' sidewalk, backed by a retaining wall or a hill like the bus stop at Atwater/Jordan. These do not permit waiting riders to stand or sit at a safe distance from the edge of the street, creating a great safety concern that someone could stumble or step into traffic. At Atwater/Fess, the retaining walls do provide a place to sit, but there is still not adequate space for the numbers of riders sometimes seen waiting there.

On 3rd Street, the University has provided a shelter at some bus stops, and these would be considered more ideal examples for heavily used bus stops.

Bus stop improvements are an important component of encouraging increased bus ridership. Increased ridership reduces overall traffic and is an established goal of the City in its Alternative Transportation and Growth Policies Plans.

Most of the bus stops in the study area need improvement. Bus stops in areas with only a narrow sidewalk should be widened or shifted to better/safer location. Bus stops currently positioned "near-side" should be shifted to far-side locations to make them safer, unless the bus is about to make a right turn, or there are significant topographic obstacles. Bus pulloffs should be constructed wherever feasible to provide better safety for busses, cars and pedestrians by separating these activities, and to reduce the blocking of arterial streets. Far-side bus pulloffs need to be positioned just after traffic signals because the busses need the breaks in traffic to reenter the flow to better keep their schedules. Bus shelters should be provided in the most heavily-used locations to encourage riding even in inclement weather. Bus pulloffs and stops need to be signed for NO Parking, Tow Away Zone and it needs to be enforced.

These are likely expensive recommendations, but the improvements are very much in sync with what the City has previously established as important goals for the City. Of all portions of the City, this Study area should provide the types of infrastructure that support the City's goals of encouraging the use of public transportation.

7. Elimination of 15-minute Parking on 3rd

Partially in conjunction with Item 6 above, the presence of the 15-minute parking areas along 3rd Street was brought into question. City and University Police noted that the 15-minute limits are unenforceable. The Police cannot enforce the time limits without maintaining a constant presence on site.

The 15-minute parking rights are abused daily by those parking to attend classes and make other longer visits. The spaces are not used in the manner they were intended. These are the only signed parking spaces that exist along the edges of either 3rd or Atwater.

The parking areas create safety concerns because pedestrians typically dart from between cars to cross 3rd Street in midblock locations. Midblock

crossing is inevitable, but visibility of pedestrians could be improved. While parking, the driver must sometimes execute a parallel parking maneuver while blocking a lane of 3rd Street.

These parking areas are an even greater concern where they are adjacent to bus stops. It is not uncommon to see cars parked in bus stops.

Illustrating a different problem, the picture above shows a situation where the driver choose to park where they apparently thought they still "fit", resulting in an encroachment into one lane of 3rd Street.

15-minute parking spaces should be eliminated in the corridor. Businesses, sorority, fraternity and other buildings have access to the rear and/or sides for deliveries, and these spaces were not intended for anything except short visits. No one should be depending on them to have a place to park their vehicle for work or school attendance. The number of safety concerns described above is justification for their removal.

On a related note, it has been determined that there should be bus pulloffs at bus stops, and that there is a problem with cars parked in bus pulloffs. For that to be a workable recommendation, it is important that bus pulloffs not be used for parking.

It is critical to create an environment where there is NO parking along these arterials. Thus, if someone parks a vehicle in a bus pulloff or anywhere in the corridor, they are violating the law, period. It greatly enhances law enforcement when all that must be witnessed is the observance of a parked vehicle. These routes are traversed frequently by law enforcement, not requiring special routes or patterns. Law enforcement should be encouraged to look for these violations, and this provides them with a much easier means of enforcement. The elimination of this parking will make 3rd Street a safer corridor.

8. Intersection Sight Distance Improvements

Intersection sight distance is a significant problem in several locations in the Study Area. Poor sight distance means that crossing or entering traffic must make a judgment on whether or not to enter the arterial street with insufficient information.

The result of this is that drivers move forward until they can see (frequently meaning their front bumper is projecting into the crosswalk or arterial lane while they decide).

In a more severe case at Atwater/Highland, crossing cars, bicyclists and pedestrians are not able to see because of a hill on Atwater and must make the judgment without the needed sight distance. Mr. Ridgway estimated the time between first seeing an oncoming vehicle and it entering the west side crosswalk to be approximately five seconds.

Sight distance is a readily understandable safety criterion to most laypeople because they know that the intersection feels "uncomfortable". In stakeholder meetings, the Fire Department noted a strong concern over this issue, because these arterials are heavily traveled during emergency responses, and the public, especially in cars, must try to find the emergency vehicle at times when they can only hear it.

Sight distance can be very expensive to achieve because it frequently requires that a triangular piece of property be purchased on the corner of a private property.

For the benefit of all corridor users, sight-distance is an important consideration. While expensive and frequently opposed by the affected property owner, right-of-way purchases should be considered where the sight distance is especially short and the beneficiaries are many. High accident locations should be reviewed this type of improvement. Corners of arterials that experience higher traffic should be considered such as Atwater/Henderson.

Most sites can be improved with better management of vegetation, and by planting species that do not block visibility. With cost being a big concern. perhaps the City could first approach a property owner with an offer to work with them to better maintain their landscaping or with an offer to remove a planting and replace it with some other desirable species. With a cooperative property owner, this could save the City a lot of money and still provide a meaningful benefit.

9. Intersection Corner Radii

Most pedestrian advocates are opposed to the increase of intersection corner radii because they result in longer crosswalks. It is a situation where there are competing interests and in most cases, competing safety concerns. For pedestrians, minimizing crossing distance is an important concern. For large vehicles and busses, their drivers need to navigate turns safely, without overtopping the curb with the right-rear tires, and without encroaching into the opposing traffic lanes as they round the turn.

A notable location with these competing interests is Atwater/Jordan, where a large number of pedestrians are present, but busses must also navigate the turns. Transit officials noted that they are very concerned with the safety of the pedestrians (their riders), but also with other vehicles and pedestrians as they try to minimize their encroachment and not overtop a sidewalk where pedestrians could be present. No one, including this author, wishes to try to judge which safety concern is greater.

For the purposes of this Study Area, the recommendation is that corner radii only be considered for enlargement at locations where two conditions are satisfied:

- *Locations where a problem is known to exist either because a stakeholder specifically noted it or it has contributed to an recorded accident, and*
- *Locations which are intersections between an arterial and a more heavily traveled street (an example would be Atwater/Jordan).*

There is no easy way to weigh these competing safety concerns, and this seems a reasonable way to apply judgment in this corridor where so many pedestrians must safely traverse these important arterial streets.

10. Pedestrian Crossing Warning Devices

The addition of a traffic signal is only one means to consider for improving the safety for pedestrians at highly-used crossing locations.

Signals cause delay for travelers on the arterials, and may be counterproductive to expressed goals of providing efficient traffic flow and reducing congestion. Signals do not prevent accidents and sometimes do not even reduce them. It is a goal of traffic engineering to recommend traffic signals only where they appear to be the best solution available.

Where pedestrian crossings are a big concern, another possible option is the installation of pedestrian crossing warning devices. These devices can take many forms including signs or flashing lights on poles, on cables, or even embedded in the road pavement. Adding a splitter island to 3rd Street at a heavy crossing is a possibility, but generally not favored due to concerns about loss of smooth traffic flow on 3rd.

Crossing warning devices are most useful at locations of highest pedestrian concentrations. Along 3rd Street, this can be difficult to define given the nearly unlimited use of mid-block areas throughout the corridor. If warning devices are used everywhere, then drivers will tend to ignore all of them. There are safety advantages to encouraging the use of designated crosswalks through some form of channelization; in this area's case, low stone walls.

In this Study Area, the best application of pedestrian crossing warning devices seems to be adjacent to major pedestrian traffic generators. Examples are at 3rd/Fess where the new garage will add many pedestrians during traditional rush hour time ranges. At this location, a warning device might be a reasonable response to the need for additional awareness of pedestrians, and possibly be a safer option than adding another signal.

Another example is east of Jordan on 3rd, where the concentration of off-campus restaurants and the bookstore create an area of high pedestrian activity. Many pedestrians are unwilling to walk to the signal at Jordan Avenue, and are crossing in areas east or west of Jordan.

Pedestrian crossing warning devices in the form of flashered signs are recommended at3rd/Fess and at 3rd/Swain.

11. Bike Route Improvements

Many stakeholders asked for consideration of East-West bicycle routes in the corridor, and the City's Alternative Transportation Plan supports the need for them. But options are very limited. A separate path would be most desirable, but there is insufficient right of way along either street, making such an improvement very expensive. If bicycles are to share the road or have a bike lane, then bicycles need to be directed to travel in the same direction as motorized traffic. This requires the splitting of east and westbound bicycles to 3rd and Atwater.

Due to the heavy bus traffic with bus stops on the right side, there is great concern over putting bicycle lanes on the right side. In some areas, there is insufficient pavement width for a bike lane at all. Left-side bike-lanes could be considered but are unorthodox, and unexpected by motorists.

The Workgroup expressed strong opposition to bicycle lanes on 3rd or Atwater at this time, and opposition to bike lanes on the left side because it is contradictory to common practice. There was a short discussion about the use of the midblock alley between 3rd and Atwater as a bike route. This idea was not supported because the alley is not continuous, would present

safety concerns due to conflicts with delivery trucks, cars accessing the parking areas, and the crossings at each north-south street.

As much as it is needed, the corridors will not support bicycle lanes as they are currently configured. There is insufficient right-of-way to widen Atwater as would be needed for that street and the heavy concentration of busses and bus stops makes 3rd Street a concern. The cost of trying to provide sufficient pavement width for bike lanes would be very high and would necessitate impacting virtually every bordering property owner for the needed land.

The University did reveal that they are looking into the possibility of some sort of path improvement within the campus itself that might offer the improved east-west travel needed. There was no firm commitment to constructing this facility, only that they were reviewing the idea.

At this time, the only marked east-west bike route in the area is along Hunter Street, one street south of Atwater. Given no better alternative, it is recommended that this route be reviewed for how it might be improved so that it is a safer, more attractive and better known facility. The route on Hunter does not connect to another bike route at either of its ends at Henderson or High Street, which suggests additional study outside of this effort to determine how connectivity might be provided.

Whereas this Study does not recommend east-west bike routes or lanes on either Atwater or 3rd, this is only a part of the need in the Study Area.

North-south movements are also vitally important to the attractiveness of the corridor to bicyclists. Additional north-south bike routes need to be provided. Ideal locations would provide a bicycle-friendly connection from the residential areas south of Atwater (from the designated bike route on Hunter) to points of "dispersion" at the edge of campus. Such locations must allow entry into the campus area north of 3rd where bicyclists can gain access to campus roads, walks and bike storage areas. Consist with the Alternative Transportation Plan, these routes need to offer connectivity and be well marked.

The only location that currently provides this type of connection is Jordan Avenue. While this location is recommended for bike-related improvements, the heavy motorized traffic that is already there suggests some other less trafficked areas could be even more desirable. It is critically important that additional north-south routes provide the same sort of continuous link that Jordan provides, including the ability to disperse onto campus walks and roads once 3rd Street is crossed.

The designation of north-south routes are suggested at Woodlawn Avenue, Hawthorne Drive, and Rose Avenue. Each of these three provides an excellent connection to campus roadways and walks. It is noted that Woodlawn already appears on the City's mapping of bike routes. Bicyclists were seen, though no bike lanes or signage were noted.

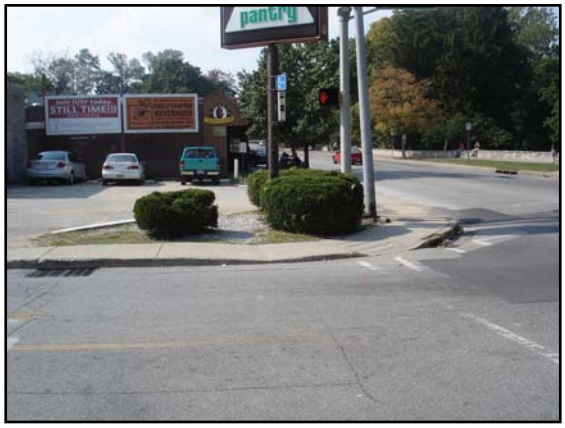
The edge of campus at Woodlawn (north side of 3rd) is only accessible via stairs, so for this to become a reasonable route, the University would have to agree to a small site improvement that provided ramps.

Recommendations along these routes including designating bike lanes, removing parking, and signing them as bike routes.

12. Access/Entry Changes at BP Gas Station and Village Pantry

The intersections of 3rd/Indiana and 3rd/Jordan appear in the MPO's 1997-2003 Accident Report in the Top 15 Intersections by Accident Severity. Records for 3rd/Jordan include personal injury accidents with bicycles and one with a pedestrian.

Improving the safety of these intersections is a challenging yet important endeavor. In previous discussions under Item 2, a series of improvements to better separate pedestrians and bicyclists from motor traffic at 3rd/Jordan were discussed. Also in the previous section describing Figure 3-2, some small improvements to enhance the intersection of 3rd/Indiana were listed.



In each case, it is recommended that one drive be closed at a corner business to provide a safety benefit. For the Village Pantry (3rd/Jordan), this results in a decrease from three drives down to two. At the BP gas station (3rd/Indiana), this results in a decrease from four down to three drives. In each case, the site will have a modest gain in parking spaces in conjunction with the change.

The Study Workgroup was supportive of these changes and they are recommended as one part of improvements in their respective areas.

13. Consideration of Atwater/Hawthorne Signal

The intersection of Atwater and Hawthorne received additional evaluation for two reasons that are perhaps not obvious:

First: Except for Atwater/Henderson (where a signal is recommended), this is the only intersection along the one-way pair that offers a signal on 3rd but does not have one on Atwater. That pattern suggests counts may be higher here than in other locations, especially for turning movements.

Second: Hawthorne is recommended to receive bike route designation. If existing pedestrian and bicycle counts are near to meeting warrants at this intersection, then the new designation as a bike route could create conditions justifying the consideration of a signal.

48-hour traffic and peak turning movement counts were taken at this location by City forces. The warrant analyses resulted in the following:

Atwater / Hawthorne – Signal Warrant Analyses Results	
Warrant 1 (Vehicle Volume)	Vehicle counts do NOT satisfy Warrant 1 for the 100% and 80% volume standards.
Warrant 4 (Pedestrian Volume)	Pedestrian volumes do NOT satisfy Warrant 4. In fact, it is likely that very few, if any, hours will have at least 100 pedestrians/bicyclists crossing this intersection.
Warrant 7 (Crash Experience)	The intersection was NOT noted as a high accident location.
Conclusion	Due to the fact that a traffic signal can result in an increase of certain kinds of accidents, a traffic signal is NOT recommended at this location. Future review of the accident records at this location is recommended to determine if there is a notable increase in accidents at this location.

14. "Gateways" to the University

While it is not really an "infrastructure improvement", stakeholders (including the University) expressed an interest in having some sort of "Gateway into the University" treatment at each end of the corridor.

The University expressed that they do desire these types of improvements but feel they are the University's concern, and would be constructed on University property. University attendees stated that these would take the form of landscaping improvements including masonry walls, plantings and such, rather than large, vertical or overhead structures. The northeast corner at Henderson and Atwater and the northwest corner at Union and

3rd were noted as possible locations for landscaping and masonry "gateways" to the University area.

15. Comments about "New Urbanism"

Several groups, especially Neighborhood Associations, noted the desire for the area between 3rd and Atwater to become more of a destination for pedestrians with more "mixed-development". This would include commercial activities such as small restaurants, cafes, and newsstands. Principles of New Urbanism include walkability, connectivity, and mixed use. It was noted that the vast majority of this property is University-owned and that such development has not been a goal of the University.

While it is not within the scope of this study to examine economic development goals and potential, the desire for the corridor to be friendlier to walking and other forms of alternative transportation is consistent with this Study and with other City goals. It is possible for this study be supportive of New-Urbanism initiatives by incorporating infrastructure improvements that will enhance the general character of the area. Improvements to pedestrian, bus, and bicycle related infrastructure are very much a goal of this Study, and are recommended in conjunction with the support of 3rd and Atwater as the primary arterials that they are and must continue to be. Future initiatives in this direction would require significant involvement by the University as the primary property owner.

IV. RECOMMENDED IMPROVEMENTS

For the convenience of the many stakeholders of this Study, recommendations are presented in this section in three formats. These different formats allow the reader to follow the development of recommendations through the Needs Identification, Alternative Development, and Alternatives Evaluation phases of the Study. Because many stakeholders are primarily interested in only a portion of the Study Area, the recommendations are also presented by specific location.

First, improvements are presented by their general description. This allows the reader to review recommendations in the context of the report and the evaluation process. Recommendations include notes about the corridor user groups that will most benefit from those improvements. Specific locations where the recommendation is to be applied are listed. To assist with cross-referencing, a reference number is assigned to each recommendation.

Second, recommendations are listed for each segment of the study area, for intersections and sections between intersections. This allows the reader to focus on a specific intersection or street section of interest. The reference number for recommendations is noted to assist with cross-referencing back to their descriptions in the first section.

Third, the recommendations are presented graphically in **Figures 5-1 thru 5-6.** This allows the reader to see the recommendations on the study area mapping, applied to the locations in a conceptual form. *It should be noted that Figure 5 does not present a final design. At this stage, improvements have only been developed to a conceptual or planning level. Detailed design would be needed to determine the best way to achieve the intent of the recommendation, given actual site constraints of available right-of-way, topography, existing utilities, and other features.*

A. Recommendations Listed by General Description and User Benefits

The following section provides a complete listing of the recommendations of this Study, roughly divided in the following categories:

- Recommendations for improvements inside the Study Area, but applicable to multiple locations
- Recommendations for the West-End, given the interrelated nature of improvements in that area
- Recommendations for the East-End, given the interrelated nature of improvements in that area
- Recommendations for other specific locations
- Recommendations for improvements or additional study outside of the Study Area

1. General Recommendations inside the Study Area

Recommendations in this section are inside the Study Area, but apply to multiple locations or are more general in nature. The following are recommended for implementation:

101	**Install Opti-Com receivers at Signalized Intersections**	**Benefits For:**	
This equipment allows emergency responders to override traffic signals to get green lights, and for cross streets to receive red, reducing response times and improving safety.			Pedestrians
		X	Motor Vehicle Drivers
			Bus Riders
Locations:	All locations with signals		Bicyclists
			Large Vehicles, Bus

102	**Change Pedestrian Signal Heads from "Walk/Don't Walk" to Countdown Timers**	**Benefits For:**	
This equipment has been shown to improve pedestrian safety by encouraging prompt clearing of the crosswalk by pedestrians. It also assists pedestrians in judging whether or not they have adequate time remaining before they start.		**X**	Pedestrians
		X	Motor Vehicle Drivers
			Bus Riders
Locations:	At all signalized crossings, especially those across 3rd and across Jordan	**X**	Bicyclists
			Large Vehicles, Bus

103	**Install interconnect cable between signals on Atwater (which is currently manually timed)**	**Benefits For:**	
Interconnected signals will allow better coordination of signal timings and will assist in making system adjustments for traffic conditions, improving eastbound traffic flow. (3rd Street is already on a wireless network). ***Do this in conjunction with new fiberoptic telecommunications planned by City ITS to share cost.***			Pedestrians
		X	Motor Vehicle Drivers
			Bus Riders
		X	Taxpayers
Locations:	Along Atwater Avenue from 3rd/Dunn to High Street		Bicyclists
			Large Vehicles, Bus

104	**Consult with City Utilities when planning future corridor road improvements**	**Benefits For:**	
CBU has noted that existing sewer and water were installed in the 1920's, and are in need of replacement. Taxpayer money will be saved if utility replacement is coordinated with road projects.			Pedestrians
			Motor Vehicle Drivers
			Bus Riders
		X	Taxpayers
Locations:	All roads with sewer and water lines under them in the Study Area		Bicyclists
			Large Vehicles, Bus

105	**Separate sidewalks from curbs with a green strip**	**Benefits For:**	
Where right –of-way is available, separation of pedestrians from motor vehicles makes each safer, and improves the comfort and attractiveness of the corridors for all users.		**X**	Pedestrians
		X	Motor Vehicle Drivers
			Bus Riders
Locations:	3rd Street: Dunn to Fess (south side), Ballantine to Highland (south side), Swain to Mitchell (south side), Mitchell to Union (north side), High to Jefferson (south side) Atwater Avenue: Henderson to Fess (north side), Highland to Mitchell (both sides), Faculty to Highland (north side), Mitchell to High (south side) High Street: Atwater to 3rd (east side)	**X**	Bicyclists
			Large Vehicles, Bus

106	**Replace/Add Sidewalks where missing or in disrepair**	**Benefits For:**	
Offering good sidewalks on all streets where pedestrians are expected is a vital component to overall safety, giving them an alternative to walking in the street.		**X**	Pedestrians
		X	Motor Vehicle Drivers
			Bus Riders
Locations:	3rd Street: Dunn to Indiana (south side), Bryan to Jefferson (north side); Atwater: Swain to Mitchell (north side) and Faculty to Hawthorne (south side); also Rose Ave, Arbutus Drive (east sides only) Faculty (both sides partial block) Park Avenue (south of Atwater)	**X**	Bicyclists
			Large Vehicles, Bus

107	**Narrow the arterials where excessively wide**	**Benefits For:**	
In several locations, 3rd or Atwater are 30 or more feet wide when a traditional two-lane road would offer about 22 or 24 feet. Not by coincidence, these are areas that stakeholders noted that traffic speeds are well above the 25 MPH speed limit. Narrow arterials to help lower speeds, reduce pedestrian crossing distances, and increase space available for sidewalks and separation from curb.		**X**	Pedestrians
		X	Motor Vehicle Drivers
			Bus Riders
Locations:	Atwater from Highland to Mitchell	**X**	Bicyclists
			Large Vehicles, Bus

108	**Keep crosswalk and bike lane markings fresh**	**Benefits For:**	
Keeping markings bright assists motorists in identifying markings and the implied hazardous area as they approach, and in stopping short of them when appropriate.		**X**	Pedestrians
		X	Motor Vehicle Drivers
			Bus Riders
Locations:	Review entire area annually to identify needs	**X**	Bicyclists
			Large Vehicles, Bus

109	**Install Crosswalk Warning Devices at heavily used crossings that are not at traffic signals**	**Benefits For:**	
These treatments provide an additional measure of safety and warning to alert drivers to locations with especially high pedestrian traffic crossing. Use only in areas where conditions for a pedestrian warrant for a signal may be met, or where there is accident history, but a signal is not desirable due to other considerations.		**X**	Pedestrians
		X	Motor Vehicle Drivers
			Bus Riders
Locations:	across 3rd Street at Fess (flashered signs) across 3rd Street at Swain (flashered signs) across 3rd Street at Highland (signs only)	**X**	Bicyclists
			Large Vehicles, Bus

110	**Install curb ramps where missing or in disrepair**	**Benefits For:**	
It is important that accessible routes be well maintained and offer continuity across streets.		**X**	Pedestrians
			Motor Vehicle Drivers
			Bus Riders
Locations:	3rd: between Woodlawn and Faculty 3rd: south side at Indiana 3rd: north side at Bryan Atwater: south side at Faculty Atwater: south side at Woodlawn (pothole)	**X**	Bicyclists
			Large Vehicles, Bus

111	**Remove obstructions to sight distance in intersection corners**	**Benefits For:**	
Intersection sight distance is one of the most critical elements to safe intersection operations. Improvements to sight distance allow travelers to more safely cross the arterials or join traffic. Improvements may require permanent or temporary right of way to implement.		**X**	Pedestrians
		X	Motor Vehicle Drivers
			Bus Riders
Locations:	Atwater/Fess, SW corner Atwater/Park, SW corner Atwater/Hawthorne, SW corner Atwater/Woodlawn, NW corner Atwater/Ballantine, SW corner 3rd/Rose, NE and SE corners 3rd/Swain, SE corner	**X**	Bicyclists
			Large Vehicles, Bus

112	**Encourage pedestrians to cross at crosswalks or safer locations using signage or low stone walls**	**Benefits For:**	
Predictability is an important factor to safety, and there is a distinct advantage to having pedestrians cross at safer locations, so long as the additional signal, signs, warning devices or markings are truly providing a safer location to cross. Pedestrians' use of midblock areas is largely		**X**	Pedestrians
		X	Motor Vehicle Drivers
			Bus Riders

unavoidable, but in areas where the midblock is notably less safe than a nearby crosswalk, measures should be considered to actively encourage pedestrians to go to the better location.			
Locations:	Atwater/Henderson (using a stone wall west of Henderson). On 3rd between Highland and Swain (using signs and painted crosswalks)	**X**	Bicyclists
			Large Vehicles, Bus

113	**Be willing to add pedestrian benches or bike racks in locations with apparent need.**	**Benefits For:**	
The corridor does and should support increased use of alternative transportation, but these amenities are expensive and are a maintenance issue, so implementation must be limited to areas of need. They also must be located so as not to obstruct sidewalks. Benches should be available at bus stops at a minimum. Bicycles chained to a sign post or a small tree is another indication of a need.		**X**	Pedestrians
			Motor Vehicle Drivers
		X	Bus Riders
Locations:	Consider where a problem is noted or when specifically requested by a stakeholder group such as the Bike/Ped Safety Commission.	**X**	Bicyclists
			Large Vehicles, Bus

114	**Provide additional north-south bike routes, improve existing ones with bike lanes, signage, and removal of parking**	**Benefits For:**	
Woodlawn and Jordan are the only designated north-south routes, and they do not offer bike lanes or other bicycle-friendly characteristics. Additional bicycle-friendly crossings of 3rd and Atwater are needed to connect the residential areas to the edge of campus.			Pedestrians
		X	Motor Vehicle Drivers
			Bus Riders
Locations:	Jordan (Elim Parking, Add bike lanes) Woodlawn (Sign as Shared, add ramp to north side of 3rd for access to campus) Hawthorne (Elim Parking, Add Bike lanes) Rose Ave (Sign as Shared)	**X**	Bicyclists
			Large Vehicles, Bus

115	**Place an annual emphasis on bicycle safety awareness each Fall, coordinated with IU**	**Benefits For:**	
A contributing factor of many past bicycle/vehicle accidents in the campus area has included the bicyclist's riding without respect for common "rules of the road", including riding the wrong way in 3rd Street, crossing intersections without yielding the right of way, etc. Bikes on streets must follow traffic laws.			Pedestrians
		X	Motor Vehicle Drivers
			Bus Riders

Locations:	Flyers, mailings, or postings at locations where bicyclists congregate (bike racks). Coordinate effort with University.	**X**	Bicyclists
			Large Vehicles, Bus

116	**Remove 15-minute parking areas on 3rd Street**	**Benefits For:**	
These parking areas are abused and unenforceable. They contribute to safety concerns by blocking visibility and with stopping/entering traffic. They also increase the illegal use of bus pulloffs as parking.		**X**	Pedestrians
		X	Motor Vehicle Drivers
			Bus Riders
Locations:	Various locations along 3rd Street	**X**	Bicyclists
		X	Large Vehicles, Bus

117	**Add bus pulloffs for existing bus stops**	**Benefits For:**	
Bus pulloffs allow busses a refuge for pick ups/drop offs, instead of stopping in traffic and causing traffic to change lanes or stop. The use of pulloffs also increases the space between pedestrians and traffic on the street.			Pedestrians
		X	Motor Vehicle Drivers
		X	Bus Riders
Locations:	3rd/St. Charles Church, 3rd/Union, 3rd/Rose, 3rd/Hawthorne, 3rd at Swain Hall, 3rd at School of Law, Atwater/Fess, Atwater/School of Optometry, Atwater/Hawthorne	**X**	Bicyclists
		X	Large Vehicles, Bus

118	**Relocate bus stops to farside of intersections**	**Benefits For:**	
Busses can more easily reenter the traffic flow when the bus stop or bus pulloff is located on the farside of a traffic signal. Also, busses stopping on the farside of an intersection do not obstruct sight distance for travelers wishing to cross the street in front of the bus while it is stopped		**X**	Pedestrians
		X	Motor Vehicle Drivers
			Bus Riders
Locations:	3rd/Union, 3rd/Rose, Atwater/Fess, Atwater/School of Optometry	**X**	Bicyclists
		X	Large Vehicles, Bus

119	**Widen sidewalks at bus stops**	**Benefits For:**	
If a bus pulloff is not feasible, at least widening the sidewalk provides some additional protection for those waiting at the bus stop, and for those pedestrians trying to pass bus riders on the sidewalk.		**X**	Pedestrians
			Motor Vehicle Drivers
		X	Bus Riders
Locations:	Atwater/Jordan (no pulloff) 3rd at St. Charles (with pulloff)	**X**	Bicyclists
			Large Vehicles, Bus

120	**Add bus shelters at busiest bus stops**	**Benefits For:**	
The City and University wish to encourage use of public transportation. In inclement weather, and even for shade,			Pedestrians
			Motor Vehicle Drivers

the additional of bus shelters will increase the attractiveness and use of the bus system.		**X**	Bus Riders
Locations:	3rd at School of Law, 3rd/Hawthorne, 3rd/Swain Hall, 3rd/Forest Quadrangle, Atwater/School of Optometry		Bicyclists
			Large Vehicles, Bus

121	**Enforce NO PARKING in bus pulloffs**	**Benefits For:**	
Safe operation of the bus system demands that these pulloffs not be used for other purposes. By eliminating the 15-minute parking areas, there is no parking in the corridor			Pedestrians
		X	Motor Vehicle Drivers
		X	Bus Riders
Locations:	Throughout the corridors, and enforced by both City and University police when noted		Bicyclists
		X	Large Vehicles, Bus

122	**Enforce speed limits in areas of greatest pedestrian concern**	**Benefits For:**	
Speed has been cited as a factor in most of the most serious injury accidents involving pedestrians and bicycles. All stakeholders agreed that traffic should move at a speed close to the posted limit of 25 MPH.		**X**	Pedestrians
		X	Motor Vehicle Drivers
			Bus Riders
Locations:	3rd Street: Faculty to Fess, Rose to Jordan Atwater: Fess to Faculty, Highland - Mitchell	**X**	Bicyclists
			Large Vehicles, Bus

123	**Increase corner radii for Large Vehicles**	**Benefits For:**	
Because of the competing concern to minimize pedestrian crossing distances, only do this where there is a clear need for large vehicles and busses to turn on a regular basis, and where a stakeholder has noted a specific safety concern.			Pedestrians
			Motor Vehicle Drivers
			Bus Riders
Locations:	SW corner of Atwater/Jordan (busses) NW corner of 3rd/Jefferson (fire equipment) SE corner of Atwater/High (any)		Bicyclists
		X	Large Vehicles, Bus

124	**Add one-way signs on signal mast arms**	**Benefits For:**	
Mostly for the benefit of the thousands of visitors to the area, add additional one-way signage overhead at the signals to assist motorists to navigate the area more safely			Pedestrians
		X	Motor Vehicle Drivers
			Bus Riders
Locations:	All signalized intersections		Bicyclists
			Large Vehicles, Bus

125	**Replace inlet castings that are not bicycle-safe**	**Benefits For:**	
While this was not noted to be much of a problem, it is important to emphasize that other recommended improvements will include new storm sewer inlets, and these must be bicycle safe			Pedestrians
			Motor Vehicle Drivers
			Bus Riders
Locations:	Atwater/Mitchell, others?	**X**	Bicyclists

2. Recommendations for the West-end

The following improvements are recommended in the area referred to in the Study as the West-End:

201	**Channelize 3rd Street traffic with raised islands**	**Benefits For:**	
To improve the separation of vehicles and pedestrians in this intersection, and to better channelize vehicles into their appropriate lanes through this curved and skewed intersection, provide raised (curbed) islands in 3rd Street. These also provide a refuge for pedestrians if needed due to the necessity for the 3rd Street crossings to be longer.		**X**	Pedestrians
		X	Motor Vehicle Drivers
			Bus Riders
Locations:	3rd/Dunn	**X**	Bicyclists
			Large Vehicles, Bus

202	**Reinstate crosswalk on south side of 3rd/Dunn**	**Benefits For:**	
People were witnessed to cross here in spite of the lack of curb ramps and even a sign prohibiting it. By narrowing the roadway and by shifting left turns from westbound 3rd (see Figure), it is possible to make this crossing safer. It should be timed to cross when the westbound left turn gets a green.		**X**	Pedestrians
			Motor Vehicle Drivers
			Bus Riders
Locations:	3rd/Dunn	**X**	Bicyclists
			Large Vehicles, Bus

203	**Shift westbound left turn lane on 3rd/Dunn to improve visibility with crosswalk**	**Benefits For:**	
This is described above, and is recommended to better allow drivers to see the pedestrians ready to cross Dunn Street at the new crosswalk..		**X**	Pedestrians
		X	Motor Vehicle Drivers
			Bus Riders
Locations:	3rd/Dunn		Bicyclists
			Large Vehicles, Bus

204	**Relocate connector road with South Dunn Street away from 3rd/Dunn intersection**	**Benefits For:**	
This will reduce confusion for drivers as they come from 3rd and unexpectedly find themselves in the lane to connect to South Dunn Street. It also allows the narrowing of the street just south of 3rd/Dunn for a better crossing.		**X**	Pedestrians
		X	Motor Vehicle Drivers
			Bus Riders
Locations:	South of 3rd/Dunn intersection		Bicyclists
			Large Vehicles, Bus

205	**Install guide signage to assist motorists from 3rd/Dunn over to Atwater**	**Benefits For:**	
Visitors to the area are confused by the layout of the streets and the start of the one-way pair. Signage could assist motorists to find the continuation of Dunn Street, the connection to go north on Indiana, or to reamin in the travel lanes to continue east.			Pedestrians
		X	Motor Vehicle Drivers
			Bus Riders
Locations:	In the section where Dunn turns into Atwater		Bicyclists
			Large Vehicles, Bus

206	**Remove a portion of the left turn lane (to Indiana) in the curve west of Henderson**	**Benefits For:**	
This turn lane is excessively long, and the wider pavement in the curve encourages speeding leading into the Atwater/Henderson intersection.		**X**	Pedestrians
		X	Motor Vehicle Drivers
			Bus Riders
Locations:	In the section where Dunn turns into Atwater		Bicyclists
			Large Vehicles, Bus

207	**Modify drive access to BP Gas Station**	**Benefits For:**	
The BP has 4 drives and the southernmost one on Indiana invites drivers on 3rd to angle through the crosswalk to enter the gas station. This is a high accident location and this will improve predictability as well as providing better pedestrian refuge in the NW corner of the intersection		**X**	Pedestrians
		X	Motor Vehicle Drivers
			Bus Riders
Locations:	3rd/Indiana, NW corner	**X**	Bicyclists
		X	Large Vehicles, Bus

208	**Install a new traffic signal at Atwater/Henderson**	**Benefits For:**	
City implemented several measures in 2003 and 2004 intended to reduce accidents at this location, but accidents have not decreased. With the new parking garage in the area, and given that safety and pedestrian warrants are still met at this location, a signal is recommended.		**X**	Pedestrians
		X	Motor Vehicle Drivers
			Bus Riders
Locations:	Atwater/Henderson	**X**	Bicyclists
			Large Vehicles, Bus

209	**Add a crosswalk with Flasher Warning Signs at 3rd and Fess**	**Benefits For:**	
The new parking garage will increase pedestrian crossings at this location to the point where additional safety measures are recommended. A signal is not desired at this time due to operational concerns on 3rd Street, and because a signal would generate its own safety concerns.		**X**	Pedestrians
		X	Motor Vehicle Drivers
			Bus Riders
Locations:	3rd/Fess		Bicyclists
			Large Vehicles, Bus

210	**Remove island and free flowing left turn at Atwater/Henderson**	**Benefits For:**	
With the addition of a new signal, the safest pedestrian crossing of Atwater is at the signal with a protected phase. The free-flowing left turn is less safe because it is difficult for pedestrians to predict oncoming traffic.		**X**	Pedestrians
		X	Motor Vehicle Drivers
			Bus Riders
Locations:	Atwater/Henderson	**X**	Bicyclists
			Large Vehicles, Bus

211	**Thin the trees north of Atwater on the inside of the curve**	**Benefits For:**	
Even with a new signal, improved visibility at this high accident location is needed. Drivers need to see the signal and stopped traffic, as well as pedestrians waiting on the sidewalks. Crossing traffic needs to see oncoming vehicles as they approach, including those wishing to make the right on red from Henderson to Atwater.		**X**	Pedestrians
		X	Motor Vehicle Drivers
			Bus Riders
Locations:	Atwater, just west of Henderson	**X**	Bicyclists
			Large Vehicles, Bus

212	**Place a pedestrian channelizing wall on the north side of Atwater just west of Henderson**	**Benefits For:**	
With the implementation of a new signal, the safest crossing is at the intersection itself. Pedestrians should be actively discouraged from the midblock crossing so that they come to the cross walks at Henderson. If this is not discouraged, pedestrians will be walking between stopped cars west of Henderson, which is unsafe.		**X**	Pedestrians
		X	Motor Vehicle Drivers
			Bus Riders
Locations:	Atwater, just west of Henderson	**X**	Bicyclists
			Large Vehicles, Bus

213	**Add "No Thru Traffic" signs to Fess on the south side of Atwater**	**Benefits For:**	
It is difficult to predict what driving habits and routes people will develop with the operation of the new garage. It is reasonable to predict that some may wish to use Fess as a route to go south, rather than going to 3rd/Dunn/Henderson. For the benefit of the neighborhood, this movement should be prohibited before this habit develops.			Pedestrians
			Motor Vehicle Drivers
			Bus Riders
Locations:	Atwater/Fess		Bicyclists
			Large Vehicles, Bus

214	**Realign the connection of the Henderson stub into Indiana Avenue into a more traditional "T"**	**Benefits For:**	
This approach to Indiana is excessively wide and does not orient cars to make a left onto Indiana. It increases pedestrian exposure unnecessarily in the curve of Indiana.		**X**	Pedestrians
		X	Motor Vehicle Drivers
			Bus Riders
Locations:	Indiana between Atwater and 3rd	**X**	Bicyclists
			Large Vehicles, Bus

215	**Coordinate with University to incorporate desired street improvements into the new garage project**	**Benefits For:**	
The block around the new garage needs several improvements which should be accomplished as part of the garage project. Sidewalks along Atwater and Fess should be separated from the curb, and widened. Brush and debris should be removed to improve visibility and lighting conditions. The intersection of 3rd/Fess should receive pedestrian crossing warning devices due it the anticipated increase in pedestrians. These improvements are best done as part of that larger project.		**X**	Pedestrians
			Motor Vehicle Drivers
			Bus Riders
Locations:	Streets around the new garage		Bicyclists
		X	Taxpayers

216	**Provide a separate right turn with pedestrian refuge island at Atwater/Henderson**	**Benefits For:**	
Due to the broad concern about vehicles not looking for pedestrians as they turn right from Henderson to Atwater, provide this turn as a separate movement so that pedestrians can anticipate which cars are turning, and make their crossing separate from these vehicles. Unlike a		**X**	Pedestrians
		X	Motor Vehicle Drivers
			Bus Riders

previous City plan, this island should be offset from Henderson through traffic to better minimize pedestrian exposure. This will minimize the crossing distance also.			
Locations:	Atwater/Henderson	**X**	Bicyclists
			Large Vehicles, Bus

217	**Move newspaper machines away from curb ramps at 3rd/Dunn**	**Benefits For:**	
These machines are crowding the sidewalk and curb ramps, and reduce pedestrian space. They reduce visibility of and for pedestrians. Shift them to another location that is not in the intersection.		**X**	Pedestrians
		X	Motor Vehicle Drivers
			Bus Riders
Locations:	3rd/Dunn	**X**	Bicyclists
			Large Vehicles, Bus

3. Recommendations for the East-end

The following improvements are recommended in the area referred to in the Study as the East-End:

301	**Extend the one-way pair of 3rd/Atwater by making Atwater one-way from Mitchell to High**	**Benefits For:**	
Part of the overall recommendation for **Alternative 4-6.** Roadway section to be widened slightly to two eleven-foot lanes with curb and gutter, sidewalks on both sides with the south side separated from the curb.		**X**	Pedestrians
		X	Motor Vehicle Drivers
			Bus Riders
Locations:	Atwater from Mitchell to High	**X**	Bicyclists
		X	Large Vehicles, Bus

302	**Reconstruct High from Atwater to 3rd to eliminate offset intersections**	**Benefits For:**	
Part of the overall recommendation for **Alternative 4-6.** Roadway section is to include multiple turn lanes from High to 3rd. High Street will be realigned to meet Bryan. Atwater will be diverted south to meet a new drive for the St. Charles Church.		**X**	Pedestrians
		X	Motor Vehicle Drivers
			Bus Riders
Locations:	High Street	**X**	Bicyclists
		X	Large Vehicles, Bus

303	**Install new signal at Atwater/High**	**Benefits For:**	
Part of the overall recommendation for **Alternative 4-6.** A		**X**	Pedestrians

new signal is needed were Atwater, which will be the primary arterial, meets High Street, a secondary arterial.		**X**	Motor Vehicle Drivers
			Bus Riders
Locations:	Atwater/High		Bicyclists
		X	Large Vehicles, Bus

304	**Reconstruct Church drive to meet Atwater**	**Benefits For:**	
The realignment of Atwater to the south will be required to avoid the historic property at the end of Atwater. Church drive will be as far south as possible. Remove existing drive to High Street. Part of **Alternative 4-6.**			Pedestrians
		X	Motor Vehicle Drivers
			Bus Riders
Locations:	Opposite Atwater on High Street		Bicyclists
			Large Vehicles, Bus

305	**Replace signal at 3rd/High**	**Benefits For:**	
The realigned intersection will require new equipment, additional signal heads, and a full replacement of the existing signal. Include related improvements such as hard-wired interconnect to Atwater, and OptiCom receiver equipment. Part of **Alternative 4-6.**		**X**	Pedestrians
		X	Motor Vehicle Drivers
		X	Bus Riders
Locations:	3rd/High	**X**	Bicyclists
		X	Large Vehicles, Bus

306	**Convert 3rd to one-way from High to Mitchell**	**Benefits For:**	
A part of **Alternative 4-6**, traffic to be two-lanes, westbound. Includes needed sign removals and new signs.		**X**	Pedestrians
		X	Motor Vehicle Drivers
		X	Bus Riders
Locations:	3rd from Mitchell to High	**X**	Bicyclists
		X	Large Vehicles, Bus

307	**Convert Clifton to one-way southbound**	**Benefits For:**	
To assist drivers from Union Street in making the connection to eastbound traffic on Atwater, convert Clifton to one-way southbound. Part of **Alternative 4-6.**		**X**	Pedestrians
		X	Motor Vehicle Drivers
			Bus Riders
Locations:	Clifton from 3rd to Atwater		Bicyclists
			Large Vehicles, Bus

308	**Convert Mitchell to a one-lane, one-way north with parking allowed on one side.**	**Benefits For:**	
In part to assist in mitigating lost parking in other areas,		**X**	Pedestrians

but mostly because there is excess pavement, this conversion will quiet activity on Mitchell and restore it to an access for adjacent residences on the churches. Still keep street wide enough to handle busses on their routes if the transit authority does not change the routes.		**X**	Motor Vehicle Drivers
		X	Bus Riders
Locations:	Mitchell between 3rd and Atwater		Bicyclists
			Large Vehicles, Bus

309	**Reconstruct the sidewalk along the north side of St. Charles Church (south side of 3rd Street)**	**Benefits For:**	
The existing sidewalk is below 3rd Street, and is also the lowest ground north of the Church building. It floods when it rains, and is buried by snowplows in the winter. It also feels uncomfortable to pedestrians, who are more exposed to traffic while essentially walking below it. There is no reasonable way to extend the sidewalk to meet the curb at the existing bus stop.		**X**	Pedestrians
			Motor Vehicle Drivers
		X	Bus Riders
Locations:	3rd Street west of High Street	**X**	Bicyclists
			Large Vehicles, Bus

310	**Remove the drive to St. Charles that is one 3rd, closest to High Street**	**Benefits For:**	
The drive is too close to 3rd and High to allow anything but right turns, and St. Charles has another drive to the east. The drive is an attractive nuisance due to drivers who view it as a way to bypass the red light to make the turn from northbound High Street to eastbound 3rd.		**X**	Pedestrians
		X	Motor Vehicle Drivers
			Bus Riders
Locations:	St. Charles property, just east of High Street		Bicyclists
			Large Vehicles, Bus

4. Recommendations for Other Specific Locations

The Study included detailed review of areas in the middle portions of the Study area. The following improvements are recommended:

401	**Eliminate Parking along Jordan Avenue**	**Benefits For:**	
City transit has requested this parking be eliminated for safety of movement. The parking reduces visibility and makes the street narrow for its many travelers. It is also a designated bike route, and is made more hazardous by the parking.		**X**	Pedestrians
		X	Motor Vehicle Drivers
			Bus Riders
Locations:	Jordan between Atwater and 3rd	**X**	Bicyclists
		X	Large Vehicles, Bus

402	**Shorten left turn lanes along Atwater both east and west of Woodlawn**	**Benefits For:**	
The existing turn lanes from Park to Woodlawn and from Woodlawn to Faculty are excessively long, encouraging traffic to speed due to the wide pavement, and extending pedestrian crossings at Woodlawn on the east side. Many pedestrians cross from the School of Optometry. The turn lanes to Woodlawn and the Atwater Garage are needed, but not with this much storage.		**X**	Pedestrians
			Motor Vehicle Drivers
			Bus Riders
Locations:	Atwater from Park to Faculty		Bicyclists
			Large Vehicles, Bus

403	**Modify drives to Village Pantry at 3rd/Jordan**	**Benefits For:**	
Improve the predictability of vehicle movement while increasing pedestrian space and safety. Simplify movements around this high accident location. Village Pantry would lose one drive, but actually gain a little parking (1 or 2 spaces).		**X**	Pedestrians
		X	Motor Vehicle Drivers
			Bus Riders
Locations:	3rd/Jordan. SW corner	**X**	Bicyclists
			Large Vehicles, Bus

404	**Install Curb in front of Kinser Cleaners**	**Benefits For:**	
Prevent cars from blocking this sidewalk and creating a safety hazard. Give the much-needed space back to pedestrians. Eliminate the condition where cars back onto 3rd Street to leave the site.		**X**	Pedestrians
		X	Motor Vehicle Drivers
			Bus Riders
Locations:	On the south side of 3rd, just west of Jordan	**X**	Bicyclists
			Large Vehicles, Bus

405	**Correct poor sight distance at Atwater/Highland by lowering profile of Atwater**	**Benefits For:**	
No amount of obstacle clearing will increase the sight distance when it is the hill crest on Atwater that blocks the view. This is a high accident location and the cause is very apparent. It will be expensive, but much needed to reduce accidents.		**X**	Pedestrians
		X	Motor Vehicle Drivers
			Bus Riders
Locations:	Atwater Avenue between Ballantine and Highland	**X**	Bicyclists
			Large Vehicles, Bus

406	**Eliminate Parking along Hawthorne**	**Benefits For:**	
In conjunction with bike improvements, noted earlier, and to help improve conditions in this high accident area.		**X**	Pedestrians
		X	Motor Vehicle Drivers
			Bus Riders
Locations:	Hawthorne	**X**	Bicyclists
			Large Vehicles, Bus

407	**Realign Atwater Avenue in the vicinity of Eastside to remove the kink and to widen a narrow section**	**Benefits For:**	
Atwater is poorly aligned here, making it difficult to stay in one's assigned lane when the road is already narrow			Pedestrians
		X	Motor Vehicle Drivers
			Bus Riders
Locations:	Atwater/Eastside		Bicyclists
			Large Vehicles, Bus

408	**Raise the profile of Atwater between Rose and Clifton to eliminate a substandard sag in road**	**Benefits For:**	
Neighbors report frequent screeching of tires, especially in wet conditions, at this sudden dip in Atwater. The sag causes sight distance problems and increases the likelihood of a loss of vehicle control. Drainage problems reported at Rose/Hunter would need to be considered before making road improvements.			Pedestrians
		X	Motor Vehicle Drivers
			Bus Riders
Locations:	Atwater between Rose and Clifton		Bicyclists
			Large Vehicles, Bus

409	**Restripe Swain to allow delivery parking, then enforce NO PARKING along 3rd Street**	**Benefits For:**	
3rd Street just east of Jordan is a high accident location, and		**X**	Pedestrians

parked delivery trucks block vision in an area heavily used by crossing pedestrians. Traffic is required to shift around delivery trucks. To simplify activities in this area, and to improve visibility, shift this needed parking onto Swain.		**X**	Motor Vehicle Drivers
			Bus Riders
Locations:	3rd/Swain	**X**	Bicyclists
		X	Large Vehicles, Bus

410	**Coordinate with University to provide access to the campus via a ramp at Woodlawn**	**Benefits For:**	
Woodlawn is a designated bike route, but there is no access into the campus at Woodlawn except up stairs. A ramped access is needed at this location.		**X**	Pedestrians
			Motor Vehicle Drivers
			Bus Riders
Locations:	North side of 3rd at Woodlawn	**X**	Bicyclists
			Large Vehicles, Bus

411	**Shift stop bars on Jordan at Atwater farther from this intersection**	**Benefits For:**	
City transit reports problems in negotiating turns at Jordan from Atwater. Narrow streets and close stop bars make it difficult. To improve safety for all, shift the stop bars back.			Pedestrians
		X	Motor Vehicle Drivers
			Bus Riders
Locations:			Bicyclists
		X	Large Vehicles, Bus

412	**Remove island in 3rd Street at Mitchell**	**Benefits For:**	
Island no longer needed to channelize traffic in a one-way pattern.		**X**	Pedestrians
		X	Motor Vehicle Drivers
			Bus Riders
Locations:	3rd/Mitchell		Bicyclists
		X	Large Vehicles, Bus

5. Recommendations outside the Study Area

The Study identified several needs that are outside of the Study Area and would require additional consideration or analyses that were outside the scope of this effort:

501	**Identify opportunities to expand access and increase ridership of the busses by commuters**	**Benefits For:**	
In conjunction with the Growth Policies Plan and the Alternative Transportation Plan, the use of public transportation can reduce traffic in the corridor. Improving access to the system and increasing ridership is supported strongly by stakeholders. Bus traffic would increase, but overall vehicle traffic should decrease.		**X**	Pedestrians
		X	Motor Vehicle Drivers
		X	Bus Riders
Locations:	Not Known	**X**	Bicyclists
		X	Large Vehicles, Bus

502	**Conduct a review of Hunter Avenue's conditions as the designated East-West Bike Route**	**Benefits For:**	
Hunter is probably too far south to be viewed favorably by most bicyclists, but it the best option available for longer east-west movements. Bikes will continue to share the sidewalks with pedestrians. This is not desirable, but is generally safer than bikes sharing the road with the cars, and results in less serious accidents. With improvements to north-south routes, use of Hunter may become more attractive. It should be improved to provide the best east-west bicycle movement that it can.			Pedestrians
			Motor Vehicle Drivers
			Bus Riders
Locations:	Hunter Avenue from Henderson to High	**X**	Bicyclists
			Large Vehicles, Bus

503	**Review traffic conditions on South Henderson Street (Hillside to Maxwell)**	**Benefits For:**	
The new parking garage and the new signal at Atwater/Henderson MAY have an impact to traffic counts along South Henderson. South Henderson lacks sidewalks, curbs and pedestrian facilities, especially bordering the Bryan Park Neighborhood across from Bryan Park and Templeton School. Henderson serves as a secondary arterial. Additional review of this area seems appropriate, even though an increase in traffic is yet unconfirmed.		**X**	Pedestrians
		X	Motor Vehicle Drivers
		X	Bus Riders
Locations:	Hunter Avenue from Henderson to High	**X**	Bicyclists
		X	Large Vehicles, Bus

504	**Review accident trends at key intersections after improvements are made**	**Benefits For:**	
This Study put special emphasis on providing safety-related improvements at all high accident locations. It is appropriate to give several measures a reasonable trial before implementing more severe changes, like the addition of a traffic signal. Key locations should be watched for the next three years to determine if accidents are reduced.		**X**	Pedestrians
		X	Motor Vehicle Drivers
		X	Bus Riders
Locations:	Atwater/Hawthorne, 3rd/Fess, Atwater/Fess, Atwater/Highland	**X**	Bicyclists
		X	Large Vehicles, Bus

505	**Review a reported drainage problem in the vicinity of Rose and Hunter**	**Benefits For:**	
Eastside Neighborhood stakeholders noted an ongoing problem with localized flooding at the intersection of Rose and Hunter, which may have been aggravated by the recent construction of a detention area upstream at Atwater/Clifton. CBU personnel agreed to check on this as a drainage complaint.			Pedestrians
			Motor Vehicle Drivers
			Bus Riders
Locations:	Rose at Hunter		Bicyclists
			Large Vehicles, Bus

B. Recommendations Listed by Street Segment

Recommendations for each street segment in the Study Area are presented in this section. Street segments are presented in sequential order by direction of traffic flow, with cross streets presented last.

1. Recommendations in 3rd Street Corridor (Presented westbound)

3rd Street	East of Bryan	Est. Cost	Part of Project
106	Provide sidewalk on north side	$18,000	East-End
309 119	Reconstruct sidewalk on south side to prevent flooding of walk, widen sidewalk at bus stop	$46,000	East-End
117 118	Provide bus pulloff at bus stop, shift bus stop to east, away from High Street	$35,000	East-End
123	Increase NW corner radius at Jefferson for turning fire trucks	$8,000	East-End
310	Remove westmost drive to St. Charles	$10,000	East-End

3rd Street	At High/Bryan	Est. Cost	Part of Project
302	Reconstruct new intersection without the offset (High realigned to meet Bryan)	$300,000	East-End
102	Change pedestrian WALK to Countdown Timers	Included	East-End
110	Install missing curb ramps at Bryan	$2,000	East-End
305	Replace Signal for new intersection of 3rd/High/Bryan	$120,000	East-End
101	Install OptiCom receiver on Signal	Included	East-End

3rd Street	Between High and Union	Est. Cost	Part of Project
306	Convert 3rd to one-way westbound from High to Mitchell	$3,000	East-End

3rd Street	At Union/Clifton	Est. Cost	Part of Project
118	Relocate bus stop to farside of intersection	N/A	East-End
306	Convert 3rd to one-way westbound from High to Mitchell	$3,000	East-End
307	Convert Clifton to one-way southbound to improve connection from Union to eastbound traffic	$1,000	East-End

3rd Street	Between Union/Clifton and Rose	Est. Cost	Part of Project
117	Provide bus pulloff at bus stop	$35,000	East-End

306	Convert 3rd to one-way westbound from High to Mitchell	$3,000	East-End
105	Provide separated sidewalk on north side of 3rd	$44,000	East-End

3rd Street	**At Rose**	**Est. Cost**	**Part of Project**
111	Improve sight distance in NE and SE corners	$35,000	East-End
118	Relocate bus stop to farside of intersection	N/A	East-End

3rd Street	**Between Rose and Mitchell**	**Est. Cost**	**Part of Project**
116	Remove 15-minute parking area pavement, add curb	$30,000	East-End
117	Provide bus pulloff at bus stop	Included	East-End
120	Provide bus shelter at bus stop (Forest Quad)	$10,000	Transit Shelters
122	Request additional speed enforcement in this area	N/A	City / IU Police
306	Convert 3rd to one-way westbound from High to Mitchell	$3,000	East-End
105	Provide separated sidewalk on north side of 3rd	$15,000	East-End

3rd Street	**At Mitchell**	**Est. Cost**	**Part of Project**
306	Convert 3rd to one-way westbound from High to Mitchell	$3,000	East-End
412	Remove island in 3rd Street at Mitchell	$8,000	East-End

3rd Street	**Between Mitchell and Jordan**	**Est. Cost**	**Part of Project**
105	Provide separated sidewalk on south side (Mitchell to Swain)	$30,000	Sidewalk Prog.
109	Install marked crosswalk across 3rd with flashered warning signs on west side of Swain	$15,000	Jordan Avenue
111	Improve intersection sight distance in SE corner at Swain	$2,000	Jordan Avenue
112	Add signage encouraging pedestrians to use crosswalks at Swain or Jordan	$1,000	Jordan Avenue
122	Request additional speed enforcement in this area	N/A	City / IU Police
409	Enforce NO PARKING in front of restaurants, redirect trucks to Swain	N/A	City / IU Police Jordan Avenue

3rd Street	**At Jordan**	**Est. Cost**	**Part of Project**
101	Install OptiCom receiver on Signal	$6,000	Jordan Avenue
102	Change pedestrian WALK to Countdown Timers	$8,000	Jordan Avenue
124	Add One-Way signs to mast arms on signals	$1,000	Jordan Avenue

403	Remove 1 drive into Village Pantry, modify sidewalk area and reorient parking in their lot (SW corner)	$28,000	Jordan Avenue
504	Review future accident trends to determine if additional actions needed	N/A	MPO Studies

3rd Street	**Between Jordan and Highland**	**Est. Cost**	**Part of Project**
404	Install curb across front of Kinser Cleaners	$18,000	Jordan Avenue
112	Install signage encouraging crossing at crosswalks in this block (direct to Jordan or Highland)	$1,000	Jordan Avenue

3rd Street	**At Highland**	**Est. Cost**	**Part of Project**
109	Install crosswalk markings and non-flashered warning signs across 3rd on east side of Highland	$2000	Jordan Avenue

3rd Street	**Between Highland and Hawthorne**	**Est. Cost**	**Part of Project**
105	Provide separated sidewalk on south side (Ballantine to Highland)	$40,000	Sidewalk Prog.
116	Remove 15-minute parking area pavement, add curb	$6,000	Bus/Curb Impr.
117	Provide bus pulloff at bus stop	$40,000	Bus/Curb Impr.
120	Provide bus shelter at bus stop (Memorial Hall)	$10,000	Transit Shelters

3rd Street	**At Hawthorne**	**Est. Cost**	**Part of Project**
101	Install OptiCom receiver on Signal	$6,000	Signal Impr. Prog
102	Change pedestrian WALK to Countdown Timers	$8,000	Signal Impr. Prog
124	Add One-Way signs to mast arms on signals	$1,000	Signal Impr. Prog
504	Review future accident trends to determine if additional actions needed	N/A	MPO Studies

3rd Street	**Between Hawthorne and Woodlawn**	**Est. Cost**	**Part of Project**
110	Install missing curb ramps, south side	$1,000	Sidewalk Prog.
122	Request additional speed enforcement in this area	N/A	City / IU Police

3rd Street	**At Woodlawn**	**Est. Cost**	**Part of Project**
101	Install OptiCom receiver on Signal	$6,000	Signal Impr. Prog
102	Change pedestrian WALK to Countdown Timers	$8,000	Signal Impr. Prog

124	Add One-Way signs to mast arms on signals	$1,000	Signal Impr. Prog
410	Install ramped access into campus area adjacent to existing stairs	$15,000	Bike Route Prog.
504	Review future accident trends to determine if additional actions needed	N/A	MPO Studies

3rd Street	**Between Woodlawn and Fess**	**Est. Cost**	**Part of Project**
116	Remove 15-minute parking area pavement, add curb	$12,000	Bus/Curb Impr.
117	Provide bus pulloff at bus stop (Swain Hall)	$45,000	Bus/Curb Impr.
120	Provide bus shelter at bus stop (Swain Hall)	$10,000	Transit Shelters
122	Request additional speed enforcement in this area	N/A	City / IU Police

3rd Street	**At Fess**	**Est. Cost**	**Part of Project**
109 209	Install marked crosswalk across 3rd with flashered warning signs on east side of Fess	$15,000	West End/Garage
112	Add signage encouraging use of crosswalk	$1,000	West End/Garage
504	Review future accident trends to determine if additional actions needed	N/A	MPO Studies

3rd Street	**Between Fess and Indiana**	**Est. Cost**	**Part of Project**
105	Provide separated sidewalk on south side	$17,500	West End/Garage
112	Add signage encouraging use of crosswalks	$1,000	West End/Garage
117	Provide bus pulloff at bus stop (School of Law)	$40,000	West End/Garage
120	Provide bus shelter at bus stop (School of Law)	$10,000	Transit Shelters
215	Implement sidewalk and other improvements with new parking garage project (Coordinate with Univ.)	N/A	West End/Garage

3rd Street	**At Indiana**	**Est. Cost**	**Part of Project**
101	Install OptiCom receiver on Signal	$6,000	Signal Impr. Prog
102	Change pedestrian WALK to Countdown Timers	$8,000	Signal Impr. Prog
110	Install missing curb ramps	$1,000	West End/Garage
124	Add One-Way signs to mast arms on signals	$1,000	Signal Impr. Prog
207	Remove 1 drive into BP gas station, modify sidewalk and add parking in their lot (NW corner)	$18,000	West 3rd / Dunn
504	Review future accident trends to determine if additional actions needed	N/A	MPO Studies

3rd Street	**Between Indiana and Dunn**	**Est. Cost**	**Part of Project**
105	Provide separated sidewalk on south side	$32,000	West 3rd / Dunn

3rd Street	**At Dunn**	**Est. Cost**	**Part of Project**
101	Install OptiCom receiver on Signal	$6,000	West 3rd / Dunn
102	Change pedestrian WALK to Countdown Timers	$8,000	West 3rd / Dunn
124	Add One-Way signs to mast arms on signals	$1,000	West 3rd / Dunn
201	Provide raised islands in east and west approaches to channelize traffic/provide pedestrian refuge	$13,000	West 3rd / Dunn
202	Add crosswalk across Dunn south side of 3rd	$1,000	West 3rd / Dunn
203	Shift westbound left turn lane to south to improve visibility of crosswalk	$25,000	West 3rd / Dunn
217	Move newspaper machines away from intersection	$1,000	N/A
504	Review future accident trends to determine if additional actions needed	N/A	MPO Studies

2. Recommendations in Atwater Ave. Corridor (presented eastbound)

Atwater	**Between 3rd and Henderson**	**Est. Cost**	**Part of Project**
103	Install interconnect cable along Atwater	$12,000	West End/Garage
112	Add signage encouraging use of crosswalk at Henderson	$1,000	West End/Garage
204	Relocate connector road with South Dunn Street farther south	$35,000	West 3rd / Dunn
205	Add guide signage to assist motorists to South Dunn, North Indiana, or to proceed east	$1,500	West 3rd / Dunn
206	Remove most of left turn lane to Indiana from eastbound Atwater	$8,000	West End/Garage
211	Thin trees along north side (inside of curve) to improve visibility to new signal	$5,000	West End/Garage
212	Construct a low stone wall on north side to discourage midblock crossings in this area	$30,000	West End/Garage

Atwater	**At Henderson**	**Est. Cost**	**Part of Project**
101	Install OptiCom receiver on Signal	$6,000	West End/Garage
102	Install pedestrian Countdown Timers	Included	West End/Garage
103	Install interconnect cable along Atwater	Included	West End/Garage
124	Add One-Way signs to mast arms on signals	$1,000	West End/Garage
208	Add new signal	$110,000	West End/Garage

210	Remove existing island and free-flowing left turn lane to Indiana	$10,000	West End/Garage
216	Add pedestrian refuge island and separated right turn from Henderson to Atwater	$20,000	West End/Garage
504	Review future accident trends to determine if additional actions needed	N/A	MPO Studies

Atwater	**Between Henderson and Fess**	**Est. Cost**	**Part of Project**
103	Install interconnect cable along Atwater	$5,000	West End/Garage
215	Implement sidewalk and other improvements with new parking garage project (Coordinate with Univ.)	N/A	West End/Garage

Atwater	**At Fess**	**Est. Cost**	**Part of Project**
103	Install interconnect cable along Atwater	Included	West End/Garage
111	Improve intersection sight distance in SW corner	$5,000	West End/Garage
118	Relocate bus stop to farside of intersection	N/A	West End/Garage
213	Add “No Thru Traffic” signs to south side to discourage use of neighborhood streets from garage	$300	West End/Garage
504	Review future accident trends to determine if additional actions needed	N/A	MPO Studies

Atwater	**Between Fess and Woodlawn**	**Est. Cost**	**Part of Project**
103	Install interconnect cable along Atwater	$8,000	Atwter/Woodlawn
111	Improve sight distance in SW corner at Park Ave.	$5,000	Atwter/Woodlawn
117	Provide bus pulloff at bus stop (Fess, Park)	$35,000	Atwter/Woodlawn
117	Combine School of Optometry bus stop with one closer to Park Ave.	$4,000	Atwter/Woodlawn
118	Relocate bus stop to farside of intersection (Park Av)	N/A	Atwter/Woodlawn
120	Provide bus shelter at bus stop (School of Optomtry.)	$10,000	Transit Shelters
122	Request additional speed enforcement in this area	N/A	City / IU Police
402	Remove portion of eastbound left turn lane at Woodlawn, narrow street	$12,000	Atwter/Woodlawn

Atwater	At Woodlawn	Est. Cost	Part of Project
101	Install OptiCom receiver on Signal	$6,000	Signal Impr. Prog
102	Change pedestrian WALK to Countdown Timers	$8,000	Signal Impr. Prog
103	Install interconnect cable along Atwater	Included	Atwter/Woodlawn
111	Improve intersection sight distance in NW corner	$2,000	Atwter/Woodlawn
124	Add One-Way signs to mast arms on signals	$1,000	Signal Impr. Prog
402	Narrow pedestrian crossing by removing continuous eastbound turn lane on east side of intersection	$20,000	Atwter/Woodlawn
504	Review future accident trends to determine if additional actions needed	N/A	MPO Studies

Atwater	Between Woodlawn and Hawthorne	Est. Cost	Part of Project
103	Install interconnect cable along Atwater	$8,000	Atwater/Hawthorn
105	Provide separated sidewalk on north side (Faculty to Hawthorne)	$19,000	Atwater/Hawthorn
106	Replace deteriorated sidewalk on south side (Faculty to Hawthorne)	$13,200	Atwater/Hawthorn
110	Repair pavement at curb ramp on south side at both Woodlawn and Faculty	$1,000	Atwater/Hawthorn
117	Provide bus bulloff at bus stop (west of Hawthorne)	$35,000	Atwater/Hawthorn
402	Remove portion of turn lane to Faculty, narrow street	Included	Atwter/Woodlawn

Atwater	At Hawthorne	Est. Cost	Part of Project
103	Install interconnect cable along Atwater	Included	Atwater/Hawthorn
111	Improve intersection sight distance in SW corner	$15,000	Atwater/Hawthorn
504	Review future accident trends to determine if additional actions needed	N/A	MPO Studies

Atwater	Between Hawthorne and Highland	Est. Cost	Part of Project
103	Install interconnect cable along Atwater	$8,000	Atwater/Hawthorn
105	Provide separated sidewalk on north side	$38,400	Atwater/Hawthorn
111	Improve intersection sight distance in SW corner at Ballantine	$7,000	Atwater/Hawthorn
405	Reconstruct (Lower the profile of) Atwater between Ballantine and Highland to improve sight distance at Highland	$175,000	Atwater/Highland

Atwater	At Highland	Est. Cost	Part of Project
103	Install interconnect cable along Atwater	Included	Atwater/Highland
504	Review future accident trends to determine if additional actions needed	N/A	MPO Studies

Atwater	Between Highland and Jordan	Est. Cost	Part of Project
103	Install interconnect cable along Atwater	$5,000	Atwater/Jordan
105	Provide separated sidewalks on both sides	$42,000	Atwater/Jordan
107	Narrow Atwater to create space for sidewalks, etc	$42,000	Atwater/Jordan
122	Request additional speed enforcement in this area	N/A	City / IU Police

Atwater	At Jordan	Est. Cost	Part of Project
101	Install OptiCom receiver on Signal	$6,000	Atwater/Jordan
102	Change pedestrian WALK to Countdown Timers	$8,000	Atwater/Jordan
103	Install interconnect cable along Atwater	Included	Atwater/Jordan
119	Widen sidewalk at bus stop	$1,000	Atwater/Jordan
123	Increase SW corner radius for turning busses	$7,000	Atwater/Jordan
124	Add One-Way signs to mast arms on signals	$1,000	Atwater/Jordan
504	Review future accident trends to determine if additional actions needed	N/A	MPO Studies

Atwater	Between Jordan and Mitchell	Est. Cost	Part of Project
105	Provide separated sidewalks on both sides	$72,000	Atwater/Jordan
106	Add missing sidewalk on north side (Swain to Mitchell)	Included	Atwater/Jordan
107	Narrow Atwater to create space for sidewalks, etc	$72,000	Atwater/Jordan
122	Request additional speed enforcement in this area	N/A	City / IU Police

Atwater	At Mitchell	Est. Cost	Part of Project
125	Replace inlet casting that is not bicycle-safe	$1,000	N/A
301	Extend one-way traffic on Atwater from Mitchell to High Street (convert Atwater to one-way). Atwater to be slightly widened with curb and gutter and sidewalks on both sides, south side separated	Included	East-End

Atwater	Between Mitchell and Rose	Est. Cost	Part of Project
407	Realign and widen Atwater through Eastside Drive to remove the kink and to provide standard width	$50,000	East-End

301	Extend one-way traffic on Atwater from Mitchell to High Street (convert Atwater to one-way) Atwater to be slightly widened with curb and gutter and sidewalks on both sides, south side separated	$540,000	East-End

Atwater	**At Rose**	**Est. Cost**	**Part of Project**
301	Extend one-way traffic on Atwater from Mitchell to High Street (convert Atwater to one-way) Atwater to be slightly widened with curb and gutter and sidewalks on both sides, south side separated	Included	East-End

Atwater	**Between Rose and Clifton**	**Est. Cost**	**Part of Project**
408	Reconstruct (raise the profile of) Atwater to eliminate substandard sag	$100,000	East-End
301	Extend one-way traffic on Atwater from Mitchell to High Street (convert Atwater to one-way) Atwater to be slightly widened with curb and gutter and sidewalks on both sides, south side separated	$180,000	East-End

Atwater	**At Clifton**	**Est. Cost**	**Part of Project**
301	Extend one-way traffic on Atwater from Mitchell to High Street (convert Atwater to one-way) Atwater to be slightly widened with curb and gutter and sidewalks on both sides, south side separated	Included	East-End
307	Clifton to be one-way southbound between 3rd and Atwater	Included	East-End

Atwater	**Between Clifton and High**	**Est. Cost**	**Part of Project**
301	Extend one-way traffic on Atwater from Mitchell to High Street (convert Atwater to one-way) Atwater to be slightly widened with curb and gutter and sidewalks on both sides, south side separated	$180,000	East-End

Atwater	**At High**	**Est. Cost**	**Part of Project**
101	Install OptiCom receiver on Signal	Included	East-End
102	Install pedestrian Countdown Timers	Included	East-End
103	Install interconnect cable to 3rd/High	Included	East-End
124	Add One-Way signs to mast arms on signals	Included	East-End
303	Install new signal at Atwater/High/Church entrance	$110,000	East-End
302 304	Realign east end of Atwater to line up with new Church drive, avoid historic property	$50,000	East-End

3. Recommendations for each Crossing Street

Henderson Street / Indiana Avenue		**Est. Cost**	**Part of Project**
214	Realign the Henderson stub into a T-connection with Indiana	$25,000	West End/Garage
215	Implement sidewalk and other improvements with new parking garage project (Coordinate with Univ.)	N/A	West End/Garage

Fess Avenue		**Est. Cost**	**Part of Project**
215	Implement sidewalk and other improvements with new parking garage project (Coordinate with Univ.)	N/A	West End/Garage

Park Avenue		**Est. Cost**	**Part of Project**
106	(South of Atwater) – Replace sidewalks	$18,000	Sidewalk Prog.

Woodlawn Avenue		**Est. Cost**	**Part of Project**
114	Sign as shared bike route	$500	Bike Route Prog.

Faculty Avenue		**Est. Cost**	**Part of Project**
106	Add missing sidewalk segments, each side	$23,000	Sidewalk Prog.

Hawthorne Drive		**Est. Cost**	**Part of Project**
114 406	Eliminate parking, add striped bike lanes, sign for bike route	$3000	Bike Route Prog.

Ballantine Road		**Est. Cost**	**Part of Project**
	None	N/A	N/A

Highland Avenue		**Est. Cost**	**Part of Project**
	None	N/A	N/A

Jordan Avenue		**Est. Cost**	**Part of Project**
114	Eliminate parking, stripe partial block for bike lanes	$4,000	Jordan Avenue
411	Shift stop bars on either side of Atwater away from Atwater to allow turning busses better movement	Included	Jordan Avenue

Swain Avenue		**Est. Cost**	**Part of Project**
409	Restripe north portion of Swain to allow delivery truck parking along west side and provide signage	$3,000	Jordan Avenue

Mitchell Street		**Est. Cost**	**Part of Project**
308	Convert to one-lane (extra wide), one-way northbound with parking on east side.	$3,000	East-End

Eastside Drive		**Est. Cost**	**Part of Project**
	None	N/A	N/A

Arbutus Drive		**Est. Cost**	**Part of Project**
106	Add sidewalk to east side of street	$28,000	Sidewalk Prog.

Rose Avenue		**Est. Cost**	**Part of Project**
106	Add sidewalk to east side of street	$28,000	Sidewalk Prog.
114	Sign as shared bike route	$1,000	Bike Route Prog.

Clifton Avenue		**Est. Cost**	**Part of Project**
307	Convert to one-way southbound to improve circulation of traffic in one-way pair, improve access from Union Street.	$2,000	East-End

Union Street		**Est. Cost**	**Part of Project**
	None	N/A	N/A

High Street		**Est. Cost**	**Part of Project**
103	Install interconnect cable between 3rd and Atwater	$4,000	East-End
302	Reconstruct section from Atwater to 3rd to realign for new intersections, eliminate offsets. Add turn lanes at 3rd, and reconstruct connecting church drive to meet at Atwater.	$530,000	East-End

C. Prioritization of Improvements

The recommendations in this report total approximately $4,075,000, over half of which are included in the improvements associated with widening and extending Atwater Avenue as the one-way arterial street to High Street, and new intersections at both Atwater/High and 3rd/High as described in **Alternative 4-6.**

The rest of the improvements are part of smaller investments that do not need to be pursued as part of multi-million dollar efforts.

The improvements can be loosely divided into the following project categories, some based on areas, and some based on work types:

Designation	Description	Approximate Cost
East End	Alternative 4-6 + Misc.	$2,471,000
West End/Garage	Atwater/Henderson, et. al.	$ 314,000
West 3rd/Dunn	3rd/Dunn and vicinity	$ 141,000
Atwater/Woodlawn	Atwater from Park to Faculty	$ 86,000
Atwater/Hawthorne	Atwater from Faculty to Ballantine	$ 143,000
Atwater/Highland	Atwater from Ballantine to Highland	$ 175,000
Atwater/Jordan	Atwater from Highland to Mitchell	$ 256,000
Jordan Avenue	Jordan Ave and 3rd/Jordan	$ 89,000
Bus/Curb	Bus Pulloffs, Elim. Parking	$ 103,000
Signal Improvements	Opticom, Pedestrian timers, etc.	$ 60,000
Bike Route Impr.	Bike Route Markings, Signs	$ 19,000
Sidewalk Prog.	Misc Sidewalk Work	$ 168,000
Transit Shelters	Shelters at bus stops	$ 50,000

The categories that refer to a specific area should generally be pursued as a single project. They have been divided based on the nature of the work needed in order to help the City save money through economy of scale. Multiple sections of Atwater could be combined for this same reason.

Prioritization of these improvements is heavily dependent upon several issues including funding availability and coordination with other projects or initiatives.

Because construction of the University parking garage is anticipated in 2006, improvements related to the garage are recommended for further development immediately, in hopes that all or some of these improvements could be in place when the garage enters operation.

The East-End project, modeled around Alternative 4-6, is the single biggest investment in the corridor, and needs to be pursued as one large project, funded through the MPO with State and/or Federal assistance as the designated project in

the MPO's Transportation Improvement Program. These projects generally take several years to bring to construction, so this could be initiated now with an anticipation that it will take 2-4 years to design and acquire needed right-of way. The City should anticipate construction of this work in 2009 at the earliest.

The other pressing issue that should be considered is safety. Top accident locations should be improved as funding and resources allow, starting with the highest ranking Top Accident Locations. These are:

- 3rd/Jordan
- Atwater/Henderson (in conjunction with garage)
- 3rd/Woodlawn
- 3rd/Indiana
- 3rd/Dunn

Other improvements can be pursued as funding allows. The City's annual sidewalk program can address many small needs in the corridor. The transit authorities may have other funding available to address bus pulloffs or bus shelters. The upgrade of the signals with Opticom receivers may be fundable through grants available to the City's Fire or Police Departments.

Lastly, the University must be viewed as a key partner in many of these improvements. Many of the improvement described are conceptually sketched on University property. The block around the new garage is a great example of where roadway and sidewalk improvements are needed, partly because of the new garage. The City and the University should cooperate in the achievement of these improvements because both the City and the University are served by them.

Right-of-way will be needed for many of these improvements, especially on the East-End, and the University is the primary property owner throughout the corridor. While no promises were made, the University did positively express the desire to see improvements made, and agreed to work closely with the City in helping to bring these to fruition. Right-of-way grants may be the best way for the University to assist the City. Both parties have much to gain.

D. Recommendations Shown Graphically

Figures 5-1 thru 5-6 show the listed recommendations applied to the Study Area Map.

Holder for Figures 5-1 to 5-6

V. CLOSING

This purpose of this Study was to identify and evaluate alternatives for infrastructure improvements that will:

- **Enhance safety for all corridor users**, especially at points of interface between motor vehicles and non-motorized users,
- **Improve the efficiency of the corridor** to support better flow of both east-west and crossing movements,
- Support the City's expressed policies of **encouraging the increased use of public transit and other non-motorized forms of travel**, and
- **Consider the needs of all users** - vehicles, pedestrians, bus riders and bicyclists.

We believe this purpose has been met. There is something for everyone within the recommendations. Pedestrians, motorists, bus riders and bicyclists each have much to gain if all of the improvements can be implemented.

Studies do not make improvements, they merely facilitate them. This investment by the City can only be deemed worthwhile if the recommendations are specific and actionable. Ambiguous recommendations and those that call for "further study" are not useful, and if that is what this Study had resulted in, it would be deemed a wasted effort.

The attempt has been made to be as specific and actionable as possible. A firm position has been offered so that the reader is not left wondering about the outcome.

Still, that means that for those people who are opposed to a particular recommendation, the results of the Study will not please them. Finding what are deemed to be the overall best solutions to the problems in the corridor has required the consideration of many points of view. Rarely, would everyone agree on what the "best" is. The Study effort requires the balance of the different, and frequently competing, interests. Given the depth of the analyses and the narrative explanations, the reader should appreciate that the Study took a steady and reasoned approach to developing the recommendations.

It is perhaps the most unfortunate characteristic of public improvements, especially improvements to roadways, that benefits and impacts are never balanced. Many of the improvements noted herein could benefit literally thousands of people every day. Unfortunately, the impacts are not nearly so evenly shared. Finding the "best" solution requires objectivity, but also empathy for those who will be impacted.

This Study started, and will end, with the involvement of stakeholders. Many people who will never read this Study will benefit from the improvements described herein. It is hoped that the two largest stakeholders, the City and the University, will adopt these recommendations and find ways to cooperatively implement even the most challenging of them for the common benefit of their many constituents. Many of the citizens of Bloomington are the students, faculty and staff of the University.