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**City of
Bloomington
Parks & Recreation**



Cascades Park

**(Miller Showers to
Griffy Lake)**



Bicycle / Pedestrian Feasibility Study

Final Report

Prepared by:



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Bloomington Interim Report – Indiana Historic Sites and Structures Inventory, April 2004, by City of Bloomington Housing and Neighborhood Development Department.

Guide for the Development of Bicycle Facilities, 1999, by the American Association of State Highway and Transportation Officials.

Guide for the Planning, Design and Operation of Pedestrian Facilities, July 2004, by the American Association of State Highway and Transportation Officials.

Indiana Design Manual, May 2005, Indiana Department of Transportation.

Indiana Manual for Uniform Traffic Control Devices, December 2001, Indiana Department of Transportation.

Bicycle & Pedestrian Feasibility Study for Cascades Park from Miller Showers Park to Griffy Lake

Report Date: June 2007, Final Report

Prepared for Owner: City of Bloomington
Department of Parks & Recreation

Prepared by Engineer: Brock Ridgway, P.E.
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I. INTRODUCTION

A. Background/Study Area

Cascades Park was established in the early 1920's and is Bloomington's oldest park property. Considered by many to be the City's most picturesque park, it is noted for its narrow, winding valley, short natural waterfalls and rocky stream. A two-lane road runs parallel and close to the stream. The road used to be State Road 37, but SR 37 has long since been rerouted and the road is now used only as a local secondary collector and park road.



The banks of the stream have been permanently armored in many areas with a mix of limestone block, concrete wall, stone gabions and poured riprap. Some of the oldest sections of the stone walls are considered historically significant. These were built in the same period as the Park's stone shelter buildings as WPA projects in the 1930's.

The Parks Department recently added a

handicapped-accessible playground near the center of the park. Paths connect the playground to the shelters and parking lots in this area. The playground is very popular and well-used, but visitors must drive into the park or brave riding alongside traffic before any separated facilities are available near the playground.

The park road, which was resurfaced in 2006, is very popular with bike teams who prefer to ride alongside traffic and use the park corridor as part of a longer training route.



This illustrates a glaring problem in the Study Area: only competitive bicyclists who prefer to ride on the road have ready access to the central part of Cascades Park. Competitive bicyclists are using the road and its picturesque surroundings as a route for longer rides. They are not riding to gain access to the park's other amenities.

There is a great need for a safe and comfortable way for pedestrians and recreational bicyclists, such as families, to gain access to the central park area.

The Cascades Park property is much larger than just the narrow valley for which it is best known. The park property also includes a larger area to the west. The area west of the park's main valley features rolling, karst topography and is home to Cascades Golf Course and the City's Skatepark. This area is referred to as Upper Cascades and the valley is called Lower Cascades. The hillside that separates them is very steep. Upper Cascades sits approximately 95' above Lower Cascades in most areas.

While the Park's topography is its greatest asset, it also presents the greatest challenge to providing bicycle and pedestrian access. To the east, the park property is bordered by a very steep hill up to the Walnut Street corridor. To the south, the narrowness of the valley with the stream and road limits entry to a tight corridor. To the west, the elevation change between Upper and Lower Cascades presents a significant barrier. To the north, the valley broadens, but becomes increasing marshy and hosts suspected wetlands. It is the most approachable side of the park but is also the least developed.

It is because of these obvious challenges that the City has not yet taken action to provide better pedestrian access to the central portion of Cascades Park. The success of the new playground has increased the popularity of the Park and has increased the demand for improved bicycle and pedestrian facilities. ***The City's Department of Parks and Recreation has therefore initiated this Study to determine the best way to provide improved bicycle and pedestrian access while respecting the unique character of the park property.***

As part of initiating this Study, the Parks Department identified the limits of the Study Area. The limits were set based on providing access and connectivity to important destinations, and on ending at logical termini from which other bicycle and pedestrian amenities might be developed in the future.

Study Limits:

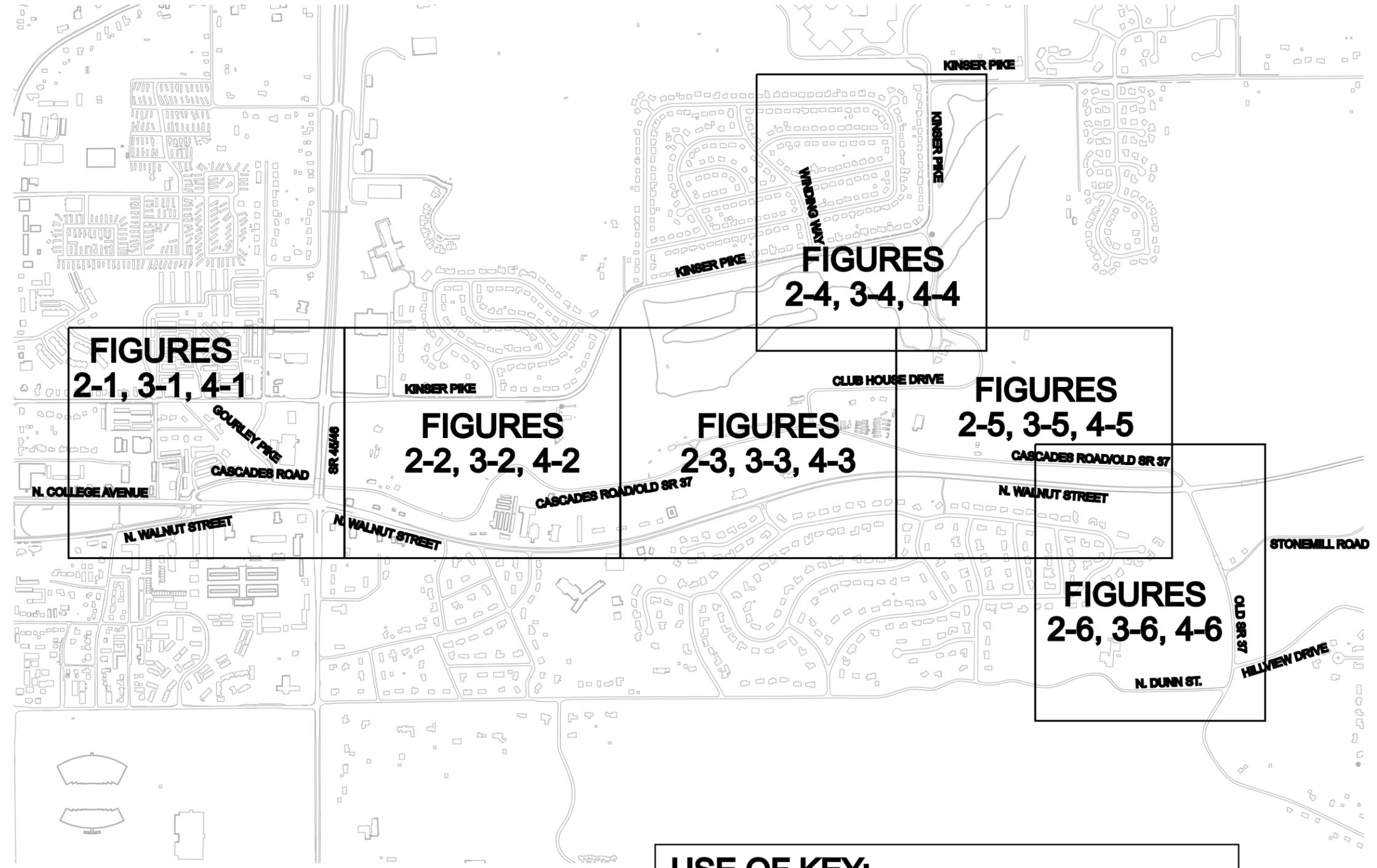
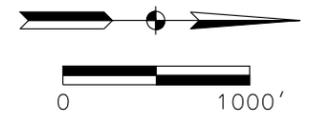
The south edge of the Study Area begins at the northern edge of Miller Showers Park, where Cascades Road meets Walnut Street.

To the north, the Study area extends outside of the existing Park property to the intersection of Old SR 37 (Cascades Road) with Walnut Street. The Study Area then extends to the east, across Walnut Street along Old SR 37 to Dunn Street, and then back south to the former Griffy Lake Filtration Plant.

The Upper Cascades area is included in the Study Area by up to three connection routes. The first two involve connections from Lower Cascades up the hill to the City's Skatepark. The Skatepark can be approached from either its north or south side. The third connection corridor is along Club House drive to the Golf Course property, and then extends farther west along Kinser Pike to the edge of the Bloomington North High School property. This is the only improved (paved) route among the three.

From north to south the Study Area is over 1.75 miles long, and from east to west approximately one mile. With its curvilinear alignment and three additional links from Lower to Upper Cascades, this Study includes the review of over 3 miles of corridor for desired bicycle and pedestrian facilities.

The Study Area is shown on **Figure 1A** on the following page.



**FIGURES
2-1, 3-1, 4-1**

**FIGURES
2-2, 3-2, 4-2**

**FIGURES
2-3, 3-3, 4-3**

**FIGURES
2-4, 3-4, 4-4**

**FIGURES
2-5, 3-5, 4-5**

**FIGURES
2-6, 3-6, 4-6**

**USE OF KEY:
THIS KEY SHALL BE USED WITH
FIGURES 2, 3 AND 4 THROUGHOUT
THIS STUDY REPORT**

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**CITY OF BLOOMINGTON
DEPT. OF PUBLIC WORKS**

MAP KEY



**CASCADES PARK /
GRIFFY LAKE
BIKE / PEDESTRIAN
FEASIBILITY STUDY**

**FIGURE
1B**

B. Purpose

The purpose of this Study is to identify recommended improvements that will provide bicycle and pedestrian access to the Study Area in the most optimal manner possible. The “optimal solution” to providing access is a subjective standard, but in this effort is considered to require that access be provided in a manner that addresses the safety and needs of all of the park users (recreational cyclists and pedestrians, competitive cyclists, and motor-vehicle drivers), but also minimizes necessary impacts to the Park’s natural environment. If the optimal solution was obvious or easy, there would be no need for this Study. Much of this report is dedicated to the process of identifying alternatives and evaluating them based on their characteristics, benefits, and potential impacts.

“*Providing access to the Study Area*” includes two related, but different goals for these bicycle and pedestrian facilities:

The first goal is to *provide access to destinations*. New facilities are intended to allow people to reach various destinations along safe facilities designed for their use. This access may not always provide full compliance for “Accessibility” under the definition of the Americans with Disabilities Act (ADA). While that standard is certainly an important goal for any of these improvements, some exceptions may be required where the slopes, grade differences, or avoidance of a major impact to natural or historic resources warrant such exceptions.

The second goal is to improve *mobility*. People using alternative transportation should be able to use these facilities to make connections to other parts of the City’s network of walks, paths and bike routes. Such is the purpose of extending the Study Area to examine a complete link between Miller Showers Park and the Griffy Lake Filtration Plant Area and to the Upper Cascades area.

In the Study Area, the path connections to be created include the primary link through Lower Cascades from Miller Showers Park to the Griffy Lake Filtration Plant. Important recreational destinations along this primary connection are to be connected in the process, such as the City’s playground, softball fields and park shelters. The other primary connections are the lateral connections from Lower Cascades to the Upper Cascades area, which are to terminate at Bloomington North High School and the City’s skatepark. The golf course is an important destination along these routes.

C. Study Phasing

The conduct of this Study is most easily described as a progression of phases. The Engineer conducted the Study in these phases to progressively identify the alternatives that are available, and then to more objectively evaluate them to arrive at recommended alternatives. These phases are described below.

1. Data Collection Phase

The Study began with a wide variety of data-gathering activities. The Engineer obtained a variety of maps from local, state and internet sources. The City's existing Bike Route Map, Bus Routes and Alternative Transportation Masterplan were obtained for background information about the Study Area.

Data collection also included an Early Coordination effort that consisted of letters and phone calls to local government officials and the Monroe County School Corporation. Information was requested from utilities, Monroe County and Indiana Department of Transportation (INDOT) sources.

The primary intention of this phase was to gather all of the pertinent information about the Study Area together in one place...in this case on a map that was initially called the Study Basemap. The Basemap was started from the City's existing GIS mapping, and then became an evolving document that was further modified and made more readable, to the point that it barely resembles the original GIS mapping. The Study Basemap was further augmented by the results of the fieldwork effort in the next phase.

Information collected in this phase was compiled into the first draft of the **Study Area Existing Conditions (Figures 2-1 thru 2-6).**

2. Field Reconnaissance Phase

This phase included several walks and trips through the Study Area to gather data. The Engineer walked each area at least twice, and some areas more if the features were particularly complex. Engineer also drove the site to see it from the perspective of drivers.

An inventory was taken of road conditions and traffic signs. Pavement condition was reviewed to identify areas where the pavement condition is ill-suited to bicycle riding. Speed limits and visibility/sight-distances were observed, especially in areas of likely future path crossings. The Engineer took hundreds pictures for use during the study and to assist in meetings.

Site topography was noted, especially slopes, rock outcrops, sinkholes, and roadway edge/shoulder conditions, etc. Features such as fences, guardrails, bridges, channel walls, and other items not available from the GIS were added to the mapping. Natural watercourses, ditches, and waterfalls were added to the mapping. The result of these activities was the further modification of the Study Basemap into what became the figure for **Study Area Existing Conditions (Figures 2-1 thru 2-6).**

3. Criteria Review and Development Phase

This phase included the identification of a Study Workgroup that would meet with the Engineer and review the Study on the City's behalf. This group was formed from representatives of Parks & Recreation, Planning, Engineering, and Housing & Neighborhood Development.

The Engineer presented an initial list of Design Criteria for typical bicycle/path facilities so that alternatives would be based upon assumed dimensions. Design criteria were offered for sidepaths, bike lanes and for shared road facilities. For each facility and characteristic, "desired" and "minimum" dimensions were established.

Second, Alternative Evaluation Criteria were proposed for the upcoming effort to compare alternatives. These were presented in the form of a categorized list including such characteristics as safety, natural environment concerns, consistency, and estimated cost. The Study Workgroup reviewed the criteria and offered revisions that guided the effort.

4. Alternative Development Phase

This phase was intended to identify possible alternatives for the Study Area. Using the Study Base Map as a background, the first step was to break the Study Area into "segments", which are described as sections of the Study Area where particular site constraints are present.

Next, the Engineer identified preliminary alternatives for each segment. Exhibits were prepared that showed the initial alternatives along with their key characteristics and challenges. These preliminary alternatives were presented to the Study Workgroup for their consideration and refinement. Alternatives were initially presented as:

- ◆ **Possible:** Generally buildable, though perhaps with known challenges
- ◆ **Difficult:** Worth considering, though with obvious and major challenges
- ◆ **Not Feasible:** Not Worth considering due to an obvious and probably insurmountable challenge.

The Alternatives were not formally evaluated at this phase, though if an obvious fatal flaw were noted, then these alternatives were designated as Not Feasible pending final review by the Workgroup. Through discussion with the Workgroup, the list of potential alternatives was expanded and revised. Alternatives are presented in **Section III** and also on **Figures 3-1 thru 3-6**. *Only those Alternatives which were classified as Possible or Difficult were evaluated in the next phase.*

5. Alternative Evaluation Phase

In this phase, the Engineer conducted the evaluation of the Alternatives by reviewing each one against the Evaluation Criteria that were previously developed. Even though many of the Evaluation Criteria are fairly subjective in nature, by splitting the evaluation into many separate criteria, and evaluating each one relative to the other alternatives, the evaluation process itself is more objective. The results of these evaluations are presented in tabular format in **Section III**.

6. Report/Recommendations Phase

In this Phase the Engineer analyzed the results of the Alternatives Evaluation Phase, and identified the recommended improvements. Recommendations take neighboring segments into account, consider broader goals such as corridor consistency, and present what the Engineer believes to be the optimal comprehensive solution to the Study Area's needs.

Recommendations are presented in **Section IV** and also in graphic form on **Figures 4-1 thru 4-6**.

D. Description of Study Approach / Procedures

1. Early Coordination with Local Officials

The Study began with an effort to involve City and local officials by requesting their comments and concerns about the Study Area and its needs. The following departments and agencies were contacted in the Early Coordination part of the project:

- ◆ City Council members
- ◆ Economic Development
- ◆ Engineering Department
- ◆ Fire Department
- ◆ Housing and Neighborhood Development
- ◆ Parks & Recreation
- ◆ Planning Department
- ◆ Police Department
- ◆ Traffic Division
- ◆ Transit
- ◆ Utility Department
- ◆ Monroe County School Corporation

Each of these groups was given the opportunity to comment on the Study's goals and note any concerns or comments that they would like to

have considered in the study process. Feedback was obtained from many of those contacted, and the results of this process are noted throughout **Figure 2** and in **Section II**. Samples of the letters sent to solicit comments are in **Appendix B**.

2. Mapping Collection

The Engineer obtained various maps for the Study Area. The maps were reviewed and information that was deemed pertinent to the Study was either added to the Study figures or included in this report.

Mapping obtained for this Study included:

- ◆ Excerpts from the City's Alternative Transportation Master Plan
- ◆ City Bus Routes Map
- ◆ City Bike Route Map
- ◆ City Master Thoroughfare Plan
- ◆ Wetland Inventory Map
- ◆ USGS Topographic Quad Map
- ◆ FEMA Flood Insurance Rate Maps for floodplains and floodways
- ◆ City Geographic Information System (GIS) mapping in electronic form to use as the base map for other Study figures.
- ◆ Digital Aerial Photography

Bridge plans were obtained from Monroe County for their bridge on Old SR 37 just east of Walnut Street, and from INDOT for their bridge on SR 45/46 over Cascades Road.

The Engineer checked the databases kept by the Indiana Department of Environmental Management to determine if there are any Underground Storage Tanks, Leaking Underground Storage Tanks, Brownfields or other sites in the Study Area that are being tracked by that agency.

The results of this effort are found throughout the Study, especially in **Figure 2** and in **Section II**. Many of the maps are too large for direct inclusion in the report. A section from the USGS Topographic Quad Map and the FEMA Flood Insurance Rate Maps are provided in **Appendix C**, since these maps are not so easily obtained from the City's website.

3. Field Reconnaissance Activities

The Engineer conducted several tasks in the field to obtain additional information not available on the mapping. Inventory and measurements were taken for features that were deemed to be significant to the potential addition of bicycle and pedestrian facilities. These included:

- ◆ Guardrails
- ◆ Fences

- ◆ Culverts
- ◆ Pedestrian Bridges
- ◆ Exposed Rock and Rock Outcrops
- ◆ Waterfalls
- ◆ Traffic Signage and Speed Limits
- ◆ Pavement Widths
- ◆ Pavement Condition
- ◆ Utility Features

The Engineer also collected hundreds of pictures and compiled photo albums to better facilitate meetings and for use in this report. Information collected was added to **Figure 2** and is described in **Section II**.

4. Preparation of Study Area Base Map

In order to present the variety of data that was gathered for this Study, it was necessary to have mapping that could be made into various figures and exhibits in the report. In this case, the City's own GIS mapping was the base map from which the figures were created.

The City provided its GIS mapping and aerial photography. Features most important to the Study were made more prominent and other layers were removed to create more readable and attractive exhibits. Important features such as fences, wood lines and cart paths that were visible in the aerial photographs, but not in the GIS mapping, were added.

The area is large, and irregularly shaped, and it was determined that six sheets at a scale of 1"=200' would provide the most reasonable scale at which to present the information.

The base map provides the foundation for the figures in the report.

5. Study Workgroup Identification and Involvement

The Study is primarily an engineering feasibility study, and as such is expected to provide City staff with important information and guidance for making future project implementation decisions. The Study combines information about the Study Area from many sources in a manner that has not before been available to decision makers. The complexity of the area makes this a needed step toward the eventual design of the facilities.

Previous efforts by the City in developing its Alternative Transportation Masterplan incorporated involvement by the general public to assist in setting general goals and vision for this area. This Study is focused on determining how best to implement the recommendations of that previous work, and thus the current need for involvement is primarily through those

individuals and Departments that will be charged with implementing projects.

It was important that the Engineer have the involvement of City Staff to provide guidance, review and feedback throughout the course of the Study. The Study Workgroup was created to address this vital need. The Study Workgroup was comprised of representatives of the Departments of Parks & Recreation, Planning, Engineering, and Housing & Neighborhood Development. The Workgroup served several vital functions in the process including:

- ◆ Setting the initial purpose of the Study and the Study limits
- ◆ Approving the Study Approach
- ◆ Supporting Eagle Ridge in the acquisition of Study Area data.
- ◆ Reviewing and assisting in the prioritization of the Alternative Evaluation Criteria
- ◆ Reviewing and revising the Design Criteria for multi-use paths, sidepaths, bike lanes, and shared road facilities
- ◆ Assisting in the identification and development of potential alternatives
- ◆ Review and comment on the Alternative Evaluation process
- ◆ Review of the Study Report.

Interaction with the Study Workgroup was ongoing during the preparation of the Study, but most of the feedback and comments were gathered during three formalized meetings referred to as Study Workgroup Meetings. The meetings were held at key milestones in order to gain needed guidance and decisions at critical times during the effort. These key milestones were the:

- ◆ Review of the Study Area Base Map / Review of Design and Evaluation Criteria
- ◆ Review and Development of Alternatives
- ◆ Presentation of the Draft Report with Recommendations

The activities of the Study Workgroup are documented in **Appendix A.**

6. Development of Bike/Pedestrian Facility Design Criteria

Design Criteria are the basic feature descriptions and dimensions that would apply to the development of potential alternatives. Initial recommendations for “desired” and “minimum” dimensions were offered by the Engineer. There was discussion over these criteria, as well as some discussion about the City’s experience and tolerance of failing to meet these criteria due to site constraints. The Design Criteria, as accepted by the Study Workgroup, are as follows:

Sidepath Design Criteria:

	Desired Value	Minimum Value	Notes
Width	10' in high mixed-usage areas, 8' in other areas	Generally 8', 6' in extreme site conditions	Widen on Steep Grades
Side Clearance to obstacles	6' max	18" minimum	Poles, signs, etc.
Path shoulder grades	2' wide, 5' wide if at top of a slope	Use rail/barrier above dangerous slope if too close	Make shoulder as flat as possible (2% cross slope desired for joggers)
Vertical Clearance	As much as practicable	8' for point obstacles, 10' for underpasses	N/A in study area
Design Speed	Design to selected speed of faster bicyclists	20 mph, if downgrades exceed 4%, raise to 30 mph	Consider mixed use setting. Encourage faster cyclists to use roadway
Separation from road edge	As much as practicable	If under 5', consider physical separation barrier	
Sight Distances	As much as possible, mutual visibility is essential	See Note	Depends on factors of speed, grade and roadway curvature. Consider values for cars on roadway at crossing points
Curve Radius	100' for 20 mph, 156' for 25 mph 225' for 30 mph		
Grades	Less than 5%	5-6% up to 800', 7% up to 400', 8% up to 300' 9% up to 200' 10% up to 100' 11% up to 50' 12.5+% Not Allowed	Add additional 4' width for dismount/pushing bicycles, add several other safety measures to warn of descent speeds and provide for clearances, use switchbacks
Bike/Ped Bridge Clear Width	Path width + 2' each side	Path width	

Bike Lane Design Criteria:

	Desired Value	Minimum Value	Notes
Bike lane width	6' in rural setting, 4' in urban setting 5' next to parking 5' next to guardrail or other barrier	4'	

Shared Road Design Criteria:

	Desired Value	Minimum Value	Notes
Paved Shoulder Width	4' wide, 5' if next to barrier or rail	2'	Any shoulder is better than none
Widened street lanes	14', 15' on steep grades	12'	

7. Development of Alternative Evaluation Criteria

The Alternative Evaluation Criteria are the characteristics of the various bicycle and pedestrian alternatives that were used to measure and compare those alternatives. These Evaluation Criteria identify the most important issues to the City in deciding which alternative is optimal. The Evaluation Criteria provide a more holistic and objective way to “weigh” which alternatives would best meet the City’s goals.

The Engineer provided a tentative list of evaluation criteria that could be used to compare the alternatives. The initial list was offered to facilitate the discussion and brain-storming of the Study Workgroup. Criteria of greater importance and lesser importance were identified, and the list was refined to better represent the will of the Workgroup.

The Workgroup noted which criteria were more or less important to them. These were provided in followup emails. The full documentation of this process is explained in **Appendix A – Study Workgroup Meeting Records**, in the record dated February 13, 2007.

The effort identified two types of Evaluation Criteria. First were the “Fatal Flaws” that if noted would effectively eliminate an alternative from further consideration. Second were the less-critical criteria that could be used to evaluate alternatives and compare them.

Fatal Flaws for Use in Eliminating Alternatives:
◆ Results in a “net loss” to safety
◆ Fails to provide the primary linkage from Miller Showers Park to Griffy Lake Filtration Plant
◆ Results in an unsafe or operational problem at the entrance to IMI
◆ Wetland Impact greater than 0.10 acre
◆ Failure to meet requirements for remediation of Bike Shop site

If alternatives do not possess fatal flaws, then the following criteria were used to evaluate and compare alternatives in later study phases:

<u>Alternative Evaluation Criteria</u>
<u>Safety Criteria:</u>
◆ Safety of Recreational bike/ped (off-road) users
◆ Safety of competitive (on-road) bicyclists
◆ Safety of Motorists
<u>Access and Connectivity Criteria:</u>
◆ Supports connections to future system links/destinations
◆ Compliance with ADA-accessibility requirements
<u>Park and Roadway Use Criteria:</u>
◆ Potential for reduction in park use due to inconvenience of one-way roads
◆ Potential for negative impacts to passive areas of the park
◆ Provides for both competitive and recreational users without mixing them
◆ Operational impacts of one-way roads to use by schools, residents or emergency services
<u>Natural Environment Impacts:</u>
◆ Impacts to mature trees
◆ Impacts to stream channel or banks that are natural or could be restored to more natural condition
<u>Construction Cost Criteria:</u>
◆ Approximate construction cost
<u>Quality of Bike/Ped Experience:</u>
◆ Enjoyable facility from perspective of recreational cyclist or pedestrian
◆ Consistency of facility with adjacent sections

8. Identification of Study Area Segments and Initial Alternatives

Various portions of the Study Area have common characteristics that offer a particular set of potential alternatives. Thus the Study Area could be broken into segments where a particular set of alternatives are feasible. The Engineer reviewed the Study Area mapping and set the segments where significant changes in the corridor occurred.

For example, a hillside close to the road edge might make a sidepath more difficult but still possible, whereas a multi-use path far off the road edge may not be feasible. The separation between the road and the creek

suggests whether a sidepath on that side is feasible. If flat ground exists on the far side of the creek, then a multi-use path on that side may be a feasible alternative.

The intention of breaking the Study Area into segments was to determine what alternatives might be feasible, and then to note where conditions had changed and the available alternatives were different. The identification of the Study Area segments and their potential alternatives is presented in **Section III** and in **Figure 3**. Figure 3 in its initial form was the central discussion exhibit for the second Study Workgroup Meeting.

9. Procedure for Cost Estimation

Probable construction costs were reviewed on a conceptual level. They were established by the number of “key cost elements” that are featured in a particular alternative. Key cost elements for this work include:

- ◆ New Bridge
- ◆ Size of the Bridge (Small or Large Span) Bridge
- ◆ Hillside and Rock Excavation
- ◆ Major Clearing Operations
- ◆ Significant Grading/Earthmoving
- ◆ Stream Bank Stabilization
- ◆ Amount of New Pavement
- ◆ Amount of Full Depth Pavement (needed for vehicular traffic)
- ◆ New traffic signal

The estimates presented herein should be considered conceptual only, and are only intended to be used as a means to compare alternatives. Lacking an actual site survey with likely geotechnical investigations, this Study cannot provide the more detailed estimates usually prepared with a designed project. Still, this is a conceptual level effort and the feedback is meaningful for a general consideration of potential costs.

The cost estimates are offered in the form of approximate ranges:

Low Cost – Few or no key cost elements, anticipating fairly standard path construction costs.

Moderate Cost – One or two key cost elements, with some consideration for the magnitude of the cost elements.

High Cost – Two or more cost elements, and significant in size.

Very High Cost – Multiple cost elements, more than one of large magnitude.

II. STUDY AREA FEATURES, CONSTRAINTS AND ISSUES

A. Natural Environment Features

1. Wetlands

Wetland research and delineations were conducted by Williams Creek



Consulting. Four separate wetlands were identified including two that border the northern section of Cascades Road north of the softball fields, one small one in the southeast corner of the intersection of Walnut and Old SR 37, and one large one north of the Griffy Lake Filtration Plan and inside of Old SR 37 and Dunn Street. The largest one is over 5 acres in size. All four of these are deemed to be jurisdictional “waters of

the U.S.” per the procedures of the Army Corps of Engineers. These are shown on the aerial photograph outlined in blue.

Early communication with members of the Study Workgroup revealed a strong desire to avoid impacts to wetlands. The Army Corps of Engineers and the Indiana Department of Environmental Management would require aggressive permitting efforts and mitigation for impacts that are larger than 0.10 acre. ***It was determined for this Study that Wetland Impacts are considered a fatal flaw, and no alternative with an impact greater than 0.10 acre would be considered.***

On a positive note, the wetlands are considered a vital resource and the Study acknowledges that ***some alternatives offer an opportunity to incorporate a wetland or wildlife viewing feature.*** To meet the goal of avoiding significant impacts, the alternative must be routed to border, not cross, a wetland. The wetlands have been added to **Figures 2, 3 and 4.**

A full Wetland Investigation Report was prepared by Williams Creek and was submitted to the Parks Department under separate cover.

2. Cascades and Water Falls

The total drop from Upper Cascades to Lower Cascades is approximately 95'. Several small, natural falls are present in the Park; each offering a notable natural attraction that should be left undisturbed by any bicycle/pedestrian improvements. There is at least one opportunity, noted below, where the largest of these falls could be a noted feature alongside a path improvement.



The largest waterfall is approximately 15' high. It is in the southern portion of the park, west of the Waterfall Shelter. A footpath provides access to the area below the falls. This fall is very close to an existing unimproved trail that is being considered as a potential path route up to the City Skatepark. It would not impact the falls for viewing to be provided along a path that followed this trail. A railing will be needed for safety. The falls are noted on **Figure 2**.

Another ravine area that was checked for potential routing of a connection from Upper to Lower Cascades is just west of the Tibetan Monastery near the base of Club House Drive. This ravine features a series of smaller falls in steps. The area around those falls is deemed too steep to be appropriate for paved path improvements. Each of the natural falls offers a potential highlight along an unimproved park trail, but each is in a ravine that is too steep for path construction.

3. Stream Channels and Banks

The creek through Cascades Park is a valued natural resource, even though very little of the channel is still in a natural condition. City staff noted that runoff from the IMI facility frequently clouds the water. The quality of the water is questionable, though this was not researched because it is not pertinent to the Study.

The stream channel has been lined by various manmade treatments, including stone masonry blocks, concrete, stone gabion baskets, and even poured riprap. A few natural areas remain. The walled sections make the creek unapproachable to the visitor in most areas, and a roadside hazard on the park road, where vertical drops of 8' within 5' of the edge of pavement are not uncommon.

Parks staff has commented that there is a desire to restore the creek banks to a natural or at least more approachable



condition, though this is only feasible on the western side. On the east side of the creek, the separation from the road is too limited to permit such a treatment without removing the road.

For the purpose of this Study, ***the creek is considered to be untouchable space, with the exception of potential bridge improvements to create new crossings or to improve existing ones.*** Path improvements should also be kept separated from the creek to the extent possible to not preclude future bank treatment projects by the City. Walled sections of the creek are noted on **Figure 2.**

4. Mature Trees



Early coordination with the Urban Forester revealed that there is a high regard for the mature tree growth in the park, but no single tree or species of tree was noted as especially sensitive. Mature trees are regarded as an important feature in the park and efforts should be made to avoid impacts that are not absolutely necessary.

That being said, the general consensus appears to be that ***tree impacts should be avoided whenever practicable, but should not be considered a fatal flaw or exclude an***

alternative from consideration if its benefits justify the impact.

The City conducts replanting as a routine part of its projects. It is worth noting that the IDNR will require tree mitigation, generally at a rate of 2:1, for any tree impacts in the mapped floodway. This includes most of the Lower Cascades Study Area and the area north of the Griffy Filtration Plant.

5. Wildlife Habitat

The Engineer checked with the Parks Department for any information or comment regarding the potential for sensitive wildlife habitat in the Study Area. With the exception of wetlands, which are discussed elsewhere, no special concerns were noted regarding wildlife habitat.



B. Built Environment Features

1. Historically Significant Structures

The City's Project Manager for Historic Preservation noted several features in the park which have been determined to be historically significant. These include:

- ◆ Waterfall Shelter
- ◆ A small well house structure near the Waterfall Shelter
- ◆ The stone retaining wall behind the Waterfall Shelter
- ◆ A small Well House structure



- ◆ across from the abandoned Bike Shop.
- ◆ Thirty-eight limestone benches and tables in Lower Cascades
- ◆ Sycamore Shelter (formerly the Bath House Shelter)
- ◆ Limestone block channel walls along the creek

Most of these features were built in the 1930's as WPA projects.

Generally speaking, *impacts to these facilities would not be acceptable*. Fortunately, most of them are positioned in areas that allow path alternatives to avoid them.

2. Playgrounds

The new accessible playground in Lower Cascades is a popular and important asset for the City. It has increased interest and visitation of Cascades Park since its opening. Providing connection to this facility is an important goal for this Study.

It is also important that the potential addition of a bicycle and pedestrian facility through the park does not negatively impact the use of the playground. This could happen either by taking some of its limited space, or by creating an unsafe condition where bicyclists would be too close to



small children who are playing. Separation is very appropriate in this circumstance.

There is also a set of swing sets near the Sycamore Shelter that is expected to remain. Suitable separation from any potential bicycle path is also appropriate there.

Alternatives in these areas must avoid direct impact to the playgrounds, and should maintain appropriate separation to reduce the

likelihood on conflicts with playground patrons.

3. Recreational Spaces

a. Picnic Shelters

The Park hosts two primary picnic shelters, the Waterfall Shelter and the Sycamore Shelter. Both are in Lower Cascades in the central portion of the Park. Both are west of the creek.

Both shelters are used routinely. For the purposes of this Study, *it is important that any new bicycle and pedestrian facility does not negatively impact their use* by passing too closely to the shelters or by making access more difficult. In fact, new bike/ped facilities could improve the access to these facilities. As noted previously, both shelter houses are deemed “historically significant” and may not be impacted directly.



b. Softball Fields

Located in the northern part of Lower Cascades, these fields are not heavily used except during City tournament events. Still, they are a valued asset and are expected to continue to be used. For this Study, *they are considered an important destination that needs to be linked to new bicycle and pedestrian facilities.* The most important constraints that the area presents is a lengthy chain link fence alongside Cascades Road. This fence varies from 5’ to 8’ from the edge of the road. The fence could be moved if

necessary. A bigger concern is the existing concessions building, which cannot be moved. Fortunately, there is a space of 21' between the building and the fence, which would allow sufficient room for a path so long as the softball patrons were safely separated from the path facility and conflicts minimized. Some internal fencing modifications may be required to safely accommodate a path.

c. Volleyball Court

There is an informal volleyball net with a sand court just east of the Waterfall Shelter. It is unpaved and has no marked lines or boundary. It should be avoided if possible, but it also would not be a major challenge to relocate the court if that is deemed necessary.

d. Skate Park

One of the desired path links for this Study is to connect Lower Cascades to the City Stakepark on Kinser Pike. The Skatepark is relatively new and avoiding impacts to its operation is not a particular problem. ***A short path connection has already been built along the west edge of the property that is appropriate for the connection of a path from off-site.*** The analyses of alternatives for this connection are a topic later in this report.

4. Road Pavement Widths

Most of the roads in the Study Area have a width that varies from 20' to 22'. This includes Cascades Road, Old SR 37, and Club House Drive. Kinser Pike is generally wider at approximately 24'. Dunn Street is notably narrower at only 17'.

Roadway widths impact the Study primarily when examining the alternatives for Shared Road (Signed Bike Routes) and Bike Lanes. Design Criteria call for minimum lanes widths of 12' to support a Shared Road (Bike Route) use. ***Only Kinser Pike could be considered to meet this standard.*** All other roads are too narrow to be considered appropriate for Bike Routes. Given that Bike Lanes should be 4' wide at a minimum, ***none of the roads in the Study should be deemed sufficiently wide at this time to be appropriate for the marking of Bike Lanes.*** Taking 4' from the existing road will make the vehicle lanes unsuitably narrow and force vehicles into the bicycle lane.

The conclusion that can be drawn from this is that any alternative for a Shared Road or a Bike Lane must include a widening of the available pavement, with the only exception of Kinser Pike as a Bike Route. Current

Bike Routes on Cascades Road and Club House Drive have been designated under substandard conditions. They do work, but this is primarily because the roads are relatively low in motor vehicle use.

5. Sight Distances

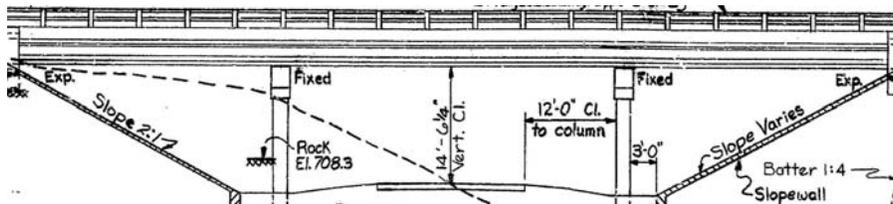
Sight Distance is the primary safety concern when evaluating potential locations for bicyclists and pedestrians to cross the paths of motor vehicles. It is important that all travelers can see each other at a sufficient distance to make a good crossing decision, and also that drivers can stop in the event that someone is in the crossing in an emergency situation.

Sight Distance is primarily a factor of the speed of motor vehicles. Drivers must be able to see a pedestrian in the walkway and come to a full stop. Also, *we must consider the actual speed of the vehicles, which is usually greater than the posted speed limit.* From the Indiana Design Manual published by INDOT, the following Stopping Sight Distance criteria were adopted to examine potential crossings:

Motor Vehicle Speed	Roads Applicable	Minimum Stopping Sight Distance
30 mph	Cascades Road (posted at 20 mph), Club House Drive	200 feet
45 mph	Old SR 37, Kinser Pike, Dunn Street (posted at 30 mph)	360 feet

6. Underpass for SR 45/46

Cascades Road goes under SR 45/46 just north of Gourley Pike. The underside offers plenty of vertical clearance, and the distance between the road edge and the bridge piers is approximately 11.5' on the east side of Cascades Road and approximately 12.5' on the west side. The drawing below is from the original plans for this structure, showing the average proposed offset from the piers was intended to be 12'. While this does



present a fairly tight location for a potential sidepath, *the location can support a sidepath to either side of the existing road edge.* Shifting of the approaches, while

feasible, would force traffic closer to the bridge piers, which is not desirable from the perspective of driver safety. It also appears to be possible to route a path behind the eastern pier, though the path would need to be ramped to make it. INDOT will not permit the undermining of

the bridge piers, so excavation under the bridge or slope walls is not feasible. A route behind the pier columns would be expensive to build.

7. Roadway Bridges

a. Narrow Bridge just north of IMI Entrance

There is an old concrete bridge with deteriorated concrete railings 650' north of the IMI Entrance. It offers a width inside the railings of 24'. The east-side railing is partially collapsed and is being held in place by an abandoned sanitary sewer pipe, otherwise it would have long since fallen. The bridge does not provide adequate width for the potential addition of bike lanes. A sidepath could only be considered here if either the road is converted to one-way, or if the structure were replaced with a wider one to allow the addition of a sidepath.



As can be seen, the structure railings are already failing. The bridge is of substandard width and the area

immediately east shows a history of erosion and scour. ***Regardless of the alternative eventually recommended, this structure is in need of replacement.*** Because it needs to be replaced, this bridge need not be considered a determining constraint in the Study...the bridge should be replaced in the manner that also supports the recommended alternatives for this segment of the roadway.



b. Bridge on Club House Drive

The bridge on Club House Drive is immediately west of Cascades Road. It is a concrete slab bridge with a 26' span of the creek, and offers 28' between the wooded railings that are anchored to either side. It does offer sufficient width to offer a bike lane on either side if vehicle lanes were marked at 9' wide.

The width of the bridge is not sufficient to support a sidepath. Due to the number of school buses traversing this route, any

recommendations to narrow the width available to motor vehicles

would require careful consideration. These large vehicles are in the process of completing or initiating a turn while on the bridge, demanding even more space. Narrowing of the pavement is not advisable given the turning sweep of these large vehicles.

c. Old SR 37 Bridge east of Walnut

This bridge is part of Monroe County's inventory (designated as #911) and is a single-span concrete prestressed beam bridge with a 70' span over Griffy Creek.



The bridge currently has a 20.5' bituminous pavement overlay for Old SR 37, and offers a total width between railings of 33'. The north shoulder area is 6' wide and the south shoulder area is 7' wide.

Given the span required to cross the creek at this location, and the potential expense of a bridge that size, the potential for crossing a sidepath ON this bridge must be considered.

33' is sufficient to support both the road and a sidepath. However, with vehicles traveling at an estimated speed of 45 mph in this area (posted at 30 mph), separation of the path from the road becomes an important consideration. In order to provide a sidepath, the road would have to be shifted to one side, and a barrier should be placed between the road and path. Roadway approaches would have to be widened to that side to support the shift of the road. This is deemed feasible, but it is acknowledged that crossing Griffy Creek in any manner is going to be expensive.

The Study Workgroup suggested that the underside of the bridge be examined for its potential to offer a safe crossing under Old SR 37. This could potentially eliminate the need to provide a traditional at-grade path crossing with its usual safety concerns. ***Unfortunately, the Engineer checked the site and determined that adequate space is not available under this bridge.***

d. Dunn Street Bridge

The "bridge" that carries Dunn Street over Griffy Creek is actually a pair of 72" corrugated metal pipes with a block-masonry headwall at each end. This structure is in extremely poor condition. It offers no railings, though the masonry headwalls extend high enough to present a sort of curb alongside the road. Except, that is,

where the masonry has broken free. On both sides, there is an abrupt drop to the creek from the edge of the road and no curb or rail offered.

The roadway is 17' wide with no shoulders. There is undermining and scour of both the headwalls and the pipes evident on both ends of the pipes. The water on the downstream (west) end was noted to be quite deep, perhaps 5' or more.



This structure is hazardous and needs to be replaced regardless of bicycle/pedestrian concerns. Its replacement should include due consideration for how bicycle and pedestrian traffic might also be accommodated.

8. Pedestrian Bridges

The Lower Cascades Park area offers six pedestrian bridges over the creeks. These have span lengths that vary from 14' to 34', and range from 2.6' to 13' in width (between the railings). Of the six, only three are sufficiently wide to suggest two-way use, and only one offers sufficient width to be suitable as part of a standard path.

Two of the bridges include steps, making them unsatisfactory for accessibility. ***The bridges are a vital part of the Park's assets but are limited in their use because of these factors.***

The two most suitable bridges are those nearest the playground. These appear to be the newest. One is 5.5' wide and the other is 13' wide. While the one is clearly substandard as a two-way path bridge, it provides



this service currently and might be viewed as an appropriate route to riders to dismount and then walk their bicycles across to park them at the playground. 5.5' is not wide enough to offer a traditional two-way biking facility.

Because bridges are a vital part of a path facility, alternatives must consider additional bridges or the replacement of some bridges.

9. Concrete Ford for Motor Vehicles

This rather unique feature is located in the central portion of Lower Cascades. A ford is provided that is used by motorists to access a gravel parking area west of the creek. It also forms a concrete slide that is used as a play area by children. Water-quality issues aside, it is a notable park feature and it is expected to be maintained.



The ford does not offer safe access for bicyclists or pedestrians. After even short rain events, the water is quite fast and powerful. It has even been known to push small vehicles into the creekbed.

For the purpose of the Study, this feature is simply assumed to remain in place, but is not viewed as contributing to bicycle or pedestrian mobility.

10. Lack of Shoulder / Edge Drops

In addition to the edge drops noted at some bridges, there is also concern for missing shoulders and edge drops along the roadways in the Study



Area. Foremost among these is along the edge of Cascades Road in the southern half of the Lower Cascades area. Here, the creek is especially close to the road edge. There is no shoulder and in some areas the drop to the creek is less than 3' from the edge of the road. *This is important to the Study in that it makes sidepaths infeasible, and even means that a roadway widening to add bike lanes will not be possible on the west edge of the road without railings and bank stabilization in some areas.*

Other areas with edge drop concerns include Club House Drive in its ascent to Upper

Cascades. The hillside off the east side of the road is quite steep but no shoulder or railing is offered. This makes roadway widening or the addition of bike lanes more complicated in these areas. It essentially precludes widening of Club House Drive on the east side.

Edge drops were not noted to be of special concern along Kinser Pike, the portion of Club House Drive in Upper Cascades, on Cascades Road north of Club House Drive, or along Old SR 37 east of Walnut.

11. Signalized Intersection at Old SR 37 and Walnut Street.

The existing signal at the intersection of North Walnut and Old SR 37 is a two-pole span with no left turn or pedestrian displays. The City's Traffic Division reports that the existing controller is a fully-actuated system with presence detection on Old SR 37 and pulse/high-speed detection on North Walnut. The signal cabinet was upgraded in the summer of 2006 and is upgradeable for additional phasing or pedestrian actuation if needed.



Traffic Division recommends that if the bike path crosses Walnut Street at the intersection, then the signal should be replaced with a four-pole box span configuration and pedestrian actuated countdown displays. They suggest that if turning warrants are met, then it may be desirable to add left-turn displays at this time. (Such warrants are not in the scope of this Study, but should be completed later). The addition of left turn lanes would require some additional lane construction with additional vehicle detection. The Traffic Division has no current plans to upgrade this signal.

C. Study Area Constraints

1. Grade from Lower to Upper Cascades

a. Two Trail Links to Skate Park



There are two existing unimproved trails from Lower Cascades to the City's Skatepark.

The first route traverses the hill and ravine just north of the Skatepark. The trail was created when a sanitary sewer was installed, and the manholes are evident at regular intervals along the 1,060'-long route.

This route starts near the concrete ford in Lower Cascades and runs westward up the hill. The trail passes through a clearing near the Park's tallest natural waterfall.

The trail eventually meets a short section of paved path in the Skatepark. The trail climbs a total of 95' at an average grade of 9.6%.

PROFILE OF TRAIL TO SKATEPARK FROM CONCRETE FORD						Totals:
Length of Section (feet):	210	310	240	120	180	1,060 feet
Climb in Section (feet):	28	26	6	18	17	95
Average Grade:	13.3%	8.4%	2.5%	15.0%	9.4%	9.6%

With two of its sections at over 10% grade, this unpaved route is only used by hikers and mountain bikers. The middle of the route offers a relatively gentle slope of 2.5%. There is also one area where the trail widens enough to offer an obvious potential resting area, though a railing would be needed.

The western sections, which are currently at 15% and 9.4%, could be flattened with a series of switchbacks to reduce the grades. Space appears to be available to achieve this. The lower section at over 13% does not have the space available for such a treatment.

This appears to be the only feasible route that connects to the Skatepark from the north. Other prospective routes in this vicinity that ascend the hillside would intrude into the ravine and falls, or the hill slopes are too steep to be considered feasible

routes. Only with major impacts to the natural environment, including large excavations of the existing hillsides, could the needed connection be achieved on a different route in this area.

This route is not “accessible” by ADA standards. If paved, this route must be specially marked and signed to warn travelers of steep grades. Inexperienced riders should dismount and walk their bicycles, especially if traveling downhill. Pull-off areas should be considered at regular intervals to provide a place to rest safely while making an ascent. Even under the best circumstances, this route will continue to be very challenging, especially to inexperienced riders.

The second route to the Skatepark from Lower Cascades also follows a sanitary sewer. This route starts from the vicinity of an existing but deteriorated bridge along Cascades road where a crumbling concrete bridge crosses the creek. A sewer line climbs the hill in this area along the boundary between the park property and the IMI property.

Use of this trail is not currently encouraged. It is posted for “No Trespassing” by IMI. Based on map review, it is unclear if the barricades are truly on IMI’s property. Concerns by IMI over use of this route are likely, though it may be possible to stay on Park property along the route. Coordination with IMI would certainly be needed. These concerns aside, this route offers an interesting alternative to the steeper and more difficult grades found on the other route to the skate park.



On this trail, the grade difference is more manageable. Lower Cascades is at higher elevation at this end, and the total climb to the skate park is only about 50’. The route climbs for only about 760’ of its total 1,200’ length, resulting in an average climb of 6.6% (4.1% for the total length). The route appears to have the potential to be made ADA-

accessible.

PROFILE OF TRAIL TO SKATEPARK ON ROUTE NEXT TO IMI						Totals:
Length of Section (feet):	200	60	200	300	440	1,200 feet
Climb in Section (feet):	14	8	14	16	0	50
Average Grade:	7.0%	13.3%	7.0%	5.3%	0.0%	4.1%

Upon field review, it was found that there are no severe drops to either side of the route, either into the Lower Cascades valley or

into the IMI property. The route does not appear to offer the widths needed for switchbacks, but neither is the edge of the hill so close as to prevent regrading along the route. It is amply wide for frequent resting points.

It is reasonable to assume that a barrier fence would be needed along the route to deter trespassing onto IMI property. Even with this added concern, the route appears to offer the best opportunity to make a connection between Lower and Upper Cascades at slopes more accessible and appropriate for recreational riders.

b. Roadway Link on Club House Drive

The only paved connection from Lower to Upper Cascades is on Club House Drive. This route is also steep, but is a current marked bike route and it is used by competitive bikers. Overall, the route climbs 92' at an average grade of 8.4%.

The profile of this climb is as follows:

PROFILE OF CLUB HOUSE DRIVE FROM LOWER TO UPPER CASCADES									Totals:
Length of Section (feet):	130	70	130	70	180	230	160	130	1,100 feet
Climb in Section (feet):	8	8	18	8	14	24	4	8	92
Average Grade:	6.2%	11.4%	13.8%	11.4%	7.8%	10.4%	2.5%	6.2%	8.4%

Field review included an examination of the ravine west of the Tibetan Monastery. This ravine is fairly wide and offers an inviting grade at first, but then rapidly steepens into hillsides that are not deemed feasible routes for a path without causing major impacts to the hillsides and environment. There is a notable set of step-falls in this ravine that would make a nice destination for an unimproved park trail, but only for use by hikers.

Club House Drive appears to offer the only feasible corridor for the routing of a paved facility. No independent alignment appears to be feasible. The east side of Club House drops steeply all the way to the creek at the bottom of the valley. The west side could be excavated to make room for a sidepath, though at high cost.

This location should be clearly marked to warn bicyclists of the steep grades. Travelers should be encouraged to dismount, and uphill travelers should have rest areas available for the ascent.

2. Hillsides, Slopes and Rock Outcrops

The hillsides, slopes and rock features form what is both the greatest asset of the park and its greatest challenge. The slopes and rock outcrops can be excavated to limited extent, but this work makes path facilities much more expensive to construct. Impacts to these features are not deemed desirable, but will be necessary in some cases to provide a bicyclist and pedestrian-friendly facility. The purpose of the Study is to find the optimal solution by balancing these varied factors and minimizing the impacts to the natural environment.



Per discussions with the Study Workgroup, it is recognized that some impacts to the hillsides, slopes, and rock outcrops will be necessary. These impacts should be limited to critical locations. The Workgroup was not supportive of new path alignments that ascend the hillside from Lower to Upper Cascades due to the magnitude of this effort both in terms of cost and in impact to the natural environment of the Park.

3. Valley Width in Lower Cascades

Lower Cascades, especially its southern half, is quite narrow. In some areas, the creek and the existing roadway occupy almost the entire floor of the valley. In other areas, some flat ground is available to the west of the creek, or to the east of the road. This width constraint weighs heavily on the alternatives available in these areas.

4. Floodplains and Floodways

Flood Insurance Rate Maps are available for most of the Study Area. Both Griffy Creek and the stream that runs the full length of Lower Cascades have been fully mapped to include determination of flood elevations (FEMA designates these areas as Zone AE). These are presented in **Appendix C**.

A review of the mapping reveals that essentially the entire usable portion of Lower Cascades (the relatively flat ground at the base of the valley), is

in the floodway, not just the floodplain. The portion of the Study Area along Griffy Creek is also in the mapped floodway. Also, both areas have more than 1 square mile of watershed that drains to them, which is the threshold for IDNR permitting.

This has important ramifications for future alternatives and the eventual design of projects. The IDNR has jurisdiction over these areas, and any projects in the floodway will require the obtainment of a permit for Construction in a Floodway. Additionally, trees that are cleared in a regulated floodway require mitigation, generally at a 2:1 ratio. That is a concern, but is compatible with the City's stated policy of tree replacement in conjunction with its projects.

Future projects will have to demonstrate that they do not decrease the cross sectional area available in a flood event to convey water, or that such decrease is minimal enough so as to not raise flood elevations by more than 0.14 foot. In some cases, approval can also be gained if the negative impacts are suffered only by the property owner of the project, and do not affect adjacent property owners. Evidence of these generally requires watershed and waterway modeling, though this is not always the case. What is certain is that permits will be needed, and careful consideration will be required to ensure there is no significant negative impact to the ability of these creeks to convey stormwater.

5. Bike Shop Site

The City recently acquired this property alongside Cascades Road. The site is a known brownfield and the City is currently awaiting a final determination from IDEM on the required remediation requirements. The site is tracked by IDEM under Site Code #4980015. The City intends to remove the building from the site.



The expected remediation includes placing a permanent hard surface over the site and a ban on excavation of the soils. Much of the site is impervious already. For the purpose of this Study, there are only two issues to consider. First, *a path improvement would need to be placed over the top of whatever permanent hard surface is set here.* Second, the mandate that the area remain hard surface suggests that this may be an

ideal location for basketball, tennis, parking or something else that needs a hard surface anyway. *Future alternatives across this site should consider the eventual use of the site. Paths should be located to avoid conflict with these other needs. Also, some consideration should be given to connecting this site to other nearby destinations such as the playground.*

6. Tibetan Monastery

The existing monastery structure is a unique and valued feature in this quiet setting. Impacts to the structure are not deemed to be acceptable. *Path improvements that may need to be routed around the edges of the property should be routed so as to not significantly change the setting of the monastery itself.*

7. Mobile Home Park

The mobile home park that is located on the west side of Cascades Road just north of Club House Drive poses an obstacle to the addition of a sidepath or multi-use path on the west side of Cascades Drive. Some of the units are close to the road, and a path facility would need to be positioned close to them. Residents park near the edge of Cascades Road, forming another obstruction.

Another challenge in this area is a row of evergreen trees that lines the edge of Cascades Road. Their location would not allow a sidepath through this area. Furthermore, were the trees to be kept as is, they present a significant obstacle to proper sight distance and would prevent drivers exiting the mobile home park from seeing path users along this side of Cascades Road.

Through consultation with the Study Workgroup, it was learned that IDEM may have had discussion with the park owners regarding concerns over their septic systems. **This was not verified.** At this time, the park is home to many residents as evidenced by the numbers of vehicles entering and exiting the park during fieldwork.



For the purpose of this Study, and given the fact that any path improvements could be years away due to funding limitations, it was decided that the mere presence of the park is not sufficient reason to exclude alternatives on the west side of Cascades Road. Conditions change over time, and the

circumstances could arrive that would allow at least a strip of land alongside Cascades Road to be purchased by the City or otherwise made usable for a bicycle and pedestrian facility.

8. IMI Entrance

The IMI entrance poses a special area of concern in this Study. The site is heavily used, and Cascades Road is heavily traveled by concrete trucks. This is not expected to change. For this Study, *it is important to note the site and to ensure that alternatives in this area are able to*



provide a safe and reasonable way for bicyclists and trucks to operate in each other's vicinity. This may be achieved either by putting the path facility on the opposite side of the road or by improving sight distances to allow bicyclists to safely cross the entrance.

9. Cascades Golf Course



The golf course is an important feature in the Study Area because it is both a destination and a major constraint to permissible routes for path facilities.

The Study Workgroup confirmed that no alternatives should be considered which requires a major change in the golf courses or their operation. *This was interpreted to mean that no routes that cross an existing fairway should be examined.* Also, no alternative

should require a major change to a tee or green area. That being said, the only corridor that allows the potential for a connection from Kinser Pike to the golf course clubhouse is alongside Club House Drive.

The fences shown in the picture could be shifted farther from the road, but a path along the route would also have to impact full-grown trees lining Club House Drive. Land inside the fences could be used for path improvements if not being used as a part of fairways, greens or tee areas. It is important that path travelers and golf course patrons (using the cart paths) are kept on separate facilities.

D. Bicycle/Pedestrian Issues

1. Types of Improvements under Consideration

To clarify what is meant by a “sidepath” or “shared road” or other alternative, the various bicycle and pedestrian facilities that are under consideration and discussed in this report are described below:

Shared Road (Signed Bike Route) – a street that is shared by both vehicles and bicycles without a designated bicycle area. These are preferred by experienced/competitive bicyclists but not preferred by inexperienced bicyclists. For pedestrians, this type of route only offers walking on the edge of the road.

Bike Lanes – a portion of the road that has been designated and designed for the use of bicycles with distinct signage and pavement markings. Bike lanes are on both sides of a two-way road, and are used only one-way on either side. Bike lanes are preferable to Shared Roads because they offer a designated place for bicyclists and provide some separation from motor vehicles. Pedestrians gain this same advantage of separation from vehicles.

Sidepath – a paved surface that is separated from the road and designated for use by bicyclists and pedestrians, excluding motor vehicles. For the purpose of this Study, the sidepath is assumed to follow the road in an essentially parallel alignment, though the separation may vary. Sidepaths are preferred by less experienced bicyclists. Some concerns of mixed use by pedestrians and bicyclists are noted, though the separation from vehicles makes this a better facility for bicycles and pedestrians than bike lanes. Experienced or competitive bicyclists do not prefer these facilities because they have to contend with slower moving, less-predictable users. For this Study, this is the most basic form of a preferred bicycle/pedestrian facility because it offers separation from motor vehicles.

Multi-Use Path – a paved surface that is on an independent route from roadways. Similar to sidepaths in use and preferences, but since it does not follow the same route as the road, it attracts more experienced bicyclists. The multi-use path is fully separated from traffic and sometimes provides a different link than the road. In this Study, this is the most desirable form of bicycle/pedestrian facility.

Unimproved Trail - an unpaved trail only for use by pedestrians and mountain bikers. They are not ADA-compliant because they are unpaved. In some areas of the Study, it is the only feasible way to provide access, due to grades or natural environment features.

These definitions are compatible with and adapted from, the Alternative Transportation and Greenways System Plan.

2. Difference between Competitive Bicyclists and Recreational Users



The Study takes into account the significant difference between experienced (or competitive) bicyclists and recreational bicyclists. Cascades Park is traversed by many cyclists including cycling teams who are moving at higher speeds and prefer to ride on the road. They would use a bike lane if offered, but typically do not prefer to use sidepaths because they do not wish to deal with slower moving travelers. There is also a notable safety concern of having pedestrians and inexperienced cyclists such as young children in a position to stray in front of much faster cyclists. ***For the Study, these competitive cyclists are assumed to prefer to be on the road regardless of other facilities that may be available. For them, it is important to find ways to provide improved Shared Road or Bike Lane facilities.***

Inexperienced and recreational bicyclists include such riders as children and families, or those moving at a more leisurely pace. They prefer to be separated from traffic, including fast-moving cyclists. ***For this Study, it is assumed that these recreational riders (and pedestrians), will prefer to use sidepaths or multi-use paths whenever available.***

3. Preference for Separated Facilities for Recreational Users

The Study Workgroup noted that it is a primary goal of this Study to find a feasible way to provide a separated facility for recreational bicyclists and pedestrians. With the addition of the playground to an already family-oriented and casual-recreational area, the Study Workgroup strongly urged the preference be toward separated facilities for these users. The group even noted that a family with young riders might likely choose to ride in the car if separated facilities are not available. This preference is reasonable given the current use of the park. Currently, competitive riders already use the area in spite of its shortcomings. Recreational riders are not presently using the park to any notable extent.

In the Alternative Evaluation process, the feasible alternatives are grouped for these different types of users. Consideration is given to each and even though their needs are related, they are different.

4. Importance of Consistency

The Study Workgroup noted a strong preference for alternatives that offer a high degree of consistency. Consistency of the facilities would include the following considerations:

- ◆ Staying on one side of the road, not switching back and forth.
- ◆ Minimizing the number of road crossings
- ◆ Providing a typical width and appearance with few changes
- ◆ Minimizing the number of changes in the type of facility provided.

Providing a consistent facility has benefits for safety, enjoyment, and even cost. *For this reason, the evaluation of alternatives includes a criterion for examining an alternative's consistency with adjacent segments.*

5. Conflicts/Crossings with Motor Vehicles

Perhaps the single most important feature for providing a safe bicycle/pedestrian facility is to make crossing points as few in number, and as safe, as possible.

Sight Distance is a key element in the review of potential crossing points and was discussed previously. Crossings should be located where drivers have the chance to come to a full-stop in the event there is a pedestrian or cyclist in the roadway.

Crossings must be well marked for both the path user and especially for the vehicle driver. Pavement markings and warning signs are needed.

Various options are available for enhanced signage to include pedestrian actuated warning lights and countdown timers.



To provide access across North Walnut Street, the only crossing location being considered is at the intersection. Traffic is moving too fast to consider any other location. For this Study, *it is assumed that the upgrade of this intersection will be an integral part of any recommendation. The upgrade will include pedestrian actuation and phasing adjustments, pedestrian countdown heads, and widened pavement to allow for a more separated crossing.*

6. ADA Compliance and Accessibility

ADA compliance is an important consideration for any bicycle and pedestrian facility. In all but the most extreme cases, accessibility should be a key design criterion and must be satisfied.

This Study Area offers a clear case of an “extreme case”. Connections from Lower to Upper Cascades cannot always be completed in a fully ADA-compliant configuration without causing major and unacceptable impacts to the natural environment of the park. This is a common problem throughout Bloomington and is not a unique characteristic of the Park.

To the extent possible, *future designs should attempt to make the facilities as compliant as possible*, even if it means providing frequent resting points or other considerations to help users contend with the steep grades.

7. Public Safety / Emergency Response

Early coordination with the Fire Department revealed its primary concerns about multi-use paths are in regard to responding to emergencies. They expressed that if a multi-use path is not fully visible from the roadway, then the path should have some sort of location/identification system so that emergency services would know how to find someone and know where to enter the path to reach them more quickly. The way to achieve this might be by providing distance markers at regular intervals, so long as these markers are unique to each location.

The Fire Department also requested that if the signal at Walnut Street and Old SR 37 is to be upgraded, then the signal equipment include new Opticom receivers. These allow the emergency vehicles to pre-empt the operation of the signal so that they can get a green light and move more safely through the intersection.

Both of these issues are important, but not really in the nature of this Study. Those are design issues that should be considered when future projects are in detailed development and design. *Wayfinding and location-marking signage would be best adopted on a City-wide scale to maximize consistency and local understanding of the markers*. Special equipment can be included in a future design for the intersection of North Walnut and Old SR 37.

E. Alternative Transportation and Other Local Issues

1. City Bus Connections

The only City bus route in the Study Area is along Kinser Pike, with stops at Club House Drive and at Bloomington North High School. This route is designated as Route #1. Transit officials noted that all City buses are equipped with bike racks, and they are used.

Recommendations from this Study will further the effort to increase the City's interconnected network of Alternative Transportation options. Because the Study Area includes this bus route, the addition of bicycle and pedestrian facilities will be able to link with the bus system.

It is not a focus of this Study, but the addition of a City bus route into the central part of the Lower Cascades Park may be a reasonable response to the increasing interest in the new playground.

2. School Bus Routes

Through coordination with the Monroe County School Corporation, it was discovered that the Study Area is traversed by school buses on regular routes. School officials estimate that Club House Drive is used by 11 buses each morning and evening. Of these, 10 go north to the intersection of Walnut with Old 37. Only one goes north through the main part of Lower Cascades, eventually connecting to North College Avenue at Miller Showers.

The School Corporation informed us that 6 of the 10 buses using Club House and the north section of Cascades Road are contract buses. These drivers are due additional compensation if any change is made to their contracted route that increases the mileage. If the road were closed to school bus use at current rates it would cost the MCSC an estimated \$9,720 per year. Future years could be renegotiated and reduce that cost, but certainly the MCSC would face an additional cost if school buses could no longer use the route for any reason.

For the purpose of this Study, the only potential change that would affect bus routes is the possible conversion of the roads to one-way streets. If this were to happen on the northern section of Cascades Road, the MCSC has a strong preference that the road be one-way northbound to help the buses keep their afternoon schedules. *Potential impacts to school bus routes and added costs to MCSC are important considerations for this Study, especially when evaluating the alternative to make roads one-way.*

3. Review of City’s Alternative Transportation and Greenways System Plan

The City’s Alternative Transportation and Greenways System Plan (ATGSP) includes this area, but with minimal recommendations. It calls for both Cascades Road and Club House Drive to be designated as Signed Bike Routes. They already are. At the time the plan was written, the new playground had not yet been built. The changed condition is one of the reasons that it is now desirable to develop bicycle and pedestrian facilities to an even higher level in the Study Area.

Any improvements to bicycle and pedestrian facilities beyond the current condition will be considered compatible with, and enhancing, the recommendations in the ATGSP. City Planning noted that an update to the ATGSP is underway for 2007, and that they will incorporate the recommendations of this Study into the update of the ATGSP.

The ATGSP calls for the implementation of bike lanes along North Walnut Street. This is a busy, arterial street with high-speed traffic. Planning noted that if bicycle facilities for competitive bicyclists were improved through Cascades Park, then this may provide a reasonable alternative to riding alongside arterial traffic on Walnut. This will also be considered in the update to the ATGSP.

4. Consideration for Possible Future Bike/Ped Links

Planning noted several locations that may be connected to the path system in the future. The potential connection and the area that might be linked in the future are as follows:

Location to be served in Study Area:	Potential Area to Link:
Hillview Drive @ Old SR 37	Marlin Hills
North Stone Mill Road @ Old SR 37	Marlin Hills
Club House Drive (at road to Lion’s Club Shelter)	Northwood Estates
Kinser Pike @ Winding Way	Fritz Terrace Nbrhd.
Kinser Pike at City Skatepark	Cascades Addition
Old SR 37 (Cascades Road) @ Gourley Pike	Colonial Crest Apts.
Griffy Lake Filtration Plant	Blue Ridge Nbrhd.

For this Study, the extent to which an alternative supports these potential future connections is an evaluation criterion.

5. Anticipated Developments

The Engineer contacted the Planning Department for information on anticipated developments in the Study area. The only location noted is at the northeast corner of North Walnut with Old SR 37, which has been identified as a potential office space site.

The Development Review process of the City takes into account the need on the site for path and sidewalk improvements. *Bicycle and pedestrian facilities need to traverse this area. The Planning Department should ensure that a path, or at least space for a path, is provided in the site plan.* This developer may even be required to construct some of these facilities during their construction project.



6. Potential Needs for Utility Upgrades in Study Area

The Lower Cascades area has a significant amount of sanitary sewer piping. Watermains are not believed to be present. As part of the Study, the Engineer attempted to coordinate with the City Utility Department to determine if they are aware of any problems with their pipes in the Study limits. They were also asked if they have plans for upgrades or replacements in the near future.

If so, there would be potential cost advantages to the City to at least ensure that a path project were not built that would need to be replaced after a utility project. In these circumstances, it would be best to coordinate the project to ensure that the work was done only once. There may even be opportunities to share some costs. The Utility Department did not notify the Engineer of any problems or plans for utility upgrades.

7. Conversion of Roads to One-way for Motor Vehicles

One of the alternatives under consideration in the Study Area is the potential conversion of at least a portion of Cascades Road or Club House Drive to one-way streets. This would simplify the process of providing a separated sidepath in the narrower areas.

After discussions with the Study Workgroup and the Monroe County Schools, it is deemed undesirable to give further consideration to the conversion of Club House Drive or the portion of Cascades Road north of Club House Drive. These areas have residential housing and apartments. The roads are used by school busses going both directions.

This leaves the section of Cascades Road south of Club House Drive to be considered. It is agreed that such a conversion should not occur south of the entrance to IMI, because this would require all of IMI’s concrete trucks to drive through the central part of Lower Cascades including past the playground. This is very undesirable.

For the purpose of this Study then, *the only roadway which is being considered for one-way conversion is that section of Cascades Road that is north of the IMI entrance, yet south of Club House Drive. There is also strong consensus among the Study Workgroup that the direction of one-way travel would be northbound to ease entry into the park from the central parts of the City.*

In the section of Cascades Road under consideration, recent traffic data provides the following peak traffic counts:

Average Peak Hour Volume on Weekdays in Early March 2007	Northbound Traffic Volume		Southbound Traffic Volume	
	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
Just south of Club House Drive	19	52	24	49
Just north of IMI Entrance	19	49	24	43

This data provides us with the average number of vehicles going each direction during the peak hour of the weekday mornings and afternoons. Per the discussion above, it is the southbound traffic that would be diverted to other routes if the road were made one way. On a daily basis, the average number of vehicles using this section of road on weekdays is as follows:

Average Daily Volume on Weekdays in Early March 2007	Northbound Traffic	Southbound Traffic
Just south of Club House Drive	370	392
Just north of IMI Entrance	361	379

This data brings forth a couple of notable issues. First, there is a definite existing pattern of vehicles that enter the area going southbound for some destination in the corridor, then turn around and return north. There is no other reasonable explanation for the higher counts near Club House Drive.

Second, all the data above was collected in the first week of March. Temperatures were relatively cold, so there is very little playground visitation traffic represented in these numbers. In fact, this data provides numbers that represent a more accurate count of the vehicles traversing the road that are not visiting the park itself.

This is not an exact science, and certainly some of the traffic is related to park use. Even during fieldwork on the coldest days, several parked vehicles were noted with people eating lunch in their vehicles, taking a walk, or exercising. Maintenance vehicles were seen on the park road as well, and some stopped in the corridor. The Average Daily Volume numbers above are not only travelers going through the park. Some percentage are stopping.

If this section of Cascades is made one-way northbound, *one can surmise that the number of southbound trips that will be diverted to other routes on an average weekday, not considering park visits, is probably between 300 and 350 trips each day.*

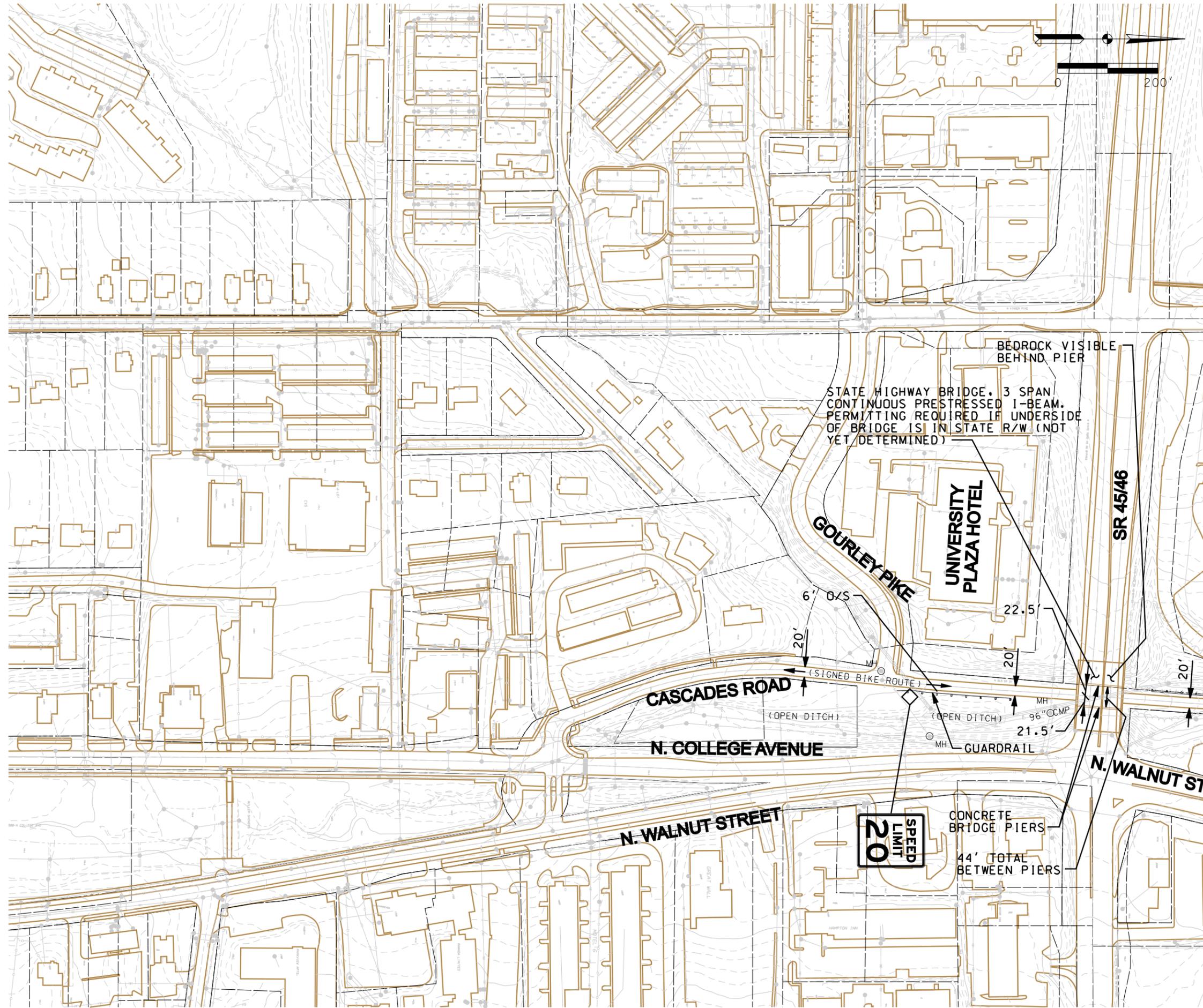
Given that the road connects to North College Avenue at Miller Showers, it is reasonable to assume that most of these diverted trips will be made on the northern section of Cascades Road and then southbound on Walnut Street.

This information is useful in trying to assess the impact of converting the road to one-way use.

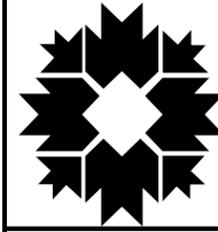
Figures 2-1 through 2-6 on the following pages provide a graphic summary of the data collection efforts of the Study, and include notes and details related to the content of this section.

On these figures, many notes are provided regarding the Study Area's features, constraints and issues.

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CITY OF BLOOMINGTON
 DEPT. OF PUBLIC WORKS
**EXHIBIT 2 - STUDY AREA
 EXISTING CONDITIONS**



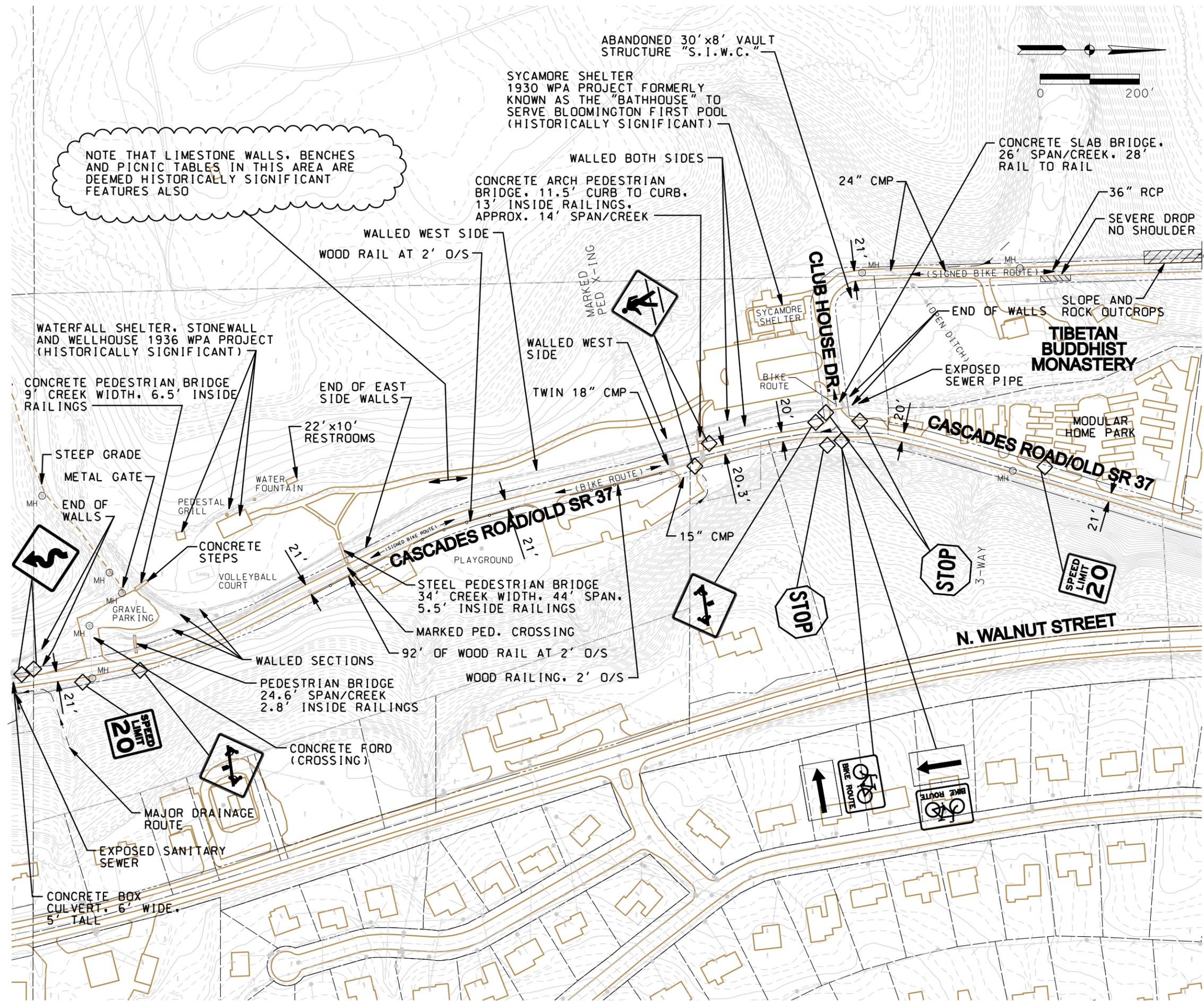
CASCADES PARK /
 GRIFFY LAKE
 BIKE / PEDESTRIAN
 FEASIBILITY STUDY

FIGURE
2-1

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NOTE THAT LIMESTONE WALLS, BENCHES AND PICNIC TABLES IN THIS AREA ARE DEEMED HISTORICALLY SIGNIFICANT FEATURES ALSO

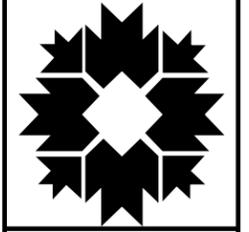
ABANDONED 30'x8' VAULT STRUCTURE "S.I.W.C."

SYCAMORE SHELTER 1930 WPA PROJECT FORMERLY KNOWN AS THE "BATHHOUSE" TO SERVE BLOOMINGTON FIRST POOL (HISTORICALLY SIGNIFICANT)



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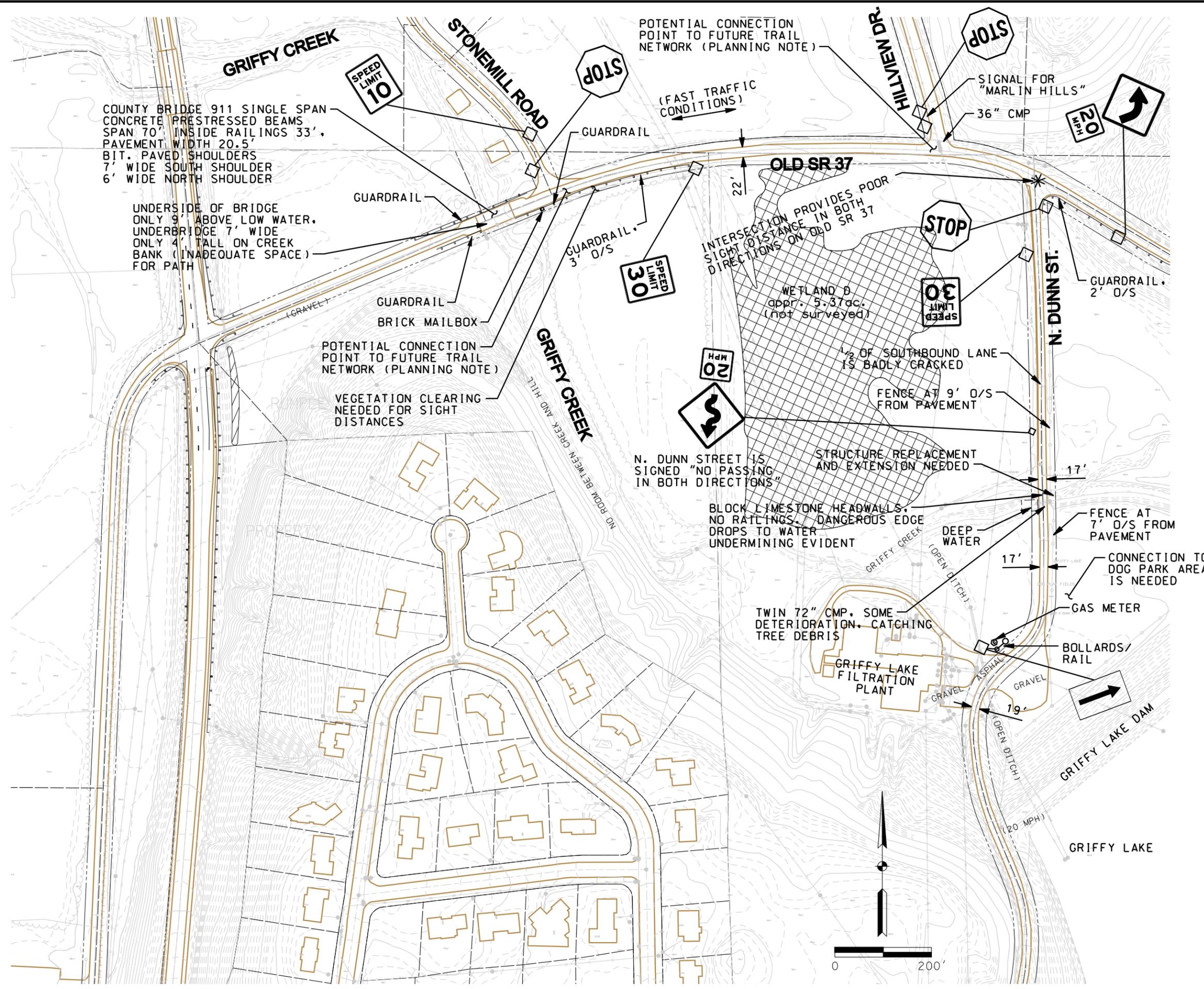
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**EXHIBIT 2 - STUDY AREA
 EXISTING CONDITIONS**



CASCADES PARK /
 GRIFFY LAKE
 BIKE / PEDESTRIAN
 FEASIBILITY STUDY

FIGURE
2-3

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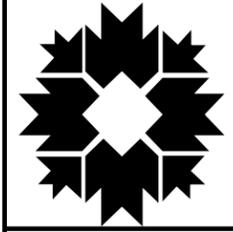
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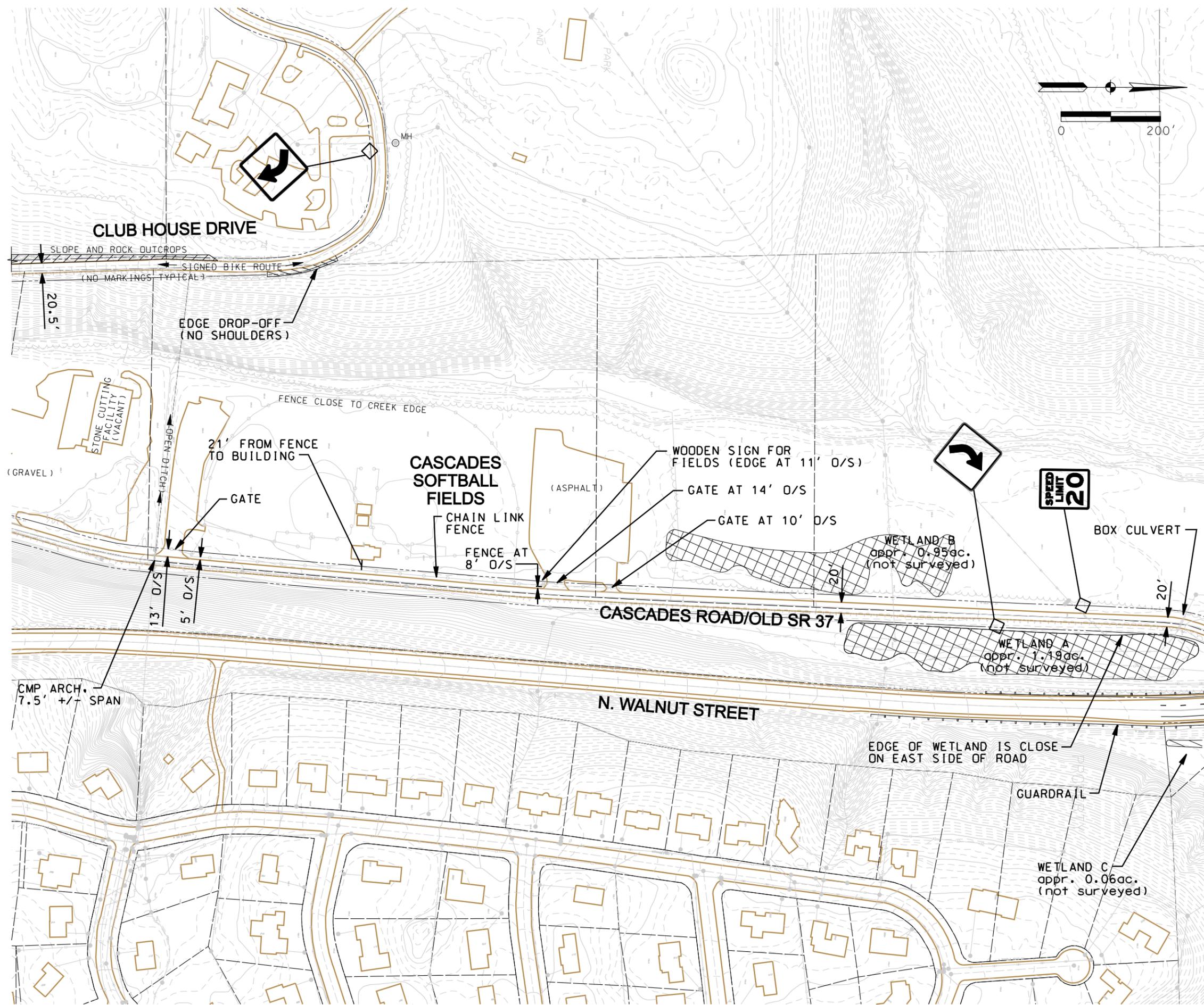
EXHIBIT 2 - STUDY AREA
EXISTING CONDITIONS



CASCADES PARK /
GRIFFY LAKE
BIKE / PEDESTRIAN
FEASIBILITY STUDY

FIGURE
2-6

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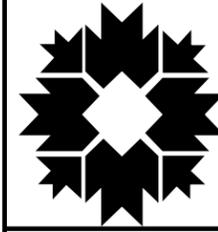
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EXHIBIT 2 - STUDY AREA
EXISTING CONDITIONS



CASCADES PARK /
GRIFFY LAKE
BIKE / PEDESTRIAN
FEASIBILITY STUDY

FIGURE
2-5

III. ALTERNATIVES IDENTIFICATION AND EVALUATION

A. Segments and Potential Alternatives

*The Study Area was divided into segments in which various constraints combine to determine the alternatives that are available. Where the site constraints change, a new segment was started with its own set of potential alternatives. These Segments are presented on **Figures 3-1 to 3-6**.*

1. Segment A: Miller Showers Park to SR 45/46 Bridge

This segment is characterized by its fairly narrow corridor. The deep ditch east of the road and the private property west of the road exclude multi-use paths, but its open roadside conditions are friendly to sidepaths and roadway widening. The space between bridge piers is 44', allowing a sidepath, though a bit tight, to be placed on either side of the road. The conversion of Cascades Road to one-way in this area is not being considered to prevent access problems to Gourley Pike and to IMI.

The segment starts at the existing crosswalk from Miller Showers Park, and any alternative must meet the existing crosswalk on College Avenue. The segment ends just north of the SR 45/46 bridge at the point where guardrail begins on the west side of the road.

Alternatives in Segment A

Possible: Sidepath on west side
 Sidepath on east side
 Shared road or bike lanes with widening

Difficult: N/A

Not Feasible: Multiuse path either side (inadequate space)
 One way of Cascades with sidepath (public/usage-IMI)

2. Segment B: SR 45/46 Bridge to IMI Entrance

This segment is tightly constrained on both sides with a hillside to the east and the guardrail and deep ditch to the west. Multi-use paths are not feasible here. A sidepath on the east side is difficult because it will require some hillside excavation. A sidepath on the west side is only feasible if constructed in conjunction with a shift of the roadway to the east. The potential one-way conversion of Cascades Road is not feasible here to avoid ingress/egress concerns at IMI.

Alternatives in Segment B

- Possible: Shared road or bike lanes with widening
- Difficult: Sidepath on east side (hillside)
Sidepath on west side with road shift to the east (hillside)
- Not Feasible: One way of Cascades with sidepath (public/usage-IMI)
Sidepath on west side without road shift to the east (guardrail)
Multiuse paths either side (inadequate space)

3. Segment C: IMI Entrance to Narrow Bridge

This segment is narrow and constrained similar to segment B. There is no guardrail on the west side but the creek bank is very close to the roadway. The hillside to the east would need to be cut to make room for a sidepath on that side, which is feasible but difficult. This segment starts north of IMI, thus the one-way conversion of Cascades Road is deemed a potential alternative in this segment.

Alternatives in Segment C

- Possible: Shared road or bike lanes with widening
- Difficult: One way of Cascades with sidepath (public/usage)
Sidepath on east side (hillside)
- Not Feasible: Multiuse paths either side (inadequate space)
Sidepath on west side (creek too close)

4. Segment D: Narrow Bridge to South of Bike Shop

While this segment is constrained on the east side of Cascades Road by the same hillside, the west side has changed. Relatively flat ground becomes available on the west side of the creek, and a true multi-use path is now possible. The multi-use path on the west side of the creek would require the construction of a new bridge across the creek. There is currently a crumbling concrete structure that makes this crossing, but it would need to be replaced.

This creek crossing should be located where the existing structure is. The reconstruction of another structure under Cascades Road is desirable given its condition, but not necessarily required unless a sidepath or bike lanes are proposed. If both structures are replaced, construction should be tackled at the same time to minimize cost and road closures.

This segment hosts the sharpest curves on Cascades Road and sight distances are very poor in the curve. This is a concern for sidepath and roadway widening options. The roadway could be shifted westward around the curve to lessen hillside impacts, though this would not necessarily be any less expensive to build. Conversion to one-way continues to be an alternative in this segment.

Alternatives in Segment D

- Possible: Shared road or bike lanes with widening
Multiuse path west side of creek (new bridge req'd)
- Difficult: One way of Cascades with sidepath (public/usage)
Sidepath on east side of road (hillside, but could widen road to west around curve, also need new bridge on road)
- Not Feasible: Multiuse paths east side of creek (hillside)
Sidepath on west side of road (creek too close)

5. Segment E: South of Bike Shop to Concrete Ford

The west side of the creek continues to offer relatively flat ground, making a multi-use path attractive here. A replacement of the small bridge to access the area around the Waterfall Shelter would be needed.

The area east of the road is wider and allows the consideration of a sidepath with greater separation. Work on the east side will need to consider the future changes to the bike shop site. This is likely to include paved facilities such as basketball courts or parking. A multi-use path on the east side is still not considered so that this paved space might be better preserved for its likely future. Even without a multi-use path on this side, it is important that some sort of paved connection to other nearby park features be provided. In the event that a path is not recommended for the east side, then a sidewalk to the playground with access to nearby pedestrian bridges is desirable.

The creek is very close to the road excluding a sidepath on the west side of the road. The one-way conversion of the road continues to be an option.

Alternatives in Segment E

- Possible: Shared road or bike lanes with widening
Multiuse path west side of creek (bridge over small creek req'd)

Sidepath on east side (must consider bike shop remediation and future facilities on that site)

Difficult: One way of Cascades with sidepath (public/usage)

Not Feasible: Multiuse paths east side (inadequate space)
Sidepath on west side (creek too close)

6. **Segment F: Concrete Ford to Club House Drive Intersection**

This segment offers much the same topography as Segment E, but the presence of the playground excludes any multi-use trail alignments to avoid proximity to the playground. It also makes the placement of a sidepath on this side more difficult in order to prevent conflicts and hazards from close proximity to the playground.

A multi-use path west of the creek continues to be possible, and it is recognized that connections across the creek to the playground would be vital. Existing bridges suit this purpose. This is the last segment in which a one-way conversion is to be considered.

Alternatives in Segment F

Possible: Shared road or bike lanes with widening
Multiuse path west side of creek (use existing bridges over creek to access playground)

Difficult: One way of Cascades with sidepath (public/usage)
Sidepath on east side (proximity to small children-playground)

Not Feasible: Multiuse paths east side of creek (inadequate space)
Sidepath on west side (creek too close)

7. **Segment G: Club House Drive Intersection to Softball Fields**

This segment of the Cascades Road corridor is characterized by a steep hillside to the east, and a broad flat valley to the west. The flat ground is occupied by the softball fields, a stone cutting facility, and a mobile home park. Sidepaths on either side will be difficult, though for very different reasons.

One-way treatments for the road are no longer considered due to school busses and residential property in this area. Multi-use paths are not feasible on the west side due to the aforementioned properties. The

softball fields extend almost to the creek and do not leave room for a path behind them.

Alternatives in Segment G

Possible: Shared road or bike lanes with widening

Difficult: Sidepath on west side (mobile homes and parking)
Sidepath on east side (hill/drainage)

Not Feasible: One way of Cascades with sidepath (public/usage)
Multiuse paths (soft ball fields - fence)

8. Segment H: Softball Fields to West of Intersection with Walnut

This segment offers relatively flat ground to either side of Cascades Road, but also has wetlands identified to either side. The wetlands are closest to Cascades Road on the east side of the road, making a multi-use path infeasible, and a sidepath very difficult.

A west-side multi-use is possible, and would have to be routed through wooded areas. It would have to be placed west of the delineated wetland. A sidepath on the west side is also possible.

Alternatives in Segment H

Possible: Sidepath on west side
Multiuse path west of the delineated wetlands
Shared road or bike lanes with widening

Difficult: Sidepath on east side (wetlands)

Not Feasible: Multiuse path east side (wetlands)
One way of Cascades with sidepath (public/usage)

9. Segment I: Intersection Area, Old SR 37 & Walnut Street

This small segment is the intersection of North Walnut and Old SR 37. For safety reasons only alternatives that cross at the intersection, with appropriate pedestrian-friendly actuation, etc., are being considered here.

A new signal will be required to support the introduction of a sidepath with a crossing at this location. It is believed that a north side crossing will conflict with fewer turning vehicles in the intersection. Crossing on both

sides may be possible, but would introduce more conflicts as well as less predictability of movements by pedestrians and bicyclists.

Alternatives in Segment I

Possible: (NOTE: Intersection Improvement required for all)
Sidepath and crossing on north side Old 37
Sidepath and crossing on south side Old 37
Shared road or bike lanes with widening

Difficult: Crossing both sides (more crossing conflicts)

Not Feasible: Multiuse paths/separated crossing (must cross at intersection)

10. Segment J: East of Intersection with Walnut to Stone Mill Road

This segment offers ample flat terrain to either side of Old SR 37, but is constrained by the new development on the north side and the hillside on the south side. The segment includes the existing bridge over Griffy Creek. Because the existing bridge offers a 33' width, sufficient for the roadway and a sidepath, the dual use of the existing bridge must be considered. Regardless of the side, the roadway would have to be shifted off-center to make room for a sidepath.

Providing a separate bridge is a difficult option. While constructible, a new bridge of this span will be very expensive.

Alternatives in Segment J

Possible: Sidepath north side
Sidepath south side
(Both require shifting of approaches on bridge)
Shared road or bike lanes with widening

Difficult: Sidepaths with separate pedestrian bridge (cost)

Not Feasible: Multiuse paths without a new pedestrian bridge

11. Segment K: Stone Mill Road to Dunn Street Bridge

This large segment includes any routes from the area near Stone Mill Road and the bridge on Dunn Street. The area hosts a large wetland (over 5 acres) and also large meadowland. Because of major safety concerns at the intersection of Dunn Street with Old SR 37, alternatives that use this

intersection are not preferred. They only appear on the list because they are the existing condition.

To reduce wetland impacts, no multi-use path should go through the wetland. Both a sidepath and a multi-use path on the south side of Old SR 37 are possible. A creekside multi-use path would be difficult, but is to be evaluated.

Alternatives in Segment K

Possible: Multiuse path through meadow/adjacent to wetlands
Sidepath west of Dunn/south of Old 37

Difficult: Multiuse path alongside creek (floodway/permit)
Bike Lanes with road widening (poor sight distances)
Shared road (existing condition)

Not Feasible: Multiuse path through wetlands
Sidepath east of Dunn/north of Old 37 (safety)

12. Segment L: Dunn Street Bridge to Griffy Filtration Plant

This segment includes the bridge on Dunn Street and the area immediately north and east of the Griffy Lake Filtration Plant. It is constrained on the east side of Dunn Street by the fenced dogpark, and thus east-side alternatives are not deemed feasible. However, it is recognized that a paved connection to the dogpark is desirable.

The structure on Dunn Street needs to be replaced. Alternatives include the replacement of the structure as an assumed part of the work required. A multi-use path or a sidepath on the west side are both deemed possible.

A separate pedestrian bridge could be built, but is considered difficult due to its cost.

Alternatives in Segment L

Possible: Multi-use path with Dunn structure replacement
Sidepath on west side with Dunn structure replacement
Shared road (existing condition)
Bike Lanes with Dunn structure replacement and roadway widening

Difficult: Multiuse path with pedestrian bridge (cost)

Not Feasible: Bike Lanes without Dunn structure replacement (lacks width)
Sidepath on East side with Dunn structure replacement (fence)
Multi use path without a pedestrian bridge (hill slopes to creek)

13. **Segment M: From Lower Cascades to Skate Park**

This segment is the link from Lower Cascades to the City's Skatepark. It includes the two existing unimproved trails as well as areas north or south of these existing trails. It is characterized by the climb of the steep hillside from Lower to Upper Cascades.

The only feasible alternatives are along the existing trails, and all are difficult. The existing trail near IMI offers more attractive slopes. Also, it appears that the existing trail may cross into IMI's property, and that parts of IMI's operation are on City park property. Coordination with IMI will be required if this trail is to be improved.

Alternatives in Segment M

Possible: N/A

Difficult: Multiuse paths on existing trails (steep grades and high cost to regrade paths)
Possible partial segment switchbacks

Not Feasible: Multiuse path on new alignments (high cost/impact)

14. **Segment N: Club House Drive, Area in Lower Cascades**

This segment is the portion of the Club House Drive corridor in the Lower Cascades area. It is occupied by the Tibetan Monastery, Sycamore Shelter, and the bridge on Club House Drive. It offers flatter topography but impacts around the shelter or monastery must be kept to a minimum.

Sidepaths on either side are feasible, though one on the west side of Club House would lead to potential conflicts with the entries to the parking lot at the Sycamore Shelter. A multi-use path close to the Tibetan Monastery would probably be frowned on, and one on the west side would need to be routed behind the Sycamore Shelter as far from the building as practicable.

Alternatives in Segment N

Possible: Shared road or bike lanes with widening

Sidepath on east side

Difficult: Sidepath on west side (slope/parking conflicts)
Multi-use path behind shelter (thru picnic area)
Multi-use path on east side (private property)

Not Feasible: One way of Club House Dr. with sidepath (public/usage)

15. Segment O: Club House Drive, Hill to Upper Cascades

This segment is the portion of the Club House Drive corridor that ascends the hill from Lower to Upper Cascades. It starts near the Tibetan Monastery and ends east of the golf course club house. It is characterized by steep hillsides on both sides, the one on the east being especially steep. There are no feasible alternatives on the east side.

There are no easy options on the west either. Roadway widening or a sidepath will be difficult and expensive due to the excavation of the hillside. A multi-use path on an independent alignment (with switchbacks) may be feasible, but will be extremely expensive.

Alternatives in Segment O

Possible: Shared road (existing condition)

Difficult: Bike lanes with widening (dropoff east/hill west)
Sidepath on west side (high cost, hill excavation/retention)
Multiuse path on west side with switchbacks (very high cost, impacts)
Reconstruct Club House to average grade (very high cost)

Not Feasible: Sidepath east (cost, loss of road support)
Multiuse path on east side (constructability, extreme cost)
Multi use path route through golf course (impacts to golf course)
One way of Club House Dr. with sidepath (public/usage)

16. Segment P: Club House Drive, Next to Golf Course Parking

Located fully in Upper Cascades, this segment offers rolling topography and adequate room on either side of the road for a sidepath. Parking for the golf course, and its traffic, create a special concern on the south side of this roadway. Multi-use paths on independent alignment are not deemed feasible in this segment due to the potential impacts to golf course facilities. The only alternatives are along the roadway corridor.

Alternatives in Segment P

- Possible: Shared road or bike lanes with widening
Sidepath on north side
- Difficult: Sidepath on south side (conflict with parking)
- Not Feasible: Multiuse paths on either side (impacts to golf course)
One way of Club House Dr. with sidepath (public/usage)

17. Segment Q: Club House Drive, between the golf courses

This segment is very similar to Segment P in that only alternatives alongside the roadway are under consideration, but the golf course parking is not a special concern making north and south sides equally feasible. Potential conflicting features are the existing wooden fences, mature trees, and the cart paths. Avoiding significant impacts to the golf course are important, but relocating sections of either the fence or the cartpath would not be unreasonable if needed. Mature trees should be avoided if at all possible.

Alternatives in Segment Q

- Possible: Shared road or bike lanes with widening
Sidepath on north side
Sidepath on south side
- Difficult: N/A
- Not Feasible: Multiuse paths either side (impacts to golf course)
One way of Club House Dr. with sidepath (public/usage)

18. Segment R: Kinser Pike, Club House Drive to North High School

This segment is limited by the golf course on the north side and residential properties on the south. Only roadside alternatives are deemed feasible. A sidepath on the north side will require work bordering the golf course and the shifting of the existing fence. A sidepath on the south side is feasible but would be very expensive due to limited right-of-way.

Alternatives in Segment R

- Possible: Shared road or bike lanes with widening
- Difficult: Convert south side sidewalk to sidepath (lack of R/W)
Sidepath on north side (proximity to golf course)

Not Feasible: Multiuse paths on either side (private property and golf course)

Figures 3-1 through 3-6 show these segments and the listing of alternatives on mapping of the Study Area.

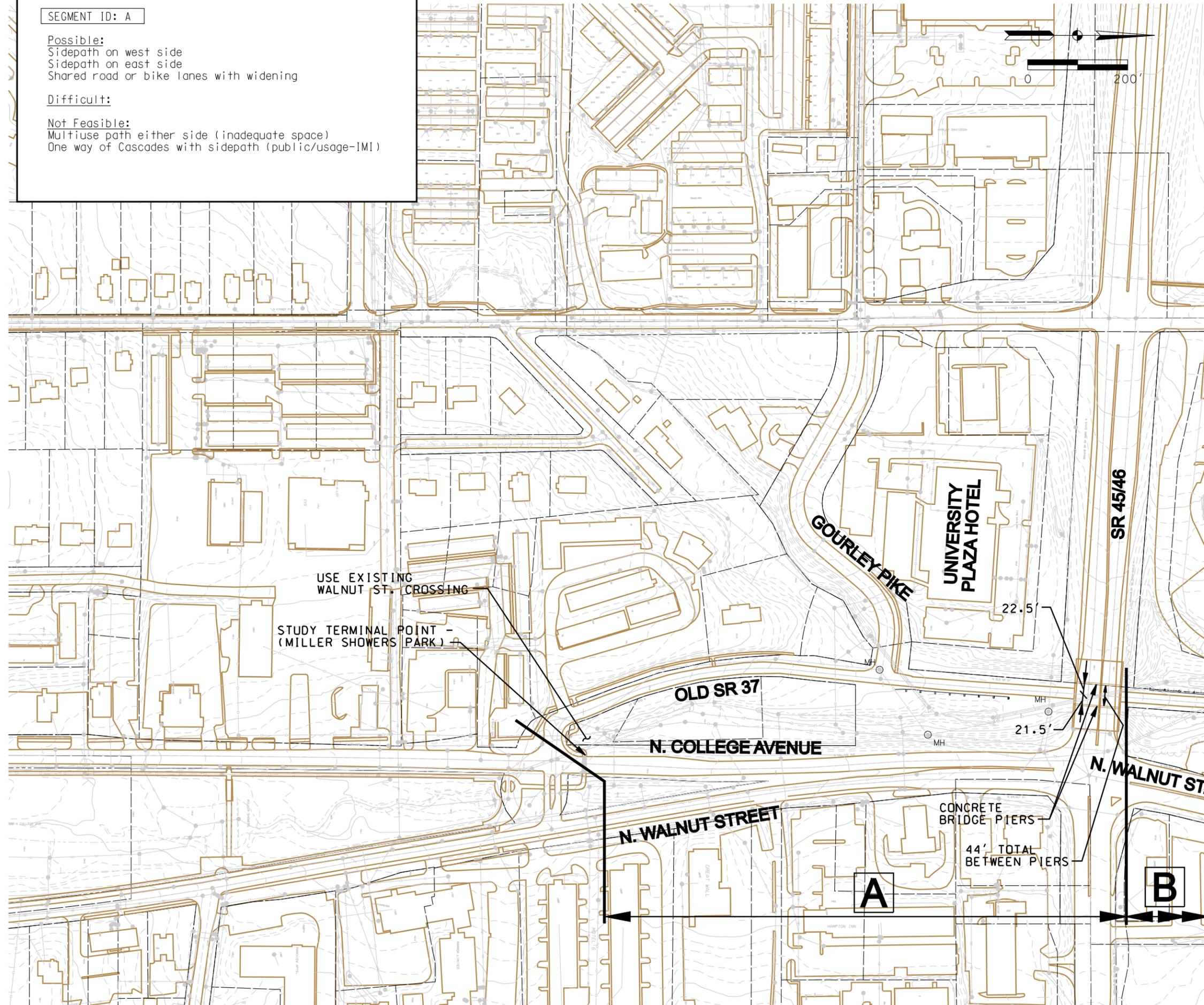
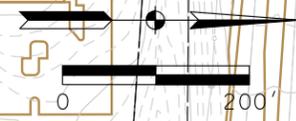
After these Figures, the evaluation of these alternatives is presented for each segment. This evaluation is presented in tabular format that provides the evaluation for each alternative side-by-side, and grades them on each of the Alternative Evaluation criteria. The evaluations are presented in **Section III-B**.

SEGMENT ID: A

Possible:
Sidepath on west side
Sidepath on east side
Shared road or bike lanes with widening

Difficult:

Not Feasible:
Multiuse path either side (inadequate space)
One way of Cascades with sidepath (public/usage-IMI)



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CASCADES PARK /
GRIFFY LAKE
BIKE / PEDESTRIAN
FEASIBILITY STUDY

FIGURE
3-1

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SEGMENT ID: B

Possible:

Shared road or bike lanes with widening

Difficult:

Sidewalk on east side (hillside)
Sidewalk on west side with road shift to east.

Not Feasible:

One way of Cascades with sidewalk (public/usage-IMI)
Sidewalk on west side without a road shift to the east (guardrail)
Multiuse paths either side (inadequate space)

SEGMENT ID: C

Possible:

Shared road or bike lanes with widening

Difficult:

One way of Cascades with sidewalk (public/usage)
Sidewalk on east side (hillside)

Not Feasible:

Multiuse paths either side (inadequate space)
Sidewalk on west side (creek too close)

SEGMENT ID: D

Possible:

Shared road or bike lanes with widening
Multiuse path west side of creek (Bridge req'd)

Difficult:

One way of Cascades with sidewalk (public/usage)
Sidewalk on east side (hillside)
-could widen road to west around curve

Not Feasible:

Multiuse paths east side of creek (inadequate space)
Sidewalk on west side (creek too close)

SEGMENT ID: E

Possible:

Shared road or bike lanes with widening
Multiuse path west side of creek (bridge over small creek req'd)
Sidewalk on east side (must consider bike shop remediation-also consider drainage off hill)

Difficult:

One way of Cascades with sidewalk (public/usage)

Not Feasible:

Multiuse paths east side of creek (inadequate space)
Sidewalk on west side (creek too close)

SEGMENT ID: M (Routes to Skate Park)

Possible:

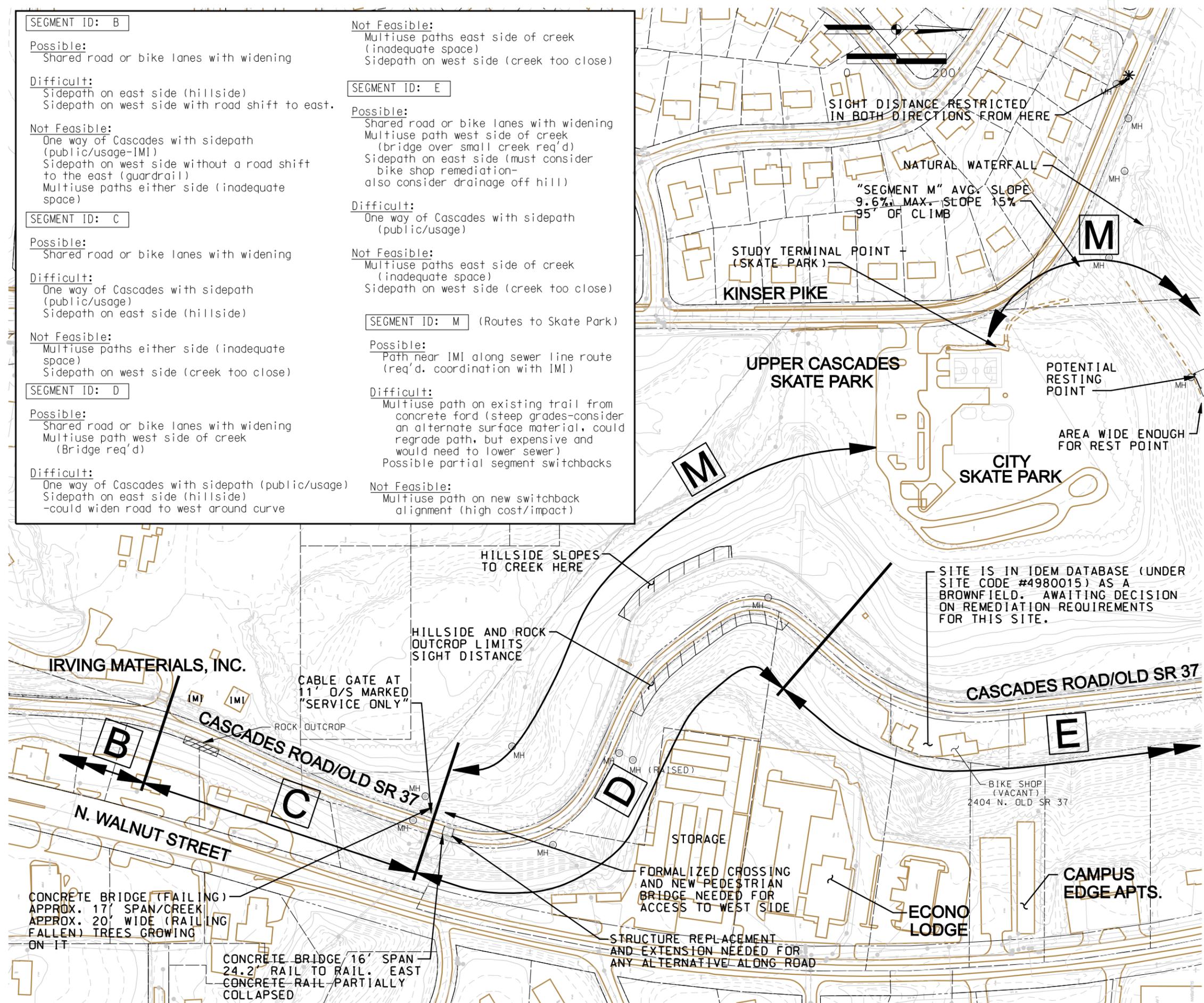
Path near IMI along sewer line route (req'd. coordination with IMI)

Difficult:

Multiuse path on existing trail from concrete ford (steep grades-consider an alternate surface material, could regrade path, but expensive and would need to lower sewer)
Possible partial segment switchbacks

Not Feasible:

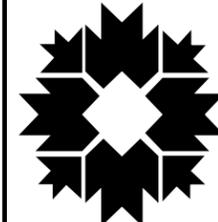
Multiuse path on new switchback alignment (high cost/impact)



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FIGURE
 3-2

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SEGMENT ID: F

Possible:
 Shared road or bike lanes with widening
 Multiuse path west side of creek (use existing bridges over creek)

Difficult:
 One way of Cascades with sidepath (public/usage)
 Sidepath on east side (proximity to small children-playground)

Not Feasible:
 Multiuse paths east side of creek (inadequate space)
 Sidepath on west side (creek too close)

SEGMENT ID: G

Possible:
 Shared road or bike lanes with widening

Difficult:
 Sidepath on west side (mobile homes and parking)
 Sidepath on east side (hill/drainage)

Not Feasible:
 Multiuse paths (soft ball fields - fence)
 One way of Cascades with sidepath (public/usage)

SEGMENT ID: N

Possible:
 Shared road or bike lanes with widening
 Sidepath on east side

Difficult:
 Sidepath on west side (slope/parking conflicts)
 Multiuse path behind shelter (thru picnic area)
 Multi use path on east side (private property)

Not Feasible:
 One way of Club House Dr. with sidepath (public/usage)

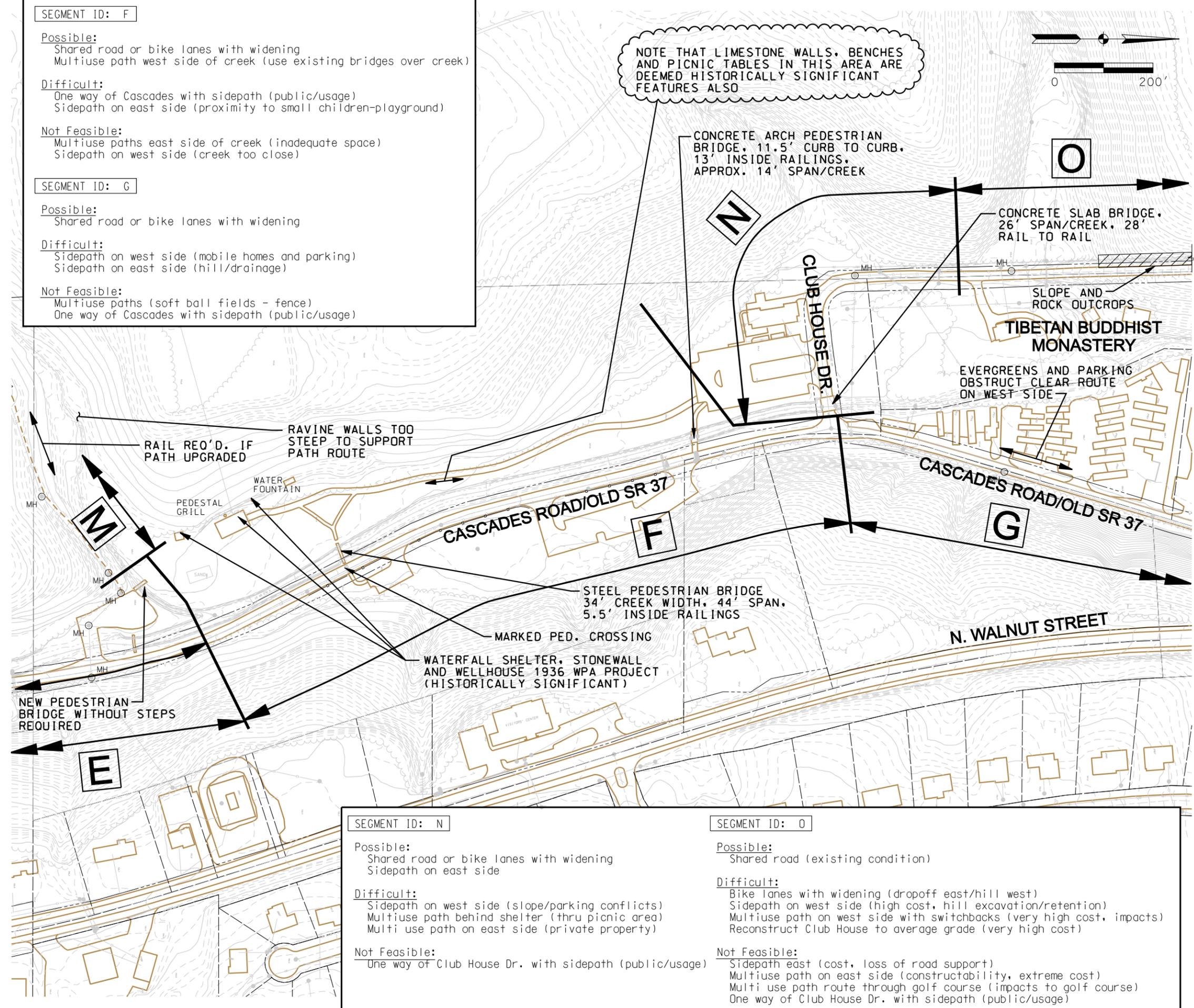
SEGMENT ID: O

Possible:
 Shared road (existing condition)

Difficult:
 Bike lanes with widening (dropoff east/hill west)
 Sidepath on west side (high cost, hill excavation/retention)
 Multiuse path on west side with switchbacks (very high cost, impacts)
 Reconstruct Club House to average grade (very high cost)

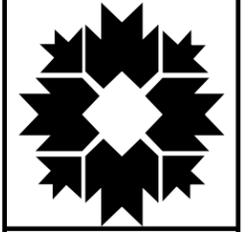
Not Feasible:
 Sidepath east (cost, loss of road support)
 Multiuse path on east side (constructability, extreme cost)
 Multi use path route through golf course (impacts to golf course)
 One way of Club House Dr. with sidepath (public/usage)

NOTE THAT LIMESTONE WALLS, BENCHES AND PICNIC TABLES IN THIS AREA ARE DEEMED HISTORICALLY SIGNIFICANT FEATURES ALSO



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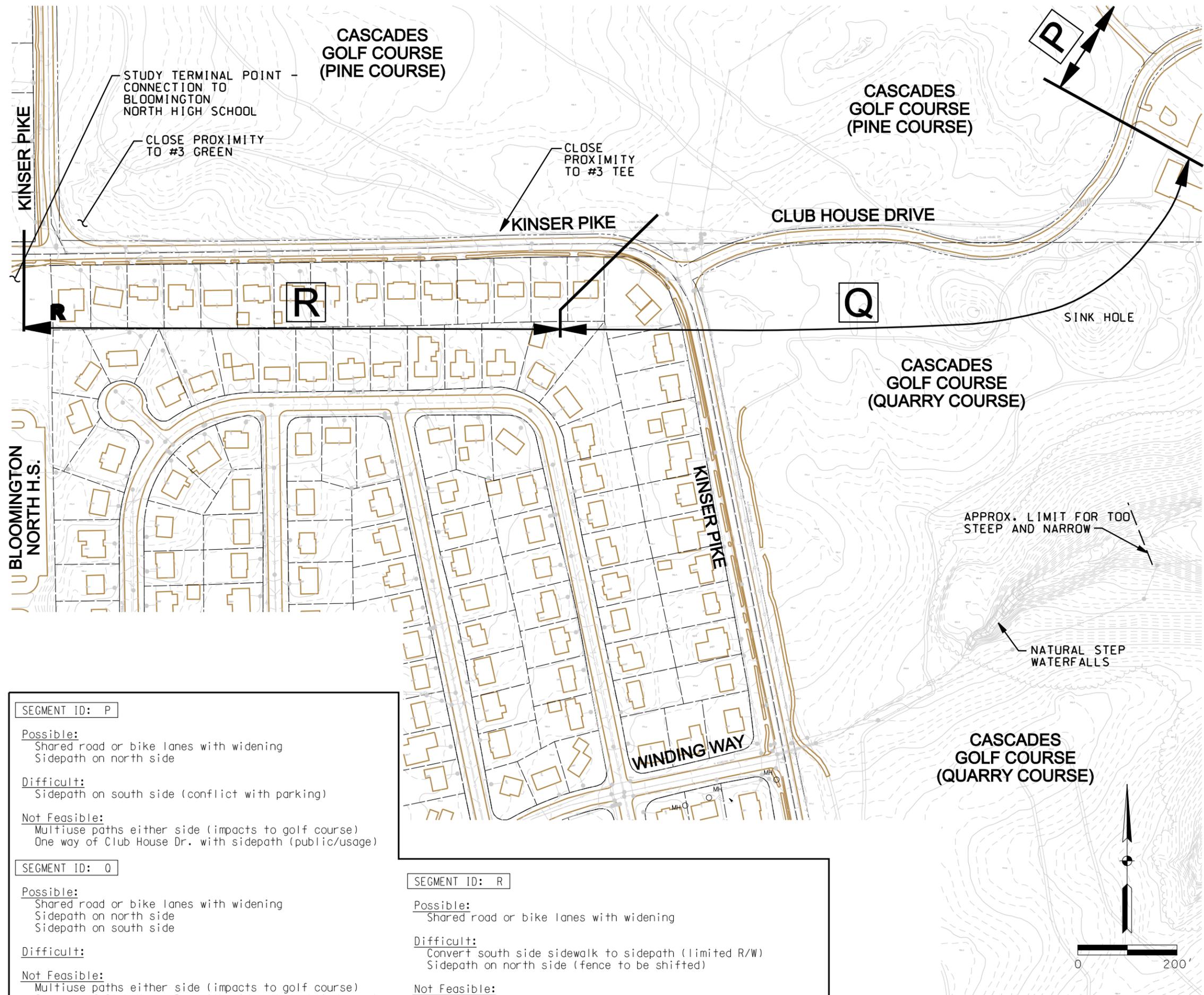
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FIGURE
3-3

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SEGMENT ID: P

Possible:
Shared road or bike lanes with widening
Sidepath on north side

Difficult:
Sidepath on south side (conflict with parking)

Not Feasible:
Multiuse paths either side (impacts to golf course)
One way of Club House Dr. with sidepath (public/usage)

SEGMENT ID: Q

Possible:
Shared road or bike lanes with widening
Sidepath on north side
Sidepath on south side

Difficult:

Not Feasible:
Multiuse paths either side (impacts to golf course)
One way of Club House Dr. with sidepath (public/usage)

SEGMENT ID: R

Possible:
Shared road or bike lanes with widening

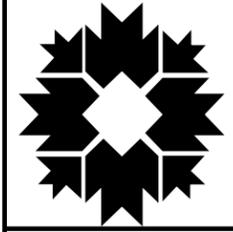
Difficult:
Convert south side sidewalk to sidepath (limited R/W)
Sidepath on north side (fence to be shifted)

Not Feasible:
Multiuse paths either side (private property and golf course)

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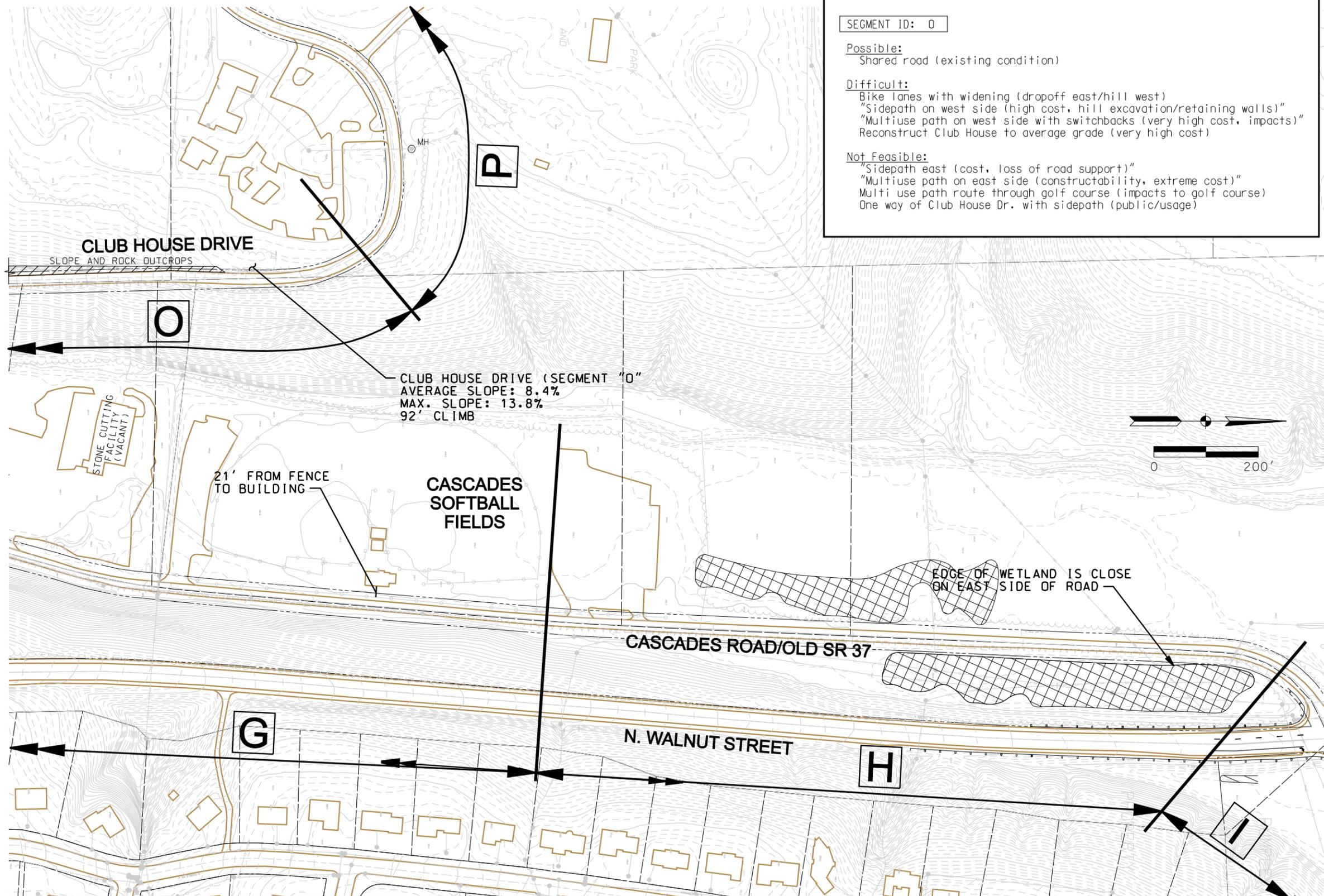
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FIGURE
 3-4

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SEGMENT ID: O

Possible:
Shared road (existing condition)

Difficult:
Bike lanes with widening (dropoff east/hill west)
"Sidepath on west side (high cost, hill excavation/retaining walls)"
"Multiuse path on west side with switchbacks (very high cost, impacts)"
Reconstruct Club House to average grade (very high cost)

Not Feasible:
"Sidepath east (cost, loss of road support)"
"Multiuse path on east side (constructability, extreme cost)"
Multi use path route through golf course (impacts to golf course)
One way of Club House Dr. with sidepath (public/usage)

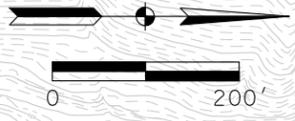
CLUB HOUSE DRIVE
SLOPE AND ROCK OUTCROPS

CLUB HOUSE DRIVE (SEGMENT "O")
AVERAGE SLOPE: 8.4%
MAX. SLOPE: 13.8%
92' CLIMB

21' FROM FENCE TO BUILDING

STONE CUTTING FACILITY (VACANT)

CASCADES SOFTBALL FIELDS



EDGE OF WETLAND IS CLOSE ON EAST SIDE OF ROAD

CASCADES ROAD/OLD SR 37

N. WALNUT STREET

SEGMENT ID: G

Possible:
Shared road or bike lanes with widening

Difficult:
Sidepath on west side (mobile homes and parking)
Sidepath on east side (hill/drainage)

Not Feasible:
Multiuse paths (soft ball fields - fence)
One way of Cascades with sidepath (public/usage)

SEGMENT ID: H

Possible:
Sidepath on west side
Multiuse path west of Cascades
Shared road or bike lanes with widening

Difficult:
Sidepath on east side (wetlands)

Not Feasible:
Multiuse path east side (wetlands)
One way of Cascades with sidepath (public/usage)

SEGMENT ID: P

Possible:
Shared road or bike lanes with widening
Sidepath on north side

Difficult:
Sidepath on south side (conflict with parking)

Not Feasible:
Multiuse paths either side (impacts to golf course)
One way of Club House Dr. with sidepath (public/usage)

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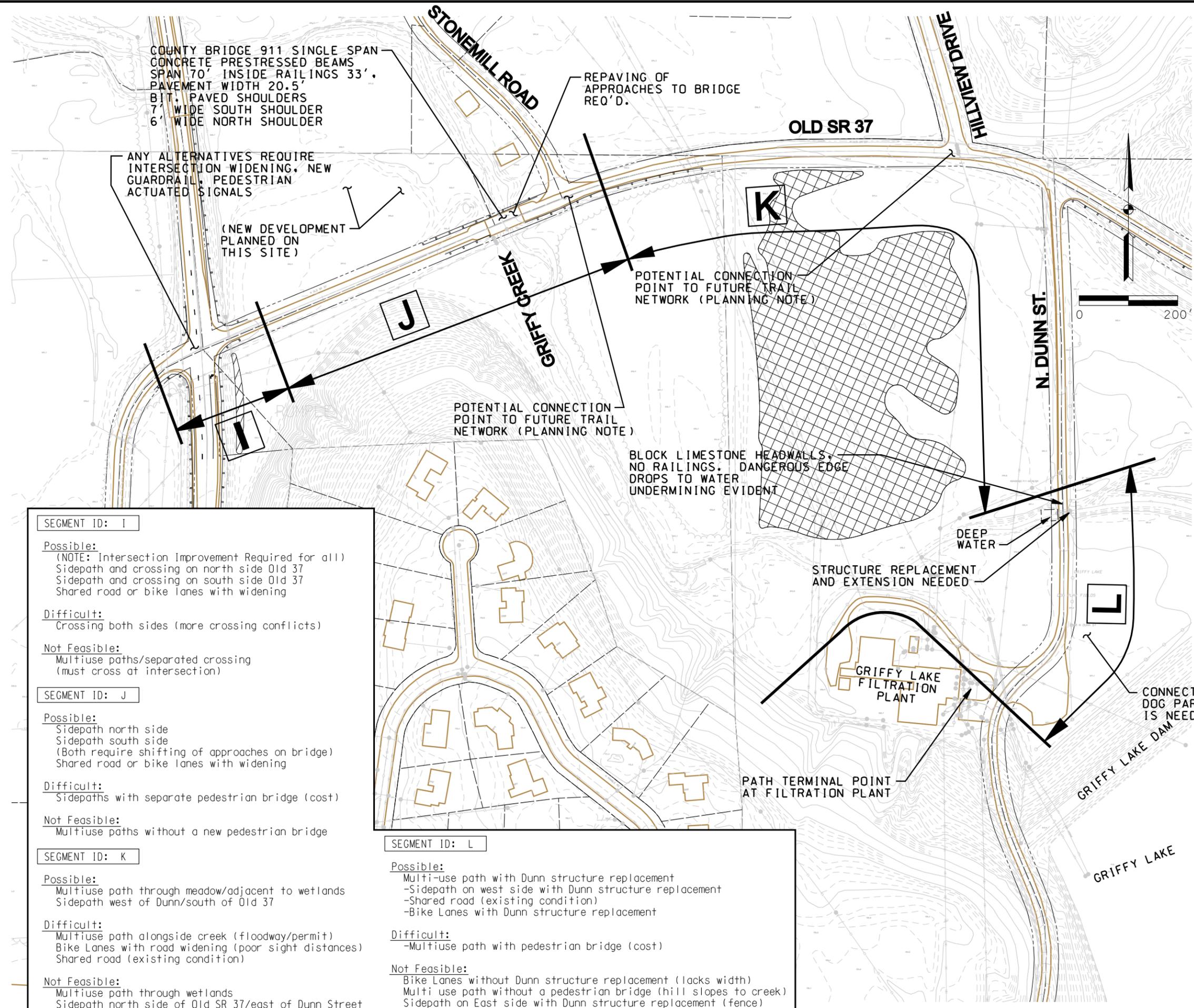
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FIGURE
3-5

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SEGMENT ID: I

Possible:
 (NOTE: Intersection Improvement Required for all)
 Sidepath and crossing on north side Old 37
 Sidepath and crossing on south side Old 37
 Shared road or bike lanes with widening

Difficult:
 Crossing both sides (more crossing conflicts)

Not Feasible:
 Multiuse paths/separated crossing (must cross at intersection)

SEGMENT ID: J

Possible:
 Sidepath north side
 Sidepath south side
 (Both require shifting of approaches on bridge)
 Shared road or bike lanes with widening

Difficult:
 Sidepaths with separate pedestrian bridge (cost)

Not Feasible:
 Multiuse paths without a new pedestrian bridge

SEGMENT ID: K

Possible:
 Multiuse path through meadow/adjacent to wetlands
 Sidepath west of Dunn/south of Old 37

Difficult:
 Multiuse path alongside creek (floodway/permit)
 Bike Lanes with road widening (poor sight distances)
 Shared road (existing condition)

Not Feasible:
 Multiuse path through wetlands
 Sidepath north side of Old SR 37/east of Dunn Street

SEGMENT ID: L

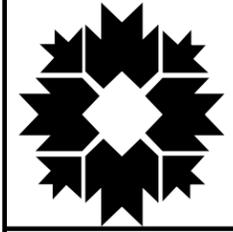
Possible:
 Multi-use path with Dunn structure replacement
 -Sidepath on west side with Dunn structure replacement
 -Shared road (existing condition)
 -Bike Lanes with Dunn structure replacement

Difficult:
 -Multiuse path with pedestrian bridge (cost)

Not Feasible:
 Bike Lanes without Dunn structure replacement (lacks width)
 Multi use path without a pedestrian bridge (hill slopes to creek)
 Sidepath on East side with Dunn structure replacement (fence)

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FIGURE
3-6

B. Alternatives Evaluation for each Segment

1. Evaluation for Segment A

Segment A - Miller Showers Park to SR 45/46 Bridge					
Evaluation Criteria:	Alternatives under Consideration in this Segment:				
	Sidepath on west side of road	Sidepath on east side of road	Shared Road with widening	Bike Lanes with widening	Existing Condition
Safety for recreational users	Separation provided	Separation provided	Users on road with cars	Provides a designated area	Users on road with cars
Safety for competitive cyclists	Unlikely to use sidepath	Unlikely to use sidepath	Improves on existing	Improves on existing	Using it now
Safety for Motorists	Separation provided	Separation provided	Minor benefit	Minor benefit	Users on road with cars
Supports future connections	Easiest connection to Gourley	Crosswalk to Gourley needed	No effect	No effect	No effect
ADA-Compliant	Yes	Yes	No	Yes, but roadside	No
Potential for negative impacts to passive areas	None Present	None Present	N/A	N/A	N/A
Separates recreational and competitive users	Yes	Yes	No	No	No
Impacts to Mature Trees	None in this Area	None in this Area	No	No	N/A
Impacts to stream channel or banks	None	None	None	None	None
Approximate Construction Cost	Low - Typical path	Low – Typical Path	Low - Widening	Low – Widening	None
Enjoyment of Facility by Recreational User	Nice, but roadside	Nice, but roadside	Attention on Traffic	Road Edge	Attention on Traffic
Consistency of Facility with adjacent Segments	Miller Showers crosswalk is on east side	Ties with Miller Showers crosswalk	Ok	Ok	Ok

Color Key:	Good Value	Neutral	Poor Value
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2. Evaluation for Segment B

Segment B - SR 45/46 Bridge to IMI Entrance					
Evaluation Criteria:	Alternatives under Consideration in this Segment:				
	Sidepath on west side (with road shift)	Sidepath on east side of road	Shared Road with widening	Bike Lanes with widening	Existing Condition
Safety for recreational users	Separation provided, but IMI Entrance	Separation provided	Users on road with cars	Provides a designated area	Users on road with cars
Safety for competitive cyclists	Unlikely to use sidepath	Unlikely to use sidepath	Improves on existing	Improves on existing	Using it now
Safety for Motorists	Separation provided	Separation provided	Minor benefit	Minor benefit	Users on road with cars
Supports future connections	No effect	No effect	No effect	No effect	No effect
ADA-Compliant	Yes	Yes	No	Yes, but roadside	No
Potential for negative impacts to passive areas	None Present	None Present	N/A	N/A	N/A
Separates recreational and competitive users	Yes	Yes	No	No	No
Impacts to Mature Trees	Minor	Minor	No	No	N/A
Impacts to stream channel or banks	None	None	None	None	None
Approximate Construction Cost	Moderate to High - Hillside and thicker road pavement	Moderate - Hillside	Low	Low	None
Enjoyment of Facility by Recreational User	Nice, but roadside	Nice, but roadside	Attention on Traffic	Road edge	Attention on Traffic
Consistency of Facility with adjacent Segments	Ok	Ok	Ok	Ok	Ok

Color Key:	Good Value	Neutral	Poor Value
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3. Evaluation for Segment C

Segment C - IMI Entrance to Narrow Bridge					
Evaluation Criteria:	Alternatives under Consideration in this Segment:				
	One-way of road with sidepath	Sidepath on east side of road	Shared Road with widening	Bike Lanes with widening	Existing Condition
Safety for recreational users	Separation provide, but close to creek	Separation provided	Users on road with cars	Provides a designated area	Users on road with cars
Safety for competitive cyclists	Forces southbound cyclists onto path	Unlikely to use sidepath	Improves on existing	Improves on existing	Using it now
Safety for Motorists	Separation provided	Separated, but creek close	Minor benefit	Minor benefit	Users on road with cars and creek edge
Supports future connections	No effect	No effect	No effect	No effect	No effect
ADA-Compliant	Yes	Yes	No	Yes, but roadside	No
Potential for reduction in Park use (one-way inconvenience)	Possible	N/A	N/A	N/A	N/A
Potential for negative impacts to passive areas	None Present	None Present	N/A	N/A	N/A
Separates recreational and competitive users	No - all southbound on path	Yes	No	No	No
Operational impacts of one-way roads	Possible	N/A	N/A	N/A	N/A
Impacts to Mature Trees	Minor	Moderate	No	Minor	N/A
Impacts to stream channel or banks	Some Bank Stabilization	Some stream bank stabilization	None	Minor Bank Stabilization	None
Approximate Construction Cost	Low to Moderate - stream bank and hill	Moderate - stream bank and hill	Low	Moderate - stream bank and hill	None
Enjoyment of Facility by Recreational User	Nice, but roadside	Nice, but roadside	Attention on Traffic	Road Edge	Attention on Traffic
Consistency of Facility with adjacent Segments	Ok	Ok - but Seg. D has west path option	Ok	Ok	Ok

4. Evaluation for Segment D

Segment D - Narrow Bridge to South of Bike Shop						
Evaluation Criteria:	Alternatives under Consideration in this Segment:					
	One-way of road with sidepath	Sidepath on east side of road	Multi-use path west of creek	Shared Road with widening	Bike Lanes with widening	Existing Condition
Safety for recreational users	Separation provided	Separation provided	Separation provided	Users on road with cars	Provides a designated area	Users on road with cars
Safety for competitive cyclists	Southbound cyclists must use path	Unlikely to use sidepath	Unlikely to use path	Improves on existing	Improves on existing	Using it now
Safety for Motorists	Separation provided	Separated, but creek edge close	Separation provided	Minor benefit	Minor benefit	Users on road with cars
Supports future connections	No effect	No effect	No effect	No effect	No effect	No effect
ADA-Compliant	Yes	Yes	Yes	No	Yes, but roadside	No
Potential for reduction in Park use (one-way inconvenience)	Possible	N/A	N/A	N/A	N/A	N/A
Potential for negative impacts to passive areas	No	No	Possible	No	No	N/A
Separates recreational and competitive users	No - all southbound on path	Yes	Yes	No	No	No
Operational impacts of one-way roads	Possible	N/A	N/A	N/A	N/A	N/A
Impacts to Mature Trees	Minor	Moderate	Minor	Minor	Minor	N/A
Impacts to stream channel or banks	Minor Bank Stabilization	Bank Stabilization required	Minor Bank Stabilization	None	Minor Bank Stabilization	None
Approximate Construction Cost	Moderate - stream bank and hill	High - stream bank, hill and new bridge-road	Higher - hill, new bridge for creek	Low - some stream bank	Moderate - stream bank and hill	None
Enjoyment of Facility by Recreational User	Nice, but roadside	Nice, but roadside	Very nice, scenic	Attention on Traffic	Road Edge	Attention on Traffic
Consistency of Facility with adjacent Segments	Ok	Ok	Better for Connection to Skatepark	Ok	Ok	Ok

5. Evaluation for Segment E

Segment E - South of Bike Shop to Concrete Ford						
Evaluation Criteria:	Alternatives under Consideration in this Segment:					
	One-way of road with sidepath	Sidepath on east side of road	Multi-use path west of creek	Shared Road with widening	Bike Lanes with widening	Existing Condition
Safety for recreational users	Separation provided	Separation provided	Separation provided	Users on road with cars	Provides a designated area	Users on road with cars
Safety for competitive cyclists	Forces southbound cyclists onto path	Unlikely to use sidepath	Unlikely to use path	Improves on existing	Improves on existing	Using it now
Safety for Motorists	Separation provided	Separation provided	Separation provided	Minor benefit	Minor benefit	Users on road with cars
Supports future connections	No effect	No effect	No effect	No effect	No effect	No effect
ADA-Compliant	Yes	Yes	Yes	No	Yes, but roadside	No
Potential for reduction in Park use (one-way inconvenience)	Possible	N/A	N/A	N/A	N/A	N/A
Potential for negative impacts to passive areas	No	Bike Shop area to be paved	Possible	No	No	N/A
Separates recreational and competitive users	No - all southbound on path	Yes	Yes	No	No	No
Operational impacts of one-way roads	Possible	N/A	N/A	N/A	N/A	N/A
Impacts to mature trees	Minor	Minor	Minor	Minor	Minor	N/A
Impacts to stream channel or banks	Minor Bank Stabilization	Minor Bank Stabilization	No	None	Minor Bank Stabilization	None
Approximate Construction Cost	Moderate - stream bank	Moderate - stream bank	Moderate - new small bridge	Low	Moderate - stream bank	None
Enjoyment of Facility by Recreational User	Nice, but roadside	Nice, but roadside	Very nice, scenic	Attention on Traffic	Road Edge	Attention on Traffic
Consistency of Facility with adjacent Segments	Ok	More direct access to playground in Seg. F	Better for connection to Skatepark	Ok	Ok	Ok

6. Evaluation for Segment F

Segment F - Concrete Ford to Club House Drive Intersection						
Evaluation Criteria:	Alternatives under Consideration in this Segment:					
	One-way of road with sidepath	Sidepath on east side of road	Multi-use path west of creek	Shared Road with widening	Bike Lanes with widening	Existing Condition
Safety for recreational users	Separation provided	Separation provided, but not from playground	Separation provided	Users on road with cars	Provides a designated area	Users on road with cars
Safety for competitive cyclists	Southbound cyclists must use path	Unlikely to use sidepath	Unlikely to use path	Improves on existing	Improves on existing	Using it now
Safety for Motorists	Separated, but with crossings	Separated, but with crossings	Separated, but with crossings	Less predictable crossings	Less predictable crossings	Users on road with cars
Supports future connections	No effect	No effect	No Effect	No effect	No effect	No effect
ADA-Compliant	Yes	Yes	Yes	No	Yes, but roadside	No
Potential for reduction in Park use (one-way inconvenience)	Possible	N/A	N/A	N/A	N/A	N/A
Potential for negative impacts to passive areas	No	No	Possible	No	No	N/A
Separates recreational and competitive users	No - all southbound on path	Yes	Yes	No	No	No
Operational impacts of one-way roads	Possible	N/A	N/A	N/A	N/A	N/A
Impacts to Mature Trees	Minor	Minor	Minor	Minor	Minor	N/A
Impacts to stream channel or banks	Minor Bank Stabilization	Minor Bank Stabilization	No	None	Minor Bank Stabilization	None
Approximate Construction Cost	Moderate - stream bank	Moderate - stream bank	Low	Low	Moderate - stream bank	None
Enjoyment of Facility by Recreational User	Nice, but roadside	Nice, but roadside	Very nice, scenic	Attention on Traffic	Road Edge	Attention on Traffic
Consistency of Facility with adjacent Segments	Ok	Ok	Better connection to Club House	Ok	Ok	Ok

7. Evaluation for Segment G

Segment G - Club House Drive Intersection to Softball Fields					
Evaluation Criteria:	Alternatives under Consideration in this Segment:				
	Sidepath on west side of road	Sidepath on east side of road	Shared Road with widening	Bike Lanes with widening	Existing Condition
Safety for recreational users	Separation provided	Separation provided	Users on road with cars	Provides a designated area	Users on road with cars
Safety for competitive cyclists	Unlikely to use sidepath	Unlikely to use sidepath	Improves on existing	Improves on existing	Using it now
Safety for Motorists	Separation provided	Separation provided	Minor benefit	Minor benefit	Users on road with cars
Supports future connections	No effect	No effect	No effect	No effect	No effect
ADA-Compliant	Yes	Yes	No	Yes, but roadside	No
Potential for negative impacts to passive areas	No	No	No	No	N/A
Separates recreational and competitive users	Yes	Yes	No	No	No
Impacts to Mature Trees	Moderate - evergreens	Minor	No	Minor	N/A
Impacts to stream channel or banks	None	None	None	None	None
Approximate Construction Cost	Low	Moderate - Hillside	Low	Low	None
Enjoyment of Facility by Recreational User	Nice, but roadside	Nice, but roadside	Attention on Traffic	Road Edge	Attention on Traffic
Consistency of Facility with adjacent Segments	Better for residents and softball	Ok	Ok	Ok	Ok

Color Key:	Good Value	Neutral	Poor Value
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8. Evaluation for Segment H

Segment H - Softball Fields to West of Intersection with Walnut						
Evaluation Criteria:	Alternatives under Consideration in this Segment:					
	Sidepath on west side of road	Sidepath on east side of road	Multi-use path w. of wetlands	Shared Road with widening	Bike Lanes with widening	Existing Condition
Safety for recreational users	Separation provided	Minimal separation due to wetlands	Separation provided	Users on road with cars	Provides a designated area	Users on road with cars
Safety for competitive cyclists	Unlikely to use sidepath	Unlikely to use sidepath	Unlikely to use path	Improves on existing	Improves on existing	Using it now
Safety for Motorists	Separation provided	Separation provided	Separation provided	Minor benefit	Minor benefit	Users on road with cars
Supports future connections	No effect	No effect	No Effect	No effect	No effect	No effect
ADA-Compliant	Yes	Yes	Yes	No	Yes, but roadside	No
Potential for negative impacts to passive areas	No	No	Minor - Area not otherwise used	No	No	N/A
Separates recreational and competitive users	Yes	Yes	Yes	No	No	No
Impacts to Mature Trees	Moderate - edge of woods	Moderate	Potentially High - new alignment	Minor	Minor	N/A
Impacts to stream channel or banks	No	Edge of Wetland	No	None	No	None
Approximate Construction Cost	Low	Moderate - embankment	Moderate - clearing and grading	Low	Low	None
Enjoyment of Facility by Recreational User	Nice, decent separation	Nice, but roadside	Potentially very nice	Attention on Traffic	Road edge	Attention on Traffic
Consistency of Facility with adjacent Segments	Ok	Ok	Ok	Ok	Ok	Ok

Color Key:	Good Value	Neutral	Poor Value
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9. Evaluation for Segment I

Segment I - Intersection Area, Old SR 37 at Walnut						
Evaluation Criteria:	Alternatives under Consideration in this Segment:					
	Sidepath and crossing on north side	Sidepath and crossing on south side	Sidepath, but allow crossings on all sides	Shared Road with widening	Bike Lanes with widening	Existing Condition
Safety for recreational users	Separation provided	Separation provided	Less Predictable movements	Users on road with cars	Becomes a shared road at intersection	Users on road with cars
Safety for competitive cyclists	Probably cross with cars	Probably cross with cars	Probably cross with cars	Improves on existing	Becomes a shared road at intersection	Using it now
Safety for Motorists	More predictability, fewer conflicts	More predictability, but more conflicts	Less Predictable movements	Users on road and crossing both sides	Users on road and crossing both sides	Users on road with cars
Supports future connections	Favors connections to north	Favors connection to south	No Effect	No effect	No effect	No effect
ADA-Compliant	Yes	Yes	Yes	No	Yes, but roadside	No
Potential for negative impacts to passive areas	N/A	N/A	N/A	N/A	N/A	N/A
Separates recreational and competitive users	Yes	Yes	Yes, except in crossings	No	No	No
Impacts to Mature Trees	No	No	No	No	No	N/A
Impacts to stream channel or banks	No	Clips end of wetland	No	None	No	None
Approximate Construction Cost	High due to new Signal	High due to new Signal	High due to new Signal	Low	Low	None
Enjoyment of Facility by Recreational User	Let's settle for comfortable	Let's settle for comfortable	Demands more decisions	Attention on Traffic	Attention on Traffic	Attention on Traffic
Consistency of Facility with adjacent Segments	Ok	Ok	Ok	Ok	Ok	Ok

Color Key:	Good Value	Neutral	Poor Value
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10. Evaluation for Segment J

Segment J - East of Intersection with Walnut to Stone Mill Road						
Evaluation Criteria:	Alternatives under Consideration in this Segment:					
	Sidepath on north side and use existing bridge	Sidepath on south side and use existing bridge	Sidepath (either side) with new bridge	Shared Road with widening	Bike Lanes with widening	Existing Condition
Safety for recreational users	Separation provided	Separation provided	Separation provided	Users on road with cars	Provides a designated area	Users on road with cars
Safety for competitive cyclists	Unlikely to use sidepath	Unlikely to use sidepath	Unlikely to use sidepath	Improves on existing	Improves on existing	Using it now
Safety for Motorists	Separation provided, but narrows the bridge	Separation provided, but narrows the bridge	Separation provided	Minor benefit	Minor benefit	Users on road with cars
Supports future connections	Better connection to Stone Mill Rd	No effect	Only positive if on north side	No effect	No effect	No effect
ADA-Compliant	Yes	Yes	Yes	No	Yes, but roadside	No
Potential for negative impacts to passive areas	No	No	No	No	No	N/A
Separates recreational and competitive users	Yes	Yes	Yes	No	No	No
Impacts to Mature Trees	Minor	Minor	Not certain, but at least moderate	None	None	N/A
Impacts to stream channel or banks	No	No	Yes - New Bridge	None	No	None
Approximate Construction Cost	Moderate to High - bridge modifications	Moderate to High - bridge mods.	Very High - Large new bridge	Low	Low	None
Enjoyment of Facility by Recreational User	Nice, but roadside	Nice, but roadside	Potentially very nice	Attention on Traffic	Road edge	Attention on Traffic
Consistency of Facility with adjacent Segments	Ok	South side connects better to Segment K	South side connects better to Segment K	Ok	Ok	Ok

11. Evaluation for Segment K

Segment K – Stone Mill Road to Dunn Street Bridge						
Evaluation Criteria:	Alternatives under Consideration in this Segment:					
	Sidepath on south side of Old SR 37	Multi-use path following creek	Multi-use path through meadow	Shared Road with widening	Bike Lanes with widening	Existing Condition
Safety for recreational users	Separation provided	Separation provided	Separation provided	Lousy Sight Distance - on road with cars	Lousy Sight Distance - on road with cars	Lousy Sight Distance - on road with cars
Safety for competitive cyclists	Unlikely to use sidepath	Unlikely to use path	Unlikely to use path	Improves on existing	Improves on existing	Using it now
Safety for Motorists	Separation Provided	Separation Provided	Separation provided	Minor benefit	Minor benefit	Users on road with cars
Supports future connections	Better connection to Hillview	Difficult connection to Hillview	Better connection to Hillview	No effect	No effect	No effect
ADA-Compliant	Yes	Yes	Yes	No - Grades	No - Grades	No - Grades
Potential for negative impacts to passive areas	Perhaps, but not currently used	Perhaps, but not currently used	Perhaps, but not currently used	No	No	N/A
Separates recreational and competitive	Yes	Yes	Yes	No	No	No
Impacts to Mature Trees	Minor	Moderate Impacts	Minor	None	None	N/A
Impacts to stream channel or banks	No	Likely	No	None	No	None
Approximate Construction Cost	Moderate - some grading	Moderate - some grading and soils	Moderate - some grading	Low	Low	None
Enjoyment of Facility by Recreational User	Nice, but roadside	Potentially very nice	Potentially very nice	Attention on Traffic	Road edge	Attention on Traffic
Consistency of Facility with adjacent Segments	Ok	Ok	Ok	Ok	Ok	Ok

12. Evaluation for Segment L

Segment L - Dunn Street Bridge to Griffy Filtration Plant						
Evaluation Criteria:	Alternatives under Consideration in this Segment:					
	Sidepath on west side with New Dunn Bridge	Multi-use path with new Dunn Street bridge	Multi-use path with new pedestrian bridge	Shared Road with widening and new Dunn Bridge	Bike Lanes with widening and new Dunn Bridge	Existing Condition
Safety for recreational users	Separation provided	Separation provided	Separation provided	On road with cars	Provides designated Area	On road with cars
Safety for competitive cyclists	Unlikely to use sidepath	Unlikely to use path	Unlikely to use path	Improves on existing	Improves on existing	Using it now
Safety for Motorists	Separation Provided	Separation Provided	Separation provided	New bridge	New bridge	Users on road with cars
Supports future connections	No effect	No effect	No effect	No effect	No effect	No effect
ADA-Compliant	Yes	Yes	Yes	No	Yes, but roadside	No
Potential for negative impacts to passive areas	No	Perhaps, but not currently used	Perhaps, but not currently used	No	No	N/A
Separates recreational and competitive users	Yes	Yes	Yes	No	No	No
Impacts to Mature Trees	No	No	No	None	None	N/A
Impacts to stream channel or banks	Yes- New bridge	Yes- New bridge	Yes- New bridge	Yes- New bridge	Yes- New bridge	None
Approximate Construction Cost	High - bridge	High - bridge	Very High - two bridges	High - bridge	High - bridge	None
Enjoyment of Facility by Recreational User	Nice, but roadside	Potentially very nice	Potentially very nice	Attention on Traffic	Road Edge	Attention on Traffic
Consistency of Facility with adjacent Segments	Ok	Ok	Ok	Ok	Ok	Ok

Color Key:	Good Value	Neutral	Poor Value
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13. Evaluation for Segment M

Segment M - From Lower Cascades to Skatepark				
Evaluation Criteria:	Alternatives under Consideration in this Segment:			
	Multi-use Path on existing trail from concrete ford	Multi-use path on existing trail next to IMI	Multi-use path from concrete ford with regrading of existing trail	Existing Conditions
Safety for recreational users	Grades very steep, need railings	Grades difficult, but rest points possible	Still steep, challenging	Only suitable for hikers and mountain bikes
Safety for competitive cyclists	Would improve it, but still challenging	Would improve it, but still challenging	Would improve it, but still challenging	Only trail by concrete ford currently used
Safety for Motorists	N/A	N/A	N/A	N/A
Supports future connections	All support connect to Kinser	All support connect to Kinser	All support connect to Kinser	All support connect to Kinser
ADA-Compliant	No - Grades severe	Likely, though difficult	No - still difficult	No - unimproved trail
Potential for negative impacts to passive areas	Only proximity to waterfall an issue	None	Only proximity to waterfall an issue	N/A
Separates recreational and competitive users	No	No	No	No
Impacts to Mature Trees	Moderate - upper section	Minor	High due to excavations	N/A
Impacts to stream channel or banks	None	None	None	None
Approximate Construction Cost	Moderate - regrading	Moderate to high-regrading and new fence	Very High - Sanitary sewer	None
Enjoyment of Facility by Recreational User	Intimidating, but scenic	Potentially very nice and possibly ADA compliant, great view over the creek	Intimidating, but scenic	Not currently used
Consistency of Facility with adjacent Segments	Ok	Ok	Ok	Ok

Color Key:	Good Value	Neutral	Poor Value
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14. Evaluation for Segment N

Segment N - Club House Drive in Lower Cascades						
Evaluation Criteria:	Alternatives under Consideration in this Segment:					
	Sidepath on south and west side of Club House	Sidepath or multi-use path north side of Club House	Multi-use path behind Sycamore Shelter	Shared Road with widening	Bike Lanes with widening	Existing Condition
Safety for recreational users	Separated, but mixing with parking lot entrance	Separation provided	Separation provided	Users on road with cars	Provides a designated area	Users on road with cars
Safety for competitive cyclists	Unlikely to use sidepath	Unlikely to use path	Unlikely to use path	Improves on existing	Improves on existing	Using it now
Safety for Motorists	Separated, except at parking lot	Separation Provided	Separation provided	Minor benefit	Minor benefit	Users on road with cars
Supports future connections	No effect	No effect	No effect	No effect	No effect	No effect
ADA-Compliant	Yes	Yes	Yes	No	Yes, but roadside	No
Potential for negative impacts to passive areas	No	Perhaps to Monastery setting	Unlikely	No	No	N/A
Separates recreational and competitive users	Yes	Yes	Yes	No	No	No
Impacts to Mature Trees	No	Minor	No	None	None	N/A
Impacts to stream channel or banks	No	No	No	None	No	None
Approximate Construction Cost	Low	Low	Low	Low	Low	None
Enjoyment of Facility by Recreational User	Nice, but roadside	Nice, but roadside	Very Nice	Attention on Traffic	Road Edge	Attention on Traffic
Consistency of Facility with adjacent Segments	Better connection to Segments F&O	Requires Crossing for O	Better connection to Segments F&O	Ok	Ok	Ok

Color Key:	Good Value	Neutral	Poor Value
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15. Evaluation for Segment O

Segment O - Club House Drive, Hill to Upper Cascades						
Evaluation Criteria:	Alternatives under Consideration in this Segment:					
	Sidepath on west side of Club House	Multi-use path on west side with switch-backs	Reconstruct Club House Drive to average slope	Shared Road with widening	Bike Lanes with widening	Existing Condition
Safety for recreational users	Separation provided, but grades challenging	Separation provided	Separation not provided, grades still difficult	Users on road with cars. Grades challenging	Provides a designated area, grades still challenging	Grades challenging, no separation
Safety for competitive cyclists	Unlikely to use sidepath	Unlikely to use path	Minor improvement	Improves on existing	Improves on existing	Using it now
Safety for Motorists	Separation Provided	Separation Provided	Minor improvement for sight distance	Minor benefit	Minor benefit	Users on road with cars
Supports future connections	No effect	No effect	No effect	No effect	No effect	No effect
ADA-Compliant	Maybe with rest points	Maybe	Maybe with rest points	No	No	No
Potential for negative impacts to passive areas	No	No	No	No	No	N/A
Separates recreational and competitive users	Yes	Yes	No	No	No	No
Impacts to Mature Trees	Moderate to High	Extremely High	Moderate to High	Moderate	Moderate	N/A
Impacts to stream channel or banks	No	No	No	None	No	None
Approximate Construction Cost	High (excavation)	Very High	Very High (road reconst.)	High (excavation)	High (excavation)	None
Enjoyment of Facility by Recreational User	Challenging, but separated	Potentially nice, but difficult	Not separated, challenging	Attention on Traffic	Not separated, challenging	Attention on Traffic
Consistency of Facility with adjacent Segments	Ok	Ok	Ok	Ok	Ok	Ok

Color Key:	Good Value	Neutral	Poor Value
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16. Evaluation for Segment P

Segment P - Club House Drive Next to Golf Course Parking					
Evaluation Criteria:	Alternatives under Consideration in this Segment:				
	Sidepath on north side of road	Sidepath on south side of road	Shared Road with widening	Bike Lanes with widening	Existing Condition
Safety for recreational users	Separation provided, but crossing needed	Separation provided - but mixing with parking	Users on road with cars	Provides a designated area	Users on road with cars
Safety for competitive cyclists	Unlikely to use sidepath	Unlikely to use sidepath	Improves on existing	Improves on existing	Using it now
Safety for Motorists	Separated	Separated, except at parking	Minor benefit	Minor benefit	Users on road with cars
Supports future connections	Better connection to Northwood	No effect	No effect	No effect	No effect
ADA-Compliant	Yes	Yes	No	Yes, but roadside	No
Potential for negative impacts to passive areas	No	No	No	No	N/A
Separates recreational and competitive users	Yes	Yes	No	No	No
Impacts to Mature Trees	Minor	Minor	No	No	N/A
Impacts to stream channel or banks	None	None	None	None	None
Approximate Construction Cost	Low	Low	Low	Low	None
Enjoyment of Facility by Recreational User	Nice, but roadside	Nice, but roadside	Attention on Traffic	Road Edge	Attention on Traffic
Consistency of Facility with adjacent Segments	Ok	Better to connect to Segment O	Ok	Ok	Ok

Color Key:	Good Value	Neutral	Poor Value
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17. Evaluation for Segment Q

Segment Q - Club House Drive between the golf courses					
Evaluation Criteria:	Alternatives under Consideration in this Segment:				
	Sidepath on north side of road	Sidepath on south side of road	Shared Road with widening	Bike Lanes with widening	Existing Condition
Safety for recreational users	Separation provided	Separation provided	Users on road with cars	Provides a designated area	Users on road with cars
Safety for competitive cyclists	Unlikely to use sidepath	Unlikely to use sidepath	Improves on existing	Improves on existing	Using it now
Safety for Motorists	Separation provided	Separation provided	Minor benefit	Minor benefit	Users on road with cars
Supports future connections	No effect	No effect	No effect	No effect	No effect
ADA-Compliant	Yes	Yes	No	Yes, but roadside	No
Potential for negative impacts to passive areas	No	No	No	No	N/A
Separates recreational and competitive users	Yes	Yes	No	No	No
Impacts to Mature Trees	Minor - can avoid	Minor - can avoid	No	No	N/A
Impacts to stream channel or banks	None	None	None	None	None
Approximate Construction Cost	Moderate – Fence and carpath	Moderate - Fence and carpath	Low	Low	None
Enjoyment of Facility by Recreational User	Very nice if behind fence	Very nice if behind fence	Attention on Traffic	Road Edge	Attention on Traffic
Consistency of Facility with adjacent Segments	Ok	Ok	Ok	Ok	Ok

Color Key:	Good Value	Neutral	Poor Value
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18. Evaluation for Segment R

Segment R - Kinser Pike, Club House to High School					
Evaluation Criteria:	Alternatives under Consideration in this Segment:				
	Convert south side sidewalk to sidepath	Sidepath on north side of road	Shared Road with widening	Bike Lanes with widening	Existing Condition
Safety for recreational users	Separation provided	Separation provided	Users on road with cars	Provides a designated area	Users on road with cars
Safety for competitive cyclists	Unlikely to use sidepath	Unlikely to use sidepath	Improves on existing	Improves on existing	Using it now
Safety for Motorists	Separation provided	Separation provided	Minor benefit	Minor benefit	Users on road with cars
Supports future connections	Crossing at Club House difficult	Crossing of Kinser at BNHS favored	No effect	No effect	No effect
ADA-Compliant	Yes	Yes	No	Yes, but roadside	No
Potential for negative impacts to passive areas	No	Close to golf course (green #3)	No	No	N/A
Separates recreational and competitive users	Yes	Yes	No	No	No
Impacts to Mature Trees	Minor	Minor	No	No	N/A
Impacts to stream channel or banks	None	None	None	None	None
Approximate Construction Cost	Very High - Property	Moderate - Fence & golf course	Low	Low	None
Enjoyment of Facility by Recreational User	Nice, but roadside	Nice, but roadside	Attention on Traffic	Road Edge	Attention on Traffic
Consistency of Facility with adjacent Segments	Ok	Ok	Ok	Ok	Ok

Color Key:	Good Value	Neutral	Poor Value
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IV. RECOMMENDED IMPROVEMENTS

These recommendations are developed with emphasis on the needs of the recreational path user. The Study Workgroup established the Study's purpose and expressed that the greatest need is a separated facility for recreational users wherever feasible. Competitive bicyclists are no less important, but they are already successfully using the facility available to them (the road). *Thus, the recommendations first identify the recommended alternatives that provide for the recreational users, and then examine additional enhancements along the roadway that would better meet the needs for competitive cyclists.*

A. Recommended Improvements by Segment

1. Segment A: Miller Showers Park to SR 45/46 Bridge

Evaluation Notes:

Making the connection to the crosswalk over to Miller Showers Park is an important consideration and favors the east sidepath. Being on the west side would connect better to Gourley Pike, but also require north-south path users to cross Gourley Pike. With a separated facility provided, the needs for competitive cyclists are more focused on simple enhancements to their safety and comfort. Full bike lanes would be excessive when a sidepath is available.



Recommendations:

A sidepath on the east side is recommended for recreational users in Segment A. A crosswalk should be provided from the sidewalk along Gourley Pike to provide better access to the path. The northwest corner of the intersection with Gourley Pike should be formalized for this crosswalk by providing a full barrier curb and ramp, and removing excess roadway pavement that is there.

For cyclists, providing a paved shoulder along both sides of Cascades Road is recommended. This should be achieved with pavement widening where space allows, and the shoulders should be striped to separate them from the through lanes. "Share the Road" signage is recommended to remind drivers that bicyclists are likely to be using the road.

2. Segment B: SR 45/46 Bridge to IMI Entrance

Evaluation Notes:

East sidepath will require some excavation into the hillside, but so will a west sidepath to shift the road east. Some full-depth road reconstruction will be required to shift the road east. A west sidepath will require path users to cross the entrance at IMI.

Consideration of Adjacent Segments:

East sidepath is preferred in Segment A, independent of this segment.

Recommendation:

East Sidepath is recommended alternative for recreational users in Segment B, especially to reduce the conflicts at the entrance to IMI.



For cyclists, providing paved shoulders on the road is recommended. There should be lane striping to separate the shoulders from the through lanes, but full width bike lanes are not necessary.

3. Segment C: IMI Entrance to Narrow Bridge

Evaluation Notes:

The potential one-way conversion of the road has several potential impacts that bear consideration. Competitive cyclists should not be allowed to ride the one-way road opposite traffic, which is a well established rule of the road for cyclists. That means that southbound cyclists need to be on the path, and thus separation of recreational and competitive users is lost.

Traffic analysis revealed that between 300-350 vehicle trips will be rerouted each day if the road is made one-way. There would be an operational impact to commuters, residents, and emergency vehicles.

Concerns over the inconvenience to park usage may be overstated. People will visit the park if attracted to it, and having to enter one side to leave from the other is less of a concern to someone stopping in the park.

An East sidepath will require hillside excavation but is otherwise deemed feasible.

Consideration of Adjacent Segments:

East sidepath is preferred in Segment B, independent of this segment. Segments to the north do not reveal a preference for the one-way treatments.

Recommendation:

In this segment, the one-way option seems to be roughly equivalent to the sidepath option, but the one-way choice cannot be made for just one segment. It would also need to have a strong showing in Segments D, E, and F. It is difficult to predict the full extent of the impacts of the one-way conversion. In this segment, the traditional sidepath is favored slightly.

An East Sidepath is recommended for recreational users. It is acknowledged that the one-way treatment is feasible, but carries some operational and safety concerns that go beyond this segment.



For cyclists, providing paved shoulders on the road is recommended where feasible. Some bank stabilization will be needed in small areas along the roadside due to the proximity of the creek edge.

4. Segment D: Narrow Bridge to South of Bike Shop

Evaluation Notes:

The structure under Cascades Road is narrow and deteriorating and is likely to require replacement in the future regardless of any selection. It only has to be replaced now if a sidepath or bike lanes are to be added at that location. The one-way option and the multi-use path across the creek would not require the structure to be replaced at this time.

The one-way alternative continues to have validity, though the same concerns about contra-flow cyclists and operational concerns exist.

The east sidepath could be considered, but does result in the greatest amount of stream bank work due to the need to widen the roadway area (i.e. the road must be kept close to the creek. It would also force a choice between several hundred feet of hillside impact or the shifting of the road around the curve, resulting in several hundred feet of embankment and new full-depth road pavement. The Engineer has some discomfort with the blind curves on the road, reducing sight distances below standards. This is an existing condition, but nonetheless is a concern when potentially introducing a path along the roadside. Areas of poor visibility are more likely to present safety problems.

The multi-use path west of the creek appears to offer the best combination of benefits, including providing the greatest possible separation of recreational users from competitive users and vehicles. It is the first opportunity to create a path that is not dominated by the roadway and its users. This does place the path in an otherwise passive area of the park, and would be higher in cost due to the need for a creek bridge.

Consideration of Adjacent Segments:

As this is the start of a multi-use path alternative, a transition and crossing of the road and creek will be needed. This would be best located in the vicinity of the bridge replacements. Protection of sight distance areas would be needed.

The east sidepath was recommended for Segment C, independent of this segment. Taking advantage of the chance to provide a multi-use path still holds appeal even with the required crossing of the road and creek.



Recommendation:

A multi-use path west of the creek is the recommended alternative for recreational users in Segment D. A new bridge across the creek will be

required to support this option. The existing structure is badly deteriorated anyway.

For cyclists, providing paved shoulders on the road, with appropriate lane striping, is recommended.

5. Segment E: South of Bike Shop to Concrete Ford

Evaluation Notes:

The east sidepath is more attractive because of the open ground on the east side of the road, which would reduce hillside excavation and stream bank concerns. The one-way option continues to be available, with its usual concerns.

The west side multi-use path is also more attractive because there are no hillside conflicts and connections to the Skatepark are much better served from this side. The concrete ford does not provide the needed access. The multi-use path on the west side continues to be favored over eastside routes.

Consideration of Adjacent Segments:

A west side multi-use path was recommended in Segment D independently of this Segment.

Recommendation:

A multi-use path west of the creek is the recommended alternative for recreational users in Segment E. In addition, a sidewalk connection should be provided from the bike shop site to the playground area and the nearby pedestrian bridges. This will better serve the future uses of this site.



For cyclists, providing paved shoulders on the road with appropriate striping is recommended.

6. Segment F: Concrete Ford to Club House Drive Intersection

Evaluation Notes:

The multi-use path west of the creek continues to out-perform the other alternatives, but bears some additional review. First, access to the new playground must be provided. As previously described, there are two existing creek bridges appropriate for this use. Second, Segment F includes the primary “passive area” in the park including the Waterfall Shelter, volleyball court, a small playground, and a gravel walking path. Introducing a paved path would affect users in this area.

In spite of this shortcoming, the advantages of keeping recreational users far away from the road and the new playground make this an attractive location for an enjoyable path experience. It is a trade-off, but the passive area seems wide enough to serve these mixed uses. The introduction of a multi-use path will essentially involve the paving of the existing gravel path.



Consideration of Adjacent Segments:

A west side multi-use path was recommended in Segment E independently of this Segment.

A west side location seems to better support connections to alternatives along Club House Drive.

Recommendation:

A multi-use path west of the creek is the recommended alternative for recreational users in Segment F. For cyclists, providing paved shoulders on Cascades Road is recommended.



7. Segment G: Club House Drive Intersection to Softball Fields

Evaluation Notes:

Either sidepath seems feasible, with the eastside offering a hillside challenge but the west side offering the challenge of the trailer park and some trees. Given that the residents are intended to be users of the path, positioning the path on the west side seems appropriate. Given the additional presence of the softball fields, another key destination, the west sidepath is more attractive. There is space on the softball property for a path to be placed behind the existing roadside fence and still not impact the concessions building. Care will be needed to separate and channelize trail users from softball visitors to reduce conflicts.

The west side is challenged mostly by the proximity of the trailers and a row of evergreen trees. The Study Workgroup noted that the presence of the trailer park should not preclude consideration of a sidepath on this side of the road.



Consideration of Adjacent Segments:

A multi-use path on the west side of the creek was recommended for Segment F independently of this segment. Crossing the creek is required in the area where Segments F and G meet. This does not bear on the decision in this segment, except that an east sidepath would require a crossing of Cascades Road in addition to the crossing of the creek.

The bridge on Club House Drive is wide, but not appropriate given that large vehicles are in their turning sweep on this bridge. The path needs to cross the creek but this is better achieved on the pedestrian and bike bridge 280' south of the intersection. There is no direct connection to Segment N without either using the existing Club House bridge, or providing a new bridge to link Segment G to Segment N. The existing pedestrian bridge south of Club House offers a 13' width, and seems suitable as the primary path connection across the creek in this area.

Recommendation:

A West Sidepath is recommended for recreational users in Segment G. The connection into Segment F should be made with a crossing of Club House Drive at the intersection with Cascades, then an extension of the path to use the existing pedestrian/bike bridge (in Segment F-See Figure 4-3).

For cyclists, providing paved shoulders on the road is recommended.

The City should keep a close eye on the disposition of the trailer park property, looking for an opportunity to obtain a strip of land along the road to provide this sidepath. The path should be routed inside of the existing fence along the softball fields, and carefully positioned to pass close by the concessions and maintenance building at the fields.



8. Segment H: Softball Fields to West of Intersection with Walnut

Evaluation Notes:

The east sidepath route would be very difficult due to the close proximity of the wetland on this side. The spacing is too tight.

The west sidepath could be nice because a greater amount of separation from the road is achievable without impacting the wetlands. The west multi-use path is also viewed favorably, and offers an opportunity for a fully independent route. However, the additional expense and impacts of a multi-use path might not be justified, as the west sidepath would provide an adequate facility.

Consideration of Adjacent Segments:

A west sidepath was recommended for Segment G, independently of this Segment.

Recommendation:

The west sidepath is recommended to reduce the tree impacts and the construction cost, but the City could easily take the option of the west multi-use path without any negative repercussions to adjacent segments.

This recommendation is also related to providing a higher level of consistency with the prior segment.

For cyclists, providing paved shoulders on Cascades Road is recommended.



9. Segment I: Intersection Area, Old SR 37 & Walnut Street

Evaluation Notes:

The Engineer observed what seems to be a higher occurrence of vehicles turning south from Old 37 onto Walnut Street than turning north. This is toward the City and makes sense. Given that fact alone, crossing bicyclists and pedestrians on the north side would reduce conflicts with vehicles.

Allowing crossings on both sides introduces a measure of unpredictability that is not beneficial. The area is not fully developed and need not anticipate pedestrians from all directions.

The potential development in the northeast quadrant demands a high level of coordination and review if the sidepath is recommended for the north side.

The introduction of a pedestrian crossing at this location will demand the widening of the intersection and the replacement of the signal equipment.

Consideration of Adjacent Segments:

A west side (becoming north) sidepath was the recommended alternative for Segment H, made independently of this Segment.

Recommendation:

A north sidepath is recommended in Segment I, including a designated crosswalk and a new signal configuration that supports pedestrian actuation and timing. Per City Traffic Division, turning counts should be obtained to determine if left turn lanes should be added at the same time.



Opti-com receivers should be included per the Fire Department.

This path should be coordinated with the northeast corner development plan to require that the path be planned across this frontage.

For cyclists, providing paved shoulders on Cascades Road and also Old SR 37 is recommended.

10. Segment J: East of Intersection with Walnut to Stone Mill Road

Evaluation Notes:

The key feature in this segment is the crossing of Griffy Creek. The existing bridge has a 70' span and a new pedestrian bridge will be very expensive. Crossing bicycles and pedestrians on the existing bridge is possible, but will demand close coordination with the Monroe County Engineer. If the County is opposed to sharing use on the bridge, then the only feasible alternative is an independent bicycle/pedestrian bridge.

A shifting of the existing road is needed to provide a sidepath on the bridge. This would include full-depth pavement to realign the approaches to the bridge. A physical separation, such as a barrier wall, would be appropriate to protect path users. This would likely be the most difficult issue to coordinate with the County. It could still be a satisfactory crossing, albeit with minimal separation, if a barrier cannot be placed.

The new development along the north side of Old SR 37 needs to be coordinated with any path facility proposed for the north side.

The Study Workgroup suggested the bridge be examined to determine if it may be possible to cross the path under the bridge to get path users from north to south without the at-grade crossing. Additional field work revealed that there is not sufficient space, either horizontally or vertically, to provide this crossing under the bridge.

Consideration of Adjacent Segments:

A north sidepath was recommended for Segment I. It is already clear that being on the south side is preferred in the next segment (K). Therefore, ***this segment needs to include a crossing of the path from the north to the south side of Old SR 37.*** Assuming clearing of vegetation along the south side of Old SR 37 as it rounds the curve east of Griffy Creek, this crossing can be provided, including adequate sight distances. The best locations would be in the section starting west of the bridge to the area just east of Stone Mill Road.

Recommendations:

A north sidepath from the intersection with Walnut is recommended. This path should cross the front of the new development on that side, then cross the existing bridge on the north side, if allowed by Monroe County officials. The approaches to the bridge on Old SR 37 will need to be shifted to the south to align the road for a path to share the bridge.

The north sidepath should extend to a crossing of Stone Mill Road, and then should curve to a perpendicular crossing of Old SR 37 just east of Stone Mill Road. This will provide for future linkage north along Stone Mill Road and prepare the path to cross Old SR 37.



Clearing of vegetation on the south side of Old SR 37 is needed to provide sight distance for drivers and path users. A crossing with warning signs and upgraded markings should be provided.

If sharing the existing bridge is not allowed, a separate pedestrian bridge is needed north of the existing highway bridge. This can work in conjunction with the other recommendations noted.

For competitive cyclists, providing a shoulder on Old SR

37 is recommended, except on the bridge, where space will be at a premium.

11. Segment K: Stone Mill Road to Dunn Street Bridge

Evaluation Notes:

In this segment, being north of Old SR 37 (east of Stone Mill Road) has no attraction. This is because the intersection of Dunn Street with Old SR 37 offers insufficient sight distance and the hill approaching the intersection on either road is quite steep, especially on Dunn Street. It is an undesirable location for bicycles and pedestrians to interact with motor vehicles.

A sidepath, a multi-use path through the meadow (north of the wetlands), and a multi-use path along the creek (south of the wetlands) are all feasible. The route along the creek has more likely impacts to the environment and is more likely to get into difficult soils. The sidepath is fine, but the multi-use path north of the wetland is even better. It provides the greatest possibility of providing wetland and wildlife viewing and is even farther from the road.

Consideration of Adjacent Segments:

Adjacent segments do not appear to bear on this decision.

Recommendations:

The multi-use path through the meadow and across the north side of the wetlands is recommended for Segment K because it avoids the more difficult creek route and still offers an excellent opportunity to make the wetlands a notable path-side feature.



For cyclists, providing a paved shoulder along Old SR 37 and Dunn Street is recommended. "Share the Road" signage and appropriate lane striping to separate the shoulders is also recommended.

Due to the narrowness of Dunn Street, the roadway should receive a true widening to provide at least 10' lanes in each direction and a shoulder on each side. This requires the addition of about 4' on either side. The City may want to consider some limited pavement reconstruction on Dunn Street. Portions of the southbound lane are badly cracked due to a likely pavement base failure.

12. Segment L: Dunn Street Bridge to Griffy Filtration Plant

Evaluation Notes:

The segment includes a choice between three fairly good alternatives. A separate pedestrian bridge would be nice but seems unnecessary given that the Dunn Street Bridge needs to be replaced anyway. It would be better to replace the structure for the road in conjunction with path needs.

The multi-use path to the Filtration Plant parking provided the greatest separation with no additional concerns. A connection to the dog park on the east side of Dunn Street is needed since it is another park destination.

Consideration of Adjacent Segments:

Segment K seems to bear very little on this decision. Any of these alternatives are compatible.

Recommendations:

A multi-use path to the filtration plant, in conjunction with a replacement (and extension) of the Dunn Street structure is recommended for Segment L.



For cyclists, providing a paved shoulder along Dunn Street is recommended. "Share the Road" signage and appropriate lane striping to separate the shoulders is also recommended.

Due to the narrowness of Dunn Street, the roadway should receive a true widening to provide at least 10' lanes in each direction and a shoulder on each side. This requires the addition of about 4' on either side.

A marked crossing of Dunn Street should be provided for access from the path to the dog park on the east side of Dunn Street.

13. Segment M: From Lower Cascades to Skate Park

Evaluation Notes:

This segment offers two choices in how to make the most of existing unimproved trails. While easier grades are desirable, the City must consider the greatly increased cost and the additional impacts that they would take to provide.

The path from the concrete ford is currently used, but only by hikers and mountain bikers. The path next to IMI is not currently used.

The grades on the trail from the concrete ford are partially correctible. The upper section can be modified to include switchbacks to ease its slope. The steepest portion is the lower portion, which is too narrow to consider switchbacks. The grades on this route cannot be made ADA-compliant

without major impacts. The route will continue to be very challenging even after an improvement is made. Railings are needed, and the slopes will be such that there is concern for slipping in wet, leaf-covered, or icy conditions. A rough surface may actually be preferable to reduce this hazard.

It is likely that path users will be entering the area at the bottom of the hill going too fast and then need to make some sort of turn or stop immediately, and will be unable to see approaching path users on the path in Lower Cascades.



Paving this trail would greatly increase this problem by speeding the downhill path users and inviting other wheeled users such as skaters.

The trail next to IMI offers the potential for being made ADA-compliant. The route is wide enough to offer required resting points along its length. Its greatest challenge is the proximity to IMI, and the likely sensitivity to having a public access way behind their facility.

Based solely on GIS mapping and aerial photographs, it appears that the IMI operation is encroaching into City park property and that the existing sanitary sewer may encroach into IMI property. Detailed survey is certainly needed to verify this. A fence is likely to be needed to discourage trespassing into IMI property. Some regrading will be needed to make the route more favorable. Space appears available, and the grade changes that are needed are more manageable.

Consideration of Adjacent Segments:

The adjacent segments in Lower Cascades do bear somewhat on this decision. A path must be available on the west side of the creek to connect to, or these facilities should include their own crossing of the creeks in Lower Cascades. Previous recommendations will support both of these routes.

Recommendations:

A paved multi-use path is recommended along the route next to IMI. This would include the following additional measures:

- ◆ *Regrade where possible to reduce slopes.*
- ◆ *Post warning signs about the grades.*
- ◆ *Provide resting points or landings along the route that are nearly flat and out of the way of path traffic.*
- ◆ *Provide a wider path section (consider 10') to make more room for walking one's bicycle on the hill.*
- ◆ *Coordinate with IMI for the needed property to construct an ADA-compliant path, perhaps in exchange for City property on which they appear to have encroached.*



On the route from the concrete ford, only the enhancement of the existing unimproved trail is recommended. Given it is not feasible to make the slopes in the lower portion more manageable, providing pavement may only encourage less experienced cyclists, skaters and skateboarders into an unsafe situation. *The trail can be smoothed of ruts, widened and cross-graded to enhance drainage to improve its condition. A railing can be provided in areas with the steepest edge. The addition of switchbacks in the upper portion of the trail is also recommended as a way to enhance this route. The area over the waterfall can be formalized to increase the enjoyment of this feature. Recreational users should dismount, and be directed to the longer, but safer, route at IMI.*

A paved multi-use path to the concrete ford area is NOT recommended because the route does not provide the kind of implied safety that a paved path would present to the public.

14. Segment N: Club House Drive, Area in Lower Cascades

Evaluation Notes:

The sidepath along the south side of Club House would require the path be routed across the entry drives for the shelter parking lot. This mix of uses creates safety concerns.

A sidepath or multi-use path along the north side of Club House would likely impact the setting around the monastery, which is not desired.

A multi-use path behind (west of) the shelter building has proximity concerns with the picnicking around that shelter. Field review indicated that it is possible to bypass the shelter without being too close.

Consideration of Adjacent Segments:

Segment O (on the hill) only offers west side alternatives.

Recommendations:

The multi-use path behind the shelter building is recommended for this segment. It should stay out of the parking lot and the route must be carefully selected to minimize concerns around the shelter building. Mature trees should be avoided.



For cyclists, Club House Drive should be striped to better identify the edge of the road and shoulder. A shoulder should be added where the pavement is too narrow to stripe one.

15. Segment O: Club House Drive, Hill to Upper Cascades

Evaluation Notes:

Any alternative other than the existing condition bears a significant cost and potential for tree impacts. A multi-use path on independent alignment would have the greatest impacts by far, and would still result in a very challenging route with likely steep grades. Reconstructing the road to better grades will be very expensive for minimal gain.

A sidepath on the west side will be difficult to build, though the least in impacts and likely cost.

Consideration of Adjacent Segments:

The recommended alternative in Segment N is compatible with west side path alignments. That decision was impacted by this segment, which only offers feasible alternatives on the west side.

Recommendations:

A west sidepath, with frequent resting points and warning signs is recommended for an eventual separated facility in this segment. It is doubtful that the need for this separated facility is strong enough at this time to justify the cost. The City



may wish to delay implementation of this segment until the bicycle count and local demand for this route is further developed. This alternative is going to be high in cost and the facility will still be challenging even if separated.

As an interim step, the City should consider the bike lane option. This alternative fails to provide a separated facility, but it might help to establish a genuine demand along this route before the additional expense of a separated facility is incurred. This could be accomplished with lighter impacts and reduced cost. Some hillside excavation is still needed since all pavement widening must be on the west side.

For cyclists, Club House Drive should be striped to better identify the edge of the road and shoulder. A shoulder should be provided where the pavement is too narrow to stripe one.

16. Segment P: Club House Drive, Next to Golf Course Parking

Evaluation Notes:

Sight distance is limited in Segment P due to the curve of the road. Placing a sidepath on the north side would require a crossing of the road in this segment. Upon field review, it was determined that satisfactory, though limited, sight distance can be provided if the crossing is provided near the

apex of the roadway curve, and if some roadside grading and brush clearing is performed. Sight triangles would need to be protected after implementation.

A south sidepath must be routed across the entries to the golf course parking. This is not desirable either, so the relative nature of the hazard should be considered. Cars entering and exiting the parking will be going more slowly than cars on the street, but the conflicts would be more frequent and more difficult to predict by bicyclists and motorists.

Consideration of Adjacent Segments:

The requirement to cross the path for the north sidepath was already noted. A south sidepath is more compatible with Segment O.



Recommendations:

A north sidepath is recommended for this segment due to concerns about the mixing of traffic across the entrances to the parking lot. The path crossing will need to be well marked with appropriate signage.

For cyclists, Club House Drive should be striped to better identify the edge of the road and shoulder. A shoulder should be provided where the pavement is too narrow to stripe one.

17. Segment Q: Club House Drive, between the golf courses

Evaluation Notes:

Either side of the road seems to be a suitable location for a sidepath. The fences are too close to the road, so either a fence would need to be shifted away or the path would need to go just behind it. The fence shifting option is not preferred because there are a large number of mature trees lining the road that would also be in the way. These impacts are very undesirable in this setting.

The north side of the road has more cart paths, but these are being used for access to tee areas or for returns to the clubhouse. A fairway does not run parallel on the north side. The south side of the road has fewer cart path concerns, but a fairway runs parallel to the road. Again, both sides seem balanced.

Consideration of Adjacent Segments:

Segment R offers a strong recommendation for a path on the north side of Kinser, which is a better connection for a north side path. Segment P offered a recommendation for a north side path also.

Recommendation:

A multi-use path on the north side of Club House Drive is recommended. It should be located just north of the fence. Maintaining separation from the cart paths is necessary, and the bicycle/ped facility should be closest to



the road. In certain areas, it will be necessary to adopt the current cart path as the sidepath, and to provide a new cartpath instead. This will leave the existing fences largely undisturbed along Club House Drive.

For cyclists, Club House Drive should be striped to better identify the edge of the road and shoulder. A shoulder should be provided where the pavement is too narrow to stripe one.

18. Segment R: Kinser Pike, Club House Drive to North High School

Evaluation Notes:

The Study Workgroup notes strong opposition to the widening of the sidepath on the south side of Kinser because of the large number of private parcels that would be impacted. The cost and difficulty of this should be avoided.

That being said, this segment's evaluation is based on ensuring that a sidepath on the north side is feasible. This was checked, and the fence on the north side will have to be shifted approximately 5 feet along Kinser to

make room for the path. It is not desirable to place the path inside the fence due to the parallel fairway on the golf course. That is not the most desirable situation either, but is viewed as the best alternative available.

Consideration of Adjacent Segments:

The previous segment bore no importance in this recommendation. The connection to the High School is important, and a crossing will be required. This is best achieved at the existing intersection with the High School, because Kinser is at a stop condition.

Recommendation:

A multi-use path on the north side of Kinser is recommended. The fence must be shifted only so far as to accommodate the sidepath with the minimum separation from the roadway. ***A marked crossing of Kinser should be provided,***

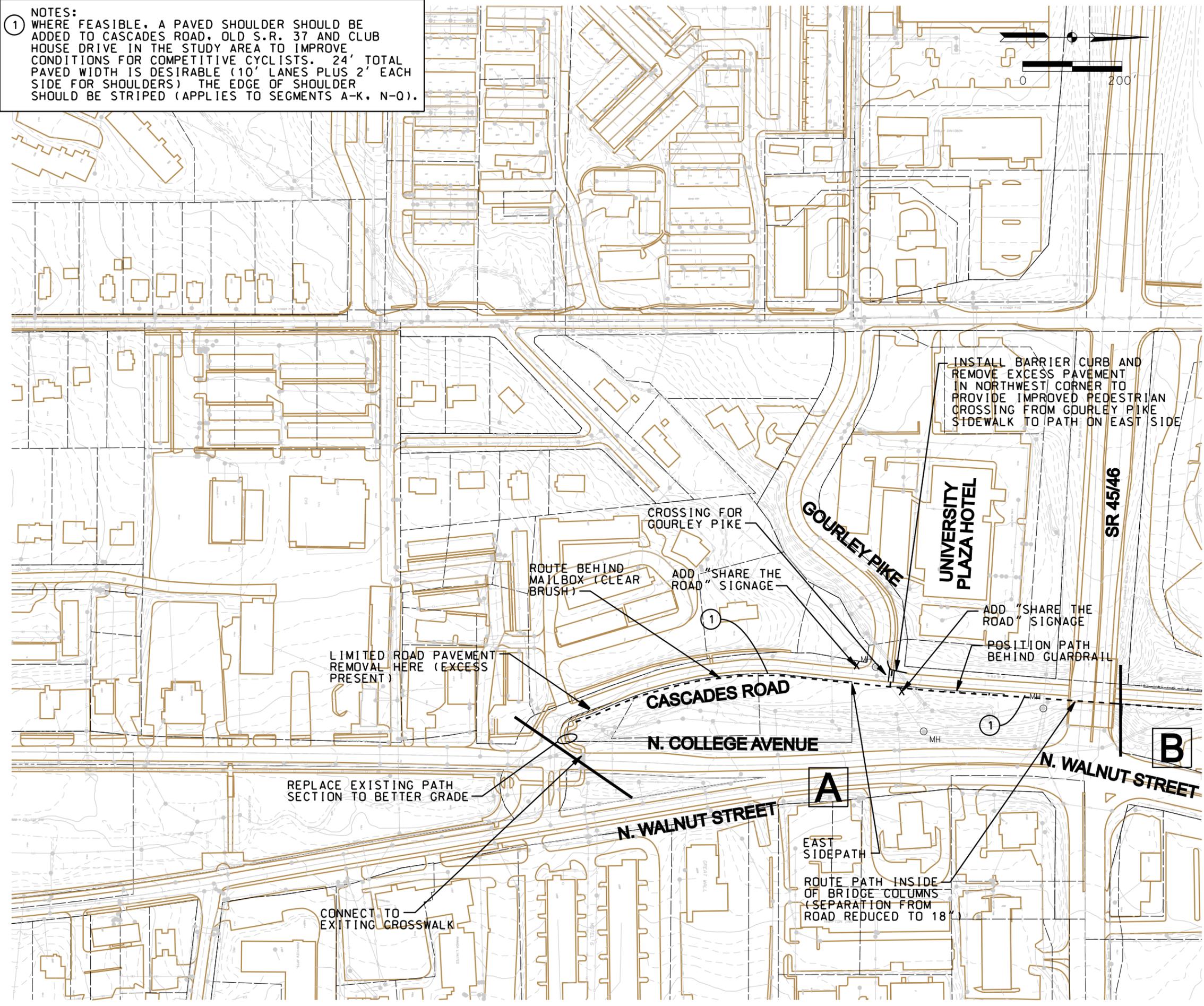


and this should be provided at the bend in Kinser at the west Study limit where Kinser already has a stop sign. ***The intersection should be narrowed here.*** The radius available exceeds requirements and the crossing will be exceptionally long without this modification.

For cyclists, Kinser should be marked with lane edge lines to delineate a shoulder which can function as a narrow, unmarked bike lane. This would provide an additional degree of separation between cars and cyclists, and would not impact either the south side curb or require the widening of the road. A bike lane would be excessive with the adjacent sidepath.

All recommendations are presented on the following plan sheets, Figures 4-1 through 4-6:

NOTES:
 ① WHERE FEASIBLE, A PAVED SHOULDER SHOULD BE ADDED TO CASCADES ROAD, OLD S.R. 37 AND CLUB HOUSE DRIVE IN THE STUDY AREA TO IMPROVE CONDITIONS FOR COMPETITIVE CYCLISTS. 24' TOTAL PAVED WIDTH IS DESIRABLE (10' LANES PLUS 2' EACH SIDE FOR SHOULDERS) THE EDGE OF SHOULDER SHOULD BE STRIPED (APPLIES TO SEGMENTS A-K, N-O).



CITY OF BLOOMINGTON
 DEPT. OF PUBLIC WORKS

RECOMMENDED
 ALTERNATIVES



CASCADES PARK /
 GRIFFY LAKE
 BIKE / PEDESTRIAN
 FEASIBILITY STUDY

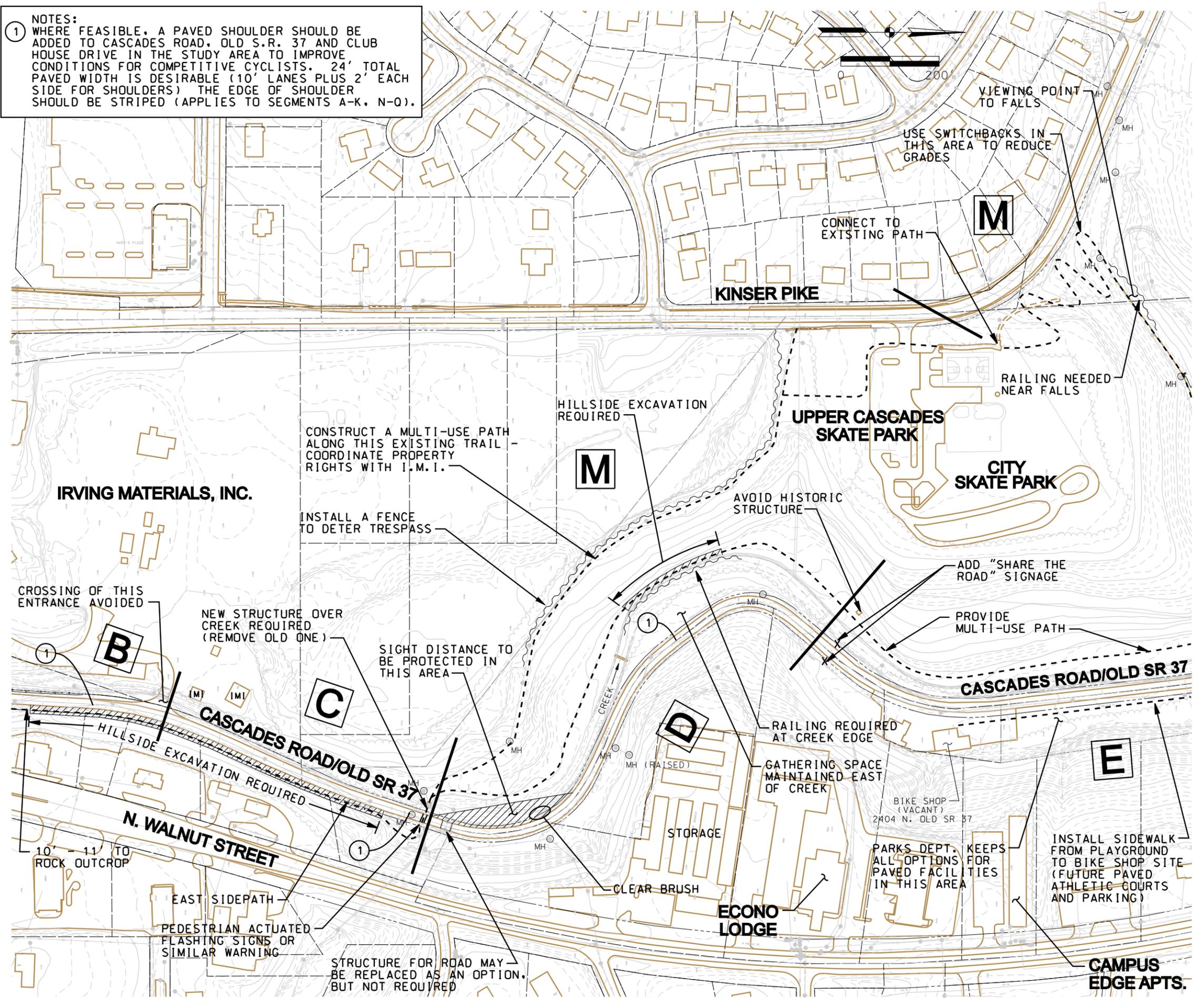
FIGURE
 4-1

PREPARED BY:

 1321 Laurel Oak Drive
 Avon, Indiana 46123
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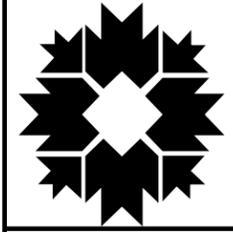
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**RECOMMENDED
 ALTERNATIVES**

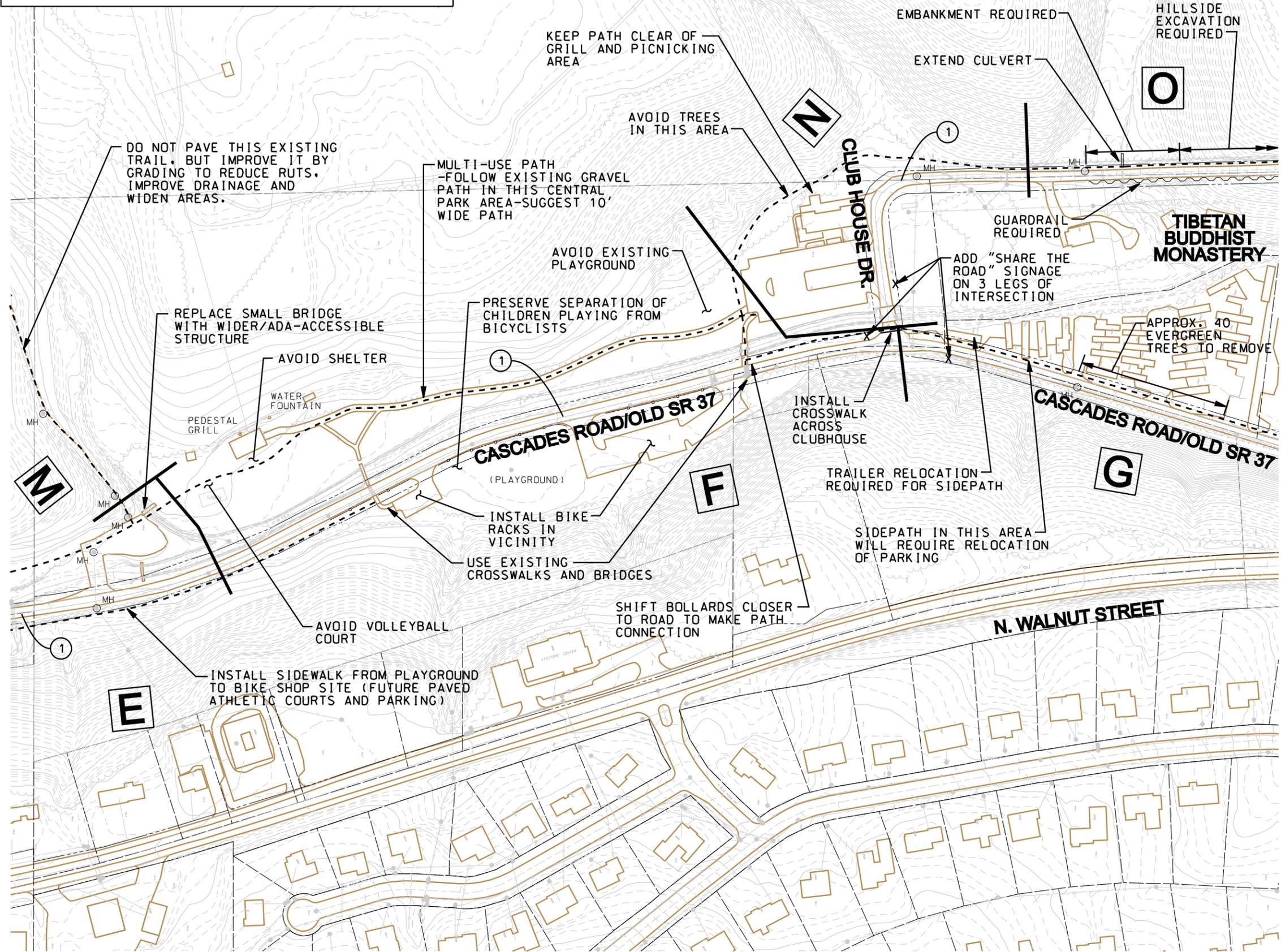
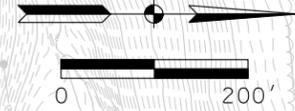


CASCADES PARK /
 GRIFFY LAKE
 BIKE / PEDESTRIAN
 FEASIBILITY STUDY

FIGURE
4-2

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1 NOTES:
 WHERE FEASIBLE, A PAVED SHOULDER SHOULD BE ADDED TO CASCADES ROAD, OLD S.R. 37 AND CLUB HOUSE DRIVE IN THE STUDY AREA TO IMPROVE CONDITIONS FOR COMPETITIVE CYCLISTS. 24' TOTAL PAVED WIDTH IS DESIRABLE (10' LANES PLUS 2' EACH SIDE FOR SHOULDERS) THE EDGE OF SHOULDER SHOULD BE STRIPED (APPLIES TO SEGMENTS A-K, N-O).



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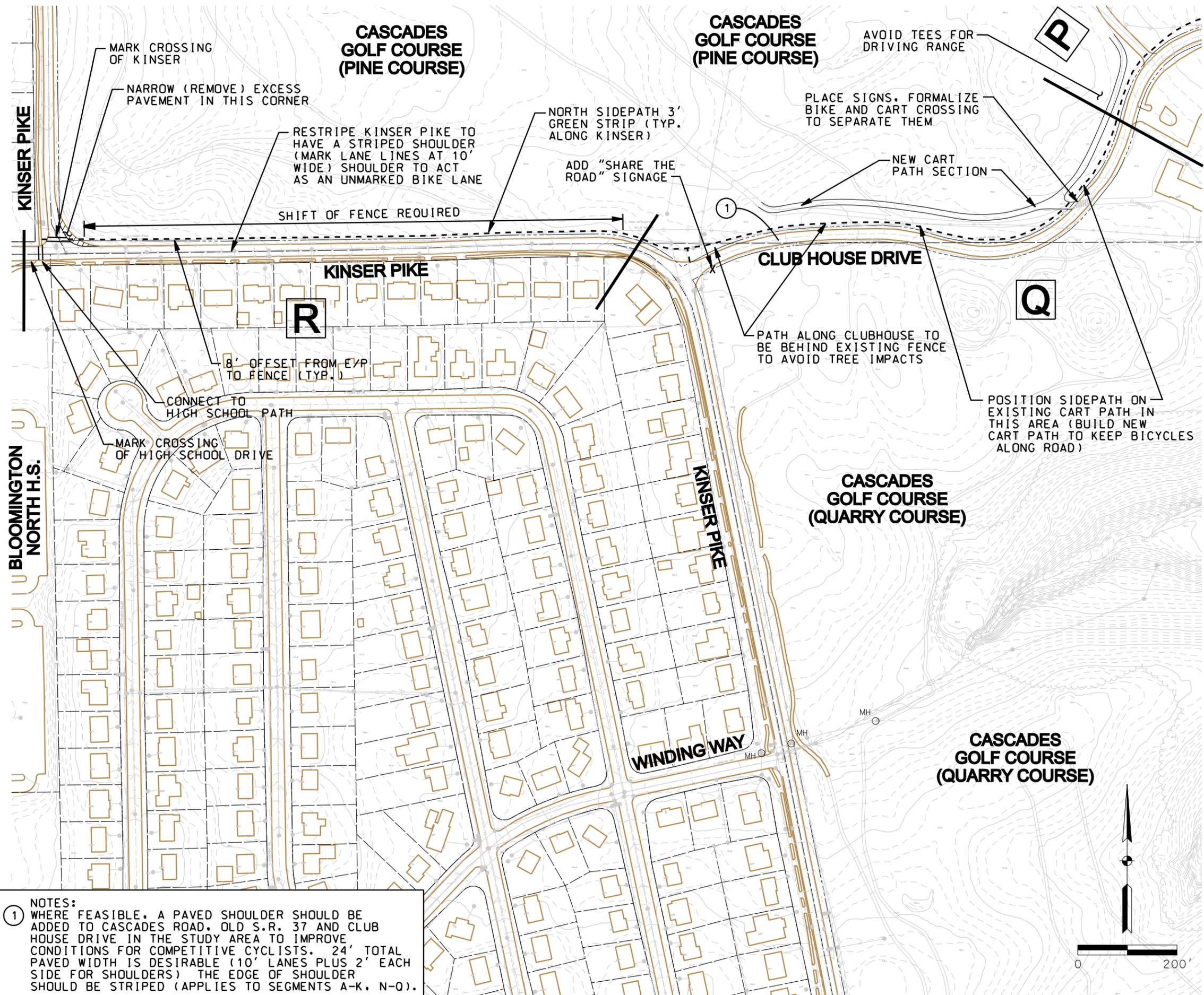
RECOMMENDED
 ALTERNATIVES



CASCADES PARK /
 GRIFFY LAKE
 BIKE / PEDESTRIAN
 FEASIBILITY STUDY

FIGURE
4-3

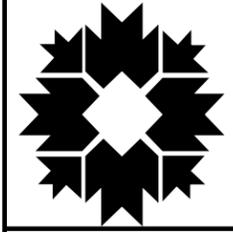
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① NOTES:
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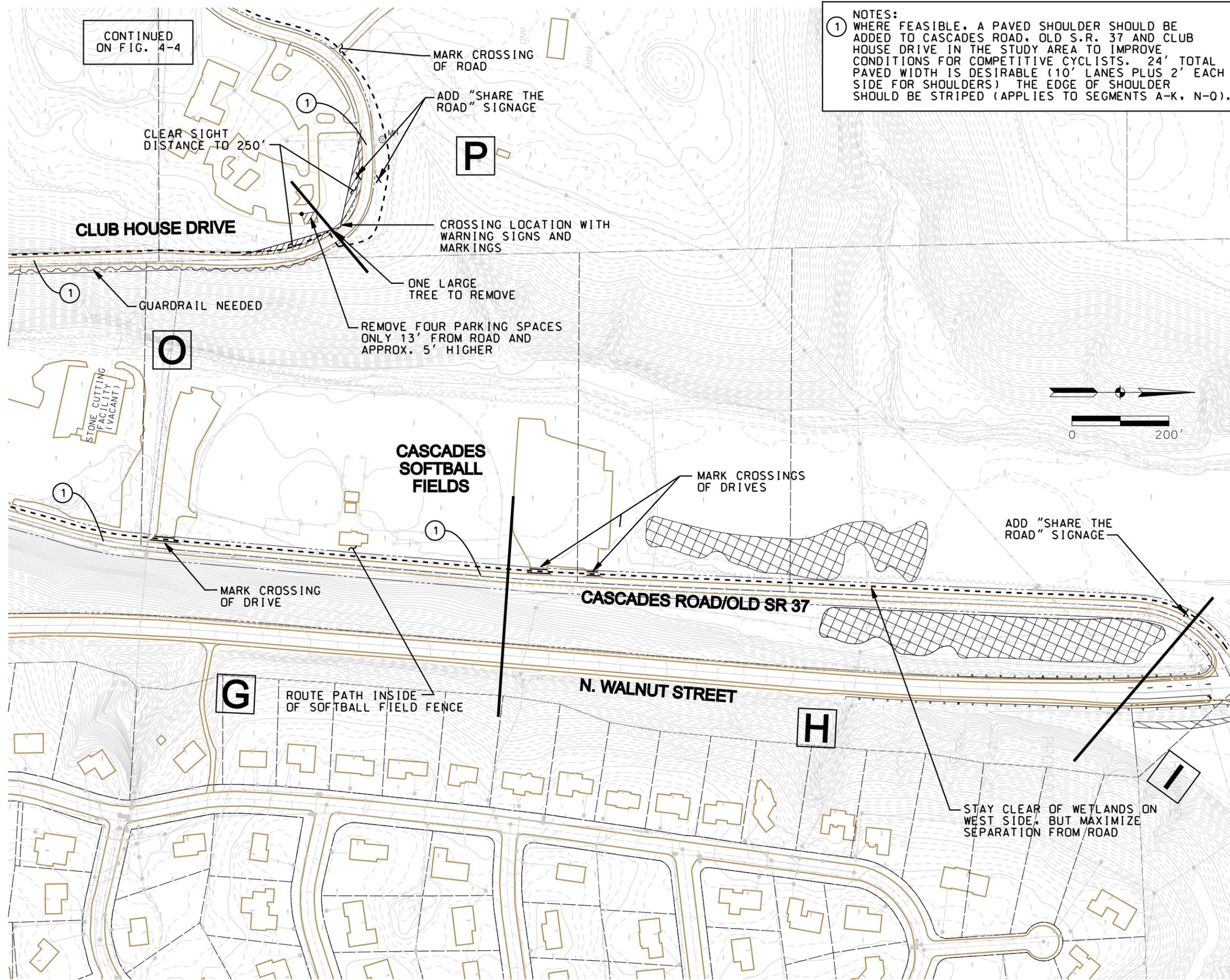
CITY OF BLOOMINGTON
 DEPT. OF PUBLIC WORKS
RECOMMENDED ALTERNATIVES



CASCADES PARK /
 GRIFFY LAKE
 BIKE / PEDESTRIAN
 FEASIBILITY STUDY

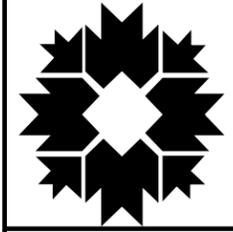
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CITY OF BLOOMINGTON
 DEPT. OF PUBLIC WORKS
**RECOMMENDED
 ALTERNATIVES**



CASCADES PARK /
 GRIFFY LAKE
 BIKE / PEDESTRIAN
 FEASIBILITY STUDY

FIGURE
4-5

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V. CLOSING

A. Prioritization of Improvements

The Study is primarily an engineering feasibility study, and as such is expected to provide City staff with information and guidance for making project implementation decisions. The Study combines information about the area from many sources in a format that has not been available to decision makers before this Study.

The improvements herein will probably take several years to implement, and are likely to be built in phases. The City has many needs for bicycle and pedestrian facilities, and those in the Study Area will be added to the City's other needs and prioritized based on many different factors. Funding availability, public interest, political interest, and opportunities to cooperate with other initiatives are only a few of the possible factors to weigh on such decisions.

It has been the purpose of this effort to identify improvements that can best provide bicycle and pedestrian access to the Study Area. By first identifying the many constraints that exist in the Area, and then comparing feasible alternatives, this Study has identified what are believed to be the optimal ways to provide the desired access.

It is acknowledged that it is up to City decision makers to review these recommendations, decide on which improvements to make, and then determine how best to implement them to achieve the City's goals.

B. Implementation Strategy

Referring only to the recommendations made in this Study, the Engineer offers the following thoughts on how the City might best implement the needed facilities.

Emphasis should be placed on providing the facilities that will be the most used first. To do this, priority should be based on connecting the highest number of recreational cyclists and pedestrians to the primary destinations in the Study Area. This naturally emphasizes the development of the improvements to the south.

Improvements to the north can follow as demand and development increases. In cases where major road or structure replacement projects will be needed for an area to be compatible with a path, then these projects can be pursued separately in advance of path improvements.

It is known that the Griffy Lake Recreational Area is soon to be studied for ways to enhance its use. The addition of bicycle and pedestrian improvements is sure to be an issue in that study area. As improvements are made there, the demand for a

continuous set of “linked parks” that allow travel all the way from Miller Showers Park to Griffy Lake will increase.

The Engineer offers the following proposed breakdown of improvements following this implementation strategy.

Proposed Order for Study Area Improvements			
Priority Ranking	Goal	Description of Improvements	Segments Included
1	Provide connection from Miller Showers Park to central portion of Lower Cascades	Provide sidepath and multi-use path improvements where designated, new path bridge over creek, (structure under Cascades Road optional)	A, B, C, D, E, F
2	Provide accessible route from Lower to Upper Cascades.	Multi-use path on route of existing unimproved trail next to IMI. Provide fence between Park and IMI property.	M
3	Provide connection from central portion of Lower Cascades to Walnut Street	Sidepath on west side of Cascades Road	F, G, H
4	Upgrade the intersection of Walnut and Old SR 37	Intersection Improvement and Signal with any needed turn lanes, signal equipment, and north side path crossing, ready for pedestrian actuation	I
5	Provide connection from BNHS to Club House Drive	Sidepath north side of Kinser	R
6	Provide connection from Kinser to golf course club house	Sidepath north side of Club House	P, Q
7	Conduct roadway improvements to North Dunn Street including new structure on Griffy Creek	Partial roadway reconstruction, widening and structure replacement on Dunn Street	K, L
8	Provide path connection from North Walnut to Griffy Filtration Plant	Sidepath west of Griffy Creek on Old 37, multi-use path in other areas, new bridge or bridge modification for County Bridge 911 for path crossing over Griffy Creek	J,K,L
9	Improve trail to Skatepark from concrete ford area	Grading and widening of unpaved trail	M
10	Improve mobility around Sycamore Shelter and to Club House Drive	Multi-use path behind shelter	N
11	Provide improve bike/ped facility along Club House Drive	Sidepath on west side of Club House	O, P

APPENDIX A

Study Workgroup Meeting Records



MEETING RECORD

Meeting: **Study Workgroup Meeting – Criteria Review**
 Project Name: **Cascades Park / Griffy Lake Bike / Ped Feasibility Study**

Owner: **City of Bloomington, Dept. of Parks & Recreation**
 Project #: **Eagle Ridge # 009**
 Location: **Hooker Conference Room**
 Date/Time: **February 13, 2007; 2-4 p.m.**

Attendees: (*Present if Checked)

	Name:	Representing:	Email:	Phone:
*	David Williams	Parks & Recreation	williamd@bloomington.in.gov	812-349-3706
*	Steve Cotter	Parks & Recreation	cotters@bloomington.in.gov	812-349-3736
*	Scott Robinson	Planning	robinsos@bloomington.in.gov	812-349-3423
*	Joe Fish	Planning	fishj@bloomington.in.gov	812-349-3423
*	Bob Woolford	HAND	woolforr@bloomington.in.gov	812-349-3401
*	Justin Wykoff	Engineering/DPW	wykoffj@bloomington.in.gov	812-349-3417
*	Brock Ridgway	Eagle Ridge	bridgway@eagleridgecivil.com	317-370-9672

This record includes comments made by Workgroup members after the meeting via email. It also includes the refinement of the study criteria based on this later feedback. All attendees are asked to review the record. Please inform Brock of any needed corrections, clarifications, or notes that should be added to this record and Brock will revise and redistribute this meeting record.

MEETING MINUTES

1. Status of Study Effort

The discussion started with an overview of the status of the study. The Data Collection Phase is essentially complete, though two areas where information is still requested are noted below. Field Reconnaissance Phase is complete. The Criteria Review and Development Phase is underway, and this Workgroup Meeting is its primary activity. Alternatives Development will commence after this meeting. Information presented was as follows:

DATA COLLECTION PHASE

Study Area Basemap - DONE

City Coordination (Items Pending):

Contact Mike Bengtson at CBU for information about existing city-owned utilities in the area, and for information on any needed or planned improvements to water, sanitary or storm sewers.

Contact David Williams at Parks for information about a recent site assessment at the abandoned bike shop in the study area.

INDOT Coordination - DONE

Miscellaneous Data Collection - DONE

FIELD RECONNAISSANCE PHASE

Site Reconnaissance - DONE

Wetland Delineation Report - DONE

Update Study Constraint Base Map - DONE

CRITERIA REVIEW AND DEVELOPMENT PHASE – (CURRENT PHASE)

Identify initial **Design Criteria** for review by Workgroup -DONE

Identify initial **Alternative Evaluation Criteria** for review by Workgroup - DONE

Conduct Workgroup to consider Design and Evaluation criteria – DONE

Finalize Criteria for use in Alternative Development and Evaluation phases – CURRENT

ALTERNATIVE DEVELOPMENT PHASE – (NEXT PHASE)

Initial Alternatives Identified - PENDING

Alternatives Workshop - PENDING

ALTERNATIVE EVALUATION PHASE

REPORT / RECOMMENDATIONS PHASE

PROJECT MANAGEMENT TASKS - ONGOING

2. Schedule Status

Project is slightly over two months ahead of schedule due to good weather and a three week headstart on the Notice to Proceed. Schedule status and tentative future milestone are as follows:

MILESTONE	ESTIMATED DATES	ACTUAL (TENTATIVE) DATES
Notice to Proceed	January 2, 2007	December 12, 2006
Complete initial Study Area Base Map and Identify Study Workgroup members	February 16, 2007	January 2, 2007
Complete Fieldwork	March 16, 2007	January 11, 2007
Publish Updates Study Base Map	March 30, 2007	February 9, 2007
Conduct Criteria Review Workshop with Workgroup	April 16, 2007	February 13, 2007
Publish Exhibits of Initial Alternatives	June 22, 2007	At next workshop on March 9, 2007
Conduct Alternatives Development Workshop with Workgroup	June 29, 2007	Scheduled for March 9, 2007
Conduct Workshop Presentation of Recommendations & Publish Draft Report	August 10, 2007	April 2007
Compile Comments / Revise / Publish Final Report	August 31, 2007	May 2007

3. Discussion of Alternative Evaluation Criteria

Brock offered a tentative list of evaluation criteria that might be used to compare future alternatives. The alternatives have not yet been identified...this list is offered to identify those issues that are most important to the Workgroup members. It is desired to prioritize this list to identify those features that should be given the greatest consideration. It is also desirable to delete those criteria that can be reasonably merged with others or are not deemed important enough to be a determining factor.

While the Workgroup did not offer any suggestion on which possible criteria might be deleted, members did note which criteria were more or less important to them. These were provided in followup emails and are noted in the Table below. Brock subsequently reviewed this list along with the Workgroup members' feedback and makes the following recommendations in red:

Potential Evaluation Criteria	Noted as High Importance By:	Noted as Lesser Importance By:	Deemed a Fatal Flaw?	Keep as Evaluation Criteria?
General Safety Benefits –				
Net safety benefits to the public (all travelers) <i>Brock suggests the best way to achieve a review from all perspectives is to use separate criteria for each, and evaluate them independently. The combination of all three will identify the “Net Benefit”.</i>	* Planning * Parks		YES	No
Safety of recreational bike/ped (off-road) users due to drops, slopes, sight distances and conflicts with <i>or separation from</i> on-road bikes and traffic.	* Planning * Parks		No	YES
Safety of competitive (on-road) users not compromised <i>Revise this to “Safety of competitive (on-road) bicyclists due to vehicle traffic, road edge conditions, ped crossings, and alignment”</i>	* Planning * Parks		No	YES
<i>New criteria: Safety to drivers on the roadways and parking areas based on potential conflicts and crossings with other users, or due to road edge conditions.</i>	* Planning * Parks		No	YES
Extent to which a separated facility (multiuse path or sidepath) is provided, instead of a bike lane or shared road. <i>This will be included in the items above.</i>	* Parks		No	No
Number of crossings/conflicts with vehicular traffic <i>This will be included in the items above.</i>			No	No

Potential Evaluation Criteria	Noted as High Importance By:	Noted as Lesser Importance By:	Deemed a Fatal Flaw?	Keep as Evaluation Criteria?
Achievement of Access and Connectivity				
Achievement of primary links noted in the Study's purpose. <i>Brock suggests deletion of the criterion because failure to make the primary links would be a "fatal flaw"</i>	* Planning * Parks		YES	No
Connection to path users (neighborhoods and other paths) <i>Brock suggests this be modified to "Supports connections to future system links/destinations" because links to neighborhoods in the Study Area will be checked as a fatal flaw above.</i>	* Planning		No	YES
Accessibility to parking or trailheads for park/ride. <i>Deleted because making the primary links will achieve this goal.</i>			No	No
Accessibility to public transit network (bus routes) <i>Deleted because making the primary links will achieve this goal.</i>		* Planning	No	No
Compliance with ADA <i>Criterion kept because a route that complies with ADA would be favored over one that does not.</i>			No	YES
Access for residents in the Study Area. <i>Merged with item above.</i>			No	No
Impacts to Park/ Roadway Use Mobility				
Potential for reduction in park use due to perceived inconvenience (one way of road)	* Parks	* Planning	No	YES
Potential for or impact to "passive" areas	* Parks	* Planning	No	YES
Alternatives support both competitive level and recreational biking, but also deal with concerns of mixing bicycle uses (e.g. competitive teams versus young children) <i>Brock suggests this criterion be kept with the acknowledgement that this may only be achieved with the adoption of multiple alternatives in many or all of the segments.</i>	* Parks		No	YES
Impacts to operation/safety at IMI. <i>Criterion deleted because no alternative that does not provide reasonable and safe access to IMI will be deemed feasible.</i>			YES	No
<i>New criterion: Operational concerns for road use by the Schools/ residents/ or emergency services</i>			No	YES

Potential Evaluation Criteria	Noted as High Importance By:	Noted as Lesser Importance By:	Deemed a Fatal Flaw?	Keep as Evaluation Criteria?
Minimization of Natural Environment Impacts				
Impacts to mature trees	* Parks		No	YES
Impacts to wetlands. <i>Deleted because any impact greater than 0.10 acre will be deemed a fatal flaw.</i>			YES	No
Compatibility with required remediation at bike shop. <i>Deleted because these are requirements, and failure to meet them would be a fatal flaw.</i>			YES	No
Needs for, or limitations to future choices, for changes to stream banks. <i>Revise this criterion to: Impacts to stream channel or stream banks that are natural or could be restored to more natural conditions</i>	* Parks		No	YES
Approximate Construction Cost Considerations				
Amount of rock excavation required <i>Criterion deleted – merged into Approx Const Cost.</i>			No	No
New Pavement required. <i>Criterion deleted – merged into Approx Const Cost.</i>		* Planning	No	No
Length of retaining wall required. <i>Merged into Approx Const Cost</i>			No	No
Number of bridges required <i>Merged into Approx Const Cost</i>			No	No
Length of slope or fall protection railing required. <i>Merged into Approx Const Cost.</i>			No	No
Approximate construction cost	* Planning	* Parks	No	YES
Support of other City Needs				
Degree to which an alternative supports the goals of the Alternative Transportation Plan. <i>Delete this criterion - providing bike/ped facilities in any form will exceed the goals of the Alt. Transp. Plan (which only calls for signed routes in this area).</i>		* Parks	No	No
Satisfaction of another City goal (e.g. a utility improvement could share the route and cost). <i>Brock suggests deletion of this criteria so that Bike /Ped facilities may be evaluated on their own merit...and not because a utility improvement is needed.</i>		* Planning * Parks	No	No

Potential Evaluation Criteria	Noted as High Importance By:	Noted as Lesser Importance By:	Deemed a Fatal Flaw?	Keep as Evaluation Criteria?
Quality of Bike/Ped Experience				
Subjective opinion of degree to which the alternative provides a safe, scenic, and enjoyable experience. <i>Brock suggests this criteria be kept, but modified to be evaluated “from the perspective of a recreational bicyclist or pedestrian”.</i>			No	YES
Consistency of Bike/Ped facility through the corridor <i>Generally interpreted as making few changes to the location or type of facility that is provided – but will need to be evaluated across multiple corridor segments.</i>	* Planning * Parks		No	YES

In summary, the following evaluation criteria will be used as fatal flaws to eliminate an alternative:

Fatal Flaws to Eliminate Alternatives:

Results in a “net loss” to safety
Fails to provide link to one of the key destinations in the Study Area
Results in an unsafe or operational problem at the entrance to IMI
Wetland Impact greater than 0.10 acre
Failure to meet requirements for remediation of Bike Shop site

If alternatives do not possess fatal flaws, then the following criteria will be used to evaluate and compare alternatives in later study phases:

Revised Alternative Evaluation Criteria (Unranked)

Safety Criteria:

Safety of Recreational bike/ped (off-road) users
Safety of competitive (on-road) bicyclists
Safety of Motorists

Access and Connectivity Criteria:

Supports connections to future system links/destinations
Compliance with ADA-accessibility requirements

Park and Roadway Use Criteria:

Potential for reduction in park use due to inconvenience of one-way roads
Potential for negative impacts to passive areas of the park
Provides for both competitive and recreational users without mixing the two
Operational impacts of one-way roads to use by schools, residents or emergency services

Natural Environment Impacts:

Impacts to mature trees
Impacts to stream channel or banks that are natural or could be restored to more natural condition

Construction Cost Criteria:

Approximate construction cost

Quality of Bike/Ped Experience:

Enjoyable facility from the perspective of a recreational cyclist or pedestrian
Consistency of facility with adjacent sections

Brock requests the review of these above criteria by the Study Workgroup before they are adopted into the Study. Further ranking of the list at this point is not suggested by Brock, though the Workgroup should consider the issue. It is very subjective process in any case, and there is limited potential benefit to identifying a specific ranking to these.

4. Discussion of Bicycle/Pedestrian Facility Design Criteria

Design Criteria are the basic feature descriptions and dimensions that would apply to the development of potential alternatives. Initial recommendations for “desired” and “minimum” dimensions were offered by Brock. There was discussion over these criteria, as well as some discussion about the City’s experience and tolerance of failing to meet these criteria due to site constraints.

The Design Criteria, as modified in the discussion, are as follows:

Sidepath Characteristics:

	Desired Value	Minimum Value	Notes
Width	10’ in high mixed-usage areas, 8’ in other areas	Generally 8’, 6’ in extreme site conditions	Widen on Steep Grades
Side Clearance to obstacles	6’ max	18” minimum	Poles, signs, etc.
Path shoulder grades	2’ wide, 5’ wide if at top of a slope	Use rail/barrier above dangerous slope if too close	Make shoulder as flat as possible (2% cross slope desired for joggers)
Vertical Clearance	As much as practicable	8’ for point obstacles, 10’ for underpasses	N/A in study area
Design Speed	Design to selected speed of faster bicyclists	20 mph, if downgrades exceed 4%, raise to 30 mph	Consider mixed use setting. Encourage faster cyclists to use roadway.
Separation from road edge	As much as practicable	If under 5’, consider physical separation barrier	
Sight Distances	As much as possible, mutual visibility is essential	See Note	Depends on factors of speed, grade and roadway curvature. Consider values for cars on roadway at crossing points
Curve Radius	100’ for 20 mph, 156’ for 25 mph 225’ for 30 mph		
Grades	Less than 5%	5-6% up to 800’, 7% up to 400’, 8% up to 300’ 9% up to 200’ 10% up to 100’ 11+% up to 50’	Add additional 4’ width for dismount/pushing bicycles, add several other safety measures to warn of descent speeds and provide for clearances, use switchbacks
Bike/Ped Bridge Clear Width	Path width + 2’ each side	Path width	

Bike Lane Characteristics:

	Desired Value	Minimum Value	Notes
Bike lane width	6' in rural setting, 4' in urban setting 5' next to parking 5' next to guardrail or other barrier	4'	

Shared Road Characteristics:

	Desired Value	Minimum Value	Notes
Paved Shoulder Width	4' wide, 5' if next to barrier or rail	2'	Any shoulder is better than none
Widened street lanes	14', 15' on steep grades	12'	

The members noted their understanding that there may be cases where full ADA compliance is not possible given site topography, but that ADA compliance should always be considered a goal.

Again, the review of these Design Criteria by the Study Workgroup is requested prior to their final adoption into the Study.

5. Other Issues:

Joe Fish with Planning and Bob Woolford of the HAND Department have been added to the Study Workgroup.

Miscellaneous comments noted during this Workgroup Meeting:

Concrete trucks use Cascades Road both north and south of their entrance, though more traffic was noted going south to Walnut.

In making the links from Lower Cascades to Upper Cascades, we may need to consider providing a separate pedestrian trail to get pedestrians off the road if an off-road bike facility cannot be accommodated.

We should consider the need for a sidepath along the west side of Kinser Pike in the future, though it is recognized that only a portion of Kinser is in the Study Area. A sidepath on the golf course side is not preferred do to the potential hazard and liability of having the trail next to the golf course.

David Williams expressed a strong preference for a protected, off-road path for bike/ped use from north to south through the park.

Group is unsure how much public or political opposition there might be to making the roads one-way to create greater room for a sidepath.

Brock committed to calling the Monroe County Schools to get better information about school bus use of the roads.

Connections for the Blue Ridge subdivision to the study area were discussed but not identified. That area is on the ridge above the Filtration Plant and there are no easements or public right-of-way except for Dunn Street. It is generally believed that the only feasible connection will be along Dunn Street to the Griffy Dam area, and these are outside of this Study Area.

Cascades Road was resurfaced in 2006.

Brock noted that the City's Urban Forester had noted only a general concern to minimize tree impacts, but did not note any specific concerns or especially sensitive specimens in the Study Area.

Group noted that there is a much lower anticipated usage of the Park by pedestrians in the north section of the Park (generally north of the mobile home park).

Recommendations should consider the likelihood that the City could eventually own the land on both sides of the road all the way from Miller Showers to Griffy Lake, essentially presenting a system of linked park properties.

Steve Cotter noted a desire to avoid cutting into the slopes of the hills due to concerns about erosion and stability.

Emergency services should be contacted regarding the possibility of converting the various roadway sections to one-way traffic.

The need for traffic data was discussed and it was generally agreed that Engineering would obtain data for each road segment in the study area that might be considered for a one-way conversion. This includes Cascades south of Club House, Cascades north of Club House, and Club House from Kinser to Cascades.

Workgroup members noted that they would hold internal discussions regarding the idea of one-way conversions with other City officials.

Brock is to add one-way conversions to the alternatives list in the appropriate segments of the study so that they will receive due consideration in that phase of the Study.

Brock asked Workgroup members to try to talk to CBU at other venues to see if they have any comments on the Study. They have not yet responded to coordination requests.

Workgroup generally stated that the primary goal of the Study is to identify "feasible" alternatives...though it is still expected that Brock will make recommendations from among the feasible alternatives for the City's consideration.

6. Next Workshop: Alternatives Development Workshop

The next workshop is scheduled for Friday, March 9 at 9 am in the Kelly Conference Room.

Agenda is expected to include:

- ◆ Discussion on Ranking the Evaluation Criteria
- ◆ Final Adoption of the Evaluation Criteria
- ◆ Final Adoption of the Design Criteria
- ◆ Review of the Mapping with Initial Alternatives as prepared by Brock
- ◆ Alternatives Development Discussion (Add, Delete, Revise, Reclassify)



MEETING RECORD

Meeting: **Study Workgroup Meeting – Alternatives Development**
 Project Name: **Cascades Park / Griffy Lake Bike / Ped Feasibility Study**

Owner: **City of Bloomington, Dept. of Parks & Recreation**
 Project #: **Eagle Ridge # 009**
 Location: **Kelly Conference Room**
 Date/Time: **March 9, 2007; 9-11 p.m.**

Attendees: (*Present if Checked)

	Name:	Representing:	Email:	Phone:
*	David Williams	Parks & Recreation	williamd@bloomington.in.gov	812-349-3706
*	Steve Cotter	Parks & Recreation	cotters@bloomington.in.gov	812-349-3736
*	Scott Robinson	Planning	robinsos@bloomington.in.gov	812-349-3423
*	Joe Fish	Planning	fishj@bloomington.in.gov	812-349-3423
*	Bob Woolford	HAND	woolforr@bloomington.in.gov	812-349-3401
*	Justin Wykoff	Engineering/DPW	wykoffj@bloomington.in.gov	812-349-3417
*	Brock Ridgway	Eagle Ridge	bridgway@eagleridgecivil.com	317-370-9672

All attendees are asked to review the record. Please inform Brock of any needed corrections, clarifications, or notes that should be added to this record and Brock will revise and redistribute this meeting record.

MEETING AGENDA

1. Status of Study Effort

DATA COLLECTION PHASE

Study Area Basemap - DONE
 City Coordination (Items Pending):

Contact Mike Bengtson at CBU for information about existing city-owned utilities in the area, and for information on any needed or planned improvements to water, sanitary or storm sewers.

INDOT Coordination - DONE
 Miscellaneous Data Collection - DONE

FIELD RECONNAISSANCE PHASE

Site Reconnaissance - DONE
 Wetland Delineation Report - DONE
 Update Study Constraint Base Map - DONE

CRITERIA REVIEW AND DEVELOPMENT PHASE

Identify initial **Design Criteria** for review by Workgroup -DONE
 Identify initial **Alternative Evaluation Criteria** for review by Workgroup - DONE

Conduct Workgroup to consider Design and Evaluation criteria – DONE
 Finalize Criteria for use in Alternative Development and Evaluation phases – DONE

ALTERNATIVE DEVELOPMENT PHASE – (CURRENT)

Initial Alternatives Identified - DONE
 Alternatives Workshop - CURRENT

ALTERNATIVE EVALUATION PHASE (NEXT)

REPORT / RECOMMENDATIONS PHASE

PROJECT MANAGEMENT TASKS - ONGOING

2. Schedule Status

Schedule status and tentative future milestone are as follows:

MILESTONE	ESTIMATED DATES	ACTUAL (TENTATIVE) DATES
Notice to Proceed	January 2, 2007	December 12, 2006
Complete initial Study Area Base Map and Identify Study Workgroup members	February 16, 2007	January 2, 2007
Complete Fieldwork	March 16, 2007	January 11, 2007
Publish Updates Study Base Map	March 30, 2007	February 9, 2007
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Conduct Alternatives Development Workshop with Workgroup	June 29, 2007	March 9, 2007
Conduct Workshop Presentation of Recommendations & Publish Draft Report	August 10, 2007	April 2007
Compile Comments / Revise / Publish Final Report	August 31, 2007	April or May 2007

3. Final Adoption of Alternative Evaluation Criteria

Workgroup was offered the following list for comment. The group discussed the criteria and the comments offered are noted below. The notion of ranking the criteria was discussed but the group was not generally supportive of ranking the criteria. These have now been adopted as the alternative evaluation criteria for the upcoming Alternative Evaluation Phase.

Fatal Flaws to Eliminate Alternatives:

- ◆ Results in a “net loss” to safety
- ◆ Fails to provide link to one of the key destinations in the Study Area (*David Williams stated that he only wants the primary north-south link between Miller Showers and Griffy Lake to be treated as a fatal flaw*)
- ◆ Results in an unsafe or operational problem at the entrance to IMI
- ◆ Wetland Impact greater than 0.10 acre
- ◆ Failure to meet requirements for remediation of Bike Shop site

If alternatives do not possess fatal flaws, then the following criteria will be used to evaluate and compare alternatives in later study phases:

Revised Alternative Evaluation Criteria (Unranked)

Safety Criteria:

Safety of Recreational bike/ped (off-road) users
Safety of competitive (on-road) bicyclists
Safety of Motorists

Access and Connectivity Criteria:

Supports connections to future system links/destinations
Compliance with ADA-accessibility requirements

Park and Roadway Use Criteria:

Potential for reduction in park use due to inconvenience of one-way roads
Potential for negative impacts to passive areas of the park
Provides for both competitive and recreational users without mixing the two
Operational impacts of one-way roads to use by schools, residents or emergency services

Natural Environment Impacts:

Impacts to mature trees
Impacts to stream channel or banks that are natural or could be restored to more natural condition

Construction Cost Criteria:

Approximate construction cost

Quality of Bike/Ped Experience:

Enjoyable facility from the perspective of a recreational cyclist or pedestrian
Consistency of facility with adjacent sections

4. Review of Figure 3 – Segments and Initial Alternatives

Brock presented the draft version of Figure 3, which identifies the Study Area segments and the Initial List of Alternatives for each. The discussion progressed through each segment.

The Workgroup noted that they do not wish to consider the conversion of Club House to a one-way road, and also do not want to consider Cascades Road north of Club House Drive. Only the section of Cascades Road south of Club House Drive will be considered for conversion to one-way.

The Workgroup noted that they want a sidepath along the north side a Kinser to be considered, outside of the fence for the golf course, even if it means the fence must be shifted north a few feet.

These were the only changes to the Segments and Alternatives offered, and will be reflected in the next phase of the work (Alternatives Evaluation). The segments and alternatives will be presented in the Study Report.

5. Next Workshop: Presentation of Draft Recommendations

*The next workshop is scheduled for **To be Determined, likely early April.***

Agenda is expected to include:

- ◆ Presentation of the results of the Alternatives Evaluation process
- ◆ Presentation of Engineer's Draft Recommendations
- ◆ Discussion and Comment period.

APPENDIX B

Early Coordination Letters

December 14, 2006

Brad Wisler
Member, City Council District II
1111 Briarcliff Drive
Bloomington, IN 47404

**Re: Request for Early Coordination and Comments
Cascades Park / Griffy Lake Bicycle Path Feasibility Study**

Dear Councilman Wisler:

The Bloomington Parks Department is initiating a study to determine the feasibility and recommended route of bicycle and pedestrian facilities through Cascades Park. The intent is to provide a link that extends all the way from the edge of Miller Showers Park, through Cascades Park, across North Walnut Street to the Filtration plant area at Griffy Lake. It is also proposed to connect Lower Cascades Park to the Upper Cascades area including the City Skate Park, Golf Course, and Bloomington North High School. A map is attached to assist you in better understanding the location and limits of the study.

Eagle Ridge Civil Engineering Services, LLC has been retained to conduct the study which will be coordinated through David Williams at the Parks Department.

This is our first step in communicating with you about the conduct of this study. It is intended to introduce you to the study, and to solicit your initial ideas and feedback for these potential improvements in your district.

At this time, we ask your assistance with the following:

- **Please identify any concerns or comments you have about the study and the study area. This study is expected to result in recommendations for future path projects.**

If you have any questions, you may contact me at the number or email below. **Please provide your response to this letter by Friday, January 5, 2007.**

I look forward to working with you to make this a better study. Thank you very much for your assistance.

Sincerely Yours,

Brock Ridgway, P.E.
Project Manager

Enclosures: **Cascades Study Area Map**

December 14, 2006

Danise Alano
Asst. Dir. Of Economic Development
City Hall at Showers, Suite 210
PO Box 100
Bloomington, IN 47402

**Re: Request for Early Coordination and Comments
Cascades Park / Griffy Lake Bicycle Path Feasibility Study**

Dear Ms. Alano:

The Bloomington Parks Department is initiating a study to determine the feasibility and recommended route of bicycle and pedestrian facilities through Cascades Park. The intent is to provide a link that extends all the way from the edge of Miller Showers Park, through Cascades Park, across North Walnut Street to the Filtration plant area at Griffy Lake. It is also proposed to connect Lower Cascades Park to the Upper Cascades area including the City Skate Park, Golf Course, and Bloomington North High School. A map is attached to assist you in better understanding the location and limits of the study.

Eagle Ridge Civil Engineering Services, LLC has been retained to conduct the study which will be coordinated through David Williams at the Parks Department.

At this time, we ask your assistance with the following:

- **Please identify any concerns or comments you have about the study and the study area. This study is expected to result in recommendations for future path projects.**

If you have any questions, you may contact me at the number or email below. **Please provide your response to this letter by Friday, January 5, 2007.**

I look forward to working with you to make this a better study. Thank you very much for your assistance.

Sincerely Yours,

Brock Ridgway, P.E.
Project Manager

Enclosures: **Cascades Study Area Map**

December 14, 2006

Jeff Barlow, Chief
Bloomington Fire Department
300 E. Fourth Street
Bloomington, IN 47408

**Re: Request for Early Coordination and Comments
Cascades Park / Griffy Lake Bicycle Path Feasibility Study**

Dear Jeff:

The Bloomington Parks Department is initiating a study to determine the feasibility and recommended route of bicycle and pedestrian facilities through Cascades Park. The intent is to provide a link that extends all the way from the edge of Miller Showers Park, through Cascades Park, across North Walnut Street to the Filtration plant area at Griffy Lake. It is also proposed to connect Lower Cascades Park to the Upper Cascades area including the City Skate Park, Golf Course, and Bloomington North High School. A map is attached to assist you in better understanding the location and limits of the study.

Eagle Ridge Civil Engineering Services, LLC has been retained to conduct the study which will be coordinated through the Parks Department.

At this time, we ask your assistance with the following:

- Please note any concerns or comments you have about the study area.
- **We would especially like to hear from you on any issues that you feel need to be considered relating to emergency response and public safety for these proposed path and trail facilities.**

If you have any questions, you may contact me at the number or email below. **Please provide your response to this letter by Friday, January 5, 2007.**

I look forward to working with you to make this a better study. Thank you very much for your assistance.

Sincerely Yours,

Brock Ridgway, P.E.
Project Manager

Enclosures: **Cascades Study Area Map**

December 14, 2006

Lee Huss, Urban Forester
Bloomington Parks Department
City Hall at Showers, Suite 250
PO Box 100
Bloomington, IN 47402

**Re: Request for Early Coordination and Comments
Cascades Park / Griffy Lake Bicycle Path Feasibility Study**

Dear Lee:

The Bloomington Parks Department is initiating a study to determine the feasibility and recommended route of bicycle and pedestrian facilities through Cascades Park. The intent is to provide a link that extends all the way from the edge of Miller Showers Park, through Cascades Park, across North Walnut Street to the Filtration plant area at Griffy Lake. It is also proposed to connect Lower Cascades Park to the Upper Cascades area including the City Skate Park, Golf Course, and Bloomington North High School. A map is attached to assist you in better understanding the location and limits of the study.

Eagle Ridge Civil Engineering Services, LLC has been retained to conduct the study which will be coordinated through the Parks Department.

At this time, we ask your assistance with the following:

- Identifying any concerns or comments you have about the study area.
- **Many of the potential routes that will be examined could include sections through wooded areas, and some tree impacts will occur.** Recognizing that the study area is fairly large, can you offer any guidance that would be helpful in evaluating potential routes. Such guidance might include information about:
 - **The presence of notable individual trees, especially in the limits of the park**
 - **General guidance on a size of tree that should be avoided**
 - **Specific guidance on a species of tree that should be avoided.**

I apologize that this request is a bit vague. **My real intent is to get some feedback from you that I can use when conducting field work that would help me to identify trees that should be avoided.** Many site constraints will be considered, and we want to ensure that minimizing tree impacts is one of them.

If you have any questions, you may contact me at the number or email below. **Please provide your response to this letter by Friday, January 5, 2007.**

I look forward to working with you to make this a better study. Thank you very much for your assistance.

Sincerely Yours,

Brock Ridgway, P.E.
Project Manager

Enclosures: **Cascades Study Area Map**

December 14, 2006

Nancy Hiestand, Program Manager
Historic Preservation Commission
City Hall at Showers, Suite 130
PO Box 100
Bloomington, IN 47402

**Re: Request for Early Coordination and Comments
Cascades Park / Griffy Lake Bicycle Path Feasibility Study**

Dear Nancy:

The Bloomington Parks Department is initiating a study to determine the feasibility and recommended route of bicycle and pedestrian facilities through Cascades Park. The intent is to provide a link that extends all the way from the edge of Miller Showers Park, through Cascades Park, across North Walnut Street to the Filtration plant area at Griffy Lake. It is also proposed to connect Lower Cascades Park to the Upper Cascades area including the City Skate Park, Golf Course, and Bloomington North High School. A map is attached to assist you in better understanding the location and limits of the study.

Eagle Ridge Civil Engineering Services, LLC has been retained to conduct the study which will be coordinated through the Parks Department.

At this time, we ask your assistance with the following:

- **Please note any concerns or comments you have about the study area, especially noting if you are aware of the presence of historically or culturally sensitive properties in the study area.**

If you have any questions, you may contact me at the number or email below. **Please provide your response to this letter by Friday, January 5, 2007.**

I look forward to working with you to make this a better study. Thank you very much for your assistance.

Sincerely Yours,

Brock Ridgway, P.E.
Project Manager

Enclosures: **Cascades Study Area Map**

December 14, 2006

Scott Robinson
Bloomington Planning Department
City Hall at Showers, Suite 160
PO Box 100
Bloomington, IN 47402

**Re: Request for Early Coordination and Comments
Cascades Park / Griffy Lake Bicycle Path Feasibility Study**

Dear Scott:

The Bloomington Parks Department is initiating a study to determine the feasibility and recommended route of bicycle and pedestrian facilities through Cascades Park. The intent is to provide a link that extends all the way from the edge of Miller Showers Park, through Cascades Park, across North Walnut Street to the Filtration plant area at Griffy Lake. It is also proposed to connect Lower Cascades Park to the Upper Cascades area including the City Skate Park, Golf Course, and Bloomington North High School. A map is attached to assist you in better understanding the location and limits of the study.

Eagle Ridge Civil Engineering Services, LLC has been retained to conduct the study which will be coordinated through the Parks Department.

At this time, we ask your assistance with the following:

- Identifying any concerns or comments you have about the study area.
- **Obtaining information about potential changes or new developments that may be in planning.** This study is going to examine existing conditions, but future changes must also be considered. There may be opportunities for cooperation that could benefit all involved.

If you have any questions, you may contact me at the number or email below. **Please provide your response to this letter by Friday, January 5, 2007.**

I look forward to working with you to make this a better study. Thank you very much for your assistance.

Sincerely Yours,

Brock Ridgway, P.E.
Project Manager

Enclosures: **Cascades Study Area Map**

December 14, 2006

Mike Hostetler, Chief
Bloomington Police Department
220 E. Third Street
Bloomington, IN 47401

**Re: Request for Early Coordination and Comments
Cascades Park / Griffy Lake Bicycle Path Feasibility Study**

Dear Chief Hostetler:

The Bloomington Parks Department is initiating a study to determine the feasibility and recommended route of bicycle and pedestrian facilities through Cascades Park. The intent is to provide a link that extends all the way from the edge of Miller Showers Park, through Cascades Park, across North Walnut Street to the Filtration plant area at Griffy Lake. It is also proposed to connect Lower Cascades Park to the Upper Cascades area including the City Skate Park, Golf Course, and Bloomington North High School. A map is attached to assist you in better understanding the location and limits of the study.

Eagle Ridge Civil Engineering Services, LLC has been retained to conduct the study which will be coordinated through the Parks Department.

At this time, we ask your assistance with the following:

- Please note any concerns or comments you have about the study area.
- **We would especially like to hear from you on any issues that you feel need to be considered relating to emergency response and public safety for these proposed path and trail facilities.**

If you have any questions, you may contact me at the number or email below. **Please provide your response to this letter by Friday, January 5, 2007.**

I look forward to working with you to make this a better study. Thank you very much for your assistance.

Sincerely Yours,

Brock Ridgway, P.E.
Project Manager

Enclosures: **Cascades Study Area Map**

December 14, 2006

Don Porter
Bloomington Traffic Division
PO Box 100
Bloomington, IN 47402

**Re: Request for Early Coordination and Comments
Cascades Park / Griffy Lake Bicycle Path Feasibility Study**

Dear Don:

The Bloomington Parks Department is initiating a study to determine the feasibility and recommended route of bicycle and pedestrian facilities through Cascades Park. The intent is to provide a link that extends all the way from the edge of Miller Showers Park, through Cascades Park, across North Walnut Street to the Filtration plant area at Griffy Lake. It is also proposed to connect Lower Cascades Park to the Upper Cascades area including the City Skate Park, Golf Course, and Bloomington North High School. A map is attached to assist you in better understanding the location and limits of the study.

Eagle Ridge Civil Engineering Services, LLC has been retained to conduct the study which will be coordinated through the Parks Department.

At this time, we ask your assistance with the following:

- Please note any concerns or comments you have about the study area.
- **The proposed path route will include a new bicycle and pedestrian-friendly crossing of North Walnut at Old SR 37, probably including pedestrian actuation at the signal. We ask your help in obtaining information about the traffic signal at North Walnut and Old SR 37 including a copy of intersection and signal plans that are kept by your Department. Information on actuation would be helpful.**
- Additionally, please provide information about potential changes or new developments that may be in planning. This study is going to examine existing conditions, but future changes must also be considered. There may be opportunities for cooperation that could benefit all involved.

If you have any questions, you may contact me at the number or email below. **Please provide your response to this letter by Friday, January 5, 2007.**

I look forward to working with you to make this a better study. Thank you very much for your assistance.

Sincerely Yours,

Brock Ridgway, P.E.
Project Manager

Enclosures: **Cascades Study Area Map**

December 14, 2006

Lew May
General Manager
Bloomington Transit
130 W. Grimes Lane
Bloomington, IN 47403

**Re: Request for Early Coordination and Comments
Cascades Park / Griffy Lake Bicycle Path Feasibility Study**

Dear Mr. May:

The Bloomington Parks Department is initiating a study to determine the feasibility and recommended route of bicycle and pedestrian facilities through Cascades Park. The intent is to provide a link that extends all the way from the edge of Miller Showers Park, through Cascades Park, across North Walnut Street to the Filtration plant area at Griffy Lake. It is also proposed to connect Lower Cascades Park to the Upper Cascades area including the City Skate Park, Golf Course, and Bloomington North High School. A map is attached to assist you in better understanding the location and limits of the study.

Eagle Ridge Civil Engineering Services, LLC has been retained to conduct the study which will be coordinated through the Parks Department.

At this time, we ask your assistance with the following:

- **Obtaining information about the routes and frequency of bus traffic in the project area. Also locations of current and proposed bus stops.**
- We are very interested in ensuring that direct links between the bus system and the path network are available to users. **Please provide information about potential changes or new developments that may be in planning.** This study is going to examine existing conditions, but future changes must also be considered. There may be opportunities for cooperation that could benefit all involved.

If you have any questions, you may contact me at the number or email below. **Please provide your response to this letter by Friday, January 5, 2007.**

I look forward to working with you to make this a better study. Thank you very much for your assistance.

Sincerely Yours,

Brock Ridgway, P.E.
Project Manager

Enclosures: **Cascades Study Area Map**

December 14, 2006

Mike Bengtson
City of Bloomington Utilities
1969 S. Henderson Street
Bloomington, IN 47401

**Re: Request for Early Coordination and Comments
Cascades Park / Griffy Lake Bicycle Path Feasibility Study**

Dear Mike:

The Bloomington Parks Department is initiating a study to determine the feasibility and recommended route of bicycle and pedestrian facilities through Cascades Park. The intent is to provide a link that extends all the way from the edge of Miller Showers Park, through Cascades Park, across North Walnut Street to the Filtration plant area at Griffy Lake. It is also proposed to connect Lower Cascades Park to the Upper Cascades area including the City Skate Park, Golf Course, and Bloomington North High School. A map is attached to assist you in better understanding the location and limits of the study.

Eagle Ridge Civil Engineering Services, LLC has been retained to conduct the study which will be coordinated through the Parks Department.

At this time, we ask your assistance with the following:

- Identifying any concerns or comments you have about the study area. This study is expected to result in recommendations for future path projects. We will be examining alternatives and the potential impact to existing utilities is an important criterion for evaluation.
- At this time, we request background information about your facilities. We are obtaining mapping from the City's GIS system. **Any information that you have regarding condition, depths and sizes, even if unconfirmed, may be of assistance.**
- Additionally, **please provide any information you have about potential changes or upgrades you are considering in the next ten years. Note any known system problems that need improvement.** There may be opportunities for cooperation on future work that could benefit all involved.

If you have any questions, you may contact me at the number or email below. **Please provide your response to this letter by Friday, January 5, 2007.**

I look forward to working with you to make this a better study. Thank you very much for your assistance.

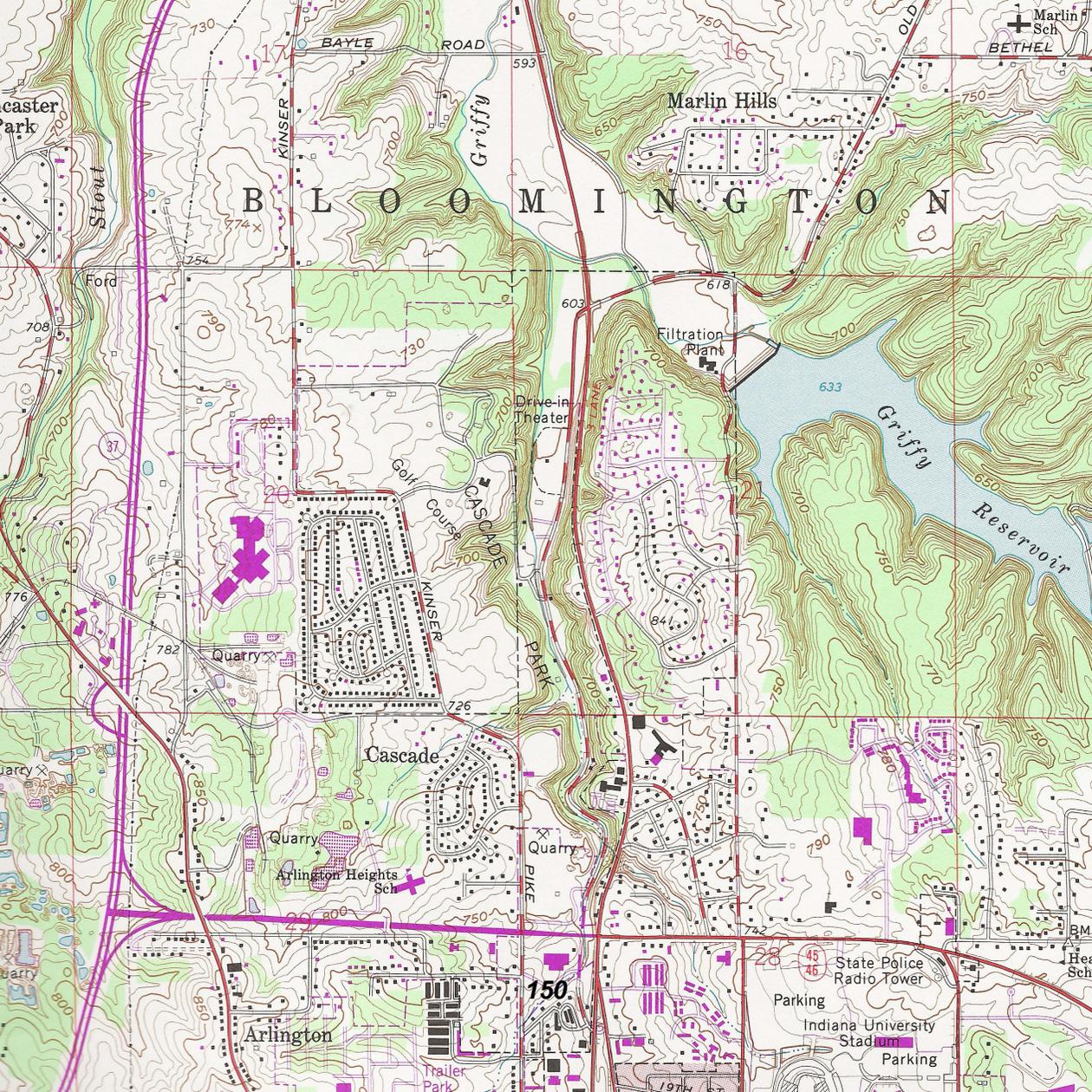
Sincerely Yours,

Brock Ridgway, P.E.
Project Manager

Enclosures: **Cascades Study Area Map**

APPENDIX C

Miscellaneous Mapping



Marlin Sch
BETHEL

Eastern Park

BLOOMINGTON

Marlin Hills

Ford

Filtration Plant

Drive-in Theater

Griffy Reservoir

Golf Course

CASCADE

Quarry

Cascade

Quarry
Arlington Heights Sch

Quarry

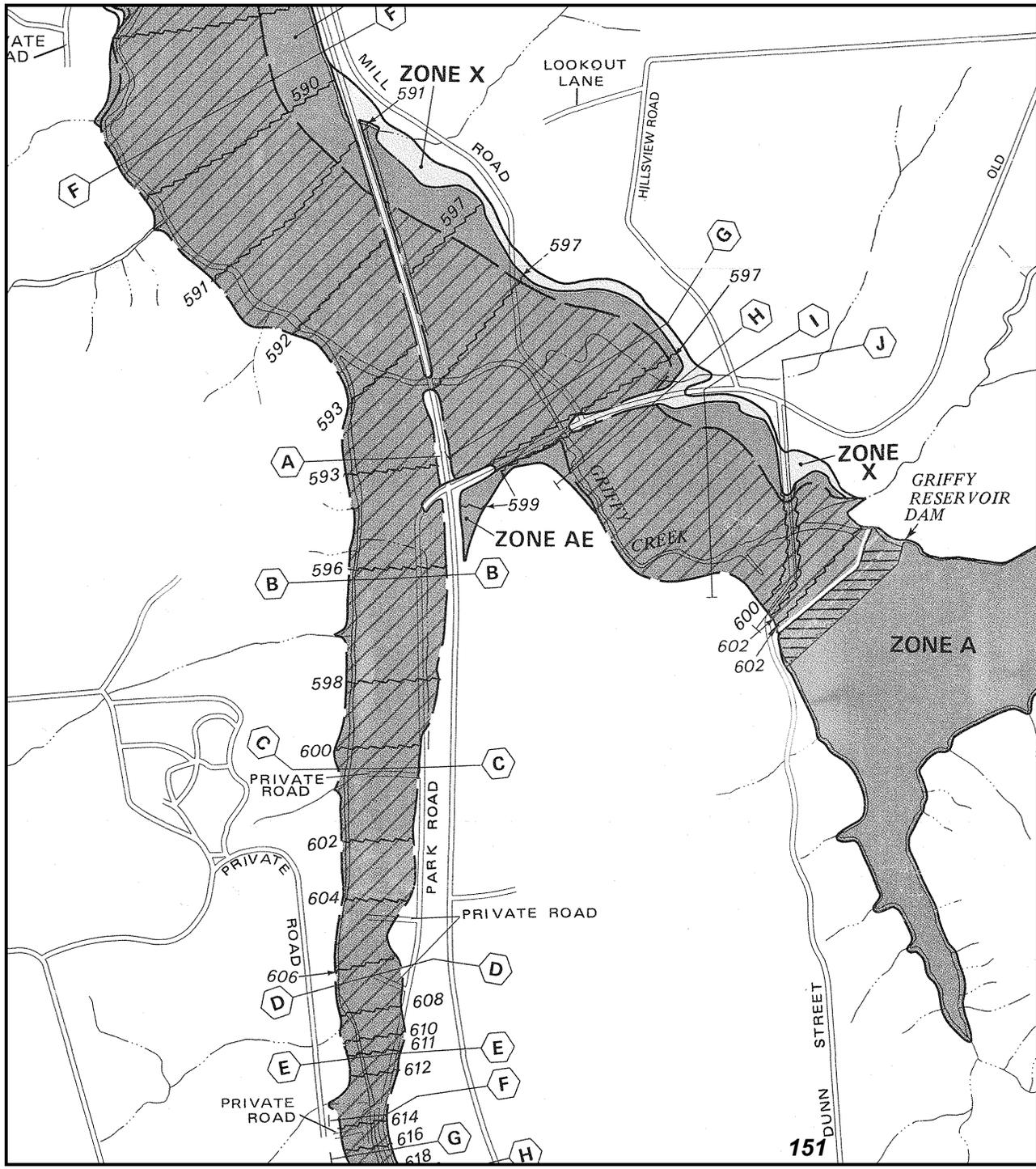
Arlington

150

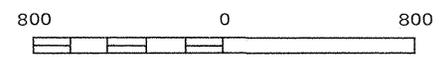
State Police Radio Tower
Parking

Indiana University Stadium
Parking

Trailer Park



APPROXIMATE SCALE IN FEET

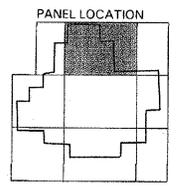


NATIONAL FLOOD INSURANCE PROGRAM

**FIRM
FLOOD INSURANCE RATE MAP**

CITY OF
BLOOMINGTON,
INDIANA
MONROE COUNTY

PANEL 10 OF 45
(SEE MAP INDEX FOR PANELS NOT PRINTED)

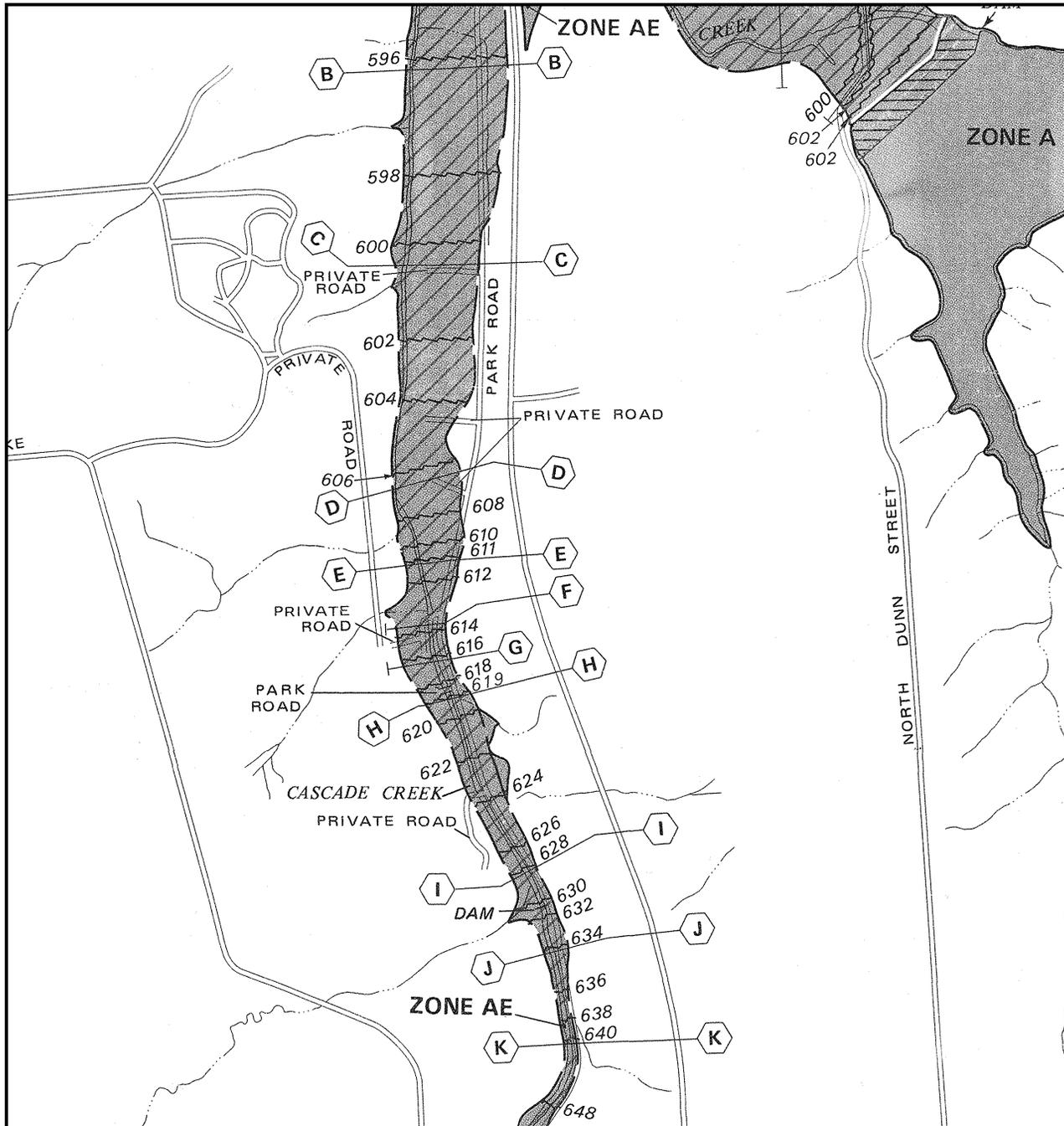


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MAP REVISED:
JUNE 17, 1991

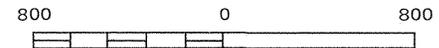


Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov



APPROXIMATE SCALE IN FEET

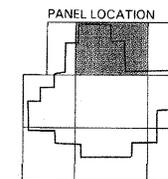


NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

CITY OF
BLOOMINGTON,
INDIANA
MONROE COUNTY

PANEL 10 OF 45
(SEE MAP INDEX FOR PANELS NOT PRINTED)



COMMUNITY—PANEL NUMBER:
180169 0010 C
MAP REVISED:
JUNE 17, 1991

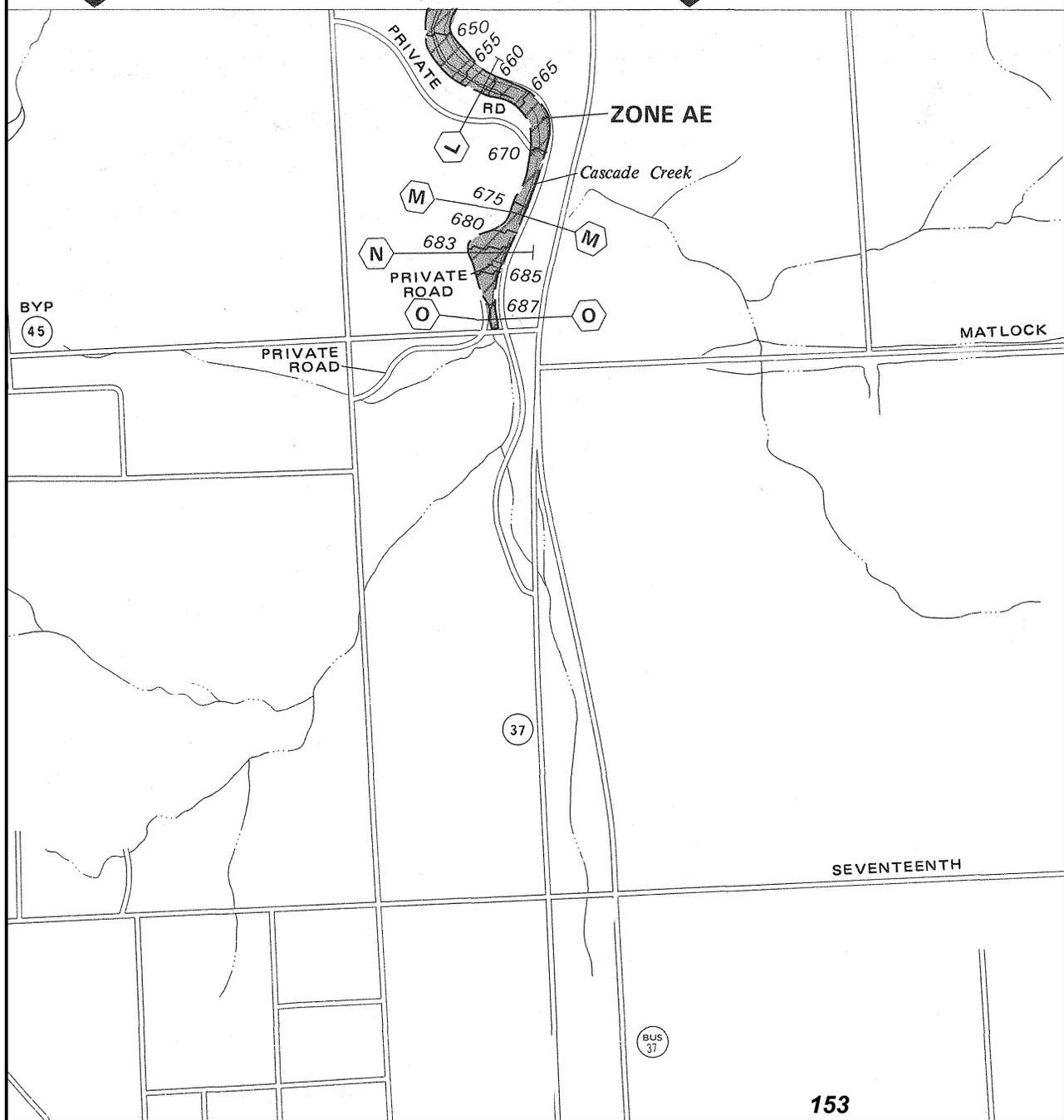


Federal Emergency Management Agency

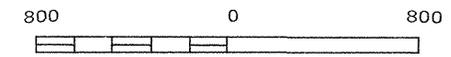
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C

D



APPROXIMATE SCALE IN FEET

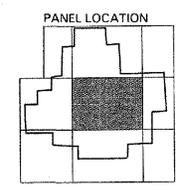


NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

CITY OF
BLOOMINGTON,
INDIANA
MONROE COUNTY

PANEL 25 OF 45
(SEE MAP INDEX FOR PANELS NOT PRINTED)

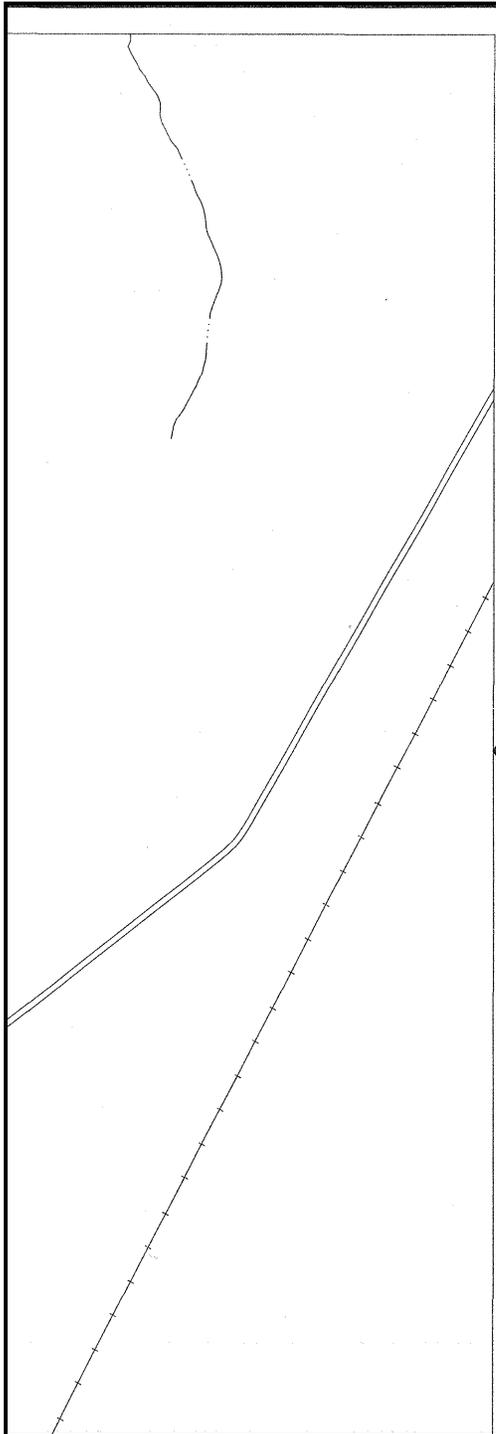


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JUNE 17, 1991

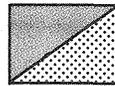


Federal Emergency Management Agency

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LEGEND



SPECIAL FLOOD HAZARD AREAS INUNDATED BY 100-YEAR FLOOD

- ZONE A** No base flood elevations determined.
- ZONE AE** Base flood elevations determined.
- ZONE AH** Flood depths of 1 to 3 feet (usually areas of ponding); base flood elevations determined.
- ZONE AO** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- ZONE A99** To be protected from 100-year flood by Federal flood protection system under construction; no base elevations determined.
- ZONE V** Coastal flood with velocity hazard (wave action); no base flood elevations determined.
- ZONE VE** Coastal flood with velocity hazard (wave action); base flood elevations determined.

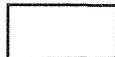


FLOODWAY AREAS IN ZONE AE



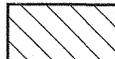
OTHER FLOOD AREAS

- ZONE X** Areas of 500-year flood; areas of 100-year flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 100-year flood.



OTHER AREAS

- ZONE X** Areas determined to be outside 500-year flood plain.
- ZONE D** Areas in which flood hazards are undetermined.



UNDEVELOPED COASTAL BARRIERS



Flood Boundary



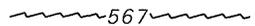
Floodway Boundary



Zone D Boundary



Boundary Dividing Special Flood Hazard Zones, and Boundary Dividing Areas of Different Coastal Base Flood Elevations Within Special Flood Hazard Zone.



Base Flood Elevation Line; Elevation in Feet*



Cross Section Line

(EL 19)

Base Flood Elevation in Feet Where Uniform Within Zone*

RM5_x

Elevation Reference Mark

M3.0

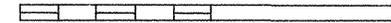
Mile Mark

*Referenced to the National Geodetic Vertical Datum of 1929



APPROXIMATE SCALE IN FEET

800 0 800



Referenced to the National Geodetic Vertical Datum of 1929

NOTES

This map is for use in administering the National Flood Insurance Program; does not necessarily identify all planimetric features outside Special Flood Hazard Area or all areas subject to flooding, particularly from local drainage sources of small size.

Areas of Special Flood Hazard (100-year flood) include zones, A, AE, AI-A3, AH, AO, A99, V, VE and V1-V30.

Certain areas not in Special Flood Hazard Areas may be protected by flood control structures.

Boundaries of the floodways were computed at cross sections and interpolate between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the Federal Emergency Management Agency. Floodway widths in some areas may be too narrow to show to scale. Refer to Floodway Data Table where floodway width is shown at 1/20 inch.

Coastal base flood elevations apply only landward of the shoreline.

This map incorporates approximate boundaries of coastal barriers established under the Coastal Barrier Resources Act (PL 97-348).

Corporate limits shown are current as of the date of this map. The user should contact appropriate community officials to determine if corporate limits have changed subsequent to the issuance of this map.

For adjoining panels, see separately printed Map Index.

MAP REPOSITORY

Planning Department, 220 East Third, Bloomington, Indiana (Map available for reference only, not for distribution.)

INITIAL IDENTIFICATION:

JUNE 21, 1974

FLOOD HAZARD BOUNDARY MAP REVISION:

FLOOD INSURANCE RATE MAP EFFECTIVE:

JUNE 15, 1978

FLOOD INSURANCE RATE MAP REVISIONS:

Map revised June 17, 1991

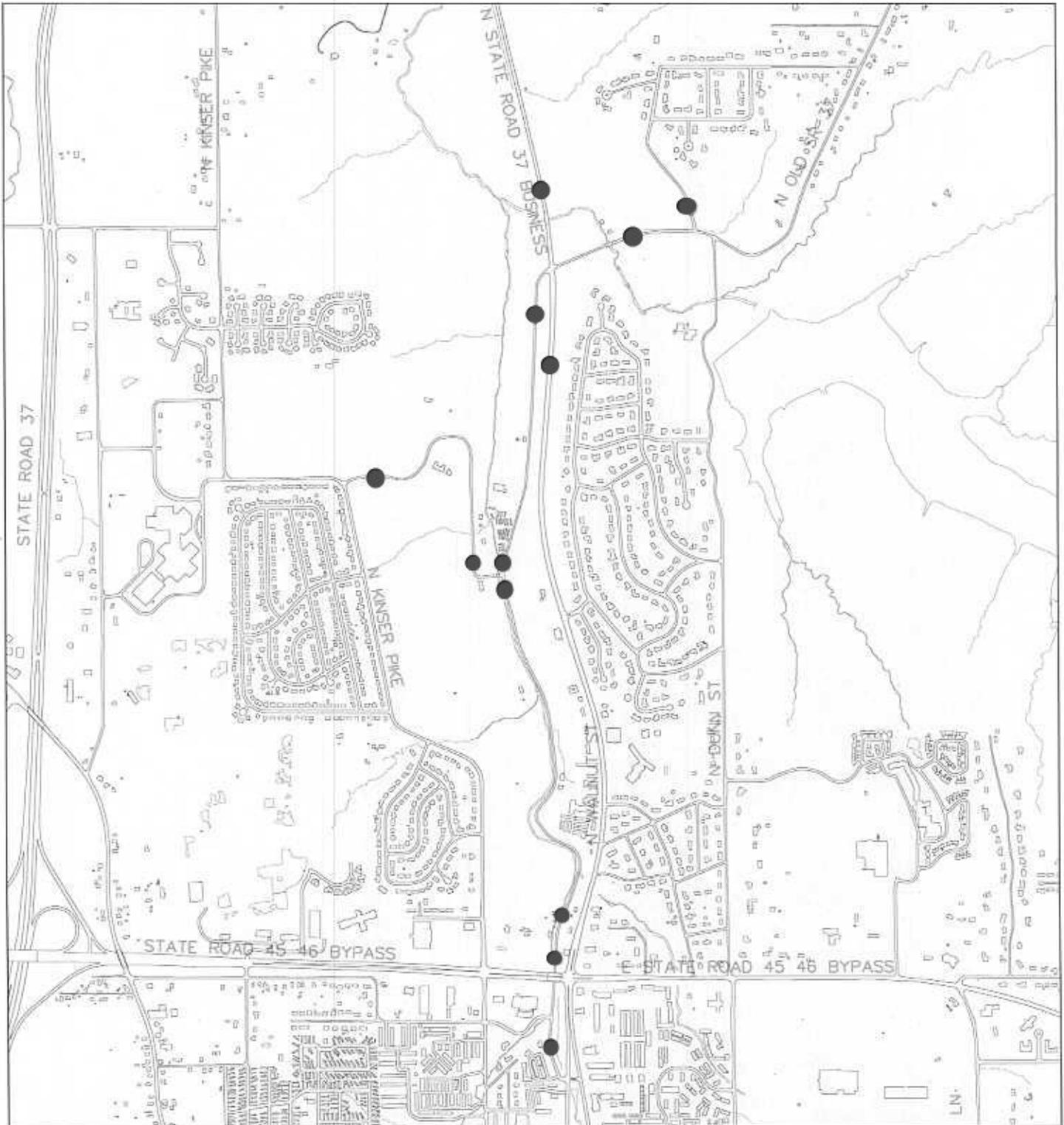
to add base flood elevations, special flood hazard areas, floodway, cross sections, and to reflect new FEMA titleblock.

To determine if flood insurance is available, contact an insurance agent or call

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

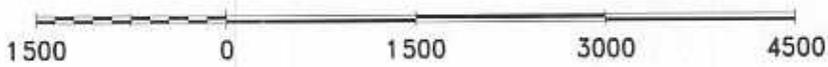
APPENDIX D

Motor Vehicle Traffic Data



Locations of Traffic Counts

By: wykoffj
23 Feb 07



City of Bloomington
Engineering



Scale: 1" = 1500'

City of Bloomington
 Engineering Department
 401 N. Morton Street
 Bloomington, IN 47404

Old SR37 N
 S of Gourley Pk
 Site Code: q4836

For: Cascades Park Study
 Weather: Cold & Some Light Snow
 Counter #: 14994
 Counted By: Sheryl

Date Start: 01-Mar-07

Start Time	01-Mar-07		Fri		Sat		Sun		Mon		Tue		Wed		Week Average	
	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
12:00 AM	3	6	7	4	6	10	2	10	7	3	4	3	4	4	5	6
01:00	4	1	4	4	4	3	3	5	3	8	0	3	2	4	3	4
02:00	3	3	3	3	8	5	6	4	2	3	3	2	3	3	4	3
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07:00	7	20	10	23	1	8	2	2	3	17	6	28	10	33	6	19
08:00	11	17	11	15	10	9	2	5	10	20	20	13	11	16	11	14
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04:00	26	28	60	60	20	34	14	27	44	41	42	39	52	55	37	41
05:00	69	34	73	42	20	44	16	31	73	32	74	38	72	38	57	37
06:00	30	29	25	37	15	32	13	18	26	32	29	28	31	27	24	29
07:00	26	22	18	24	15	22	16	20	18	7	12	22	16	23	17	20
08:00	9	9	16	19	8	17	14	14	18	18	24	15	13	15	15	15
09:00	17	11	15	28	15	17	10	9	15	12	13	10	11	15	14	15
10:00	6	11	14	22	44	14	13	10	6	9	11	3	11	12	15	12
11:00	10	10	14	14	9	15	8	12	6	5	7	3	12	9	9	10
Total Day	405	361	463	546	298	393	245	320	427	424	430	413	443	467	388	419
AM Peak	11:00	07:00	09:00	10:00	11:00	11:00	10:00	11:00	11:00	11:00	11:00	07:00	11:00	07:00	11:00	11:00
Vol.	25	20	23	29	19	30	16	18	25	29	36	28	23	33	22	25
PM Peak	17:00	17:00	17:00	16:00	22:00	17:00	14:00	14:00	17:00	15:00	17:00	16:00	17:00	16:00	17:00	16:00
Vol.	69	34	73	60	44	44	29	31	73	43	74	39	72	55	57	41
Comb. Total	766		1009		691		565		851		843		910		807	
ADT	Not Calculated															

City of Bloomington
 Engineering Department
 401 N. Morton Street
 Bloomington, IN 47404

Old SR37 North
 Bet Gourley Pk & Safety Lane
 Site Code: q492

For: Cascades Park Study
 Weather: Cold & Some Light Snow
 Counter #: 10285
 Counted By: Sheryl

Date Start: 01-Mar-07

Start Time	01-Mar-07		Fri		Sat		Sun		Mon		Tue		Wed		Week Average	
	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
12:00 AM	1	7	1	2	2	7	4	6	5	1	2	2	3	3	3	4
01:00	3	1	2	3	2	3	1	0	0	6	2	3	0	3	1	3
02:00	0	2	1	4	2	4	4	3	2	2	1	1	3	3	2	3
03:00	0	1	2	2	1	1	1	3	0	1	1	0	1	0	1	1
04:00	0	4	1	2	3	2	1	0	0	1	0	2	2	2	1	2
05:00	0	2	4	3	0	2	0	1	0	2	2	4	1	2	1	2
06:00	3	4	2	6	4	8	0	2	1	7	0	5	3	5	2	5
07:00	5	18	6	21	1	7	4	2	2	18	7	22	7	30	5	17
08:00	8	22	11	17	7	8	3	5	11	25	11	26	10	18	9	17
09:00	11	13	14	12	9	7	6	7	10	19	13	20	15	17	11	14
10:00	15	14	14	28	12	7	9	13	24	25	12	24	13	21	14	19
11:00	14	13	15	20	18	26	7	12	23	30	24	25	21	23	17	21
12:00 PM	23	21	25	22	26	13	25	18	39	28	31	26	22	16	27	21
01:00	24	25	35	27	26	34	18	21	27	29	27	30	34	31	27	28
02:00	34	29	38	37	21	23	31	28	35	30	34	31	34	36	32	31
03:00	29	30	36	37	17	22	18	25	46	40	29	23	51	38	32	31
04:00	35	30	51	55	24	31	15	17	45	50	35	38	53	56	37	40
05:00	32	31	57	36	21	22	15	28	60	35	42	39	46	35	39	32
06:00	18	17	32	31	15	21	16	19	20	29	25	24	23	27	21	24
07:00	14	18	16	17	16	16	9	12	11	9	18	20	17	24	14	17
08:00	7	10	16	15	10	12	15	8	14	13	14	15	12	13	13	12
09:00	10	8	12	22	13	14	10	4	6	7	9	8	7	11	10	11
10:00	5	7	12	14	27	9	14	10	8	9	4	3	6	9	11	9
11:00	7	8	7	5	6	11	3	11	3	2	2	6	9	7	5	7
Total Day	298	335	410	438	283	310	229	255	392	418	345	397	393	430	335	371
AM Peak	10:00	08:00	11:00	10:00	11:00	11:00	10:00	10:00	10:00	11:00	11:00	08:00	11:00	07:00	11:00	11:00
Vol.	15	22	15	28	18	26	9	13	24	30	24	26	21	30	17	21
PM Peak	16:00	17:00	17:00	16:00	22:00	13:00	14:00	14:00	17:00	16:00	17:00	17:00	16:00	16:00	17:00	16:00
Vol.	35	31	57	55	27	34	31	28	60	50	42	39	53	56	39	40

Comb. Total	633	848	593	484	810	742	823	706
ADT	Not Calculated							

City of Bloomington
 Engineering Department
 401 N. Morton Street
 Bloomington, IN 47404

Old SR37 North
 N of Safety Lane at Quarry
 Site Code: p512

For: Cascades Park Study
 Weather: Cold & Some Light Snow
 Counter #: 10274
 Counted By: Sheryl

Date Start: 01-Mar-07

Start Time	01-Mar-07		Fri		Sat		Sun		Mon		Tue		Wed		Week Average	
	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
12:00 AM	1	7	1	2	2	7	4	6	5	1	2	2	3	3	3	4
01:00	3	1	2	3	2	3	1	0	0	6	2	3	0	3	1	3
02:00	0	2	1	4	2	4	4	3	2	2	1	1	3	3	2	3
03:00	0	1	1	3	1	1	1	3	0	1	1	0	1	0	1	1
04:00	0	3	1	2	3	2	1	0	0	1	0	2	2	2	1	2
05:00	0	2	4	3	0	2	0	1	0	2	1	3	0	1	1	2
06:00	2	3	0	5	3	7	0	2	1	8	0	5	3	4	1	5
07:00	3	18	5	16	2	2	4	2	1	17	6	15	7	22	4	13
08:00	7	19	11	16	8	9	3	5	12	18	11	29	9	18	9	16
09:00	11	12	14	12	9	6	6	7	10	17	14	17	13	15	11	12
10:00	14	14	13	26	12	7	9	13	23	23	12	22	12	19	14	18
11:00	14	13	14	19	14	23	7	12	25	26	21	20	21	21	17	19
12:00 PM	21	17	25	19	24	15	25	18	38	27	29	21	22	16	26	19
01:00	21	24	35	29	27	33	18	21	25	25	25	31	31	31	26	28
02:00	35	29	38	36	22	22	32	30	35	26	35	29	36	37	33	30
03:00	37	29	36	34	17	22	18	24	46	36	26	19	52	40	33	29
04:00	41	27	49	55	24	31	15	17	45	44	31	35	44	50	36	37
05:00	32	29	56	33	21	22	15	28	59	36	39	32	44	30	38	30
06:00	19	18	31	31	16	22	17	19	19	29	26	24	25	30	22	25
07:00	14	18	16	16	17	17	9	12	11	9	18	20	18	25	15	17
08:00	8	11	16	15	10	12	16	9	14	13	13	14	12	13	13	12
09:00	10	7	15	24	13	14	10	4	7	8	9	8	7	10	10	11
10:00	5	7	13	13	28	10	14	11	8	9	4	3	6	9	11	9
11:00	7	8	6	4	7	12	3	11	3	2	2	6	10	8	5	7
Total Day	305	319	403	420	284	305	232	258	389	386	328	361	381	410	333	352
AM Peak	10:00	08:00	09:00	10:00	11:00	11:00	10:00	10:00	11:00	11:00	11:00	08:00	11:00	07:00	11:00	11:00
Vol.	14	19	14	26	14	23	9	13	25	26	21	29	21	22	17	19
PM Peak	16:00	14:00	17:00	16:00	22:00	13:00	14:00	14:00	17:00	16:00	17:00	16:00	15:00	16:00	17:00	16:00
Vol.	41	29	56	55	28	33	32	30	59	44	39	35	52	50	38	37

Comb. Total	624	823	589	490	775	689	791	685
ADT	Not Calculated							

City of Bloomington
 Engineering Department
 401 N. Morton Street
 Bloomington, IN 47404

Old SR37 North
 S of Clubhouse Dr
 Site Code: q492

For: Cascades Park Study
 Weather: Cold & Some Light Snow
 Counter #: 15043
 Counted By: Sheryl

Date Start: 01-Mar-07

Start Time	01-Mar-07		Fri		Sat		Sun		Mon		Tue		Wed		Week Average	
	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
12:00 AM	1	6	1	3	2	7	3	5	4	3	2	2	2	2	2	4
01:00	1	1	2	2	2	4	1	0	0	3	1	2	0	3	1	2
02:00	0	0	0	3	2	3	2	3	2	2	1	1	3	3	1	2
03:00	0	2	1	1	1	1	1	1	0	1	1	1	0	0	1	1
04:00	0	2	1	2	3	2	1	0	0	1	0	2	2	1	1	1
05:00	0	2	4	3	0	2	0	1	0	2	1	3	0	1	1	2
06:00	2	3	0	5	3	6	0	2	2	8	0	5	3	4	1	5
07:00	4	20	5	17	1	2	2	1	1	16	4	16	5	22	3	13
08:00	6	19	11	15	7	9	3	4	12	19	11	26	9	18	8	16
09:00	10	11	13	13	9	6	5	7	8	16	15	19	15	16	11	13
10:00	14	15	12	24	12	8	12	15	19	22	14	22	11	19	13	18
11:00	13	17	16	23	11	19	7	14	29	30	17	24	18	18	16	21
12:00 PM	25	16	28	28	22	17	26	23	34	27	29	23	19	19	26	22
01:00	22	23	29	24	27	35	17	18	23	24	29	29	33	35	26	27
02:00	29	29	38	36	24	24	30	34	37	32	32	28	38	40	33	32
03:00	40	35	40	31	22	26	21	21	49	33	28	21	47	46	35	30
04:00	50	41	47	65	23	31	15	17	35	54	36	41	51	46	37	42
05:00	32	28	61	33	24	22	16	28	61	30	39	27	46	31	40	28
06:00	21	23	29	27	19	24	15	19	23	21	25	28	28	31	23	25
07:00	17	19	19	15	19	19	17	19	13	12	22	20	17	23	18	18
08:00	14	19	14	15	8	11	18	14	12	14	15	14	22	19	15	15
09:00	13	7	10	17	13	15	20	16	9	8	7	7	8	10	11	11
10:00	7	8	12	12	29	10	24	19	10	9	5	4	6	11	13	10
11:00	8	9	8	4	8	11	2	6	4	3	2	5	13	9	6	7
Total Day	329	355	401	418	291	314	258	287	387	390	336	370	396	427	342	365
AM Peak	10:00	07:00	11:00	10:00	10:00	11:00	10:00	10:00	11:00	11:00	11:00	08:00	11:00	07:00	11:00	11:00
Vol.	14	20	16	24	12	19	12	15	29	30	17	26	18	22	16	21
PM Peak	16:00	16:00	17:00	16:00	22:00	13:00	14:00	14:00	17:00	16:00	17:00	16:00	16:00	15:00	17:00	16:00
Vol.	50	41	61	65	29	35	30	34	61	54	39	41	51	46	40	42
Comb. Total	684		819		605		545		777		706		823		707	
ADT	Not Calculated															

City of Bloomington
 Engineering Department
 401 N. Morton Street
 Bloomington, IN 47404

Clubhouse Drive
 W of Sycamore Shelter
 Site Code: p513

For: Cascades Park Study
 Weather: Cold & Some Light Snow
 Counter #: 10273

Date Start: 01-Mar-07

Tubes placed N-A, S-B So A=W & B=E

Start Time	01-Mar-07		Fri		Sat		Sun		Mon		Tue		Wed		Week Average	
	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	WB	EB
12:00 AM	2	1	1	2	2	3	3	3	2	3	1	2	1	2	2	2
01:00	0	3	3	0	2	2	3	0	1	0	0	1	0	0	1	1
02:00	1	0	4	2	5	2	1	0	0	2	1	0	1	0	2	1
03:00	2	0	0	0	3	3	0	0	1	0	1	0	0	0	1	0
04:00	0	1	1	1	1	1	1	0	2	1	2	1	0	0	1	1
05:00	2	3	0	1	2	1	1	0	1	2	1	3	2	2	1	2
06:00	0	4	1	3	0	1	3	2	3	4	1	2	3	6	2	3
07:00	26	58	25	55	1	2	1	3	19	60	23	55	23	52	17	41
08:00	6	16	4	14	4	5	7	2	10	13	14	12	9	13	8	11
09:00	6	10	10	13	4	10	7	9	13	9	15	15	9	9	9	11
10:00	8	10	18	21	13	12	13	16	10	18	8	8	11	7	12	13
11:00	12	11	16	13	17	6	8	6	13	15	17	15	12	16	14	12
12:00 PM	15	13	26	20	23	24	17	21	19	19	28	28	22	17	21	20
01:00	26	25	25	23	31	20	14	18	18	14	25	25	30	28	24	22
02:00	60	25	71	28	15	14	23	21	59	30	57	28	67	38	50	26
03:00	26	24	24	22	26	20	21	17	38	36	37	22	62	32	33	25
04:00	39	35	45	43	34	33	18	13	32	28	47	34	43	33	37	31
05:00	31	34	33	34	30	42	24	17	37	35	28	34	40	37	32	33
06:00	19	18	29	25	20	20	20	13	16	26	24	20	25	56	22	25
07:00	13	10	15	14	14	23	20	20	24	15	32	18	28	18	21	17
08:00	14	10	9	9	11	7	19	17	13	17	18	16	42	14	18	13
09:00	6	9	18	12	12	6	14	18	18	4	12	8	10	3	13	9
10:00	2	2	17	10	12	15	21	24	10	9	4	6	10	6	11	10
11:00	6	6	8	10	21	12	4	1	4	2	2	2	2	2	7	5
Total Day	322	328	403	375	303	284	263	241	363	362	398	355	452	391	359	334
AM Peak	07:00	07:00	07:00	07:00	11:00	10:00	10:00	10:00	07:00	07:00	07:00	07:00	07:00	07:00	07:00	07:00
Vol.	26	58	25	55	17	12	13	16	19	60	23	55	23	52	17	41
PM Peak	14:00	16:00	14:00	16:00	16:00	17:00	17:00	22:00	14:00	15:00	14:00	16:00	14:00	18:00	14:00	17:00
Vol.	60	35	71	43	34	42	24	24	59	36	57	34	67	56	50	33

Comb. Total	650	778	587	504	725	753	843	693
ADT	Not Calculated							

City of Bloomington
 Engineering Department
 401 N. Morton Street
 Bloomington, IN 47404

Clubhouse Drive
 E of Kinser Pk
 Site Code: p513

For: Cascades Park Study
 Weather: Cold & Some Light Snow
 Counter #: 15003
 Counted By: Sheryl

Date Start: 01-Mar-07

Start Time	01-Mar-07		Fri		Sat		Sun		Mon		Tue		Wed		Week Average	
	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
12:00 AM	2	1	1	2	2	2	3	3	1	1	1	3	1	2	2	2
01:00	0	2	5	1	2	1	3	0	0	0	0	1	0	0	1	1
02:00	1	1	2	1	5	2	1	0	0	1	0	1	0	1	0	1
03:00	2	0	0	0	3	4	0	0	1	0	1	0	0	0	1	1
04:00	0	2	0	0	1	1	1	0	1	0	1	1	0	0	1	1
05:00	1	2	0	2	2	1	1	0	1	3	1	3	2	3	1	2
06:00	0	4	1	3	0	2	2	1	3	4	1	2	2	5	1	3
07:00	27	60	25	55	2	2	0	1	24	60	25	56	27	55	19	41
08:00	6	15	4	14	2	5	7	2	10	12	12	10	7	11	7	10
09:00	4	8	10	11	7	6	6	9	9	8	11	10	16	8	9	9
10:00	5	7	16	21	14	6	9	10	5	11	7	12	21	9	11	11
11:00	14	10	20	11	10	4	8	7	16	21	15	15	18	19	14	12
12:00 PM	14	11	18	16	9	14	13	14	18	14	23	19	27	15	17	15
01:00	17	17	23	23	19	12	11	12	14	12	20	16	21	21	18	16
02:00	51	20	66	22	15	13	17	12	52	24	69	18	59	32	47	20
03:00	19	16	24	22	23	16	15	14	26	21	28	20	53	27	27	19
04:00	26	20	43	37	25	24	13	11	30	20	33	38	33	30	29	26
05:00	21	28	29	28	24	34	20	15	38	31	26	30	37	34	28	29
06:00	12	10	27	22	13	16	16	12	14	29	18	13	21	57	17	23
07:00	7	6	11	12	11	22	9	9	19	8	14	5	23	18	13	11
08:00	7	3	6	6	11	8	11	8	11	13	12	10	34	5	13	8
09:00	3	5	13	5	12	6	2	3	13	1	10	8	8	0	9	4
10:00	1	2	10	5	10	11	2	5	3	3	1	3	7	4	5	5
11:00	3	2	6	8	17	10	0	2	3	0	2	2	1	1	5	4
Total Day	243	252	360	327	239	222	170	150	312	297	332	295	419	356	297	274
AM Peak	07:00	07:00	07:00	07:00	10:00	09:00	10:00	10:00	07:00	07:00	07:00	07:00	07:00	07:00	07:00	07:00
Vol.	27	60	25	55	14	6	9	10	24	60	25	56	27	55	19	41
PM Peak	14:00	17:00	14:00	16:00	16:00	17:00	17:00	17:00	14:00	17:00	14:00	16:00	14:00	18:00	14:00	17:00
Vol.	51	28	66	37	25	34	20	15	52	31	69	38	59	57	47	29
Comb. Total	495		687		461		320		609		627		775		571	
ADT	Not Calculated															

City of Bloomington
 Engineering Department
 401 N. Morton Street
 Bloomington, IN 47404

Old SR37 North
 N of Clubhouse Dr
 Site Code: p512

For: Cascades Park Study
 Weather: Cold & Some Light Snow
 Counter #: 15004
 Counted By: Sheryl

Date Start: 01-Mar-07

Start Time	01-Mar-07		Fri		Sat		Sun		Mon		Tue		Wed		Week Average	
	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
12:00 AM	5	7	3	5	4	8	6	5	3	2	1	2	2	2	3	4
01:00	1	4	4	1	3	5	5	0	0	2	1	3	0	3	2	3
02:00	2	0	3	3	4	2	4	3	0	2	1	0	5	3	3	2
03:00	2	2	1	1	2	2	1	1	2	1	1	0	0	0	1	1
04:00	0	5	2	3	3	3	3	0	2	2	1	4	2	1	2	3
05:00	2	4	3	4	2	1	0	0	1	4	2	6	3	3	2	3
06:00	2	7	1	7	2	6	4	4	6	11	4	7	3	9	3	7
07:00	27	74	31	72	1	3	1	2	26	70	26	70	28	70	20	52
08:00	11	29	17	25	4	9	7	2	18	25	18	35	16	22	13	21
09:00	8	14	12	14	6	11	9	11	14	18	16	20	15	15	11	15
10:00	19	20	23	32	14	8	13	17	15	28	17	18	16	20	17	20
11:00	19	18	23	25	21	14	10	13	28	30	22	26	23	25	21	22
12:00 PM	21	15	28	21	19	18	25	26	28	22	32	26	22	21	25	21
01:00	30	28	43	33	30	26	21	22	26	23	30	27	33	33	30	27
02:00	70	30	83	32	29	24	28	28	79	38	71	34	75	40	62	32
03:00	37	30	48	36	28	26	21	16	49	27	39	16	62	26	41	25
04:00	47	37	75	68	39	38	21	19	45	44	52	48	60	42	48	42
05:00	40	35	67	35	30	39	24	23	72	40	53	37	61	36	50	35
06:00	25	24	34	25	22	29	23	23	26	33	32	26	25	54	27	31
07:00	15	16	25	15	19	28	11	15	27	16	31	15	38	27	24	19
08:00	11	10	13	13	15	12	24	15	14	21	22	14	45	10	21	14
09:00	12	7	13	12	19	13	9	8	23	5	16	11	13	5	15	9
10:00	6	7	15	7	31	16	11	7	9	6	2	3	5	6	11	7
11:00	6	6	12	8	23	12	3	2	6	3	2	5	9	5	9	6
Total Day	418	429	579	497	370	353	284	262	519	473	492	453	561	478	461	421
AM Peak	07:00	07:00	07:00	07:00	11:00	11:00	10:00	10:00	11:00	07:00	07:00	07:00	07:00	07:00	11:00	07:00
Vol.	27	74	31	72	21	14	13	17	28	70	26	70	28	70	21	52
PM Peak	14:00	16:00	14:00	16:00	16:00	17:00	14:00	14:00	14:00	16:00	14:00	16:00	14:00	18:00	14:00	16:00
Vol.	70	37	83	68	39	39	28	28	79	44	71	48	75	54	62	42

Comb. Total	847	1076	723	546	992	945	1039	882
ADT	Not Calculated							

City of Bloomington
 Engineering Department
 401 N. Morton Street
 Bloomington, IN 47404

Old SR37 N
 S of Walnut St
 Site Code: p512

For: Cascades Park Study
 Weather: Cold & Some Light Snow
 Counter #: 15044
 Counted By: Sheryl

Date Start: 01-Mar-07

Start Time	01-Mar-07		Fri		Sat		Sun		Mon		Tue		Wed		Week Average	
	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
12:00 AM	1	5	1	4	1	7	3	4	2	1	1	2	1	2	1	4
01:00	1	4	3	0	3	4	4	0	0	2	1	2	0	3	2	2
02:00	1	0	2	3	4	2	1	3	0	2	1	0	3	1	2	2
03:00	3	3	0	1	2	2	1	0	1	2	2	0	0	0	1	1
04:00	0	4	2	2	2	2	3	0	3	2	0	2	2	2	2	2
05:00	1	2	1	1	1	2	0	0	1	2	1	3	2	2	1	2
06:00	0	5	1	6	1	4	2	4	3	10	1	9	2	5	1	6
07:00	21	69	23	65	1	4	1	2	18	71	22	61	21	66	15	48
08:00	7	28	16	25	4	6	5	2	14	21	15	28	11	21	10	19
09:00	6	11	8	13	5	9	7	12	11	16	13	18	15	16	9	14
10:00	13	16	17	29	12	9	11	14	11	23	13	18	14	18	13	18
11:00	14	17	16	23	17	13	9	12	23	27	15	21	17	20	16	19
12:00 PM	24	12	29	21	18	17	23	20	21	18	24	20	21	20	23	18
01:00	21	24	37	29	24	24	18	23	31	21	26	21	29	25	27	24
02:00	62	29	71	27	26	19	23	26	62	36	61	31	61	31	52	28
03:00	34	29	38	31	24	24	19	13	48	27	36	17	47	25	35	24
04:00	47	35	66	74	33	35	17	18	36	43	46	44	57	40	43	41
05:00	35	39	61	33	29	39	17	21	65	35	47	40	52	35	44	35
06:00	22	19	26	21	18	25	20	20	22	28	23	22	25	56	22	27
07:00	12	12	18	10	16	27	7	12	21	13	24	9	28	18	18	14
08:00	11	10	8	10	9	10	17	11	11	13	14	10	40	10	16	11
09:00	9	8	11	12	12	6	5	6	18	6	12	9	10	5	11	7
10:00	5	5	11	6	26	13	9	6	7	5	2	3	4	5	9	6
11:00	4	6	9	8	21	12	3	2	5	3	2	5	7	5	7	6
Total Day	354	392	475	454	309	315	225	231	434	427	402	395	469	431	380	378
AM Peak	07:00	07:00	07:00	07:00	11:00	11:00	10:00	10:00	11:00	07:00	07:00	07:00	07:00	07:00	11:00	07:00
Vol.	21	69	23	65	17	13	11	14	23	71	22	61	21	66	16	48
PM Peak	14:00	17:00	14:00	16:00	16:00	17:00	12:00	14:00	17:00	16:00	14:00	16:00	14:00	18:00	14:00	16:00
Vol.	62	39	71	74	33	39	23	26	65	43	61	44	61	56	52	41

Comb. Total	746	929	624	456	861	797	900	758
ADT	Not Calculated							

City of Bloomington
 Engineering Department
 401 N. Morton Street
 Bloomington, IN 47404

Walnut Street
 S of Old SR37 N
 Site Code: q519

For: Cascades Park Study
 Weather: Cold & Some Light Snow
 Counter #: 10283
 Counted By: Sheryl

Date Start: 01-Mar-07

Start Time	01-Mar-07		Fri		Sat		Sun		Mon		Tue		Wed		Week Average	
	NB	SB	NB	SB												
12:00 AM	45	48	42	47	89	120	101	73	35	74	35	43	93	65	63	67
01:00	27	39	32	36	58	84	64	47	16	30	21	25	25	28	35	41
02:00	16	25	11	25	25	34	39	23	10	25	19	19	15	16	19	24
03:00	26	18	24	19	31	32	46	18	19	16	19	17	27	17	27	20
04:00	26	36	30	37	30	31	40	27	25	25	25	28	36	36	30	31
05:00	61	78	65	80	41	31	38	18	79	79	61	80	71	79	59	64
06:00	200	256	190	245	77	88	50	39	193	265	197	272	214	264	160	204
07:00	356	551	366	546	131	173	104	71	353	560	330	573	356	526	285	429
08:00	332	512	364	526	228	247	136	114	309	549	323	500	314	510	287	423
09:00	262	412	313	422	259	290	264	210	255	423	244	322	286	367	269	349
10:00	239	337	378	367	349	387	330	222	261	336	265	310	264	325	298	326
11:00	333	338	406	357	441	440	483	302	321	366	284	330	307	330	368	352
12:00 PM	376	321	495	380	454	413	505	348	350	345	372	341	387	327	420	354
01:00	422	313	530	412	520	406	502	377	360	310	358	315	424	287	445	346
02:00	464	304	587	405	470	415	468	405	415	340	419	320	392	323	459	359
03:00	609	342	702	458	494	482	499	400	485	394	514	352	579	417	555	406
04:00	665	427	705	529	468	556	520	453	532	381	590	392	619	415	586	450
05:00	671	494	792	603	381	693	409	460	684	455	619	476	670	491	604	525
06:00	484	395	518	520	331	705	332	418	409	380	427	400	415	418	417	462
07:00	338	280	358	413	223	575	269	413	309	232	301	234	338	256	305	343
08:00	298	234	315	372	286	277	219	367	249	173	278	185	355	190	286	257
09:00	230	195	251	276	308	220	163	238	186	157	221	140	211	168	224	199
10:00	133	158	199	233	802	192	111	192	113	99	121	132	148	150	232	165
11:00	60	106	145	159	361	165	64	137	41	69	77	111	73	91	117	120
Total Day	6673	6219	7818	7467	6857	7056	5756	5372	6009	6083	6120	5917	6619	6096	6550	6316
AM Peak	07:00	07:00	11:00	07:00	11:00	11:00	11:00	11:00	07:00	07:00	07:00	07:00	07:00	07:00	11:00	07:00
Vol.	356	551	406	546	441	440	483	302	353	560	330	573	356	526	368	429
PM Peak	17:00	17:00	17:00	17:00	22:00	18:00	16:00	17:00	17:00	17:00	17:00	17:00	17:00	17:00	17:00	17:00
Vol.	671	494	792	603	802	705	520	460	684	455	619	476	670	491	604	525

Comb. Total	12892	15285	13913	11128	12092	12037	12715	12866
ADT	Not Calculated							

City of Bloomington
 Engineering Department
 401 N. Morton Street
 Bloomington, IN 47404

Business 37 North
 N of Old SR37 N
 Site Code: rcl1423

For: Cascades Park Study
 Weather: Cold & Some Light Snow
 Counter #: 10275
 Counted By: Sheryl

Date Start: 01-Mar-07

Start Time	01-Mar-07		Fri		Sat		Sun		Mon		Tue		Wed		Week Average	
	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
12:00 AM	22	50	25	44	63	110	69	62	33	66	19	40	73	61	43	62
01:00	19	34	20	27	35	71	47	41	13	28	10	19	14	27	23	35
02:00	11	16	7	21	19	30	29	17	8	26	11	17	11	13	14	20
03:00	23	10	21	11	24	29	40	16	16	9	12	9	19	7	22	13
04:00	22	11	27	21	27	22	28	22	18	9	23	14	30	17	25	17
05:00	58	40	66	37	39	16	37	15	79	45	59	44	58	39	57	34
06:00	183	128	179	144	60	50	45	26	176	146	176	153	182	156	143	115
07:00	345	353	358	351	121	101	86	46	333	371	310	358	312	361	266	277
08:00	260	351	279	356	191	136	122	74	235	384	248	356	245	382	226	291
09:00	198	313	243	292	201	188	211	120	200	323	182	250	222	266	208	250
10:00	187	244	300	270	268	282	277	129	196	249	195	217	165	252	227	235
11:00	233	251	329	272	333	331	397	229	231	290	206	250	184	286	273	273
12:00 PM	293	253	394	299	350	308	408	237	243	272	239	265	229	285	308	274
01:00	309	242	429	330	399	341	412	306	237	213	255	257	246	292	327	283
02:00	348	235	467	321	367	334	375	322	300	275	270	252	221	282	335	289
03:00	434	248	532	371	398	414	395	326	305	318	324	280	278	411	381	338
04:00	469	353	536	469	321	521	395	377	328	314	377	339	330	400	394	396
05:00	453	402	575	536	276	640	304	389	408	368	381	399	340	473	391	458
06:00	331	312	367	448	213	653	233	370	242	276	237	329	204	322	261	387
07:00	210	232	244	341	161	566	175	358	151	163	156	183	181	222	183	295
08:00	189	187	194	315	191	233	161	334	140	129	167	163	198	154	177	216
09:00	159	170	167	230	250	172	115	217	116	118	142	102	108	170	151	168
10:00	93	136	117	199	760	159	79	166	67	81	68	121	72	138	179	143
11:00	39	90	87	143	324	139	49	126	26	62	41	100	37	79	86	106
Total Day	4888	4661	5963	5848	5391	5846	4489	4325	4101	4535	4108	4517	3959	5095	4700	4975
AM Peak	07:00	07:00	07:00	08:00	11:00	11:00	11:00	11:00	07:00	08:00	07:00	07:00	07:00	08:00	11:00	08:00
Vol.	345	353	358	356	333	331	397	229	333	384	310	358	312	382	273	291
PM Peak	16:00	17:00	17:00	17:00	22:00	18:00	13:00	17:00	17:00	17:00	17:00	17:00	17:00	17:00	16:00	17:00
Vol.	469	402	575	536	760	653	412	389	408	368	381	399	340	473	394	458

Comb. Total 9549 11811 11237 8814 8636 8625 9054 9675

ADT Not Calculated

City of Bloomington
 Engineering Department
 401 N. Morton Street
 Bloomington, IN 47404

Old SR37 North
 N of Walnut St
 Site Code: q534

For: Cascades Park Study
 Weather: Cold & Some Light Snow
 Counter #: 10272
 Counted By: Sheryl

Date Start: 01-Mar-07

Start Time	01-Mar-07		Fri		Sat		Sun		Mon		Tue		Wed		Week Average	
	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
12:00 AM	25	6	20	7	32	16	35	15	9	10	21	8	23	9	24	10
01:00	11	8	15	8	28	18	21	5	3	4	11	9	12	5	14	8
02:00	5	6	6	8	10	7	13	10	5	3	7	1	6	4	7	6
03:00	6	13	3	10	9	8	9	4	2	7	8	8	7	12	6	9
04:00	3	25	3	17	4	10	13	6	8	19	4	22	8	20	6	17
05:00	6	35	4	48	4	16	5	6	7	43	5	50	12	46	6	35
06:00	23	144	25	125	15	41	6	16	25	140	25	139	30	142	21	107
07:00	77	329	86	332	13	69	18	28	76	325	71	337	74	326	59	249
08:00	78	220	97	204	37	117	23	47	94	202	84	195	83	204	71	170
09:00	73	127	88	151	60	123	64	112	67	130	68	108	66	153	69	129
10:00	66	119	93	126	104	135	68	115	82	117	93	119	84	123	84	122
11:00	111	109	108	126	135	145	98	93	105	108	87	121	95	116	106	117
12:00 PM	114	95	123	103	128	130	115	140	129	109	132	119	121	110	123	115
01:00	137	114	126	122	157	116	130	116	134	117	113	103	119	98	131	112
02:00	191	117	214	125	124	115	133	120	180	122	194	111	188	122	175	119
03:00	213	135	214	155	146	121	132	114	208	133	201	126	252	140	195	132
04:00	265	126	259	178	192	121	142	104	240	139	244	148	252	161	228	140
05:00	270	166	306	163	159	120	135	115	348	164	279	176	299	181	257	155
06:00	190	115	197	130	156	117	129	99	200	144	213	125	195	192	183	132
07:00	142	57	144	101	131	95	110	81	171	73	165	69	161	82	146	80
08:00	124	56	129	76	103	60	96	59	117	54	127	45	184	67	126	60
09:00	88	40	104	60	81	68	55	34	91	46	82	48	99	27	86	46
10:00	43	30	91	40	107	95	40	32	58	27	52	31	65	39	65	42
11:00	29	21	65	27	84	55	20	16	26	15	38	18	37	20	43	25
Total Day	2290	2213	2520	2442	2019	1918	1610	1487	2385	2251	2324	2236	2472	2399	2231	2137
AM Peak	11:00	07:00	11:00	07:00	11:00	11:00	11:00	10:00	11:00	07:00	10:00	07:00	11:00	07:00	11:00	07:00
Vol.	111	329	108	332	135	145	98	115	105	325	93	337	95	326	106	249
PM Peak	17:00	17:00	17:00	16:00	16:00	12:00	16:00	12:00	17:00	17:00	17:00	17:00	17:00	18:00	17:00	17:00
Vol.	270	166	306	178	192	130	142	140	348	164	279	176	299	192	257	155

Comb. Total 4503 4962 3937 3097 4636 4560 4871 4368

ADT Not Calculated

City of Bloomington
 Engineering Department
 401 N. Morton Street
 Bloomington, IN 47404

Hillview Drive
 N of Old SR37N
 Site Code: q5310

For: Cascades Park Study
 Weather: Cold & Some Light Snow
 Counter #: 10284
 Counted By: Sheryl

Date Start: 01-Mar-07

Start Time	01-Mar-07		Fri		Sat		Sun		Mon		Tue		Wed		Week Average	
	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
12:00 AM	5	1	3	0	1	0	5	0	1	1	2	1	1	0	3	0
01:00	0	1	0	2	2	2	2	1	1	0	1	0	2	0	1	1
02:00	1	1	1	1	1	0	1	0	0	0	1	0	0	0	1	0
03:00	2	1	0	0	1	1	0	0	0	1	0	0	0	0	0	0
04:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00	0	2	0	2	0	0	0	0	0	2	0	0	1	1	0	1
06:00	0	6	0	8	2	5	0	2	1	7	2	10	1	10	1	7
07:00	5	32	3	23	0	7	1	4	3	23	2	22	4	30	3	20
08:00	7	16	7	27	2	13	1	4	9	22	7	23	2	21	5	18
09:00	8	13	7	12	9	11	3	10	11	20	7	12	10	13	8	13
10:00	8	12	9	9	14	13	5	17	8	11	4	13	13	9	9	12
11:00	12	14	7	12	9	17	9	10	8	12	8	10	11	10	9	12
12:00 PM	20	7	13	12	13	15	17	8	10	9	16	15	10	11	14	11
01:00	12	18	17	9	18	15	13	13	13	12	7	8	19	14	14	13
02:00	18	10	18	14	12	7	8	9	20	14	18	7	25	10	17	10
03:00	11	13	20	14	18	14	10	14	19	16	18	17	14	22	16	16
04:00	17	10	21	9	14	13	10	11	21	13	17	9	14	11	16	11
05:00	30	18	25	10	10	12	9	7	28	15	26	15	30	14	23	13
06:00	17	13	11	17	6	7	13	7	18	12	11	9	15	23	13	13
07:00	16	8	19	8	10	12	12	8	9	7	12	5	11	5	13	8
08:00	7	8	8	5	9	2	15	5	16	5	5	4	16	3	11	5
09:00	10	2	4	3	5	3	5	6	15	4	10	2	10	2	8	3
10:00	5	3	13	2	9	2	7	1	1	0	8	3	2	1	6	2
11:00	1	1	4	0	6	3	3	0	2	2	2	1	0	0	3	1
Total Day	212	210	210	199	171	174	149	137	214	208	184	186	211	210	194	190
AM Peak	11:00	07:00	10:00	08:00	10:00	11:00	11:00	10:00	09:00	07:00	11:00	08:00	10:00	07:00	10:00	07:00
Vol.	12	32	9	27	14	17	9	17	11	23	8	23	13	30	9	20
PM Peak	17:00	13:00	17:00	18:00	13:00	12:00	12:00	15:00	17:00	15:00	17:00	15:00	17:00	18:00	17:00	15:00
Vol.	30	18	25	17	18	15	17	14	28	16	26	17	30	23	23	16
Comb. Total	422		409		345		286		422		370		421		384	
ADT	Not Calculated															