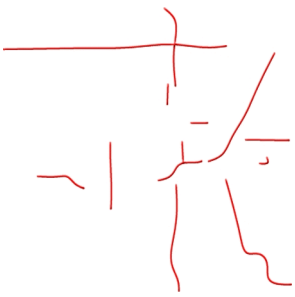
3.0 Analysis

Transporting Ecologies Studio conducted local, national and international analysis of bicycle infrastructure as part of this Master Plan Addendum. Analysis included reviews of existing bicycle recommendation reports, field analysis of existing infrastructure, case studies and field studies of notable bicycle integrated cities, studies of rail and utility corridors, spatial analysis of existing infrastructure and demand potential, geographical barriers studies and riparian corridors and hydrology studies. This information was used to develop a list of the highest priority connectivity needs as well as to reveal any potentials for additional paths not included in the 2001 Master Plan.



Existing implementation plan reinforces a fragmented network.

2001 Master Plan Review

The 2001 Alachua Countywide Master Plan Report identified goals, objectives and proposed priorities to upgrade existing segments and add new paths or trails. This work included a Quality of Service Analysis and a Latent Demand Analysis submitted as part of the Master Plan under separate covers.

The strength of the 2001 report is in the detailed analysis of infrastructure adopting the Department of Transportation (DOT) street and road data and supplementing that information with a bicycle infrastructure analysis including quality of service analysis (QOS), latent demand analysis and estimated costs for most segments to bring the quality of service from the existing (typically “D” or “E”) to “B” for city and county streets and “C” for state roads. Excellent research into possible new lane and path systems was also included.

Transporting Ecologies identifies “Braid” priorities that include in-place bicycle infrastructure and new linkages for a connected network

Weaknesses of the analysis and recommendations include lack of cost data for key segments (those with the highest latent demand scores) and the extensive segmentation of the network into small data blocks (less than 1 mile segments on average). This methodology revealed 200 priority I (highest priority) segments with no protocol for organizing these into a logical order for implementation. Consequently, project segments are matched based on budget amounts or other influences rather than a coherent connectivity strategy or targeted network approach.

Bicycle Travel Latent Demand studies provided in the 2001 Master Plan report focus on a quantification of the potential for bicycle use based on Travel Analysis Zone (TAZ) data for automobile transportation modeling assuming that if no cars are available, all trips within 0.5, 1.0 and 1.5 (or 2.0 in some cases) miles for specific trips such as school, work, shopping or recreation would be made by bicycle. This produces a single number for each segment but does not indicate which strings of segments work together to provide connected “Braids” of high latent demand segments (or facilities).

Bicycle Quality of Service

Bicycle Quality of Service (QOS) recommendations in the 2001 Master Plan optimize refined segmentation in the assignment of service levels for the existing infrastructure. Through community input, the plan establishes design criteria of "B" level quality for local streets and roads and "C" level quality for state roads. Appropriate on average, many highly traveled corridors with high potential to capture riders might necessitate a higher quality of service while other less traveled local infrastructure might be appropriate with "C" level service. A more targeted strategy is included here with the highest latent demand segments near the campus proposed as "A" and "B" level service while other lower demand areas are sufficient with "C" level of service. On average, this is consistent with the 2001 Master Plan.

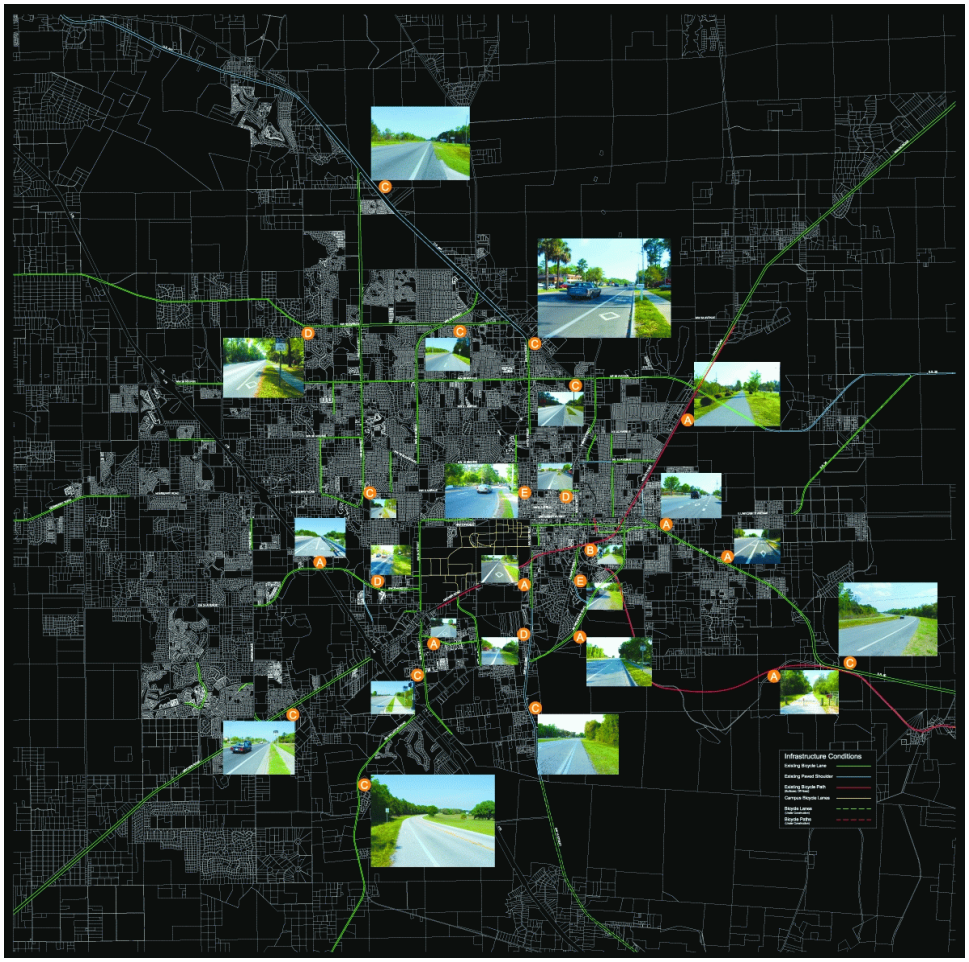
Quality of Service Comparison Matrix

The *Quality of Service Matrix* provides visualizations and definitions of bicycle quality of service (QOS) for various infrastructual elements. PDF poster size is included with the CD provided with this report.

Existing Infrastructure

Compilations of the 2001 Master Plan map studies, Gainesville bike routes map, field investigations and documentation were integrated into an overall assessment map illustrating the extent of the existing network, quality of service rating and images of the segment indicated. It is clear from this study map that the existing system is segmented and incomplete. There are high quality segments that are enjoyable to ride. However, cyclists are often confronted with "end-of-line" conditions requiring undesirable negotiations with automobiles or inconvenient out-of-the-way detours. This analysis supports the Transportation Mobility Element of the Comprehensive Plan by identifying arterials and collector segments not currently designed for in-street bicycle transportation (Policy 4.1.5).

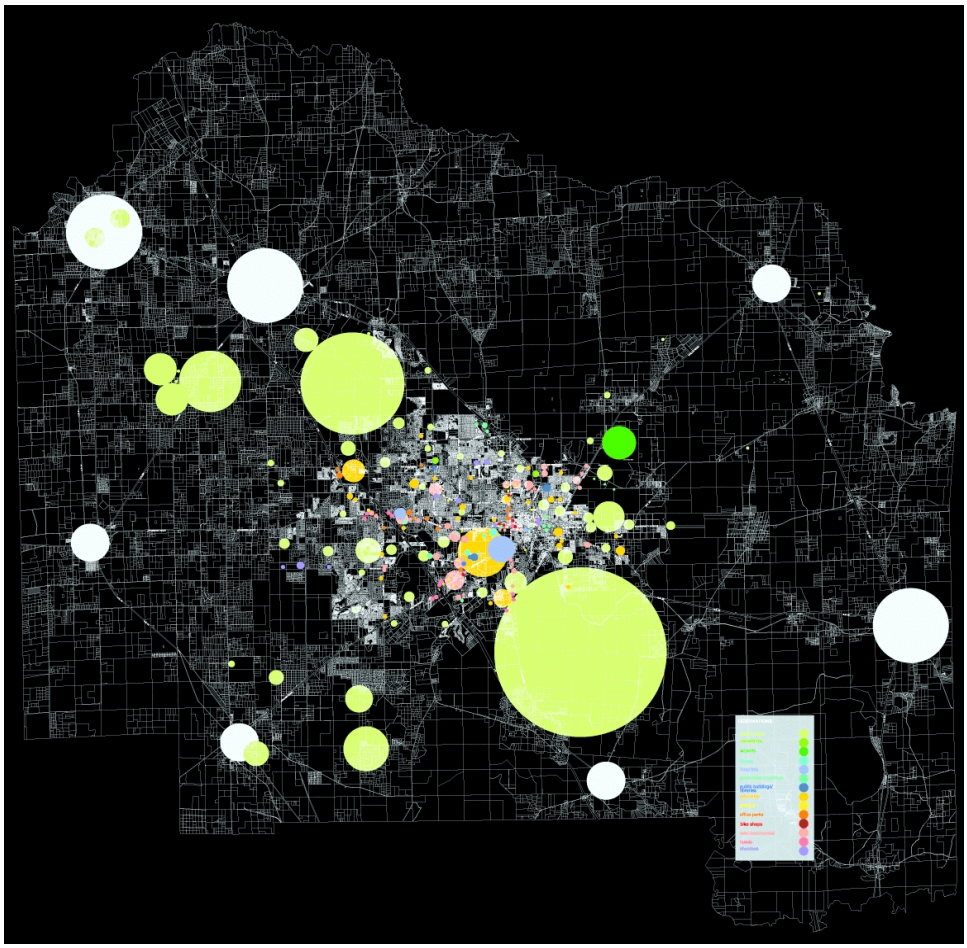
Existing Infrastructure map. Includes visual and QOS rating at locations marked by an orange dot.



Destination Analysis

Potential bicycle destinations were evaluated based on a quasi-gravitational model. Within destination groups such as parks, schools, cultural facilities, retail, work, bicycle repair, religious and other institutions, specific destinations were given a graphic weighting of the potential to draw visitors. This was based on the expected magnitude of visitors given the size, public access and adjacency to other destinations such as shopping centers. Visualizations of this information confirmed that major collector streets gathered the destinations in a linear manner linking key point destinations such as the University of Florida, Shands Hospital/VA, Oaks Mall, Sante Fe Community College and the downtown. Most destinations are on the network of arterial streets connecting these points. This part of the overall analysis partially fulfills the prioritization requirement of the Transportation Element (Policy 4.1.6) of the Gainesville Comprehensive Plan.

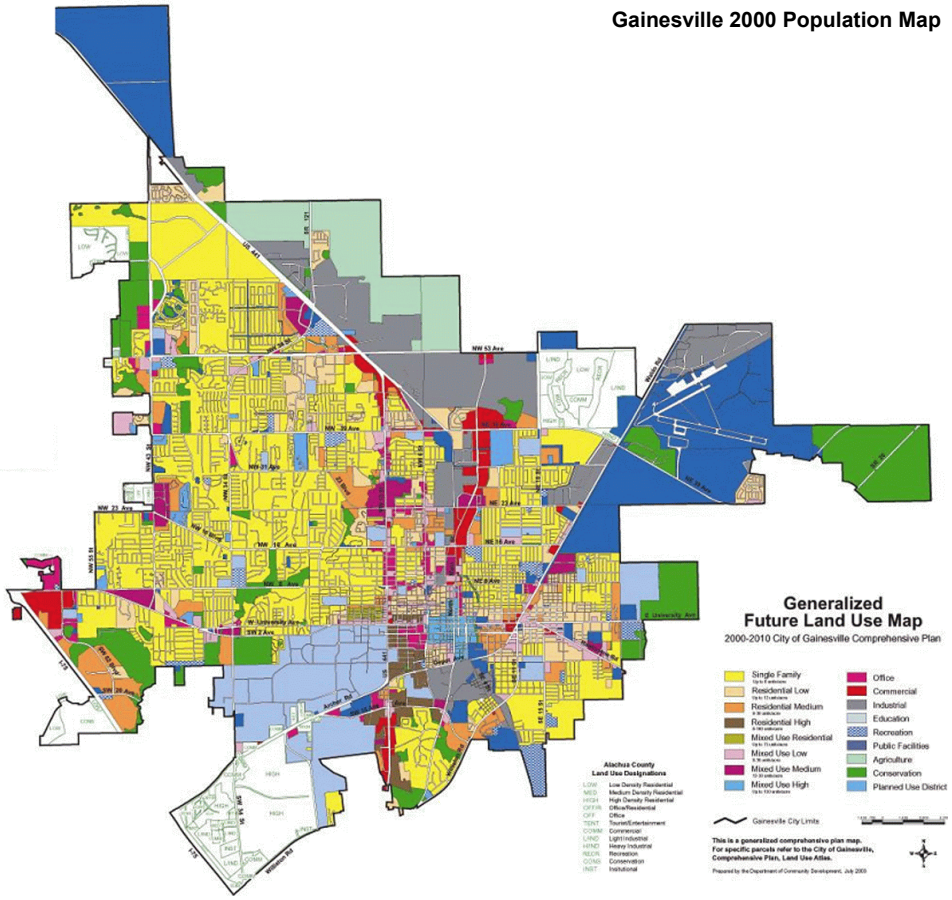
Destination Matrix mapping analysis - countywide

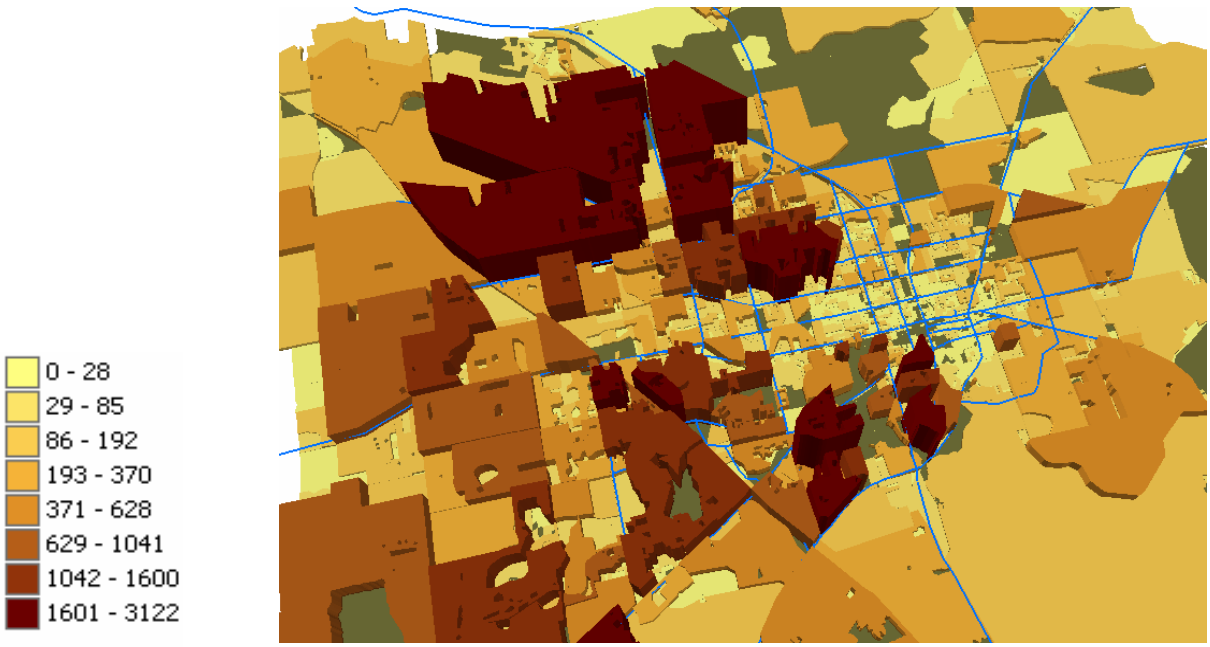


Destination analysis provided the insights into the potential high use Braids and where resources should be focused to make connections between living areas and trip destinations. Moving beyond traditional land use mapping strategies assigning areas of use, the destination matrix reveals overlapping densities within zoning boundaries and the advantages of locations that combine uses in zones.

Gainesville 2000-2010 Generalized Land Use Map

Gainesville 2000 Population Map



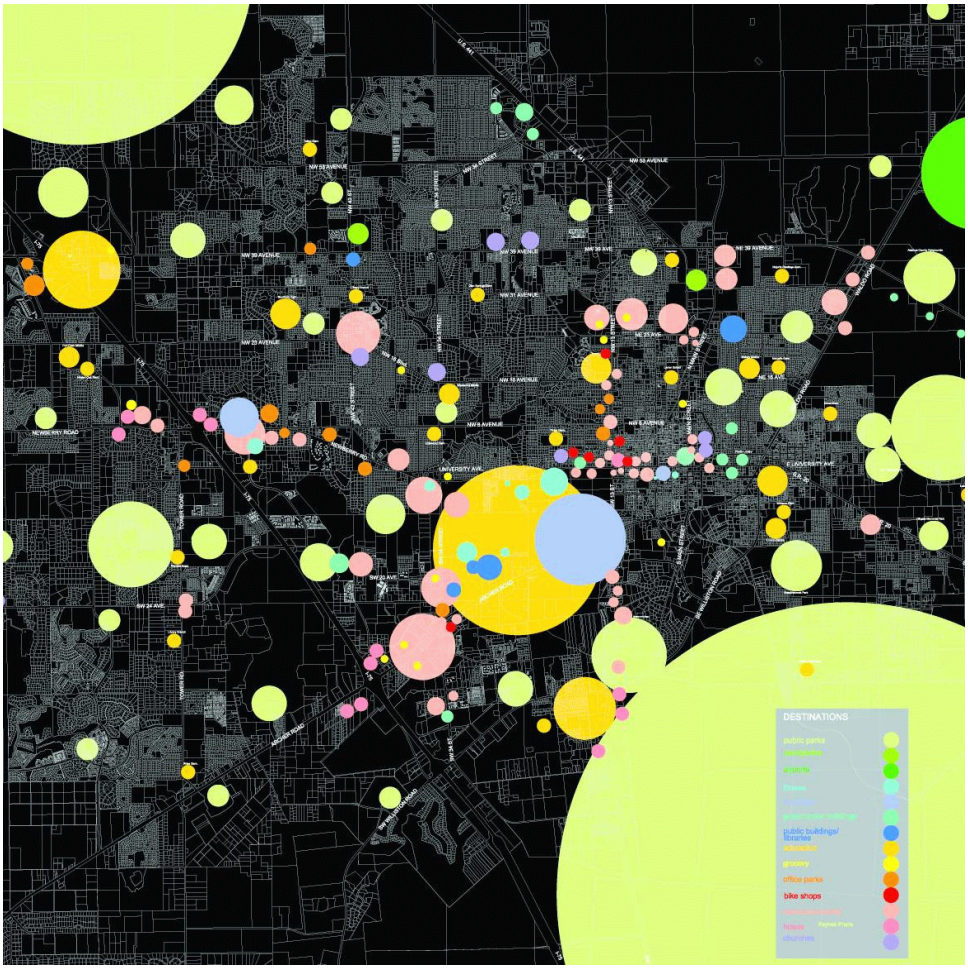


Considering population concentrations conjoined with the linear structure of destination distribution, linkages could be made that leverage existing infrastructure rather than propose new routes. Much of the population lies within 5 miles of the core (UF) and significant portions are within 3 miles. Based on our surveys (discussed in the Public Disposition Section) people would ride on average 25 minutes through well designed infrastructure — equivalent distance of 4+ miles.

Existing arterial connectors in the core of the urbanized area organize destinations like a string of pearls. To advance routinized use, optimize bicycle connectivity, and create the shortest possible routes, a similar linear structure is required allowing cyclists to pass the most alternate destinations between routine destinations such as school or work.

Latent demand models from the 2001 Master Plan report were included in this analysis. The demand scores for arterial connectors were in the 90 to 100 range (100 highest possible). Cost benefit analysis from the 2001 report was also included as part of the Braid prioritization factors discussed in the Prioritization and Recommendations section later in this report.

With the majority of the population density distributed to the north and south favoring the west side of town, linkages that string these locations to the most visited destinations would require both north-south and east-west connectors. Linking residential areas with destinations via existing arterial auto connectors utilizes the natural density built-up along these corridors. Although these may not be the simplest projects to implement, they offer the most potential for increased cycling as a viable routinized transportation option.



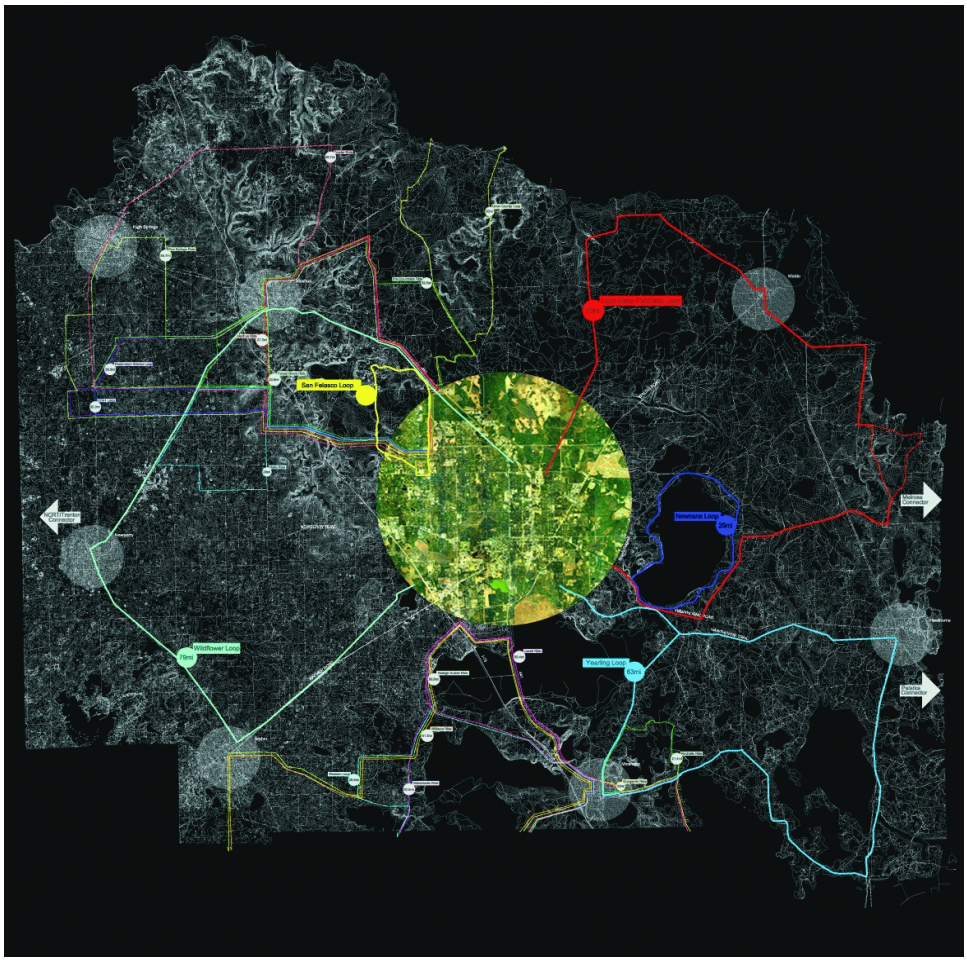
Destination Matrix mapping analysis - urban core

University Avenue and West 13th Street (US 441) act as threads stringing together a large number of businesses. Additionally, these streets provide shortest distance connectivity between large residential zones and key destinations such as the University of Florida. They also provide the most logical connectors for park-n-ride or park-n-bike facilities — a facility that could formalize the underground system currently on-going. The City of Gainesville Comprehensive Plan, in the Transportation Mobility Element Objective 1.1 (Policies 1.1.1 & 1.1.3) calls for these arterials (University Avenue and 13th Street) to be modified to provide transportation choice, multi-modality and livability.

Rural Infrastructure - Loops Analysis

Analysis of rural connectivity and use was implemented through mapping studies and interviews and workshops with representatives from the Gainesville Cycling Club. Existing rides were mapped and themed to identify desirable routes currently in use for recreational and competitive riding. Proposals were made for new routes to improve connectivity between Gainesville and satellite municipalities as well as extending further to the east and west would allow connectivity to the Nature Coast State Trail (west via Trenton) and the Cross Florida Greenway (east via Hawthorne) connecting to Palatka, thus establishing Gainesville as a major cross state connector for cycling enthusiasts and eco tourists.

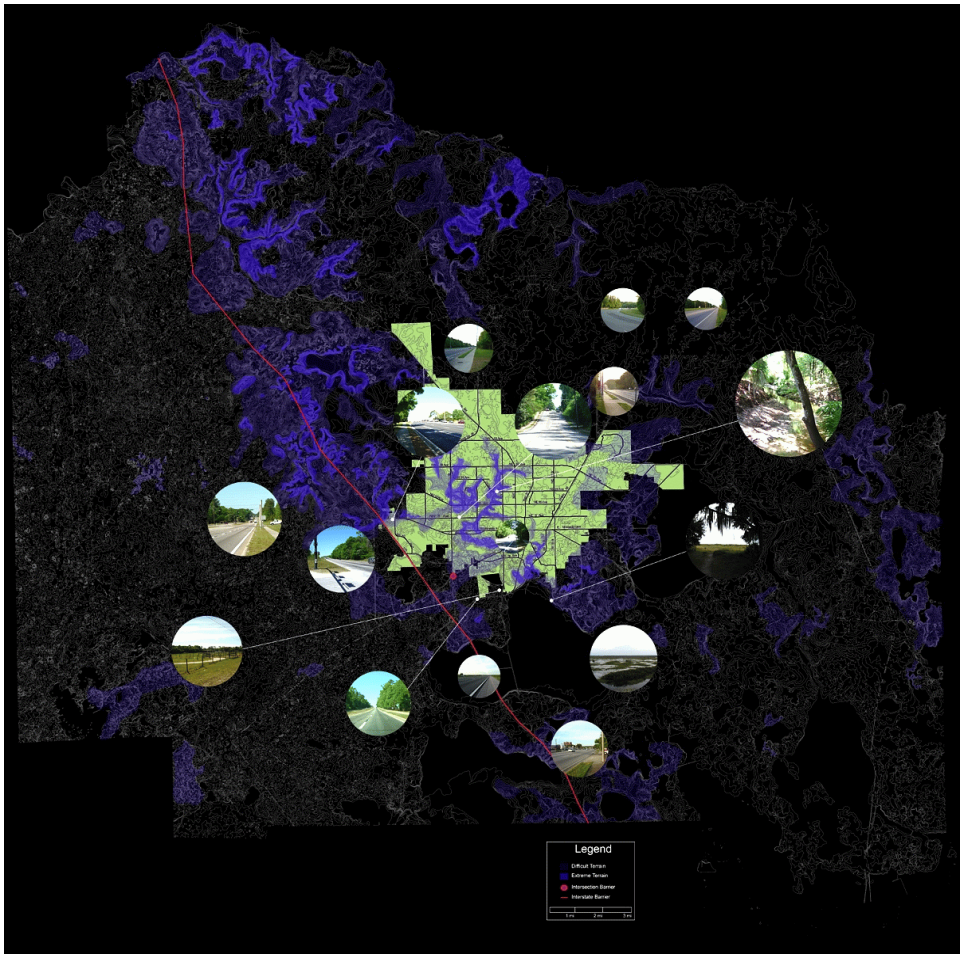
Rural loops analysis and proposal for future expansion



Geographical Barriers Analysis

Analysis of geographical barriers was conducted to assess the impact of topographic relief on potential commuter cycling routes in and around the urban core. Steep inclines can be a serious deterrent to routinized (commuter) cycling especially in a hot and humid climate such as Gainesville. In a effort to identify the most direct yet most level routes, topographic barriers were identified. Interstate I-75 was also indicated as a major geographical barrier as it diverts cycle traffic substantial distances as compared to typical cycle trips between most residential areas and common commuter destinations utilizing a grid network. At the request of the public, the intersection at Archer Road and SW 34th Street was included as a geographical barrier. The study identifies areas that should be avoided in terms of primary cycling infrastructure. As alternate routes for the hearty cyclist they provide important variation and connectivity to hilly neighborhoods and should be supported, but not relied upon as primary infrastructure.

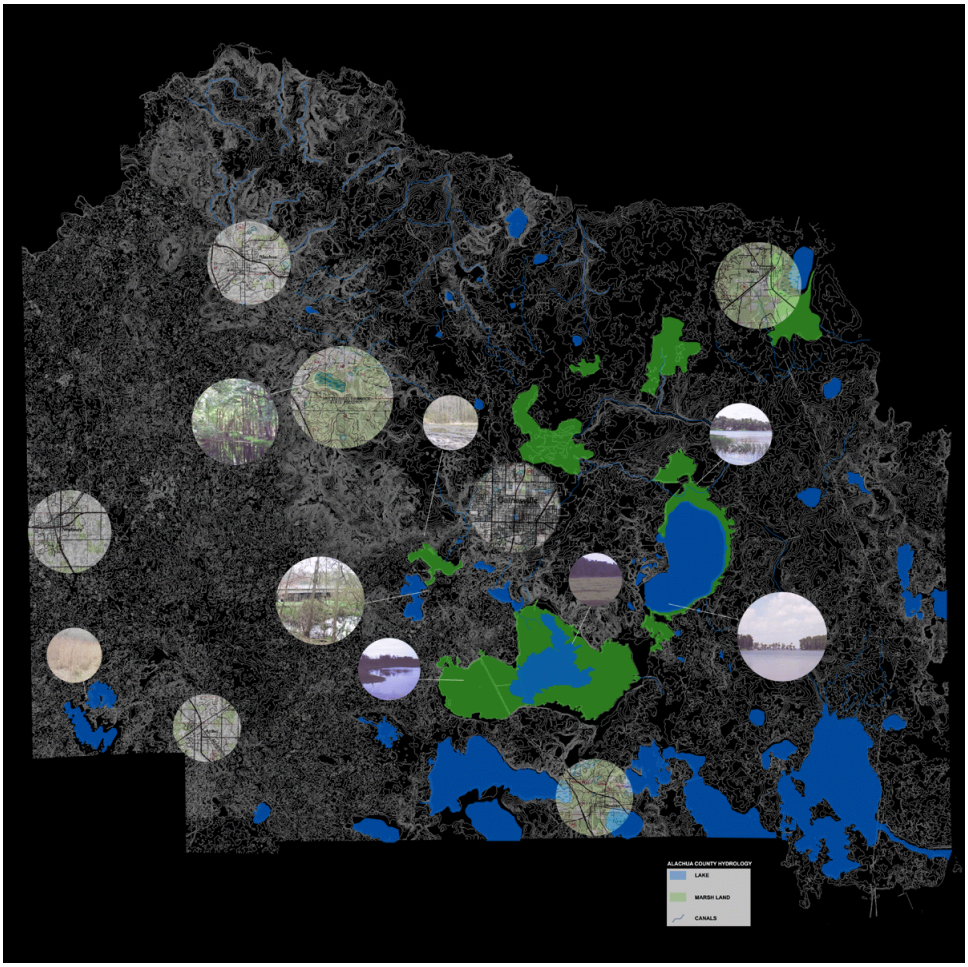
Geographic Barriers map. Blue tinted area shows difficult terrain.



Hydrology Analysis

The potential to capture existing riparian corridors and natural watersheds as bicycle and pedestrian greenway connectors was evaluated primarily through the hydrology analysis. Study identified riparian corridors that move through residential and commercial zones offering the potential for nature trail connectivity to many locations in Gainesville. Engaging this natural resource as an extension of the rich on-street network, a model cyclist and pedestrian connected community could evolve. Riparian corridors are mostly undeveloped in the urban area and provide natural habitat for local and invasive flora and fauna — a condition that could be cultivated and nurtured through investment, occupation and observation.

Hydrology map. Registers major riparian systems, wetlands and lakes.



Public Disposition Analysis

Public information was gathered during a bicycle master plan workshop held April 1, 2004 at the Florida Community Design Center. A formal survey questionnaire was also distributed during the workshop and to other cyclists later at bicycle related events. The survey form is included in Appendix A of this report. A workshop and telephone interviews were conducted with representatives from Gainesville Cycle Club and phone interviews were conducted with concerned citizens responding to news articles printed in the Gainesville Sun on April 1st and 2nd , 2004.

Identifying "nets" potentials

Introduction of Project

Public workshop

Alachua Braid identification and suggestions

The workshop was attended by 35 members of the public. This included the general public, Bicycle/Pedestrian Advisory Board, Gainesville Cycling Club members and state and local agency staff members. After a brief introduction of the project conceptual framework and a discussion of the prioritization goals, a lengthy question and answer session was conducted to address possible outcomes from the recommendations. After this, citizens broke out into two workgroups with maps and markers and were asked to sketch and note problem areas, revisions, new initiatives, and renovation proposals to improve the system.

Workshop group postulating alternate routes

Public Workshop Comments & Recommendations

Comments from the Public Workshop are included below. General comments were recorded after the project introduction and during two focus groups A and B each with approximately 10 members (people moved in and out of the base groups).

Introductory Issues:

- Separation needed on high speed roads (Paine's Prairie, University Ave., West of campus). Not just rumble strips!
- Initiatives for connectivity of new residential construction through enforcement of "Nets" strategies is desirable.
- Disrepair on "successful" paths (Depot Rail-Trail, Hawthorne Trail).
- Linkages (Continuous Braids) needed.
- Support facilities (showers, lockers, repair, transportation) for Downtown and the Airport? Suggested investigation into Tampa and Orlando initiatives.
- Future park linkages (Parks/Rec Department allocating money for future park development) Is Transporting Ecologies flexible to accommodate new parks?
- Tourism possibilities (International athletes – cycling/long distance running)

Focus Group A

- Completion of the Hawthorne Trail connection into the NE. City support dependant on seeing completion of a project.
- Measuring trip generation potential (regular usage, not just recreational/weekend use, consider marketing as well as population factors)
- Lack of SW to NE cross-link connection (hull road/34th to NE Duckpond).
- Intersection barriers (excessive wait time for traffic signals).
- Hawthorne trail braid into NE connection should be HIGHEST PRIORITY!
- Depot Trail maintenance needed (roots, glass).
- Lack of continuity problematic, especially around UF. Access points disappear before reaching campus.
- Archer braid as multi-use corridor (follows Hawthorne Trail example- bikes, blades, walking). Linear parks/RR routes.
- Possible encouragement of future bike commuting by providing recreation/separated trails.
- Narrowing of 34th street NW after University Ave.
- North-South, East-West braids of equal priority.
- CONTINUITY!
- Connection with city (phone/web) for path/trail maintenance. Single agency needed to oversee maintenance. Who does one contact for issues on each trail?
- More destinations along trails (parks and play areas). Encourage neighborhood development along trails. Potential destination based business opportunities.
- No services along trails (water, restrooms, air) Ex. At Boulware Springs, the water access is inside of a building at a distance from the trail.

Focus Group B

- Quality of service low on NW 24th St. between 34th St. and 441.
- Dangerous intersection area from 13th St. to Archer Rd.
- Quality of service 'E' going (13th St.) from Wal-mart to University Ave – lack of (2 mi.) bike lane.
- No commute (no bike lane, need facilities) from 6th St.; additionally pot-holes south of 16th in front of Lloyd Sports (on NW 13th St.).
- No commute (no bike lane, need facilities) Main Street.
- Connect off-road trails from town to San Felasco Nature Preserve.
- Recreational routes: connecting residential and community areas to recreational areas needed.
- Mix of paved and non-paved trails preferred.
- Consider Citizen volunteers for patrolling and communication.
- Community designers needed.
- Designing around topography is not necessary (people enjoy hills and obstacles).
- Increase connectors.
- High priority East/West Braid on Hawthorne to Depot across Campus Hull Rd. to Tower Rd. and Kanapaha.
- Nets: Safe ways to school (biking, etc) connect to back side of schools for more access.
- Intersection treatments between connectors, so that people won't feel intimidated by the connectors.
- Reclaim road on N Main to add bike lanes connect to Waldo.
- Possible Loop around Prairie 234 off-road facility connects to Hawthorne Trail.
- No safe North South route through Gainesville.

Local citizens, students and staff engaged in focus group evaluation of proposed Braids as a network priority.

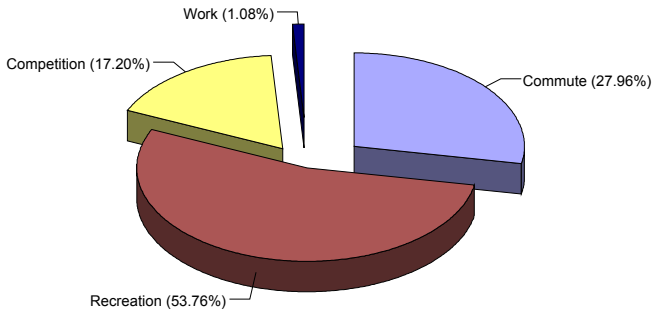
Questionnaire Survey of Public Perception

In addition to the hands-on public workshop sessions, participants were asked to complete a questionnaire survey more specifically targeting information regarding use, potential use, perception of safety and prioritization preferences. The survey was also implemented at a local cycle rally. The groups participating in the survey represent the attitudes of experienced and recreational cyclists in Gainesville. Results do not represent the community at-large but reveal important issues that are a concern to regular and moderately regular cyclists — 55 cyclists responded to the survey.

Cycling Activities breakdown

The majority of cycling activity is recreational (54%) with commuting following second (28%). Respondents indicated each use category they participated in regularly. The work category is for persons who use their bicycle for commercial purposes.

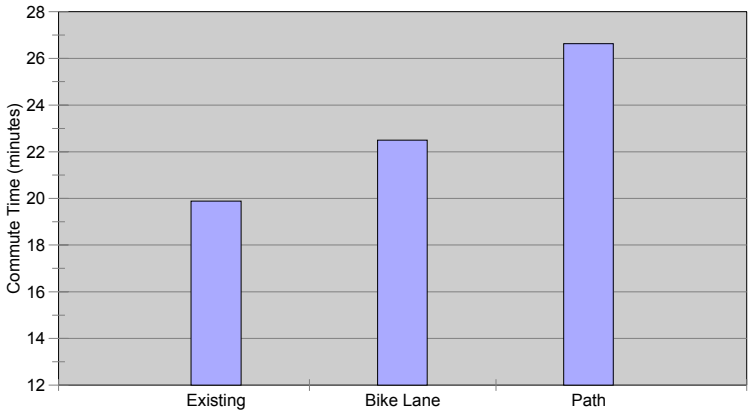
Cycling Activities



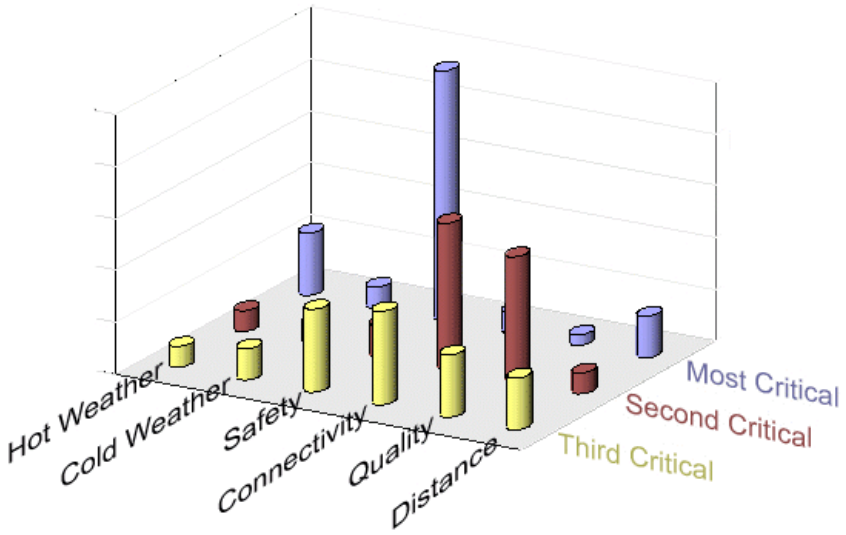
Travel Time Breakdown

Respondents were asked to estimate the trip time (minutes) they would devote to commuting by bicycle to work, shopping or services given the following conditions in their area — on the existing system, on new connected bike lanes, on new connected paths (paved but separated from the road). Separated paths offer the greatest potential for longer distance cycling - up to 5 miles.

Commute Time & Quality



Obstacles to Commuting

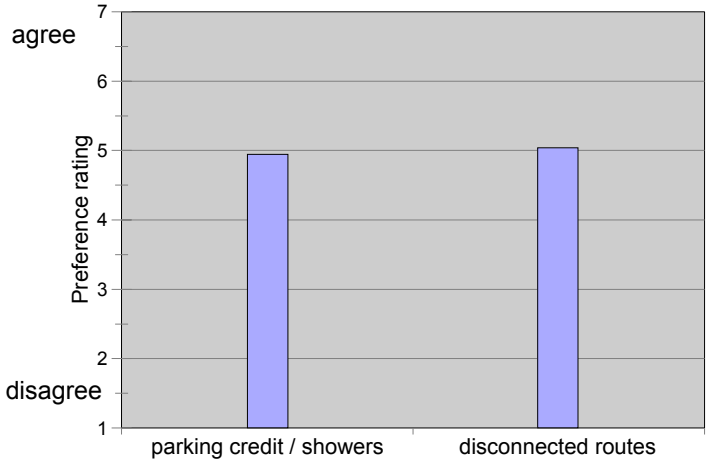


The graph above represents respondent evaluations of the listed obstacles to commuting including hot weather, cold weather, safety, connectivity, quality of ride experience, and distance needed to travel. Each respondent ranked the top three, with "1" representing the obstacle of highest concern. Safety was perceived as the most dominant obstacle to commuting with 24 highest ratings. Connectivity and quality of ride were most commonly selected second in difficulty to commuters (includes shopping and errands trips). Connectivity and safety were also the highest for the third tier obstacles. Most respondents did not see the hot climate in Gainesville as an obstacle. Safety and connectivity were the issues identified as limiting cycling in Gainesville and Alachua County.

Incentives & Impediments

Incentives & Impediments

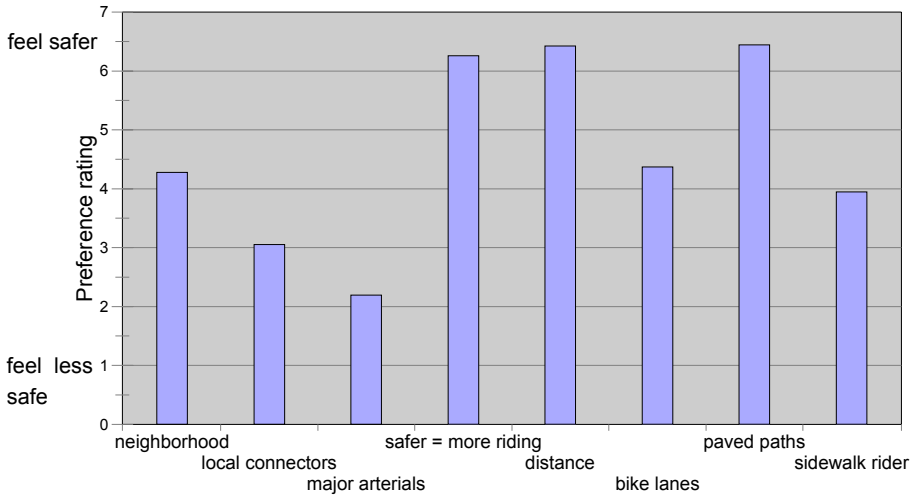
Respondents were asked if incentives such as a parking voucher or showers would influence their commuting habits and if disconnected routes inhibited their commuting habits.



Perception of Safety

Survey respondents were asked to evaluate the feeling of safety in the existing system relative to their experiences on well-designed portions of the local system or other systems on which they had ridden. The first three questions asked to rate the feeling of safety relative to neighborhood, local connectors and major arterial streets. Respondents felt significantly less safe on major arterial streets. The fourth and fifth questions asked if respondents would ride more often and farther distances if the system were perceived as safer (high score here was “feel safe”). Most felt that they would ride more if they felt the system was safer. The next two questions (6 & 7) evaluated which of the following infrastructures people feel safer on — lanes or paths (separated). The last question asks if the rider rides on the sidewalk as a way to feel safer in the network.

Perception of Safety



Automobile yielding to cyclist at arterial rotary in Malmo, Sweden. Cyclist moves confidently through the intersection as the car approaches and then stops.

This data represents respondent perceived safety and may have as much to do with rider skill, public awareness of cyclists, motorist responsibilities or anecdotal events such as fatal accidents as it does with the actual infrastructure. However, three important aspects of a cycle network are identified from this data set as promoting perceived safety in Gainesville and Alachua County:

- People would ride more if the system was perceived as being safer.
- People would ride longer distances if the network was perceived as safer.
- People feel that separated paved paths make them feel safer.

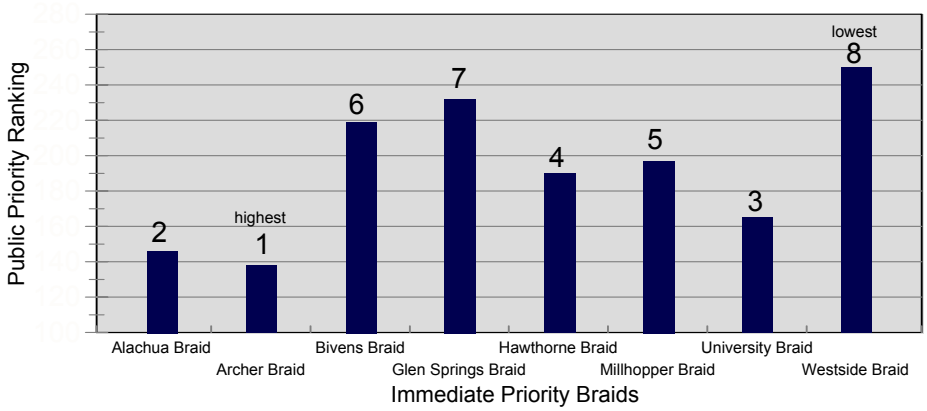
Public Prioritization Preference of Immediate Priority Braids

During the project introduction, the public attendees were informed of the draft phase proposal for specific connecting corridors "Braids" that would link destinations and organize the segmented priorities of the 2001 Master Plan to promote improved connectivity. Maps of the proposed braids were distributed as part of the workshop and attendees prioritized the braids in rank order from 1 to 8 (lowest number indicates highest ranking). Survey respondents not attending the meeting were given a map of the proposed Braids and a brief discussion of the intentions of the survey.

Public Survey Braid Priorities

Public Priority Ranking of Braids

1. *Archer*
2. *Alachua*
3. *University*
4. *Hawthorne*
5. *Millhopper*
6. *Bivens*
7. *Glen Springs*
8. *Westside*



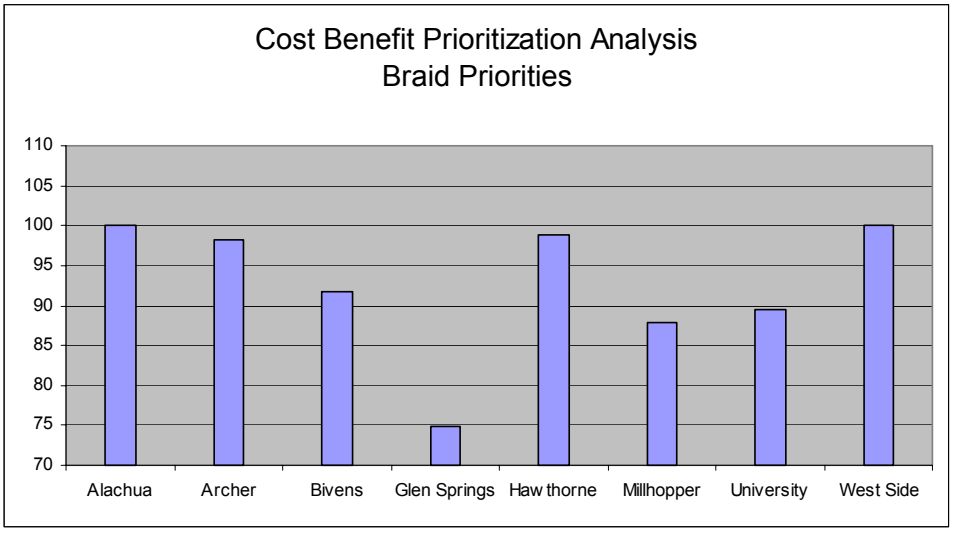
The results above show two clear top preferences for the Archer Braid and the Alachua Braid with slight favor toward the Archer Braid (lowest number is highest preference). The University Braid was clearly the third choice. The Hawthorne and Millhopper Braids respectively were 4th and 5th yet closely grouped as with Bivens and Glen Springs Braids. Although the Westside Braid was ranked last it is statistically similar to the number 7 choice.

This data analyzed in conjunction with cost benefit analysis (provided in the 2001 Master Plan report) was a major influence in the final prioritization recommendations. Please refer to the Braids category of the Prioritization and Recommendations section later in this report for further discussion, final prioritization schedule and specific recommendations for each Braid.

Cost Benefit Analysis

Cost benefit analysis summarizes the benefit to cost of multiple segments that are intertwined to comprise the Braid. In most cases some portion or portions of the Braid has existing bicycle infrastructure that is in good to excellent condition — requiring no upgrades. Typically, there are also major segments or strings of segments that have little or no bicycle infrastructure. Therefore, to promote connectivity and avoid segmented implementation of facilities while establishing appropriate levels of service through areas of high latent demand, segments must be organized into a bundled system — a Braid. Toward this goal, cost benefit prioritization rankings illustrated in the chart below, include both needed and existing segments (existing segments receive cost benefit ratio of 100). The ranking below is the average cost benefit ratio for the aggregated segments of the entire braid.

Braids cost benefit analysis



Prioritizing by individual segments eliminates poor cost benefit segments or complicated segments requiring additional cost analysis. Many of these segment cases are integral to a connected network and must be included as priority initiatives. The methodology used in this addendum weights costs and benefits over the entire Braid (combining multiple connected segments). Therefore, more expensive but critical segments are prioritized in a manner more characteristic of their overall connectivity and latent demand potential. Cost benefit analysis information is averaged using the segment data from the 2001 Master Plan. In some cases, 2001 data segments were not given cost benefit rankings and subsequently were not included in the 2001 prioritization schedule. Those segments are critical to developing a connected system and have been included in this analysis. As with all of the segments, more detailed cost analysis is needed to initiate individual projects — the Braid priority ranking is also a method of selecting detailed study segment candidates.