DRAFT REPORT
Oxford Mississippi:
Creating a Walkable, Bikeable Community
Through Complete Streets

Prepared by

Designing Streets for Pedestrians & Bicyclists

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Background:

Designing Streets for Pedestrians and Bicyclists LLC (DSPB) - Michael Ronkin (MR) principal, and Livable Streets Inc (LSI) – Michael Moule (MM), Principal, were hired in March 2008 by the city of Oxford, Mississippi, to perform the following tasks:

1. Create complete street guiding principles (policies) and them into existing plans, on-going projects, and future projects, possible ordinance amendments.
2. Review existing plans, on-going projects, and policies in terms of complete the street concepts.
3. Hold public hearing to explain complete the street concepts and to gather public reaction and any comments/suggestions.
4. Review Bike Friendly Communities application and make suggestions on improvement.

Task 3 was accomplished on March 27 2008, as part of a 4-day field visit to Oxford, where MR and MM assessed a variety of street conditions as they relate to cyclist and pedestrian access, safety, connectivity and comfort. The content of this report fulfills tasks 1, 3 and 4. In addition, DSPB and LSI offered advice on several additional issues and projects:

5. The street layout, access and design for the planned University of Mississippi Research Park,
6. The overall relationship between the University and the City of Oxford,
7. Design suggestions for a scheduled reconstruction project on University Avenue,
8. Concurrence with MDOT for projects on or crossing state-owned highways

***Task 1a**: Create complete street guiding principles (policies)…*

The Complete Street Coalition recommends these principles, elements and implementation strategies:

1. The Principle
   - Complete streets are designed and operated to enable safe access for all; pedestrians, bicyclists, motorists and transit riders of all ages and abilities must be able to safely move along and across a complete street.
   - Creating complete streets means changing the policies and practices of transportation agencies.
   - A complete streets policy ensures that the entire right-of-way is routinely designed and operated to enable safe access for all users.
   - Transportation agencies must ensure that all road projects result in a complete street appropriate to local context and needs.

2. Elements of a Good Complete Streets Policy
   - Specifies pedestrians, bicyclists, transit operators and users, motorists, of all ages and abilities.
   - Aims to create a comprehensive, integrated, connected network.
   - Recognizes the need for flexibility: all streets are different and user needs will be balanced.
   - Is adoptable by all agencies to cover all roads.
   - Applies to both new and retrofit projects, including design, planning, maintenance and operations, for the entire right-of-way.
   - Makes exceptions specific and sets a clear procedure requiring high-level approval of exceptions.
   - Directs the use of the latest and best design standards.
   - Directs that complete streets solutions fit in with context of the community.
   - Establishes performance standards with measurable outcomes.

3. Implementation; an effective complete streets policy should prompt transportation agencies to:
   - Restructure their procedures to accommodate all users on every project.
   - Re-write their design manuals to encompass the safety of all users.
   - Re-train planners and engineers in balancing the needs of diverse users.
   - Create new data collection procedures to track how well the streets are serving all users.

4. Model ordinance: This sample policy could be adapted to meet Oxford's need, context and conditions:

   Oxford will plan for, design and construct all new transportation projects to provide appropriate accommodation for pedestrians, bicyclists, transit riders, and persons of all abilities, while promoting safe operation for all users. This principle will apply to roads and streets built by the city, the county, the state DOT and private developers. The complete streets principle will be incorporated into the city's Vision 2020 Plan; Pedestrian and Bicycle Master Plan; Land Development Code and other City plans, manuals, rules, regulations and programs as appropriate.

   All transportation projects shall reflect the land-use, historic character and transportation needs of the local community and the citywide transportation network and adhere to the latest and best design guidelines.

   Exceptions to any bicyclist, pedestrian and/or transit element should be granted only under the following circumstances:

   - There is no need, based on current or anticipated (future) use;
   - The cost is excessively disproportionate to the need, based on current or anticipated use;
   - The project is routine maintenance with no significant change to the design of the roadway.
   - Any exceptions to this policy require written justification, documentation, and approval by (*Oxford should fill in this blank).*

***Task 1.b**: … complete street guiding principles (policies) into existing plans, on-going projects, and future projects, possible ordinance amendments.*

The consulting team reviewed the Vision 2020, the City of Oxford Bicycle and Pedestrian Plan, the Land Development Code and other relevant documents to extract existing policies or standards that already imply Complete Streets. Where needed, recommendations are made to strengthen existing language, or add new language where lacking.

Vision 2020

<…> the board did adopt the following guiding principles:

1. <…>

4. Establish a densely connected network of streets and roads to guide future growth that equally serves automobiles, pedestrians, bicycles, and future possibilities for transit.

5. Relate existing and future development to the network of streets and roads and natural drainage areas, emphasizing appropriate mixes of land uses instead of single use districts.

6. Recognize that design-of buildings, landscapes, and streets-is a central part of Oxford's plan for preservation, redevelopment, and new growth.

Comment: These broad principles fit in very well with a Complete Streets policy; but they are broad, and are not necessarily reflected in other implementation documents, such as the Land Development Code, especially the provision to "Establish a densely connected network of streets and roads" and "Relate existing and future development to the network of streets and roads." Connectivity is essential for walking and biking to succeed in a community.

City of Oxford Bicycle and Pedestrian Plan

MISSION: To Create accessible and safe pathways which…

…Influence the quality of life for citizens of all ages, abilities, and economic status,

…Educate users of the health benefits of regular walking, jogging, cycling, and related activities,

…Educate school-age youth and adults alike in safe bicycle and pedestrian behavior,

…Provide safe routes to schools and other public facilities,

…And promote cycling and walking as viable transportation options.

The purpose of the Bicycle and Pedestrian Plan for the City of Oxford, Mississippi is to act as a guide for the development of a network of bicycle and pedestrian facilities within the City of Oxford and Lafayette County. The plan outlines specific goals and objectives related to the project, proposed routes, implementation and funding, maps, typical cross-sections, and other necessary support information.

Comment: Very good language.

1.3 Community Pathways

Oxford's network of community pathways will consist of four different types of bicycle facilities: shared-use paths, bicycle lanes, bicycle routes, and paved shoulders. Shared-use paths, typically found in parks and greenways, allow both pedestrians and bicyclists to use a path at the same time. Bicycle lanes are striped and signed along existing roads, and will be used in three of the first seven phases of the pathways program. Similarly, paved shoulders are typically utilized along existing roads if the existing shoulder can be paved to accommodate bicycle travel. Bicycle routes are signed shared roadways between bicyclists and vehicles. This type of facility is usually used in areas where the addition of a bicycle lane is not feasible.

Comment: the term “Bicycle Route” can be ambiguous; it is best reserved for planning purposes. Suggest replacing it with “signed routes,” as this is what users will see implemented on the ground. Nor is it exclusive of bike lanes – they can be part of a signed route too.

2.0 Goals and Objectives

The bicycle and pedestrian plan for the City of Oxford, Mississippi provides the framework for the development of safe and convenient bicycle and pedestrian access to all areas of the city, university, and areas of interest outside of the city limits.

Overall Goal: *Develop and maintain a comprehensive and coordinated bicycle and pedestrian program for the City of Oxford, Mississippi.* (1, 2, & 3)

Objectives:

1. Ensure adequate funding for the design and development of bicycle and pedestrian facilities in Oxford and Lafayette County.

2. After the implementation of the bicycle and pedestrian plan, establish an advisory committee to work with the city, university, and county on the continued use of the Bicycle and Pedestrian Plan.

Comments:

1. As important as funding is, many aspects of the plan can be implemented with little or no funding, such as adopting strong policy, ordinances or codes; this important work is not reliant on funding and shouldn’t wait.
2. Suggest forming the advisory committee prior to implementing the plan; they should be involved in the development of the plan.

2.3 Engineering Goals

Goal: *Provide an integrated network of bicycle and pedestrian facilities that are an integral part of street design.* (1, 2, & 3)

Objectives:

1. Develop standards to be used for planning decisions on where to place bicycle lanes and routes, as well as, sidewalks. Issues such as speed and volume of automobiles, number of driveways and other curb cuts, and the age and skill level of bicyclists and pedestrians should be considered.

2. The network should promote bicycle circulation through the possible usage of devices such as bicycle signal heads, bicycle detection devices at intersections, phased traffic signals, etc., to safely move bicyclists, pedestrians, and motorists through busy intersections.

3. Plan routes to provide linkages between popular destinations.

4. Develop a network of primary and secondary routes throughout the city to link neighborhoods, destinations, etc. to a primary network via a secondary network.

Comment: These are very good, but focus entirely on bikeway design. The same can and should be stated for pedestrian designs: sidewalks, crossings, and intersection design.

3.2 Proposed Routes

Comments:

1. The routes chosen are well planned, the breakdown of the various facility types (paths, bike lanes, shoulders, signed routes) are in line with national practices and fit the local context well.
2. Similar work should be done for pedestrians, though “routes” are not as relevant; filling missing sections of sidewalks, establishing linkages and enabling difficult street crossing should be prioritized.

4.0 Implementation and Funding

Comment: The cost estimates may need to be revised to take into account inflation and the higher construction standards recommended in this report. Building to higher standards adds to initial construction costs, but provide long-term savings as the city will have to spend less on maintenance in the near and long-term future. This is an important implementation strategy, as there are external funding sources available for capital projects, but all maintenance costs must be borne by the city.

4.1 Additional Funding Sources

Comment: A strong Complete Streets policy would help identify other creative funding sources, but most importantly, by incorporating the necessary pedestrian and bicyclist facilities into new and retrofit projects, costs are kept to a minimum. It is always more expensive to retrofit pedestrian and bicyclist facilities as stand-alone or add-on projects than as part of road construction or reconstruction projects.

5.0 Design and Engineering Standards

MDOT and the State of Mississippi do not have specific design and engineering standards for bicycle and pedestrian facilities. However, the American Association of State and Highway Transportation Officials (AASHTO), as well as, the Institute of Transportation Engineers (ITE) have written generic standards and guidelines that are applicable to bicycle and pedestrian facilities in most states. The guidelines for Oxford's pathways program have been compiled from AASHTO's Guide for the Development of Bicycle Facilities.

Comment: This is a good approach. The recommendations made specifically for Oxford are suitable for the local context. Oxford should consider 6' bike lanes or shoulders on streets without sidewalks but where significant pedestrian activity can be anticipated, such as on North Lamar. Oxford should also consider more substantive pavement depth for paths, to reduce long-term maintenance needs (see comment above under funding).

5.4 Bicycle Parking Facilities Guidelines

Comment: The recommendations are good. Oxford should adopt a simple, elegant design for short-term racks that can be customized with aesthetic touches to reflect local desires. The best racks are variations of the "upside-down U or staple." This serves cyclists better than the "wave" racks currently installed around the square; a good example is shown in Figure 7.2.4.

6.0 Pedestrian Plan

Offering citizens an alternative mode of transportation, opportunities for recreation and exercise, as well as, reducing congestion and single occupant vehicle trips on Oxford's streets are just a few of the goals of the Bicycle and Pedestrian Plan. Consequently, an equal number of bicycle and pedestrian facilities should be available to citizens in Oxford.

The rail-trail, comprising three phases of the community pathways program, is the only portion of the community pathways program that is a shared use pathway. The other four initial phases are a combination of bicycle lanes and routes that would exclude pedestrians from using those sections of the pathways network. Fortunately, most streets in the older, established sections of Oxford contain a sidewalk on at least one side, if not both, sides of the street allowing pedestrians to walk along most of proposed pathway routes. However, there are streets and developments within the City where sidewalks are only located on one side of the street, they are interrupted and are not continuous with other nearby sidewalks, or end without warning to a pedestrian.

Presently, the City of Oxford is reviewing accessibility within the city limits to deal with the aforementioned problems with city sidewalks. A sidewalk inventory is being conducted in each voting ward to determine which streets contain sidewalks, the condition of those sidewalks, and the widths of those sidewalks. The sidewalk inventory will then be used to compile and prioritize a list of streets where either a sidewalk needs to be built or improved.

The City of Oxford does have ordinances on the books that will support the Bicycle and Pedestrian Plan's goal of providing pedestrians with a safe alternative method of transportation, opportunities for exercise and recreation, and safe routes to schools and public facilities. One of the ordinances requires the construction of sidewalks on at least one side of the street in all new subdivision developments. Another ordinance requires the construction of sidewalks in non-residential new construction projects within the city, and all remodeling and additions that are greater than 50% of the current value of the building.

Comment: This portion of the plan needs substantial additional attention. The current plan is almost entirely bicyclist-oriented, and this short section does not do pedestrians justice. Virtually everybody walks in Oxford, including those who drive into town, park and walk a short distance to their final destination. The shared-use paths do serve pedestrians, and bike lanes and shoulders can serve as a walking facility in a semi-rural (low-density) context. Requiring sidewalks on one side of the street for new development is good, though sidewalks on both sides are preferred. But a stronger policy is needed to retrofit the many existing streets that need sidewalks on both sides.

Pedestrians also face a host of issues that are unique to their needs, such as midblock crossings, long skewed intersections, intersections with inadequate or missing pedestrian signals, frequent curb cuts on commercial streets, circuitous access to buildings through parking lots, inaccessible sidewalks, etc.

A strong Complete Streets policy would ensure these needs are addressed on all road and intersection projects, including developer-driven improvements, signal upgrades etc. Engineering standards need to be adopted that ensure road and intersection designs meet pedestrian needs. Some basic principals include separated, continuous sidewalks with minimal curb cuts, short radii at intersections, crosswalks on all 4 legs of an intersection, well-placed pedestrian signals and pushbuttons, pedestrian refuge islands to break up long crossings, and frequent and convenient midblock crossing opportunities where needed.

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Land Development Code (LDC)

Section 162 Design Standards

162.01 1. a. Provide a safe and convenient circulation system minimizing pedestrian and vehicle conflicts, and traffic congestion.

Comment*:* The best way to achieve this is to provide a very well connected system of streets, as described in Principle Four of the Oxford Comprehensive Plan. This is best done by using a grid modified grid system of streets should be used. Unfortunately, the other standards found in the Land Development Code allow conventionally suburban street networks, which typically increase pedestrian and vehicle conflicts as well as traffic congestion.

162.03 10. d. Pedestrian crosswalks, not less than six (6) feet wide, shall be required where deemed essential to provide safety as required by the Planning Commission and the Manual on Uniform Traffic Control Devices (MUTCD) Standards.

Comment*:* Although the MUTCD minimum width for crosswalks is 6 feet, the minimum crosswalk width in the LDC should be 10 feet. This provides for more visibility of the crosswalk markings, and provides more room for pedestrians at crosswalks, where pedestrians tend to bunch up.

162.04 1. c. Provide a local residential street system which discourages through traffic and provides adequate access for fire, police and other emergency vehicles.

Comment*:* Although it may seem counterintuitive, the best way to achieve both of these goals is to have a modified grid system of streets. Good connectivity disperses traffic by providing multiple route choices, which creates the best access for emergency vehicles. Additionally, while a modified grid allows for

through traffic in a general sense, the redundant network and grid modifications discourage significant through traffic on any one street.

162.04 2. c. Locals. Residential streets or rural roads not classified in a higher system, primarily providing direct access to abutting land and to collector streets. They offer the lowest level of mobility and usually carry very little truck traffic. Service for through traffic is deliberately discouraged.

***Comment**:* While through traffic should be discouraged on local streets, this is often used as an excuse to make most local streets cul-de-sacs. Instead, through traffic on local streets can be discouraged through the use of a well-connected modified grid system of streets.

162.04 3. d. Adjacent Properties. Street stubs into adjacent properties may be required to provide greater interconnectivity and ensure adequate future circulation.

***Comment**:* Add the following: Additional public right-of-ways may also be required as possible future pedestrian and bicycling connections to adjacent properties. Multiple stub streets or rights-of-way further increase interconnectivity and can allow a comprehensive modified grid system of streets after several properties are developed.

117.163 Street, Arterial:

1. **Major Arterial**: A street with access control, channelized intersections, restricted parking, and which collects and distributes traffic to and from minor arterials. Shall have a minimum right-of-way of one hundred and twenty (120) feet.
2. **Minor Arterial**: A street with signals at important intersections and stop signs on the side streets, and which collects and distributes traffic to and from collector streets. Shall have a minimum right-of-way of one hundred (100) feet.

117.164 Street, Collector: A street designed to facilitate traffic movement between minor arteries and minor streets and indirect access to abutting properties. Shall have a minimum right-of-way of eighty (80) feet.

117.165 Street, Cul-de-sac, Court, or Dead-end Street: A short street of a maximum of eight hundred (800) feet in length having one end open to traffic and the other permanently terminated by a vehicular turn-around.

117.172 Street, Minor: A street designed primarily to provide access to abutting properties. Shall have a minimum right-of-way of fifty (50) feet.

162.04 2. Classification of Public Streets or Roads

a. Arterials. Streets, roads or highways having the primary purpose of carrying through traffic and the secondary purpose of providing access to abutting properties.

b. Collector. A minor amount of through traffic may be carried on collector streets, but the system primarily provides service assess and carries local traffic movements within residential neighborhoods, or commercial and industrial areas.

c. Locals. Residential streets or rural roads not classified in a higher system, primarily providing direct access to abutting land and to collector streets. They offer the lowest level of mobility and usually carry very little truck traffic. Service for through traffic is deliberately discouraged.

d. Marginal Access. A frontage road parallel to a limited access roadway providing direct access to abutting land and collector streets.

***Comment**:* There are two definitions for street classifications in the Development Code and they don't match exactly. In addition, the first set of definitions (in Article 1), include minimum right-of-way widths, which don't match the widths outlined in Article 4, Section 162.04 4. a. As noted below, widths should not be dictated strictly by road classification.

162.04 4. Right of Way Width

a. Design Standard. The minimum widths of street and road rights-of-way and pavement widths, measured perpendicularly from lot line to lot line, shall be as shown on such plan and not be less than the following:

Type of Public Street	Right-of-Way (in feet)	Street Width (in feet)
Major or Arterial	100	64
Collector in commercial, industrial, and multi-unit residential areas	68	48
Collector in one- and Two-Unit residential areas	60	40
Minor	50	28
Marginal Access in non-residential areas	46	36
Marginal Access in residential areas	36	26

b. Variation in Right-of-Way. Any variation in right-of-way or street width requirements shall be requested in writing.

***Comment**:* We recommend a more flexible system for right-of-way and road widths, with an emphasis on context. This is particularly important for arterial and collector streets. To put this in perspective, most of the arterial streets in the older parts of Oxford – the parts of town that people enjoy or admire – couldn't be built under the current land development code. For example, arterial streets are required to be 64' wide – this is effectively suggesting construction of at least two travel lanes in each direction with either a raised median (preferred) or a two way left turn lane. Rather than an arbitrary default width, the number of through lanes for an arterial street should be determined based on actual traffic-carrying needs of the street. Similarly, the minimum widths of collector streets of 48 feet and 40 feet are fairly arbitrary, potentially resulting in more travel lanes than necessary.

A more comprehensive system of street width recommendations should be developed that also include other cross sectional elements such as raised medians, left turn lanes, bicycle lanes, parking lanes etc. Proposed dimensions for each element of the roadway cross section should be included for each street classification. The following is a possible replacement for Section 162.04 4:

162.04 4. Street and Right-of-Way Width

a. Cross Sectional Elements. Each of the elements of the roadway cross section shall have the following widths:

Type of Public Street	Raised Median	Turn Lane	Travel Lane	Bike Lane	Parking Lane	Sidewalk Corridor
Arterial in industrial areas or with speed limit 40 mph or greater	16'	12'	12'*	6'	N/A	10'
Arterial in commercial or residential areas and with speed limit 35 mph or less	14'	11'	11'	6'	8'	**
Collector or marginal access in commercial, industrial, and multi-unit residential areas	12'*	10'	10.5'	5'	7.5'	10
Collector or marginal access in one- and two-unit residential areas	12'*	10'	10'	5'	7.5'	10
Local Residential	N/A	N/A	20'*	N/A	7'	10

*Medians are not required on collector and marginal access roads
**The Sidewalk Corridor on Arterial Streets in Commercial and Residential areas shall be determined based on the context and land use. It shall be at least 10 feet wide.

For local residential streets, the width does not need to accommodate the sum of the width of all the travel lane and parking lane components. Residential streets with no parking allowed or with parking allowed on one side should be 20' wide from curb to curb, and residential streets with parking allowed on both sides should be 27' wide from curb to curb.

b. Street width. The width of streets shall be based on the cross sectional element widths in section a. above. The provision of on-street parking should be based on the context and potential demand for parking for each individual street. A traffic study should be conducted to determine how many travel lanes should be provided in each direction. Continuous center turn lanes shall not be used without specific approval from the City Engineer. Medians with left turn pockets shall be provided on arterials and on collector streets where desired or where the traffic study indicates that conflicts between turning vehicles and through vehicles are significant.

c. Right of Way Width. The right-of-way width for each street shall be determined by the sum of the cross sectional elements as determined in sections b. and c. above.

163.06 Sidewalks

1. Requirement. Sidewalks are required in all Zoning Districts. They are required in planned development overlay districts unless the requirement is waived by the Planning Commission for particular reasons. Sidewalks must be five (5) feet in width and shall be constructed of concrete mix yielding a comprehensive strength of two thousand five hundred (2,500) pounds per square inch, shall be a minimum of four inches thick, shall slope one-quarter inch (1/4") per foot in width, and shall have saw cuts installed every five (5) feet and expansion joints installed every twenty (20) feet.

2. Location. Sidewalks shall be located on both sides of the street, within the street right-of-way or adjoining public easement.

***Comment**:* Recommend changing this section to refer to the sidewalk zone system to allocate the "sidewalk corridor" as described in the following text:

The Sidewalk Zone System

The best way to achieve the goal of a clear walking area is to design sidewalks using the zone system. Each zone is a distinct sidewalk area; the 4 zones are the curb zone, furniture zone, pedestrian zone, and frontage zone. Each zone has its function, and omitting or neglecting the design of a zone compromises the quality of the walking experience. For example, potential obstructions (poles, signs, trees, drinking fountains, benches etc.) should be placed in the furniture or frontage zones.

1, The curb zone: A vertical (barrier) curb channelizes drainage and prevents people from driving onto the sidewalk. The curb zone is also where a sidewalk transitions to the street at a crosswalk or intersection; the design of the gutter pan (apron) is critical for ADA access standards.

2. The Furniture Zone: The furniture zone is located between the curb and pedestrian zones. When landscaped it is referred to as the planter strip. It's easier to meet ADA sidewalk requirements with separated sidewalks. The furniture zone has many functions:

- *Pedestrians are separated from traffic, increasing a their sense of security and comfort;*
- *Street furniture such as bicycle parking, poles, posts, mailboxes, fire hydrants, street trees, and other landscaping are normally placed in this zone, out of the walking area;*
- *The sidewalk can stay level across driveways;*
- *Ramps can be placed correctly so sidewalks, curb cuts and crosswalks line up at intersections.*
- *Creates a place to store snow removal during the winter – this is especially important in Jackson.*

The furniture zone/planter strip should be 5' wide or more. But even a lesser width offers many of the advantages listed above. Where constraints preclude the use of the same width throughout a project, the planter strip can be interrupted and resume where the constraint ends.

3. The Pedestrian Zone: This is where people walk. All planning, design and construction documents should clearly state the walking zone dimension is to be clear of obstructions. The preferred pedestrian zone width is 6'. The surface should be smooth and uniform. The pedestrian zone should be straight, or parallel to the adjacent road if the road curves, as pedestrians want to walk in a direct route. The minimum clear pedestrian zone width at any location is 4'.

4. The Frontage Zone: The frontage zone is located between the pedestrian zone and the right-of-way. Some street furniture can be placed there; it is used by window shoppers; it's where people enter and exit stores. The recommended width is 2 feet or greater. An absolute minimum of 1 foot is needed for practical purposes, for example to ensure that adjacent property owners don't erect a fence at the back of walk, or for maintenance personnel to make sidewalk repairs.

The above text is a general description of the zone system that can be incorporated into a general planning document. Appropriate Development Code language can also be developed to fit into the LDC.

Additionally, since there are sometimes locations where sidewalks are impractical in the short term, the city should explore the possibility of allowing developers to pay a "fee in lieu of" providing sidewalks as part of the project. These funds would go into a special account that would be used to build sidewalks in other locations in the city, perhaps filling in the gaps left by other developer-built sidewalks. This solution has been used by many other jurisdictions, resulting in more efficient and practical sidewalk construction practices. A local land use attorney would have to verify this is possible under Mississippi state law.

163.06 3. Alternative Systems. Alternative pedestrian systems may be provided in lieu of public sidewalks upon approval of the Planning Commission or Board of Aldermen. Alternative systems shall link all lots with activity areas such as open spaces or parking areas, shall be paved, and shall provide for the ownership and maintenance of such systems.

***Comment**:* Recommend replacing "shall link all lots with activity areas such as open spaces or parking areas" with "shall provide pedestrian access to all land uses and open spaces in a similar manner as would be provided by sidewalks adjacent to the streets."

Section 204 Off-Street Automobile Parking and Storage

***Comment**:* These parking minimums will result in significant amounts of land unnecessarily dedicated to off-street parking. Parking minimums should be replaced with parking maximums.

Task 2 Review existing plans, on-going projects, and policies in terms of complete the street concepts

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Mississippi DOT issues

An informal discussion with MDOT staff covered the following areas, with the following informal agreements and recommendations:

General:

Standards: for bikeway and walkway projects on city streets, using federal funds administered by MDOT, city standards are acceptable. If the city proposes a dimension less than MDOT standard, for example 11' travel lanes, an exception could be granted, and most likely would. On state-operated roadways, MDOT standards would apply.

Intersections of city streets with state highways: These will be most likely signalized, and the major issues of concern are:

- ÿ Detection of bicyclists: Whether loop detectors or video detection are used, Oxford and MDOT should collaborate to ensure the system detects bicyclists on actuated approaches to signalized intersections. If no motor vehicle pulls up in a reasonable time, non-detection causes frustration for bicyclists. The solutions include increasing the sensitivity of loop detectors, improving the ability of video detectors to recognize bicyclists, and placing the MUTCD standard bicycle detector marking in the most sensitive area of detection..
- ÿ Pedestrian access: Every time a signalized intersection is affected by a bikeway, walkway and/or roadway project, it should be upgraded with pedestrian signal heads, pedestrian pushbuttons, clearly marked crosswalks, and accessible ramps. The pedestrian heads and pushbuttons should be placed at locations that enable them to be easily retrofitted with accessible features such as audible signals.

Rumble strips: rumble strips on highways with no paved shoulders (or very narrow shoulders) force cyclists to ride in traffic. MDOT should reconsider its practice of providing rumble strips on all rural highways, and adopt policies that allow for exceptions on highways close to urbanized areas where bicycle traffic is expected, or adopt a policy that restricts rumble strips only to locations where 4' or more of paved shoulder can be provided beyond the ruble strip. The latter recommendation would improve the effectiveness of rumble strips, as the paved shoulder provides an area for errant drivers to recover; drivers risk spinning out of control trying to turn back onto the paved portion to the roadway from a gravel shoulder.

Specific:

Ramp termini of Hwy 7 @ Sisk Ave: Sisk Ave is slated to be retrofitted with bike lanes; sidewalks are a future consideration. The current design of the ramp termini is a typical rural configuration: the on and off-ramps split in two at Sisk Avenue, with large radii and substantial skews. This design creates challenges for bicyclists and pedestrians, due to the high speed of entering and exiting traffic, and the poor visibility between drivers, bicyclists and pedestrians, all of whom must turn their heads to see each other adequately.

- ÿ Recommendation: reconfigure ramp termini so that they intersect with Sisk Ave at right angles, similar to a typical urban intersection. Use the smallest radii possible that still allow reasonable truck movements. This will improve safety for motorists, as they will benefit from better visibility of oncoming traffic. This principal applies to other similar local streets/state highway interchanges.

Old Taylor Rd/hwy 6 Interchange: Old Taylor road is slated to be retrofitted with bike lanes: sidewalks are a future consideration. The bridge over Hwy 6 is narrow, with no sidewalks or shoulders wide enough for bicyclists. Two freestanding ped/bike bridges are proposed to be constructed on each side of the existing roadway bridge. The current design of the ramp termini is as follows: Single off and on-ramps terminate at Old Taylor Road with large radii and wide throats. This design creates challenges for bicyclists and pedestrians, due to the high speed of turning vehicles, and the poor visibility between drivers, bicyclists and pedestrians, all of whom must turn their heads to see each other adequately. The wide throat also creates a long area to cross, increasing pedestrian and bicyclist exposure.

- ÿ Recommendations: There are two alternatives considered for the ramp termini; the bike/ped recommendations are different based on the alternative chosen:

    1. Ramp-termini stop controlled (as is): Tighten the turning radii at all 4 corners of the intersections formed by the ramp termini and Old Taylor Rd to reduce turning speeds, reduce pedestrian exposure and improve visibility; this will improve the safety of pedestrians and bicyclists traversing the ramp termini. Reduce bridge width to 8' to save costs, but design slightly cantilevered railing (with rubrail for bicycle handlebars) to provide greater than 8' inside width at handlebar height. At bridge ends, continue sidewalks to ramp termini, but provide direct access to the bike lanes for cyclists, so they ride past the ramp termini on the road. Paint crosswalks across the ramp termini to indicate to drivers they must yield to pedestrians.

2. Roundabouts at ramp termini: Design roundabouts to urban standards: sufficient deflection to slow traffic to 15-18 MPH, splitter islands, marked crosswalks one car length back from the yield line, etc. Do not provide bike lanes within the roundabout. The roundabout option allows for a major cost saving, by providing one shared ped/bike bridge on the west side, as the major destination on the north side (the University) is one the west; destinations on the south side are fairy evenly distributed east and west, but the TVA path is on the west side of Old Taylor Rd. The roundabout option allows pedestrians and bicyclists approaching the bridge from the SE to cross to the SW side at the roundabout. This move would be very difficult with the existing two-way stop control, as they have to cross high-speed traffic on Old Taylor Rd.

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University of Mississippi issues

An informal discussion with UM staff covered the following areas: student circulation to, from, and within campus, connectivity between the campus and Oxford (classic "town-gown" concerns), and access and circulation within the planned research park. The following recommendations are very general in nature, with a few specific recommendations.

Student circulation to, from and within campus

The University of Mississippi is ideally located in relation to Oxford, in town and within a short distance of Oxford's core. University Avenue is both the gateway to campus and the main link to downtown. Housing is scattered around the campus, a mix of on-campus dorms, off-campus apartment housing, and private residential homes, owed and/or rented. Destinations other than housing, such as shopping and entertainment, are within a reasonable distance. These conditions would normally lead to a majority of students walking or biking to and from campus.

Several factors contribute to UM being a "driving" campus: Much of the off-campus student housing is in segregated pods, further than a reasonable walk, and for many students, further than a reasonable bicycling distance. Apart from University Avenue, campus is surrounded by fairly inhospitable roadways, difficult to traverse and not very inviting to walking or biking. The University provides easy parking and driving to and on campus. These factors combined (distances, ease of driving and inhospitable roads) result in the majority of students driving, which in turn exacerbates problems for those who choose to walk or bike, as even the roads within campus are dominated by cars.

- Recommendations:

1. Circulation within campus: Pursue the plan to provide parking decks at the periphery, connected with a ring road, but supplement this plan with a ban on on-campus parking (with reasonable exceptions such as disabilities), limit through traffic (with exceptions such as deliveries), and encourage bicycling by providing ample bike parking. Under this ambitious plan, the campus roadways need no modifications, as they all have sidewalks, and bicycling on the roadway will be easy with little motor vehicle traffic. A less ambitious plan that doesn't limit traffic and parking can be pursued, but the amount of walking and bicycling will not increase as significantly. Under this scenario, bike lanes should be provided on campus roadways, by removing parking from one side. Another alterative is to keep on-street parking, provide bike lanes on both sides, and keep a single, narrow two-way travel lane. This arrangement will have the added benefit of dramatically slowing traffic down (to well under 20 MPH). A third option is to leave the roadway as is, and to provide shared lane markings in the travel lanes.
2. Access to and from campus: The overarching issue is to limit segregated housing far from campus and to provide more on or very near campus. This will help with both issues (on campus circulation and access to and from campus) by attracting students willing to live without a car, increasing bicycling and walking naturally. But the roadways leading to campus could all benefit from improvements. University Avenue is already quite bikeable and walkable, particularly in the areas closest to campus. Proposed enhancements include wider, straighter sidewalks and more crossing opportunities for pedestrians; a road-diet (converting

the existing 4-lane pattern to two travel lanes, a center-turn lane and bike lanes) would have multiple benefits: bike lanes, slower traffic, and easier crossings (median islands cold be provided in the center turn lane at strategic locations, for example across from the new performing arts center).
The other roadways that surround campus, such as Jackson Avenue, have been designed and built to high-speed rural standards; a visitor would scarcely know they are right next to Old Miss driving by at 40 MPH. In all future projects, two strategies should be pursued:

a. Rebuild these roadways to a more urban standard, with narrow travel lanes, bike lanes, separated sidewalks, trees, etc. and

b. Encourage the University to face these roadways: future buildings should have windows and entrances to these roadways. A further step would be to design the roadways so on-street parking is possible in the future; this encourages street-facing architecture.

3. Research Park: ***(This section has been left blank for now, pending further discussions with City and University staff)***

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Oxford Bikeway Project – Phase II

The consulting team reviewed the plans for this project and have the following recommendations:

1. Throughout the plans, the words "Bike Path" are used. This is old terminology and shouldn't be used at all. Instead, for a general term, use "bikeway." Otherwise, use more specific terms for each type of facility including "bicycle lane (or bike lane)" and "shared use path." On Sheet 1-A, for each of the segments of the project, use more descriptive language for each facility type, but still fairly brief. For example, "B.O.P. North Lamar Blvd. Bike Lanes", "B.O.P. Old Taylor Road Pedestrian and Bicycle Bridges", or "B.O.P. South 18th Street Bike Lanes and Sidewalks". Also, in the legend for sheet 1-A, change "Bike Paths" to Bikeway.
2. Where roads are widened to add bicycle lanes, the pavement section should be the same as the city uses for its normal street standard – at least 3.5" of asphalt over at least 6" of base rock. When feasible, pavement section for the bike lane area should be the same as the existing pavement section of the roadway. Using a thicker pavement section will ensure the bike lanes do not wear out faster than the adjacent travel lanes, which would result in bicyclists choosing not to use the bike lanes.
3. On sheet 2-A, the typical sections show 12' travel lanes. These lane widths may be required on MDOT-owned facilities, but on city-owned streets, narrower lane widths (10 or 11 feet) may be appropriate. In addition, on streets that are constrained topographically or where there are right-of-way constraints, the bike lane may be built as narrow as 5'. For sections of the project where bike lanes can be accomplished through a simple restriping, we recommend the following guidance:

Existing curb-to-curb width	Recommended travel lane width	Recommended bike lane width
36 feet	12 feet	6 feet
34 feet	11 feet	6 feet
32 feet	11 feet	5 feet
30 feet	10 feet	5 feet
Narrower streets will need to be widened in order to install bike lanes		

Where streets need to be widened to accommodate bike lanes, they should be 30 to 34 feet wide with the travel lane and bicycle lane widths as recommended in the table above. 34 feet (11' lanes and 6' bike lanes) should be the default width. Eleven feet is the appropriate width for travel

lanes on arterial and collector streets with urban (20 to 35 mph) speeds. 6’ bike lanes are especially beneficial in areas where sidewalks do not exist and pedestrians are likely to use the bike lanes.

4. The cross section shows a 2’ furniture zone (planter strip) between the face of curb and the sidewalk. When feasible, a wider separation should be used, preferably 5 feet.

5. Bike lanes are proposed on Sisk Avenue through the interchange with Highway 7. The interchange ramp termini currently have a typical rural configuration: the on and off-ramps split in two at Sisk road, with large radii and substantial skews. This creates challenges for bicyclists and pedestrians, due to the high speed of entering and exiting traffic and the poor visibility between drivers, bicyclists and pedestrians, who must turn their heads to see each other adequately. The interchange ramp termini should be reconfigured to intersect with Sisk Avenue at right angles, similar to a typical urban intersection. Use the smallest radii possible that still allow reasonable truck movements. This will improve safety for bicyclists as well as motorists, who will benefit from better visibility of oncoming traffic. This reconfiguration will also have significant benefits in the long term, when sidewalks will be carried through the interchange. In fact, consideration should be given to expanding the project or developing a future project phase to construct sidewalks through the interchange and to the west along Sisk Avenue to Bramlett Boulevard where sidewalks continue further west.

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University Avenue Project (Lamar Boulevard to Bramlett Street) Plans:

The major issue for the University Avenue project is whether this section of roadway could be converted from 4 lanes to 3 lanes ("road diet") by restriping the roadway with one through lane in each direction, a two-way left turn lane, and bike lanes on each side of the street. In the westbound direction, the two through lanes would merge downstream of the Bramlett/18th intersection. At the approach to Lamar Boulevard, the two-way left turn lane would become a dedicated left-turn lane to turn onto Lamar Boulevard. In the eastbound direction, no merge is necessary, since the 2nd through lane currently begins at the intersection of Lamar Boulevard. At the approach to the Bramlett/18th intersection, the single through lane should diverge into two through lanes prior to the intersection, to allow for two lanes of vehicle storage at the signalized intersection. There are several issues related to this possible change to the project:

- Capacity and motor vehicle level of service: This section of University Avenue currently carries about 15,000 vehicles per day. At this volume, a four- to three-lane conversion typically results in no reduction in capacity or level of service. However, a basic traffic study is recommended prior to making the conversion. In general, signalized intersections are where capacity concerns are most important. As described above, this conversion will not change the number of approach lanes at the two signalized intersections at the ends of this project. So the level of service at these intersections will be roughly the same as the existing condition as long as the lane development at each intersection provides enough length to provide good utilization of all approach lanes. The primary possible negative effect on traffic congestion is during peak traffic times, when queue lengths at each intersection may be longer than today. Based on staff descriptions of today's traffic conditions, traffic backs up a fair amount at each of these intersections during the peak, with queues too long to be cleared during an individual signal cycle. With slightly longer queues created by the lane reduction, traffic may back up further, potentially affecting traffic operations at other intersections. However, there is a potentially positive effect of longer queues. Longer queues are likely to discourage use of University Avenue, as drivers seek alternatives (which are available in this gridded section of Oxford), which could reduce travel demand and improve vehicle level of service.
- Left turn safety at Lamar Boulevard: Based on our observations of University Ave., eastbound and westbound left-turn conflicts at Lamar Boulevard are a key safety concern. These two left-turn lanes are offset by nearly a full lane width, creating a potentially hazardous conflict: when drivers in both directions are waiting to make permissive left turns at the same time (on the green ball signal phase), their view of oncoming through traffic is blocked by the opposing vehicle. This can result in severe, high-speed right angle crashes with oncoming traffic in the adjacent through lanes. A review of crash history at this intersection will likely show crashes of this type. The proposed road diet will reduce this offset by at least 5 feet, greatly improving sight lines for opposing vehicles waiting to make a left turn, and providing a safer intersection. Changing the signal phasing to "protected only" would also help resolve this crash type, though it would add delay. The offset for westbound through vehicles at Lamar Boulevard would also be reduced, simplifying this intersection and reducing the likelihood of fixed object crashes on the northwest corner of the intersection.
- Left-turn conflicts at unsignalized locations: A similar problem exists at locations on University Ave. where motorists are making turns from University Avenue into closely spaced driveways or minor intersections, which do not need to be directly across from each other for sight lines to be compromised. University Ave. has many driveways, and crashes resulting from left-turn sight line obstructions are very likely in this corridor. A related problem exists for vehicles crossing University Avenue or turning left onto University Ave. at unsignalized intersections and driveways. When waiting for upcoming traffic signals to turn green, drivers in the outside lane on University Ave. sometimes stop to allow drivers exiting driveways or streets to turn onto or cross University Ave. Crashes are likely to occur between these drivers and approaching drivers in the inside lane. With only one through lane in each direction, these crashes are less likely to occur.
- Travel speeds: One of the major advantages of a road diet is the reduction of top end travel speeds. In the existing condition (two through lanes in each direction), drivers are able to pass

each other at high speeds. With only one lane in each direction, prudent drivers set the speed. As a result, overall speeds are slower and more consistent, enhancing safety for all users.

- Pedestrian safety and accommodation: Bicyclists benefit from the addition of bicycle lanes, and there are significant benefits for pedestrians as well. For example, bike lanes buffer the sidewalks from motor vehicle traffic. But the most significant benefits are for pedestrians who want to cross the street. Under the existing conditions, pedestrians have to look carefully in both directions to ensure it is clear to cross the street, and have to cross all four travel lanes at once if they don't want to be stranded on the double yellow centerline stripe. Pedestrians also face potential "multiple threat" crashes, where they have difficulty seeing past a stopped vehicle in one lane, resulting in a conflict with vehicles in the next lane. With the road diet, pedestrians only need to cross one through lane in each direction; the center lane generally only has slower-speed left-turning traffic. The center turn lane can provide opportunities to add short segments of raised median, providing a true refuge: this allows pedestrians to look in only one direction of traffic at a time. In the short term, the frequent driveways may make it difficult to identify appropriate locations for a refuge. But as properties on University Ave redevelop, driveways should be consolidated and/or eliminated, allowing for placement of raised medians in the future.

The reconstructed sidewalks are a nice enhancement for pedestrians. There are a few details that are important to consider during the construction:

- The sidewalk ramp detail shows a 12% slope. The maximum allowable slope for accessibility is 1:12 (8.3%). In addition, this detail shows the ramp connecting to the street at an angle other than 90°. Grade breaks are not allowed to take place at other than right angles. To remedy this situation, a right angle grade break should be made at the point where the ramp first contacts the curb and a triangular landing (2% maximum slope) should be placed in the remaining area.
- The concrete driveways must meet accessibility standards. The detail sheets do not show a driveway detail that matches the designs shown on the plan sheets. Because the planter strip between the curb and the sidewalk is so narrow, the correct solution is to drop the sidewalk to street level at the driveways, with no more than 2% cross slope. The plan sheets show a design that appears to meet these recommendations, but without a detail showing the slopes, the contractor may not build the driveways correctly. This can be dealt with by employing good construction management and inspection during the construction phase. The "ramps" down to the driveway aprons should be similar to the sidewalk ramp design described above. However, detectable warnings are not required at unsignalized driveways.
- There are other driveway design details that could be used on this project. Where the area immediately behind the sidewalk is not being used for parking at a business, the sidewalk could be set back at the driveways. A 4-foot setback would allow for the driveway slope to take place in the setback, leaving the sidewalk at full height at the back of the sloped driveway apron. This design reinforces the notion that drivers are crossing the sidewalk, encouraging them yield to pedestrians as required by law. In addition, driveway radii of 10 to 15 feet are too large for minor driveways. If the 4- to 3-lane conversion is made, the radii could be smaller, as the bike lane provides additional maneuvering space, increasing the effective radius for vehicles turning into the driveways. Radii as small as 5 feet, or a simple angled "wing" would be possible. Smaller radii further encourage drivers to respect the sidewalk and appropriately yield to pedestrians
- In general, it would be better if the entire sidewalk could be set back near the right-of-way line. Many locations on this project have private driveways and/or parking areas located on the public right-of-way. This makes it politically difficult to set the sidewalk back in these areas. However, the sidewalk does not need to be placed at the same setback from the curb throughout the entire project. There are some locations along University Ave where the right-of-way is not in private use and the sidewalk could be set back as part of this project. This may be difficult to accomplish since the project has already been bid, but a change order could result in a much more comfortable and usable sidewalk. As mentioned above, a setback sidewalk makes it easier to build the concrete driveways in an accessible manner as well. Even if this change is not to the project, the city should look for opportunities to have the sidewalk reconstructed in the better location as the properties along University Avenue redevelop.

- Many of the proposed ramp, sidewalk and driveway details recommended above can be found on line. The Oregon DOT has a wide variety of options that can be used for the situations found on this project: http://egov.oregon.gov/ODOT/HWY/ENGSERVICES/roadway_drawings.shtml#Roadway_700___Curbs__etc_

Most applicable are RD 720-760. The latest information on national accessible sidewalk standards can be found on the Access Board website: http://www.access-board.gov/prowac/