Return to table of contents

EXECUTIVE SUMMARY

INTRODUCTION

Stoughton Road is U.S. Highway 51 (USH 51) and along with Interstate Highway 39/90/94 (IH 39/90/94), the main north-south corridor for travel on the east side of Madison. As USH 51, it is also important to the movement of regional traffic through the area.

The Wisconsin Department of Transportation (WisDOT) and KL Engineering, Inc. conducted this needs assessment that studied motor vehicle, bicycle, pedestrian, and mass-transit needs of the Stoughton Road corridor, considering safety, capacity, and mobility. The Needs Assessment analyzed existing and future conditions of the project area, identified existing problems and looked at the impact that growth on the east side of Madison will have on the route.

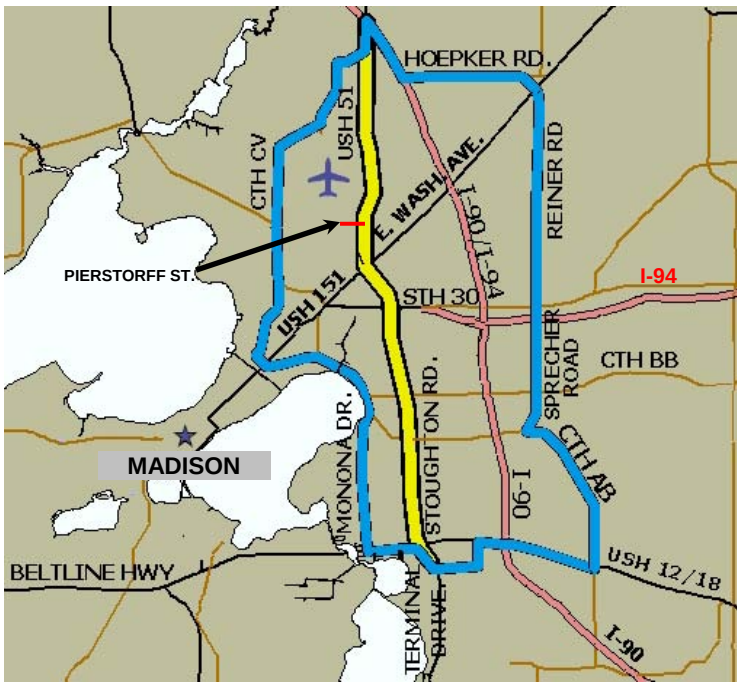
The Stoughton Road Needs Assessment study area begins at Terminal Drive/Voges Road in McFarland and continues for 9.8 miles north to the interchange with IH 39/90/94. The project study area encompasses essentially the entire east side of Madison. It includes the area from Reiner Road, Sprecher Road, and CTH AB at the east limit; and CTH CV, Packers Avenue, and Monona Drive, to the west.

Two advisory committees, Technical and Policy Advisory Committees, have guided the process. The Technical Advisory Committee (TAC) consisted of engineering, planning and administrative staff from the communities of Madison, Monona, McFarland, and Burke, and from Dane County, the Madison Area Metropolitan Planning Organization, Madison Metro, the Federal Highway Administration, the Wisconsin Department of Natural Resources the Wisconsin Department of Agriculture, Trade and Consumer Protection,, and WisDOT. The Policy Advisory Committee (PAC) included elected officials and representatives of neighborhood groups, schools, and businesses along the corridor.

Significant back-ups on USH 51 during rush hour, complaints of diverted traffic through neighborhoods voiced by the local residents, a growing number of crashes in the project area, and increasing congestion on IH 39/90/94 are some of the problems that spurred the study. Growth trends in Dane County, and on Madison's east side also made WisDOT aware that an evaluation of the current system was necessary.

No solutions for most of the identified needs have been evaluated in the Needs Assessment although some short-term, low-cost solutions that can be implemented quickly have been suggested.

MAP OF STUDY AREA

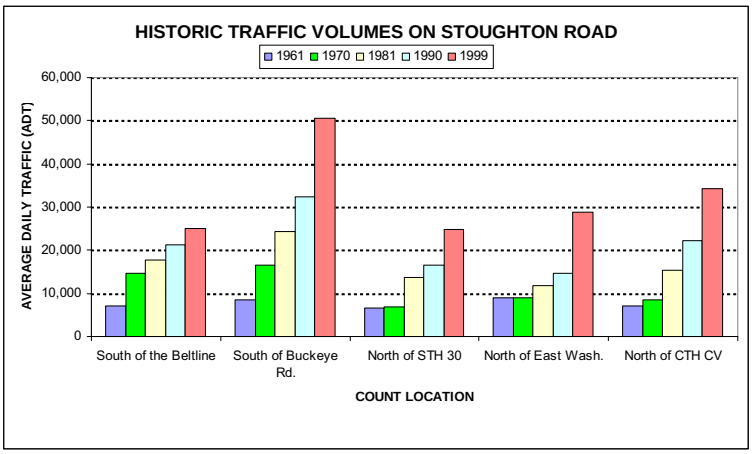


EXISTING CONDITIONS

WisDOT recognizes Stoughton Road's significance in the local and regional transportation system. The City of Madison and adjacent communities are directly impacted by the current roadway congestion and the intersection at East Washington Avenue (USH 151) continues to be an extremely congested area that has been the source of debate for several years.

There has been a significant increase in average daily traffic volumes (ADT) within the corridor in the past 40 years. The most notable increases have occurred in the past 20 years. Traffic volumes have doubled since 1981. The most significant numeric increase of the area, since 1981, has been south of Buckeye Road, 26,180 vehicles per day (vpd). The greatest percentage increase in ADT (143%) was noted north of the East Washington Avenue intersection.

HISTORIC TRAFFIC VOLUMES



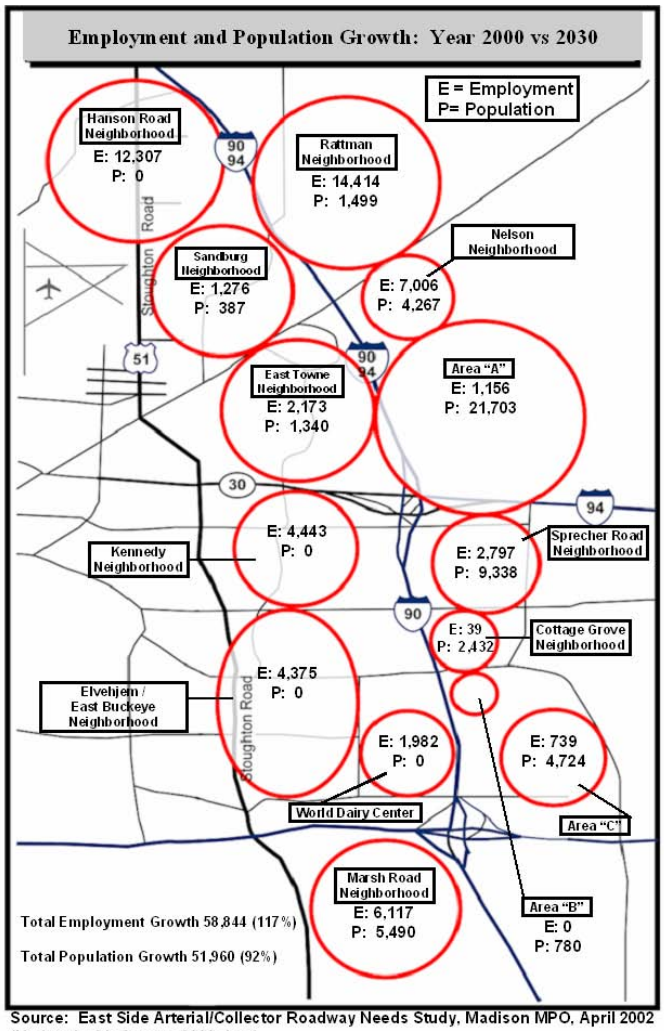
Terminal Drive/Voges Road to Pierstorff Street – ADT flows in this segment vary between 21,000 vpd and 52,000 vpd. The highest corridor volumes occur between Broadway and USH 12/18. The p.m. peak hour traffic flows in this southern segment are generally between 1,100 vehicles per hour (vph) and 2,100 vph. During the p.m. peak hour, this segment of Stoughton Road is characterized by average travel speeds of about 25 mph in each direction.

Pierstorff Street to IH 39/90/94 - ADT flows in this segment of the corridor are markedly higher north of CTH CV at about 27,000 vpd, while between CTH CV and Pierstorff Road, ADT flows are about 17,000 vpd. The traffic count of 17,000 vpd is the lowest ADT within the Stoughton Road study corridor. Just north of Pierstorff Road, the northbound p.m. peak hour volumes along Stoughton Road are about 1,500 vph. Traffic volume increases to 1,700 vph in the short section between CTH CV and IH 39/90/94. During the p.m. peak hour, this northern segment of Stoughton Road is characterized by average travel speeds between 46 mph and 51 mph.

Characteristic	**Entire Study Corridor**
Year 2002 Average Daily Traffic (vehicles per day)	Between 17,000 – 52,000
Year 2002 Average Travel Speed (mph) p.m. peak hour	32
Year 2002 Average Travel Time (minutes) p.m. peak hour	18

FUTURE CONDITIONS

The City of Madison added 20,646 residents from 1980 to1990. From 1990-2000 the City population grew by 16,482 people. The neighboring municipalities are also experiencing tremendous growth. Dane County had the largest numeric growth of all Wisconsin Counties from 2000 to 2002, adding 12,355 residents. Additional development is proposed for the east side of Madison. In the past three years, neighborhood plans have been approved for the Hanson Road, Marsh Road, and Sprecher developments. Build-out is continuing in the Rattman, Nelson, and Cottage Grove Neighborhoods.



Source: East Side Arterial/Collector Roadway Needs Study, Madison MPO, April 2002 (Updated with Census 2000 data)

Using the approved development plans the forecasts for the project area are:

- An additional 1,700 residents and 26,000 new jobs in the area around Stoughton Road west of the Interstate. The majority of these jobs will be created in the Hanson Road development.
- Potentially 50,000 new residents (22,000 within approved developments) and 32,000 new jobs in the area east of the Interstate. The majority of the new jobs will be within the Rattman and Nelson developments.

Overall the projections by the Wisconsin Department of Administration, Demographic Services Center, show a continued growth in population in Dane County to nearly 500,000 by the year 2015.

To properly evaluate the future traffic conditions, a realistic roadway network needed to be established as the basis for future year modeling. The Technical Advisory Committee for this study decided that the roadway network to be utilized for the future year traffic modeling in this study would include the projects currently included in the Long Range Transportation Plan and six lanes on the new Reiner/Sprecher arterial between CTH T and Milwaukee Street.

After discussions with the Technical and Policy Advisory Committees it was decide to utilize the transit network of commuter rail and express bus service as proposed in the Transport 2020 Study for their initial system (Minimal Operable Segment (MOS) System). Using the MOS estimates, daily bus ridership is 53,000 passengers on 39 local bus routes and four express bus services.

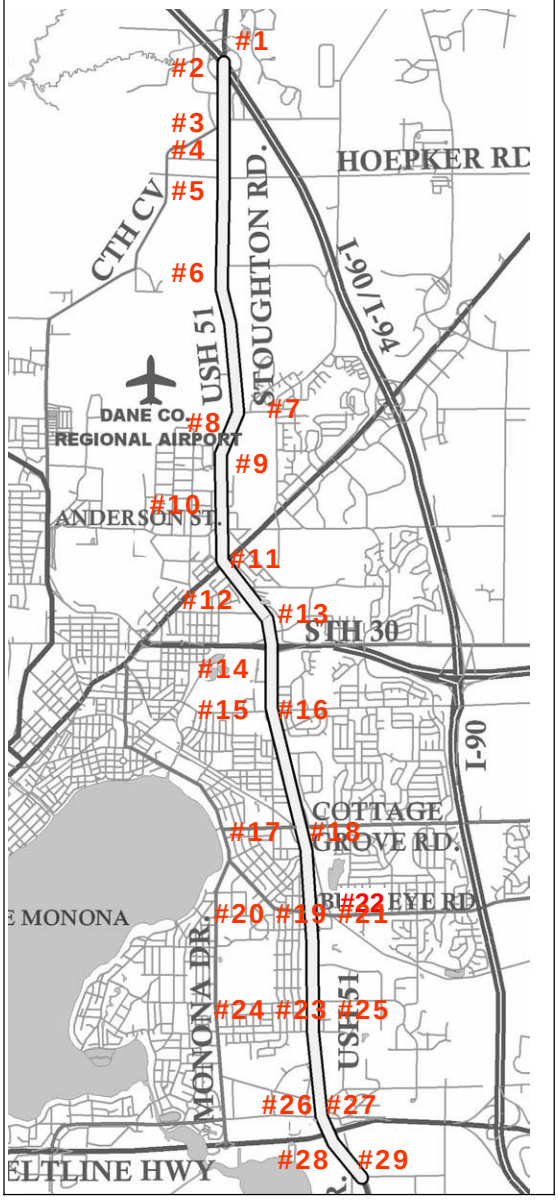
CORRIDOR NEEDS

Based on crash information provided by WisDOT, there were a total of 971 crashes on Stoughton Road and the side road approaches between 1998 and 2000, with 393 resulting in injury. These results show that, on average, a crash occurred nearly every day on Stoughton Road, including almost three per week with injuries.

The crash results indicate that the Buckeye Road intersection is a significant problem area. The rate of crashes and injury crashes is well above the intersection crash rate criteria. STH 30 is also an emerging problem area based on a high crash rate. East Washington Avenue, Pflaum Road, and Milwaukee Street qualify as areas that are becoming problems based on either their crash rate or injury-crash rate.

The table on the following page summarizes level of service results for signalized intersections under Year 2002 and Year 2030 conditions during the p.m. peak hour.

KEY STUDY INTERSECTIONS



Level of Service (LOS) is a quantitative measure that refers to the overall quality of flow at an intersection ranging from LOS A where traffic moves freely to LOS C where traffic is stable, but back-ups are beginning to occur, to LOS F where traffic is extremely restricted, many times experiencing gridlock. LOS D is considered the lowest acceptable rating for an intersection.

Intersections where level of service is D or worse for existing conditions include the following:

- The USH 12/18 westbound ramps intersection (#27) operates at LOS D.
- The Stoughton Road intersections at Buckeye Road (#19) and Pflaum Road (#23) each operate at LOS E, with average intersection delays of 60 and 71 seconds, respectively.
- The intersection of Stoughton Road at East Washington Avenue (#11) operates at LOS F with the highest average delay in the corridor at 87 seconds.

With the increased traffic volumes projected under future conditions, several signalized Stoughton Road intersections will deteriorate into LOS D, E, or F.

- Intersections that will operate at LOS D include the CTH CV intersection (#3), both STH 30 ramp intersections (#13 and #14), the Stoughton Road southbound ramp at Cottage Grove(#17), and the Stoughton Road/Broadway intersection (#26).
- One location, the USH 12/18 westbound ramps intersection (#27), will operate at LOS E.
- Four intersections will operate at LOS F including Anderson Street (#10), East Washington Avenue (#11), Buckeye Road (#19), and Pflaum Road (#23).

Of the twelve unsignalized intersections, currently five intersections have individual approaches that operate at LOS E or F due to lengthy delays while waiting for acceptable gaps in major street traffic flow.

- IH 39/90/94 interchange northbound off-ramp left-turns
- Hoepker Road intersection eastbound and westbound approaches
- Pierstorff Street
- Buckeye Road / East Frontage Road
- Pflaum Road/West Frontage Road

The Hanson Road intersection will also operate at LOS F under future conditions.

		Year 2002 Existing		Year 2030 Future	
	Location	**Control Delay Per Vehicle (seconds)**	**Level of Service (LOS)**	**Control Delay Per Vehicle (seconds)**	**Level of Service (LOS)**
3	CTH CV / Anderson Road	31	C	50	D
9	Kinsman Blvd.	16	B	27	C
10	Anderson Street	21	C	131	F
11	East Washington Avenue	87	F	168	F
12	Lexington Avenue	11	B	20	C
13	STH 30 Westbound ramps	28	C	49	D
14	STH 30 Eastbound ramps	25	C	53	D
15	Milwaukee Street – west intersection	19	B	19	B
16	Milwaukee Street – east intersection	15	B	16	B
17	Cottage Grove – west intersection	21	B	39	D
18	Cottage Grove – east intersection	6	A	15	B
19	Buckeye Road	60	E	89	F
23	Pflaum Road	71	E	98	F
26	Broadway	28	C	51	D
27	USH 12/18 Westbound ramps	36	D	56	E
28	USH 12/18 Eastbound ramps	24	C	35	C
29	Terminal Drive/Voges Road	11	B	21	C

In most locations, Stoughton Road represents a significant barrier to pedestrian and bicycle travel both across and along the corridor. Madison has the highest level of bicycling within the state and this trend will likely continue in the future. Madison has a good bikeway system but there are significant gaps in the system within the study area. Many of these gaps are created by Stoughton Road itself. The other major roadways in the study area – IH 39/90/94, the USH 12/18 (Beltline), and STH 30 - combine to surround and, to some extent, isolate this section of the city from the bicycle facilities available in the area.

Bicyclists need to be able to cross Stoughton Road at reasonable intervals and in a reasonable manner. Stoughton Road and the corridor through which it travels is, by-and-large, a giant impediment to bicycle and pedestrian travel.

The major roadways in the study area divide the corridor area and in many ways define the neighborhoods on the east side of Madison. They are a barrier to those who desire to walk to a destination on the other side of these roadways. In addition, the majority of the residential and commercial developed areas are lacking in pedestrian facilities.

CONCLUSIONS

Stoughton Road has many deficiencies that contribute to the current congested condition of the roadway including the high number of crashes, and the large amount of traffic that is diverted onto local streets and IH 39/90/94.

Following is a summation of the needs identified by the study. The needs are categorized as immediate and future. Immediate needs are those for which current deficiencies exist and future needs are those that are expected to appear in the future.

Short-term solutions to address some of these needs have been identified. These are solutions that are fairly well defined at this point, although funding has not yet been identified. The short-term solutions will only provide immediate and minimal relief for some of the problems identified in the study. Further study is recommended to evaluate potential solutions for the major problem areas, and consider all environmental impacts in accordance with federal and state laws.

NEEDS PRIORITIZATION

There are several areas of immediate need within the corridor. Solutions to these immediate needs may require large-scale improvements which requires extensive planning, design, and funding. Future needs may also require large-scale improvements; by planning for these emerging needs now, it may be possible to have plans and funding in place to make improvements when they are warranted.

Immediate Needs

East Washington Avenue – This intersection has the greatest impact on the overall function of the Stoughton Road corridor. Numerous deficiencies exist based on the high volume of traffic.

EAST WASHINGTON AVENUE INTERSECTION

High crash rates, substandard pedestrian and bicycle accommodations, the low level of service, and insufficient turn lane lengths are all caused by the intersection being over loaded with vehicles. This intersection is also the foremost concern of the neighborhoods and businesses of the study corridor.

Beltline Interchange Ramps – The high volume of traffic exiting the Beltline at the Stoughton Road interchange causes back-ups onto the Beltline caused by vehicles queuing to make turns onto Stoughton Road.

Buckeye Road and Pflaum Road Intersections and Frontage Roads – High crash rates, substandard levels of service, close frontage road locations, inadequate turning movement accommodations, and poor bicycle and pedestrian facilities place these intersections near the top of the list of Immediate Needs. The conditions at Buckeye and Pflaum Road greatly impact the neighborhoods and businesses of the area. Current congestion at these intersections is a major contributor to diverted traffic through the neighborhoods. Congestion for turning movements at the intersection is of concern to Madison Metro as the bus service hopes to add additional routes in this area in 2003 and anticipates that the buses will experience delays at these locations. Because of their close proximity to one another, solutions to these problem intersections should be considered together.

Enforcement for Speed-related Violations - Many of the crashes within the project corridor were due to speed-related offenses.

Diversion of Traffic to Neighborhoods – Due to congestion on Stoughton Road many local collector roadways are becoming diversion routes. These local collectors are becoming increasingly congested by vehicles traveling above the posted speed limit, creating hazardous conditions in many neighborhoods.

Noise Impacts to Residential Areas – Established residential areas west of Stoughton Road between Buckeye Road and Milwaukee Street are impacted by noise levels above current standards.

Bicycle and Pedestrian Access - Current crossing and parallel routes are not sufficient to provide for the needs of the existing bicycle and pedestrian demands.

Cottage Grove Road Interchange – Insufficient acceleration lane lengths at the entrance ramps and no deceleration lanes at exit ramps contribute to weaving and delays at this interchange.

Daentl Road Intersection – The Daentl Road intersection is located on the IH 39/90/94 exit ramp, a potentially dangerous location.

Orin Road Intersection – This intersection is located very close to Anderson Street.

Intersection Congestion – Left-turns at Pierstorff Street, Hoepker Road, and the IH 39/90/94 interchange ramps all are experiencing delays, causing levels of service below acceptable levels.

Inadequate Turning Lane Lengths – STH 30, Commercial Avenue, and Kinsman Boulevard have left turn lanes that provide inadequate queuing lengths.

Pavement Conditions - CTH CV to IH 39/90/94 will require maintenance in the near future and the worn concrete pavement at the Cottage Grove Road interchange becomes slippery in wet weather conditions.

Transit Needs – There is a need for additional park and ride facilities and bus stops in the project corridor.

Future Needs

These needs will become more evident as the area develops and traffic volumes on Stoughton Road continue to increase.

STH 30 Interchange Exit Ramps – Current conditions indicate that the number of vehicles turning north onto Stoughton Road from these ramps queues beyond the length of the existing lanes. These conditions will continue to worsen as greater volumes of traffic use this interchange.

Hoepker Road Intersection – Continued development in the American Family complex and in the Hanson Road neighborhood will increase traffic on this roadway and level of service is expected to deteriorate to "F" by 2030.

Hanson Road Intersection – As this industrial area begins to develop and traffic increases, the current rural intersection will need geometric improvements to accommodate these changes.

Anderson Street Intersection – The intersection is expected to deteriorate to a Level of Service F in 2030 conditions, due to the high volume of traffic going to/from East Washington via Stoughton Road.

Cottage Grove Road Interchange Structure Northbound (B-13-8) – The current sufficiency rating (75.1) makes this structure eligible for rehabilitation. This structure will continue to deteriorate.

Intersection Congestion – Broadway and CTH CV have movements that deteriorate to inadequate levels of service in 2030 conditions.

RAILROAD CROSSING BETWEEN LEXINGTON/COMMERCIAL AVENUE AND STH 30

Railroad Crossing – The at-grade railroad crossing between the STH 30 interchange and Lexington Avenue/Commercial Avenue is a potential high speed and commuter rail line. If the crossing remains at grade, traffic would be stopped on Stoughton Road up to 10 times an hour due to train crossings during peak periods, greatly impacting traffic mobility.

PLANNED AND POTENTIAL IMPROVEMENTS

Planned Improvements

Some of the proposed improvements are short-term improvements are not expected to include major capacity expansions – they will likely enhance safety and improve traffic flow. In addition there are improvement projects that are currently planned including:

- Signal Coordination from Buckeye Road through the Beltline – WisDOT will likely implement signal coordination by the Fall of 2003.

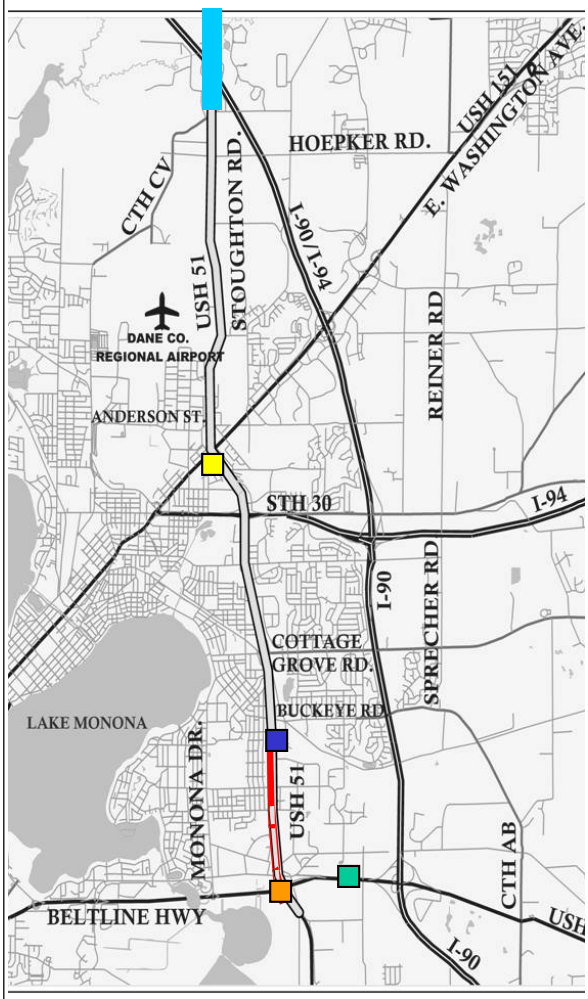
- Marsh Road Overpass – WisDOT and the City of Madison have completed plans for an overpass of the Beltline from Marsh Road connecting to Agriculture Drive. This will provide an alternative access to the developments between Stoughton Road and IH 39/90/94. It will also provide safe bicycle and pedestrian access across the Beltline from the south when construction is complete at the end of 2003.

- Buckeye Road/West Service Road Intersection – Due to current traffic conditions and the Dean Clinic development near the Buckeye Road intersection, the City of Madison will add turn lanes and conduit for potential signals at this intersection. Additional bicycle and pedestrian facilities on Buckeye Road are included in this project that is planned for construction in 2003.

- East Washington Avenue Intersection – Some minor capacity improvements and enhanced bicycle and pedestrian facilities will result from this WisDOT and City of Madison project planned for construction in 2004.

- Beltline Interchange Bicycle and Pedestrian Accommodations – WisDOT has a project in the design phase to provide sidewalk and bicycle lane accommodations on Stoughton Road through the Beltline Interchange. Construction is anticipated in 2005.

PLANNED IMPROVEMENTS



- CTH CV – IH 39/90/94 – WisDOT has a project in the design phase to replace the pavement in this section, and further north to Reardon Road. Construction is anticipated in 2004.

Potential Improvements

Additional short-term improvements that could be considered on Stoughton Road include the items listed below. They will need to be evaluated further for feasibility, cost, impacts, and funding availability.

- Beltline Interchange Ramps – Construction of an additional left turn lane on the eastbound exit ramp and extension of the right turn lane on the westbound exit ramp would enhance the capacity at the interchange and reduce vehicle queues. It may be practical to evaluate these changes in conjunction with the planned pedestrian/bicycle accommodation project.

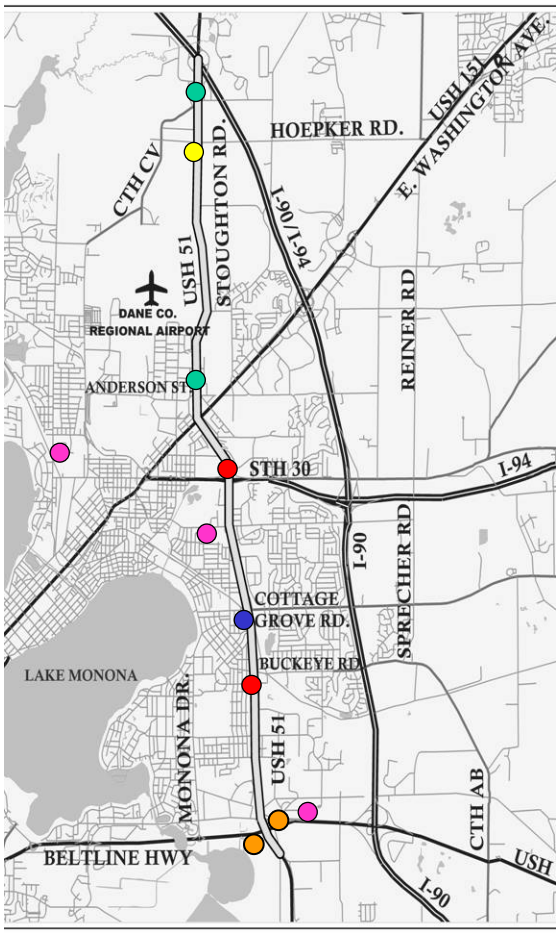
- Cottage Grove Road Interchange Acceleration Ramps – Extending these entrance ramps will enhance traffic mobility and reduce weaving in these areas.

- Hoepker Road Intersection – Extension of the left turn lanes on Stoughton Road will enhance through movements. Adding a right-turn only lane for traffic headed north on Stoughton Road will reduce queuing at the intersection.

- Orin Road and Daentl Road Intersections – Removing these direct access points to Stoughton Road and the I-90/94 ramp will enhance through movements. These areas can be served by alternative access points..

  Improved Signing and Pavement Marking – Advanced intersection signing and enhanced pavement markings designating lanes will provide better direction for drivers. Additional signing of bike routes and pavement marking of bike lanes will delineate existing bicycle accommodations in the study corridor.

POTENTIAL SHORT TERM IMPROVEMENTS



- Park and Ride Lot Expansions – Madison Metro plans to enhance its bus service to the east side of the City and wishes to add Park and Ride Lots at the North Transfer Point and East Transfer point. Expansion of the Dutch Mill Park and Ride should be considered. Additional Park and Ride facilities will potentially reduce the number of vehicle trips in the corridor.

- Improved Pedestrian and Bicycle Facilities – Connection of the sidewalk through the Buckeye Road intersection will make the area more attractive to pedestrians. WisDOT and the City of Madison are also investigating the potential for a combined bicycle/pedestrian path crossing Stoughton Road near the Lexington and Commercial Avenue intersection.

Increased Traffic Enforcement – WisDOT and the City of Madison should consider ways to provide additional enforcement on Stoughton Road, and the intersecting streets where speeding is a problem.

Service Patrol – A service patrol vehicle for Stoughton Road would provide early response to vehicles in crashes and contribute to timely clearing of the roadway.

Explore Solutions for Noise in Cottage Grove area – Suggestions included allowing brush to grow up on the hill near the ramps to provide some absorption of noise, fixing the expansion joint on the Cottage Grove Road structure that is noisy when heavy trucks go over it, and putting up a sign to prohibit engine-braking on the ramps.

Modify/close Pierstorff Street intersection – Left turns from Pierstorff Street to Stoughton Road may be prohibited in the near future.

Bus Stop Near Anderson Street – WisDOT will be working with the developer of the vacant lot at the Orin Road intersection to connect the frontage road from Anderson Street to Kinsman Boulevard. This would provide Madison Metro a good location for a bus stop near Anderson Street.

Long-Term Improvement Needs

Many of the deficiencies discussed in the Needs Prioritization section are not items that can be immediately addressed. Solutions to address these needs will require a complete evaluation of the impacts of various alternatives and greater expenditure of funds. After the impacts have been documented and a specific recommendation is made, funding sources for these improvements will need to be identified. Solutions to all the long-term issues outlined below should be explored in a comprehensive environmental corridor study. The ultimate goal is to improve the corridor for all modes of transportation, addressing the concerns and frustrations of all corridor users to provide a safe, efficient transportation facility.

East Washington Avenue Intersection.
This is a very large intersection with poor geometrics. It is very congested, and a significant barrier to bicycle and pedestrian travel. Alternatives for this intersection should be considered in conjunction with alternative land use scenarios for the adjoining lands.

Buckeye and Pflaum Roads
These two intersections share similar problems and should be evaluated together because of their proximity to one another.

IH 39/90/94 Ramps and STH 30 Ramps
These experience serious back-ups now or are projected to in the future.

Hoepker and Hanson Roads
Both of these intersections will be at level of service F by 2030 and will require additional upgrades beyond the scope of the potential short-term improvements.

Bicycle Accommodations and Connections
Numerous disconnects and barriers exist for bicyclists attempting to use the Stoughton Road corridor.

Lane Capacity on Stoughton Road

At this time, the congestion problems on Stoughton Road do not appear to be directly related to the amount of lane capacity – rather, they seem to be more related to problematic intersections. However, the evaluation of alternatives for intersection improvement should include the possible need for lane additions in the future, so that any major intersection improvements would not preclude the addition of lanes, if they were warranted at some time in the future. Noise abatement considerations would be evaluated in conjunction with capacity expansion.

Cottage Grove Road

Evaluation for the potential to add deceleration lanes and address structure problems should be done. The evaluation should include options for addressing the significant noise problem that exists in the area.

Railroad Crossing Needs

If proposed rail projects (commuter rail and high speed rail) proceed, this at-grade rail intersection may become problematic. Further evaluation of this situation may be needed.

Park and Ride Lots/Transit Oriented Development

A collaborative effort with Madison Metro, WisDOT and the City of Madison should consider the potential for adding park and ride lots at the Madison Metro transfer points, along with exploration of the potential for adding new employment sites and residential units in these areas to support transit service in the area.

Return to table of contents