

# ***APPENDIX D***



# MEMO

**TO:** Files  
**FROM:** Ralph Blum  
**RE:** Meeting Summary  
Door County  
Sturgeon Bay Remote Control Study

On May 8, 2007 a meeting was held in the Door County Highway Department office. In attendance were the following:

Neil Michaelson – WisDOT  
Brett Wallace – WisDOT  
Dale Weber – WisDOT  
Bill Polsten – Door Co. Highway

John Kolodzies – Door Co. Highway  
Larry Heard – Door Co. Highway  
Mark Unger – URS  
Ralph Blum – URS

The purpose of the meeting was to discuss the Sturgeon Bay Remote Control Study that the Department has underway. The purpose of the study is to evaluate the feasibility and practicality of remotely operating the movable bridges in Sturgeon Bay. The study is not yet complete but the Department wanted to inform the County of the progress to date and to get their initial reactions to the results of the study.

The meeting began at 12:30 PM.

Brett Wallace opened the meeting and discussed the remote control project in Menasha. He said that it has been successful so far. The Department is proceeding slowly and is learning a lot as it goes forward. He advised that a Local Officials meeting and a PIM have been scheduled for June 6, 2007. Brett then turned the meeting over to Neil Michaelson. Neil and Ralph Blum presented a summary of the concept of remote control for movable bridges, as well as the assumptions that were used and the savings that could be expected from this initiative.

During and following the presentation there were questions and comments from the county staff.

The comments were generally positive. There was concern regarding night operations, foggy conditions and distance perception with the video cameras. It was noted that under adverse conditions that would not allow safe remote operations, an operator would be sent to run each of the bridges on-site.

Mr. Kolodzies asked how the total number of openings at other locations compared to the number at the Sturgeon Bay bridges. Mr. Blum responded that the number of openings at Oshkosh were much larger. He also noted that the Oshkosh and Menasha bridges only operate 16 hours per day and a much shorter season.

The county suggested that we include bridge opening information for 2004, 2005 and 2006 in the report and noted that a substantial number of new slips have been added in Sturgeon Bay recently. Brett asked URS to add this information to the study.

The meeting adjourned at approximately 2:30 PM.

Meeting Date: June 6, 2007

Subject: Sturgeon Bay Remote Control Feasibility Report  
Presentation to Public Officials  
Door County Offices

Participants: Mike Serpe, Door County Administrator (Part of the Meeting)  
Brett Wallace, WisDOT  
Neil Michaelson, WisDOT  
Dale Weber, WisDOT  
Ralph Bloom, URS  
Mark Unger, URS  
Anthony R. Depies, City of Sturgeon Bay Engineer (Part of the Meeting)

A public officials meeting was held to discuss the findings of the Sturgeon Bay Remote Control Feasibility Report. Since Mr. Serpe was the only official to attend and he noted that he was familiar with and supports the project, no formal presentation was given.

Mr. Serpe asked what the intended operating procedure was for inclement and foggy weather. Neil Michaelson replied that the intention was to bring in operators to man each bridge, so there would be no degradation in service when compared to today. Mr. Serpe wondered if radar or infra-red sensing technologies could be used to provide an even better view than is provided today. WisDOT agreed to investigate that suggestion.

Mr. Serpe expressed his opinion that this project should use the latest technology available. He said that this project would be in place a long time and so if anything there should be an "overkill in technology".

Mr. Serpe also noted that on the coldest days of the year there is sometimes problems with the hydraulic fluid in the operating system at the Bayview Bridge. Neil said that this was not a problem that remote control would solve, but the next maintenance upgrade could address it.

Mr. Serpe also asked about the necessary bridge tender staffing level when the new Maple Oregon Bridge opens and during remote control. Brett Wallace offered that the details had not yet been worked out, but it was the Department's intention to work with the operators to phase in remote operation so that attrition could take care of any long term staff reductions.

With that, Mr. Serpe left. Later, Mr. Anthony R. Depies of the City of Sturgeon Bay came to the meeting. His primary issue was the operations of the new Maple Oregon Bridge in conjunction with the Michigan Street bridge. He expressed the City's desire that one of these two bridges be open at all times, except when it is necessary to open both of the bridges to allow large commercial vessels to pass. He suggested that the Michigan Street Bridge be opened on the hour as it is now and that the Maple Oregon Street Bridge be opened at 10 minutes before the hour and 10 minutes after the hour. This would allow recreational boat traffic to transit the area of the

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two bridges in a reasonable time period and not cause major impacts to the traffic in Sturgeon Bay. Neil said that no final decisions have been made yet on the operating protocol, and that the Department was working through some scenarios. The state will certainly keep the city informed on the issue. Mr. Depies had no more questions, and the meeting adjourned.



# Memorandum of Meeting

Meeting Date: June 6, 2007

Subject: Sturgeon Bay Remote Control Feasibility Report  
Public Information Meeting  
Sturgeon Bay High School

Participants: Presenters:  
Neil Michaelson, WisDOT  
Ralph Bloom, URS  
Others:  
Brett Wallace, WisDOT  
Dale Weber, WisDOT  
Mark Unger, URS  
See Attached List for Public Attendees

A public information meeting was held to discuss the findings of the Sturgeon Bay Remote Control Feasibility Report. Mr. Michaelson began the presentation (copy attached) of the report at approximately 5:30. Neil delivered the first eight slides and Ralph Blum delivered the others. Upon completion of the presentation, the floor was opened to questions.

The first question asked if cameras would be sufficient to keep up with the large number of vessel movements in Sturgeon Bay and with vessels moving into and from the marinas. The questioner also was concerned with what would happen if an emergency were to occur. Mr. Blum suggested that the view of the waterway activities would be enhanced using the cameras and monitors that would be deployed as part of remote control. If the emergency involved the operation or lack of operation of the bridge, then the current procedures of notifying WisDOT and getting a repair crew there would not be changed.

One of the bridge tenders in the audience noted that there are sometimes pedestrians and drivers on the bridge who do not understand English. Two or three times a year he goes on to the bridge to gesture and personally communicate with them to get off of the bridge before it opens. Currently, the operator can leave the operators house and intervene, but with remote operation, this won't be possible. Mr. Blum said that there would be speakers and microphones to communicate with the people, but if they did not understand English, that would do little good. The bridge tender noted that the problem involved speakers of many different languages and not a few predominant languages (Door County is a tourist area and summer employees are hired from any number of countries and tourists also hail from many international locations). In any case, the bridge should not be operated with a vehicle or pedestrian on it, and either the bridge tender or a police officer would have to take care of it.

Another bridge tender in the audience said that he was told that in the early 1990s Sturgeon Bay had the most bridge openings in the state. He was concerned that procedures worked out in Manitowoc, Oshkosh and Milwaukee would not be applicable in Sturgeon Bay. Brett Wallace noted that the critical measure for remote control is the number of openings per hour. Since the

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bridges across Sturgeon Bay open hourly for recreational traffic and on demand for commercial vessels, the number of openings per hour is well below those recorded in Oshkosh. The Feasibility Study shows that no more than 10 openings per hour will take place in Sturgeon Bay.

A member of the audience asked about what the plans were for staffing both the new Maple-Oregon Bridge and the Michigan Street Bridge. This was critical since the Michigan Street Bridge would be inoperable due to rehabilitation shortly after the Maple-Oregon Bridge was opened. Brett Wallace recognized the issue and indicated that the Department is working toward a goal to close Michigan Street simultaneously with the opening of Maple-Oregon Street. If that is the case, then no new operators would have to be hired, since the Michigan Street operators would switch over to the new Maple-Oregon bridge.

Two follow up questions were asked. The first was "Would training be provided for operating the new bridge?" Neil said that training would be provided. The second question asked if the repairs to the Michigan Street Bridge could be performed with the bridge opened to allow the passage of vessels. This question was also answered in the affirmative.

With no more discussion, the meeting was adjourned.

# ATTENDEES

## PUBLIC INFORMATIONAL MEETING

**Sturgeon Bay Remote Control Feasibility Report  
Wednesday, June 6, 2007**

NAME	EMAIL	AFFLIATION	MAILING ADDRESS
Gary Souk	<a href="mailto:garyksouk@hotmail.com">garyksouk@hotmail.com</a>		224 South 7 <sup>th</sup> Avenue Sturgeon Bay, WI 54235-2216
James Schaefer			5452 Cr TT Sturgeon Bay, WI 54235
Christie Weber		Citizens for our Bridges	311 Pennsylvania St. Sturgeon Bay, WI 54235
Pat MacDonald		Citizens for our Bridges	311 Pennsylvania St. Sturgeon Bay, WI 54235
Steve Graf	<a href="mailto:Wisg55_03@yahoo.com">Wisg55_03@yahoo.com</a>	Door County Highway Dept.	833 Michigan St. Sturgeon Bay, WI 54235
John Haen	<a href="mailto:Stickman56@Charteerc.aet">Stickman56@Charteerc.aet</a>	Door County Highway Dept.	1326 Utah St. Sturgeon Bay, WI 54235
Dick Grota		EHYC	906 Memorial Dr. Sturgeon Bay, WI 54235
Laddie Chapman	<a href="mailto:musicat@dorrbell.net">musicat@dorrbell.net</a>	Quest Realty	4102 Glidden Dr. Sturgeon Bay, WI 54235
David McAllister		Sturgeon Bay City Council	354 N. 16 <sup>th</sup> Drive Sturgeon Bay, WI 54235
Tim Graul		TGMS	P.O. Box 290 Sturgeon Bay, WI 54235

A Presentation of the:

# Feasibility Study for Remote Control of Movable Bridges in Sturgeon Bay



June 6, 2007



## Presentation Outline

- Location & Purpose of Study
- Remote Operation
- Other Remotely Operated Bridges in WI
- Bridge Configurations and Protocols
- Current Bridge Operations
- Future Bridge Operations with Remote Control
- Equipment Needed for Remote Operations
- Cost Comparisons
- Safety Issues
- Opportunities
- Conclusions
- Recommendations

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## Location & Purpose of Study

### • Study Location

- Movable Bridges in Sturgeon Bay

- 2 Existing

- Michigan Street
- Bayview

- 1 Under Construction

- Maple-Oregon Street



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## Location & Purpose of Study

- All Double Leaf Bascule Bridges
- Serve Recreational & Commercial Boat Traffic
- Bridge Separation 750 Feet and 7,800 Feet
- Bridges under WisDOT Jurisdiction and Control



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## Location & Purpose of Study

### • Purpose of Study

- Evaluate the Feasibility of Remote Operations to:

- Improve the Safety of Bridge Operations
- Reduce Annual Bridge Operational Cost
- Reduce Wear and Tear on Bridge Mechanical Equipment

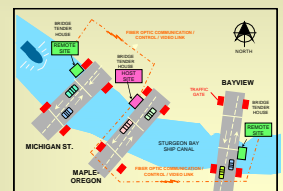


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## Remote Operation

### – What is Remote Operation?

- Operating a Bridge from Another Location
- 1 Operator will Handle Multiple Bridges
- Requires Additional Equipment
  - Cameras
  - Monitors
  - Communication Lines
  - Computers



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## Other Remotely Operated Bridges in WI

- 12 Remotely Operated Movable Bridges in Milwaukee



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## Other Remotely Operated Bridges in WI

- 1 Remotely Operated in Manitowoc (USH 10)
- 1 Remotely Operated in Menasha
- 4 Remotely Operated Railroad Bridges



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## Bridge Configurations and Protocols

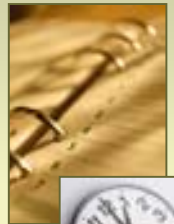
- All 3 Bridges are Same Type
  - Double Leaf Bascules (drawbridges)
- Michigan St. has Low Clearance and Requires Frequent Openings
- 1 Operator at Each Bridge - 3 Operators Total at All Times of Operation



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## Bridge Configurations and Protocols

- **Michigan Street Operations**
  - March 15 – Dec 31  
24 hours - 7days/week  
Hourly and Commercial Vessels On Request
  - Jan 1 – March 14  
12 hour notice
- **Bayview Operations**
  - March 15 – Nov 30  
24 hours - 7days/week  
On Request
  - Dec 1 – March 14  
12 hour notice
- **Maple-Oregon Operations**
  - Will be the same as Michigan St.



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## Current Bridge Operations

- Hourly Bridge Openings
  - 10 years of bridge opening log data analyzed (1994-2003)
  - Number of openings shows a slightly decreasing trend during the 10 years
  - No increase is projected
  - Maximum hourly openings in 10 years
    - 3 @ Michigan Street Bridge
    - 4 @ Bayview Bridge
    - 3 (Projected) @ Maple-Oregon Street Bridge
    - 10 TOTAL openings in maximum hour

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## Current Bridge Operations

- Each Bridge Staffed about 7000 Hours per Year

$$3 \text{ bridges} \times 7,000 \text{ hrs / year} = 21,000 \text{ (20,232+)} \text{ hrs paid time per year}$$



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### Future Bridge Operations with Remote Control

- Bridge Opening & Closing (Cycle) Measured at 2 ½ to 4 Minutes
- Typical Cycle of 6 Minutes (or 10 per Hour) Recommended for Remote Operation Staffing to Account for:
  - Operator Fatigue
  - Multiple Vessels per Opening
  - Large Vessels
  - Required Operator Documentation



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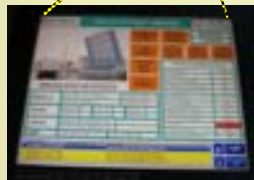
### Future Bridge Operations with Remote Control

- Number of Remote Operators Needed
 
$$\left( \frac{\text{Demand}}{\text{Rate}} \right)$$
  - Maximum Hourly Openings (demand) for all 3 Bridges predicted to not exceed 10.
  - At 6 minutes each the rate would be 10 per hour.
  - Number of operators needed with remote control = 10/10=1
  - One operator would be able to handle all three bridges on Maximum Day

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### Future Bridge Operations with Remote Control

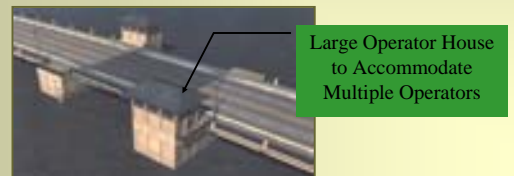
- Therefore, Projected Staffing for Remote Operations
  - One operator per shift to handle 3 bridges



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### Future Bridge Operations with Remote Control

- 2 of the bridges could be Operated from the 3rd bridge
- The control location would need a larger operators house
- New Maple-Oregon Street Bridge is designed with a large operators house
- Therefore, the new Maple Oregon Street Bridge should be the Control Location



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### Equipment Needed for Remote Operation

- Modern Operating System with Programmable Logic Controllers
- Cameras at Remotely Controlled Bridge - minimum of 4 needed at each Bridge
- Video Monitors at Controlling Bridge
- Fiber Optic Communication Lines Between Bridges
- Modernization of Bridge Operating Systems will Promote Conversion
- Lighting of Waterway at the Remote Bridges
- Microphones & Speakers for Verbal Communication Between All Sites



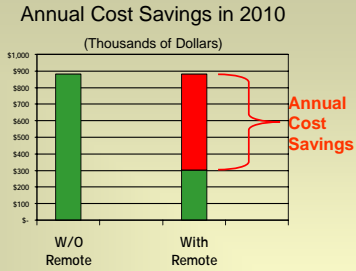
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### Labor Cost Comparisons

- Without Remote Control
  - Existing Operator Costs for 2 Bridges
    - Total Annual (2005) Operator Cost = \$516,000
    - Projected Annual (2010) Operator Cost = \$580,000
  - Projected Operator Cost for 3 bridges
    - Projected Annual (2010) Operator Cost = \$880,000
- With Remote Control
  - Projected Operator Costs for 3 bridges
    - Projected Annual (2010) Operator Cost = \$301,000

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## Cost Comparisons



Without Remote Control ≈ \$880,000  
 With Remote Control ≈ \$301,000  
 Annual Cost Savings ≈ **\$579,000**

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## Cost Comparisons

- Conversion Costs for Remote Operation
  - Maple-Oregon Conversion Cost = \$ 366,000
  - Michigan Street Conversion Cost = \$ 389,000
  - Bayview Conversion Cost\* = \$1,147,000
  - Total = \$2,000,000 +/-
- Annual Operator Cost Savings = \$579,000
- Recapture Conversion Cost in less than 4 years

\* includes Electrical and Control Equipment. Upgrades

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## Safety Issues

- Existing Operator “Blind Spots” will be Eliminated with Remote Control Cameras.
- No Reported Incidents at Milwaukee’s or Manitowoc’s Remotely Operated Bridges.
- Risk of Operator Induced Bridge Damage will be Lessened With Computer Controlled Operation
- Standby Operators may be Needed During Inclement Weather



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## Opportunities

- Record of Gate Violations Available on Cameras
- Better Communication between Bridges and Police, Fire, County Sheriff, and City Transit can be Provided Electronically
- Electronic Data Collection Available
- Electronic Coordination between Bridge and Traffic Signals is an Option



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## Conclusions

- Remote control of movable bridges in Wisconsin has been successful for over 15 years
- Remote control of the 10<sup>th</sup> St. Bridge in Manitowoc has been successful
- Remote operation of the Sturgeon Bay bridges is feasible
- The cost to convert will be recovered in less than 4 years
- If the Bayview bridge is included, it will require electrical upgrades.
- Maple-Oregon St. would be the most appropriate control location

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## Recommendations

- The Department should budget funding and move forward with plans to remote control the Sturgeon Bay bridges
- The conversion to remote operation should proceed as expeditiously as possible following the completion of the Maple-Oregon bridge
- The Maple-Oregon bridge should be the control center.
- Implementation should be in stages – Michigan Street first and then possibly include Bayview.

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Any Questions?

Thank You.