INTERNATIONAL ROAD DYNAMICS INC.

LTPP SPS PHASE II

WEIGH-IN-MOTION SITE ACCEPTABILITY ASSESSMENT REPORT

MINNESOTA SPS-5
LTPP ID 270500
NOVEMBER 01, 2005
CLIN 1001 TASK ORDER 4

CONTRACT NO. DTFH61-05-D-00001

U.S. Department of Transportation
Federal Highway Administration

LONG TERM Pavement PERFORMANCE

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1.0 EXECUTIVE SUMMARY

The Minnesota SPS-5 (Rehabilitation of Asphalt Concrete Pavements) test site was visited on October 24th, 2005, by the CLIN 1 team. The pavement test sections are located in the westbound outside lane on US 2 approximately 14 miles west of Bemidji in Clearwater and Beltrami counties. The team performed a search for a suitable Weigh-in-Motion (WIM) site over an approximate 16 mile range of US 2 between Mile Post 88.4 (CR 92 through the community of Bagley) to the west and Mile Post 104 to the east. This section of US 2 was deemed to have the same truck composition as that passing through the SPS test sections as well as suitable traffic operating characteristics, geometrics, and topography. This search resulted in the selection and evaluation of a WIM site at Mile Post 91.8, approximately 21 miles west of Bemidji. It is proposed to install a WIM system for the westbound outside lane approximately 5.4 miles downstream of the end of SPS-5 pavement test section 270503. This proposed WIM site location coincides with the location recommended by the State. Based upon our site evaluation it is recommended that a new WIM system utilizing Bending Plate technology be installed after corrective action has been taken to address pavement structural issues.

Although the existing 11 inch thick AC pavement does appear to be fairly stable notwithstanding the transverse cracking +/- 40 foot intervals throughout, it is not deemed suitable by the CLIN 1 team for the installation of WIM weighing sensors. As such, it is recommended that the State replace 400 feet of the existing AC pavement with a PCC WIM slab with a minimum thickness of 12 inches to accommodate the new WIM system's weighing sensors. Following installation of the new PCC WIM slab, the slab's surface as well as the PCC/AC transverse cold joints should be blanket ground to meet pavement smoothness requirements for SPS WIM sites. Upon completion of these corrective actions, a follow-up evaluation of the pavement should be made. Such evaluation should include visual observation of the new PCC WIM slab's structural stability and visual observation of trucks passing through the site. In addition to these visual observations, an analysis of new profile data should be made by the team. Upon confirmation that the pavement is acceptable in terms of structural soundness and smoothness such that the pavement is adequate for the WIM system to meet accuracy requirements, this site can be instrumented with WIM.

It is noted that it is the State's preference to have Kistler quartz piezo weighing sensors installed in the existing AC pavement. Although not replacing the pavement would save the State a major expenditure, it is the opinion of the CLIN 1 team that such a WIM system may not provide five years of research quality traffic data without the incurring of rehabilitation costs during the five year period.

2.0 EXISTING ROADWAY

Visual on-site observation of the existing roadway and traffic operating characteristics were performed and recorded by the CLIN 1 Team. This included taking roadside measurements, digital photography, and driving over the roadway to evaluate conditions at the proposed location.

2.1 PAVEMENT AND GEOMETRICS

The SPS-5 is a flexible pavement study. The existing US 2 roadway at the study location as well as at the proposed WIM site location 5.4 miles downstream from the end of the last test section consists of 4 lanes, 2 eastbound and 2 westbound. The pavement test sections and the proposed WIM system are located in the outside westbound lane. The existing westbound roadway pavement approaching, through, and departing the proposed new WIM site is AC consisting of a dense grade surface. The outside and inside (median) shoulders are also dense grade AC. The two westbound lanes are each 12 feet wide with an 11 foot wide outside shoulder and a 2.5 foot wide inside shoulder. It is noted that, according to State furnished documentation, the AC pavement section at the selected WIM site consists of a 2 inch overlay which was constructed in 1998 and a total AC thickness of 11 inches. According to the SPS-5 Construction Report (Braun Intertec Corporation, June 21, 1996) the AC pavement through the SPS-5 test sections was last rehabilitated in 1990. The newer westbound pavement starts at Mile Post 94.9, 3.1 miles in advance of the proposed WIM site. The roadway alignment is tangent and the grade is relatively flat at the proposed WIM site. In regard to cross slope, the two adjacent lanes are crowned at the lane line with each lane sloping +/- 1.5% toward their respective shoulders.

2.2 OBSERVED TRAFFIC OPERATING CHARACTERISTICS

There are numerous median crossovers and driveways in the vicinity of the proposed WIM site. Median crossovers providing access to residential driveways along the eastbound roadway are located approximately 500 feet upstream and 410 feet downstream of the scale location. No observed detrimental traffic flow conditions occurred as a result of these facilities during the team's site visit. The light traffic flow exhibited good lane discipline, staying well within the lane and shoulder line markings. Traffic is free flowing at all times at speeds between 55 and 70 MPH (posted speed limit is 65 MPH). Trucks are "cruising" through the site at constant 55 to 65 MPH speeds. In that there are no significant on/off locations between the WIM site and SPS site, the truck traffic composition at the WIM site is the same as that at the SPS site.

3.0 SITE CONFORMANCE TO EVALUATION CRITERIA

A number of site parameters where evaluated at the proposed WIM location to confirm site acceptability. These site parameters included items such as pavement, traffic patterns, availability of power and telephone, and logistics. These parameters were rated as either “Pass”, “Requires Attention”, or “To Be Performed”. At the end of this section, recommendations on site acceptance and any corrective action required is noted. The following represents the finding of the CLIN 1 Team.

3.1 PAVEMENT TYPE AND CONDITION- *REQUIRES ATTENTION*

Although the existing AC pavement approaching, through, and departing the selected WIM site is fairly smooth, the pavement is not structurally adequate for the installation of a WIM system’s weighing sensors. Although the roadway appears to be in fairly stable condition, transverse cracking is apparent at =/- 40 foot increments. It is recommended that a section of the existing AC pavement between 325 feet in advance of and 75 feet following the proposed new scale location be removed and replaced with a blanket ground PCC WIM slab with a minimum thickness of 12 inches.

3.2 PAVEMENT SMOOTHNESS- *REQUIRES ATTENTION*

Following installation of a 400 foot PCC WIM slab, experience dictates that the smoothness of the slab will need to be improved to facilitate the new WIM system’s meeting SPS accuracy requirements. The new PCC WIM slab as well as the PCC/AC transverse cold joints on each end of the slab should be blanket ground. Following pavement grinding, a reassessment of the pavement’s structural stability and smoothness should be made.

3.3 ANALYSIS OF PAVEMENT PROFILE DATA- *TO BE PERFORMED*

Following the installation of a blanket ground PCC WIM slab at the recommended WIM site location, profile data will be collected by the LTPP Regional Support Contractor (RSC) and provided to the CLIN 1 team for analysis. The CLIN 1 Team will verify whether or not the smoothness of the pavement from 325 feet in advance of to 75 feet following the WIM scale location meets the smoothness requirements for installation of a WIM system.

3.4 ROADWAY GEOMETRICS- *PASS*

The selected WIM site is located within a long tangent section of the roadway, grade is minimal, and the lane in which the sensors are to be installed is 12 feet wide. The pavement cross slope is adequate for proper roadway drainage.

3.5 TRAFFIC OPERATING CHARACTERISTICS- *PASS*

Although there are median crossovers and driveways in the vicinity of the proposed WIM site, the general traffic pattern is free flowing with good lane discipline. The truck traffic is cruising through the site and staying within the lane lines.

3.6 TRUCK TRAFFIC COMPARISON BETWEEN WIM AND TEST SITE- *PASS*

There are no significant exit/entrance locations between the WIM site and the SPS-5 pavement test sections.

3.7 POTENTIAL WIM SYSTEM INTERFERENCE SOURCES- *PASS*

The nearest source of any potential interference, power lines paralleling the eastbound lanes' right-of-way, are the standard "service" lines and will not interfere with system performance. Railroad tracks also parallel the eastbound right-of-way but are approximately 560 feet away from the proposed WIM cabinet location.

3.8 ACCESS TO POWER AND PHONE SERVICES- *PASS*

Power and phone services for residences adjacent to the eastbound roadway appear to be available for extension to the proposed WIM system's cabinet location. A phone service point exists immediately adjacent to the eastbound roadway's right-of-way and overhead power lines are an estimated 120 feet outside this right-of-way. The State will need to establish power and phone service points within 25 feet of the WIM cabinet.

3.9 EQUIPMENT INSTALLATION CAPABILITY- *PASS*

There is an excellent location for the WIM controller cabinet opposite the scales within the westbound roadway's right-of-way. The proposed location would provide 50 feet clearance from the traveled way. There is adequate access to the cabinet for off-shoulder parking, good visibility of the sensors and approaching vehicles from the cabinet location, and adequate room adjacent to the cabinet location for service facilities. Roadway and overall site drainage is good. There is no foreseen potential for ponding or flooding at the cabinet or pullbox locations. There is adequate topography for scale pit drainage. Although the 2.5 foot width of the median shoulder will accommodate only a slight lane closure traffic shift, signing and enforcing a reasonable speed limit through the work zone should provide safe clearance from live traffic during installation of the WIM system.

3.10 POTENTIAL TRAFFIC CONTROL / WORK ZONE SAFETY ISSUES- *PASS*

The traffic control should go smoothly, given the good approach sight distance and the ability to move traffic's left wheels onto the adjacent lane's median shoulder. No other work zone safety issues are foreseen at this rural site.

3.11 TRUCK CIRCUIT- *PASS*

The nearest usable westbound truck turnaround is a median crossover at approximately Mile Post 90.8 located 1.0 mile downstream of the WIM site. The median is wide enough at this location such that the test trucks will be completely off of the traveled way should they have to wait for eastbound traffic to clear.

The nearest useable eastbound truck turnaround is a median crossover at approximately Mile Post 92.3 located 0.5 mile upstream of the WIM site. This median crossover, which provides access to 221st Avenue, has an eastbound left turn pocket off of the mainline.

There are no foreseen potential circuit restrictions and both turnarounds are easily accessed and maneuvered. The test truck round trip circuit route is approximately 3 miles and the estimated lap time is 5 minutes.

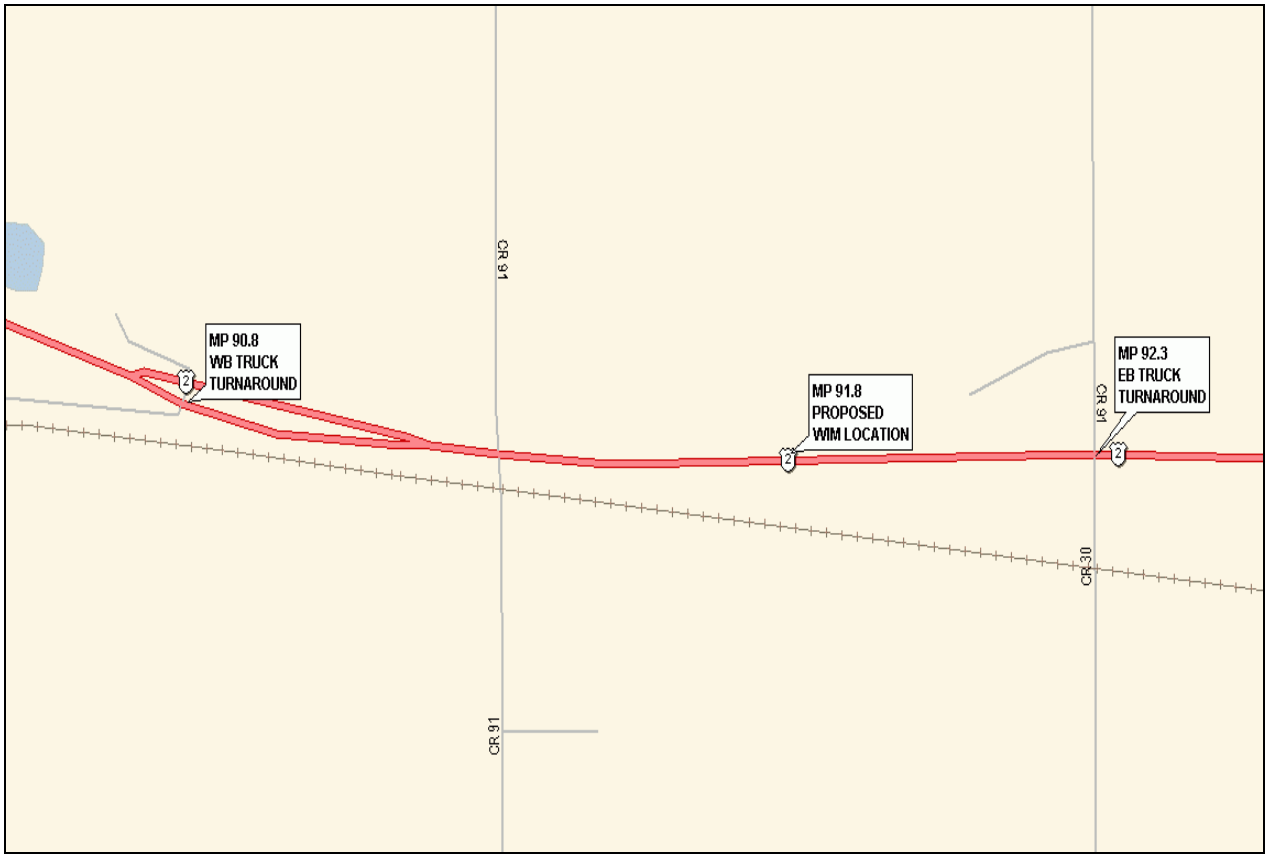


Figure 3.1: Truck Circuit Map, SPS-5 WIM Site on US 2

3.12 RECOMMENDATIONS ON SITE ACCEPTANCE / CORRECTIVE ACTIONS

The State will need to provide power and phone service points within 25 feet of the proposed WIM cabinet location. And, it is recommended that the State install a 400 foot blanket ground PCC WIM slab with a minimum thickness of 12 inches. A follow-up assessment of the WIM site pavement will need to be made, including an analysis of profile data.

4.0 TRAFFIC DATA REVIEW

Vehicle distributions of all trucks (FHWA Class 4 and higher)
(Not Available)

Vehicle distributions for heavy trucks (FHWA Class 6 and higher)
(Not Available)

Volume of trucks comprising of 10 % or more of truck population
(Not Available)

Volume of trucks comprising 10 % or more of heavy truck population
(Not Available)

After discussions with the State, it has been determined that current traffic data containing the above mentioned information is not available

5.0 PAVEMENT EVALUATION

In determining WIM site pavement acceptability, visual on-site observation of the existing AC pavement was made by the CLIN 1 Team. Additionally, structural section documentation provided by the State and the SPS-5 Construction Report were reviewed.

5.1 SURFACE CONDITION

The site evaluation concentrated efforts on the range of pavement from 900 feet prior to and 100 feet following the proposed new WIM scale location. Pictures were taken to document the surface condition, several of which are presented in Appendix E.

5.1.1 AC PAVEMENT 325 FEET IN ADVANCE OF AND 75 FEET FOLLOWING PROPOSED WIM SCALE LOCATION ("WIM PAVEMENT")

According to documentation furnished by the State, the AC pavement section at the selected WIM site consists of a 2 inch overlay which was constructed in 1998 and a total AC thickness of 11 inches. Although the AC pavement and shoulder throughout the 400 ft section exhibit transverse cracking at approximate 40 foot intervals, the condition of the pavement appears to be fairly stable. However, it is the opinion of the CLIN 1 team that this pavement is not structurally suitable for installing WIM sensors. It is suggested by the CLIN 1 Team that the existing AC pavement be replaced by a PCC WIM slab with a minimum 12 inch thickness.

5.1.2 AC PAVEMENT UPSTREAM AND DOWNSTREAM OF WIM PAVEMENT

As exists, there are no discernable differences between the 400 foot "WIM Pavement" section and the "WIM Pavement" approach and departure pavements included in the 1000 foot evaluation section.

5.1.3 SHOULDER CONDITION

The roadway shoulders are AC throughout the study area. The upper lift was placed in 1998 in conjunction with the traveled way overlay. The shoulder pavement exhibits transverse cracking but otherwise appears to be in fair condition.

5.2 SURFACE PROFILE

Observations of trucks and other vehicle types approaching the selected scale location exhibited only minimal body motion with the exception of a major long wavelength profile problem ("dip") at approximately 440 feet in advance of the proposed scale location. Trucks exhibited significant body motion as they passed through this location but such body motion dampened out well before the trucks reached the proposed scale location. Only minimal body motion could be observed in trucks passing through the proposed scale location.

Several automobile “drive throughs” by the CLIN 1 team members appeared to confirm the above noted observations. Only minimal vehicle body and suspension motion could be felt passing through the proposed scale location.

5.3 PAVEMENT EVALUATION SUMMARY

Based upon the CLIN 1 team’s on-site observations and review of the State furnished documentation on the pavement’s structural section, it is recommended that WIM weighing sensors not be installed in the existing AC pavement. For a structurally secure installation of the WIM’s weighing sensors, 400 feet of the existing AC pavement should be replaced with a blanket ground PCC WIM slab.

Upon completion of the new PCC WIM slab installation, the site’s pavement will need to be re-evaluated for structural stability and smoothness and profile data provided to our team for analysis to confirm that the pavement’s smoothness meets requirements for installation of an SPS WIM site.

6.0 PROPOSED WIM SITE- INFORMATION

6.1 LOCATION – US 2, MP 91.8

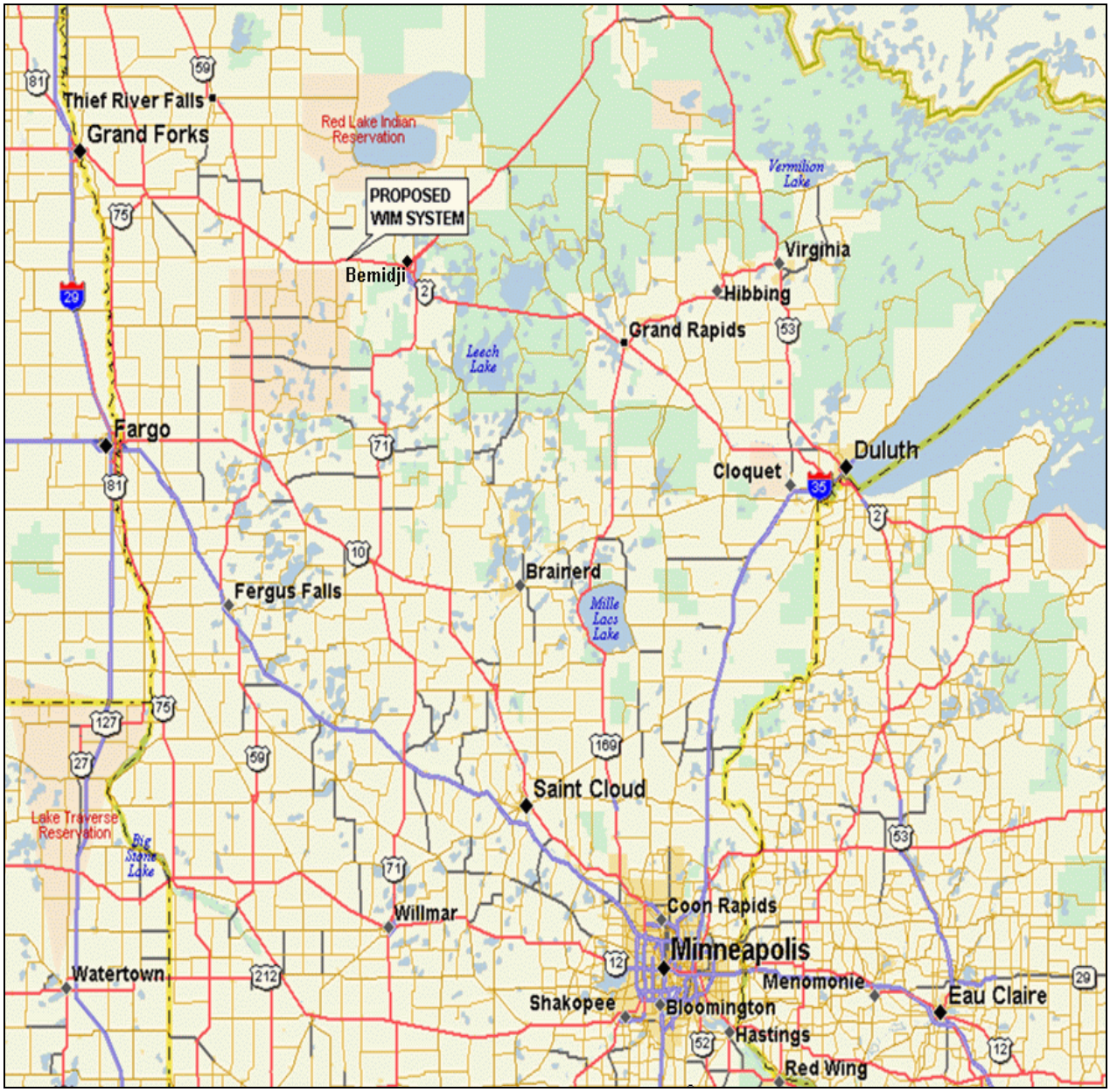


Figure 6.1: Map of the US 2 WIM Site

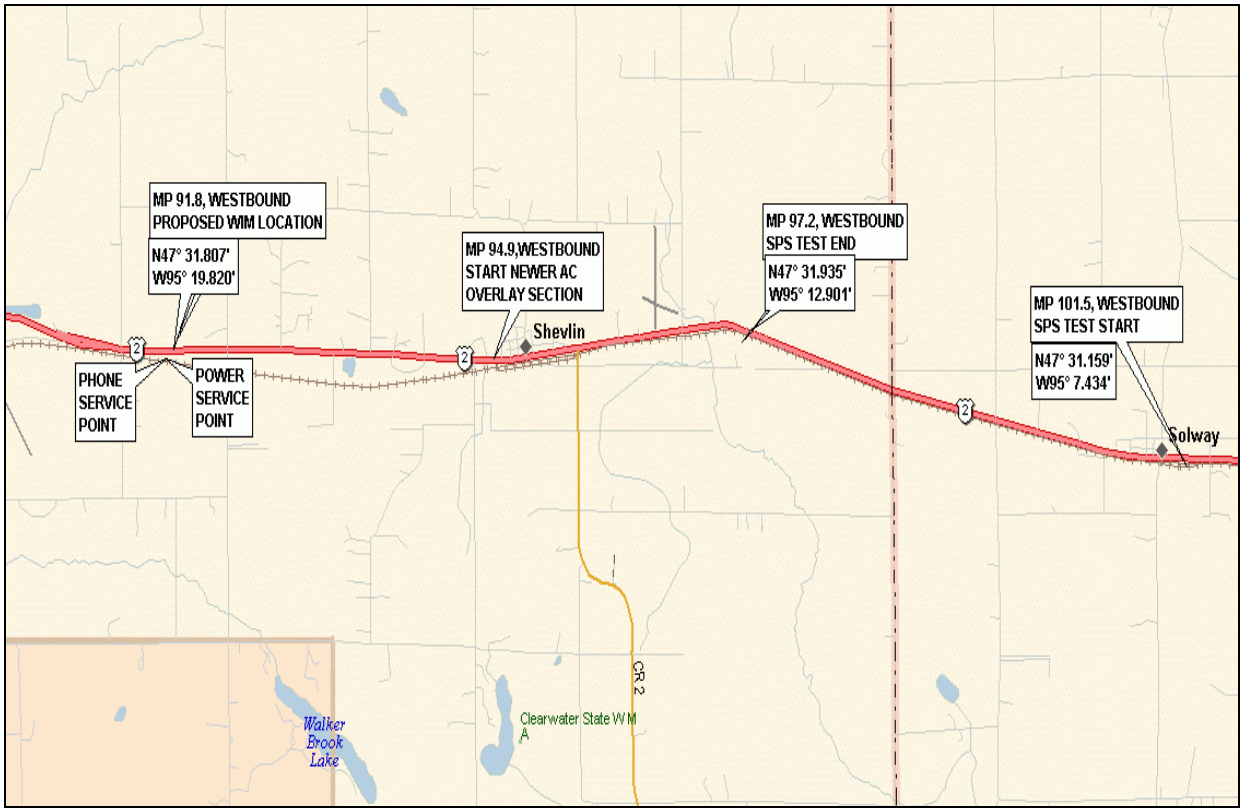


Figure 6.2: Map of the US 2 SPS-5 WIM Site at Milepost 91.8

The pavement test sections are located in the westbound outside lane on US 2 approximately 14 miles west of Bemidji in Clearwater and Beltrami counties.

The location selected for the proposed WIM system installation is at Mile Post 91.8, approximately 21 miles west of Bemidji between Shevlin and Bagley. It is proposed to install a WIM system for the westbound outside lane approximately 5.4 miles downstream of the end of SPS-5 pavement test section 270503.

The proposed WIM controller cabinet can be located within the roadway's right-of-way opposite the scales approximately 50 feet off the edge of traveled way.

7.0 RECOMMENDED WIM TECHNOLOGY

The State has expressed the desire to utilize Quartz Sensor technology. However, it is the recommendation of the CLIN 1 team that Bending Plate technology be utilized at this site. This recommendation is made based upon the PAT bending plate's excellent track record in terms of performance, minimal calibration "drift", and longevity as well as ease of maintenance. Although the Kistler quartz piezo sensors certainly show promise, they simply do not yet have the proven track record of the PAT bending plates. A bending plate system will meet the accuracy expectations of both the State and LTPP and provide the best value in terms of performance with minimal down time and maintenance.

7.1 RECOMMENDED LOCATION AND LAYOUT FOR THE WIM SYSTEM

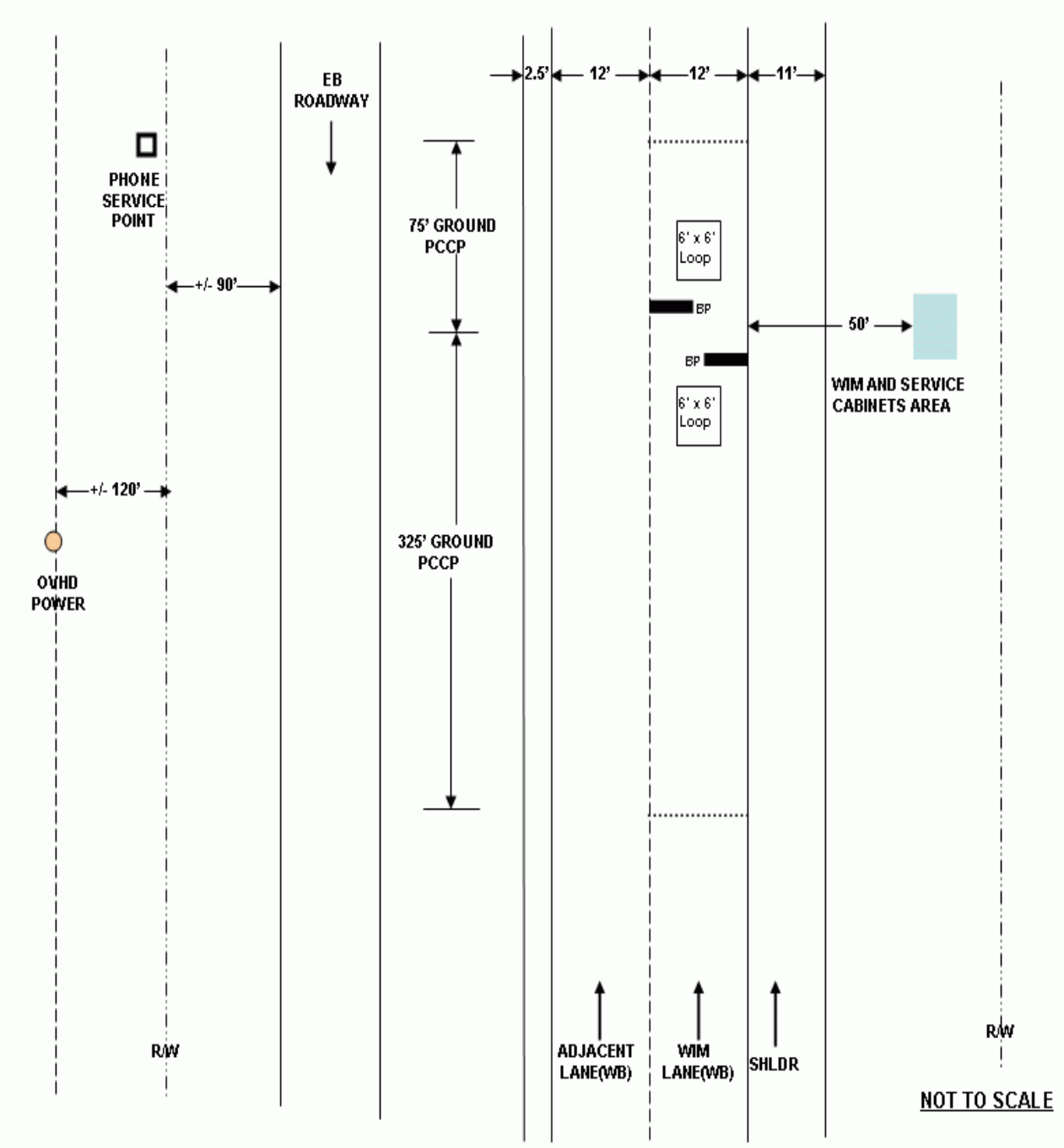


Figure 7.1: Proposed WIM Site Layout

GPS Coordinates for Scales: N47° 31.807', W95° 19.820'

A.0 COORDINATION DETAILS

Task Order # 4, which authorized the CLIN 1001 "Determine Acceptability of Proposed Site" for the Minnesota SPS-5 Site (LTPP ID 270500), was issued on August 5, 2005.

Contacts were made with interested parties as follows:

- Contracting Officer's Technical Representative (COTR)
  - Debbie Walker – FHWA-LTPP ph: 202-493-3068
  - Initial contact made October 5, 2005

- State Highway Agency (SHA)
  - George Cepress – MINN DOT ph: 651-296-0217
  - Mark Novak – MINN DOT ph: 651-296-2607
  - Ben Worel – MINN DOT ph: 651-779-5522
  - Initial contact made October 5, 2005

- LTPP Regional Support Contractor (RSC)
  - Basel Abukhater - Stantec ph: 716-632-0804
  - Initial contact made October 5, 2005

- FHWA Division Office
  - William Lohr – FHWA Div Rep ph: 651-291-6122
  - Initial contact made October 5, 2005

The "Pre-Visit Handout Guide" was distributed on October 17, 2005, to the following individuals:

- George Cepress
- Mark Novak
- Ben Worel
- Debbie Walker

The site was visited on October 24, 2005, by Roy Czinku (IRD) and Rich Quinley (WIMTECH).

A briefing session was held at 9:00 a.m. October 25, 2005 at the Minnesota DOT Office, 395 John Ireland Blvd., Saint Paul, MN 55155. Attendees included George Cepress (MNDOT), Mark Novak (MNDOT), Bill Martinson (MNDOT), and Roy Czinku (IRD).

INTERNATIONAL ROAD DYNAMICS INC.

LTPP SPS PHASE II

WEIGH-IN-MOTION SITE ACCEPTABILITY PRE-VISIT HANDOUT GUIDE

MINNESOTA SPS-5
LTPP ID 270500

Date: October 25, 2005

CONTRACT NO. DTFH61-05-D-00001

U.S. Department of Transportation
Federal Highway Administration

LONG TERM PAVEMENT PERFORMANCE

B.0 PRE-VISIT HANDOUT GUIDE

B.1 SCHEDULE

a. Briefing session
   i. Meeting is scheduled for 9:00 a.m. October 25, 2005 at the Minnesota DOT Office, 395 John Ireland Blvd., Saint Paul, MN 55155
b. Site visit
   i. October 24, 2005

B.2 BRIEFING SESSION OCTOBER 25, 2005, POINTS OF CONTACT

a. Contracting Officer's Technical Representative (COTR)
   i. Debbie Walker – FHWA-LTPP ph: 202-493-3068
b. State Highway Agency (SHA)
   i. George Cepress – MINN DOT ph: 651-296-0217
c. LTPP Regional Support Contractor (RSC)
   i. Basel Abukhater – Stantec ph: 716-632-0804
d. FHWA Division Office
   i. William Lohr – FHWA Div Rep ph: 651-291-6122

B.3 INFORMATION REQUESTS

a. From COTR
   i. FHWA Division contact person
   ii. New pavement profile from RSC if recent profile data unavailable
b. From RSC
   i. SHA contact person
   ii. SPS roadway section layouts (plan view and/or stationing or mileposts)
   iii. Recent pavement profile data (within the past year)
   iv. Request any current traffic data (within past 2 years)
c. From SHA
   i. As-built info on roadway at proposed site
      1. Pavement cross section and structural section
      2. Alignment and grade
      3. Any utilities located in WIM install work area
   ii. Location and general availability of power and phone services, service providers, service provider contacts and phone numbers (may be beneficial if power and phone utility reps be requested to participate in briefing session and/or site visit)
   iii. Will SHA agree to extend power and phone services from existing available access points to demarcation points near planned controller cabinet location?
   iv. If existing roadway pavement is AC or inadequate PCC will SHA consider replacement with 400' PCC slab if recommended per site assessment?

v. What permits will be needed to install equipment and what are procedures and time frames for obtainment?
vi. Required cabinet clear zone from edge of traveled way?
vii. If no detour routing available at proposed site (or three or more adjacent lanes), will SHA permit shifting inside lane traffic partially onto inside shoulder to provide safe clearance during installation in outside lane?
viii. Historic truck traffic data?

B.4 SITE LOCATION INFORMATION

a. Proposed WIM site
   i. US 2, westbound outside lane, vicinity Mile Posts 88 to 104
b. Briefing session location
   i. Minnesota DOT Office, 395 John Ireland Blvd., Saint Paul, MN 55155
c. Nearest major airport
   i. Minneapolis/St. Paul International, MN

Distribution --- COTR, RSC, SHA, FHWA Division, MACTEC, Site Assessment Team

INTERNATIONAL ROAD DYNAMICS INC.

LTPP SPS PHASE II

WEIGH-IN-MOTION SITE ACCEPTABILITY

SITE VISIT EVALUATION FORM

MINNESOTA SPS-5 LTPP ID 270500

Date of Site Visit: October 24, 2005

CONTRACT NO. DTFH61-05-D-00001

U.S. Department of Transportation Federal Highway Administration

LONG TERM Pavement PERFORMANCE

C.0 SITE EVALUATION FORM

C.1 PROPOSED WIM LOCATION

Proposed WIM Site Location – 4 Lane Roadway (2 Lanes each Direction)

Route: US 2 Mile Post: 91.8 Direction: WB Lane: Outside

Proposed WIM Site is 5.4 miles downstream of the end of SPS Test Section 270503 approximately 21 miles west of Bemidji in Clearwater County.

C.1.1 EXISTING ROADWAY SURROUNDING THE PROPOSED WIM SITE

Type Pavement: AC Pavement Age Top lift placed 1998

Lane Width: 12 feet Thickness: 11 inches

Observed Structural Soundness: Fair Observed Smoothness: Fair

Outside NB Shoulder Type: AC Width: 11 feet

Outside NB Shoulder Condition: Fair

Inside NB Shoulder Type: AC Width: 2.5 feet

Inside NB Shoulder Condition: Fair

C.1.2 PAVEMENT 325' PRIOR AND 75' FOLLOWING WIM SCALE LOCATION

Type: AC Thickness: 11 inches Jointed or Continuous: N/A

Observed Structural Soundness: Fair Observed Smoothness: Fair

Notes/Comments on Pavement:
The existing roadway is AC and appears to be in fair structural condition. However, both the traveled way and shoulders exhibit transverse cracking at approximately every 40 feet. The 400 foot "WIM Pavement" section is the same as the approaching and departing pavement. The existing pavement should be replaced with a 400 foot blanket ground PCC WIM slab for the installation of WIM weighing sensors.

C.1.3 ROADWAY GEOMETRICS

Horizontal Alignment: Tangent Grade: Minimal (Less than +0.5 %)

Cross-slope: Crowned on lane line, +/- 1.5 % away Lane width: 12 feet

C.1.4 OBSERVED TRAFFIC OPERATING CHARACTERISTICS

Passing, merging, not following lane lines? Good Lane Discipline –occasional passing

Stop and go traffic, congestion periods? Free flowing, see notes below

Traffic signals/interchanges affecting traffic? Median crossovers and driveways in vicinity of selected location do not affect traffic flow (see notes below)

Other adverse traffic flow conditions? Traffic Flow is light

Truck traffic at "cruising" speed (no lugging)? No lugging, smooth flow

Truck traffic staying within lane lines? Yes, trucks track within lane lines

Observed truck suspension or body motion dynamics? Noted significant body motion at dip 440 feet in advance proposed scale location, but only minimal body and suspension motion noted through scale area

Truck traffic composition same at WIM site and SPS site? Yes

Truck traffic on/off locations between WIM site and SPS site? No (see notes)

Posted Speed Limit: 65 MPH

Observed Truck Speeds: 55–65 MPH

Notes/Comments on Geometrics and/or Traffic Operating Characteristics:
There are median crossovers at +/- 500 feet upstream and 410 feet downstream of the proposed scale locations providing access to/from residential driveways off the eastbound roadway. No observed detrimental effects on traffic flow occurred as a result of these crossovers. Vehicles track smoothly through this area at speeds between 55 and 70 MPH (posted speed is 65 MPH for all traffic). There is very good lane discipline at this site. Traffic flow is light on this US highway. Several drive throughs were performed and only minor body and suspension motion was observed across the proposed scale location.

C.1.5 ACCESS TO UTILITY SERVICES

Potential source(s) for power: Overhead power lines run parallel to the eastbound roadway an estimated 120 feet beyond the right-of-way.

Potential source(s) for telephone: Underground phone lines parallel the eastbound roadway with a service point immediately adjacent to the right-of-way.

C.1.6 EQUIPMENT INSTALLATION CAPABILITY

Adequate location for controller cabinet? Yes, large area between roadway and R/W

Distance from edge of traveled way to right of way? NA -varies

Distance from edge of traveled way to cabinet? +/-50 feet

Visibility from cabinet of sensors and approaching vehicles? Very good

Adequate location for service facilities? Yes, large area adjacent proposed cabinet

Adequate drainage for scale pits? Yes

Adequate roadway and overall site drainage? Yes

Potential for ponding or flooding at cabinet or pullboxes? Minimal

Potential for traffic control problems during installation? Minimal; although the inside lane's shoulder is quite narrow, the traffic is light and can be shifted away from the outside lane's work area

Ability to provide safe clearance in work zone from live traffic via:

- ☑ OK from State Agency to use opposite shoulder for traffic shift
- ☐ Multiple Adjacent Lanes

Notes/Comments on Equipment Installation Capability:
The traffic is light. We will have to work closely with the State to coordinate lane closures. There is 2.5 feet available on inside lane shoulder to accommodate a traffic shift.

C.1.7 POTENTIAL WIM SENSOR/EQUIPMENT INTERFERENCE SOURCES

Overhead power lines? Parallel to EB roadway right of way. These are service lines that will not affect WIM system operation.

Adjacent railroad? 560 feet south of cabinet location (parallels eastbound roadway)

C.1.8 CONDITIONS FOR USE OF TEST TRUCKS FOR CALIBRATION AND EVALUATIONS

Direction WB

Nearest usable truck turnaround location:
Median crossover at approximately Mile Post 90.8 located downstream of the WIM site. The median is wide enough at this location such that the test trucks will be completely off of the traveled way.

Distance from WIM: 1.0 Miles

Direction EB

Nearest usable truck turnaround location:
Median crossover at approximately Mile Post 92.3 located upstream of the WIM site. This median crossover, which provides access to 221st Avenue, has an eastbound left turn pocket off of the mainline.

Distance from WIM: 0.5 Miles

Circuit travel distance: 3 Miles Estimated lap time: 5 Minutes

Potential circuit route restrictions? None

Identification and location of trucking firm and certified static scales:

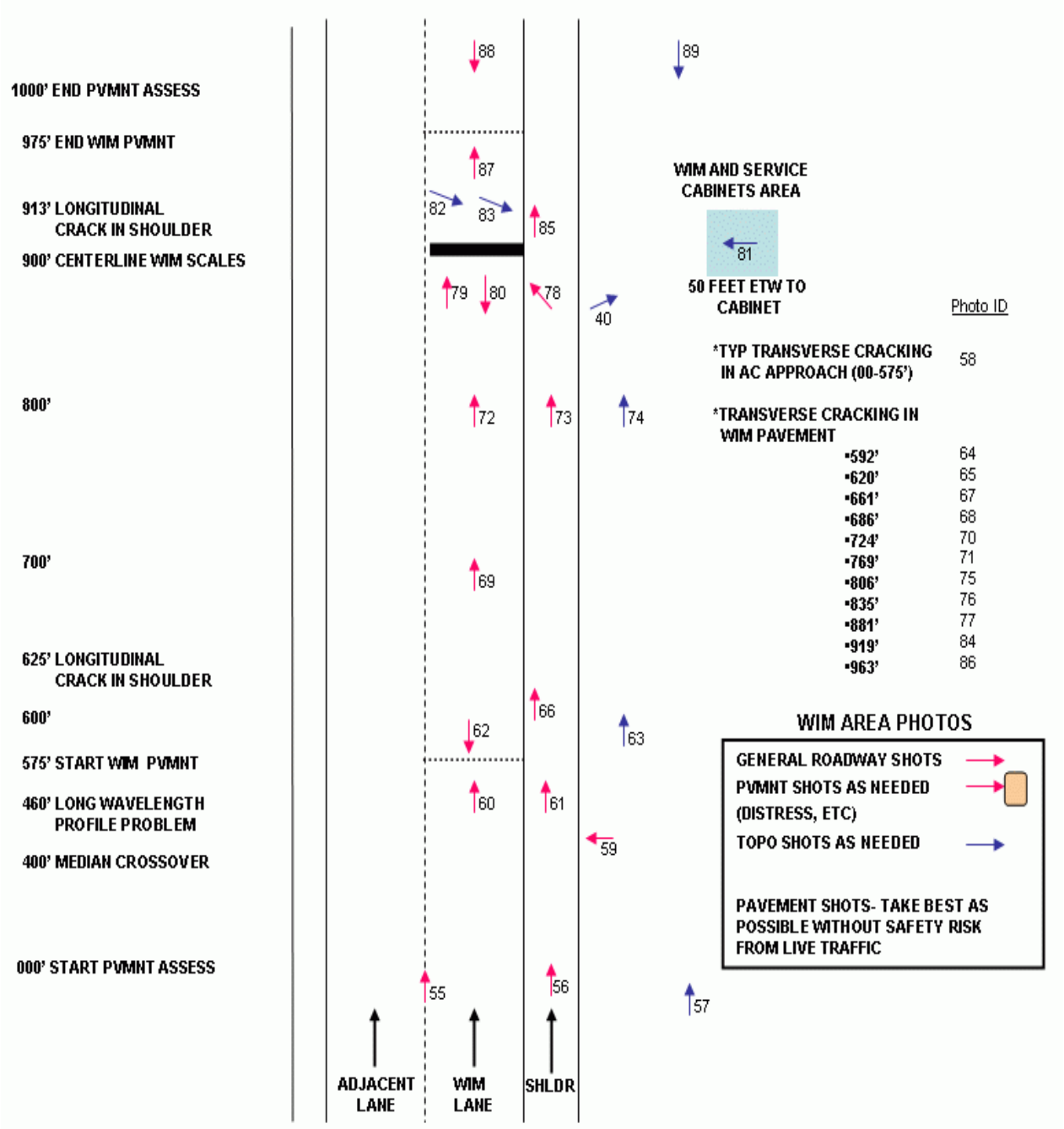
Name North Country Transport Contact Cory Wright

Address 7129 Irvine Ave NW, Bemidji, MN

Phone 218-751-7812 Hours 8:00 a.m. – 5:00 p.m.

Notes/Comments on Test Truck Circuit and Static Weighing Facility:
North Country Transport is located approximately 25 miles from the Proposed WIM Site. They currently have 5 - 3S2 Tractor Trailer Air Ride vehicles and drivers available given 2-3 weeks notice. A certified static scale for weighing is located close to their facility.

C.2 LOCATION LOG OF PHOTOS



C.3 EQUIPMENT AND MATERIALS

☑ Site Evaluation Forms
☑ Graph paper and note paper
☑ Clipboard
☑ Pens & pencils
☐ Small stapler
☑ Digital camera, with PC cable
☑ GPS receiver
☑ Notebook PC
☑ Calculator
☑ Cell phone
☑ Site Pre-visit Handout Guide
☑ Metal tape measure (25 ft.)
☑ Measuring wheel (ft.) and/or 100 ft. rag tape
☑ Folding rule (6 foot)
☑ Hand level
☑ Small torpedo level
☑ Keel markers
☑ Spray can white paint
☑ String Line
☑ Line Level
☑ Hammer and Concrete Nails
☐ _____

Request furnish on-site by Highway Agency:
☑ Spray can white paint
☐ Lath, 4 ft.
☐ Hammer
☐ Misc. small tools
☑ Keys for known Agency service cabinets
Note: Key for existing cabinet is a standard Type II

Proper attire for field work and expected weather:
☑ Durable shoes
☑ Cold weather layering
☑ Rain gear
☐ _____

Safety equipment per State Highway Agency requirements:
☑ Hard hat
☑ Safety vest – type Hi-Vis Safety Yellow
☑ Steel toe shoes
☐ Other required equipment _____

D.0 SHEET 17

Sheet 17	*STATE_CODE	27
LTPP Traffic Data	*SPS PROJECT ID	270500
WIM SITE INVENTORY	*SPS WIM_ID	SPS-5

1.* ROUTE US 2 MILEPOST 91.8 LTPP DIRECTION W

2.* WIM SITE DESCRIPTION - Grade ≥0.5 % Sag vertical N
Nearest SPS section upstream of the site 270503
Distance from sensor to nearest upstream SPS Section 5.4 miles

3.* LANE CONFIGURATION
Lanes in LTPP direction 2 Lane width 12 ft

Median - 1 – painted
2 – physical barrier
3 – grass
4 – none

Shoulder - 1 – curb and gutter
2 – paved AC
3 – paved PCC
4 – unpaved
5 – none

Shoulder width 11 ft

4.* PAVEMENT TYPE AC

8. RAMPS OR INTERSECTIONS
Intersection/driveway within 300 m upstream of sensor location Y
Intersection/driveway within 300 m downstream of sensor location Y
Is shoulder routinely used for turns or passing? N

Form completed by: Roy Czinku - IRD Date: October 25, 2005

E.0 PHOTOGRAPHS

E.1.1 MARKER FOR FIRST SPS TEST SECTION

E.1.2 FACING DOWNSTREAM 900 FEET IN ADVANCE OF WIM SCALE LOCATION

E.1.3 TYPICAL, TRANSVERSE CRACKING IN AC APPROACH TO WIM PAVEMENT

E.1.4 FACING DOWNSTREAM AT START OF 400 FOOT WIM PAVEMENT SECTION

E.1.5 FACING UPSTREAM AT START OF 400 FOOT WIM PAVEMENT SECTION

E.1.6 TYPICAL, TRANSVERSE CRACKING IN 400' WIM PAVEMENT SECTION

E.1.7 RECOMMENDED SCALE LOCATION

E.1.8 FACING DOWNSTREAM AT END OF 400' WIM PAVEMENT SECTION

E.1.9 FACING UPSTREAM AT END OF 1000 FOOT PAVEMENT ASSESSMENT SECTION

E.1.10 RECOMMENDED CABINET LOCATION

E.1.11 EXISTING OVERHEAD POWER LINES PARALLELING EASTBOUND ROADWAY

E.1.12 EXISTING PHONE SERVICE ADJACENT EASTBOUND ROADWAY R/W