



INTERNATIONAL ROAD DYNAMICS INC.

LTPP SPS PHASE II

WEIGH-IN-MOTION SITE ACCEPTABILITY ASSESSMENT REPORT

VIRGINIA SPS-1
LTPP ID 510100
OCTOBER 11, 2006
CLIN 2001 TASK ORDER 16



CONTRACT NO. DTFH61-05-D-00001



LONG TERM
pavement
PERFORMANCE

TABLE OF CONTENTS

1.0 EXECUTIVE SUMMARY..... 3

2.0 EXISTING ROADWAY..... 4

 2.1 PAVEMENT AND GEOMETRICS..... 4

 2.2 PCC WIM SLAB 4

 2.3 OBSERVED TRAFFIC OPERATING CHARACTERISTICS..... 4

3.0 SITE CONFORMANCE TO EVALUATION CRITERIA..... 4

 3.1 PAVEMENT TYPE AND CONDITION- PASS 4

 3.2 OBSERVED PAVEMENT SMOOTHNESS- PASS 4

 3.3 ANALYSIS OF PAVEMENT PROFILE DATA- TO BE DETERMINED..... 5

 3.4 ROADWAY GEOMETRICS- PASS..... 5

 3.5 TRAFFIC OPERATING CHARACTERISTICS- PASS 5

 3.6 TRUCK TRAFFIC COMPARISON BETWEEN WIM AND TEST SITE- PASS 5

 3.7 POTENTIAL WIM INTERFERENCE SOURCES- PASS 5

 3.8 ACCESS TO POWER AND PHONE SERVICES- PASS 5

 3.9 EQUIPMENT INSTALLATION CAPABILITY- PASS..... 5

 3.10 POTENTIAL TRAFFIC CONTROL / WORK ZONE SAFETY ISSUES- PASS..... 5

 3.11 TRUCK CIRCUIT – PASS..... 6

 3.12 RECOMMENDATIONS ON SITE ACCEPTANCE / CORRECTIVE ACTIONS 8

4.0 TRAFFIC DATA REVIEW..... 9

 4.1 LOCATION – US-29 MP 12.8..... 10

5.0 RECOMMENDED WIM TECHNOLOGY..... 1

 5.1 RECOMMENDED LOCATION AND LAYOUT FOR THE WIM SYSTEM..... 2

A.0 COORDINATION DETAILS 3

B.0 PRE-VISIT HANDOUT GUIDE..... 1

 B.1 SCHEDULE 1

 B.2 POINTS OF CONTACT, PHONE NO.S 1

 B.3 INFORMATION REQUESTS 1

 B.4 SITE LOCATION INFORMATION..... 2

C.0 SITE EVALUATION FORM..... 1

 C.1 PROPOSED WIM LOCATION 2

 C.1.1 Existing Roadway Surrounding the Proposed WIM Site 2

 C.1.2 Pavement 325’ Prior and 75’ Following WIM Scale Location..... 2

 C.1.3 Roadway Geometrics..... 2

 C.1.4 Observed Traffic Operating Characteristics 2

 C.1.5 Access to Utility Services..... 3

 C.1.6 Equipment Installation Capability..... 3

 C.1.7 Potential WIM Sensor/Equipment Interference Sources 4

 C.1.8 Conditions for Use of Test Trucks for Calibration and Evaluations 4

D.0 SHEET 17..... 1

E.0 PHOTOGRAPHS 2

 E.1.1 SPS test section marker..... 2

 E.1.2 Facing downstream 900 feet in advance of WIM scale location..... 2

E.1.3 Facing downstream 600 feet in advance of WIM scale location..... 3
E.1.4 Facing downstream at start of 400 foot PAVEMENT Grind section 3
E.1.5 Facing upstream at start of 400 foot WIM PAVEMENT section 4
E.1.6 WIM PAVEMENT, facing downstream 100 feet in advance of scales..... 4
E.1.7 Facing upstream 200 ft. from recommended scales location 5
E.1.8 Recommended WIM sensor location 5
E.1.9 Recommended cabinet location..... 6

1.0 EXECUTIVE SUMMARY

On October 9, 2006 a Weigh-in-Motion (WIM) site acceptability assessment was performed for the Virginia SPS-1 site. The site is located on US-29 at Mile Post 12.8 near the town of Danville, county of Pittsylvania. This assessment was the second assessment performed at this site.

Virginia DOT installed two 400 foot section of Portland Cement Concrete (PCC) in both south bound lanes. Both lanes were blanket ground with a 36" blanket grinder. A member of the CLIN 1 team observed the grinding operation and performed the straightedge checks of the pavement profile's smoothness. The pavement grinding was 325 feet in advance and 75 feet following the WIM scale location. The pavement grinding passed the straightedge checks for SPS WIM sites. The southbound driving lane is the designated LTPP lane. Virginia DOT has approved installation of weigh-in-motion sensors in both southbound lanes.

Immediately following the grinding operation Virginia DOT performed the Pavement Profile testing. These results must be reviewed by the CLIN 1 team prior to installation of the weigh-in-motion sensors. Once these results are approved the site can be instrumented with a bending plate WIM system.

2.0 EXISTING ROADWAY

2.1 PAVEMENT AND GEOMETRICS

The site is located on a 4 lane highway, 2 southbound and 2 northbound lanes. The southbound driving lane (LTPP lane) is 14 ft. wide and the southbound passing lane is 12 ft. wide. The horizontal alignment is tangent with minimal grade (positive 0.275%). Although there is a +2% grade 800 feet in advance and -2% grade 200 feet trailing the proposed WIM location, such grade changes are short in length and have no effect on the trucks passing through the site. In regard to cross slope, the two lanes slope 2% away from the median.

2.2 PCC WIM SLAB

Virginia DOT recently installed this 400 ft. section of CRCP in both south bound travel lanes to accommodate installation of the WIM system. The pavement is 12 inch thick.

2.3 OBSERVED TRAFFIC OPERATING CHARACTERISTICS

The light to medium traffic flow exhibited good lane discipline, staying well within the lane and shoulder line markings. Traffic is free flowing at all times with speeds between 60 and 70 MPH (posted speed limit is 65 MPH for all vehicles). There are no signals or merging in the WIM site vicinity. Trucks are “cruising” through the site at constant speeds. In that there are no on/off locations between 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

3.1 PAVEMENT TYPE AND CONDITION- PASS

This 12 inch thick CRCP pavement is brand new 325 feet before and 75 feet after the WIM scale location.

3.2 OBSERVED PAVEMENT SMOOTHNESS- PASS

On October 9, 2006 the State performed a blanket grind of the designated 400 foot “WIM Pavement” section on both southbound lanes. The CLIN 1 team member observed the grinding operation and performed the straightedge checks of the pavement profile’s smoothness. The pavement grinding was 325 feet in advance and 75 feet following the WIM scale location and passed the straightedge checks for SPS WIM sites.

3.3 ANALYSIS OF PAVEMENT PROFILE DATA- TO BE DETERMINED

The Pavement Profile information has been gathered. This data needs to be reviewed by the CLIN 1 team to determine if the pavement profile shows any problems.

3.4 ROADWAY GEOMETRICS- PASS

The grade is minimal and the lane in which the sensors are to be installed is 14 feet wide. The pavement cross slope is adequate for proper roadway drainage.

3.5 TRAFFIC OPERATING CHARACTERISTICS- PASS

The general traffic pattern is free flowing with good lane discipline. There are no interchanges or signals affecting traffic flow. 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 exit/entrance locations between the WIM site and the SPS-1 pavement test sections.

3.7 POTENTIAL WIM INTERFERENCE SOURCES- PASS

There are no sources of potential interference in and around the proposed WIM system location.

3.8 ACCESS TO POWER AND PHONE SERVICES- PASS

The State will run power and telephone service to the proposed WIM controller cabinet location from an existing service point 450 feet upstream of the proposed site.

3.9 EQUIPMENT INSTALLATION CAPABILITY- PASS

There are adequate locations for the WIM controller cabinet on either side of the roadway. There is good visibility from the proposed WIM controller cabinet of the sensors and the approaching vehicles. There is adequate room adjacent to the cabinet location for service facilities. Overall site drainage is adequate and there is no foreseen potential for ponding or flooding at the cabinet or at the pullboxes. There is adequate topography for scale pit drainage and there is the ability to provide safe clearance in the work zone 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 approaching sight distance, the lack of nearby intersections or interchanges, and the ability to move

traffic's left wheels onto the adjacent lane's shoulder. No other work zone safety problems are foreseen at this location.

3.11 TRUCK CIRCUIT – PASS

The test truck round trip circuit route is 12.8 miles and the turnaround locations are easily accessed and maneuvered. The estimated lap time is 17 minutes.

The nearest usable NB truck turnaround location is the VA726 Exit, a distance of 2.4 miles North of the WIM site. The nearest usable SB turnaround location is the 360 Halifax Exit, a distance of 3.5 miles South of the WIM site.

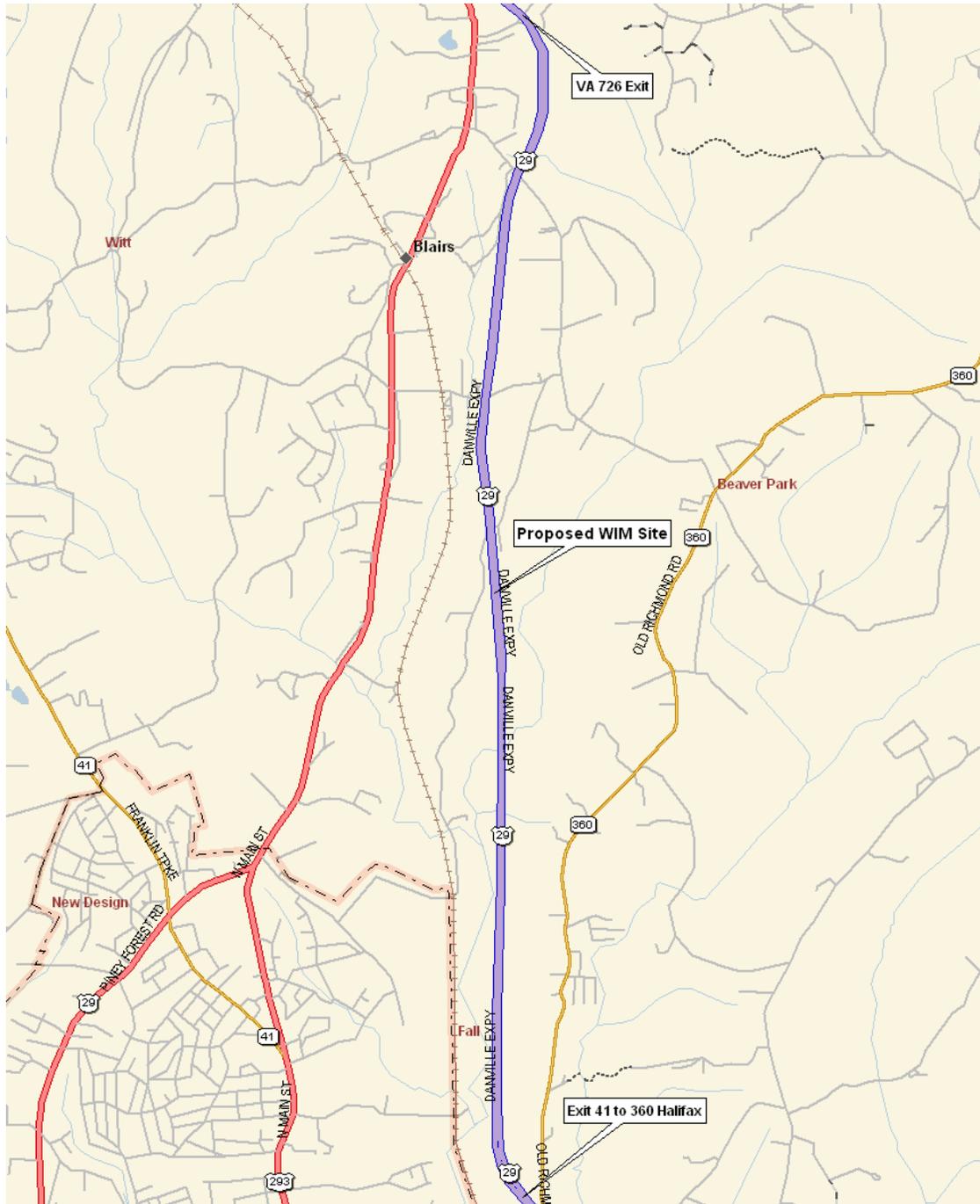


Figure 1: Truck Circuit Map

3.12 RECOMMENDATIONS ON SITE ACCEPTANCE / CORRECTIVE ACTIONS

The Bending Plate Weigh Pads should be installed 75 feet from the end of the proposed 400 foot PCC slab. This would put the sensors within 100 feet from the proposed cabinet location.

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 and the RSC, it has been determined that current traffic data containing the above mentioned information is not available. The State has not had a continuous classification program at this location for quite some time and the RSC has verified that no meaningful class data from this site has been collected.

The Virginia Department of Transportation Web Site lists Annual Average Daily Traffic at this location to be 9400 and the Average Daily Truck Traffic to be 1504. This information is based on portable studies that the State performs on an annual basis. Based upon observations during our site visit it should be noted that the majority of the truck traffic at this location is Class 9. We recommend using class 9 vehicles for the calibration after the installation has been completed.

4.1 LOCATION – US-29 MP 12.8

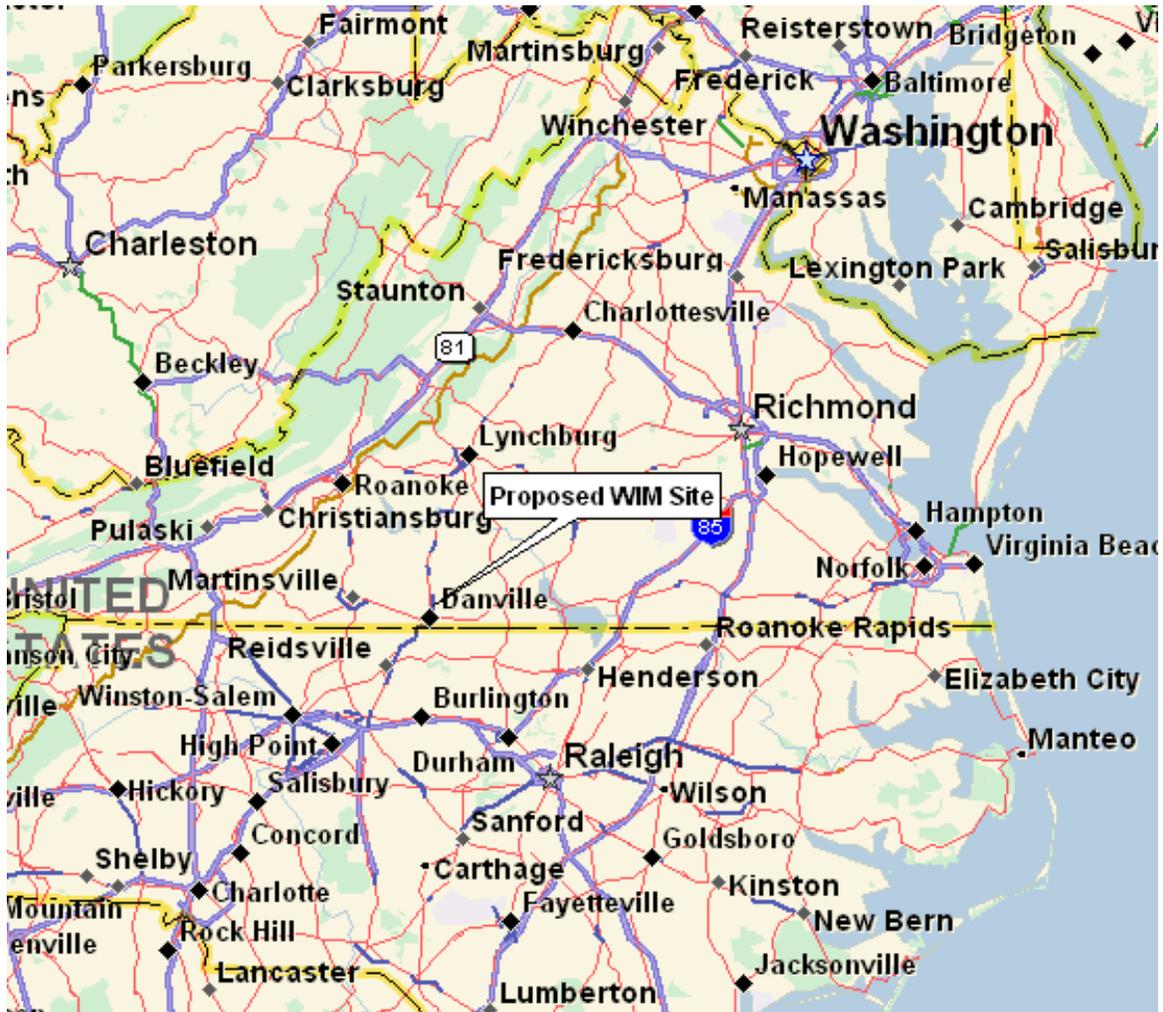


Figure 8: Map of US-29 WIM Site

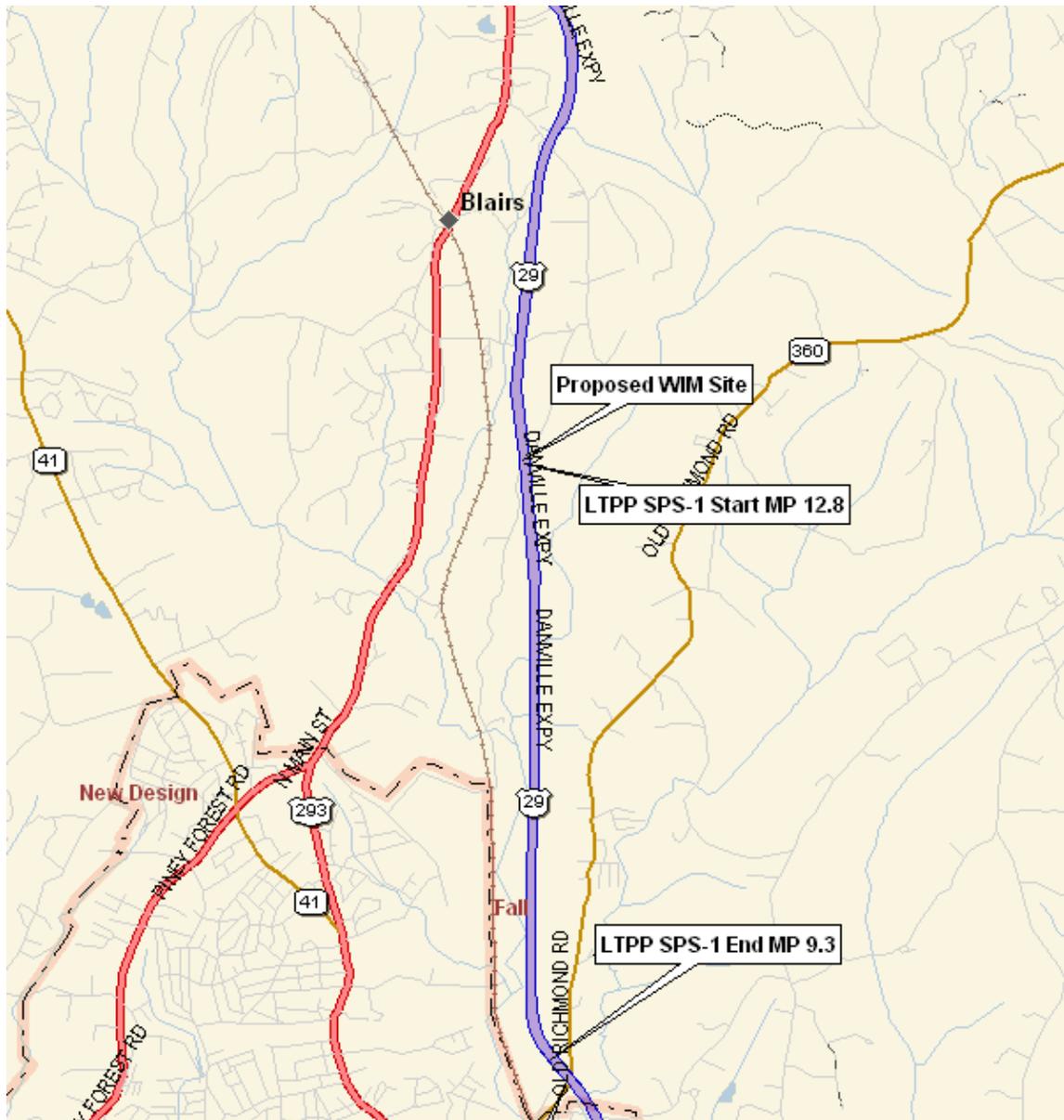


Figure 9: Map of US-29 WIM Site at Milepost 12.8

The LTPP SPS-1 test sections, approximately 160 miles from Richmond, are located in the southbound outside lane of US-29 between mileposts 9.3 and 12.8, just north of US-360 near the town of Danville.

The proposed site for the WIM system installation is located at milepost 12.8, 200 feet north of the first test section in the SPS-1 experiment, with scales to be installed in the SB outside lane. The controller cabinet and solar power array from the abandoned traffic data collection system is still present and is located 500 feet north of the proposed site.

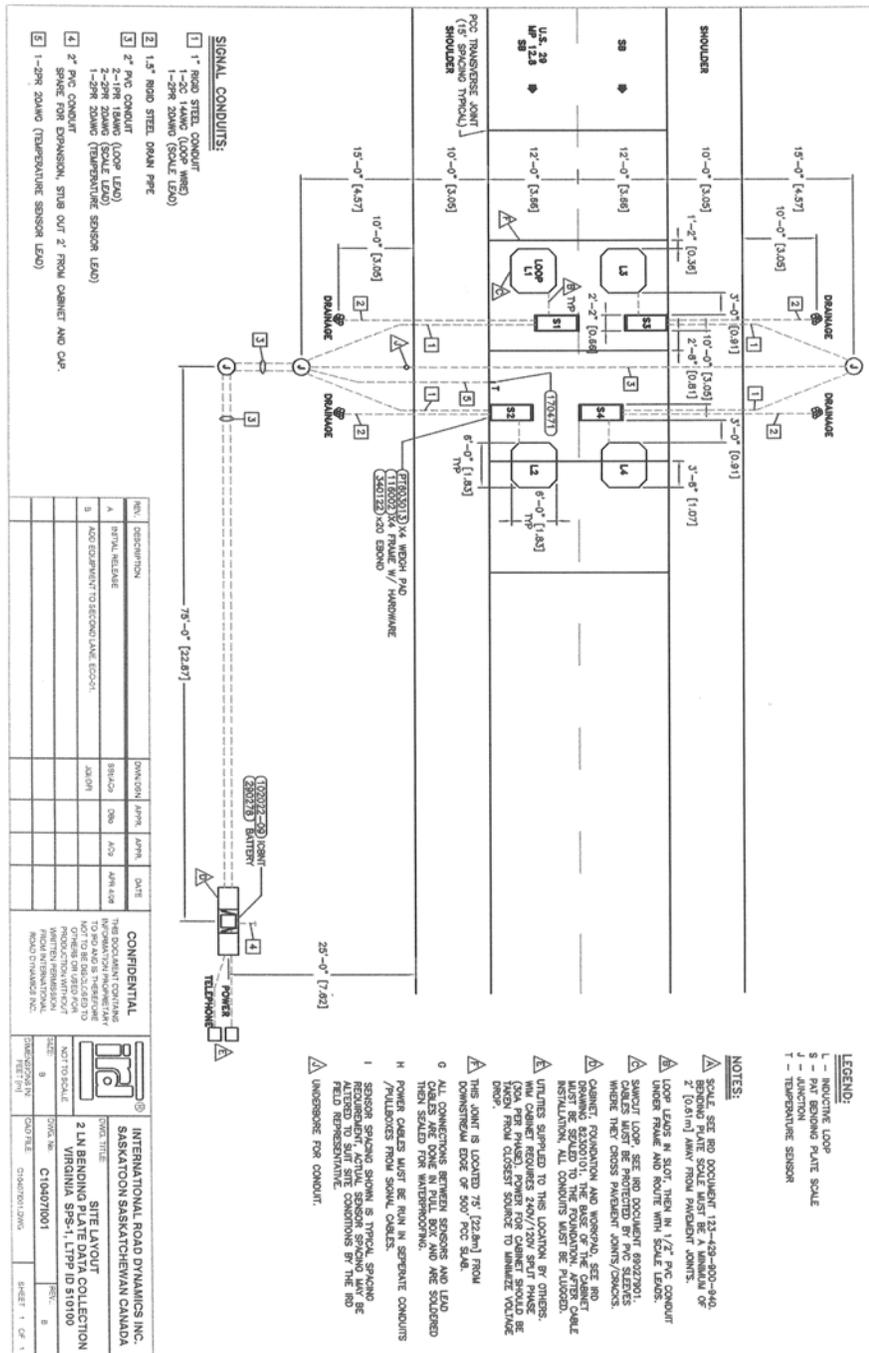
5.0 RECOMMENDED WIM TECHNOLOGY

Based upon the site conditions and discussions with the State, the bending plate technology is recommended for use at this site. It will fit the performance expectations of the State, and accommodate installation and future maintenance that fit into VDOT's lane closure plans.

Kistler was ruled out as a result of past experiences that VDOT has had with similar sensor technology.

Single Load Cell was ruled out due to installation restrictions caused by the continuous reinforcing within the proposed PCC slab.

5.1 RECOMMENDED LOCATION AND LAYOUT FOR THE WIM SYSTEM



Proposed WIM location
 N 36°39'36"
 W 079°21'56"

A.0 COORDINATION DETAILS

Task Order #16, which authorized the CLIN 2001 “Determine Acceptability of Proposed Site” for the Virginia SPS-1 Site (LTPP ID 510100), was issued on November 13, 2006. This Site Acceptability Assessment was a follow up to our original visit dated January 24, 2005.

Contacts were made with interested parties as follows:

- Contracting Officer’s Technical Representative (COTR)
 - Debbie Walker – FHWA-LTPP ph: 202-493-3068
- State Highway Agency (SHA)
 - Richard Bush – SHA/VDOT ph: 804-786-7006
 - Tom Schinkel – SHA/VDOT
- LTPP Regional Support Contractor (RSC)
 - Basel Abukhater – RSC/Stantec ph: 716-632-0804
- FHWA Division Office
Lorenzo Casanova
 - Lorenzo Casanova– FHWA Div Rep ph: 804-775-3362



INTERNATIONAL ROAD DYNAMICS INC.

LTPP SPS PHASE II

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

VIRGINIA SPS-1
LTPP ID 510100

Date: September 15, 2006



CONTRACT NO. DTFH61-05-D-00001



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B.0 PRE-VISIT HANDOUT GUIDE

B.1 SCHEDULE

- a. Briefing session
 - i. Meeting is scheduled for 8:00 a.m. on October 9, 2006, on-site at SPS-1, Danville located on US-29 Milepost 12.8
- b. Site visit
 - i. October 9, 2006

B.2 POINTS OF CONTACT, PHONE NO.S

- a. Contracting Officer's Technical Representative (COTR)
 - i. Debbie Walker – FHWA-LTPP ph: 202-493-3068
- b. State Highway Agency (SHA)
 - i. Tom Winkelman – SHA/IDOT ph: 804-786-7006
 - ii. Ramon Taylor – SHA/IDOT
- c. LTPP Regional Support Contractor (RSC)
 - i. Basel Abukhater – RSC/Stantec ph: 716-632-0804
- d. FHWA Division Office
 - i. Pal Choudry – FHWA Div Rep ph: 217-492-4637

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
- 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-29 Mile Post 12.8 SB Outside Lane
- b. Briefing session location
 - i. On-site at proposed WIM location
- c. Nearest major airport
 - i. Richmond International Airport

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



INTERNATIONAL ROAD DYNAMICS INC.

LTPP SPS PHASE II

WEIGH-IN-MOTION SITE ACCEPTABILITY

SITE VISIT EVALUATION FORM

**VIRGINIA SPS-1
LTPP ID 510100**

Date of Site Visit: October 9, 2006



CONTRACT NO. DTFH61-05-D-00001



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C.0 SITE EVALUATION FORM

- 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
- Other required equipment _____

C.1 PROPOSED WIM LOCATION

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

Route US 29 Mile Post 12.8 Direction SB Lane Driving

Proximity to applicable SPS test section 200 feet upstream of SPS-1 Test Section (510100)

C.1.1 EXISTING ROADWAY SURROUNDING THE PROPOSED WIM SITE

Type Pavement CRCP

Lane Width 14 feet Thickness 12 inches

Observed Structural Soundness Good

Observed Smoothness Good

Outside SB Shoulder Type Asphalt Width 10 feet

Outside SB Shoulder Condition Good

Inside SB Shoulder Type Asphalt Width 4 feet

Inside SB Shoulder Condition Good

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

Type CRCP Structural Soundness Good, New Roadway
Smoothness Blanket grinding complete

Thickness 12 inches Jointed or Continuous Continuous

Notes/Comments on Pavement

New CRCP pavement was installed in August 2006 in both southbound lanes, 325 ft. prior and 75 ft. following WIM scale location. Blanket grinding and road profile data was completed on October 9, 2006.

C.1.3 ROADWAY GEOMETRICS

Horizontal Alignment No curves immediately before or after WIM

Grade Uphill grade which levels out 800 feet upstream of proposed WIM location

Cross-slope 2% Lane width 14 feet

C.1.4 OBSERVED TRAFFIC OPERATING CHARACTERISTICS

Passing, merging, not following lane lines? None - Good Lane Discipline

Stop and go traffic, congestion periods? None - Free Flowing at all Times

Traffic signals or interchanges affecting traffic flow? None – nearest exit two miles away

Other adverse traffic flow conditions? None

Truck traffic at “cruising” speed and no lugging? No Lugging noticed during site inspection

Truck traffic staying within lane lines? Yes, site located on a straight away

Observed truck suspension or body motion dynamics? No visible body motion after grinding

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

Truck traffic on/off locations between WIM site and SPS site? None

Notes/Comments on Geometrics and/or Traffic Operating Characteristics

The proposed WIM location is on a flat, level area at the top of a rise. Trucks are not lugging as they approach the proposed WIM location. The proposed WIM location is approximately 200 feet in advance of the SPS-1 Test Section. SR 695 overpass runs over the roadway just upstream of the proposed WIM site. There is no access to SR 695 from US-29.

C.1.5 ACCESS TO UTILITY SERVICES

Potential source(s) for power Existing – 475 feet upstream of proposed WIM location

Potential source(s) for telephone Existing – 475 feet away from proposed WIM location

C.1.6 EQUIPMENT INSTALLATION CAPABILITY

Adequate location for controller cabinet? Yes, approximately 100 feet from WIM sensors behind existing guard rail on southbound drive lane shoulder

Distance from edge of traveled way to cabinet 25 feet Off Roadway, 75 feet downstream of WIM

Visibility from cabinet of sensors and approaching vehicles? Very Good

Adequate location for service facilities? Yes

Adequate drainage for scale pits? Yes

Adequate roadway and overall site drainage? Yes

Potential for ponding or flooding at cabinet or pullboxes? None

Potential for traffic control problems during installation? None

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

None, everything checks out on equipment installation capability.

C.1.7 POTENTIAL WIM SENSOR/EQUIPMENT INTERFERENCE SOURCES

Overhead power lines? None Adjacent railroad? None

Note: there is an overpass 100 ft upstream of proposed WIM location. This will not interfere with the installation

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

Direction NB - Nearest usable truck turnaround location:

Exit VA726 Distance from WIM 2.4 Miles

Direction SB - Nearest usable truck turnaround location:

Exit 41 to 360 Halifax Distance from WIM 3.5 Miles

Circuit travel distance 12.8 Miles Estimated lap time 15 Minutes

Potential circuit route restrictions? None, very good access

Identification and location of Truck Firm and certified static scales:

Name Thomson Trucking Inc. Contact Jeff Foust

Address 200 Quarry Access Rd. Danville, VA 24541

Phone 434-799-6743 Hours 8:00 am – 5:00 pm

Cost per initial weighing \$8.00 Cost per additional weighing \$2.00

Notes/Comments on Test Truck Circuit and Static Weighing Facility

CAT Scale, Pilot Travel Center , Hwy 58 & Hwy 59 Danville, VA

D.0 SHEET 17

Sheet 17	*STATE_CODE	LTPP
LTPP Traffic Data	*SPS PROJECT ID	510100
WIM SITE INVENTORY	*SPS WIM ID	SPS-1

1.* ROUTE MILEPOST LTPP DIRECTION - N S E W

2.* WIM SITE DESCRIPTION - Grade % Sag vertical Y / N
 Nearest SPS section upstream of the site
 Distance from sensor to nearest upstream SPS Section ft

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

4.* PAVEMENT TYPE

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

Form completed by Date

E.0 PHOTOGRAPHS

E.1.1 SPS TEST SECTION MARKER



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



E.1.3 FACING DOWNSTREAM 600 FEET IN ADVANCE OF WIM SCALE LOCATION



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



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



E.1.6 WIM PAVEMENT, FACING DOWNSTREAM 100 FEET IN ADVANCE OF SCALES



E.1.7 FACING UPSTREAM 200 FT. FROM RECOMMENDED SCALES LOCATION



E.1.8 RECOMMENDED WIM SENSOR LOCATION



E.1.9 RECOMMENDED CABINET LOCATION



WIM Cabinet

2006/10/09