User Guide

Ride Quality

August 2018

Revision History

The revision history identifies the version number, the date the change became effective, a brief description of the change, all sections impacted by the change, and the required review / approval. The revision history table (below) captures each change made to this document.

Version	Effective Date	Brief Description of Change	Affected Section(s)	Prepared By	Reviewed By	Approved By
1.0	3/29/18	Initial Release		Babar Khan		
1.1	5/10/18	Updated based on feedback from TxDOT	All	Babar Khan		
1.2	5/15/18	Updated based on feedback from Todd Copenhaver; Magdy Mikhail; Jeff Howdeshell	2.2.2; 2.2.3; Appendix A and B; Definitions, Acronyms, and Abbreviations	Babar Khan		
1.3	5/17/18	Updated based on feedback from Todd Copenhaver; Magdy Mikhail	2.2.2; 2.2.3; Appendix A	Babar Khan	Magdy Mikhail	Magdy Mikhail
1.4	8/01/2018	Added section 2.1 Browser Compatibility Section	2.1	Babar Khan		
1.5	8/02/2018	Made format changes based on feedback from Ann Zeeck	Header and footer	Babar Khan		

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1 Introduction

The Ride Quality (RideQC) web application is used to analyze inertial profiler data collected on TxDOT highways after construction is completed, or after the base layer is finished.

Prior to invoking these Ride Quality Specifications, the user should read the Guidance Document from the Construction Division to determine the proper pay schedule for the type of construction work to be done. The user should also read the specification and the associated Test Method Tex-1001-S.

The contractor is responsible for delivering profile data files that conform to the file format specified in Test Method Tex-1001-S. The contractor must also deliver a table indicating filenames and pavement locations for each file. These data files will be used as input to the RideQC web application. Output of the RideQC web application will provide the International Roughness Indexes (IRI's) for every 0.1 mile section of the paving operation along with the associated bonus or penalty payments. The web application will locate any areas of localized roughness (bumps or dips) on the pavement's surface which will have penalties associated with them if the user has selected a penalty other than $0.00.

2 Functionality

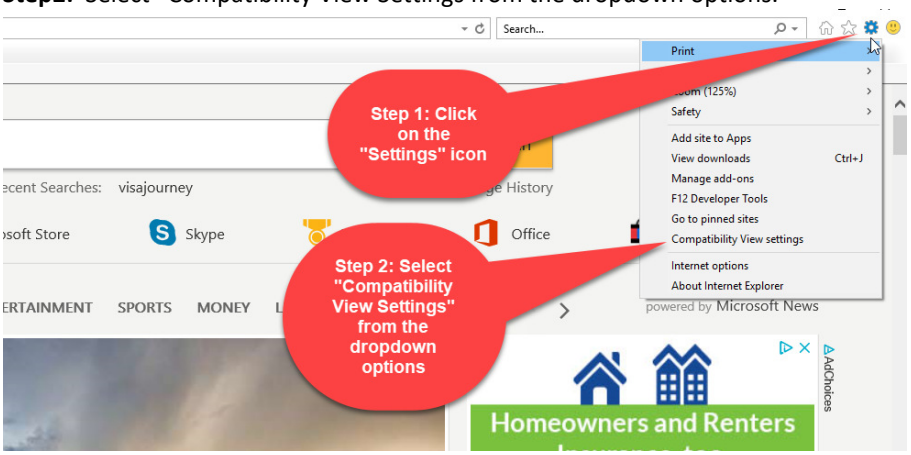
2.1 Brower Compatibility

Google Chrome is the recommended web brower to access Ride Quality Web Application.

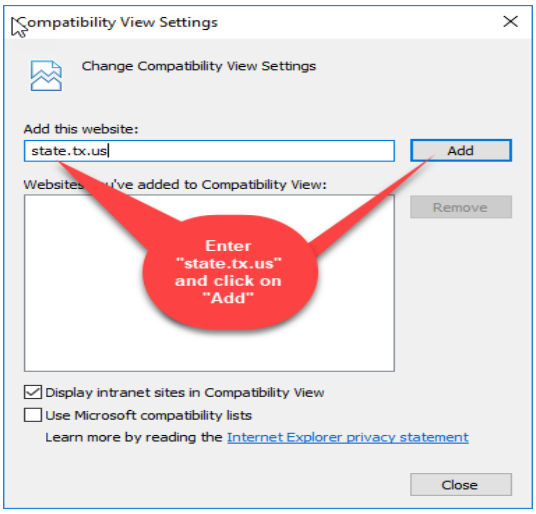
The Internet Explorer (IE) 11 web browser can be used on the user's computer with setting updates. (The Ride Quality Web Application is not supported on any other web browser.) When using IE 11, prior to accessing Ride Quality Web Application, the user must update "Compatibility View Settings" by entering the value "state.tx.us" in IE 11 settings window. This step will ensure no error message is received while accessing the application.

Instructions to update "Compatibility View Settings":

Step1: Open IE 11 and click on the "settings" icon.
Step2: Select "Compatibility View Settings from the dropdown options.

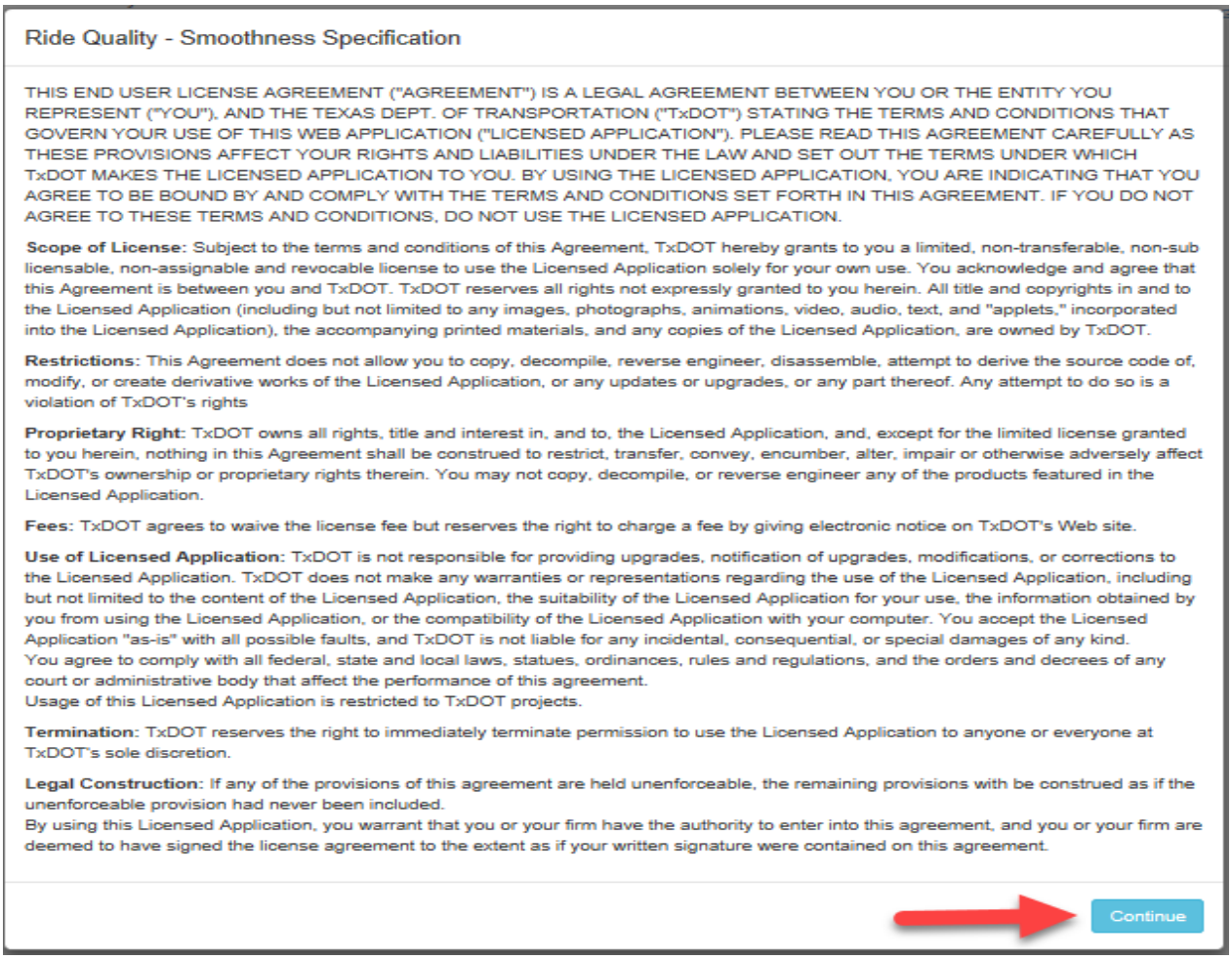


Step 3: Enter "state.tx.us" in the add this website section and click "add".
Step 4: Close the window.



2.2 Accessing Ride Quality Web Application

The Ride Quality Launch page is available at the following URL: http://204.64.21.185/RideQC. No authentication is needed to access the application. When you browse to Ride Quality Launch page, the Disclaimer Page will be displayed:



Ride Quality - Smoothness Specification

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Continue

Figure 1: Disclaimer Page

Click on the **"Continue"** button to access **Ride Quality Input Page**.

2.3 Ride Quality Input Page

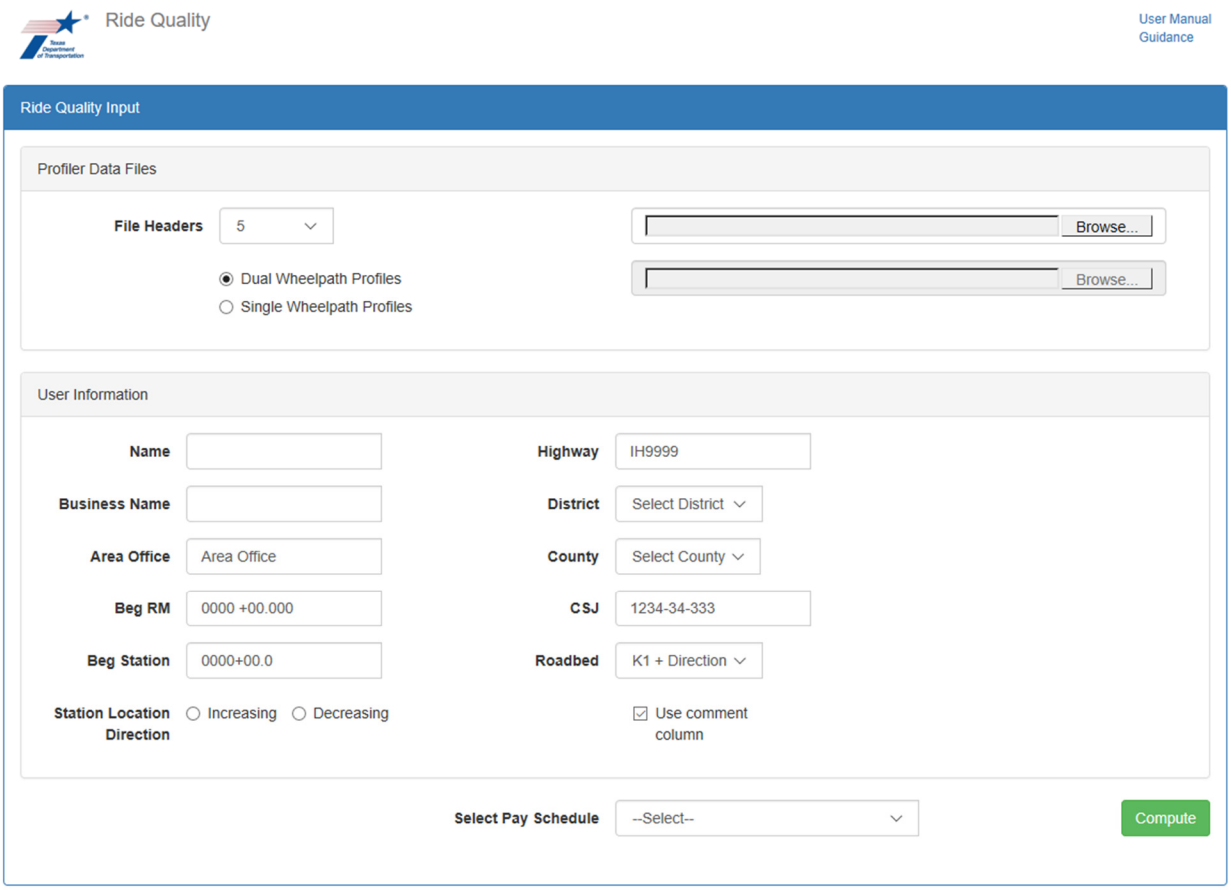
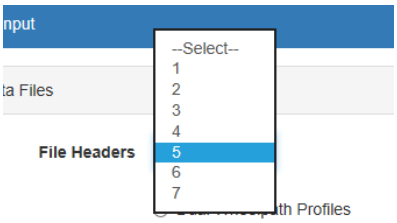


Figure 2: Ride Quality Input Page

What you see when you click the “Continue” button.

2.3.1 Profiler Data Files Section

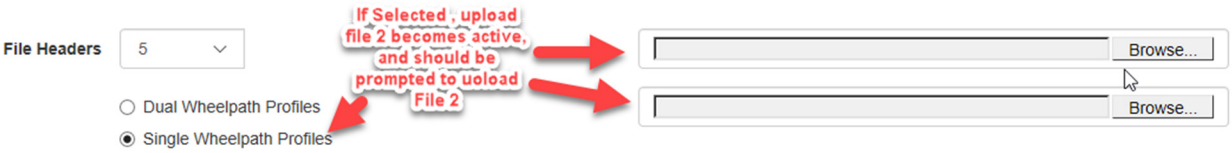
1: File Headers: Drop down box displays values 1 through 7, If user selects 6 or 7 the system displays the following message in a dialogue box "This value is normally set to 5. Five lines is the standard number of lines in a profile dataset."



2: Dual Wheelpath Profiles: For data files to be processed with both left and right wheel paths in the same file select the Dual Wheelpath Profiles option (this is already set as the default). If selected, browse 2 becomes inactive.

3: Single Wheelpath Profiles: To load data files containing only one wheel path per file, select the Single Wheelpath Profiles option. If Selected, browse 2 becomes active, and should be prompted to upload File 2. Then select a file for each wheel path for a total of two files showing. The first file should correspond to the left wheel path, and the second file the right wheel path.

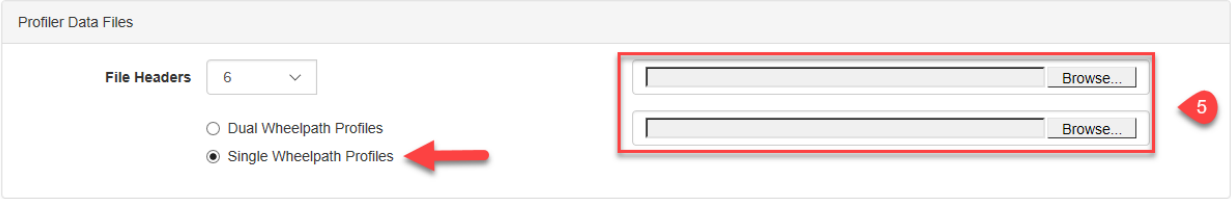
Notes: Ensure both left and right profile files are specified before computing



4: Browse 1: User can only upload a .PRO file as the input. If any other file/format is input by the user the system will generate an error message. The input file will populate the user information fields extracted from the input file. Notes: Business Name will be a manually entered field and is not a part of the input file.

5: Browse 1 & 2: User can only upload a .PRO file as the input. If any other file/format is input by the user the system will generate an error message. The input file will populate the user information fields extracted from the input file. This field is inactive unless "Single WheelPath profiles" is selected. This populates the user Information fields that are extracted from the input file. All fields are required.

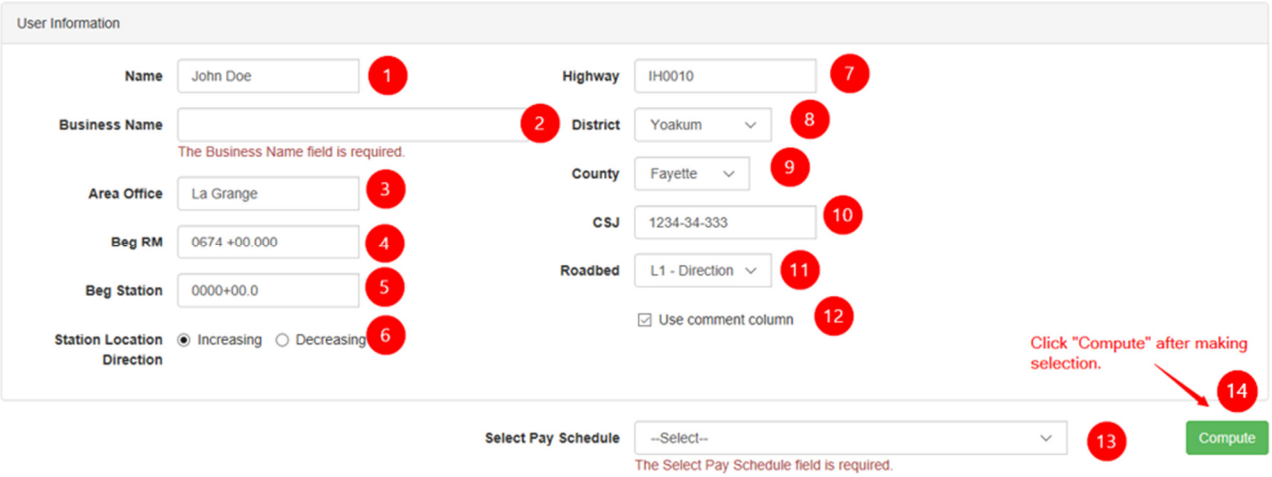
Note: Business Name will be a manually entered field and is not a part of the input file



After the file is selected the data file is scanned for the required header information and a prompt appears to update the user information area.

2.3.2 User Information Section

The user must manually set those fields which are not in the data file header including Beg Station, CSJ, Name, Area Office, and Phone. If a Beg Station is inserted it must be in the format shown. All fields are mandatory.



1: Name: The name of the operator who ran the profile in the field. Populated from the header of the input file, editable field, mandatory, and cannot be left blank.

2: Business Name: This will be a manually entered field and is not a part of the input file. This field is editable, mandatory, and cannot be left blank.

3: Area Office: Editable field,mandatory, and cannot be left blank.

4: **Beg RM:** Editable field, mandatory, and cannont be left blank.

5: Beg Station: The Beg Station field sets the first station number and it may happen that if a Decreasing direction is selected the program may flag an error during processing that negative station locations are being created. To correct this either set the Beg Station field to a higher value or change the direction. Editable field, mandatory, and cannot be left blank.

6: Station Location Direction: Increasing/Decreasing – Select either/or. Mandatory.

7: Highway: Must be in PMIS format of 2 letters followed by 4 numbers like **IH0010** with no spaces.Editable field, mandatory, and cannot be left blank.

8: District: Dropdown list of all the districts in Texas, editable field, mandatory, and cannot be left blank.

9: County: List of counties based on the district selected. Editable field, mandatory, and cannot be left blank.

10: CSJ: Editable field, not mandatory, report will be computed. CSJ information must be correct/ accurate to load the Ride Quality report into Site Manager.

11: RoadBed +Direction: Drop down contains the following (K1-K9,K0,R1-R5,L1-L5,A1-A3,X1-X3), editable field, mandatory.

12: Use Comment Column: Checked marked by 'default' when an end user opens the Ride Quality web app. If comment column is left "unchecked" the ride quality results will not take into account any sections which have been marked as "leave-outs" and this will cause a difference in the calculations.

13: Select Pay Schedule: Drop down contains the following five items:

Spec 585 - Schedule 1 -$500/bump

Spec 585 - Schedule 2 - $250/bump

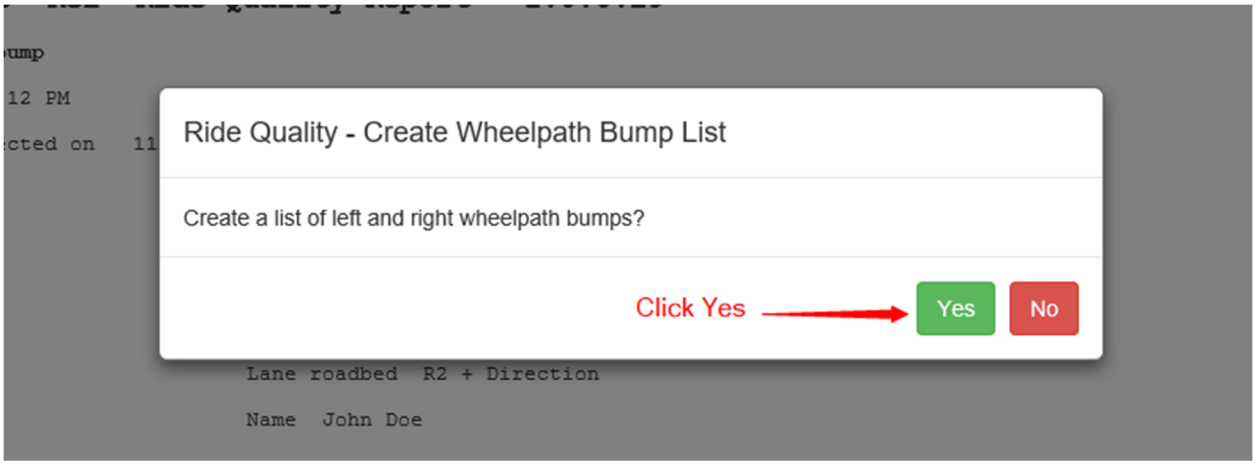
Spec 585 - Schedule 3 - no bump fine

Item 247 - 2014 Spec

SS 3012

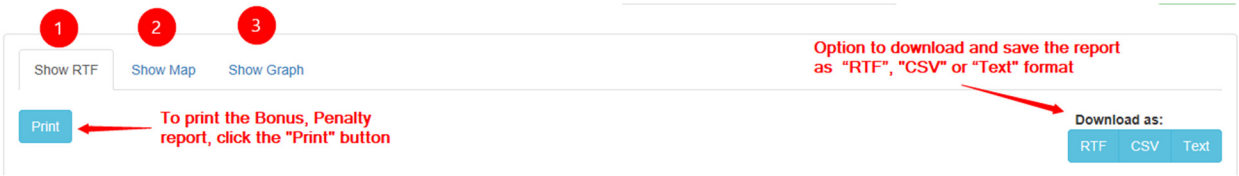
Editable field, mandatory. This dropdown option can be selected at any point in time either before of after file upload. However, you cannot compute the entries until this item is selected. A full discussion of each pay schedule is given in Appendix A -page 15 of this document.

14: "**Compute" Button:** After completing the user information section, the user can click the "Compute" button. After a few seconds of initial processing the user is prompted about creating a list of left and/or right wheelpath bumps. Clicking either button resumes the data processing and the results will appear in the Show RTF tab that will be displayed in a new frame on the existing web page.



2.3.3 Report Generation: Bonus/Penalty Report

A similar RTF format of the Bonus/Penalty report will be produced. The report will provide the user options to navigate between Show RTF, Show Map, and Show Graph tabs. The report will also provide options to Download and Print.



1: Show RTF: The report is divided into four sections (see the complete sample report generated from the sample data file in Appendix B).

- **Header Section** displays the information about the data collected and location information:

```
Ride Quality Analysis  Rel  Ride Quality Report - 1.0.0.30
Spec 585 - Schedule 1 -$500/bump
Report run on  5/9/2018 8:03:10 PM
Input profile data file collected on   05/31/2017

District  Paris(01)                          Highway  SH0056W
Area Office  Grayson                         Beg RM  0000 +00.000
County   Grayson(092)                        Beg Station 0000+00.0
CSJ  1234-34-333                             Lane roadbed  K6 - Direction
Business Name  ABC Company                   Name  John Doe
Comment:  33.640911,-96.584625,781,255,31
Comment:  SH 11 GRAYSON CO. Start : 0.0000 feet , End : 15010.4167 feet
Input file:  graysoncutathugebump.pro
```

- **Penalty Section and Road Summary -** Where pay schedule and penalties are summarized.

```
Bump penalty fine -$500 each one.
Bumps tagged if greater or equal to 0.1505 inches.
Bonus paid for average IRI values of  30($600) to 60($0)
Penalty assessed for average IRIs of  65($0) to 95(-$600)
Bonus paid in sections with bump

Profile Length(Miles)  0.932    Length(Station Units)    49+21.7ft
```

- **Bump Section** - Lists bumps and/or dips found in the section by distance and station number. These areas should be examined in conjunction with the ride section to evaluate where corrective work is required.

[From the starting point in miles] [Station Location in feet offset from the start location] [Any areas of localized roughness (bumps or dips) on the pavement's surface] [Bump width] [Bump Height] [Penalty per bump/dip]

Distance	Station	Type	Width(feet)	Elev(inches)	Penalty
00.0703	3+71.4	Dip	8.8	-.18	-$ 500
00.0723	3+81.5	Dip	.1	-.15	-$ 500
00.0782	4+12.9	Dip	.1	-.15	-$ 500
00.0818	4+32.2	Bump	.1	.15	-$ 500
00.1683	8+88.6	Bump	10.8	.36	-$ 500
00.1704	8+99.8	Dip	2.3	-.75	-$ 500
00.1724	9+10.2	Dip	17.7	-.34	-$ 500
00.2939	15+51.9	Bump	.8	.16	-$ 500
00.6066	32+02.9	Dip	1.9	-.18	-$ 500
00.6124	32+33.7	Bump	26.8	.23	-$ 500
00.6203	32+75.4	Dip	1.5	-.16	-$ 500

```
Bumps/dips detected  11                    Bump Fines  -$ 5500
*Notes: Bumps closer than 5 feet are not shown or counted.
Bump widths shown are not a true indication of the actual bump width but rather
the portion of the bump equal to or exceeding 0.1505 inches from the moving average of the
profile.
Bumps not calculated on margins of profile where filtering is tapered on and off.

00.0000     0+00.0 *** Leave Out Start
00.0514     2+71.5 *** Leave Out End Total Leave Out = 271.5ft
```

- **Ride Section** - Is a tenth mile summary of the ride quality over the section. The column headings show the Distance from the starting point in miles, Station location (in feet), PSI (Present Serviceability Index) number, IRI (International Roughness Index) (L) and IRI (R) representing left and right IRI), Average IRI, Pay * Section Length where pay is the bonus or penalty on a sliding scale based upon the average IRI value times the section length (0.1 miles), and total Pay. If the Use comment column option was selected leave-outs may appear in the section where the comment column code is not zero. In areas where the average IRI exceeds the allowable a "Corrective Work" message appears and no bonus or penalty is assigned.

[From the starting point in miles]
[Station location in feet offset from the start location]
[Present Serviceability Index]
[Left - inches per mile]
[Right - inches per mile]
[Average IRI]
Pay * section length where pay is the bonus or penalty on a sliding scale based upon the average IRI value times the section length (0.1 miles)
Total Pay

Distance	Station	PSI	IRI(L)	IRI(R)	Avg IRI	Pay*SectLen	Pay
00.1000	5+28.0	3.25	105.93	142.32	124.00	-$ Corrective Work	
00.2000	10+56.0	3.04	97.34	179.25	138.00	-$ Corrective Work	
00.3000	15+84.0	3.92	78.66	94.48	87.00	-$440*(0.1000/0.10)	-$ 440
00.4000	21+12.0	3.97	87.38	80.13	84.00	-$380*(0.1000/0.10)	-$ 380
00.5000	26+40.0	3.65	104.66	97.02	101.00	-$ Corrective Work	
00.6000	31+68.0	3.58	102.60	106.21	104.00	-$ Corrective Work	
00.7000	36+96.0	3.43	104.68	121.47	113.00	-$ Corrective Work	
00.7598	40+11.7	4.25	70.98	70.61	71.00	-$120*(0.0598/0.10)	-$ 72
						Pay Adjustment Subtotal	-$ 892

00.7598 40+11.8 *** Leave Out Start
00.8320 43+93.1 *** Leave Out End Total Leave Out = 381.3ft

Distance	Station	PSI	IRI(L)	IRI(R)	Avg IRI	Pay*SectLen	Pay
00.9000	47+52.0	4.71	56.05	48.47	52.00	$160*(0.0680/0.10)	$ 109
00.9321	49+21.5	4.58	58.20	56.28	57.00	$ 60*(0.0321/0.10)	$ 19
						Pay Adjustment Subtotal	-$ 764

Ave Left IRI 89.8 Ave Right IRI 104.0 Ave IRI 96.9
Total IRI adjustments -$ 1656
Total Bump adjustments -$ 5500
Total adjustments -$ 7156
Bumps/dips for each wheelpath: no penalties assigned.
Left Wheelpath

Distance	Station	Type	Width(feet)	Elev(inches)
00.0707	3+73.5	Dip	2.3	-.17
00.0723	3+81.8	Dip	1.3	-.16
00.0756	3+99.3	Dip	.9	-.16
00.0823	4+34.4	Bump	17.7	.21
00.1632	8+61.8	Bump	1.3	.16
00.1688	8+91.2	Bump	7.6	.25
00.1719	9+07.5	Dip	1.3	-.23

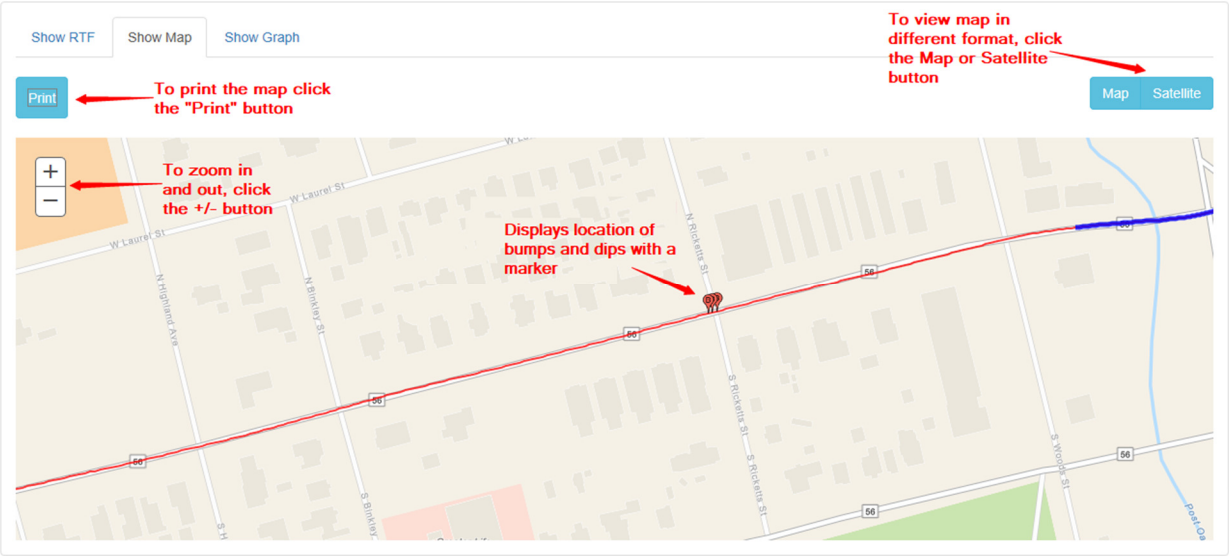
Bumps/dips for each wheelpath: no penalties assigned.
Right Wheelpath

Distance	Station	Type	Width(feet)	Elev(inches)
00.0701	3+69.9	Dip	9.8	-.20
00.0722	3+81.4	Dip	.2	-.15
00.0777	4+10.0	Dip	.1	-.15
00.0818	4+31.8	Bump	18.1	.28
00.1513	7+98.7	Dip	.6	-.16
00.1637	8+64.3	Bump	.3	.15
00.1656	8+74.3	Dip	.6	-.15

2: Show Map

Show map displays the location of the bumps and dips with a marker. Placing the mouse cursor over any point on the map will show information at that point.

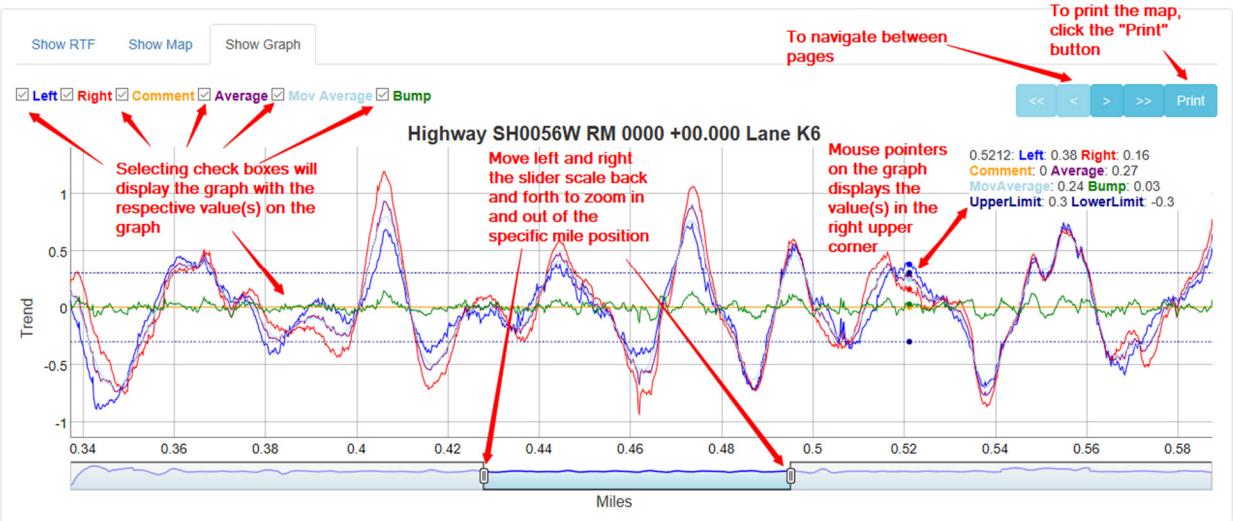
- Map View



- Satellite View

3: Show Graph:

Graphical display of the profiles including bumps and dips. To view the graph, click on the “Show Graph” tab on the web page. Each profile is displayed as recorded, as well as derived profiles. Bumps are shown as the residual derived profile. Users can choose an area of interest with a draggable slider scale at the bottom of the graph. Scroll controls at the upper right allow setting the amount of the profile to view as well as the location.



Appendix A: Pay Schedule Comparison

General Rules for All Specifications

If bump penalties are omitted so are IRI bonuses. Schedule 3 is the only schedule which does not penalize for poor ride scores. Schedules 1 and 2 penalize for poor ride scores and when the max IRI is exceeded "Corrective Action" is indicated.

For Item 585 the bump/dip penalties are decided by the pay schedule used

Schedule	Bump Penalty Amount	Bump Gap Value (ft)	Bonus paid in sections containing bumps	Penalty for high IRI's	Corrective work flagged
585 - Schedule 1	$500	5	YES	YES	YES
585 - Schedule 2	$250	5	YES	YES	YES
585 - Schedule 3	$0	5	NO	NO	NO
Item 247 – 2014 Spec	$0	5	NO	NO	YES
SS 3012	$704	5	YES	YES	YES

Appendix B: Sample Report

Ride Quality Analysis Rel Ride Quality Report - 1.0.0.30

Spec 585 - Schedule 1 -$500/bump
Report run on 5/9/2018 1:19:46 AM
Input profile data file collected on 11/03/2015

District Yoakum(13) Highway IH0010
Area Office La Grange Beg RM 0674 +00.000
County Fayette(076) Beg Station 0000+00.0
CSJ 1234-34-333 Lane roadbed L1 - Direction
Business Name ABC Company Name John Doe
Comment: 29.693297,-96.902530,395,80,66
Comment: WinDTProj2015.08.31 C:\VAMOS\DATAFILES\Dist13\Cty000\IH0010_R1_20151103_1440.pro
Input file: Dual_Wheel_Decreasing.pro

Bump penalty fine -$500 each one.
Bumps tagged if greater or equal to 0.1505 inches.
Bonus paid for average IRI values of 30($600) to 60($0)
Penalty assessed for average IRIs of 65($0) to 95(-$600)
Bonus paid in sections with bump

Profile Length(Miles) 14.130 Length(Station Units) 746+07.5ft

Distance	Station	Type	Width(feet)	Elev(inches)	Penalty
00.0047	0+25.0	Dip	4.2	-.46	-$ 500
00.0081	0+42.7	Bump	2.2	.18	-$ 500
01.0330	54+54.5	Bump	2.8	.18	-$ 500
02.9986	158+32.5	Dip	.3	-.16	-$ 500
03.6848	194+55.7	Dip	.3	-.17	-$ 500
06.3918	337+48.7	Dip	.7	-.15	-$ 500
07.2054	380+44.7	Dip	6.5	-.17	-$ 500
09.3643	494+43.3	Bump	.5	.16	-$ 500
11.0762	584+82.2	Dip	1.8	-.19	-$ 500
12.3600	652+60.7	Dip	1.5	-.18	-$ 500
13.9487	736+49.3	Dip	1.7	-.17	-$ 500
14.0932	744+12.2	Bump	2.3	.18	-$ 500
14.0950	744+21.5	Dip	4.3	-.18	-$ 500
14.0984	744+39.3	Bump	3.3	.24	-$ 500
14.1006	744+51.2	Dip	2.7	-.17	-$ 500

Bumps/dips detected 15 Bump Fines -$ 7500
***Notes: Bumps closer than 5 feet are not shown or counted.**
Bump widths shown are not a true indication of the actual bump width but rather
the portion of the bump equal to or exceeding 0.1505 inches from the moving average of the profile.
Bumps not calculated on margins of profile where filtering is tapered on and off.

Distance	Station	PSI	IRI(L)	IRI(R)	Avg IRI	Pay*SectLen	Pay

00.1000	5+28.0	3.72	108.33	85.25	97.00	-$	Corrective Work
00.1325	6+99.6	4.38	78.78	51.44	65.00	$ 0*(0.0325/0.10)	$ 0

Pay Adjustment Subtotal $ 0

00.1325 6+99.8 * Leave Out Start**

00.2273 12+00.0 * Leave Out End Total Leave Out = 500.2ft**

Distance	Station	PSI	IRI(L)	IRI(R)	Avg IRI	Pay*SectLen	Pay
00.3000	15+84.0	4.68	62.46	44.71	54.00	$120*(0.0727/0.10)	$ 87
00.4000	21+12.0	4.68	61.59	45.85	54.00	$120*(0.1000/0.10)	$ 120
00.5000	26+40.0	4.73	54.10	47.41	51.00	$180*(0.1000/0.10)	$ 180
00.6000	31+68.0	4.78	50.62	42.75	47.00	$260*(0.1000/0.10)	$ 260
00.7000	36+96.0	4.71	54.16	49.62	52.00	$160*(0.1000/0.10)	$ 160
00.8000	42+24.0	4.44	71.58	54.43	63.00	$ 0*(0.1000/0.10)	$ 0
00.9000	47+52.0	4.81	43.05	44.87	44.00	$320*(0.1000/0.10)	$ 320
01.0000	52+80.0	4.50	61.43	59.02	60.00	$ 0*(0.1000/0.10)	$ 0
01.1000	58+08.0	4.38	64.42	66.58	65.00	$ 0*(0.1000/0.10)	$ 0
01.2000	63+36.0	4.75	51.26	46.38	49.00	$220*(0.1000/0.10)	$ 220
01.3000	68+64.0	4.67	54.36	53.34	54.00	$120*(0.1000/0.10)	$ 120
01.4000	73+92.0	4.68	54.57	52.64	54.00	$120*(0.1000/0.10)	$ 120
01.5000	79+20.0	4.77	53.19	40.71	47.00	$260*(0.1000/0.10)	$ 260
01.6000	84+48.0	4.71	56.41	47.97	52.00	$160*(0.1000/0.10)	$ 160
01.7000	89+76.0	4.78	47.88	45.03	46.00	$280*(0.1000/0.10)	$ 280
01.8000	95+04.0	4.55	58.61	58.40	59.00	$ 20*(0.1000/0.10)	$ 20
01.9000	100+32.0	4.70	52.01	53.31	53.00	$140*(0.1000/0.10)	$ 140
02.0000	105+60.0	4.80	51.54	37.91	45.00	$300*(0.1000/0.10)	$ 300
02.1000	110+88.0	4.72	57.61	44.26	51.00	$180*(0.1000/0.10)	$ 180
02.2000	116+16.0	4.62	58.67	53.24	56.00	$ 80*(0.1000/0.10)	$ 80
02.3000	121+44.0	4.73	55.40	45.73	51.00	$180*(0.1000/0.10)	$ 180
02.4000	126+72.0	4.83	47.16	38.05	43.00	$340*(0.1000/0.10)	$ 340
02.5000	132+00.0	4.78	49.94	43.00	46.00	$280*(0.1000/0.10)	$ 280
02.6000	137+28.0	4.80	49.55	40.79	45.00	$300*(0.1000/0.10)	$ 300
02.7000	142+56.0	4.46	69.83	54.54	62.00	$ 0*(0.1000/0.10)	$ 0
02.8000	147+84.0	4.77	46.28	48.12	47.00	$260*(0.1000/0.10)	$ 260
02.9000	153+12.0	4.75	50.93	46.46	49.00	$220*(0.1000/0.10)	$ 220
03.0000	158+40.0	4.43	66.66	60.03	63.00	$ 0*(0.1000/0.10)	$ 0
03.1000	163+68.0	4.73	51.21	49.94	51.00	$180*(0.1000/0.10)	$ 180
03.2000	168+96.0	4.47	57.54	65.62	62.00	$ 0*(0.1000/0.10)	$ 0
03.3000	174+24.0	4.38	65.16	65.75	65.00	$ 0*(0.1000/0.10)	$ 0
03.4000	179+52.0	4.82	46.46	41.09	44.00	$320*(0.1000/0.10)	$ 320
03.5000	184+80.0	4.80	51.69	38.17	45.00	$300*(0.1000/0.10)	$ 300
03.6000	190+08.0	4.81	48.59	39.58	44.00	$320*(0.1000/0.10)	$ 320
03.7000	195+36.0	4.68	58.77	48.20	53.00	$140*(0.1000/0.10)	$ 140
03.8000	200+64.0	4.72	57.55	44.52	51.00	$180*(0.1000/0.10)	$ 180
03.9000	205+92.0	4.79	51.48	39.28	45.00	$300*(0.1000/0.10)	$ 300
04.0000	211+20.0	4.79	50.50	40.90	46.00	$280*(0.1000/0.10)	$ 280
04.1000	216+48.0	4.86	47.48	34.30	41.00	$380*(0.1000/0.10)	$ 380
04.2000	221+76.0	4.85	45.88	37.14	42.00	$360*(0.1000/0.10)	$ 360
04.3000	227+04.0	4.78	47.32	45.68	47.00	$260*(0.1000/0.10)	$ 260
04.4000	232+32.0	4.87	43.82	36.22	40.00	$400*(0.1000/0.10)	$ 400
04.5000	237+60.0	4.48	68.08	54.48	61.00	$ 0*(0.1000/0.10)	$ 0

04.6000	242+88.0	4.73	50.74	50.22	50.00	$200*(0.1000/0.10)	$ 200
04.7000	248+16.0	4.51	59.39	60.38	60.00	$ 0*(0.1000/0.10)	$ 0
04.8000	253+44.0	4.74	54.46	44.44	49.00	$220*(0.1000/0.10)	$ 220
04.9000	258+72.0	4.81	52.35	36.81	45.00	$300*(0.1000/0.10)	$ 300
05.0000	264+00.0	4.81	49.23	38.71	44.00	$320*(0.1000/0.10)	$ 320
05.1000	269+28.0	4.80	49.55	40.80	45.00	$300*(0.1000/0.10)	$ 300
05.2000	274+56.0	4.75	53.02	44.15	49.00	$220*(0.1000/0.10)	$ 220
05.3000	279+84.0	4.63	62.92	48.20	56.00	$ 80*(0.1000/0.10)	$ 80
05.4000	285+12.0	4.86	43.53	37.35	40.00	$400*(0.1000/0.10)	$ 400
05.5000	290+40.0	4.77	51.75	42.58	47.00	$260*(0.1000/0.10)	$ 260
05.6000	295+68.0	4.70	54.86	50.47	53.00	$140*(0.1000/0.10)	$ 140
05.7000	300+96.0	4.81	46.80	41.15	44.00	$320*(0.1000/0.10)	$ 320
05.8000	306+24.0	4.80	44.78	44.67	45.00	$300*(0.1000/0.10)	$ 300
05.9000	311+52.0	4.90	40.96	35.27	38.00	$440*(0.1000/0.10)	$ 440
06.0000	316+80.0	4.72	49.36	52.77	51.00	$180*(0.1000/0.10)	$ 180
06.1000	322+08.0	4.69	57.50	48.53	53.00	$140*(0.1000/0.10)	$ 140
06.2000	327+36.0	4.76	58.04	38.80	48.00	$240*(0.1000/0.10)	$ 240
06.3000	332+64.0	4.77	53.00	41.82	47.00	$260*(0.1000/0.10)	$ 260
06.4000	337+92.0	4.67	62.76	45.21	54.00	$120*(0.1000/0.10)	$ 120
06.5000	343+20.0	4.67	60.61	47.47	54.00	$120*(0.1000/0.10)	$ 120
06.6000	348+48.0	4.59	64.48	49.11	57.00	$ 60*(0.1000/0.10)	$ 60
06.7000	353+76.0	4.75	49.31	47.76	49.00	$220*(0.1000/0.10)	$ 220
06.8000	359+04.0	4.87	43.52	36.16	40.00	$400*(0.1000/0.10)	$ 400
06.9000	364+32.0	4.88	37.56	40.74	39.00	$420*(0.1000/0.10)	$ 420
07.0000	369+60.0	4.92	37.98	35.38	37.00	$460*(0.1000/0.10)	$ 460
07.1000	374+88.0	4.88	39.20	39.79	39.00	$420*(0.1000/0.10)	$ 420
07.2000	380+16.0	4.50	51.90	69.34	61.00	$ 0*(0.1000/0.10)	$ 0
07.3000	385+44.0	4.03	80.09	82.26	81.00	-$320*(0.1000/0.10)	-$ 320
07.4000	390+72.0	4.38	55.09	75.20	65.00	$ 0*(0.1000/0.10)	$ 0
07.5000	396+00.0	4.47	52.21	70.85	62.00	$ 0*(0.1000/0.10)	$ 0
07.6000	401+28.0	4.96	33.67	33.99	34.00	$520*(0.1000/0.10)	$ 520
07.7000	406+56.0	4.56	56.51	59.73	58.00	$ 40*(0.1000/0.10)	$ 40
07.8000	411+84.0	4.75	55.54	41.79	49.00	$220*(0.1000/0.10)	$ 220
07.9000	417+12.0	4.82	46.71	39.97	43.00	$340*(0.1000/0.10)	$ 340
08.0000	422+40.0	4.66	46.39	62.22	54.00	$120*(0.1000/0.10)	$ 120
08.1000	427+68.0	4.77	43.33	50.87	47.00	$260*(0.1000/0.10)	$ 260
08.2000	432+96.0	4.75	42.97	54.47	49.00	$220*(0.1000/0.10)	$ 220
08.3000	438+24.0	4.87	40.07	39.91	40.00	$400*(0.1000/0.10)	$ 400
08.4000	443+52.0	4.83	46.72	39.33	43.00	$340*(0.1000/0.10)	$ 340
08.5000	448+80.0	4.91	40.07	34.10	37.00	$460*(0.1000/0.10)	$ 460
08.6000	454+08.0	4.77	40.48	54.55	48.00	$240*(0.1000/0.10)	$ 240
08.7000	459+36.0	4.80	39.07	51.34	45.00	$300*(0.1000/0.10)	$ 300
08.8000	464+64.0	4.79	37.78	53.57	46.00	$280*(0.1000/0.10)	$ 280
08.9000	469+92.0	4.86	35.29	46.67	41.00	$380*(0.1000/0.10)	$ 380
09.0000	475+20.0	4.81	35.30	53.93	45.00	$300*(0.1000/0.10)	$ 300
09.1000	480+48.0	4.78	44.36	49.37	47.00	$260*(0.1000/0.10)	$ 260
09.2000	485+76.0	4.66	49.31	59.33	54.00	$120*(0.1000/0.10)	$ 120
09.3000	491+04.0	4.58	53.34	61.42	57.00	$ 60*(0.1000/0.10)	$ 60
09.4000	496+32.0	4.62	50.51	61.19	56.00	$ 80*(0.1000/0.10)	$ 80
09.5000	501+60.0	4.63	46.08	64.55	55.00	$100*(0.1000/0.10)	$ 100

09.6000	506+88.0	4.72	42.74	60.07	51.00	$180*(0.1000/0.10)	$ 180
09.7000	512+16.0	4.56	52.40	63.87	58.00	$ 40*(0.1000/0.10)	$ 40
09.8000	517+44.0	4.71	45.62	57.77	52.00	$160*(0.1000/0.10)	$ 160
09.9000	522+72.0	4.67	53.06	54.58	54.00	$120*(0.1000/0.10)	$ 120
10.0000	528+00.0	4.71	44.23	59.67	52.00	$160*(0.1000/0.10)	$ 160
10.1000	533+28.0	4.76	48.59	47.29	48.00	$240*(0.1000/0.10)	$ 240
10.2000	538+56.0	4.78	42.77	50.36	47.00	$260*(0.1000/0.10)	$ 260
10.3000	543+84.0	4.79	38.79	53.30	46.00	$280*(0.1000/0.10)	$ 280
10.4000	549+12.0	4.45	58.11	66.88	62.00	$ 0*(0.1000/0.10)	$ 0
10.5000	554+40.0	4.53	51.58	66.65	59.00	$ 20*(0.1000/0.10)	$ 20
10.6000	559+68.0	4.55	45.66	71.59	59.00	$ 20*(0.1000/0.10)	$ 20
10.7000	564+96.0	4.63	47.93	63.19	56.00	$ 80*(0.1000/0.10)	$ 80
10.8000	570+24.0	4.61	53.15	59.10	56.00	$ 80*(0.1000/0.10)	$ 80
10.9000	575+52.0	4.52	50.85	68.36	60.00	$ 0*(0.1000/0.10)	$ 0
11.0000	580+80.0	4.61	53.12	59.58	56.00	$ 80*(0.1000/0.10)	$ 80
11.1000	586+08.0	4.29	64.89	73.03	69.00	-$ 80*(0.1000/0.10)	-$ 80
11.2000	591+36.0	4.74	55.07	44.43	50.00	$200*(0.1000/0.10)	$ 200
11.3000	596+64.0	4.72	55.42	47.39	51.00	$180*(0.1000/0.10)	$ 180
11.4000	601+92.0	4.45	54.68	70.19	62.00	$ 0*(0.1000/0.10)	$ 0
11.5000	607+20.0	4.80	41.32	48.35	45.00	$300*(0.1000/0.10)	$ 300
11.6000	612+48.0	4.93	36.99	35.45	36.00	$480*(0.1000/0.10)	$ 480
11.7000	617+76.0	4.06	71.98	86.77	79.00	-$280*(0.1000/0.10)	-$ 280
11.8000	623+04.0	4.61	51.73	60.61	56.00	$ 80*(0.1000/0.10)	$ 80
11.9000	628+32.0	4.79	47.00	44.71	46.00	$280*(0.1000/0.10)	$ 280
12.0000	633+60.0	4.52	52.36	67.16	60.00	$ 0*(0.1000/0.10)	$ 0
12.1000	638+88.0	4.83	38.64	46.82	43.00	$340*(0.1000/0.10)	$ 340
12.2000	644+16.0	4.48	58.25	63.97	61.00	$ 0*(0.1000/0.10)	0
12.3000	649+44.0	4.81	39.71	48.09	44.00	$320*(0.1000/0.10)	$ 320
12.4000	654+72.0	4.14	73.07	78.84	76.00	-$220*(0.1000/0.10)	-$ 220
12.5000	660+00.0	4.70	58.23	46.94	53.00	$140*(0.1000/0.10)	$ 140
12.6000	665+28.0	4.17	77.78	71.19	74.00	-$180*(0.1000/0.10)	-$ 180
12.7000	670+56.0	4.54	61.43	56.40	59.00	$ 20*(0.1000/0.10)	$ 20
12.8000	675+84.0	4.81	46.01	42.29	44.00	$320*(0.1000/0.10)	$ 320
12.9000	681+12.0	4.72	52.78	49.04	51.00	$180*(0.1000/0.10)	$ 180
13.0000	686+40.0	4.64	52.38	57.52	55.00	$100*(0.1000/0.10)	$ 100
13.1000	691+68.0	4.72	52.98	49.88	51.00	$180*(0.1000/0.10)	$ 180
13.2000	696+96.0	4.78	45.48	46.92	46.00	$280*(0.1000/0.10)	$ 280
13.3000	702+24.0	4.78	51.69	41.50	47.00	$260*(0.1000/0.10)	$ 260
13.4000	707+52.0	4.62	54.01	57.34	56.00	$ 80*(0.1000/0.10)	$ 80
13.5000	712+80.0	4.53	59.62	59.12	59.00	$ 20*(0.1000/0.10)	$ 20
13.6000	718+08.0	4.42	59.94	67.47	64.00	$ 0*(0.1000/0.10)	$ 0
13.7000	723+36.0	4.37	63.78	67.40	66.00	-$ 20*(0.1000/0.10)	-$ 20
13.8000	728+64.0	4.28	63.27	75.92	70.00	-$100*(0.1000/0.10)	-$ 100
13.9000	733+92.0	4.75	51.81	46.30	49.00	$220*(0.1000/0.10)	$ 220
14.0000	739+20.0	4.26	69.46	70.98	70.00	-$100*(0.1000/0.10)	-$ 100
14.1000	744+48.0	4.12	73.20	80.39	77.00	-$240*(0.1000/0.10)	-$ 240
14.1302	746+07.5	4.08	79.53	77.65	79.00	-$280*(0.0302/0.10)	-$ 84

Pay Adjustment Subtotal $23663

Ave Left IRI 52.7 Ave Right IRI 52.1 Ave IRI 52.4

Total IRI adjustments $ 23663
Total Bump adjustments -$ 7500
Total adjustments $ 16163

Bumps/dips for each wheelpath: no penalties assigned.

Left Wheelpath

Distance	Station	Type	Width(feet)	Elev(inches)
00.0048	0+25.2	Dip	4.5	-.45
00.0072	0+38.2	Dip	3.0	-.22
00.3825	20+19.8	Dip	.3	-.16
00.9530	50+31.7	Bump	1.0	.18
02.6698	140+96.3	Bump	.2	.15
02.9986	158+32.5	Dip	.5	-.19
03.6848	194+55.7	Dip	.3	-.17
07.2045	380+39.8	Bump	1.2	.18
07.2064	380+49.8	Dip	.7	-.16
07.2867	384+73.8	Bump	3.8	.18
07.2892	384+86.8	Dip	2.3	-.18
11.0762	584+82.5	Dip	1.0	-.18
12.3600	652+61.0	Dip	.5	-.16
13.7229	724+57.2	Dip	.3	-.16
14.0983	744+39.0	Bump	4.0	.34
14.1003	744+49.7	Dip	.2	-.16

Bumps/dips for each wheelpath: no penalties assigned.

Right Wheelpath

Distance	Station	Type	Width(feet)	Elev(inches)
00.0047	0+25.0	Dip	4.0	-.46
00.0061	0+32.3	Bump	1.8	.18
00.0078	0+41.3	Bump	4.2	.27
00.3253	17+17.3	Bump	.7	.16
00.6818	36+00.2	Bump	1.0	.16
00.9510	50+21.5	Bump	1.5	.19
00.9915	52+35.3	Dip	1.2	-.17
01.0329	54+53.5	Bump	5.2	.25
01.0403	54+92.7	Bump	1.0	.16
01.2641	66+74.3	Bump	.3	.15
01.3642	72+03.2	Bump	1.5	.23
03.6848	194+55.7	Dip	.3	-.17
03.6897	194+81.5	Dip	1.8	-.20
04.7783	252+29.2	Dip	.2	-.15
06.3918	337+48.5	Dip	.8	-.16
07.1313	376+53.2	Bump	.7	.16
07.2055	380+44.8	Dip	1.0	-.18
07.4565	393+70.5	Dip	.3	-.15
09.3641	494+42.7	Bump	1.7	.18
11.0761	584+81.8	Dip	3.2	-.21
12.0230	634+81.3	Dip	1.8	-.22
12.3598	652+59.7	Dip	4.0	-.21

Definitions, Acronyms, and Abbreviations

The following table identifies commonly used abbreviations, nomenclature, and definitions used for this project.

Acronym or Term	Definition
Bump	A bump is calculated by taking the average profile minus the moving average profile, and any points exceeding +0.1505 inches are considered bumps.
CSJ	Control-Section-Job numbers are numbers assigned to all on-system public highways in Texas.The control number is assigned to a stretch of highway that often breaks at a county line or a major highway intersection, river or stream, but can also break at any convenient location. The section number is a number within a specific control and is usually assigned sequentially from the beginning of the control. The job number is the sequential number for any type of construction project (bridge, paving, etc.) that may have ever occurred on that section of highway. The CSJ is a unique, identifying nine-digit number for a project.
Dip	A dip is calculated by taking the average profile minus the moving average profile, and any points less than -0.1505 inches are considered dips.
ESRI GIS	Environmental Systems Research Institute Geographic Information System.
IRI	International Roughness Index.
Item 247 Flexible Base	Construct a Foundation Course composed of Flexible Base.
Item 585 - Ride Quality of Pavement Surfaces	Specifications that assist TxDOT district staff with managing and proper documentation of Ride Quality data and corresponding bonus/penalties.
PSI	Present Serviceability Index – Scale from 0-5 calculated from IRI scores, where low IRI scores give a high PSI.
RFT	Rich Text Format.
TxDOT	Texas Department of Transportation
TEX-1001-S	(See Appendix A, TEX 1001-S) The reporting interval (distance between successive relative elevation measurements) in inches or meters- the maximum reporting interval is 2 in (0.0508 m)