LADOTD Calculating Present Serviceability Rating (PSR) for HPMS from Federal Distress Measures

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PROBLEM

Some collected sections have no IRI value due to the vehicle having to slow down but we have ratings for Percent Cracking, Rutting, and Faulting. Couldn’t a PSR value be calculated on these sections using the known values???

REASONS FOR LOW SPEED

- Stop at intersection/Roundabout
- Road Congestion
- Slow vehicle
- Slow down for rail road crossing
- Construction
- Stop to clean camera/windshield

STOP AT AN INTERSECTION

YIELD AT A ROUNDABOUT

ROAD CONGESTION

CONSTRUCTION

STOP TO CLEAN CAMERA/WINDSHIELD

SLOW DOWN FOR A VEHICLE

RAILROAD CROSSING

PSR (PRESENT SERVICEABILITY RATING)

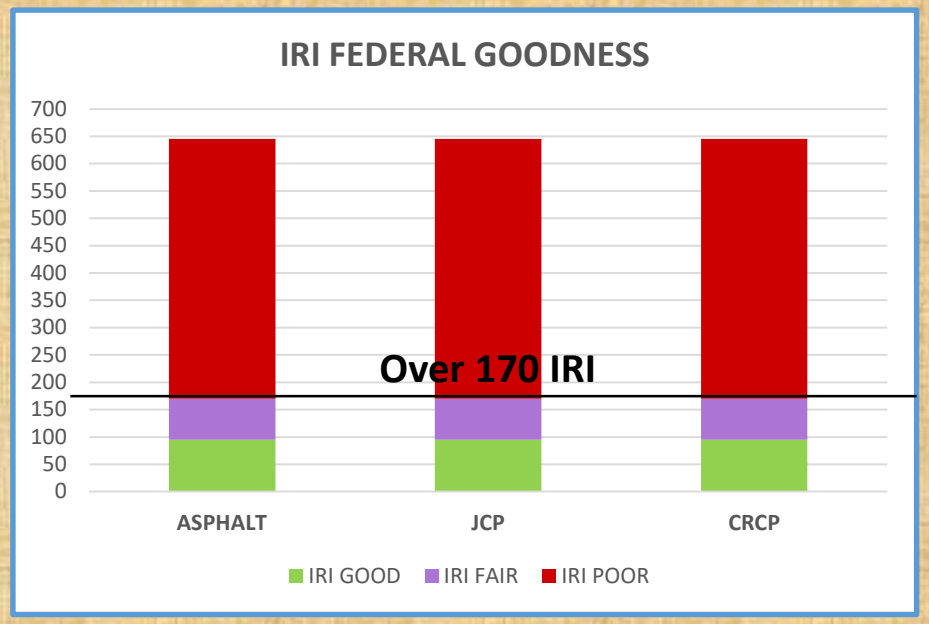
For investment requirements modeling to estimate pavement deterioration, section deficiencies, and needed improvements, in cost allocation studies, in pavement condition trends, and for other analysis purposes including NHS performance. Also, for performance measure calculation for pavement condition on the NHS.

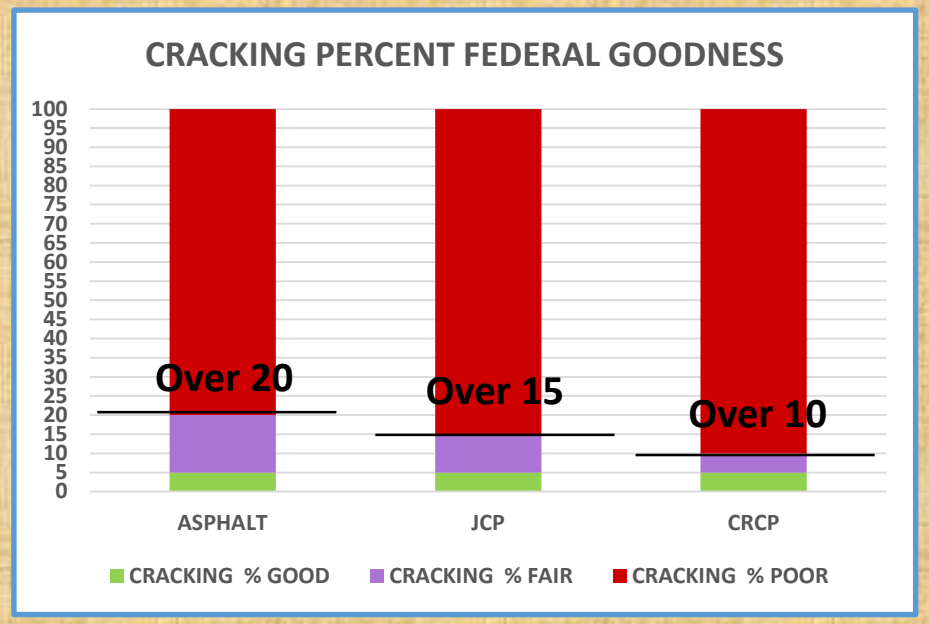
HPMS Present Serviceability Rating Table

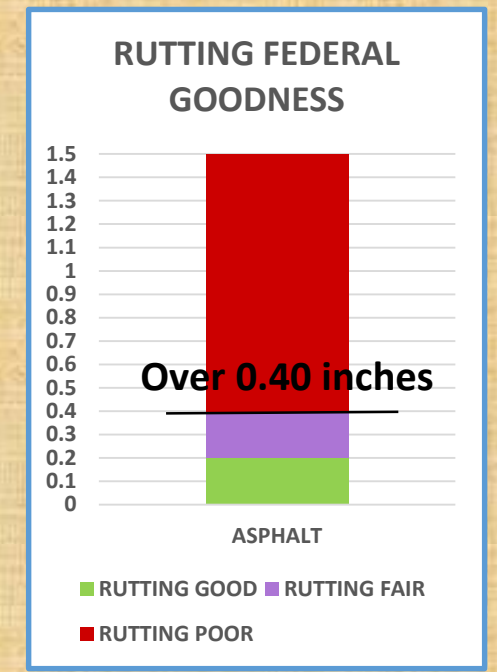
Table 4.4: Present Serviceability Rating

PSR	Description
4.0 – 5.0	Only new (or nearly new) superior pavements are likely to be smooth enough and distress free (sufficiently free of cracks and patches) to qualify for this category. Most pavements constructed or resurfaced during the data year would normally be rated in this category.
3.0 – 4.0	Pavements in this category, although not quite as smooth as those described above, give a first class ride and exhibit few, if any, visible signs of surface deterioration. Flexible pavements may be beginning to show evidence of rutting and fine random cracks. Rigid pavements may be beginning to show evidence of slight surface deterioration, such as minor cracks and spalling.
2.0 – 3.0	The riding qualities of pavements in this category are noticeably inferior to those of new pavements, and may be barely tolerable for high-speed traffic. Surface defects of flexible pavements may include rutting, map cracking, and extensive patching. Rigid pavements in this group may have a few joint failures, faulting and/or cracking, and some pumping.
1.0 – 2.0	Pavements in this category have deteriorated to such an Extent that they affect the speed of free-flow traffic. Flexible pavement may have large potholes and deep cracks. Distress includes raveling, cracking, rutting and occurs over 50 percent of the surface. Rigid pavement distress includes joint spalling, patching, cracking, scaling, and may include pumping and faulting.
0.1 – 1.0	Pavements in this category are in an extremely deteriorated condition. The facility is passable only at reduced speeds, and with considerable ride discomfort. Large potholes and deep cracks exist. Distress occurs over 75 percent or more of the surface.

FEDERAL GOODNESS MEASURES

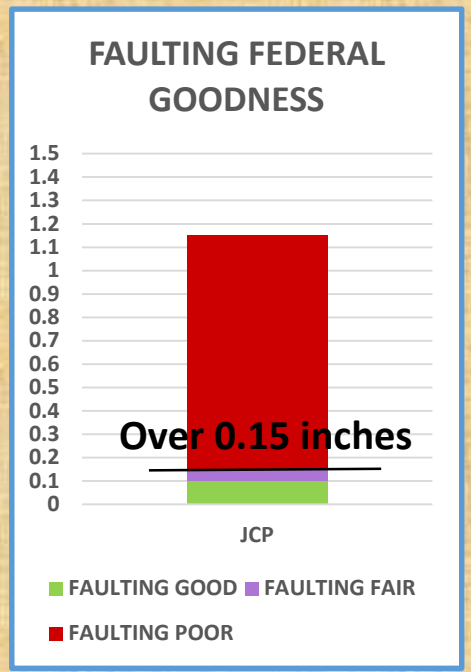






2 of each of these categories need to be **POOR** to be considered **POOR** overall

All categories need to be **GOOD** to be considered **GOOD** overall



PERCENT CRACKING CALCULATION

For JCP Pavement:

Number of slabs is determined by number of rated Joints, beginning and end of bridges, and beginning and end of JCP.

Each of these slabs are marked as cracked if there is one or more rated transverse crack is the span.

Percentage Cracking Calculation:

Number of Cracked slabs / Number of total slabs per tenth

PERCENT CRACKING CALCULATION

For ASP and COM:

Percentage Cracking Calculation:

((Longitudinal distance in left wheel path in miles*5280 ft./mile with cracking x 3 foot wheel path) + (Longitudinal distance in right wheel path in miles*5280 ft./mile with cracking x 3 foot wheel path)) / Total Area of Lane feet^2

Area of Lane is calculated as:

Measured Lane width feet x 5280 feet/mile x length mile of interval (0.1 or less)

PERCENT CRACKING CALCULATION

For ASP and COM:

PERCENT CRACKING CALCULATION

For CRC:

Percentage Cracking Calculation:

Sum of all { Crack Area as (length x 1 foot) + area of punch out or patching } / Area of 0.1 miles segment

Area of 0.1 mile segment is computed as : 528 ft. x Average (Rated Lane width in ft.) as sq.ft

If the summary interval is less than 0.1 mile it is calculated as:

5280 feet/mile x Length in miles x Avg (Lane width in feet)

HPMS GUIDANCE REGARDING CRACKING

For ASP:

- The Cracking Percent for ASP is the percentage of the total area exhibiting visible fatigue type cracking for all severity levels in the wheelpath for each section.

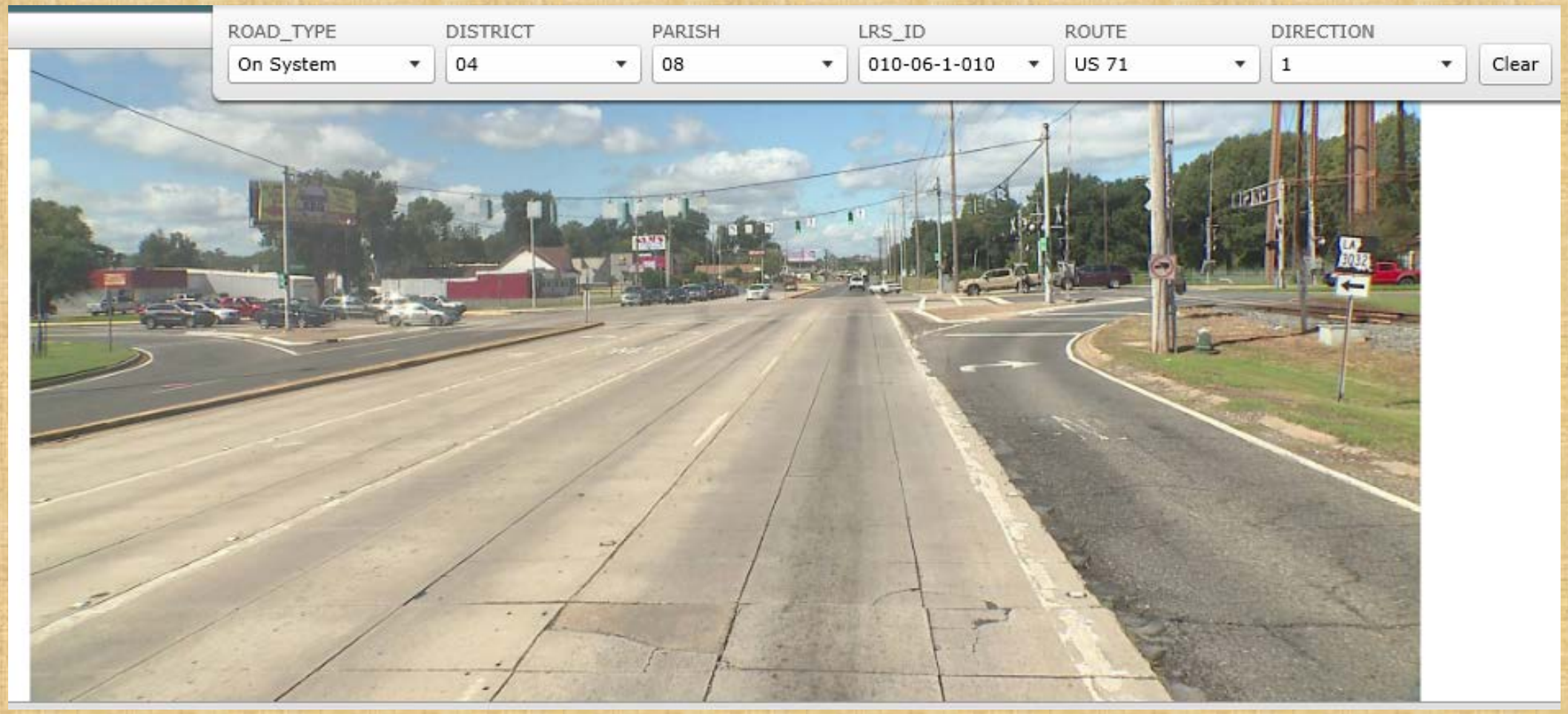
For JCP:

- The Cracking Percent for JCP is the number of slabs containing one or more transverse cracks extending for at least ½ the lane width within the section divided by the total number of slabs in the section.

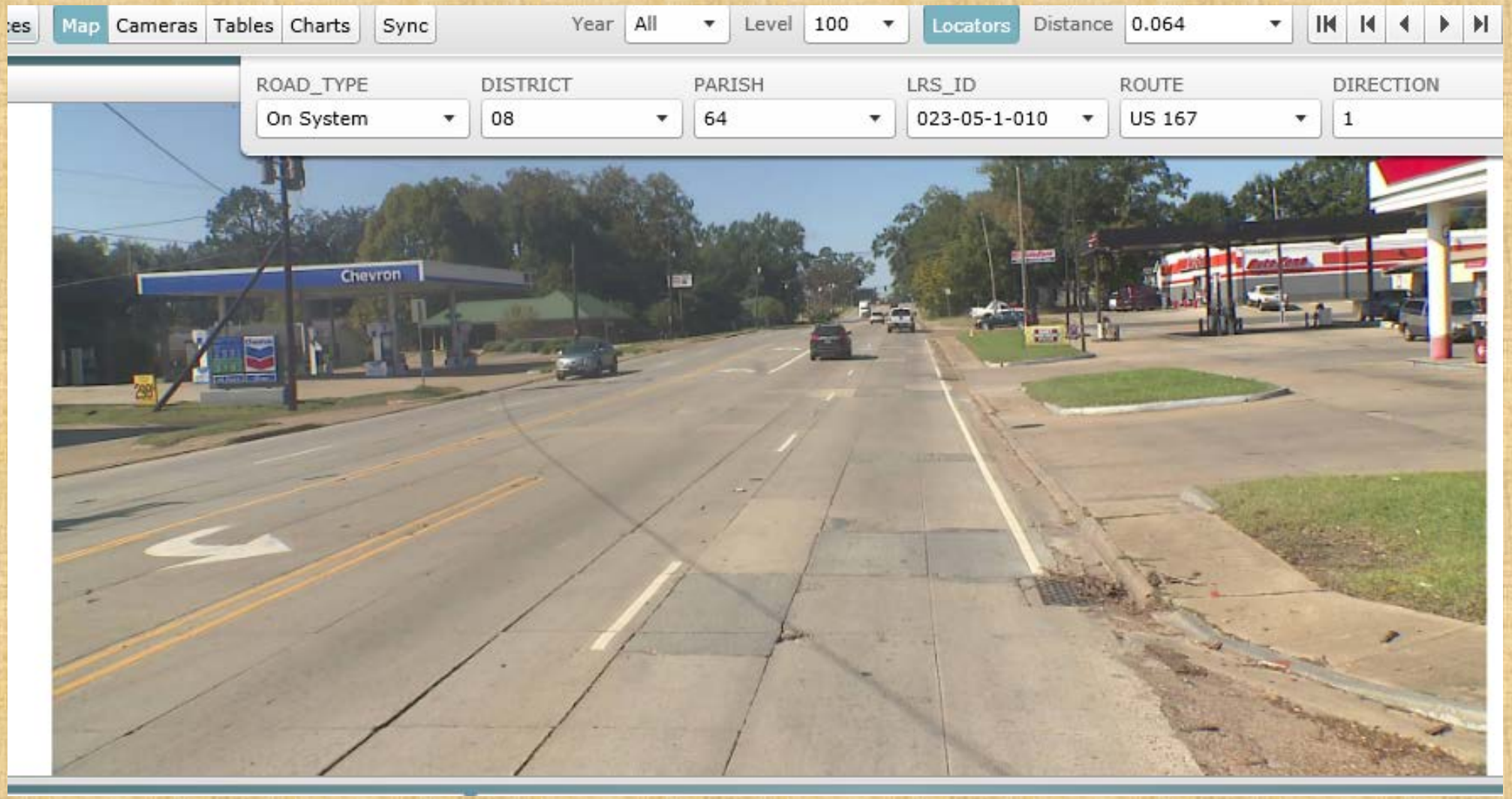
  Partial slabs shall contribute to the section that contains the majority of the slab length.

  Number of slabs with transverse cracks / Total number of slabs in the section

Sections that have 100 to 130 joints per tenth of mile



Sections that have 100 to 130 joints per tenth of mile



HPMS GUIDANCE REGARDING CRACKING

For CRCP:

- The Percentage of Cracking for CRCP pavements is determined as the area of pavements where cracking or distresses are detected by the total area of the section.

Area of Pavements where cracking is detected / Total area of the section

- For Longitudinal Cracking, the cracked area is determined as the length of the crack multiplied by 1 foot width.

Cracked area = Length of the crack X 1 foot width

- For Punchouts, the area is determined by the 2 transverse cracks and the edge of pavement or longitudinal joint.

HPMS Present Serviceability Rating Table

PSR	Description
4.0 – 5.0	**Only new** (or nearly new) **superior pavements** are likely to be smooth enough and **distress free** (sufficiently free of cracks and patches) to qualify for this category. Most pavements constructed or resurfaced during the data year would normally be rated in this category.

PSR RATING	PAVETYPE	RUTTING	INCHES	CRACKING	%	FAULTING	INCHES
5	ASP	GOOD	<0.20	GOOD	< 5		
5	COM	GOOD	<0.20	GOOD	< 5		
5	JCP			GOOD	< 5	GOOD	<0.1
5	CRC			GOOD	< 5		

5.0 PSR ASP

5.0 PSR COM

5.0 PSR JCP

HPMS Present Serviceability Rating Table

PSR	Description
4.0 – 5.0	**Only new** (or nearly new) **superior pavements** are likely to be smooth enough and **distress free** (sufficiently free of cracks and patches) to qualify for this category. Most pavements constructed or resurfaced during the data year would normally be rated in this category.

PSR RATING	PAVETYPE	RUTTING	INCHES	CRACKING	%	FAULTING	INCHES
4	ASP	FAIR	>=0.20 AND <0.40	GOOD	< 5		
4	COM	FAIR	>=0.20 AND <0.40	GOOD	< 5		
4	JCP			GOOD	< 5	FAIR	>=0.1 AND < 0.15

HPMS Present Serviceability Rating Table

PSR	Description
3.0 – 4.0	Pavements in this category, although not quite as smooth as those described above, give a first class ride and exhibit few, if any, visible signs of surface deterioration. **Flexible pavements** may be **beginning to show evidence of rutting** and **fine random cracks**. **Rigid pavements** may be beginning to show evidence of slight surface deterioration, such as **minor cracks and spalling**.

PSR RATING	PAVETYPE	RUTTING	INCHES	CRACKING	%	FAULTING	INCHES
4	ASP	FAIR	>=0.20 AND <0.40	GOOD	< 5		
4	COM	FAIR	>=0.20 AND <0.40	GOOD	< 5		
4	JCP			GOOD	< 5	FAIR	>=0.1 AND < 0.15

4.0 PSR ASP


4.0 PSR - ASP
LRS ID 006-03-2-010
BURGER KING
NOW HIRING
SQG 899
3.077
3.078
3.079
3.080
3.081

4.0 PSR COM

4.0 PSR JCP

HPMS Present Serviceability Rating Table

PSR	Description
3.0 – 4.0	Pavements in this category, although not quite as smooth as those described above, give a first class ride and exhibit few, if any, visible signs of surface deterioration. **Flexible pavements** may be **beginning to show evidence of rutting** and **fine random cracks**. **Rigid pavements** may be beginning to show evidence of slight surface deterioration, such as **minor cracks and spalling**.

PSR RATING	PAVETYPE	RUTTING	INCHES	CRACKING	%	FAULTING	INCHES
3	ASP	GOOD	<0.20	FAIR	>=5 AND <20		
3	COM	GOOD	<0.20	FAIR	>=5 AND <15		
3	JCP			FAIR	>=5 AND <10	GOOD	<0.1

HPMS Present Serviceability Rating Table

PSR	Description
2.0 – 3.0	The **riding qualities** of pavements in this category are **noticeably inferior** to those of new pavements, and may be barely tolerable for high-speed traffic. Surface defects of **flexible pavements** may **include rutting**, **map cracking**, and extensive patching. **Rigid pavements** in this group may have a **few joint failures**, **faulting** and/or cracking, and some pumping.

PSR RATING	PAVETYPE	RUTTING	INCHES	CRACKING	%	FAULTING	INCHES
3	ASP	GOOD	<0.20	FAIR	>=5 AND <20		
3	COM	GOOD	<0.20	FAIR	>=5 AND <15		
3	JCP			FAIR	>=5 AND <10	GOOD	<0.1

HPMS Present Serviceability Rating Table

PSR	Description
3.0 – 4.0	Pavements in this category, although not quite as smooth as those described above, give a first class ride and exhibit few, if any, visible signs of surface deterioration. **Flexible pavements** may be **beginning to show evidence of rutting** and **fine random cracks**. **Rigid pavements** may be beginning to show evidence of slight surface deterioration, such as **minor cracks and spalling**.

PSR RATING	PAVETYPE	RUTTING	INCHES	CRACKING	%	FAULTING	INCHES
3	ASP	FAIR	>=0.20 AND <0.40	FAIR	>=5 AND <20		
3	COM	FAIR	>=0.20 AND <0.40	FAIR	>=5 AND <15		
3	JCP			FAIR	>=5 AND <10	FAIR	>=0.1 AND < 0.15

HPMS Present Serviceability Rating Table

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PSR RATING	PAVETYPE	RUTTING	INCHES	CRACKING	%	FAULTING	INCHES
3	ASP	FAIR	>=0.20 AND <0.40	FAIR	>=5 AND <20		
3	COM	FAIR	>=0.20 AND <0.40	FAIR	>=5 AND <15		
3	JCP			FAIR	>=5 AND <10	FAIR	>=0.1 AND < 0.15

HPMS Present Serviceability Rating Table

PSR	Description
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PSR RATING	PAVETYPE	RUTTING	INCHES	CRACKING	%	FAULTING	INCHES
3	ASP	POOR	>=0.40	GOOD	< 5		
3	COM	POOR	>=0.40	GOOD	< 5		
3	JCP			GOOD	< 5	POOR	>=0.15

HPMS Present Serviceability Rating Table

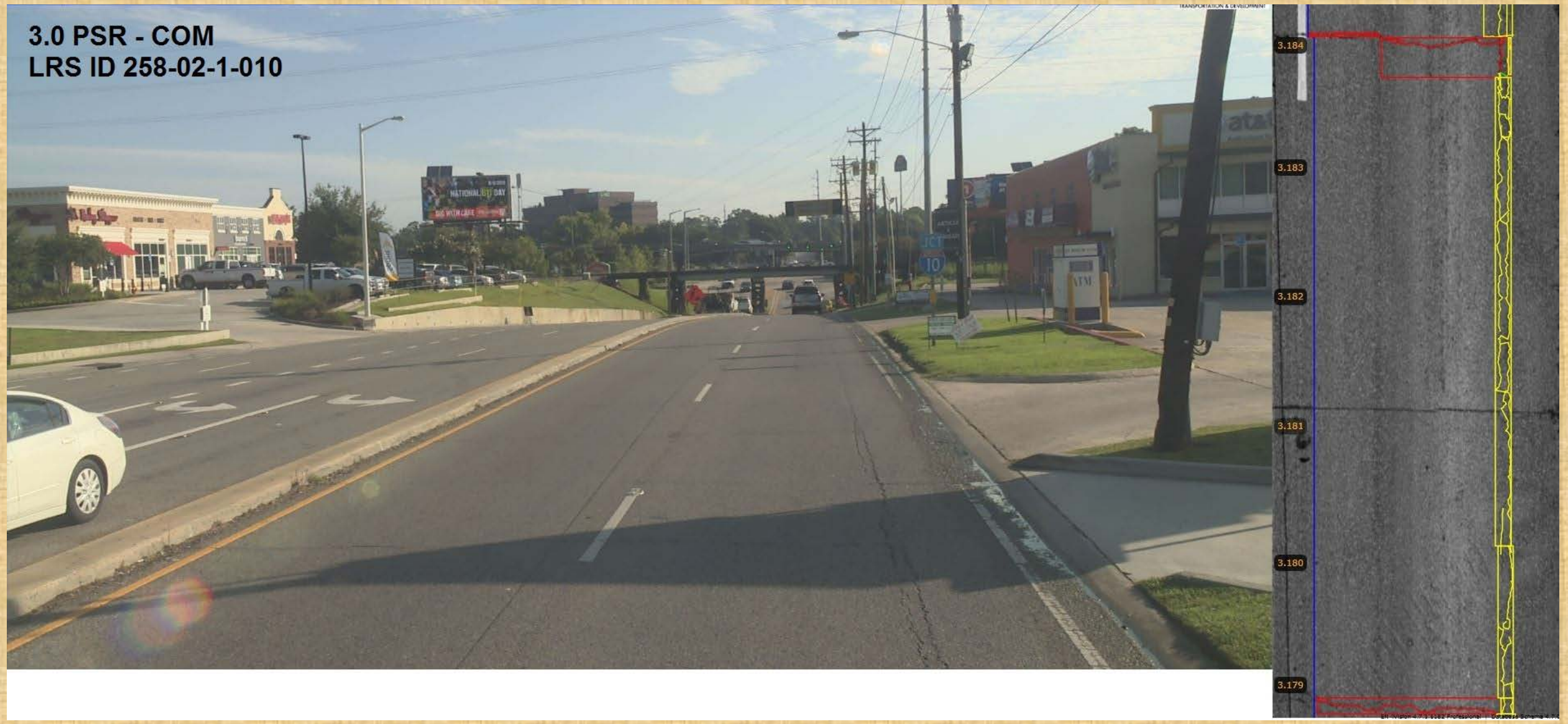
PSR	Description
2.0 – 3.0	The **riding qualities** of pavements in this category are **noticeably inferior** to those of new pavements, and may be barely tolerable for high-speed traffic. Surface defects of **flexible pavements** may **include rutting**, **map cracking**, and extensive patching. **Rigid pavements** in this group may have a **few joint failures**, **faulting** and/or cracking, and some pumping.

PSR RATING	PAVETYPE	RUTTING	INCHES	CRACKING	%	FAULTING	INCHES
3	ASP	POOR	>=0.40	GOOD	< 5		
3	COM	POOR	>=0.40	GOOD	< 5		
3	JCP			GOOD	< 5	POOR	>=0.15

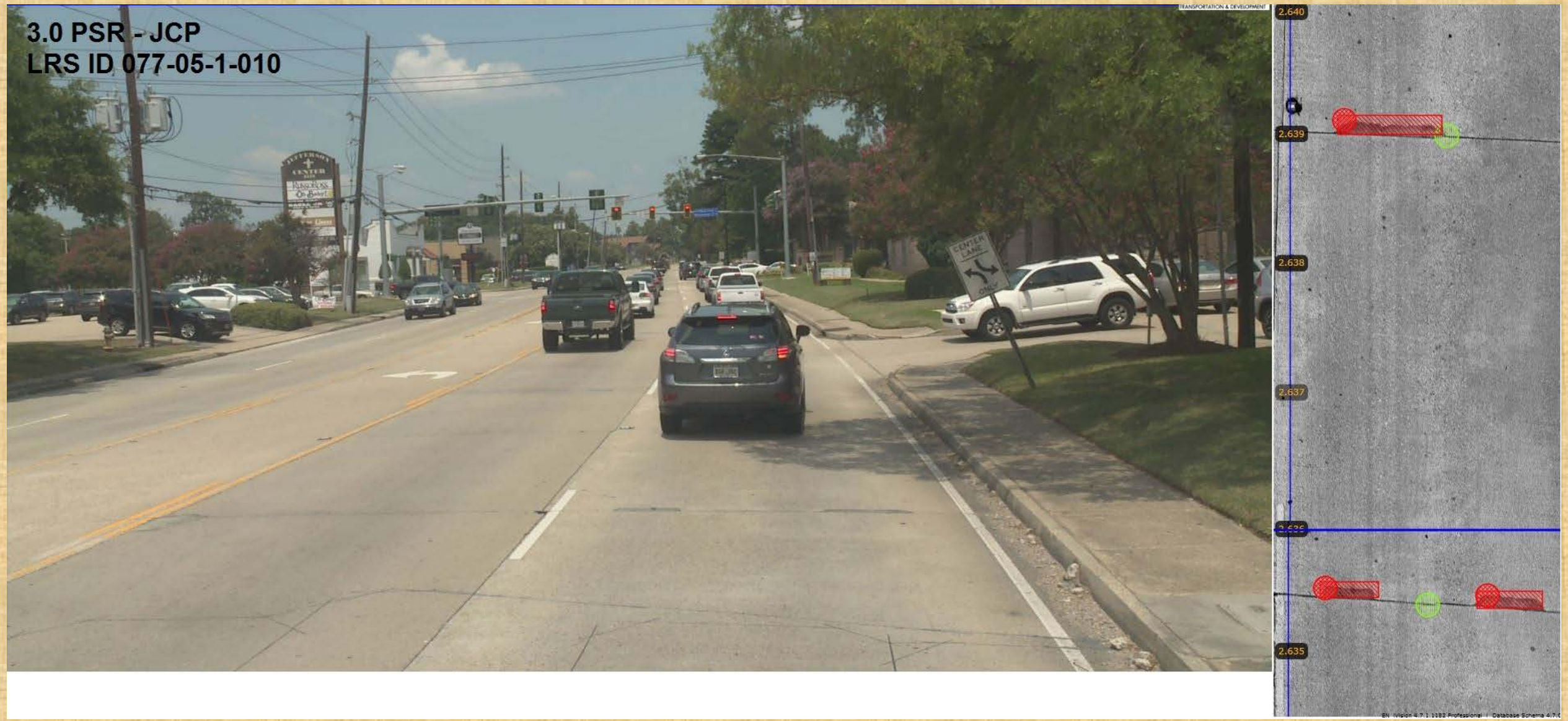
3.0 PSR ASP


3.0 PSR - ASP
LRS ID 056-07-1-010
ONLY
ONLY
9.221
9.220
9.219
9.218
9.217
9.216

3.0 PSR COM



3.0 PSR JCP



HPMS Present Serviceability Rating Table

PSR	Description
2.0 – 3.0	The **riding qualities** of pavements in this category are **noticeably inferior** to those of new pavements, and may be barely tolerable for high-speed traffic. Surface defects of **flexible pavements** may **include rutting**, **map cracking**, and extensive patching. **Rigid pavements** in this group may have a **few joint failures**, **faulting** and/or cracking, and some pumping.

PSR RATING	PAVETYPE	RUTTING	INCHES	CRACKING	%	FAULTING	INCHES
2	ASP	POOR	>=0.40	POOR	>=20 AND <=25		
2	COM	POOR	>=0.40	POOR	>=20 AND <=25		
2	JCP			POOR	>=15 AND <=50	POOR	>=0.15
2	CRC			POOR	>=10 AND <=50		

HPMS Present Serviceability Rating Table

PSR	Description
1.0 – 2.0	Pavements in this category have deteriorated to such an Extent that they **affect the speed of free-flow traffic**. **Flexible pavement** may have large potholes and **deep cracks**. **Distress** includes raveling, cracking, rutting and **occurs over 50 percent of the surface**. **Rigid pavement distress** includes joint spalling, patching, cracking, scaling, and may include pumping and **faulting**.

PSR RATING	PAVETYPE	RUTTING	INCHES	CRACKING	%	FAULTING	INCHES
2	ASP	POOR	>=0.40	POOR	>=20 AND <=25		
2	COM	POOR	>=0.40	POOR	>=20 AND <=25		
2	JCP			POOR	>=15 AND <=50	POOR	>=0.15
2	CRC			POOR	>=10 AND <=50		

HPMS Present Serviceability Rating Table

PSR	Description
2.0 – 3.0	The **riding qualities** of pavements in this category are **noticeably inferior** to those of new pavements, and may be barely tolerable for high-speed traffic. Surface defects of **flexible pavements** may **include rutting**, **map cracking**, and extensive patching. **Rigid pavements** in this group may have a **few joint failures**, **faulting** and/or cracking, and some pumping.

PSR RATING	PAVETYPE	RUTTING	INCHES	CRACKING	%	FAULTING	INCHES
2	ASP	GOOD	<0.20	POOR	>=20 AND <=25		
2	COM	GOOD	<0.20	POOR	>=20 AND <=25		
2	JCP			POOR	>=15 AND <=50	GOOD	<0.1
2	ASP	FAIR	>=0.20 AND <0.40	POOR	>=20 AND <=25		
2	COM	FAIR	>=0.20 AND <0.40	POOR	>=20 AND <=25		
2	JCP			POOR	>=15 AND <=50	FAIR	>=0.1 AND < 0.15

HPMS Present Serviceability Rating Table

PSR	Description
1.0 – 2.0	Pavements in this category have deteriorated to such an Extent that they **affect the speed of free-flow traffic**. **Flexible pavement** may have large potholes and **deep cracks**. **Distress** includes raveling, cracking, rutting and **occurs over 50 percent of the surface**. **Rigid pavement distress** includes joint spalling, patching, cracking, scaling, and may include pumping and **faulting**.

PSR RATING	PAVETYPE	RUTTING	INCHES	CRACKING	%	FAULTING	INCHES
2	ASP	GOOD	<0.20	POOR	>=20 AND <=25		
2	COM	GOOD	<0.20	POOR	>=20 AND <=25		
2	JCP			POOR	>=15 AND <=50	GOOD	<0.1
2	ASP	FAIR	>=0.20 AND <0.40	POOR	>=20 AND <=25		
2	COM	FAIR	>=0.20 AND <0.40	POOR	>=20 AND <=25		
2	JCP			POOR	>=15 AND <=50	FAIR	>=0.1 AND < 0.15

HPMS Present Serviceability Rating Table

PSR	Description
2.0 – 3.0	The **riding qualities** of pavements in this category are **noticeably inferior** to those of new pavements, and may be barely tolerable for high-speed traffic. Surface defects of **flexible pavements** may **include rutting**, **map cracking**, and extensive patching. **Rigid pavements** in this group may have a **few joint failures**, **faulting** and/or cracking, and some pumping.

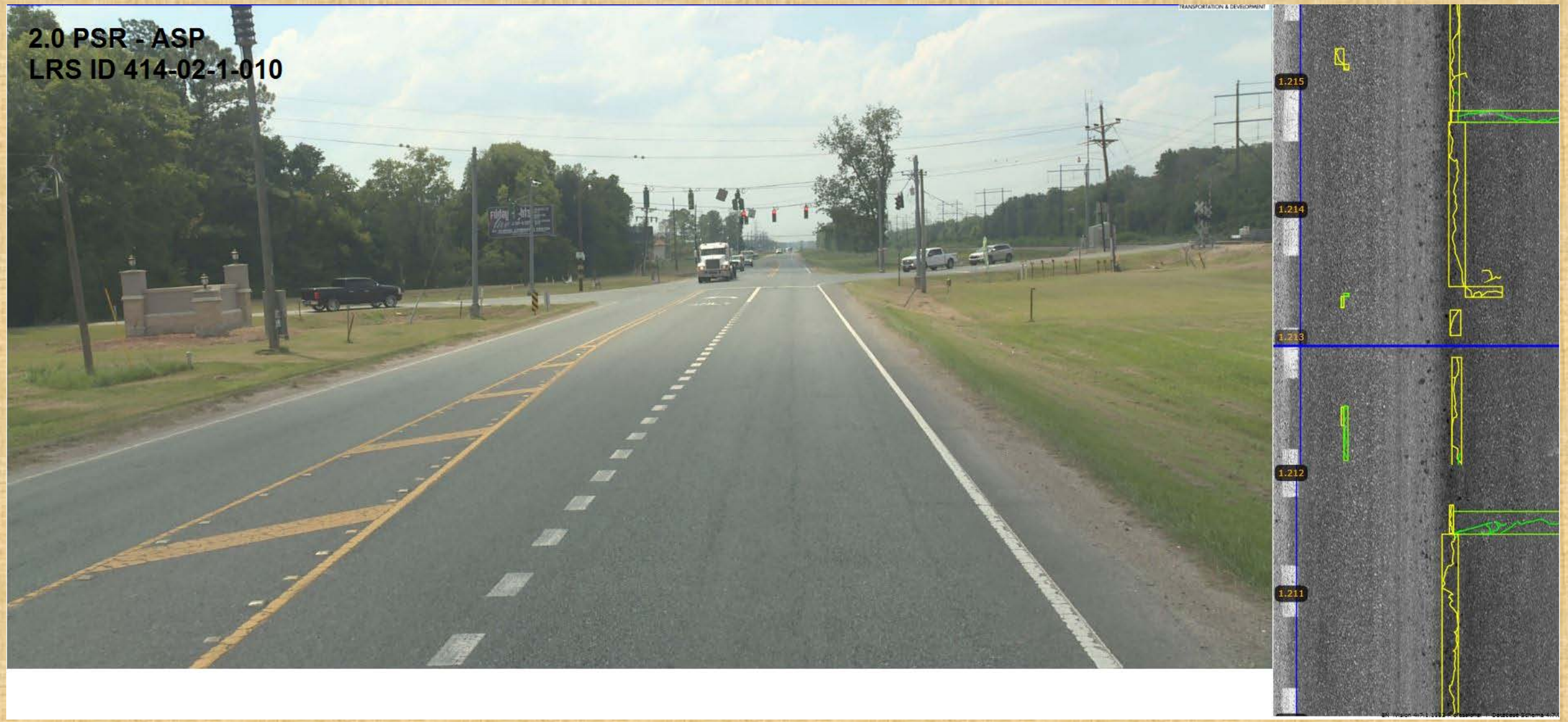
PSR RATING	PAVETYPE	RUTTING	INCHES	CRACKING	%	FAULTING	INCHES
2	ASP	POOR	>=0.40	FAIR	>=5 AND <20		
2	COM	POOR	>=0.40	FAIR	>=5 AND <20		
2	JCP			FAIR	>=5 AND <15	POOR	>=0.15

HPMS Present Serviceability Rating Table

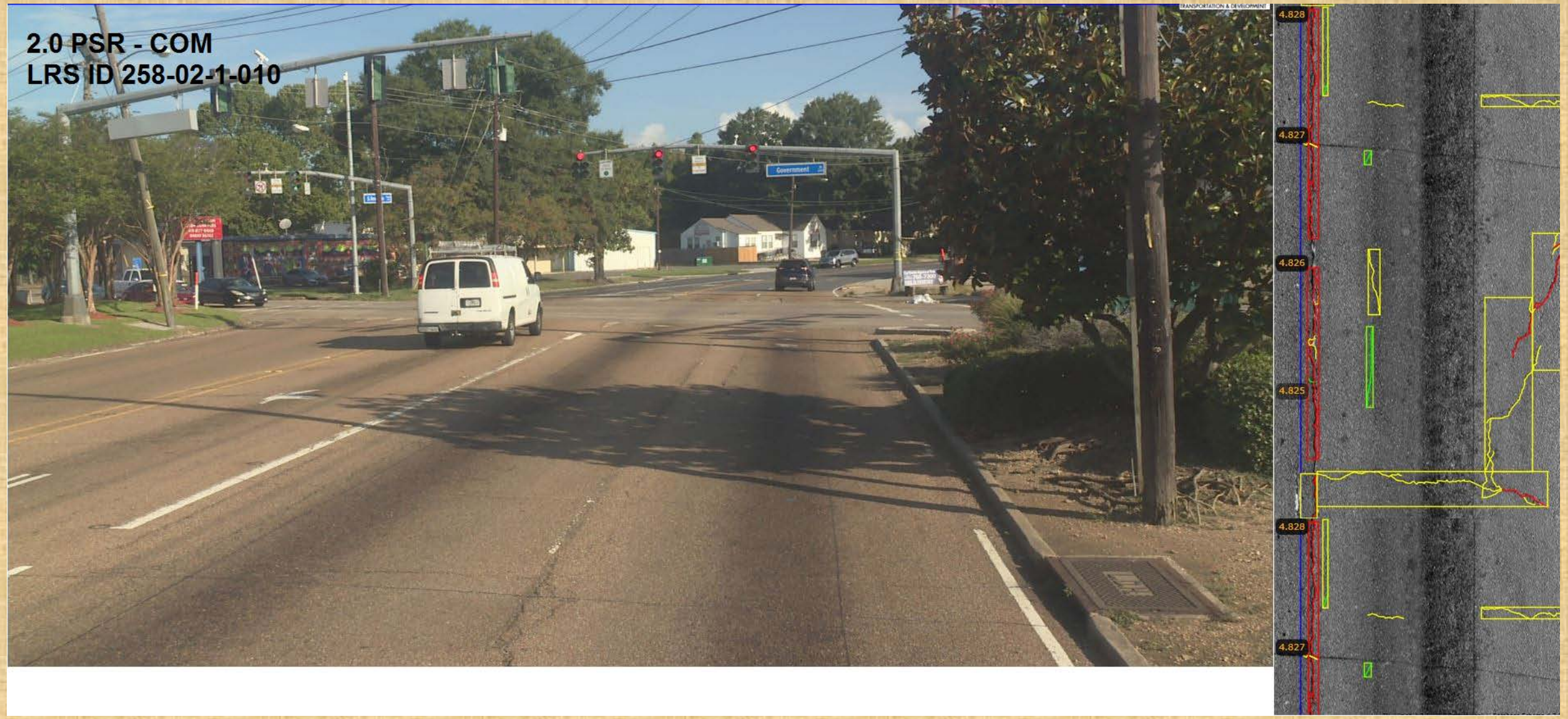
PSR	Description
1.0 – 2.0	Pavements in this category have deteriorated to such an Extent that they **affect the speed of free-flow traffic**. **Flexible pavement** may have large potholes and **deep cracks**. **Distress** includes raveling, cracking, rutting and **occurs over 50 percent of the surface**. **Rigid pavement distress** includes joint spalling, patching, cracking, scaling, and may include pumping and **faulting**.

PSR RATING	PAVETYPE	RUTTING	INCHES	CRACKING	%	FAULTING	INCHES
2	ASP	POOR	>=0.40	FAIR	>=5 AND <20		
2	COM	POOR	>=0.40	FAIR	>=5 AND <20		
2	JCP			FAIR	>=5 AND <15	POOR	>=0.15

2.0 PSR ASP



2.0 PSR COM


2.0 PSR - COM
LRS ID 258-02-1-010
Government
4.828
4.827
4.826
4.825
4.828
4.827

2.0 PSR JCP


2.0 PSR - JCP
LRS ID 254-01-1-010
Walgreens
1.622
1.621
1.620
1.619
1.618
1.617

HPMS Present Serviceability Rating Table

PSR	Description
1.0 – 2.0	Pavements in this category have deteriorated to such an Extent that they **affect the speed of free-flow traffic**. **Flexible pavement** may have large potholes and **deep cracks**. **Distress** includes raveling, cracking, rutting and **occurs over 50 percent of the surface**. **Rigid pavement distress** includes joint spalling, patching, cracking, scaling, and may include pumping and **faulting**.

PSR RATING	PAVETYPE	CRACKING	%
1	ASP	POOR	>25 AND <=37.5
1	COM	POOR	>25 AND <=37.5
1	JCP	POOR	>50 AND <=75
1	CRC	POOR	>50 AND <=75

HPMS Present Serviceability Rating Table

PSR	Description
0.5 – 1.0	**Pavements** in this category are in an **extremely deteriorated condition**. The facility is **passable only at reduced speeds**, and with considerable ride discomfort. Large potholes and deep cracks exist. **Distress occurs over 75 percent** or more of the surface.

PSR RATING	PAVETYPE	CRACKING	%
1	ASP	POOR	>25 AND <=37.5
1	COM	POOR	>25 AND <=37.5
1	JCP	POOR	>50 AND <=75
1	CRC	POOR	>50 AND <=75

1.0 PSR ASP

THERE ARE NO ASPHALT ROADS WITH 1.0 PSR RATING IN THIS SUBMITTAL

1.0 PSR COM

1.0 PSR JCP

HPMS Present Serviceability Rating Table

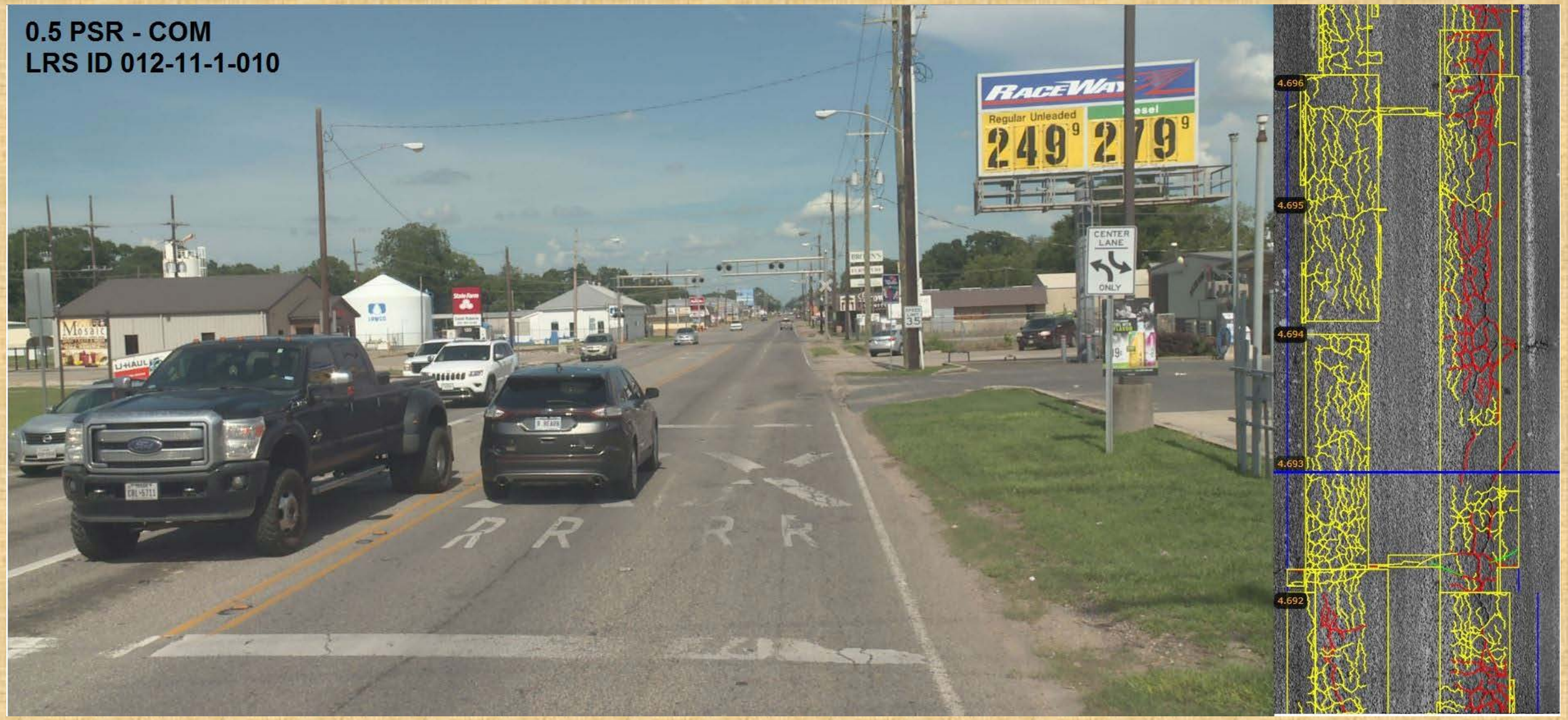
PSR	Description
0.5 – 1.0	**Pavements** in this category are in an **extremely deteriorated condition**. The facility is **passable only at reduced speeds**, and with considerable ride discomfort. Large potholes and deep cracks exist. **Distress occurs over 75 percent** or more of the surface.

PSR RATING	PAVETYPE	CRACKING	%
0.5	ASP	POOR	>37.5
0.5	COM	POOR	>37.5
0.5	JCP	POOR	>75
0.5	CRC	POOR	>75

0.5 PSR ASP

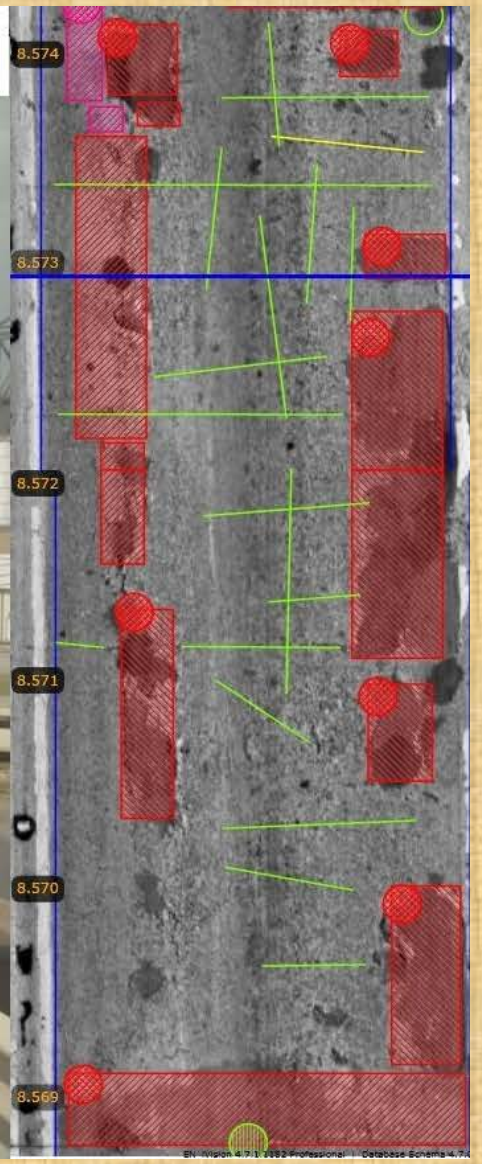

0.5 PSR - ASP
LRS ID 273-03-1-010
ONLY
McDona
1.044
1.043
1.042
1.041
1.040
1.039

0.5 PSR COM


0.5 PSR - COM
LRS ID 012-11-1-010
RACEWAY
Regular Unleaded
249 9
279 9
CENTER LANE
ONLY
4.696
4.695
4.694
4.693
4.692

0.5 PSR JCP

RATED AS JCP -- BRIDGE



Questions?

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