Table of Contents

What is HPMS ................................................................................................................ 1
What Purpose Does HPMS Serve ................................................................................... 1
How Does Florida Collect HPMS Data ............................................................................. 1
How Does Data Collection Procedures Effect HPMS Data ............................................. 2
2001 HPMS Sections (Statewide) ..................................................................................... 3
Number of HPMS Rated Sections .................................................................................. 4
Number of HPMS Rated Miles ....................................................................................... 5
Number of HPMS Designated Sections .......................................................................... 6
Number of HPMS Designated Miles .............................................................................. 7
2001 Frequency Distribution of IRI (Flexible Sections Statewide) ................................. 8
2001 Frequency Distribution of IRI (Rigid Sections Statewide) ...................................... 9
2001 Frequency Distribution of IRI (Flexible and Rigid Sections Statewide) ................. 10
2001 Frequency Distribution of IRI (Sample Sections Statewide) ................................. 11
Percent of Rated Miles within IRI Ranges from 1995 to 2001
(Flexible Sections Statewide) ......................................................................................... 12
Table of Contents (Continued)

Percent of Rated Miles within IRI Ranges from 1995 to 2001
(Rigid Sections Statewide) .................................................................13

Percent of Rated Miles within IRI Ranges from 1995 to 2001
(Flexible and Rigid Sections Statewide) ...........................................14

Percent of Rated Miles within IRI Ranges from 1995 to 2001
(Sample Sections Statewide) .............................................................15

Number of HPMS Off System Rated and Designated Sections ....................16

Number of HPMS Off System Rated and Designated Miles ........................17

2001 Frequency Distribution of IRI (Off System HPMS) ..........................18

Percent of Rated Miles within IRI Ranges from 2000 to 2001
(HPMS Off System) ........................................................................19
What Is HPMS?

The Highway Performance Monitoring System (HPMS) is an inventory system with an integrated database that provides essential information on the extent, condition, performance, use, and operating characteristics of the Nation’s highway system.

What Purpose Does HPMS Serve?

The HPMS was developed in 1978 to address a need for a national highway transportation system database. Since then, several enhancements have sharpened its focus on timely issues and enhanced analytical tools.

Traditionally, HPMS data has been used to support informed highway planning, policy and decision making at the national, State, and local levels. This includes the apportionment and allocation of federal-aid funds as well as the determination of appropriate cost-effective strategies to rehabilitate and preserve existing highway transportation infrastructure.

The HPMS database is unique because it directly ties together roadway physical, operational, usage (travel), condition, and performance data that can be analyzed and summarized at sub-state, statewide, and national levels by highway system. A newly added Geographic Information System (GIS) capability will greatly enhance the users’ ability to analyze and display HPMS data.

How Does Florida Collect HPMS Data?

In the State of Florida, the State Materials Office of the Florida Department of Transportation (FDOT) collects the required data on selected sections of the State Highway System on an annual basis. The State Materials Office began collecting ride data for the HPMS, in conjunction with its Pavement Condition Survey (PCS) program, in 1991. Prior to the 1994/1995 survey, Florida reported the data collected on sample sections only. Thereafter, however, the Department was required to report the ride values in one direction for both flexible and rigid roadways from the Pavement Management System (PMS) database. The flexible and rigid pavement sections were in addition to the HPMS sample sections. For PMS purposes, the State Materials Office collects ride values in both directions for divided roadways and in one direction for composite roadways on the entire State maintained roadway system.

Currently, FHWA requires collecting HPMS ride data, in one direction only, on the entire State Highway System (referred to as “Designated Sections”). These Sections follow the same section lengths and limits as the PCS sections. At times, the Designated Sections may not be all rated for different reasons (such as being under reconstruction, part of ongoing construction projects, or other causes). In such an instance, the sections among the Designated Sections that were rated are labeled (or referred to) as “Rated Sections”. Furthermore, FHWA also requires the collection of ride data on specific locations (that could be in either direction) that, in most cases, do not coincide with any PCS section.
These sections are known as “Sample Sections” and are identified by number, county section number, beginning milepost and ending milepost.

Prior to the 1998/99 survey, the data was collected using ultrasonic sensors and the ride values were reported in terms of International Roughness Index (IRI), without any filtering. Thereafter, the Department implemented the use of laser sensors for ride data collection. The ride values are still reported as International Roughness Index but filtered to a 300-foot wavelength (IRIF300). IRI is rigorously defined as a specific mathematical transform (and, thus, a property) of a true profile. The calculation of IRI takes into consideration wavelengths between 4 and 100 feet. It is believed that wavelengths outside this band do not contribute to the roughness felt in vehicles at speeds near 50 mph (testing speed). IRI values are reported in compliance with the FHWA order M 5600. 1B, appendix J, dated August 30, 1993.

In January of 2000, the State Materials Office started the collection of ride data, in terms of IRI, also for the HPMS off system sections. The data collection process in this case is similar to that of other HPMS sections. The data collection itself, however, is conducted during the time period between annual PCS surveys.

The data collected between 1991 and 1996, in compliance with FHWA requirements, included bridges, railroad crossings, etc. But in accordance with the present requirements, the current data collection omits bridges, railroad crossings, etc.

**How Does Data Collection Procedures Affect HPMS Data?**

Although standards specifying the HPMS data collection and reporting process do exist (Appendix J), their interpretation/implementation may not be always the same among the state highway agencies. For instance, in order to determine IRI values, the profile data may be averaged differently (moving average, straight average, etc.). The profile data may also be filtered differently (no filtering, 300-foot wavelength, etc.). In addition, the profile data may be collected using various sensor types (ultrasonic, laser, optical, or infrared sensors) while the sensors may also be spaced differently on the test vehicle (transverse locations). Moreover, some states report HPMS data from that collected as part of their Pavement Management System, rather than the specific HPMS sample sections. Consequently, it may not be realistic or appropriate to compare data between states.

The present report provides essential information on the current ride quality of the Florida roadway system. It also includes a summary of the historical ride data.
2001 HPMS Sections
Statewide

HPMS Rated Miles: 11,387 Mi.
(One Direction from PCS)

Flexible 97.9%
(11,146 Mi.)
Rigid 2.1%
(241 Mi.)

Number of HPMS Sections: 4,677
(One Direction from PCS)

Flexible 97.3%
(4,551 Sections)
Rigid 2.7%
(126 Sections)

Total PCS Rated Miles: 18,169 Mi.
(Both Directions)

PCS Miles 100%
(18,169 Mi.)

Sample HPMS Sections 12.5%
(2,263 Miles)

Sample HPMS Sections are extracted from PCS data and reported to FHWA.
Number of HPMS Rated Miles

FLEXIBLE MILES

RIGID MILES

FLEXIBLE AND RIGID MILES

SAMPLE MILES
Number of HPMS Designated Sections

- FLEXIBLE SECTIONS
- RIGID SECTIONS
- FLEXIBLE AND RIGID SECTIONS
- SAMPLE SECTIONS
Number of HPMS Designated Miles

- **Flexible Miles**: Increasing trend from 11,423 to 11,628 miles.
- **Rigid Miles**: Decreasing trend from 374 to 265 miles.
- **Flexible and Rigid Miles**: Mixed trend with fluctuations.
- **Sample Miles**: Initial rise followed by stabilization.
2001 Frequency Distribution of IRI
Statewide

Flexible Sections

Number of Flexible Sections: 4,551
Miles of Flexible Sections Rated: 11,146
2001 Frequency Distribution of IRI

Statewide

Rigid Sections

Number of Rigid Sections: 126
Miles of Rigid Sections Rated: 241
2001 Frequency Distribution of IRI
Statewide

Flexible and Rigid Sections

Number of Flexible and Rigid Sections: 4,677
Miles of Flexible and Rigid Sections Rated: 11,387
2001 Frequency Distribution of IRI
Statewide

Sample Sections

Number of Sample Sections: 2,056
Miles of Sample Sections Rated: 2,263
Percent of Rated Miles within IRI Ranges from 1995 – 2001

Statewide

Flexible Sections

IRI Ranges According to Appendix J of the HPMS Manual
Percent of Rated Miles within IRI Ranges from 1995 – 2001

Statewide
Rigid Sections

IRI Ranges According to Appendix J of the HPMS Manual
Percent of Rated Miles within IRI Ranges from 1995 – 2001

Statewide

Flexible and Rigid Sections

IRI Ranges According to Appendix J of the HPMS Manual
Percent of Rated Miles within IRI Ranges from 1995 – 2001

Statewide Sample Sections

IRI Ranges According to Appendix J of the HPMS Manual
HPMS Off-System
Rated and Designated Sections

<table>
<thead>
<tr>
<th>Year</th>
<th>Rated Sections</th>
<th>Designated Sections</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>250</td>
<td>260</td>
</tr>
<tr>
<td>2001</td>
<td>266</td>
<td>279</td>
</tr>
</tbody>
</table>
HPMS Off-System
Rated and Designated Miles

Year

2000
2001

Miles

343
346

356
362

Rated Miles
Designated Miles
2001 Frequency Distribution of IRI

Off-System HPMS

Number of Sections Rated: 266
Miles Rated: 346
Percent of Rated Miles within IRI Ranges from 2000 – 2001

Off-System HPMS

IRI Ranges According to Appendix J of the HPMS Manual

<table>
<thead>
<tr>
<th>IRI Range</th>
<th>2000</th>
<th>2001</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-80</td>
<td>27.18</td>
<td>22.17</td>
</tr>
<tr>
<td>81-130</td>
<td>50.25</td>
<td>55.18</td>
</tr>
<tr>
<td>131+</td>
<td>22.56</td>
<td>22.65</td>
</tr>
</tbody>
</table>