

# STATE OF FLORIDA



## **2007 RESILIENT MODULUS OF ROADBED SOILS FACTS & FIGURES**

**Research Report  
FL/DOT/SMO/08-515**

**Charles Holzschuher  
Hyung Lee**

**APRIL 2008**

**STATE MATERIALS OFFICE**

## TABLE OF CONTENTS

TABLE OF CONTENTS.....	i
PAVEMENT MATERIAL SYSTEMS .....	ii
EXECUTIVE SUMMARY .....	iii
PART I: OVERVIEW.....	1
INTRODUCTION .....	2
Deflection-Based Techniques .....	2
USE OF DEFLECTION-BASED DEVICES: FLORIDA HISTORICAL PERSPECTIVE.....	2
Benkelman Beam .....	2
Dynalect.....	3
Falling Weight Deflectometer.....	4
FLORIDA TESTING PROCEDURE.....	5
Deflection Testing.....	5
Prediction of In-Place Moduli of Embankment Material .....	5
PROJECT TESTING REQUESTS.....	7
Field Testing Requirements .....	8
IDENTIFICATION OF VIBRATION SENSITIVE WORK ZONES .....	8
PART II:.....	11
REFERENCES .....	32

## **PAVEMENT MATERIAL SYSTEMS**

The Pavement Material Systems provides the Department with the technical expertise to ensure safe and durable pavement systems. This section interacts and partners with other central and district offices, the Federal Highway Administration, pavement industry, and other stakeholders. To support these goals, presented are the Pavement Material System's Mission, Vision, and Value Statements.

### **Mission**

Make Florida's pavements safer, last longer, and perform better.

### **Vision**

The best pavements in the country.

### **Values**

Do it R.I.T.E (Respect, Integrity, Teamwork, and Excellence), Now!

To learn more about our people, functions, and services, we invite you to visit us at:

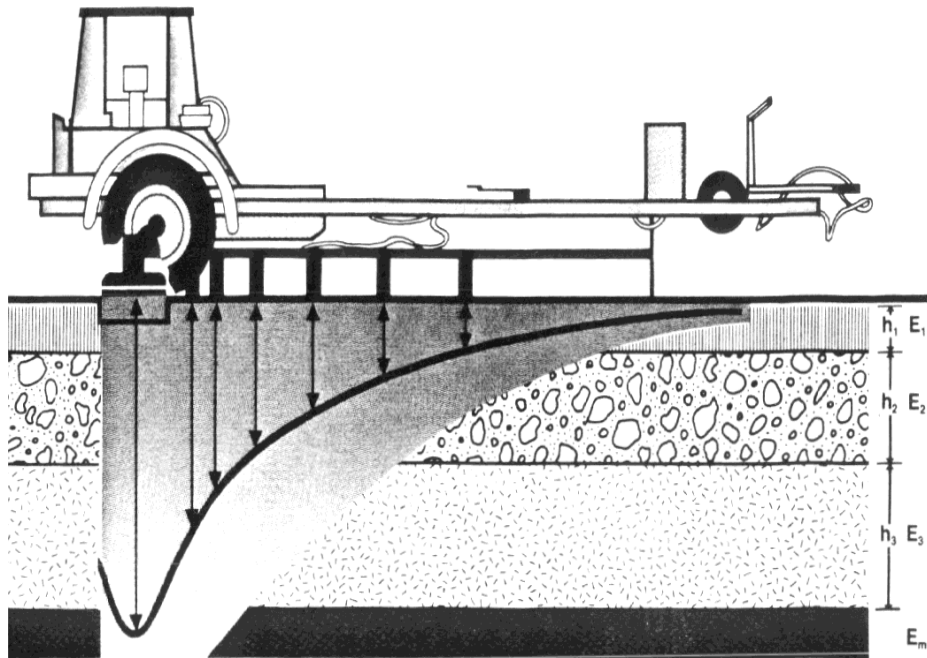
<http://www.dot.state.fl.us/statematerialsoffice/pavement/pavementhome.htm>

## EXECUTIVE SUMMARY

One of the primary functions of the Non-Destructive Testing Group, a unit of the State Materials Office in Gainesville, Florida, is to characterize the in-situ properties of Florida's roadbed materials for pavement design purposes. The basis for such a characterization is the resilient modulus ( $M_R$ ). The resilient modulus is a measure of the material elastic property recognizing its certain nonlinear characteristics. It is estimated, in our case, in-place from deflection measurements. This information has been critical to the Department's effort to support informed highway planning, as well as policy and decision making. This requires the apportionment and allocation of funds as well as the determination of appropriate cost-effective strategies to rehabilitate and preserve existing highway transportation infrastructure.

This report is intended to provide information regarding our program testing procedures, to report current and past  $M_R$  values on a statewide basis, and to identify historical regional  $M_R$  trends in the various Districts.

# PART I: OVERVIEW



## INTRODUCTION

One of the primary functions of the Non-Destructive Testing (NDT) program is to characterize the in-situ properties of the Florida's roadbed (embankment) materials for pavement design purposes. The basis for such a characterization is the resilient modulus ( $M_R$ ). The resilient modulus is a measure of a material's elastic property recognizing its nonlinear characteristics. It is directly estimated, in our case, in-place using deflection-based techniques.

### Deflection-Based Techniques

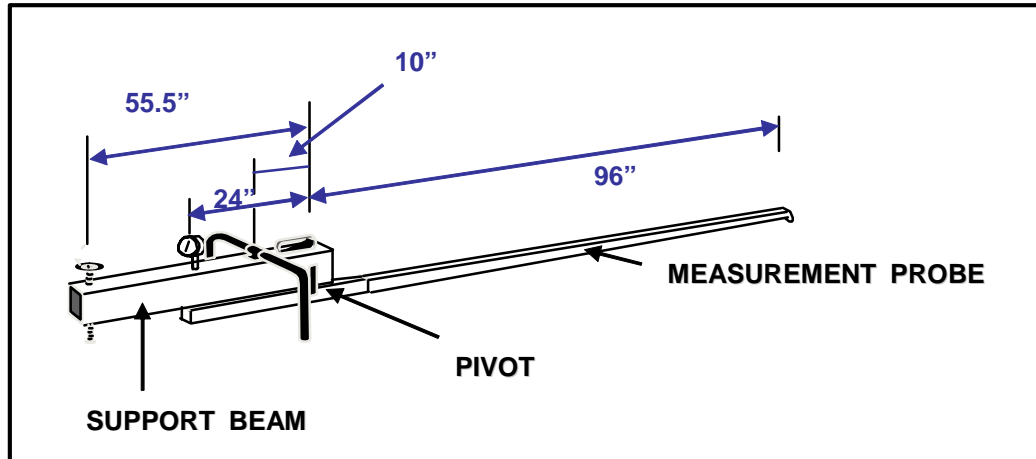
Due to their speed and ease of operation deflection-based techniques are being widely used in the evaluation of the structural integrity and for estimating the elastic moduli of in-place pavement systems. The deflections can be non-destructively induced and measured using various commercially available devices. These devices are designed based on a variety of loading modes and measuring sensors. The loading modes include static, steady-state vibratory, and impulse loading; while the resulting responses are measured with sensors that include geophones, accelerometers, and linear voltage differential transducers (LVDT).

### USE OF DEFLECTION-BASED DEVICES: FLORIDA HISTORICAL PERSPECTIVE

The Department implemented the use of the Falling Weight Deflectometer (FWD) in the early 1980s. It has, however for pavement design purposes, initially specified the use of a Benkelman Beam, and then the use of a vibratory-type device (Dynalect).

#### Benkelman Beam

The Benkelman Beam was the first deflection-based device used in Florida for pavement design purposes. It was developed by A.C. Benkelman during the Western Association of State Highway Officials (WASHO) Road Test. It consists of a measurement probe hinged to a three-legged reference beam, as schematically illustrated in Figure 1. The probe is positioned between the rear dual tires of a truck, and the rebound deflection is measured by a dial placed on the reference beam when the truck is slowly driven away. Although this method is simple and relatively inexpensive, it is also slow and labor intensive. In addition, the measurements are usually limited to maximum deflections only and are produced under unrealistic load durations. Furthermore, the leveled position of the reference beam may, in some cases, be unduly influenced by the deflection basin.



**Figure 1. Schematic Illustration of a Benkelman Beam**

### **Dynaflect**

In mid-1980s, the Department switched to a steady-state vibratory device, known as Dynaflect. The Dynaflect consists of a relatively lightweight (2,000 lbs.) two-wheel trailer equipped with an automated data acquisition and control system. The deflections are generated by a combination of a sinusoidal dynamic load and the static weight of the trailer. The dynamic loading of a pavement surface is done using two counter-rotating eccentric steel weights. These steel weights, rotating at a constant frequency of eight cycles per second (8 Hz), generate a peak-to-peak dynamic load of approximately 1000 pounds in magnitude. The resulting deflections of a pavement system are measured with geophones. The geophones are electromechanical devices that use a magnetic field to produce an electrical impulse. These geophones are suspended, at set intervals, from the tongue of the trailer.

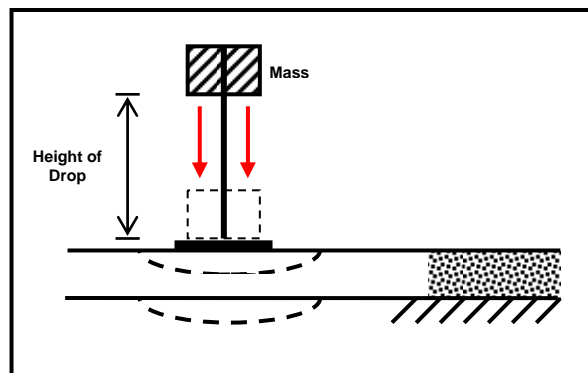
A primary advantage of the Dynaflect over a static-loading device, such as Benkelman beam, is that a reference frame is not required. In addition, the Dynaflect generates a complete deflection basin at each test location. However, the fixed magnitude and the loading frequency are its major limitations. A photographic illustration of a Dynaflect is given in Figure 2.



**Figure 2. Dynaflect Device**

## Falling Weight Deflectometer

The Falling Weight Deflectometer (FWD) consists of a trailer mounted, falling weight system capable of loading a pavement in a manner that simulates actual wheel loads in both magnitude and duration. An impulse load is generated by dropping a mass from a specified height. The mass is raised hydraulically, then released by an electrical signal and dropped with a buffer system on a 12-inch diameter rigid steel plate. A set of springs between the falling mass and hit bracket mounted above the load cell buffers the impact by decelerating the mass. A thin, neoprene pad rests between the plate and the pavement surface to allow for an even load distribution. When a weight is dropped, an impulse load enters the pavement system creating body and surface waves. The resulting vertical velocity of the pavement surface is picked up through a series of sensors located along the centerline of the trailer. These signals are then used to obtain the maximum deflection from each geophone through analog integrations. A single analog integration of a signal generates the deflection-time trace. The deflection measurements are recorded by the data acquisition system typically located in the tow vehicle. Figure 3 provides a schematic illustration of the FWD loading principle.



**Figure 3. FWD Loading Principle**

The use of the Falling Weight Deflectometer (FWD) testing for pavement design and rehabilitation purposes was first introduced by AASHTO in the 1993 Pavement Design Guide. In recent years, the FWD has gained further acceptance among highway agencies because of its versatility, reliability, and ease of use. The FWD loading is believed to better simulate the effects of traffic on pavement structures. Therefore as of March 2001, the Department has implemented the use of FWD for all pavement-related evaluations, including design activities. A photographic illustration of the FWD is shown in Figure 4.



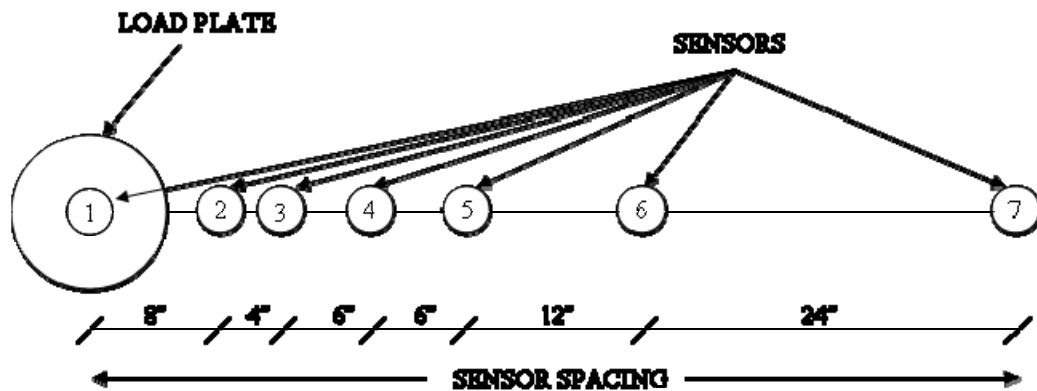


**Figure 4. Falling Weight Deflectometer**

## FLORIDA TESTING PROCEDURE

### Deflection Testing

When testing with the FWD for pavement design purposes, two 9-kip load drops are used. However, only the deflection data resulting from the last loadings are considered for roadbed soil characterization. It is generally believed that the deflection data produced under the first impact load may not always be representative of the true pavement response (2). Therefore, the first load is mainly used for the loading plate “seating” purposes. All the deflection data are obtained using the sensor configuration shown in Figure 5.



**Figure 5. Schematic Illustration of Sensor Configuration**

### Prediction of In-Place Moduli of Embankment Material

The current procedure for predicting the insitu strength of the embankment material of a pavement system is based on the procedure described in the *AASHTO Guide*

for *Design of Pavements Structures* calibrated to Florida conditions (3). This method was originally proposed by Ullidtz (4), and is based on Boussinesq's theory on a concentrated load applied on an elastic half-space (5). In this procedure, the modulus of an embankment material is estimated as follows:

$$E_r = 0.24P / d_r \cdot r \quad (2)$$

Where:

$E_r$  = Subgrade modulus, in psi;

$P$  = Applied load, in pounds;

$d_r$  = Deflection measured at a radial distance  $r$ , in inches; and

$r$  = Radial distance at which the deflection is measured, in inches.

The *AASHTO Design Guide* suggests the deflection used in the above equation be measured as close as possible to the loading plate and yet be sufficiently far from the load. This is suggested to satisfy the assumption that, at points sufficiently distant from the load, the deflections measured at the pavement surface are mainly due to the embankment deformation, and are also independent of the load plate size. Florida's previous experience with non-destructive deflection testing has shown that the pavement deflections measured at 36 inches away from the load are appropriate for the determination of the embankment moduli. Therefore, only the pavement deflections measured at 36 inches ( $r = 36$  inches in equation 2) away from the load are considered for design purposes in the Florida procedure. Furthermore, within a project limits, the resilient modulus ( $M_r$ ) value is reported based on the mean deflection plus two standard deviations ( $d_r = \text{mean deflection} + 2 \sigma$ ).

## PROJECT TESTING REQUESTS

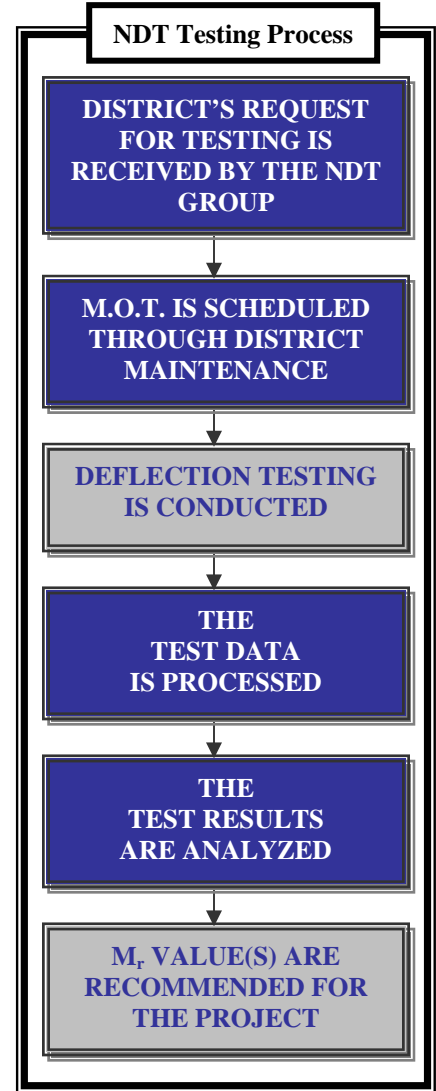
*To request a project to be tested, simply contact the following District FWD coordinators:*

District	Name	E-mail
1	Debra Childs	Debra.childs@dot.state.fl.us
2	Chad Townsend	Chad.townsend@dot.state.fl.us
3	Samuel Weede	Samuel.weede@dot.state.fl.us
4	William Sonnett	William.sonnett@dot.state.fl.us
5	Timothy Keefe	Timothy.keefe@dot.state.fl.us
6	Cathy Margoshes	Cathy.margoshes@dot.state.fl.us
7	Mary Sheets	Mary.sheets@dot.state.fl.us
Turnpike	William Cook	William.cook@dot.state.fl.us

Include the following information within the body of the request:

- 1.) Roadway Id (e.g. SR 91, 91470000, FL Turnpike)
- 2.) County Name (e.g. Okeechobee)
- 3.) Project Limits (e.g. MP 181.7 to MP 188.9)
- 4.) Exceptional Needs (e.g. Extend testing 1000 ft past Begin/End segment limits, vibration analysis desired.)
- 5.) Project Location Map
- 6.) Recommended Due Date
- 7.) MOT, Traffic Restrictions

After the District FWD coordinators have gathered the information needed for the requested projects, they will submit the request to the SMO's NDT group. The NDT group will then review the submitted requests and schedule Maintenance of Traffic (MOT) with District Maintenance Offices for deflection testing. The flow chart to the right details the project testing process.



For coordination purposes, it is best to provide the State Materials Office with as much time as possible by submitting any testing requests immediately after the work program has been updated and the project schedules are set. In order to ensure that all requests may be dealt with in a timely and efficient manner, a minimum of 6 months is required by the State Materials Office for testing. For further information on SMO's FWD deflection testing process, contact:

Charles Holzschuher, Nondestructive Testing  
[charles.holzschuher@dot.state.fl.us](mailto:charles.holzschuher@dot.state.fl.us)  
 Fax: (352) 955-6345

## Field Testing Requirements

Generally testing is only conducted on 2-lane projects greater than 1 mile long, or on multi-lane projects greater than 0.5 mile long.

Testing frequency for 2-lane projects is conducted at 28 tests / mile in one direction. For multi-lane projects testing is conducted at 14 tests / mile / each direction.

## IDENTIFICATION OF VIBRATION SENSITIVE WORK ZONES

Based on the findings of a recent research project, FDOT developed a methodology for identifying vibration-sensitive portions of resurfacing projects during routine pre-construction testing that does not require a detailed knowledge of the layering of the pavement structure or the geology of the surrounding site (6, 7). When the State Materials Office personnel is informed that a project is potentially vibration-sensitive, the FWD operator will be alerted to record the full FWD displacement time histories on each FWD test performed during pre-design testing. The time history data will then be processed to develop upper bound predictor of the ground motion at the site. By knowing or assuming a frequency for the vibratory roller to be used during construction, the peak particle velocity can be used to identify locations along a given project where vibratory compaction is not recommended. The analysis procedure is outlined in Figure 6.

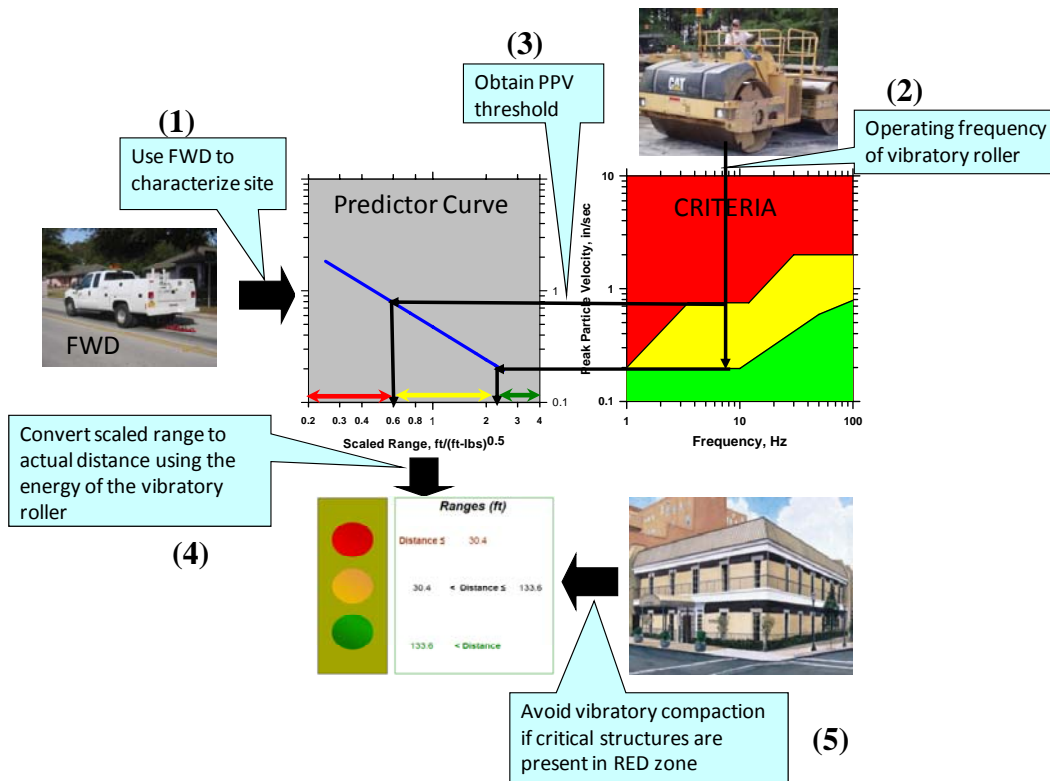


Figure 6. Vibration Analysis Procedures (6, 7)

The outcome of the analysis is a brief report that provides the limits for the “Red”, “Yellow” and “Green” zones defined as:

- RED zone: designates a region where the vibratory compaction may cause damage to nearby structures.
- YELLOW zone: designates a region where the vibratory compaction may cause human annoyance, but damage to buildings is unlikely.
- GREEN zone: designates the region where the vibratory compaction may or may not be noticeable, and human annoyance is unlikely.

An example of the project-specific vibration report is shown in Figure 7. If a sensitive structure is found within the limits of the “Red” zone, it is recommended that use of vibratory rollers for compaction of pavement layers be avoided and other means of compacting be considered to prevent major or minor damages in the structure, especially in urban areas.

FWD time histories can be easily collected while the typical deflection testing is performed for determining the resilient modulus values and no other information is necessary to perform the vibration analysis. To submit a request for the vibration report, simply inform the District FWD coordinators that the vibration report is needed when submitting the request for FWD testing. Then, the Nondestructive Testing Unit will provide the vibration report with the resilient modulus recommendations.



## Non-Destructive Testing Vibratory Compaction Criteria Report

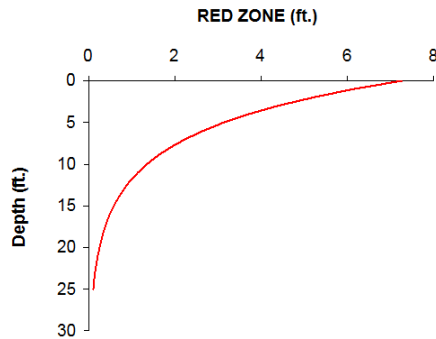
PROJECT INFORMATION	DATE
FIN:	02/16/07
COUNTY:	
SECTION ID:	
STATE ROAD NUMBER:	
DIRECTION:	
COMMENTS:	

ROLLER INFORMATION	
<input checked="" type="checkbox"/>	<i>Default roller was used.</i>
<input type="checkbox"/>	<i>Default roller was not used.</i>
LOAD (lbf):	44,120
AMPLITUDE (in):	0.035
FREQUENCY (Hz):	42
DRUM DIAMETER (in):	59

VIBRATION CRITERIA: SURFACE STRUCTURES	
RED ZONE (ft):	Distance (ft) $\leq$ 7.3
YELLOW ZONE (ft):	7.3 < Distance (ft) $\leq$ 40.8
GREEN ZONE (ft):	Distance (ft) > 40.8

Conditions in the RED ZONE should be avoided to prevent possible architectural or structural damage to buildings. Conditions in the YELLOW ZONE are acceptable; however, the department should be prepared to receive complaints from persons who may be annoyed by the vibration. Operations in the GREEN ZONE should incur few, if any, complaints from the public.

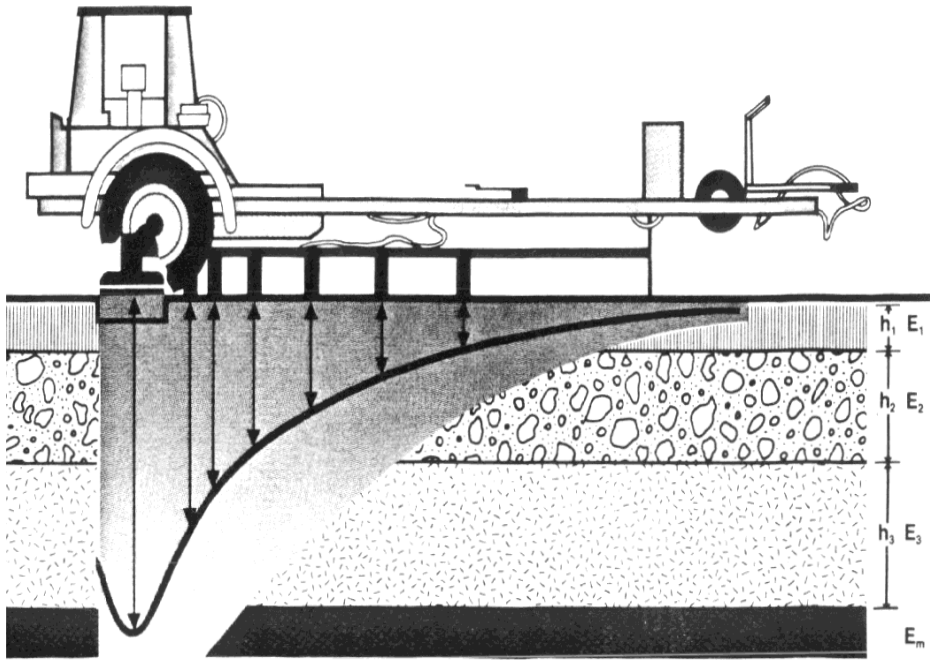
### VIBRATION CRITERIA: BURIED STRUCTURES



For fragile buried structures, the plot to the left shows the RED ZONE as a function of depth. Enter the plot at the depth of the buried structure and estimate the RED ZONE from the curve. Vibratory compaction is not recommended within a distance equal to the RED ZONE from the buried structure.

**Figure 7. Sample Vibration Report**

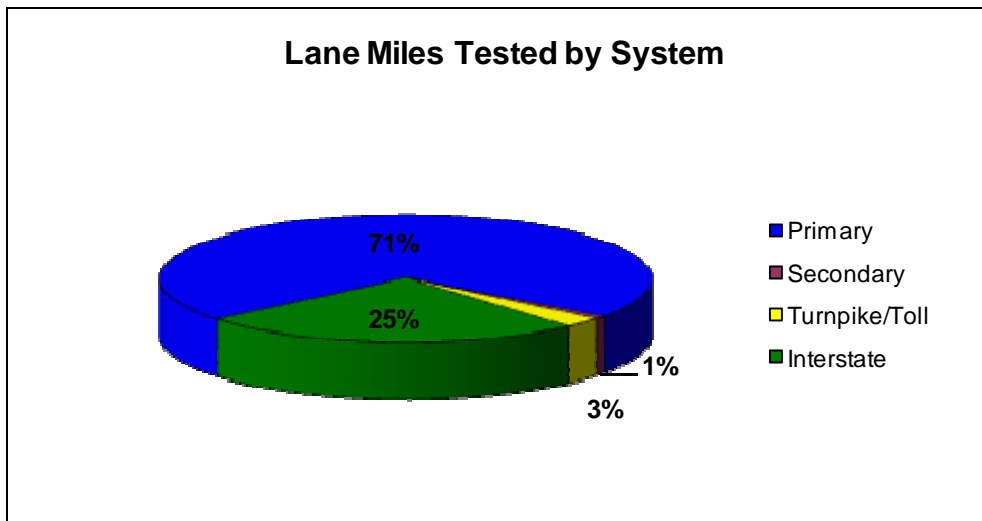
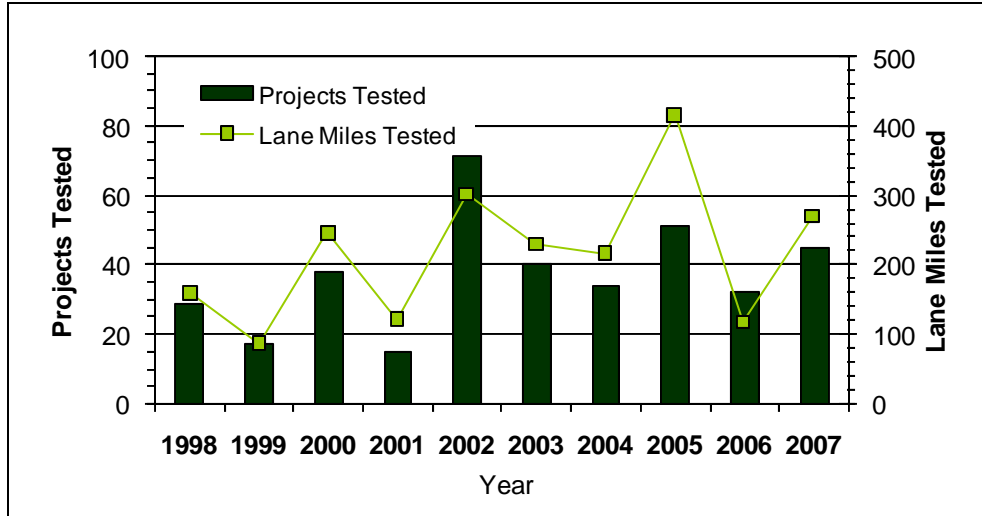
**PART II:**  
**FACTS & FIGURES<sup>1</sup>**



<sup>1</sup> Project resilient modulus values presented are the lowest values recommended for each project. Some projects may have multiple resilient modulus values.

## DISTRICT 1 TEN YEAR PRODUCTION SUMMARY

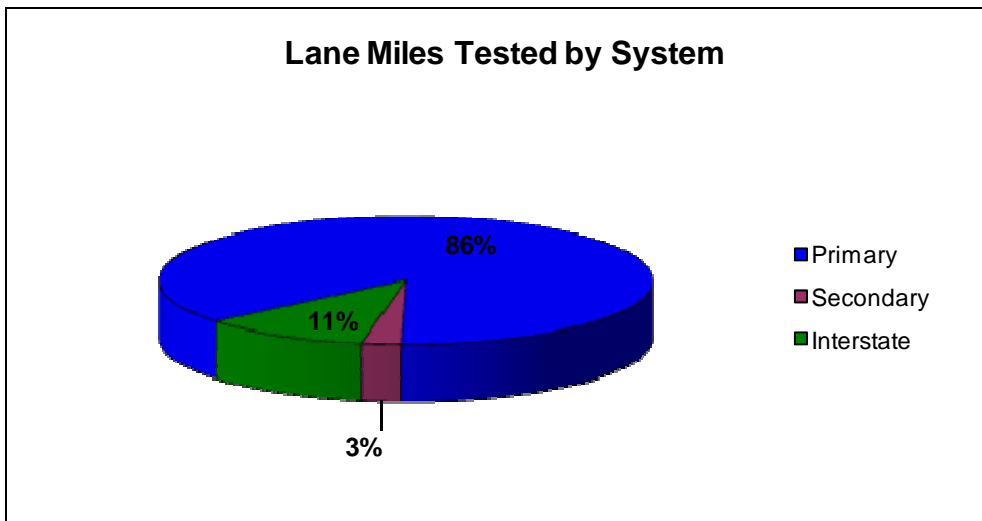
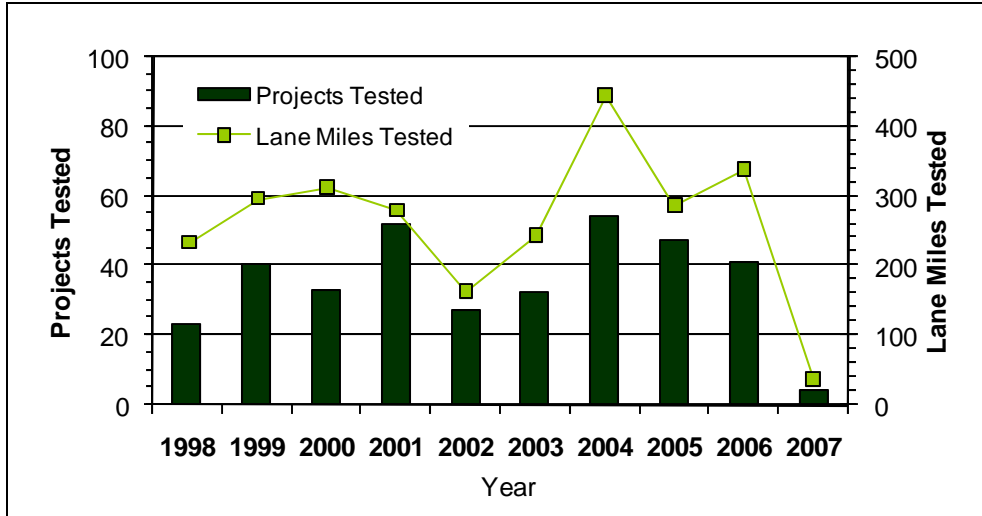
	Primary		Secondary		Turnpike/Toll		Interstate		All Systems	
	Projects	Lane Miles	Projects	Lane Miles	Projects	Lane Miles	Projects	Lane Miles	Projects	Lane Miles
1998	27	129.431	0	0.000	0	0.000	2	29.940	29	159.371
1999	15	74.338	2	11.510	0	0.000	0	0.000	17	85.848
2000	33	201.881	0	0.000	0	0.000	5	44.240	38	246.121
2001	11	57.697	0	0.000	1	14.000	3	48.970	15	120.667
2002	68	243.512	0	0.000	0	0.000	3	58.212	71	301.724
2003	32	154.144	0	0.000	0	0.000	8	74.998	40	229.142
2004	31	174.207	1	3.711	0	0.000	2	38.752	34	216.670
2005	41	258.518	0	0.000	1	42.842	9	115.278	51	416.638
2006	28	42.635	0	0.000	0	0.000	4	74.100	32	116.735
2007	37	205.964	0	0.000	0	0.000	8	63.750	45	269.714
<b>Total</b>	<b>323</b>	<b>1542.327</b>	<b>3</b>	<b>15.221</b>	<b>2</b>	<b>56.842</b>	<b>44</b>	<b>548.240</b>	<b>372</b>	<b>2162.630</b>





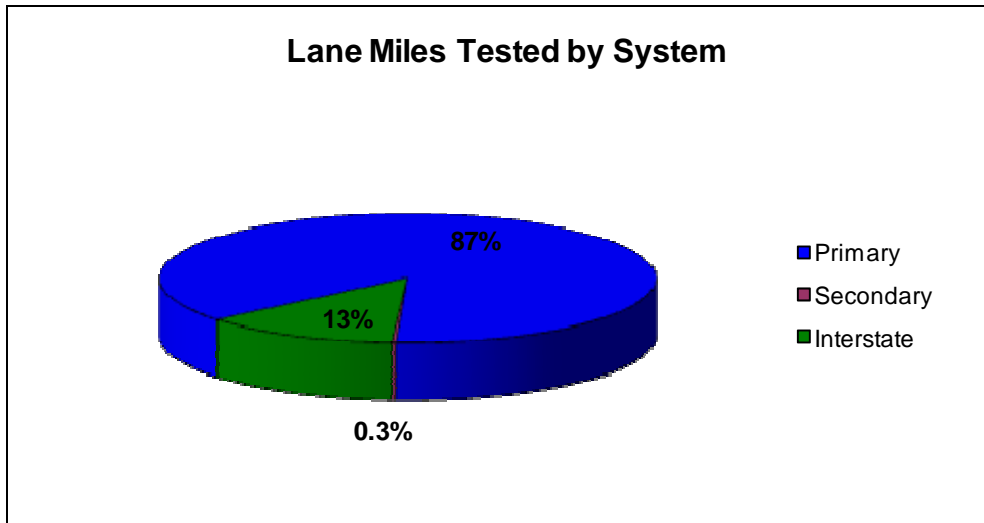
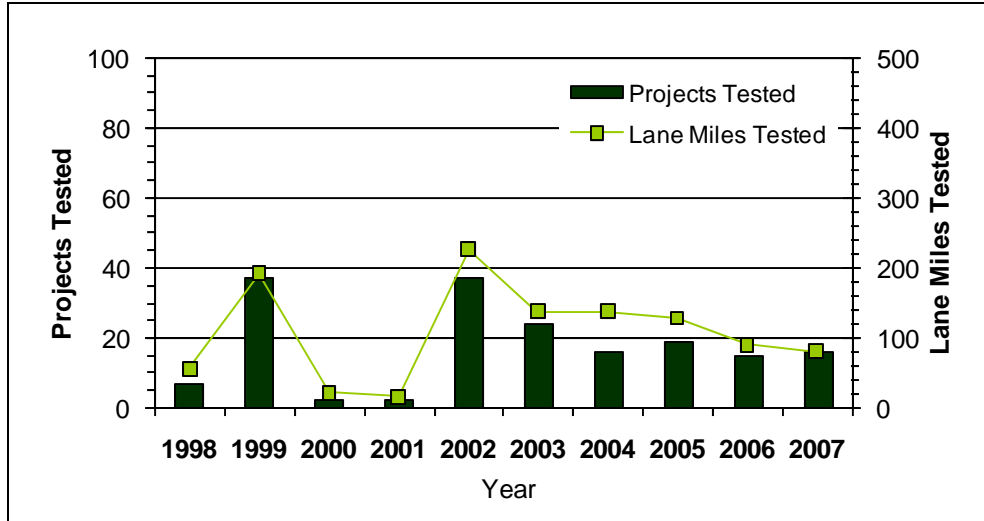
## DISTRICT 2 TEN YEAR PRODUCTION SUMMARY

	Primary		Secondary		Turnpike/Toll		Interstate		All Systems	
	Projects	Lane Miles	Projects	Lane Miles	Projects	Lane Miles	Projects	Lane Miles	Projects	Lane Miles
1998	22	223.610	0	0.000	0	0.000	1	9.160	23	233.770
1999	40	296.747	0	0.000	0	0.000	0	0.000	40	296.747
2000	30	254.138	1	6.156	0	0.000	2	49.812	33	313.106
2001	49	243.803	1	6.034	0	0.000	2	27.224	52	280.061
2002	26	153.046	0	0.000	0	0.000	1	8.734	27	162.780
2003	27	166.176	2	8.105	0	0.000	3	65.040	32	244.321
2004	47	332.541	0	0.000	0	0.000	7	105.366	54	444.907
2005	40	250.477	6	27.071	0	0.000	1	1.420	47	285.968
2006	34	292.598	3	19.062	0	0.000	4	20.554	41	339.214
2007	4	37.273	0	0.000	0	0.000	0	0.000	4	37.273
<b>Total</b>	<b>319</b>	<b>2250.409</b>	<b>13</b>	<b>66.428</b>	<b>0</b>	<b>0.000</b>	<b>21</b>	<b>287.310</b>	<b>353</b>	<b>2638.147</b>



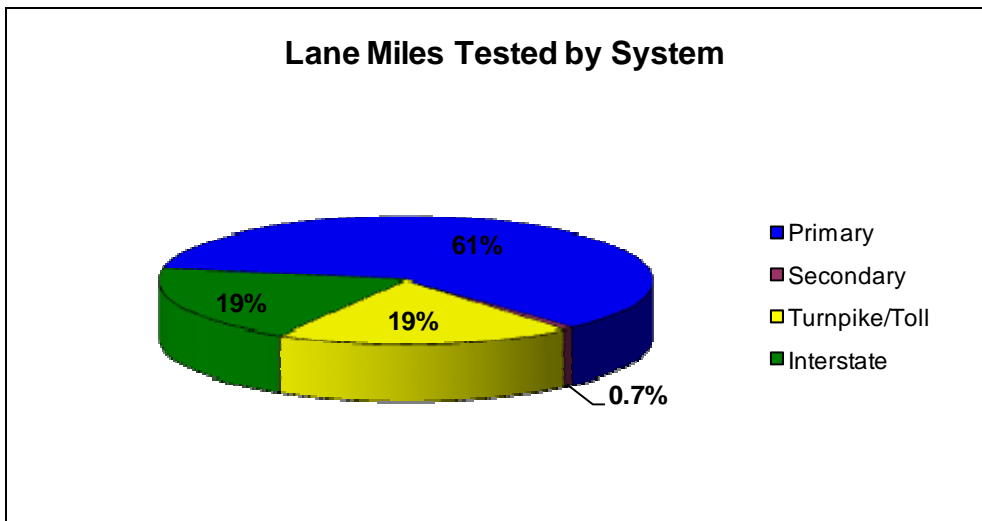
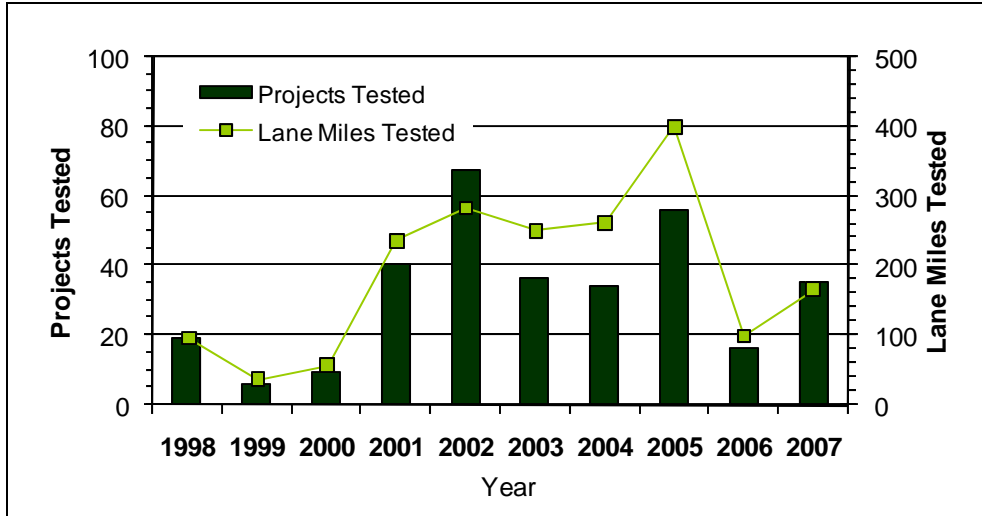
## DISTRICT 3 TEN YEAR PRODUCTION SUMMARY

	Primary		Secondary		Turnpike/Toll		Interstate		All Systems	
	Projects	Lane Miles	Projects	Lane Miles	Projects	Lane Miles	Projects	Lane Miles	Projects	Lane Miles
<b>1998</b>	7	55.061	0	0.000	0	0.000	0	0.000	7	55.061
<b>1999</b>	31	146.909	0	0.000	0	0.000	6	37.440	37	190.349
<b>2000</b>	2	20.376	0	0.000	0	0.000	0	0.000	2	20.376
<b>2001</b>	2	15.036	0	0.000	0	0.000	0	0.000	2	15.036
<b>2002</b>	37	225.450	0	0.000	0	0.000	0	0.000	37	225.450
<b>2003</b>	23	116.972	0	0.000	0	0.000	1	18.332	24	136.304
<b>2004</b>	13	87.816	1	2.857	0	0.000	2	42.910	16	136.583
<b>2005</b>	17	101.852	0	0.000	0	0.000	2	23.222	19	127.074
<b>2006</b>	14	73.388	0	0.000	0	0.000	1	15.158	15	89.546
<b>2007</b>	16	79.768	0	0.000	0	0.000	0	0.000	16	79.768
<b>Total</b>	162	922.628	1	2.857	0	0.000	12	137.062	175	1075.547



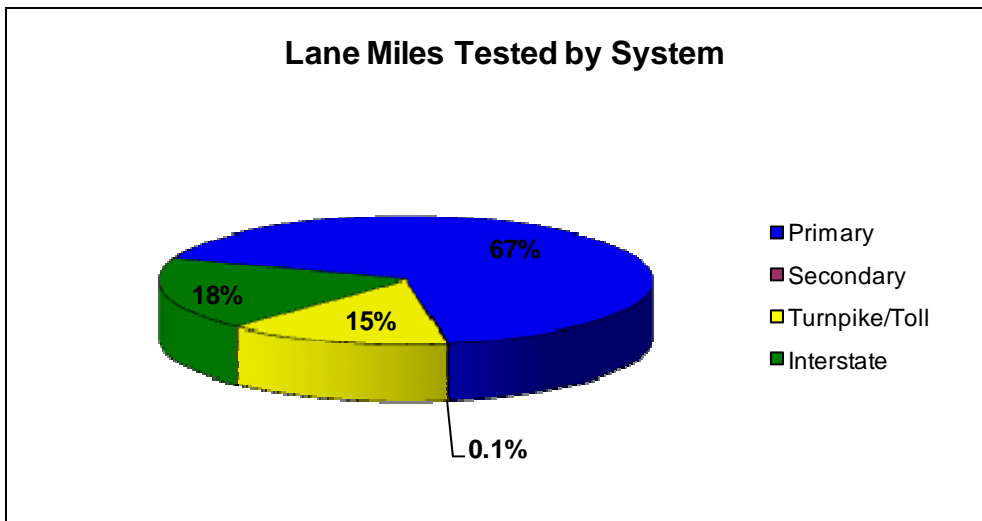
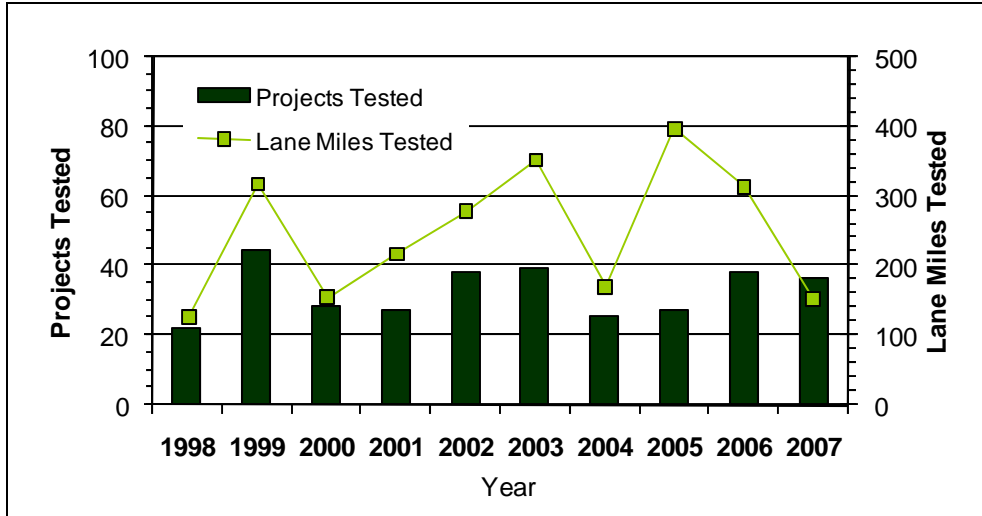
## DISTRICT 4 TEN YEAR PRODUCTION SUMMARY

	Primary		Secondary		Turnpike/Toll		Interstate		All Systems	
	Projects	Lane Miles	Projects	Lane Miles	Projects	Lane Miles	Projects	Lane Miles	Projects	Lane Miles
<b>1998</b>	15	76.506	0	0.000	2	15.963	2	0.693	19	97.162
<b>1999</b>	5	19.405	0	0.000	1	16.938	0	0.000	6	37.343
<b>2000</b>	6	20.856	0	0.000	0	0.000	3	33.492	9	57.348
<b>2001</b>	28	123.333	0	0.000	5	32.678	7	69.074	40	237.085
<b>2002</b>	58	207.308	1	0.997	2	26.000	6	40.722	67	284.027
<b>2003</b>	28	119.843	0	0.000	3	62.200	5	60.570	36	250.613
<b>2004</b>	29	157.283	0	0.000	5	99.708	0	0.000	34	261.991
<b>2005</b>	50	249.376	1	0.864	2	92.252	3	52.102	56	400.594
<b>2006</b>	9	27.138	2	2.992	0	0.000	5	62.794	16	99.924
<b>2007</b>	28	106.443	3	8.520	1	10.800	3	34.620	35	167.383
<b>Total</b>	256	1107.491	7	13.373	21	356.539	34	354.067	318	1893.470



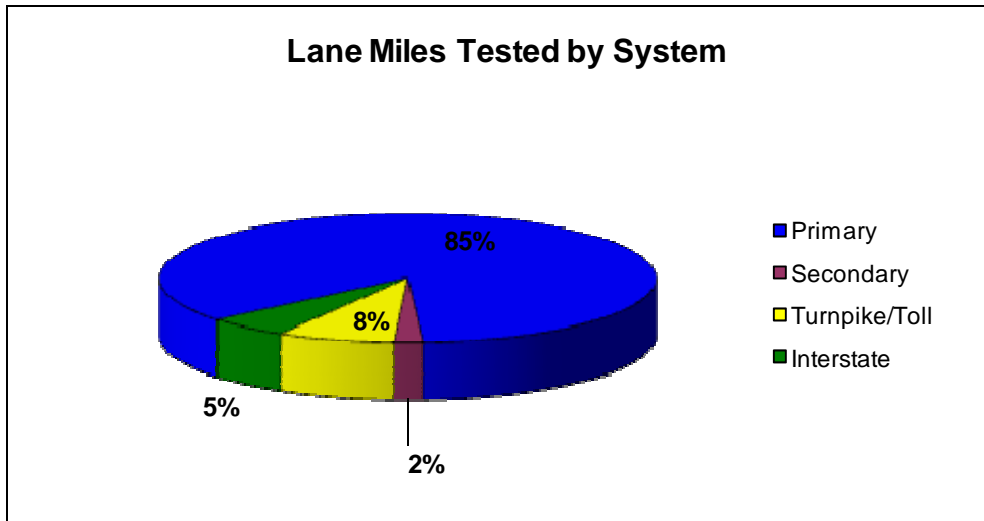
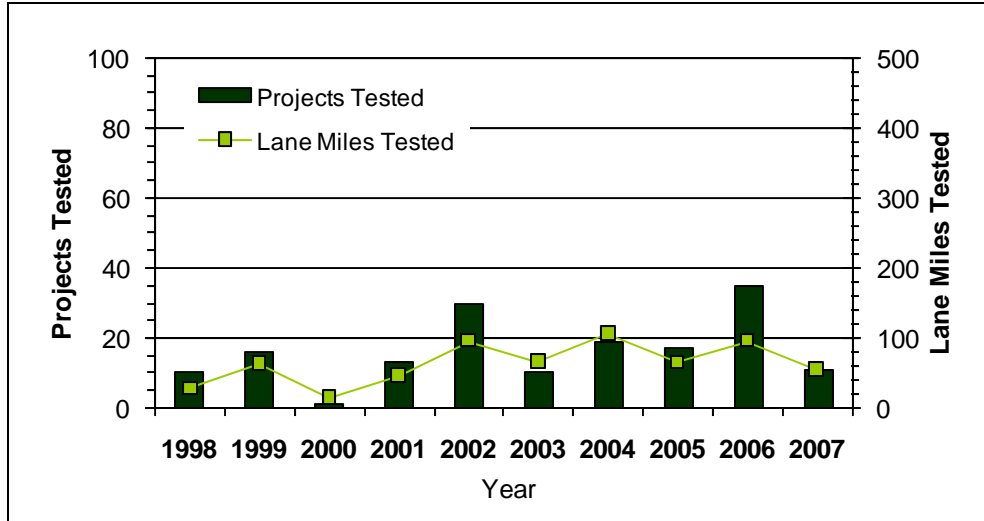
## DISTRICT 5 TEN YEAR PRODUCTION SUMMARY

	Primary		Secondary		Turnpike/Toll		Interstate		All Systems	
	Projects	Lane Miles	Projects	Lane Miles	Projects	Lane Miles	Projects	Lane Miles	Projects	Lane Miles
1998	18	105.613	0	0.000	0	0.000	4	15.012	22	124.625
1999	32	218.163	0	0.000	7	36.439	5	51.556	44	318.158
2000	18	92.273	1	1.754	5	20.160	4	30.416	28	154.603
2001	20	146.606	0	0.000	3	10.960	4	52.092	27	216.658
2002	35	251.763	0	0.000	3	23.568	0	0.000	38	278.331
2003	28	155.280	1	0.554	4	73.914	6	111.872	39	352.620
2004	24	140.590	0	0.000	0	0.000	1	27.890	25	169.480
2005	23	193.776	0	0.000	2	167.434	2	32.714	27	397.924
2006	30	169.53	0	0.000	1	21.340	7	115.096	38	313.966
2007	35	138.15	0	0.000	0	0.000	1	12.316	36	151.466
<b>Total</b>	<b>263</b>	<b>1611.744</b>	<b>2</b>	<b>2.308</b>	<b>25</b>	<b>353.815</b>	<b>34</b>	<b>448.964</b>	<b>324</b>	<b>2477.831</b>



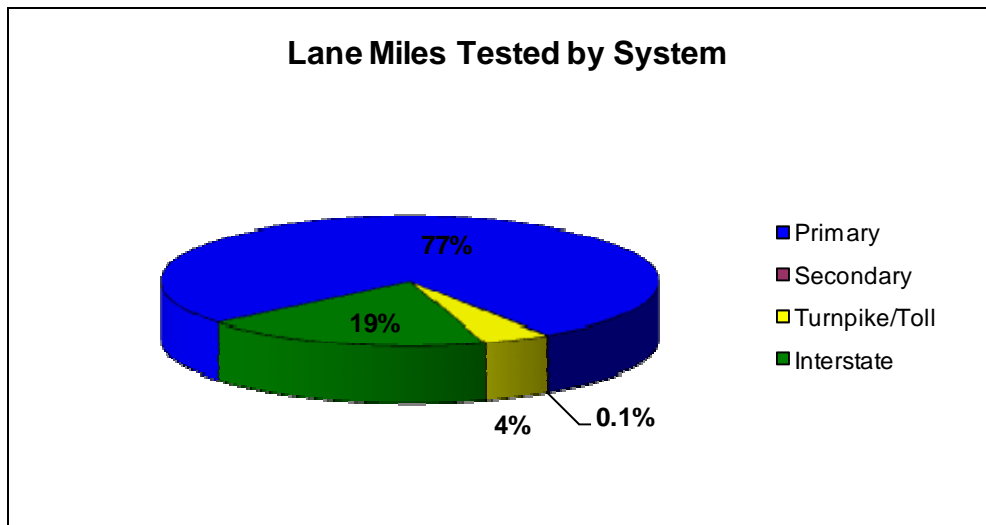
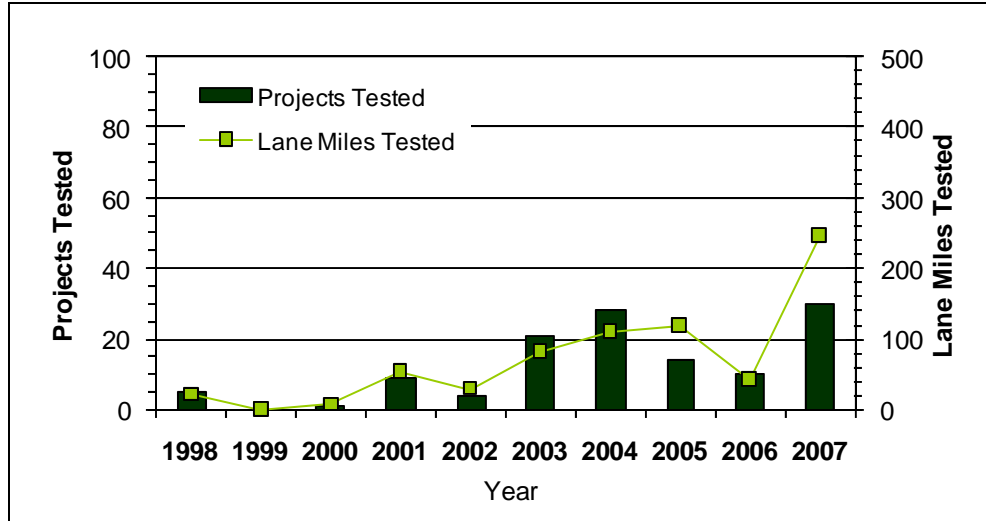
## DISTRICT 6 TEN YEAR PRODUCTION SUMMARY

	Primary		Secondary		Turnpike/Toll		Interstate		All Systems	
	Projects	Lane Miles	Projects	Lane Miles	Projects	Lane Miles	Projects	Lane Miles	Projects	Lane Miles
1998	10	25.904	0	0.000	0	0.000	0	0.000	10	25.904
1999	16	62.036	0	0.000	0	0.000	0	0.000	16	62.036
2000	1	12.715	0	0.000	0	0.000	0	0.000	1	12.715
2001	12	38.662	0	0.000	0	0.000	1	4.414	13	44.076
2002	29	82.816	1	11.065	0	0.000	0	0.000	30	94.881
2003	8	53.317	0	0.000	0	0.000	2	8.806	10	64.123
2004	18	64.316	0	0.000	1	40.150	0	0.000	19	105.466
2005	16	51.723	0	0.000	0	0.000	1	10.844	17	63.567
2006	34	91.219	0	0.000	0	0.000	1	2.484	35	94.703
2007	8	37.262	0	0.000	1	6.684	2	6.190	11	53.136
<b>Total</b>	<b>152</b>	<b>519.970</b>	<b>1</b>	<b>11.065</b>	<b>2</b>	<b>46.834</b>	<b>7</b>	<b>32.738</b>	<b>162</b>	<b>620.607</b>



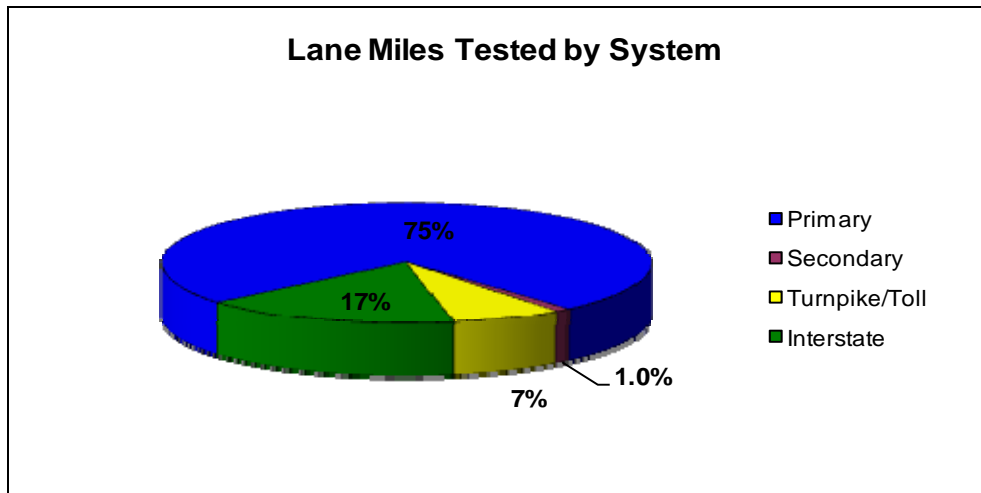
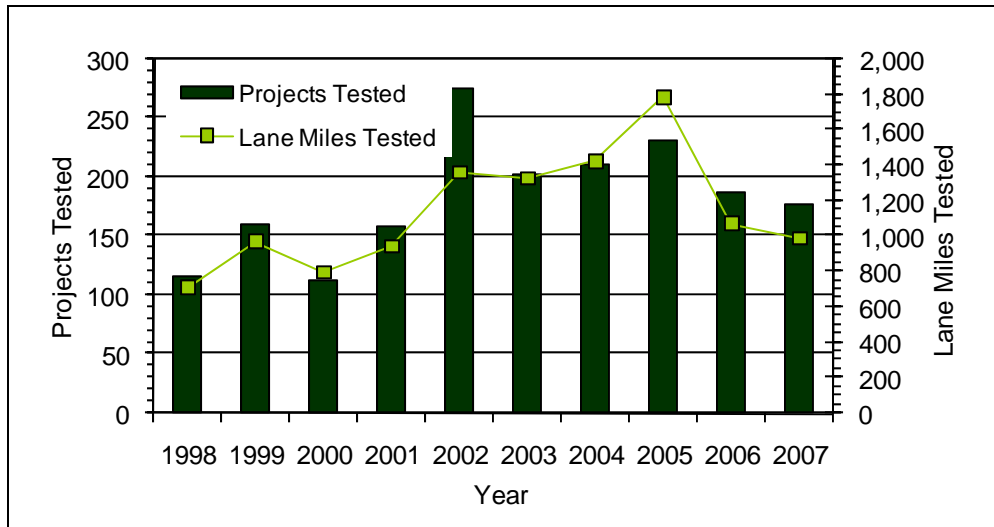
## DISTRICT 7 TEN YEAR PRODUCTION SUMMARY

	Primary		Secondary		Turnpike/Toll		Interstate		All Systems	
	Projects	Lane Miles	Projects	Lane Miles	Projects	Lane Miles	Projects	Lane Miles	Projects	Lane Miles
1998	5	21.722	0	0.000	0	0.000	0	0.000	5	21.722
1999	0	0.000	0	0.000	0	0.000	0	0.000	0	0.000
2000	1	7.746	0	0.000	0	0.000	0	0.000	1	7.746
2001	7	33.069	0	0.000	0	0.000	2	19.464	9	54.533
2002	3	9.433	0	0.000	0	0.000	1	19.232	4	29.665
2003	19	60.655	0	0.000	0	0.000	2	18.898	21	81.553
2004	27	109.088	1	0.800	0	0.000	0	0.000	28	110.888
2005	12	77.517	0	0.000	1	30.660	1	9.400	14	119.577
2006	10	42.635	0	0.000	0	0.000	0	0.000	10	42.635
2007	26	177.778	0	0.000	0	0.000	4	64.606	30	246.384
<b>Total</b>	<b>110</b>	<b>539.643</b>	<b>1</b>	<b>0.800</b>	<b>1</b>	<b>30.660</b>	<b>10</b>	<b>131.600</b>	<b>122</b>	<b>714.703</b>



## STATEWIDE TEN YEAR PRODUCTION SUMMARY

	Primary		Secondary		Turnpike/Toll		Interstate		All Systems	
	Projects	Lane Miles	Projects	Lane Miles	Projects	Lane Miles	Projects	Lane Miles	Projects	Lane Miles
1998	104	637.847	0	0.000	2	15.963	9	54.805	115	708.615
1999	139	817.598	2	11.510	8	53.377	11	88.996	160	971.481
2000	91	609.985	2	7.910	5	20.160	14	157.960	112	796.015
2001	129	658.206	1	6.034	9	57.638	19	221.238	158	943.116
2002	256	1173.328	2	12.062	5	49.568	11	126.900	274	1,361.858
2003	165	826.387	3	8.659	7	136.114	27	358.516	202	1,329.676
2004	189	1065.841	3	7.368	6	139.858	12	214.918	210	1,427.985
2005	199	1183.239	7	27.935	6	333.188	19	244.980	231	1,789.342
2006	159	739.143	5	22.054	1	21.340	22	290.186	187	1,072.723
2007	154	782.638	3	8.520	2	17.484	18	181.482	177	990.124
<b>Grand Total</b>	<b>1585</b>	<b>8494.212</b>	<b>28</b>	<b>112.052</b>	<b>51</b>	<b>844.690</b>	<b>162</b>	<b>1939.981</b>	<b>1826</b>	<b>11,390.935</b>



## 2007 PROJECT LISTING BY DISTRICT

### District 1

County Section	Financial Project Number	County	State Road	Travel Direction	Beginning Milepost	Ending Milepost	Test Date	Mr (psi)	Comments
04020	193873-2	Desoto	35	NT	11.255	13.810	9/11/07	20,000	
04020	193898-2	Desoto	35	NT	9.558	13.866	9/11/07	20,000	
06010	194019-2	Hardee	35	NTST	17.927	20.155	9/12/07	32,000	
06010	194028-2	Hardee	35	NT	15.726	17.927	9/12/07	31,000	
06010	194028-2	Hardee	35	ST	15.726	17.927	9/12/07	25,000	
09030	194485-3	Highlands	25	NTST	15.228	18.041	9/11/07	25,000	
09030	194485-3	Highlands	25	NT	15.228	18.041	9/11/07	18,000	
09030	194485-3	Highlands	25	NT	15.228	18.041	9/11/07	29,000	
09030	194485-3	Highlands	25	ST	15.228	18.041	9/11/07	14,000	
09030	194485-3	Highlands	25	ST	15.228	18.041	9/11/07	22,000	
03010	195408-2	Collier	90	ST	20.632	24.687	4/17/07	20,000	May be HMA/PCC between MP 22.970 and 23.650
12040	195710-2	Lee	867	NT	5.187	6.485	9/5/07	19,000	
13080	195808-2	Manatee	789	ST	0.000	4.545	9/6/07	16,000	
13150	195840-2	Manatee	64	ETWT	4.115	6.758	2/22/07	19,000	
13070	195983-2	Manatee	37	ST	0.000	5.534	9/6/07	13,000	
13040	196076-2	Manatee	684	ET	7.025	7.754	2/22/07	21,000	
13040	196076-2	Manatee	684	WT	7.025	7.754	2/22/07	25,000	
13020	196093-2	Manatee	43	ET	6.695	11.233	9/18/07	19,000	
13020	196093-2	Manatee	43	ET	6.695	11.233	9/18/07	29,000	
16140	196915-2	Polk	544	ET	0.000	1.890	2/5/07	17,000	
16140	196915-2	Polk	544	ET	0.000	1.890	2/5/07	24,000	
16140	196915-2	Polk	544	WT	0.000	1.890	2/5/07	13,000	
16140	196915-2	Polk	544	WT	0.000	1.890	2/5/07	20,000	
16140	196915-3	Polk	544	ETWT	1.890	3.189	2/5/07	16,000	
16110	197220-2	Polk	60	ETWT	29.402	30.541	7/30/07	25,000	
16030	197297-2	Polk	35	NTST	29.063	30.600	4/19/07	14,000	May be HMA/PCC between MP 29.600 and 30.350 in NB
16020	197370-2	Polk	600	NT	5.512	7.513	7/31/07	32,000	
16020	197370-2	Polk	600	ST	5.512	7.513	7/31/07	14,000	



## 2007 PROJECT LISTING BY DISTRICT

### District 1

County Section	Financial Project Number	County	State Road	Travel Direction	Beginning Milepost	Ending Milepost	Test Date	Mr (psi)	Comments
16020	197370-2	Polk	600	NTST	5.512	7.513	7/31/07	27,000	
16020	197372-2	Polk	600	NT	16.403	20.989	2/19/07	19,000	
16020	197372-2	Polk	600	ST	16.403	20.989	2/19/07	13,000	
16020	197372-3	Polk	600	NTST	20.989	22.460	2/19/07	13,000	
16050	197373-2	Polk	600	ST	3.367	4.278	2/19/07	15,000	
16280	197396-2	Polk	542	EB	0.380	2.476	2/21/07	13,000	
16120	197485-2	Polk	655	NT	3.740	7.125	2/21/07	17,000	
16180	197534-2	Polk	25	NT	24.469	27.925	2/14/07	27,000	
16180	197534-2	Polk	25	ST	24.469	27.925	2/14/07	21,000	
16180	197534-4	Polk	25	NT	27.925	31.970	2/14/07	27,000	
16180	197534-4	Polk	25	ST	27.925	31.970	2/14/07	22,000	
16250	197627-2	Polk	37	NTST	19.010	23.259	7/30/07	24,000	
16030	197647-2	Polk	35	NT	10.257	12.561	4/19/07	18,000	
16030	197647-2	Polk	35	NT	10.257	12.561	4/19/07	31,000	
16030	197647-2	Polk	35	ST	10.257	12.561	4/19/07	22,000	
16030	197647-2	Polk	35	ST	10.257	12.561	4/19/07	31,000	
17070	197934-3	Sarasota	72	ET	4.490	6.460	4/25/07	24,000	
17070	197934-3	Sarasota	72	WT	4.490	6.460	4/25/07	28,000	
17070	197934-3	Sarasota	72	ETWT	4.490	6.460	4/25/07	15,000	
07010	408286-3	Hendry	80	EB	12.594	17.640	9/5/07	23,000	
17008	414523-1	Sarasota	758	ET	3.049	4.848	4/25/07	18,000	
17008	414523-1	Sarasota	758	WT	3.049	4.848	4/25/07	23,000	
17070	415569-1	Sarasota	72	ETWT	13.086	21.250	4/25/07	12,000	
17070	415569-1	Sarasota	72	ETWT	13.086	21.250	4/25/07	21,000	
17070	415569-1	Sarasota	72	ETWT	13.086	21.250	4/25/07	8,000	
17070	415569-1	Sarasota	72	ETWT	13.086	21.250	4/25/07	21,000	
17070	415569-1	Sarasota	72	ETWT	13.086	21.250	4/25/07	15,000	
04020	417876-1	Desoto	35	ST	4.260	9.579	2/26/07	26,000	
04020	417876-1	Desoto	35	ST	4.260	9.579	2/26/07	21,000	
04020	417876-1	Desoto	35	ST	4.260	9.579	2/26/07	17,000	

## 2007 PROJECT LISTING BY DISTRICT

### District 1

County Section	Financial Project Number	County	State Road	Travel Direction	Beginning Milepost	Ending Milepost	Test Date	Mr (psi)	Comments
03175	419880-1	Collier	93	NTST	35.601	42.144	2/7/07	32,000	
13130	420238-1	Manatee	93	NTST	9.914	11.982	4/18/07	23,000	
17075	420240-1	Sarasota	93	NTST	29.039	37.095	8/15/07	30,000	Northbound was tested on 4/24/07
13175	420241-1	Manatee	93	NTST	3.884	5.233	4/18/07	32,000	
13075	420253-1	Manatee	93	NTST	12.896	15.723	9/18/07	32,000	
13075	420254-1	Manatee	93	NTST	3.750	8.288	9/18/07	31,000	
06010	420633-1	Hardee	35	NT	5.034	10.865	2/26/07	19,000	High deflections measured near MP 5.86
06010	420633-1	Hardee	35	NT	5.034	10.865	2/26/07	10,000	High deflections measured near MP 5.86
06010	420633-1	Hardee	35	NT	5.034	10.865	2/26/07	20,000	High deflections measured near MP 5.86
17075	420648-1	Sarasota	93	NTST	37.069	42.619	8/15/07	18,000	Northbound was tested on 4/24/07
17075	420648-1	Sarasota	93	NTST	37.069	42.619	8/15/07	18,000	Northbound was tested on 4/24/07
12001	421116-1	Lee	739	NT	3.860	5.400	9/5/07	18,000	
16010	422393-1	Polk	600	NT	0.000	2.426	7/31/07	25,000	
13140	422401-1	Manatee	64	WT	0.000	4.947	9/18/07	22,000	
13140	422401-1	Manatee	64	WT	0.000	4.947	9/18/07	16,000	
01030	N/A	Charlotte	31	NT	0.000	12.126	8/21/07	20,000	
01030	N/A	Charlotte	31	NT	0.000	12.126	8/21/07	6,000	
01030	N/A	Charlotte	31	NT	0.000	12.126	8/21/07	18,000	

**2007 PROJECT LISTING BY DISTRICT**

**District 2**

<b>County Section</b>	<b>Financial Project Number</b>	<b>County</b>	<b>State Road</b>	<b>Travel Direction</b>	<b>Beginning Milepost</b>	<b>Ending Milepost</b>	<b>Test Date</b>	<b>Mr (psi)</b>	<b>Comments</b>
26060	207756-4	Alachua	200	NT	20.535	26.115	1/28/07	22,000	
26060	207756-4	Alachua	200	ST	20.535	26.115	1/28/07	26,000	
29020	208417-1	Columbia	47	ST	0.000	4.312	2/28/07	18,000	
72080	209642-8	Duval	15	NTST	0.945	3.804	3/1/07	14,000	PCC from MP 3.360 to 3.804. Excluded from analysis
76010	209958-3	Putnam	15	NT	18.445	23.368	5/16/07	15,000	

## 2007 PROJECT LISTING BY DISTRICT

### District 3

County Section	Financial Project Number	County	State Road	Travel Direction	Beginning Milepost	Ending Milepost	Test Date	Mr (psi)	Comments
50020	416942-1	Gasden	63	NT	10.899	14.838	3/27/07	32,000	
50020	416942-1	Gasden	63	NT	10.899	14.838	3/27/07	13,000	
50020	416942-1	Gasden	63	ST	10.899	14.838	3/27/07	20,000	Maybe PCC between 11.5 and 13.050
50040	416942-1	Gasden	63	NTST	0.000	0.230	3/27/07	24,000	
46050	419299-1	Bay	20	ET	23.449	25.871	4/12/07	14,000	May be HMA/PCC
48130	419304-1	Escambia	97	NT	0.000	22.507	4/3/07	16,000	
48130	419304-1	Escambia	97	NT	0.000	22.507	4/3/07	21,000	
48130	419304-1	Escambia	97	NT	0.000	22.507	4/3/07	15,000	
48130	419304-1	Escambia	97	NT	0.000	22.507	4/3/07	22,000	
48130	419304-1	Escambia	97	NT	0.000	22.507	4/3/07	14,000	
48130	419304-1	Escambia	97	NT	0.000	22.507	4/3/07	23,000	
48130	419304-1	Escambia	97	NT	0.000	22.507	4/3/07	16,000	
48130	419304-1	Escambia	97	NT	0.000	22.507	4/3/07	23,000	
53060	419306-1	Jackson	77	NT	8.370	10.740	4/5/07	16,000	
55002	419307-1	Leon	263	NT	11.218	15.081	3/27/07	24,000	
57030	419309-1	Okaloosa	30	ET	0.000	4.653	4/11/07	13,000	May be HMA/PCC
57030	419309-1	Okaloosa	30	WT	0.000	4.653	4/11/07	15,000	
57090	419310-1	Okaloosa	285	NT	2.854	12.002	4/11/07	11,000	May be HMA/PCC
59030	419311-1	Wakulla	377	NT	0.000	3.808	3/28/07	11,000	
55010	421635-1	Leon	61	NTST	9.816	9.830	3/27/07	23,000	
55040	421635-1	Leon	61	NT	10.606	12.156	3/27/07	23,000	
55040	421635-1	Leon	61	ST	10.606	12.156	3/27/07	16,000	
55040	421635-1	Leon	61	NTST	10.606	12.156	3/27/07	30,000	
55050	421635-1	Leon	61	NTST	0.000	0.418	3/27/07	23,000	
58010	421636-1	Santa Rosa	10	ET	11.700	12.678	4/10/07	10,000	May be HMA/PCC
54020	421638-1	Jefferson	20	ETWT	16.037	16.954	3/28/07	21,000	
48012	421743-1	Escambia	95	ET	3.489	3.678	4/4/07	19,000	
48012	421743-1	Escambia	95	WT	3.489	3.678	4/4/07	23,000	
48040	421743-1	Escambia	95	NTST	2.934	3.638	4/4/07	10,000	

## 2007 PROJECT LISTING BY DISTRICT

### District 4

County Section	Financial Project Number	County	State Road	Travel Direction	Beginning Milepost	Ending Milepost	Test Date	Mr (psi)	Comments
88060	228628-1	Indian River	60	ETWT	22.411	24.075	1/18/07	24,000	
93020	229744-3	Palm Beach	5	NT	12.698	14.184	10/10/07	18,000	
93020	229744-3	Palm Beach	5	ST	12.698	14.184	10/10/07	22,000	
93016	229782-1	Palm Beach	882	ETWT	8.500	9.483	10/10/07	16,000	
93026	229812-1	Palm Beach	845	NTST	0.000	3.000	7/11/07	24,000	
94004	230338-3	St. Lucie	614	ET	0.000	2.583	6/14/07	32,000	
94004	230338-3	St. Lucie	614	ET	0.000	2.583	6/14/07	17,000	
89090	230978-1	Martin	CR 714	ETWT	0.000	1.890	10/31/07	21,000	Segment 2
89090	230978-2	Martin	CR 714	ETWT	1.890	3.780	10/31/07	15,000	Segment 1
89090	230978-3	Martin	CR 714	ETWT	3.780	4.260	10/31/07	19,000	Segment 3
94030	410717-1	St. Lucie	70	ET	20.523	21.584	6/14/07	32,000	
94030	410717-1	St. Lucie	70	WT	20.523	21.584	6/14/07	27,000	
93012	411431-2	Palm Beach	708	ETWT	2.873	3.627	7/17/07	21,000	
94001	413046-1	St. Lucie	9	NTST	14.600	22.600	8/1/07	32,000	Testing could not be completed in SBTL from MP 14.6 to 22.6 due to safety and weather issues
94070	413046-2	St. Lucie	68	ETWT	17.074	18.280	11/21/07	17,000	
88081	413048-1	Indian River	9	NTST	0.000	5.900	7/30/07	32,000	
88081	413048-1	Indian River	9	NTST	0.000	5.900	7/30/07	21,000	
93050	415312-1	Palm Beach	805	NT	5.806	6.830	1/17/07	15,000	
93050	415312-1	Palm Beach	805	ST	5.806	6.830	1/17/07	19,000	
89095	415395-1	Martin	9	NTST	8.290	11.700	11/20/07	23,000	
86471	419602-1	Broward	821	NTST	0.000	4.200	11/6/07	32,000	
86471	419602-1	Broward	821	NTST	6.500	7.700	11/6/07	27,000	
86471	419602-1	Broward	821	NTST	6.500	7.700	11/6/07	32,000	
94050	419653-2	St. Lucie	A1A	NT	3.080	5.700	11/21/07	27,000	
94050	419653-2	St. Lucie	A1A	NT	3.080	5.700	11/21/07	13,000	
86010	421654-1	Broward	5	NTST	8.200	10.300	1/16/07	25,000	

## 2007 PROJECT LISTING BY DISTRICT

### District 4

County Section	Financial Project Number	County	State Road	Travel Direction	Beginning Milepost	Ending Milepost	Test Date	Mr (psi)	Comments
86028	421656-1	Broward	834	ET	3.200	4.700	6/12/07	26,000	
86028	421656-1	Broward	834	WT	3.200	4.700	6/12/07	20,000	
86040	421657-1	Broward	820	NT	0.000	1.600	6/12/07	14,000	
86040	421657-1	Broward	820	ST	0.000	1.600	6/12/07	32,000	
86040	421657-1	Broward	820	NTST	0.000	1.600	6/12/07	32,000	
86040	421659-1	Broward	820	ETWT	10.500	15.600	6/12/07	22,000	
86040	421659-1	Broward	820	ETWT	10.500	15.600	6/12/07	31,000	
86040	421659-1	Broward	820	ET	10.500	15.600	6/12/07	27,000	
86040	421659-1	Broward	820	WT	10.500	15.600	6/12/07	21,000	
86190	421670-1	Broward	823	NTST	3.700	6.900	6/12/07	32,000	
86220	421672-1	Broward	817	NTST	7.900	8.700	1/16/07	18,000	
86220	421672-1	Broward	817	NT	6.486	7.757	6/13/07	21,000	
86220	421672-1	Broward	817	ST	6.486	7.757	6/13/07	14,000	
89060	421680-1	Martin	76	ET	9.800	12.500	7/18/07	22,000	
89091	421681-1	Martin	714	ETWT	0.000	2.400	7/31/07	20,000	
93001	421682-1	Palm Beach	786	ETWT	4.100	6.000	10/10/07	17,000	
93002	421683-1	Palm Beach	800	ETWT	0.000	0.570	7/11/07	21,000	
93004	421684-1	Palm Beach	808	ETWT	4.900	6.700	1/17/07	21,000	
93180	421691-1	Palm Beach	802	ET	0.000	1.900	7/17/07	27,000	
93180	421691-1	Palm Beach	802	WT	0.000	1.900	7/17/07	31,000	
93280	421694-1	Palm Beach	704	ETWT	3.995	5.500	7/17/07	23,000	
88070	421695-1	Indian River	A1A	ST	0.490	5.200	6/25/07	24,000	
89060	421697-1	Martin	76	ET	14.700	23.500	7/18/07	21,000	
89530	422521-1	Martin	732	ETWT	0.000	2.210	7/31/07	19,000	
93010	422910-1	Palm Beach	5	NT	2.643	5.100	7/11/07	15,000	
93010	422910-1	Palm Beach	5	ST	2.643	5.100	7/11/07	20,000	

## 2007 PROJECT LISTING BY DISTRICT

### District 5

County Section	Financial Project Number	County	State Road	Travel Direction	Beginning Milepost	Ending Milepost	Test Date	Mr (psi)	Comments
70030	411666-1	Brevard	5	SB	4.432	6.310	2/12/07	16,000	PCC between MP 4.820 and MP 5.230. This portion excluded from analysis
70030101	411666-1	Brevard	5	SB	0.000	0.389	2/12/07	16,000	Included in 70030 between MP 4.047 and 4.432
77010	411742-1	Seminole	15	NTST	10.471	13.600	1/31/07	16,000	
70220	413072-1	Brevard	9 / I-95	NT	0.000	12.316	1/8/07	26,000	ST tested on 7/27/05 under 416938-1
70220	413072-1	Brevard	9 / I-95	NT	0.000	12.316	1/8/07	29,000	ST tested on 7/27/05 under 416938-1
11070	423347-1	Lake	50	ETWT	11.289	13.603	12/5/07	20,000	
11130	421977-1	Lake	46	ET	11.200	13.710	4/16/07	13,000	
11130	421977-1	Lake	46	ET	11.200	13.710	4/16/07	20,000	May be HMA overlaid PCC between MP 11.600 and 12.325
11130	421977-1	Lake	46	ET	11.200	13.710	4/16/07	13,000	
11140	421978-1	Lake	40	ET	7.196	9.697	3/19/07	23,000	
11190	421979-1	Lake	19	ST	0.569	9.725	3/19/07	14,000	
11200	421981-1	Lake	25	ST	3.919	13.987	4/2/07	25,000	
11200	421981-1	Lake	25	ST	3.919	13.987	4/2/07	30,000	
11200	421981-1	Lake	25	NTST	13.987	15.082	4/2/07	30,000	
18030	421986-1	Sumter	471	NT	4.262	8.384	3/22/07	24,000	
70010	421990-1	Brevard	5	NTST	8.808	11.390	5/9/07	18,000	
70012	421991-1	Brevard	507	NTST	0.000	2.270	5/9/07	20,000	
73010	422001-1	Flagler	5	NTST	9.657	10.890	5/10/07	20,000	
75020	422002-1	Orange	500	NT	2.459	7.298	7/24/07	20,000	
75020	422002-1	Orange	500	ST	2.459	7.298	7/24/07	29,000	
75020	422002-1	Orange	500	ST	2.459	7.298	7/24/07	18,000	
77020	422002-1	Seminole	500	NT	0.000	0.347	7/24/07	20,000	
77020	422002-1	Seminole	500	ST	0.000	0.347	7/24/07	18,000	
75020	422003-1	Orange	500	NTST	21.784	22.865	3/21/07	22,000	
75040	422004-1	Orange	527	NT	14.819	17.387	5/21/07	17,000	
75040101	422004-1	Orange	527	ST	0.000	0.511	5/21/07	32,000	
75130	422005-1	Orange	526	ETWT	0.000	1.243	12/3/07	16,000	

## 2007 PROJECT LISTING BY DISTRICT

### District 5

County Section	Financial Project Number	County	State Road	Travel Direction	Beginning Milepost	Ending Milepost	Test Date	Mr (psi)	Comments
75250	422008-1	Orange	438	ET	0.000	1.744	4/12/07	19,000	
75250	422008-1	Orange	438	ET	0.000	1.744	4/12/07	27,000	
75250	422009-1	Orange	438	ETWT	4.901	7.346	3/21/07	24,000	
75250	422009-1	Orange	438	ETWT	4.901	7.346	3/21/07	19,000	
75250001	422010-1	Orange	438	ET	0.000	0.226	12/3/07	24,000	
75250001	422010-1	Orange	438	WT	0.000	0.226	12/3/07	32,000	
77010	422013-1	Seminole	15	ST	13.600	16.929	4/5/07	22,000	
77010	422013-1	Seminole	15	ST	13.600	16.929	4/5/07	13,000	
79010	422018-1	Volusia	5	NTST	14.710	20.024	7/2/07	27,000	
79010	422019-1	Volusia	5	NTST	20.024	23.786	5/2/07	17,000	
79010	422019-1	Volusia	5	NTST	20.024	23.786	5/2/07	31,000	
79010	422019-1	Volusia	5	NT	20.024	23.786	5/2/07	17,000	
79010	422019-1	Volusia	5	ST	20.024	23.786	5/2/07	24,000	
79040	422020-1	Volusia	15	NTST	6.186	9.407	5/16/07	22,000	
79040101	422022-1	Volusia	15	NTST	0.000	0.411	5/16/07	24,000	
79050	422023-1	Volusia	15	ST	17.190	25.873	12/4/07	14,000	
79070	422026-1	Volusia	44	ET	6.311	8.426	3/20/07	14,000	
79070	422027-1	Volusia	44	NT	26.978	31.310	5/2/07	25,000	
79070	422027-1	Volusia	44	NT	26.978	31.310	5/2/07	17,000	
79070	422027-1	Volusia	44	ST	26.978	31.310	5/2/07	17,000	
79070	422027-1	Volusia	44	ST	26.978	31.310	5/2/07	25,000	
79070	422027-1	Volusia	44	ST	26.978	31.310	5/2/07	17,000	
79070001	422028-1	Volusia	44	ET	0.000	0.934	3/20/07	12,000	
79150	422030-1	Volusia	40	ETWT	0.000	1.481	12/12/07	16,000	
79170	422031-1	Volusia	44	ET	0.000	1.433	3/20/07	16,000	
92090	422033-1	Osceola	530	ET	5.789	6.724	8/22/07	25,000	
92090	422033-1	Osceola	530	WT	5.789	6.724	8/22/07	20,000	
11070	421975-1	Lake	50	ETWT	13.595	14.984	12/5/07	22,000	



## 2007 PROJECT LISTING BY DISTRICT

### District 6

County Section	Financial Project Number	County	State Road	Travel Direction	Beginning Milepost	Ending Milepost	Test Date	Mr (psi)	Comments
87072	249593-2	Dade	985	NTST	4.170	6.170	6/27/07	32,000	
87004	405578-4	Dade	112	ETWT	1.805	4.910	7/10/07	32,000	
87004	405578-4	Dade	112	ETWT	1.805	2.564	10/9/07	32,000	
87240	422612-1	Dade	9	NTST	2.950	5.100	6/27/07	21,000	
87240	422612-1	Dade	9	NTST	2.950	5.100	6/27/07	32,000	
87055	422614-1	Dade	986	ETWT	4.185	6.788	6/27/07	32,000	
87080	422616-1	Dade	934	ET	2.678	3.718	6/26/07	8,000	
87055	422619-1	Dade	986	ET	1.833	3.886	6/27/07	24,000	
87055	422619-1	Dade	986	WT	1.833	3.886	6/27/07	32,000	
87034	422620-1	Dade	915	NTST	3.600	5.867	6/26/07	11,000	
87034	422620-1	Dade	915	NTST	3.600	5.867	6/26/07	20,000	
87090	422622-1	Dade	25	NTST	0.000	4.985	6/26/07	32,000	
87470	423204-1	Dade	91	NTST	0.000	3.342	11/6/07	32,000	

## 2007 PROJECT LISTING BY DISTRICT

### District 7

County Section	Financial Project Number	County	State Road	Travel Direction	Beginning Milepost	Ending Milepost	Test Date	Mr (psi)	Comments
10290	255846-1	Hillsborough	582	ETWT	0.000	0.505	10/25/07	21,000	
10090	255893-3	Hillsborough	574	ET	5.140	5.664	6/21/07	25,000	
15150	256774-2	Pinellas	55	NTST	22.950	25.214	7/23/07	15,000	
15020	257131-1	Pinellas	595	ST	3.298	5.909	7/23/07	18,000	
15030	257147-1	Pinellas	686	ETWT	7.867	5.503	6/18/07	30,000	
15120	257147-1	Pinellas	688	ETWT	2.137	12.927	6/18/07	20,000	
15120	257147-1	Pinellas	688	ETWT	2.137	12.927	6/18/07	29,000	
15120	257147-1	Pinellas	688	ET	2.137	12.927	6/18/07	17,000	
15120	257147-1	Pinellas	688	ET	2.137	12.927	6/18/07	26,000	
15120	257147-1	Pinellas	688	WT	2.137	12.927	6/18/07	29,000	
02030	257167-2	Citrus	55	NT	23.365	25.066	2/13/07	17,000	
02010	257191-1	Citrus	45	NT	18.425	29.986	5/1/07	17,000	
15040	403733-1	Pinellas	60	ET	4.680	6.376	9/27/07	17,000	
15040	403733-1	Pinellas	60	WT	4.680	6.376	9/27/07	12,000	
08030	406552-1	Hernando	35	NT	0.000	6.490	5/14/07	19,000	
580	411327-1	Pinellas	580	ETWT	2.220	3.202	7/23/07	25,000	
10160	413404-1	Hillsborough	580	NTST	0.000	2.073	6/21/07	20,000	
02040	416834-1	Citrus	200	NT	0.000	6.625	5/3/07	20,000	
15050	416837-1	Pinellas	590	ET	4.834	5.865	9/27/07	16,000	
15090	416838-1	Pinellas	600	ETWT	7.340	9.992	10/25/07	24,000	
14070	416839-1	Pasco	35	NT	0.000	8.150	5/31/07	19,000	
10010	416842-1	Hillsborough	43	NT	20.144	24.800	5/21/07	32,000	
10010	416842-1	Hillsborough	43	ST	20.144	24.800	5/21/07	32,000	
10010	416842-1	Hillsborough	43	ST	20.144	24.800	5/21/07	18,000	Weaker Pavement structure observed between mp 24.0 and 24.2
02030	416843-1	Citrus	55	NTST	13.524	14.926	5/15/07	21,000	
02030	416844-1	Citrus	55	NT	16.314	25.107	5/15/07	22,000	SLMP 23.365 to 25.06 tested on 2/13/07 under 257167-2. This portion was not tested again
02030	416844-1	Citrus	55	ST	16.314	25.107	5/15/07	29,000	

## 2007 PROJECT LISTING BY DISTRICT

### District 7

County Section	Financial Project Number	County	State Road	Travel Direction	Beginning Milepost	Ending Milepost	Test Date	Mr (psi)	Comments
10150	416845-1	Hillsborough	580	ET	1.310	2.670	6/21/07	22,000	
10150	416845-1	Hillsborough	580	WT	1.310	2.670	6/21/07	32,000	
15070	416847-1	Pinellas	580	ETWT	1.200	1.682	10/25/07	22,000	
10060	416848-1	Hillsborough	45	NT	27.263	27.604	5/23/07	27,000	
15010	416851-1	Pinellas	595	NTST	0.000	4.500	5/17/07	16,000	
10060	416859-1	Hillsborough	45	NTST	22.537	23.332	5/23/07	30,000	
14030	418860-2	Pasco	55	NTST	0.000	19.673	5/30/07	21,000	
14030	418860-2	Pasco	55	NT	0.000	19.673	5/30/07	13,000	
14030	418860-2	Pasco	55	ST	0.000	19.673	5/30/07	32,000	
14030	418860-2	Pasco	55	NTST	0.000	19.673	5/30/07	21,000	
10250	419259-1	Hillsborough	45	NT	6.864	7.920	6/21/07	24,000	
14140	421504-1	Pasco	93	NTST	2.159	11.740	11/13/07	28,000	
14140	421505-1	Pasco	93	NT	11.740	20.386	11/13/07	28,000	
14140	421505-1	Pasco	93	ST	11.740	20.386	11/13/07	32,000	
10190	422331-1	Hillsborough	400	ETWT	11.100	21.476	10/15/07	29,000	
08150	422443-1	Hernando	93	NTST	0.000	3.700	5/24/07	32,000	

## REFERENCES

1. Nazef A., and B. Choubane. *Survey of Current Practices of Using Falling Weight Deflectometers*. Research Report FL/DOT/SMO/01-452, Florida Department of Transportation, Gainesville, September 2001.
2. Bentsen, R. A., S. Nazarian, and J. a. Harrison. *Reliability Testing of seven Nondestructive Pavement Testing devices*. In *Nondestructive Testing of Pavement and Backcalculation Moduli*, ASTM STP 1026, A. J. Bush, III and G. Y. Baladi, Eds., American Society for Testing and Materials, Philadelphia, 1989.
3. *AASHTO Guide for the Design of Pavement Structures*. American Association of State Highway and Transportation Officials, Washington, D.C., March 1993.
4. Ullidtz, P. *Pavement Analysis*. Elsevier Science Publishers, New York, 1987.
5. Boussinesq, J. *Application des Potentiels à l'Etude de l'Equilibre et du Mouvement des Solides Elastiques*. Gauthiers-Villars, Paris 1885.
6. Jackson, N. M., Hammons, M. I., Walker, R. and H. Von Quintus. *Use of Nondestructive Techniques to Estimate the Allowable Vibratory Compaction Level during Construction*. Research Report FL/DOT/SMO/07-BDB-11, Florida Department of Transportation, Gainesville, March 2007.
7. Jackson, N. M., Choubane, B., Lee, H. S., Holzschuher, C., Hammons, M. and R. Walker. *Recommended Practice for Identifying Vibration Sensitive Work Zones Based on FWD Data*. Transportation Research Board, TRB, National Research Council, Washington D.C., January 2008. (in press)