

GDOT Pavement Preservation History

Presented by

Eric C. Pitts, P.E.

Assistant State Maintenance Engineer
Georgia Department of Transportation

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Outline

- **Introduction - GDOT Pavement Management Systems**
- **GDOT Pavement Preservation Program Practice**
- **Project Selection Program**
- **Current Revisions**

- ***PAVEMENT CONDITION
EVALUATION SYSTEM
(P.A.C.E.S.)***

P.A.C.E.S. RATING SYSTEM

- ***RATING SYSTEM FROM 0 TO 100***
- ***RATINGS BASED ON ROADWAY DEFICIENCIES***
- ***RATINGS PERFORMED YEARLY BETWEEN SEPTEMBER 1ST AND NOVEMBER 30th BY AREA ASSISTANT FOR ENTIRE STATE HIGHWAY SYSTEM***

P.A.C.E.S. (cont.)

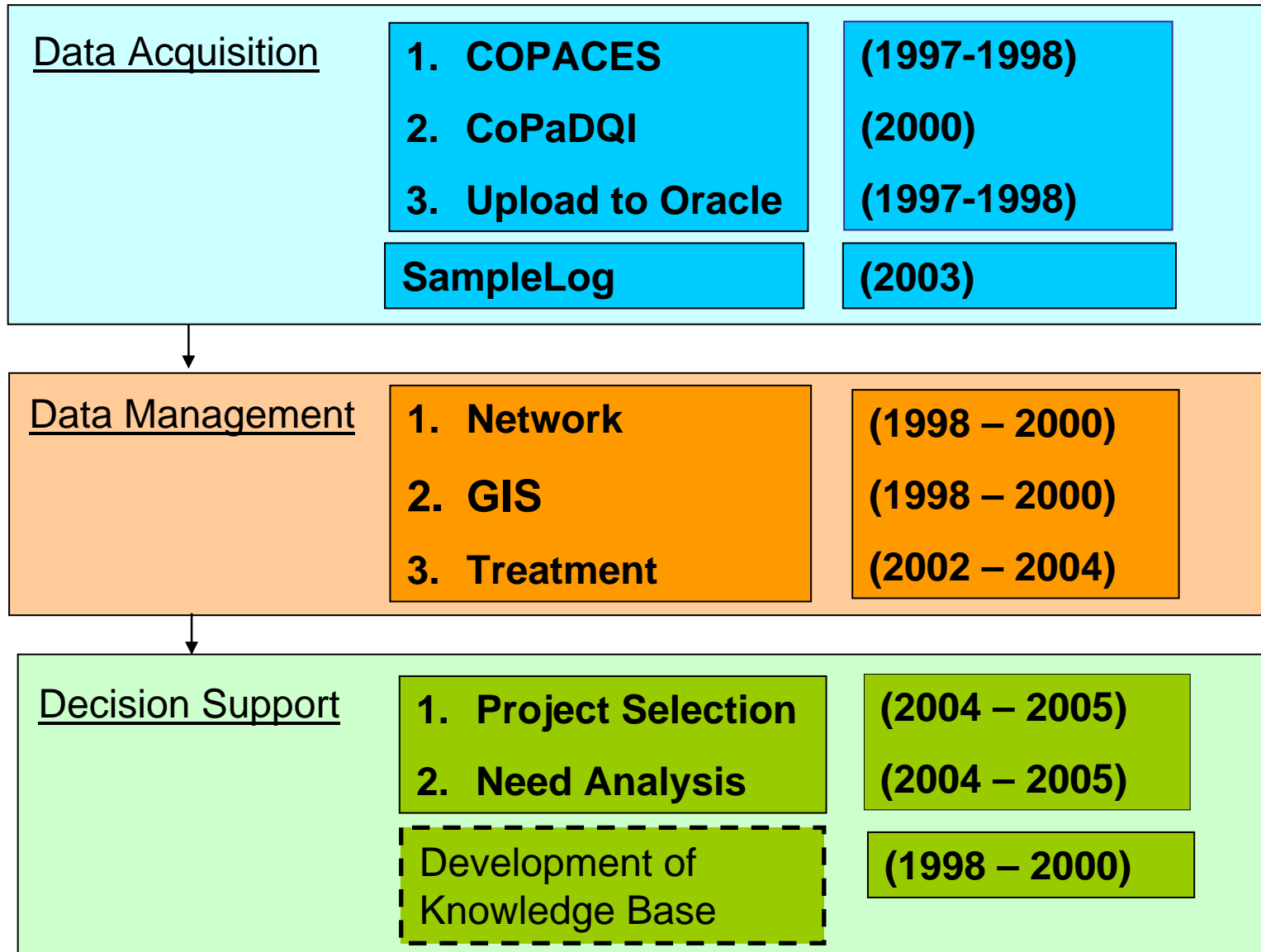
- ***ROADWAY SECTIONS WITH RATINGS OF 75 AND BELOW BY THE AREA WILL BE RATED BY THE DISTRICT AND GENERAL OFFICE***
- ***RATINGS OF 70 AND BELOW WARRANT RESURFACING***
- ***RATINGS ABOVE 70 MAY WARRANT OTHER TYPES OF TREATMENTS***

GDOT Pavement Management Systems (1)



- 18,000 centerline-mile
- Annual vehicle-miles 108,000 million
- Annual preservation budget ~160 million
Internal forces ~ 2,000
- Pavement management systems was re-engineered since 1998

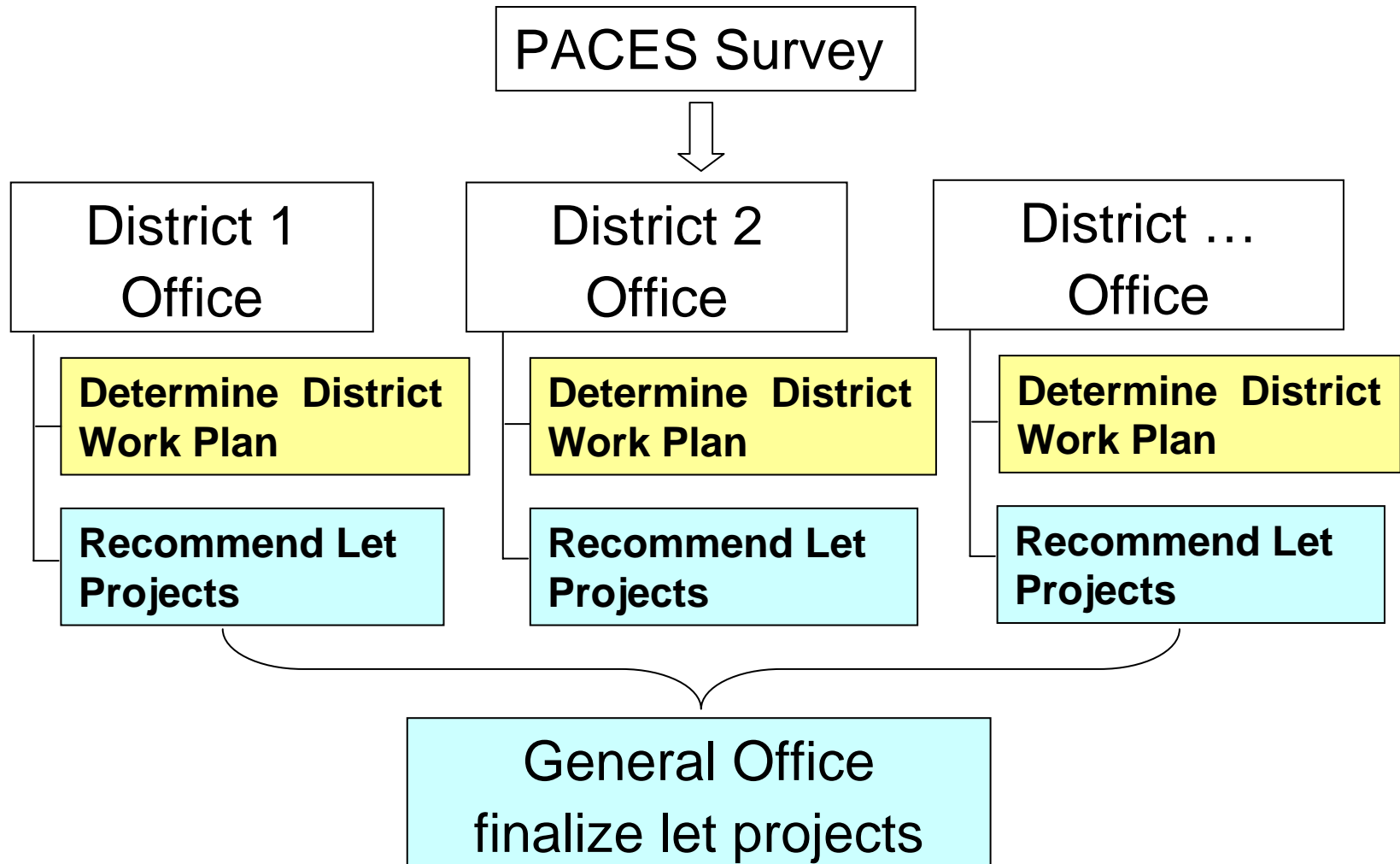
GDOT Pavement Management Systems (2)



Lessons Learned

- Buy-in from top managers
- A GDOT business operation-driven pavement management system.
- Develop and implement one module at a time with the most needed program first to minimize GDOT's risk.
- Programs were transferred and sustained by GDOT IT Office after successful implementation.

GDOT Pavement Preservation Program

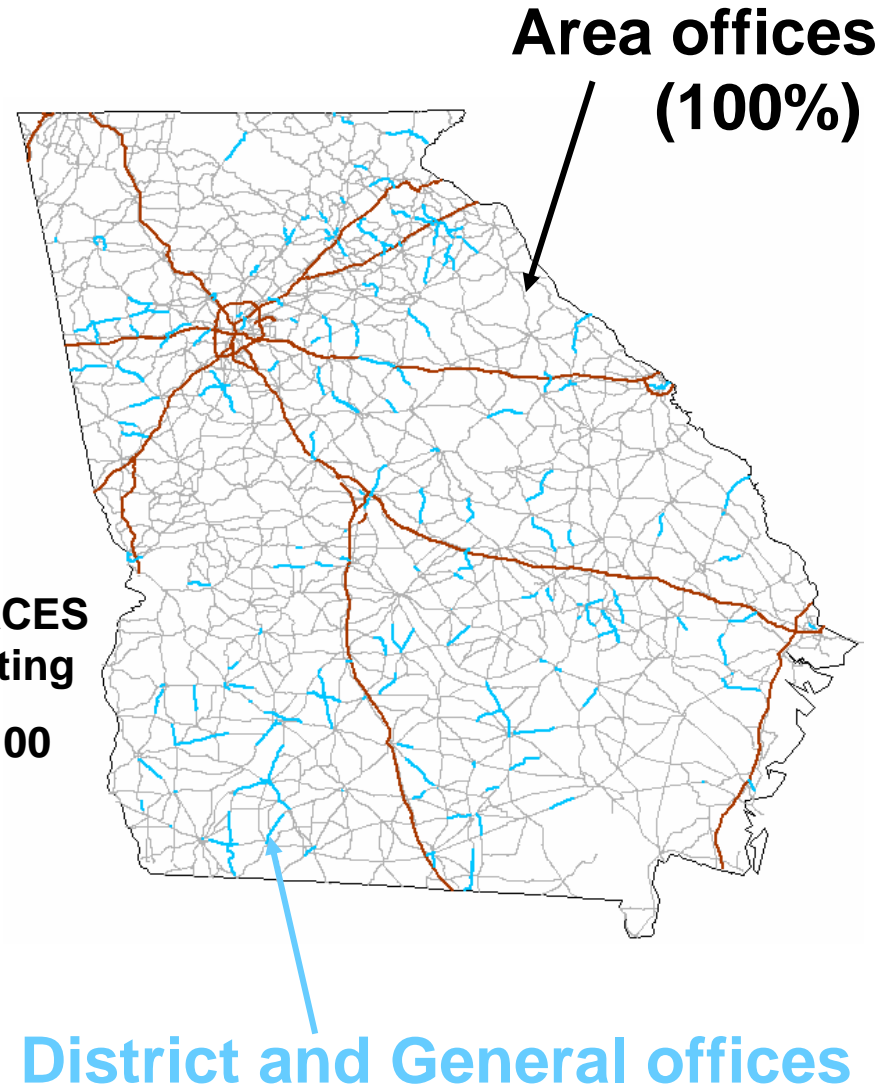


GDOT PACES Survey

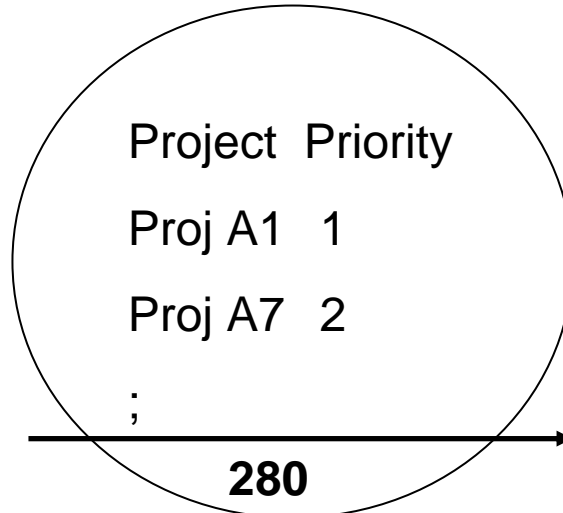
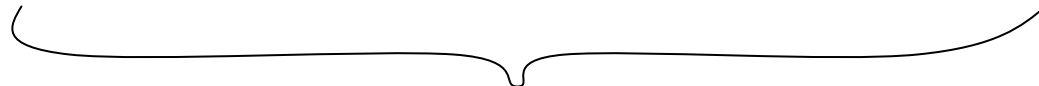


Rutting
Load Cracking
Block/Transverse Cracking
Reflection Cracking
Raveling
Edge Distress
Bleeding or Flushing
Corrugation or Pushing
Loss of Pavement Section
Potholes/Patches

⇒ PACES
Rating
1-100



Maintenance/Rehab Let Project Determination



Determine project:

- 1. Treatment method**
- 2. Cost**
- 3. Priority**

Based on:

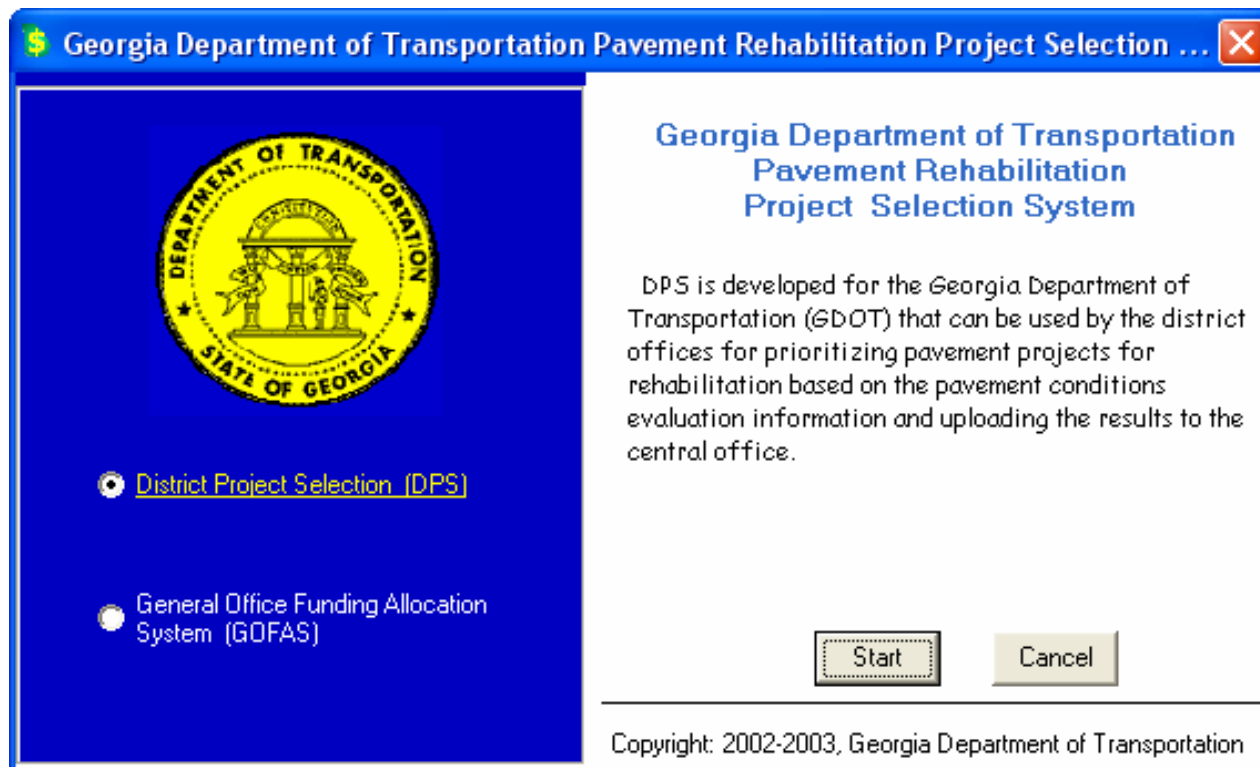
- 1. Consistent criteria and**
- 2. Standardized practices**

Which can be flexibly **customized**.

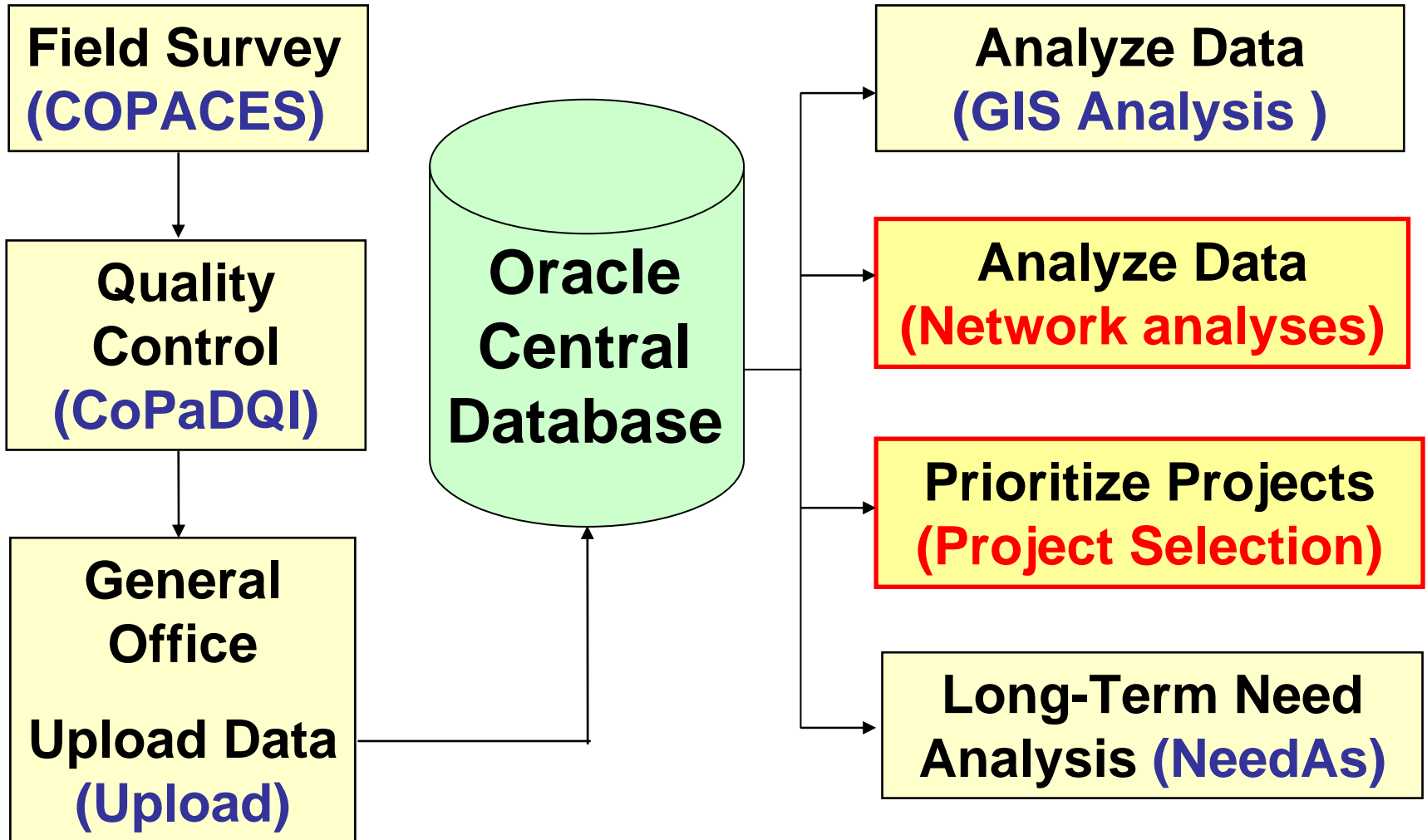
Why Enhanced Pavement Preservation System

- Decision criteria/rules are not transparent or consistent.
- Time-consuming process.
(District 1: 2,718 centerline-miles and 450 projects)
- Difficult to use the historical data to validate the decisions.
- Difficult to perform what-if analysis to evaluate potential alternatives.

GDOT Project Selection Program



Asphalt Pavement Management Operation Flow



District Project Selection

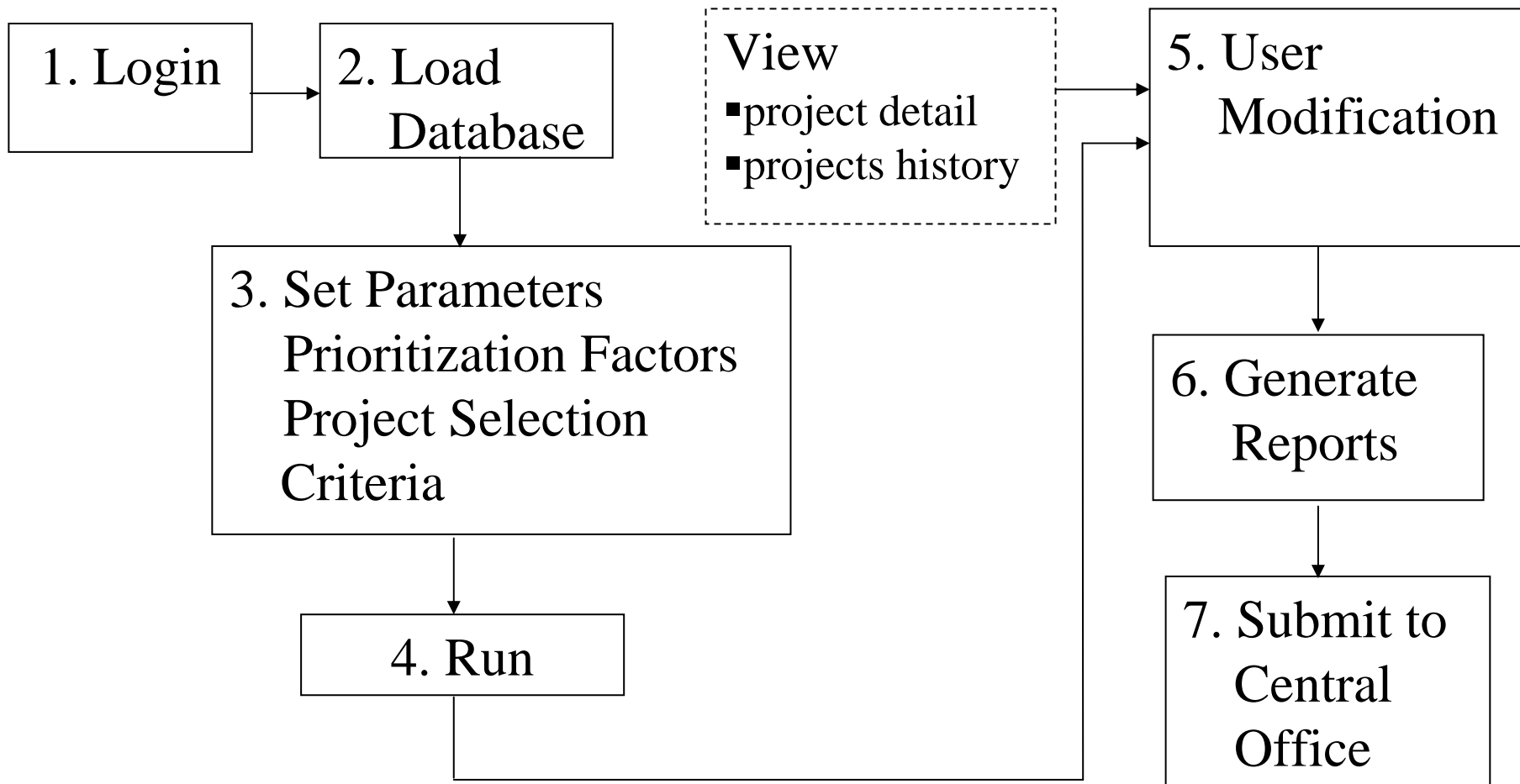
- **Objectives**

- **Decision support tool for developing resurfacing program**
- **Capture engineer's expertise for future modification**

- **Functionalities**

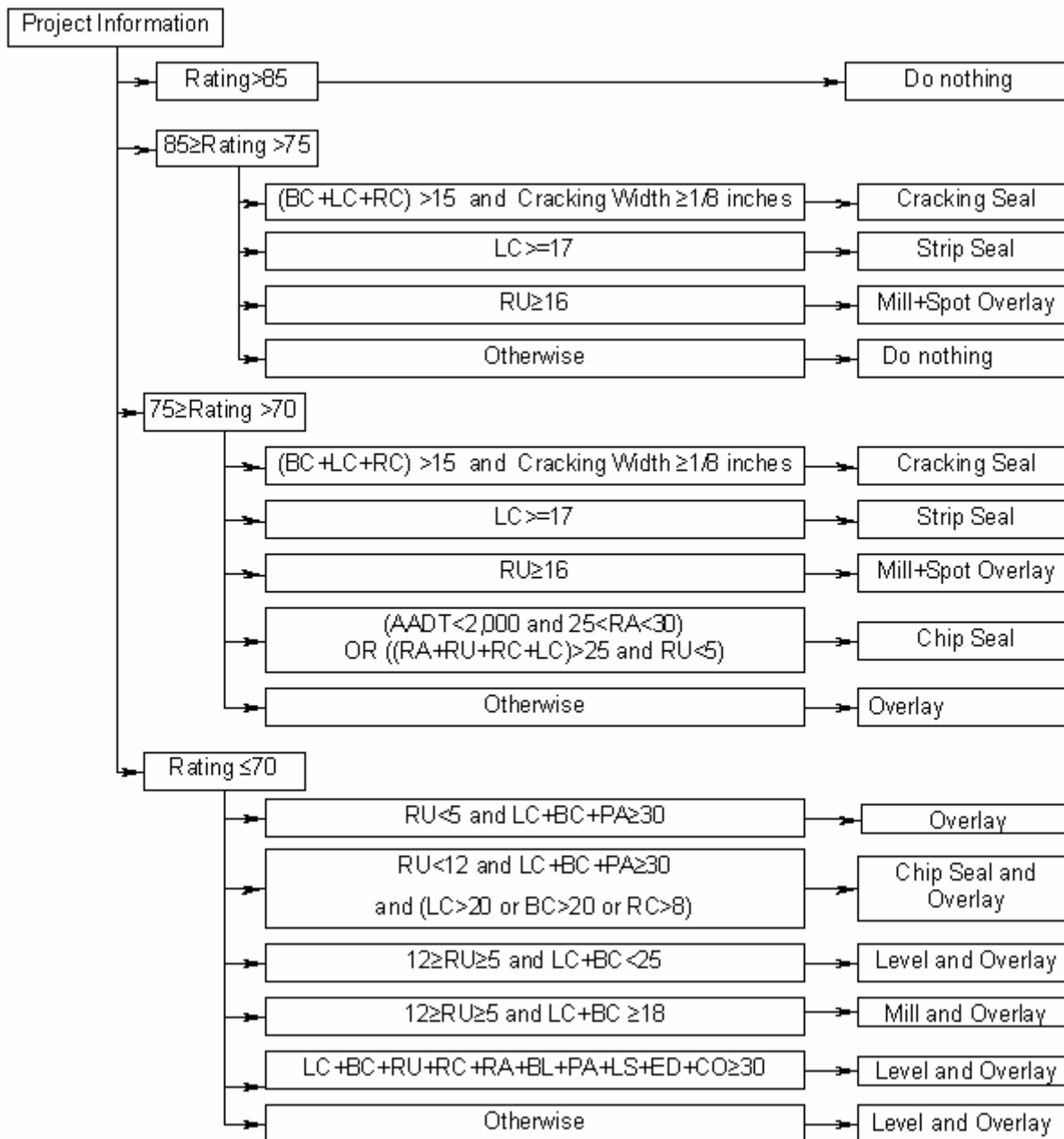
- **Determine treatment & estimate cost**
- **Prioritize projects**
- **Incorporate engineer's judgment**

DPS Operation Flow



Objectives of Project Selection Program

- Standardize treatment criteria and project selection rules.
- Enable District and General offices to collaborate in making decision on treatment method, treatment cost, project priority and balancing workload among working district or congressional district.



District 1 Project Prioritization

District Pavement Rehabilitation Prioritization System D-PREPS v1.0 - [Project Query Result]

File View Setting Run Tool Help

Select All Update Special Factor Determine Treatment View Detail Info. Combine/Separate Change Priority Output To Excel Exit

The Results of Projects to be Uploaded

	Dist Pri	Dist Pri	RouteNo	RouteS	CountyNam	MilePo	MilePostTo1	Project	Foreca	AADT	SpecialFa	FinalTreatment	Crite
▶	1	1	0012	00	Greene	10.5	11.2	54	51	12900	1	Level-Resurface	Regul
	2	2	0056	00	Burke	0	21.9	56	54	2400	1	Level-Resurface	Regul
	3	3	0081	00	Newton	7.34	11.27	57	54	19000	1	Level-Resurface	Regul
	4	4	0004	00	Richmond	20.5	23.06	58	55	24600	1	Level-Resurface	Regul
	5	5	0080	00	Jefferson	0	8	59	57	1900	1	Mill	Desig
	6	6	0012	00	Warren	13.9	19.48	60	57	5100	1	Level-Resurface	Regul
	7	7	0104	00	Columbia	1	2	61	58	33000	1	Level-Resurface	Regul
	8	8	0031	00	Laurens	39	27.88	61	58	9000	1	Level-Resurface	Regul
	9	9	0057	00	Wilkinson	15.2	28.41	62	60	3900	1	Level-Resurface	Regul

Total #: 23 Total Mileage (lane miles): 406.01 Total Cost (\$): 14,683,288

↑ ↓

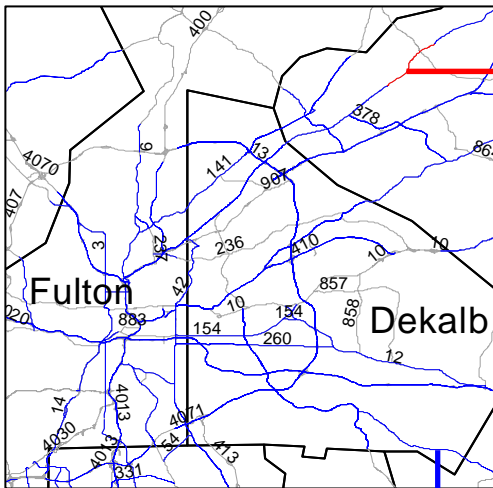
The Results of Projects not to be Uploaded

	Dist Pri	Dist Pri	RouteNo	RouteS	CountyNam	MilePo	MilePostTo1	Project	Foreca	AADT	SpecialFa	FinalTreatment	Crite
▶	24	24	0036	00	Newton	15.2	16.09	52	49	11900	1	Level-Resurface	Regul
	25	25	0080	00	Jefferson	0	8	53	51	1900	1	Level-Resurface	Regul
	26	26	0031	00	Laurens	27.88	39	54	51	9000	1	Level-Resurface	Regul
	27	27	0056	00	Burke	0	21.9	54	52	2400	1	Level-Resurface	Regul
	28	28	0023	00	Burke	9.9	29.33	56	54	2500	1	Level-Resurface	Regul
	29	29	0192	00	Emanuel	0	5	60	58	800	1	Level-Resurface	Regul
	30	30	0022	00	Baldwin	7.1	10	62	59	12200	1	Level-Resurface	Regul
	31	31	0012	00	Warren	13.9	19.48	63	60	5100	1	Level-Resurface	Regul
	32	32	0104	00	Columbia	1	2	64	61	33000	1	Level-Resurface	Regul

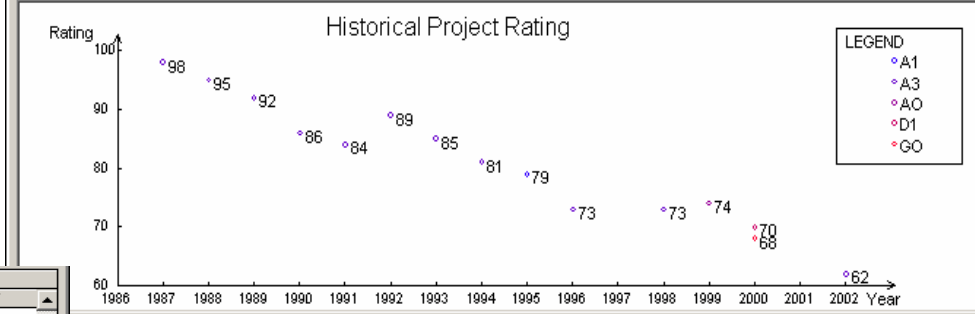
Total #: 463 Total Mileage (lane miles): 7,748.09 Total Cost (\$): 78,439,222

Database = D:\YW\Application\GDOT\Program\ProjectSelection\DPREPS\DPREPS_12_05_2004_Oracle\Results\D 1/9/2006 11:12 AM

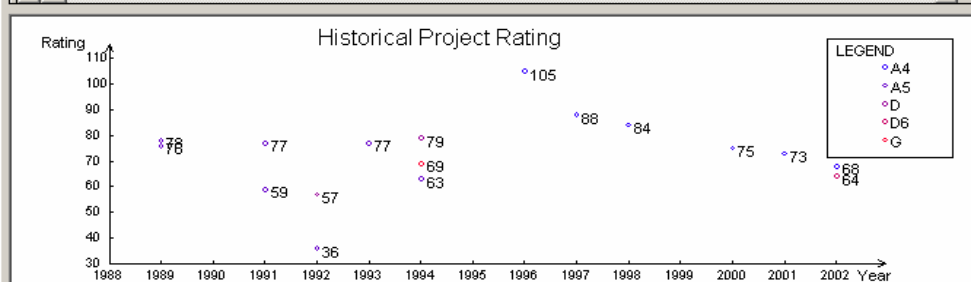
Historical Pavement Performance Information



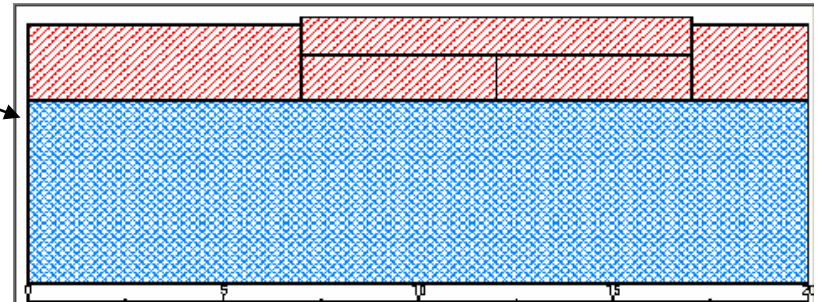
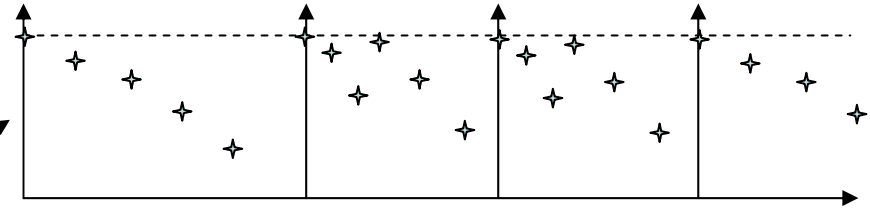
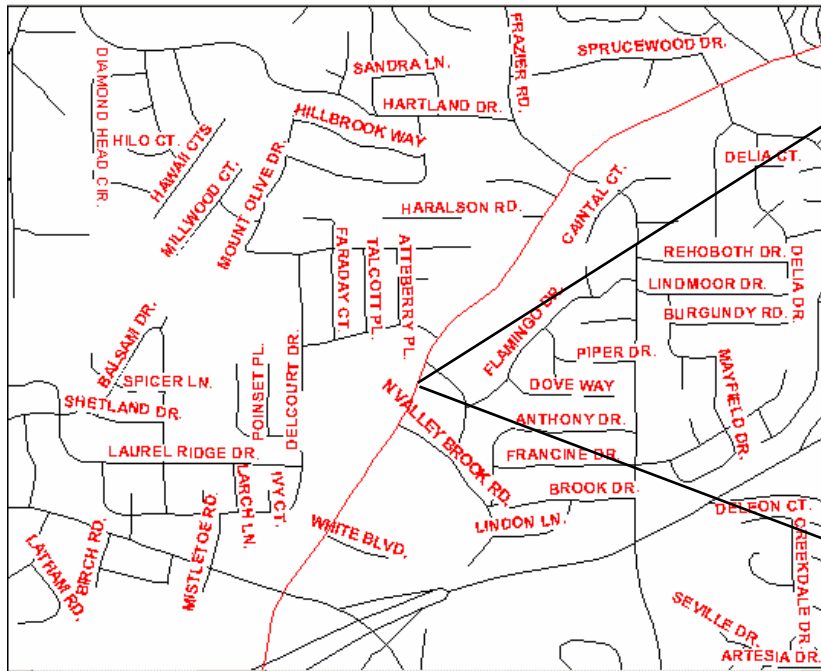
Historical survey data of selected project													
Status	Tripdate	RouteN	RouteS	RouteT	Project	Rater	Distri	Office	Count	MilePo	MilePos	AADT	
NORMAL	5/13/1992 6:47:06 AM	0051	00	1	89	JAMES MOORE	1	A3	147	10.7	14.7		
NORMAL	6/2/1993 8:14:44 AM	0051	00	1	85	JAMES MOORE	1	A3	147	10.6	14.7		
NORMAL	4/11/1994 12:59:09 PM	0051	00	1	81	JAMES MOORE	1	A3	147	10.7	14.4		
NORMAL	4/20/1995 1:58:57 PM	0051	00	1	79	JAMES S. MOORE	1	A1	147	10.7	14.4		
NORMAL	3/26/1996 5:03:31 PM	0051	00	1	73	FRED T. APPLING	1	A3	147	10.7	14.4		
NORMAL	4/3/1998 1:43:39 PM	0051	00	1	73	JEFF JACQUES	1	A3	147	10.7	14.4		
Normal	2/25/1999 7:45:15 AM	0051	00	1	74	JEFF JACQUES	1	A0	147	10.7	14.4	11800	
NORMAL	1/20/2000 2:35:18 PM	0051	00	1	68	JEFF JACQUES	1	A3	147	10.7	14.4	11800	
NORMAL	1/21/2000 4:49:56 PM	0051	00	1	70	GREGORY	1	D1	147	10.7	14.4	11800	
NORMAL	2/17/2000 9:07:55 AM	0051	00	1	68	SWINFORD	1	G0	147	10.7	14.4	11800	
NORMAL	10/17/2001 8:29:50 AM	0051	00	1	62	TMCDUFFIE	1	A3	147	10.7	14.4	11800	



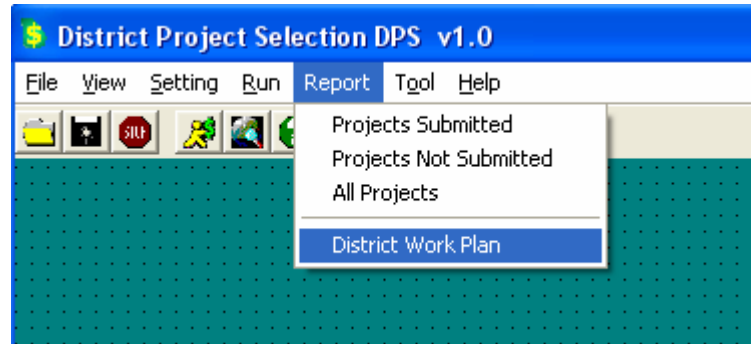
Historical survey data of selected project													
Status	Tripdate	RouteN	RouteS	RouteT	Project	Rater	Distri	Office	Count	MilePo	MilePost	AADT	
NORMAL	4/21/1993 7:00:53	00	00	1	77	TERRY WRIGHT	6	A5	115	21.9	23.7		
NORMAL	2/7/1994 12:00:53	00	00	1	63	TERRY D. WRIGHT	6	A5	115	21.8	23.4		
NORMAL	3/10/1994 12:00:53	00	00	1	79	CLIFF HARDEN	6	D	115	21.8	23.4		
NORMAL	5/24/1994 12:00:53	00	00	1	69	TERRY JONES	6	G	115	21.8	23.4		
UNDER CON	8/2/1995 2:50:53	00	00	1	105	TERRY WRIGHT	6	A4	115	21.8	23.4		
NORMAL	6/13/1997 3:00:53	00	00	1	88	TERRY D. WRIGHT	6	A4	115	21.8	23.4		
NORMAL	6/5/1998 1:30:53	00	00	1	84	GARRY PRATHER	6	A4	115	21.8	23.4		
NORMAL	2/9/2000 8:50:53	00	00	1	75	GARRY PRATHER	6	A4	115	21.8	23.4	20000	
NORMAL	10/13/2000 1:00:53	00	00	1	73	GARRY PRATHER	6	A4	115	21.8	23.4	20000	
NORMAL	10/24/2001 9:00:53	00	00	1	68	GARRY PRATHER	6	A4	115	21.8	23.4	20000	
NORMAL	4/30/2002 9:00:53	00	00	1	64	T. RUTLEDGE	6	D6	115	21.8	23.4	39800	



Pavement Structure Information



District Work Plan



1	Fiscal Year 2006					
2	District 1					
3	Area Office 1	RouteNO	RouteSuffix	County	MP From	MP To
4		0009	00	117	14	15
5		0009	WE	085	0	0.11
6		0009	SO	117	0	0.17
7		0009	00	117	0	1
8		0009	00	117	15	16
9		0009	00	117	13	14
10		0009	00	117	12	13
11		0009	00	117	11	12
12						
13	Area Office 2	RouteNO	RouteSuffix	County	MP From	MP To
14		0011	00	139	26	27.04
15		0011	00	139	12	11
16		0011	00	139	12	13.3

Rehab Project Selection and Cost Estimation

Pavement Rehabilitation Funding Allocation System REFAS v1.0 - [All Projects Detail Information]

File View Setting Treatment Run Output Tool Help

Select All Add Other Project(s) Determine Treatment Combine/Separate Change Priority View Detail Info. Determine Fund Source Exit

Select working District(s): All

1.a

The Results of Query --- Let Projects																					
	Dist	Dist Pri	State Pri	G Pri	Cong	FinalTreatme	Criteria	Cost	StateSel	Fiscal	FundTyp	StateRemar	RouteN	CountyNa	MileP	MilePos	Office	Dist F			
	1	1	1	1	9	Overlay	Default	85707	YES	2002			0284	HALL	0	1.7	GO	1			
	1	3	2	1	9	Overlay	Regular	722700	YES	2002			0105	HABERSH	0	13.14	A2	3			
	1	5	3	16	9	Overlay	Regular	429000	YES	2002			0017	STEPHENS	7.8	0	GO	5			
▶	1	36	4	24	11	Slurry Seal	Regular	326083	YES	2002			0053	OCONEE	0	13.34	A6	36			
	1	4	5	30	11	Overlay	Regular	511500	YES	2002			0015	JACKSON	12.3	21.6	A6	4			
	1	6	6	37	11	Overlay	Regular	563648	YES	2002			0186	WALTON	0	6.82	A6	6			
	1	17	7	46	11	Overlay	Regular	354423	YES	2002			0077	HART	0	7.03	GO	17			
	1	7	8	50	11	Overlay	Regular	272800	YES	2002			0017	FRANKLIN	16.36	11.4	GO	7			
	1	9	9	57	11	Overlay	Regular	67650	YES	2002			0022	MADISON	0	1.23	GO	9			
	1	11	10	63	11	Overlay	Regular	176000	YES	2002			0017	FRANKLIN	0.3	3.5	GO	11			
	1	20	11	70	11	Overlay	Regular	314594	YES	2002			0098	RANKS	0	6.24	GO	20			

Total #: 108 Total Mileage (lane miles): 687.57 Total Cost (\$): 28,069,933

1.b

The Results of Query --- Not Let Projects

	Dist	Dist Pri	State Pri	G Pri	Cong	FinalTreatme	Criteria	Cost	StateSel	Fiscal	FundTyp	StateRemar	RouteN	CountyNa	MileP	MilePos	Office	Dist F
▶	1	38	14	113	11	Slurry Seal	Regular	273769	NO	2002			0024	OCONEE	0	9.6	A6	38
	1	40	15	118	11	Slurry Seal	Regular	182513	NO	2002			0017	ELBERT	23.6	26	A3	40
	1	10	16	123	11	Overlay	Regular	203500	NO	2002			0051	HART	10.7	14.4	A3	10
	1	19	17	127	10	Overlay	Regular	506000	NO	2002			0017	ELBERT	0	9.2	GO	19
	1	12	18	131	9	Overlay	Regular	544600	NO	2002			0105	HABERSH	4	13.14	GO	12
	1	22	19	135	9	Overlay	Regular	465850	NO	2002			0011	WHITE	6.5	14.97	GO	22
	1	23	20	142	11	Overlay	Regular	114400	NO	2002			0015	JACKSON	21.6	23.68	A6	23
	1	8	21	146	11	Overlay	Regular	311846	NO	2002			0011	JACKSON	14.3	19.16	GO	8
	1	27	22	150	9	Overlay	Regular	600050	NO	2002			0136	DAWSON	23.8	27.12	A1	27
	1	28	23	159	11	Overlay	Regular	494450	NO	2002			0083	WALTON	0	8.99	A6	28

Summary

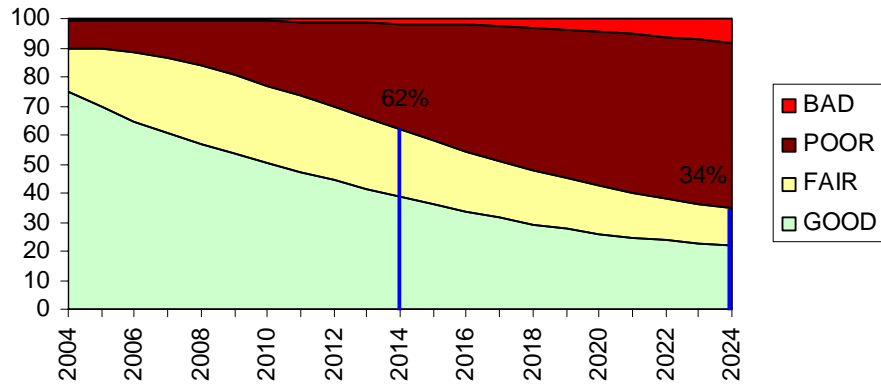
- Standardize treatment criteria and project selection rules, and make them transparent and consistent among different districts.
- Enable the engineers to make informed decision utilizing the historical pavement condition and traffic data
- Provide the flexibility to easily make modification while developing the pavement preservation program.
- Allows General Office to use what-if analyses to evaluate different scenarios.
- Streamline the annual pavement preservation program development process

On-Going Works

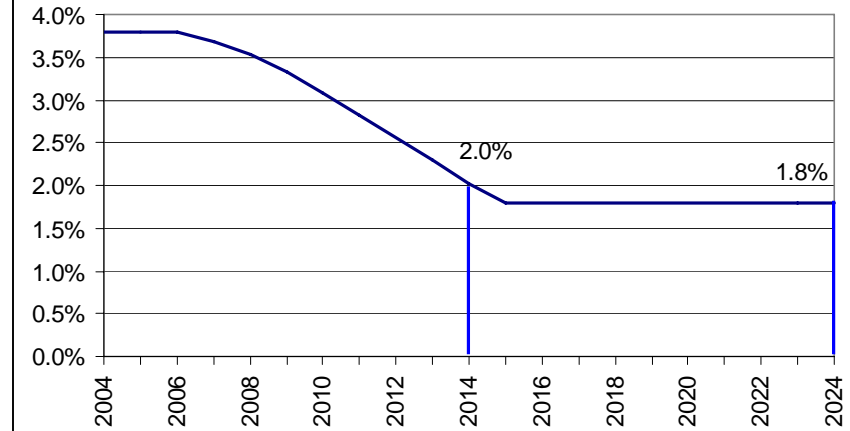
- Further researches to enhance the project selection program.
 - Network-level pavement performance forecasting and simulation
 - Optimal pavement preservation timing
 - Pavement performance/life forecasting

Long-term Network-level Asphalt Pavement Performance Forecasting and Simulation for GDOT Risk Assessment

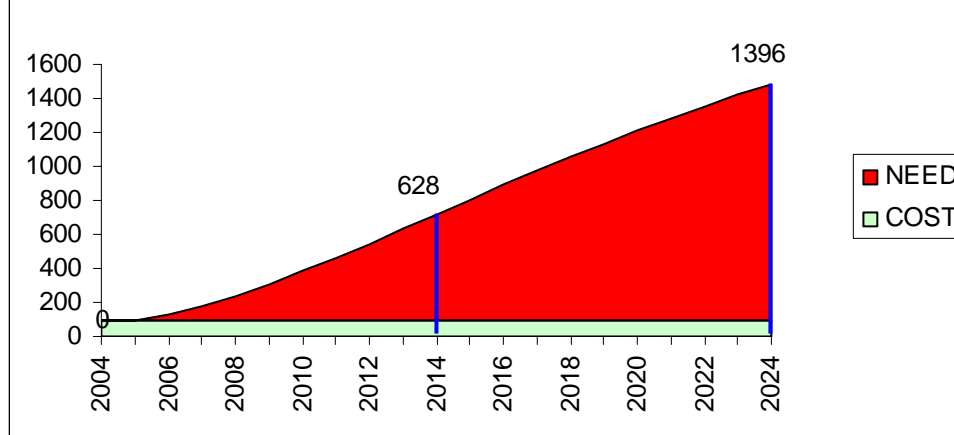
**Cost 89M Per Year with Case:
Good(100-81) Fair(71-80) Poor(51-70) Bad(<50)**



Treated Percentage

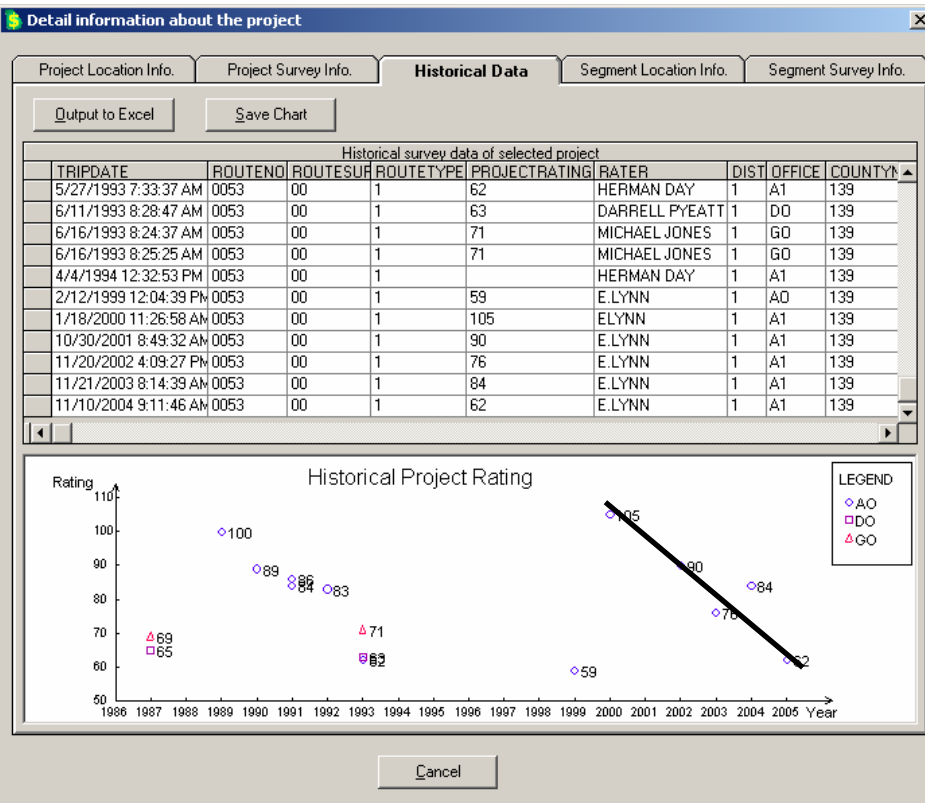


Cost and Need with Case:

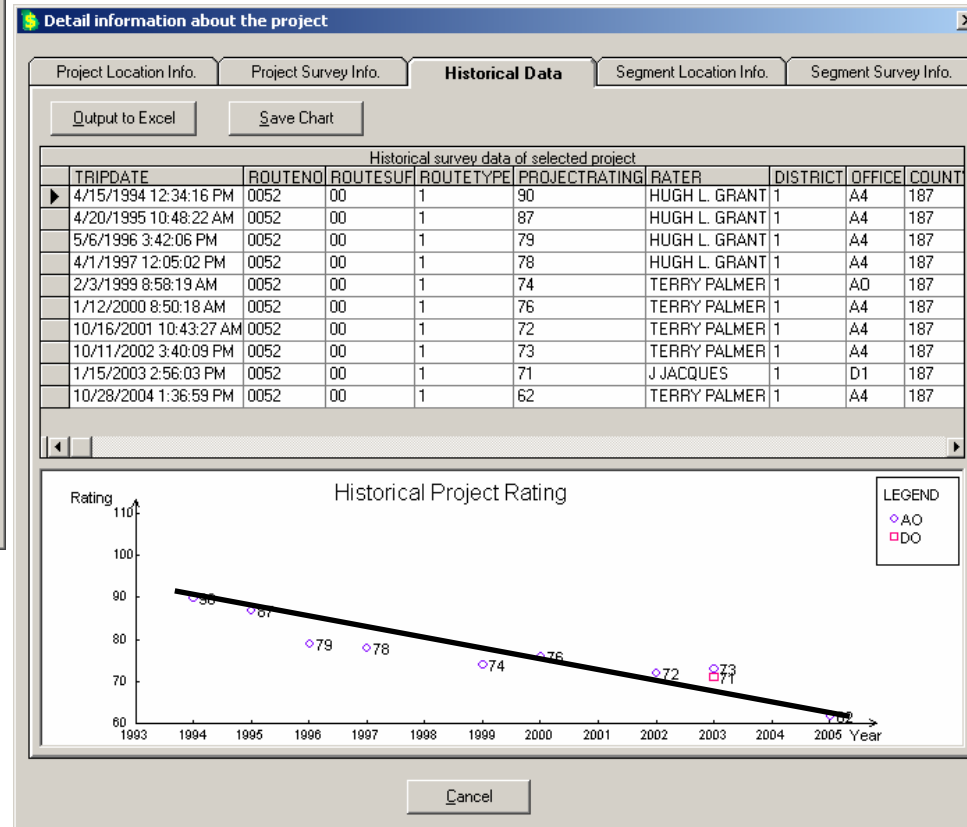


How long does our pavement last?

1. How long does our pavement last?
2. Why do they perform differently?
3. Can we optimize pavement performance?

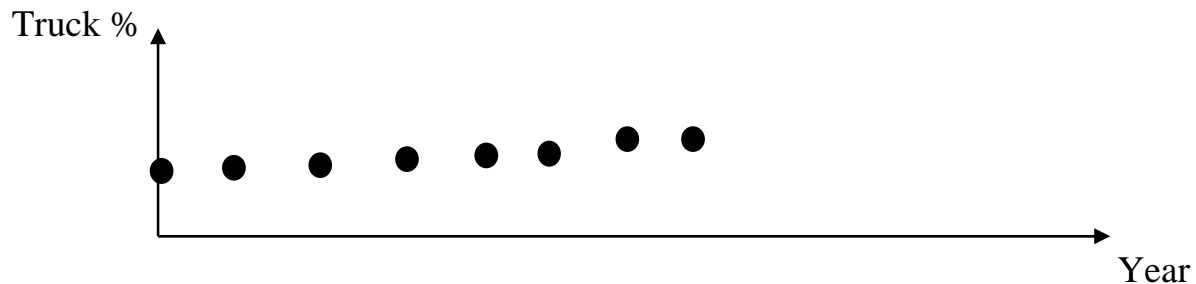
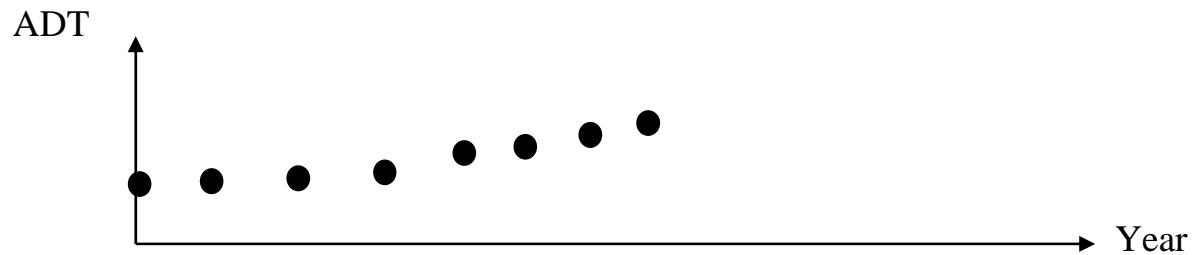
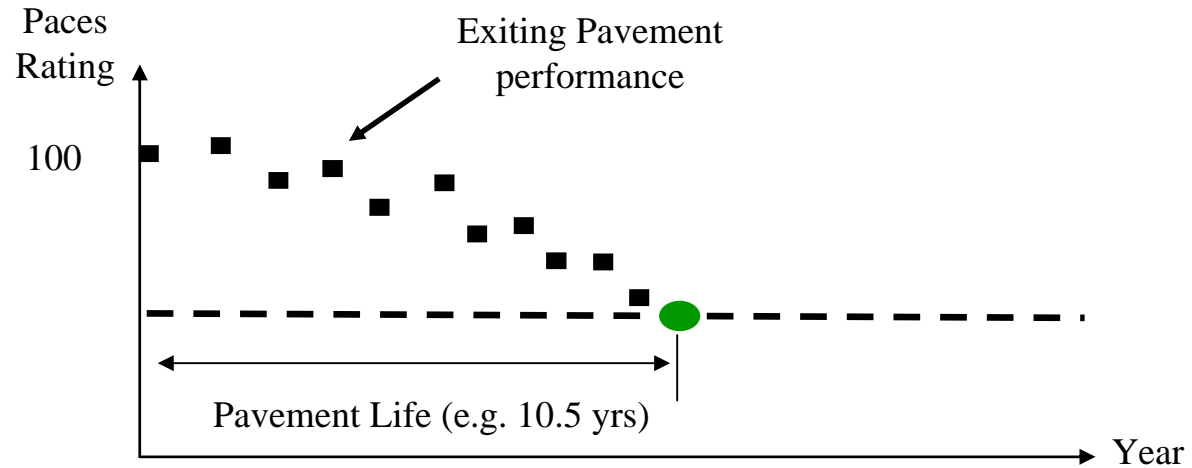


(a) Short pavement service life with high deterioration rate

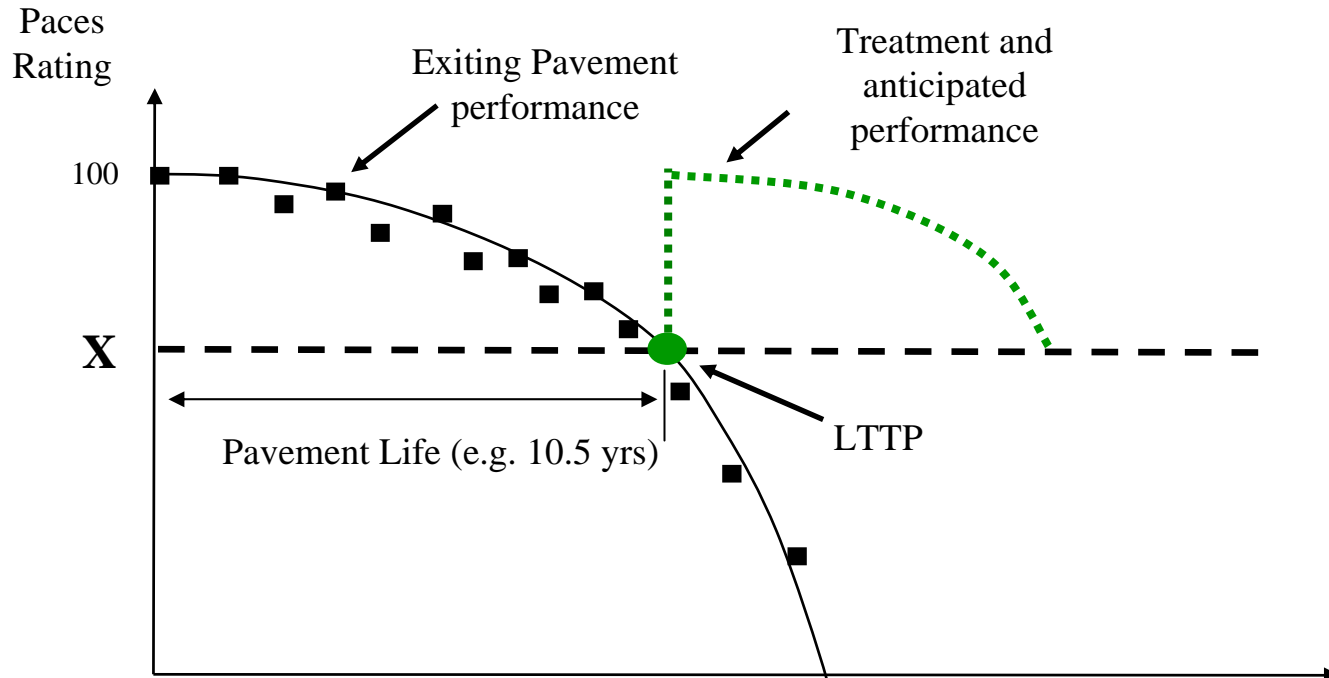
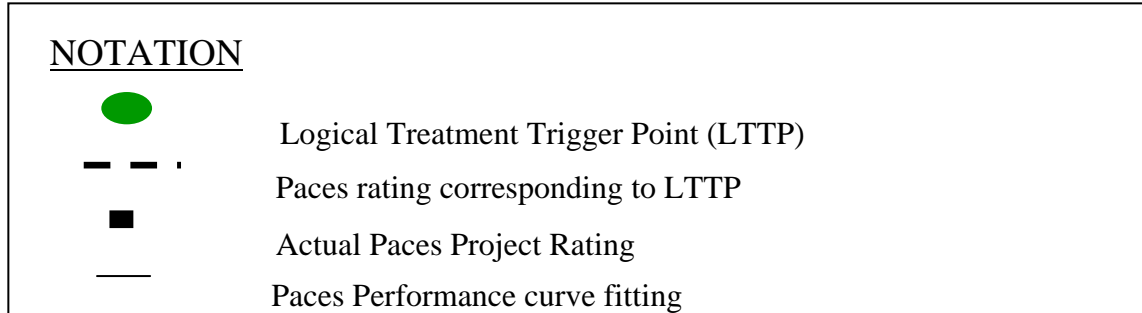


(b) Long pavement service life with low deterioration rate

Enhanced individual pavement performance/life reporting, forecasting, and analysis programs for pavement design recommendation



Study the optimal pavement preservation timing and their symptoms



Q/A