

Iowa Pavement Management Program: Overview

Asset Management Peer Exchange

ST Cloud, MN

Wednesday, May 17, 2017

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Program Coordinator

IPMP Mission

- Support of the **MANAGEMENT**, **PLANNING**, and **PROGRAMMING** needs of transportation agencies
- Provide pavement management information, tools, and training supporting both **PROJECT** level and **NETWORK** level activities

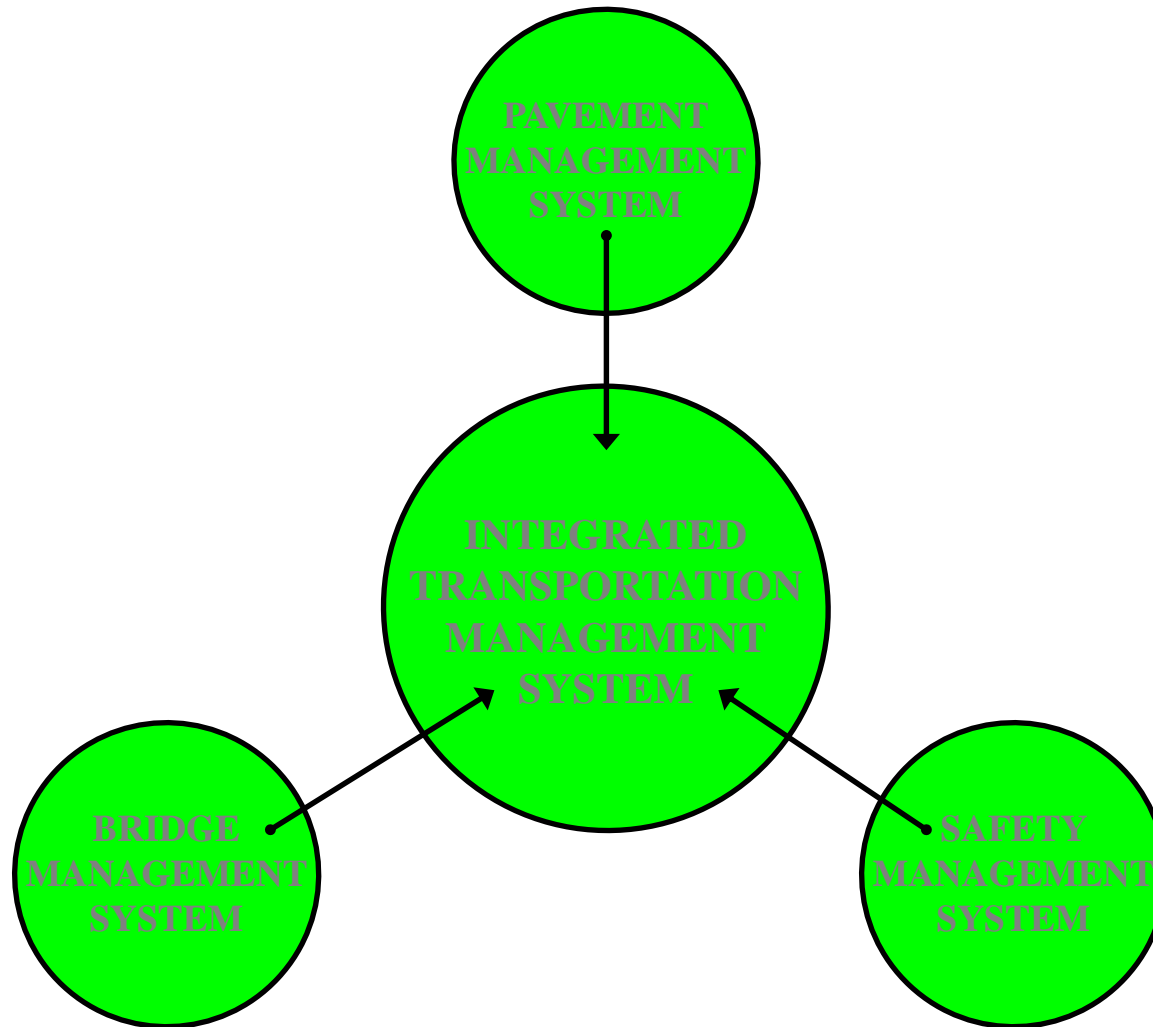
IPMP

- ISTEA Mandate (1991)
- Started in 1995
- 38,000 KM
- State, Counties and Cities
- Three Phase approach

MAJOR TASKS

- Database Design
- Pavement Management Data
- Pavement Management Software
- Information Delivery
- Training
- Implementation

DATA INTEGRATION

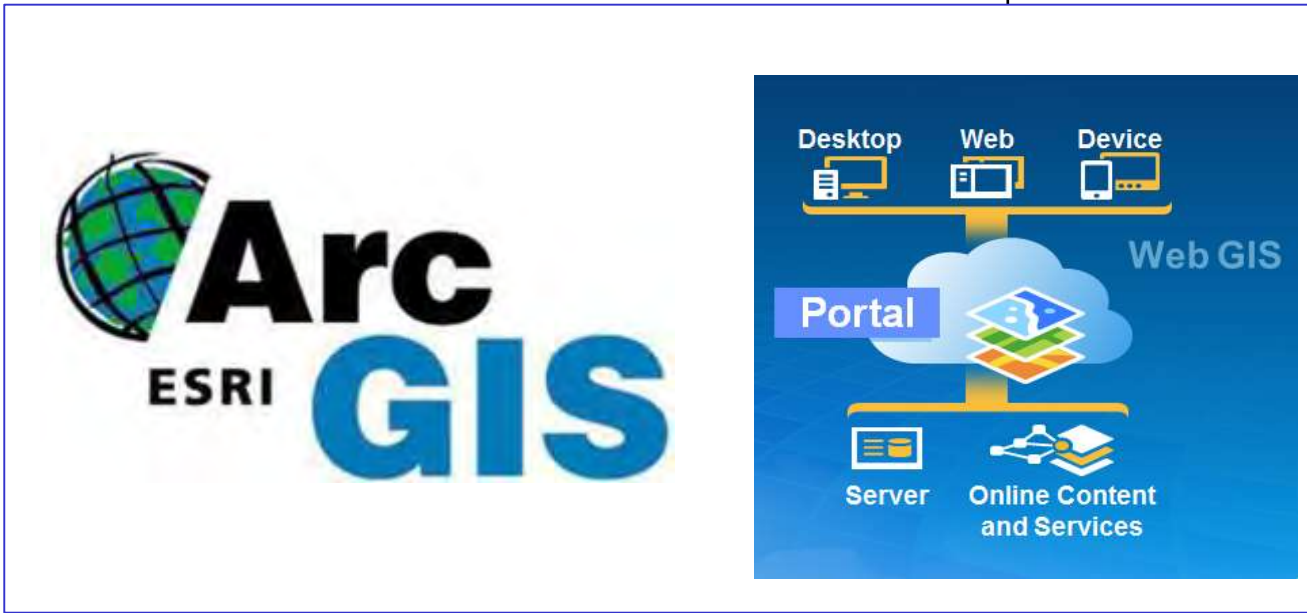


IPMP DATA DELIVERY



Graphics Only

Graphics and Data

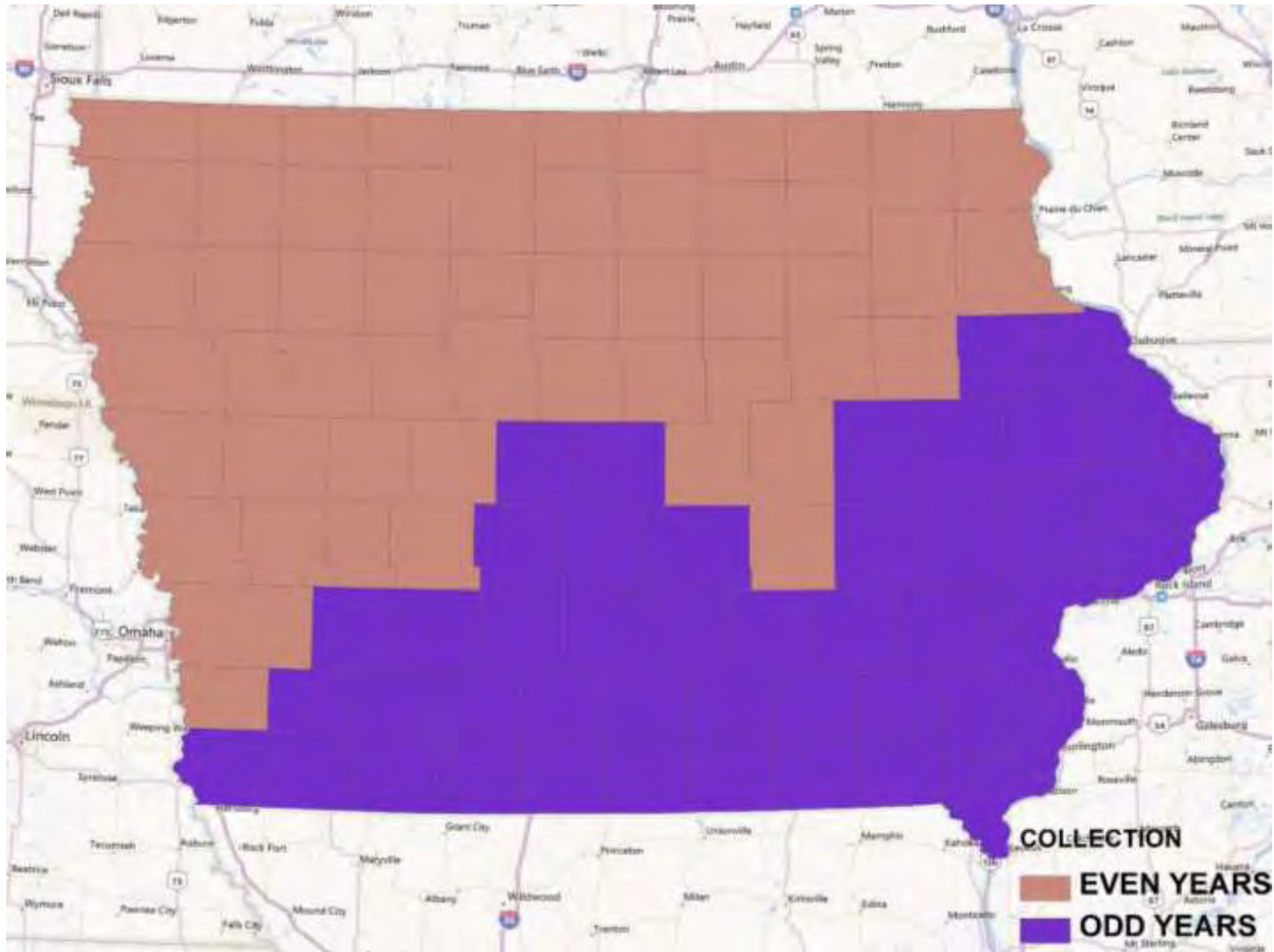


ODBC



Data Only

Data collection Plan





Raw data



Raw Distress Data

100% coverage

- Roughness (IRI) – left, right
- Rutting – left, right
- Alligator cracking – LMH
- Transverse cracking – LMH
- Longitudinal cracking – LMH
- Longitudinal wheelpath cracking - LMH
- Patch – good, bad
- Patch count
- Failure
- Bearing
- Durability cracking - count
- Joint spalling – count
- Faulting – total joints, faulted joints by wp



Data Assimilation



From local agencies

Condition

Cartography & Inventory

History



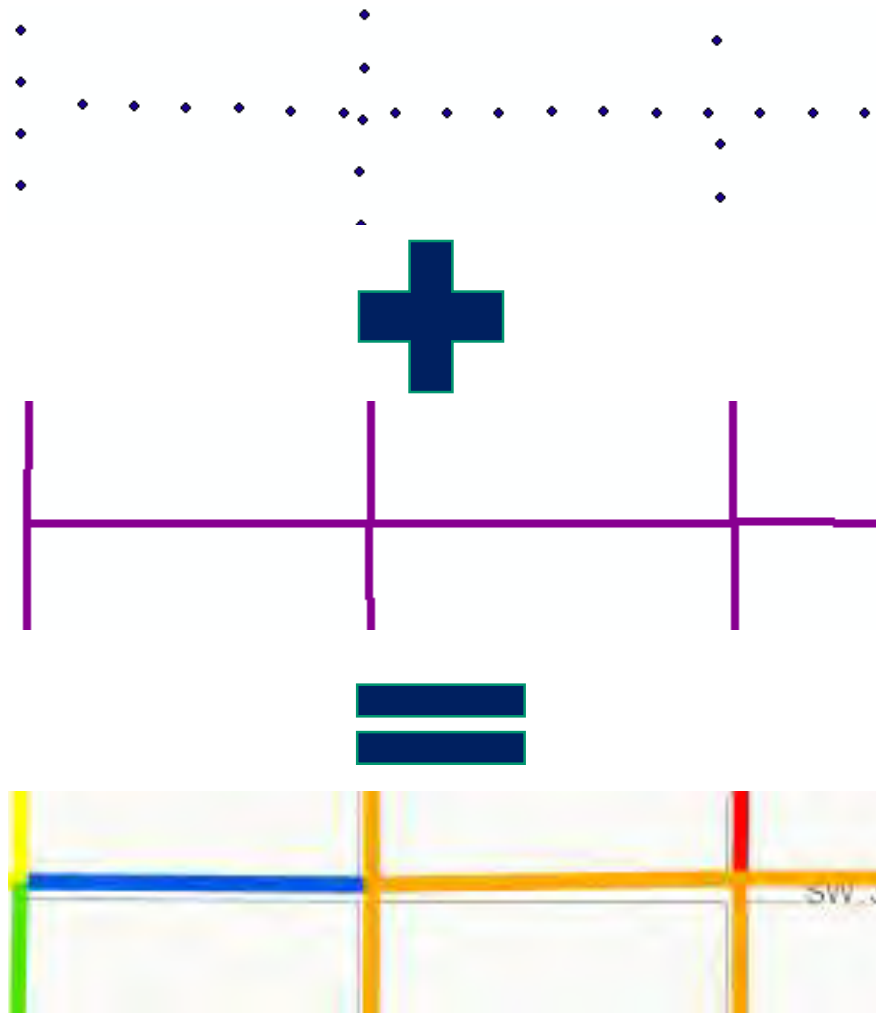
GIS Database

IPMP
GIS
Database

Dynamic Segmentation

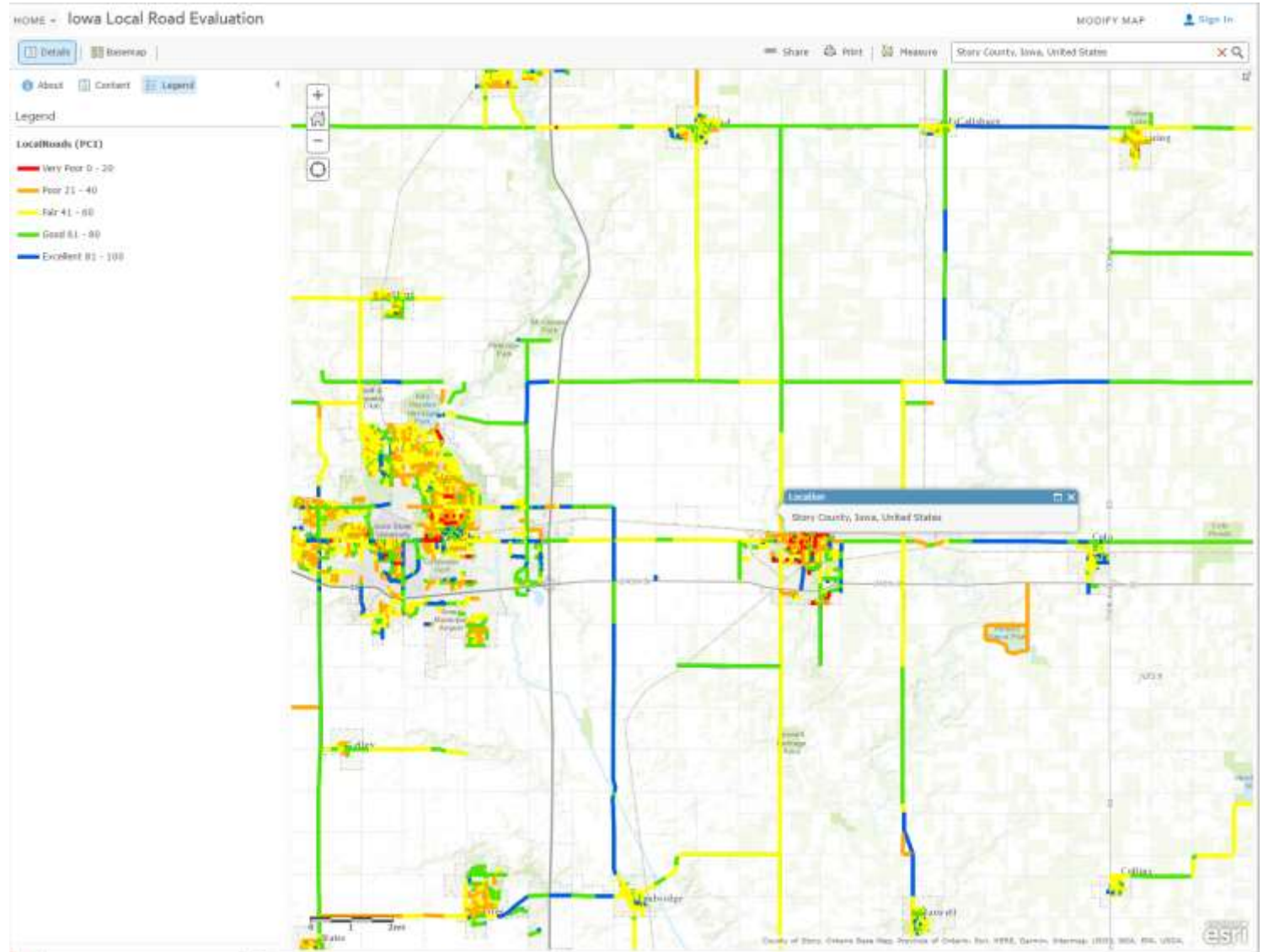
Summarized Condition Data

Pavement condition summary

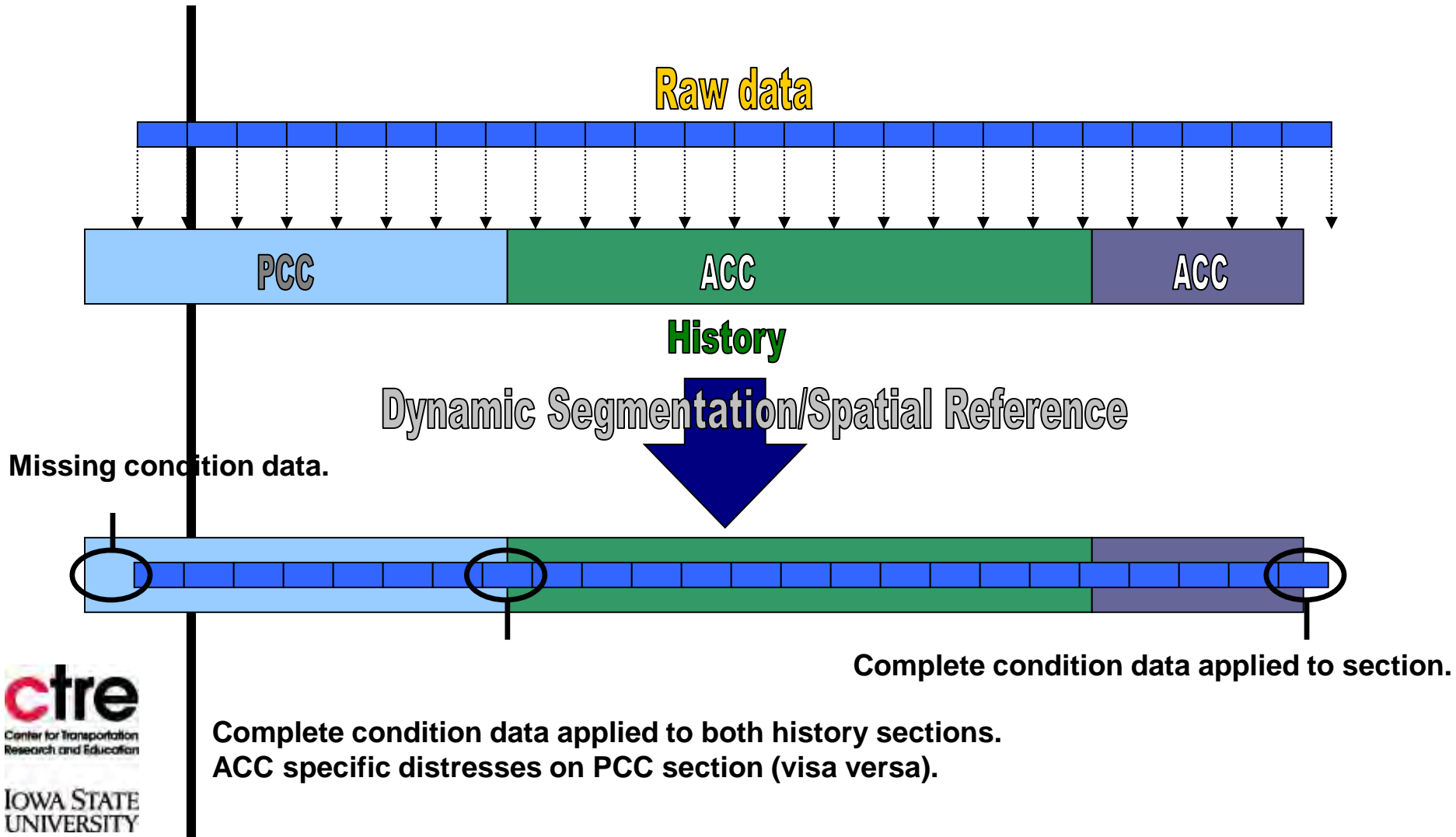


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Pavement condition summary



Summary



Pavement Condition Index (PCI)

- A combined condition index:
 - Road roughness (bumpiness)
 - Rutting
 - Cracking (transverse, longitudinal, alligator)
 - Patching
 - Faulting
- Calculated for **Asphalt, Composite,** and **Concrete** roads separately
- Scale of **0-100** with 100 being a new street

Pavement Condition Index (PCI)

- PCI Scale:
 - Very Poor = PCI 0-20
 - Poor = PCI 20-40
 - Fair = PCI 40-60
 - Good = PCI 60-80
 - Excellent = PCI 80-100

PCI Calculation

ASPHALT PAVEMENT					
DISTRESS	SEVERITY			GROUP WEIGHT (%)	TOTAL WEIGHT (%)
	LOW	MODERATE	HIGH		
IRI (ride)				35	35
ALLIGATOR CRACKING		1x	2x	40	20
RUTTING					20
TRANSVERSE CRACKING	1x	1.5x	2x	25	10
LONGITUDINAL CRACKING (non wheel path)	1x	1.5x	2x		5
LONGITUDINAL CRACKING (wheel path)	1x	1.5x	2x		10

PCI Calculation

CONCRETE PAVEMENT					
DISTRESS	SEVERITY			GROUP WEIGHT (%)	TOTAL WEIGHT (%)
	LOW	MODERATE	HIGH		
IRI (ride)				35	35
"D" CRACKING		1x	1x	40	25
JOINT SPALLING		1x	1x		15
TRANSVERSE CRACKING	1x	1.5x	2x	25	25

PCI Calculation

COMPOSITE PAVEMENT					
DISTRESS	SEVERITY			GROUP WEIGHT (%)	TOTAL WEIGHT (%)
	LOW	MODERATE	HIGH		
IRI (ride)				35	35
TRANSVERSE CRACKING	1x	1.5x	2x	50	20
LONGITUDINAL CRACKING (non wheel path)	1x	1.5x	2x		15
LONGITUDINAL CRACKING (wheel path)	1x	1.5x	2x		15
ALLIGATOR CRACKING		1x	2x	15	7.5
PATCHING	1x	1x	1x		7.5

PCI Calculation

PCI THRESHOLDS

Pavement Type	Distress	New Thresholds 528 Feet Sections
Asphalt Pavements	IRI	253 in/mile
	Rutting	0.59 in
	Block Cracking	NA
	Alligator Cracking	1040 sq.ft
	Transverse Cracking	24 cracks
	Longitudinal Cracking (non-wheel path)	158 ft
	Longitudinal Cracking (wheel path)	158 ft
Composite Pavements	IRI	253 in/mile
	Alligator Cracking	1040 sq.ft
	Transverse Cracking	24 cracks
	Longitudinal Cracking (non-wheel path)	158 ft
	Longitudinal Cracking (wheel path)	158 ft
	Patching	520 sq.ft
Concrete Pavements	IRI	253 in/mile
	Transverse Cracking	14 cracks
	D-Cracking	8 joints
	Joint Spalling	9 joints
	For PCI6, Use IRI	380



Data access and download

- To view the data
 - <http://maps.ipmp.ctre.iastate.edu/arcgis/home/> OR
 - <http://www.ctre.iastate.edu/ipmp/resources/>
- For download
 - <http://www.ctre.iastate.edu/ipmp/forms/>

IOWA STATE UNIVERSITY
Institute for Transportation

IPMP IOWA PAVEMENT
MANAGEMENT PROGRAM
a way to manage your assets

HOME SERVICES EVENTS RESOURCES STAFF ABOUT CONTACT **SERVICE REQUEST FORM**

IPMP Web Portal

Legend Basemap Find address or place

Research Park

"IPMP promotes optimal, cost-effective decisions on highway maintenance, rehabilitation, and reconstruction, using accurate past and projected pavement conditions. IPMP provides pavement management information, tools, and training supporting both PROJECT level and NETWORK level pavement management activities."

Right of Way Video log

Pathweb

The screenshot displays the Pathweb software interface, which is used for creating and viewing video logs of road sections. The interface is divided into several panels:

- Top Panel:** Contains navigation buttons: "Find Road Section", "Help", "Change Directory", "Share the Location", and "Save Current Images".
- Main Video Panel:** Shows a forward-facing video of a road. Below the video, a status bar displays: "Route US 69 N | County 00 | Route ID 500152003h | Milepost 144.752 | Dir Increasing | Date 08/07/16".
- GPS Map Panel (Bottom Left):** Shows a map with a network of roads highlighted in yellow and magenta. It includes a "Map Settings" button and an "Attribution Table" at the bottom.
- Rear View Panel (Bottom Middle):** Shows a rear-facing video of the road.
- Road Surface Panel (Bottom Right):** Shows two side-by-side images: "Surface Image" and "Surface Elevation".
- Image Control Panel (Bottom Right):** A control panel for the video log. It includes a "Stop Video" button, a list of checkboxes for various image types (e.g., "Rear View", "Road Surface", "DOT Strip"), a "Change Skid" button, and a "0.0" value.

Very Poor (PCI 0-20)



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Poor (PCI 20-40)

104370 LO 7960 70 01 5 1 1 2006/06/01 0.150 28.9

140700 LO 3000 70 5330 01 5 1 1 2005/10/22 1.585 34.3



Fair (PCI 40-60)

140670 LO 2600 70 5330 01 5 1 1 2005/10/22 0.150 39.1



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Good (PCI 60-80)

105280 LO 7700 70 01 5 1 1 2006/06/02 0.666 39.6



Excellent (PCI 80-100)

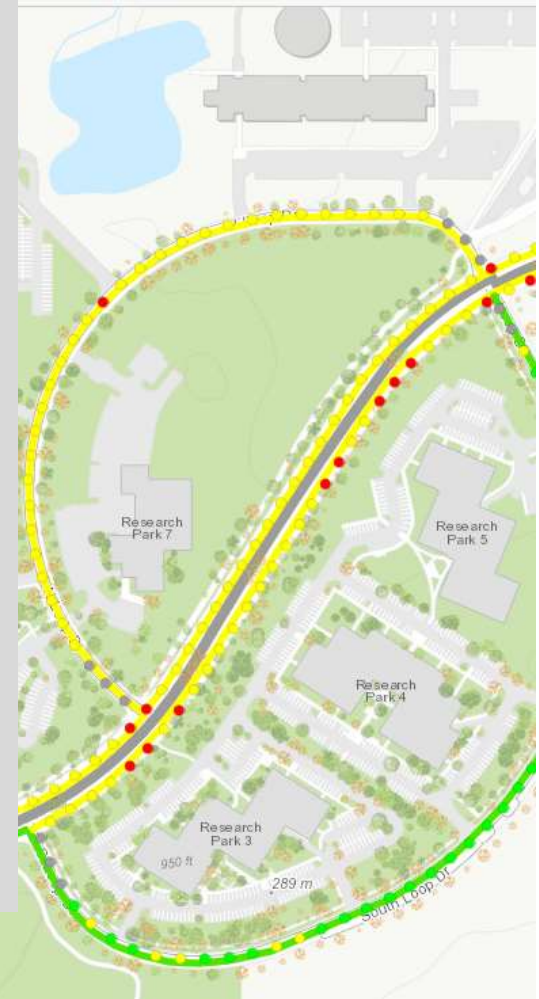


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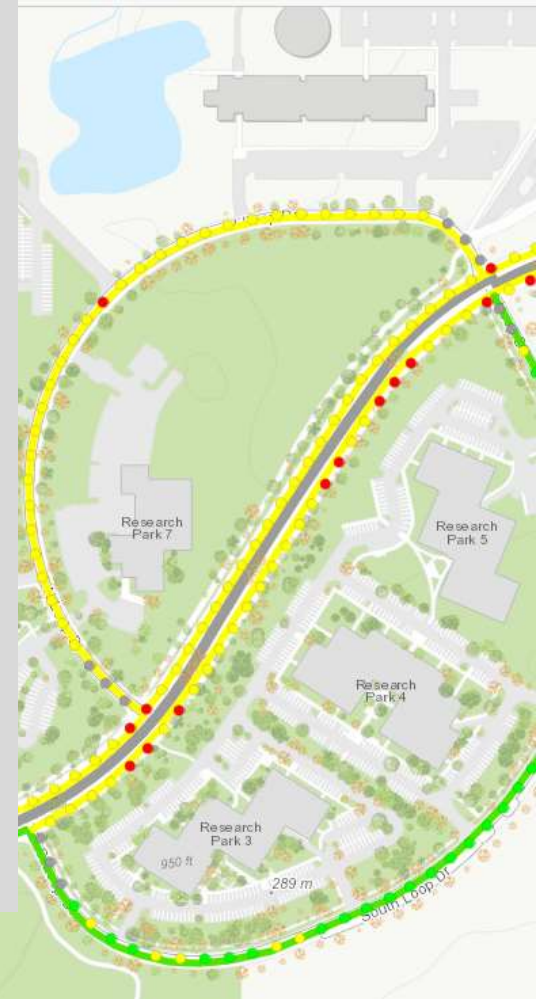
Using the PCI

- ❑ Historic data
 - ❑ Project selection- prioritization, ranking
- ❑ Forecasting
- ❑ Engaging stakeholders
- ❑ Treatments evaluation



What we offer

- ❑ Pavement management data
- ❑ PM Implementation
- ❑ Training and support
- ❑ PMS Software



Pavement management data

- Pavement condition summary
- Rawdata
- GIS Maps
- ROW Video



PM Implementation

- ❑ Integrating with historic data
- ❑ Presentation to stakeholders
- ❑ PM Software
- ❑ PM Program template



Training

- ❑ Training and support
 - ❑ Pavement management software
 - ❑ GIS Integration
 - ❑ On demand



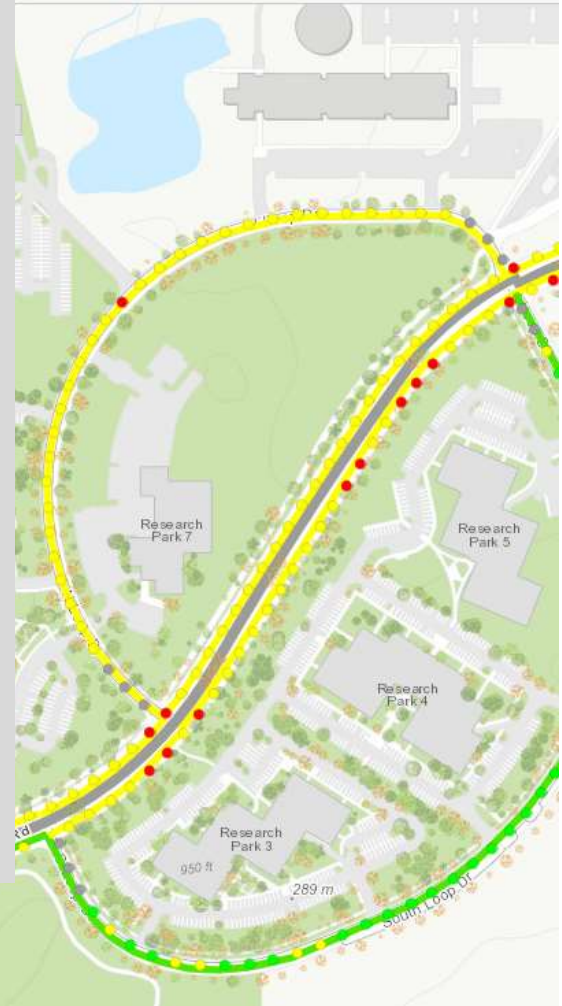
Users Group

- Quarterly meetings
- Peer exchange
 - How are you using IPMP data?
 - How can we support you?
 - To what extent
 - Biggest challenges
 - Success stories



PMS Software

- ❑ dTIMS Setup Template and Support
 - ❑ Long range transportation plan
 - ❑ Project selection
 - ❑ Forecasting
 - ❑ Estimating investment levels
 - ❑ Engaging stakeholders

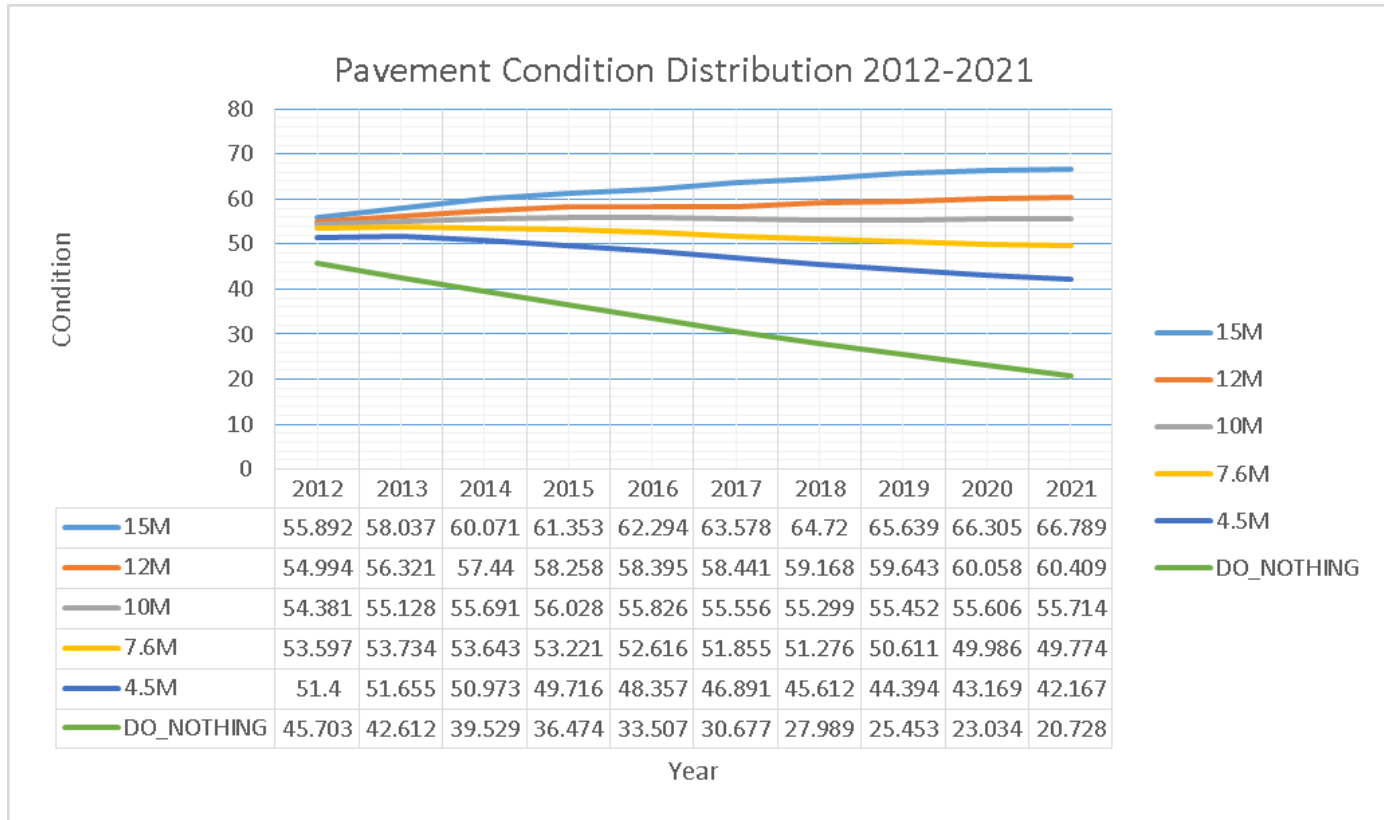


PMS Software

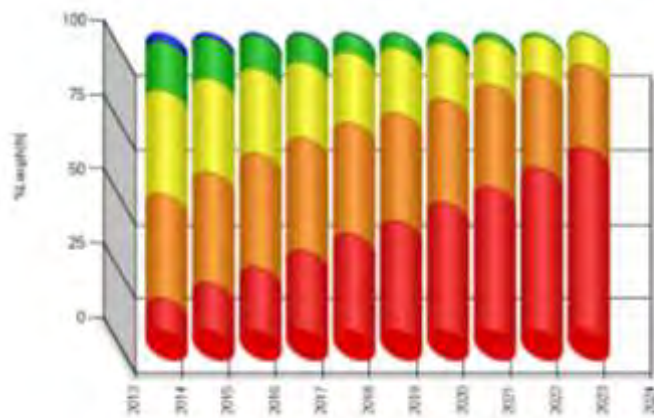
- dTIMS:
 - Multi-year Prioritization
 - Incremental Benefit Cost Analysis
 - Deterministic Performance Forecasting
 - Project Selection
 - Budget Analysis

- Implementation:
 - Data
 - Performance curves
 - Treatment strategies
 - Trigger limits
 - Improvements
 - Evaluation

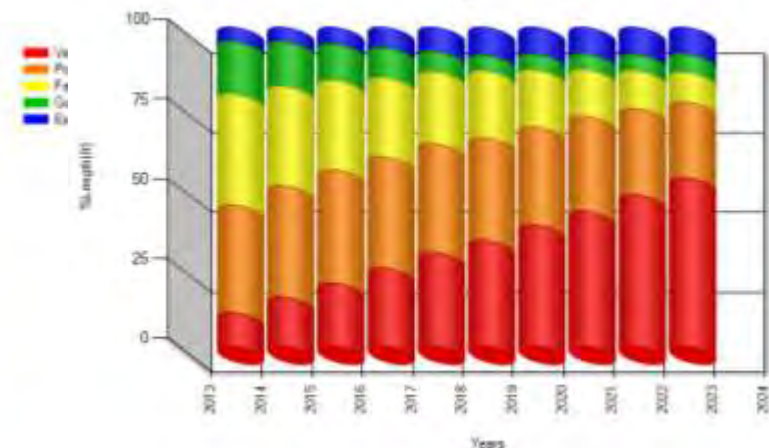
- Results:
 - Recommended Projects (by year)
 - Recommended Treatments (project & year)
 - Overall Analysis Summaries:
 - Condition
 - Backlog
 - Treatment cost
 - Treatment length



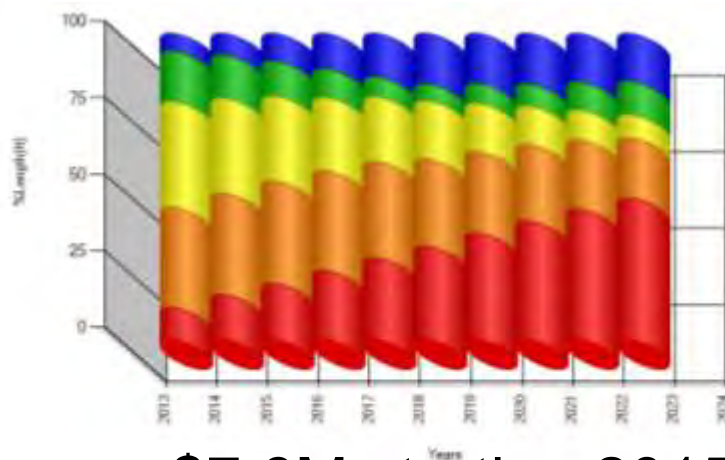
dTIMS



DO NOTHING

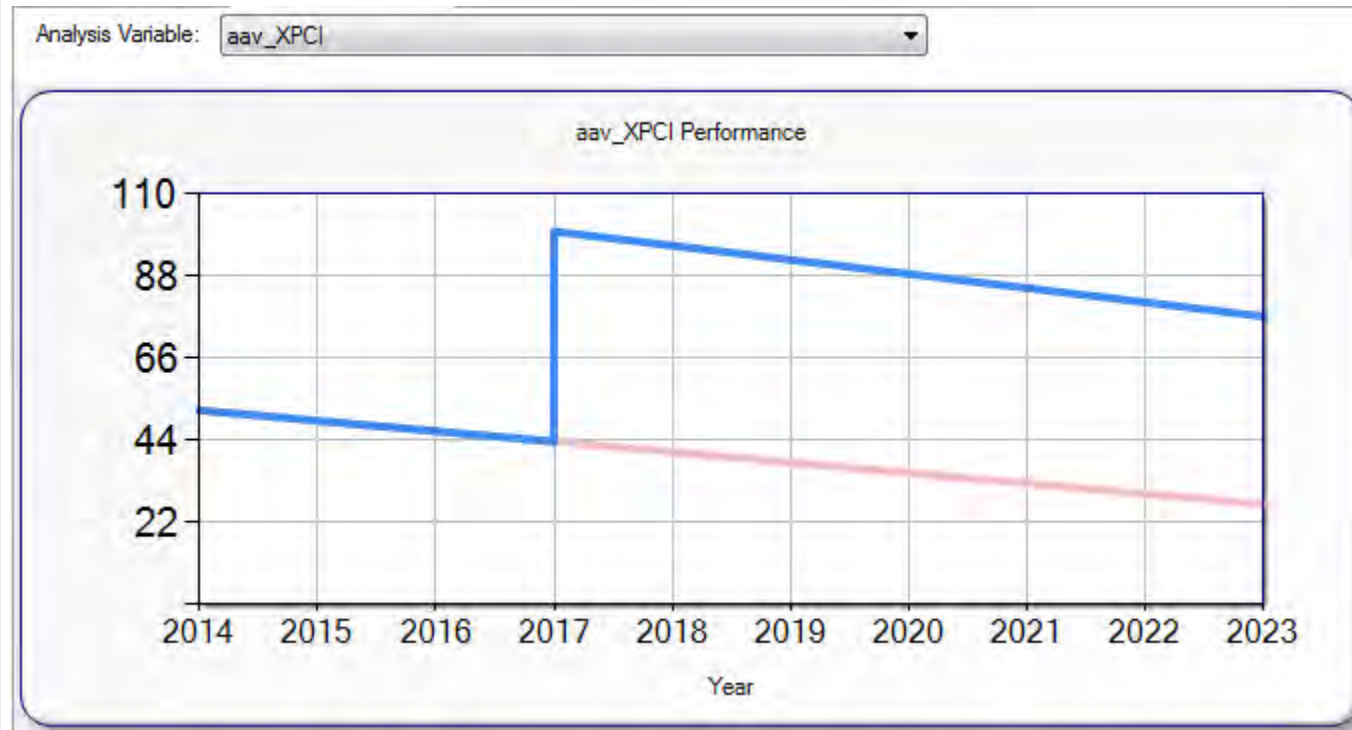


\$4M starting 2015

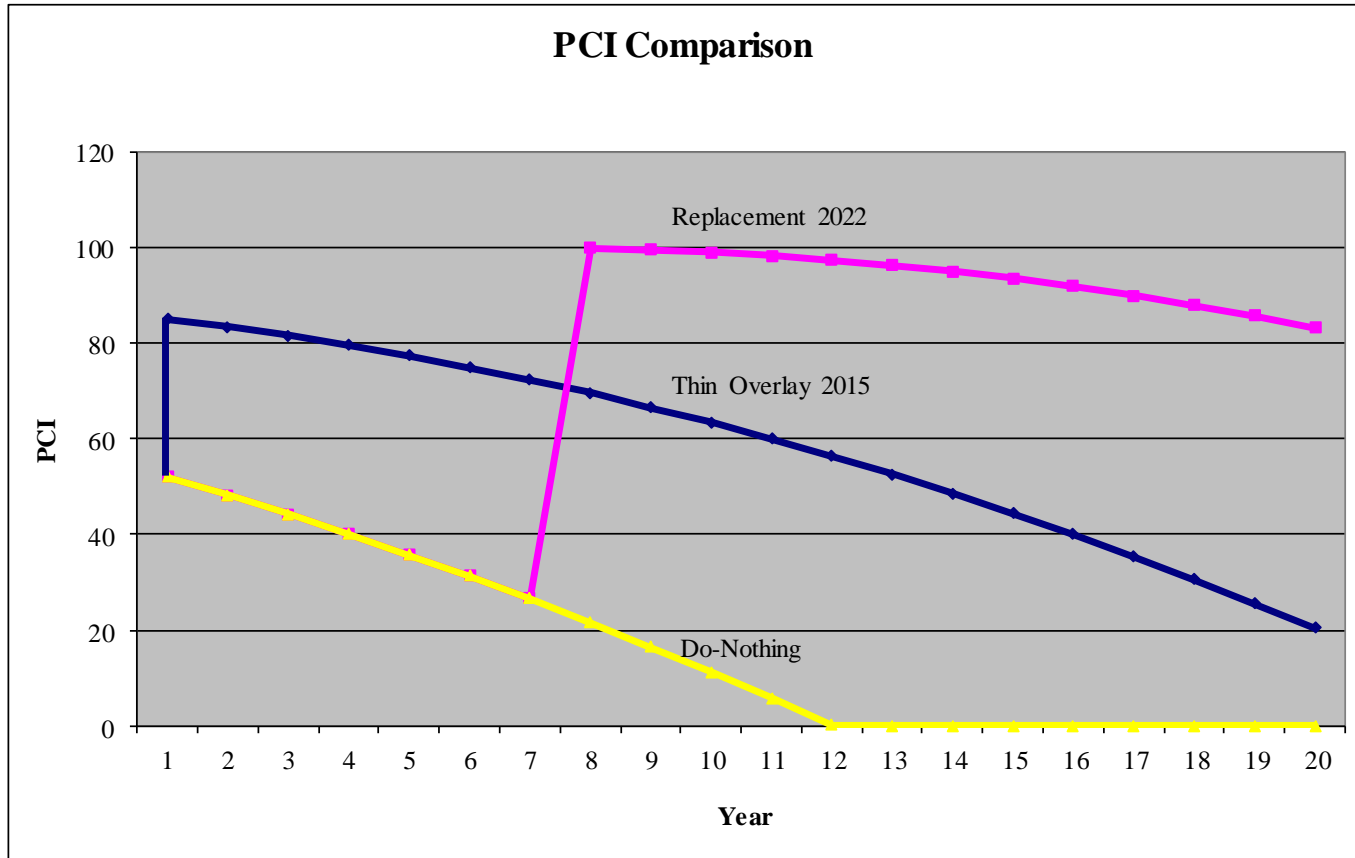


\$7.6M starting 2015

Example Results



Example Results



Questions?