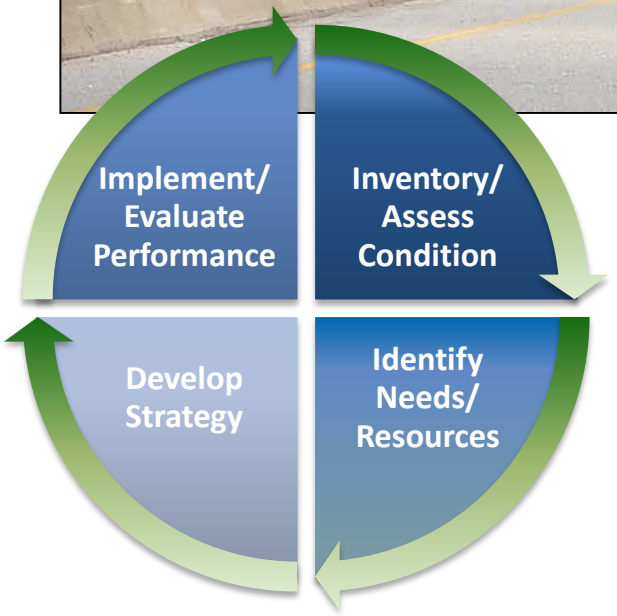
PennDOT's Asset Management Initiatives



Mid-Atlantic Quality Assurance Workshop
Wednesday, February 8, 2017
Maintenance & Asset Management Session

pennsylvania
DEPARTMENT OF TRANSPORTATION
www.dot.state.pa.us

PennDOT's Asset Management Initiatives

- Transportation Asset Management Plan (TAMP)
- Pavement Asset Management System (PAMS)
- Bridge Asset Management System (BAMS)

TAMP Background

- Case Study “Red Report” – 2003
  - Wealth of inventory and condition data.
  - Homegrown, uncoordinated mainframe applications.
  - Lack needs predictions, cost tracking, and integration across assets.

- MAP 21 - 2012
  - TAMP first discussed

- FAST Act
  - TAMP rulemaking
  - Performance measures

pennsylvania
DEPARTMENT OF TRANSPORTATION
www.dot.state.pa.us

TAMP Actions To Date

- Organization Changes:
  - Reduce “silos.”
  - Single source for condition data reporting.
  - Accentuate asset management focus.

- Draft Development:
  - Performed Gap Assessment and Self Assessment.
  - 5th draft to date.

- Steering Committee Formation:
  - Standards and requirements.
  - Oversight and monitoring.

Plan Requirements

- TAMP is for the NHS.
- All NHS pavement and bridge assets, regardless of ownership.
- Intending to eventually include other NHS infrastructure assets and assets on other public roads.
- TAMP shall cover, at a minimum, a 10-year period.

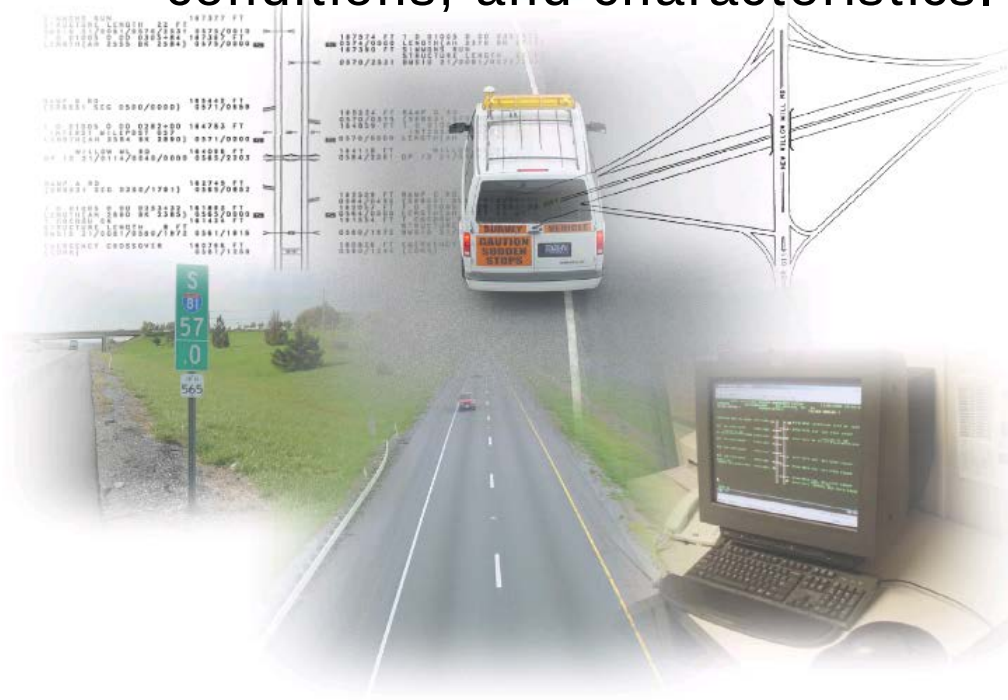
PennDOT's Asset Management Initiatives

- ~~Transportation Asset Management Plan (TAMP)~~
- Pavement Asset Management System (PAMS)
- Bridge Asset Management System (BAMS)

pennsylvania
DEPARTMENT OF TRANSPORTATION
www.dot.state.pa.us

Roadway Management System (RMS)

- PennDOT's means for:
  - Defining and monitoring the State highway network.
  - Maintaining an inventory of the roadway features, conditions, and characteristics.



```
          EXTR: 02/16/2000 ROADWAY MANAGEMENT SYSTEM          02/16/2000 08:33:33
 RMSSM090          CO:PHILADELPHIA    SLD VERTICAL   SR:1001
 PHILADELPHIA C              SEGMENT/OFFSET:       /       PHILADELPHIA C
(CITY)                  0010/1320                          001085 FT ASHDALE ST
                        001085 FT                          0010/1085 (CITY)
                                                           001058 FT
ASHDALE ST              001058 FT
(CITY)                  0010/1058                          000774 FT SHELTON ST
                        000774 FT                          0010/0774 (CITY)
                                                           000702 FT
RUSCOMB ST              000702 FT
(CITY)                  0010/0702                          000512 FT ALBANUS ST
                        000512 FT                          0010/0512 (CITY)
                                                           000497 FT
ALBANUS ST              000497 FT
(CITY)                  0010/0497
ROOSEVELT BL            000208 FT                          000208 FT ROOSEVELT BL
(SR6001 SEG 0181/1006)  0010/0208                          0010/0208 (SR6001 SEG 0181/1006)
ROOSEVELT BL            000075 FT                          000075 FT ROOSEVELT BL
(SR0001 SEG 0181/0987)  0010/0075                          0010/0075 (SR0001 SEG 0181/0987)
                        000050 FT                          000050 FT FROM 0001/0181 SH
                                                           0010/0050 (CONN)
                        000000 FT                          000000 FT ROOSEVELT BL
                                                                  (SR0001 SEG 0180/0901)
                                                           INTER-BK  RISING SUN AV
                                                                  (CITY)
                                                                  MFC BEGIN = B
ROOSEVELT BL                                                  NC RISING SUN AV
(SR0001 SEG 0180/0901)  0010/0000                          0010/0000 LENGTH(AH 2464 BK 0000)
 SR:     1001          TOTAL LEN:  7.506 MI.
 COUNTY: PHILADELPHIA  DIST:  605        SR DIR: B
 ACTN: _
SB  a                                                                        32/008
```

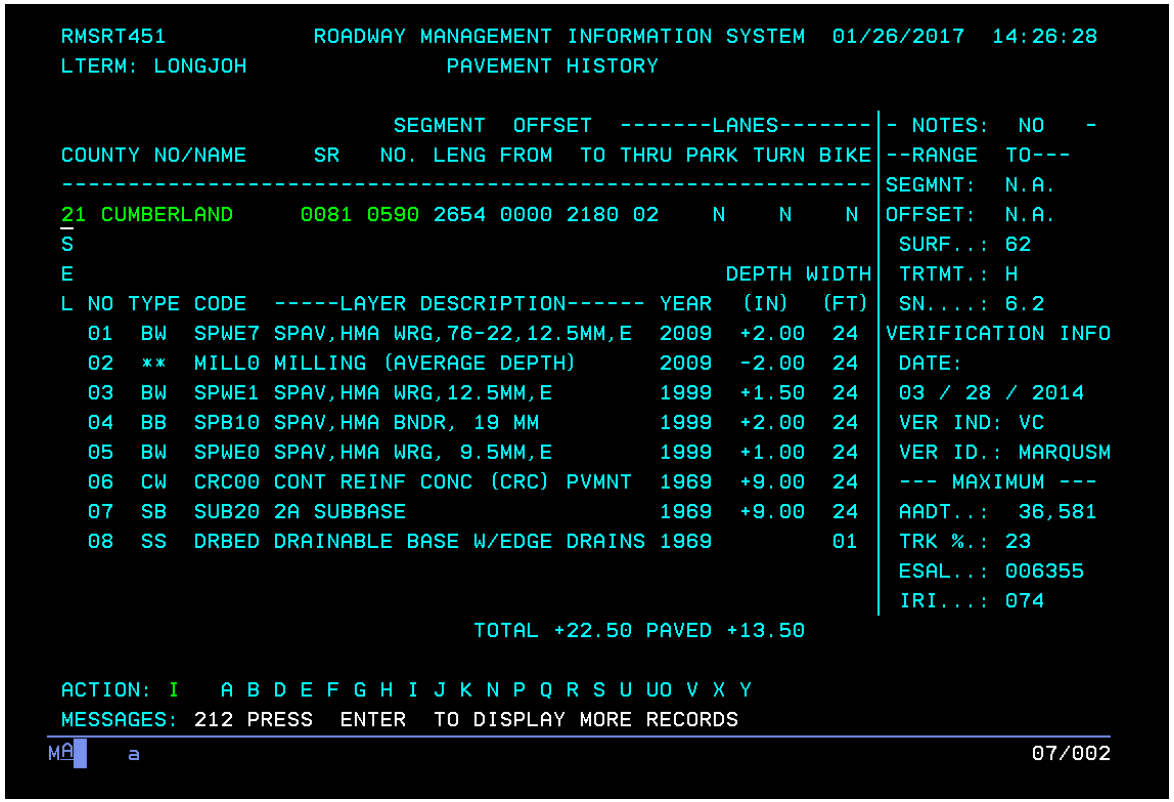
pennsylvania
DEPARTMENT OF TRANSPORTATION
www.dot.state.pa.us

Roadway Management System (RMS)

- Data stored and managed in RMS includes:
  - Roadway geometry
  - Traffic information
  - Pavement and shoulder history
  - Municipal and legislative boundaries
  - Intersection locations
  - Roadside features
  - Structure locations
  - Railroad crossings
  - Pavement testing data
  - Condition survey data (including guide rail and drainage features)
  - Posting/bonding information

Pavement History Data

- Includes layer type, layer depth, layer width, year placed.



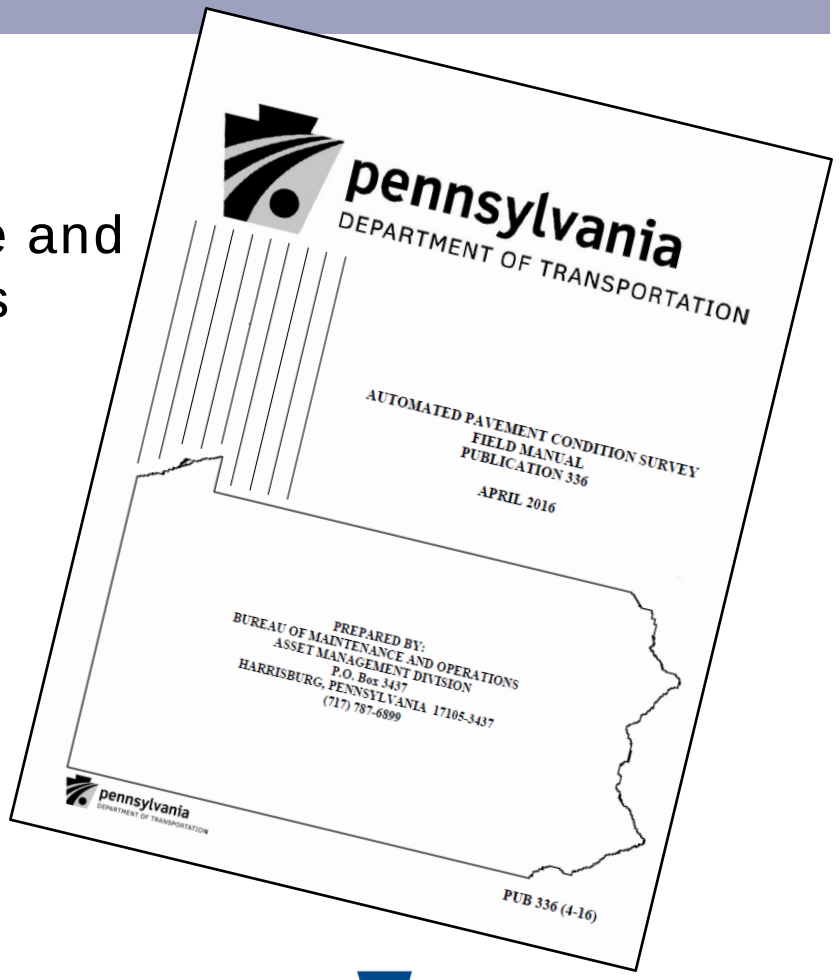
pennsylvania
DEPARTMENT OF TRANSPORTATION
www.dot.state.pa.us

Pavement Condition Data

STAMPP

Systematic Technique to Analyze and Manage Pennsylvania Pavements

- Pavement Conditions – Videologging (Pub. 336)
- Shoulder & Guiderail – manual survey (Pub. 33)
- Storm Water Facility – manual survey (Pub. 73)
- CRC & Unpaved Roads – manual survey (Pub. 343)

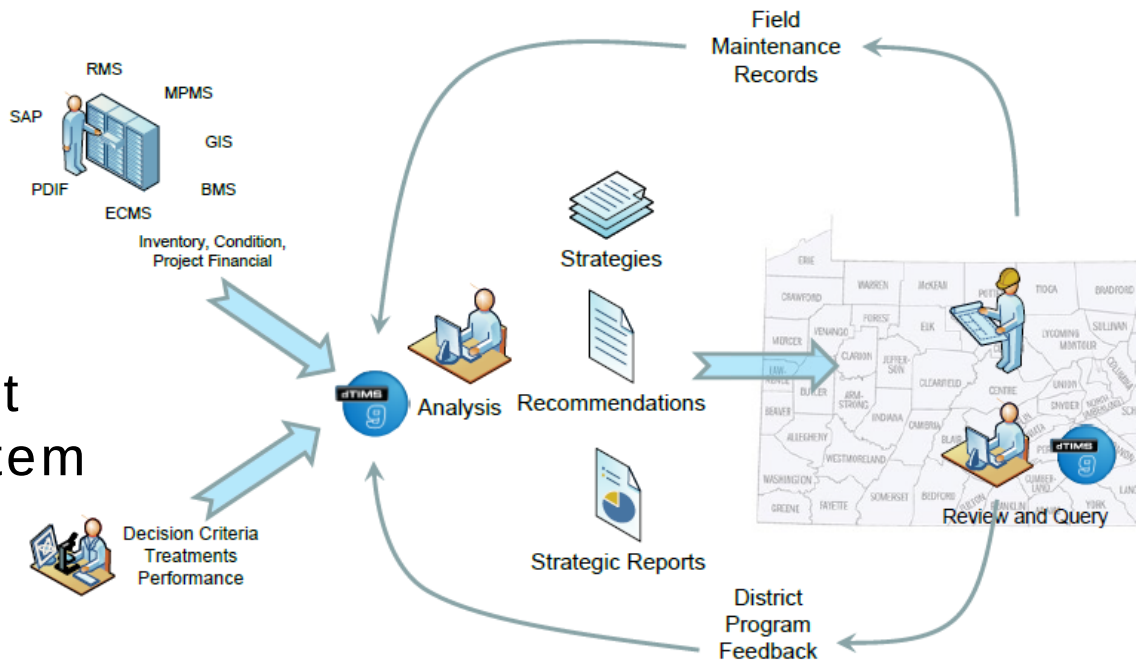


pennsylvania
DEPARTMENT OF TRANSPORTATION
www.dot.state.pa.us

Pavement Asset Management System

Makes use of data from:

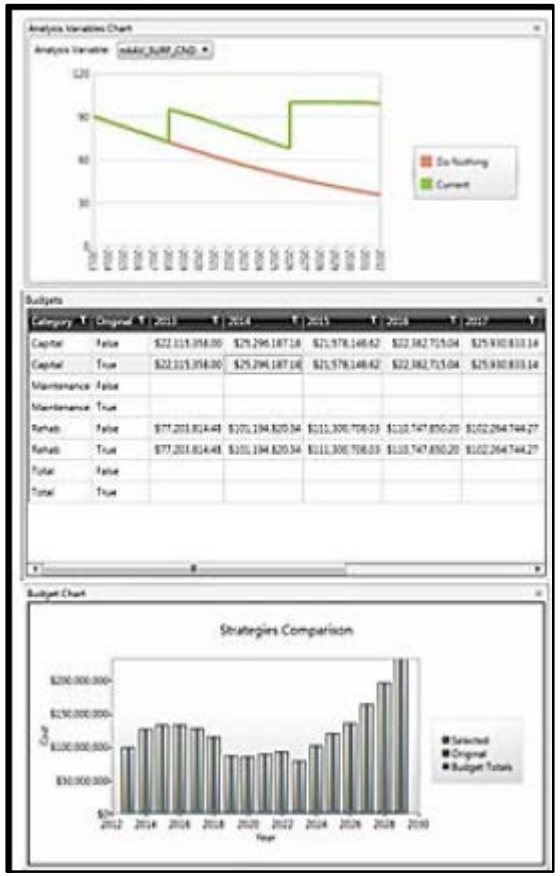
- RMS
- SAP Plant Maintenance
- Multimodal Project Management System



pennsylvania
DEPARTMENT OF TRANSPORTATION
www.dot.state.pa.us

Pavement Asset Management System

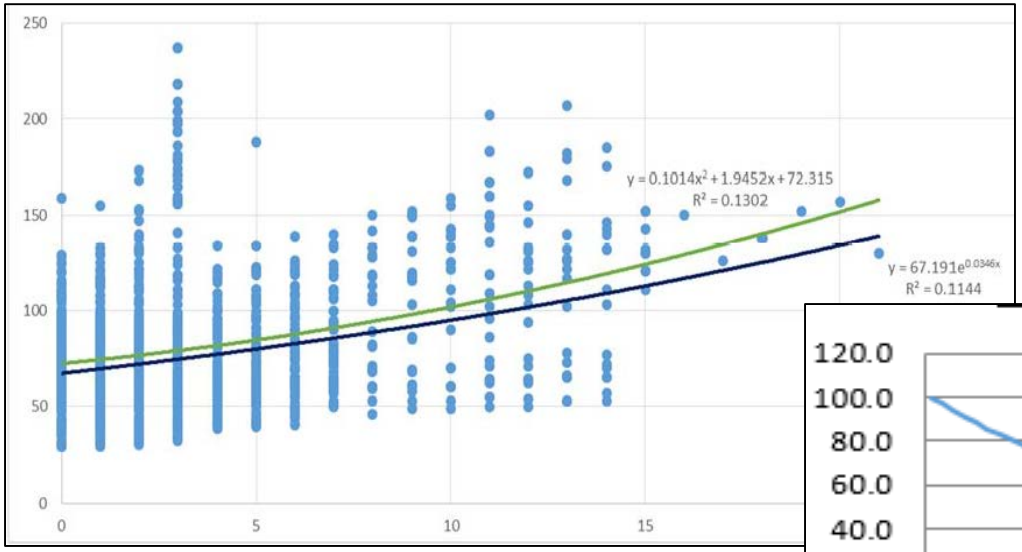
- Predict optimized strategies based on budget scenarios and condition data.
- Cost-effective network planning.
- Models for forecasting future pavement conditions.
- Existing long-term budget allocation decisions (TIP, 5-Year Plans) present challenges to implementation and affect how funds are optimized in PAMS.

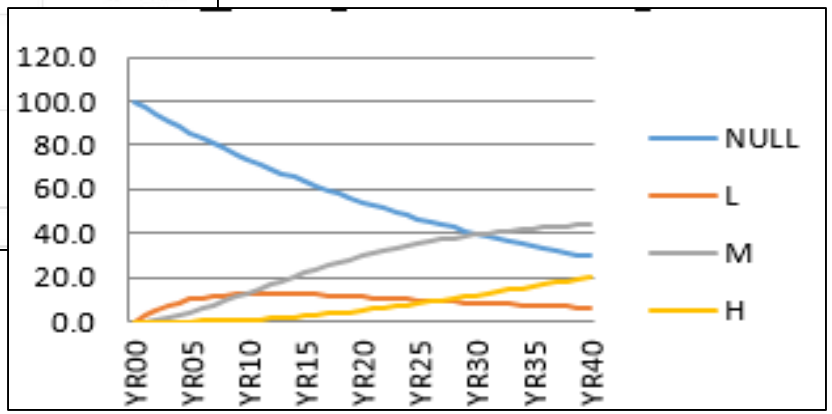


pennsylvania
DEPARTMENT OF TRANSPORTATION
www.dot.state.pa.us

Pavement Asset Management

- Without PAMS, no ability to predict individual pavement distress conditions for like pavements.





pennsylvania
DEPARTMENT OF TRANSPORTATION
www.dot.state.pa.us

Pavement Asset Management

- Deighton Associates contracted in April 2014.
- Customized off the shelf product:

  Deighton's Total Infrastructure Management System (dTIMS®)
- PAMS will be ready for use by Central Office and District Personnel in the first quarter of 2017.

Pavement Asset Management

- PAMS was moved to production in May of 2016.

- Testing and production environments were found to operate differently, and the production environment security prevented user access.

Pavement Asset Management

- Full statewide implementation of PAMS will be incremental over a 5-year timeframe.

  Year 1 – Validate the results. Feedback will determine adjustments, and gaps in data to be addressed.

  Year 2 – Continue data validation, and begin to apply to planning processes. Focus on pavement treatment selection practices as related to Surface Improvement Plans (SIP).

Pavement Asset Management

Year 3 – Continue data validation, and identify planning methods and policy direction. Focus on pavement treatment selection practices as related to SIP and TIP.

Year 4 – Establish Statewide role of PAMS utilization and results related to SIP work.

Year 5 – Monitor and fine-tune, established best-practices and finalize policy content. Utilization of PAMS for SIP Work and Pavement Preservation TIP Work.

Pavement Asset Management

- After Year 5, publish policy:
  - User Policy: who utilizes the system, when, for what.
  - Data: where does the data come from, how it can be improved or maintained.
  - Prioritization of changes/issues and how they are tasked.

PennDOT's Asset Management Initiatives

- ~~Transportation Asset Management Plan (TAMP)~~
- ~~Pavement Asset Management System (PAMS)~~
- Bridge Asset Management System (BAMS)

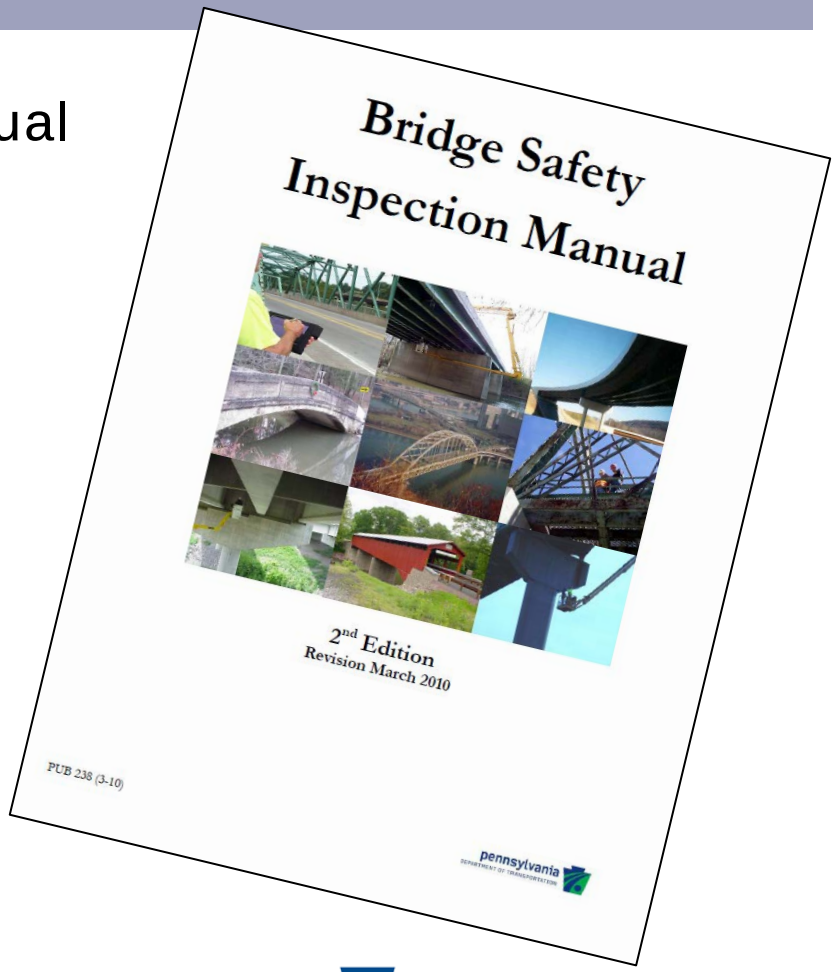
Bridge Management System (BMS2)

- Database to house all bridge inventory and condition data.
- Location and administrative data from RMS.
- Interfaces with SAP-PM for maintenance needs/activities.

pennsylvania
DEPARTMENT OF TRANSPORTATION
www.dot.state.pa.us

Bridge Inspection Data

- Bridge Safety Inspection Manual (Pub. 238)
- Specification for the National Bridge Inventory Bridge Elements (SNBIBE)
- AASHTO Manual for Bridge Element Inspection (MBEI)



pennsylvania
DEPARTMENT OF TRANSPORTATION
www.dot.state.pa.us

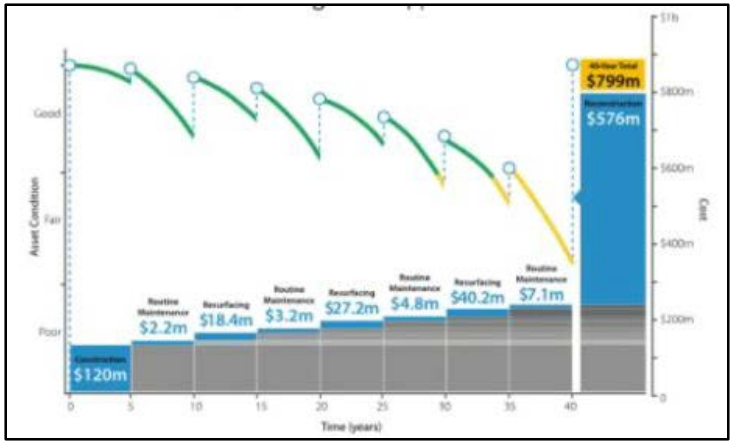
Bridge Asset Management System (BAMS)

- Similar to PAMS, BAMS is a forecasting tool to allow us to better manage our bridge assets.

- Provides information to Districts and Planning Partners to help select the right repair at the right time.

- Predict future bridge condition based on funding levels.

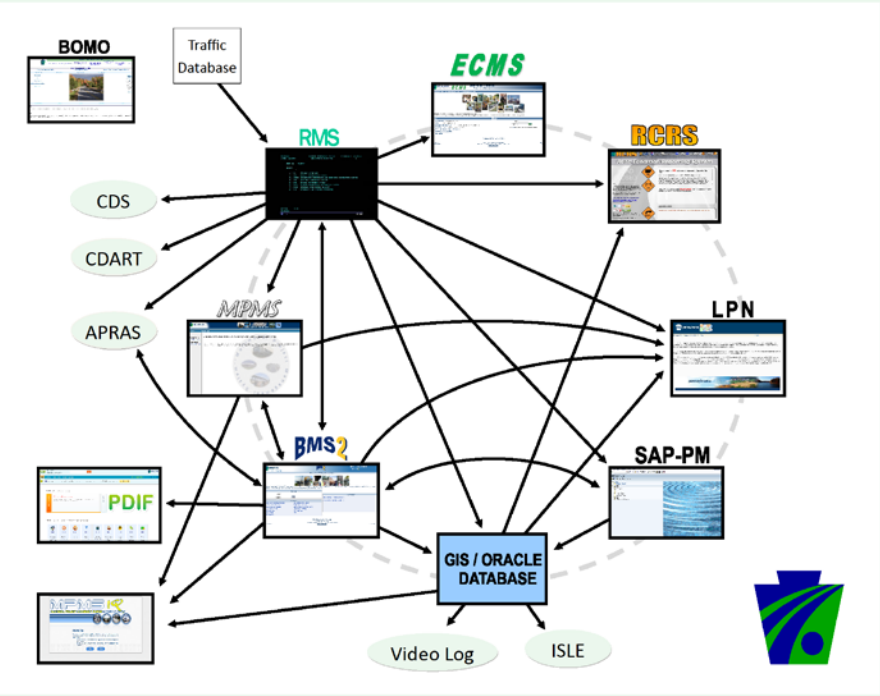
- Analyze our data sets and assist in programing to lowest life cycle cost (LLCC).



pennsylvania
DEPARTMENT OF TRANSPORTATION
www.dot.state.pa.us

Bridge Asset Management System (BAMS)

- Similar to PAMS, BAMS will rely on databases that contain years of historic inventory, inspection data and other information from:
  - BMS2
  - ECMS
  - MPMS
  - RMS



Bridge Asset Management System

Status:

- Preliminary work completed:
  - Deterioration modeling.
  - Cost modeling.

- Expected implementation in 2017.

Bridge Asset Management System (BAMS)

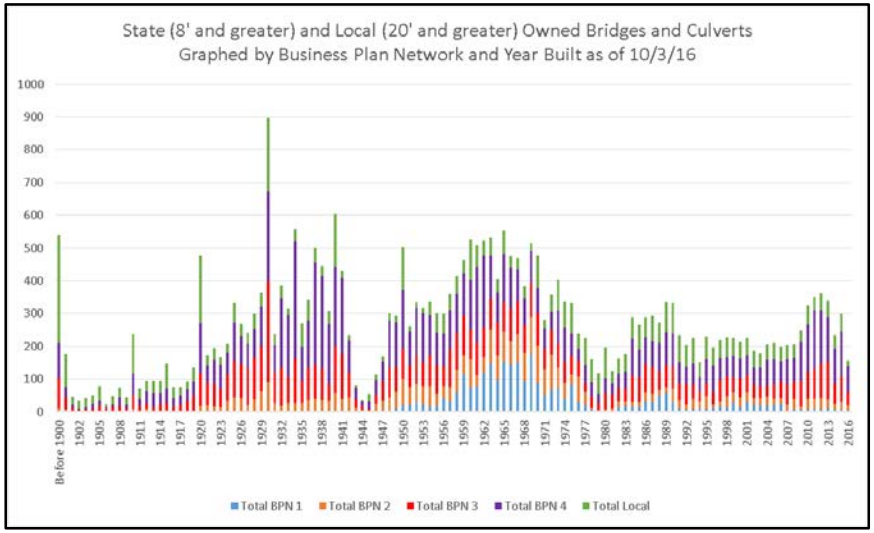
- In advance of BAMS, BAMS Lite has been developed.

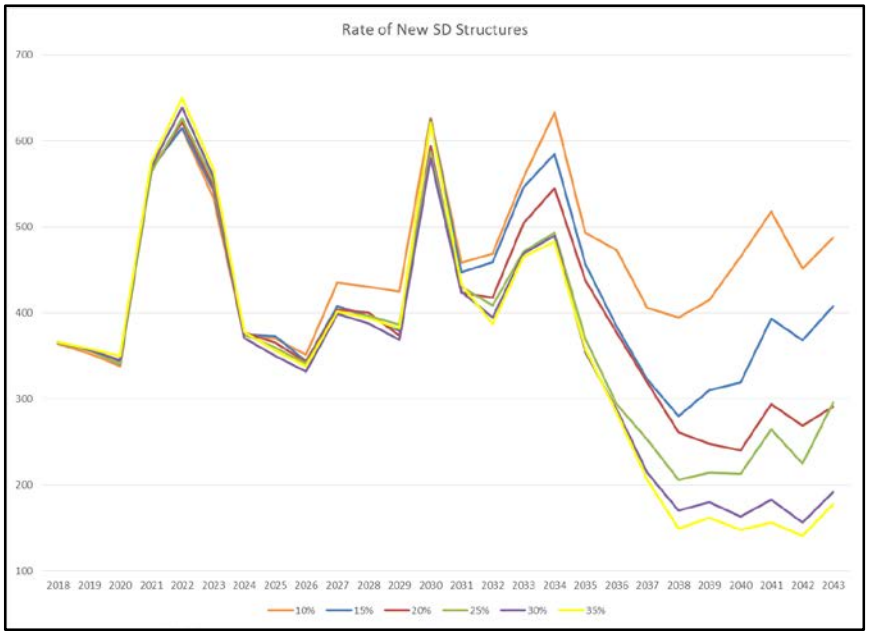
- Scaled down version of the COTS, designed to forecast bridge condition based on a given funding level.

  - Network level only.
  - Cannot create specific projects (hence “Lite”).

Bridge Asset Management System (BAMS)

- BAMS Lite - Same great information, less detail.





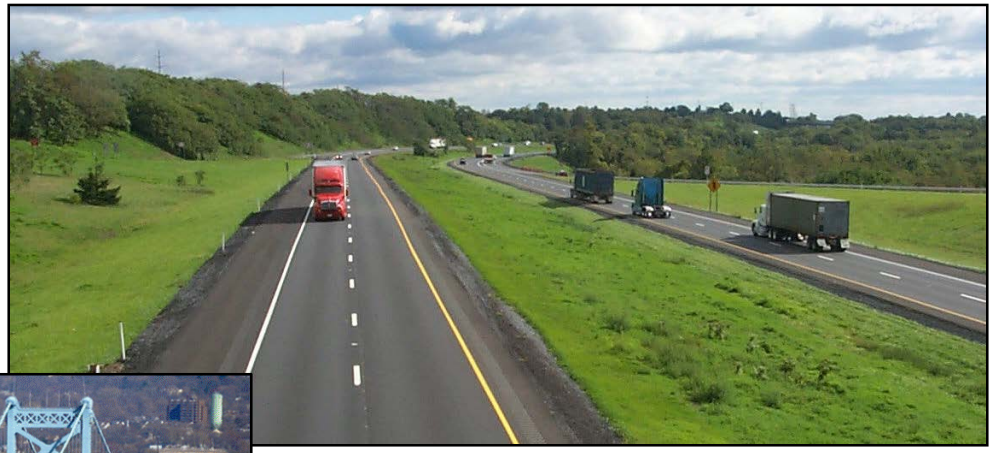
pennsylvania
DEPARTMENT OF TRANSPORTATION
www.dot.state.pa.us

PennDOT's Asset Management Initiatives

- ~~Transportation Asset Management Plan (TAMP)~~
- ~~Pavement Asset Management System (PAMS)~~
- ~~Bridge Asset Management System (BAMS)~~

PennDOT's Asset Management Initiatives

Questions?



J. Michael Long, P.E.
Chief, Asset Management Division
Bureau of Maintenance & Operations
(717) 787-6899
johlong@pa.gov

pennsylvania
DEPARTMENT OF TRANSPORTATION
www.dot.state.pa.us