

# CITY OF DALLAS PAVEMENT MANAGEMENT PRACTICES IN EMERGING TECHNOLOGIES

23<sup>rd</sup> Annual SAME Infrastructure Forum



Shahad Mohammed, PMP  
Program Administrator, Pavement and Asset Management, City of Dallas

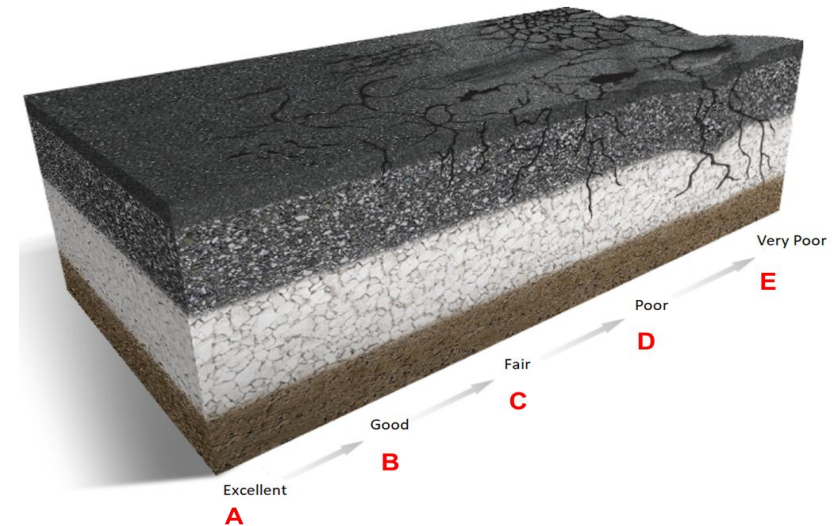
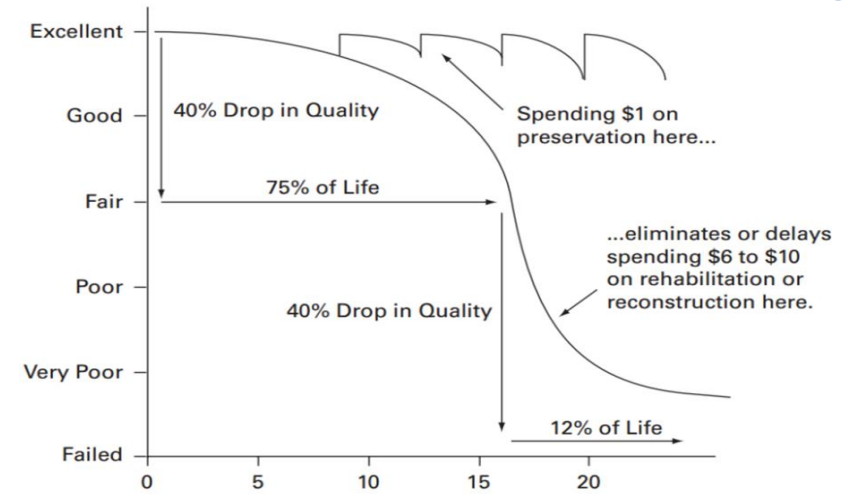
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# Agenda

- Introduction to Pavement and Asset Management
- Why Pavement Management is Important?
- City of Dallas Vision in Pavement and Asset Management
- Pavement Management System Cycle
- City of Dallas Pavement Management Practices in Emerging Technologies:
  - New ASTM E3303
  - GPR Testing
  - Cracks Detection using Smart Phone Pilot
  - Assets Inventory & Pavement Assessment Using AI Pilot
  - Cool Pavement Pilot
- Challenges with Emerging Technologies
- Questions & Answers

# • Introduction to Pavement and Asset Management

- Pavement Management is a systematic process of maintaining, upgrading and operating a network of pavements to optimize safe, smooth, and economic pavement conditions over an entire network within budgetary constraints.
- Success in pavement management is accomplished by maintaining pavements in a good or better condition while maximizing their life cycle.





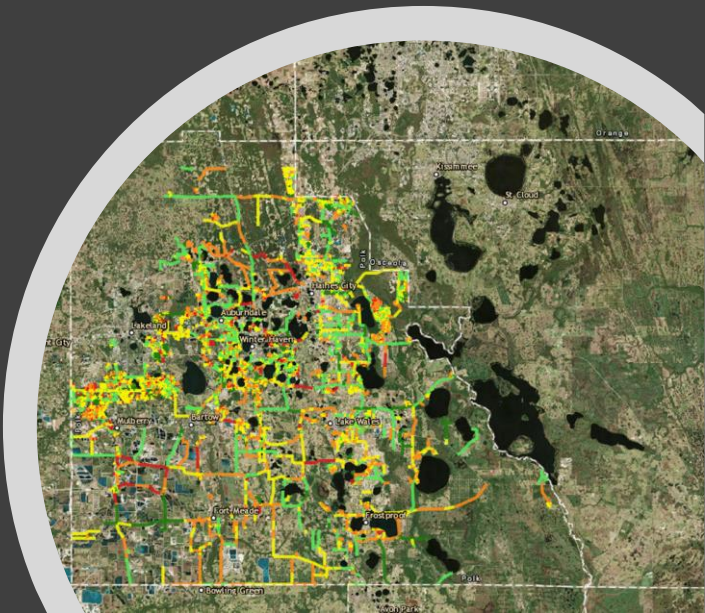
- **Why Pavement Management is Important?**
  - Pavement network is typically the single largest financial investment for a public agency
  - Strategic treatment selection and funding allocation is a complex process
  - Identifying the long-term consequences of today's funding decisions
  - Providing objective justification for maintaining or increasing pavement funding allocations
  - Formalized process provides transparency of budgeting and projects selection decisions
  - Maintains the network at the highest level of service for the traveling public for the funding available





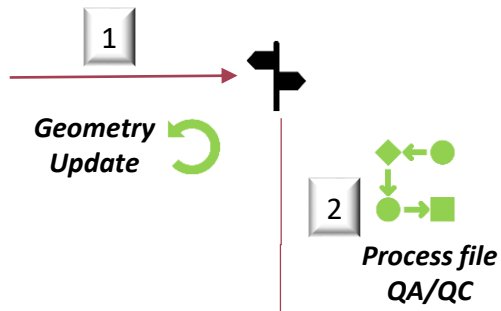
- **City of Dallas Vision in Pavement and Asset Management**

- Create a systematic pavement management process.
- Achieve data-driven decisions and minimize subjectivity.
- Implement a long-term infrastructure management solutions.
- Improve Dallas data quality and Dallas Geographical Information System GIS.
- Right treatment, right place, right time.
- City of Dallas to be on the top of the future forward Cities in the Nation.



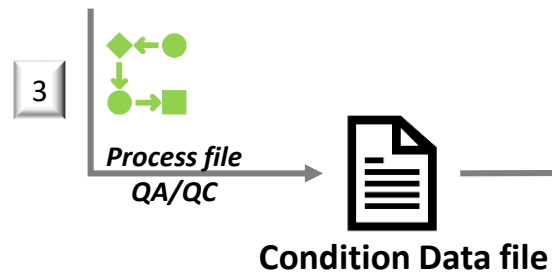
# • Pavement Management System Cycle

## Inventory File (Geospatial)



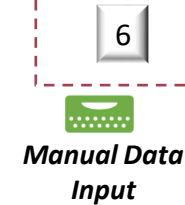
Automated Survey/Data Collection

Distress Data/Cracking Data



Construction History Data (GIS Database)

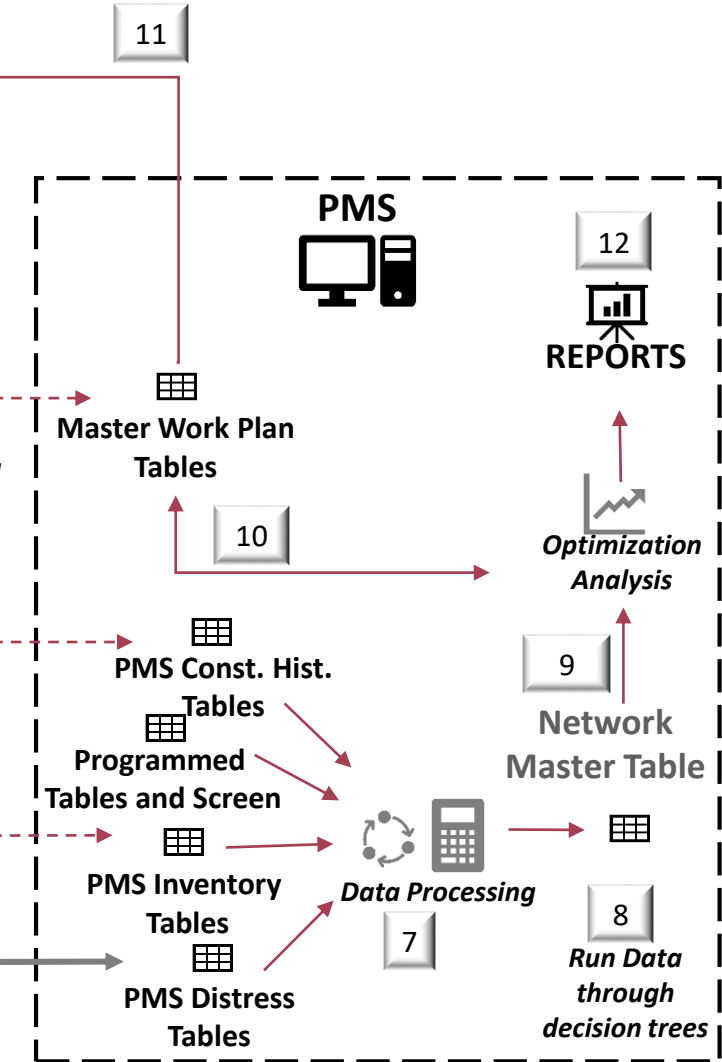
Programmed Work & Maint. History



GIS Database/Pavement Model



## Implementation



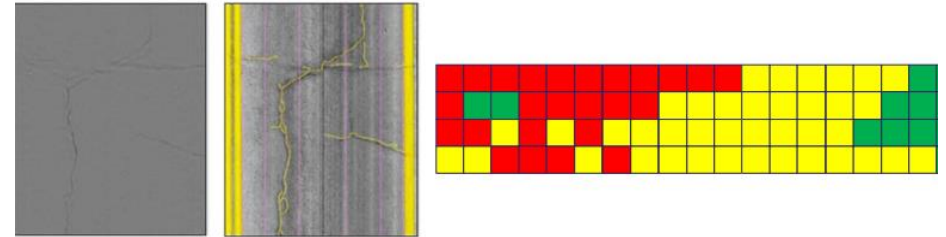


# City of Dallas Pavement Management Practices in Emerging Technologies



# • New ASTM E3303

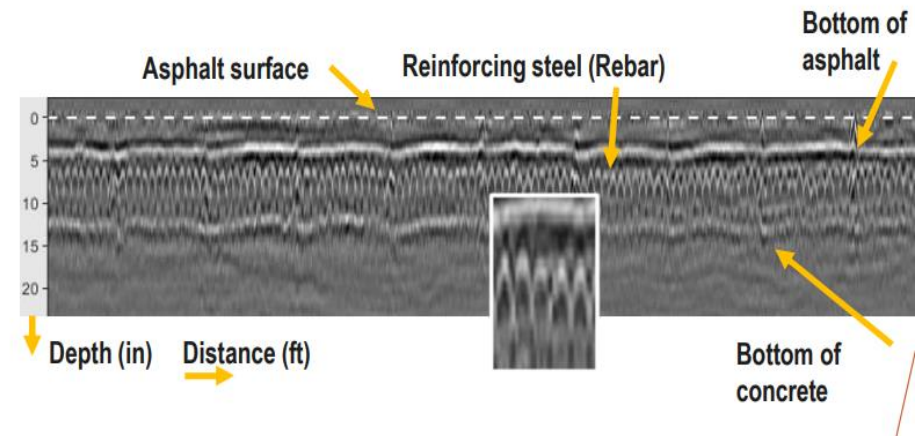
- Dallas collected about 6000 Lane Miles Data using both semi automated standard ASTM D6433 and the new fully automated ASTM E3303.
- The new standards used AI Technology to read pavement cracking to create Pavement Surface Cracking Index PSCI instead of the Pavement Condition Index PCI.
- Some of the main characteristics of this new technology is to simplify the condition reading by quantifying cracking only, having repeatability and stability of results, and provide input for pavement modeling.





# • GPR Testing

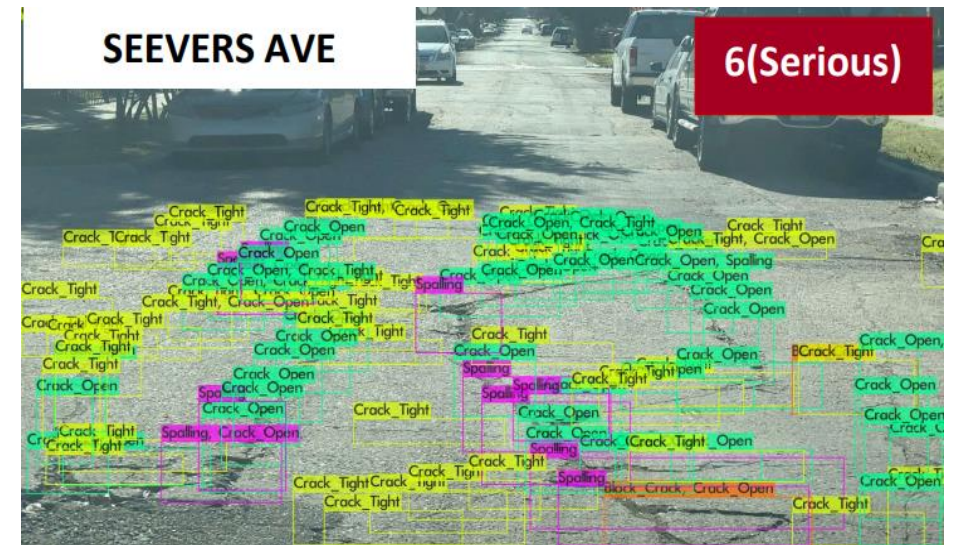
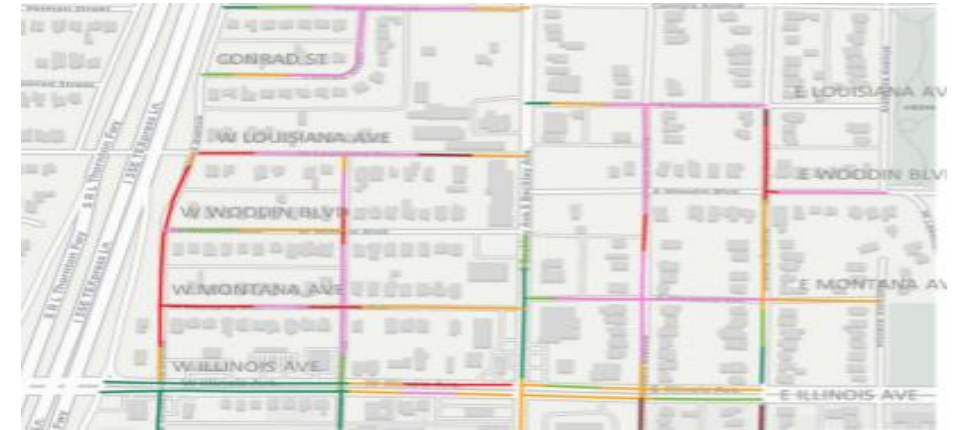
- Dallas collected around 300 Test Miles Data using GPR.
- Candidates selected to be tested were composite pavements with Asphalt over Concrete with a PCI range of 40-60.
- Data used to determine suspect composite pavements, know thickness of pavement layers, predict concrete deterioration under asphalt for maintenance budgeting purposes.





- **Cracks Detection Using Smart Phone Pilot**

- Dallas completed a pilot project using a crack detection AI technology from Japan that is newly being implemented in the United States.
- The technology is used to identify pavement health based on cracking as well as creates future prediction analysis to identify pavements of priority for maintenance attention.
- Dallas intend to compare results with the new ASTM E3303 Data for experimenting of data quality purposes.





- **Assets Inventory & Pavement Assessment Using AI Pilot**

- Dallas is working on a pilot project to mount a high-tech radar and a camera device on a City vehicle to collect inventory data and conduct pavement assessments at the same time using AI.
- This technology will have the ability to map every inventory in the streets, creates 360-degree views allowing virtual site visits, creates potholes mapping, trees and signage inventory, and collect PCI Data.



## • Cool Pavement Pilot

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- Dallas completed a pilot project to implement a pavement preservation maintenance solution that incorporates innovative solar reflective pavement surface sealant.
- The new technology shall be an environmentally friendly solution that is proven to reduce carbon emissions from pavement and provides cooler surface as well as reduces the time of implementation and material setting compared to typical resurfacing products.





- **Pavement Management Challenges with Emerging Technologies**

- Size of Network
- Data Reliability
- Criticality of the data related decisions
- Time sensitivity for deliverables
- Agency policy and Government body support.
- Tax payers and public education and understanding of process and goals



# Questions & Answers



Shahad Mohammed



+1 (214)717-1617



Shahad.mohammed@dallas.gov

# THANK YOU