2015
MUNICIPAL STREETS SEMINAR

PCC Rehabilitation Methods

City of Mason City, Iowa

November 18, 2015

Ames, Iowa

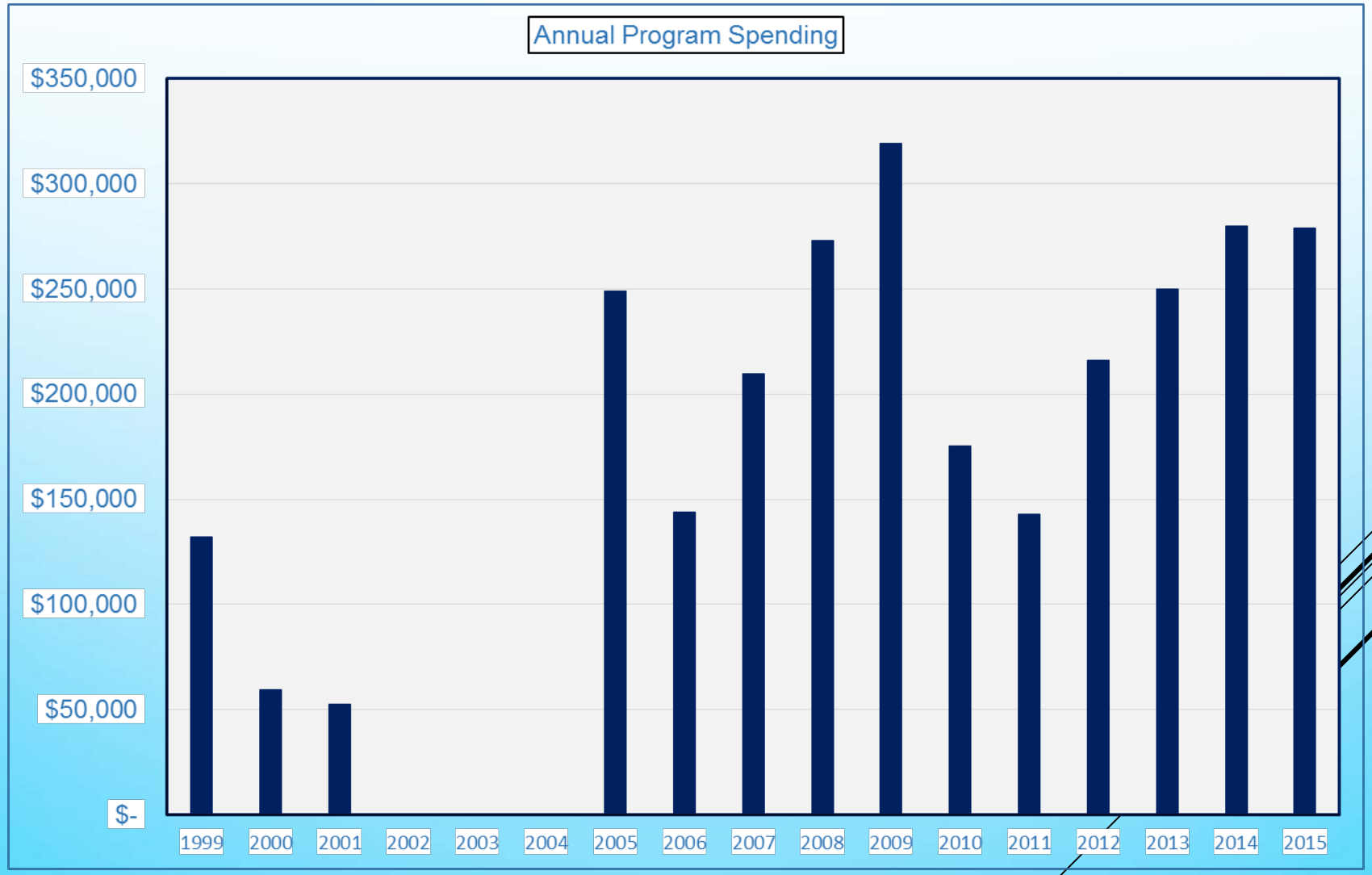
Snapshot of Mason City and Street Network

- Located in north central Iowa
- Population of 28,000
- Corporate limits encompass 27.8 sq. mi
- Approximately 195 miles of street network
  - Paved miles – 155
  - Unimproved miles – 40
    - Granular
    - Chip Seal
- Minor Arterial – 30 miles
- Collector – 18 miles
- Local streets

Street Panel and Curb Replacement Program

- City sponsored program since 1999
- Primarily funded with RUT and LOST
- Program varied significantly early on
  - In dollars and frequency
- Solid program since 2007
- Program addresses both street, and curb and gutter repairs

Historical Annual Costs



Program Priority Planning

- Street Classification
  - Arterial
  - Minor Arterial
  - Collector
  - Local
- Street Zones
  - Industrial
  - Commercial
  - Residential

Causes of Pavement Failure

- Insufficient Subgrade preparation
- Absence of or inadequate subbase material
- Poor compaction during utility installation
- Utility failures (undermining)
  - Storm sewer collapse
  - Water main break
- High ground water table
- Sump Pump discharge

Types of Pavement Failure

- Settlement (utility trenching)
- Shear settlement (subgrade shifting)
- Freeze/thaw damage
- Deep open cracking and separation
- Spalling
- Mix design
- Broken curb

Repair Components

- Full depth replacement
- Subgrade preparation and repair (soil types)
- Subbase Material
- Mix design (construction/maintenance)
- Dowel vs. No-dowel
- Broom or Rough finish
- Jointing and joint sealing
- Curing methods

Standards and Practices

- Mason City Standard Specification
- Iowa Department of Transportation
- SUDAS
- CP Tech Center

Pavement Failure Examples

Shear Settlement

Saturation Settlement

Pavement Failure Examples

Spalling

Cracked Panels

Pavement Failure Examples

Super Chlorinated Mix

Aged PCC Deep
Cracking and Separation

Replacement Patch Preparation

Patching on
Subbase Material

Patching on Grade?

Replacement Patch Preparation

Patches with Utility Box Outs

Doweled Patches

Replacement Patch Preparation

Coordinate Signal Loop Installation

Baskets and Dowel Bar Reinforcement

Finished Patches

Light to Heavy Loading

Finished Patches

- Commercial (top left)
- Industrial (bottom Left)
- Residential (top right)

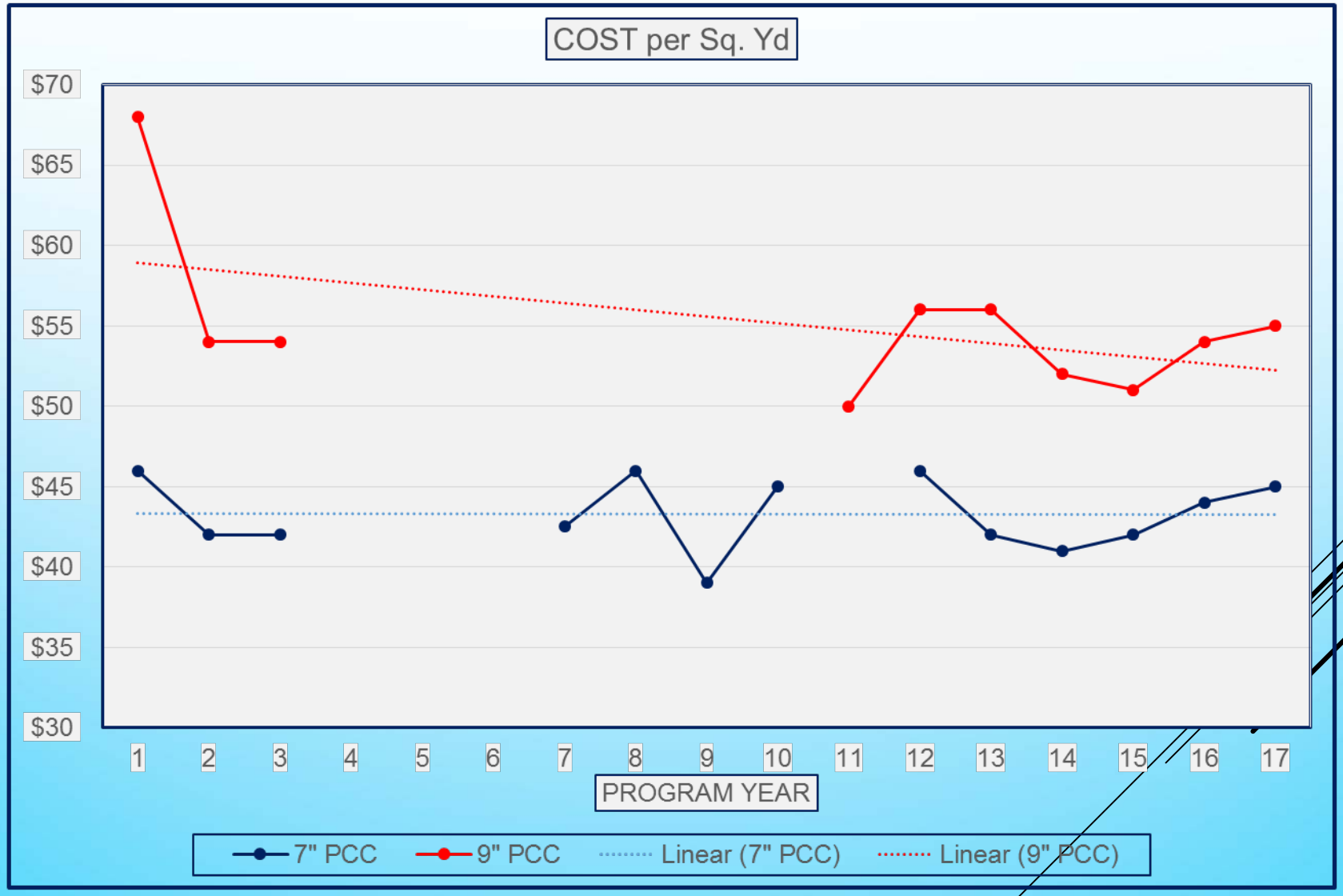
Finished Patches

Incorporate ADA Compliance

Program Statistics

- Cumulative Program Spending
  - $2,780,787.06
- Pavement Repaired – 35,480 SY
- Curb and Gutter Repaired – 19,103 LF
- Avg. Cost paid for 7” PCC - $43.27/SY
- Avg. Cost paid for 9” PCC - $55.00/SY

Program (PCC) Cost Trends



Future Program Planning

- Increase the program monetarily and focus solely on local funding and local streets
- Use other programmed funds on arterial and collector street patching and reconstruction projects
- Explore and utilize additional pavement preventive maintenance methods such as partial depth patching and thin PCC overlays
- Perform more core sampling when in question

QUESTIONS