

# *City Projects – Concepts, Costing & Construction*

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NDLC Annual Conference, Fargo – Sept 29, 2017

# Info Hand-offs



Time

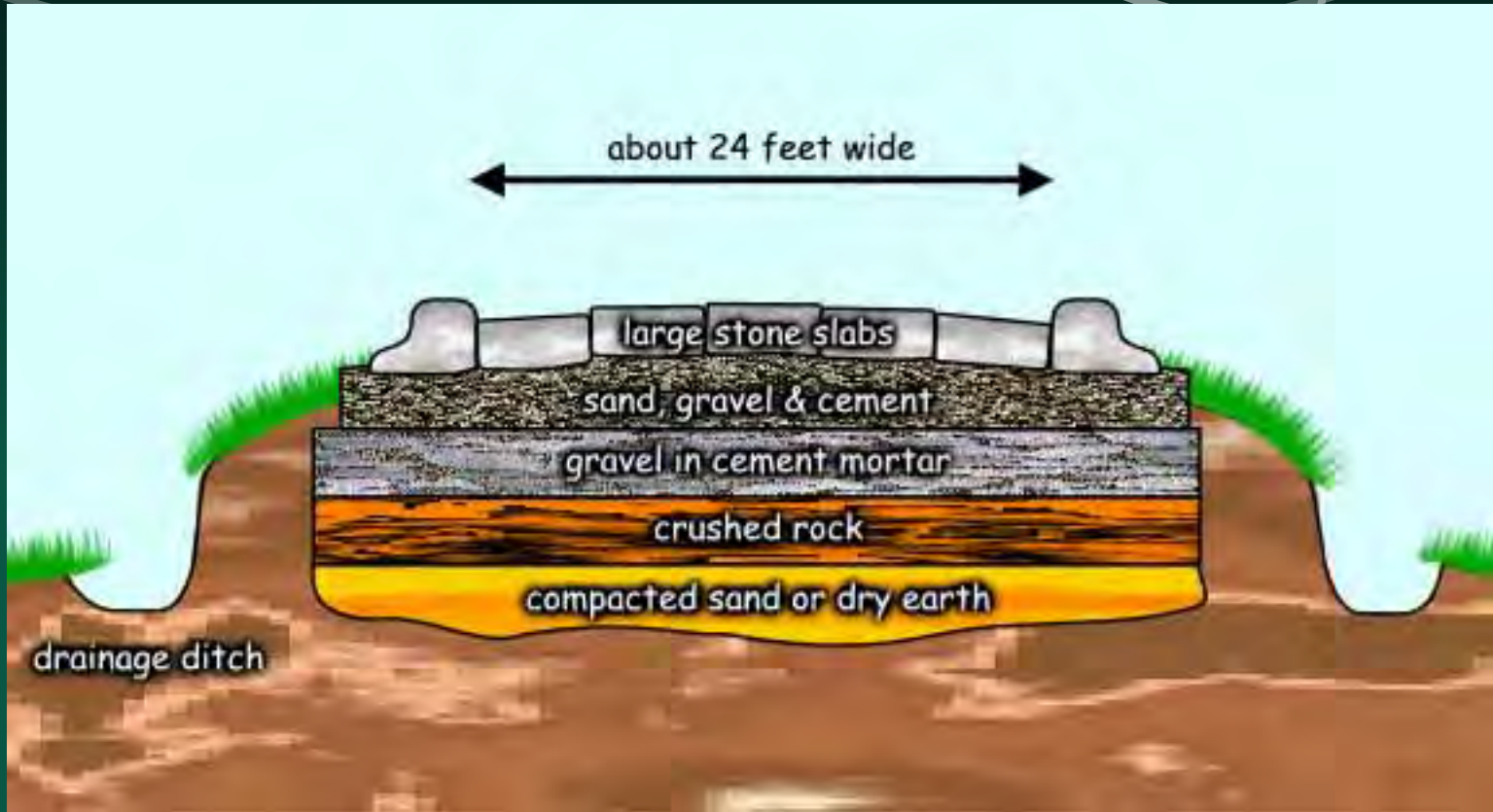
Money

Risk



# 300 B.C. Roman Empire

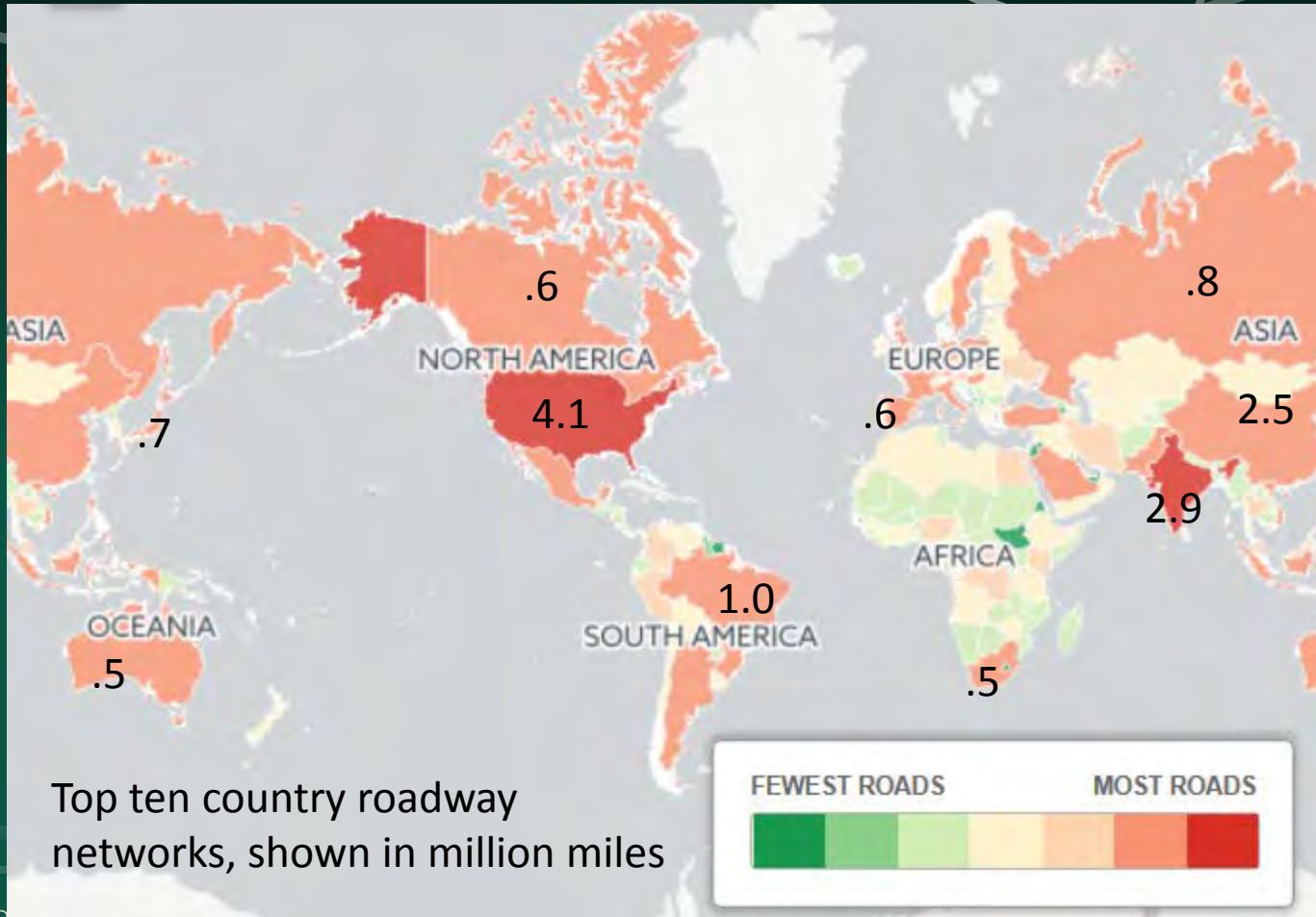




# Roadway/Street Sections







# Info Hand-offs

Time



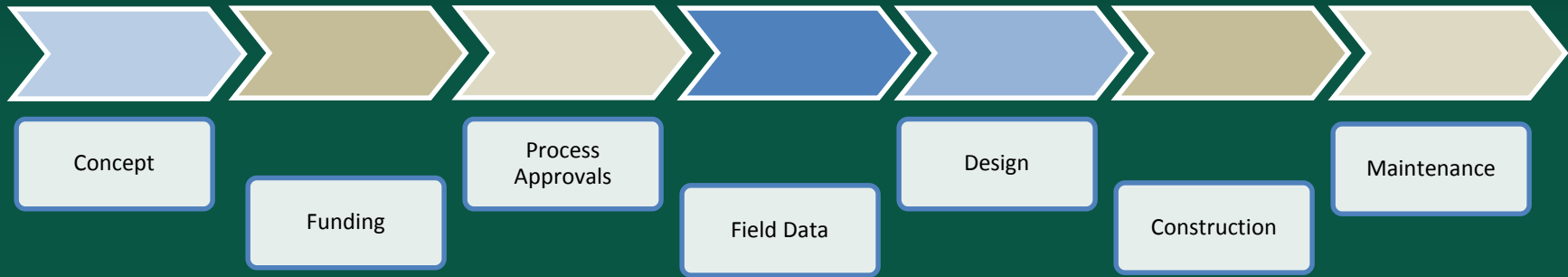


# Looking Back...





# Project Timeline





# North Dakota Legislative Branch

Legisla

[North Dakota Legislative Branch](#) | [North Dakota Century Code](#)

## Title 40

### Municipal Government

Chapter	Section Listing	Chapter Name
<a href="#">40-01</a>	<a href="#">40-01 Sections</a>	General Provisions
<a href="#">40-01.1</a>	<a href="#">40-01.1 Sections</a>	Local Governance Advisory Study
<a href="#">40-02</a>	<a href="#">40-02 Sections</a>	Incorporation of Municipalities in Unorganized Territory
<a href="#">40-03</a>	NA	Council Cities, Procedure for Incorporation [Repealed]
<a href="#">40-03.1</a>	<a href="#">40-03.1 Sections</a>	Change from Council System to Commission System
<a href="#">40-03.2</a>	<a href="#">40-03.2 Sections</a>	Change from Council System to Modern Council System
<a href="#">40-04</a>	<a href="#">40-04 Sections</a>	Commission Cities, Incorporation and Change
<a href="#">40-04.1</a>	<a href="#">40-04.1 Sections</a>	Modern Council Form of Government
<a href="#">40-05</a>	<a href="#">40-05 Sections</a>	Powers of Municipalities
<a href="#">40-05.1</a>	<a href="#">40-05.1 Sections</a>	Home Rule in Cities
<a href="#">40-06</a>	<a href="#">40-06 Sections</a>	Governing Body in Municipalities, General Provisions
<a href="#">40-07</a>	NA	Villages, Governing Body and Other Officers [Repealed]
<a href="#">40-08</a>	<a href="#">40-08 Sections</a>	Governing Body and Executive Officer in Council Cities
<a href="#">40-09</a>	<a href="#">40-09 Sections</a>	Governing Body and Executive Officer in Commission Cities
<a href="#">40-10</a>	<a href="#">40-10 Sections</a>	City Manager Plan
<a href="#">40-11</a>	<a href="#">40-11 Sections</a>	Ordinances
<a href="#">40-12</a>	<a href="#">40-12 Sections</a>	Initiative and Referendum
<a href="#">40-13</a>	<a href="#">40-13 Sections</a>	General Provisions Governing Officers in Municipalities
<a href="#">40-14</a>	<a href="#">40-14 Sections</a>	Officers in Council Cities, General
<a href="#">40-15</a>	<a href="#">40-15 Sections</a>	Officers in Commission Cities, General
<a href="#">40-16</a>	<a href="#">40-16 Sections</a>	City Auditor

# State Law

## Century Code

Municipal Government (40)

Bidding and Qualification  
Based Selection (48)

# City Projects – ND Century Code

- Develop a long-term plan
- Inform residents
- Evaluate whole city / divide into regions
- Acquiring financing
- Legal process for project
- Public involvement
- Voting vs. protesting



# IMPROVEMENTS BY SPECIAL ASSESSMENT - PROCESS CHECKLIST

- ☐ Create the improvement district by resolution (40-22-08)
- ☐ Direct the engineer to prepare the Engineer's Report (40-22-10)
- ☐ Approve the Engineer's Report (40-22-11)
- ☐ Adopt a Resolution of Necessity (except water or sewer or petition of majority) (40-22-15)
- ☐ Publish Resolution of Necessity 1 per week for 2 weeks
- ☐ 30 days to file protests after date of first publication
- ☐ Hearing at next meeting to determine sufficiency of protests and a majority of area protesting is bar to proceeding
- ☐ Direct engineer to prepare detailed plans and specifications (40-22-11)
- ☐ Approve plans and specifications and file with city auditor (40-22-11 and 14)
- ☐ Direct city auditor to advertise for bids (40-22-19 and 48-10.1-03) in official newspaper and in a trade publication
- ☐ Publish ad for bids 1 per week for 2 weeks (40-22-19 and 48-01.1-03)
- ☐ Bid opening not less than 14 days after first publication (49-01.1-03)
- ☐ Determination as to type of paving if applicable (40-22-28)
- ☐ Bidders bond (5%) and contractor's license required (48-01.1-05)
- ☐ Bids entered on minutes and referred to engineer for statement of estimates costs (40-22-29)
- ☐ Accept bid and award contract (unless more than 40% over estimate) or reject all bids (48-01.1-07)
- ☐ Bond required for performance and payment (48-02-06.2)
- ☐ Construction Contract (40-22-35 and 36)
- ☐ Issue improvement warrants/bonds (40-24-19)





# Environmental Review & Permits

- Dept. of Health
  - NDDOT
  - Game & Fish
  - State Water Commission
  - USDA / NRCS
  - US Fish & Wildlife
  - Historical Preservation Office
  - Railroads
  - Airports
  - ND Parks & Rec
  - US Army Corps of Engineers
  - Tribal Governments
  - County/Township Government
  - Water Resource Districts (Water Board) / Rural Water Districts
  - Other Potential Stakeholders: Wetlands, Utility Companies, Private Landowners, Taxpayers, Gas and Oil Pipelines, Easement Holders, Etc.
- \*Can be dependent on location, project type and funding source



# Street Surveys

## Pavement Management Plans (Large Cities)

- Regular evaluations using technology – ride quality, roughness,.....
- GIS database and mapping
- Pavement management software

## Plan Regular Inspections (Small Cities)

- Street surveys, 3-5 year interval
- Less technology
- Planning



# FLEXIBLE PAVEMENT CONDITION SURVEY RATING FORM (URBAN)



City: \_\_\_\_\_

County: \_\_\_\_\_

Date: \_\_\_\_\_

Street ID: \_\_\_\_\_

Location From: \_\_\_\_\_

to \_\_\_\_\_

Deduct Value

RIDE CONDITION	10 (Excellent)	9	8 (Good)	7	6 (Fair)	5	4 (Poor)	3	2	1	0
RATING						X					

-3.0
------

PAVEMENT DISTRESS CONDITIONS		SEVERITY OF DISTRESS			DENSITY OF DISTRESS (Percent)			
		SLIGHT	MODERATE	SEVERE	LOW 0-10%	INTERMEDIATE 10-25%	FREQUENT 25-50%	EXTENSIVE >50%
SURFACE DEFECTS	RAVELING/WEATHERING	X				X		
	FLUSHING/BLEEDING		X				X	
	POTHoles/PATCHING	X			X			
SURFACE DEFORMATIONS	SHOVING/RUTTING	X					X	
	DISTORTIONS	X			X			
	UTILITY TRENCHES		X					X
CRACKING	ALLIGATOR		X				X	
	LONGITUDINAL	X						X
	TRANSVERSE	X						X
	BLOCK	X			X			
	EDGE PAVMT. / C & G	X						X

-1.0
-3.5
-1.0
-3.0
-1.0
-8.0
-7.0
-2.0
-2.0
-0.5
-1.0

Chad Petersen – 701-845-9446  
[chad.petersen@kljeng.com](mailto:chad.petersen@kljeng.com)

Final Surface Condition Rating = 66.0



# Regulations



Americans with Disabilities Act

## ADA Guide for Small Towns



A guide for small local governments  
including towns, townships, and rural counties.





**Time to Start is NOW!!**

# Info Hand-offs



Money



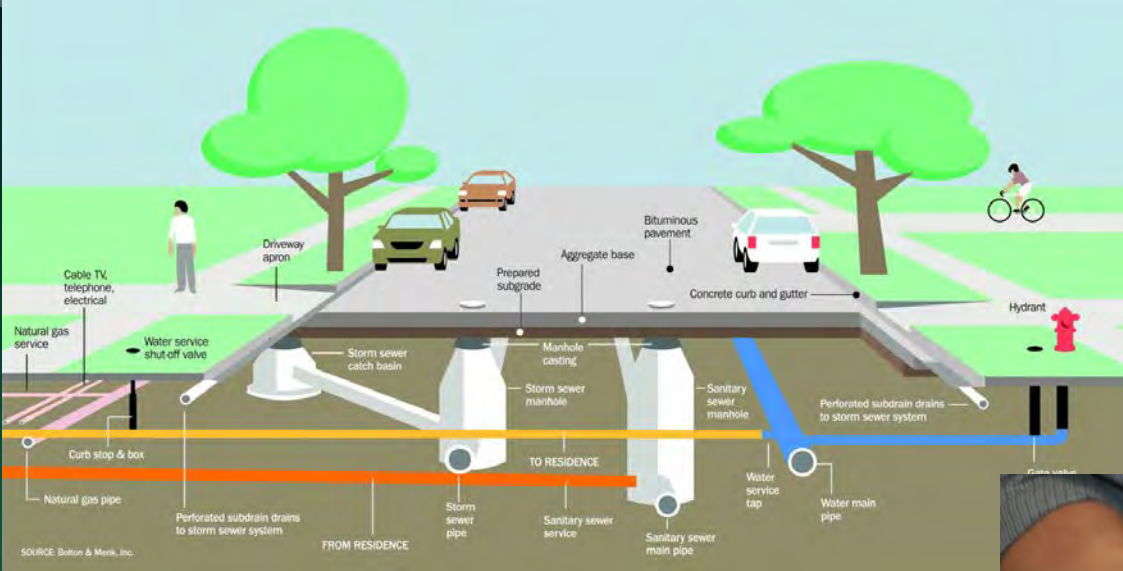
# Project Development

Planning – a key to saving money

Project specifications - used to clearly define the material and components



# Discovery Phase

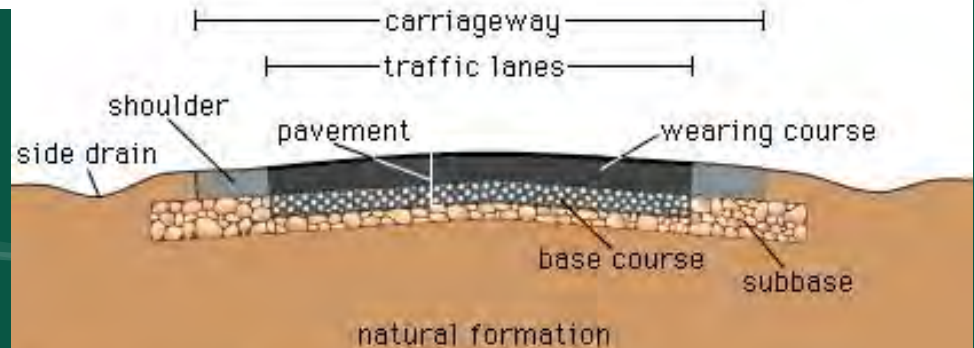
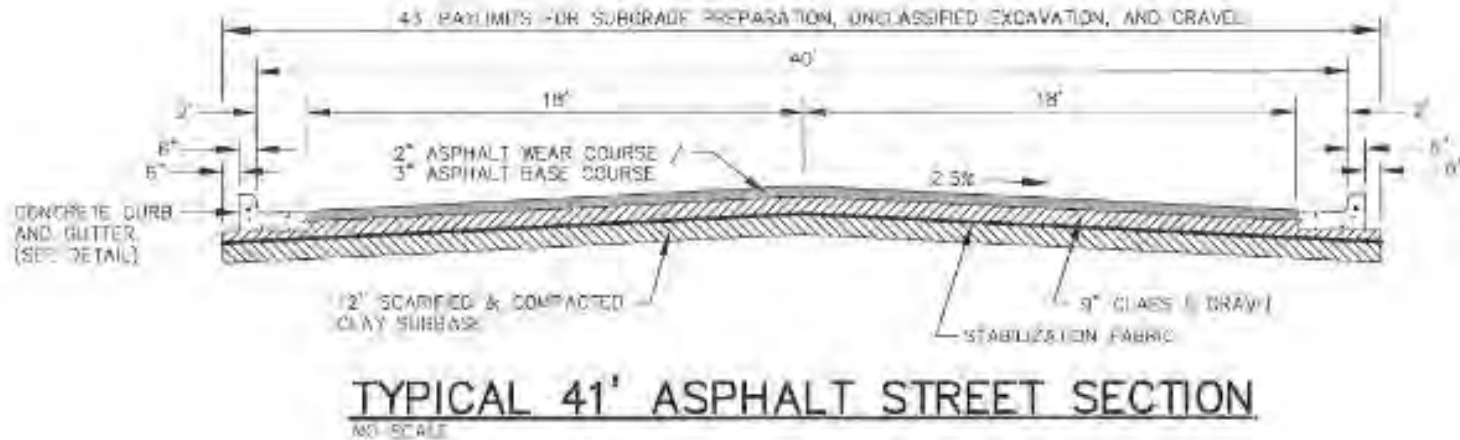






# Roadway Ailments

# Pavement Cross Section







Materials

# Costs, Funding and Repayment

- **Engineer's Opinion of Cost**
  - Single citywide project
  - Phase project, completion date, milestones...
  
- **Project Funding**
  - Low Interest Loans for Streets
    - New for 2017: Infrastructure Revolving Loan from Bank of ND (2% Interest L
  - Repayment – Determine Appropriate Length of Time
  - Repayment Options
    - Budget for Work
    - Special assessments
    - Rates / Revenues
    - Sales Tax
    - General Obligation Bonds





# Engineer's Opinion of Project Cost

- **Proposed City of Kulm 2016 (\$2,000,000)**
  - Approximate Assessment per Lineal Footage - \$86.96

## Projected Repayment Scenarios (100% Financed)

Approximate Project Area Front Footage	23,000
Approximate Assessment per Lineal Footage	\$86.96
City's Annual Payment (15 Years @ 4.5% Interest)	\$186,227.62

## Total Assessment Per Property

25' Lot	\$2,173.91
50' Lot	\$4,347.83
75' Lot	\$6,521.74
100' Lot	\$8,695.65

## Annual Payment per Property (Based on 15-Year @ 4.5% Interest)

Assessment Per Foot	\$8.10
25' Lot	\$202.42
50' Lot	\$404.84
75' Lot	\$607.26
100' Lot	\$809.69

## Notes/Assumptions:

1. This assumes 100% of project is financed.
2. This assumes a straight assessment across all areas.
3. Can consider doing project over multiple phases.
4. We assume interest rate will be better than projected 4.0% interest (conservative).



# Cost Estimates (Per Block)

Crack Seal – \$500 -1,500

Chip Seal - \$2,000 – 4,000

Edge Mill & Asphalt Overlay - \$15,000 – 25,000

Curb & Gutter - \$20,000 – 30,000

Full Depth Asphalt - \$60,000 – 90,000

Full Depth Concrete - \$100,000 -150,000

\*Costs are highly variable and dependent on factors such as width of street, type of street, size of project, timing of bids/work, location and competition between contractors!

See cost estimating handout – data provided by Jerod Klabunde, Moore Engineering, and Todd Norton & Mark Lambrecht, Advanced Engineering and Environmental Services, Inc.



# Life Cycle Costs

Construction Costs

Maintenance Costs

Salvage Value



Capital Improvements => projects

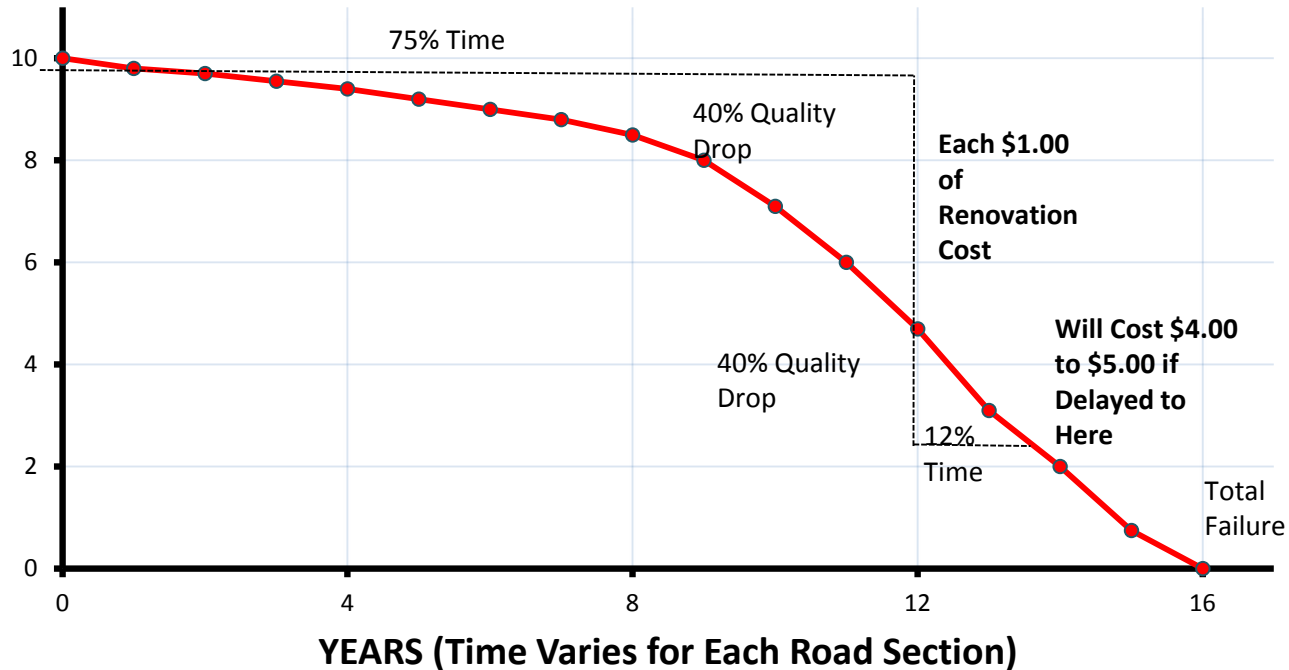


Maintenance => preserve investments



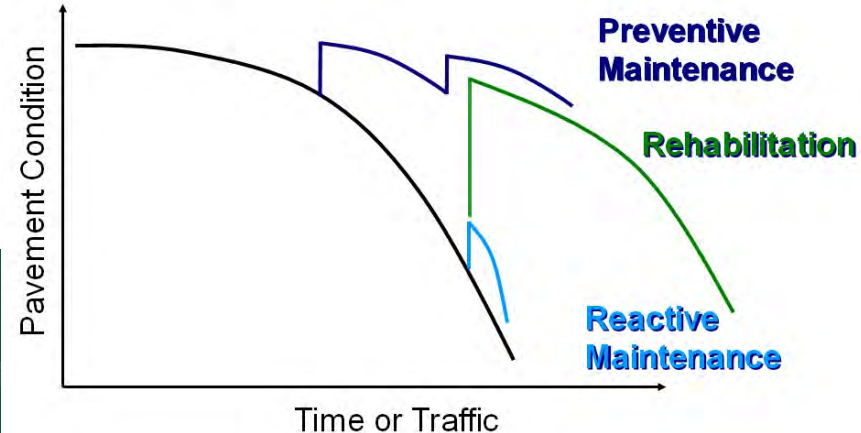
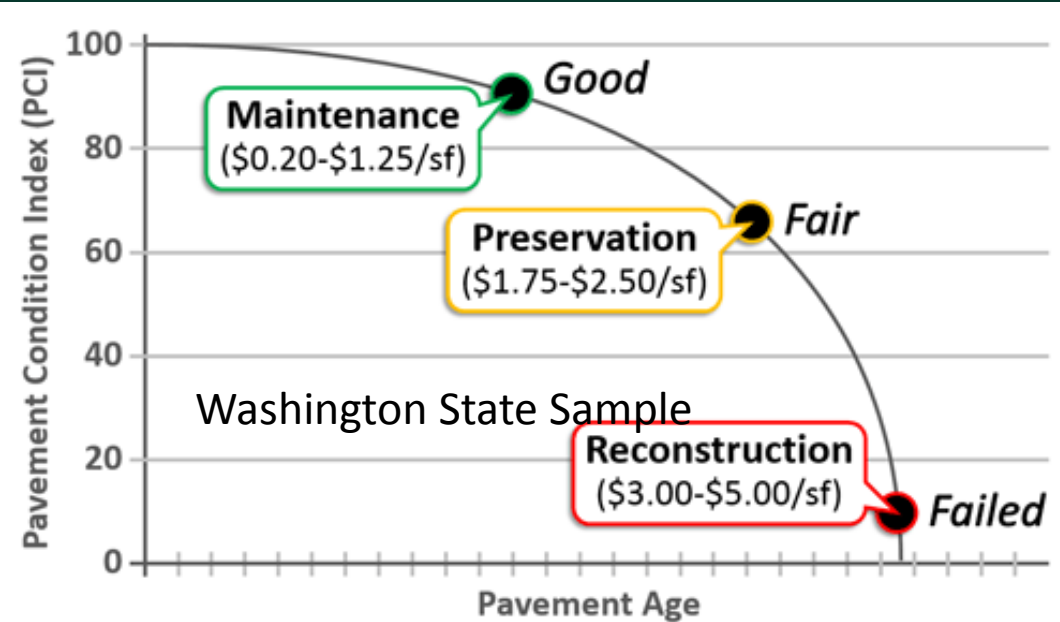
# Pavement Deterioration

Cost of 'Timely' Maintenance





# Pavement Preservation



# Alternatives – Investment Strategies





# Public Expectations







07/20/2017

# Outreach Efforts



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# Info Hand-offs

Risk



# Risk Management



Everyone Loves a .....



**SURPRISE**

# Construction Loads





# Changed Conditions



# Frost Heaves

*Frost Damage in Pavement:  
Causes and Cures* (You Tube video)

Sample expanded  
from 6 to 10 inches  
**Total Heaving: 70%**



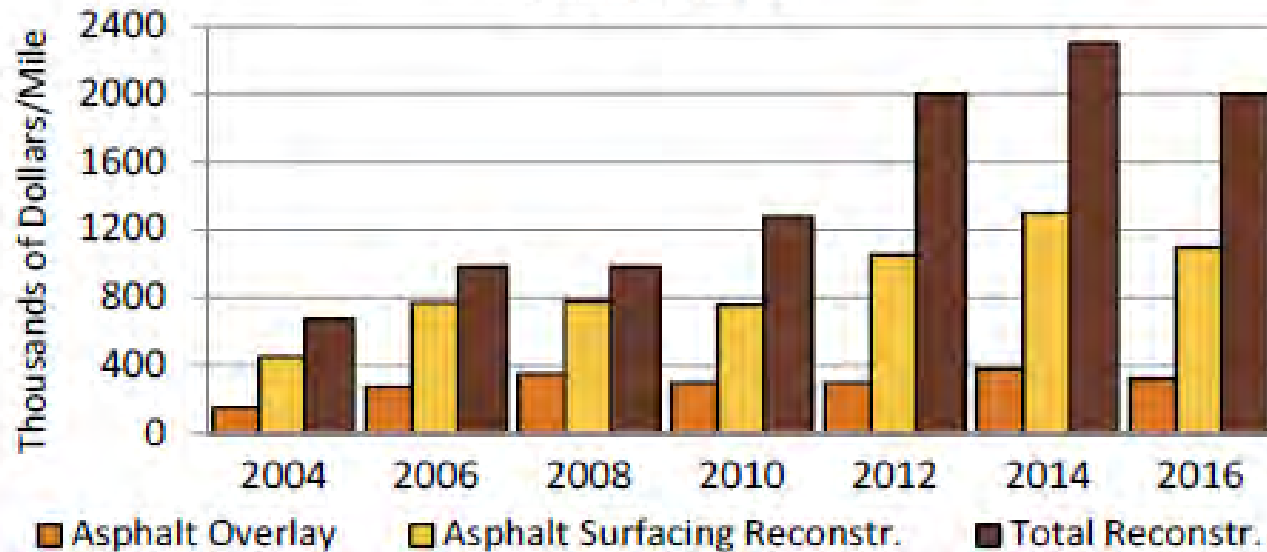
[https](https://www.youtube.com/watch?v=...)



# Industry Trends



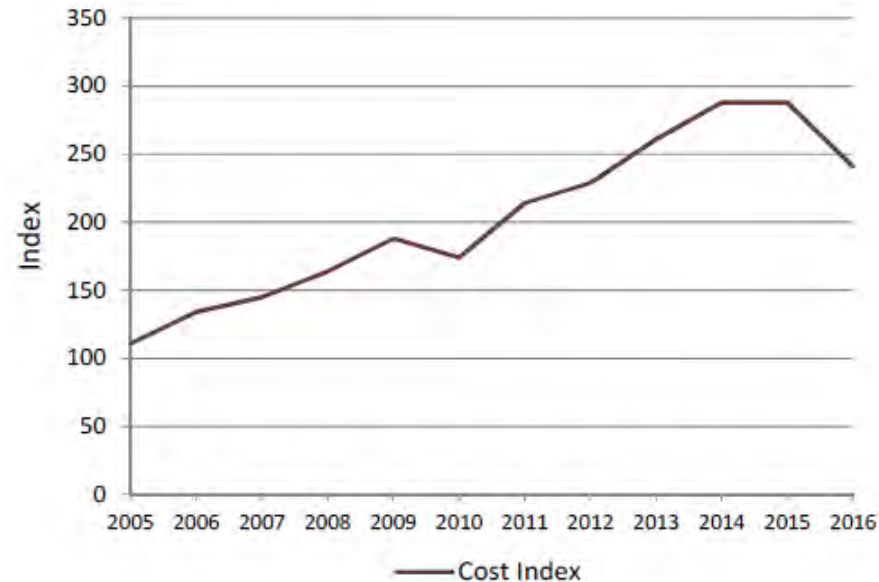
**Asphalt Improvements Per Mile  
2004 - 2016**



## Average Construction Costs - 2016

Improvement	Total Dollars/Mile
Non-Interstate seal coat (by contract) . . . . .	\$ 35,000
Interstate seal coat (by contract) . . . . .	\$ 55,000
Thin lift overlay . . . . .	\$ 180,000
3" asphalt overlay . . . . .	\$ 320,000
Asphalt surfacing reconstruction . . . . . (includes subgrade repair and resurfacing)	\$1,100,000
Total reconstruction . . . . . (includes grading and asphalt surfacing)	\$2,000,000
Interstate concrete paving . . . . . (two lanes in one direction)	\$2,400,000

## Construction Cost Index







Maintenance Equipment Needs



# Types of Pavement Failures











# Band-Aids or Stitches?



# Info Hand-offs



Time

Money

Risk



# Roman Engineer



## Resource List

ND Century Code:

Section 40 (Municipal)

Section 43 (Engineer)

Section 48 (Bid Threshold)

ND Local Government Manual

NDLC ND Officials Handbook

ADA Guide for Small Towns

# Handouts

Process Checklist

ADA Guide

Street Assessment

Rough Estimating Info

Presenter Contact Info



ND APWA | SMALL COMMUNITY OUTREACH PROGRAM



# NDLTAP TRAINING

*Helping communities expand their skills  
Delivering all your training needs*

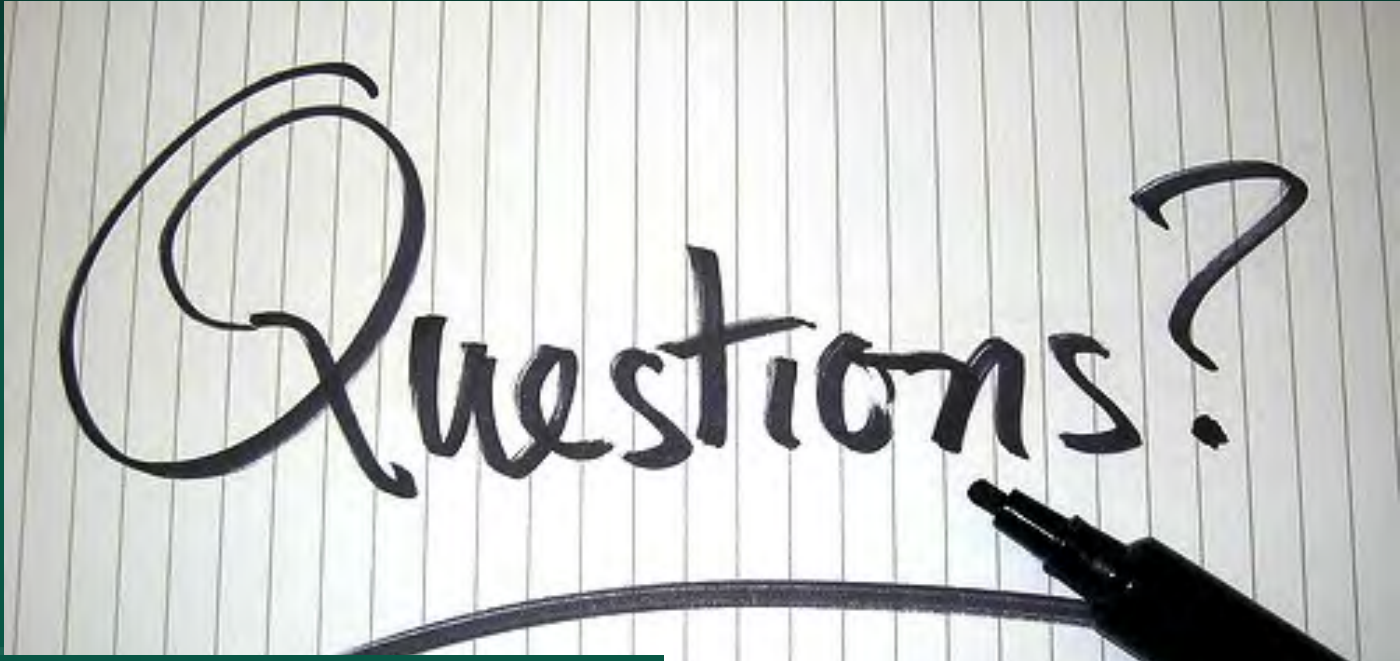
**NDSU**

UPPER GREAT PLAINS  
TRANSPORTATION INSTITUTE  
NORTH DAKOTA LOCAL TECHNICAL ASSISTANCE PROGRAM

[WWW.NDLTAP.ORG](http://WWW.NDLTAP.ORG)

NDS

...take charge and create the  
future you want!



# City Projects – Concepts, Costing & Construction



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