TRANSPORTATION FUNDING

City Council Study Session

February 24, 2014

Key Issue

- How should the projected Street Fund deficit beginning in 2016 be addressed?

Options

1. Defer, cut, or scale back planned projects in 2015 and beyond.
2. Change current policies related to:
   a) Arterial street life cycle (20-25 years)
   b) Residential street life cycle (30-35 years)
   c) Traffic level of service standard
3. Institute a new revenue source:
   a) King County (TBD) ballot measure (4/22/14)
   b) Mercer Island specific TBD effective 1/1/15
      i. Council approved: Up to $20 license fee per vehicle
      ii. Voter approved: For license fee >$20 per vehicle

Street Fund Projected Deficit

- Projected Street Fund balance per adopted 2013-2014 Budget:

2013 Forecast	2014 Forecast	2015 Forecast	2016 Forecast	2017 Forecast	2018 Forecast
$767	$1,398	$593	($856)	($1,232)	($1,876)

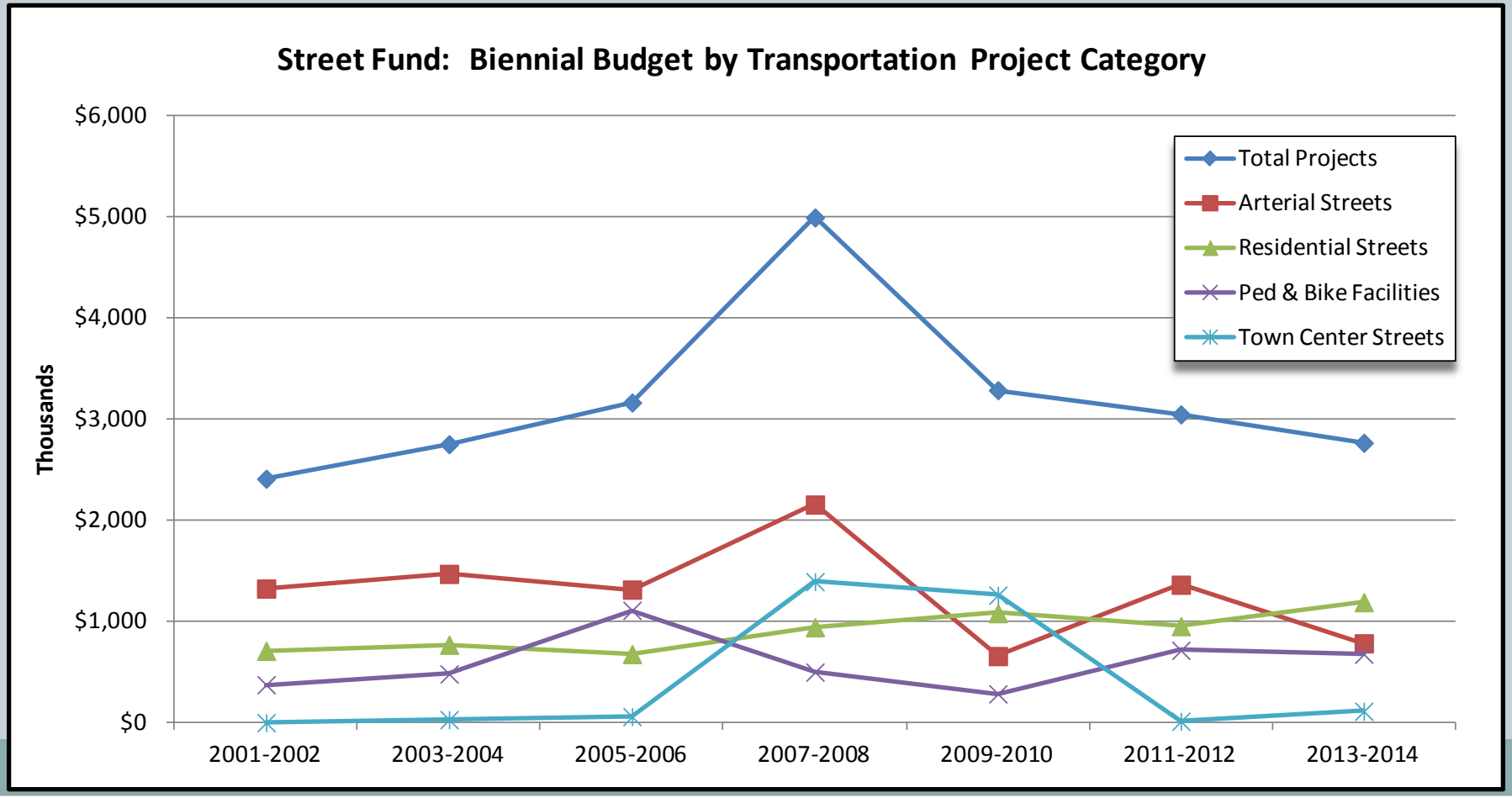
Note: Numbers are shown in thousands.

Street Fund Projected Deficit

- Declining fund balance is primarily result of:
  - Impact of "Great Recession" on REET in 2008-2012
  - Decision to take advantage of a very favorable bid environment in 2009-2012
  - Decision to take calculated risk in 2013-2014 that REET would recover faster than projected
  - Fewer state transportation grants available in 2011-2014

Street Fund Projected Deficit

How Planned Expenditures Have Changed From 2001-2002 Through 2013-2014



Option 1: Defer, Cut, or Scale Back Future Projects

- A stop gap measure
- But there are always needs (ongoing & new)
  - Arterial & residential street maintenance (chip seal/overlays)
  - PBF Plan implementation
  - School District bond measure increases interest and needs
    - SE 40th St. Roadway capacity improvements
    - Pedestrian improvements near school and north of SE 40th
    - Neighborhood traffic control north of SE 40th
    - District will pay their proportionate share

Option 1: Defer, Cut, or Scale Back Future Projects

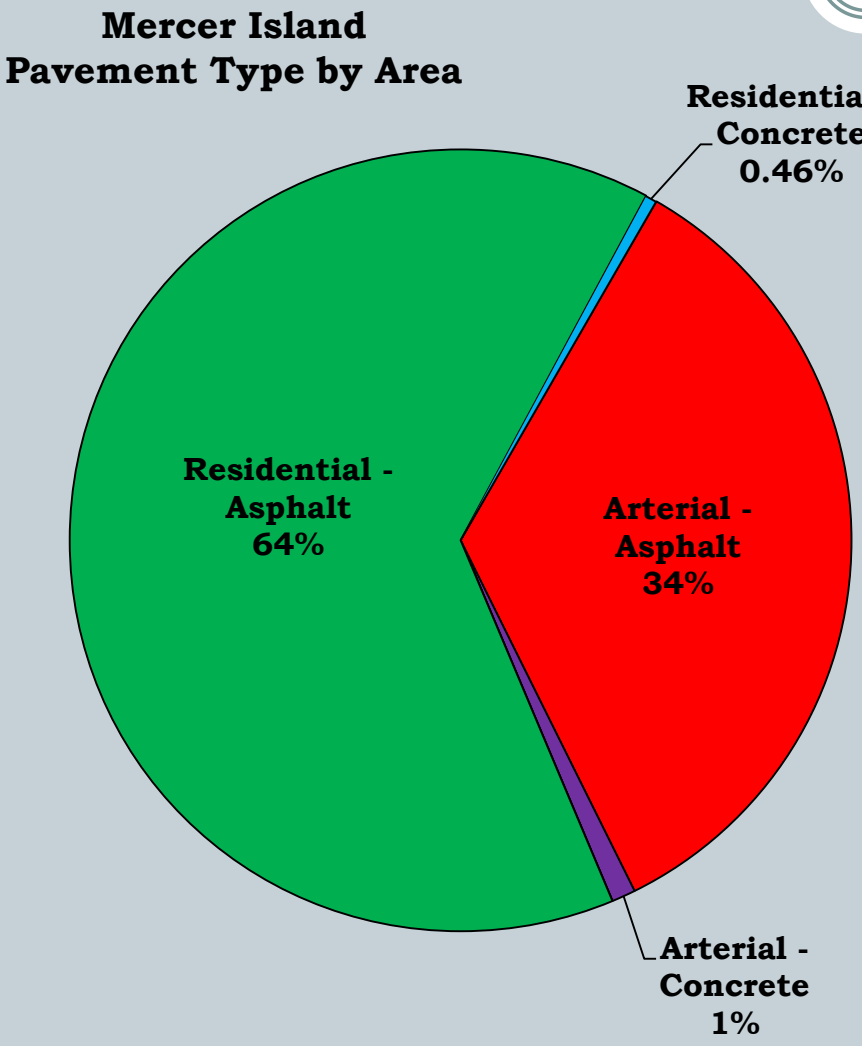
- But there are always needs (cont.)
  - Resident concerns
    - eg: speeding on 84th Ave SE and absence of pedestrian facilities
    - Pedestrian facilities will be proposed in 6 Year TIP
    - Speeding concern is under review through neighborhood traffic program. Could result in a TIP project.
- Option 1 not realistic without options 2 & 3

Option 2: Change Current Policies

Pavement Condition Ratings

- PCI Procedure and Data Collection
- Visual Pavement Distresses
- Understanding PCI Rankings
- Pavement Life Cycle and Repair Strategies
- PCI Results

Mercer Island Pavements



Total Miles = 83.

Total Area = 11.5M S

- 99% is asphalt
- Segments paved at different times, so all different ages
- Segments are at different points in their life cycle
- How do we prioritize?

What is Pavement Management?

Pavement management can be defined as:

Planning the maintenance and repair of a roadway network to optimize pavement conditions of the overall network.

Applying the proper repairs at the proper time for the least cost.

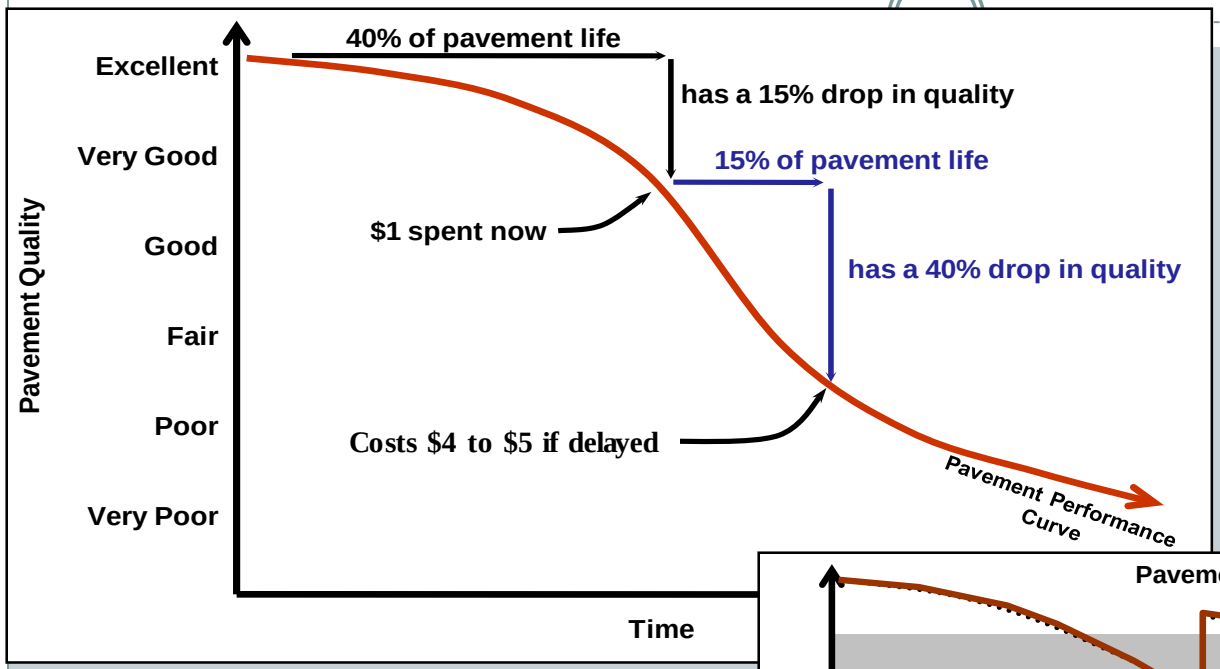
Some "action" tools for PM:

- crack sealing
- patching
- chip seal
- asphalt overlay
- reconstruction

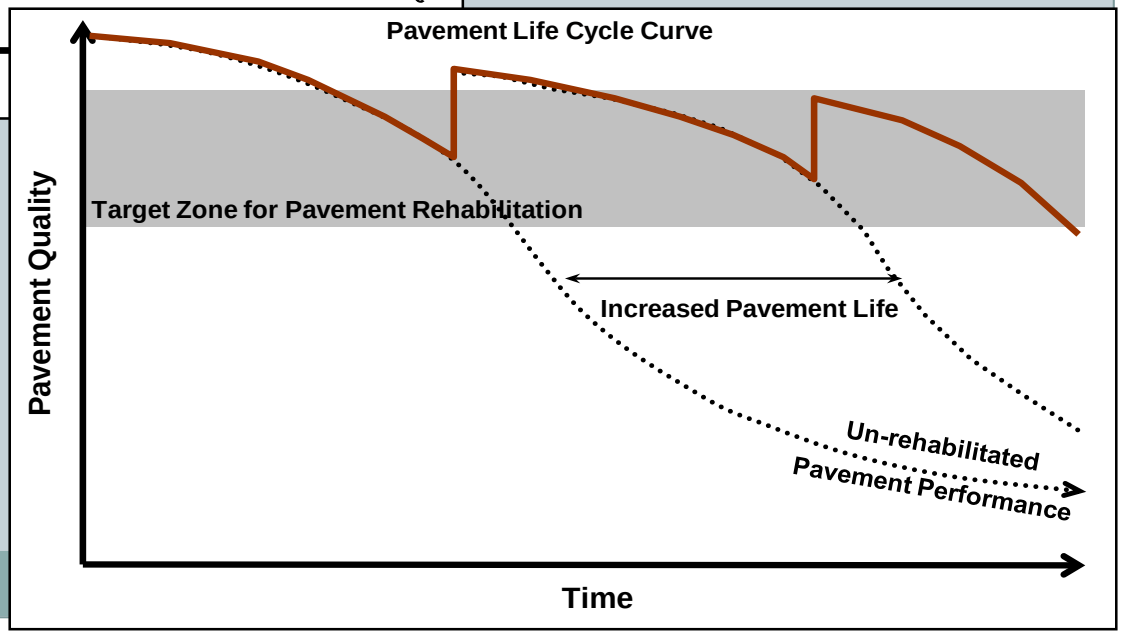
Some "planning" tools for PM:

- network inventory
- construction history
- pavement condition surveys
- 6-year plans (TIP, utilities)
- budgets

Why do Pavement Management?



It is much less expensive to keep a road in good condition than to rebuild it after its condition becomes poor.



What is Pavement Condition Index (PCI)?

- Pavement Condition Index (PCI) is: (courtesy of ASTM D6433-07)
  - a numerical indicator that rates the surface condition of the pavement
  - a measure of the present condition of the pavement based upon the visual distresses observed on the surface
  - a rational and objective basis for determining maintenance and repair needs and priorities

- PCI is not:
  - a measurement of structural capacity
  - a transportation plan
  - a one-time-only project

Pavement Condition Index Rating Process

- ASTM D6433 “Standard Procedure for Roads and Parking Lots Pavement Condition Index Surveys”
- Developed by US Army Corp of Engineers
- 0-100 rating scale
- Deduct values are calculated based on quantity and severity (L, M, H) of visual distresses found
- Area based calculations
- 19 visual distresses for asphalt pavement

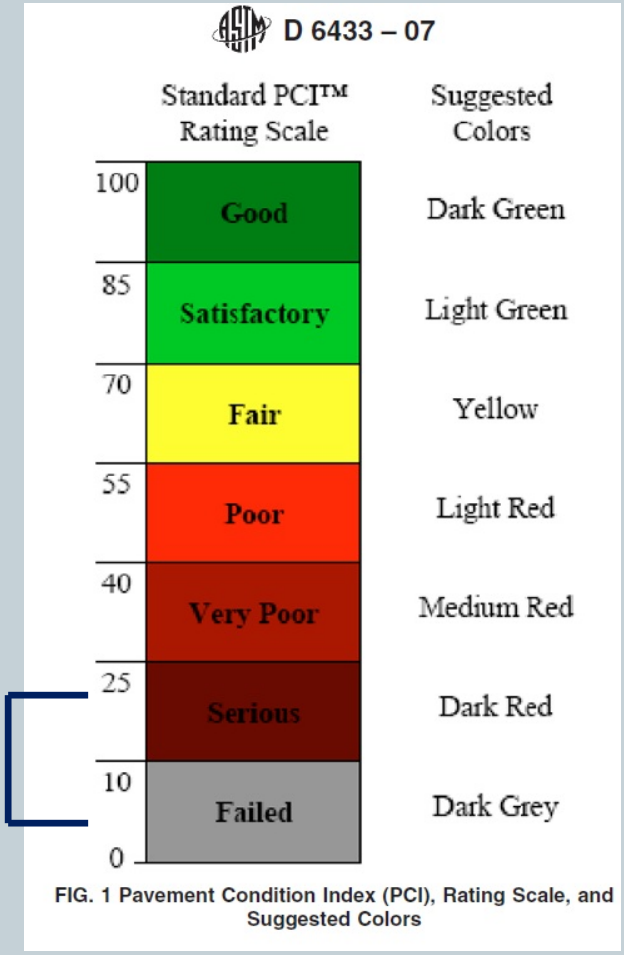


FIG. 1 Pavement Condition Index (PCI), Rating Scale, and Suggested Colors

Building the Pavement Condition Index (PCI)

Surface Distress Index (SDI)

- Alligator Cracking
- Block Cracking
- Longitudinal Cracking
- Transverse Cracking
- Reflective Cracking
- Edge Condition
- Bumps and Sags
- Depressions
- Patches
- Potholes

Distortions

67% Surface Distress

Roughness Index (RI)

- Rutting (Wheel Paths)
- Raveling

33% Roughness

Pavement Condition Index (PCI)
0 to 100 Score

- **Network was divided into over 700 pavement segments**
- **Average length of 620 feet**

Pavement Distress Examples

Alligator Cracking
Block Cracking
Longitudinal Cracking
Transverse Cracking
Reflective Cracking

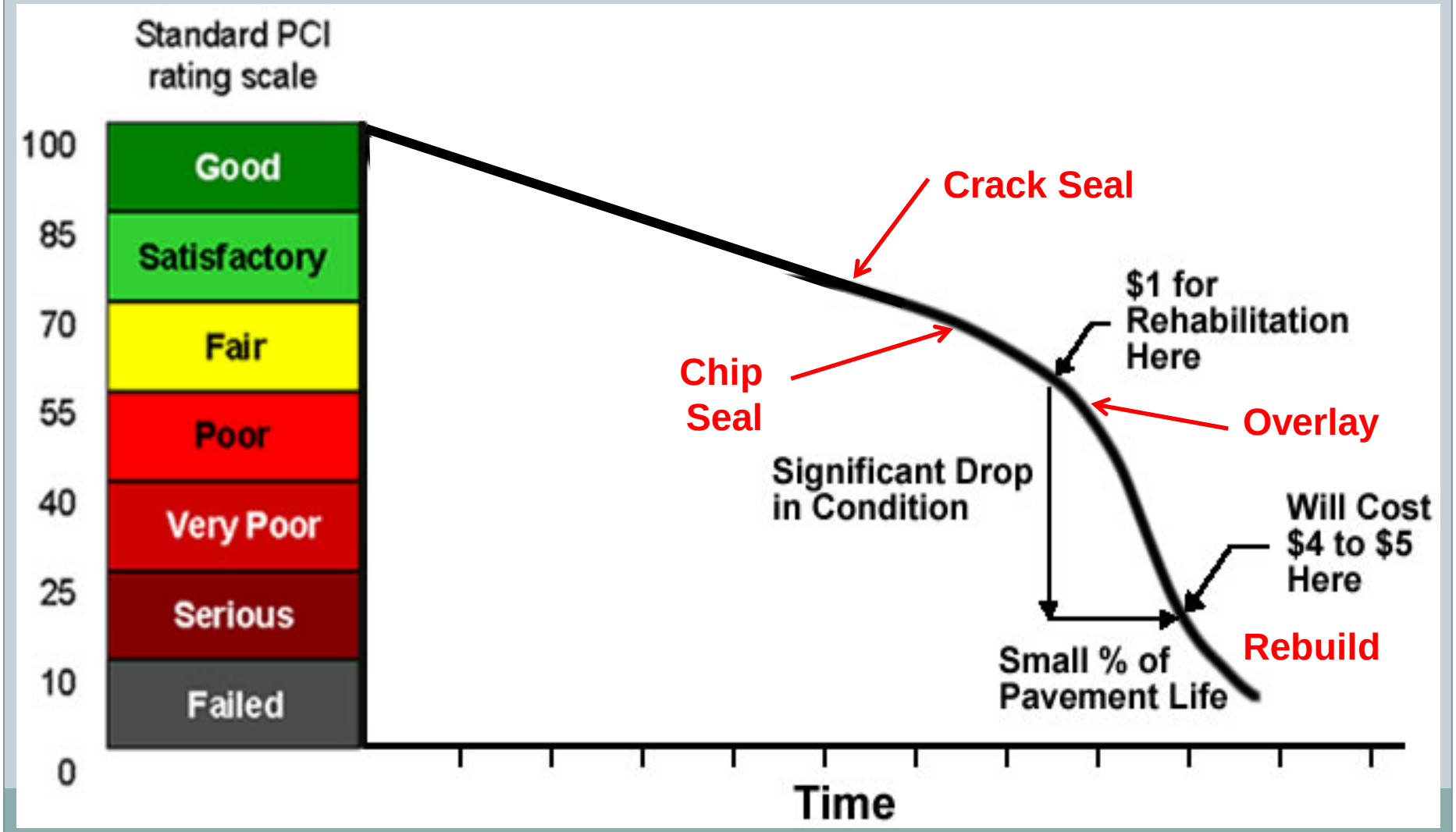
Pavement Distress Examples

Bumps and Sags
Depressions
Patches
Potholes

Pavement Distress Examples

Rutting (Wheel Paths)
Raveling

Typical Pavement Life Cycle Curve



Understanding the PCI… GOOD (100-86)

- Like new condition

88-86th A

96-ICW

Should provide 5 to 10 years service before needing maintenance or repair

Understanding the PCI… SATISFACTORY (85-71)

- Few distresses
- Some cracking (longitudinal and transverse)
- Maybe some patches

71-NMW

81-ICW

May be a candidate for crack sealing (keeps water out)

Understanding the PCI… FAIR (70-56)

- Localized distresses:
  - Alligator cracking
    - Other cracking
      - Patches

62- 85th A

64-83rd A

- May need: crack sealing, chip sealing, slurry seal, patching, thin overlay
- Sealing will keep water out of the base

Understanding the PCI… POOR (55-41)

- Distresses are much larger
- Cracking has increased in extent and severity
- Minor base failures

42- 64th St

52- 70th A

Candidate for a double chip seal or an overlay

Understanding the PCI… VERY POOR (40-26)

- Localized base failures
- Rutting and distortions visible
- Extensive cracking
- Extensive patching

37- 61st St

43- 82nd A

Candidate for thick overlay. Likely need to remove and replace large areas of pavement prior to overlay.

Understanding the PCI… FAILED (25-0)

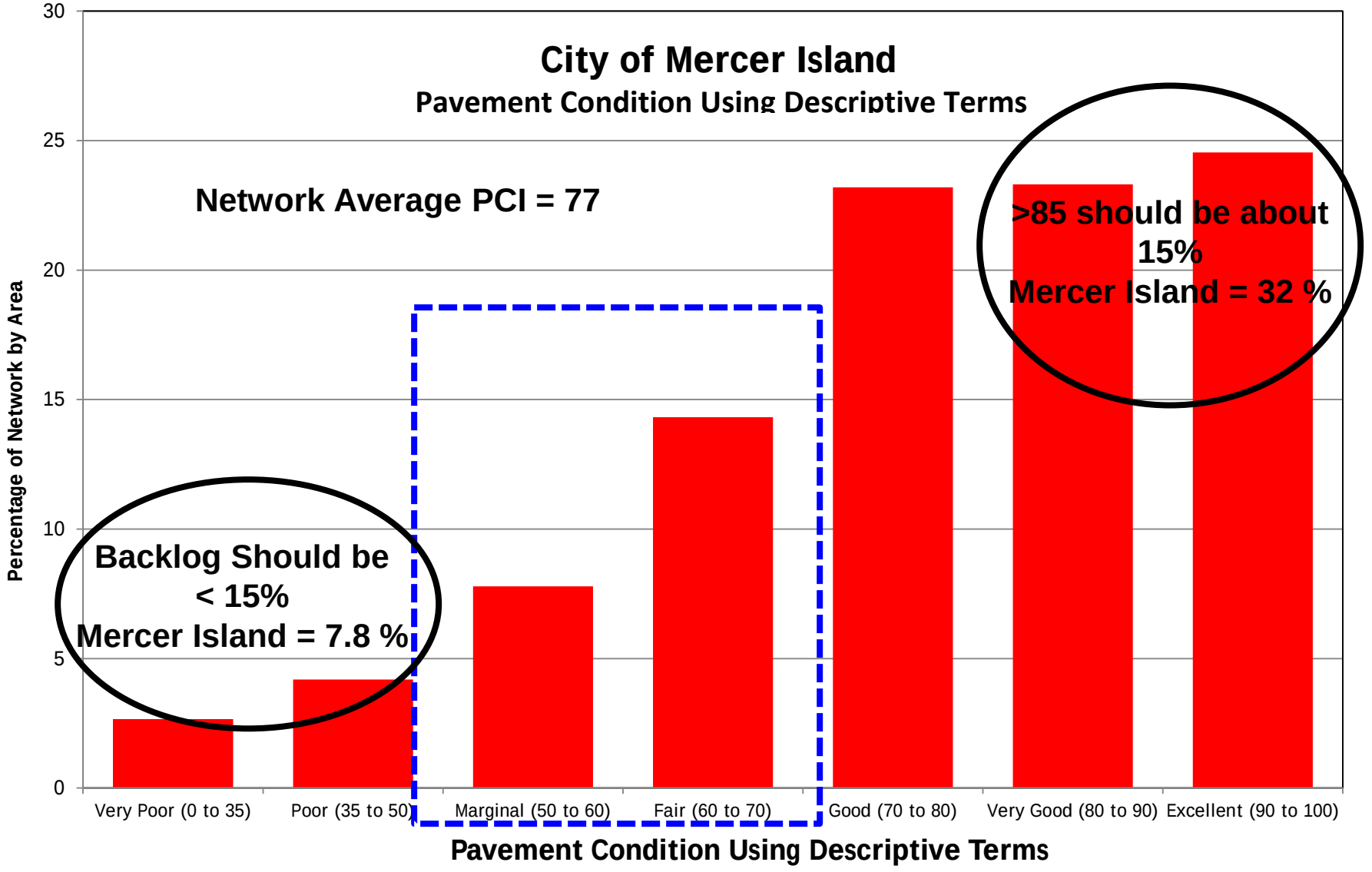
- Extensive high severity cracking
- Rutting
- Base failures

7-73rd A

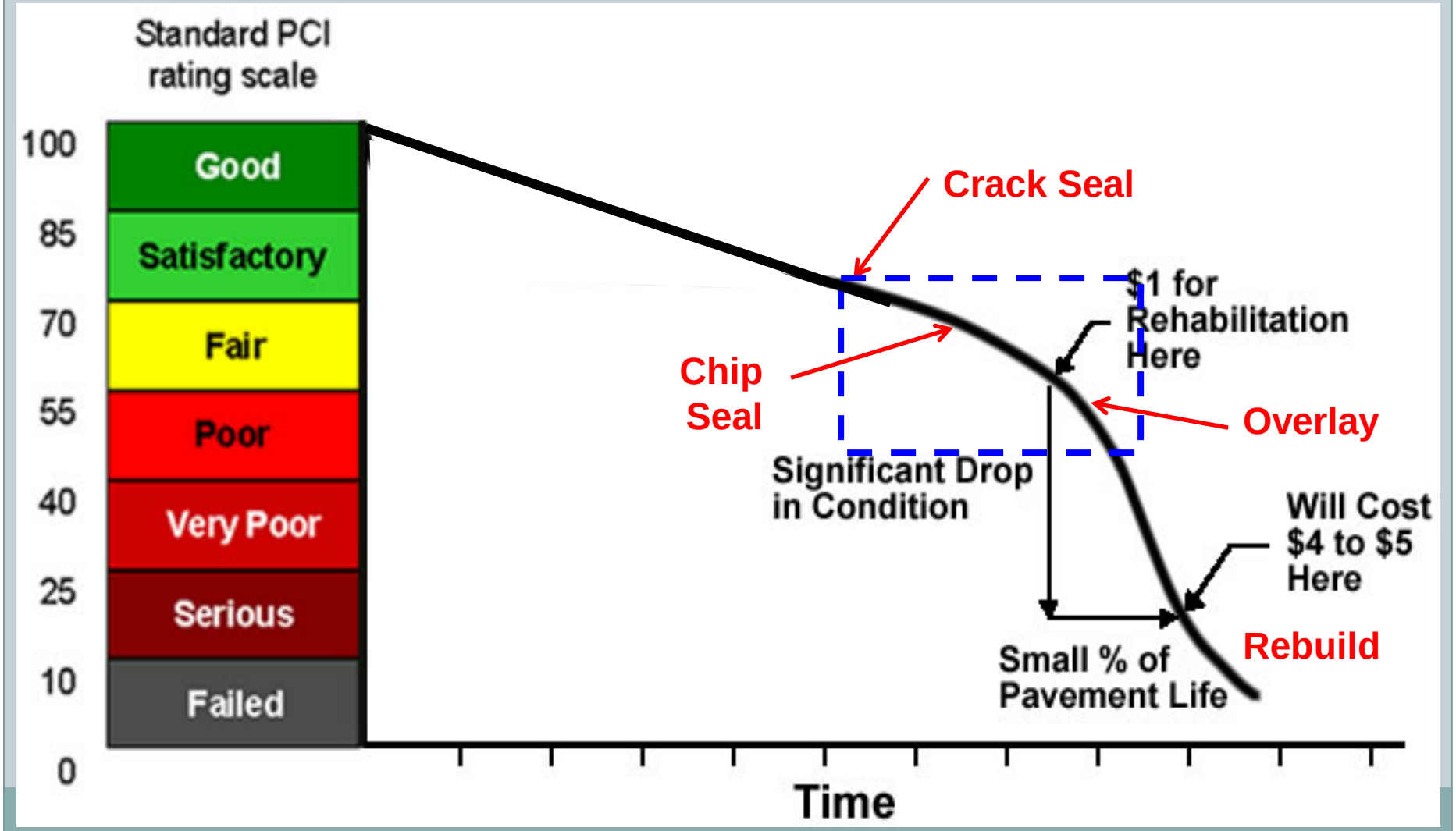
18- 91st A

- Past point of an overlay
- Needs reconstruction (remove existing pavement, some re-grading and base repair, repave)
- Doesn't get more costly than this

Mercer Island PCI Results-2013



Pavement Life Cycle Curve



Summary

- Our street network is healthy
  - 67% of network has PCI above 70
- To maintain our network in its current state, we need to:
  - Pave approx. 3% of our system annually, or 2.75 miles
  - Invest approx. $900,000 annually into our pavements

- Typical costs for:

chip sealing	FAIR	$140K per mile
patch and overlay	POOR	$350K per mile
rebuild	VERY POOR	$500K per mile

- It is much less expensive to maintain good roads than rebuild bad ones
- Extending current Life Cycle planning will significantly increase costs in the long run

PCI maps: *Arterial*, *Residential*, *Residential 0-70*

Option 2: Change current policies

- Comprehensive Plan establishes roadway congestion standard at Level of Service (LOS) C.
  - Most cities have worse LOS of D, E, or F. This is average or typical.
  - Only MI and few others have C
  - Estimate of current and future MI roadway congestion – LOS map

Option 2: Change current policies

- LOS C (high standard) vs C in school (average)
  - Requires signals, widening, turn lanes, etc. to maintain C
  - Unintended consequences
    - Residential intersections w/arterials – treated the same
    - Improvements compete with space for PBF, parking, and other improvements
    - ROW acquisition/condemnation
    - "Urban" feel – more hardscape and fewer trees/canopy
- Consider changes to LOS standard during update of Comp Plan

Option 3: TBD

- A Transportation Benefit District is:
  - A quasi-municipal corporation and independent taxing district
  - Created to acquire, construct, improve, provide, and fund transportation improvements
- Approved uses include:
  - Maintenance of existing city streets and trails
  - Investments in:
    - High capacity transportation
    - Public transportation
    - Pedestrian and bicycle facility improvements
    - Transportation demand management

Option 3: TBD

- King County TBD ballot measure
  - Goes to voters on 4/22/14
  - If approved, MI would receive $598K annually
- Mercer Island TBD approved by Council
  - Limited to $20 annual license fee per vehicle
  - Would generate $350K annually
- Mercer Island TBD approved by voters
  - Voter approval required to establish an annual license fee per vehicle >$20
  - Example: $40 license fee = $700K annually

Initial Recommendation

- Maintain current residential and arterial street repaving cycles
  - Strongly recommended by the City Engineer, Assistant City Engineer, and Street Engineer
- Reduce traffic LOS standard from C to D or E
- If KC ballot measure passes, the Street Fund's deficit situation may or may not be resolved
  - Depends on accuracy of KC revenue estimate
  - Depends on cost of traffic capacity and pedestrian improvements related to MISD construction projects
  - Depends on Council's appetite for new projects

Initial Recommendation (cont'd)

- If KC ballot measure fails, staff will prepare a 6 year TIP/CIP based on the latest REET forecast with and without a MI specific TBD ($350K/yr)
  - May 19th: First TIP agenda bill
  - Jun 16th: Second TIP agenda bill & CIP Preview agenda bill
  - Council decision whether or not to create a MI specific TBD:
    - Jun 16th or Nov 17th meeting
- If KC ballot measure fails AND if Council opts to not create a MI specific TBD, then a very light TIP will be proposed for 2015-2016

Pavement Condition Index (PCI)

- **Why select ASTM D6433?**
  - Used on 2009 project
  - Other agencies use
  - Consultants were all familiar with it

City	Centerline miles	PCI Formula	Frequency
Bellevue	412 miles	D6433	2 years
Burien	140 miles	D6433	2007
Federal Way	233 miles	D6433	Varies**
Issaquah	107 miles	MRC*	2 years*
Kirkland	245 miles	WSDOT	Varies ***
Seatac	78 miles	D6433	2 years

- **Lessons learned from 2009 project**
  - Don't let consultant divide up your street network
    - Staff divided street network into over 700 segments, based on length, intersections, previous project limits
    - Corrected errors in street network database

Mercer Island PCI Results-2013

- Primary indicators of network health
  1. Network average PCI
  2. Amount of Backlog (PCI below 50)
  3. Amount of Good (PCI over 85)

OVERALL STREET NETWORK PCI SCORES			
RATING SCALE		**MILES**	**PERCENT**
Good	86-100	26.25	32.2%
Satisfactory	71-85	29.53	35.3%
Fair	56-70	17.05	20.6%
Poor	41-55	6.66	8.2%
Very Poor	26-40	1.75	2.0%
Failed	0-25	2.26	1.7%
	TOTAL NETWORK	**83.5**	**100.0%**

Anomalies found in data:

- PCI scores have sensitivity to Alligatoring, Rutting, and Distortion distresses, as these have heavy deduct values in D6433.
- PCI scores have sensitivity to small area.
- What does this mean? Combine a short network segment with these distresses and PCI score drops significantly.