# IMS

## IMS Infrastructure Management Services

Consultants | Engineers

**DEVELOPING PROJECTS FOR STREET REHABS**

**Projects are an assembly of contiguous or adjacent segments that are grouped together and assigned a common Project Segment ID.**

**In laymen's terms, it is the process of developing logical projects that match your agency's existing business practices and funding constraints.**

Jim Tourek
West Region Client Services Manager

# *Success Starts Right Here…*

## Logical segmentation is a must!

*block-to-block – intersection-to-intersection*
*1/10th mile – 1 mile upset limits*
*Drop nodes when you have changes in pavement type!*

## Key attributes

*functional classification – pavement type – length – width*

## Field inspection data (pavement distress surveys)

*walking – windshield – or semi automated*

## Perspective of a paving contractor

*how would you assemble the work to most efficiently get it done?*

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# Rules of Thumb for Projects

Long Beach, CA
Developing Logical Segmentation

## Develop Logical Projects (Linked Segments)

*Projects are segments aggregated to form projects*

*Rehab type is based on project condition*

*Rules of Thumb:*

✓ *Any single project < 25% of total budget (upset limit)*

✓ *Upset length = 1 to 1 ½ miles in total length (higher PCI scores will accommodate longer projects)*

✓ *Should contain contiguous or adjacent segments – avoid gaps*

✓ *PCI of each segment should be within +/- 10 PCI points*

✓ *Don't change pavement type*

✓ *Do not cross arterials/collectors*

✓ *Assign Project Segment ID's in increments of 10 or 20, starting at 1000*

# *Functional Class Review*

## Principal Arterial
*continuous cross-City corridors that are up to 4 lanes across with avg. daily traffic (ADT) of 10-20k vehicles/ day.*

## Minor Arterial
*Similar features and have a centerline stripe or a designated bus route.  ADT 5-10k.*
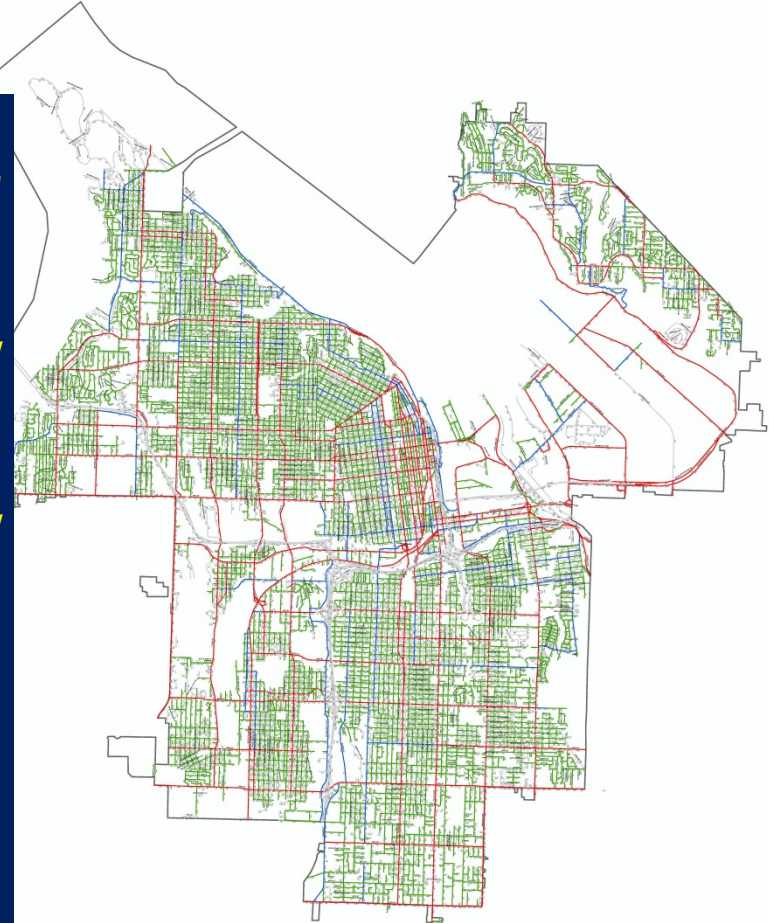
## Collector Arterials
*Similar features and have a centerline stripe or a designated bus route.  ADT 1-5k*

## Collectors
*Similar features but <u>do not</u> have a centerline stripe or a designated bus route.  ADT 1-5k*

## Residentials
*Majority of the street segments consist of all residential and frontage roads not defined above or as an industrial/ commercial.*

City of Tacoma

# *Too Much or Too Little Data…*

ASTM D6433 – 19 Asphalt Distresses
*Really????? 8-10 is sufficient*

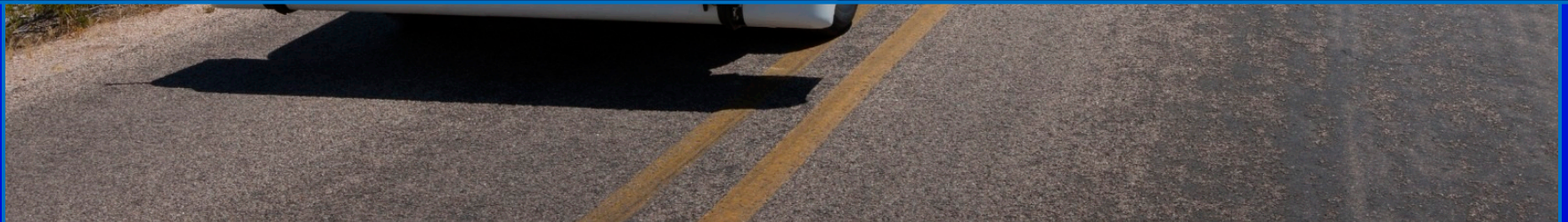Lip of Gutter, Curb reveal, Drop off, Crossfall, Constraint
*Critical for good decision making – grinding & cross slope*

Deflection Testing
*Stick to arterials and collectors – use it in the PCI & rehab activity triggers*
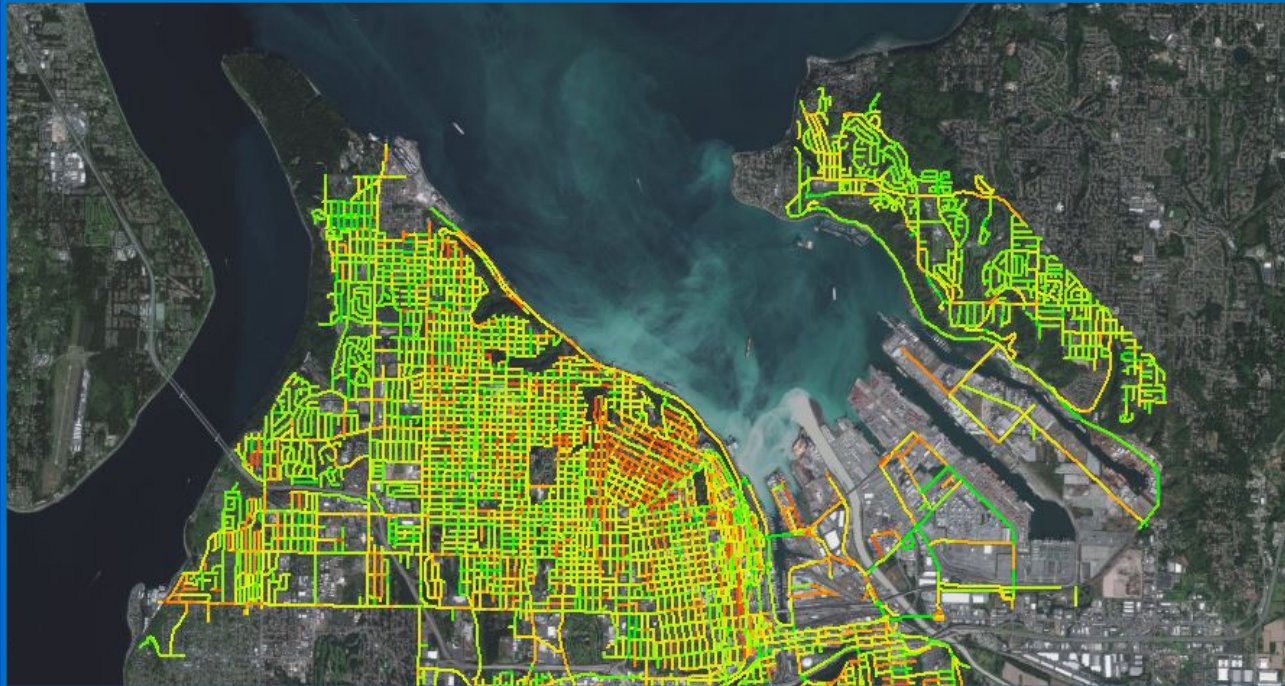
Curb Presence and Drainage Condition
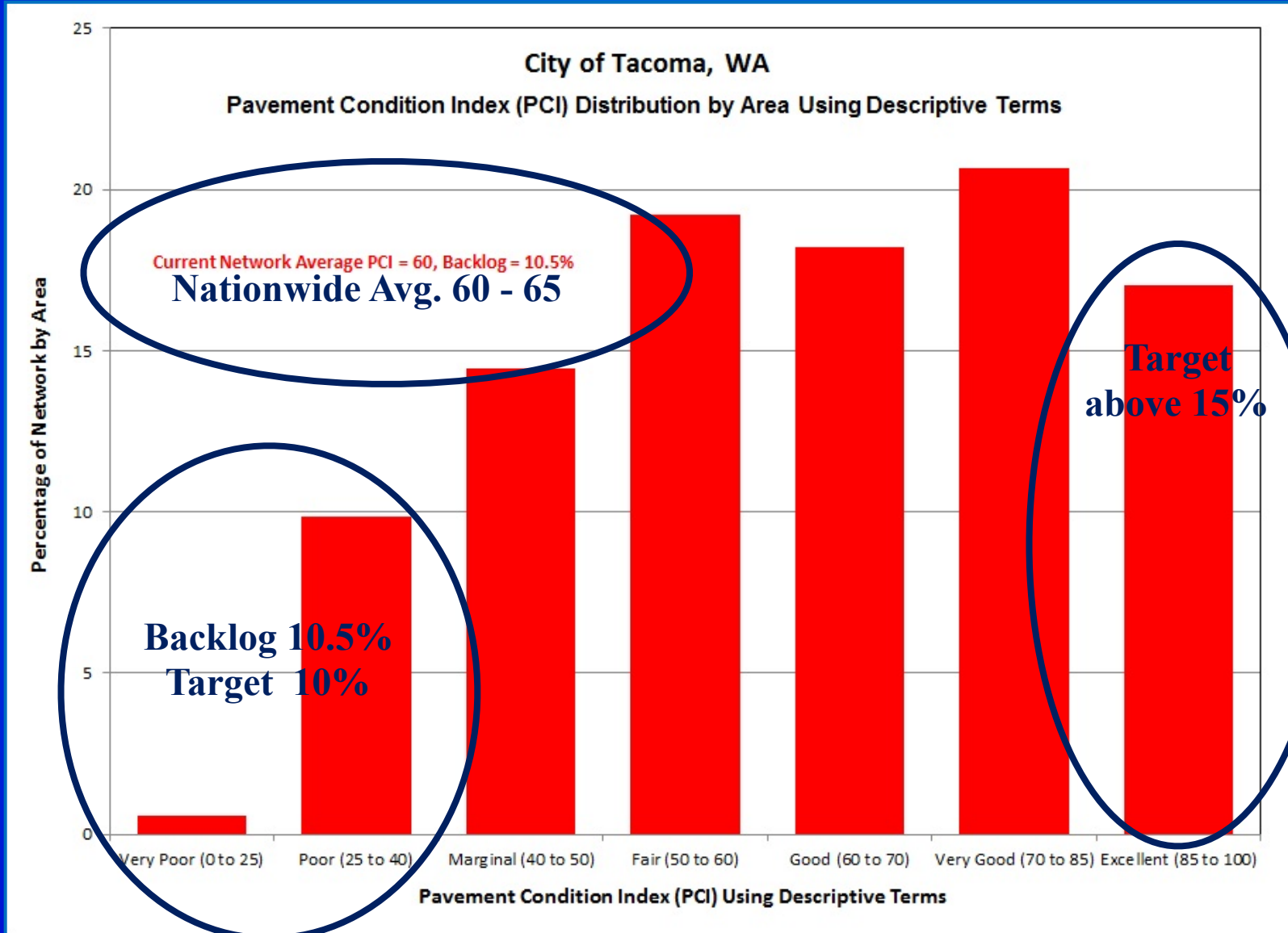*Curb vs curbless – drainage/culvert quality*

# *Tacoma Pavement Results….*



In acceptable shape now…
But what will it take to maintain the current condition
or improve the current condition profile?

# *Tacoma, WA Results…. 3 metrics of health*



**City of Tacoma, WA**

**Pavement Condition Index (PCI) Distribution by Area Using Descriptive Terms**

Current Network Average PCI = 60, Backlog = 10.5%

**Nationwide Avg. 60 - 65**

**Target above 15%**

**Backlog 10.5%
Target  10%**

Percentage of Network by Area

Very Poor (0 to 25) | Poor (25 to 40) | Marginal (40 to 50) | Fair (50 to 60) | Good (60 to 70) | Very Good (70 to 85) | Excellent (85 to 100)

**Pavement Condition Index (PCI) Using Descriptive Terms**

# Understanding the PCI….*Poor to Marginal (25 – 50)*

**Localized base failures**
**Rutting at intersections**
**Extensive cracking**
**Extensive patching**

GISID: 8853
Image: TACO034_006393_0001_LF.jpg
64TH ST
City of Tacoma
WASHINGTON

N47.1990 W122.4003
LFE001IMS
2015/07/29 16:50:38

GISID: 348
Image: TACO026_004707_0003_LF.jpg
D ST

N47.2116 W122.4366
LFE001IMS
2015/07/27 20:13:11

**Tired streets due for a thicker overlay, possibly a surface removal and replacement on ACP roads. Extensive joint, panel replacement, and grinding on PCC roads.**

**High priority to avoid reconstruction**

# *Understanding the PCI….Good (60 - 70)*



GISID: 5882
Image: TACO063_012129_0007_LF.jpg

HIGHLANDS PKWY

City of Tacoma
WASHINGTON

**Few localized distresses**
**Minimal base failures**

**If distressed due to loading on ACP roads, may need thin overlay, otherwise crack seal and surface treat (micro /chip seal/ slurry). If concrete, a good candidate for slight panel replacement on PCC roads.**

**Greatest cost benefit:**

**Thinner strategies**
**Less crown build-up**
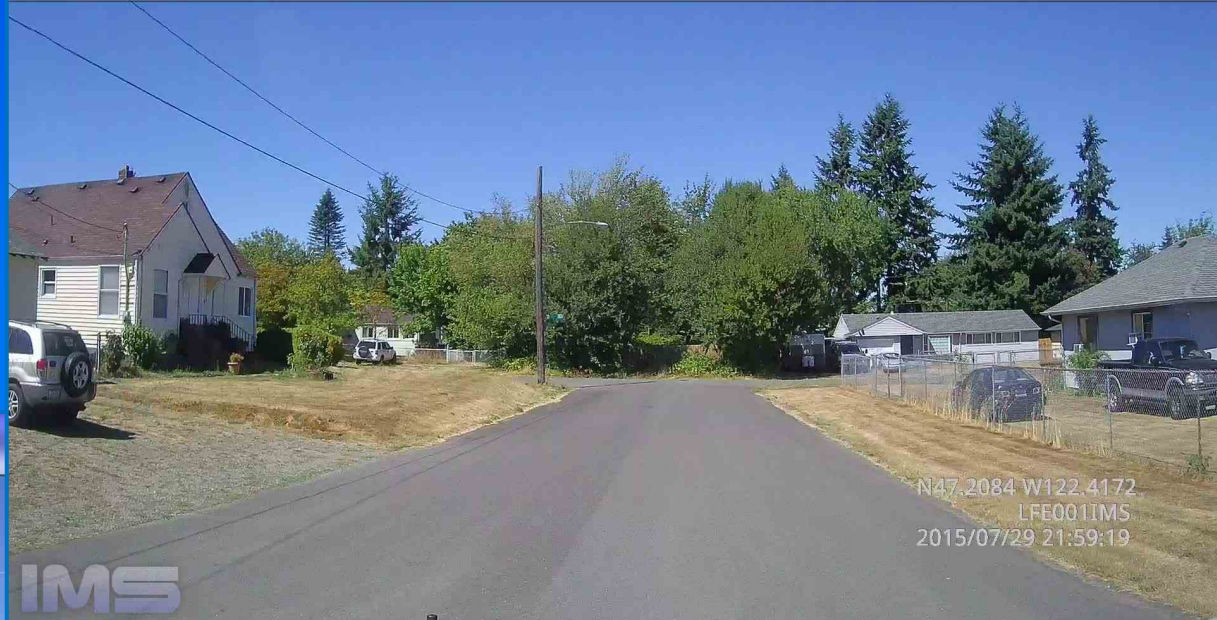**Less intrusive rehab**
**Maintain existing drainage**

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# *Understanding the PCI….Excellent (85 - 100)*

**Like new condition
Very few minor distresses
Smooth ride, good drainage**

GISID: 608
Image: TACO036_006851_0004_LF.jpg

J ST

City of Tacoma
W A S H I N G T O N

N47.2084 W122.4172
LFE001IMS
2015/07/29 21:59:19

GISID: 16884
Image: TACO039_007216_0003_LF.jpg

65TH ST

N47.1979 W122.4395
LFE001IMS
2015/07/30 17:14:22

**Should provide 5 to 10 years
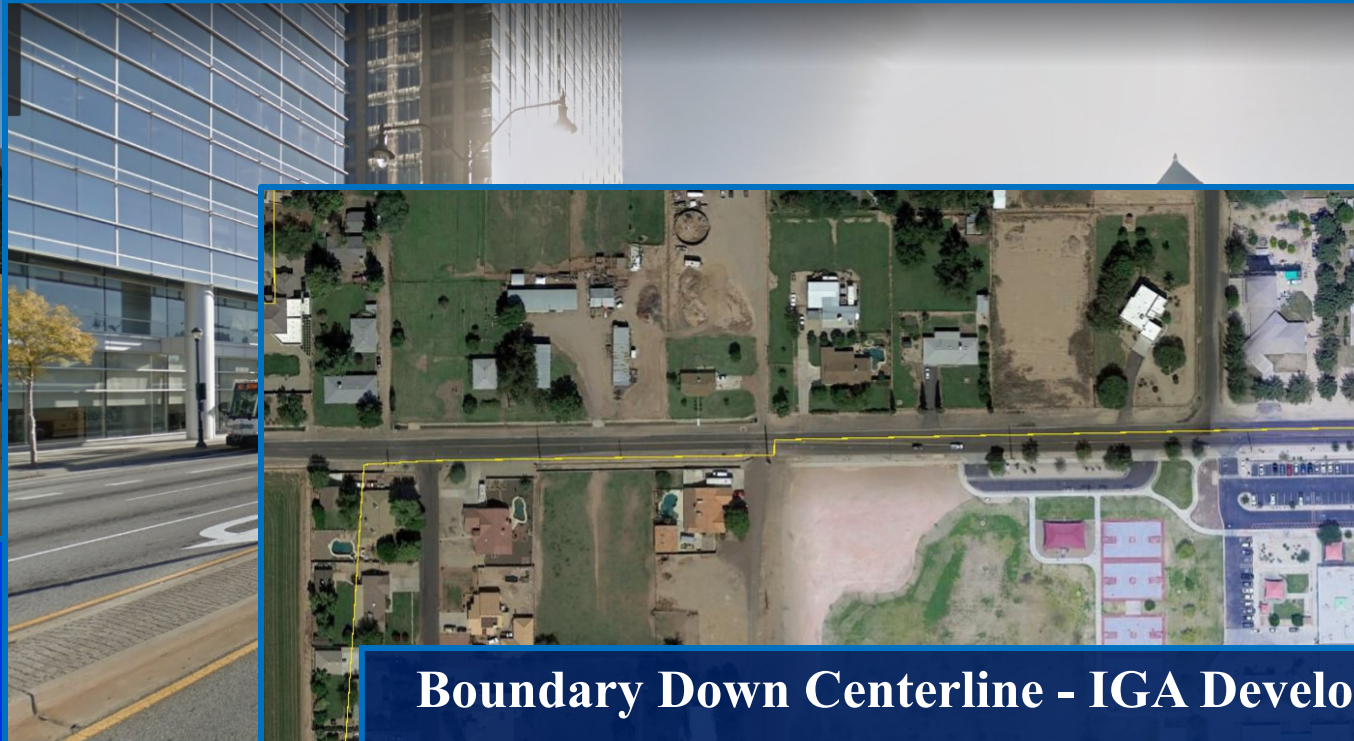prior to first rehabilitation
with routine maintenance**

# *Segment Appropriately*... *PT – FunCl – Ownership*



GISID: 1163
Image: BROK031_00006471_0002_CF.jpg

OAKRIDGE ST

BROKEN ARROW

**Boundary Down Centerline - IGA Development**

ownership falls on North or West side of road = City responsibility
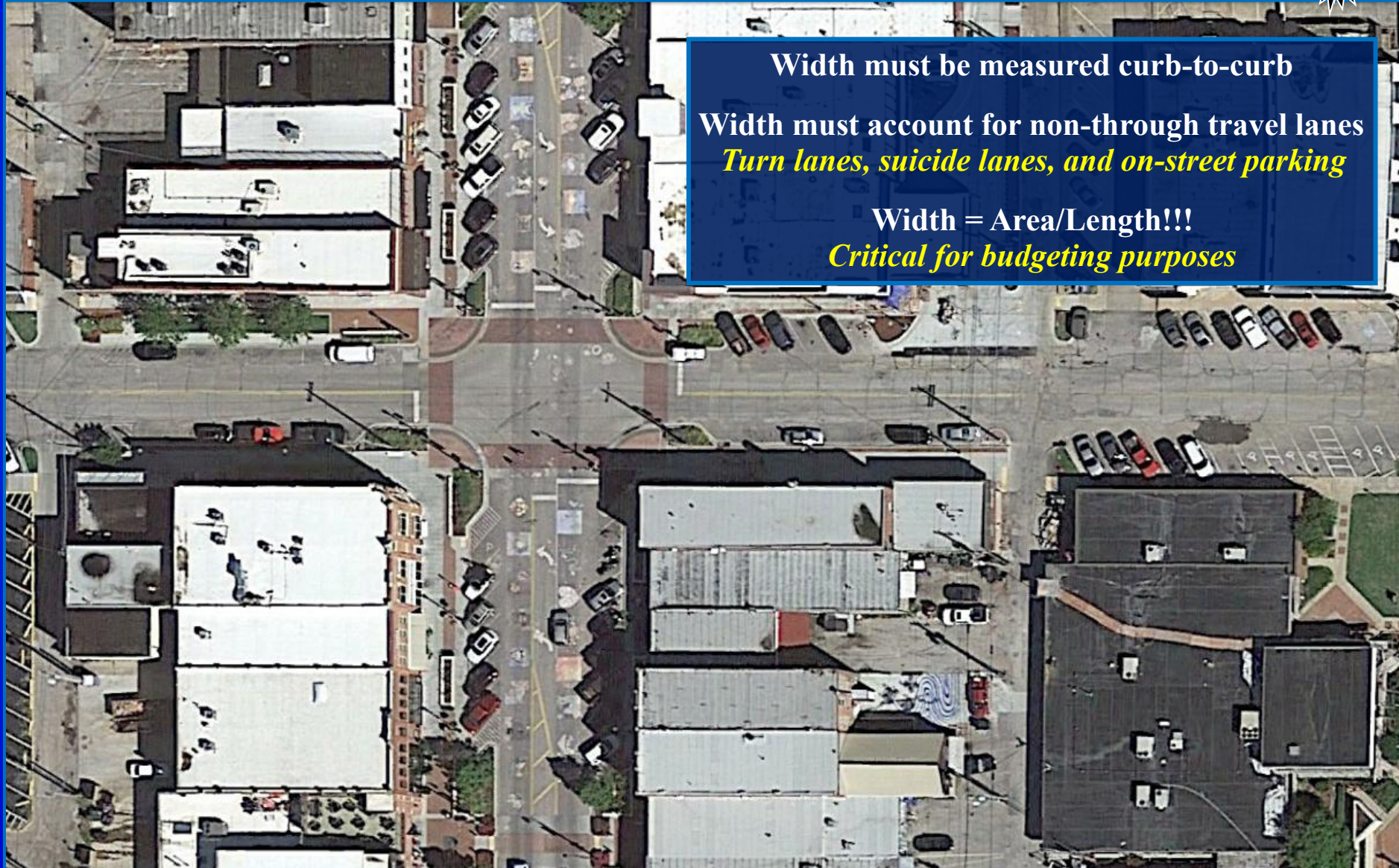Anything else = County responsibility

# *Pavement Width – often overlooked yet critical*



**Width must be measured curb-to-curb**

**Width must account for non-through travel lanes**
*Turn lanes, suicide lanes, and on-street parking*

**Width = Area/Length!!!**
*Critical for budgeting purposes*

# *Project Types… Block-to-Block*

## Block-to-Block Approach

*Extremely inefficient in terms of cohesiveness*

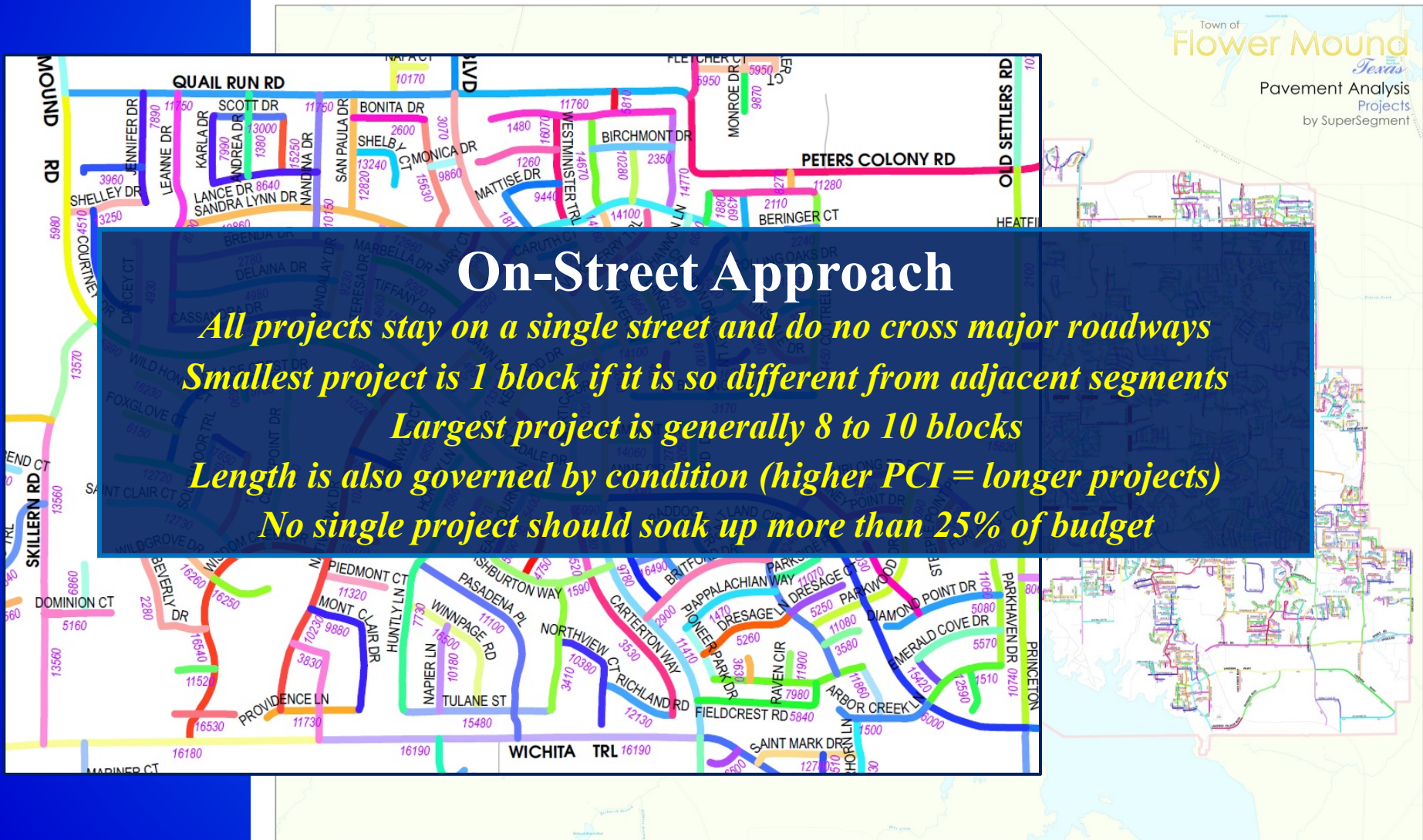*Rehab plan ends up looking like a shot gun blast*

*Generally employed by agencies that are very underfunded*

*Last resort and not very popular*

*If done correctly, can be made to work until funding improves*

# Project Types… *On-Street*



## On-Street Approach

*All projects stay on a single street and do no cross major roadways*

*Smallest project is 1 block if it is so different from adjacent segments*

*Largest project is generally 8 to 10 blocks*

*Length is also governed by condition (higher PCI = longer projects)*

*No single project should soak up more than 25% of budget*

# Project Types… *On-Street/ Side Street*

## On-Street/Side Street Approach

*Similar to On-Street but also picks up smaller side streets*

*This is the most popular method*

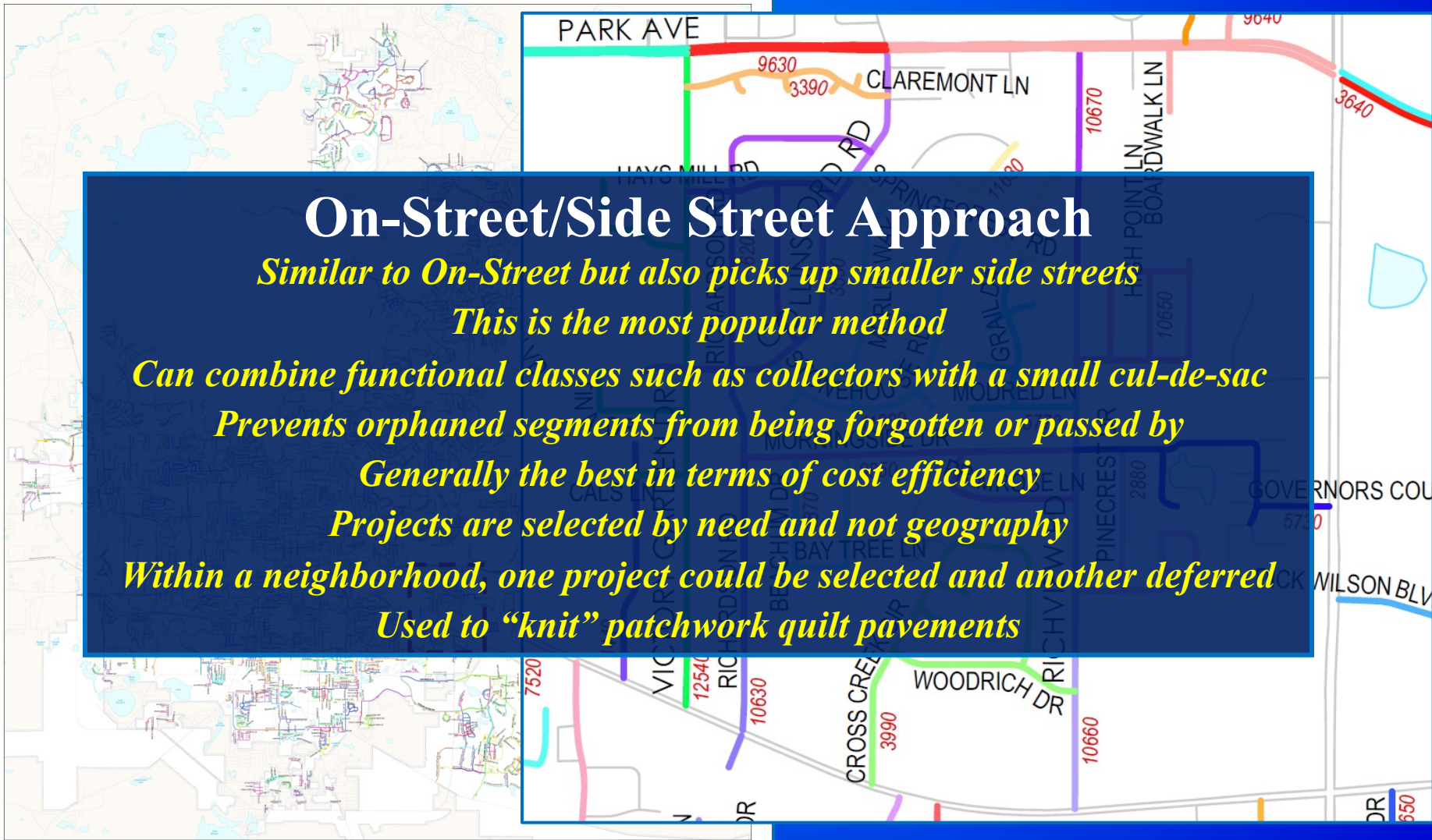*Can combine functional classes such as collectors with a small cul-de-sac*

*Prevents orphaned segments from being forgotten or passed by*

*Generally the best in terms of cost efficiency*

*Projects are selected by need and not geography*

*Within a neighborhood, one project could be selected and another deferred*

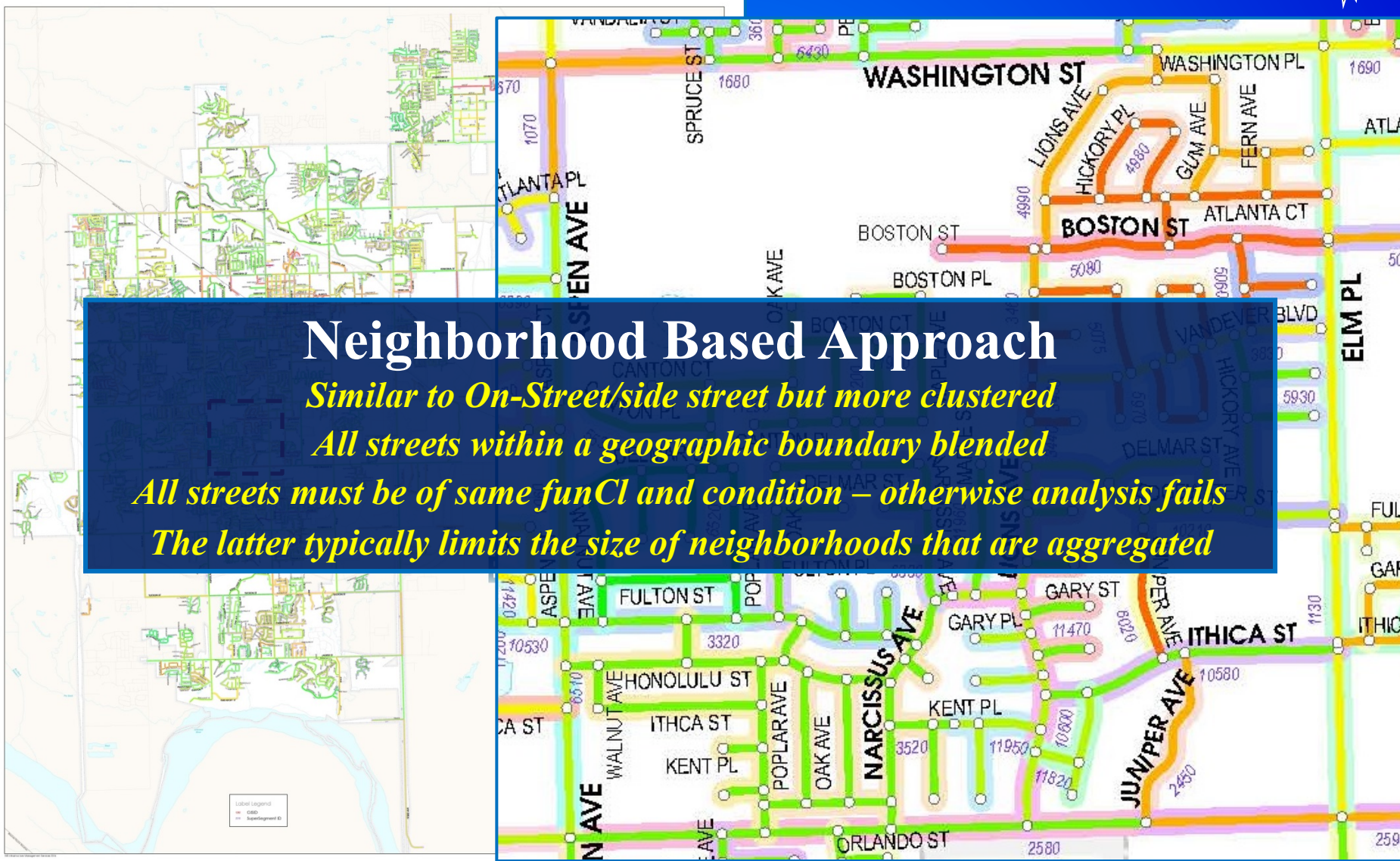*Used to "knit" patchwork quilt pavements*

## Neighborhood Based Approach

*Similar to On-Street/side street but more clustered*

*All streets within a geographic boundary blended*

*All streets must be of same funCl and condition – otherwise analysis fails*

*The latter typically limits the size of neighborhoods that are aggregated*

# Project Types… *Linked Projects*

## Neighborhood Based Approach

*Must be fully funded – spatially efficient at a cost (non-critical selections)*

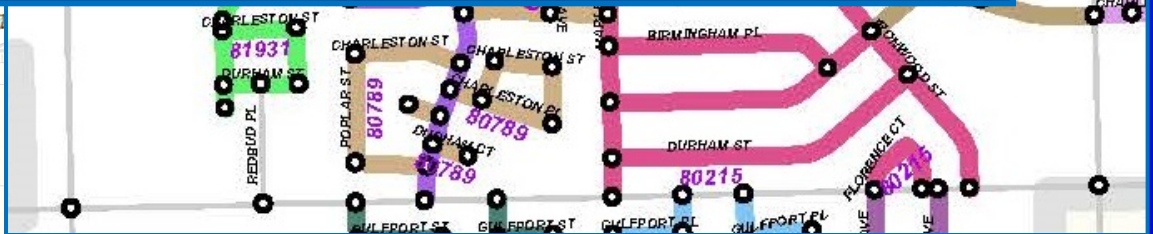*On-Street/Side Street projects linked within neighborhood*

*When one street is selected, the rest follow in same year*

*Each project within a linked group receives appropriate rehab*

*Selection is a combination of need and geography*

*Loss of efficiency as some projects will be selected prior to their need year*

*Second most popular Supersegment approach*

# *Enhancing the Analysis…the end result*



**Objective condition + attributes + IRI + structural**
*strength obtained through structural testing and/or LADD*

**<u>Dynamic</u> project development – options**
*Block – On-Street – On-Street/ Side Street - Neighborhood*

**Review full "tool-kit" of rehab strategies / unit rates**
*surface treatments – overlay thickness – panel replacements - R&R - recon*

**Integrate City specific priorities**

**Identify "Critical" roadways & "Need year"**
*this is how we introduce optimization into the analysis*
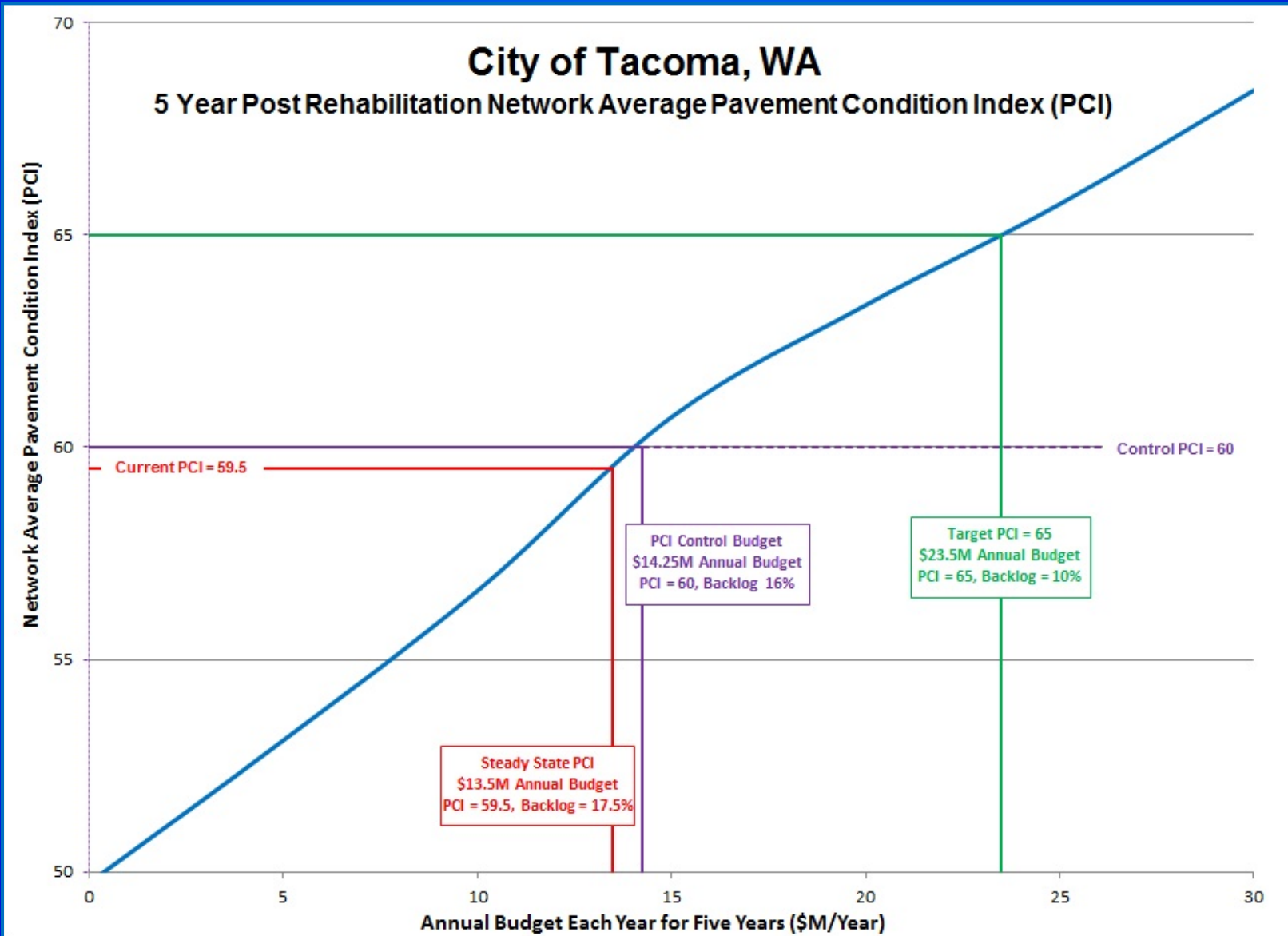
# *Why This And Not That?*



Not Selected

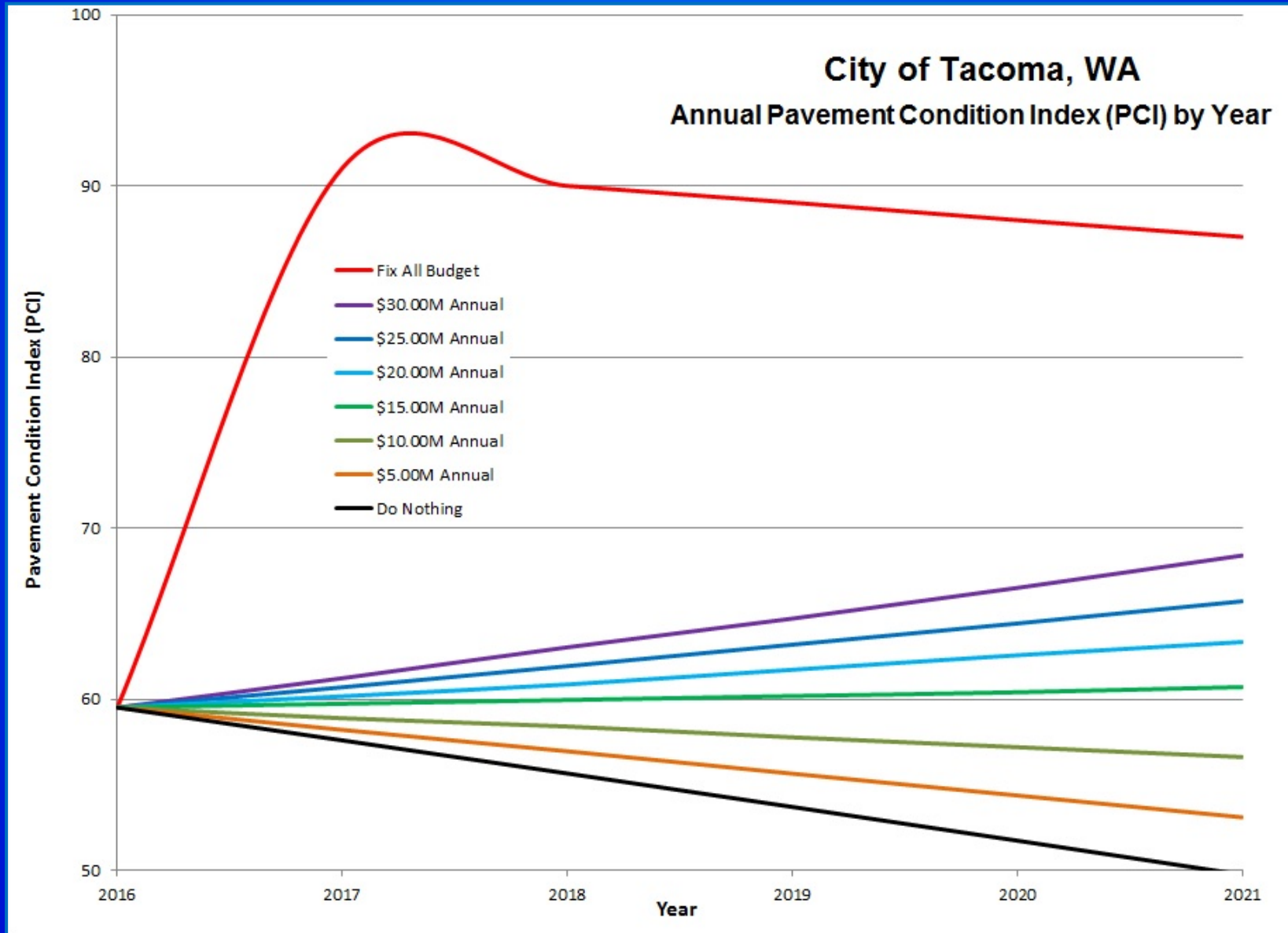An ugly street stays ugly for a long time, but good streets deteriorate fast

Reconstruction money was directed to overlays and surface treatment
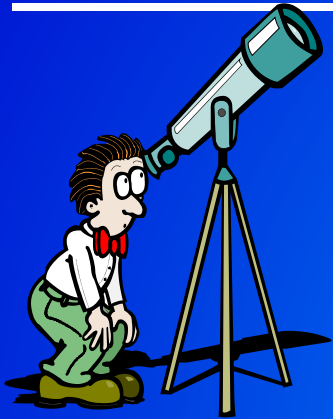
# *Post Rehab PCI & Annual Funding....*



**City of Tacoma, WA**
5 Year Post Rehabilitation Network Average Pavement Condition Index (PCI)

Current PCI = 59.5

Control PCI = 60

**PCI Control Budget**
$14.25M Annual Budget
PCI = 60, Backlog 16%

**Target PCI = 65**
$23.5M Annual Budget
PCI = 65, Backlog = 10%

**Steady State PCI**
$13.5M Annual Budget
PCI = 59.5, Backlog = 17.5%

Network Average Pavement Condition Index (PCI)

Annual Budget Each Year for Five Years ($M/Year)

# 5 Year PCI Budget Analysis….



City of Tacoma, WA
Annual Pavement Condition Index (PCI) by Year

# One Minute Close...

## It is Not Rocket Science
use your best judgement, use common sense, think like a paving contractor & don't sweat the small stuff

## Start From a Good Foundation
Logical segmentation, good attributes, objective inspection data & understand your LOS expectations

## Be Careful What You Publish
Once it's "Out There", it's written in stone

# Questions ?