Brookhaven
GEORGIA

Roadways are the economic lifeline of a community; they provide the means for communities to grow and commerce to flourish.

As such they are an investment to be maintained.

2014 State of the Roadway Network in Brookhaven

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City of Brookhaven Public Works

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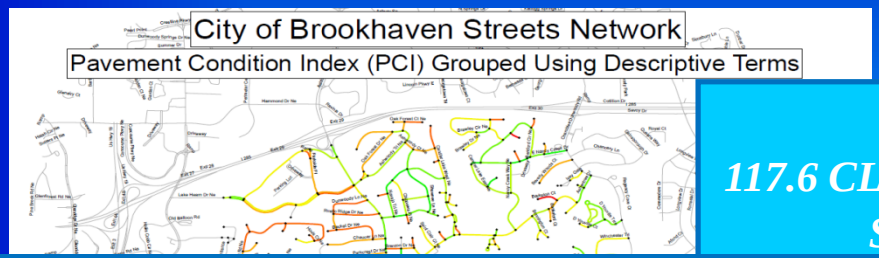
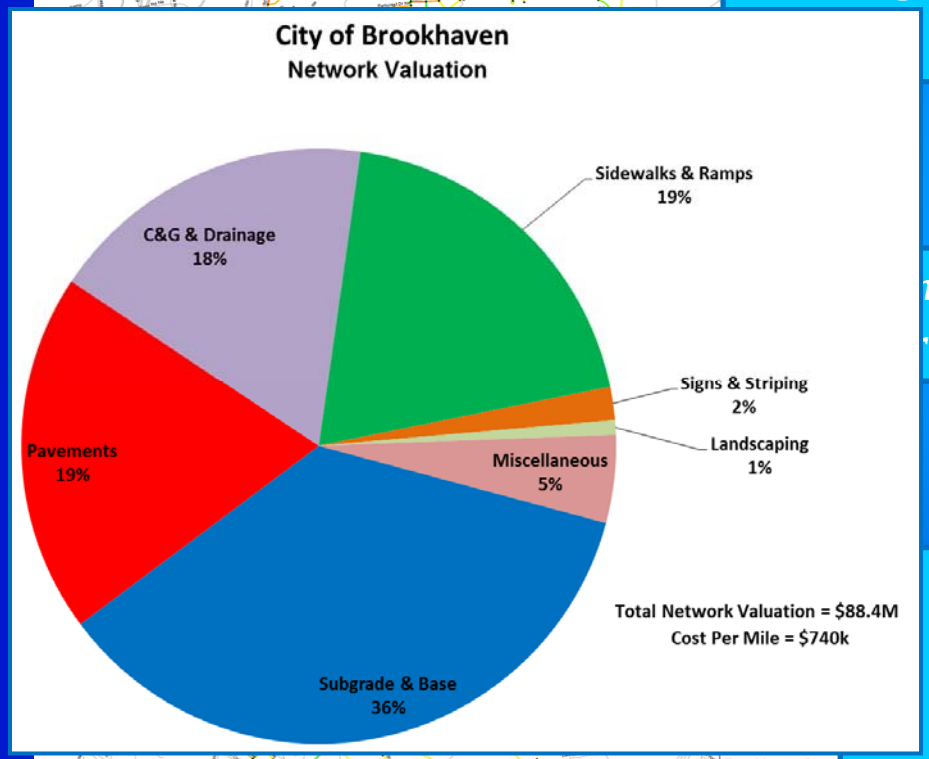
IMS Infrastructure Management Services

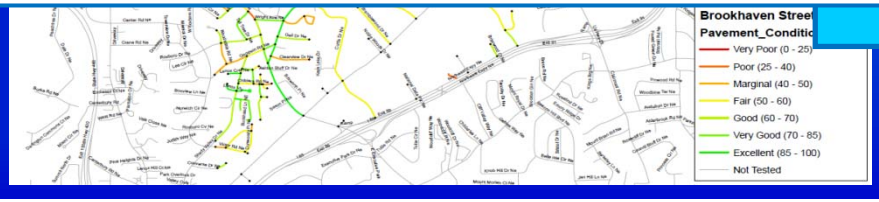
Scale of Investment….



49,000 +/- people
117.6 CL +/- miles of city owned roadways + state & private
Slightly lower density than an average City
1.9M square yards of pavement



ngle largest City asset valued at $740k/mile
$88M total plus improvements and ROW



Early look at the condition score:
PCI = 60 = Fair
Back log = 17% (target < 15%)
Rates a solid B

Concept of Pavement Management...

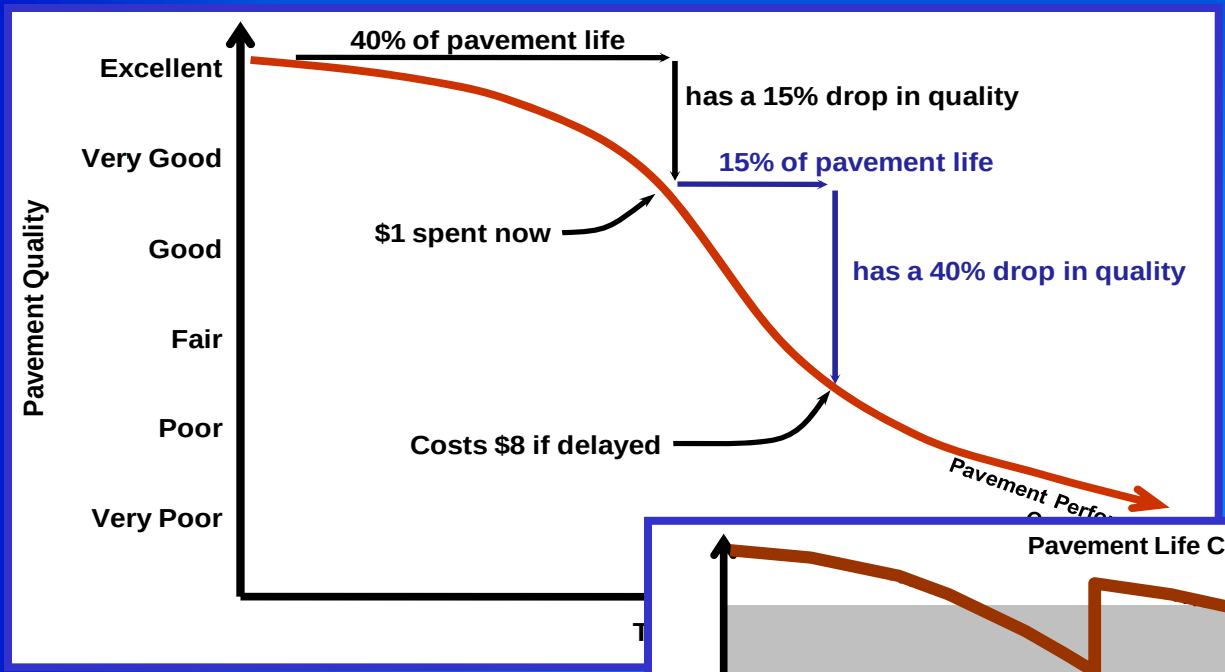
City Objectives, Policies & Budgets

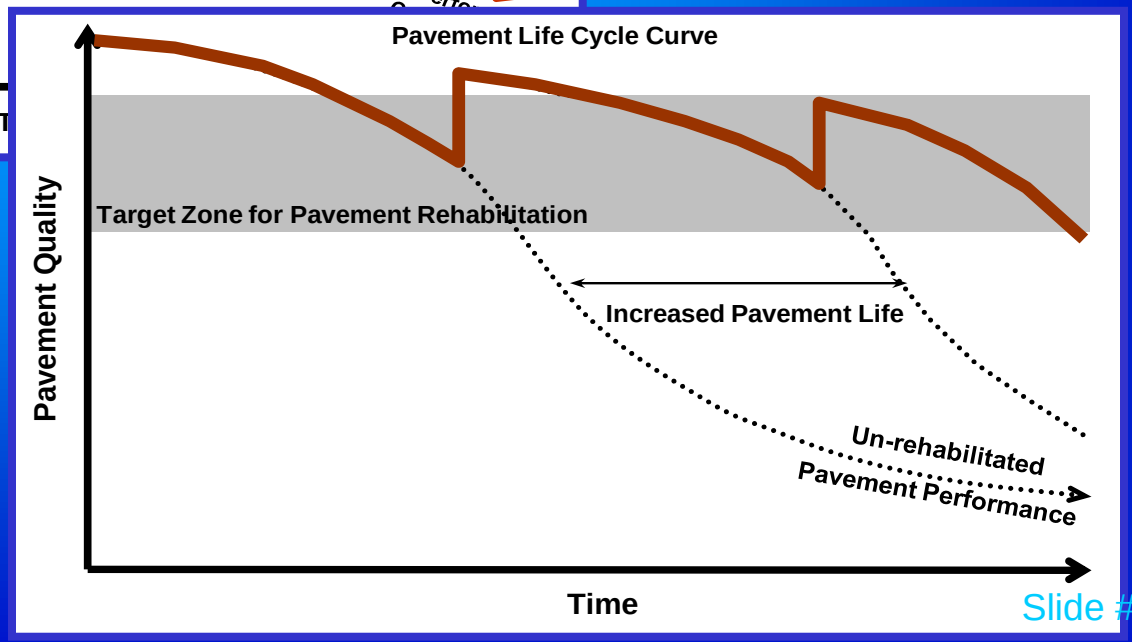
Balanced Approach

Priorities, Analysis Techniques & Reporting

Understanding of Condition

Why do Pavement Management….





Tools to Rate the Streets – Objective Surveys

Condition focuses on:

Fatigue/Alligator Cracking

Wheel path Rutting

Cracking

Distortions, Weathering & Flushing

Patching & Potholes

Building the Pavement Condition Index (PCI)

Surface Distress Index (SDI)

Rutting
Longitudinal Cracking
Alligator Cracking
Distortions
Edge Cracking
Patches & Potholes

Transverse Cracking
Map Cracking
Raveling
Bleeding

67% Surface Distress

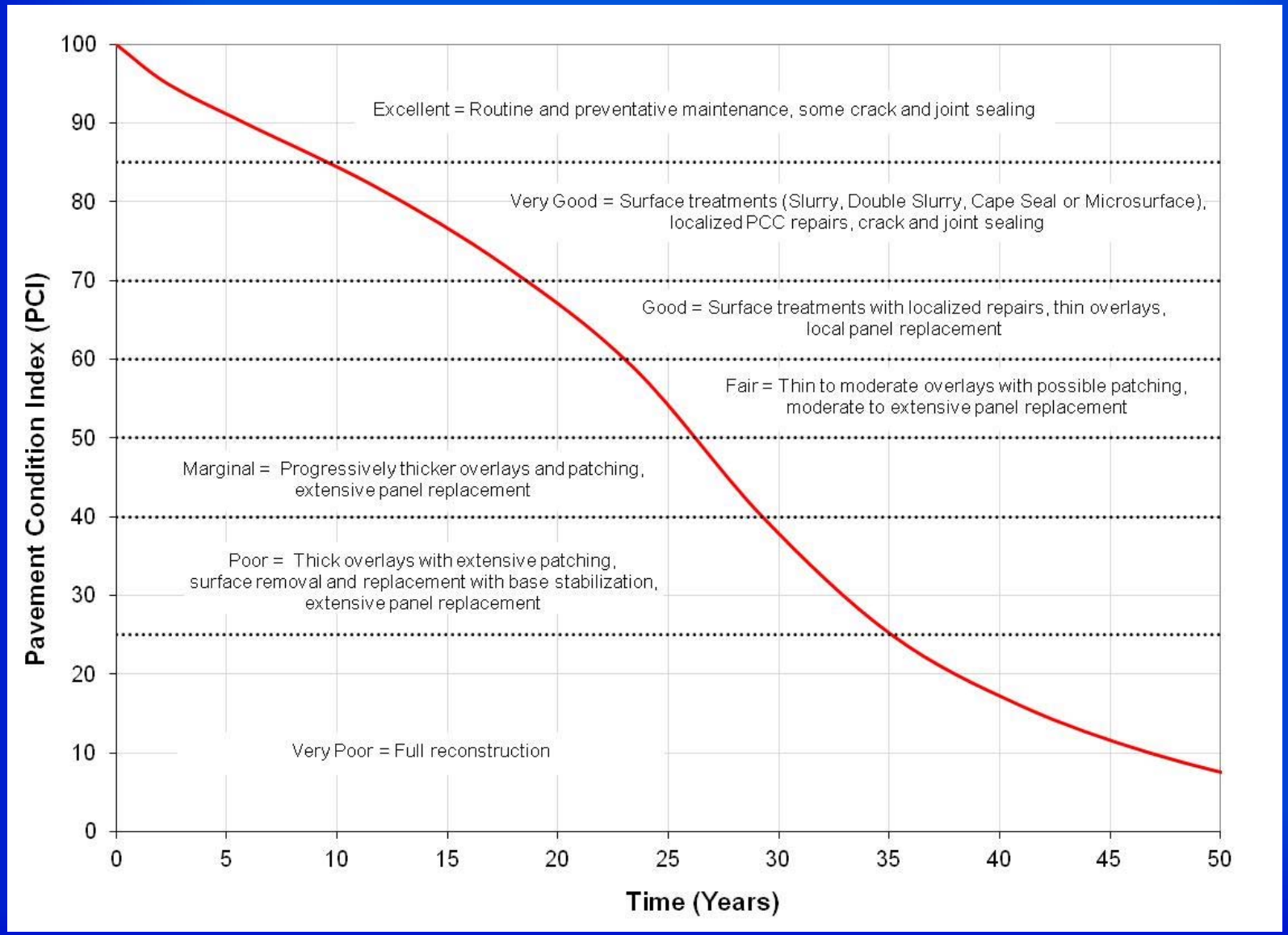
Roughness Index (RI)

Left Wheel Path
Right Wheel Path

33% Roughness

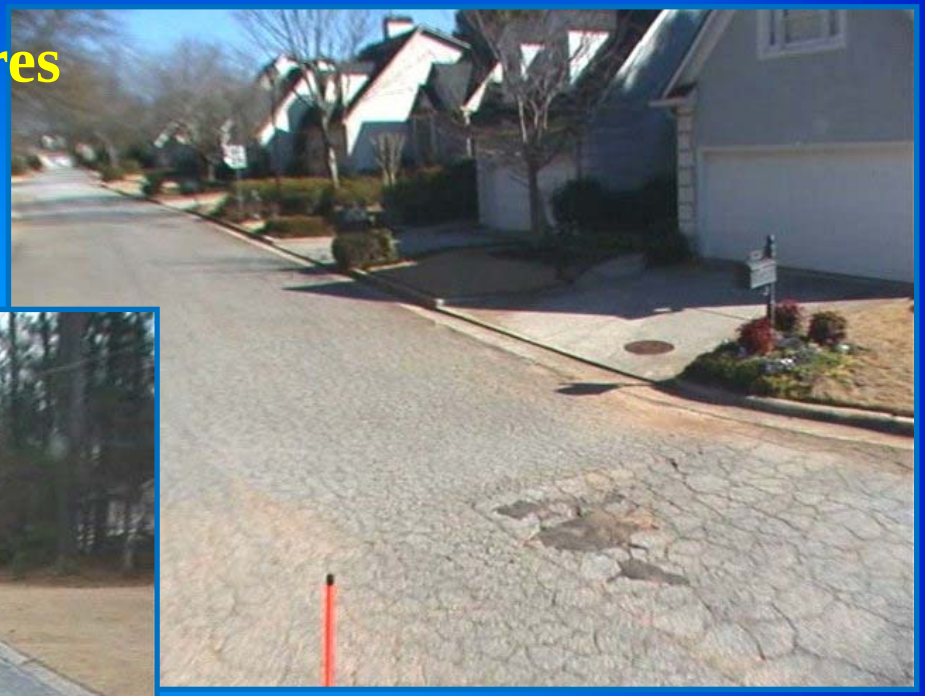
Pavement Condition Index (PCI)
0 to 100 Score

Understanding the Pavement Condition Index….



Understanding the PCI….Very Poor (0 – 25)

Base &/or Structural Failures
Rutting
Excessive Cracking



Past point of overlay based rehabilitation
Rehab timing is often driven by citizen complaints
Safety becomes a concern at very low PCI

Understanding the PCI….Poor to Marginal (25 – 40 - 50)

Localized base failures
Rutting at intersections
Extensive cracking
Extensive patching

Tired streets due for a progressively thicker overlay, possibly a surface removal and replacement
High priority to avoid reconstruction

Understanding the PCI….Fair (50 – 60)

Progressive cracking
Few base failures
Localized distresses

Optimum timing for thin – moderate overlay
Many benefits to selecting streets early
lower cost – greater return, less grinding, drainage

Understanding the PCI….Good (60 - 70)

Localized distresses
No failures

Surface treatment based rehabilitation before distresses appear adds no structural value, if distressed due to loading thin overlay, possibly with edge grinding and patching

Understanding the PCI….Very Good (70 - 85)

Very few distresses
No rutting
No base failures

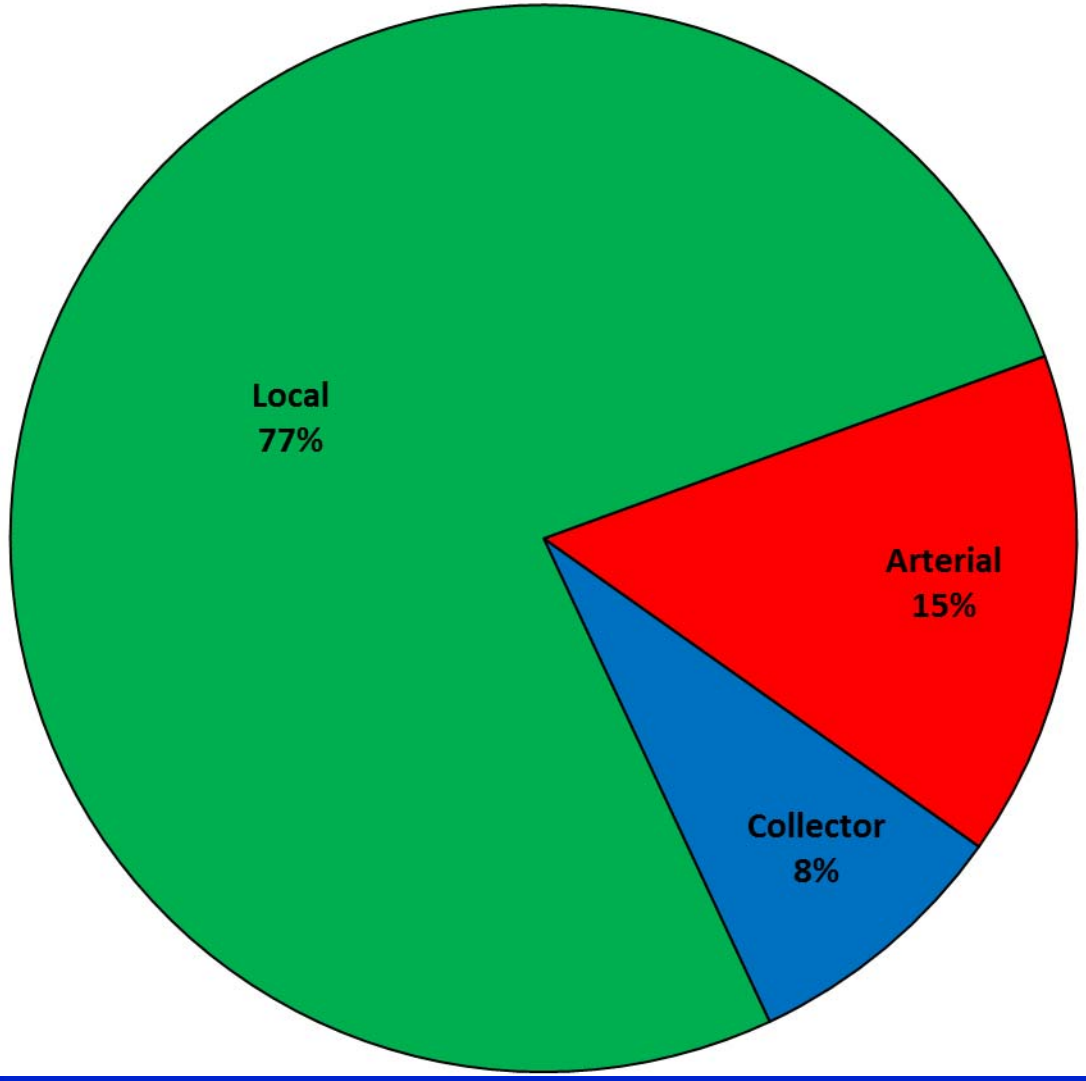
Crack seal with surface treatment
Maintains existing drainage, minimizes use of non-renewable resources
Extends pavement life at lowest cost

Understanding the PCI….Excellent (85 - 100)

Like new condition

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

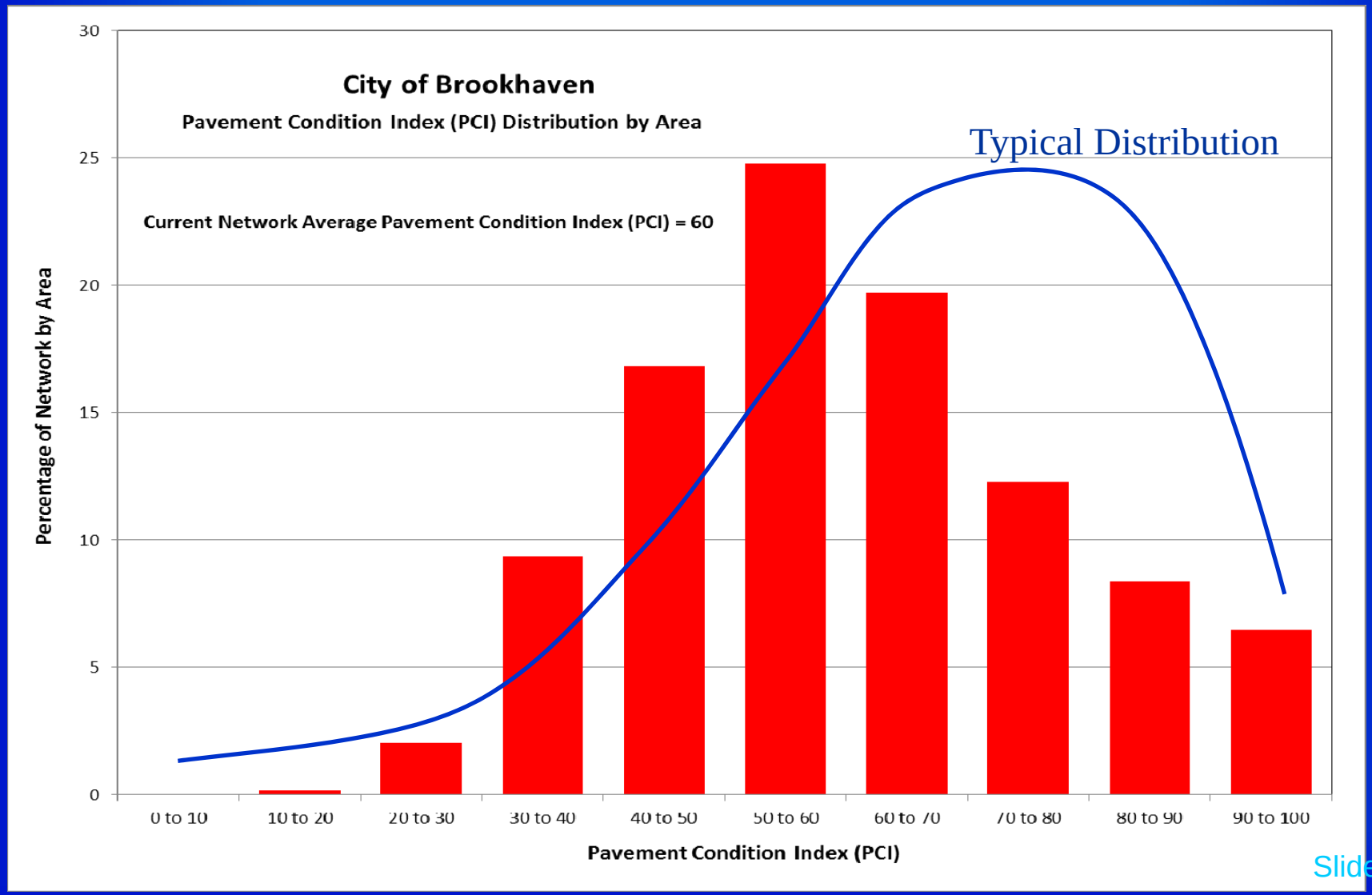
Brookhaven Functional Class…slightly high % of Locals



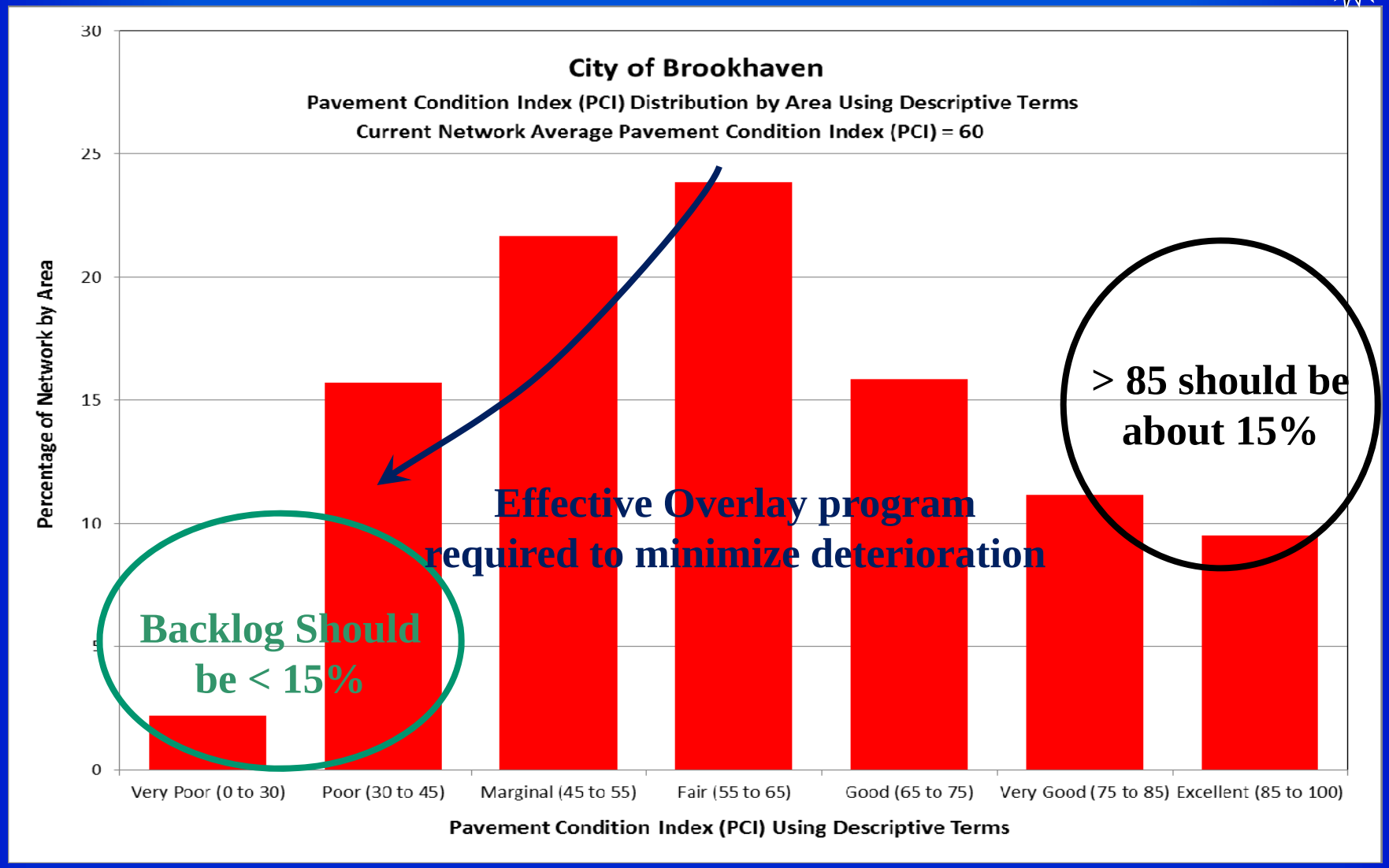
Total Area = 1.9M Sq Yrds

Total Mileage = 117.6 miles

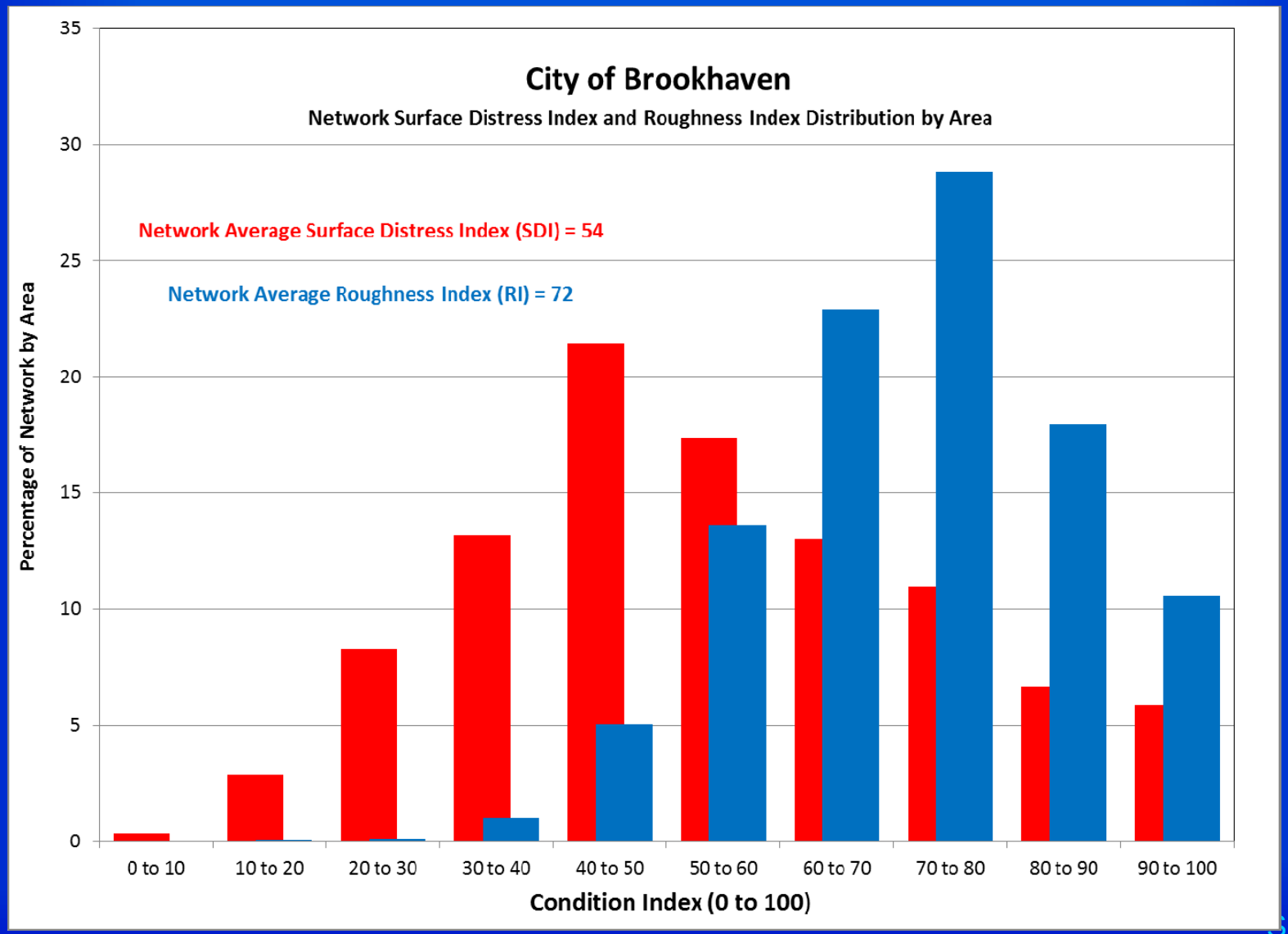
Brookhaven PCI Results for 2014….



Brookhaven Results…. some areas of concern and strengths



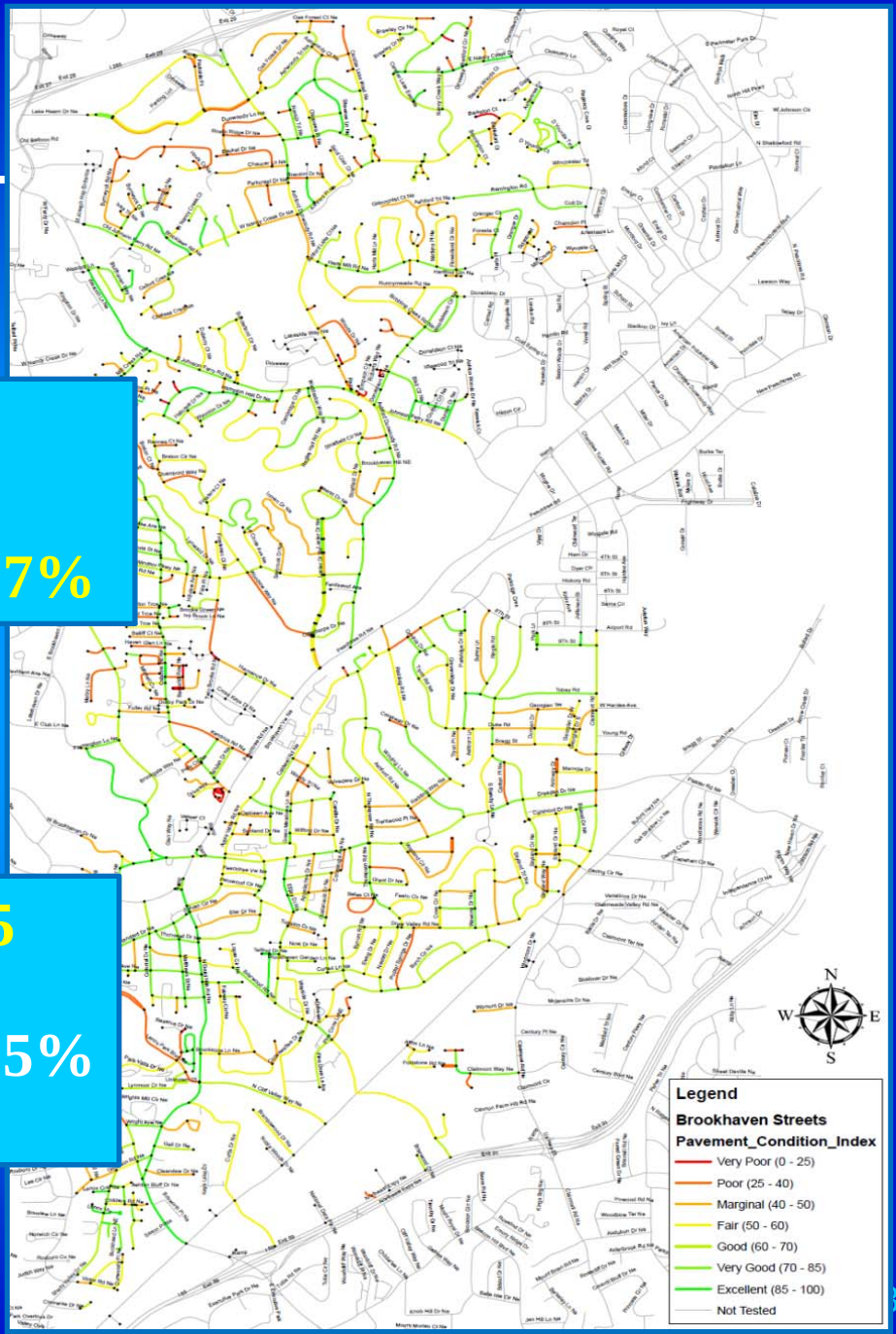
Brookhaven…. Unusually High Amounts of Surface Distress



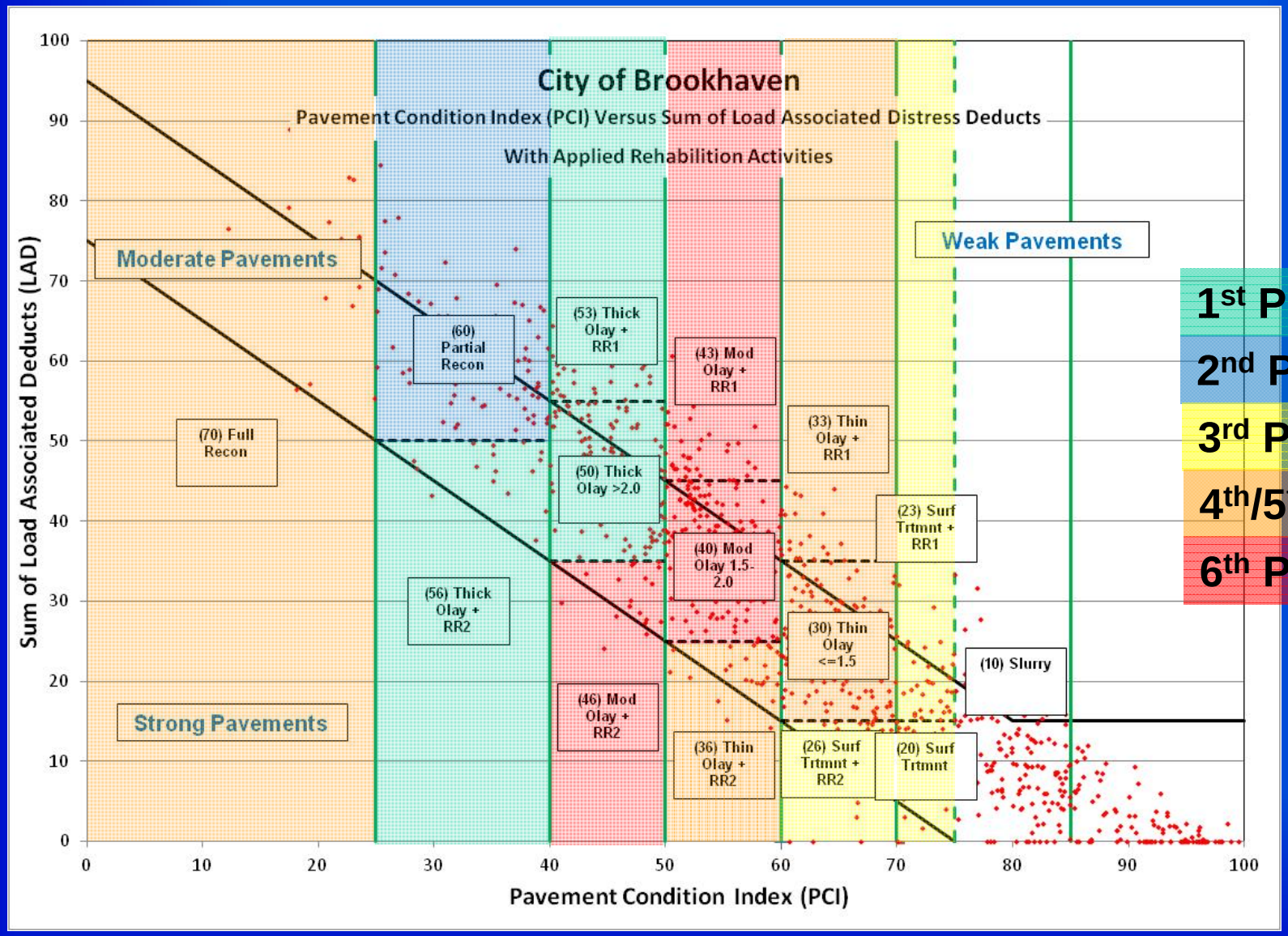
Brookhaven Results….

Average Network
PCI = 60
Backlog of reconstruction = 17%

Suggest a target PCI => 65
within 5 years
Backlog of reconstruction < 15%
within 10 years



Brookhaven Rehabilitation Needs



1st Priority

2nd Priority

3rd Priority

4th/5th Priority

6th Priority

Brookhaven Annual Funding Estimates

Based on Network Value Life Cycle Analysis

Pavement Type	Pavement Value ($)	Ultimate Life Span (yrs)	Life Cycle Annual Cost ($/yr)
Asphalt Network	88,550,000	65	1,360,000
Concrete Network	0	150	0
All Streets	**88,550,000**		**1,360,000**

Based on Current Condition Life Cycle Analysis

Pavement Type	Pavement Condition Index (PCI)	Typical Rehab Based on Condition	Blended Rehab Unit Rate ($/yd2)	Average Rehab Life Cycle (yrs)	Miles To Do Each Year (mi)	Cost Per Mile ($/mi)	Life Cycle Annual Cost ($/yr)
Asphalt Network	60	Thin Olay	11.15	15	8.1	180,000	1,460,000
Concrete Network	0	0	0.00	0	0.0	0	0
All Streets							**1,460,000**

Brookhaven Annual Funding Estimates

Based on Estimated Total Network Deficiency and Life Cycle Cost				
Asphalt Deficiency	Total Cost ($)	% of Total	Life Cycle (years)	Life Cycle Cost ($)
Full Reconstruction	888,800	3.5	50	18,000
Partial Reconstruction	6,534,700	25.8	30	218,000
Thick Olay	5,500,700	21.7	20	275,000
Moderate Olay	6,866,200	27.1	15	458,000

Brookhaven's steady state budget is estimated at just under $1.5 million annually (not including any curb or gutter repairs)

with

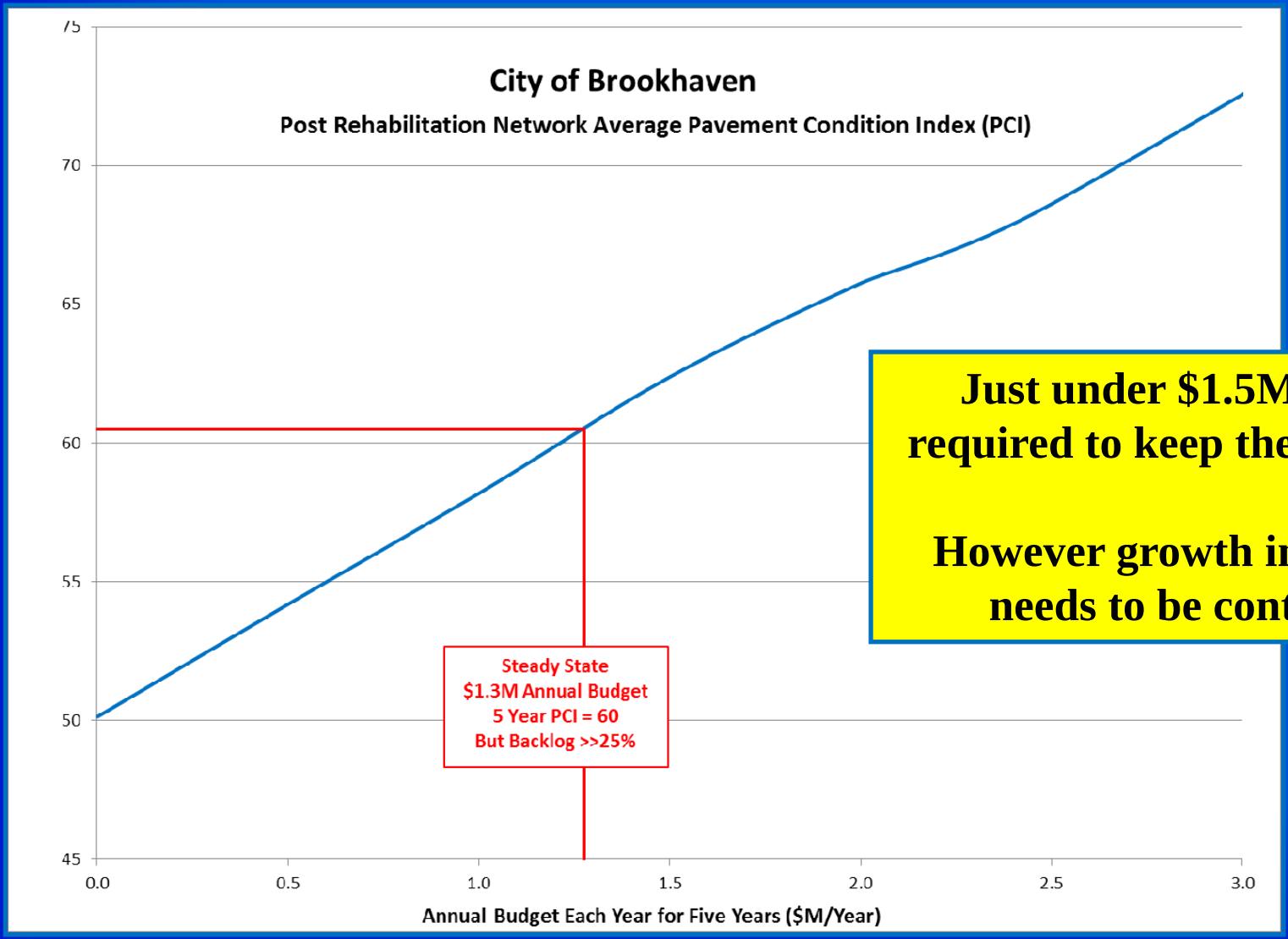
about $2.5 to $3.0 required to target a PCI > 65 and control growth in backlog, and even slightly more for ADA

Network Funding Comparison

Agency	State	Year	Mileage (mi)	PCI	Backlog	Steady State Budget ($M/yr)	Steady State Rate ($/mi)	Actual Funding ($M/yr)	Comments
Agency H	KS	2010	120	70	4%	$0.85	$7,000	$0.50	Underfunded
Agency MF	OR	2013	270	77	3%	$3.00	$11,000	$2.25	Slightly underfunded, verl low backlog
Agency B	CO	2010	442	78	6%	$3.20	$7,000	$1.60	Slightly underfunded
Agency K	TX	2010	188	76	9%	$1.50	$8,000	$1.50	Fully funded
Agency Y	CA	2011	199	68	5%	$1.60	$8,000	$1.00	Underfunded, decreasing PCI
Agency CY	WY	2010	314	68	4%	$2.50	$8,000	$2.50	Fully funded
Agency TC	TX	2010	1270	68	7%	$11.00	$9,000	$8.00	Underfunded
Agency LC	PA	2012	102	59	15%	$1.00	$10,000	$0.75	Underfunded
Agency BV	OK	2012	130	65	11%	$1.25	$10,000	$1.25	Fully funded and working to increase PCI
Agency WF	TX	2012	170	66	15%	$1.40	$8,000	$0.75	Underfunded
Agency FW	WA	2011	233	79	4%	$2.25	$10,000	$2.25	Fully funded, well structured
Agency CG	AZ	2010	310	76	4%	$3.00	$10,000	$2.00	Underfunded
Agency CB	CA	2010	333	81	2%	$3.40	$10,000	$3.40	Fully funded
Agency KW	FL	2012	65	65	7%	$0.75	$12,000	$0.75	Fully funded
Agency ST	WA	2011	78	76	4%	$0.90	$12,000	$2.25	Fully funded, well structured
Agency LC	NM	2012	457	63	17%	$5.60	$12,000	$3.00	Underfunded and concerned about backlog
Agency C	CO	2012	442	64	12%	$6.00	$14,000	$5.00	Slightly underfunded
Agency F	ND	2012	439	72	9%	$6.00	$14,000	$4.00	Underfunded
Agency FT	CA	2013	497	73	7%	$6.50	$13,000	$6.50	Fully funded, well structured
Agency LA	NM	2010	100	67	11%	$1.50	$15,000	$1.50	Fully funded and working to increase PCI
Agency SS	GA	2012	311	72	10%	$4.75	$15,000	$3.20	Underfunded, does not do surface treatments
Agency L	NE	2012	339	77	9%	$5.25	$15,000	$5.00	Slightly underfunded, majors only
Agency V	CA	2012	472	60	14%	$7.50	$16,000	$2.50	Unde nded and concerned about backlog
Agency LM	CA	2010	141	76	12%	$2.40	$17,000	$2.00	[illegible]
Agency DW	GA	2009	147	69	14%	$2.75	$19,000	$2.75	[illegible]
Agency C	CA	2011	54	66	12%	$1.10	$20,000	$1.10	[illegible]
Agency GD	AZ	2009	717	71	4%	$15.00	$21,000	$2.00	[illegible]
Agency D	TX	2010	436	61	16%	$10.00	$23,000	$3.20	Extre ely underfunded and passing a bond
Agency LV	WA	2011	108	68	7%	$2.80	$26,000	$0.55	Underfunded - looking for alternate funding
Agency DL	CA	2010	578	68	14%	$18.50	$32,000	$8.50	Very high unit rates for providing a high LOS
						Average:	**$14,000**		

At $2.5 to $3.0M/yr expect much better PCI than 60

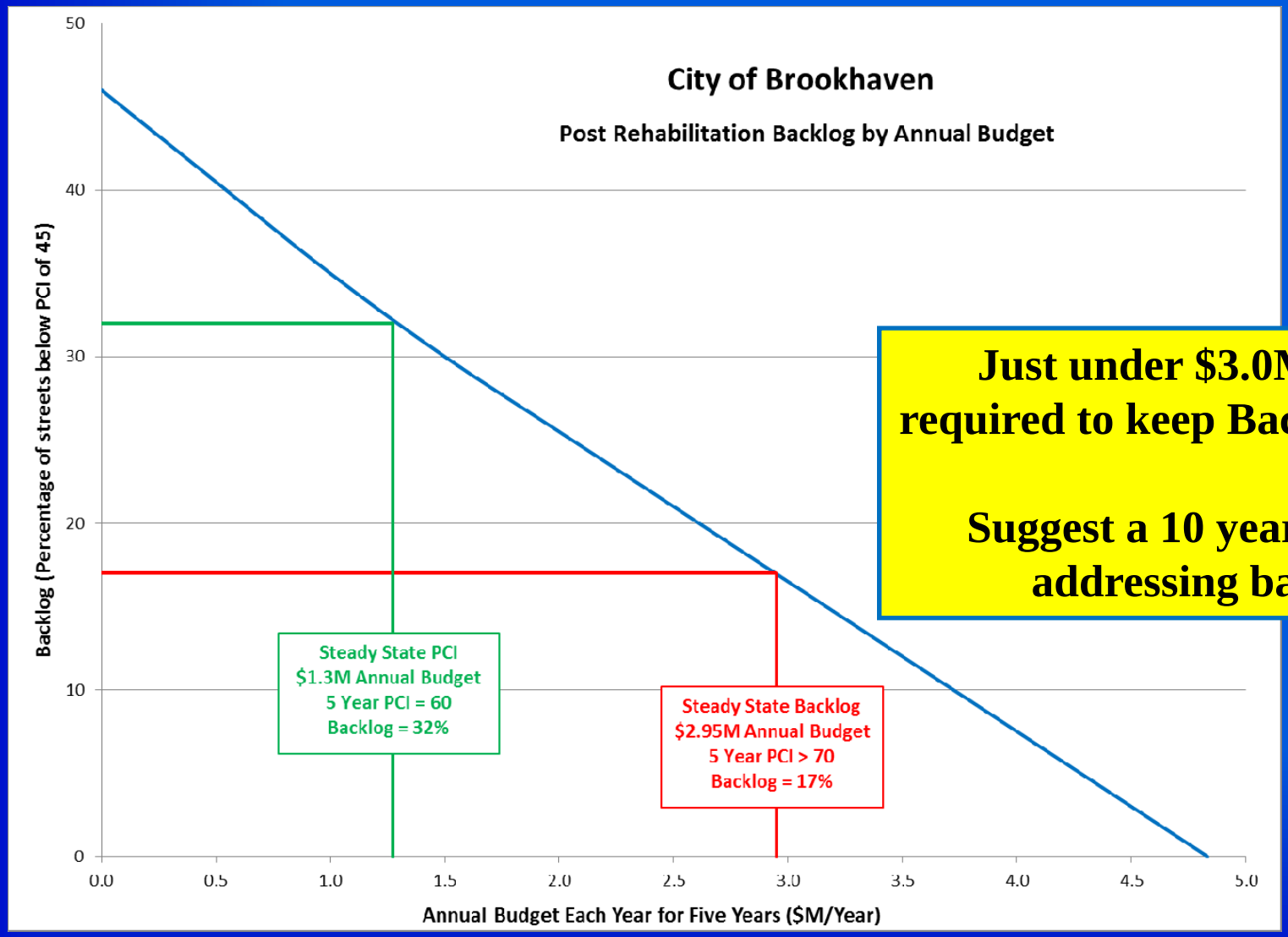
Brookhaven Steady State PCI Budget



Just under $1.5M/year is required to keep the PCI at 60

However growth in backlog needs to be controlled

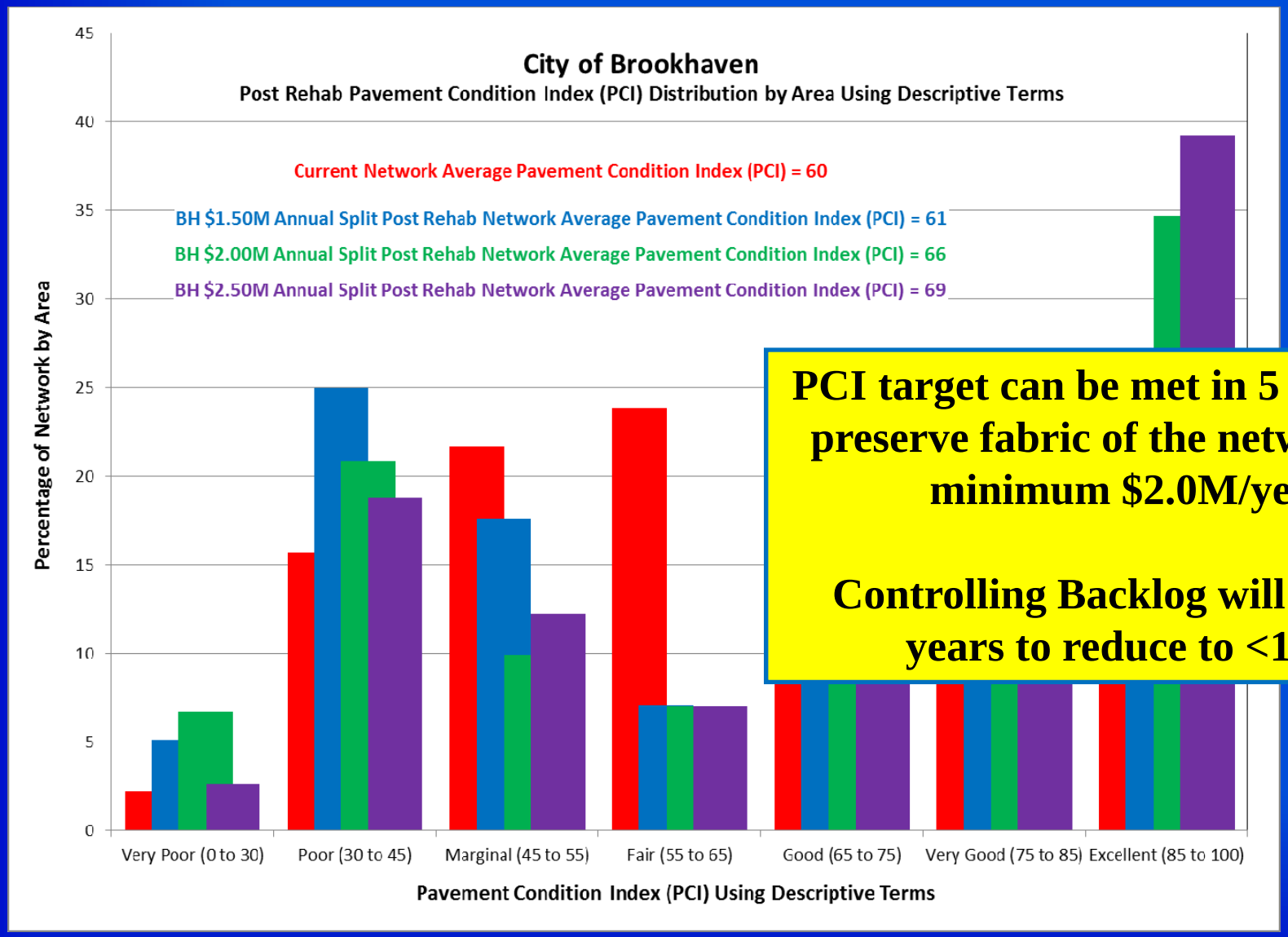
Brookhaven Controlling Growth in Backlog



Just under $3.0M/year is required to keep Backlog at 17%

Suggest a 10 year plan for addressing backlog

Brookhaven 5 Year Analysis Results



PCI target can be met in 5 years and preserve fabric of the network at a minimum $2.0M/year

Controlling Backlog will take 10 years to reduce to <15%

Questions….

2014 Paving Recommendation

Street Name	From Street	To Street	Agency Functional Class	SuperSeg Length (ft)	SuperSeg Area (yd2)	SuperSeg Strength Rating	SuperSeg PCI	Rehab Activity	Est Segment Cost ($)	Final PCI
2013 Paving (Approved)										
Dunwoody Pl	Victor Rd	NORTH END	Local	914	2852	Weak	50	Mod Olay + RR2 (1.5-2.0)		87
Etowah Dr	Ellijay Dr	Appalachee Dr	Local	481	1389	Weak	55	Mod Olay + RR2 (1.5-2.0)		87
Hunters Brook Ct	Mabry Rd	NE END	Local	407	1357	Moderate	46	Mod Olay + RR2 (1.5-2.0)		87
Pamela Dr	Tryon Rd	Cravenridge Dr	Local	758	2189	Weak	57	Mod Olay + RR2 (1.5-2.0)		87
Stratfield Dr	Stratfield Cir	Ashford Dunwoody Rd	Local	1088	3023	Weak	45	Mod Olay + RR2 (1.5-2.0)		87
								Total 2013 Paving (Actual Bid)	**$ 206,193**	
2014 Paving (Recommended)										
Arterial/Collector Roads										
Ashford Dunwoody Rd	Harts Mill Rd	S Johnson Ferry Rd SE	Arterial	3982	16701	Moderate	48	Thick Olay (>2.0)	$ 360,273	87
Lenox Park Blvd	N Druid Hills Rd	CITY LIMITS	Collector	6007	27649	Weak	32	Partial ACP Recon	$ 963,282	90
								Total Arterial/Collector Roads (Est)	**$ 1,323,555**	
Local Roads										
Appalachee Dr	Dresden Dr	Canoochee Dr	Local	1428	4014	Weak	46	Thick Olay (>2.0)	$ 64,142	88
Aragon Way	N Thompson Rd	Ashford Rd	Local	979	2829	Weak	47	Thick Olay (>2.0)	$ 45,194	88
Berkford Ct	Berkford Cir	SE END	Local	522	1449	Weak	17	Full ACP Recon / Partial Local	$ 32,595	91
Brawley Cir	Brawley Cir @TEE	EAST END	Local	3242	9237	Weak	55	Moderate Olay (1.5-2.0)	$ 123,254	87
Brookhaven Ln	Mabry Rd	WEST END	Local	392	1352	Weak	30	Partial ACP Recon	$ 48,006	91
Brookhaven Trce	SW END	Ashford Dunwoody Rd	Local	705	1959	Moderate	46	Thick Olay (>2.0)	$ 31,300	88
Brookhaven Walk	Osborne Rd NW	Osborne Rd SE	Local	790	1842	Moderate	55	Moderate Olay (1.5-2.0)	$ 24,581	87
Camille Dr	NE END	Dresden Dr	Local	1507	4107	Weak	56	Mod Olay + RR1 (1.5-2.0)	$ 59,943	87
Converse Dr	CITY LIMITS	NE END	Local	293	846	Moderate	66	Thin Olay (<=1.5)	$ 9,053	86
Coosawattee Dr	Cartecay Dr	Tugaloo Dr	Local	381	890	Weak	46	Thick Olay + RR1 (>2.0)	$ 15,326	88
Dorby Park Dr	Osborne Rd	EAST END	Local	626	1874	Weak	46	Thick Olay (>2.0)	$ 29,922	88
Downing Ln	Byrnwyck Pl	NORTH END	Local	492	1686	Weak	46	Thick Olay (>2.0)	$ 26,943	88
Dunlap Ct	Hearst Dr	NE END	Local	102	509	Strong	18	Full ACP Recon / Partial Local	$ 11,459	92
Fox Glen Ct	Harts Mill Rd	NORTH END	Local	1247	3602	Moderate	55	Moderate Olay (1.5-2.0)	$ 48,053	87
Fuller Rd	Mabry Rd	Osborne Rd	Local	1129	3137	Weak	45	Thick Olay + RR1 (>2.0)	$ 54,070	88
Haven Brook Pl	Haven Brook Ln	WEST END	Local	170	433	Moderate	56	Moderate Olay (1.5-2.0)	$ 5,782	87
Hillstone Ct	Hampton Hall Dr	NW END	Local	300	799	Weak	18	Full ACP Recon / Partial Local	$ 17,974	91
Hillview Ave	SOUTH END	Windsor Pkwy	Local	433	1009	Moderate	45	Thick Olay (>2.0)	$ 16,128	88
Trentwood Pl	N Thompson Rd	Ashford Rd	Local	1223	3533	Moderate	45	Thick Olay (>2.0)	$ 56,447	88
								Total Local Roads (Est)	**$ 720,172**	
Patching										
Ashford Lake Ct	Harts Mill Rd	NE END	Local	1023	2160	Moderate	66	Preventative Mntc	$ 5,401	74
Cortez Ln	Coosawattee Dr	Cortez Way	Local	1809	4892	Strong	66	Preventative Mntc	$ 12,234	74
East Drew Valley Rd	Drew Valley Rd SOUTH	Drew Valley Rd NORTH	Local	356	1067	Moderate	65	Preventative Mntc	$ 2,668	74
Hearst Dr	Humility Ln	Humility Ln	Local	2569	6220	Moderate	65	Preventative Mntc	$ 15,550	74
								Total Patching (Est)	**$ 35,853**	
								Total 2013/2014 Paving (Est)	**$ 2,285,773**	
2013/2014 Paving Budget										
2013 City of Brookhaven Budget									$ 1,000,000	
2014 City of Brookhaven Budget									$ 1,000,000	
2014 GDOT Local Maintenance & Improvement Grant									$ 285,773	
								Total 2013/2014 Paving Budget	**$ 2,285,773**	