CITY OF ST. CHARLES ENGINEERING DEPARTMENT

PAVEMENT PLAN
PRESENTATION AT MAPA SPRING TRAINING

ST CHARLES STREET REPAIR

- 81.72 miles maintained
- 269.29 miles total
- 187.57 miles deferred

At the current rate it will take 33 years to touch every subdivision road in the City

HOW TO KEEP UP?

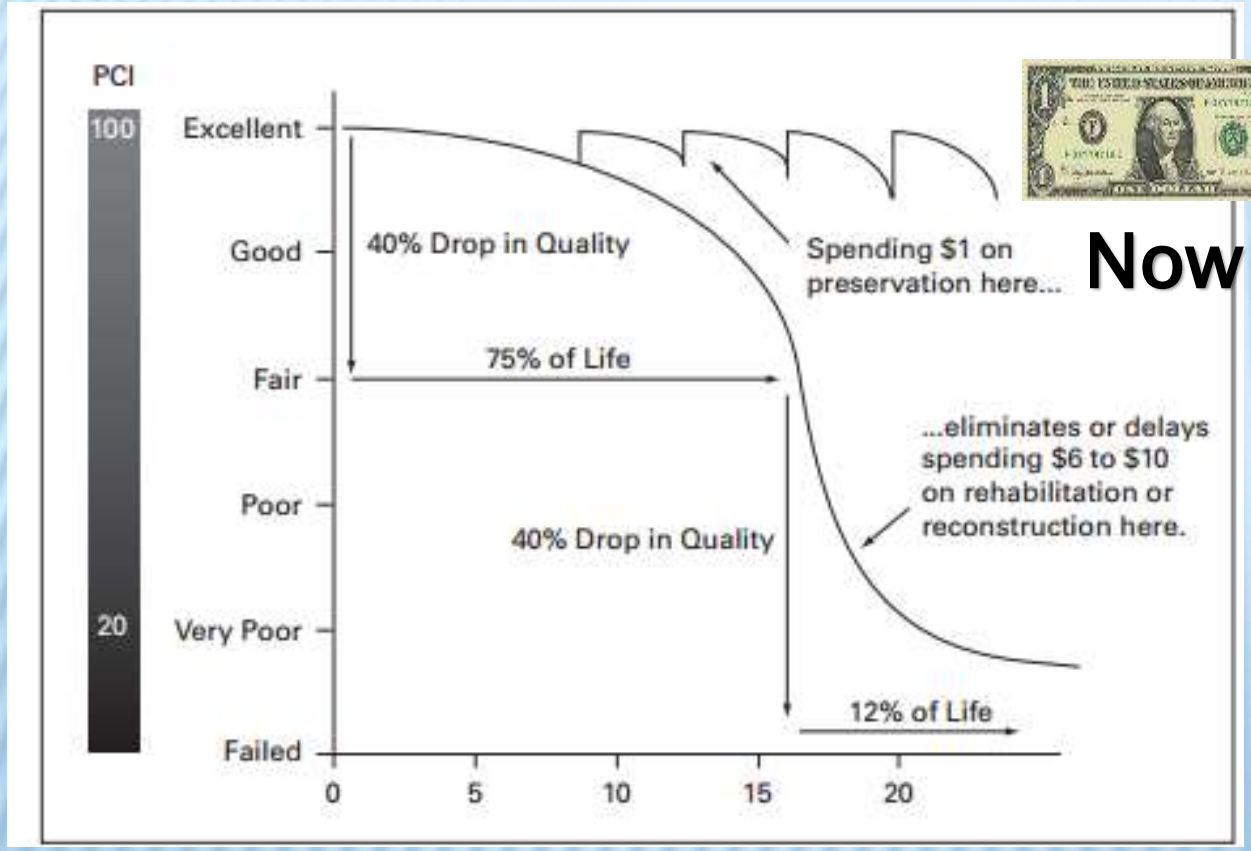
Spend more

Lower treatment costs per area

OLD WORK PLAN

- Subdivision approach
- Annual Concrete ($1M), Annual Asphalt ($1M), Repair List ($600k)
- Local/Alleys maintained separately from Arterials/Collectors
- Arterials and Collectors are maintained with Federal funds when eligible
- Fix broken curb sections with the pavement when it obstructs flow
- Repair List is reactive to complaints, Annual Concrete and Annual Asphalt based on critical work plan

EXTENDED SERVICE LIFE OF TREATMENTS



Now =

Later

FHWA Pavement Preservation Compendium

Source:

AASHTO
THE VOICE OF TRANSPORTATION

American Association of State Highway and Transportation Officials

PAVEMENT PRESERVATION PLANNING PROCESS

- Inventory of Pavement Condition
- Selection of Pavement Preservation Methods based on cost effectiveness
- Put together a work plan that maximizes performance
- Restart the process about every 5 years

PAVEMENT CONDITION COLLECTION

PAVEMENT MANAGEMENT PRINCIPLES

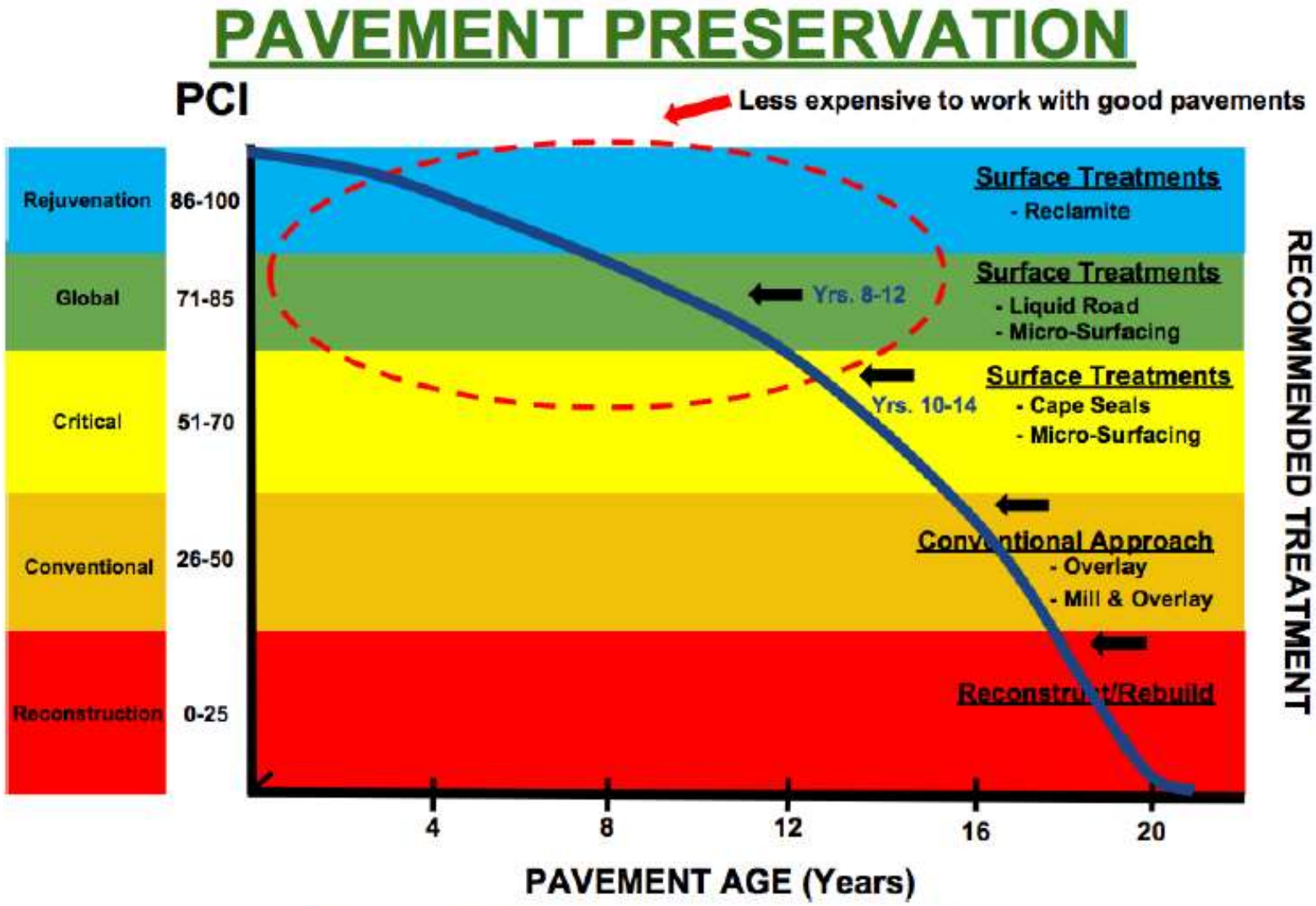


Figure 3.2.1 Pavement Preservation

EXTENDED SERVICE LIFE OF TREATMENTS

TABLE 1: Extended Service Life Gains for Preventative Maintenance Treatments

Treatment	Pavement Type	Extended Service Life (years)[a]
Overband crack filling	Flexible	Up to 2
	Composite	Up to 2
Crack sealing	Flexible	Up to 3
	Composite	Up to 3
	Rigid	Up to 3
Single chip seal	Flexible	3 to 6
	Composite	N/A[b]
Double chip seal	Flexible	4 to 7
	Composite	3 to 6
Slurry seal	Flexible	N/A[b]
	Composite	N/A[b]
Microsurfacing (single course)	Flexible	3 to 5[c]
	Composite	N/A[b]
Microsurfacing (multiple course)	Flexible	4 to 6[c]
	Composite	N/A[b]
Ultrathin hot-mix asphalt, .75-in. (20-mm) overlay	Flexible	3 to 5[c]
	Composite	3 to 5[c]
Hot-mix asphalt, 1.5-in. (40-mm) overlay	Flexible	5 to 10
	Composite	4 to 9
Hot-mix asphalt, 1.5-in (40-mm) Mill and overlay	Flexible	5 to 10
	Composite	4 to 9
Joint resealing	Rigid	3 to 5
Spall repair	Rigid	Up to 5
Full-depth concrete repairs	Rigid	3 to 10
Diamond grinding	Rigid	3 to 5[c]
Dowel-bar retrofit	Rigid	2 to 3[c]
Concrete pavement restoration	Rigid	7 to 15[c]

Notes

[a] The time range is the expected life-extending benefit given to the pavement, not the anticipated longevity of the treatment.

[b] Sufficient data are not available to determine life-extending value.

[c] Additional information is necessary to quantify the extended life more accurately.

PAVEMENT DETERIORATION CURVES

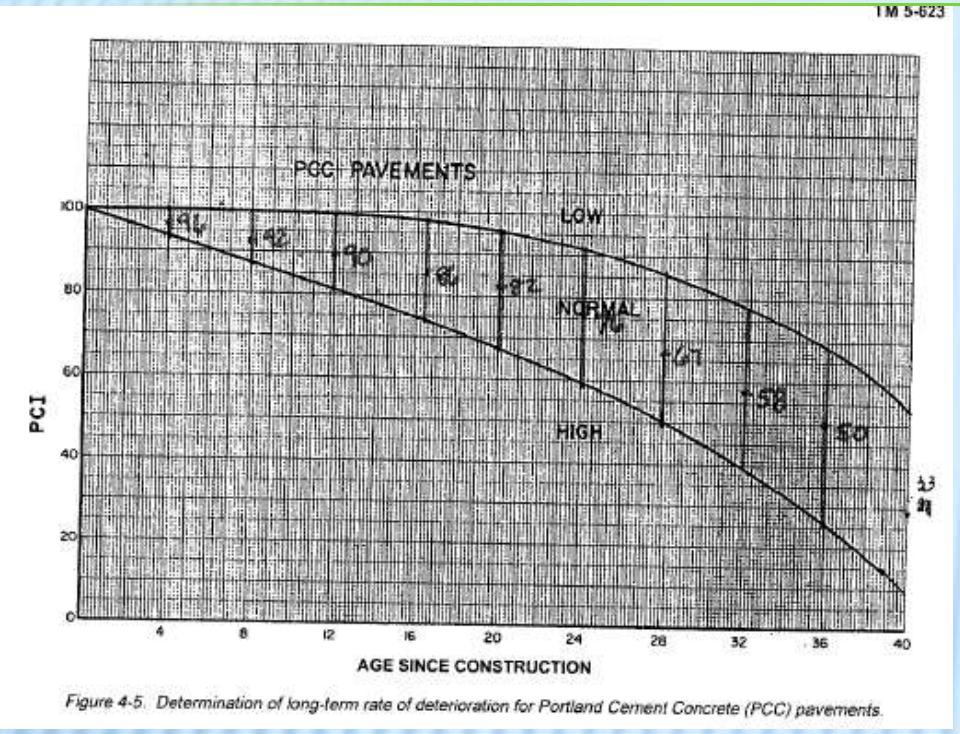


Figure 4-5. Determination of long-term rate of deterioration for Portland Cement Concrete (PCC) pavements.

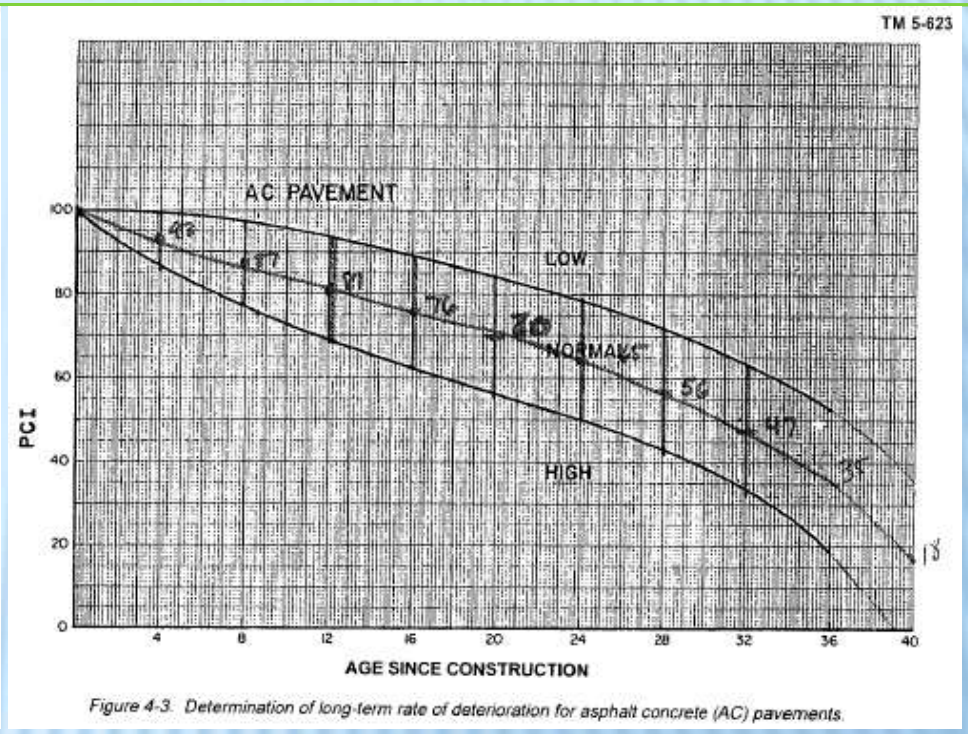


Figure 4-3. Determination of long-term rate of deterioration for asphalt concrete (AC) pavements.

Technical Manual – Pavement Maintenance Management – Department of the Army

Year ->	2015	2020	2025
	PCI	PCI	PCI
STREET A	70.0	-	-
STREET B	-	51.7	-
STREET C	-	-	33.7
	Rehab Cost	Rehab Cost	Rehab Cost
STREET A	$ 100,000.00	$ -	$ -
STREET B	$ -	$ 450,000.00	$ -
STREET C	$ -	$ -	$ 690,000.00
ANNUAL TOTAL	**$ 100,000.00**	**$ 450,000.00**	**$ 690,000.00**

GRAND TOTAL
$ 1,240,000.00

TOTAL COST DIFFERENCE OF $230,000

ST CHARLES NEW TREATMENTS

- HIGH DENSITY MINERAL BOND
- THINLAY ASPHALT
- UNDERSEALING CONCRETE

HIGH DENSITY MINERAL BOND

- Closed to traffic for 24 hours
  - Contractor plans for ingress and egress during this period
- 7 year design life
- No milling required
- Surface looks uniformly new when complete
- Used in 14 states including Kansas, Tennessee, Utah, Nevada, Texas

THINLAY ASPHALT

- Open to traffic immediately
- 9 year design life
- Minimal milling required
- Surface looks uniformly new when complete

UNDERSEALING CONCRETE

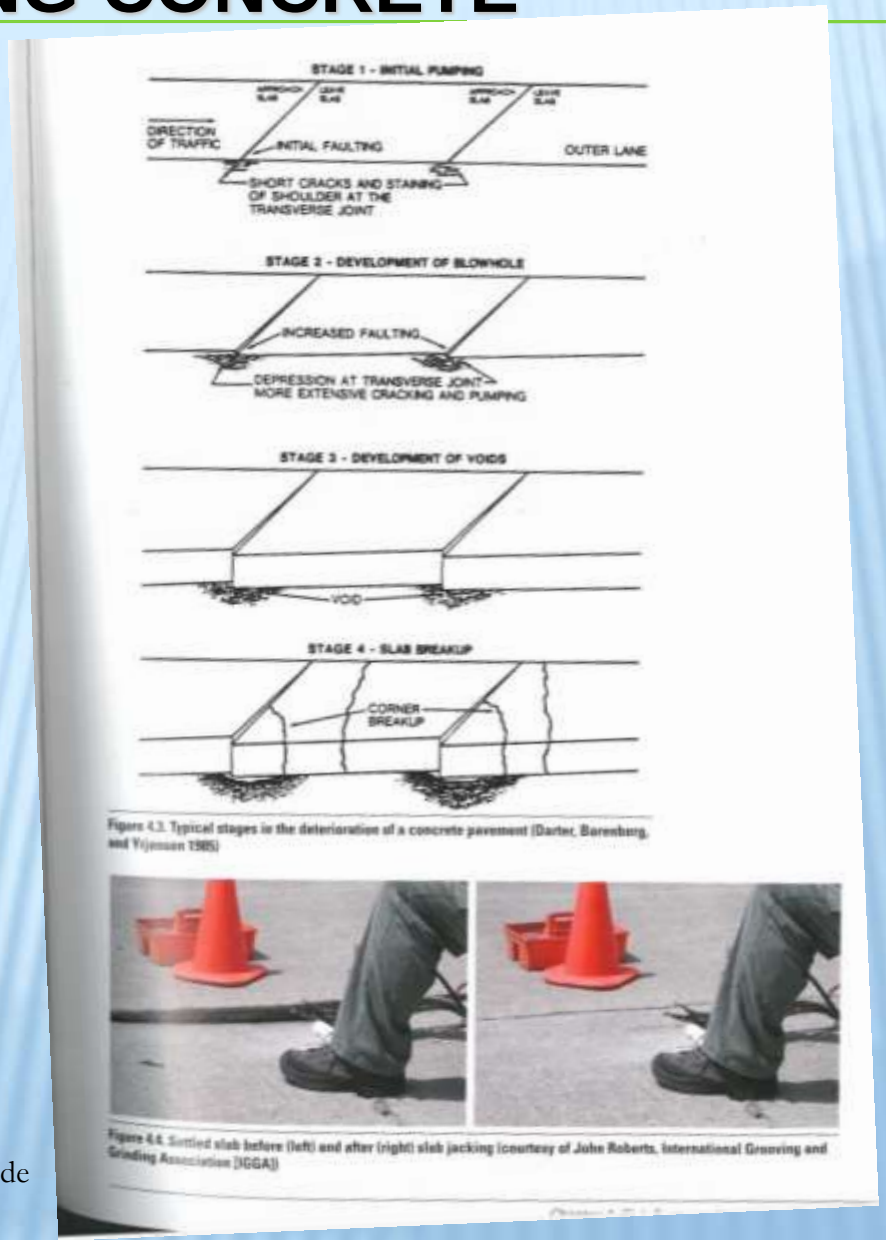
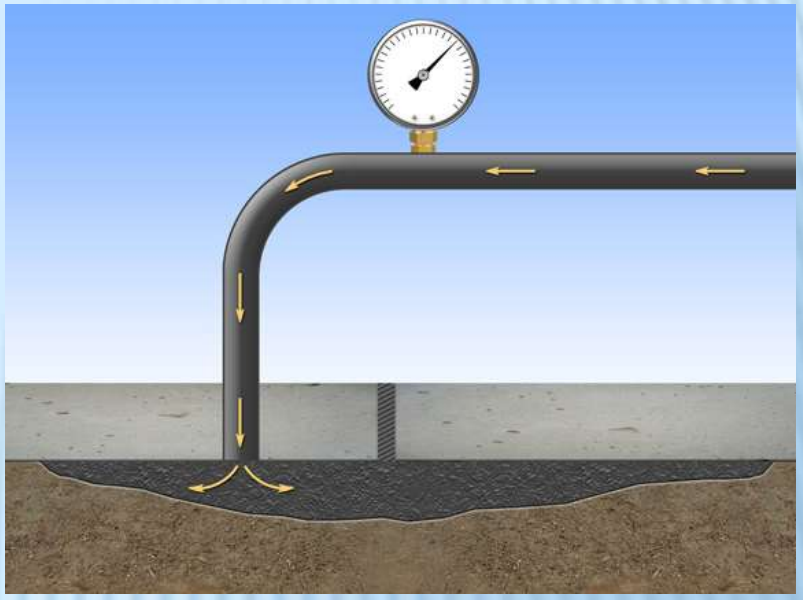


Figure 4.3. Typical stages in the deterioration of a concrete pavement (Darter, Barenberg, and Yrjanson 1985)

Figure 4.4. Settled slab before (left) and after (right) slab jacking (courtesy of John Roberts, International Grooving and Grinding Association [IGGA])

UNDERSEALING CONCRETE



- Open to traffic in one hour
- Can be used remove localized low spots (bird baths)
- Used to level joint and crack displacements (bumps)
- Provides a stable base for future pavement performance
- Surface looks the same as prior to treatment

EXISTING TREATMENT APPLICATION

- **Do more:**
  - **Cracksealing**

- **Do less:**
  - **Full depth concrete repair**
  - **2 inch mill and fill**
  - **Full depth replacement**

CONCRETE MAINTENANCE COSTS

Crack and Joint Sealing **$1.08/sqyd.**

Undersealing **$2.62/ sqyd.**

Novachip Overlay **$13.85/ sqyd.**

Slab Replacement **$65.00/sqyd.**

ASPHALT MAINTENANCE COSTS

High Density Mineral Bond **$2.75/sqyd.**

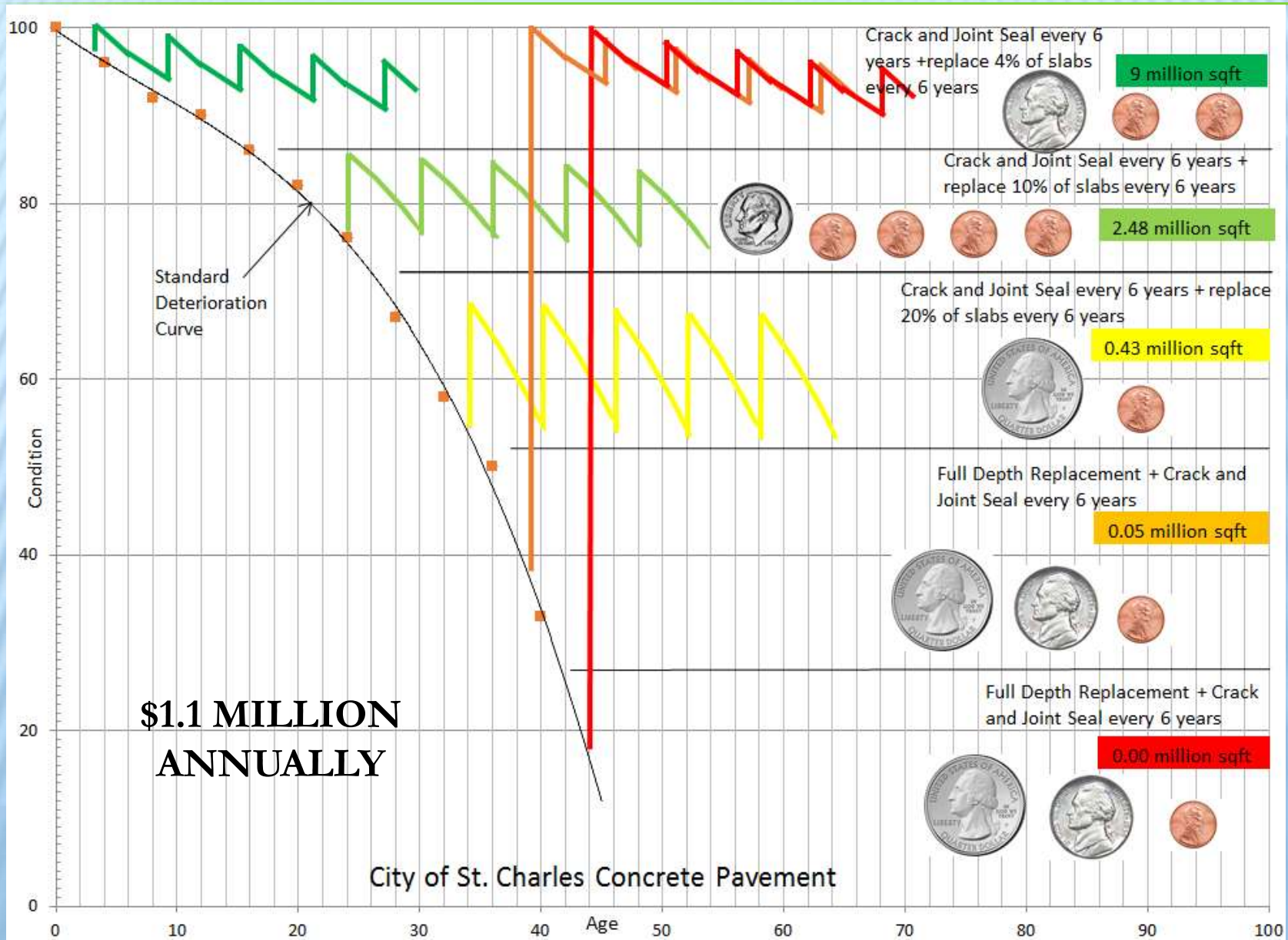
Thinlay **$6.80/sqyd.**

Novachip **$13.85/sqyd.**

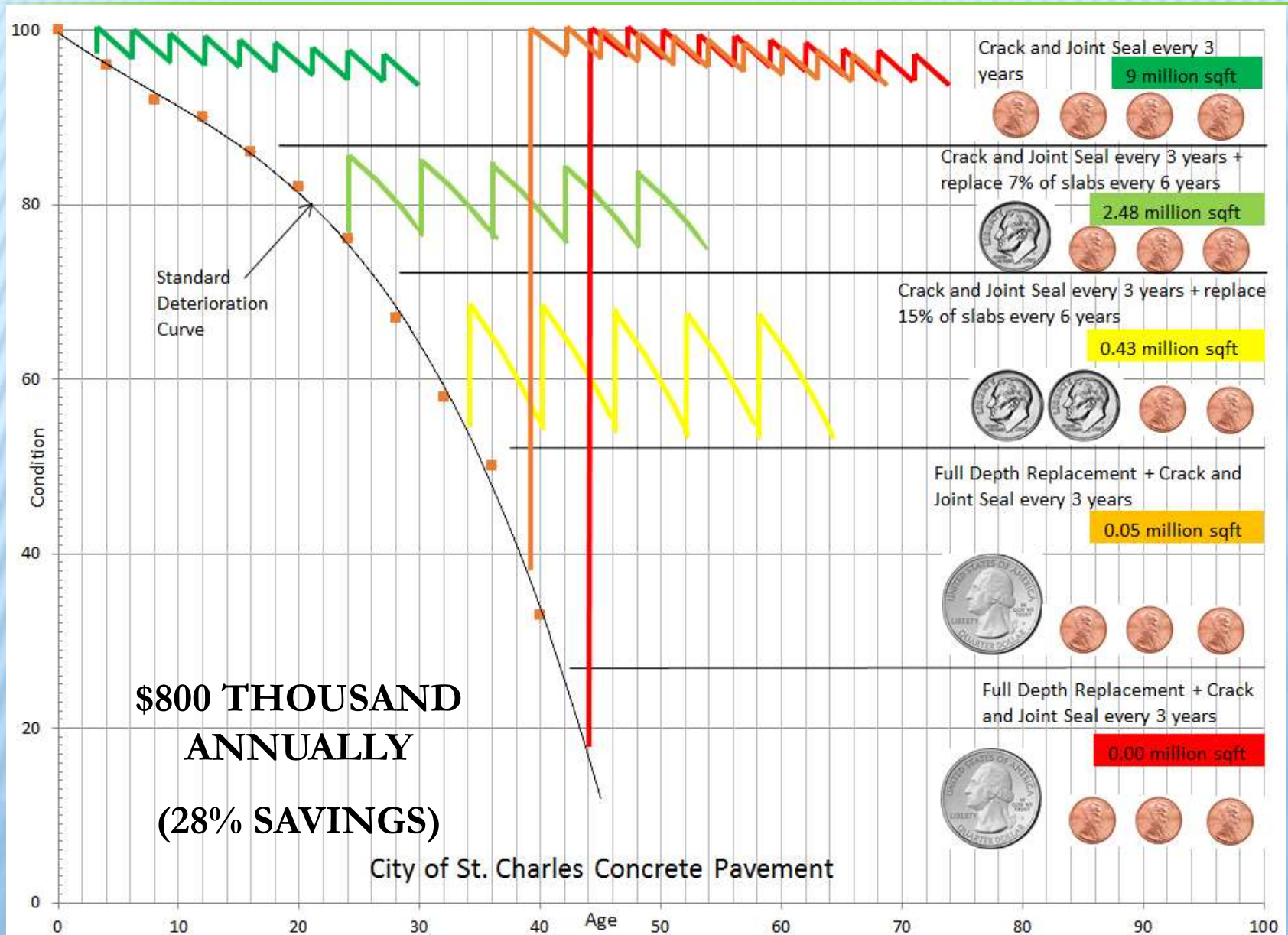
2 inch Mill /Fill **$25.55/sqyd.**

Full depth replacement **$60.00/sqyd.**

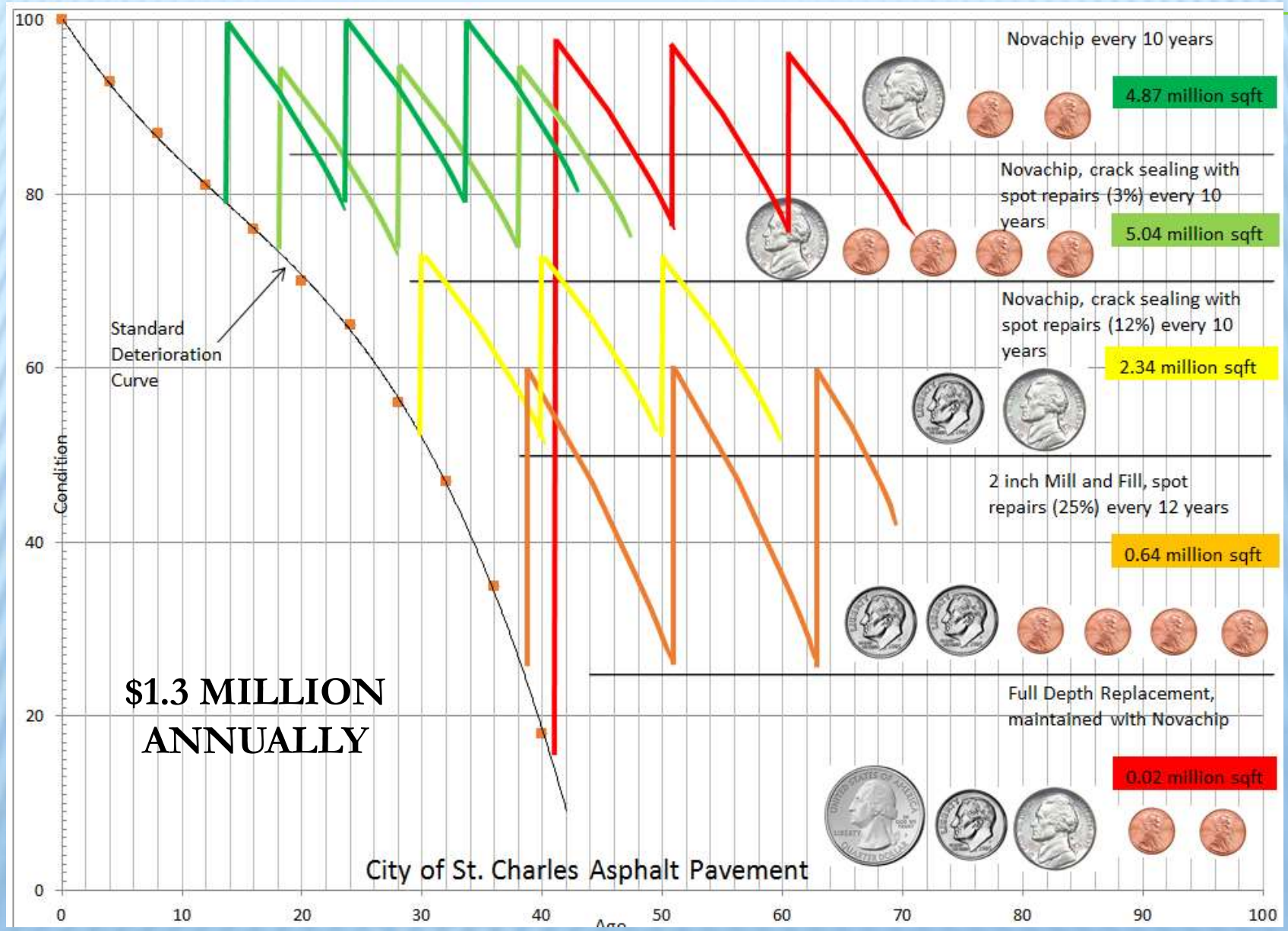
EXISTING CONCRETE SUBDIVISION APPROACH



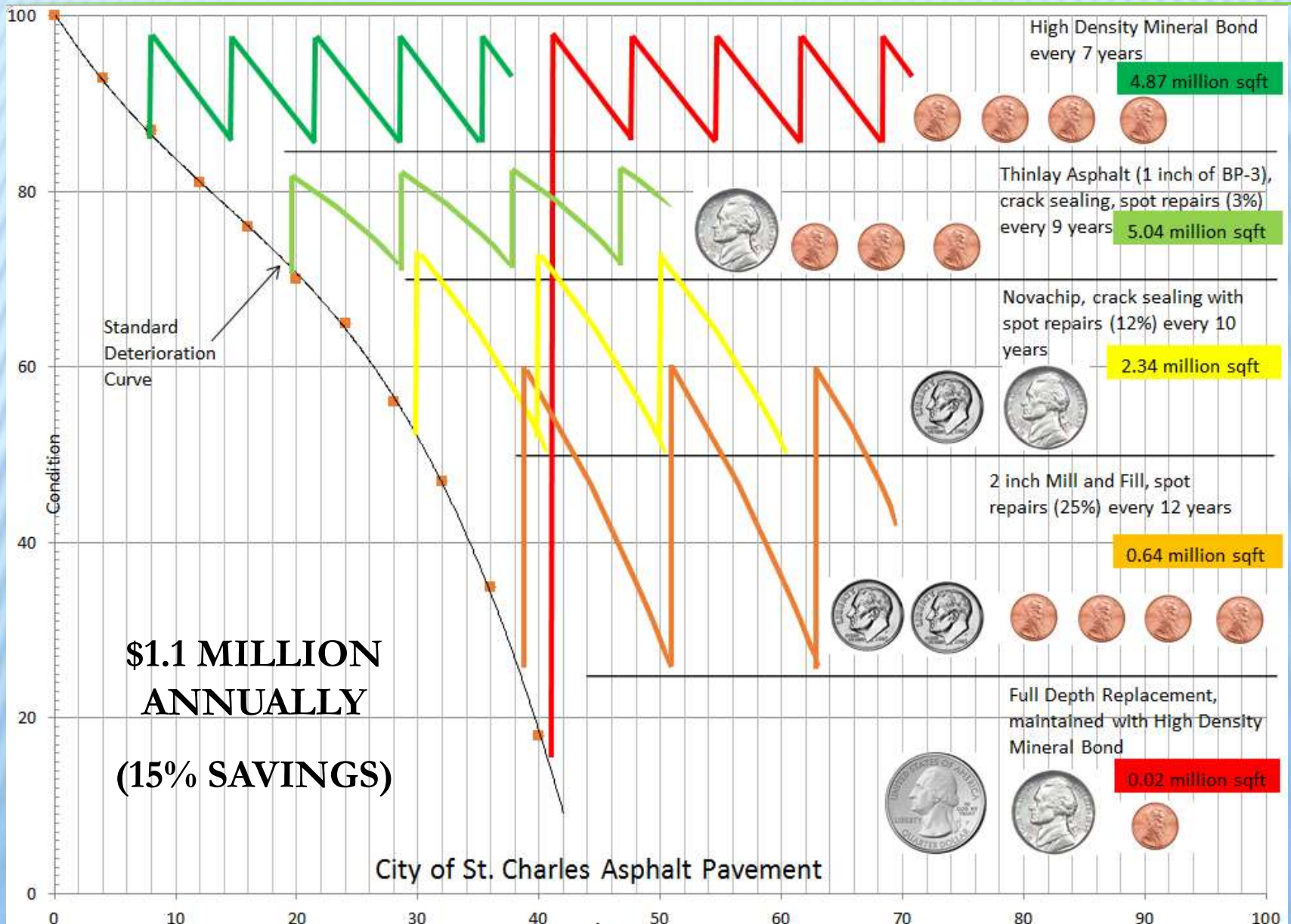
PROPOSED CONCRETE SUBDIVISION APPROACH



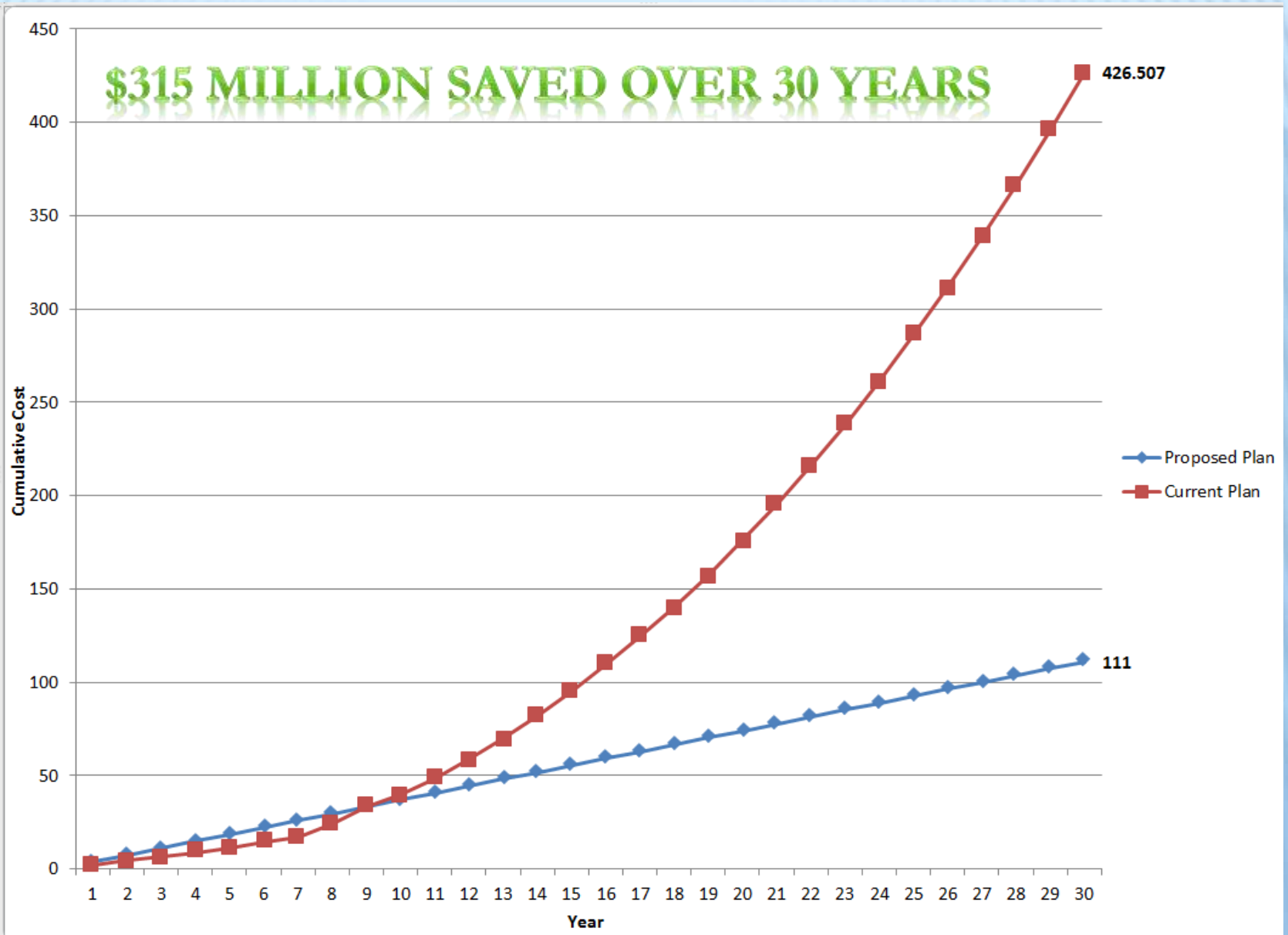
EXISTING ASPHALT SUBDIVISION APPROACH



PROPOSED ASPHALT SUBDIVISION APPROACH



PAVEMENT PRESERVATION VS. REPLACEMENT



PERCEPTION OF PAVEMENT CONDITION

2016 Concrete Project

2016 Asphalt Project

NEW WORK PLAN

Arterials and Collectors (Annually)

• Crackseal	$535,000
• Slab Replacement	$320,000
• High Density Mineral Bond	$ 60,000
• Thinlay	$480,000
• Novachip	$300,000
• Mill/Fill	$ 90,000
	Total $1,775,000

NEW WORK PLAN

Subdivision Streets and Alleys (Annually)

• Crackseal	$480,000
• Slab Replacement	$320,000
• High Density Mineral Bond	$200,000
• Thinlay	$400,000
• Novachip	$350,000
• Mill/Fill	$160,000
• Full Depth Asphalt	$ 10,000
Total	$1,920,000

GRAND TOTAL WITH ARTERIALS $3,695,000

QUESTIONS?