VDOT Hi-Polymer Asphalt – Implementation of NCAT Test Track Research

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What is Hi-Polymer Asphalt ?

Material

- Most binder is typically PG64-22
- Polymer modification to get PG76-22 (typically 2.5% - 3%)
- Hi-Polymers (SBS) are typically about 7.5%
- HP spec. requires PG76-28E with min. elastic recovery of 90%

Properties

- More flexible
- Stiff but not brittle

Performance

- Improved resistance to rutting
- Improved resistance to thermal (environmental) cracking
- Improved resistance to fatigue cracking

NCAT Experience

Test Section N7 (2009)

- Hi-Polymer mixes
- 5.75” Hi-Polymer section
- 7” control section
- Hi-Polymer section - less rutting

Test Section N8 (2010)

- OK heavy pavement
- Original section failed
- Hi-Polymer mix used
- Performed very well

Why Hi-Polymer Asphalt ?

Potential Benefits – Low Volume Roadways

- Reduce the amount of patching
- Improve performance (less cracking)
- Longer life cycle

Potential Benefits – High Volume Roadways

- Delay the onset of reflective cracking (composite pavements)
- Improve fatigue resistance = improved performance
- Reduced pavement thickness for same performance

Potential Challenges

- Increased cost of polymer modified binder
- Hand work is very difficult with some mixes

Hi-Polymer Applications in NoVa

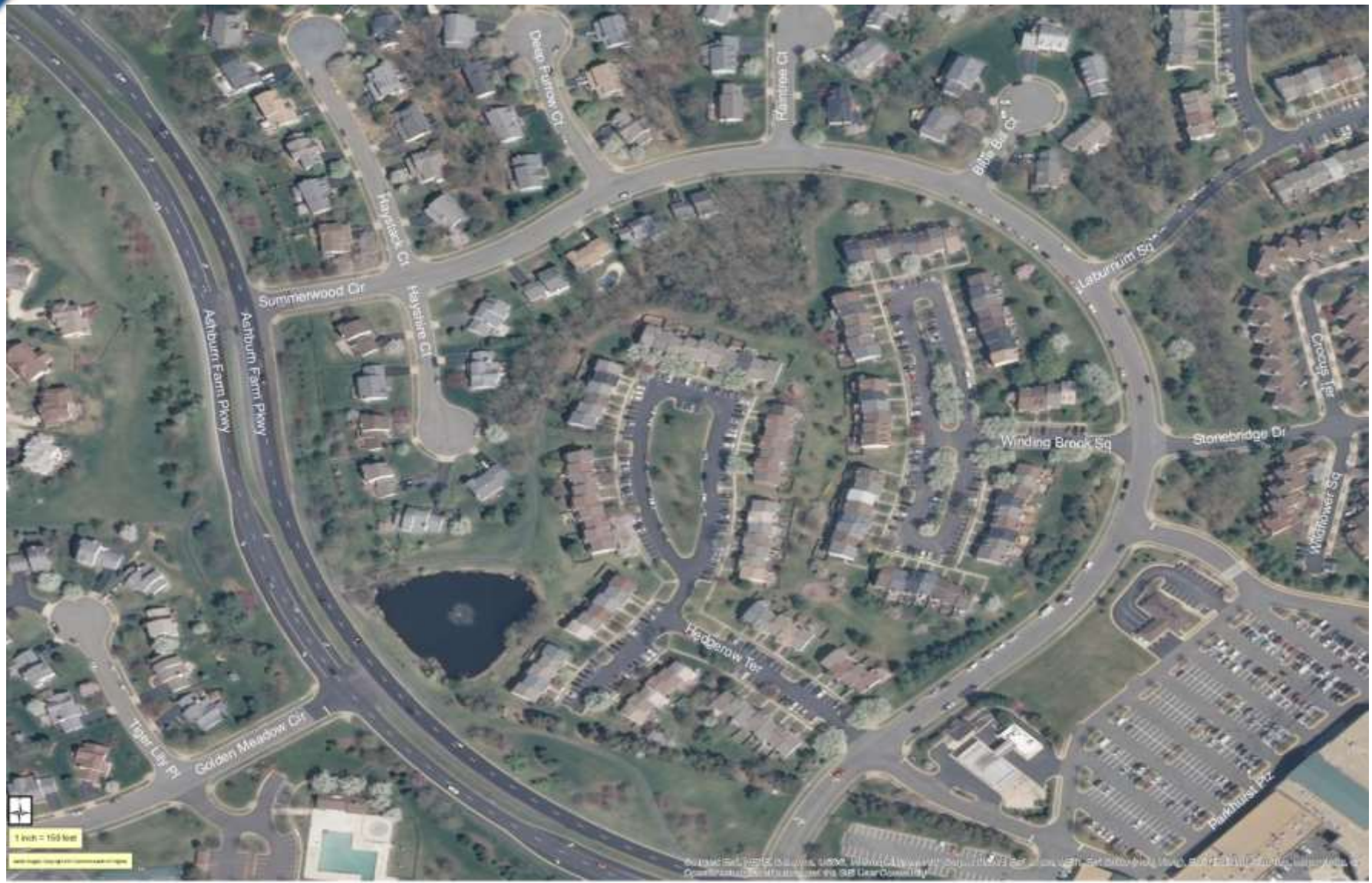
Subdivision

- Summerwood Circle and cul-de-sacs
- Completed paving in August, 2014
- SM-9.5A HP and control SM-9.5A HR

Interstate

- I-95 in Prince William County
- Paving in Summer/Fall, 2015
- SM-12.5E HP, SM-9.0E HP, SMA-9.5 HP

Summerwood Subdivision



Summerwood Subdivision

Background

- Typical subdivision streets
- CCI ratings 6 to 34, average 20

Summerwood Subdivision

Pavement Structures

- Cul-de-sac
- Typically 3” AC over 6” aggregate
- Fatigue and thermal/environmental cracking

Summerwood Subdivision

Pavement Structures

- Summerwood Circle
- Typically 4.5” AC over 8” aggregate
- Thermal /environmental cracking

Summerwood Subdivision

Milled Surfaces (Cul-de-sacs)

- Thin structures
- Base layers cracked

Summerwood Subdivision

Milled Surfaces – Summerwood Circle

- **Thicker structure**
- **Mostly block cracking**

Summerwood Subdivision

Summerwood Subdivision

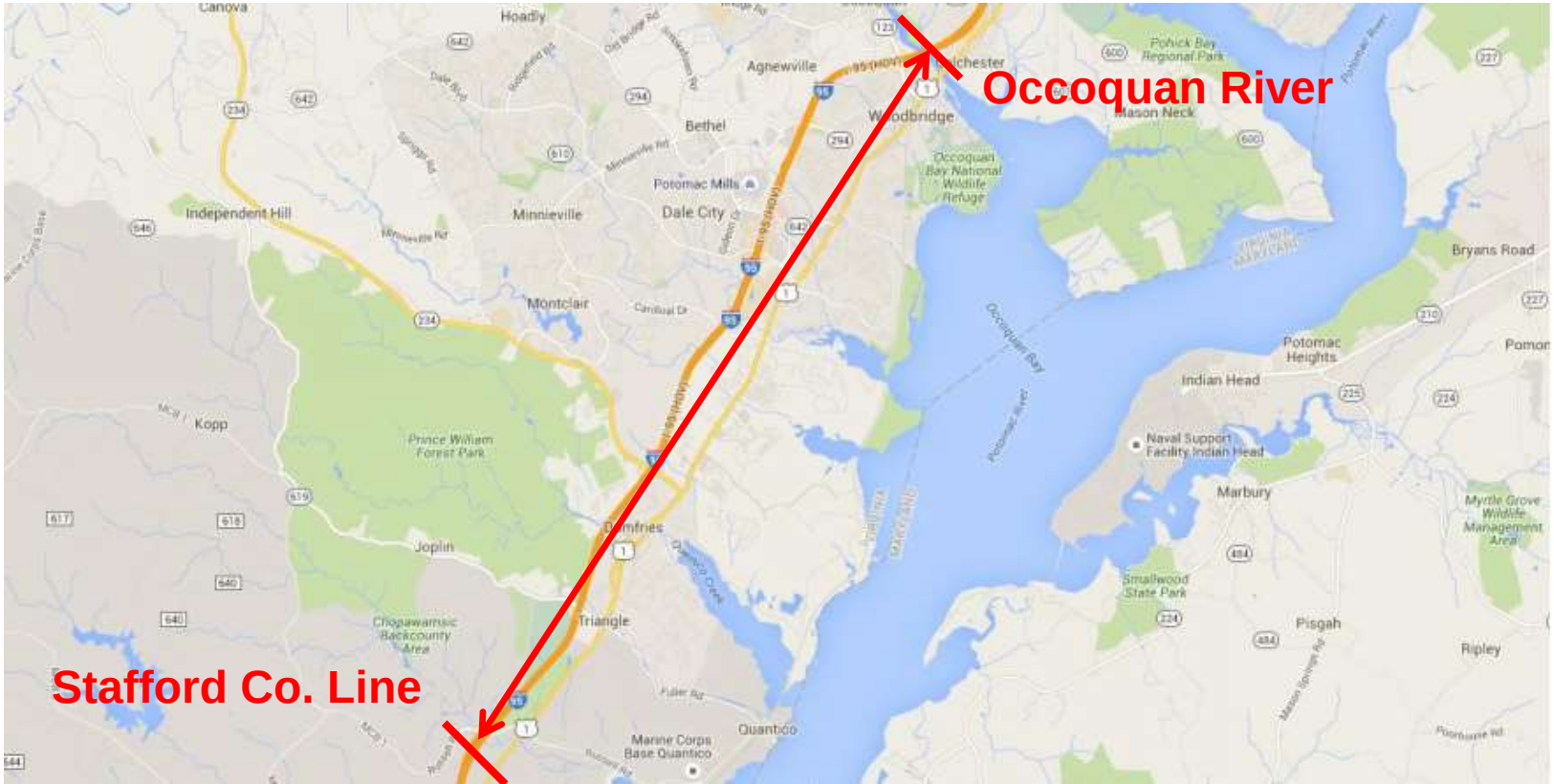
Summerwood Subdivision

Summerwood Subdivision

I-95 in Prince William County

Background

- Composite pavement (PCC overlaid with 4”-5” of AC)
- Reflective cracking at transverse joints
- Last milled/resurfaced with SMA in late 1990s



I-95 Pavement Conditions

Reflective Cracking

- **Medium Severity**

I-95 Pavement Conditions

Reflective Cracking

- **High Severity**

I-95 Pavement Conditions

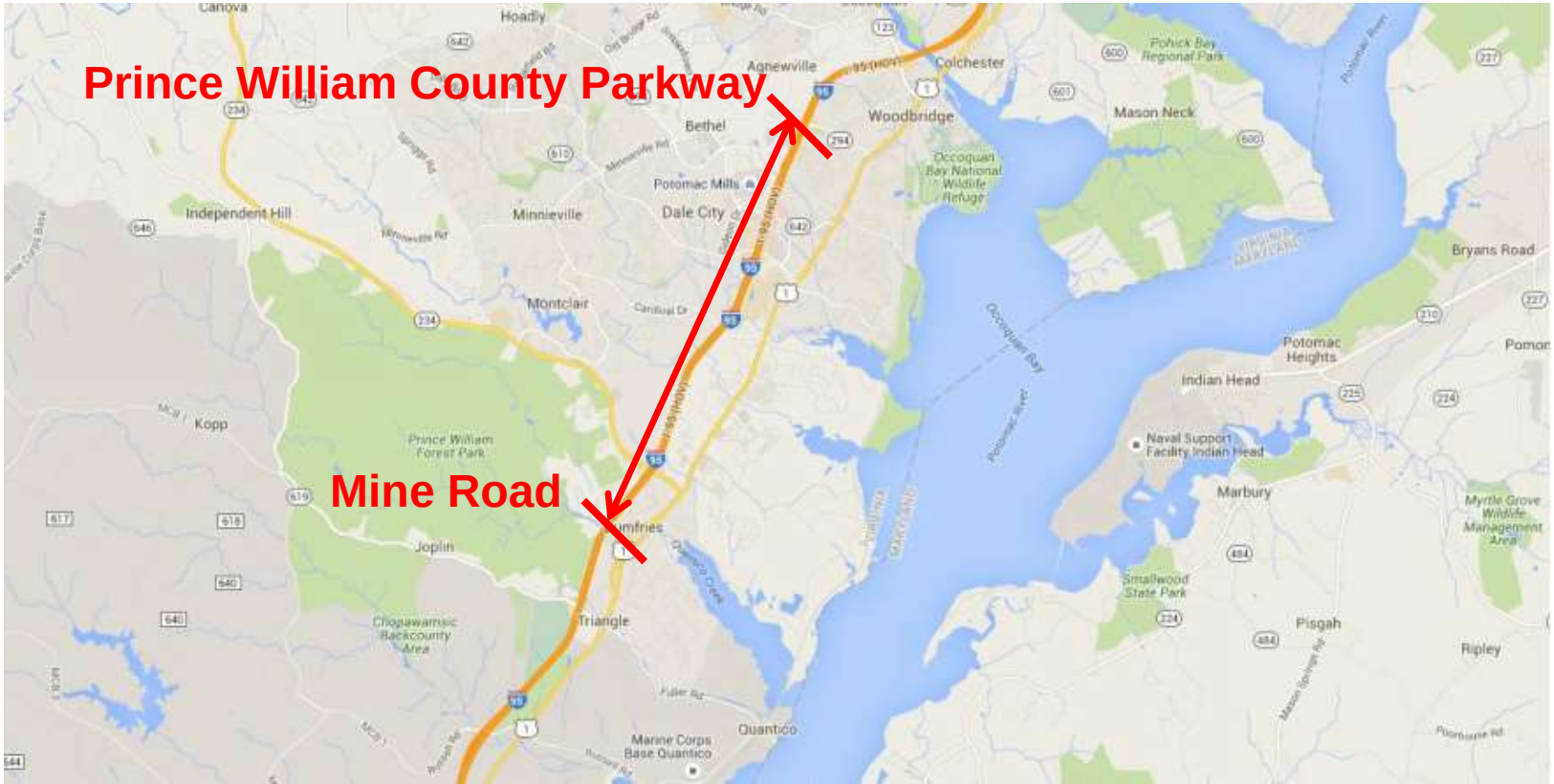
Complete Failure

- Very high severity cracking
- Base failure

I-95 in Prince William County

Current Projects

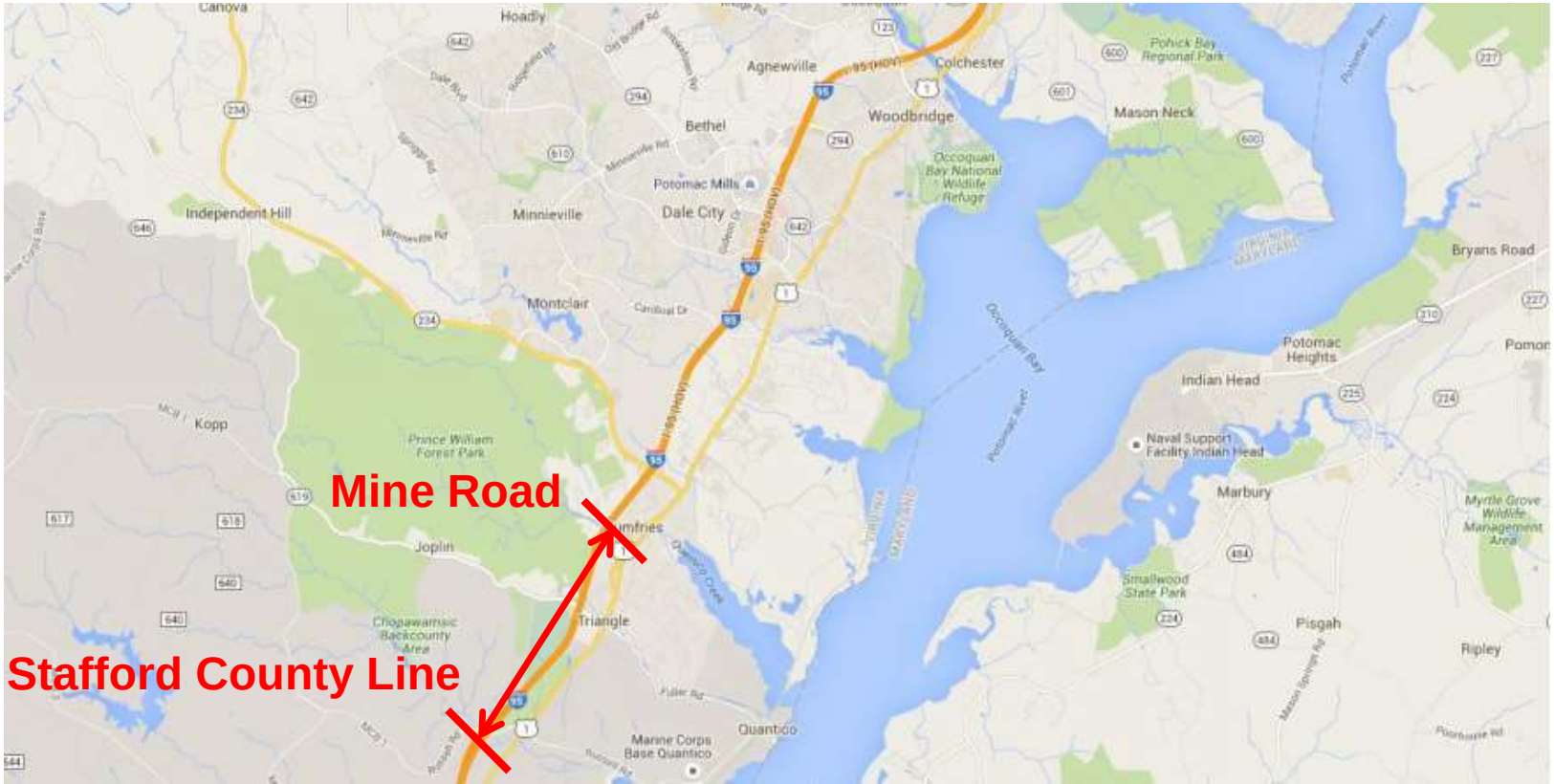
- Prince William County Parkway to Mine Road, SB and NB
- Mill 2”
- Resurface with 2” SM-12.5E



I-95 in Prince William County

Current Projects

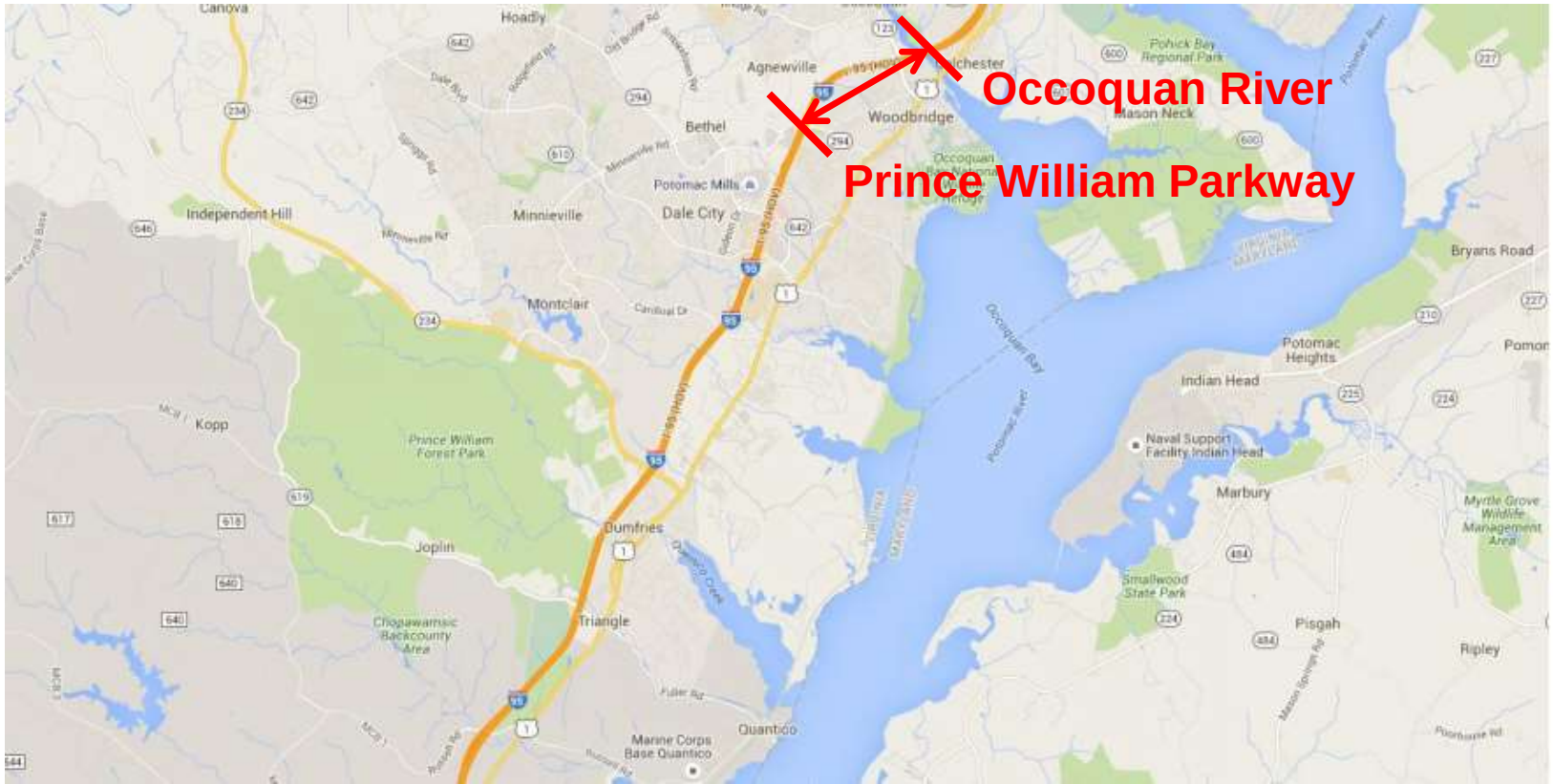
- Mine Road to Stafford County Line, SB and NB
- Mill 2”, patch at joints
- Resurface with 2” SM-12.5E (HP)



I-95 in Prince William County

Current Projects

- Occoquan River Bridge to Prince William Parkway, SB
- Mill 2”, patch at joints
- Resurface with 1” SM-9.0 (HP) and 1.5” SMA-9.5 (HP)



And now, the contractor's perspective…