



*How to address  
failing concrete  
pavement.*

# *Discussion Topics*

- ~ Compressive Strength VS Flexural Strength.
- ~ How are voids created under the pavement?
- ~ What is asphalt undersealing?
- ~ What is the process?
- ~ Other Options for Treatment.

# *Compressive Strength VS Flexural Strength*

- ~ Portland cement concrete has strong compressive strength values but is relatively weak in flexural strength, which is usually about 10-15% of its compressive strength.*
- ~ Flexural strength is ability of the slab to resist failure in bending.*
- ~ For concrete with a compressive strength of 3000 psi, the flexural strength would be....*

# Compressive Strength VS Flexural Strength



a)



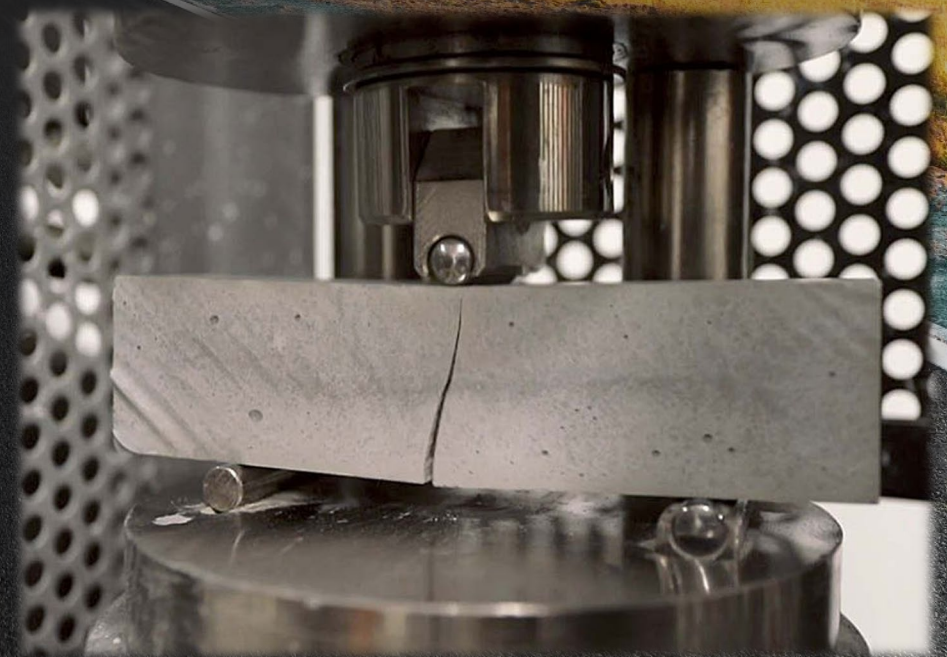
b)



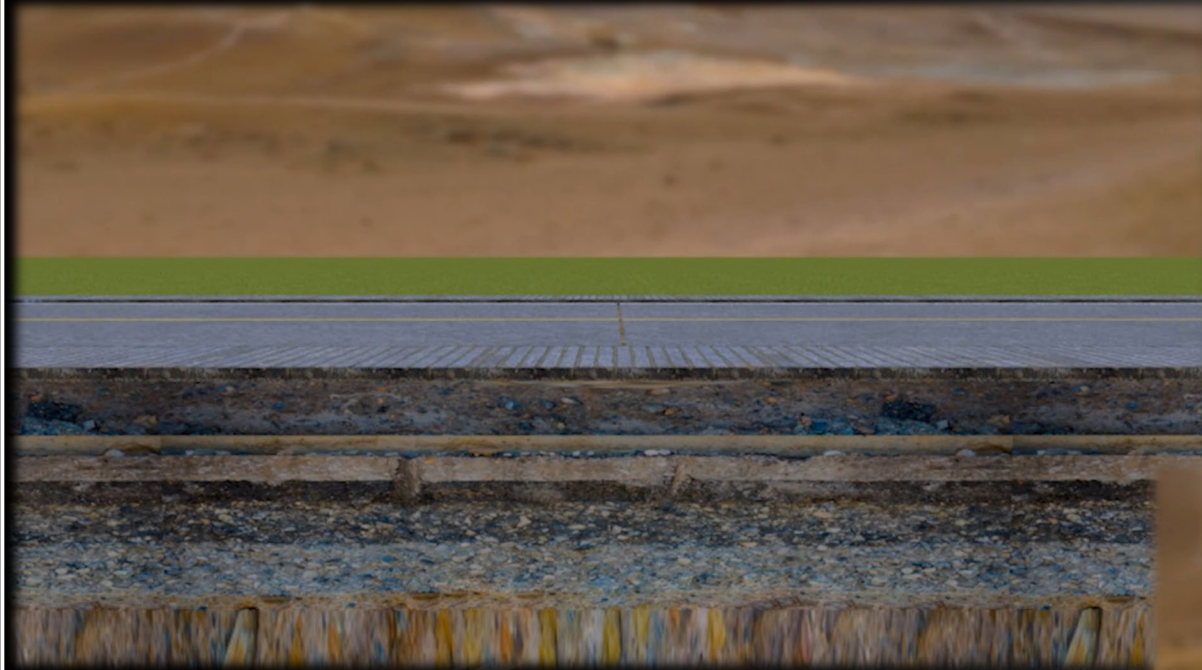
c)



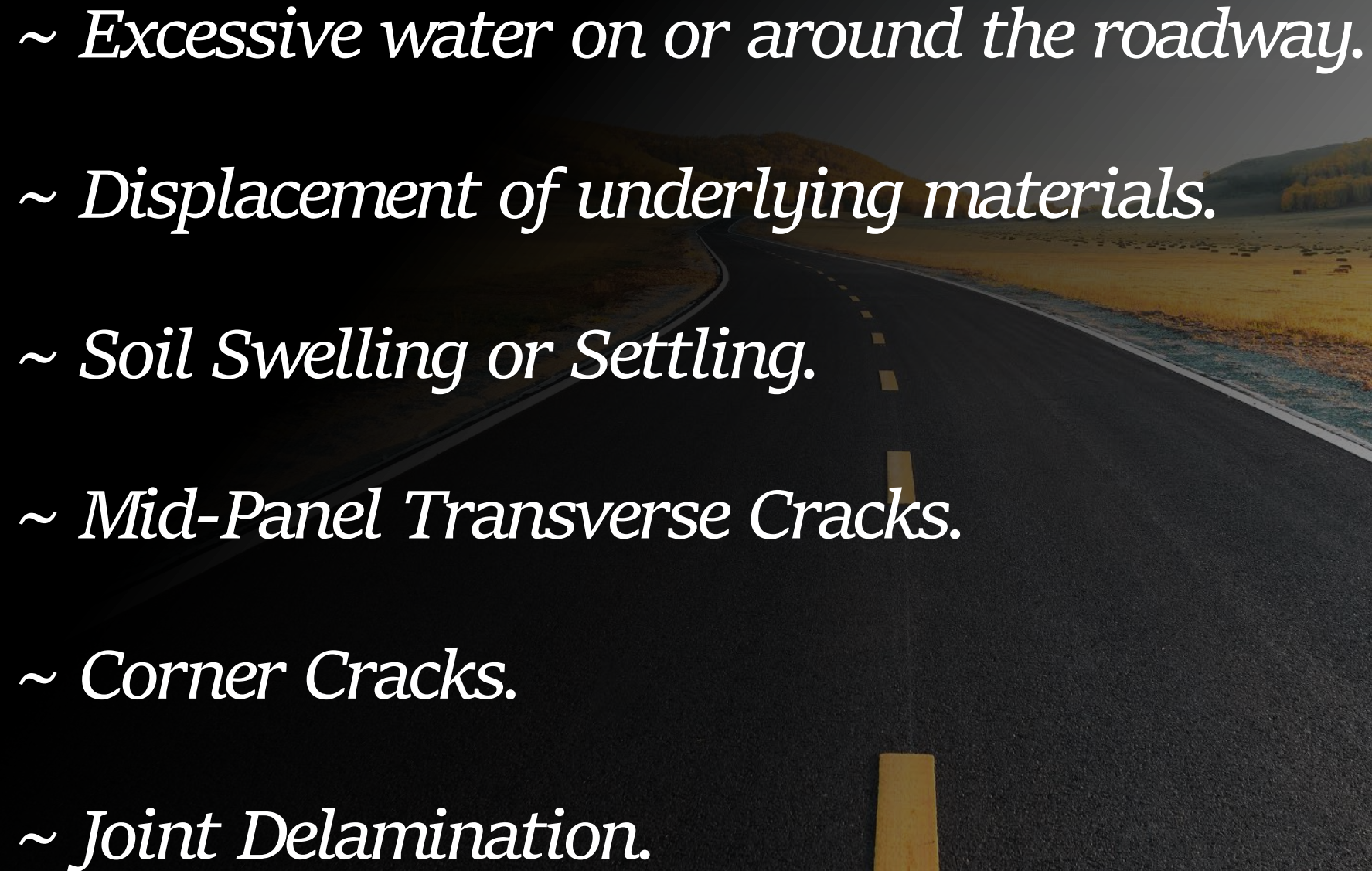
d)



# *Voids under the pavement.*



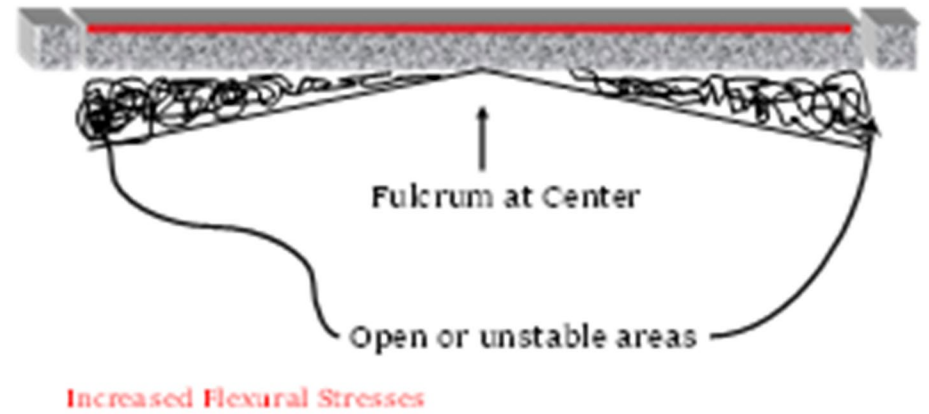
## *How are voids created?*

- ~ Excessive water on or around the roadway.*
  - ~ Displacement of underlying materials.*
  - ~ Soil Swelling or Settling.*
  - ~ Mid-Panel Transverse Cracks.*
  - ~ Corner Cracks.*
  - ~ Joint Delamination.*
- 
- A photograph of a paved road curving through a rural landscape. The road is dark asphalt with a dashed white line down the center. To the right of the road is a grassy shoulder and a field of hay bales. In the background, there are rolling hills with trees showing autumn colors. The sky is overcast. A black circle is visible in the top right corner of the image.

# Detecting Voids



## Slab Deflection (Exaggerated)



# *Slab Deflection*



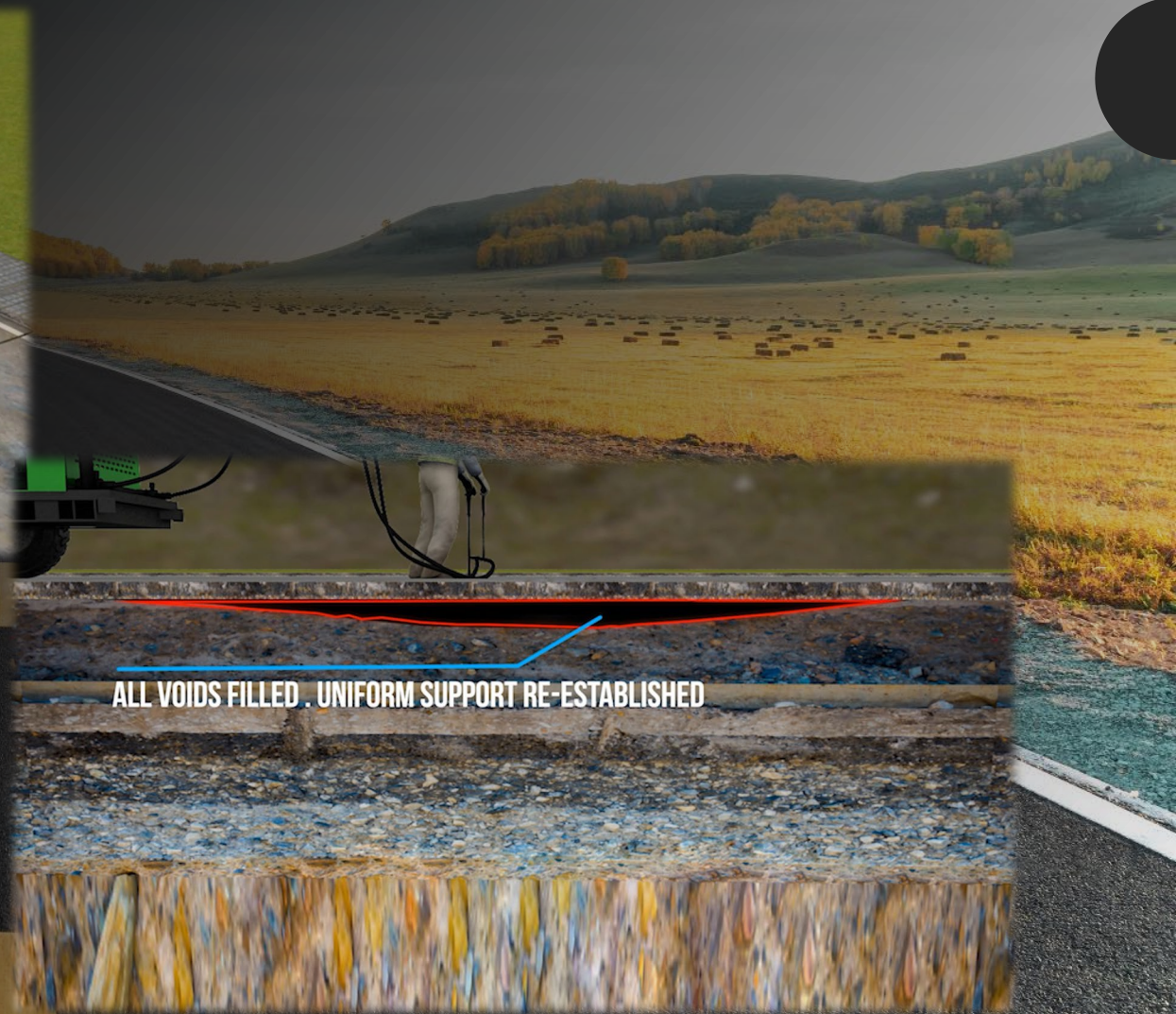
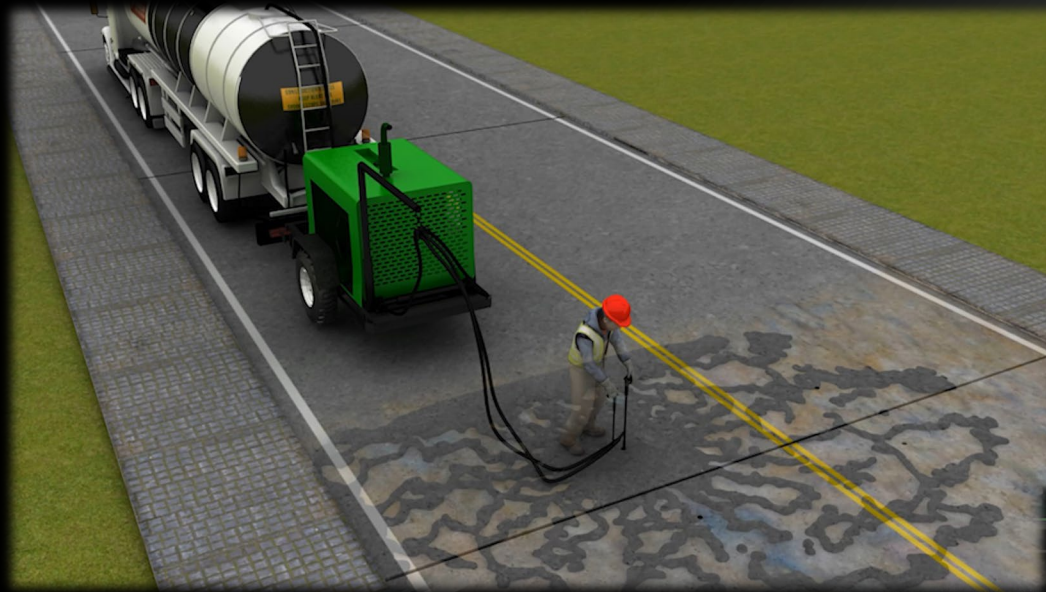
# *Slab Deflection*



# *Asphalt Undersealing*

- ~ The purpose of asphalt undersealing, also referred to as concrete pavement stabilization, is to restore full and even support to the slab, thus reducing the deflection that leads to early pavement failure.
- ~ Underseal is not intended to correct a faulted condition; this is usually done with diamond grinding and an asphalt overlay.
- ~ If good slab seating is restored before the overlay, the pavement has a good chance of staying seated for the life of the overlay.

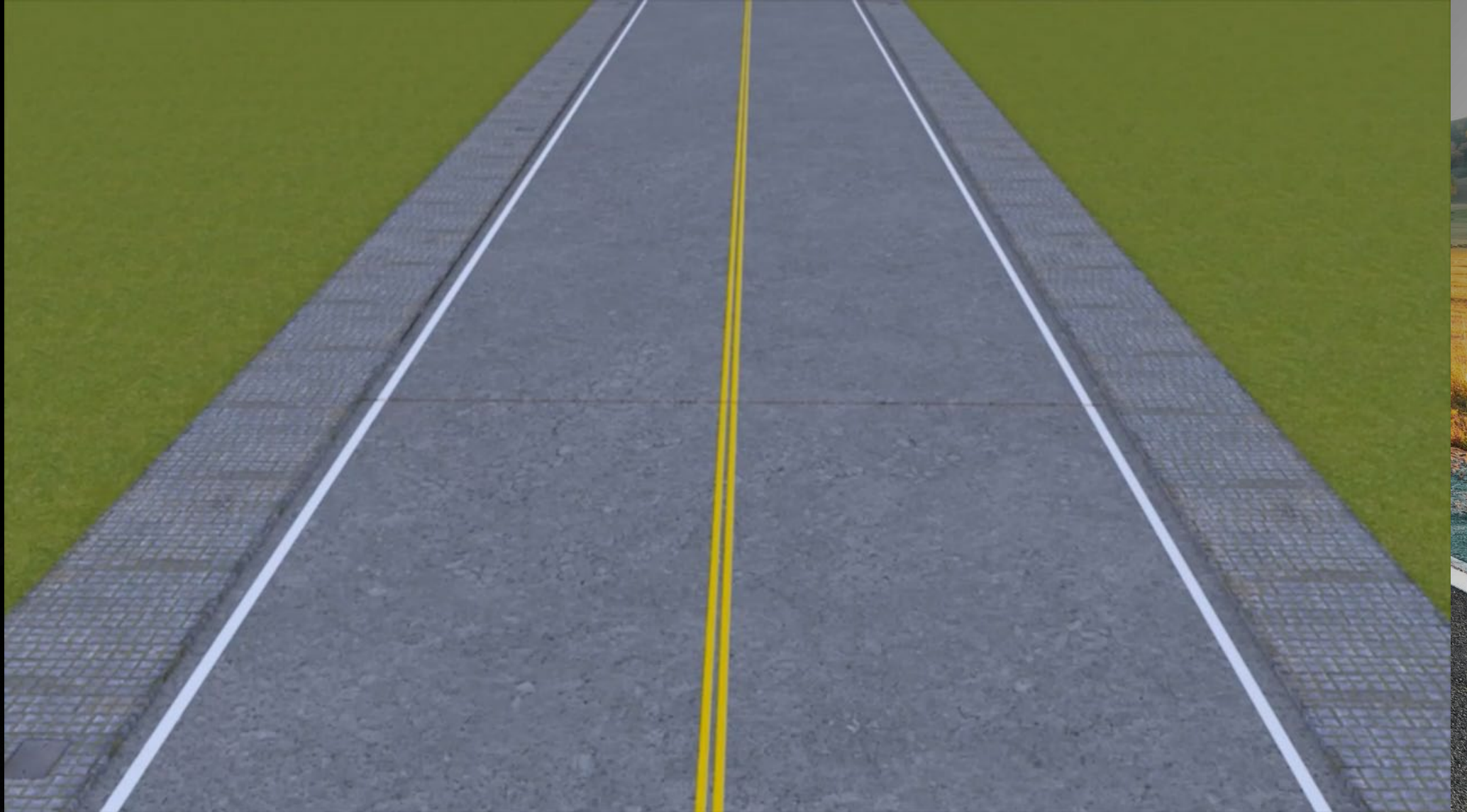
# Asphalt Undersealing



# *The Process*

- ~ Full depth holes are drilled into the pavement.
- ~ Stiff (low penetration) asphalt is then pumped into the subgrade.
- ~ In its liquid form and under pressure all voids are filled.
- ~ Asphalt then hardens to provide a rigid base for an overlay.

# *Process*



# *Other Options*

~ Polyurethane

~ Grout



