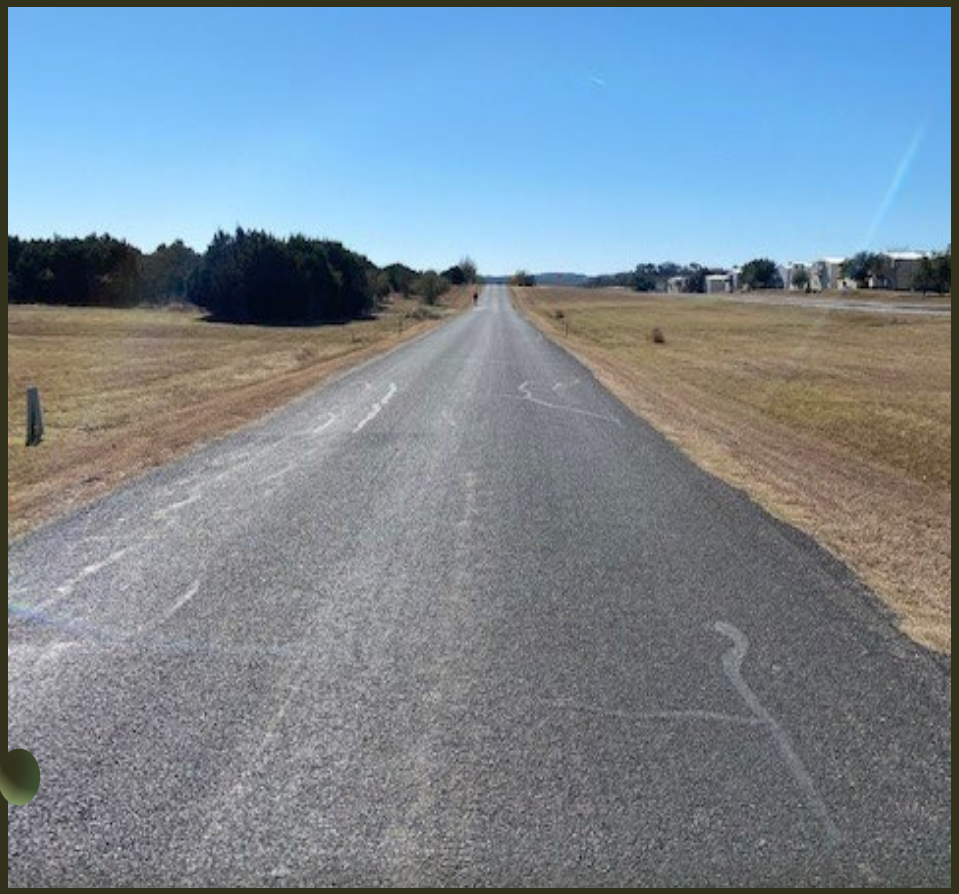
Windermere Oaks Road Review Feb. 5, 2022

by: Cornett Engineering



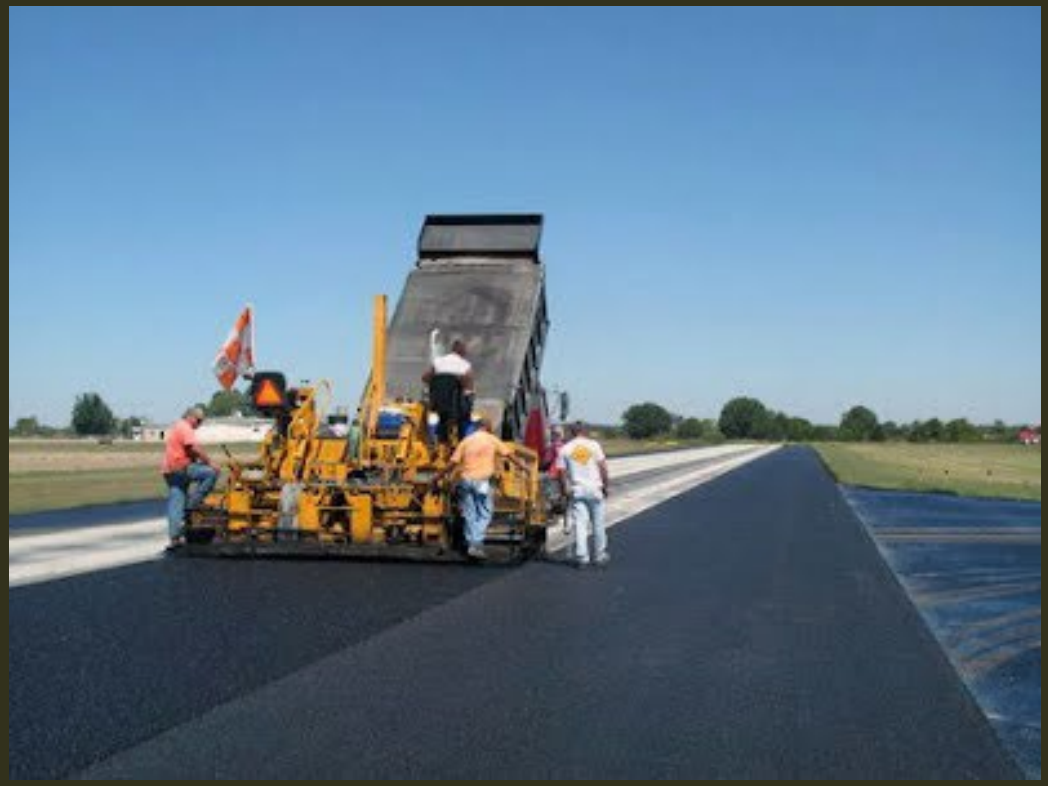
Cornett Engineering
Mark D. Cornett, P.E.

- Texas A&M University – BS Civil Engineering 1996; ME Agricultural Engineering 1999
- Private practice – 14 years
  - Commercial and residential land development
- Heavy Civil Construction Project Manager – 11 years
  - Earthwork
  - Utilities
  - Paving – concrete, hot mix, and chip seal
  - Contracts with municipal, private, TxDOT Highways and Aviation, Federal NRCS

Common Road Definitions

- Subgrade and Base – the underlying material used to build a road that supports pavement. The structure of most roads in the hill country are either a native caliche or imported crushed limestone base.
- Hot Mix Asphalt Concrete (HMAC) Pavement - plant mixed with fine and course aggregates and a liquid asphalt binder. The material is delivered “hot” and placed with a laydown machine. It is then rolled and as it cools becomes hard. The finished surface is very black. Over time the surface may wear down to the course aggregate and become gray or even white colored. Typically placed initially in 1-1/2” or 2” thicknesses. Relies on underlying base for structural integrity. Smooth finish surface.

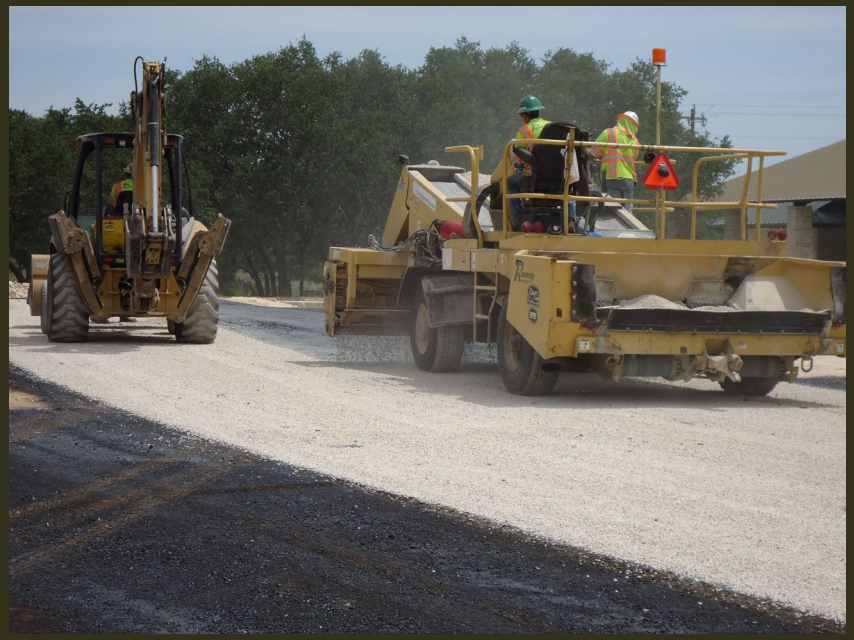
Hot mix asphalt concrete (HMAC)



Common Road Definitions (cont).

- “Chip seal” or “Seal Coat” (Single Course Surface Treatment) - pavement surface that utilizes a liquid asphalt applied with a distributor truck over the roadway at a specified application rate per square yard. Aggregate is then applied with a spreader box at a specified rate. The aggregate is then rolled into the asphalt. This has a finish of the aggregate used.

Chip Seal – color depends on aggregate

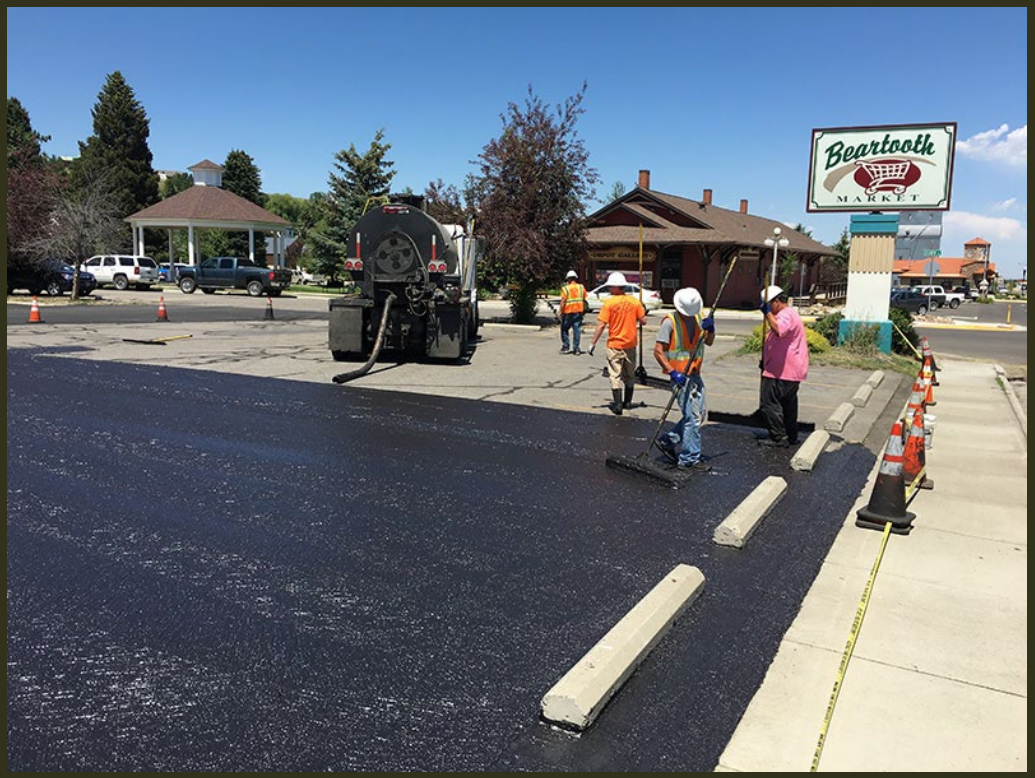


Chip Seal vs Hot Mix

Common Road Definitions (cont).

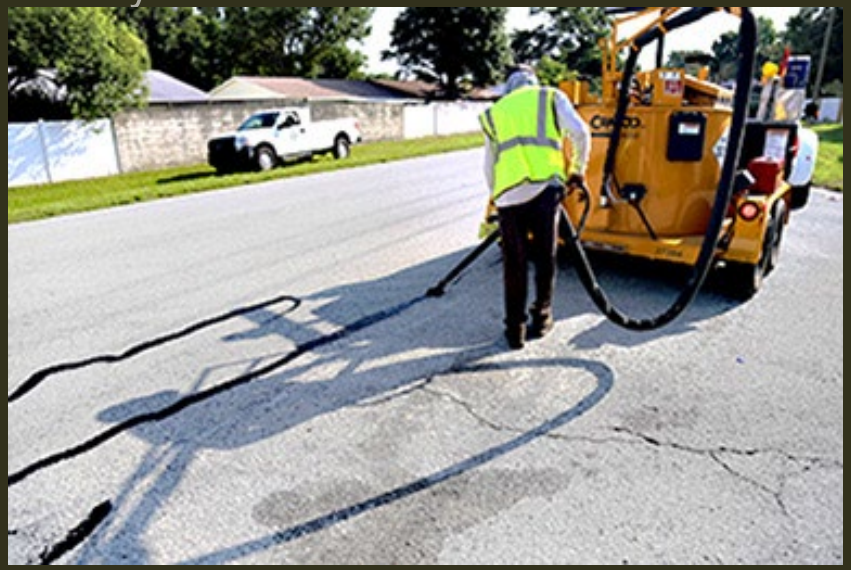
- Fog Seal. This is a term used for application of an asphaltic material over a pavement surface. Sometimes the material will have a sand slurry and other times it is only to rejuvenate the asphalt of the underlying pavement with a liquid. Typically applied to runways, parking lots, and sometimes private roads. The finished product is black in color and fades slowly over time. Used to seal very small cracks and preserve pavement from weather degradation.

Fog or Slurry Seal



Common Road Definitions (cont).

- Crack Seal – Term for applied rubberized asphalt to cracks. The cracks typically need to be ¼" or larger and clearly visible. Applied with a hand wand with a crack sealing rig. Good product for sealing cracks and creates very visible lines.



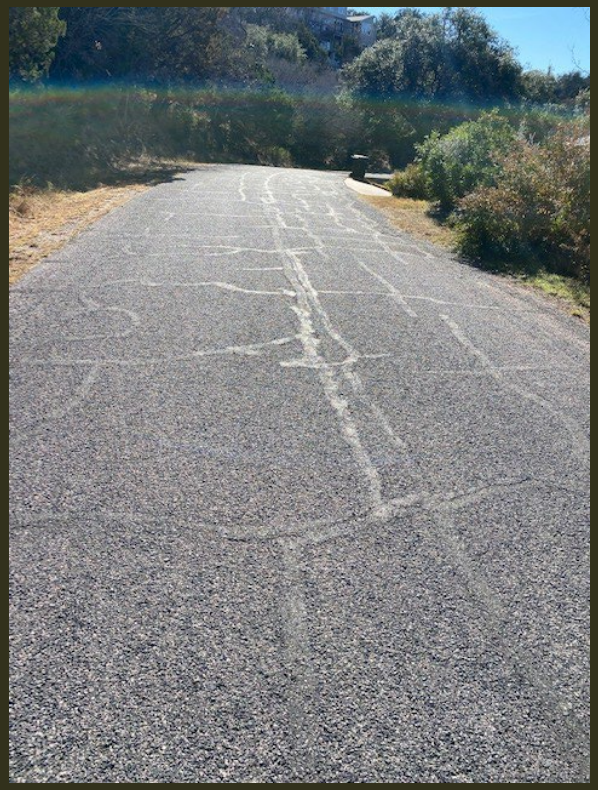
Windermere Oaks Roads

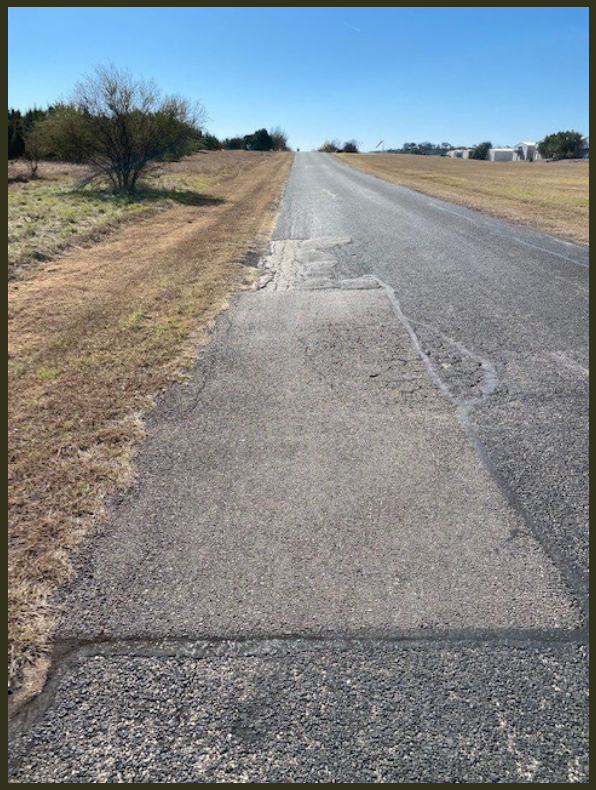
- Original road appears to have been 1-1/2″ hot mix asphalt concrete (HMAC) over a limestone base sometime mid – 1980s.
- Likely a chip seal or other pavement maintenance due to time between construction and visible improvements using aerial photos and light colored aggregate.
- Crack seal before March 2013 – very visible
- Chip seal between 2013 and 2015 using a gray aggregate. Appears to have “shelled” off in areas.

Windermere Oaks Roads

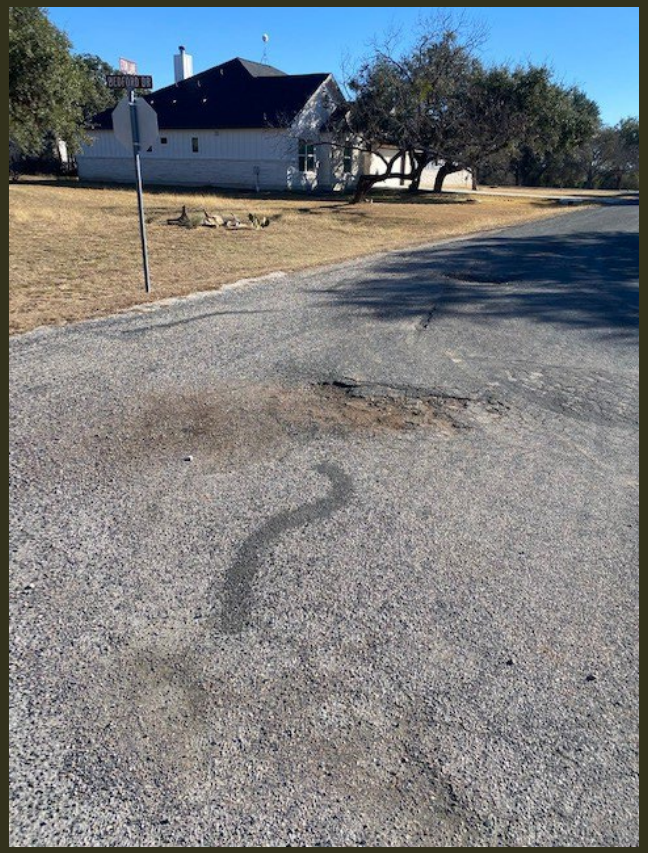
- The structure of the road is generally good.
- Minor edge damage and some failing patches or soft spots.
- Eton is in the worst condition with alligator cracking and several soft spots / potholes.
- Other roads need attention but have minor structural repairs necessary.

Windermere Oaks Pics & Discussions





Windermere Oaks Pics & Discussion



- Eton

Recommendations

- Prepare and patch roads in anticipation of either chip seal or hot mix.
  - Patch edges to 20’ width, cut out potholes and patch with 4” course hot mix
  - Crack seal any large open cracks
  - Fix any radius damage at curves
  - $50,000 allowance
- Full depth repair to Eton and repave with hot mix
  - $50,000 allowance

Option 1 – Chip Seal

- After patching and reconstruction of Eton
- Chip Seal all roads
  - Eton not necessary but it will keep everything to look the same
- Chip seal costs are approximately
  - $6 / s.y. x 55,000 s.y. = $330,000
  - Contingency / testing of $50,000
- Total Budget (patch, Eton, chip seal) = $480,000

Chip Seal

ADVANTAGES

- Lower cost
- Flexible materials will likely have less reflective cracking
- The aggregate rock will likely be consistent color for long term
- Good service life
- Provides seal to underlying base and wearing / traction course on surface
- 8-10 year service life and then be prepared for another chip seal

- DISADVANTAGES

- Rougher surface with exposed aggregate
- Difficult to perform on Cove III and steep portions of Coventry
- Patches must be done well
- Non-structural

Option 2 – Hot Mix

- After patching and reconstruction of Eton
- 2" Hot mix overlay – likely varies 1-1/2 to 2-1/2"
- Hot Mix costs are approximately
  - $12 / s.y. x 55,000 s.y. = $660,000
  - Contingency / testing of $75,000
- Total Budget (patch, Eton, hot mix) = $835,000

Hot Mix

ADVANTAGES

- Smooth finish
- Good service life
- Easier to patch prior to paving
- Provides some level of structural support over existing roadway
- Better product for steep hills
- Nearby hot mix plant

- DISADVANTAGES

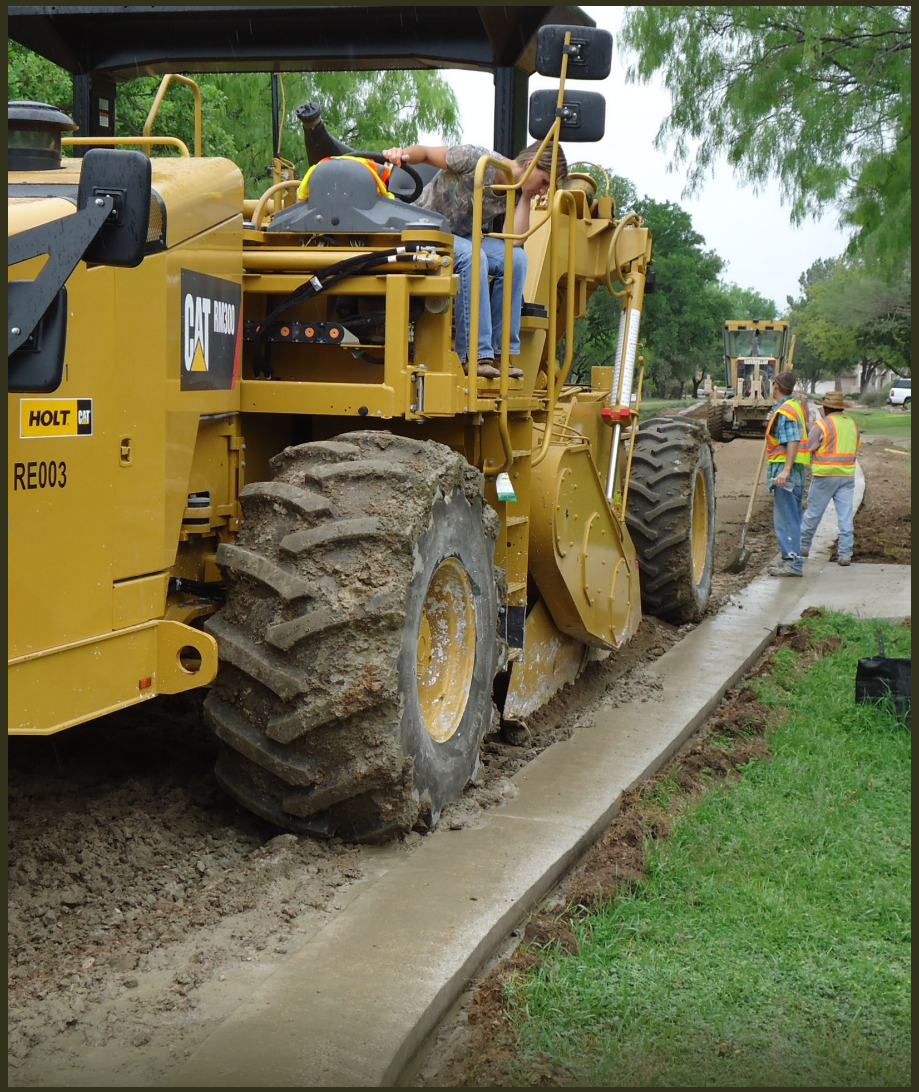
- Not as flexible as chip seal and surface cracking may occur
- More expensive than chip seal
- Edge will have a 1-1/2” drop
- Next maintenance cycle may require use of a chip seal
- Does not repair underlying material

Entrance Road Widen – Add alternate to hot mix

- Peal edge grass off and full depth reclamation
- Existing = 20’ wide Proposed = 24’ wide
- Full depth reclamation adds $10 / s.y. = $110,000
  - Contingency / Testing of $25,000
- Total Budget (patch, Eton, hot mix, widen entrance road) = $970,000

Full depth reclaimation

- When patching is significant
- Base failure
- Blends up existing pavement and base. Rework and recompact. Add more base if necessary.
- Apply 2″ hot mix to compacted surface



Conclusion

- Most roads are in good condition but in need of maintenance
- Chip seal or hot mix are both viable with patching and prep work
- Entrance road can be widened to 24’ if desired
- Eton needs reconstruction
- Work needs to occur during paving season (April – October)
- Cost likely between $500k to $1 million
- When POA determines which option (s) to move forward with, solicit proposals from qualified contractors using TxDOT standards
- Perform paving work in summer with long hot days
- Test work to ensure quality control