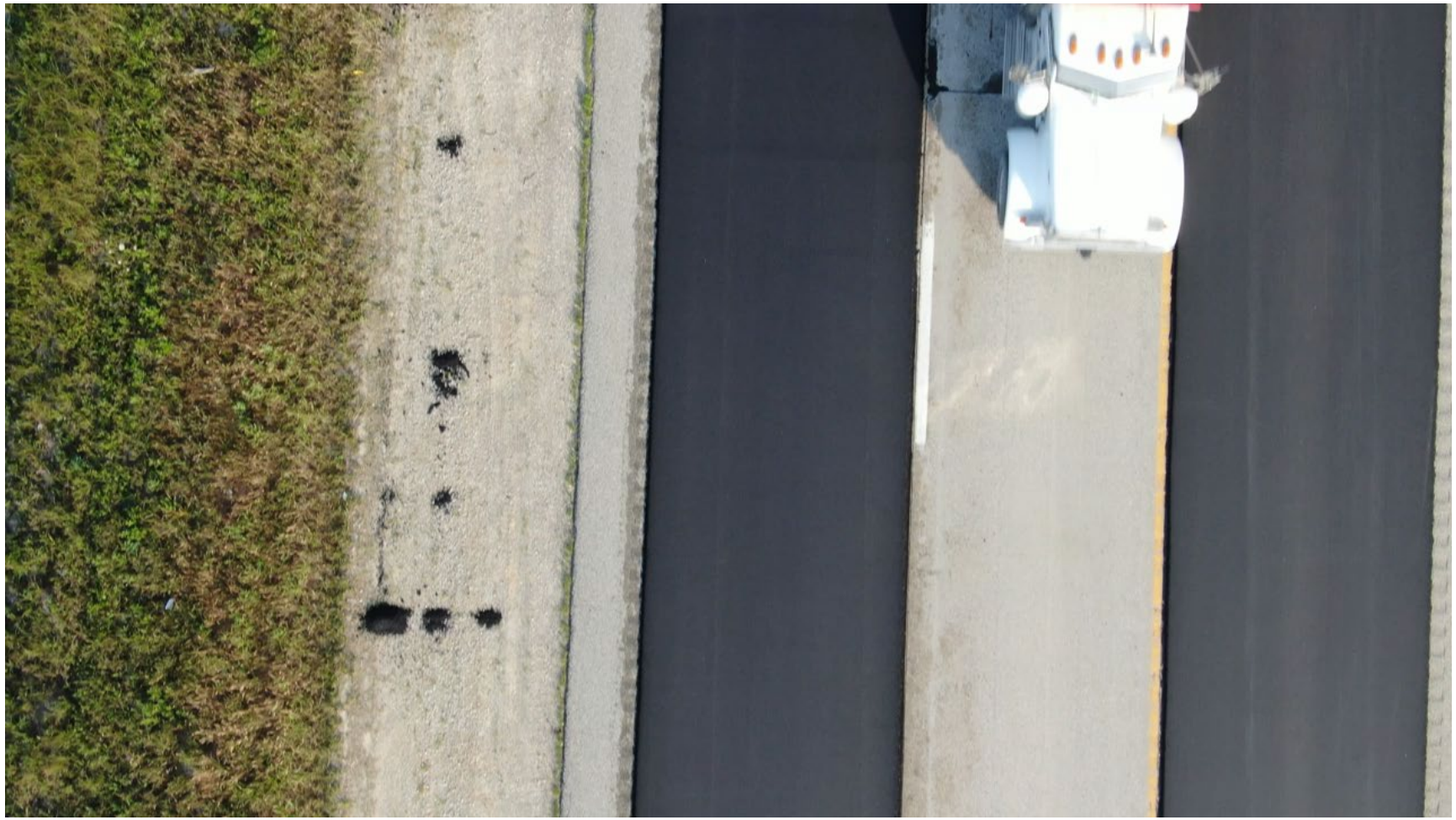
HOW TO ADDRESS FAILING CONCRETE USING ASPHALT PAVEMENTS



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AGENDA

- Introduction
- Difference between Concrete and Asphalt
- Factors to Consider
- Concrete Surface Inspection & Deficiency Corrections
  - Underseal, Crackseal, Polypatching, Joint Repairs, Slab Repairs
- Concrete Surface Cleaning
- Tack Coat Application
- Asphalt Placement
- Compaction
- Quality Control
- Conclusion

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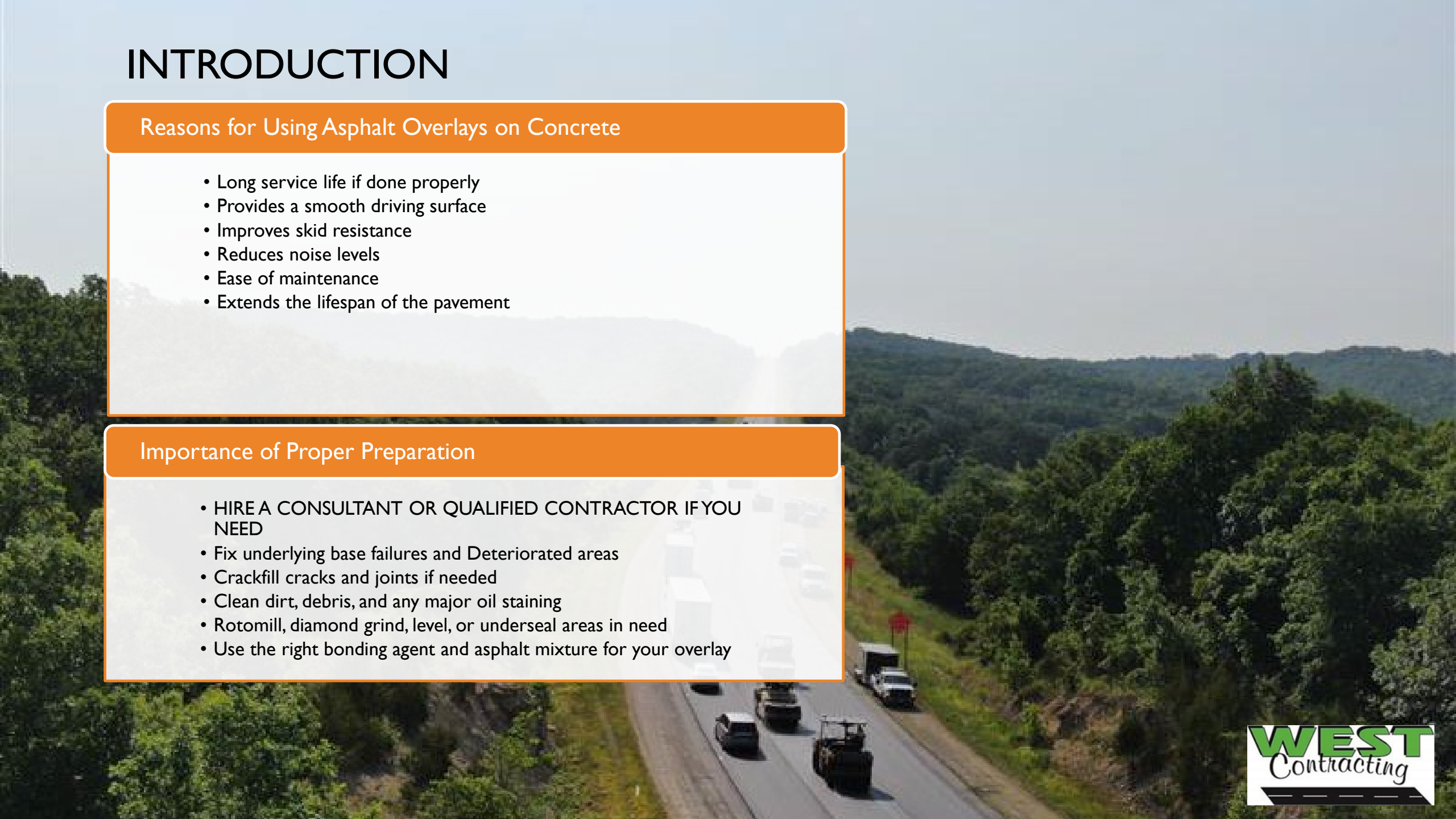
INTRODUCTION

Reasons for Using Asphalt Overlays on Concrete

- Long service life if done properly
- Provides a smooth driving surface
- Improves skid resistance
- Reduces noise levels
- Ease of maintenance
- Extends the lifespan of the pavement

Importance of Proper Preparation

- HIRE A CONSULTANT OR QUALIFIED CONTRACTOR IF YOU NEED
- Fix underlying base failures and Deteriorated areas
- Crackfill cracks and joints if needed
- Clean dirt, debris, and any major oil staining
- Rotomill, diamond grind, level, or underseal areas in need
- Use the right bonding agent and asphalt mixture for your overlay



UNDERSTANDING THE DIFFERENCE BETWEEN ASPHALT AND CONCRETE

Concrete Composition

Mixture of cement, sand, gravel, and water

Forms a solid and rigid surface when hardened

Asphalt Composition

Mixture of aggregates like crushed stone and sand

Bound together with bitumen

Known for flexibility and ability to withstand heavy loads

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FACTORS TO CONSIDER BEFORE PAVING ASPHALT OVER CONCRETE

Condition of Existing Concrete

- Check for significant cracks, potholes, or damages
- Consider removing and replacing severely deteriorated concrete

Importance of Drainage

- Ensure proper slopes and channels
- Prevent water accumulation to avoid asphalt damage or cause more base damage / failures

Determining Asphalt Thickness

- Based on existing concrete conditions and factors such as curb height or existing grades
- Consider expected traffic loads

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GET HELP IF YOU NEED IT

Intended Use of the Area

Determine the type of traffic and load the area will bear

Consider the frequency of use and potential wear and tear

Climate Considerations

Evaluate the local weather conditions

Assess the impact of temperature fluctuations on asphalt and concrete

Consulting with a Professional

Seek advice from a paving contractor

Get recommendations based on specific needs and conditions

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SURFACE INSPECTION & CORRECTIONS

- Visual Inspection for Road Issues
  - Cracking
  - Potholes / Spalling
  - Joint Repairs
  - Note significant elevation changes
- Address Major Issues
  - Crackseal
  - Concrete Joint Seal
  - Concrete Joint Repair
  - Underseal
  - Full Slab replacement or repair – Get Draining Right!

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MINOR CRACK REPAIR

Epoxy Resin

- Suitable for large cracks:
- High durability, excellent resistance to water and weathering
- Cracks are typically cleaned and then filled with epoxy
- Suitable for large cracks:

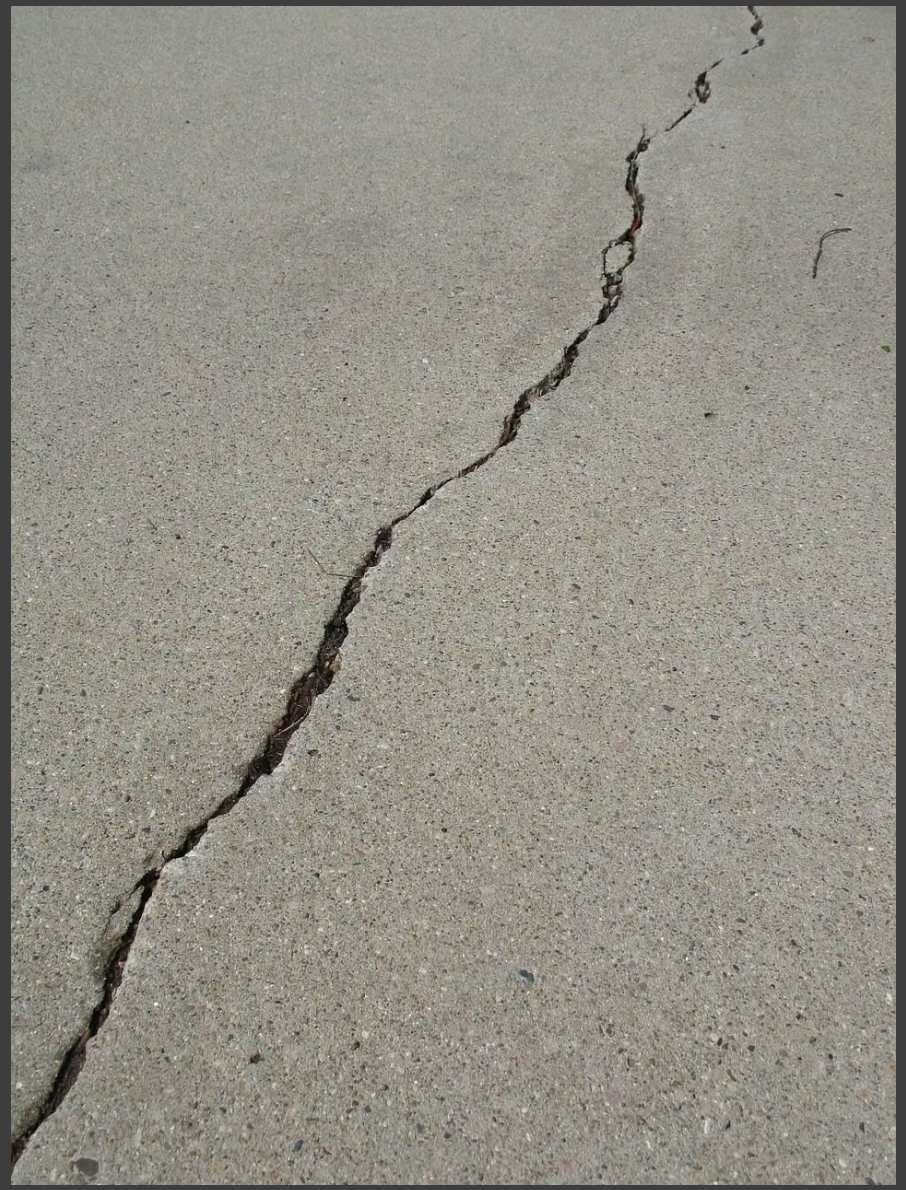
Crack Filler / Joint Sealant

- Joint sealant

Minor asphalt patching

Importance of filling cracks

- Ensures a smooth surface to overlay and fills major gaps (+ ¼ inch)



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HOW TO REPAIR POTHOLES/SPALLING

- Success for West
  - 2 foot x 2 foot x 2 inch asphalt patches
  - Square up areas with a small skid loader mill
  - Use high AC content, 9.5mm flexible mix
  - Tack coat the entirety of the repair and edges (or use CRS2-P.)
    - Make sure the mix sticks!

CONCRETE JOINT OR SLAB REPAIR

- Sawcut square around Slab
- Remove Concrete
- Remove (if needed), replace, and Compact Base rock
- Drill and place dowel's into sides of concrete around the repair
- Pour and finish new concrete (typically high early) to get traffic back on quickly

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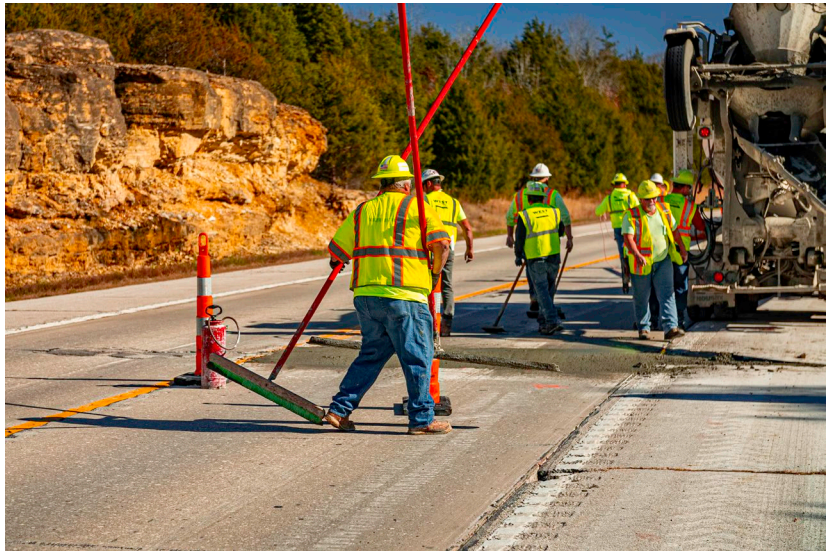
CONCRETE JOINT OR SLAB REPAIR



LEVELING FOR ELEVATION CHANGES

- Asphalt "Surface Leveling"
- Milling or Diamond Grinding
- Underseal

Depends on what you're working with to determine the fix.

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DRAINAGE!!!

Getting water off the road is one of the most important factors to keeping a road in good condition

- Crucial for pavement longevity
- Prevents moisture accumulation and damage
- Requires proper slopes and channels
- Edgeline milling may be required to get water to slope to the curb (or to match curb heights
  - Be cautious with monolithic poured concrete (vertical or rolled curb)
- Traffic Counts

LASTLY – GET THE CONCRETE SURFACE CLEAN!

- Sweeping
  - Basic method for removing loose dirt and dust
  - Requires regular maintenance
- Debris Removal
  - Essential for clearing larger waste materials
  - Prevents clogging and obstruction
- Power Washing Or Chemical Cleaning of Bad Areas
  - Effective for removing stubborn dirt and grime
  - Uses high-pressure water spray
- Importance of Cleaning
  - Removes dirt, dust, and loose materials
  - Ensures an overlay will adhere to concrete surface below

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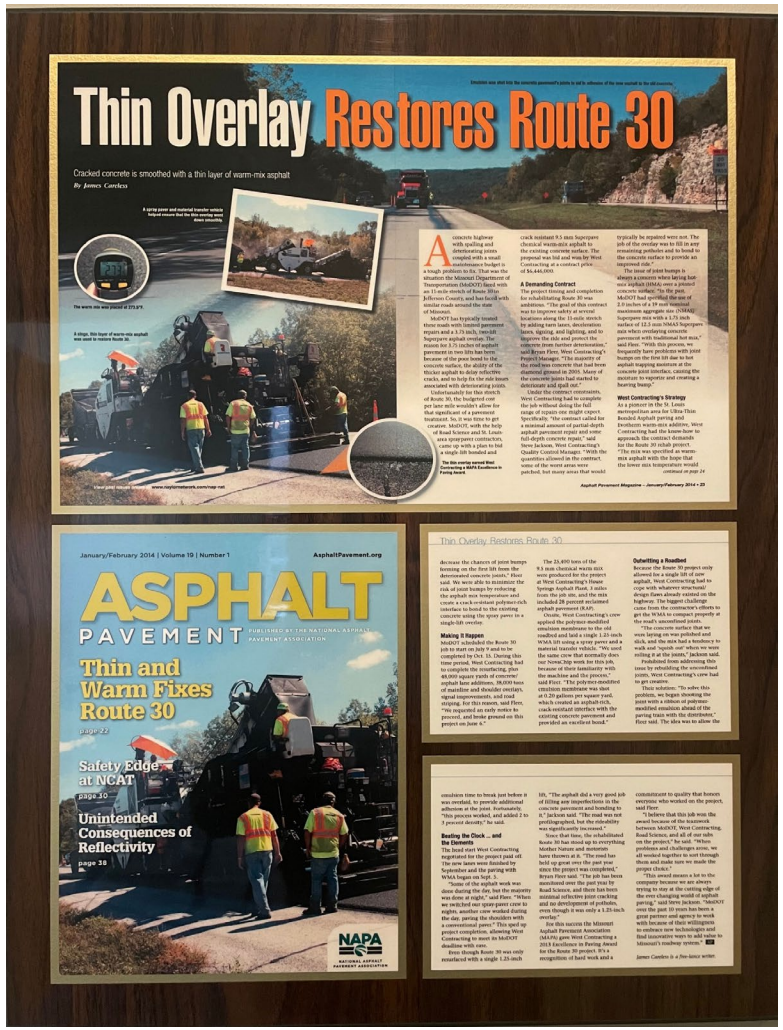
BUILDING THE RIGHT ASPHALT OVERLAY OVER PROPERLY MAINTAINED CONCRETE

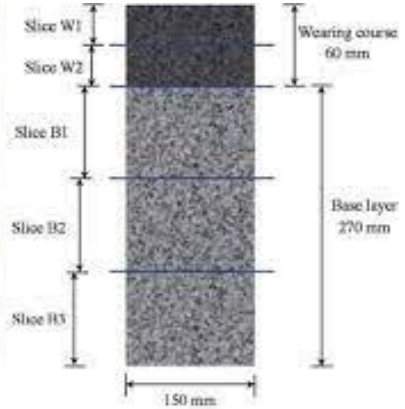
- Benefits of an overlay
  - Durable
  - Flexible
  - Cost Effective
  - Smooth new driving surface
  - Many options of asphalt mixtures, thicknesses, and bonding agents

- Challenges ahead of an overlay
  - Existing Concrete Conditions
    - Concrete joints and cracks (different expansion rate than asphalt)
  - Built-up moisture under concrete
  - Picking the right option with budget constraints
    - Tack Coats
    - Asphalt Mix
    - Equipment



MUST HAVES !

- Proper Bonding Agents and Application Rates
  - IE Tack Coat's / Emulsions
    - These ensure adhesion to the concrete you just spent a lot to fix!
    - Done properly, give you a "water barrier" between your new asphalt and old concrete
    - Examples – PG 76-22, CPEM-1, CRS2-P
- Right asphalt mix selection and thickness
  - ¾" of a strong thin mix up to a single 2" lift
    - Can apply multiple lifts of different types / purposes
- Right Equipment
  - There is a variety of ways to get to the goal, but it requires some specialized equipment or partnerships with various vendors.



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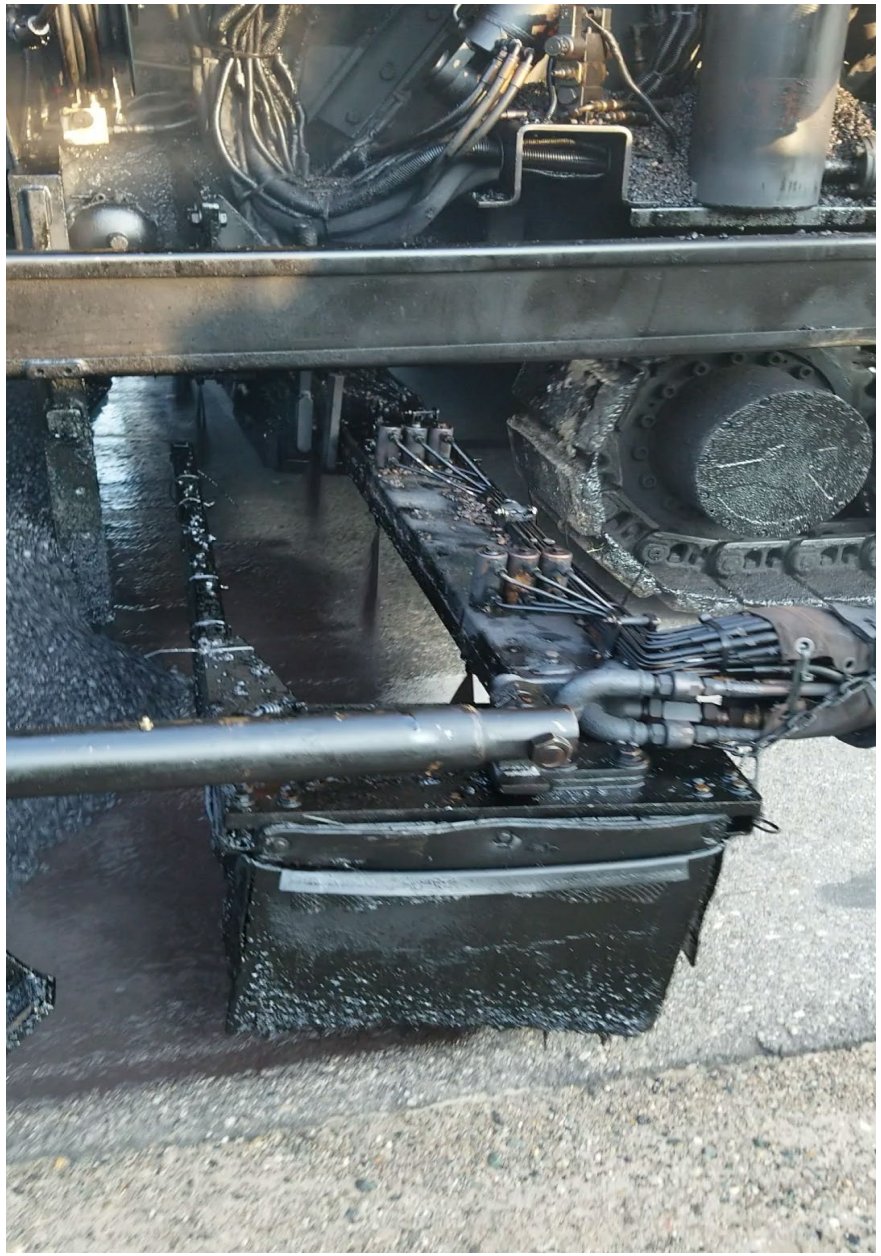
BEST PRACTICES OVER CONCRETE

- Spraypaver
  - Applies tack coat or emulsion immediately in front of a conventional asphalt screed
    - Allows a hybrid of a chip seal and overlay at same time
- SAMI – Stress Absorbing Membrane Interlayer
  - Limestone chip seal or Hot AC + glaspave fabric application over concrete
- HOT AC application (PG 76-22) applied and allowed to cure



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SPRAY PAVER

- Machine originally built to allow contractors to apply a heavy tack coat or emulsion, at 2-3x convention tack rates. AND, also apply an ultra-thin bonded wearing course (UBAWS) at 1/2inch – 1-inch thickness as a surface treatment
  - The key was to have the machine apply both products. Simple rolling pattern – 2-3x static
  - Emulsion provided a moisture barrier from asphalt or concrete underneath preventing further moisture damage.
  - Retards cracks and potholes many times over vs. conventional tack coats.
- However, via low budgets, trial (and not errors), and some smart minds behind emulsions and mixes, contractors started experimenting with uses
  - The bonding to surfaces like concrete or even milled surfaces was exceptional.

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SPRAY PAVER (CONTINUED)

- Industry went from simple ¾” UBAWS surface treatment overlays to a single or double 2.0” Superpave
  - Introduced warm mix additives, RAP, ECR, etc to create a combination of eco-friendly solutions that tests off the charts in the lab and the field.
- Innovation has been incredible – but the science behind it must be checked (recycling, compaction, mix temps) in lab and field

SAMI – STRESS ABSORBING MEMBRANE INTERLAYER

- **Think of a limestone chip seal (using CRS2-P and limestone aggregate) directly over old concrete, and then placing a 1.5”-2” asphalt overlay over it.**
  - **Purpose and Function**: SAMIs absorb and dissipate stress and strain in pavement, particularly at joints and cracks, to reduce reflective cracking.
  - **Composition and Application:** They are soft material layers applied to existing pavement, acting as cushions to aid stress dissipation. Suitable for pavements with moderate to extensive surface cracking, given a sound base and adequate drainage.
  - **Retardation of Reflective Cracking**: Delay the appearance of reflective cracks, extending overlay lifespan by 1 to 3 years.
  - **Waterproofing**: Protect pavement structure and foundation if the overlay cracks.

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HOT APPLIED ASPHALTIC CONCRETE (AC)

- **Where a distributor shoots a 350 degree PG 76-22 (poly modified oil) on concrete, allows it to cure, and then the contractor paves over it with traditional equipment**
  - In theory, similar to a spray paver –but a hot applied AC and traditional equipment will have issues in certain situations
    - High humidity – slower cure
    - Milled surface – not cleaned properly, potential for trucks to tear up, or push/shove.
    - Hot products (350 degree vs 150 degree – volatile to work with)

MIX SELECTION AND PLACEMENT

- Types of Asphalt Mixes Over Concrete
  - SAME AS WHAT CAN BE PLACED OVER ASPHALT!
  - Varies based on traffic volumes and ESAL's
    - UBAWS – Type A, B, C
    - BP-1/BP-2, Type C, Surfacel Level (more interlayer or bondbreaker)
    - Superpave Mixtures (SP048, SP095, SP125)
- Considerations for Best Practices
  - Time of Year and using WMA
    - Cold Temps OR high moistures especially, lower mix temps help prevent moisture from wicking up from joints
  - Recycled amounts in asphalt – high recycle content – use antistrip equalizer in mix
  - Heavy cracking and dealing with shorter budget – use a thinner mix with a higher AC content or something like Kevlar Fibers or ECR in it to push the upper end of flexibility.
  - Density, Density, Density – the best mixes will be properly compacted to maximize useful life.

CASE STUDIES / OUR EXPERIENCE

Old Bell Monte (private HOA) – Type A UBAWS over spalling Concrete

- HOA could not afford a tear-out and reconstruction
  - We completed some curb repairs and a few joint repairs (not many)
  - Excessively clean spalled areas – applied a CRS2-P with a hand wand and surface level mixture at all spalled joints
  - Monolithically poured rolled curbs – did not want to mill into or damage, and needed to keep curb height
  - Installed a Type A UBAWS, with a high AC Content and Kevlar Fibers, ¾" at rolled curb to 1.5" in the middle of the road
    - Not a single crack 1 year later

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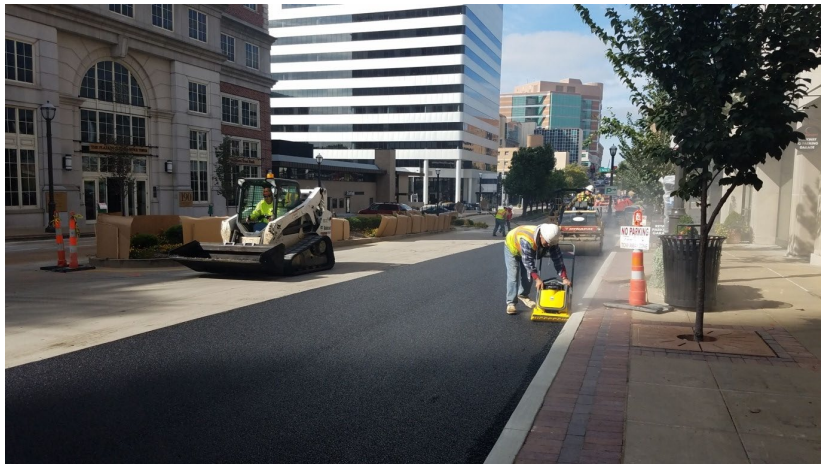
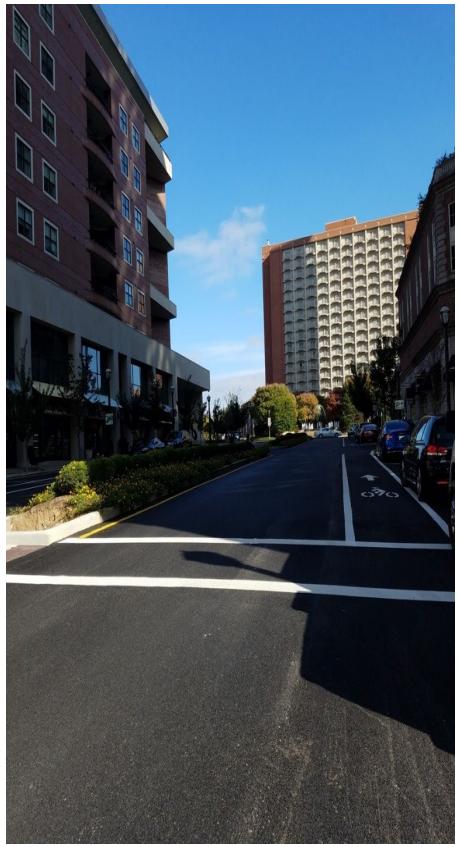
CASE STUDIES / OUR EXPERIENCE

Carondolet Plaza (Clayton)





Old Bell Monte (private)

CASE STUDIES / OUR EXPERIENCE

Carondolet Plaza (Clayton)

- Residents wanted a "better road" ahead of construction of new apartment complex
- City could not afford time or cost of complete construction and redo
- Tricky Layout, high visibility area, no tolerance for "traffic ques"
- Installed a 3/4 " UBAWS, only milled depth transitions and ADA RAMPS, left 5 ¾" of vertical curb height.
- Finished at 4pm on a Friday after a major paver issue – Machine only in a few wedding photos at Carondolet Circle

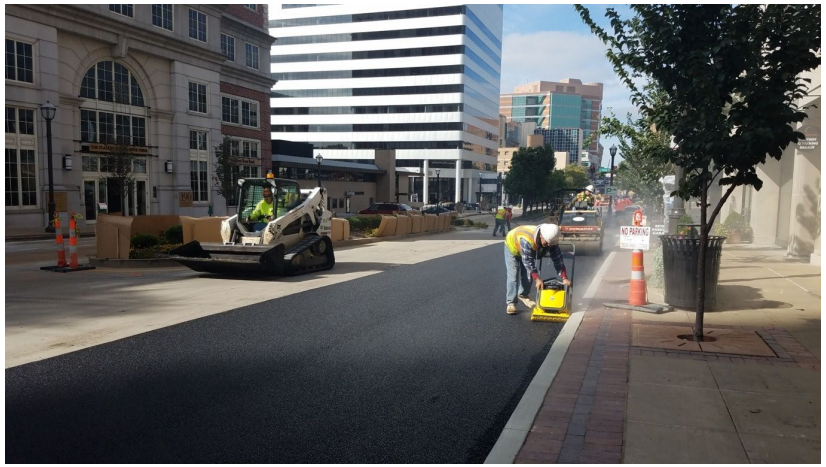
CASE STUDIES / OUR EXPERIENCE

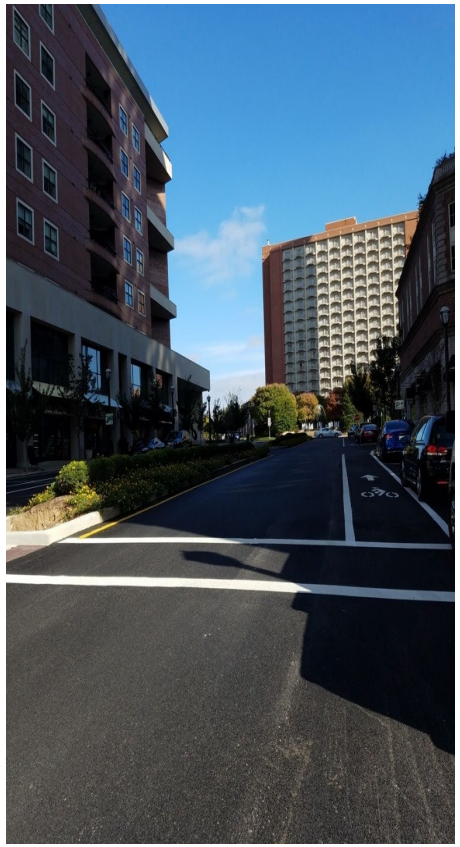
2012 – Route 30 Jefferson County

- Significantly spalled and deteriorated concrete
  - Typically demands a 3.75” overlay with traditional tack coat (.05 gal/sy)
  - West laid a 1.25” 095 CLP Superpave using WMA, anti-strip agents, and 28% RAP.
  - Still there today – slated to be re-paved in 2026.

CASE STUDIES / OUR EXPERIENCE

Carondolet Plaza (Clayton)



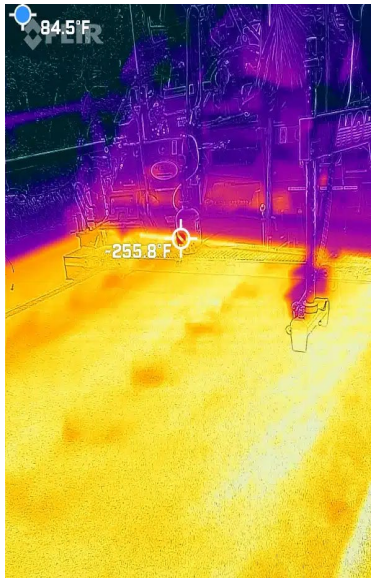


Old Bell Monte (private)

CASE STUDIES / OUR EXPERIENCE

Route 63 – Maries County

- 7.5 miles of 2-3 lane, concrete highway laden with spalling, poor joints, and potholes
  - 200 SY's of transverse, full-depth concrete joint repairs
  - 15,000 lbs hot polymer patching on spalled joints along with 2' milling and patching
  - VE'd 4"of SP190C and 2" of SP125C, into 2 lifts of an SP095C – 1st lift over the concrete using a spray paver with a CPEM-1 shot rate at .25 gal/SY.



QUALITY CONTROL

- Material supplier or independent lab verify asphalt mixture within specifications
- Verify proper tack coat / emulsion application rates
- Monitoring Asphalt Thickness and Density
  - Ensuring proper thickness for durability
  - Maintaining density for structural integrity
- Visual Inspection for Imperfections
  - Identifying surface defects
  - Ensuring smooth and even finish

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PROS AND CONS OF PAVING ASPHALT OVER CONCRETE

- Cost savings by avoiding complete removal of concrete
- Increase longevity of undlerying road
- Reduction in expenses related to labor and equipment
- Provides a smooth riding surface

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TIPS FOR A SUCCESSFUL ASPHALT OVERLAY

Preparation of Concrete Surface	Thoroughly clean the concrete surface Repair any cracks or potholes Ensure a smooth and even base
Application of Tack Coat	Promotes adhesion between asphalt and concrete Ensures overlay remains securely in place
Proper Asphalt Selection & Compaction	Achieve desired density and durability

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CONTACT INFO

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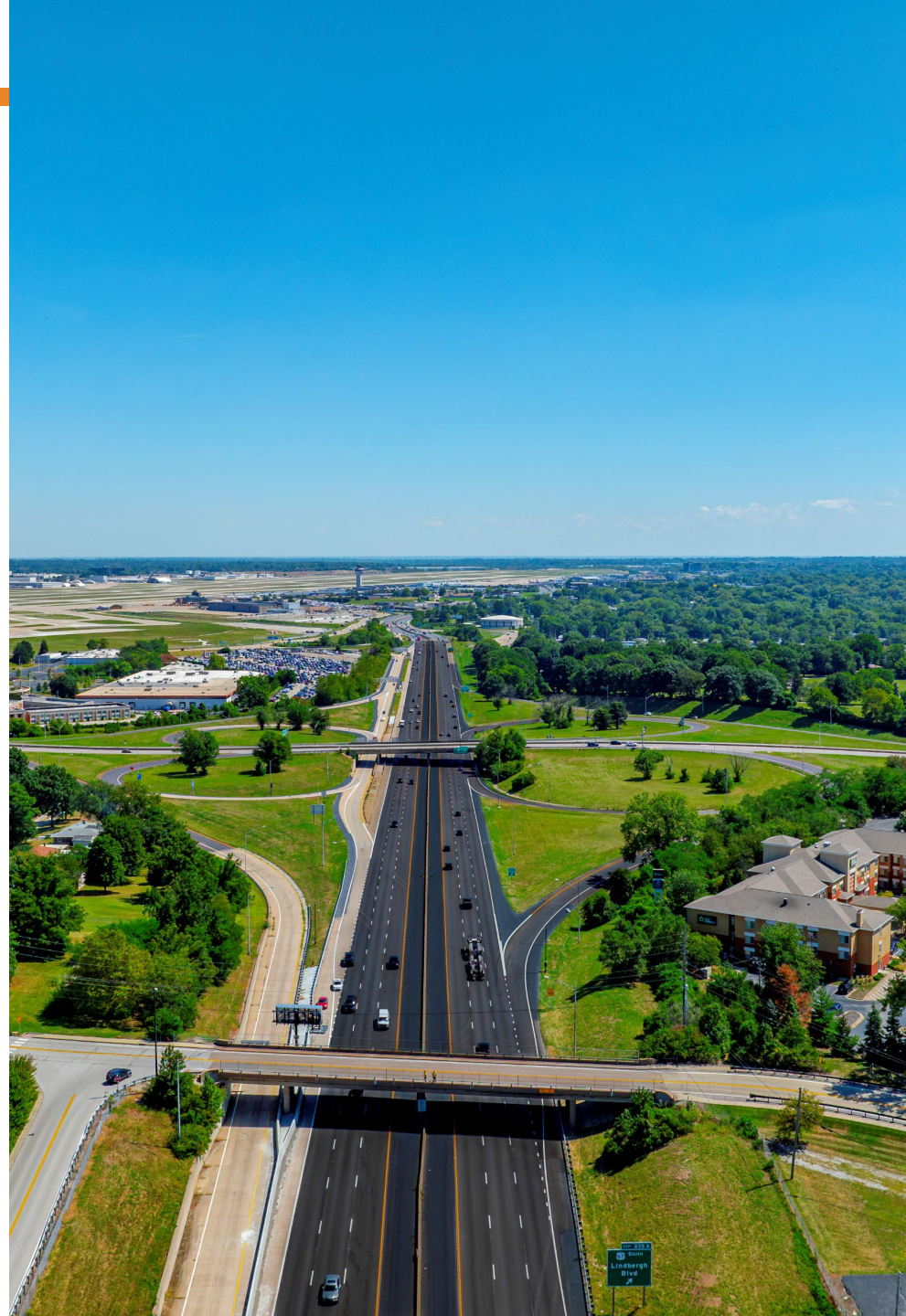

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