



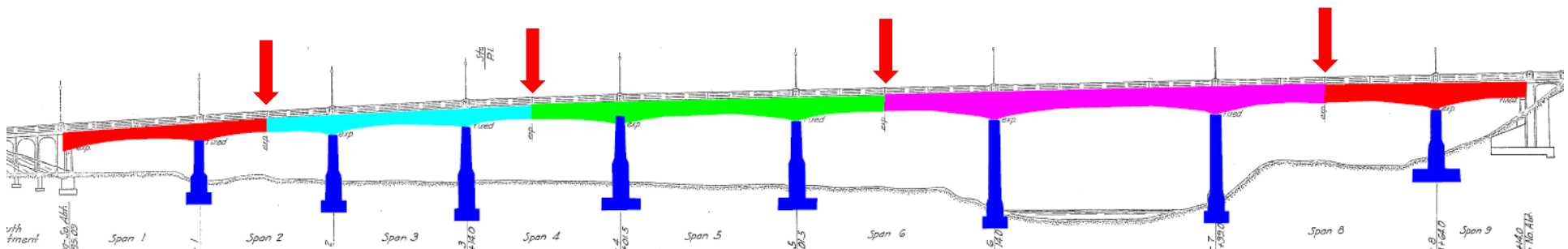
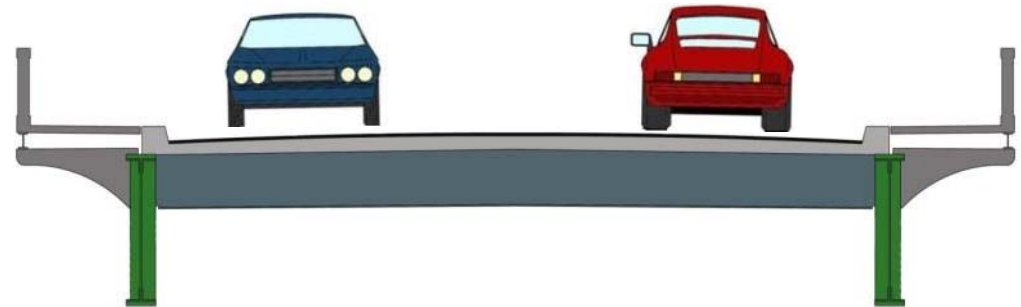
2018 Rehabilitation vs Replacement Study

**Main Street Bridge Over Roanoke River
& NS Railway (Wasena Bridge)**

Existing Wasena Bridge



- Built in 1939
- Two girder system
- Fracture critical structure
- Two column piers
- Hinge joints within the spans



Existing Substructure

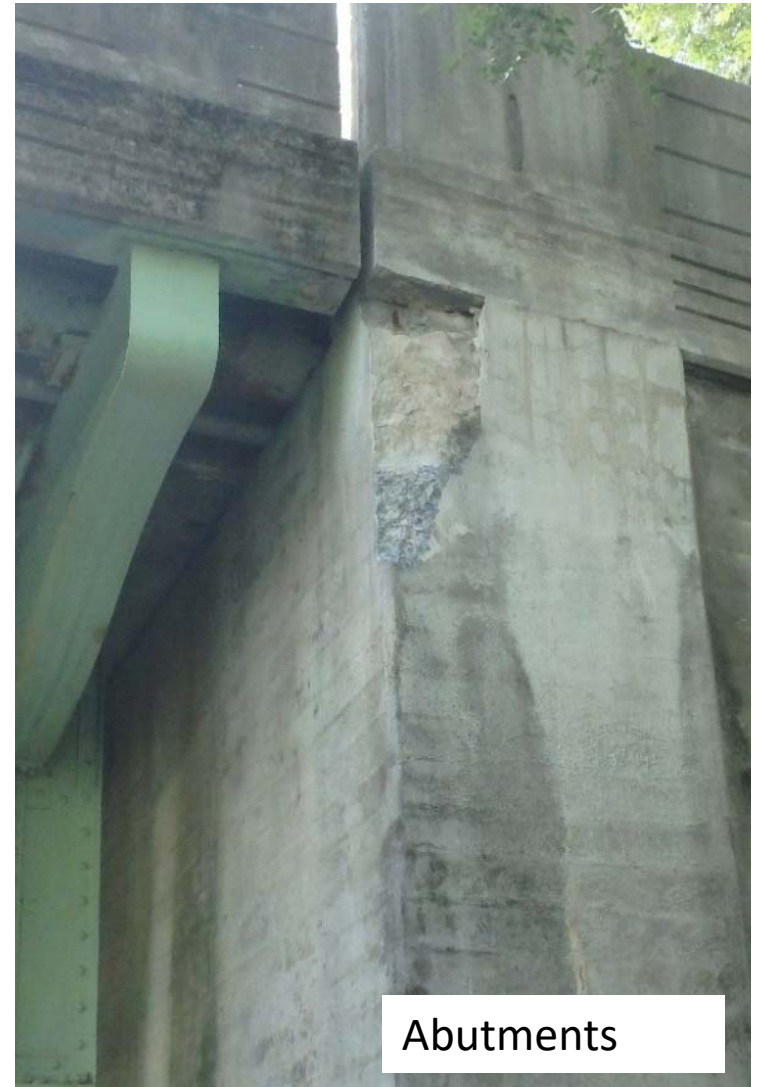
Counterforts



Piers



Abutments



Existing Superstructure



Deck



Cantilever Brackets



Girder Joints



Floor beams



Alternatives to Address Deterioration



Repair



Rehabilitate



Replace

- 80 years of service
- Ten previous repair projects
- Further repairs less effective
- Less service life
- Less cost effective
- Major Rehabilitation vs Replacement



Maintenance of Traffic



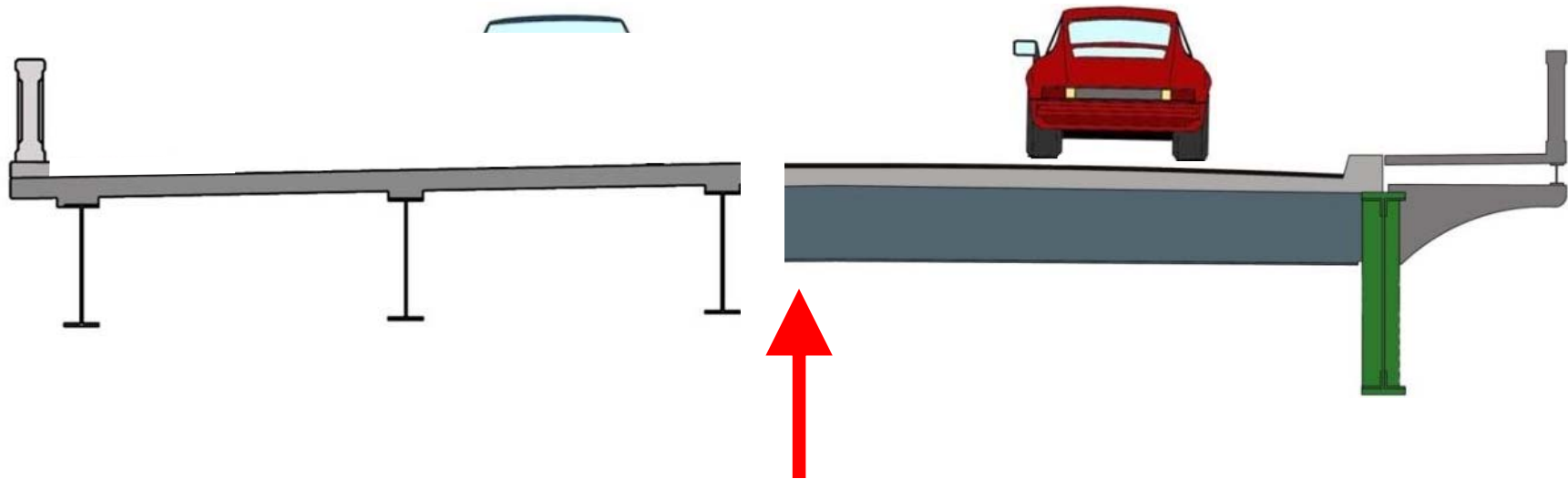
- Strategy: Build on new alignment



Maintenance of Traffic



- Strategy: Build in two stages



- Long span lengths
- Crossing over Railroad
- Increased Cost

Rehabilitate vs Replace

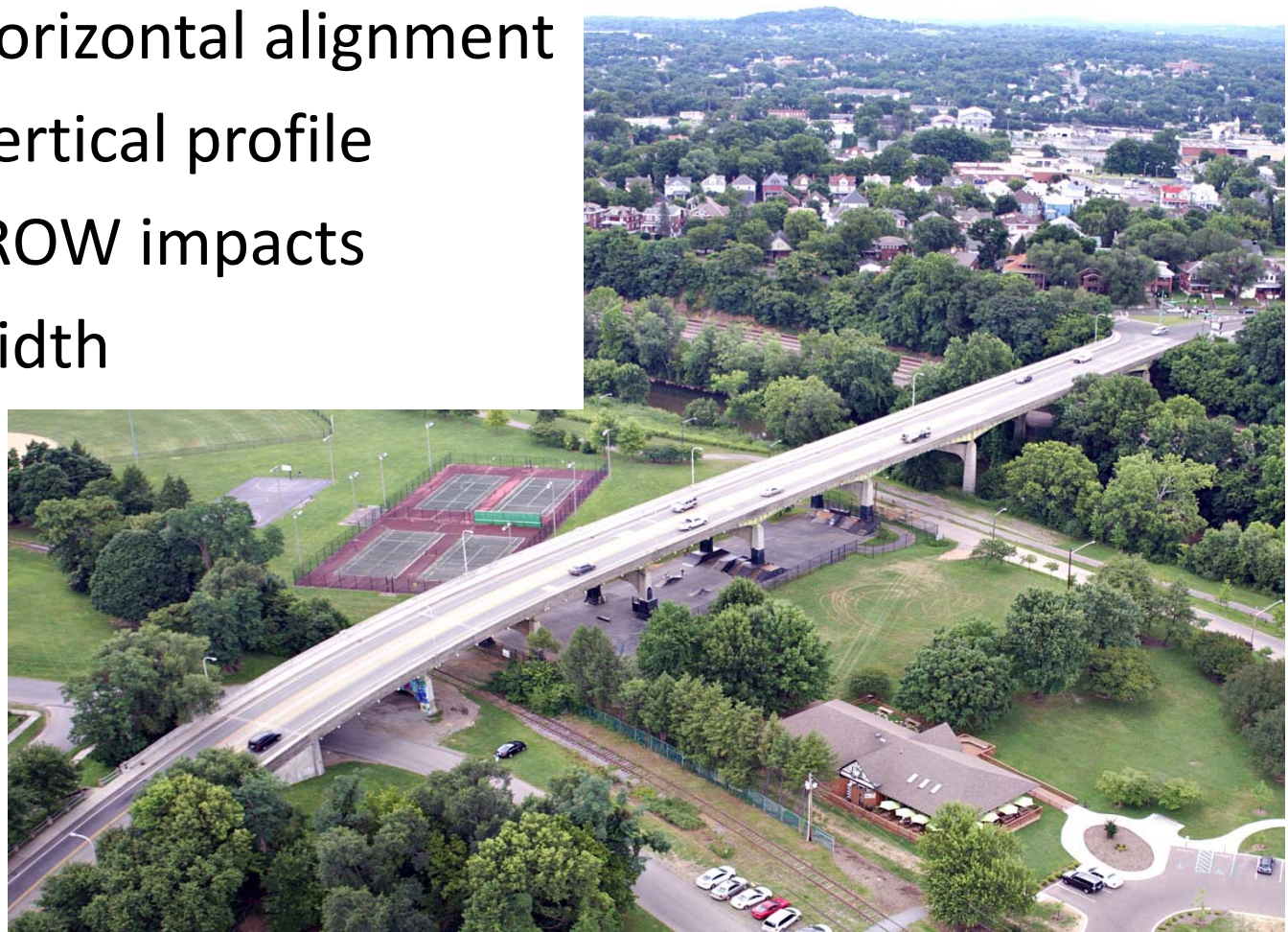


- Rehabilitation
 - Replace the superstructure
 - Deck
 - Beams
 - Reuse existing substructure
 - Repair deterioration
 - Modified to fit new superstructure
- Replacement
 - Replace entire bridge from foundations up.

Rehabilitate vs Replace



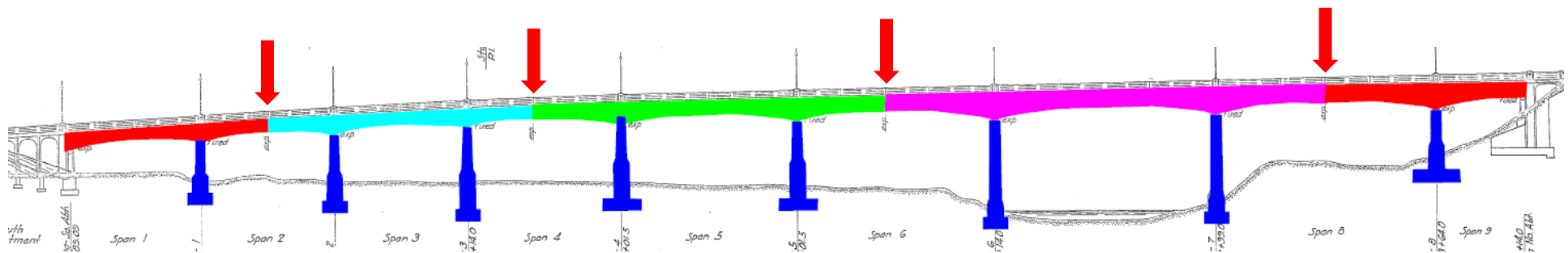
- Comparable features
 - Similar horizontal alignment
 - Similar vertical profile
 - Limited ROW impacts
 - Bridge width



Rehabilitate vs Replace



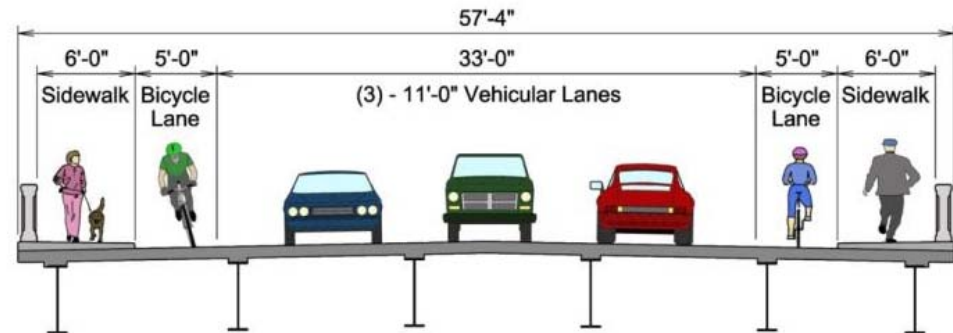
Criteria	Superstructure Replacement	Complete Replacement
5. Superstructure Type	Match existing span configuration, due to reuse of existing piers and abutment.	New span arrangement will be more efficient, with longer spans and fewer piers.
6. Superstructure Joints	Joints required due to curved alignment and pier column strength.	New structure designed to minimize deck joints and reduce future maintenance.



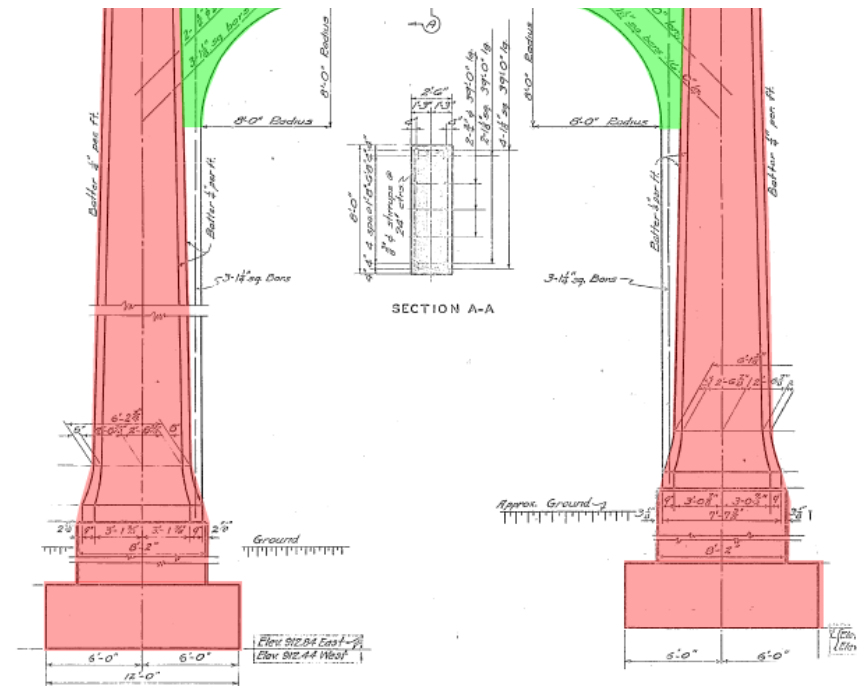
Superstructure Replacement



- Two column piers
- Individual footings
- Web wall



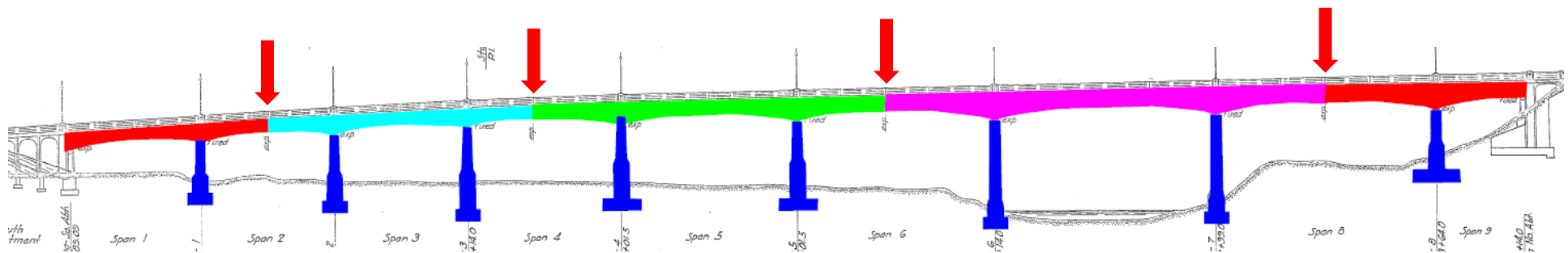
- Demolish top portion
- Construct new cap



Rehabilitate vs Replace



Criteria	Superstructure Replacement	Complete Replacement
8. Pier Reliability	2,000 square feet of pier surface repairs have been completed. Existing columns under-reinforced Retrofit with carbon fiber wrap	New pier columns designed to support all loads.
9. Foundations	Existing spread footings soft shale	New foundations on bedrock



Rehabilitate vs Replace



Criteria	Superstructure Replacement	Complete Replacement
12. Construction Duration	Estimated to be 2 years	Estimated to be 2.5 years.
13. Impacts to Traffic	Road closure estimated to be 2 years.	Road closure estimated to be 1.5 years.
14. Construction Cost	\$16M	\$20M
15. Service Life	40 years	75 years.

