



**Purpose of the meeting**

- ✓ **Learn** about the project
- ✓ **Ask** questions about potential improvements
- ✓ **Share** your thoughts on the recommended option

Welcome to the City of Austin's Barton Springs Road Bridge Public Meeting where you can learn about this project, ask questions about potential improvements and share your thoughts about the recommended improvement option. So let's get started.

# City of Austin Barton Springs Road Bridge



## About the Bridge

Nearly  
**100**  
years old  
built in 1926

**20,000**  
Vehicles per day

**1946**  
Bridge Expansion

**Key Entrance**  
to Zilker Park and  
for Major City Events

**\$36 million**  
Preliminary Funding Estimate  
(Construction + Soft Costs)

- FUNDING SOURCE:**
- Preliminary Design: 2012, 2018 and 2020 Bonds
  - Design: 2020 Bonds
  - Construction: TBD

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The Barton Springs Road Bridge was built nearly 100 years ago in 1926. In 1946, it was expanded to its current width and services up to 20,000 vehicles per day. The bridge also provides a major entrance into Zilker Park, servicing not only the park but also major City events. The preliminary funding estimate for the project is \$36 million. The project is currently funded for completion of engineering and design; future funding for construction will be obtained as the project continues into construction.

# City of Austin Barton Springs Road Bridge



**Bridge Site Challenge and Constraint Categories:**

- Park and Historic
- Environmental
- Roadway Intersection
- Bridge

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The Barton Springs Road Bridge has many site challenges and constraints, which can be grouped into four distinct categories. First is the park and its historic elements. Zilker Park, along with the many historical elements of the surrounding landscape, must be considered in developing any bridge rehabilitation and replacement alternatives. Likewise, the beautiful environment of the bridge setting must be preserved not only for drivers but also for those who use the trail system and surrounding natural landscape. The roadway intersection and its misalignment is one of the key challenges for the project, as well as the bridge structure itself. Considering the bridge’s age and current condition, a great deal of work must be done to either preserve the bridge or pay homage to the bridge with a replacement concept.



# City of Austin Barton Springs Road Bridge



## Roadway Alignment Issues

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The misalignment of the existing roadway is one of several design issues that will be addressed in this project, along with the integration of bicycle and pedestrian facilities to enhance public safety.



## Project Needs

## Project Goals / Outcomes

### Age of Structure

- 100 yrs old, Associated structural degradation

✓ Provide 75 Year Bridge Service Life

### Safety

- Barton Springs roadway not aligned
- Hillside instability at Umlauf Gardens

✓ Improve Safety  
✓ Stabilize Umlauf Gardens

### Insufficient Paths

- Not enough bike or pedestrian paths on bridge

✓ Add Multi-modal and Connect with Park Trails

### Intersection Congestion

- At Barton Springs / Azie Morton intersection

✓ Reduce Congestion with addition of right turn



The purpose and need for the project as well as project goals and outcome include ensuring safety and addressing the age of the structure. At 100 years old, there is structural deterioration that must be attended to provide 75 years of additional bridge service life. Additional safety items to be considered include the Barton Springs roadway misalignment and the hillside instability at the Umlauf Gardens. Insufficient pathways will be addressed by providing more capacity and wider paths for bikes and pedestrians – as well as focusing on connecting these new paths with existing and/or future Zilker Park paths, trails, and amenities. Intersection congestion at Barton Springs Road and Azie Morton Road will also be addressed with the addition of a right turn lane on Azie Morton Road.



## Goal During Construction

- ✓ Maintain all 4 lanes of traffic during construction
- ✓ Maintain the Azie Morton / Barton Springs intersection during construction

**20,000**  
Vehicles per day  
on Barton Springs  
Road

- Important commuter route
- Key access to Zilker Park
- Access to many special events (Trail of Lights, Austin City Limits, Blues on the Green, Zilker Park)
- Access to Zilker and Barton Hills neighborhoods

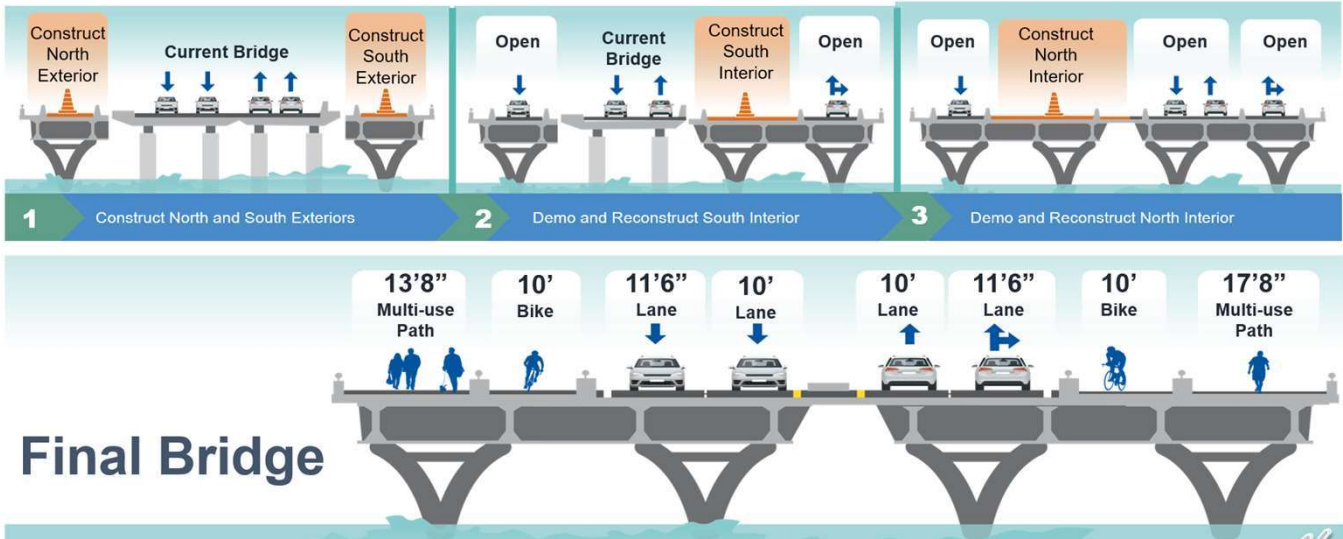


The bridge services nearly 20,000 vehicles per day. It's an important commuter route and provides key access to Zilker Park. It also provides access to many of Austin's special events throughout the year. The Barton Springs and Azie Morton intersection is also a primary access point to both the Zilker and Barton Hills neighborhoods and area businesses. Therefore, it's important that all four lanes of traffic be maintained during any construction on the bridge, as well as maintaining the functionality of the intersection between Barton Springs Road and Azie Morton Road.

# City of Austin Barton Springs Road Bridge



## Bridge Construction Phasing: 4 lanes open through construction



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To maintain four lanes of traffic throughout construction, the project has been divided into three distinct phases. Phase I involves the construction of new structures on both the north and south sides of the existing bridge. Phase II involves the demolition of one-half of the existing bridge and construction of the second half of the new structure to the south side of the current bridge. And Phase III involves the demolition of the remainder of the existing bridge in its entirety and construction of the new north side structure. In its final configuration, the bridge will include two travel lanes in each direction separated by a median, two 10-ft bike paths, and very wide multi-use paths on either side of the bridge.





# PROJECT OPTIONS



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During the course of this study, a broad range of options was explored for both rehabilitation and construction of the Barton Springs Road bridge.

## Rehabilitation Options



**1** **PRESERVE** existing structure, consider separate bike/ped structure (minimal rework - light touch)

**2** **REHABILITATE** and widen deck to include bike/ped

## Replacement Options

**RECONSTRUCT BRIDGE** completely and widen deck to include bike/ped

**1** **One-Span** option



**2** **Two-Span** option

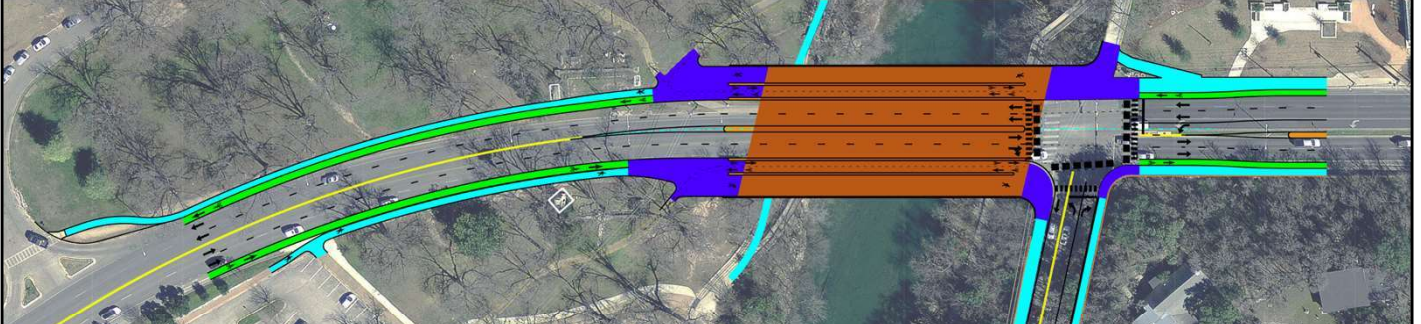


**3** **Three-Span** option



The rehabilitation options included a preservation option that maintained the existing structure with consideration given to a separate bicycle and pedestrian bridge. This involved minimal rework of the existing bridge and was considered a light touch option. The second rehabilitation option involved the full structural rehabilitation of the existing bridge along with the addition of columns and arches to provide a widened deck to provide the addition of bicycle and pedestrian facilities. Replacement options for the project included single-, two- and three-span options, all using the latest in design and construction methods to ensure a 75-year lifespan for the new bridge.

# City of Austin Barton Springs Road Bridge



## Elements Required for Rehabilitation or Replacement

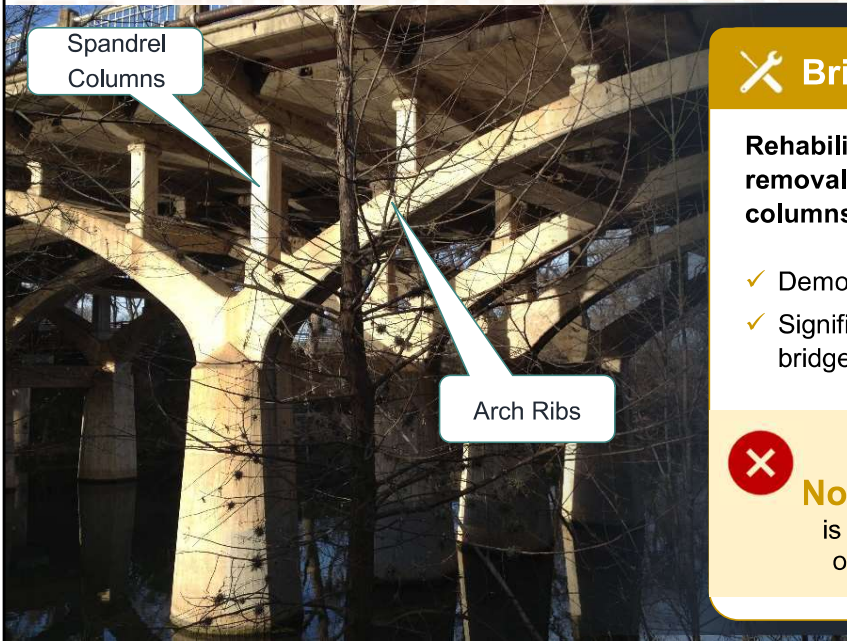
Bike Lanes	Sidewalk / Path	Shared Use Path	Proposed Bridge
<ul style="list-style-type: none"> <li>✓ Widened Bike Lane</li> <li>✓ Accommodate off-road biker trail users</li> </ul>	<ul style="list-style-type: none"> <li>✓ Accommodate hiking Trails</li> <li>✓ Wider Ped. Paths</li> <li>✓ Accommodate Pedestrians for Special Events</li> </ul>	<ul style="list-style-type: none"> <li>✓ Multimodal areas to accommodate off-road hike and bike trail users</li> </ul>	<ul style="list-style-type: none"> <li>✓ Longer service life length</li> <li>✓ Wider bridge</li> <li>✓ Better alignment for safety</li> <li>✓ Dedicated bike lanes</li> </ul>

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There are common elements for the project regardless of whether the ultimate solution is rehabilitation or replacement. Those include new bike lanes with accommodations for off-road bike trail users; sidewalk and path improvements that include wider pedestrian pathways; accommodations for pedestrians during special events; and connections with hike and bike trails. Other common elements are shared use path improvements including multi-modal areas to accommodate off-road hike and bike trail users, as well as improvements to the current bridge, including a wider deck, better alignment at the interchange for safety, and dedicated bike lanes.





## 🔧 Bridge Inspection Findings

Rehabilitation for increased service life requires removal of deck, floor beams, and spandrel columns

- ✓ Demolish the structure to the arch ribs.
- ✓ Significant work is needed: major rehabilitation or bridge replacement.

**✗ Do Nothing**  
is not an option

**1 ✗ Preserve**  
Rehabilitation Option 1 is not feasible



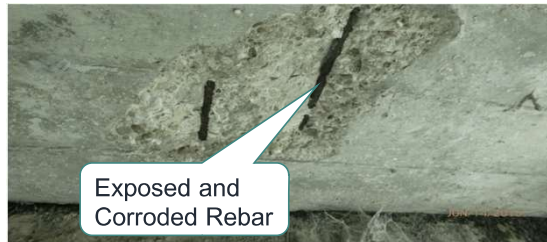
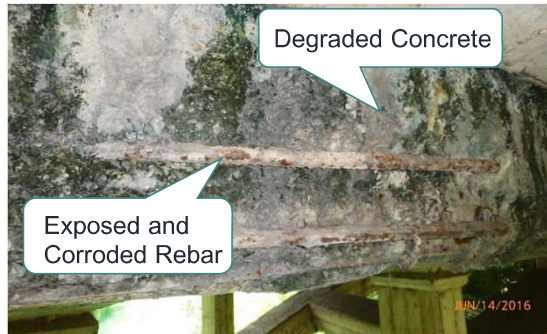
During the study, a detailed bridge inspection was performed. It was determined that in order to achieve the service life requirements for the project, the existing bridge would need to have its deck removed as well as the spandrel support columns removed and then significant repair work done to the arch ribs and the remaining structural components. The significant amount of work that would be required eliminated a do-nothing option, and it also eliminated the preservation rehabilitation option, which we've described as the light touch option.

# City of Austin Barton Springs Road Bridge



## Bridge Inspection Findings

- ✓ Deck (with integral longitudinal joint), floor beams, and spandrel columns exhibited the most degradation.
- ✓ All structural components exhibited some degradation.



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The need for significant rehabilitation of the existing bridge is illustrated in these photographs which show degraded concrete, exposed rebar, and significant concrete deterioration of the support columns.

# City of Austin Barton Springs Road Bridge



Improve  
Paths

Widen for  
Pedestrians

Maintain  
Structural  
Integrity

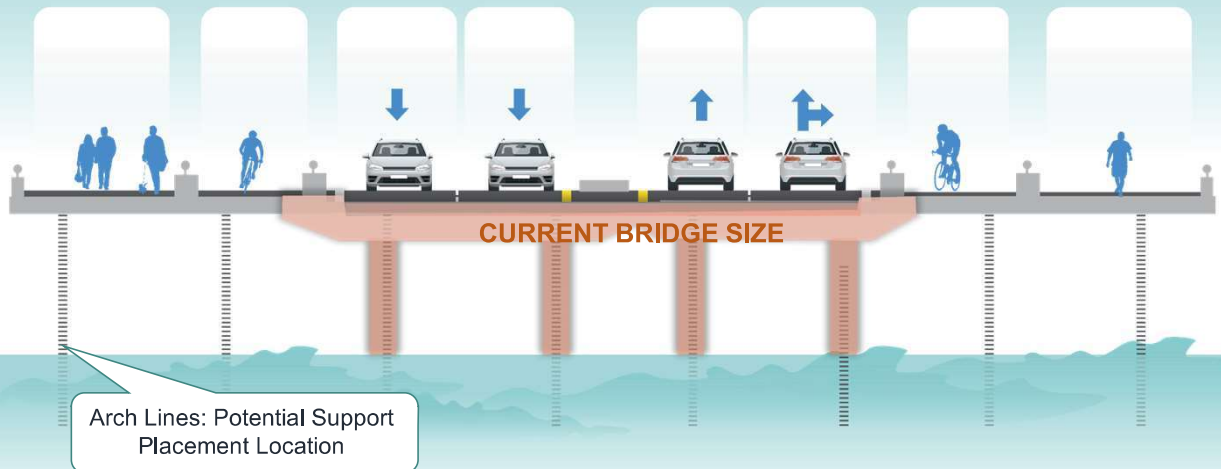
## Bridge Rehabilitation Considerations

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To address the structural degradation issues, a rehabilitation option must also consider maintaining the structural integrity of the remaining bridge components, improving the pathways under and around the bridge, and creating a wider deck to accommodate future needs for pedestrians and cyclists.



## Bridge Rehabilitation Option



Arch Lines: Potential Support Placement Location

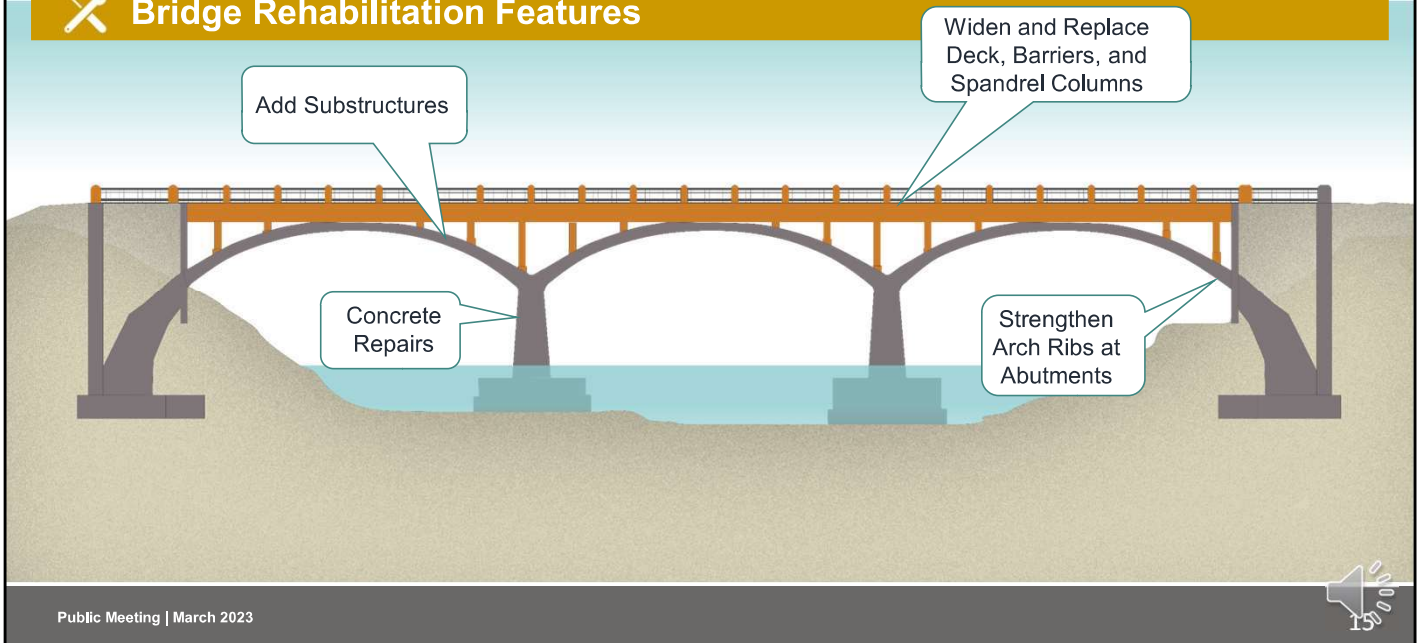


To accommodate the needs of the project, the rehabilitation option also involves a significant widening of the bridge deck. That bridge deck will be supported by the existing columns and arches and four new sets of columns and arches on either side of the existing bridge.

# City of Austin Barton Springs Road Bridge



## Bridge Rehabilitation Features



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The structural rehabilitation requirements are further illustrated in this slide. Concrete repairs would need to be performed on the piers as well as strengthening of the arch ribs and abutments. New spandrel columns and a wider deck with new barriers would also be added to the existing structure.

## Bridge Structure Rehabilitation



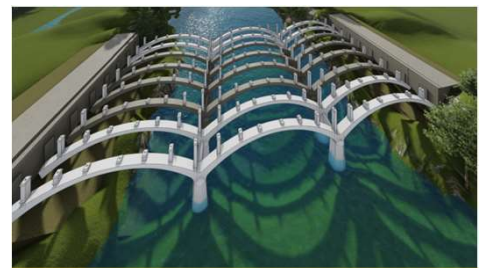
1

Remove Existing Bridge Deck and Spandrel Columns



2

Remaining Portion of Existing Structure



3

New Components: Exterior Pairs of Arch Ribs, Spandrel Columns, Deck, and Abutment Extensions

### Less than half of the original historical structure will remain

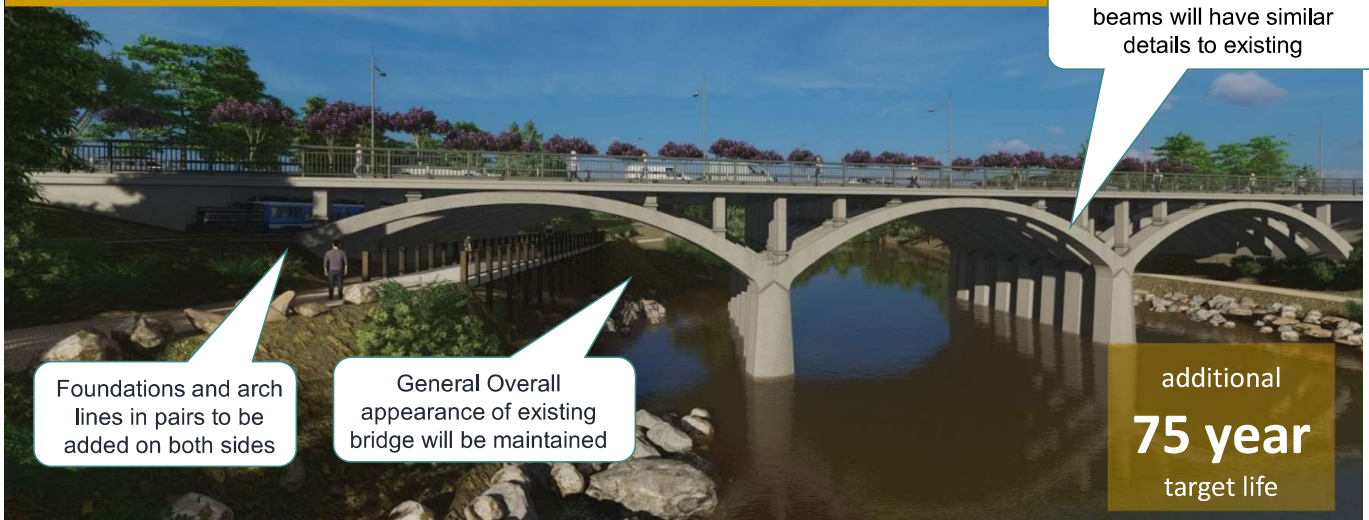
- ✓ Remaining historical structure will require refacing with new material surfaces
- ✓ View of historical structure will be mostly blocked by new structure



The construction of the rehabilitation option would first involve removing the existing bridge deck and its spandrel columns which are the vertical elements above the arch rib, exposing the remaining portions of the existing structure, including the piers, the arch ribs, and the abutments. All of those elements would be reinforced and strengthened, and then the new components, including new piers, arch ribs, spandrel columns, and deck, would be added. As a result, less than half of the original historical structure would remain in place and most of the historical structure would be obscured from view by the new structural components required to rehabilitate the bridge.



## Bridge Rehabilitation Features



Rehabilitation Option Rendering

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17

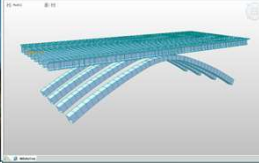


With the rehabilitation option, a great deal of care would be taken to ensure that the new components are compatible with the existing bridge components, both aesthetically and structurally. These include things like alignment of the foundations, piers, and arches with the existing structure as well as maintaining the overhang distances and overall detailing that are seen within the existing bridge.

## Bridge Replacement Options by Span Arrangement

**1**

One-Span

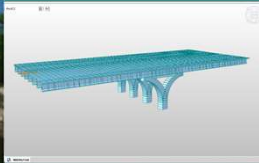


### Single Arch

- ✓ Four Arch ribs spanning creek
- ✓ Arch references existing bridge form

**2**

Two-Span

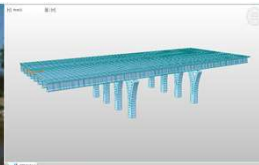


### “Y” Pier Longitudinal

- ✓ Four Y-Piers in the center of the creek
- ✓ Arch-like Appearance

**3**

Three-Span



### “Y” Pier Transverse

- ✓ Eight Y-Piers in two sets of four
- ✓ Opens center channel of the creek






Three different options were developed for the replacement alternatives on the project, all of which include arched forms that pay homage to the overall configuration of the existing bridge while using the most up to date design and construction techniques. Option 1 is a single arch, including four arches that span the creek. Option 2 is a two-span option with Y-piers oriented in the longitudinal direction. Each of those four piers is located along the centerline of the creek. And Option 3 is a three-span bridge using Y-piers oriented in the transverse direction. Option 3 has eight Y-piers divided into two sets of four aligned along either side of the creek.

# City of Austin Barton Springs Road Bridge



## Bridge Replacement Option Comparison

	1-Span	2-Span	3-Span
			
<b>Structural Complexity</b>	<ul style="list-style-type: none"> <li>Complex system</li> </ul>	<ul style="list-style-type: none"> <li>Less complex</li> <li>Uses conventional foundations</li> </ul>	<ul style="list-style-type: none"> <li>Least Complex</li> </ul>
<b>Visual Openness</b>	<ul style="list-style-type: none"> <li>Obstructed visuals</li> <li>Views along center line maintained</li> <li>Potential scour and bank/trail complexities</li> </ul>	<ul style="list-style-type: none"> <li>More visually open than 1-span option</li> <li>View along center of creek obstructed</li> </ul>	<ul style="list-style-type: none"> <li>Most visually open</li> <li>Clear views along center line of creek</li> </ul>
<b>Constructability</b>	<ul style="list-style-type: none"> <li>Most complex to build</li> <li>Requires temporary piers and falsework to make the arches</li> </ul>	<ul style="list-style-type: none"> <li>Fewest number of foundations in water</li> <li>Top of bridge requires specialty construction and falsework</li> </ul>	<ul style="list-style-type: none"> <li>Specialty construction with fewest challenges</li> </ul>
<b>Initial Const. Cost (Bridge Only)</b>	<ul style="list-style-type: none"> <li>\$18.1M</li> </ul>	<ul style="list-style-type: none"> <li>\$13.6M</li> </ul>	<ul style="list-style-type: none"> <li>\$10.2M</li> </ul>

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A detailed comparison of each of these options was performed, considering things like structural complexity, the visual openness of the bridge underneath, constructability, and the initial construction costs. Ultimately, the three-span option was considered the most desirable for a variety of reasons, including the fact that it is the least complex and provides the most openness when viewed from the pathways and waterways surrounding the bridge. Furthermore, it doesn't require as much specialty construction and is significantly less expensive at \$10.2M versus \$13.6M and \$18.1M for the two-span and one-span options.





# RECOMMENDED OPTION RENDERINGS



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Now, let's look at the recommended option in a bit more detail.

# City of Austin Barton Springs Road Bridge



## Rendering of Recommended Bridge Replacement Option (3-span)



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The recommended alternative is a three-span replacement option that includes transverse Y-piers that create arched forms flanking either side of the creek below.

# City of Austin Barton Springs Road Bridge



Larger space on west bank for trail and Zilker Eagle

Fewer elements with clean lines produces less clutter beneath the bridge.

 **Rendering of Recommended Bridge Replacement Option (3-span)**

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The three-span option has a variety of different benefits, including providing much larger spaces underneath the bridge on the west bank to accommodate trails and the Zilker Eagle. The clean lines and elegant forms of the transverse Y-piers allow viewsheds to be open underneath the bridge, creating less visual clutter and greater access to the surrounding landscape.



# City of Austin Barton Springs Road Bridge



Bridge Pedestrian Concept  
with access on both sides

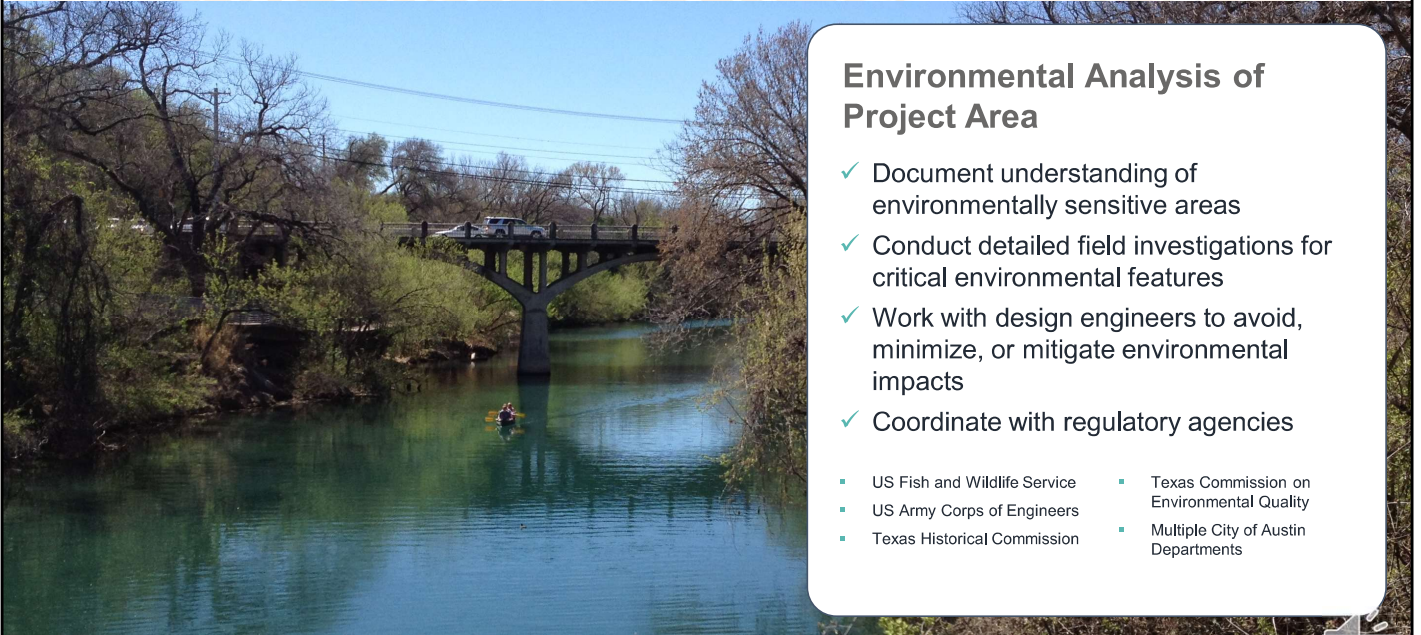


Rendering of Recommended Bridge Replacement Option (3-span)



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Once completed, the wider bridge deck will provide much greater separation between the different users on this structure. Dedicated bike lanes and generous multi-use paths on either side of the bridge will accommodate bicyclists, pedestrians, and the special event goes throughout the year.



## Environmental Analysis of Project Area

- ✓ Document understanding of environmentally sensitive areas
- ✓ Conduct detailed field investigations for critical environmental features
- ✓ Work with design engineers to avoid, minimize, or mitigate environmental impacts
- ✓ Coordinate with regulatory agencies

- US Fish and Wildlife Service
- US Army Corps of Engineers
- Texas Historical Commission
- Texas Commission on Environmental Quality
- Multiple City of Austin Departments



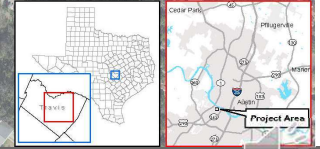
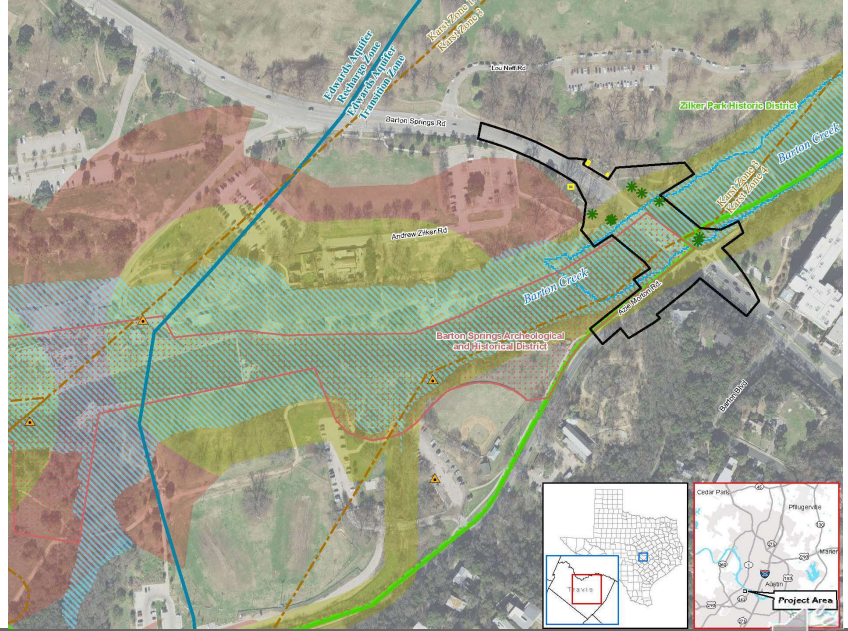
The environmental analysis of the project and project area includes documenting and understanding the environmentally sensitive areas; conducting a detailed field investigation to identify critical environmental features; working with the designers and engineers to avoid, minimize, or mitigate any of the environmental impacts; and coordinating with the regulatory agencies.

# City of Austin Barton Springs Road Bridge



## Environmental Issues / Constraints Map

- Known Heritage Tree Location
- Spring
- Regulatory Floodplain (100-Year)
- City of Austin Fully Developed 100-Year Floodplain
- Karst Zone
- Edwards Aquifer Zone
- Preliminary Limits of Construction Operations
- Entrance Monuments
- Zilker Park Historic District
- Barton Springs Archeological and Historical District
- Critical Water Quality Zone
- Water Quality Transition Zone



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A detailed environmental and constraints map has been developed for the project to inform the engineers, designers, and policymakers of the key constraints that should be considered during the development of the new project.

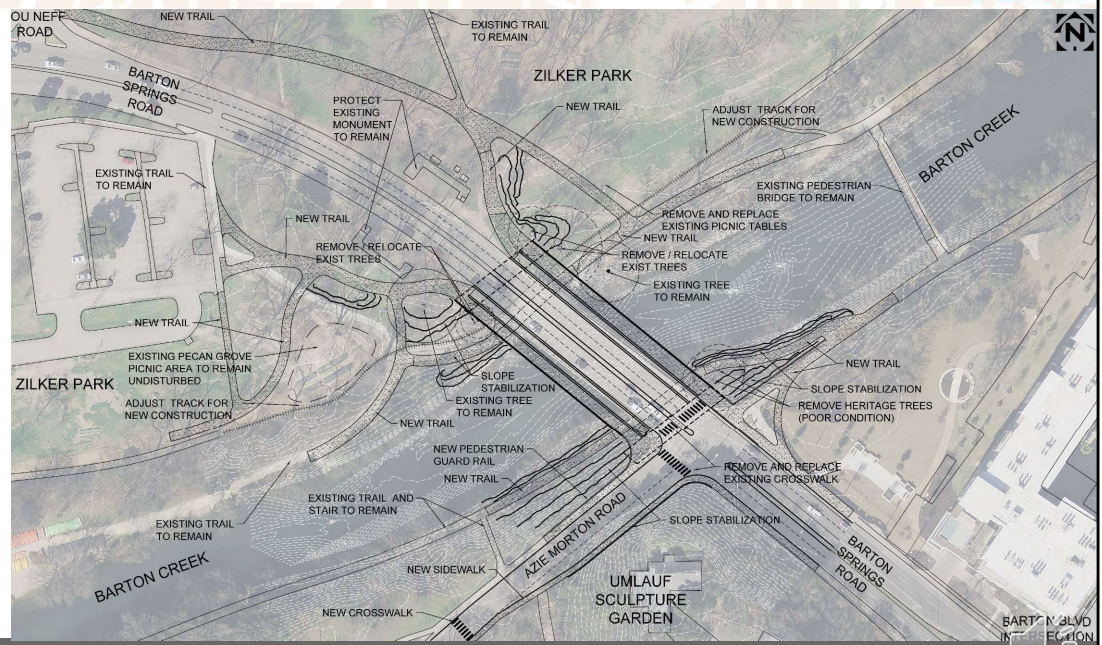


# City of Austin Barton Springs Road Bridge



## Multi-modal Connectivity with Parks

- ✓ Protect Historic Landmarks
- ✓ Protect or move Heritage Trees
- ✓ Flexibility and Connectivity with Zilker Park Vision Plan



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Multi-modal connectivity is a vital part of this new project, and the bridge design will help ensure that we are protecting historic landmarks, protecting or moving heritage trees, and creating flexibility with this project that is compatible with the new Zilker Park Vision Plan.

# City of Austin Barton Springs Road Bridge



## Comparison of Rehabilitation to Recommended Replacement Option

	Roadway Geometry		Park Amenities / Improvements			Bridge Structure								
	Right Turn lane onto Barton Springs Road	Alignment	Zilker Eagle Train	West bank hike/bike trail pedestrian bridges	Hike / Bike Trail below bridge	Architecture and Aesthetics	Impacts to Historic Structure	Length and Abutments	Foundation Work	Temporary Construction in Creek	Bicycles + Pedestrian	Service Life + Maintenance	Cost	Constructability / Risk
Rehab	✓	-	-	-	-	-	✓	-	-	-	-	-	-	-
Replace	✓	✓	✓	✓	✓	-	-	✓	-	-	-	✓	✓	✓

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A detailed analysis was conducted to compare the rehabilitation option and the recommended replacement option. This analysis considered things such as roadway geometry, park amenities and improvements, and the overall bridge structure and life-cycle performance. In this analysis, the replacement option scored better than the rehabilitation option in all but two categories, leading to a recommendation for a replacement bridge.

## Comparison Highlights



### Rehabilitation Options



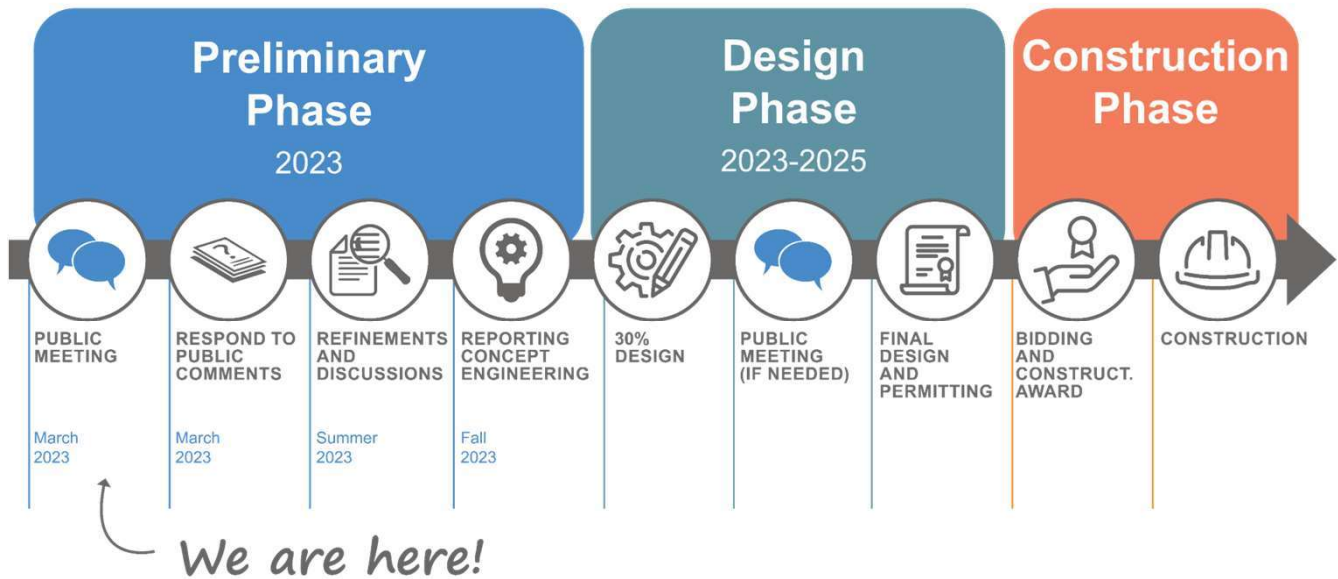
### Replacement Options

Fewer	Number of Benefits	★ MORE
More Expensive	Cost	★ 40% Less
Riskier	Short and Long Term Risk	★ Less Risk
		↶ Replacement Recommended



Some of the highlights of the comparison between replacement and rehabilitation options include the fact that the replacement option provides a greater number of benefits, is 40% less expensive, and poses much less short-term and long-term risks to the project.

# City of Austin Barton Springs Road Bridge



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The preliminary phase for this project will continue throughout 2023, starting with this public meeting and responses to public comments, discussions with the City Council, and finally, the concept engineering report. The preliminary phase will be followed by a design phase consisting of a 30% design, another public meeting as needed, and then final design and permitting. After that, the bidding and construction award will occur followed ultimately by the final construction phase which we anticipate to last 3 to 4 years due to phasing requirements needed to maintain 4 lanes of traffic while the old bridge is demolished and the new bridge is built.