

ARIZONA AVENUE ALTERNATIVES ANALYSIS

Final Report

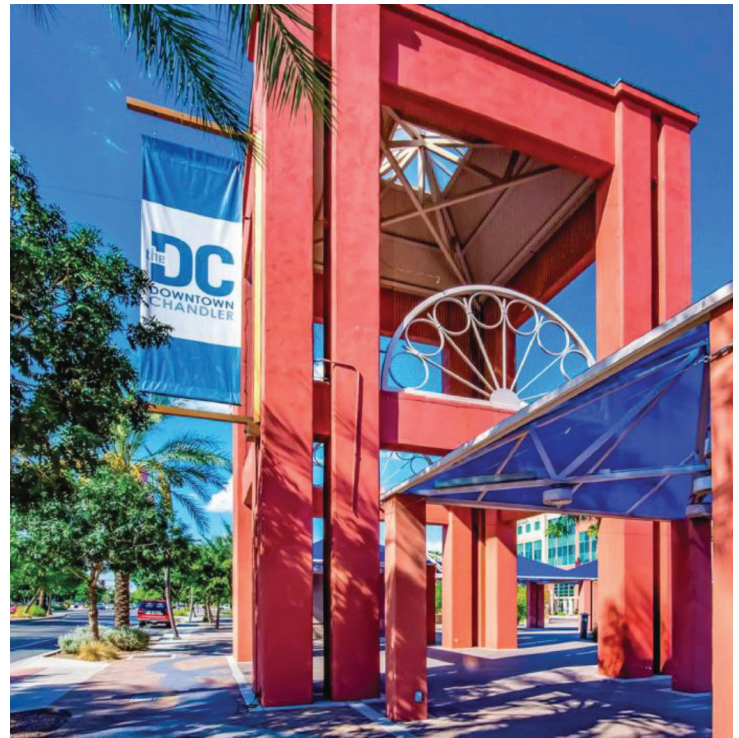


JUNE 2021

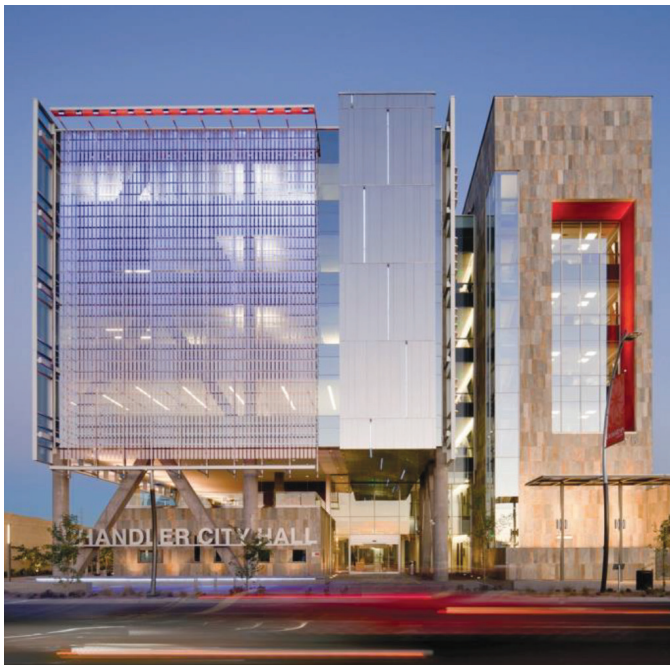


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Introduction



Valley Metro, in coordination with the City of Chandler, conducted the Arizona Avenue Alternatives Analysis (AAAA) to evaluate the potential of a future high-capacity transit (HCT) system to connect points of interest, planned developments and emerging transit corridors in Chandler and the greater East Valley.

The study identified and analyzed potential corridors for a future HCT system to serve Chandler. The results of the study will help Chandler plan and prioritize future transit investments. This report summarizes the study's methodology, recommended corridors and next steps to realize a future HCT corridor in Chandler.

Background

What is the Purpose of studying HCT in Chandler?

- To enhance HCT connectivity to the existing light rail and potential future projects in the Fiesta District in Mesa
- To support growing population and employment in the study area
- To assist with travel demand within the study area especially between Downtown Chandler and surrounding activity centers
- To further the momentum of economic and transit-oriented development in the study area
- To support regional efforts for congestion mitigation and air quality improvement
- To aid mobility of transit-dependent population

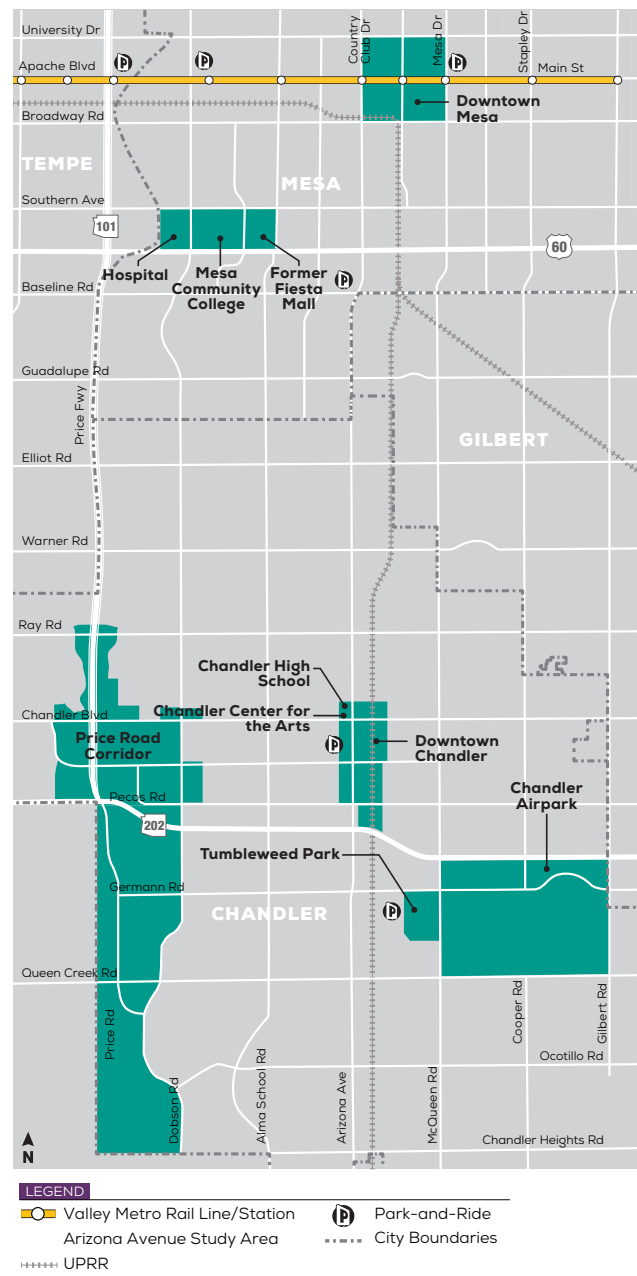
The study area has a relatively high population density, demonstrates existing transit use and includes many economic development opportunities.



Source: MAG 2017 Regional Transportation Model

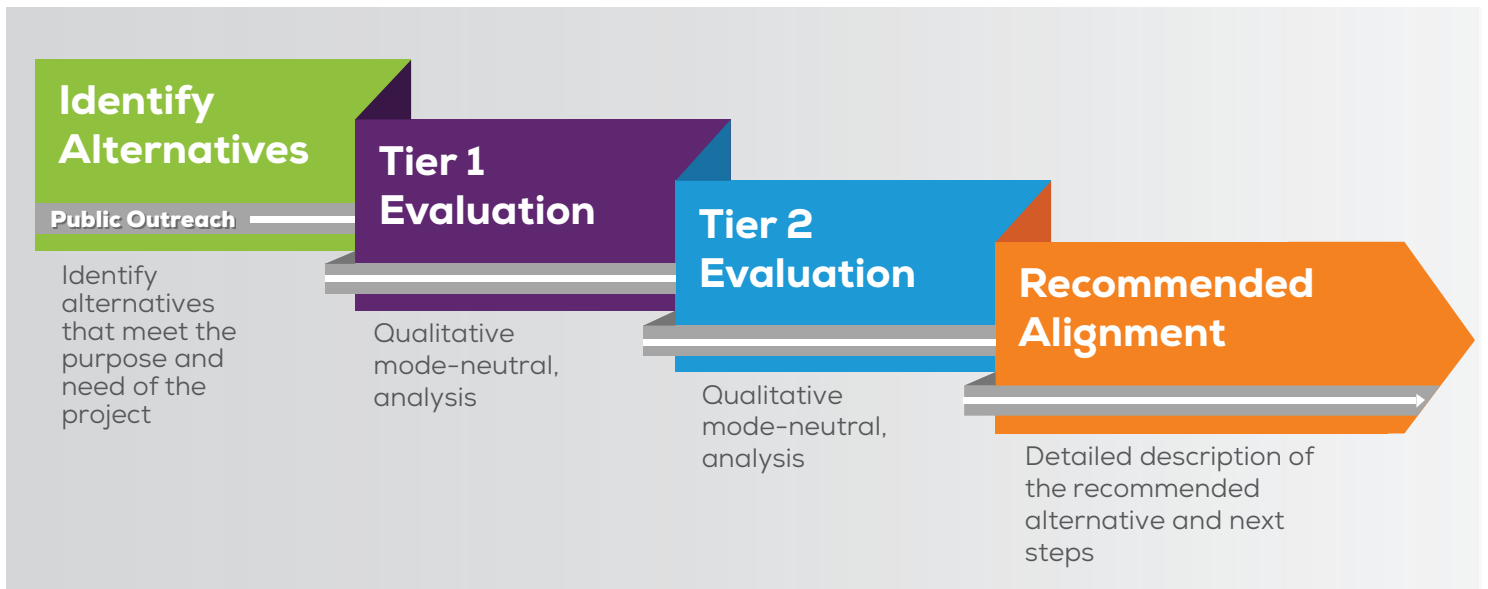
The characteristics of the study area suggest strong future growth and travel demand that warrants a future investment in HCT and other transit services.

The AAAA study area includes portions of Chandler, Mesa and Gilbert and stretches from Southern Avenue to Chandler Heights Boulevard and follows the Loop 101/Price Road and Gilbert Road. It includes Downtown Chandler, the Price Road Corridor and the Chandler Airpark District.



Analysis Process

The evaluation process identifies alternatives and compares qualitative and quantitative data to determine a recommendation.



The alternatives analysis process is a two-tiered evaluation to assess HCT alternatives.

Tier 1 Evaluation is a qualitative, high-level review of potential HCT options within the study area. The assessment of potential alignments during the Tier 1 Evaluation is mode-neutral, assuming each alternative could accommodate either type of HCT mode under consideration, i.e. rail or bus rapid transit (BRT).

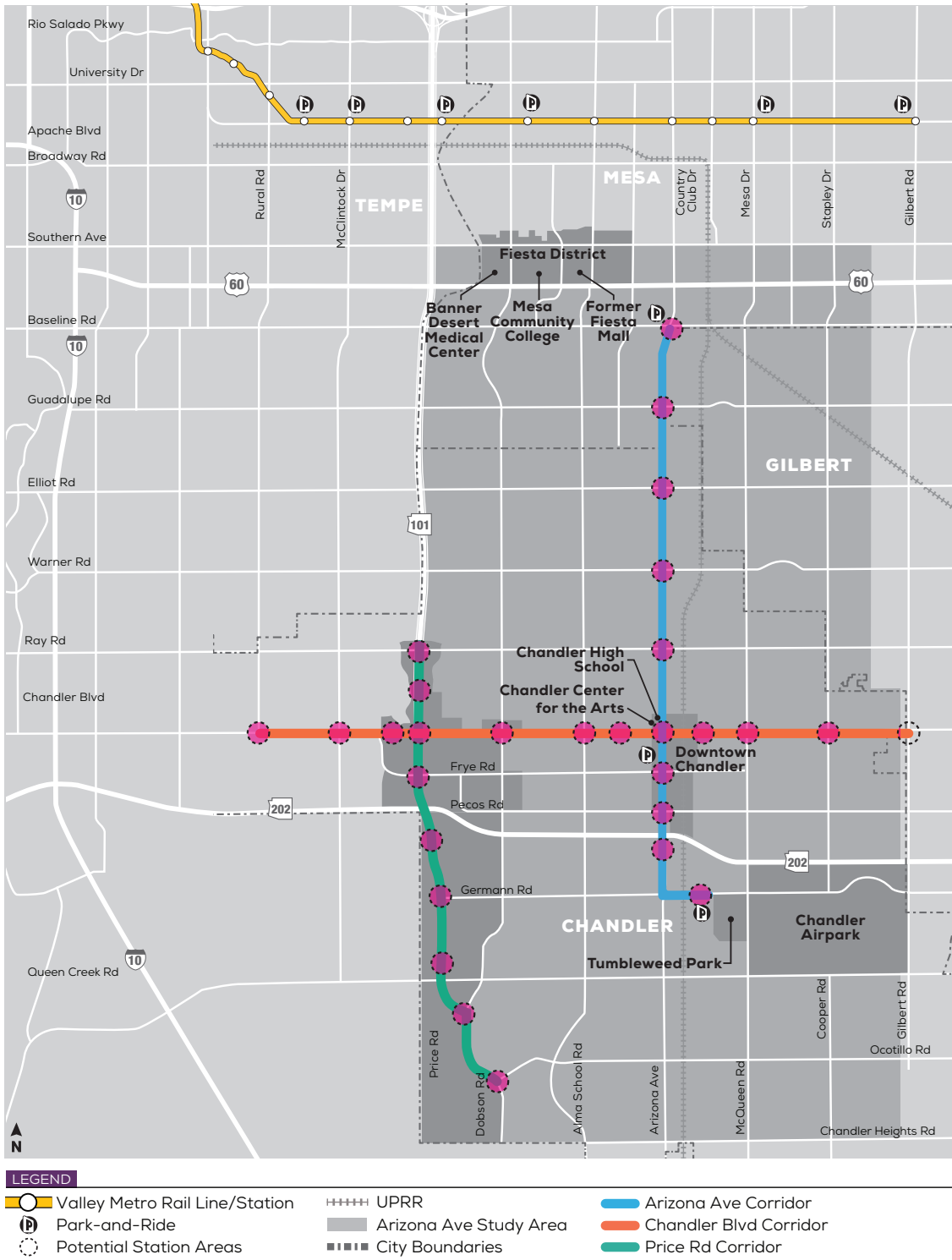
Tier 2 Evaluation assesses the alternatives through a detailed, primarily quantitative analysis with several considerations:

- Consistency with existing plans and policies
- Opportunities for economic development
- Compatibility with existing and future transportation network
- Physical and engineering constraints
- Future population and employment
- Existing transit riders

The results of the Tier 2 Evaluation indicate a Recommended Alignment for future evaluation for HCT in the AAAA study area.

Tier 1 Evaluation

In the Tier 1 Evaluation, Valley Metro and the City of Chandler defined three HCT alternatives informed by the recently adopted Chandler Transportation Master Plan, updated in 2019.



Defined Corridors

Each Corridor has unique opportunities and challenges to support a HCT investment.

Arizona Avenue

- Serves large activity centers such as Downtown Chandler
- Connects to existing bus network
- Multiple opportunities for phasing to connect existing HCT and activity centers such as Fiesta District
- Large amounts of vacant/underutilized properties with potential for transit supportive development

Chandler Boulevard

- Existing land use and transit market supports additional HCT investment
- Connects to existing bus network
- Provides numerous connections to local and regional activity centers such as Chandler Fashion Center
- Does not have a feasible direct connection to existing or future HCT routes

Price Road

- Connection to employment centers such as the Intel campus
- High opportunity of future economic development
- Low population density
- Limited existing transit service along the entire route of this corridor

Each corridor was examined with the intention of having a responsive mode suitable for the continued growth and development of Chandler. The corridor's ability to connect to future HCT projects in the region, as well as the ability to operate in mixed traffic where right of way is limited, such as Downtown Chandler, was considered.

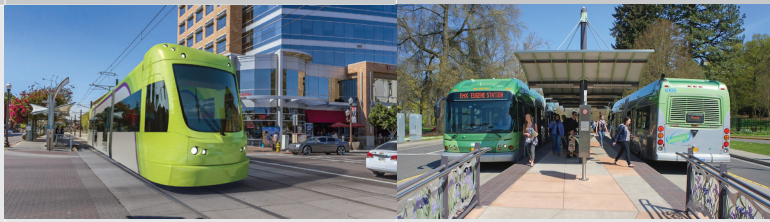


Downtown Chandler

Conceptual Designs

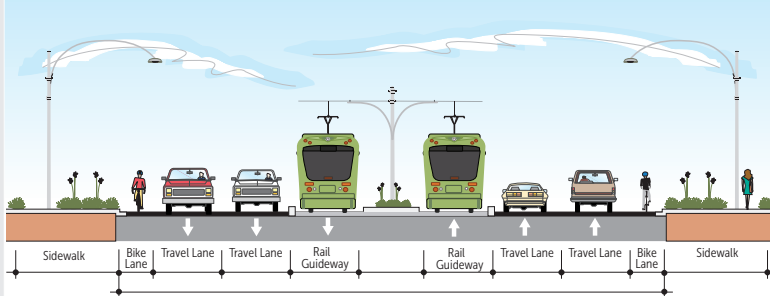
Conceptual designs were developed for a preliminary understanding of the constructability and potential impacts for two types of HCT technologies.

	RAIL	BRT
Operating Environment	Primarily dedicated guideway, mixed traffic	Semi-dedicated guideway, mixed traffic
Spacing of Stops	1/2 to 1 mile	1/2 to 1 mile
Passenger Capacity per Vehicle	130 to 160	60 to 90
Relative Capital Cost	\$\$	\$
Relative Operating Cost	\$\$\$	\$

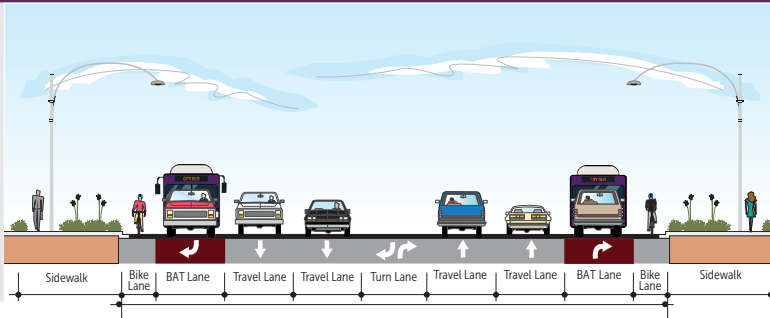
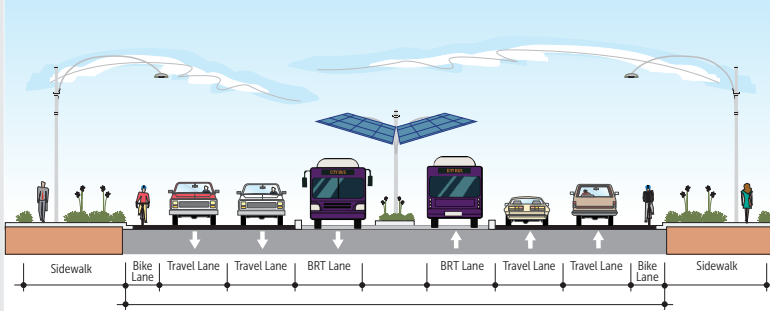


The Rail mode is a hybrid option between streetcar and light rail. It is envisioned as a streetcar vehicle with streetcar stops that operates in an exclusive guideway for a large portion of the alignment then in mixed traffic while downtown.

Bus Rapid Transit considered for analysis operates with semi-exclusive guideway in portions of the alignment.



Semi-exclusive guideway where the Rail or BRT travels in the median or on the side of the road without other vehicles requires re-purposing of automobile lanes or widening the street.



Mixed-flow guideway where automobiles and BRT share lanes together either in the median or curb lanes, uses the existing lanes.

Tier 2 Evaluation

The Tier 2 Evaluation is the secondary screening of the potential alternatives for advancement. The recommended alternatives underwent a detailed, primarily quantitative analysis. The three alignment alternatives, combined with transit types, were compared to each other across the identified criteria elements and given a rating of high(3), medium(2), or low performance(1).

Evaluation Criteria	Evaluation Criteria Weight	Alternative 1 Arizona Avenue 8.5 miles		Alternative 2 Chandler Boulevard 8 miles		Alternative 3 Price Road 5.5 miles			
		RAIL	BRT	RAIL	BRT	RAIL	BRT		
		Score	Score	Score	Score	Score	Score		
Ridership Potential	Forecasted Daily Transit Trips per Mile	5	3	2	3	1	1	Ridership Potential: forecasted number of riders that the route may attract (from STOPS computer modeling)	
	Forecasted Percent Zero-Car Transit Trips	1	1	1	2	2	3		2
	Daily Transit Trips per Mile	1	3	3	2	2	1		1
	Subtotal		19	14	19	9	9		8
Transit Access	Population Density in Stop Area	1	2	2	3	3	1	1	Transit Access: future population and employment, existing transit connections and bikeways/paths
	Employment Density in Stop Area	2	1	1	2	2	3	3	
	Publicly-Supported Housing in Study Area	1	2	2	3	3	2	1	
	Connections with Existing Transit Routes	2	3	3	2	2	1	1	
	Connections with Future HCT Routes	2	3	3	2	3	2	2	
	Connections with Bikeways/Multi-Use Paths	1	2	2	3	3	2	2	
Subtotal		20	20	21	21	16	16		
Physical & Engineering Constraints	Non-Transit Vehicle Lanes	1	2	3	2	3	3	3	Physical & Engineering Constraints: environmental, historic and cultural resources, right-of-way and utilities
	Right of Way and Land Acquisition	1	1	3	1	3	1	3	
	Potential Environmental Impacts	1	2	3	2	3	3	3	
	Utilities	1	2	3	2	3	1	3	
Subtotal		7	12	7	12	8	12		
Land Use & Economic Development	Consistency with Adopted Land Use Plans and Policies	1	3	3	3	3	1	1	Land Use & Economic Development Potential: consistency with local plans and available land for redevelopment
	Redevelopment/Transit-Oriented Development (TOD) Opportunities	1	3	3	2	2	2	2	
	Opportunity for Integration into Emerging Developments/Districts	1	3	3	1	1	1	1	
Subtotal		9	9	6	6	4	4		
Potential Costs	Capital Cost Estimate	1	2	3	1	3	1	3	Potential Costs: high-level costs to build and operate Rail and BRT along the route
	Operations and Maintenance (O&M) Cost Estimate	1	1	2	1	2	2	3	
	Cost Effectiveness	1	3	3	3	3	1	1	
Subtotal		18	20	17	20	9	11		
Transportation Efficiencies	Operating Efficiency	1	2	2	2	2	2	2	Transportation Efficiencies: how efficiently could the route be built and operated
	Transit Speed and Reliability Impediments	1	2	2	2	2	3	3	
	Scalability	1	2	2	2	2	1	2	
Subtotal		6	6	6	6	6	7		
Total		79	81	76	74	51	58		
Rank		2	1	3	4	6	5		

In coordination with the City of Chandler, the project team identified three weighted categories in the evaluation: Ridership Potential, Transit Access and Potential Costs.

Community Outreach

Community outreach was conducted for this early-stage technical evaluation, which included opportunities for the public to see and comment on the study development and promote targeted stakeholder involvement.



Open House Meetings

Four public meetings were held at different stages of the study.

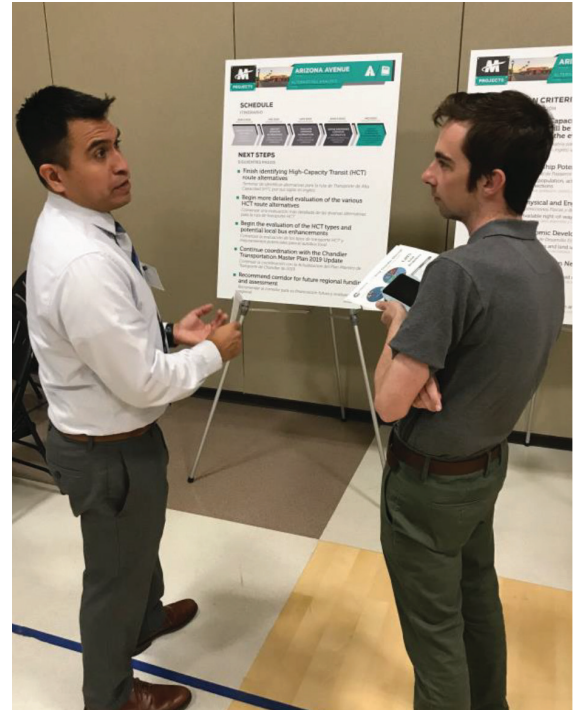
- January 23, 28, 30, 2019: presented project overview, descriptions of the corridors and the Tier 1 Evaluation process.
- October 24, 2019: stakeholders shown the three alternative corridor options.

Key Business Stakeholders

- 28 key business stakeholders attended the workshops.
- Stakeholders included large employers, special interest groups and commercial property owners.
- Discussion focused on understanding the study process and the future transit needs of the area.

Online Website and Social Media

- A webpage for the project was created on Valley Metro's website and updated quarterly or as needed.
- Valley Metro posted public meeting notifications on the agency's Facebook and Twitter pages.



AAAA open house meeting

- These notifications were frequently reposted by the City of Chandler Communications and Public Affairs Department and by several large Chandler Community Facebook groups.

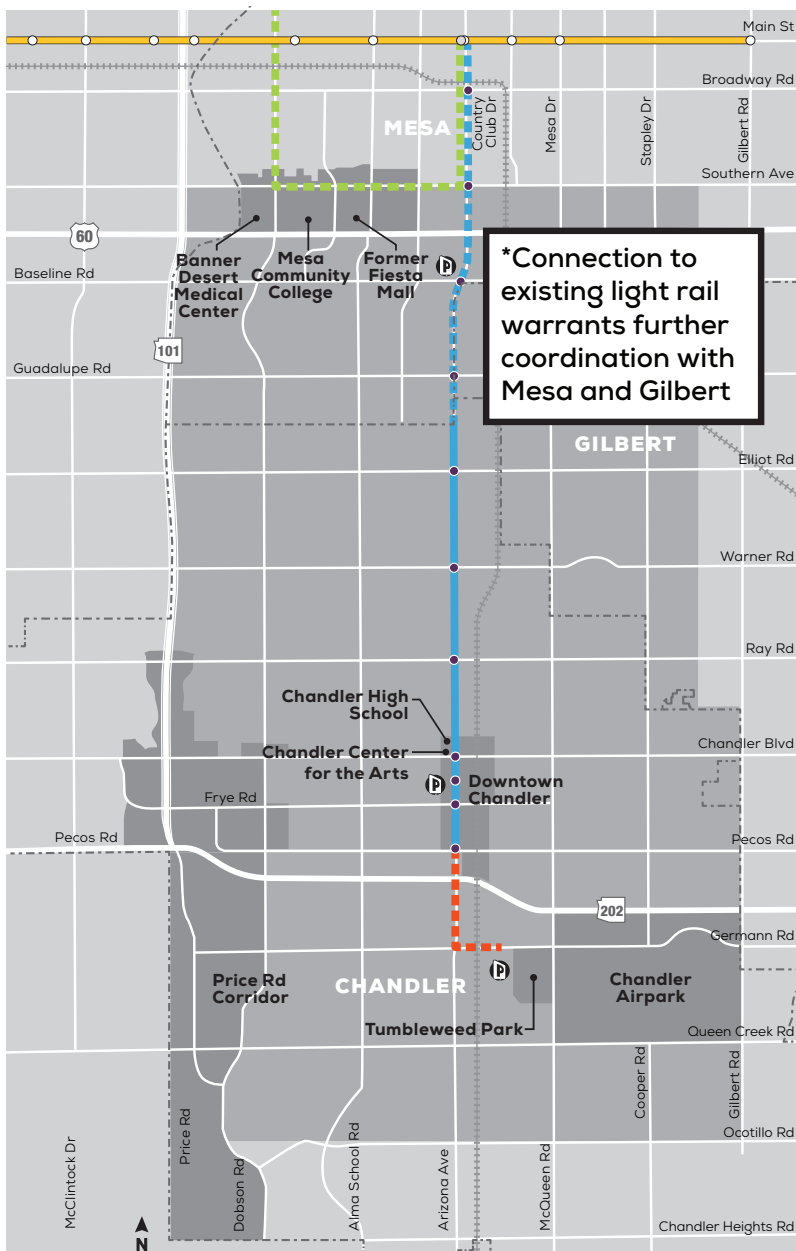
Notable Takewaways

- The majority of public input expressed support for HCT in Chandler.
- A desire to connect to existing HCT was conveyed.
- Arizona Avenue was commented as being the preferred alternative to Price Road and Chandler Blvd.

Recommendation

The recommended alignment alternative for future HCT is Arizona Avenue.

Different end-of-line options in the study area were assessed to measure ideal conditions for both BRT and Rail. For both modes Pecos Road was found to be the most feasible end-of-line option; however BRT has the ability to deviate from dedicated guideway and continue operating in mixed traffic like local bus service to the Chandler park-and-ride if desired.



Pecos Road is the recommended end-of-line option for BRT service with dedicated guideway. Future extensions that operate in mixed traffic could be made to;

- Chandler Park-and-Ride
- Germann Road

For potential rail service, the Arizona Avenue alignment begins at Pecos Road, travels north on Arizona Avenue to the Western Canal with opportunity for connection to the proposed Fiesta District HCT.

Compared to all other alternatives, Arizona Avenue ranked highest in two criteria categories:

- Mobility improvements
- Land use & economic development

Arizona Avenue rated highly in Transit Access as well.

The recommendation is mode neutral with characteristics compatible with dedicated guideway for BRT or Rail.

Future Technologies

How does transit fit into the future of transportation?

Scenario modeling allows planners, decision-makers and other key stakeholders to understand the potential impacts of a range of interrelated decisions. At some level the future is uncertain; therefore, scenario planning is not intended to predict the future. Scenario planning provides an understanding of potential future outcomes and supports decision making.

Four scenarios were modeled to explore the change in the annual number of transit riders over the next 50 years (2020-2070). The baseline indicated a continuation of existing services and conditions; Scenario 1 is personally owned autonomous vehicles (AV) as well as existing transit without service improvements; Scenario 2 is personal and shared AVs with some microtransit options, and Scenario 3 is personal and shared AVs with HCT, automated bus service and increased transit service.

Baseline

Continuation of existing service and conditions

Scenario 1

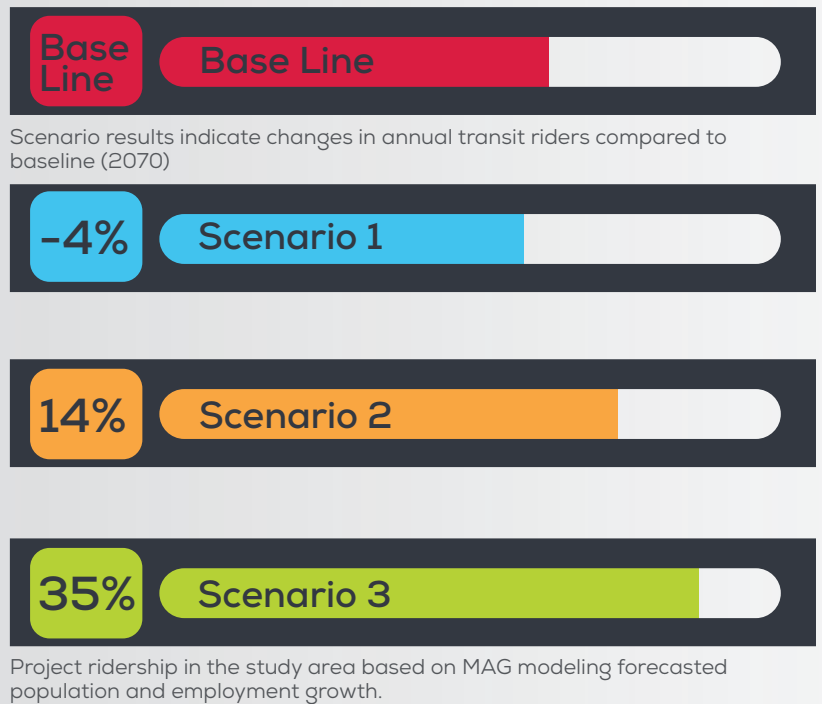
Personally owned AVs; existing transit; no service improvements

Scenario 2

Personal & shared AVs; some AV micro-transit

Scenario 3

Personal & shared AVs; Arizona Avenue HCT; AV buses; increase transit service



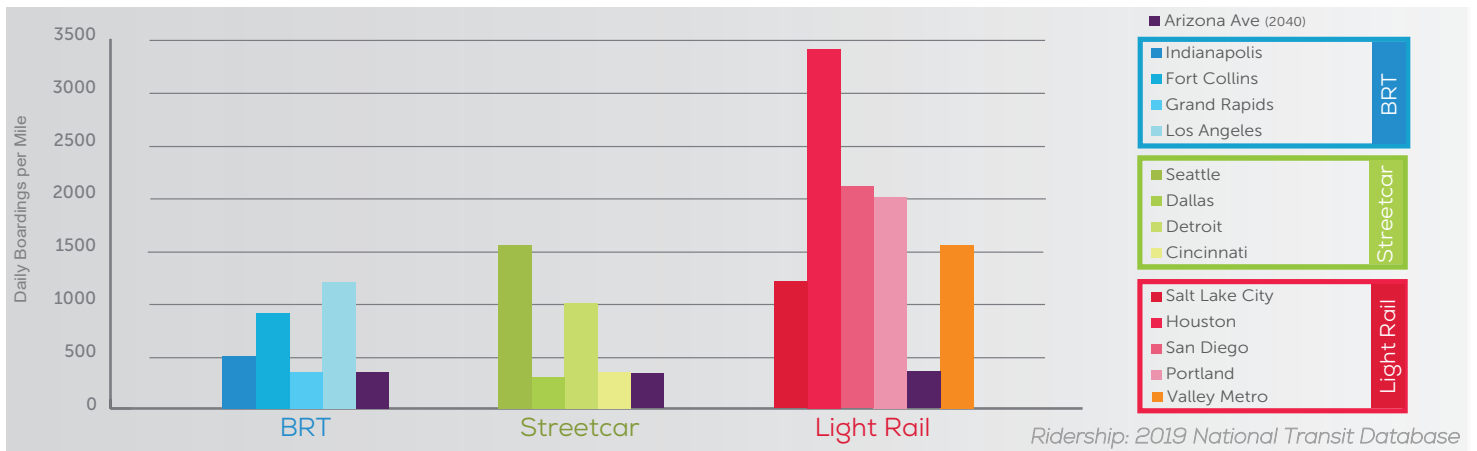
Takeaways

Personally owned AVs (Scenario 1) tend to make system performance slightly worse (lower transit ridership, more vehicles miles traveled, longer commute times) compared to the estimated baseline conditions. Adding transit investments tends to improve system performance for most of the performance measures.

Transit ridership was highest (Scenario 3) when plans and policies use AVs to provide multi-modal options.

Scenario modeling indicates transit should be part of the automated mobility future. Riders will use transit if the benefits of AV are applied to transit services.

Next Steps: Transit-Supportive Decisions



What can Arizona Avenue learn from existing HCT corridors?

- Almost all peer city BRT corridors in the comparison have some or total exclusive guideway with the exception of Grand Rapids BRT corridor, which has no exclusive guideway.
- Peer city streetcar corridors in the comparison are shorter in length than the Arizona Avenue corridor and travel a shorter distance to dense urban areas.
- Peer city light rail corridors in the comparison are full systems with multiple lines.

A number of actions can be taken to enhance HCT viability along the recommended route (Arizona Avenue). These actions include:

- Implement transit supportive policies that would encourage Transit Oriented Development, bike and pedestrian friendly connections.
- Limiting the amount of parking in the urban core, raising parking costs and providing more affordable housing in the corridor could make the corridor land use more suitable for HCT.
- Mobility improvements such as enhancing local bus network that feed into Arizona Avenue could build the transit market along the corridor.



- 1 Mixed use development (residential/office/retail)
- 2 High visibility bike lane improvements
- 3 Center lane exclusive guideway
- 4 Improved pedestrian crossing with high visibility cross walks
- 5 Widened sidewalk and landscape features

Next Steps: Regional Planning

A project with regional impact requires regional support.

In early 2020, the Maricopa Association of Governments (MAG) announced a call for projects to inform their effort in developing a new regional transportation plan (RTP) and extending Maricopa County's dedicated transportation sales tax (Proposition 400). The City of Chandler submitted Arizona Avenue as a future HCT investment.

This corridor could compete for future regional funding from the extension of Proposition 400. A locally preferred alternative (LPA) will need to be approved by the City of Chandler to be adopted into the RTP.

Select a HCT Mode for Arizona Avenue.

One of the next steps to selecting the LPA for this corridor is deciding the best HCT mode. The study concluded Arizona Avenue as the recommended corridor, but the results were mode-neutral.

Two primary modes were evaluated to select the recommended corridor: 1) BRT and 2) Rail, which includes streetcar and light rail.

Goals of the future HCT mode analysis would include further evaluation of BRT and rail modes and:

- coordinating with the City of Mesa and the Town of Gilbert to evaluate HCT connections north of Arizona Avenue
- ensuring a straight forward connection with other HCT corridors and the regional HCT system to maximize use of the transit investment and minimize the need for riders to transfer between modes
- weighing the costs and impacts, including right of way, of each mode against the potential return on investment

Future steps following the selection of a regionally adopted LPA before design and construction include:

1) Preliminary Engineering

Develop 30% designs for the corridor, and perform right of way and utilities investigations to further understand costs and impacts

2) Environmental Assessment

Documentation of impacts and mitigation, community outreach and coordination with the Federal Transit Administration