

COMMUTER RAIL

System Planning



Commuter Rail Planning
Stakeholders Meeting #2 - Presentation
July 8, 2009

Meeting Agenda

- ◁ **Study Key Issues and Lessons Learned**
- ◁ **Study Purpose and Key Elements**
- ◁ **Grand Avenue Existing and Future Conditions**
- ◁ **Commuter Rail Planning Factors**
- ◁ **Corridor/Segment Review**
- ◁ **Schedule**
- ◁ **Q & A**

Study Key Issues and Lessons Learned

Key Issues/Lessons Learned

- ◁ The implementation of commuter rail in other areas provides an outline of potential issues and lessons to be learned.
- ◁ A project from Rail North Texas provides a useful list of lessons to be learned and potential issues to be aware of.



Key Issues/Lessons Learned (cont.)

- ◀ Issue: Railroad Coordination
 - ▶ Keep railroads informed and involved
 - ▶ Collect as much data as possible
 - ▶ Be realistic in developing operating agreements and scenarios, while understanding the railroads' perspective
- ◀ Issue: Cost Estimating
 - ▶ Update cost estimates annually or more often
 - ▶ Be conservative but use recent actual industry prices
 - ▶ Be sure stakeholders understand the baseline cost estimate

Key Issues/Lessons Learned (cont.)

- ◀ Issue: Rail Vehicles
 - ▶ Long lead-time, unpredictable cost item
 - ▶ Explore options early and be flexible
 - ▶ Prepare stakeholders for options
 - ▶ Seek out partnering opportunities with other agencies
- ◀ Issue: Existing and Future Land Use Plans
 - ▶ Consider necessary land use changes and timing
 - ▶ Consider jurisdictional desires while managing expectations and being realistic
 - ▶ Identify additional work needed before locating station nodes

Key Issues/Lessons Learned (cont.)

◀ Issue: Community Issues

- ▶ There will always be opposition so be prepared
- ▶ Try to answer all questions (within reason)
- ▶ Educate the public and be proactive
- ▶ Be realistic as to what impacts may occur
- ▶ Typical issues may include traffic impacts at crossings and park and rides, safety, quiet zones, property values

◀ Issue: Funding

- ▶ There are no easy answers and Federal funding may not always be realistic
- ▶ Local funding has budget and schedule advantages
- ▶ Finding right mix of funding that has public, agency and legislative support
- ▶ Funding sources needed for both capital and operating expenses

Commuter Rail Corridor Development Plan Purpose and Key Elements

Grand Avenue and Yuma West Commuter Rail Corridor Development Plans

◀ Purpose:

- Determine feasibility of implementing commuter rail service:
 - ▶ Wickenburg to downtown Phoenix (Grand Avenue)
 - ▶ Arlington to central Phoenix (Yuma West)
- Corridor Development Plan elements necessary to successfully implement commuter rail service along corridor

Grand Avenue and Yuma West Commuter Rail Corridor Development Plans (cont.)

◀ Key Elements

- Stakeholder outreach
- Railroad coordination
- Purpose and Need technical assessment:
 - ▶ Past planning efforts
 - ▶ Rail facilities and operations
 - ▶ Highway facilities and operations
 - ▶ Adjacent land uses and access requirements
 - ▶ Commuter rail design and operating requirements

Grand Avenue and Yuma West Commuter Rail Corridor Development Plans (cont.)

◀ Key Elements

- Existing and future conditions:
 - ▶ Demographics, land use, physical inventory
- Railroad operational assessment
- Inventory of parallel highway networks
- Rail service operating and capital requirements

Grand Avenue Existing and Future Conditions

Yuma West Corridor Development Plan Update

- ◀ Activities Completed or in Progress:
 - ▶ Project Management Plan – Complete
 - ▶ Purpose and Need Technical Memorandum – Complete
 - ▶ Railroad Inventory – Complete
 - ▶ Existing and Future Conditions Technical Memorandum – In progress
 - ▶ Station Planning Technical Memorandum – In progress
 - ▶ Operations Plan – In progress

Existing and Future Conditions

- ◀ **Total Project Corridor Population**
 - Increase by more than 41% from 2007 to 2030

- ◀ **Total Corridor Employment**
 - Increase by more than 52% from 2007 to 2030

Project Corridor Total *Population* between 2007-2030

Study Area	2007	2030	% Change 2007-2030
<i>MAG Region</i>	3,927,827	6,122,490	55.9
Project Corridor	692,537	978,647	41.3

Project Corridor Total *Employment* between 2007-2030

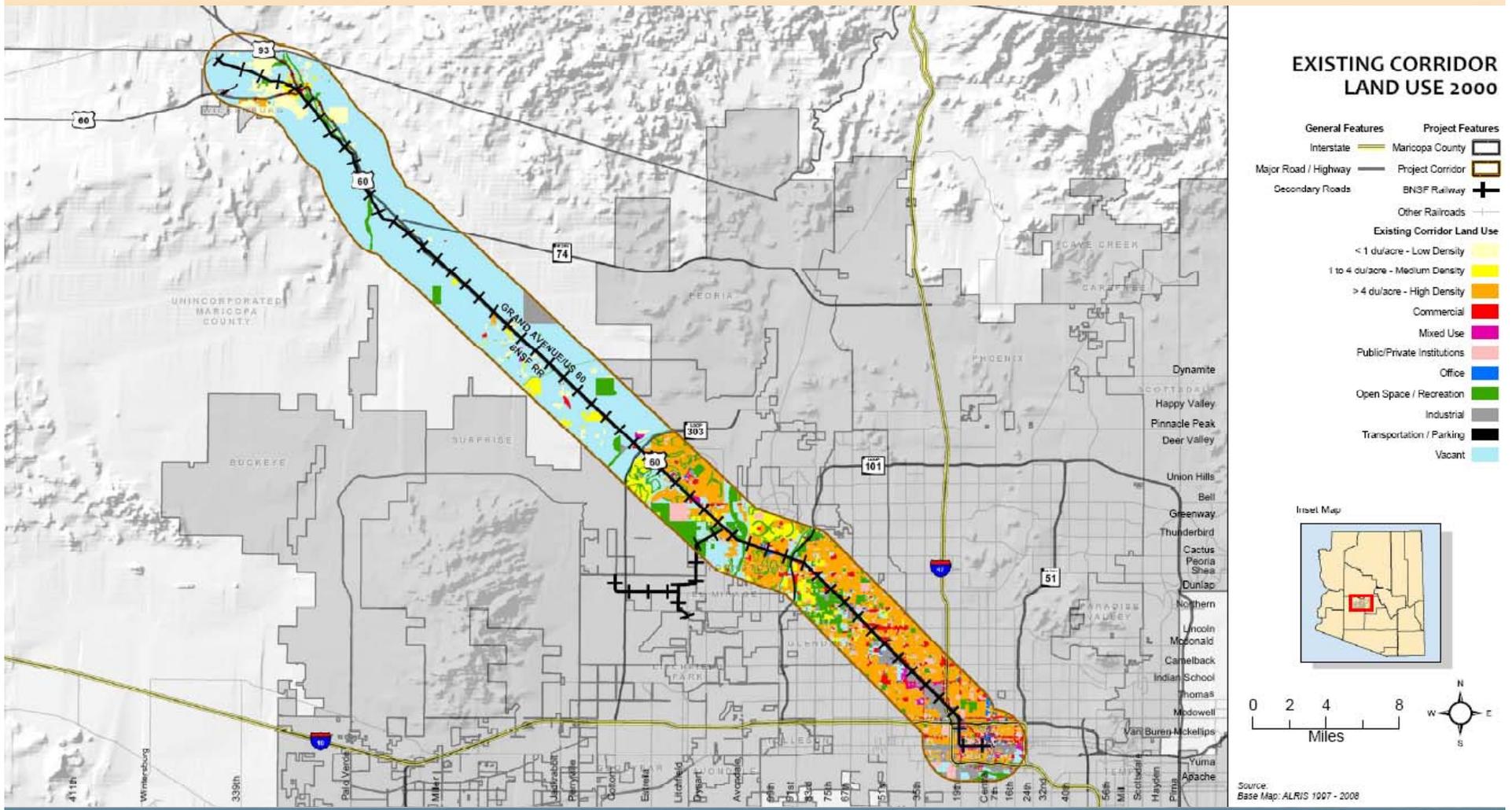
Study Area	2007	2030	% Change 2007-2030
<i>MAG Region</i>	1,935,423	3,373,001	74.3
Project Corridor	365,903	557,917	52.5

Existing and Future Conditions (cont.)

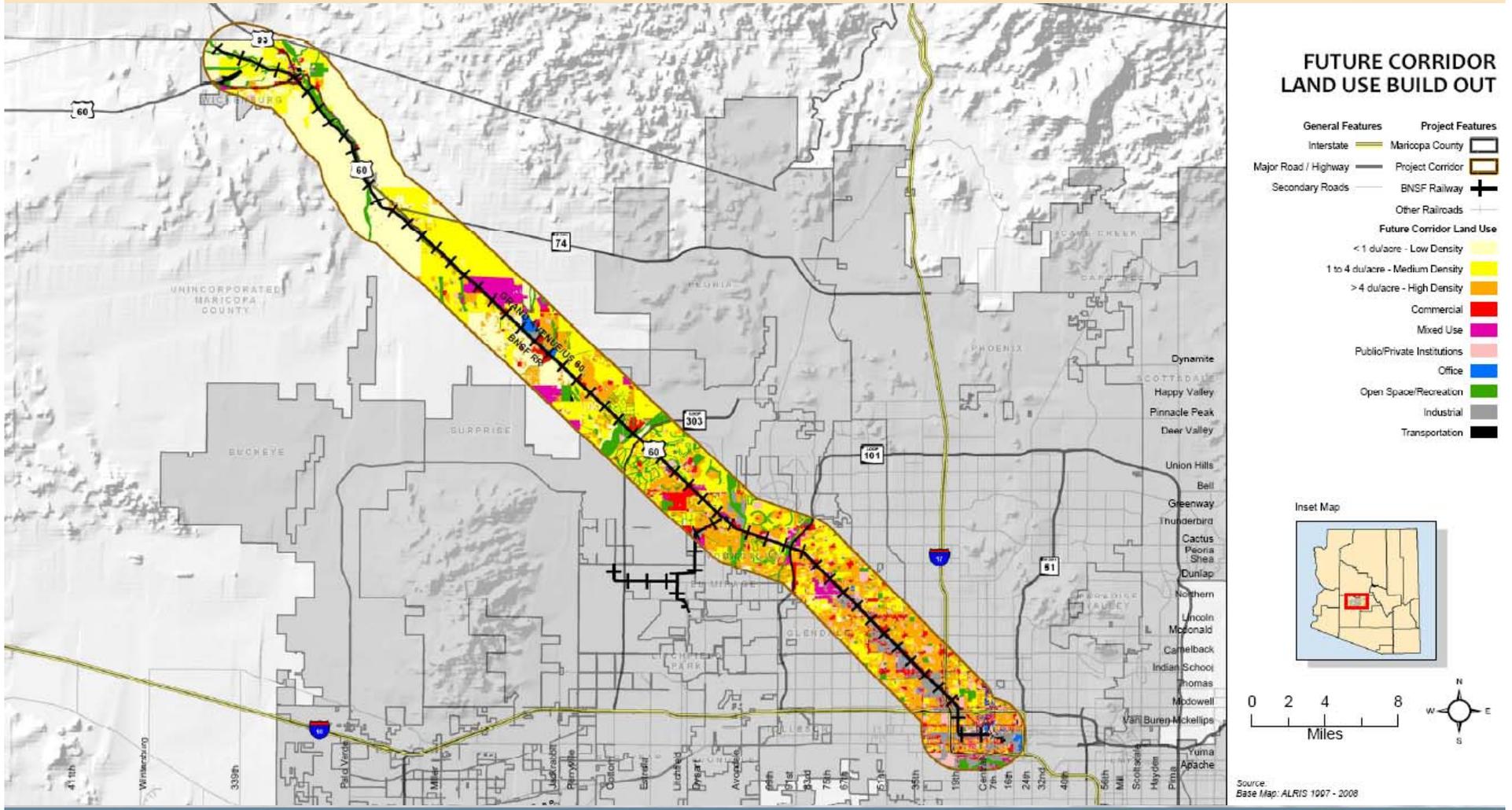
- ◀ **The most prevalent existing land uses identified in the project corridor are:**
 - Vacant Land: 51%
 - Residential: 26%
 - Open Space/Recreation: 9%

- ◀ **The most prevalent projected future land uses identified for build-out in the project corridor are:**
 - Residential 70%
 - Open Space/Recreation 9%,
 - Commercial 6%.

Existing and Future Conditions (cont.)



Existing and Future Conditions (cont.)



Existing and Future Conditions (cont.)

◀ BNSF Existing Facilities

- Phoenix Yard
- Mobest Yard
- The Desert Lift Intermodal Facility
- Alhambra Yard
- Glendale North/South Yards
- The BNSF Automobile Distribution Center
- Ennis Wye

Existing and Future Conditions (cont.)

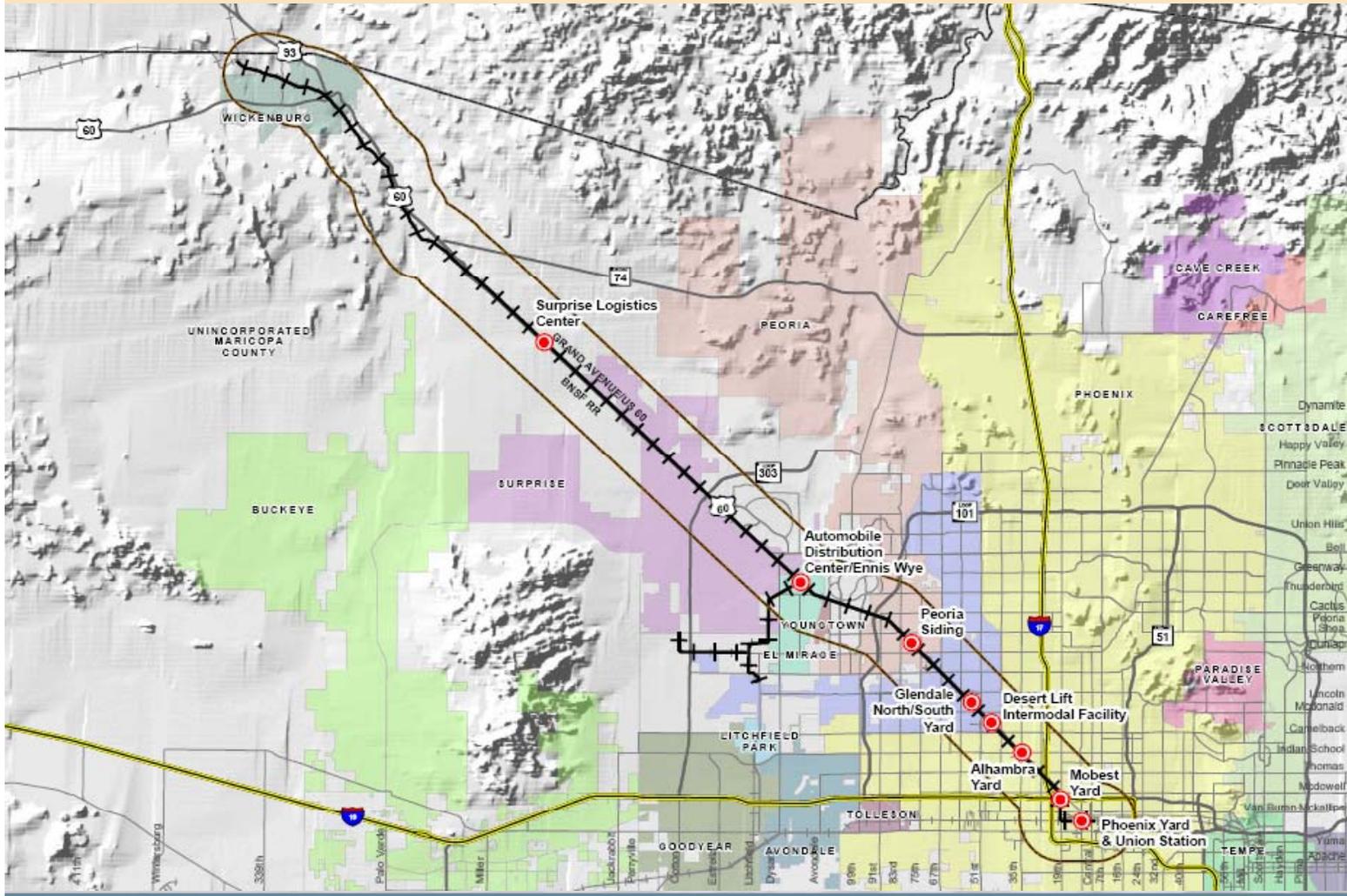
◀ **BNSF Future Plans**

- 41,000 carloads a year enter into Phoenix equating to 10 trains a day
- Number of carloads will increase to 71,000 by 2012 and increase the number of trains per day to 17

◀ **Expansion and relocation opportunities:**

- Ennis Wye
- Surprise Logistics Center
- Peoria Siding
- Connect North/South Glendale Yards

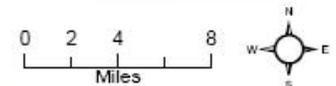
Existing and Future Conditions (cont.)



RAILROAD FACILITIES

- Railroad Facilities ●
- Project Features
- Maricopa County □
- BNSF Railway +
- Other Railroads —
- General Features
- Interstate ≡
- Major Road / Highway —
- Secondary Roads —

Inset Map

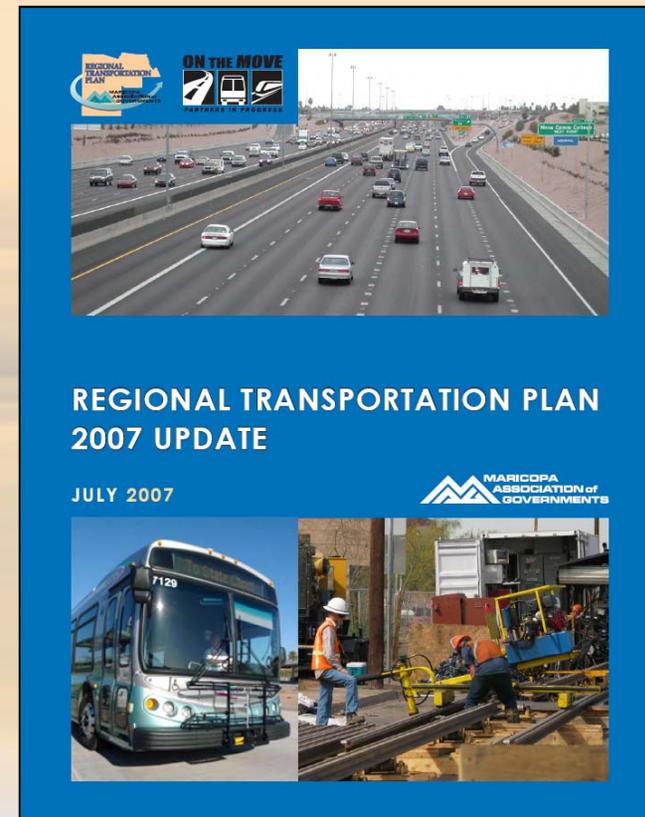


Source:
Base Map: ALRIS 1997 - 2005

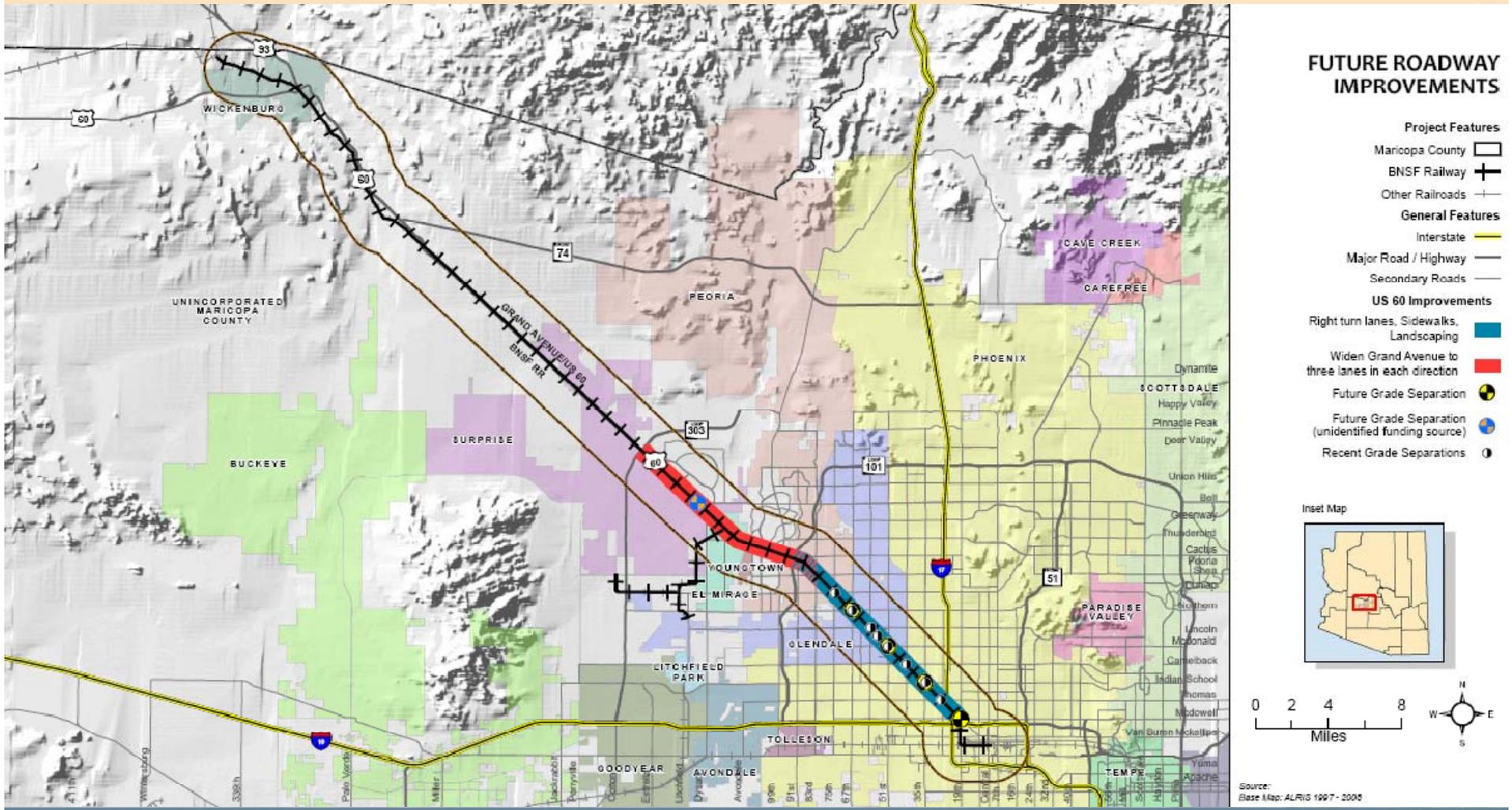
Existing and Future Conditions (cont.)

◀ RTP future improvements identified:

- Addition of *general purpose lanes*;
- Addition of *grade separations*; *and*
- Other improvements, such as *right turn lanes, sidewalks, and landscaping*.

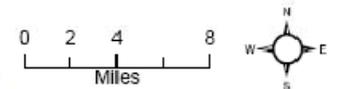


Existing and Future Conditions (cont.)



FUTURE ROADWAY IMPROVEMENTS

- Project Features**
- Maricopa County
 - BNSF Railway
 - Other Railroads
- General Features**
- Interstate
 - Major Road / Highway
 - Secondary Roads
- US 60 Improvements**
- Right turn lanes, Sidewalks, Landscaping
 - Widen Grand Avenue to three lanes in each direction
 - Future Grade Separation
 - Future Grade Separation (unidentified funding source)
 - Recent Grade Separations



Source:
Base Map: ALRIS 1997 - 2000

Existing and Future Conditions (cont.)

◀ *Existing Fixed Route Bus Service*

Local Bus Routes

- ▶ Total of 16 bus routes serving corridor
- ▶ Grand Avenue Limited (Monday through Friday service)

Circulators

- ▶ Glendale Urban Shuttle 1
- ▶ Glendale Urban Shuttle 2

Existing and Future Conditions (cont.)

Regional Connectors

- ▶ Wickenburg Connector: Wickenburg to Arrowhead Town Center in Glendale

Express Bus

- ▶ Route 572 operating between Surprise and Scottsdale
- ▶ Route 571 providing service downtown
- ▶ No stops located along Grand Avenue

Existing and Future Conditions (cont.)

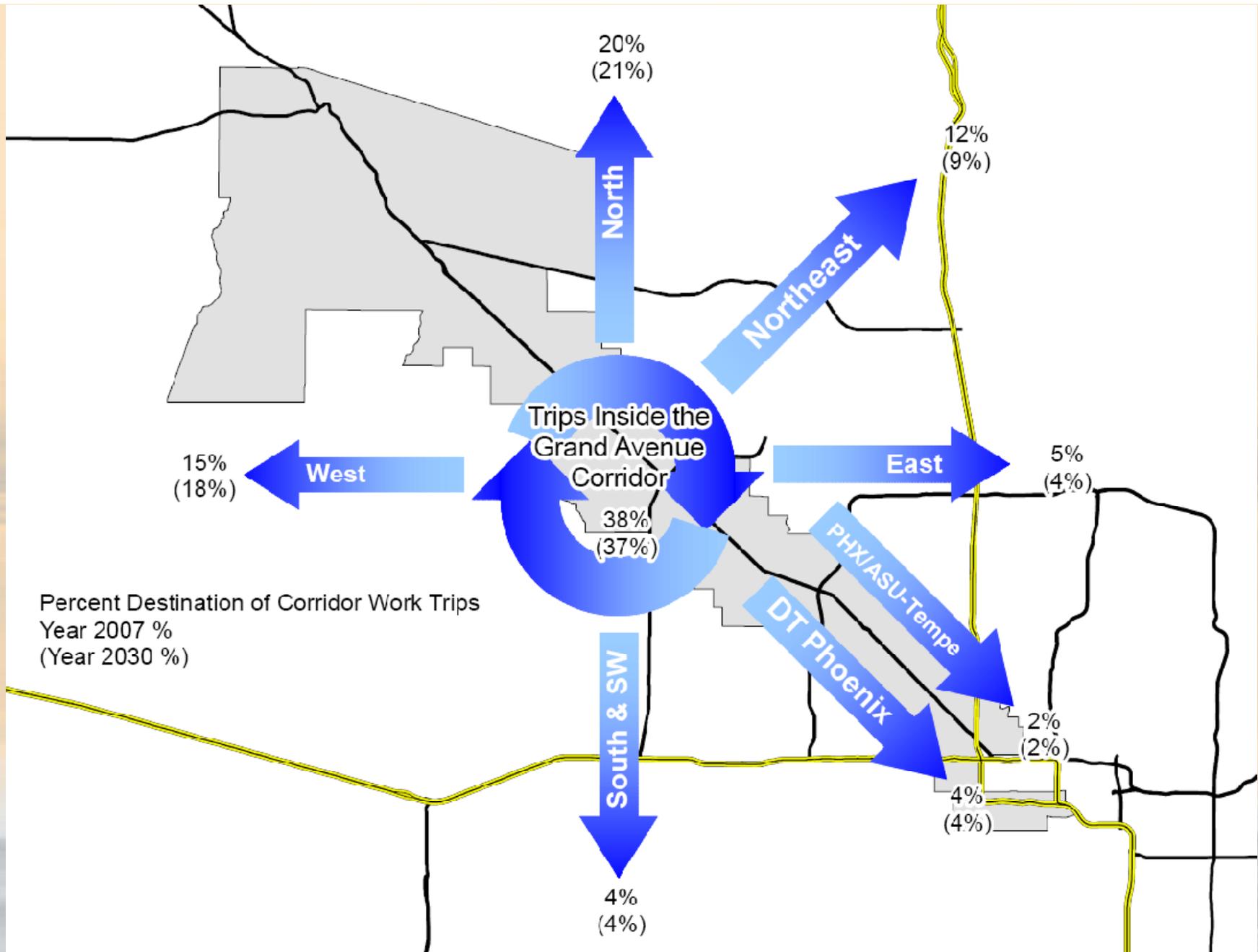
Planned Fixed Route Bus Service

- MAG RTP identifies 12 Supergrid routes in the project corridor
- Express Bus: Loop 303 Express between Arrowhead Towne Center and Desert Sky Mall via SR-303L

Existing and Future Conditions (cont.)

Home Based Work Trip Modeling Analysis

- ◀ Home Based Work Trips (HBW) were analyzed from the MAG TransCAD model.
- ◀ Purpose was to understand the destinations of HBW within the corridor for year 2007 and 2030.
- ◀ Nearly 172,000 originated within the corridor, with 38% of these trips remaining within the corridor.



Commuter Rail System Study Purpose and Key Elements

Purpose of the Project

- ◁ Evaluate commuter rail options for the MAG region and the potential connecting routes immediately adjacent to the MAG region.
- ◁ Establish priorities for implementing commuter rail service through the evaluation of ridership potential, operating strategies, and associated capital and operating costs.
- ◁ Evaluate existing freight corridors and possible rail extension areas identified in the Commuter Rail Strategic Plan.

MAG Commuter Rail System Study

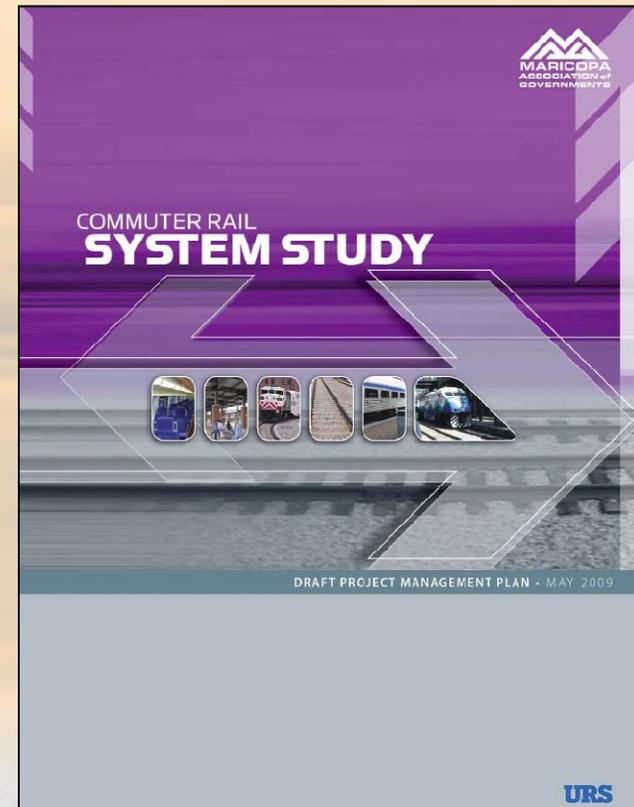
◀ **Key Elements:**

- Analysis of regional ridership potential
- Operating strategies and transit connectivity
- Railroad coordination
- Collaboration with statewide and inter-regional planning processes

MAG Commuter Rail System Study (cont.)

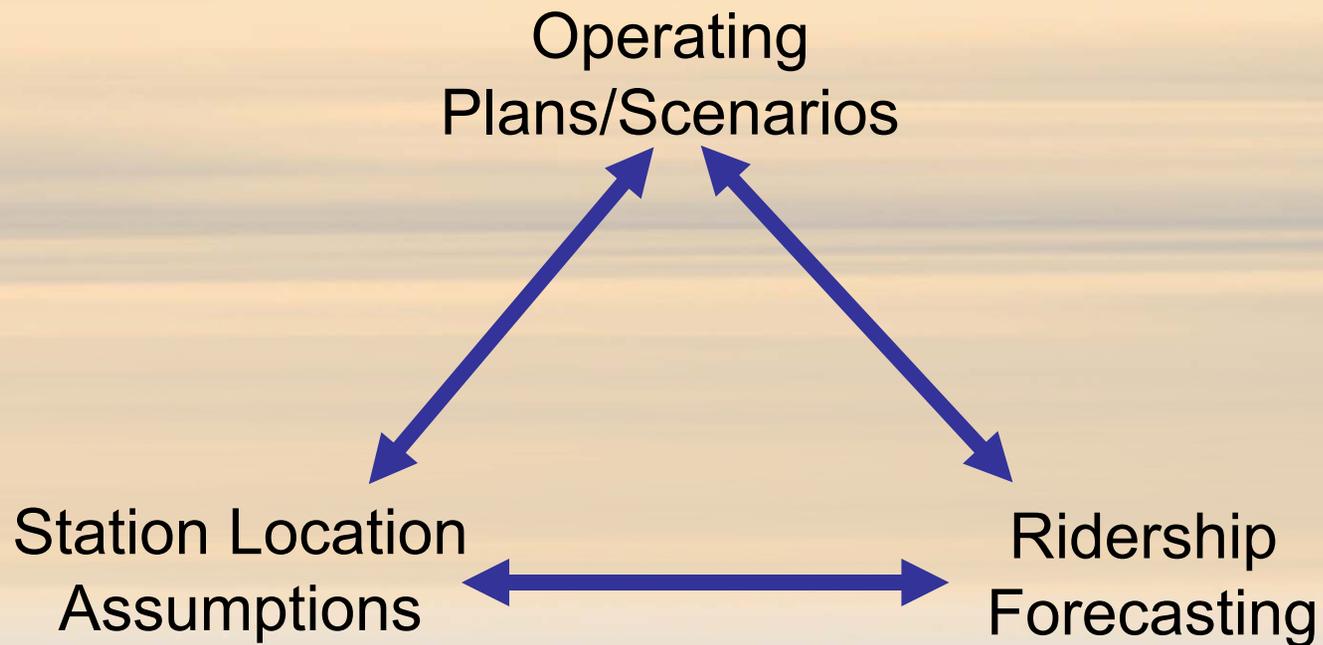
◀ Key Elements:

- Prioritize corridors:
 - ▶ Conceptual level financial analysis
 - Service implementation
 - FTA New Starts funding



Commuter Rail Planning Study Factors

Operations/Stations/Ridership



Operations/Stations/Ridership (cont.)

- 1. Develop initial operating concepts**
- 2. Review/refine initial regional assumptions for stations:**
 - ▶ High-Capacity Transit Study
 - ▶ Commuter Rail Strategic Plan
 - ▶ Regional Transit Framework Study

Operations/Stations/Ridership (cont.)

3. Refine operating plans

- ▶ Station spacing
- ▶ Run times (including dwell times)
- ▶ Fleet size assumptions

4. Input into travel demand forecasting process

5. Run forecasts

- ▶ Stand-alone corridors first; evaluate vs. No Action
- ▶ Interlining or networks next; evaluate vs. No Action
- ▶ Model runs in July

Cost Methodologies

Capital costs:

1. **Grand/Yuma Corridors**: based on individual infrastructure components (length of track, number of turnouts, special conditions, etc.) since more detail is available
2. **System Study Corridors**: unit per-mile costs based on current industry costs, engineering/ constructability issues, railroad issues (sliding scale based on degree of complexity)

Cost Methodologies (cont.)

Operating and maintenance costs:

1. **All Corridors**: based on analysis of comparable systems; latest estimates for labor, fuel, etc.; National Transit Database reports on operating costs.

Commuter Rail Corridor Evaluation Process

- ◀ **Developed as many comparable categories and criteria as possible, which focused on:**
 - ▶ Primary mode choice
 - ▶ Rider perception
 - ▶ System/policy compatibility
 - ▶ Cost-effectiveness
 - ▶ Implementation/constructability

Commuter Rail Corridor Evaluation Process (cont.)

◀ **Primary mode choice:**

- Estimated corridor end-to-end travel time savings
- Total daily ridership forecast
- Total peak hour ridership forecast

◀ **Rider perception:**

- Direct connections to activity centers

Commuter Rail Corridor Evaluation Process (cont.)

◁ **System/Policy Compatibility:**

- Land use compatibility
- Impact on Regional Travel and Air Quality

◁ **Cost effectiveness:**

Total capital cost per corridor or system mile

- Total annualized capital and O & M cost per corridor or system mile
- Annual O & M cost per annual rider
- Total annual cost per annual rider
- Annual cost per travel time savings

Commuter Rail Corridor Evaluation Process (cont.)

◀ **Implementation / constructability:**

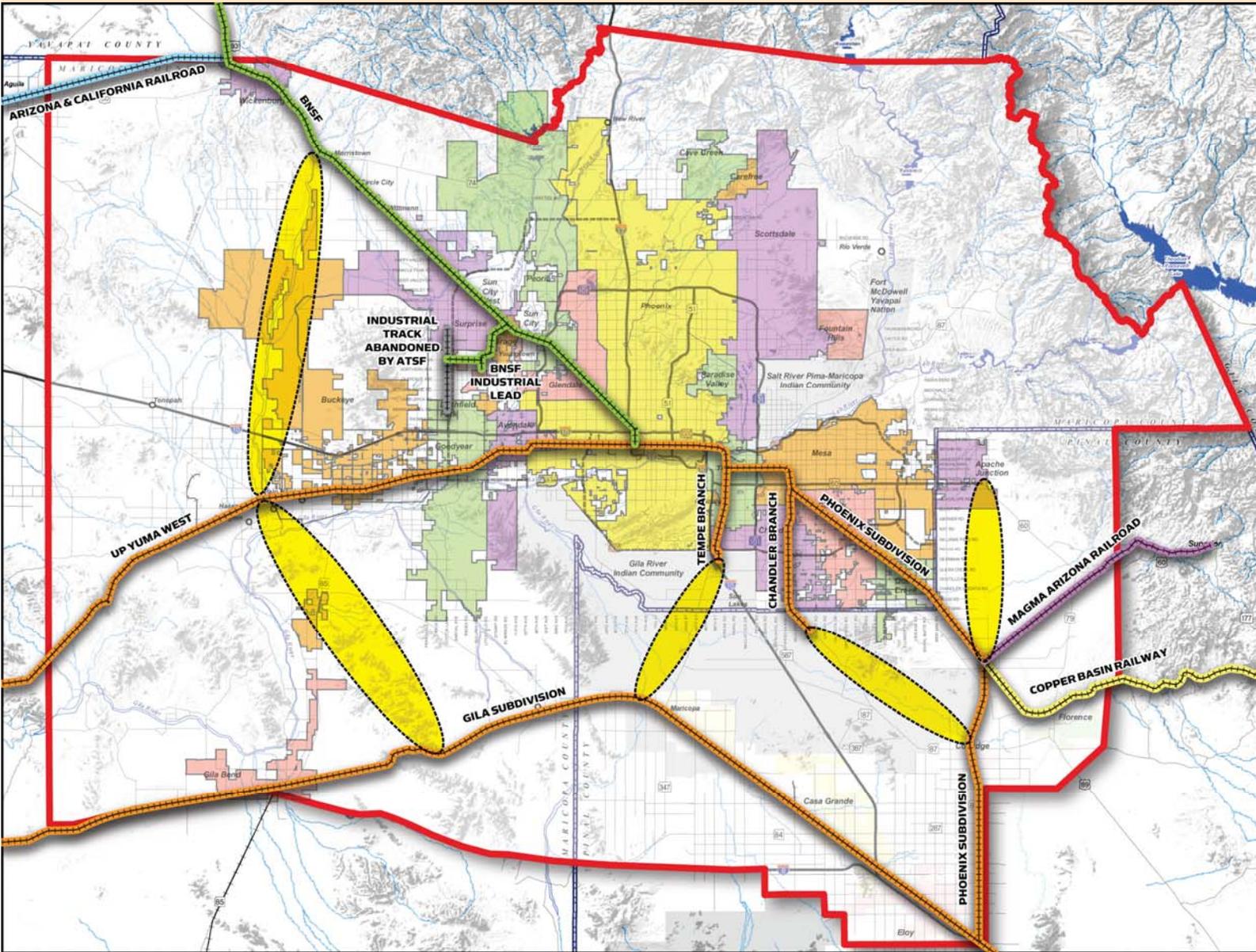
- Ease of implementation/constructability (issues related to ROW, environmental factors, etc.)
- Compatibility with freight railroad
- Benefit to adjacent or crossing highway infrastructure

Corridor/Segment Review

MAG COMMUTER RAIL STRATEGIC PLAN

EXISTING RAILROADS & POSSIBLE EXTENSIONS

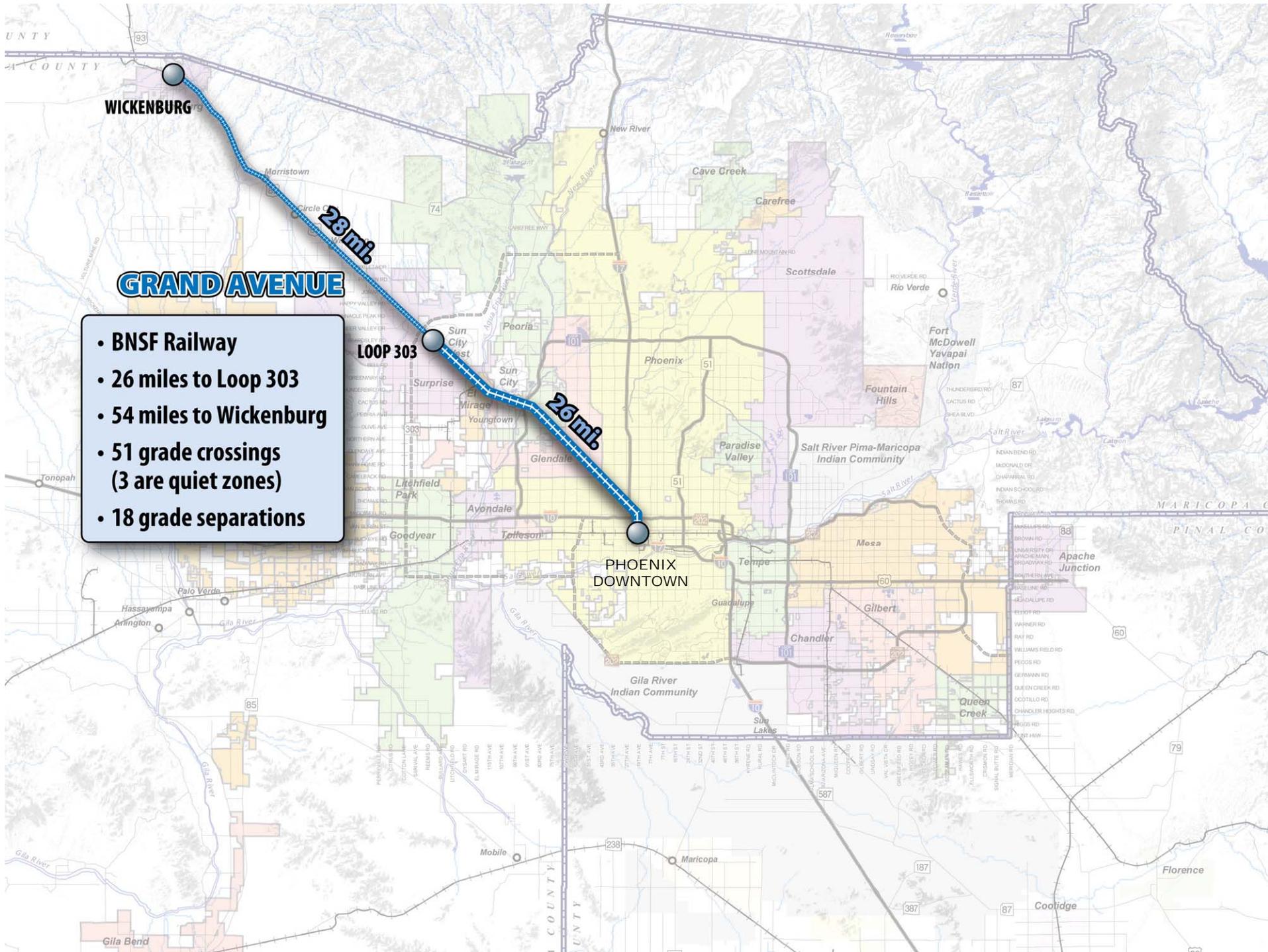
- Legend**
-  BNSF
 -  UP Mainline
 -  Magma Arizona Railroad
 -  Copper Basin Railway
 -  Arizona & California Railroad (AZRC) (since 1991)
 -  Industrial track abandoned by ATSF (early 1990s)
 -  Possible rail extension areas
 -  Commuter Rail Study Area



Source: URS Date: Jan. 2008

Corridor Segment Assumptions

- ◁ **Extent of rail line**
- ◁ **Minimum Cost:**
 - Initial Service
 - One or more corridors
 - Limited capital improvements
 - Peak period service focus
- ◁ **Maximum Service:**
 - Full corridor or system
 - Peak period and all day service
 - Significant capital improvements



GRAND AVENUE

- BNSF Railway
- 26 miles to Loop 303
- 54 miles to Wickenburg
- 51 grade crossings (3 are quiet zones)
- 18 grade separations

28 mi

26 mi

PHOENIX DOWNTOWN

WICKENBURG

LOOP 303

YAVAPAI COUNTY

GILA COUNTY

MARICOPA COUNTY

Florence

Coolidge

79

60

88

87

74

93

Gila Bend

Mobile

Maricopa

238

187

387

587

101

60

101

51

101

74

93

Arington

Goodyear

Litchfield Park

Avondale

Goodyear

Goodyear

Goodyear

Hassayampa

Palo Verde

Surprise

Surprise

Surprise

Surprise

Surprise

Avondale

Avondale

Avondale

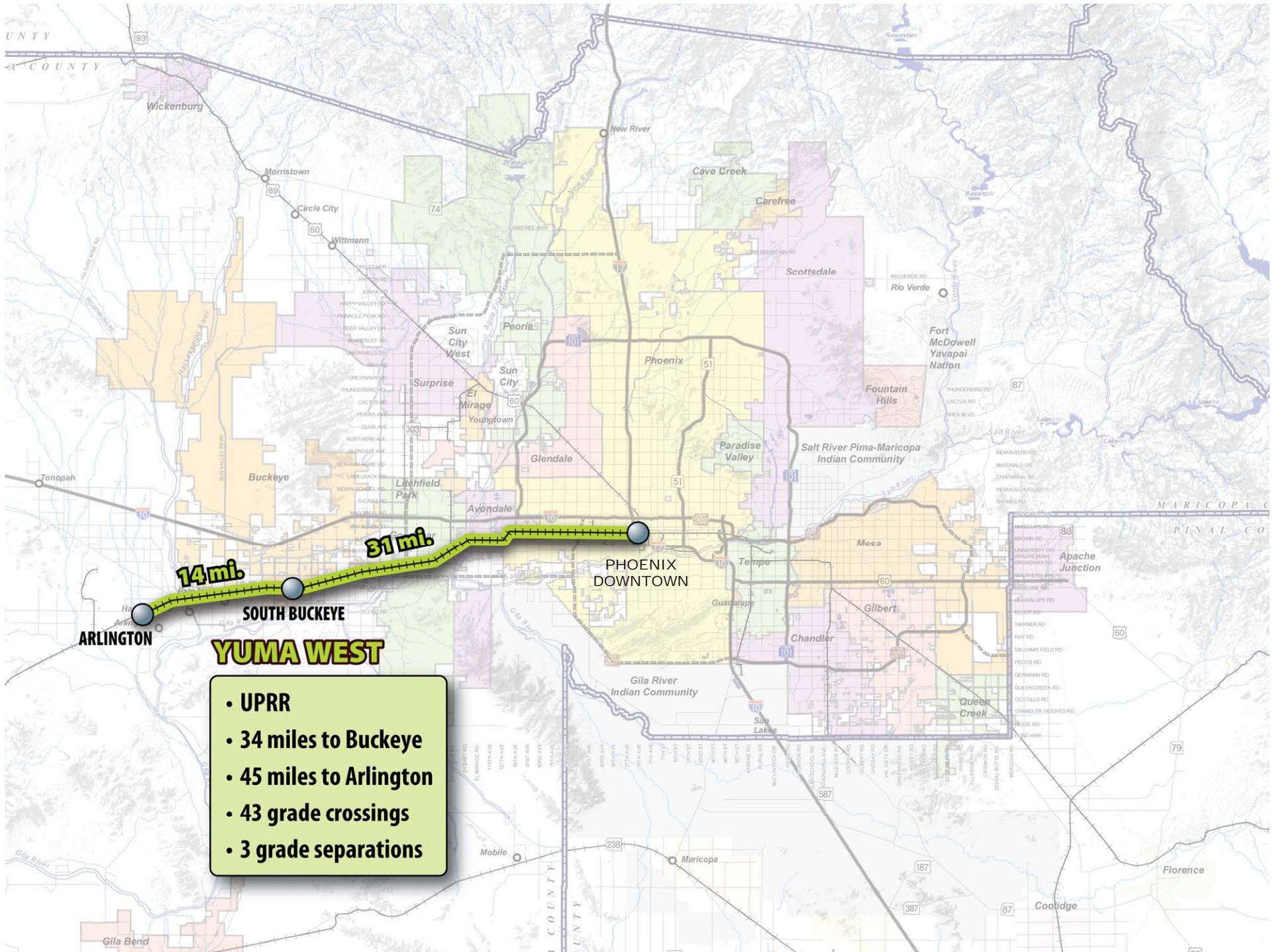
Avondale

Avondale

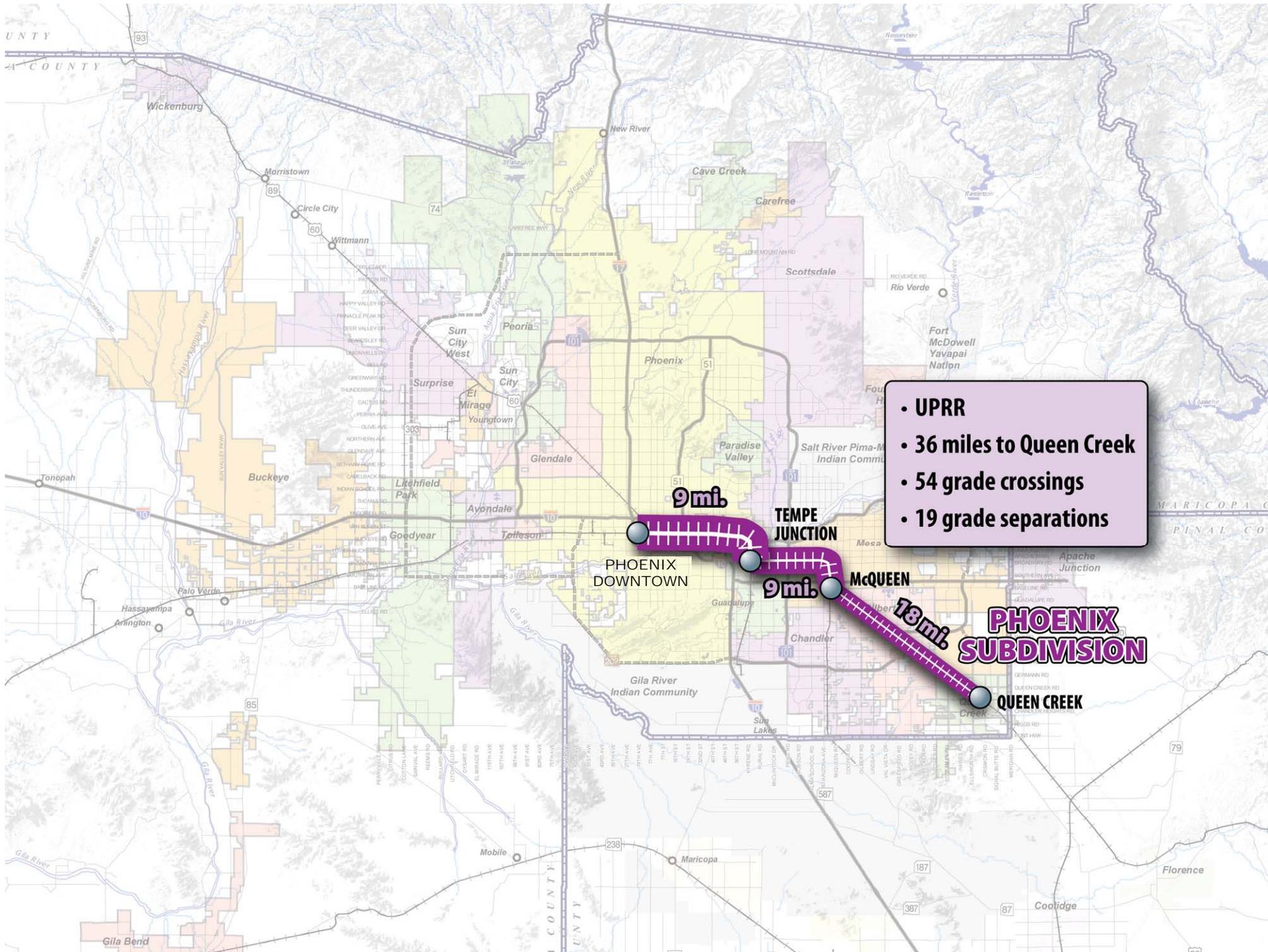
Avondale

Avondale

Goodyear



- UPRR
- 34 miles to Buckeye
- 45 miles to Arlington
- 43 grade crossings
- 3 grade separations



- UPRR
- 36 miles to Queen Creek
- 54 grade crossings
- 19 grade separations

PHOENIX SUBDIVISION

PHOENIX DOWNTOWN

TEMPE JUNCTION

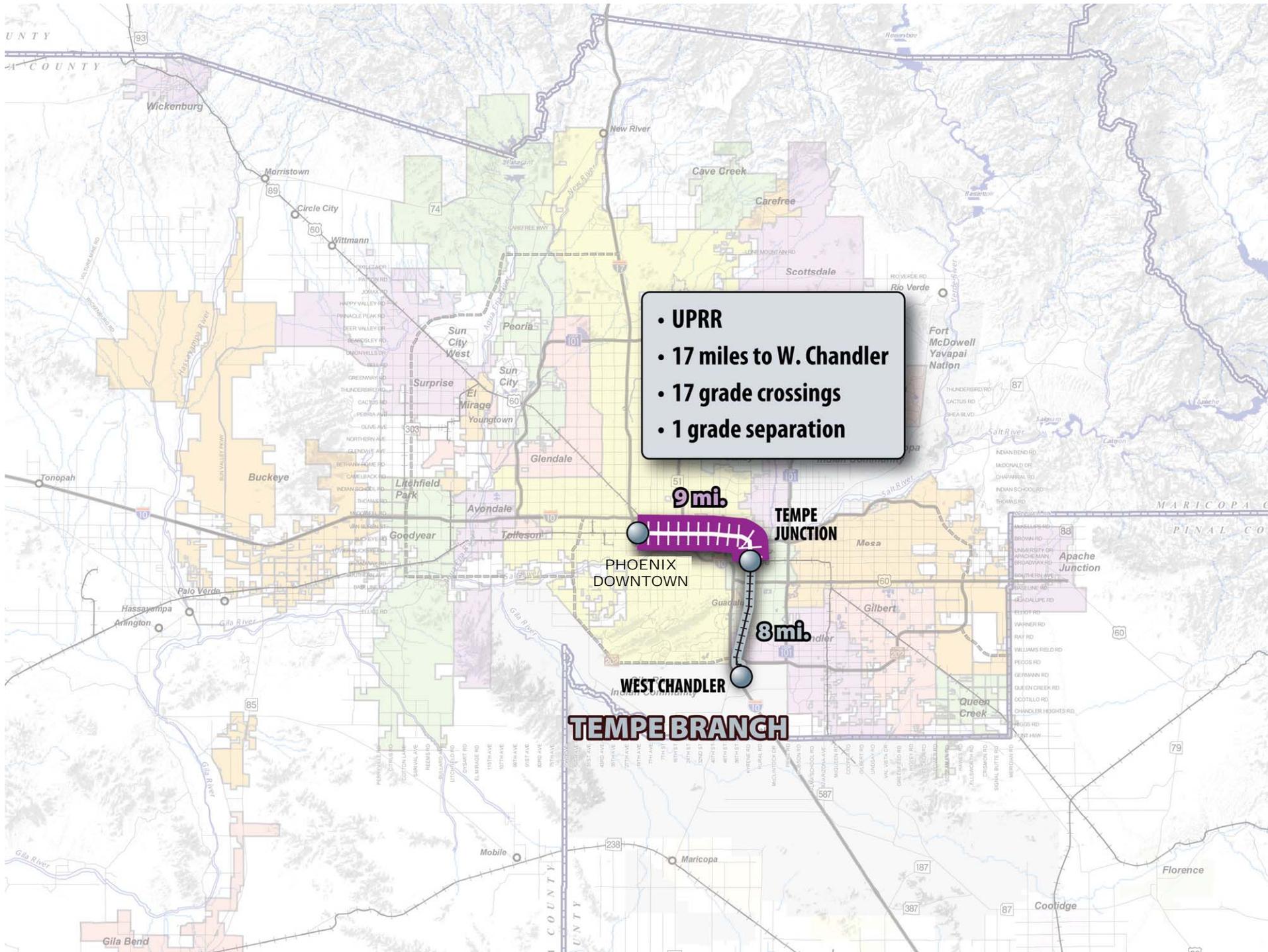
MCQUEEN

QUEEN CREEK

9 mi.

9 mi.

13 mi.



- UPRR
- 17 miles to W. Chandler
- 17 grade crossings
- 1 grade separation

9 mi.

PHOENIX
DOWNTOWN

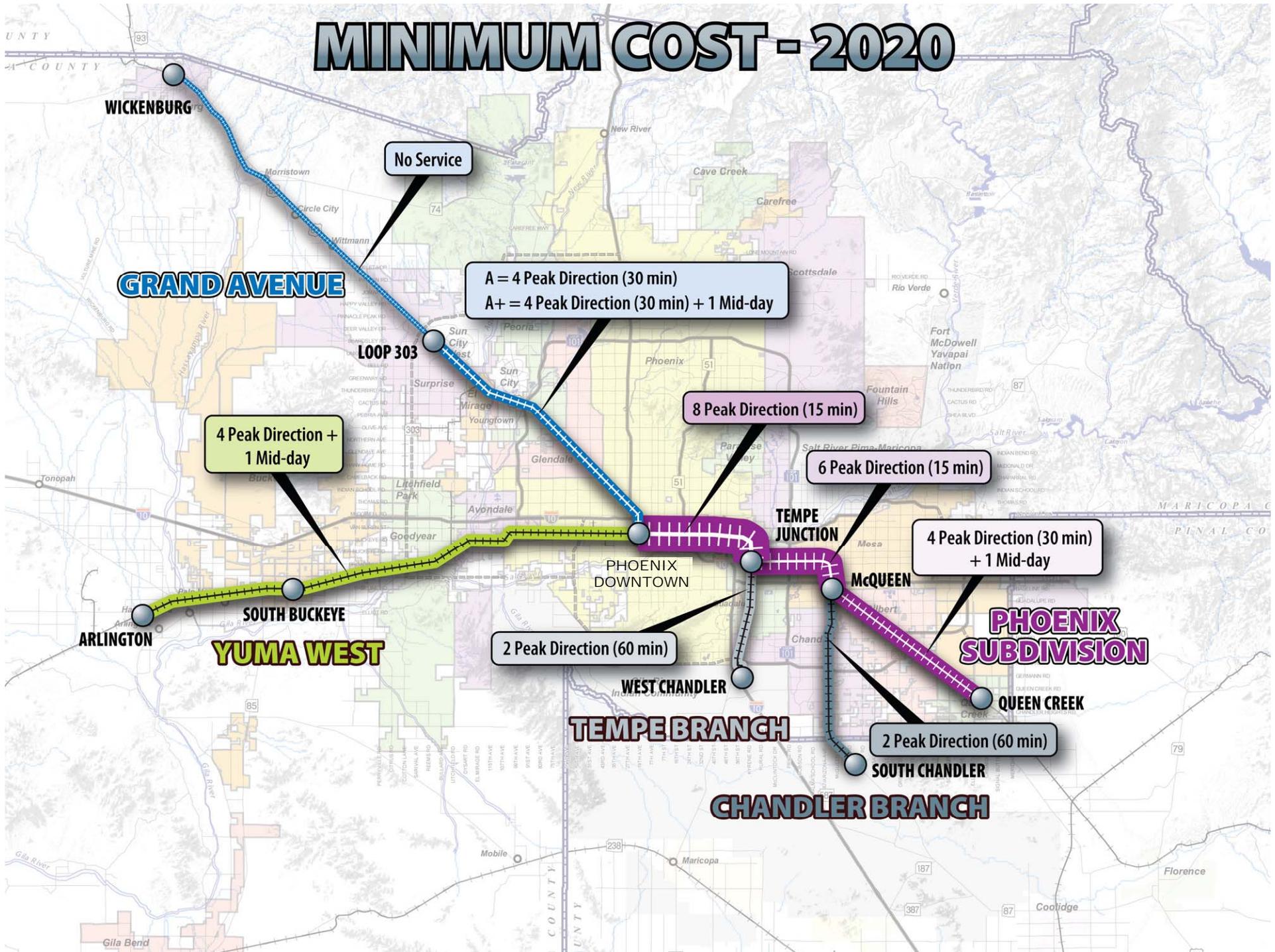
TEMPE
JUNCTION

8 mi.

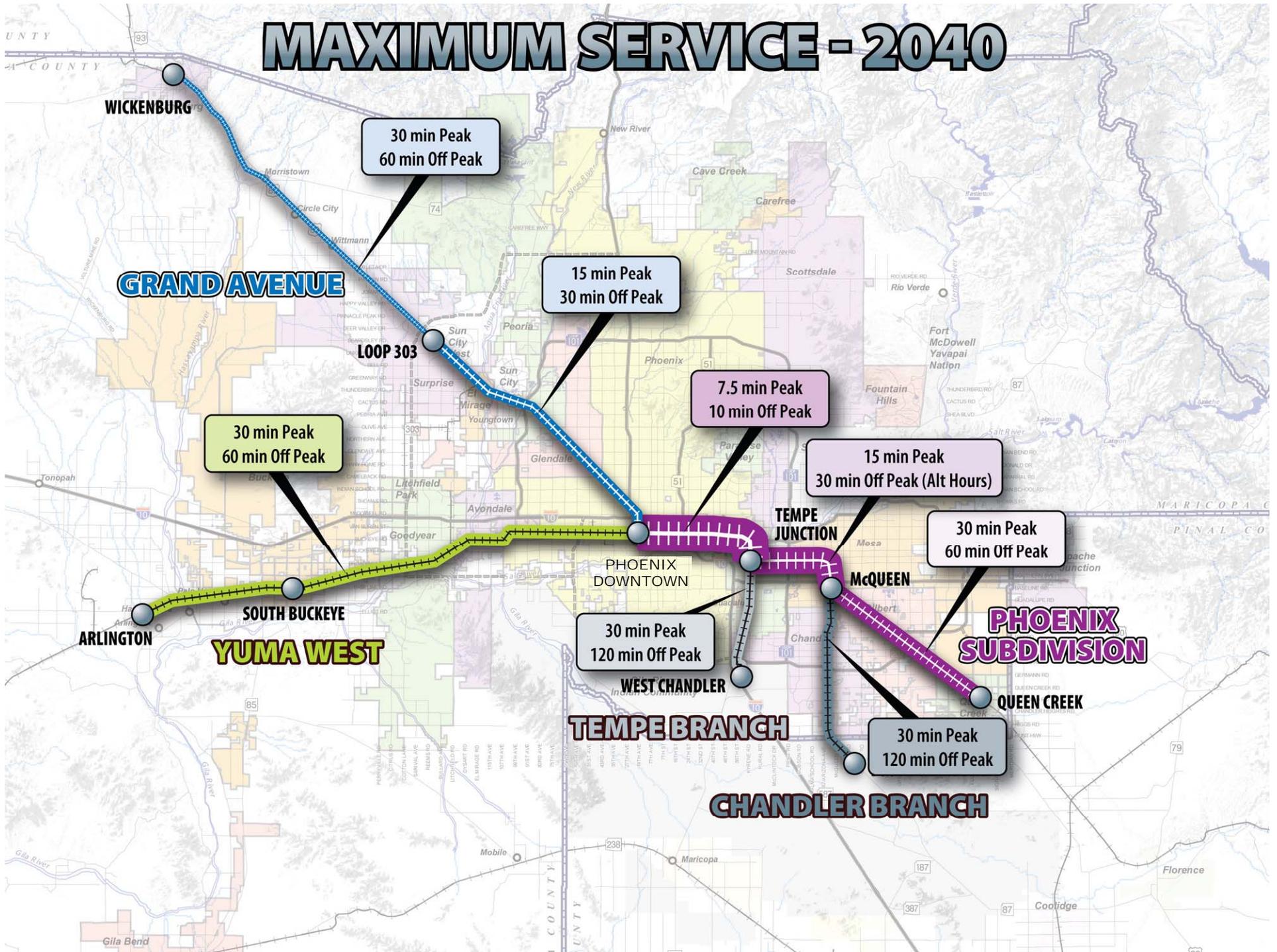
WEST CHANDLER

TEMPE BRANCH

MINIMUM COST - 2020



MAXIMUM SERVICE - 2040



POTENTIAL FUTURE EXTENSION: HASSAYAMPA VALLEY

- Arlington to Castle Hot Springs Junction
- Approximately 40 miles
- Potential highway median alignment

GRAND AVENUE

40 mi.

LOOP 303

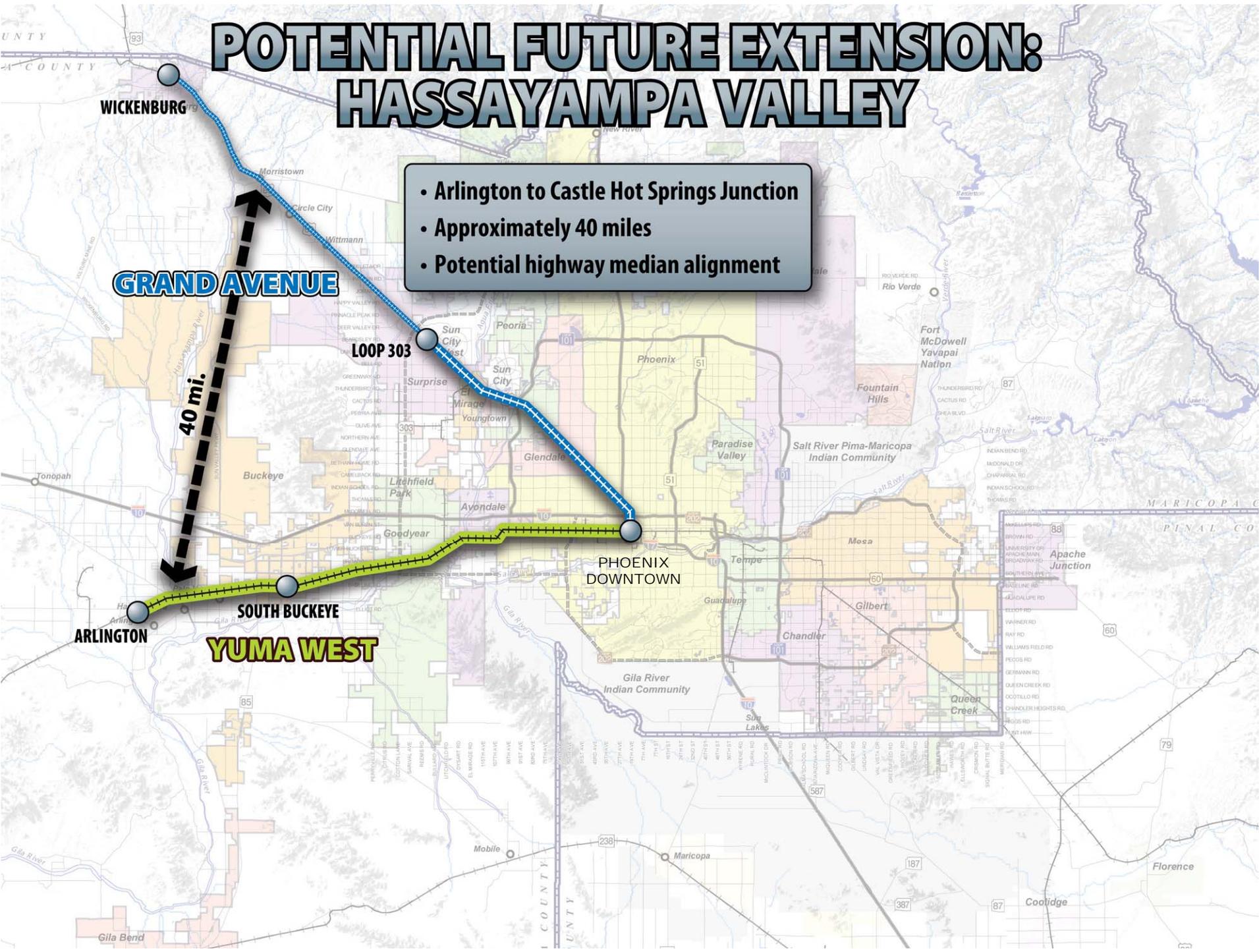
PHOENIX DOWNTOWN

SOUTH BUCKEYE

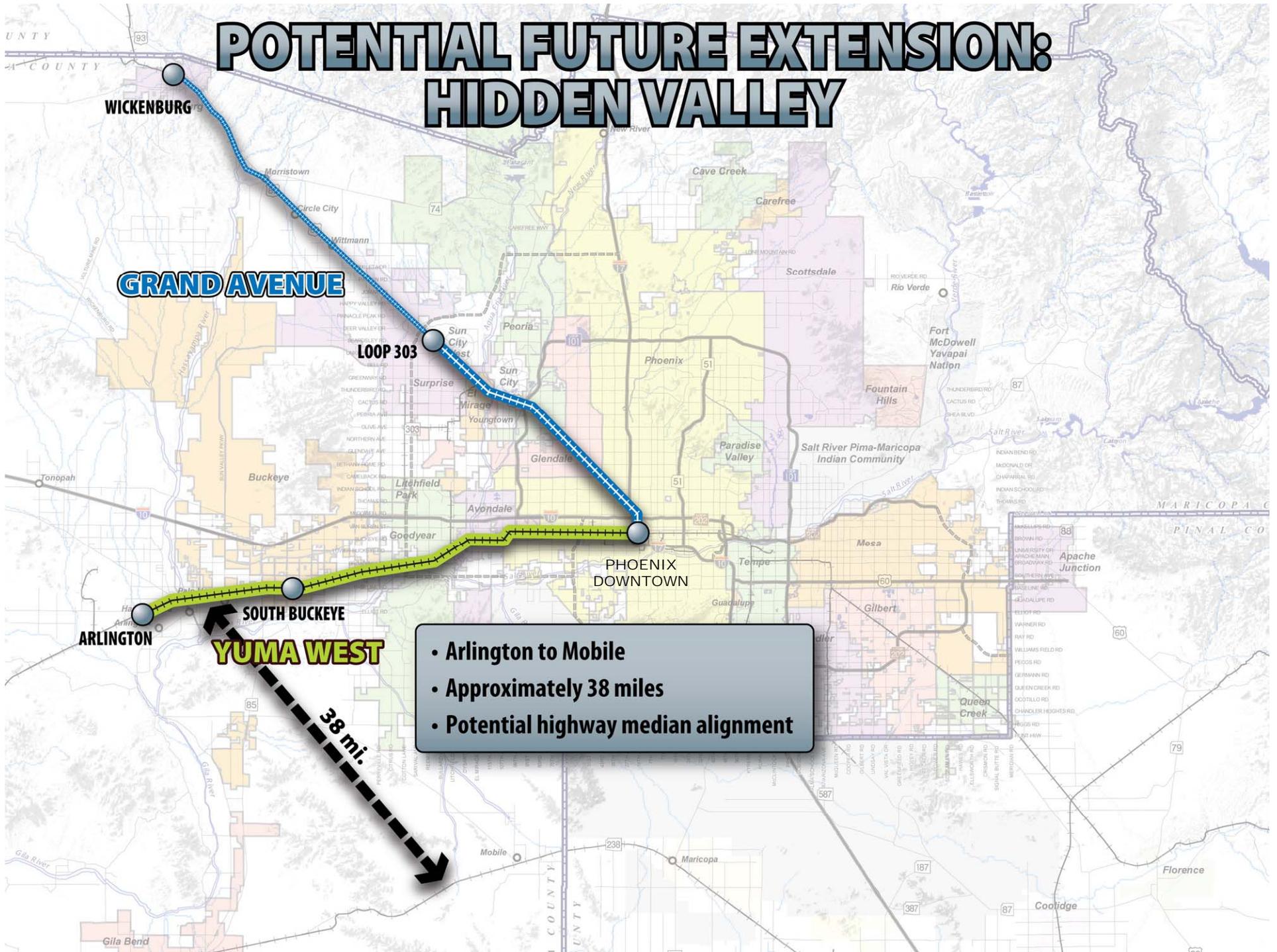
YUMA WEST

ARLINGTON

WICKENBURG

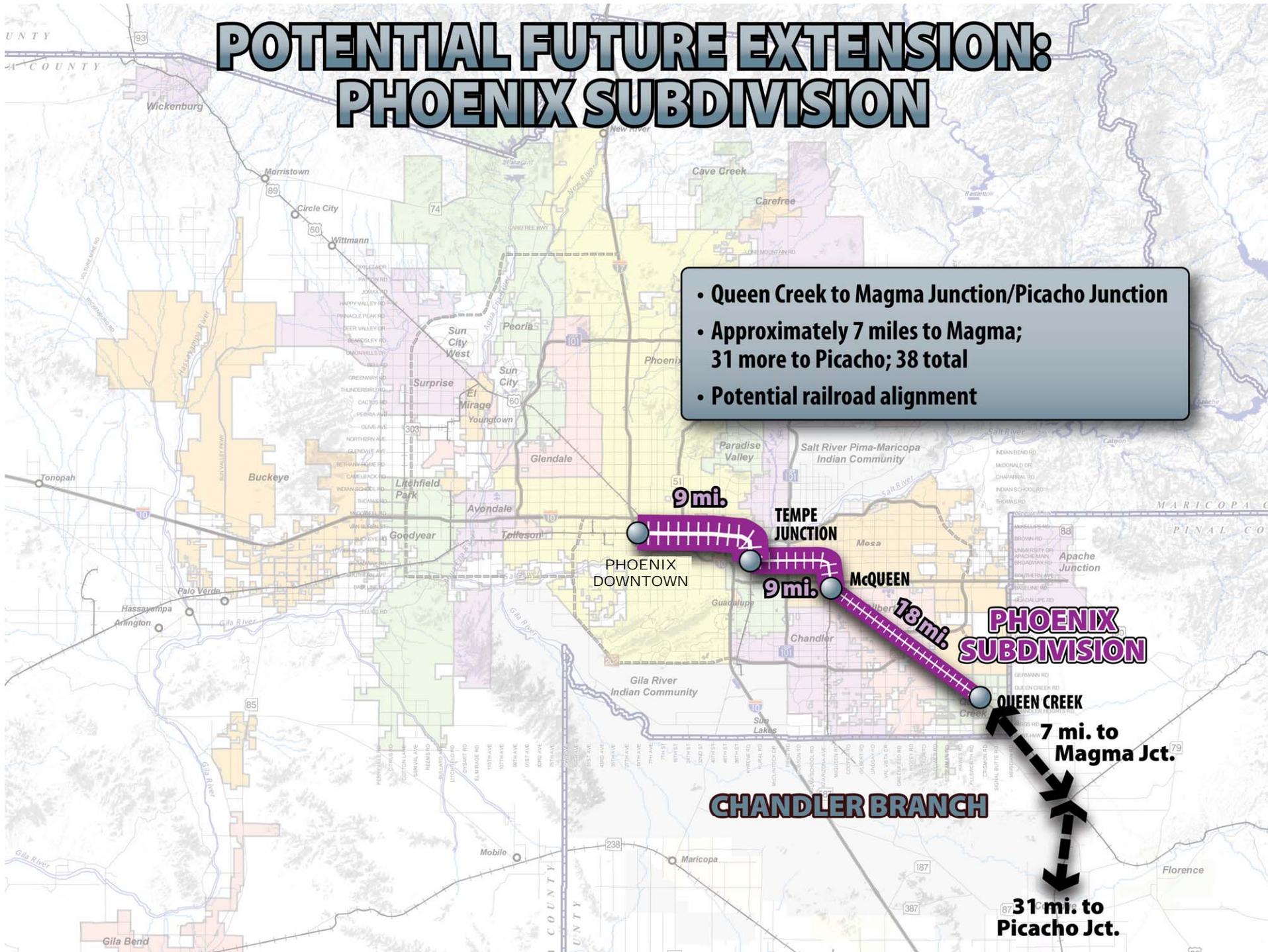


POTENTIAL FUTURE EXTENSION: HIDDEN VALLEY



POTENTIAL FUTURE EXTENSION: PHOENIX SUBDIVISION

- Queen Creek to Magma Junction/Picacho Junction
- Approximately 7 miles to Magma; 31 more to Picacho; 38 total
- Potential railroad alignment



9 mi.

9 mi.

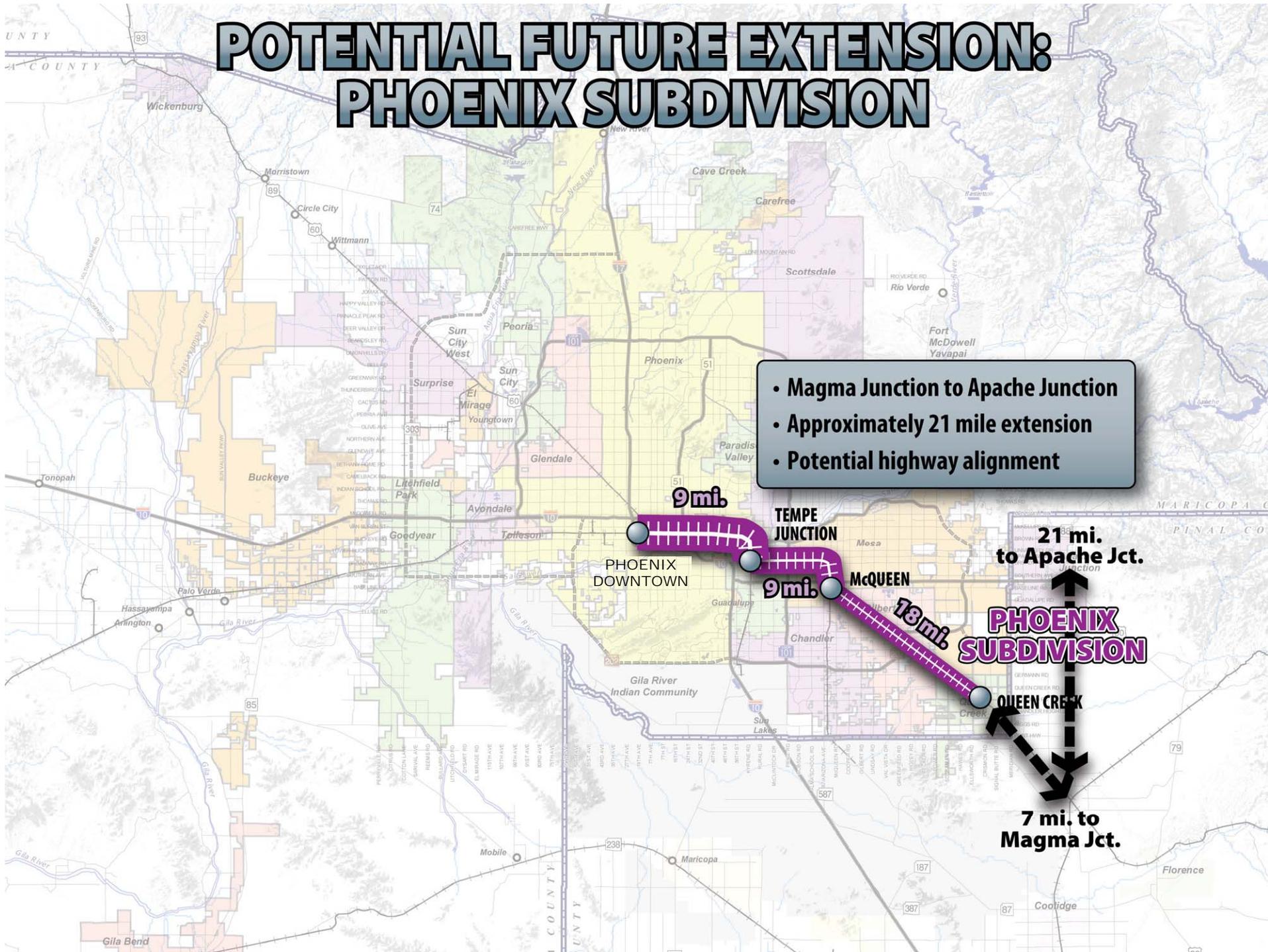
18 mi.

7 mi. to
Magma Jct.

31 mi. to
Picacho Jct.

POTENTIAL FUTURE EXTENSION: PHOENIX SUBDIVISION

- Magma Junction to Apache Junction
- Approximately 21 mile extension
- Potential highway alignment



9 mi.

PHOENIX DOWNTOWN

9 mi.

13 mi.

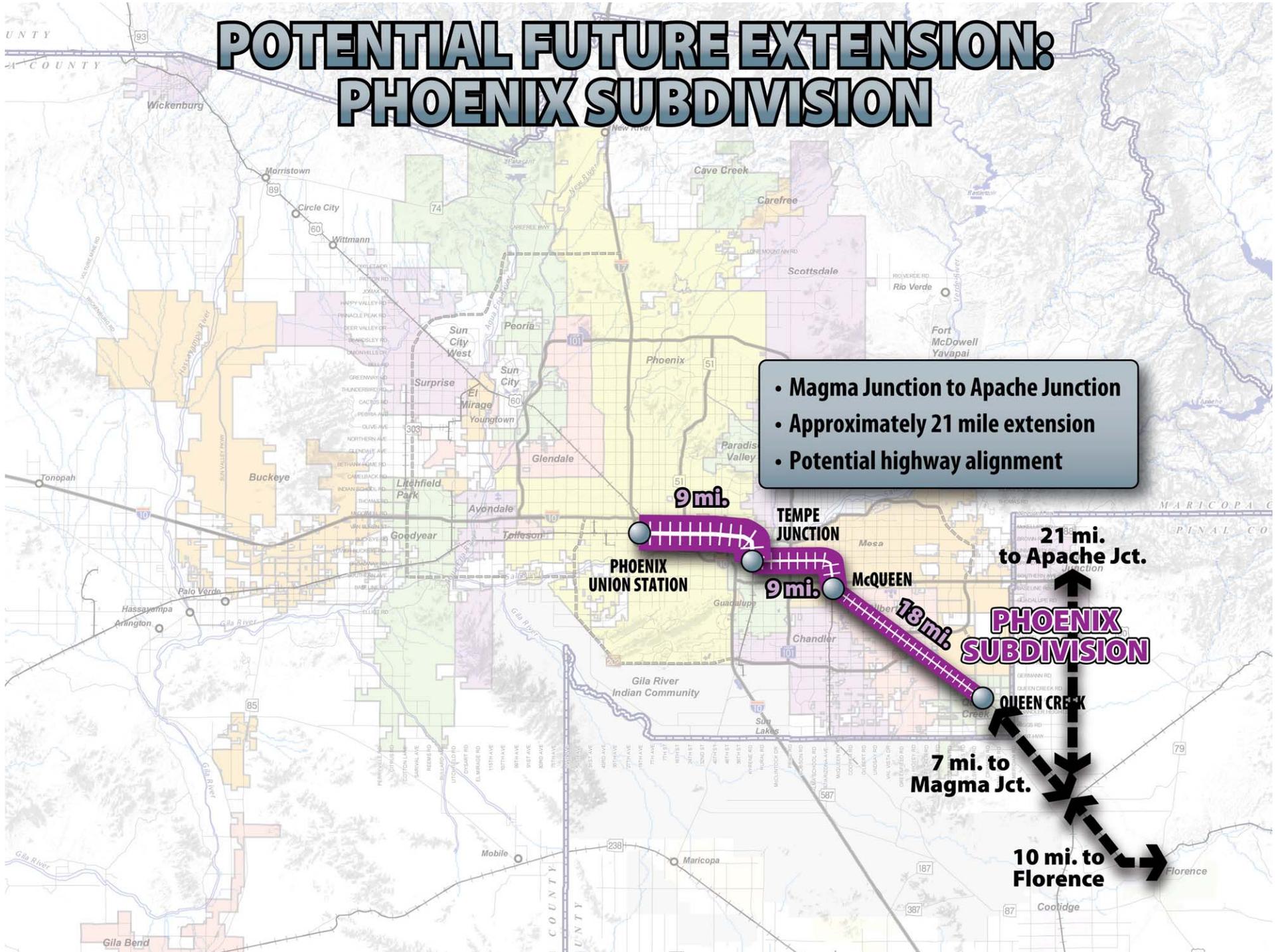
21 mi. to Apache Jct.

PHOENIX SUBDIVISION

QUEEN CREEK

7 mi. to Magma Jct.

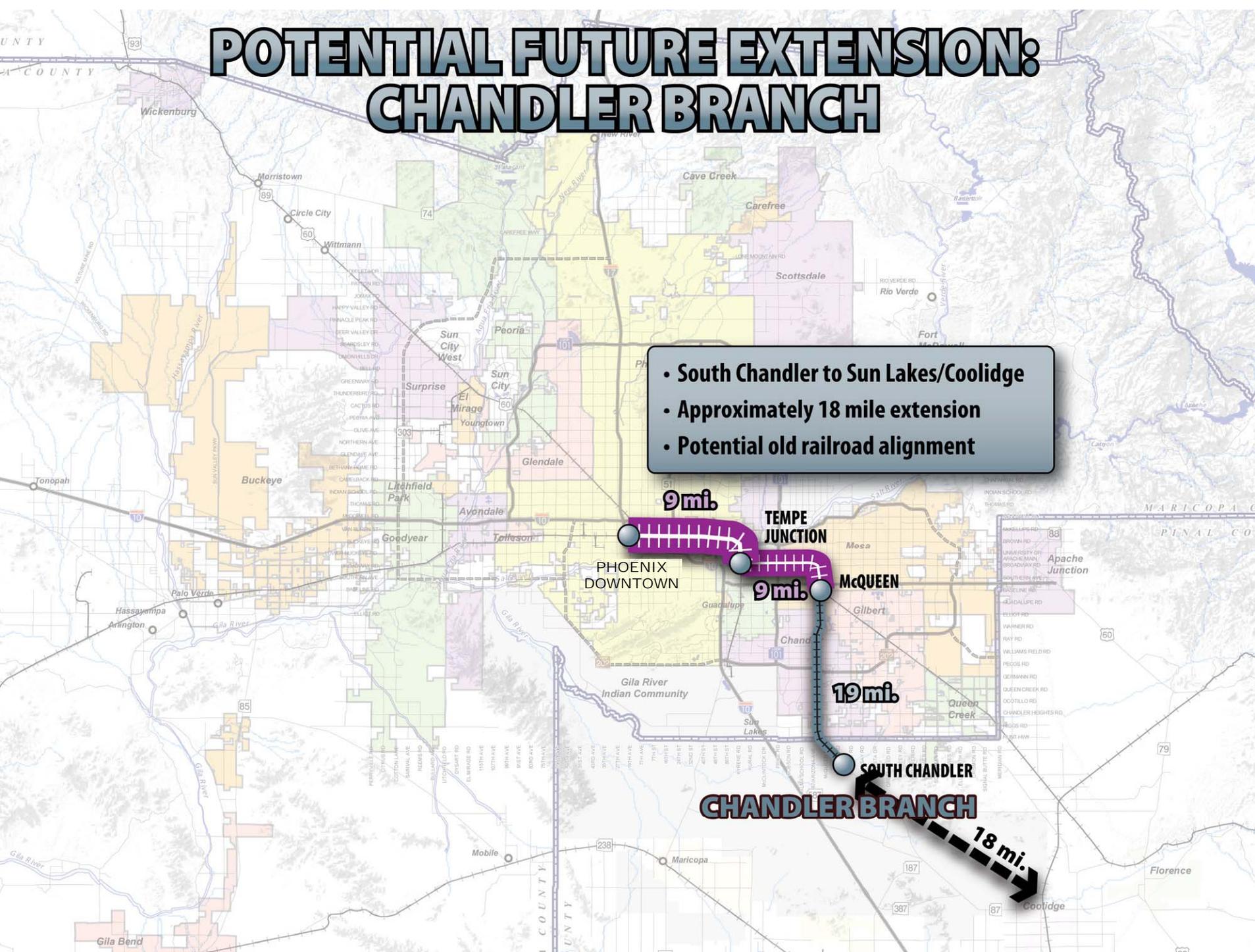
POTENTIAL FUTURE EXTENSION: PHOENIX SUBDIVISION



- Magma Junction to Apache Junction
- Approximately 21 mile extension
- Potential highway alignment

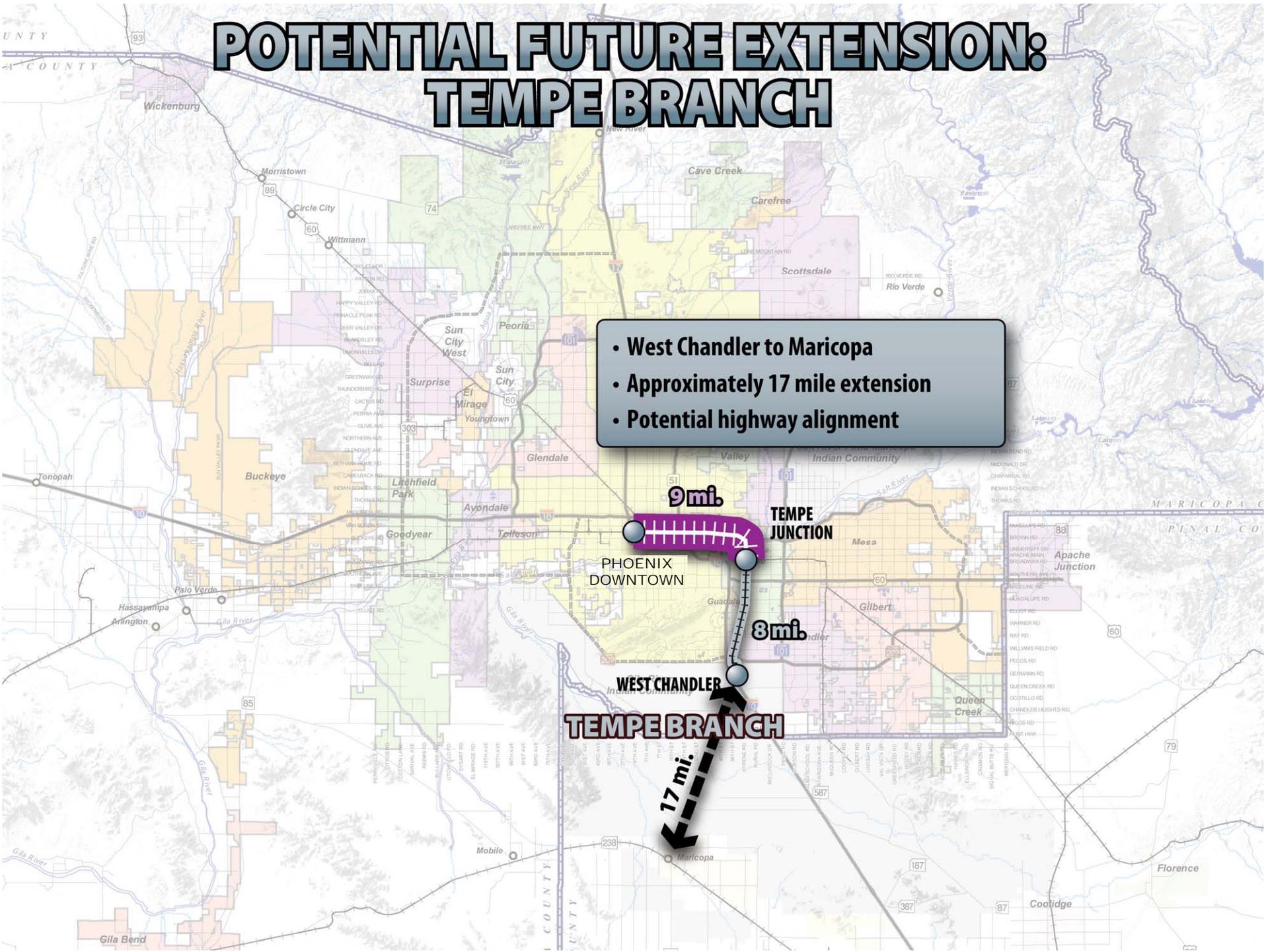
POTENTIAL FUTURE EXTENSION: CHANDLER BRANCH

- South Chandler to Sun Lakes/Coolidge
- Approximately 18 mile extension
- Potential old railroad alignment



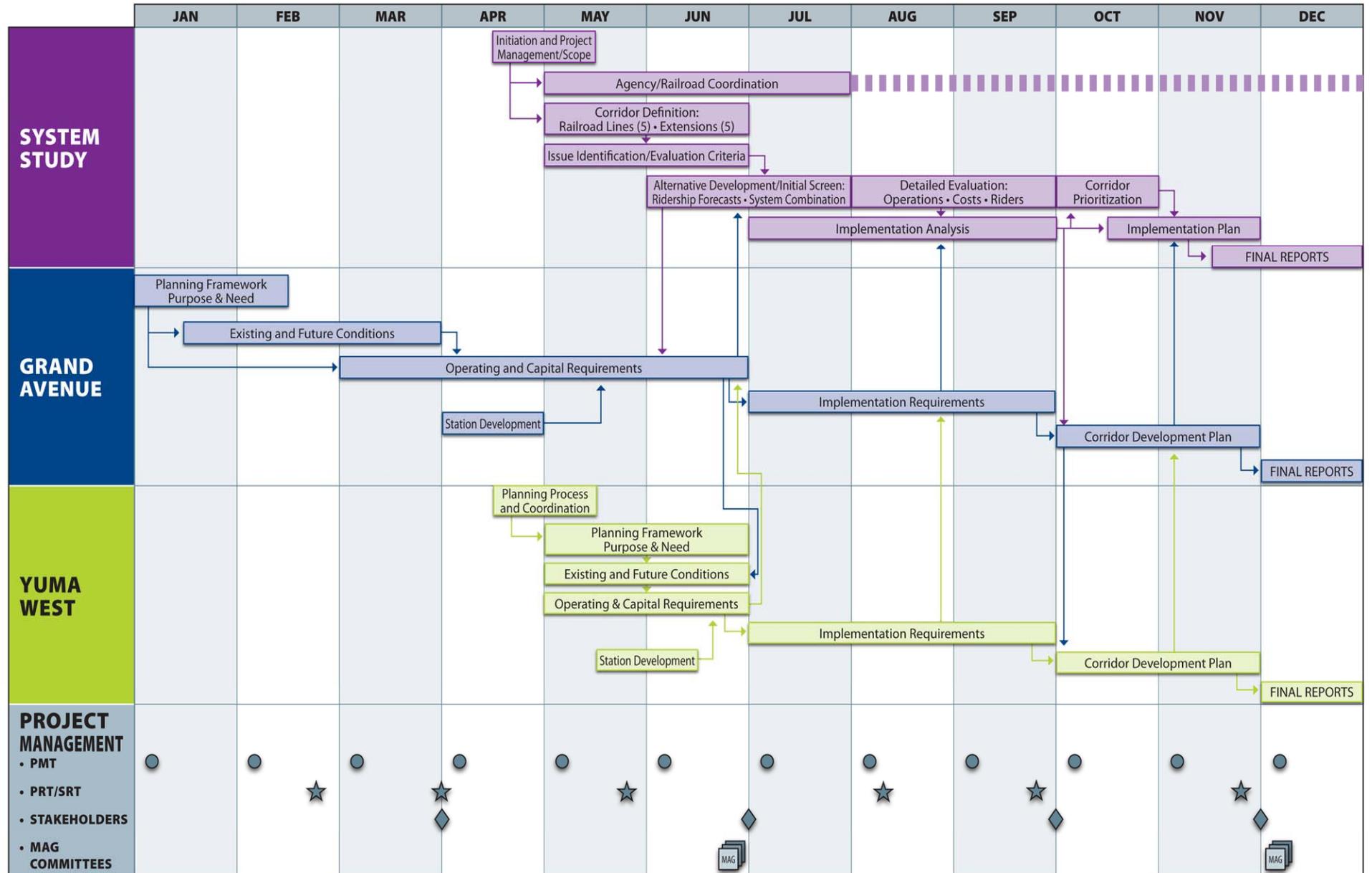
POTENTIAL FUTURE EXTENSION: TEMPE BRANCH

- West Chandler to Maricopa
- Approximately 17 mile extension
- Potential highway alignment



Project Schedule

COMMUTER RAIL PROJECT INTEGRATION - DRAFT



June 5, 2009

Thank you!

Q & A