MARICOPA ASSOCIATION of GOVERNMENTS

COMMUTER RAIL
System Planning

Commuter Rail Planning
Stakeholder Presentation
November 12, 2009

URS

Meeting Agenda

- **Schedule and Overall Project Progress**
- **Ridership Forecasting Update**
- **Peer City Review**
- **Vehicle and Maintenance Facility Recommendations**
- **Next Steps**
- **Q & A**

COMMUTER RAIL PROJECT INTEGRATION - DRAFT

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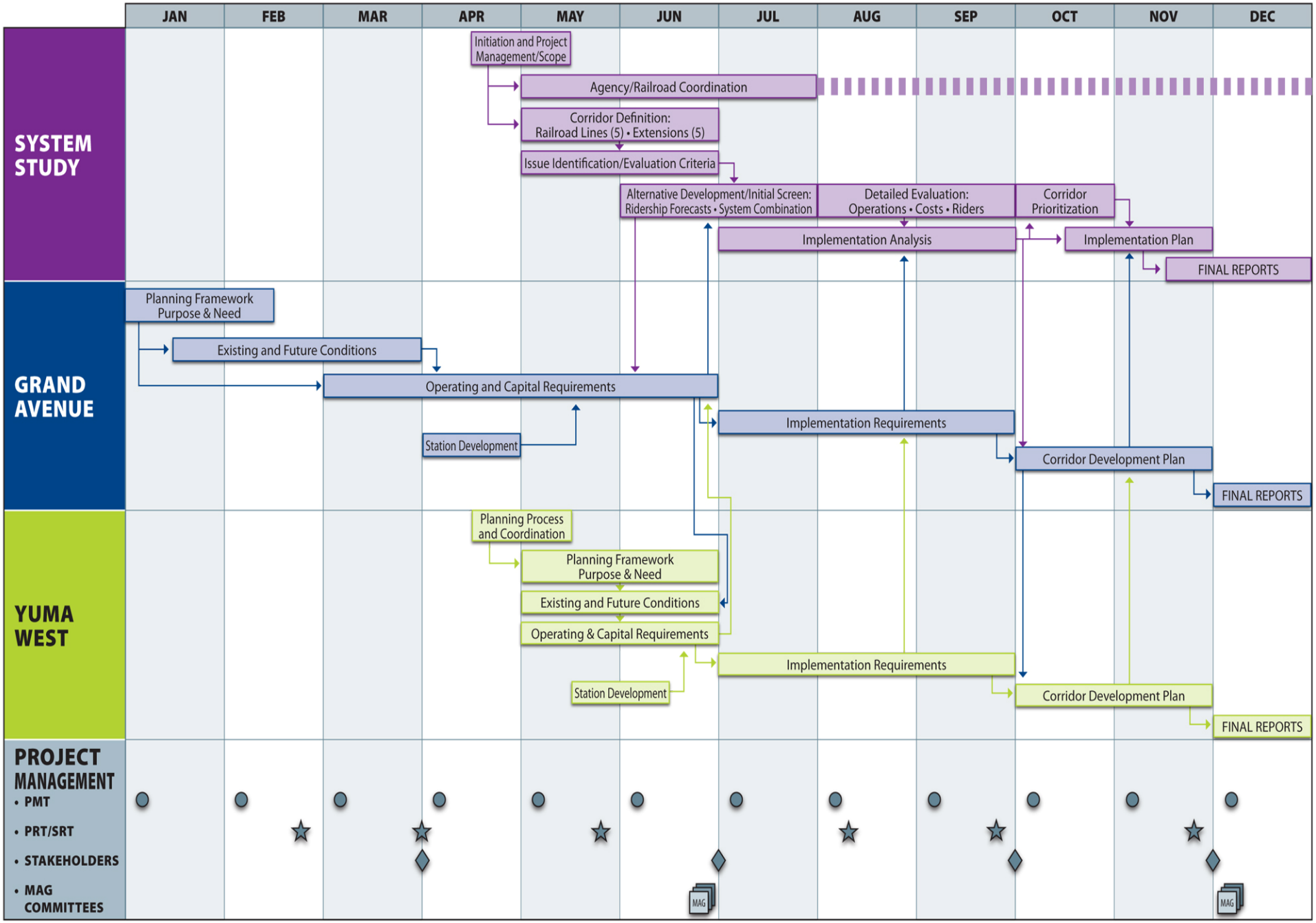
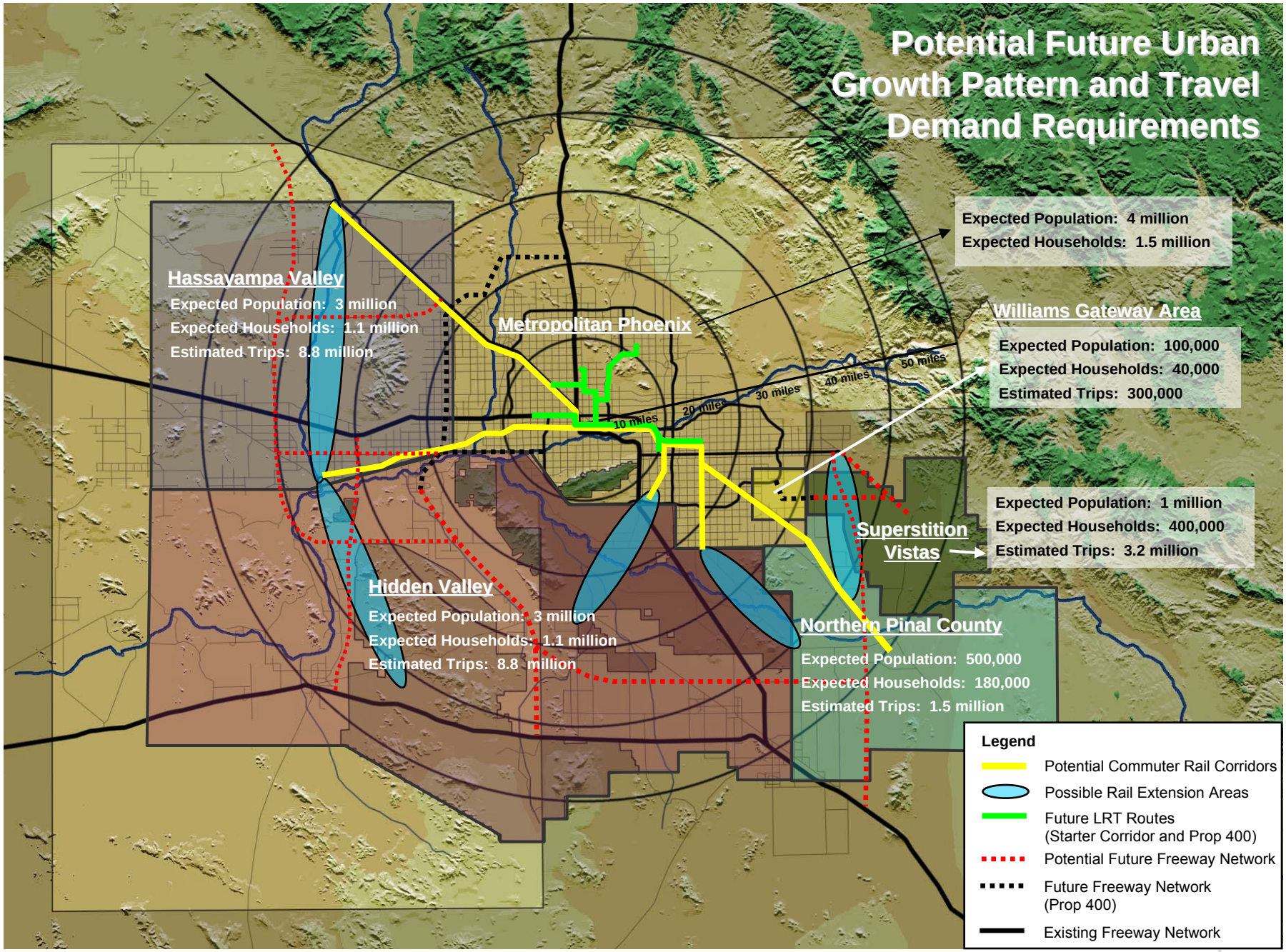


June 5, 2009

Potential Future Urban Growth Pattern and Travel Demand Requirements



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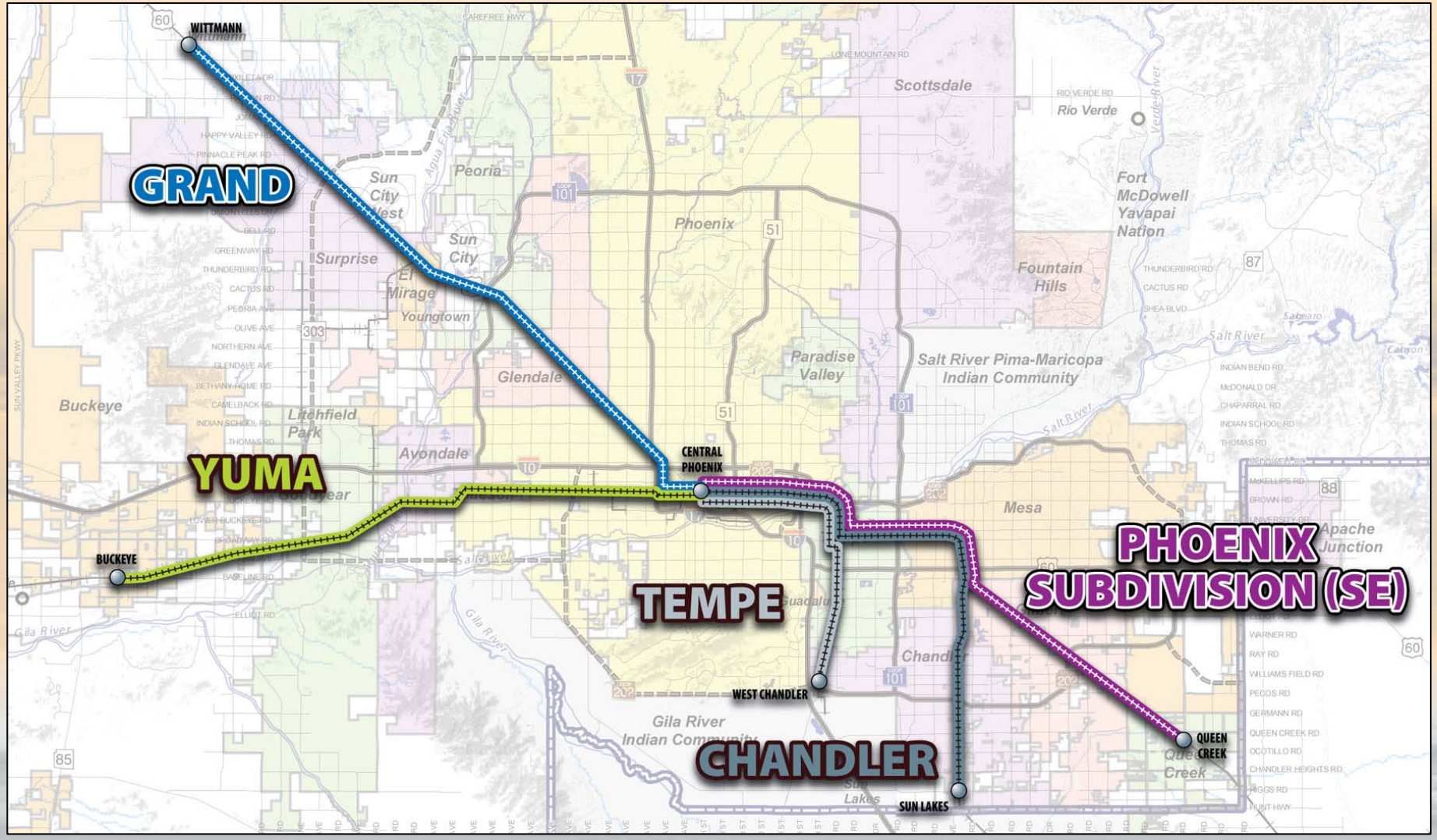
DMJM HARRIS | AECOM

System Study Corridors



Base Model Runs

1–Corridor Alternatives

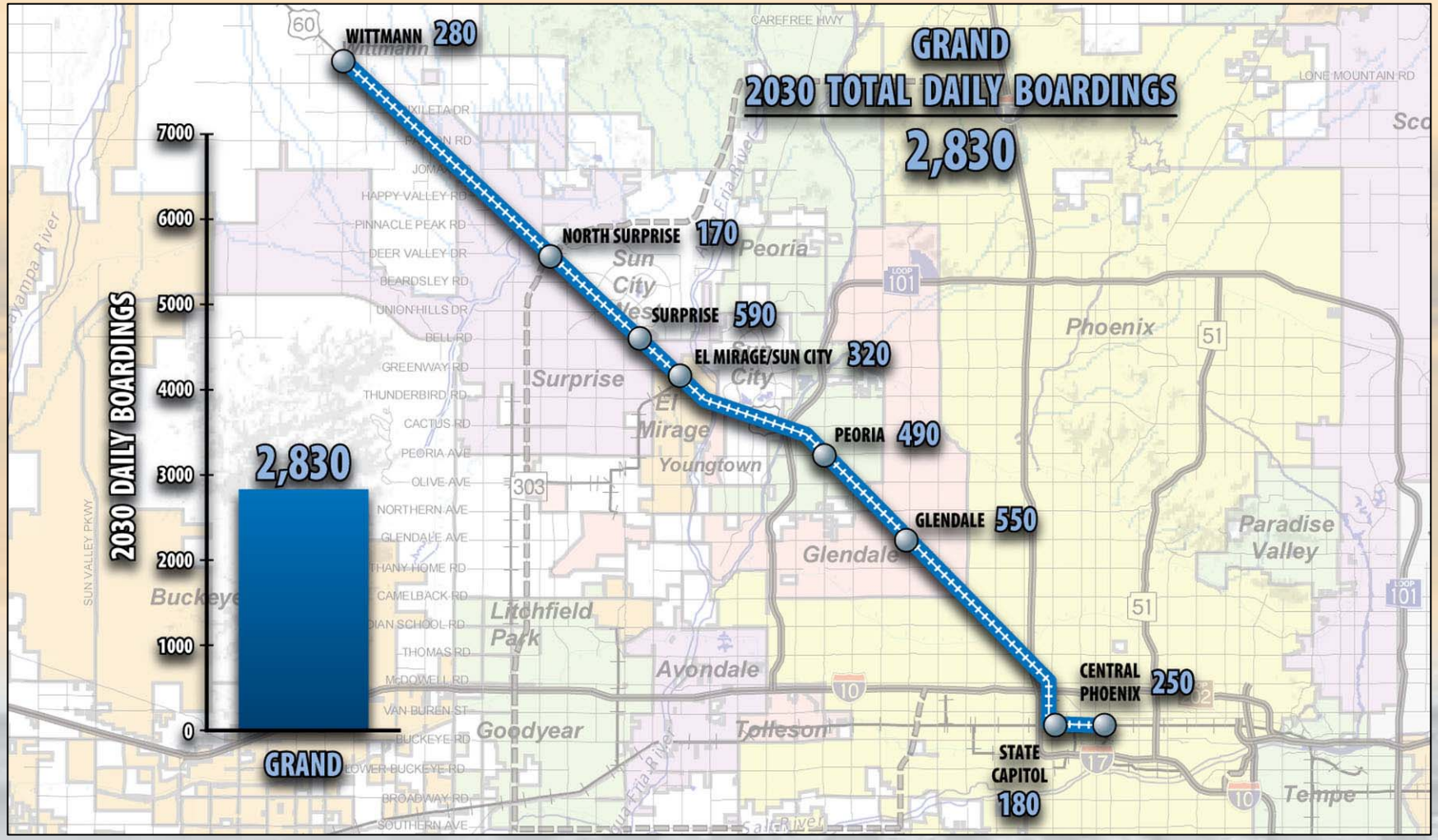
- Grand Avenue: Wittmann to Central Phoenix
- Yuma: Buckeye to Central Phoenix
- SE: Downtown Queen Creek to Central Phoenix
- Tempe: W Chandler to Central Phoenix
- Chandler: Sun Lakes to Central Phoenix

Multi–Corridor Alternatives

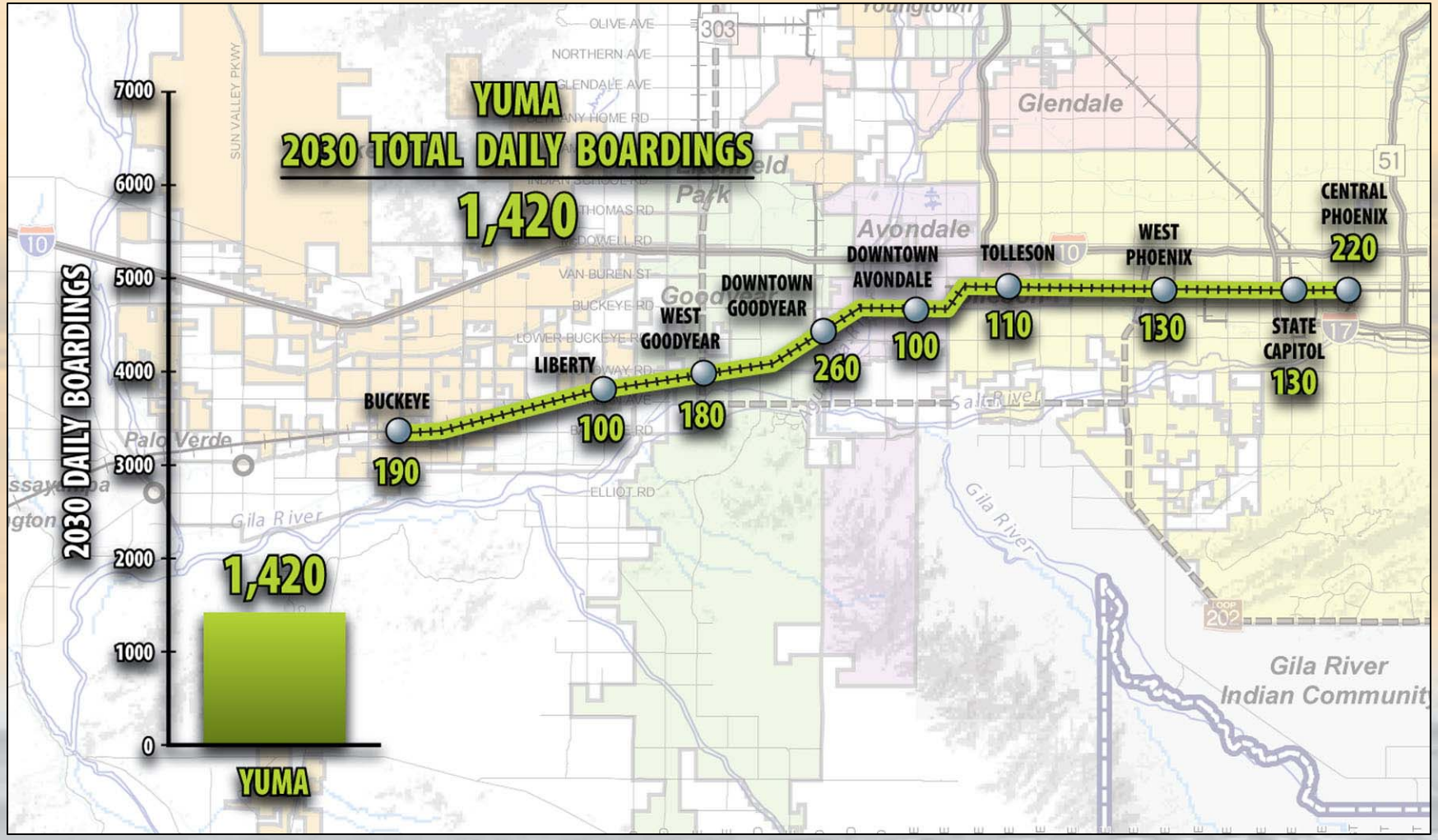
- Grand Avenue– Yuma – SE
- Grand Avenue – Yuma – SE – Chandler
- Grand Avenue – Yuma – SE – Tempe

  - Model includes 2030 RPTA/RTP improvements
  - Headways are 30 minute peak/60 minute off-peak

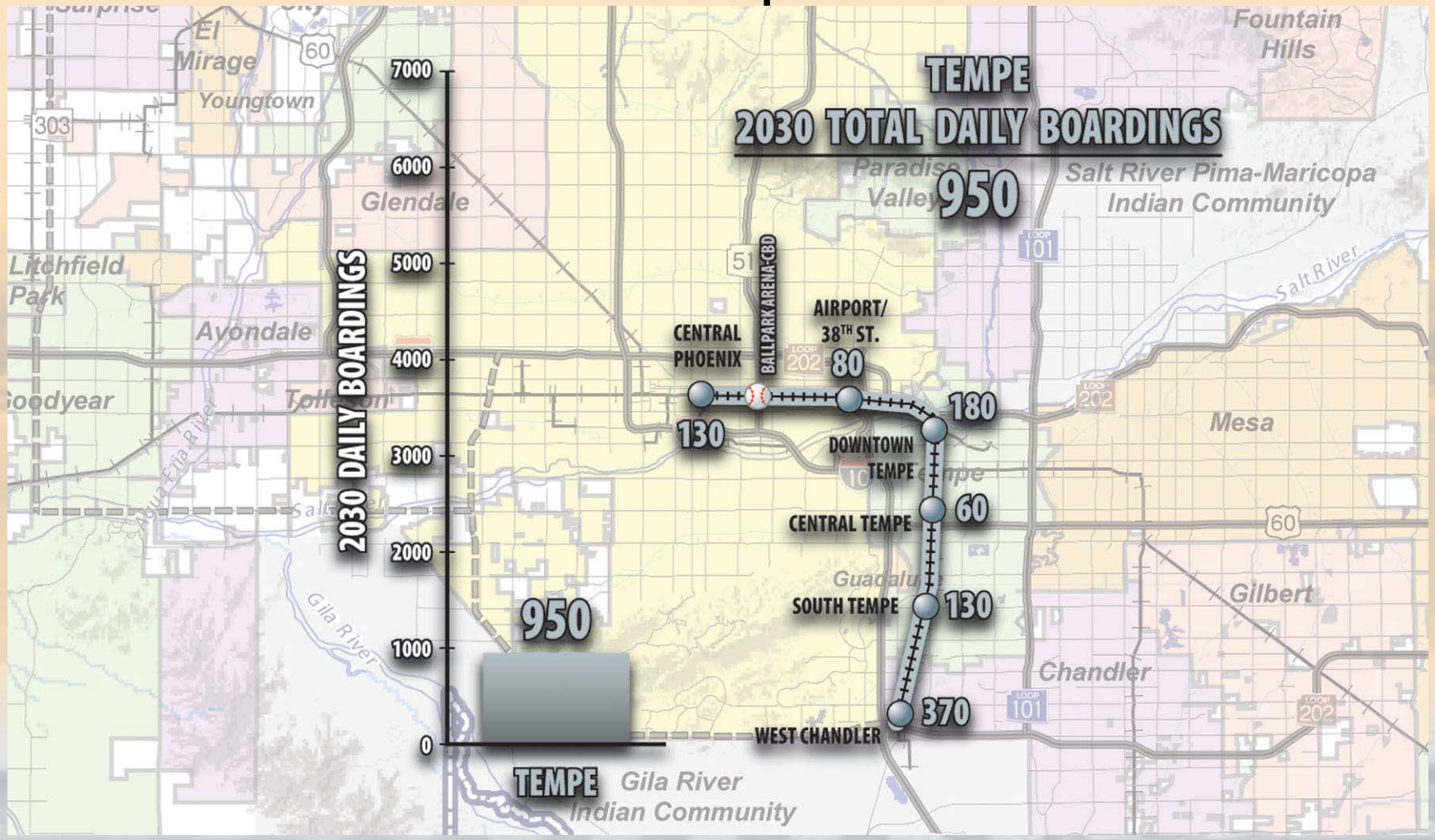
2030 Daily CRT Ridership and Station Boardings
Grand Avenue



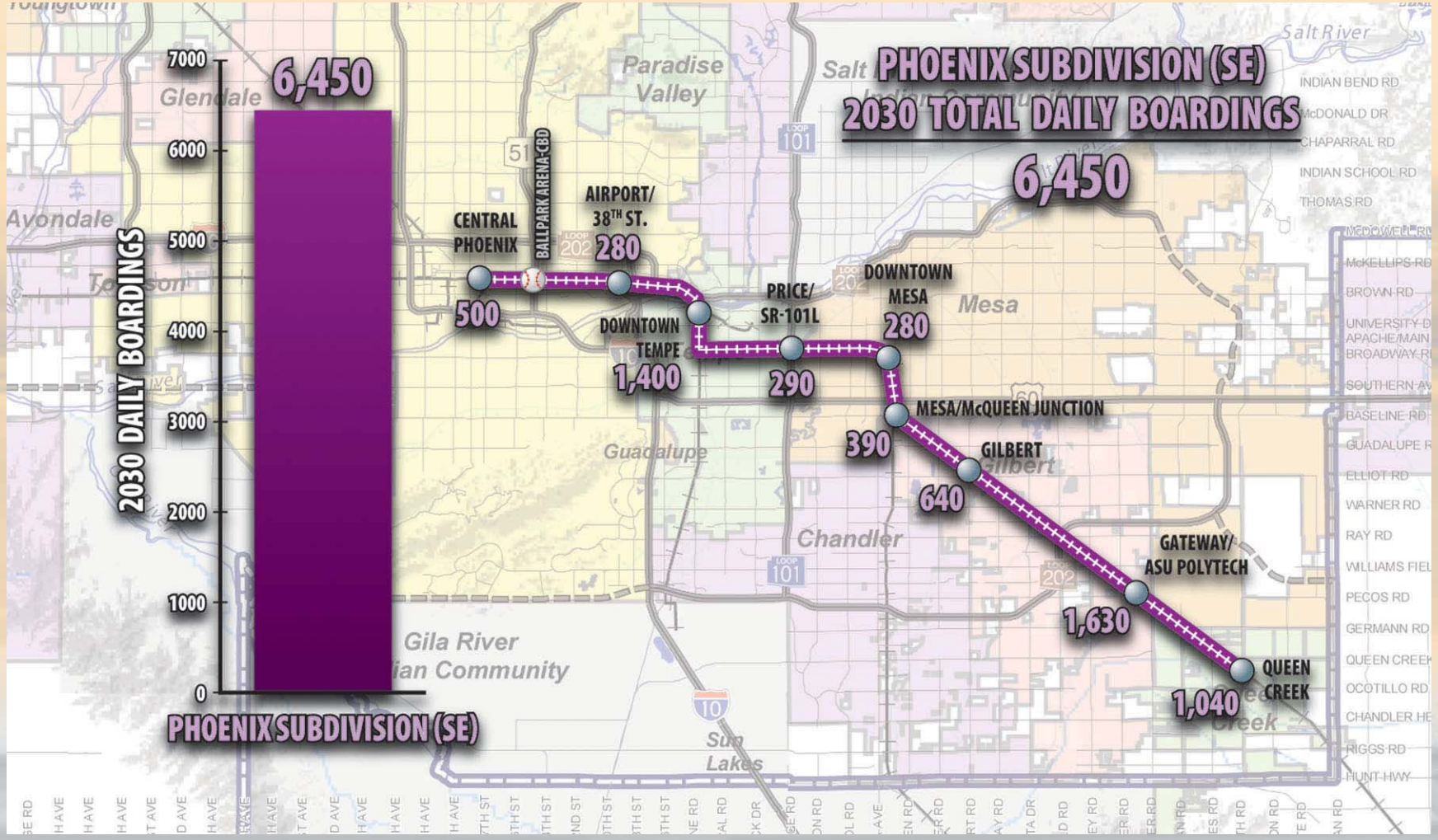
2030 Daily CRT Ridership and Station Boardings
Yuma West



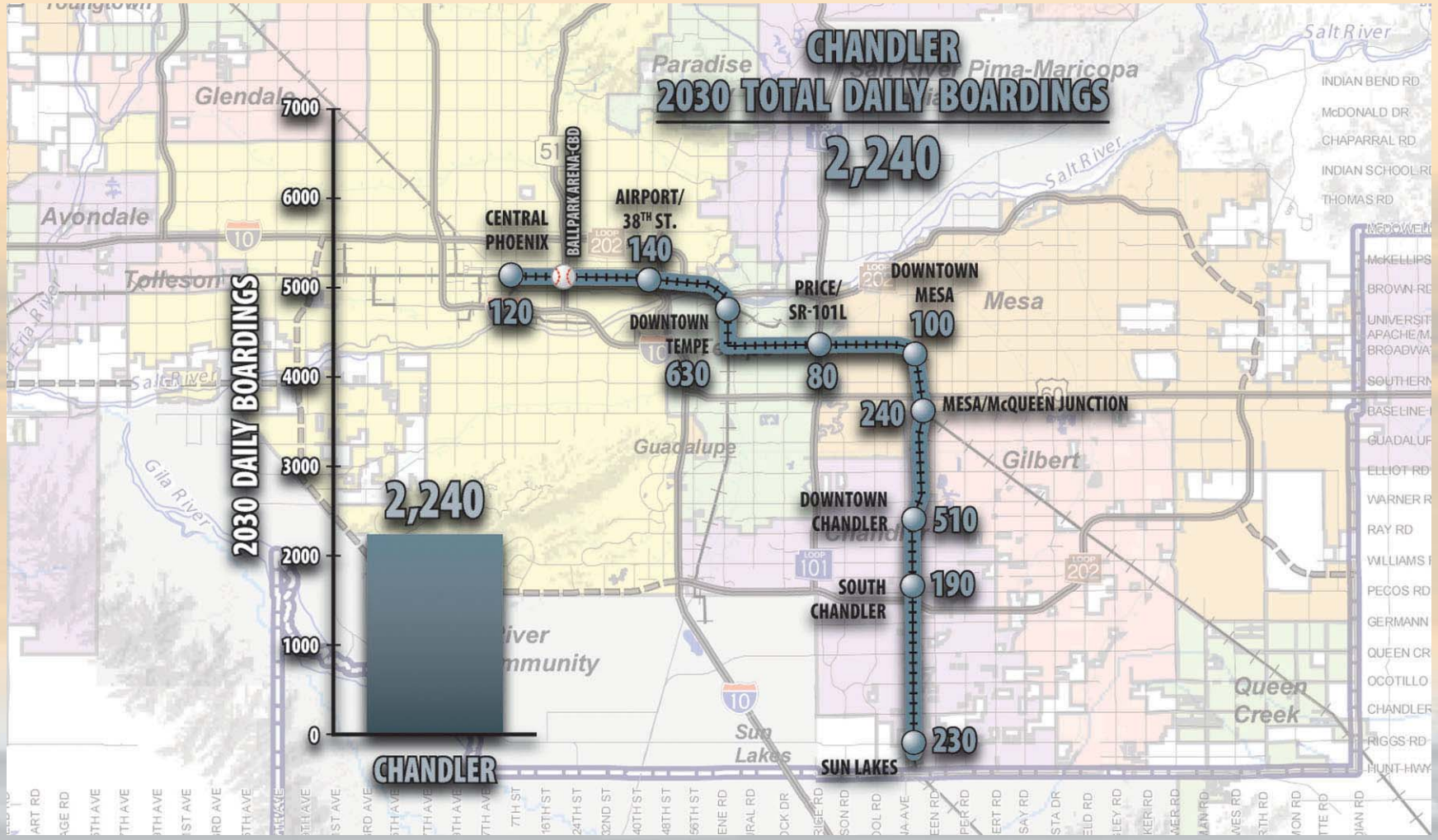
2030 Daily CRT Ridership and Station Boardings Tempe



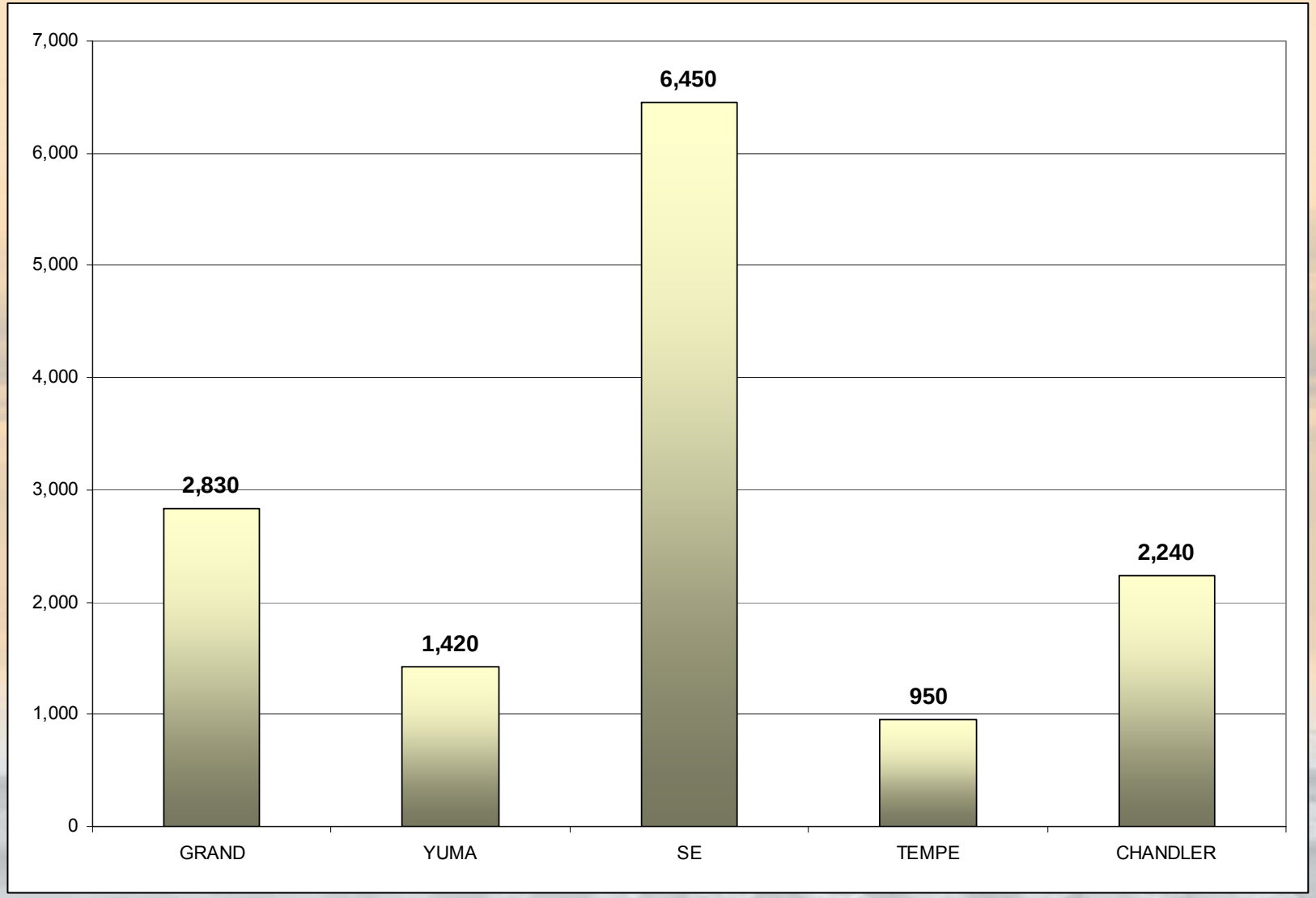
2030 Daily CRT Ridership and Station Boardings Southeast



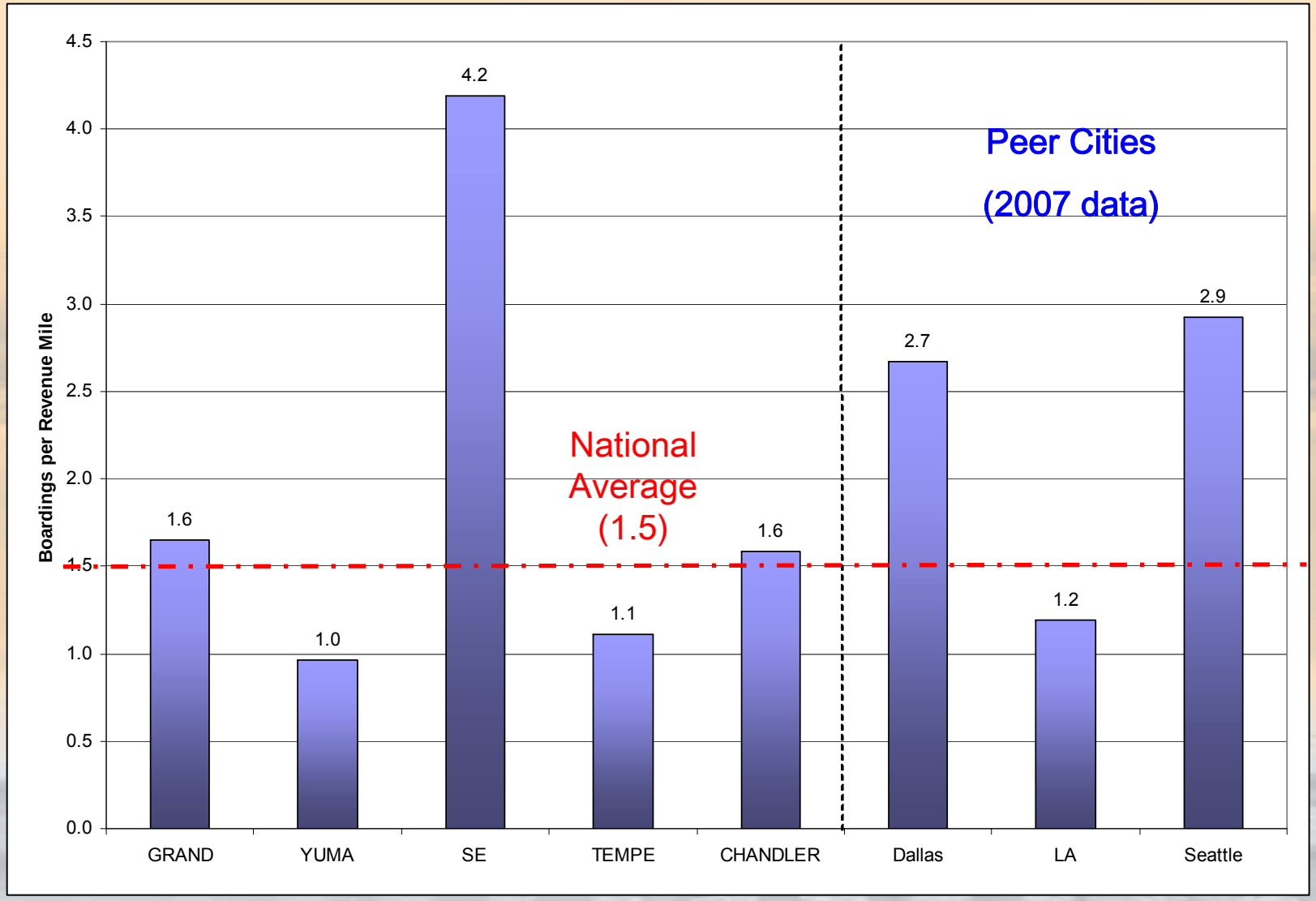
2030 Daily CRT Ridership and Station Boardings Chandler



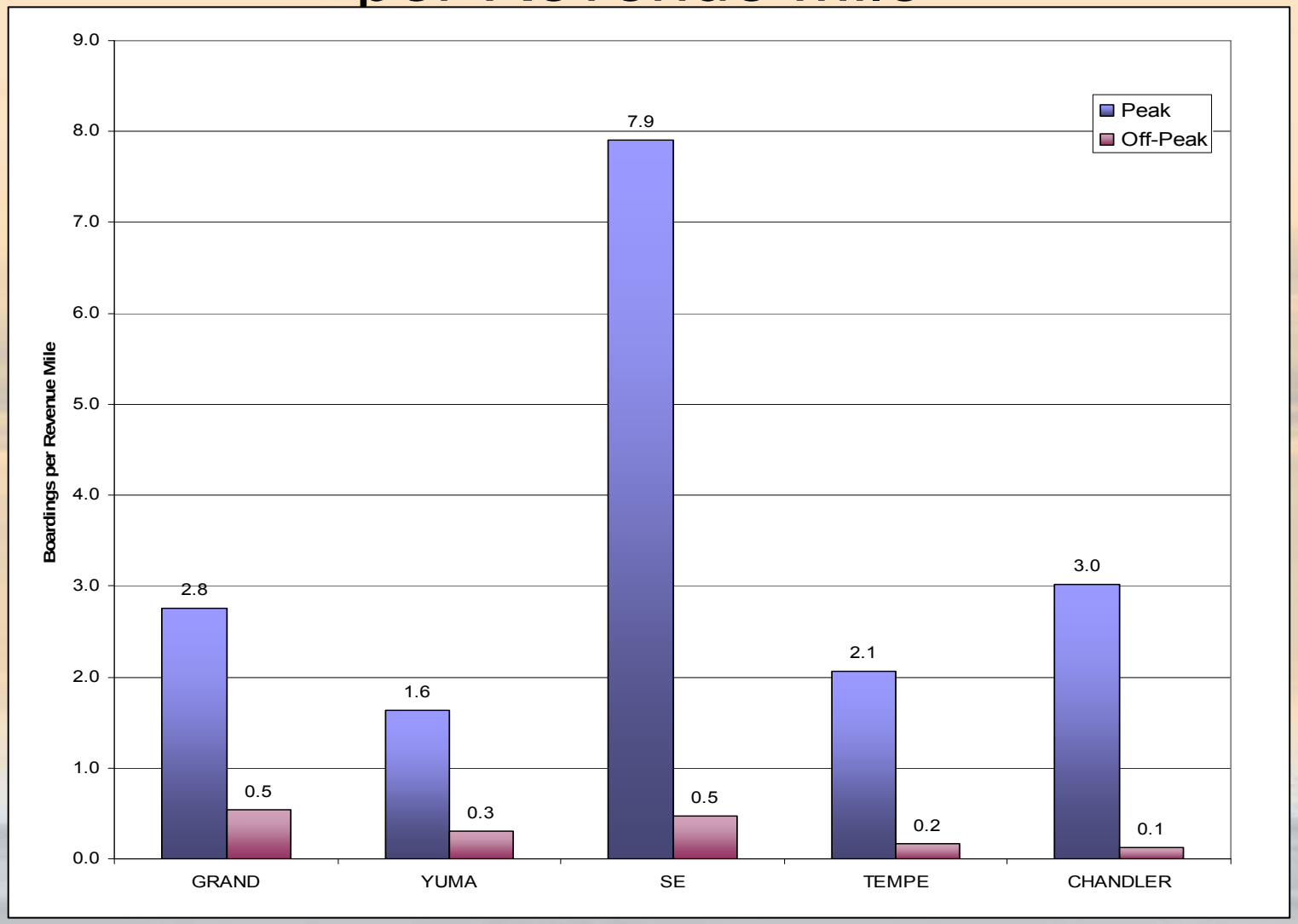
2030 Daily CRT Ridership



2030 Daily CRT Boardings per Revenue Mile



2030 Peak/Off-peak CRT Boardings per Revenue Mile



Base Model Run Observations

- SE, Grand Avenue , and Chandler are the strongest corridors and rank well in boardings per revenue mile compared to peer cities.
- Heavy peak use; low off-peak use.
- Overall, strong bus and LRT connections strengthen commuter rail ridership.

Interlined Model Runs

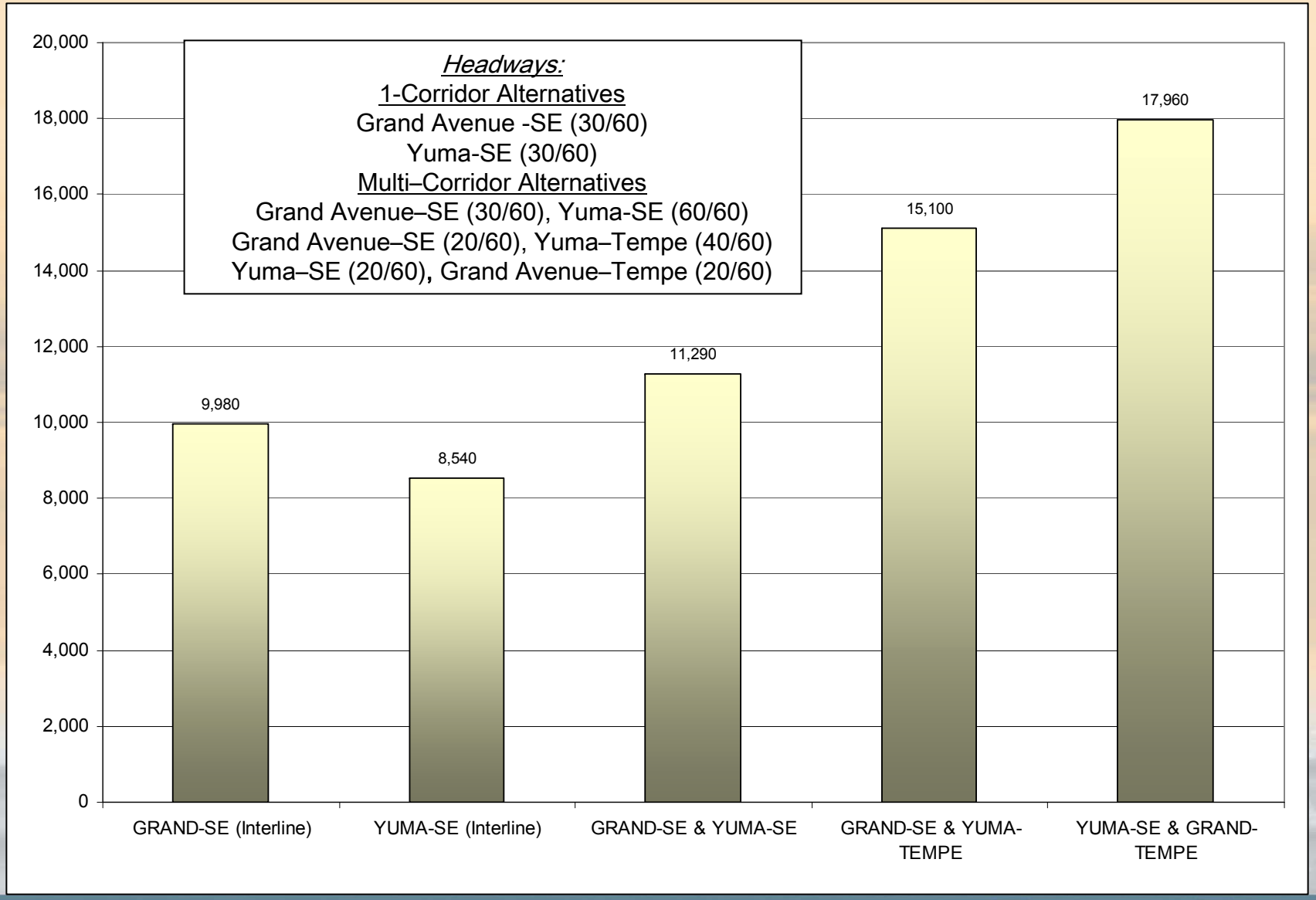
1–Corridor Alternatives

- Grand Avenue–SE: Wittmann to Downtown Queen Creek (30/60)
- Yuma–SE: Buckeye to Downtown Queen Creek (30/60)

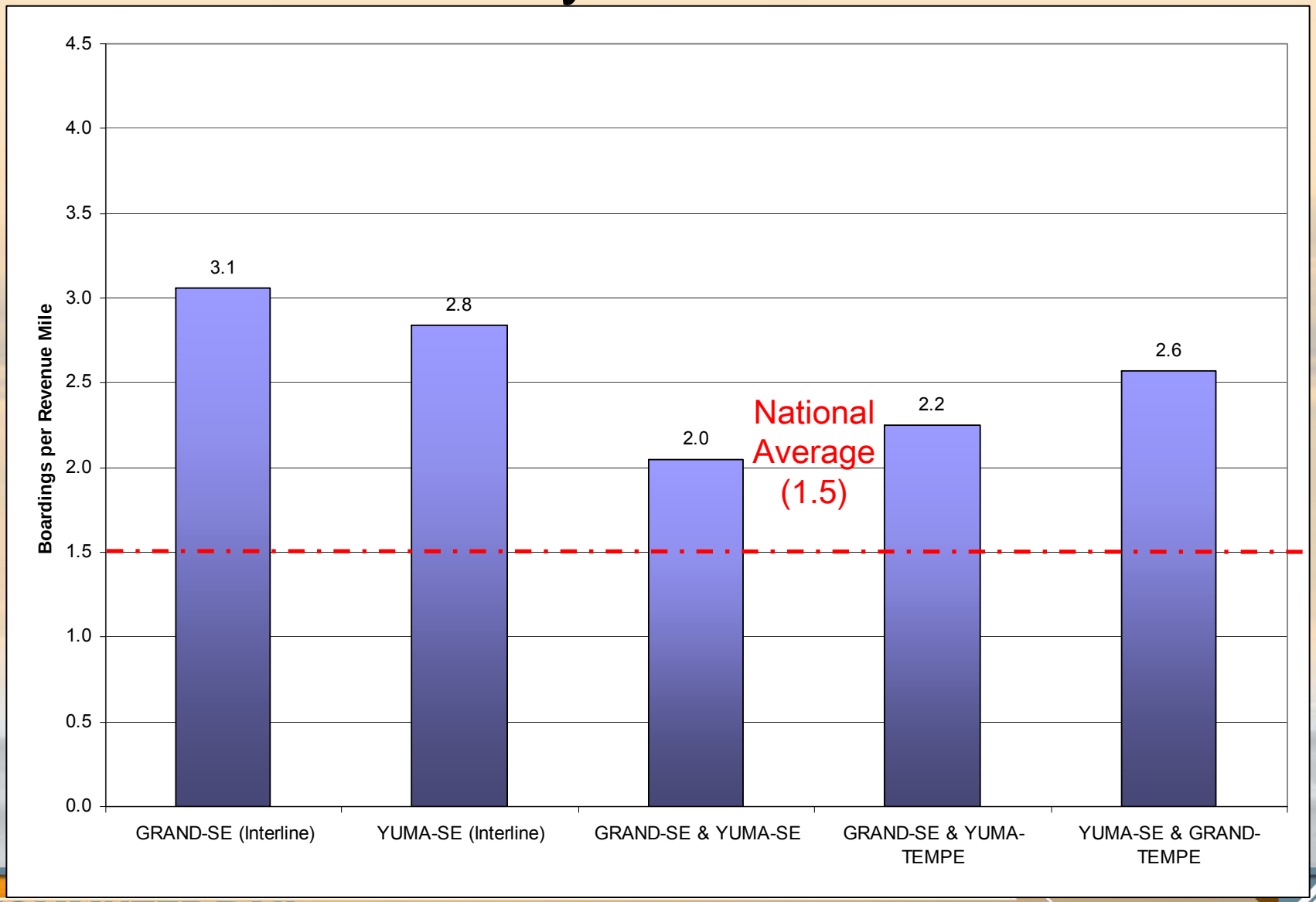
Multi–Corridor Alternatives

- Grand Avenue–SE (30/60), Yuma–SE (60/60)
- Grand Avenue–SE (20/60), Yuma–Tempe (40/60)
- Yuma–SE (20/60), Grand Avenue–Tempe (20/60)

2030 Daily CRT Ridership by Model Run



2030 Daily CRT Boardings per Revenue Mile by Model Run



Interlined Model Run Observations

- Interlining improves ridership and boardings per revenue mile over individual corridors
  - When Grand Avenue or Yuma are interlined with SE, ridership increase is under 10%
  - Boardings per revenue mile are improved the most on Yuma corridor when interlined with SE
- Heavy peak use; low off-peak use
- Grand Avenue-SE interline is slightly more productive at 20/60 than at 30/60 headway (boarding per revenue mile changes from 3.1 to 3.2)

Ridership Forecasting Next Steps

- Review highway network relative to commuter rail service lines
- Optimize bus routes as feeders into commuter rail line
- Perform base corridor ridership sensitivity tests
- Estimate potential ridership for extensions
- Finalize ridership analysis

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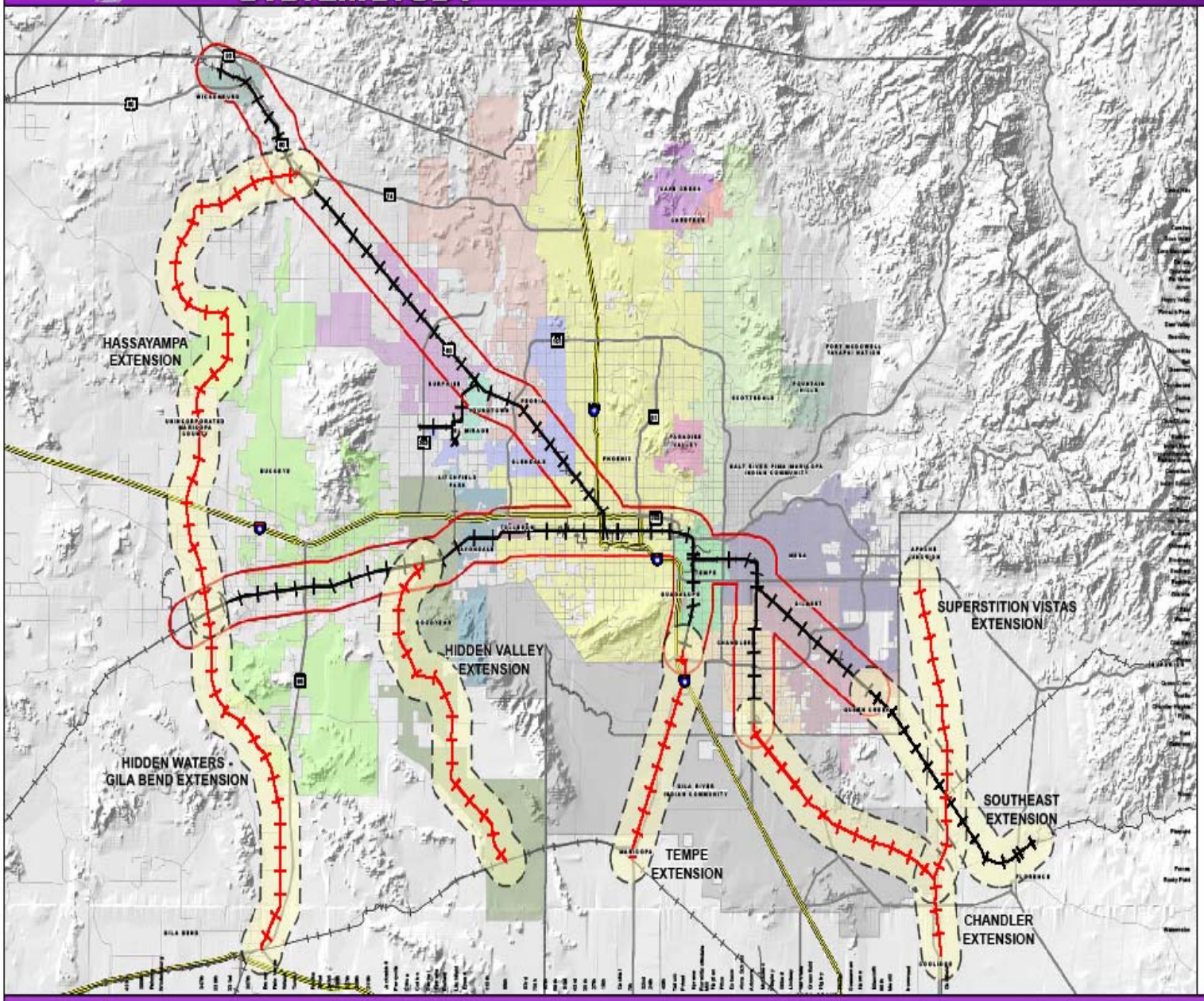
POSSIBLE FUTURE COMMUTER RAIL EXTENSIONS & CONCEPTUAL STATION AREA LOCATIONS



Project Features

- Maricopa County
- System Study Planning Area
- MAG Region Existing Railroads
- Future Extensions
- Future Corridors

General Features

- Interstate
- Major Road / Highway
- Secondary Roads
- Other Railroads

Inset Map

0 2 4 8
Miles

N W E S

Source:
Base Map: ALRIS 1997 - 2006

Peer City/Region Comparisons: Recent Commuter Rail Systems

System	Start Year	Length (in route miles)	Trains Per Day (Weekday)	Daily Ridership (Weekday)
Altamont Commuter Express (ACE) (San Jose-Stockton, CA)	1998	86	6-8	3,700
Coaster (San Diego-Oceanside, CA)	1995	41	22	6,000
Front Runner (Salt Lake City-Ogden, UT)	2008	44	71	4,100
Metrolink, San Bernardino Line (Los Angeles-San Bernardino, CA)	1992	56	39	11,950
Metrolink, Ventura County Line (Los Angeles-Oxnard/Montalvo, CA)	1992	71	22	4,000
Music City Star (Nashville-Lebanon, TN)	2006	32	11	1,000
New Mexico Rail Runner Express (Santa Fe-Albuquerque-Belen, NM)	2006	93	24	4,500
Sounder, North Line (Seattle-Everett, WA.)	2003	35	8	1,500
Sounder, South Line (Seattle-Tacoma, WA.)	2000	47	18	11,000
Trinity Railway Express (TRE) (Dallas-Ft. Worth, TX)	1996	34	49	9,800

Vehicle Technology Recommendation

- Locomotive Hauled Coaches (LHCs)
  - Powered by one diesel-electric locomotive engine.
  - Locomotive pulls train in one direction and pushes train in opposite direction. A cab car with operating controls is put on one end of the train and a locomotive at the other end
  - 2-car to 12-car consists
  - Seated capacity of each double-deck passenger car is approximately 140 passengers

Vehicle Technology Recommendation

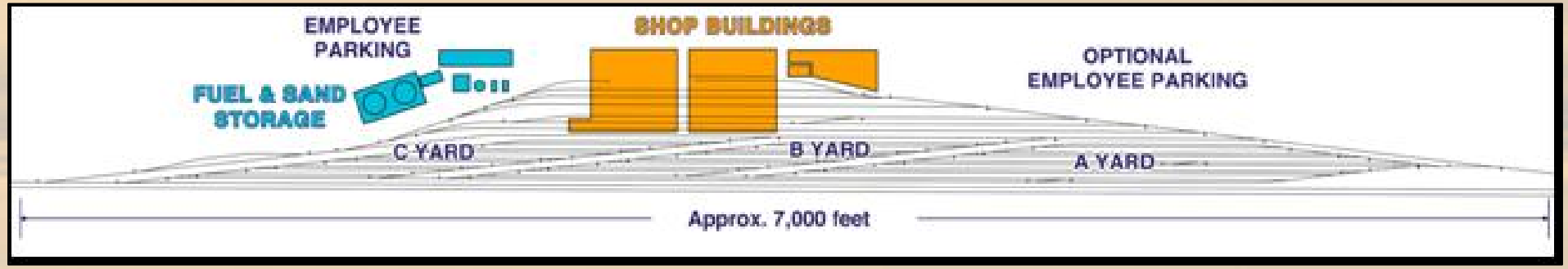
- LHC Vehicles
  - FRA-compliant - meet federal requirements for crashworthiness and can share tracks with freight trains and operate concurrently with freight traffic.
  - Used extensively in commuter rail systems across the US.
  - Off-the-shelf proven technology.

Vehicle Technology Recommendation

- LHC Clean Diesel Technology
  - New EPA Clean Diesel Standards
  - Maryland Area Regional Commuter (MARC) Rail System introduced new fleets of “green” locomotives that can reduce emissions of:
    - nitrous oxide by 42%,
    - carbon monoxide by 70%;
    - and particulates, such as soot, by 67% over current fleet.
  - Use of alternative fuels is being tested in several commuter rail systems throughout the US.

Commuter Rail Maintenance Facilities (CRMFs)

Facility to repair, maintain, clean, fuel, and store commuter rail vehicles.



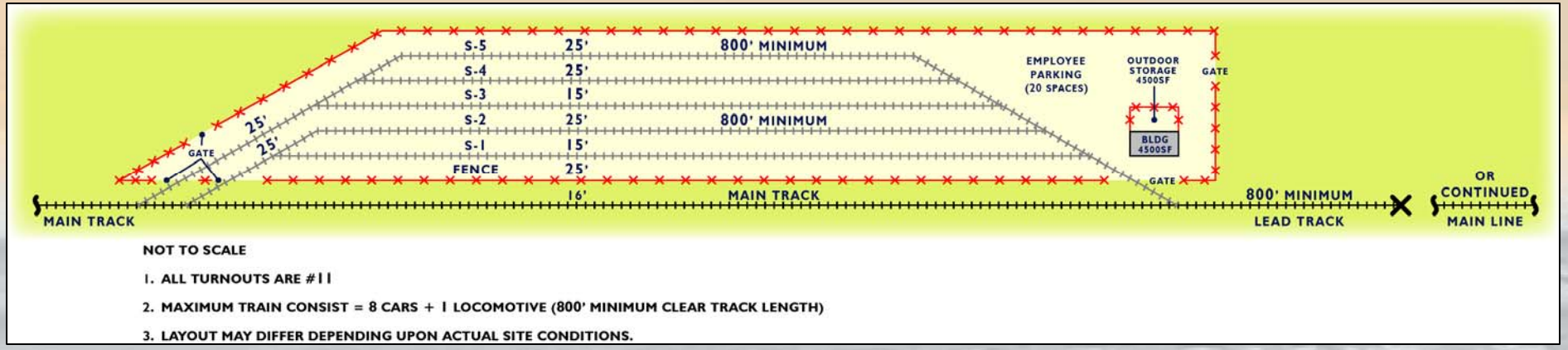
Typical CRMF Site Layout

Dallas-Fort Worth TRE Equipment Maintenance Facility

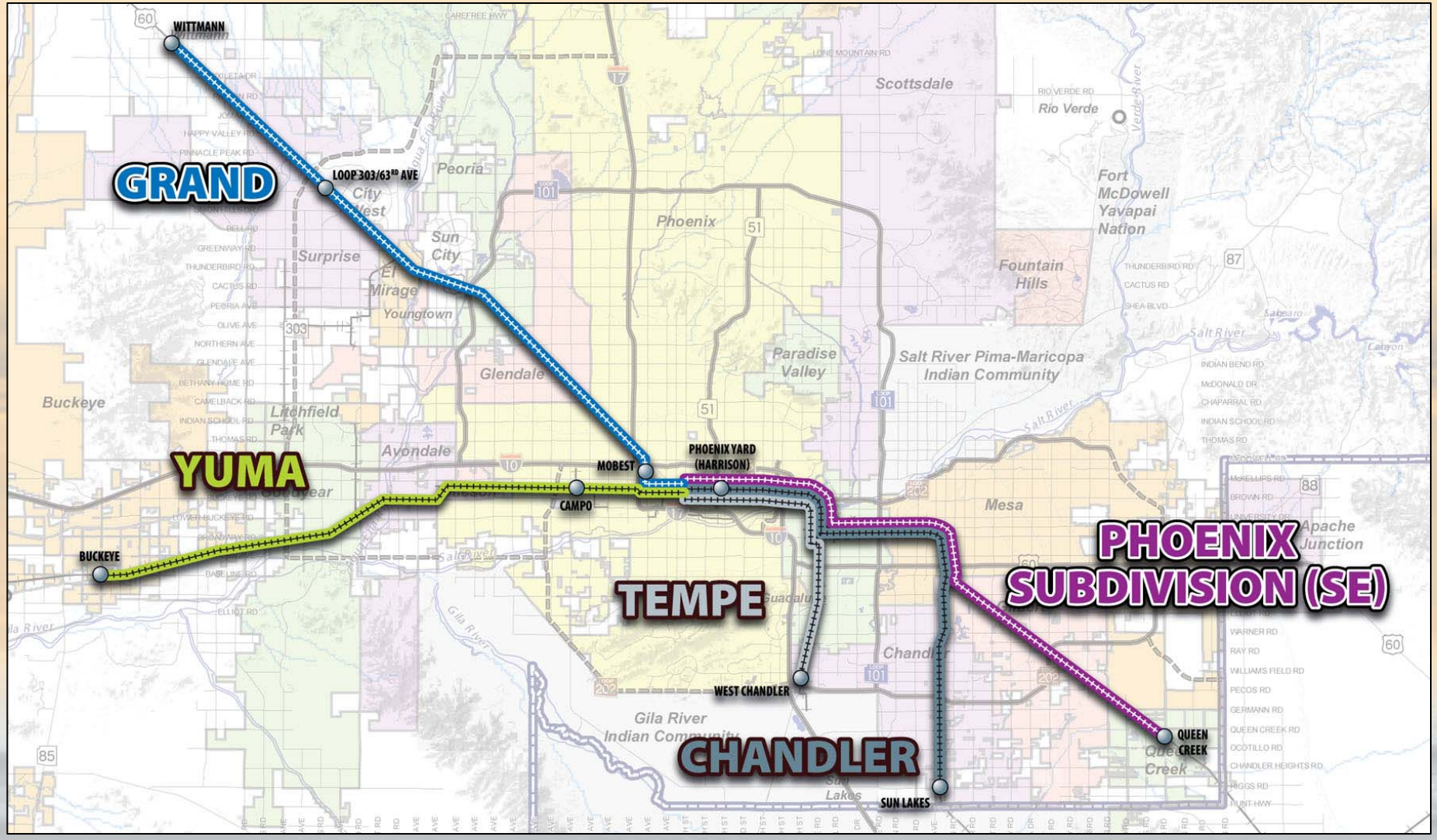
Layover/Tail Track Facilities

Smaller facilities than a CRMF. Used for vehicle storage and minor vehicle cleaning and inspection.

- Often 6-10 acres in size – but dependent on service line needs.
- Stores at most half the fleet of trains at end of line so they can be ready for the AM and PM start.



Potential CRMF/Layover Facility Locations



Next Steps

- Finalize ridership forecasting, including interlining scenarios, base corridor sensitivity tests, and extensions
- Finalize ranking of corridors
- Finalize Corridor Development Plan Draft Reports: Grand Avenue & Yuma West Corridors
- Develop System Study Draft Report

Q & A

Thank you!