MARICOPA ASSOCIATION of GOVERNMENTS

COMMUTER RAIL

System Planning

System Review Team (SRT) Meeting

September 22, 2009

URS

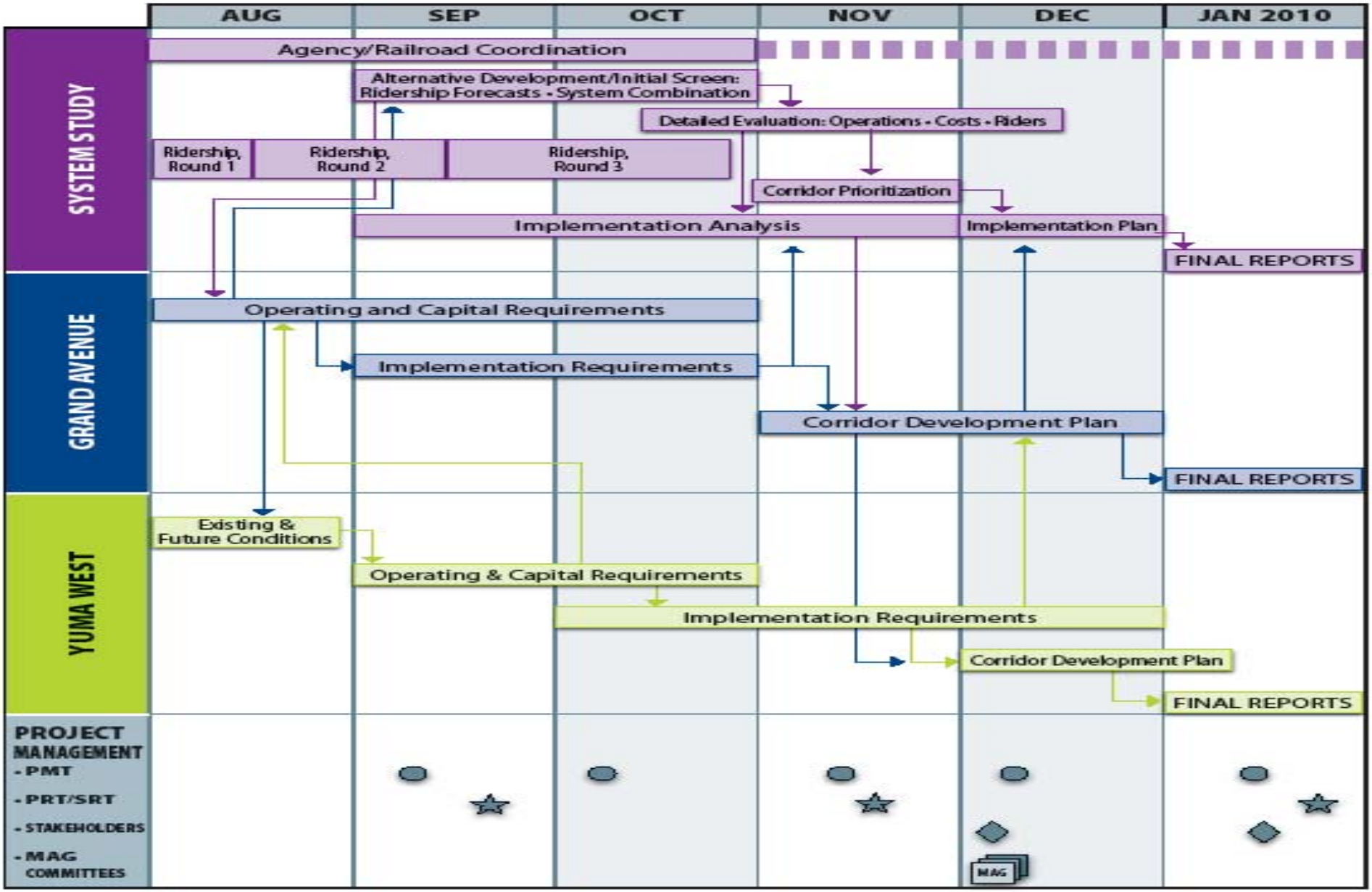
Agenda

- Overall Project Schedule
- Existing and Future Conditions Overview
- Ridership Forecasting
- Vehicle Recommendations
- Maintenance Facility Options
- Next Steps

Project Progress Since June SRT Meeting

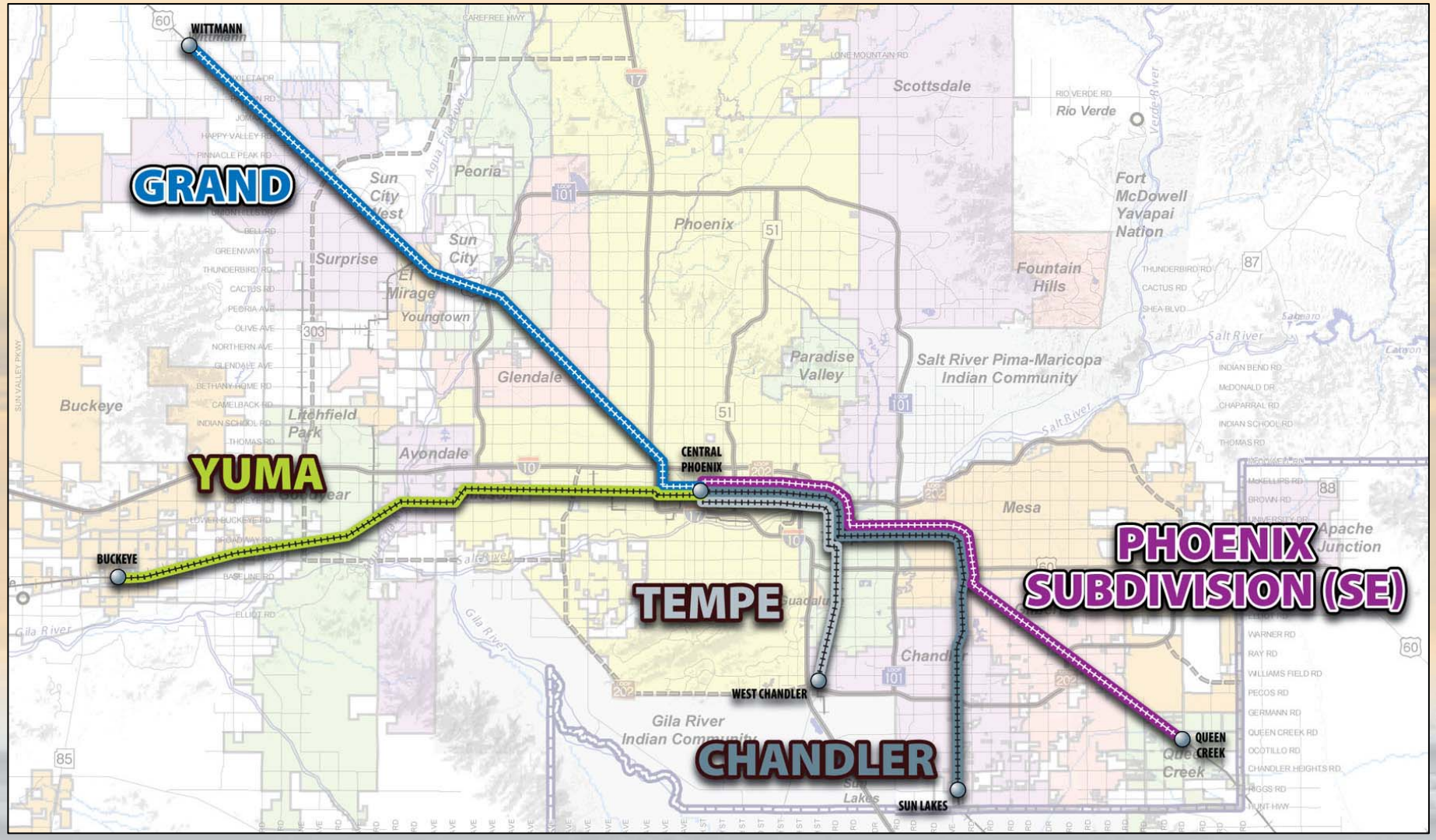
- Completed review of existing and future conditions along the rail corridor
- Completed two rounds of ridership forecast modeling
- Assessed vehicle technology and maintenance facility options
- **Now**: Developing cost estimates, conducting final round of modeling, and initiating implementation analysis of system alternatives

COMMUTER RAIL PROJECT INTEGRATION - DRAFT



August 21, 2009

System Study Corridors



Existing and Future Conditions

- **Demographics (2007 compared to 2030)**
  - Population and employment increases are expected throughout all corridors ranging from a 20% to 34% increase in population and employment (Chandler corridor), to a 103% and 76% increase (Yuma West corridor).
- **Land Use (projected to 2030)**
  - Grand Avenue and Yuma West corridors are expected to experience the highest increase in residential land use compared to other corridors.
  - The Tempe corridor is expected to experience the lowest change in land use.

Existing and Future Conditions (cont'd)

- **Railroad Characteristics**
  - All corridors experience active freight activity, although traffic is lightest along Yuma West corridor.
  - Existing railroad facilities could affect commuter rail service implementation.
- **Transit**
  - Fixed route transit service currently exists within the Tempe, Chandler, and Southeast corridors.
  - Transit service within the Grand and Yuma corridors is expected to improve with planned super-grid regional bus service.

Peer City Comparisons: Recent Commuter Rail Systems

System	Start Year	Length (in miles)	Daily Ridership
Sounder (WA), Seattle to Tacoma	2000	47	11,000
Sounder (WA), Seattle to Everett	2000	35	1,500
Trinity Railway Express (TX)	1996	34	9,800
RailRunner (NM)	2006	93	4,500
Coaster (CA)	1995	41	6,000
Front Runner (UT)	2008	43	4,100
Altamont Commuter Express (CA)	1998	86	3,700

Overview of Ridership Forecasting Process

Preliminary Model Runs –

Maximum Service Tests

↓

Base Model Runs –

System Study Base and Interlined Scenarios

↓

Sensitivity Test Model Runs

↓

Systems Analysis and Corridor Prioritization

Preliminary Model Runs

- Preliminary model results indicated:
  - Grand Avenue: West Wickenburg and Downtown Wickenburg stations were low-performing stations (fewer than 100 daily boardings).
  - Yuma West: Arlington station was lowest-performing station (fewer than 50 daily boardings).

- Results of preliminary model runs:
  - Grand Base Scenario was shortened to Wittmann.
  - Yuma Base Scenario was shortened to Buckeye.

Base Model Runs

1–Corridor Alternatives

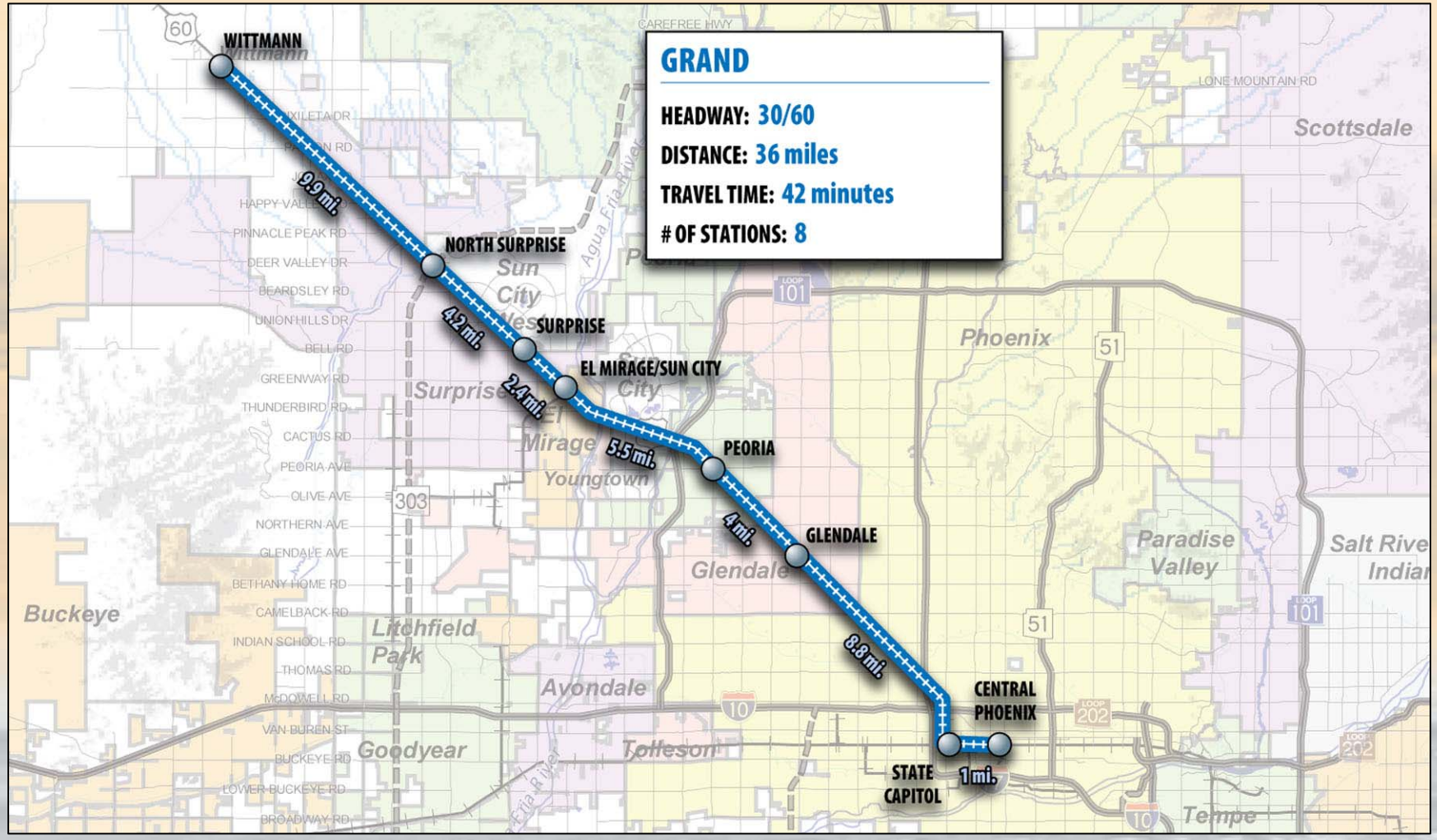
- Grand: Wittmann to Central Phoenix
- Yuma: Buckeye to Central Phoenix
- SE: Downtown Queen Creek to Central Phoenix
- Tempe: W Chandler to Central Phoenix
- Chandler: Sun Lakes to Central Phoenix

Multi–Corridor Alternatives

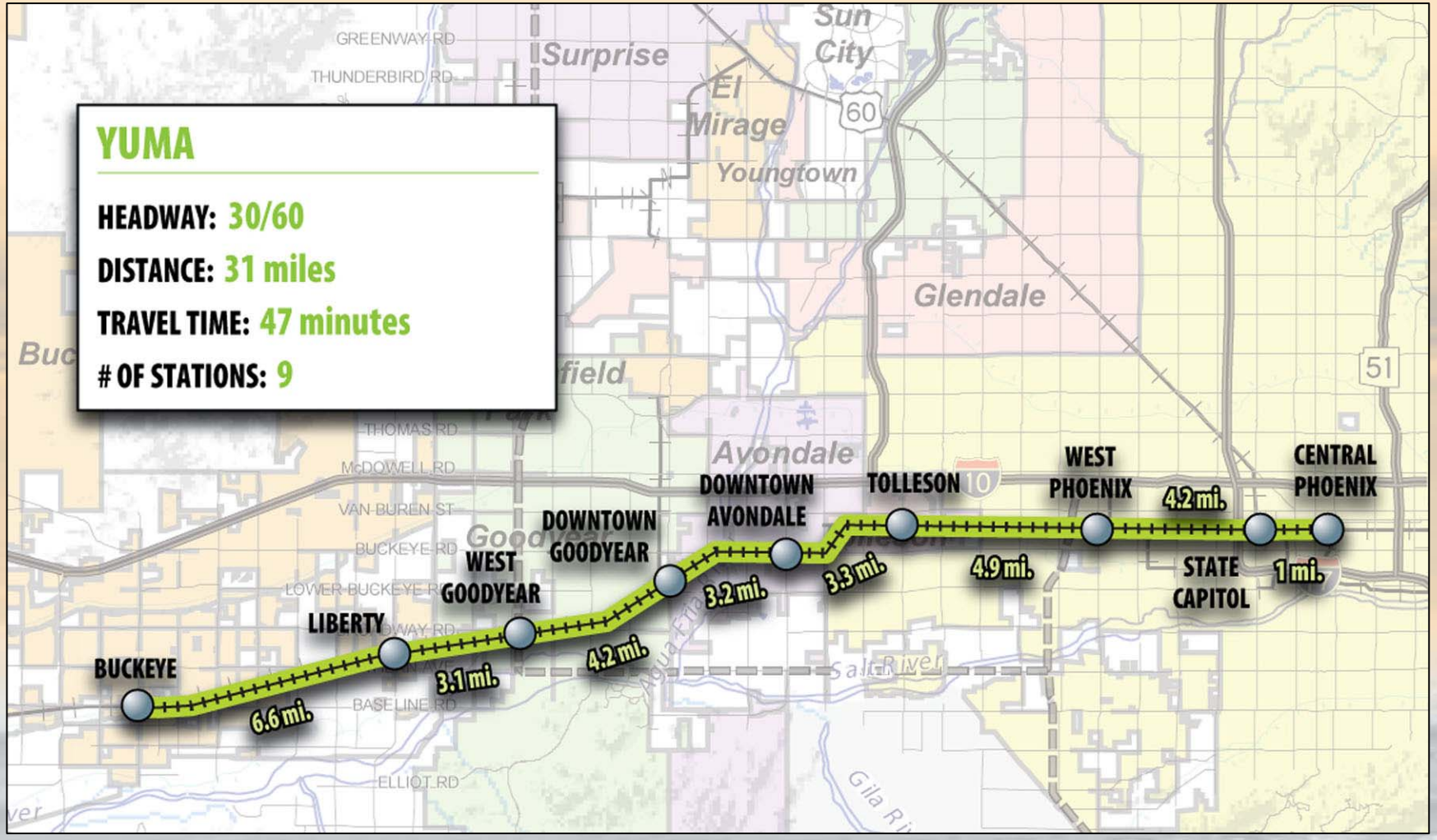
- Grand – Yuma – SE
- Grand – Yuma – SE – Chandler
- Grand – Yuma – SE – Tempe

  - Model includes 2030 RPTA/RTP improvements
  - Headways are 30 min peak/60 min off-peak
  - **See handout for station to station travel times*

Inputs and Assumptions
GRAND

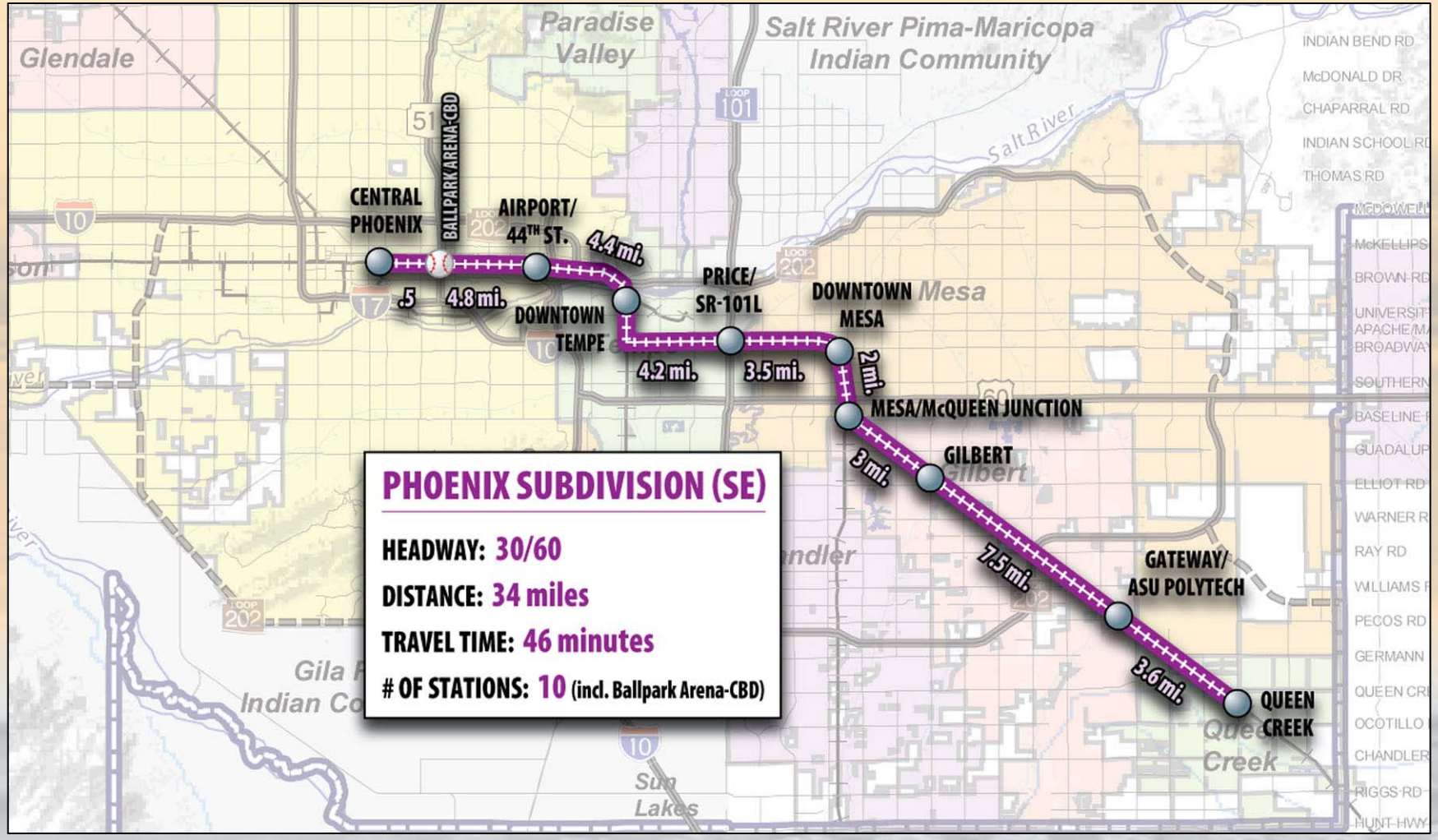


Inputs and Assumptions
YUMA



Inputs and Assumptions

Phoenix Subdivision (SE)



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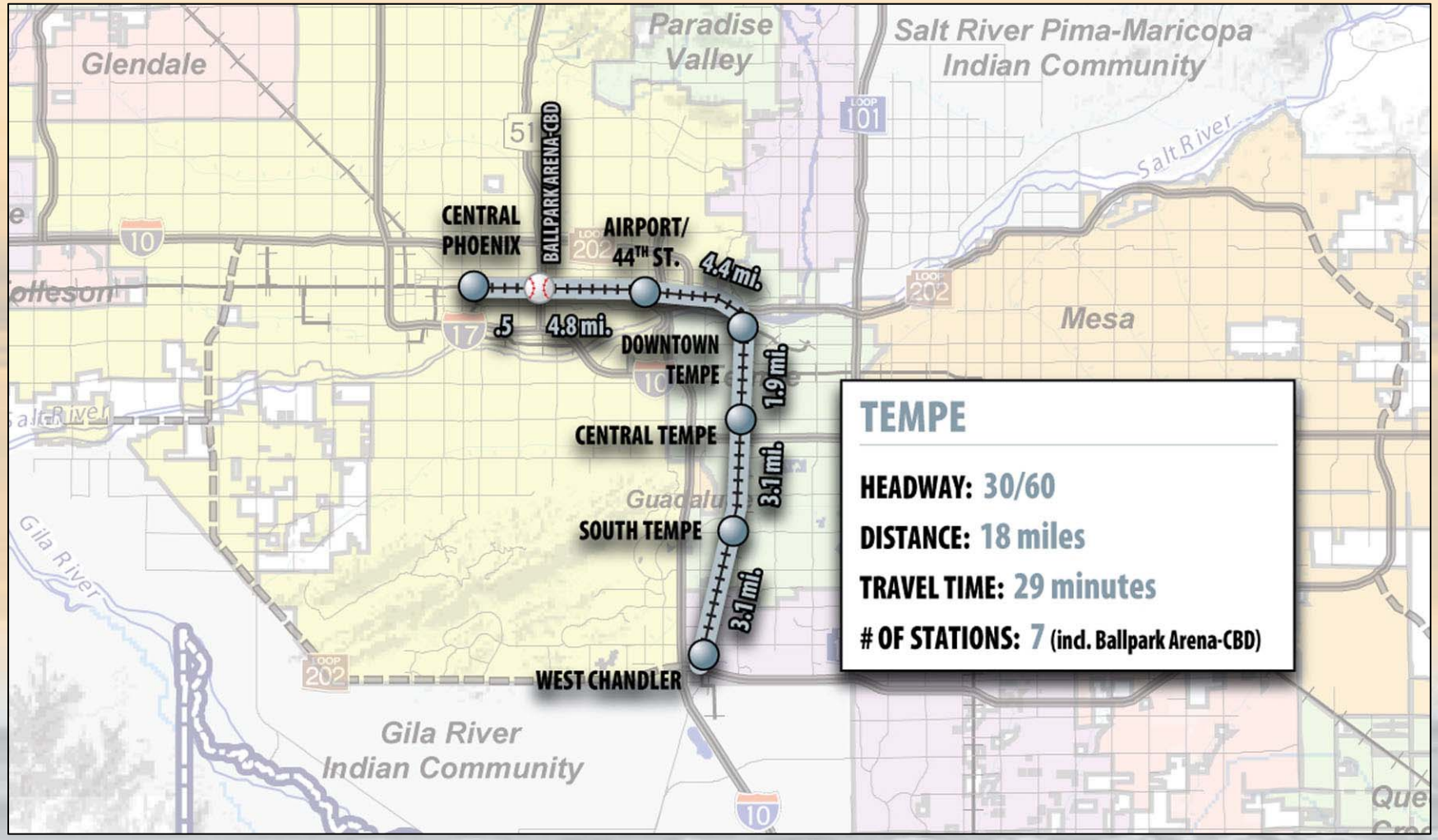
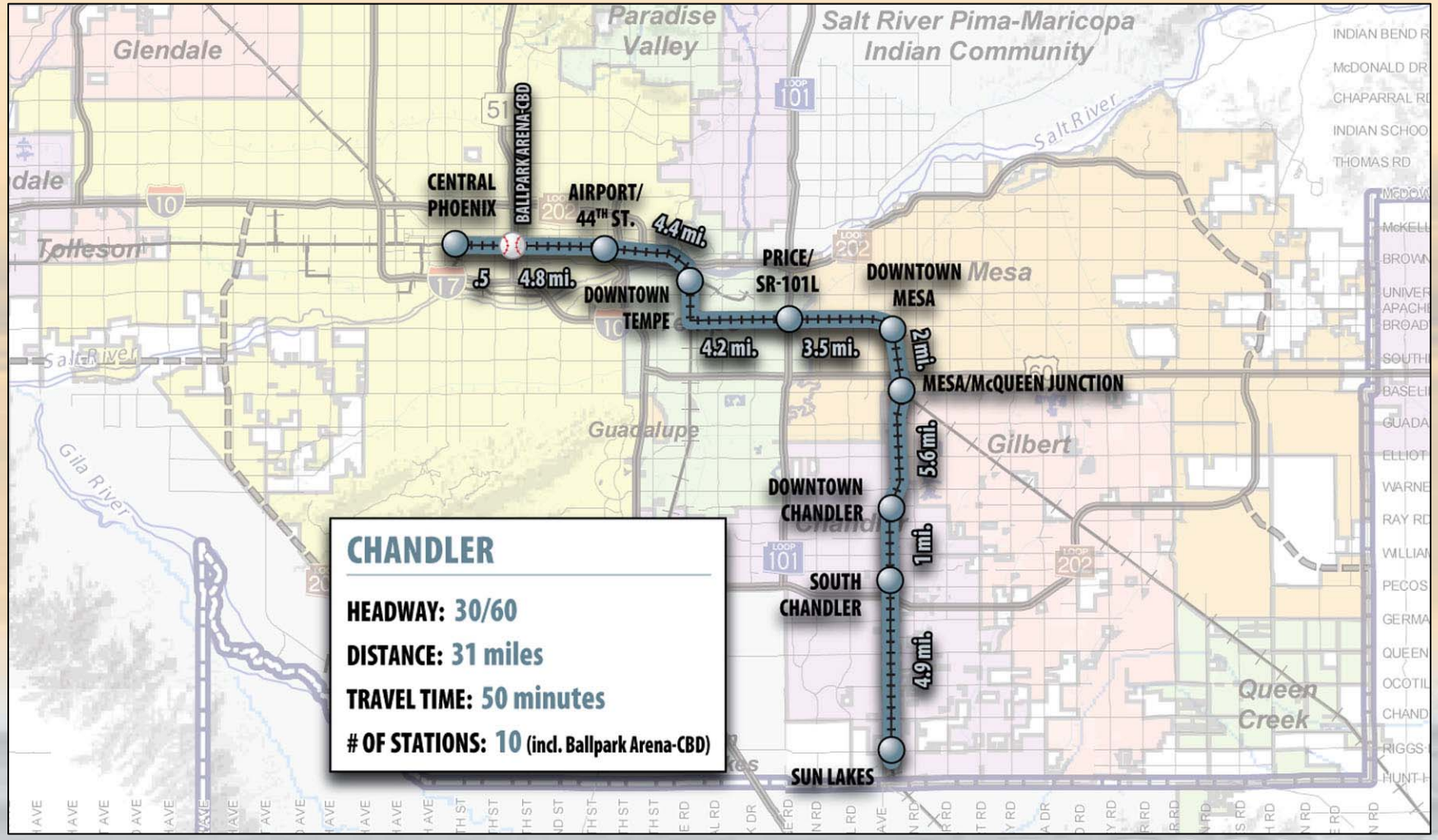
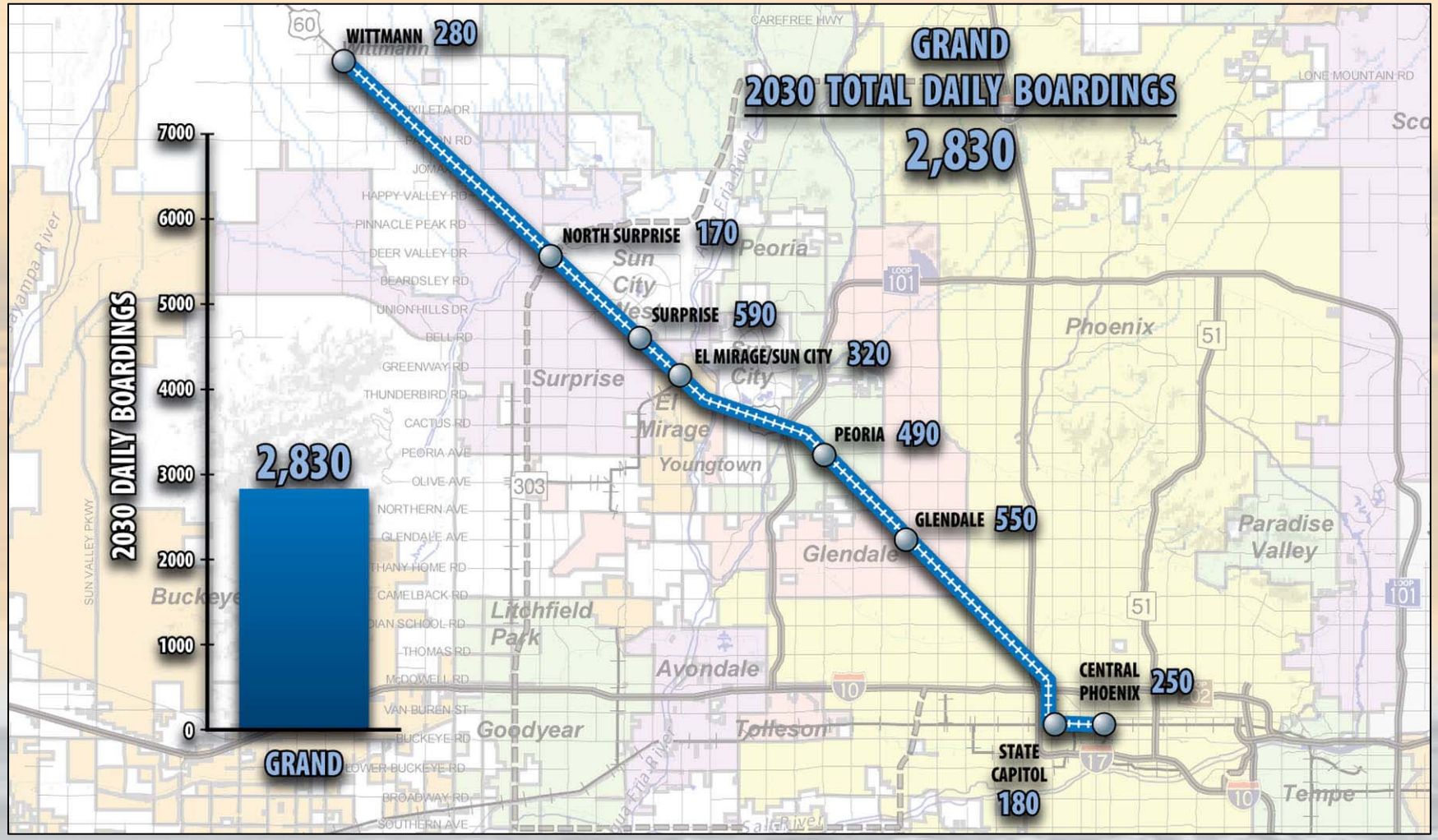
TEMPE



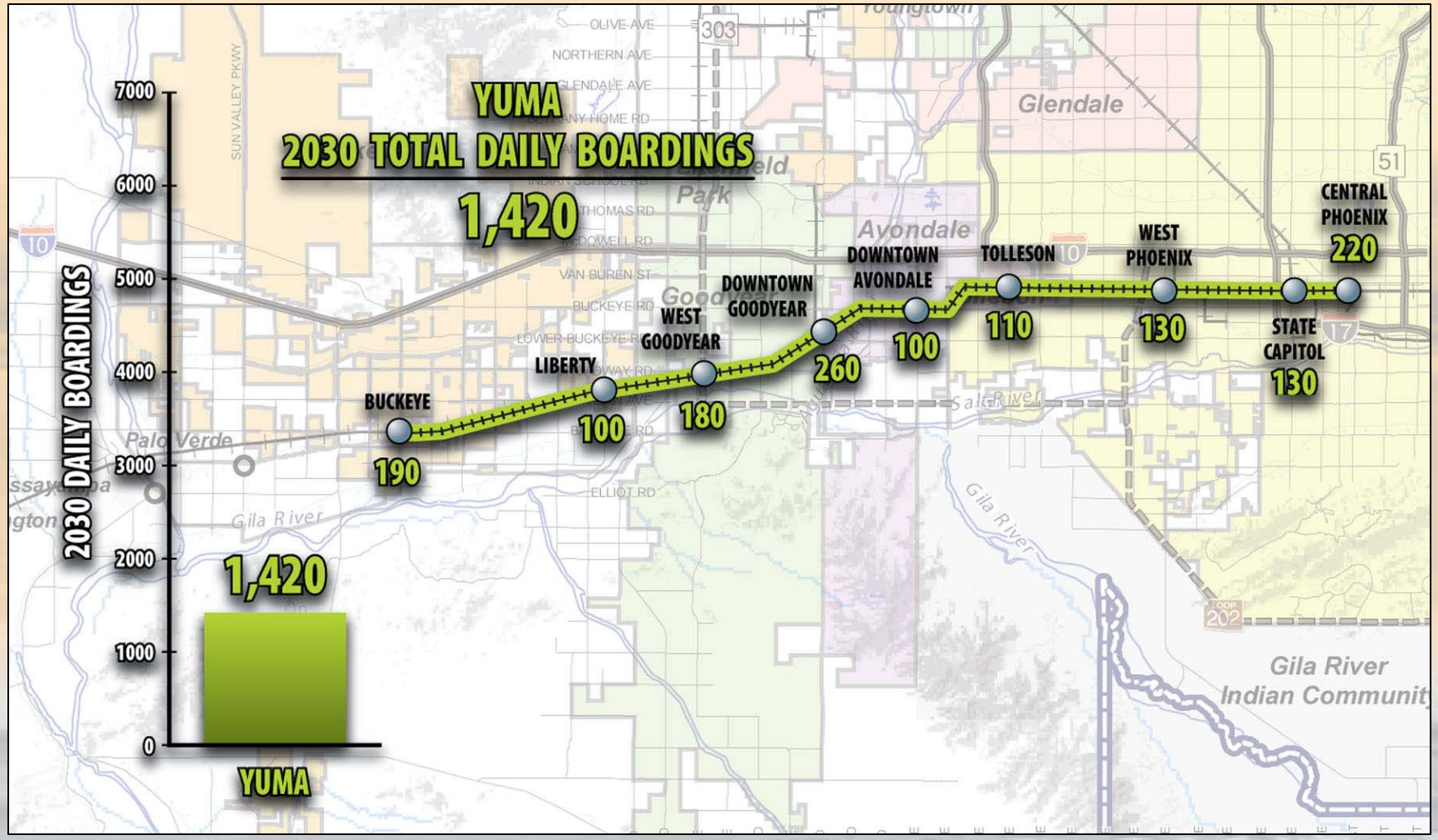
Inputs and Assumptions
CHANDLER



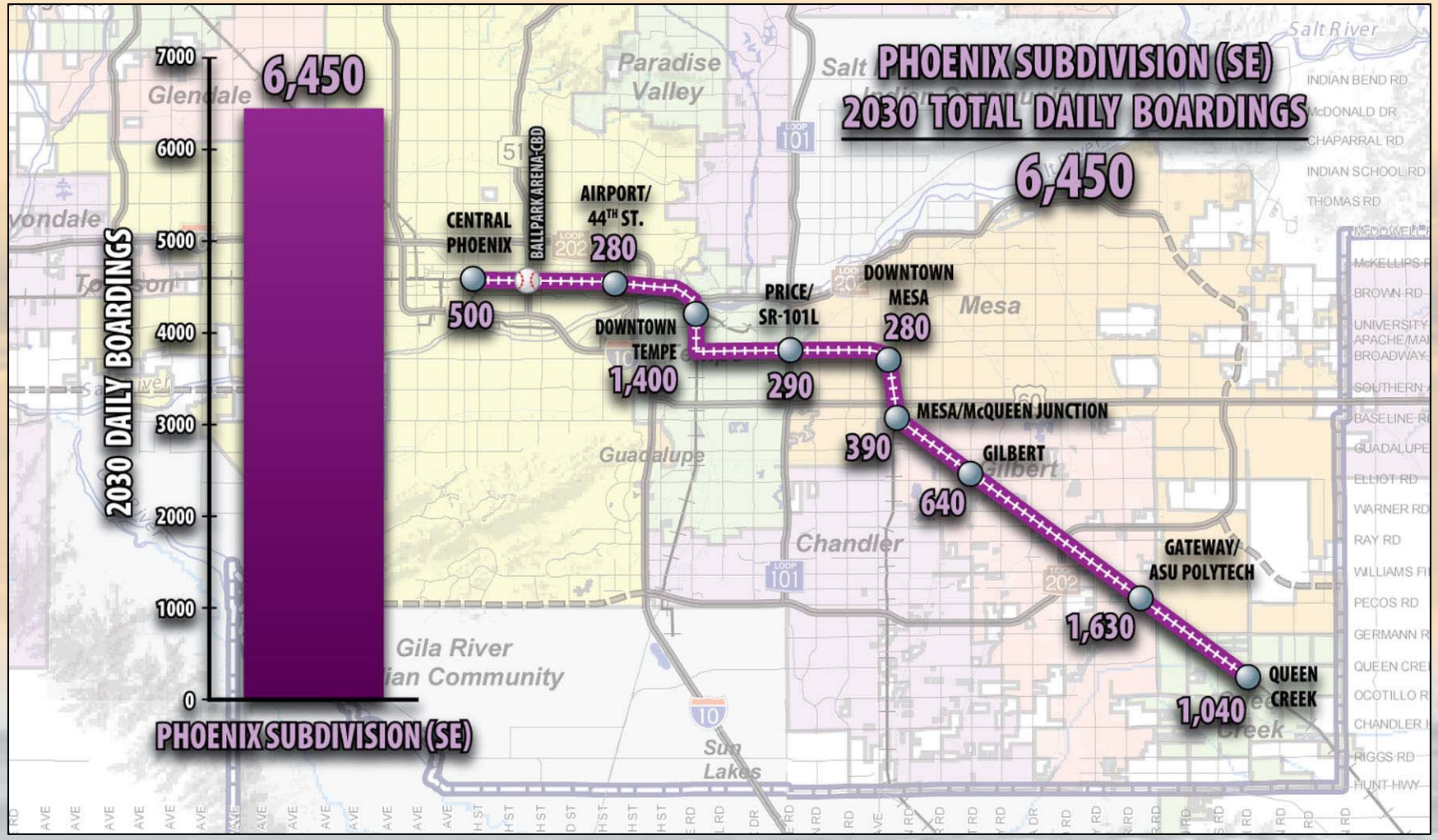
2030 Daily CRT Ridership and Station Boardings GRAND



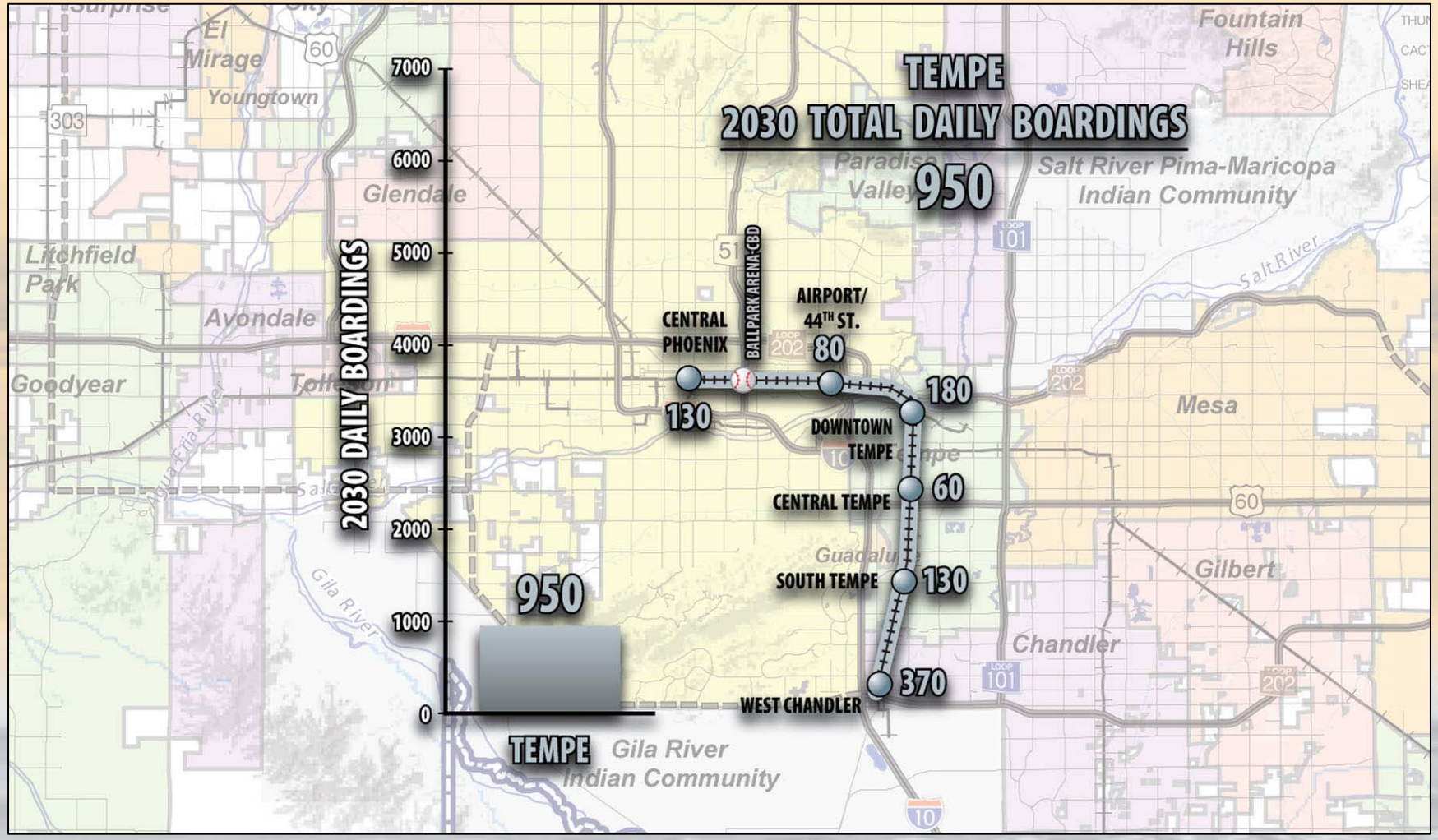
2030 Daily CRT Ridership and Station Boardings
YUMA



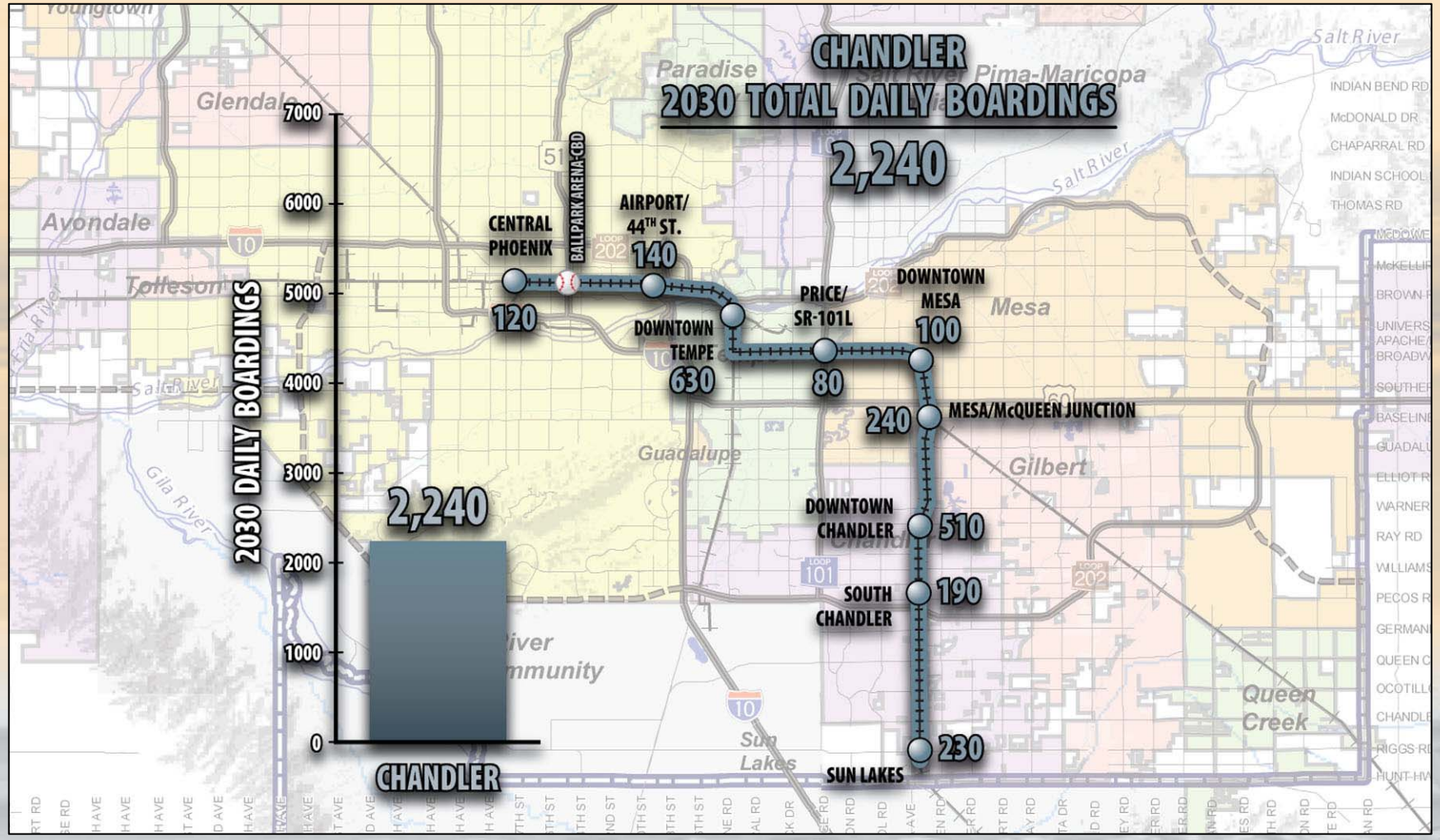
2030 Daily CRT Ridership and Station Boardings SOUTHEAST



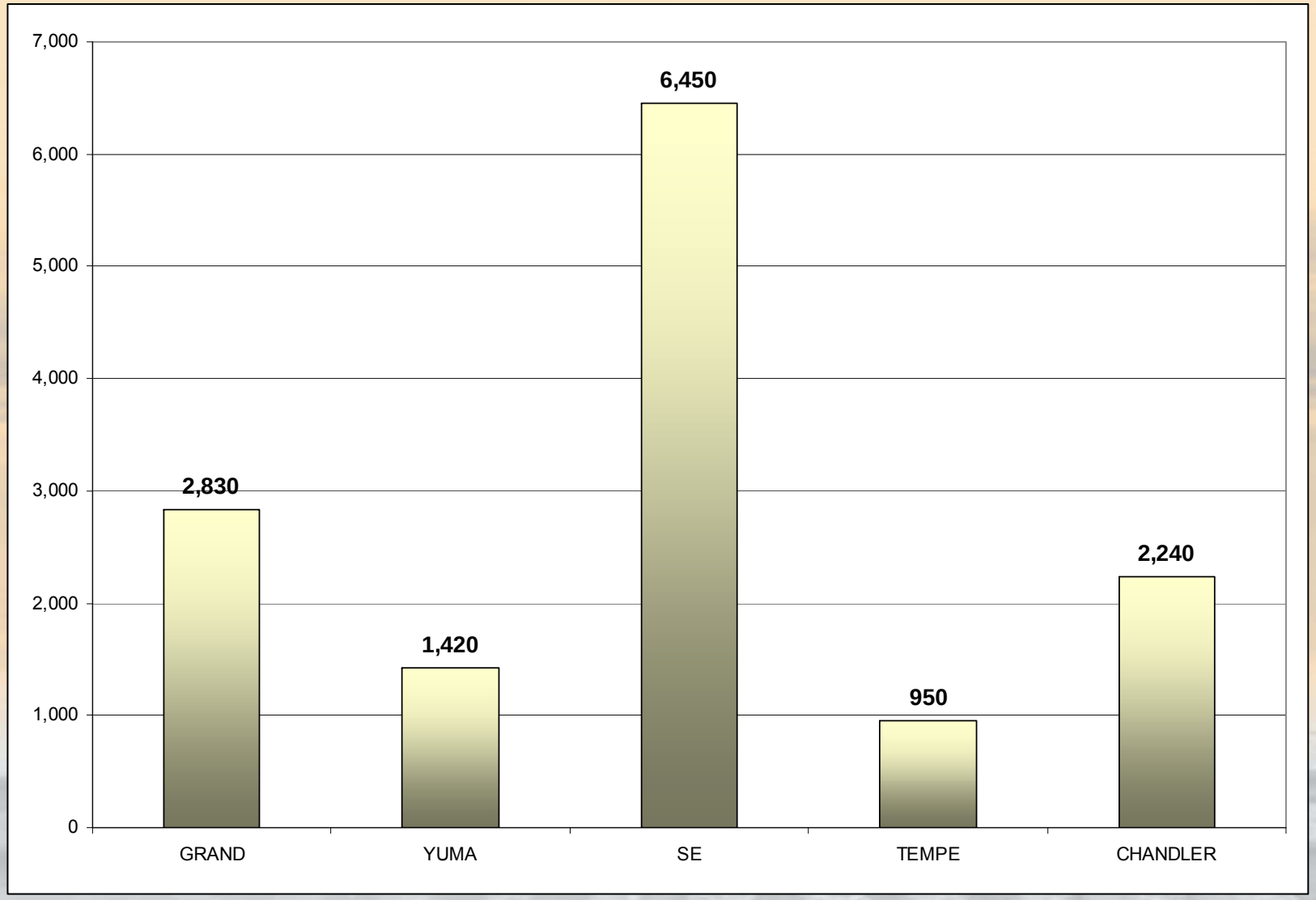
2030 Daily CRT Ridership and Station Boardings
TEMPE



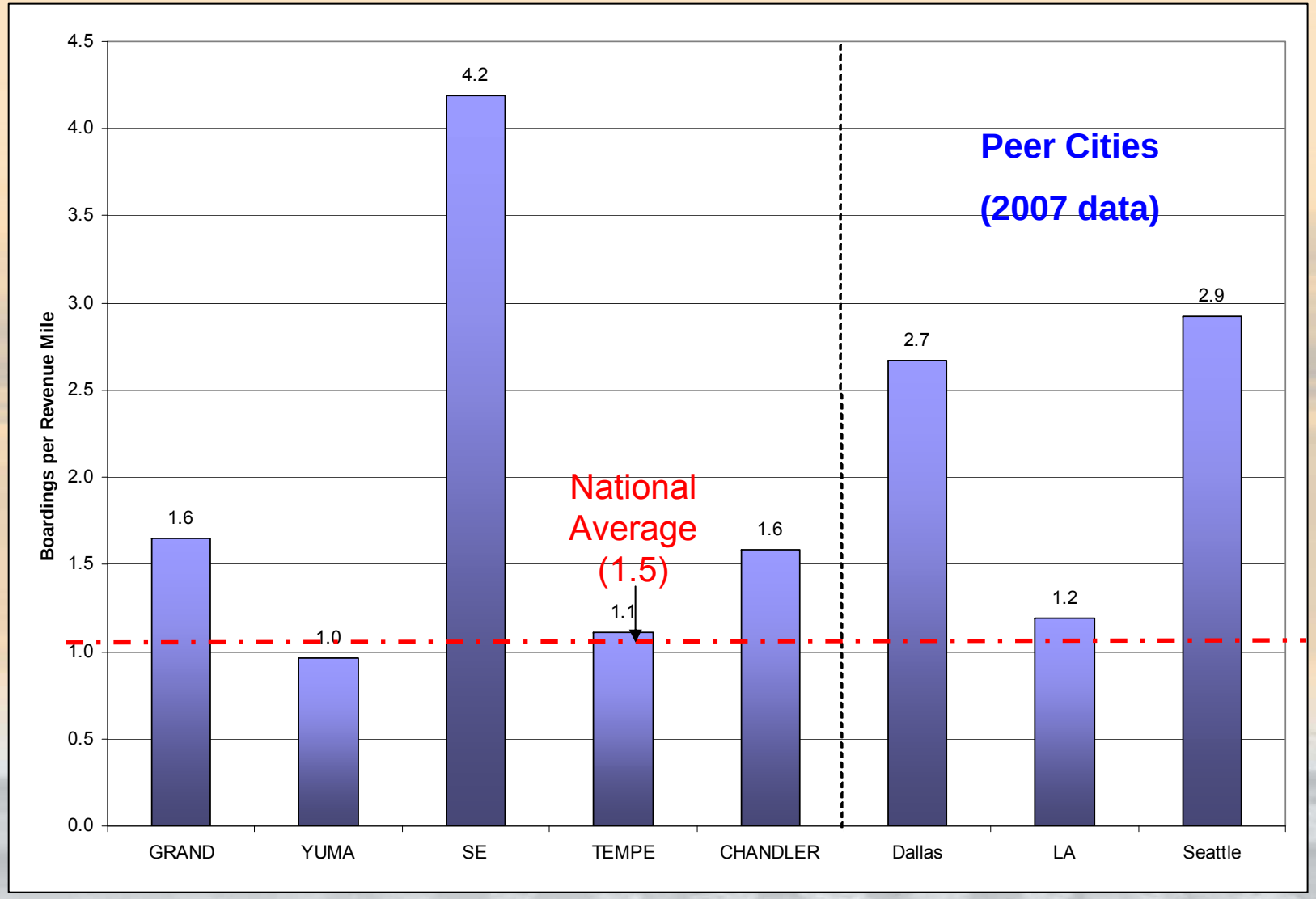
2030 Daily CRT Ridership and Station Boardings
CHANDLER



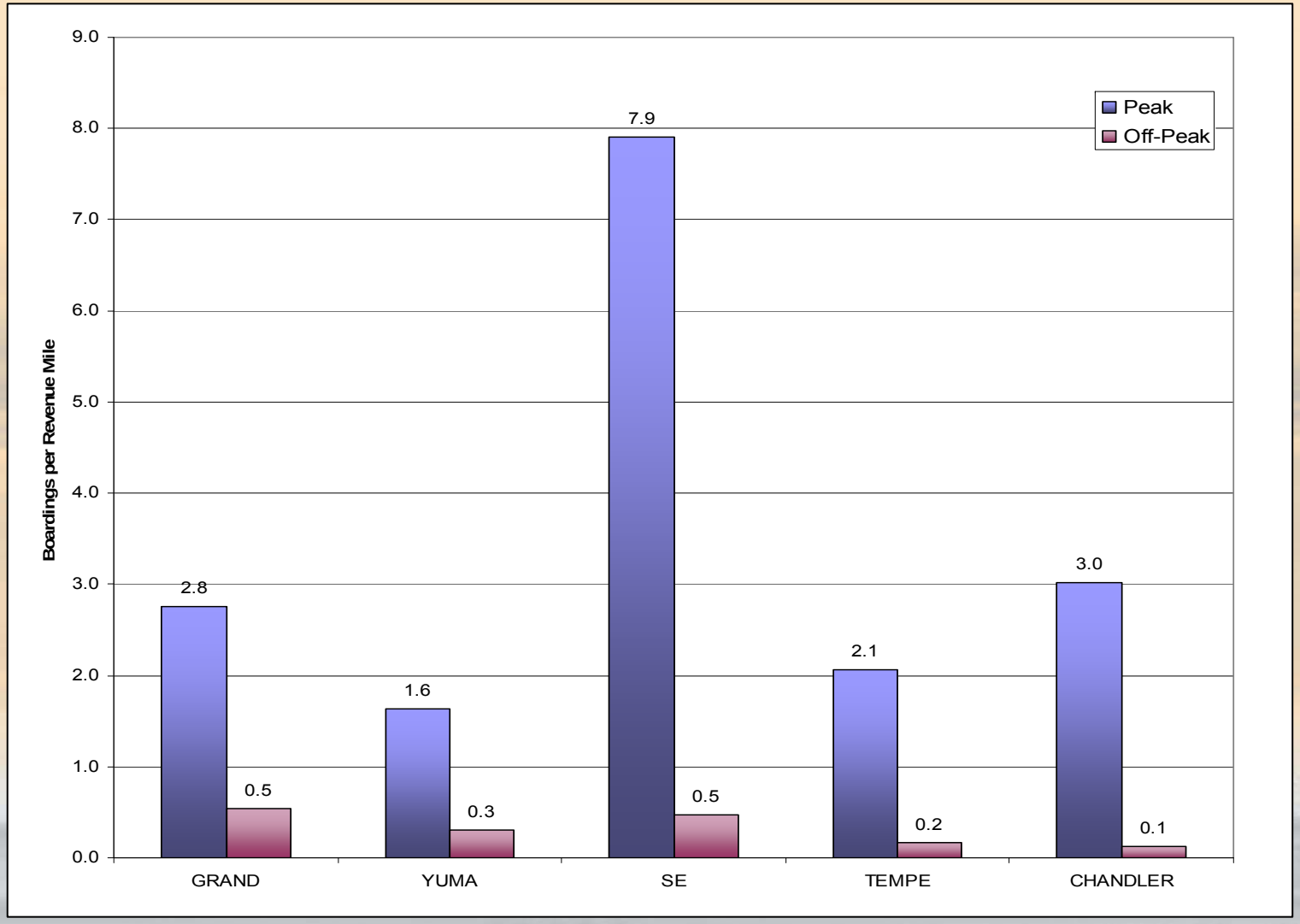
2030 Daily CRT Ridership



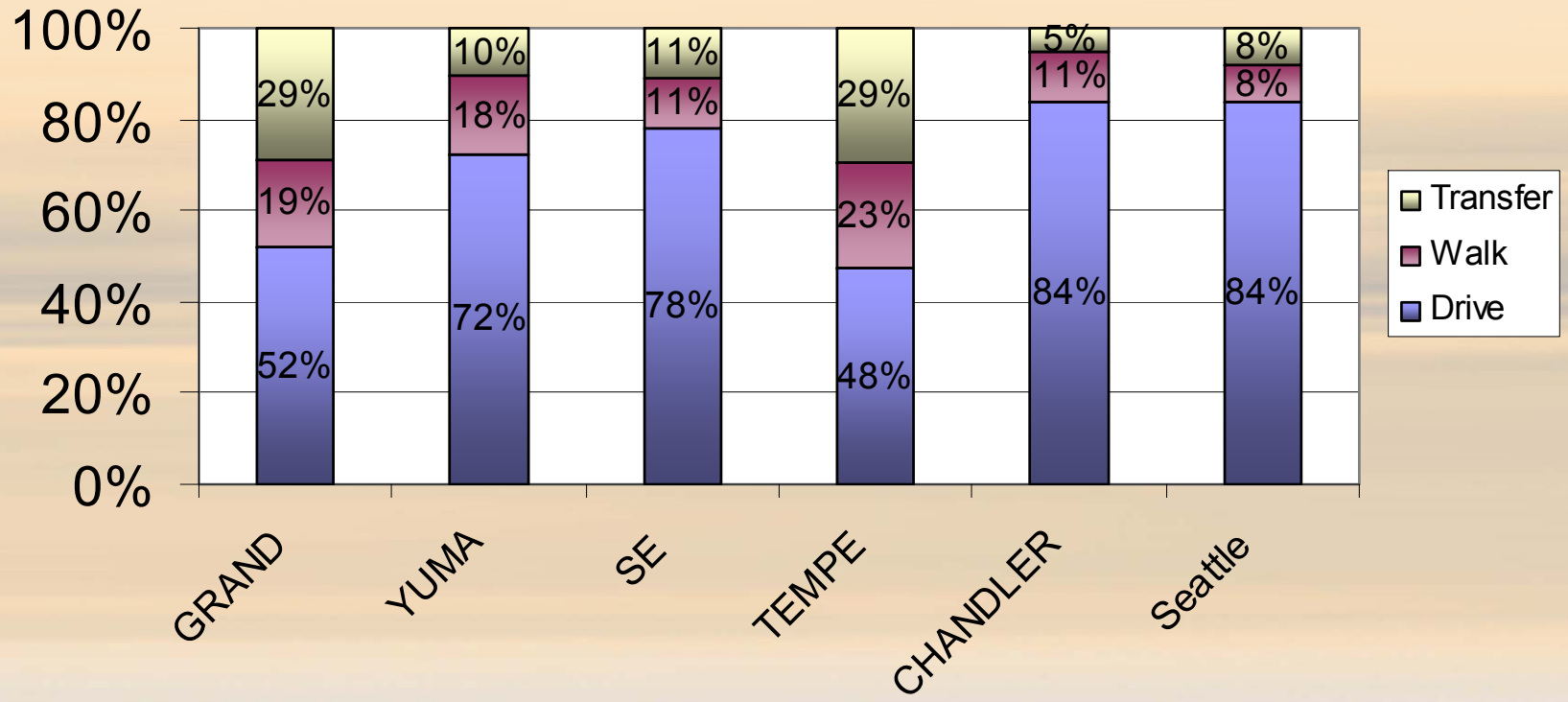
2030 Daily CRT Boardings per Revenue Mile



Peak/Off-peak Boardings per Revenue Mile



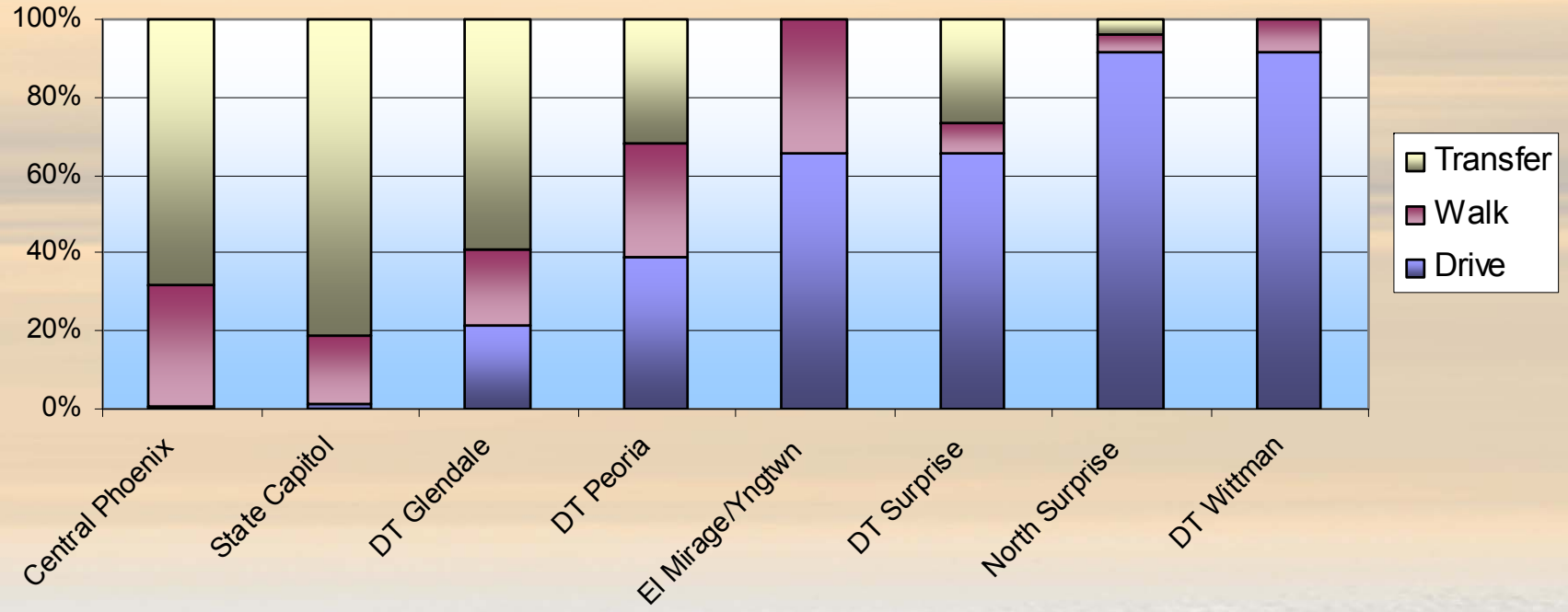
2030 CRT Peak Period Mode of Access



Note: Percentages calculated without Central Phoenix Station

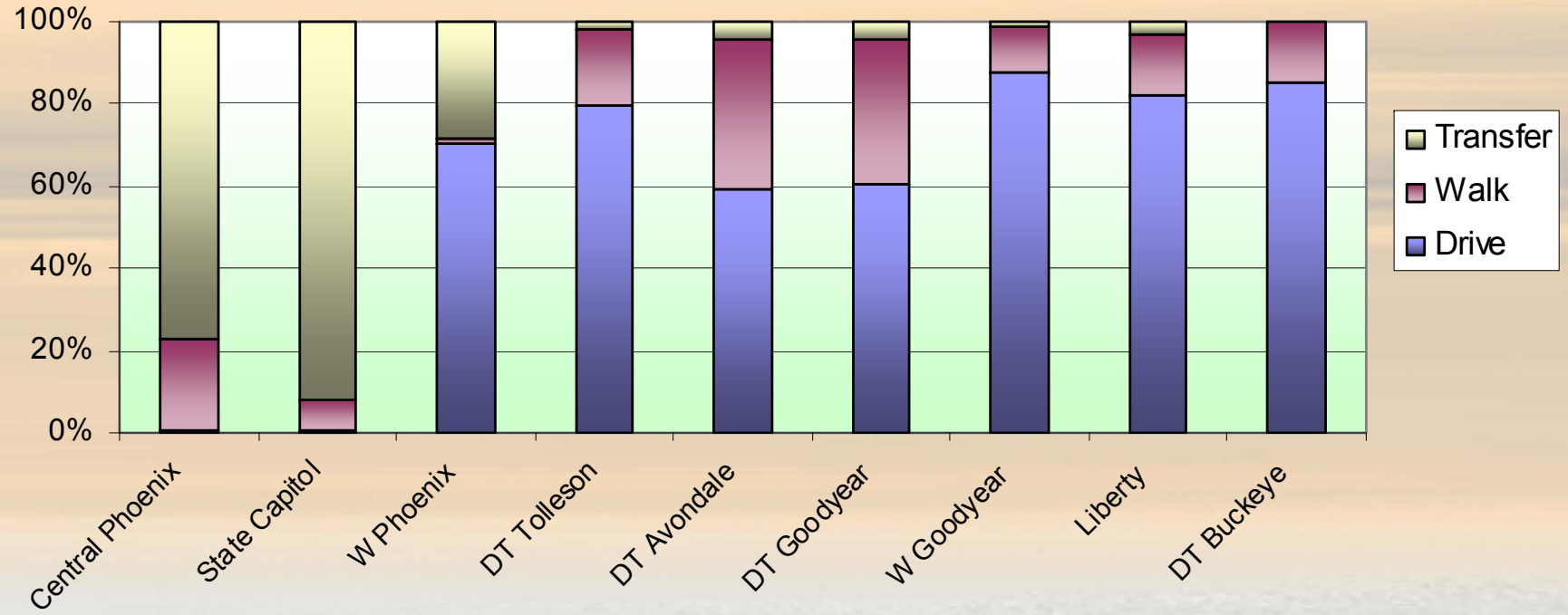
2030 CRT Peak Period Mode of Access by Station

GRAND



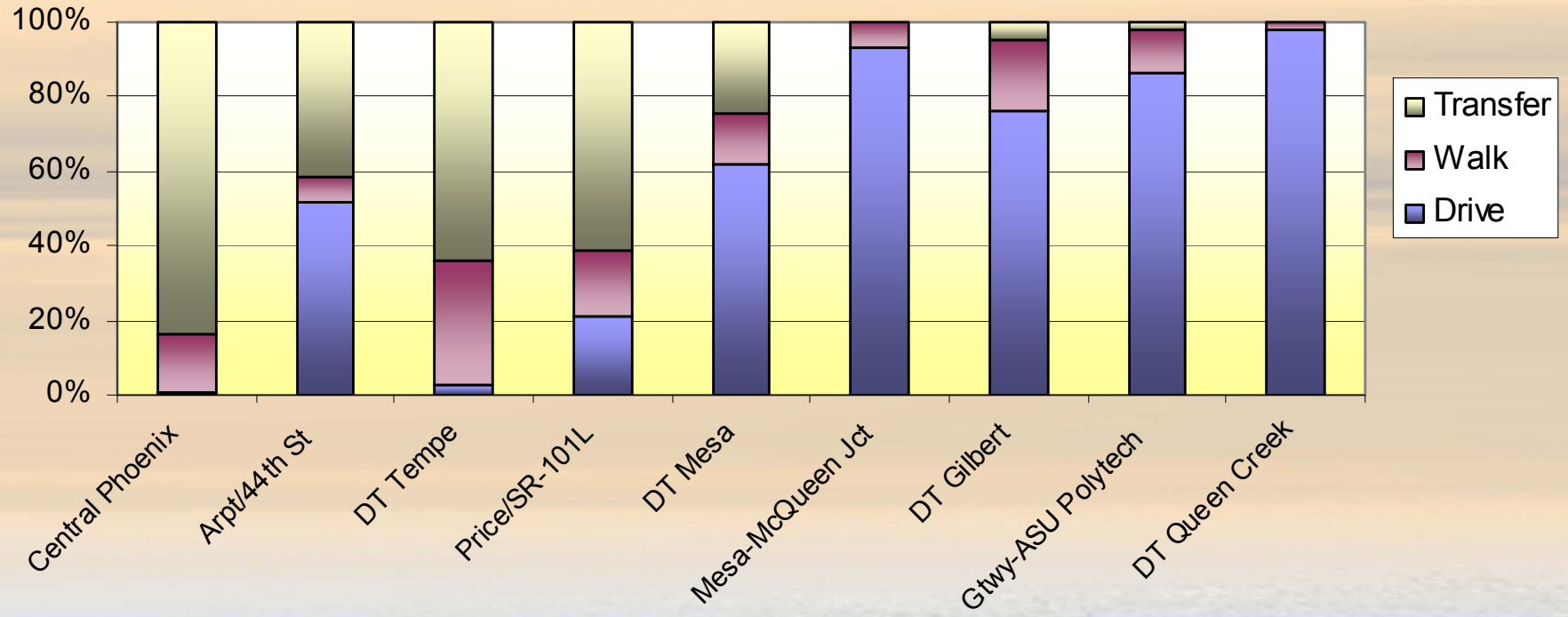
2030 CRT Peak Period Mode of Access by Station

YUMA



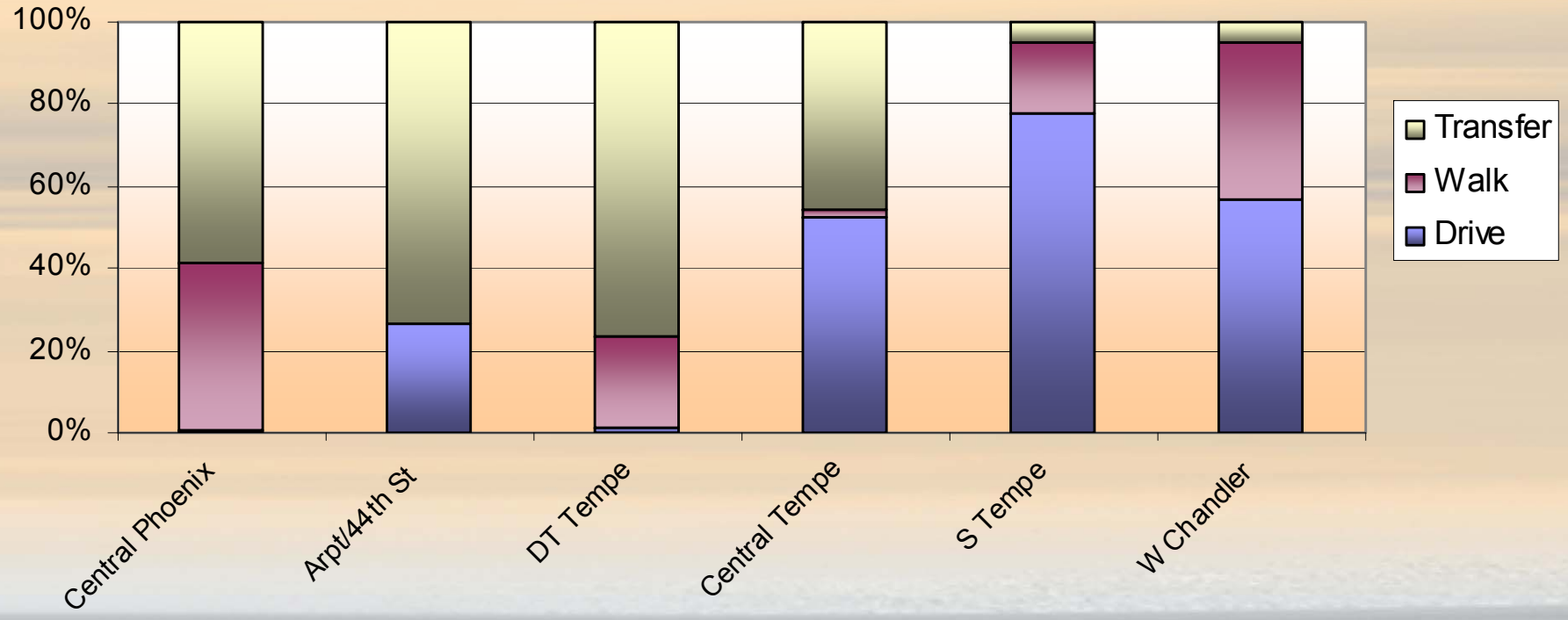
2030 CRT Peak Period Mode of Access by Station

SOUTHEAST



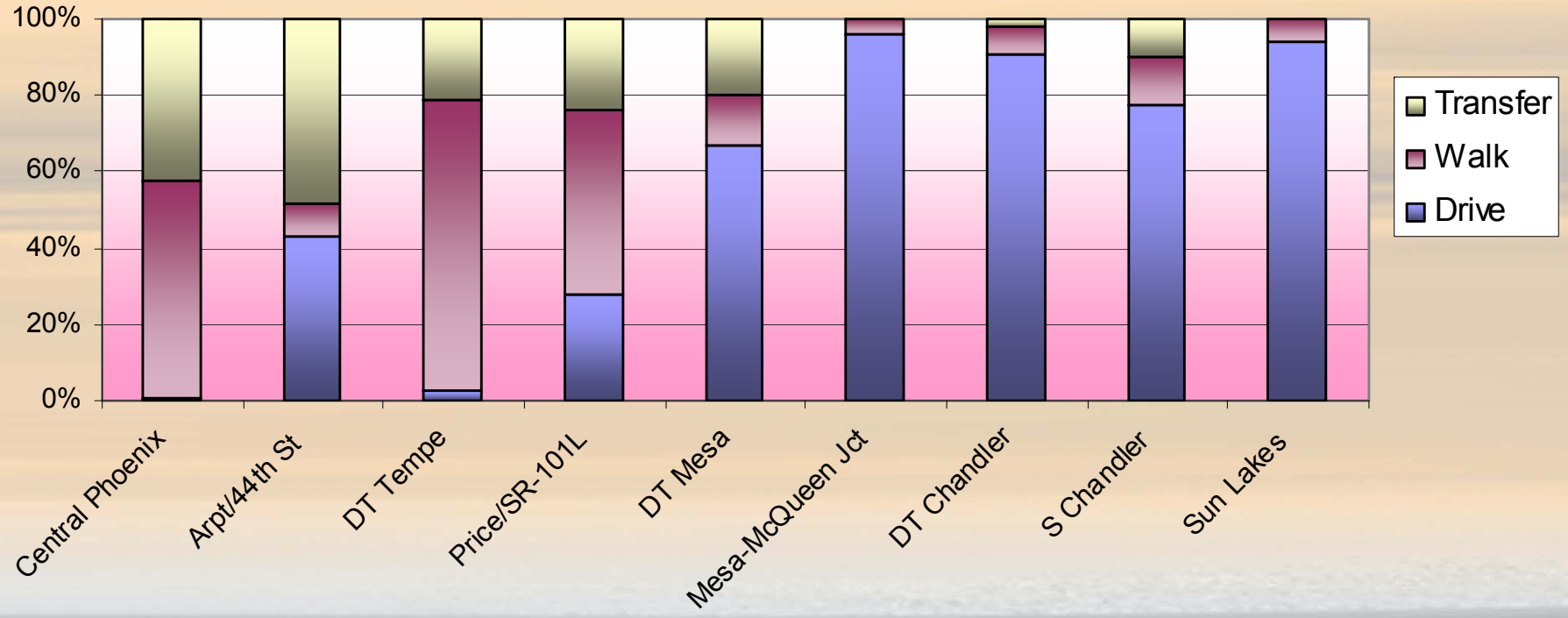
2030 CRT Peak Period Mode of Access by Station

TEMPE



2030 CRT Peak Period Mode of Access by Station

CHANDLER



Base Model Run Observations

- SE, Grand, 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.
- In multi-corridor scenarios, all corridors – except Chandler – increase in ridership. SE corridor is likely drawing ridership from Chandler.
- Grand and Tempe corridors have strong bus and LRT connections.

Base Model Run Observations (cont.)

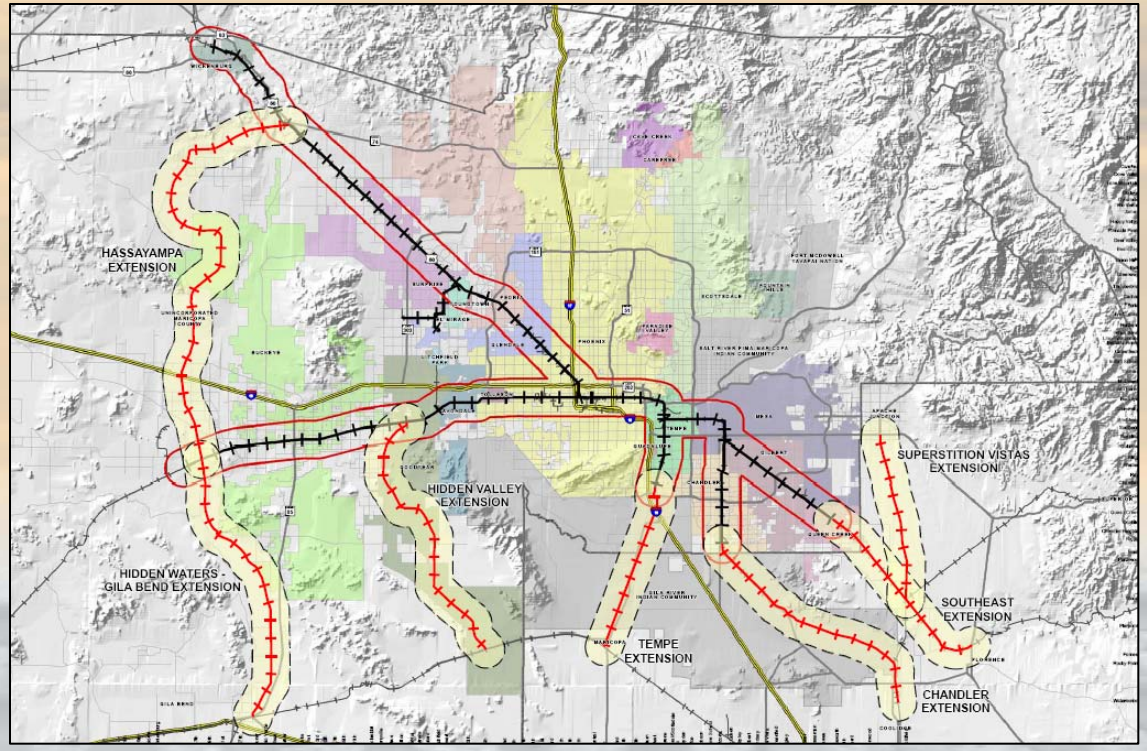
- Grand Corridor:
  - Overall good ridership
  - Strong ridership throughout the middle of the corridor (Glendale to Downtown Surprise)
  - Highest boardings at Downtown Glendale and Downtown Surprise
- Yuma Corridor:
  - Lower overall ridership than other corridors
  - Highest boardings at Central Phoenix and Downtown Goodyear stations
- East Valley Corridors:
  - SE is strongest individual corridor in the system.
  - SE: Highest boardings at Downtown Tempe and Gateway-ASU Polytech
  - Tempe: Highest boardings at Downtown Tempe and West Chandler
  - Chandler: Highest boardings at Downtown Tempe and Downtown Chandler

2030 Systemwide Rail: CRT and LRT

- RTP includes approximately 57 miles of high capacity transit.
- 2030 systemwide daily boardings on planned 57-mile high capacity transit system are approximately 129,000.
- LRT boardings remain stable (within 1% of RTP) across all CRT alternatives.
- Model shows CRT to be adding riders rather than "stealing" riders from LRT.

Next Steps in Ridership Forecasting Process

- Base Model Scenario Refinements
- Interlined Model Scenarios and Sensitivity Test Model Runs
- Potential Future Extensions
- Systems Analysis and Corridor Prioritization



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

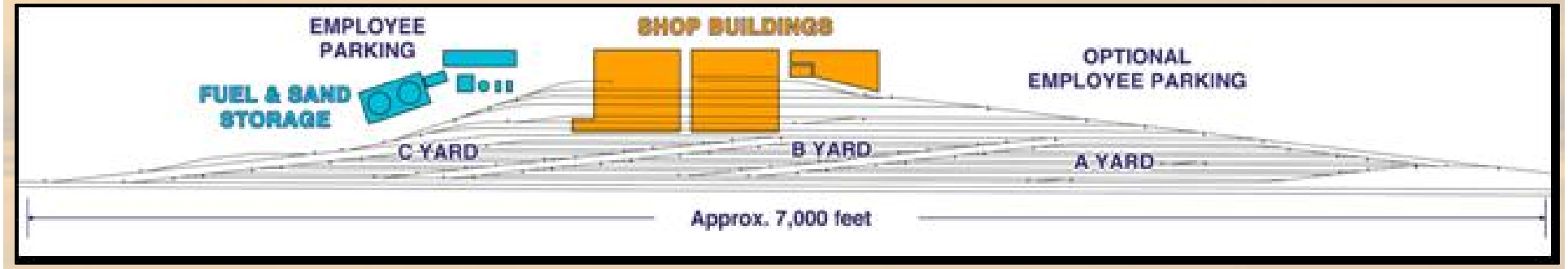
- LHC Vehicles
  - FRA-compliant - meet federal requirements for crashworthiness and can share tracks with freight trains and operate concurrently with freight traffic.
  - Used extensively in commuter rail systems across the US.
  - Off-the-shelf proven technology.

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.



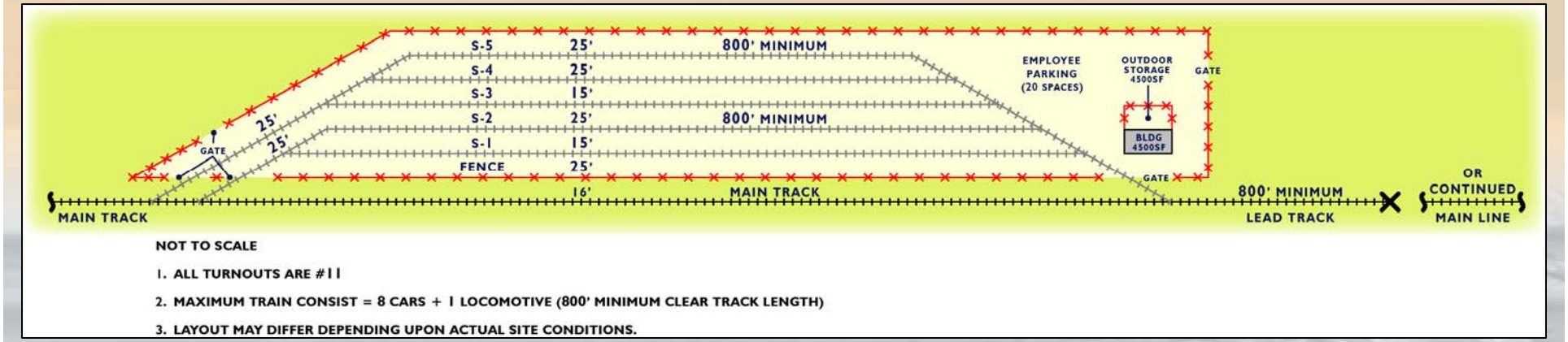
Typical CRMF Site Layout

Dallas-Fort Worth TRE Equipment Maintenance Facility

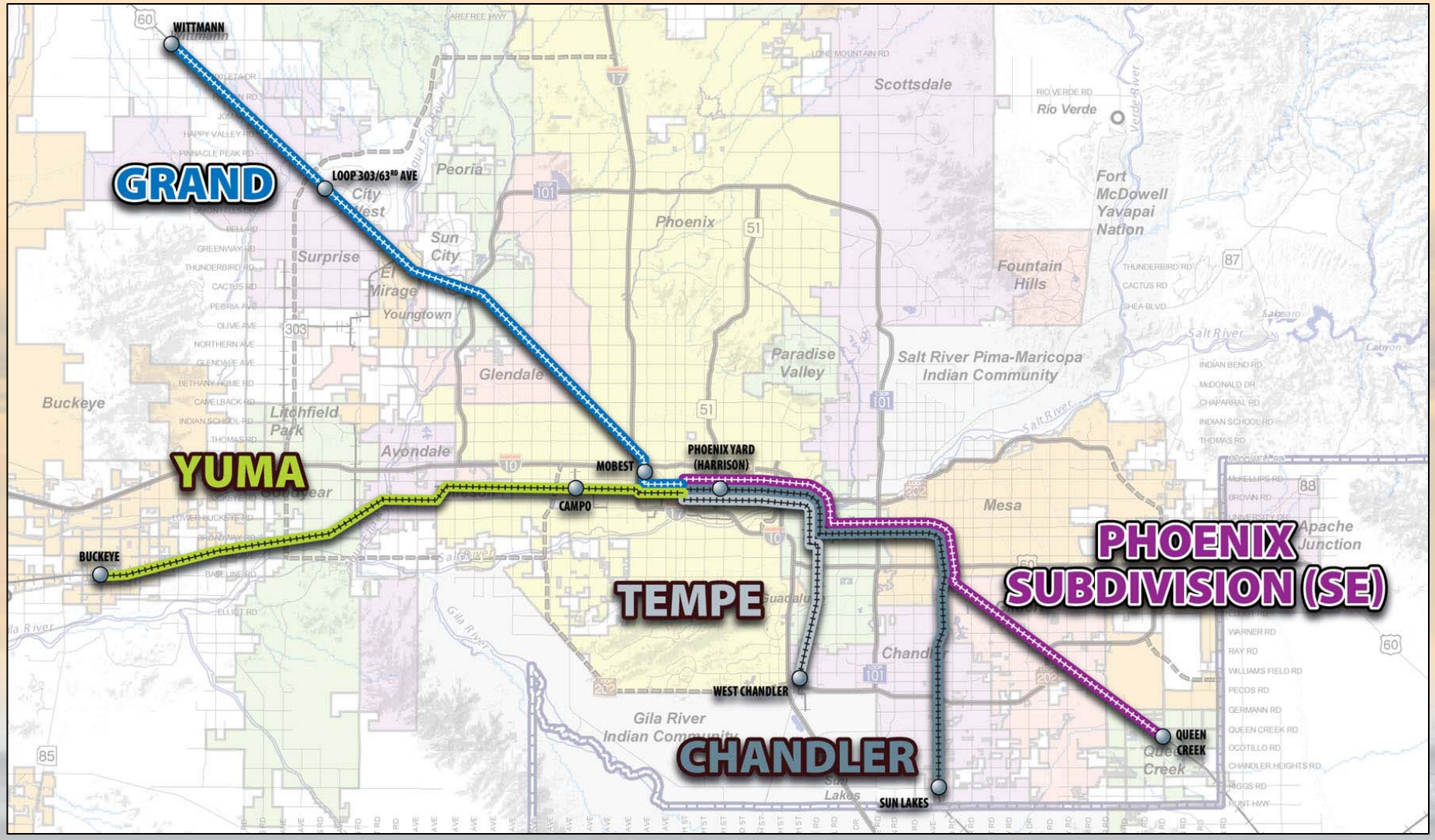
Layover/Tail Track Facilities

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

- Complete final round of model runs
- Complete preliminary capital and operating cost estimates
- Conduct implementation analysis
- Screen and prioritize alternative system corridors

Questions?

Next SRT meeting: November 16, 2009, 1:30 pm