2004 Infrastructure Report Card

Transportation

- Purpose
  - Assess character and integrity of our critical transportation infrastructure
  - To take a position – and advocate for improving our infrastructure

- Other examples: ASCE National, GA, CO

The Committee

- Chet Teaford, P.E. (*EEC*) – Chairman
- Mark Pilwallis, P.E. (*Gannett-Fleming*)
- Jennifer Bohac, P.E. (*HDR / City of Scottsdale*)
- Lance McIntosh, P.E. (*Z&H*)
- Terry Nash, P.E. (*HDR*)
- Tricia Brown, P.E. (*EEC / AMEC*)

Methodology

- Base on “data” as much as possible
- Compare to national and similar size metro areas
- “C” = average
- Discuss with Agencies
  - FHWA, ADOT, RPTA, COP, MAG, COT, PC

Sectors Evaluated

Roads

Bridges

Transit

Aviation

Pavement Condition

Phoenix / Maricopa County	Tucson / Pima County	Rest of State	Arizona
B+	**B-**	**B+**	**B+**
•**AZ in top 20% for pavement smoothness - urban areas** •**Phoenix area benefiting from new / overlaid f/ways**	•AZ in top 20% for pavement smoothness for urban areas •**Tucson suffering some due to lack of funding for any road improvements**	•**AZ in top 10% for pavement smoothness for rural areas** •ADOT has well managed pavement preservation program	•AZ in top 10% for pavement smoothness for rural areas and top 20% for urban areas •ADOT has well managed pavement preservation program
TRENDS			
⟷	↓	↓	↓

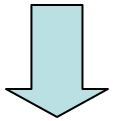
Needs vs. Capacity (Congestion)

Phoenix / Maricopa County

C+

- **Phx ~ average for congestion for cities of similar size (**rush hrs/day, % congested travel)
- AZ is #13 for Traffic / lane (Urban)
- Even w/ Prop 400, congestion will get worse

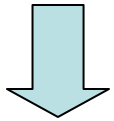
TRENDS

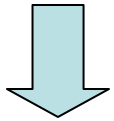


Needs vs. Capacity (Congestion)

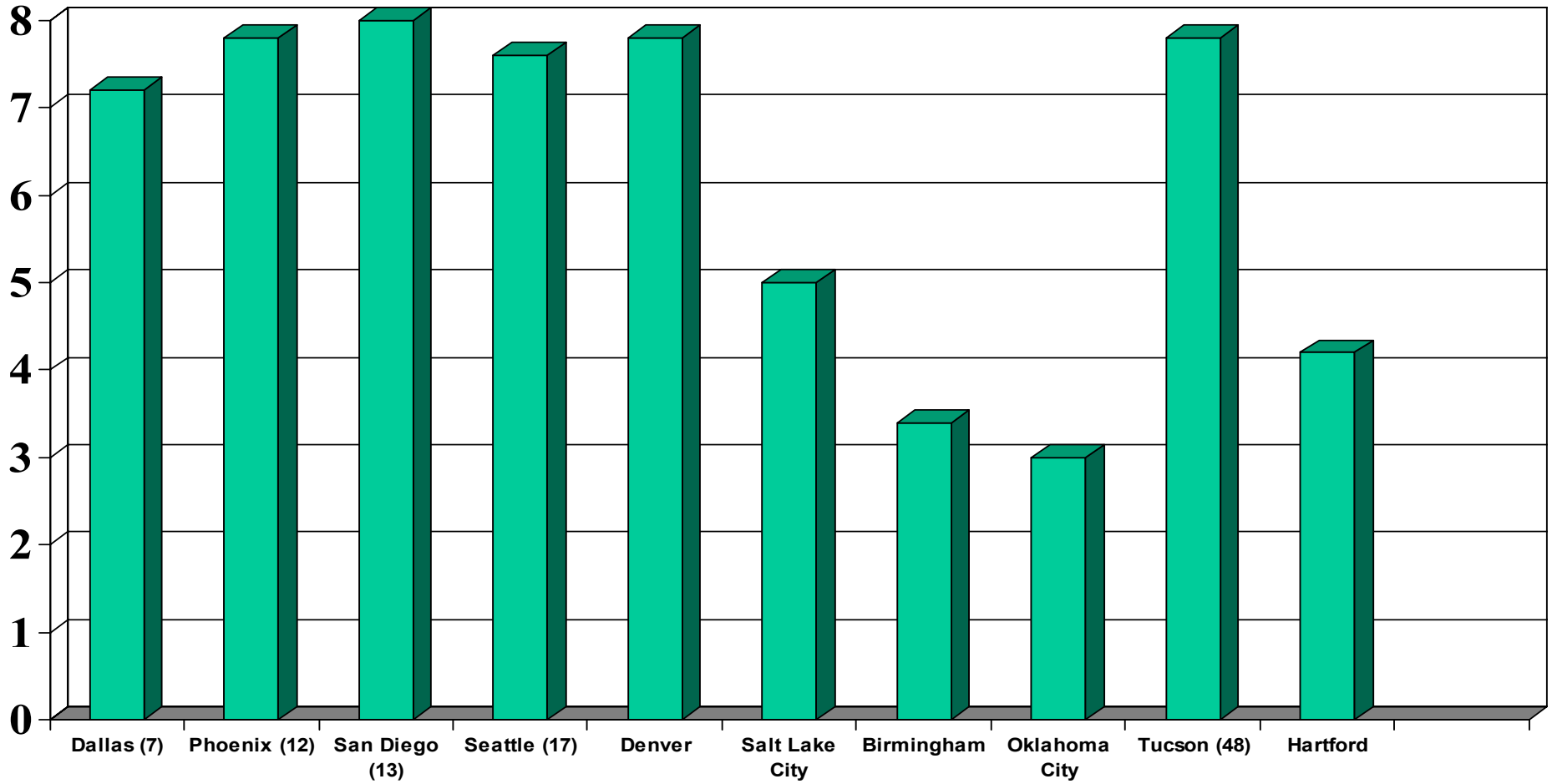
Phoenix / Maricopa County	Tucson / Pima County
C+	**D**
•**Phx about average for congestion for cities of similar size** (rush hrs/day, % congested travel) •AZ ranks #13 for Traffic / lane on Urban Arterials •Even w/ Prop 400, congestion will get worse	•Tucson has **significantly worse congestion** than most cities of similar size •**Rush hours / day – is similar to that of Phoenix, Dallas and Seattle**

TRENDS





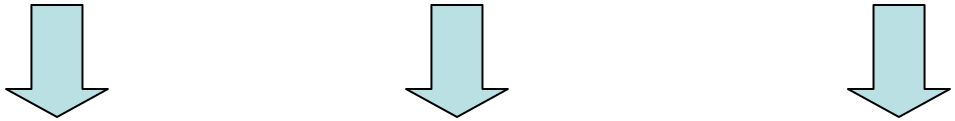
Rush Hours / Day



Needs vs. Capacity (Congestion)

Phoenix / Maricopa County	Tucson / Pima County	Rest of State
C+	**D**	**C-**
•**Phx about average for congestion for cities of similar size-**in rush hrs/day, % congested travel, etc. •AZ ranks #13 for Traffic / lane on Urban Arterials	•Tucson has significantly worse congestion than most cities of similar size •**Rush hours / day – is similar to that of Phoenix, Dallas and Seattle**	•**AZ ranks #24** amongst states for Av Daily Traffic / lane on Rural Arterials •**Congestion in emerging metro areas (Prescott, Yuma, Flagstaff, etc) is a concern**

TRENDS



Needs vs. Capacity (Congestion)

Phoenix / Maricopa County	Tucson / Pima County	Rest of State	Arizona
C	**D**	**C-**	**C**
•**Phx about average for congestion for cities of similar size-**in rush hrs/day, % congested travel, etc. •AZ ranks #13 for Traffic / lane on Urban Arterials	•Tucson has significantly worse congestion than most cities of similar size •**Rush hours / day – is similar to that of Phoenix, Dallas and Seattle**	•AZ ranks #24 amongst states for Av Daily Traffic / lane on Rural Arterials •**Congestion in emerging metro areas (Prescott, Yuma, Flagstaff, etc) is a concern**	•AZ ranks #24 amongst states for Av Daily Traffic / lane on Rural Arterials and #12 on all arterials •**AZ ranks #13 for Traffic / lane on Urban Arterials**
TRENDS			
↓	↓	↓	↓

Safety

Phoenix / Maricopa County

D

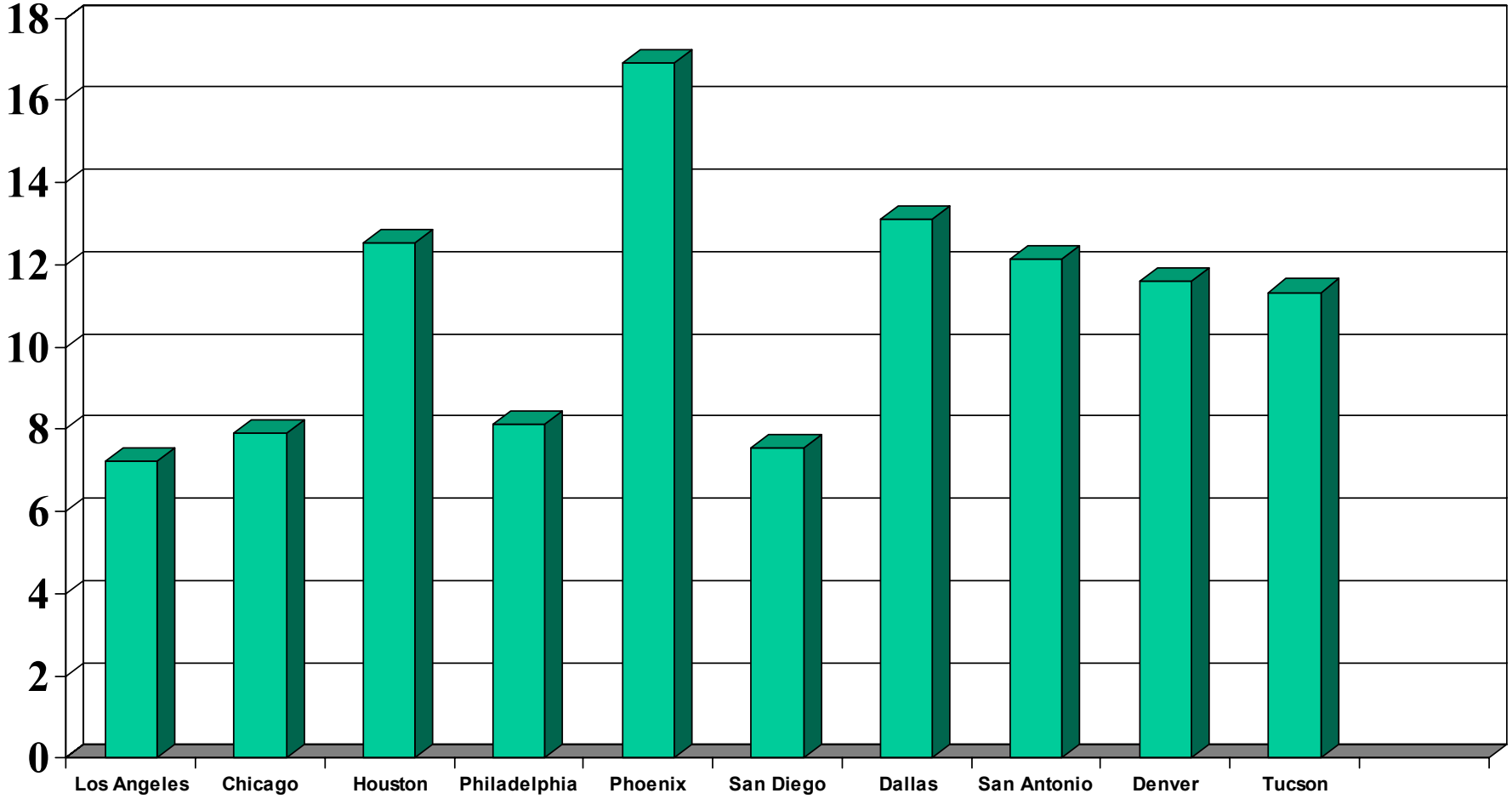
- **Phx - one of highest auto and pedestrian fatality rates in US**
- AZ ranks poorly in intersection fatality rates
- State Farm Ins. (2001) says Phx has **2 of the 10 most dangerous intersections** in US

TRENDS

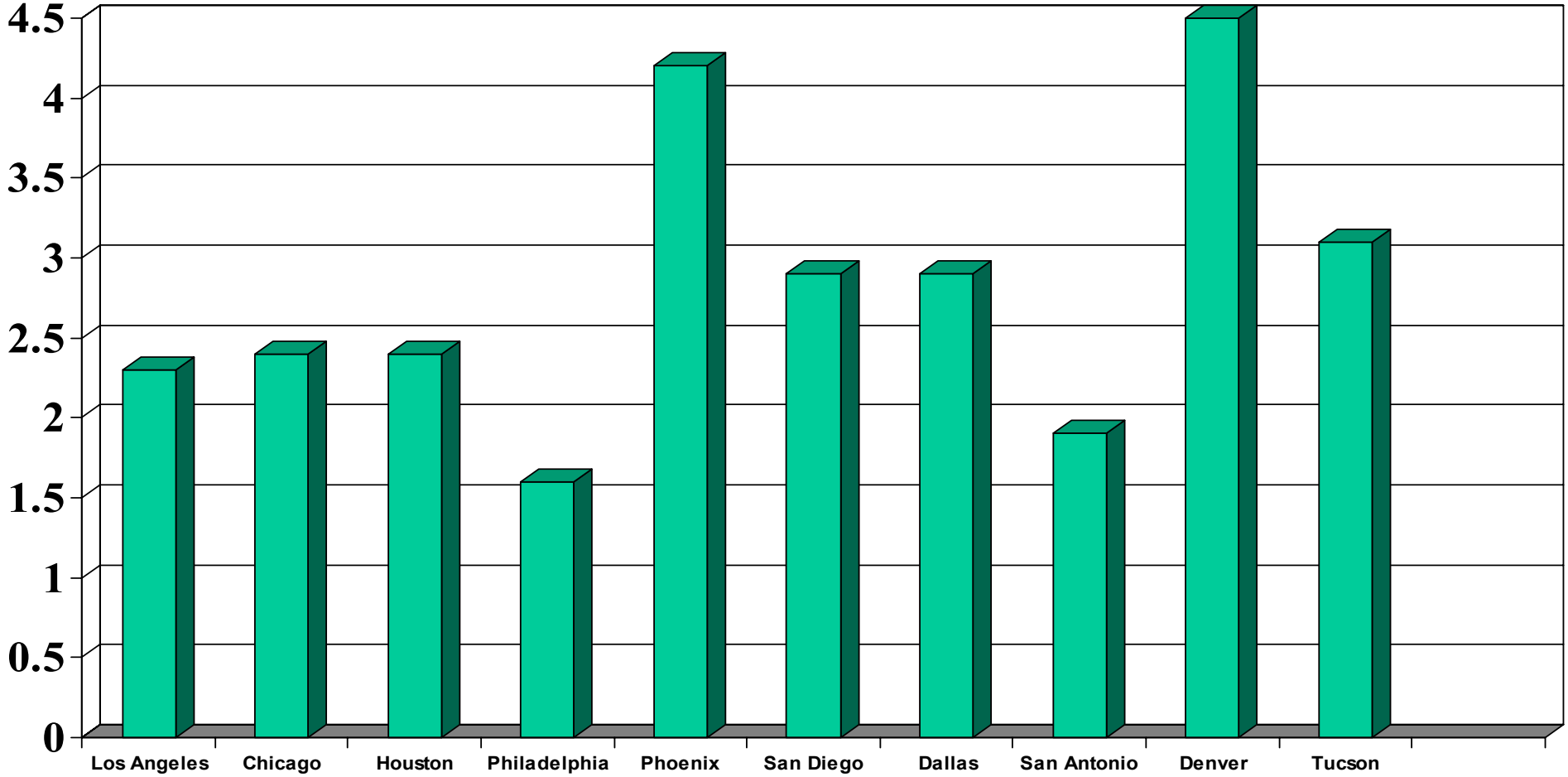
Safety

Phoenix / Maricopa County	Tucson / Pima County
D	**D+**
•**Phx has one of highest auto and pedestrian fatality rates in US** •AZ ranks poorly in intersection fatality rates •State Farm Ins. says Phx has 2 of the 10 most dangerous intersections in US	•Auto and pedestrian **fatality rates are high** •AZ ranks poorly in intersection fatality rates
TRENDS	
	

Fatality Rates by City
(per 100,000 population)



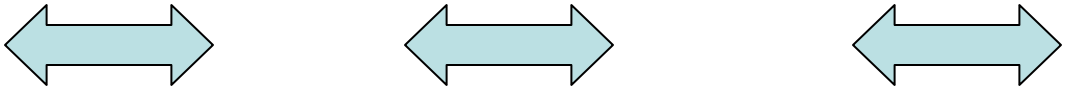
Pedestrian Fatality Rates
(per 100,000 population)



Safety

Phoenix / Maricopa County	Tucson / Pima County	Rest of State
D	**D+**	**D**
•**Phx has one of highest auto and pedestrian fatality rates in US** •AZ ranks poorly in intersection fatality rates	•Auto and pedestrian fatality rates are high •AZ ranks poorly in intersection fatality rates	•**AZ <u>Fatality rates are amongst worst in US</u>; accident / fatality rates in rural counties often similar to – or greater than – in urban areas**

TRENDS



Safety

Phoenix / Maricopa County	Tucson / Pima County	Rest of State	Arizona
D	**D+**	**D**	**D**
•**Phx has one of highest auto and pedestrian fatality rates in US** •AZ ranks poorly in intersection fatality rates	•Auto and pedestrian fatality rates are high •AZ ranks poorly in intersection fatality rates	•**AZ Fatality rates are amongst worst in US; accident / fatality rates in rural counties often similar to – or greater than – in urban areas**	•**AZ routinely rates <u>amongst worst states for accident and fatality rates</u>.** •**AZ ranks <u>#9 in % of intersection fatality rates</u>** •Our **<u>cities our among the most dangerous</u>** in the US
TRENDS			
⟷	⟷	⟷	⟷

Funding

Phoenix / Maricopa County	Tucson / Pima County	Rest of State	Arizona
A	**C-**	**C**	**C+**
•**Maricopa County and cities have passed funding initiatives** •RARF runs out in 2005 •Passage of **Prop 400 will provide roadway funding for 20 years**	•**Tucson has continually struggled to get funding for transportation projects** •Pima **County did pass bond initiative** for transportation in '90's	•A few **fast-growing areas have passed transportation initiatives** (e.g. Yavapai County; Flagstaff) •Many **emerging urban areas lack adequate funding** source for badly needed upgrades	•**AZ continues to be a "donor" state – to the detriment of its citizens.** •Some areas, e.g. Tucson, struggle to pass badly needed funding initiatives.
TRENDS			
⟷	↓	↓	↓

CONCLUSIONS

Roadways Overall Grade: C

1. Explosive Growth is #1 challenge

2. Several agencies are innovating
   - Project Delivery (e.g. Design Build)
   - Technology (Asphalt Rubber Pavement)

3. Safety on AZ roadways should receive more attention than it does

RECOMMENDATIONS

1. Work harder to **improve safety**
2. **Actively support transportation planning and funding initiatives**
   - ½-cent initiative in Pima County
   - Other local / regional initiatives

Sectors Evaluated

Roads

Bridges

Transit

Aviation

Background

- Definition (NBI):
  - …erected over a depression or obstruction…having an opening of more than 20 feet between abutments or ends of boxes…"
- Arizona has a total of 6,955 bridges:
  - 2,492 are National Highway System (NHS)
  - 4,463 are Non-NHS

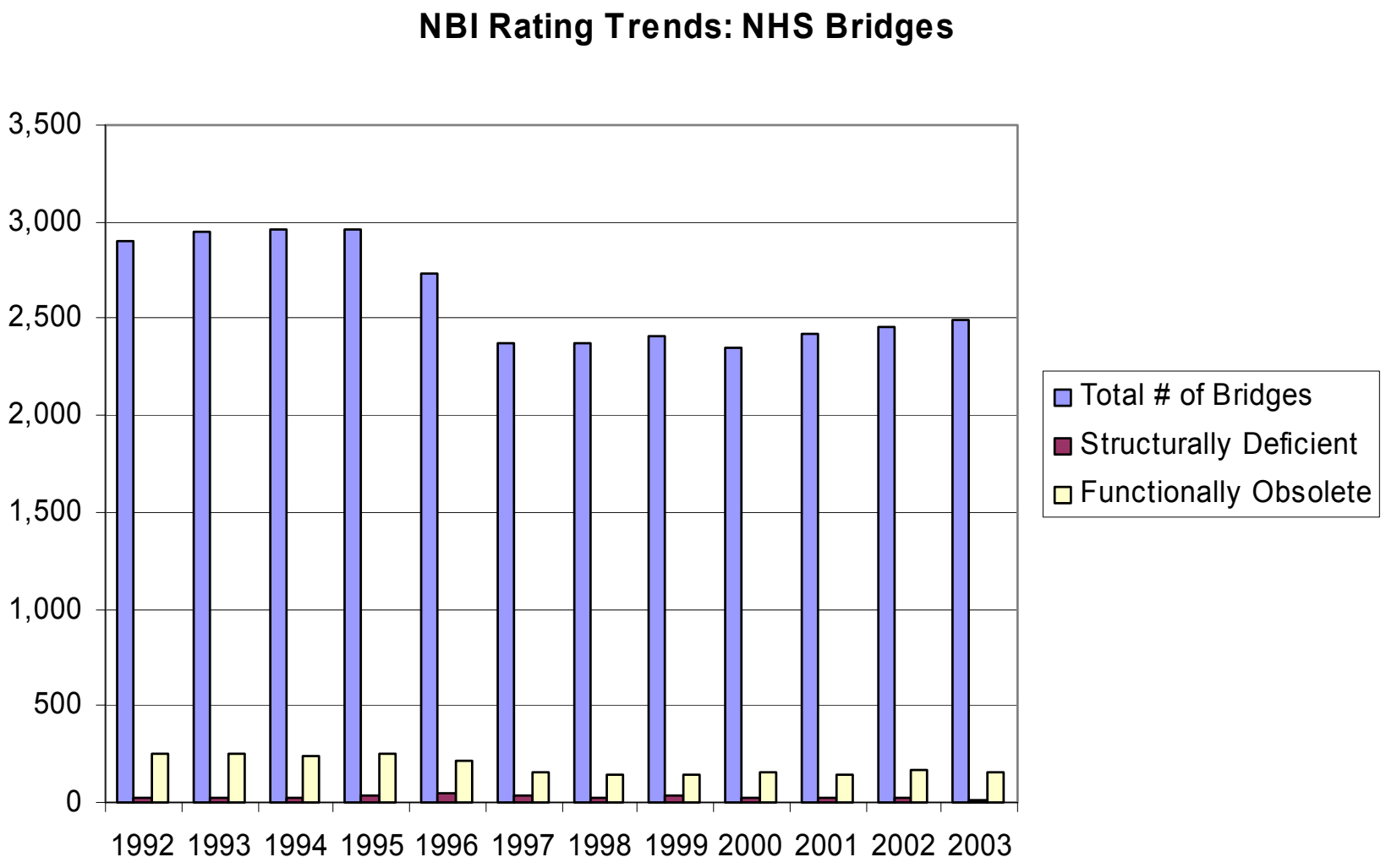
NBIS Bridge Rating System – Basis for Grading

NBIS "Sufficiency Rating" provides a numerical condition and function rating for each bridge, and flags problem conditions with two labels:

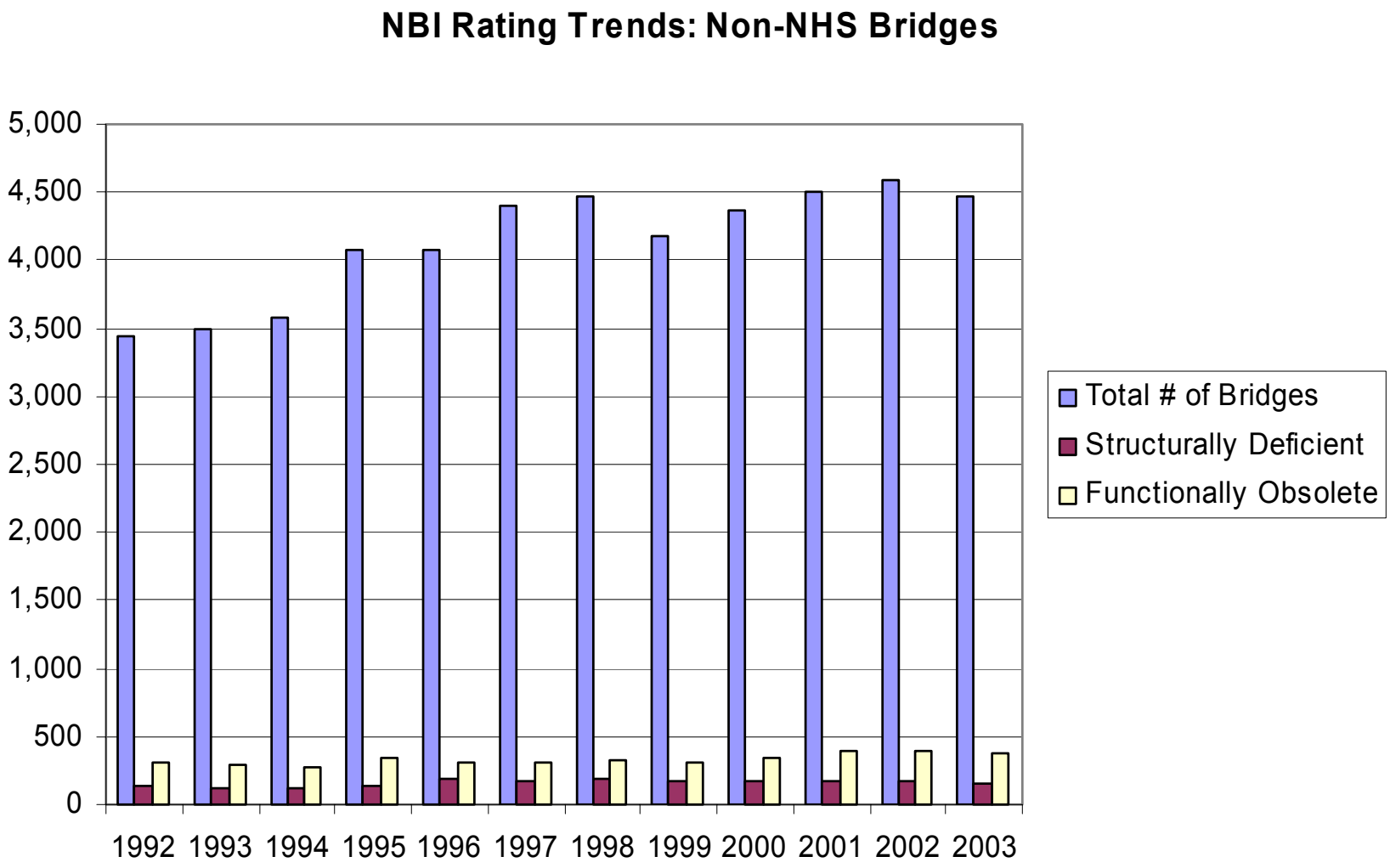
- **Structurally Deficient (SD)**
  - Safe to carry traffic loads but is approaching the condition for replacement or rehabilitation.

- **Functionally Obsolete (FO)**
  - Safe to carry traffic loads but has less than desirable geometric conditions.

NBI Rating Trends: **NHS Bridges**



NBI Rating Trends: Non-NHS Bridges



NBI Rating Trends: **SI&A Distribution**

Arizona		
SUMARY OF BRIDGE SUFFICENCY RATINGS		
Rating Range	# of Bridges	Percent of Inventory
80-100	5,425	**78%**
70-80	918	**13%**
60-70	417	**6%**
50-60	98	**1.5%**
<50	97	**1.5%**

Over 90% of AZ Bridges have sufficiency ratings >70 !

Type	Structurally Deficient % (# of bridges)	Functionally Obsolete % (# of bridges)	Total % (#)	Nat'l Avg. %	Grade	Trend
AZ - NHS (Nat'l Hwy System) (2,492 bridges)	**0.7% (17)**	**6.5% (161)**	**7.1% (178)**	**21%**	**A**	⟷
AZ – Non-NHS (4,463 bridges)	**3.4% (153)**	**8.5% (379)**	**11.9% (532)**	**29%**	**B+**	⟷

Note 1: Arizona consistently ranks in the top 5 of states for adequacy and structural integrity of their bridges.

Note 2: One national publication (Hartgen) ranked Arizona #1 in quality of their bridges, based on 2002 deficiency data.

CONCLUSIONS

Bridges Overall Grade: A-

1. AZ Bridges are in generally very good condition:
   - Predominantly high sufficiency ratings
   - Generally benign climate / environment
   - Scour and seismic programs are in place
   - **Less than 3% of total inventory is deficient**
2. General **condition has improved from 1992 to 2003:**
   - NHS: from 9.51% to 7.14% (SD + FO)
   - Non-NHS: from 12.6% to 11.9% (SD + FO)
3. Maintaining condition will become more of a challenge:
   - **# of bridges in inventory will continue to grow**
   - Funding for maintenance has remained flat

RECOMMENDATIONS

1. **Maintain bridge maintenance funding at adequate levels**
   - AZ is **adding 60 to 80 bridges / year** – maintenance funding needs to keep up with growth

2. **Look to maintain the functionality** of the existing bridge inventory as user demand increases throughout Arizona:
   - Population increase
   - Truck traffic and load increases
   - Key commerce routes: US 93, I-10 & I-40

Sectors Evaluated

Roads

Bridges

Transit

Aviation

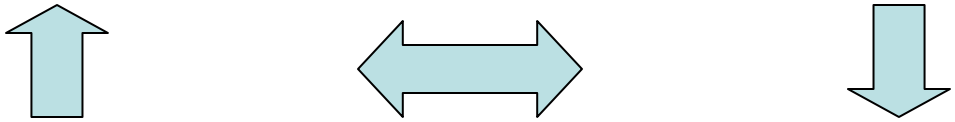
Attributes

- System Performance
- Age of Fleet
- Funding
- Accessibility

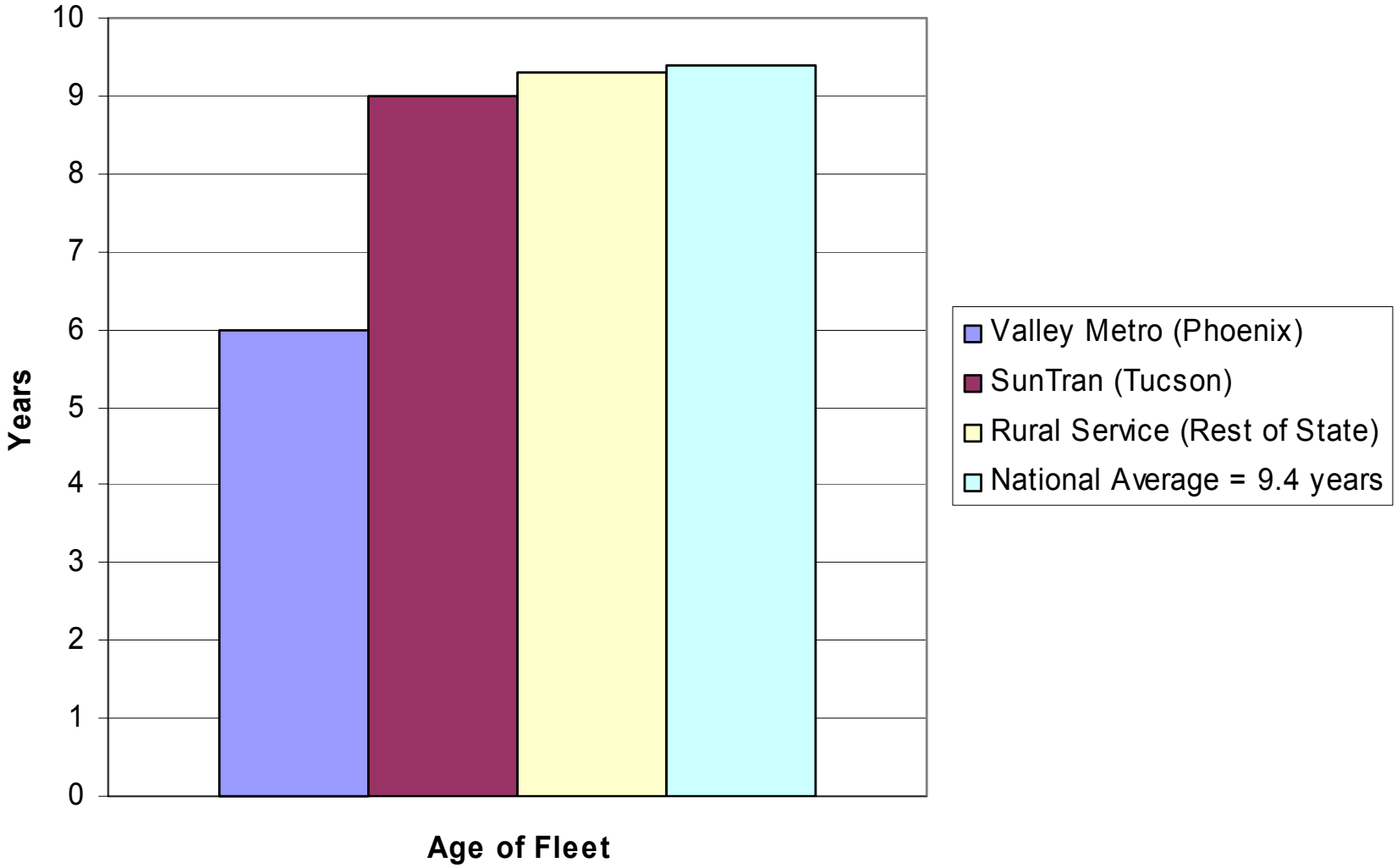
System Performance

Phoenix / Maricopa County	Tucson / Pima County	Rest of State	Arizona
C+	**C-**	**D**	**C**
• Bus **ridership has increased 35%** since 2000. • **Introduced RAPID** – very popular • System **usage still below that of similar cities**.	• Bus **ridership has increased 6.5%** over the past year. • System **usage is comparable to similar cities**.	• Rural transit agencies have seen **little increase in service** • Trend is downward as areas grow rapidly	• **While capacity and ridership have generally increased, transit has struggled to keep up with our explosive growth**.

TRENDS



Age of Fleet


10
9
8
7
6
5
4
3
2
1
0
Years
Age of Fleet
Valley Metro (Phoenix)
SunTran (Tucson)
Rural Service (Rest of State)
National Average = 9.4 years

Funding

Phoenix / Maricopa County	Tucson / Pima County	Rest of State	Arizona
A	**D**	**D**	**C-**
• Supported by 23% local, 77% federal funds • Bus **farebox recovery ratio is 27.8%, equal to cities of similar size** • **Four local cities have passed transit funding initiatives** within past eight years. •**Prop 400 provides significant long-term $$ source** for buses and light rail	• Supported by **17% local, 83% federal funds** • Bus **farebox recovery ratio is 18.3%, due to high operating costs**. • Annual operating **costs have increased 34%** over past five years.	• **Supported by federal transit grants and statewide Local Transportation Assistance Fund.** LTAF fund generated by lottery and **can be jeopardized by statewide budget shortfalls.**	• The Phoenix area should continue to serve as a model for the rest of the state for transit funding & community support.

Accessibility

Defined as how accessible the transit system is to people that might use it (i.e. does it give citizens a choice for transportation).

Phoenix / Maricopa County	Tucson / Pima County	Rest of State	Arizona
C-	**C-**	**D**	**C-**
• **54.5% of pop. within ¼ mile of service.** • Only two east-west bus routes at Sky Harbor • Only 4 Park & Rides in region	• **59% of metro area has transit service** • Good special programs & public campaign • Low accessibility for visitors.	• 23 rural towns & reservations have some type of transit service, but the **scope and variety of service is limited**.	• Providing **transit to rapidly growing areas of the state remains a challenge.**
TRENDS			
↓	↓	↓	

CONCLUSIONS

Transit Overall Grade: C+

1. Transit agencies have been **struggling to keep up with the rapid growth of our state**. They have managed to provide good performance with their limited funding.

2. Public acceptance is **hampered by the "automobile culture"** of the West. Nonetheless, ridership has increased recently.

3. **Advanced technology and programs will help** to increase the public's perception of transit.

4. **Passage of Prop 400 in Maricopa County will greatly improve its ability to provide transit services** for the next 20 years.

RECOMMENDATIONS

1. Alternative transit modes, such as **commuter rail, bus rapid transit, and high speed intercity rail, need to be considered in transit planning statewide.**

2. Rapidly growing areas of the state (such as Prescott and Pinal County) need to begin studying their transit needs for the next 20 years.

Sectors Evaluated

Roads

Bridges

Transit

Aviation

Attributes

- Capacity
- Accessibility
- Pavement Condition
- Meets Minimum Development Standards
- Funding

Capacity

Commercial Service (12 Airports)	Other Primary Airports (47 Airports)	Secondary Airports (23 Airports)	All Airports State of Arizona
C	**B**	**A**	**B-**
25% of airports operating near or above 60% capacity level. FAA recommends planning for additional runway capacity when activity approaches 60% of the annual service volume.	**13% of airports operating near or above 60%** capacity level.	**No airports operating above 60%** capacity level.	Planning for runway expansion is being undertaken at several airports. However, it is anticipated that the rapid growth of our state will continue to outpace the capacity improvements.
TRENDS			
↓	↓	↓	↓

Accessibility

Commercial Service (12 Airports)	Other Primary Airports (47 Airports)	Secondary Airports (23 Airports)	All Airports State of Arizona
B-	**A-**	**A**	**A-**
Access w/in 60 minutes of a major Metro. airport. **51 cities with a population of 5000 or more exist in the state. 47 of these meet criteria.**	Access to an airport that can handle business-type aviation aircraft w/in 30 minutes. **20 communities with a population of 15,000 or more exist in the state. 18 of these meet the criteria.**	Access to an airport providing general aviation service w/in 30 minutes. **No communities with populations greater than 1,000 fell outside the 30 minute service area.**	**Overall access to the state's airport system appears to be good.** However, access to affordable commercial service in areas outside of Phoenix and Tucson needs to be improved.
TRENDS			
↓	↓	↓	↓

Pavement Condition

Commercial Service (12 Airports)	Other Primary Airports (47 Airports)	Secondary Airports (23 Airports)	All Airports State of Arizona
A	**A**	**NONE**	**A**
The average (non-area weighted) PCI value for the group is 84. This correlates to a **pavement condition in the "excellent" range**.	The average (non-area weighted) PCI value for the group is 80. This correlates to a **pavement condition in the "excellent" range.**	No Data Available.	The area weighted PCI value is based on the PCI and its pavement area. The weighted PCI value for all of AZ's airports is 79, which correlates to pavement in the "excellent" range.
TRENDS			
↓	↓	↓	↓

Meets Minimum Development Standards

Commercial Service (12 Airports)	Other Primary Airports (47 Airports)	Secondary Airports (23 Airports)	All Airports State of Arizona
C-	**D-**	**D-**	**D-**
70% of state and federal development standards are met.	**56% of state and federal development standards are met**.	**35% of state and federal development standards are met**.	Across all airports, **only 51% of state and federal development standards are met**.

TRENDS

Funding

Commercial Service (12 Airports)	Other Primary Airports (47 Airports)	Secondary Airports (23 Airports)	All Airports State of Arizona
C-	**D**	**C**	**C-**
For 10-yr planning period, **$396 million is needed to maintain existing level of service.** $756 million is needed to bring all airports to minimum guidelines **Current investment is $242 million**	For 10-yr planning period, **$605 million is needed to maintain existing level of service.** 1.06 billion is needed to bring all airports to minimum guidelines. **Current investment is $323 million.**	For 10-yr planning period, **$26 million is needed to maintain existing level of service.** 46 million is needed to bring all airports to minimum guidelines. **Current investment is $18 million.**	For 10-yr planning period, an additional 276 million is needed to maintain existing level of service and an additional 1.12 billion is needed to bring all airports to minimum guidelines.
TRENDS			
↓	↓	↓	↓

CONCLUSIONS

Aviation Overall Grade: B-

1. **Funding levels are not adequate to maintain the system as it is today.**

2. Funding has historically been allocated efficiently to maintain accessibility.

RECOMMENDATIONS

1. **Funding above the current level is required.** The aviation industry in Arizona is demonstrated by its annual economic impact estimated to be ~$38.5 billion.

2. **Additional planning is needed in key growth areas of the state.** It is vital to ensure that adequate airport facilities are constructed to accommodate the future capacity demands that are generated. In addition the planning will enable the limited funding to be allocated as appropriate.

Questions?