



Arizona Department of Transportation



Building a Quality Arizona Traffic Operations July 12, 2007

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Arizona General Information

- ❖ **Population** **6 Million +**

- ❖ **Total Area** **114,000 mi²**
 - **1,000 mi²** **Water**
 - **39,000 mi²** **< 3,000 ft elev**
 - **27,000 mi²** **3,000 - 5,000 ft elev**
 - **47,000 mi²** **> 5,000 ft elev**

- ❖ **Elevation Range** **100 - 12,600 ft**





Arizona General Information (continued)

Total State Highway System	6,200 mi
▪ Interstate Highway	1,200 mi
▪ US Route	1,800 mi
▪ State Route	3,200 mi





Rural Transportation Issues

- ❖ Higher Average Speed
- ❖ Unfamiliarity of Tourists with Surroundings
- ❖ Long Driving Distances
- ❖ Extreme Climate Conditions
- ❖ Slow Emergency Services Response
- ❖ 40% of Vehicle-Miles & 60% of Traffic Fatalities
- ❖ Fatal Single-Vehicle, Run-off-the-Road Crashes
- ❖ Fewer Alternate Routes



Urban Transportation Issues

- ❖ **Congestion**
 - **Recurring**
 - **Non-Recurring**
- ❖ **Demand Exceeds Capacity or Incident Occurs**
- ❖ **During the Peak Periods, the Level of Service is E or F on many freeways**
- ❖ **Some Crashes may be related to Congestion**
- ❖ **National Cost of Congestion - \$Billions per year**



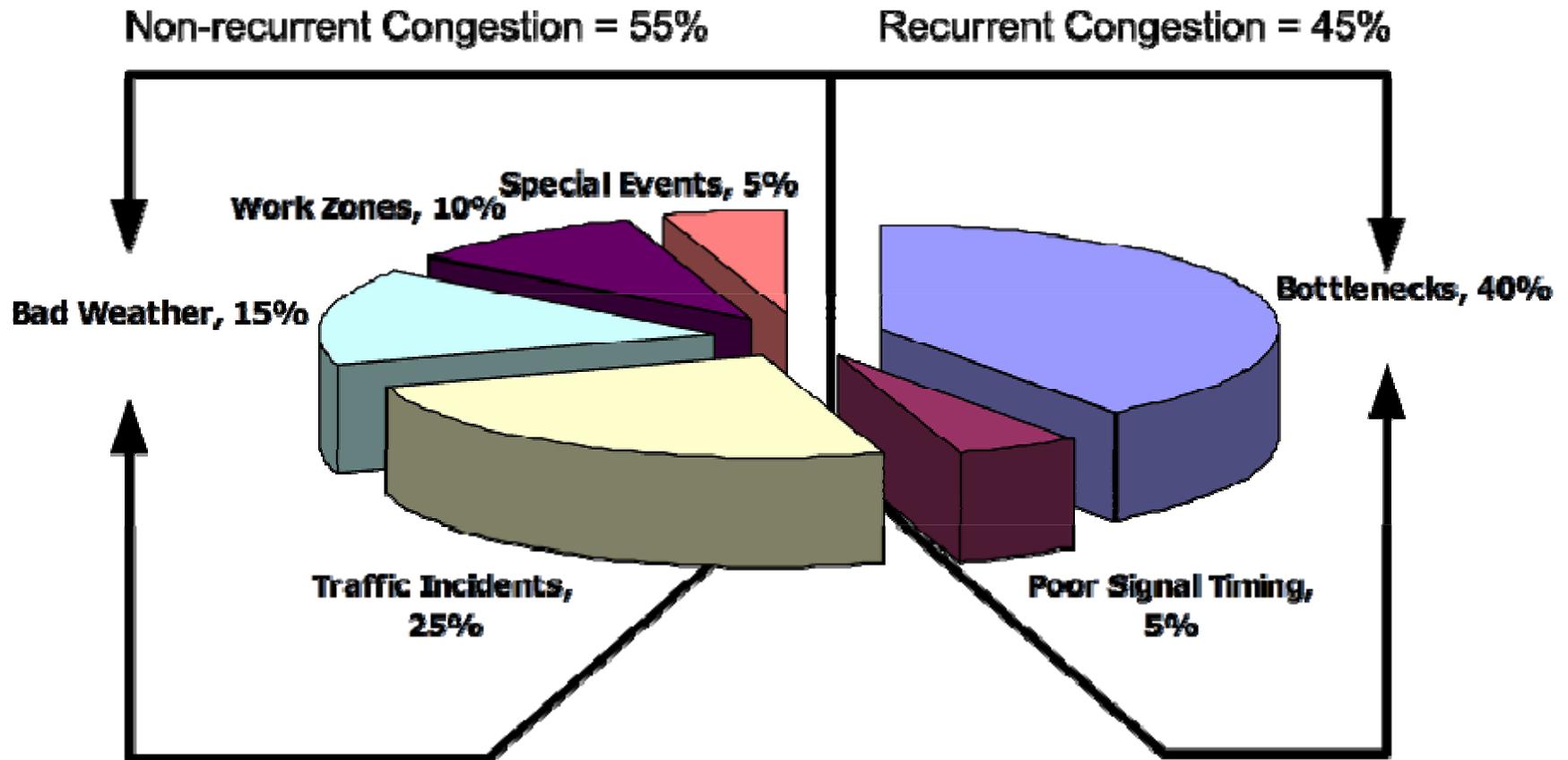
The affects of congestion nationally include:

- Road congestion annually results in 3.7 billion hours of travel delay and 2.3 billion gallons of wasted fuel.
- When unreliability, extra inventory, and environmental costs across the entire transportation system are included, the cost of congestion climbs to nearly \$200 billion annually.





Causes of Congestion in the U.S.





ADOT Traffic Operations

❖ Incident Management



❖ Traffic Management



❖ Travel Information





ADOT ITS Equipment

- ❖ DMS 150+
- ❖ CCTV Cameras 150+
- ❖ Ramp Meters 100+
- ❖ RWIS Sites 16





Transportation Technology Group

- ❖ **Manage ADOT Traffic Operations Center (TOC)**
- ❖ **Statewide 24/7 Operations**
- ❖ **Full-Time State Employee Operators**
- ❖ **Central Hub for Managing Traffic**





TOC Control Room

- **Operators provide 24/7 Coverage**
- **Operators must complete certification program**
- **At least 2 Operators are in the Control Room at all times**



TOC Control Room

- **Operators constantly monitor DPS CAD, ADOT & DPS radios, and monitors.**
- **Operators enter information into HCRS**
- **Operators dispatch ADOT staff to provide traffic control, repair guardrail, clear the roadway of debris, etc.**



TOC Control Room

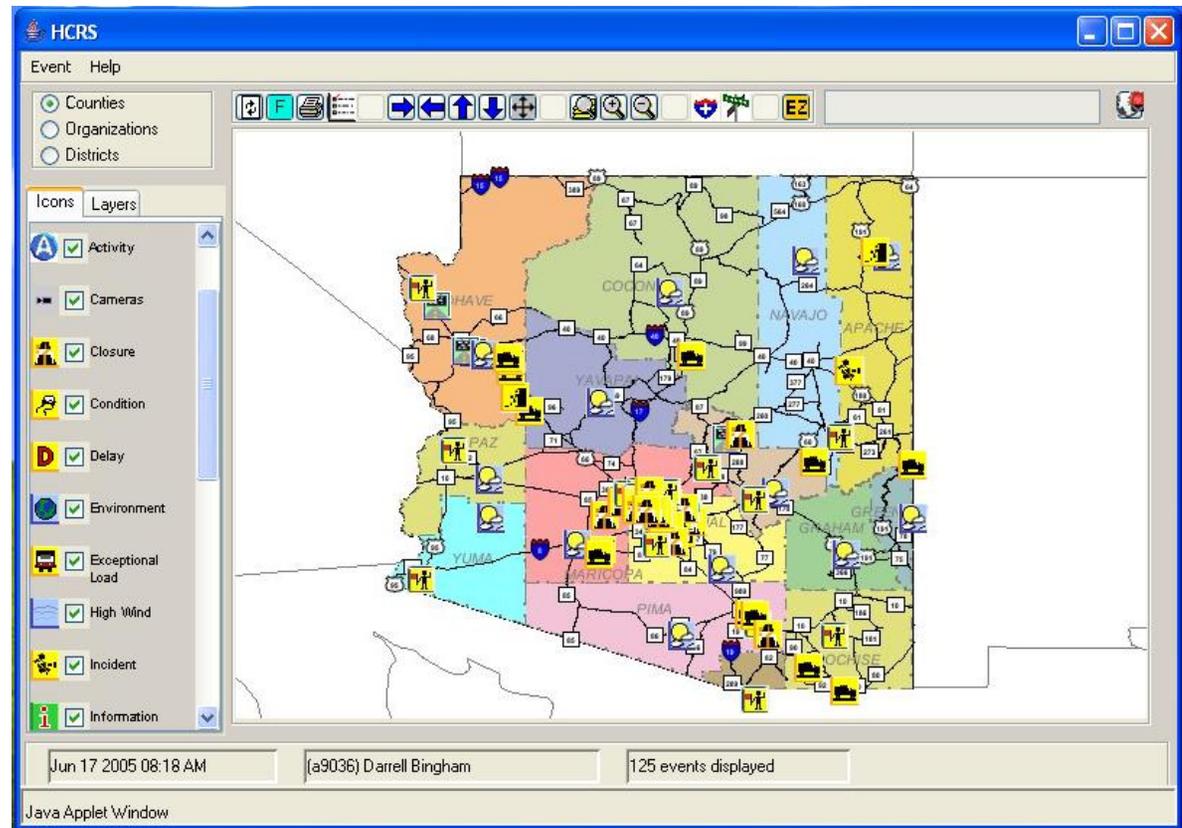
- Information from HCRS is automatically transferred into the 5-1-1 system (telephone: 5-1-1 and web site: az511.com)
- The public can obtain information regarding incidents, road closures, travel times, etc. by accessing the 5-1-1 system
- Operators can enter floodgate information (serious forest fires, floods, AMBER alerts, etc.) into the 5-1-1 system



Highway Condition Reporting System

- **10,000+ monthly entries**
- **Capable of receiving entries worldwide**
- **Information from HCRS travels the globe:**
 - Sent to az511.com within 10 seconds
 - Sent to ftp site within one (1) minute
 - Sent to 511 within three (3) minutes

HCRS





AMBER ALERT



DMS



Telephone System



AZ511.com



Pager



Email



TMC's



Amber Notification



ADOT Traffic Operations Center

Goal:
All broadcast
within 5 minutes
of TOC notification



Incident Management

- ❖ Detection
- ❖ Verification
- ❖ Response
- ❖ Removal
- ❖ Site Management
- ❖ Motorist Information
- ❖ Freeway Service Patrol
- ❖ ALERT





Incident Management

Alert Vehicle



DMS



Truck Escape Ramp Detection



Freeway Service Patrol



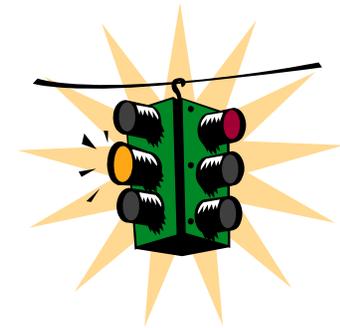
Temporary Traffic Control Devices





Traffic Management

- ❖ Detection
- ❖ Closed-Circuit TV
- ❖ Variable-Message Sign
- ❖ Ramp Metering
- ❖ Traffic Interchange Signal Control
- ❖ Alternate Route Diversion Plans
- ❖ Operational Strategies





Traffic Management

5-1-1 Sign



Controller Cabinet



Ramp Meters



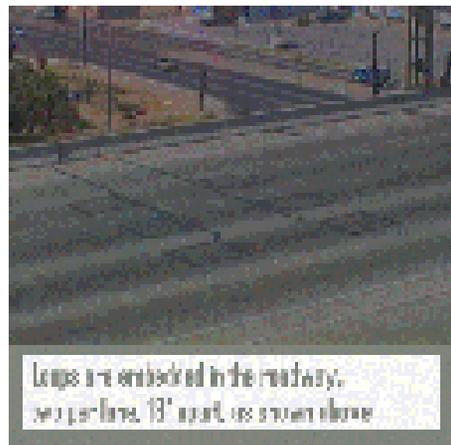
RWIS



Call Box



Detector Loops



HAR





Travel Information

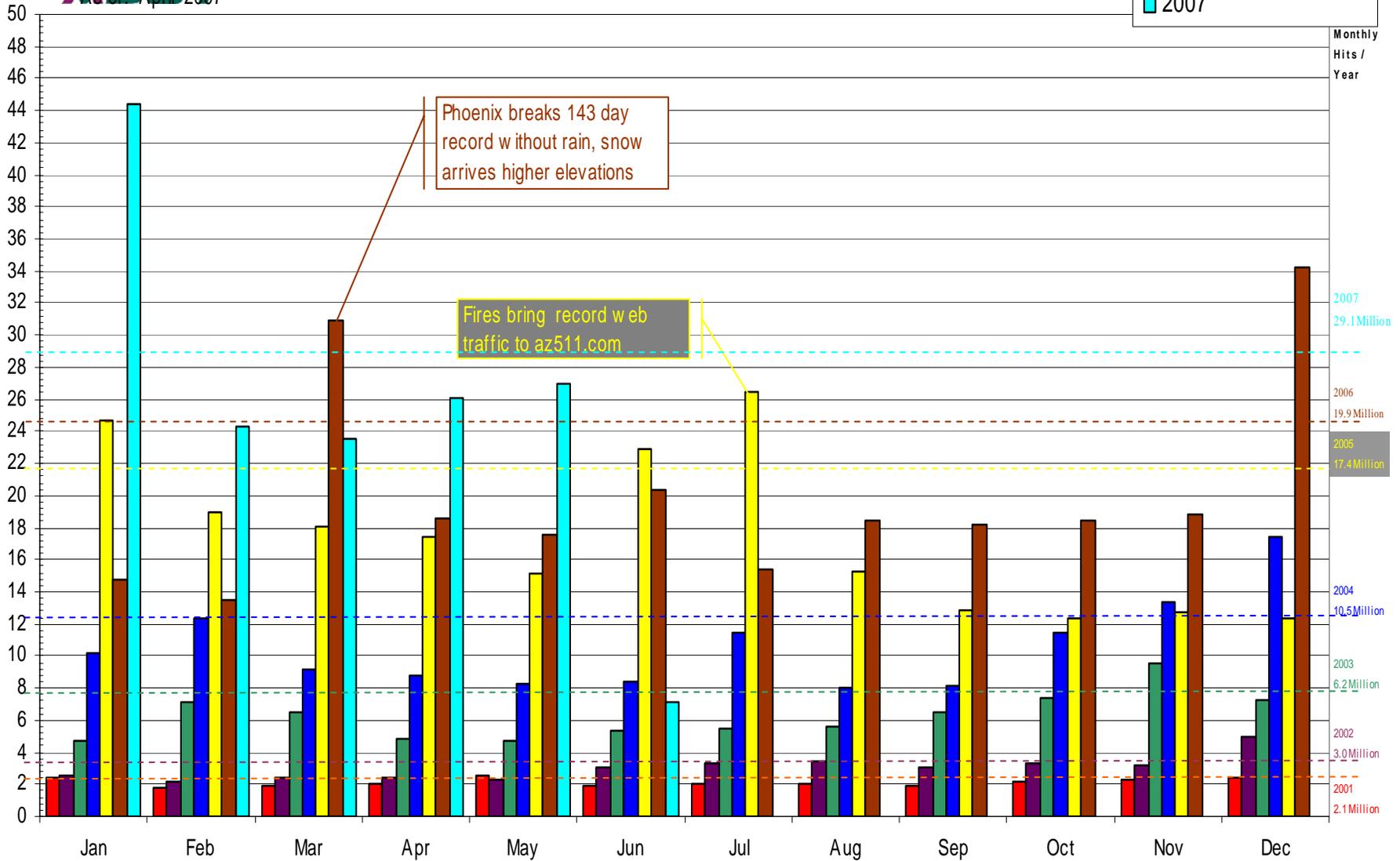
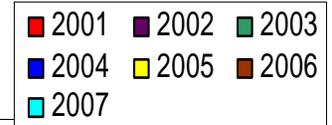
- ❖ Dynamic Message Sign
- ❖ Commercial Radio
- ❖ Internet
- ❖ 511





AZ511.COM

AZ511.com Historical Hits

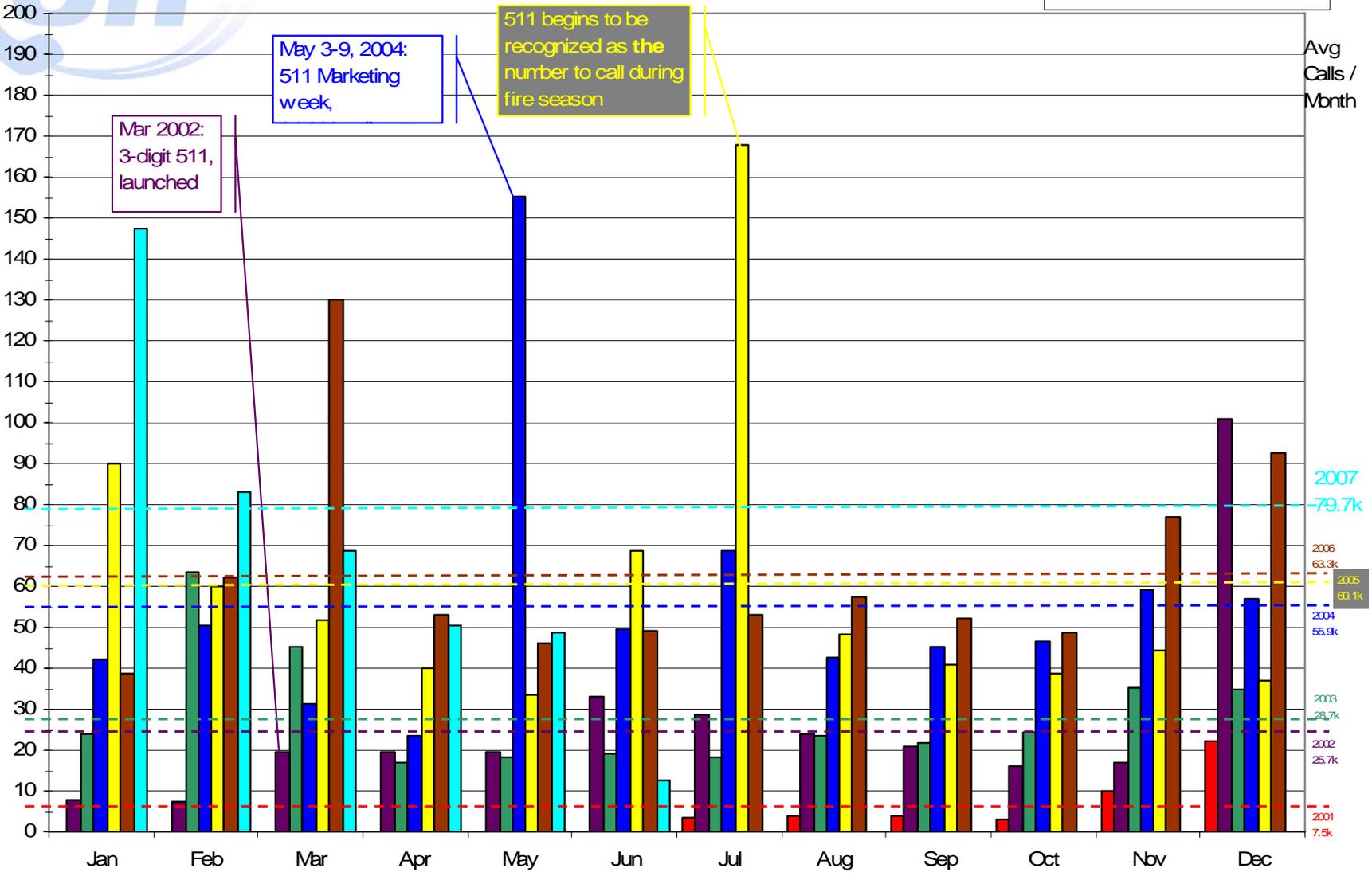


5-1-1



Arizona's 5-1-1 System
Call Volumes – Yearly Comparisons

■ 2001 ■ 2002 ■ 2003 ■ 2004
■ 2005 ■ 2006 ■ 2007



Avg Calls / Month

2007: 79.7k
 2006: 63.3k
 2005: 60.1k
 2004: 55.9k
 2003: 28.7k
 2002: 25.7k
 2001: 7.5k



ADOT ITS Research

- ❖ Adaptive Ramp Metering
- ❖ Rural ITS
- ❖ I-19 WiFi
- ❖ Snowplows Simulator Training
- ❖ Radio Interoperability
- ❖ Emergency Evacuation
- ❖ Traffic Detection
- ❖ Vehicle Infrastructure Integration (V.I.I.)



Vehicle Infrastructure Integration





Performance Measurements

- ❖ **5-1-1: Number of Calls & “Hits” on Web Site**
- ❖ **Number of Incidents Entered into HCRS**
- ❖ **Incident Clearance Times**
- ❖ **Average % of Freeways reaching LOS of “E” or “F”**
- ❖ **Number of Messages on DMS**



Challenges

- ❖ **Arizona is the Fastest Growing State in the USA**
- ❖ **Rapidly Changing Technology**
- ❖ **Integration of New & Existing Systems**
- ❖ **Recruiting, Training, & Retaining Qualified Staff**



Future

- ❖ **Integrated Corridor Management (ICM)/Urban Partnership Agreement/ITS Congestion Management Proposals**
- ❖ **Expansion of FMS**
- ❖ **Alternate TOC (City of Peoria)**
- ❖ **Interim TOC (I-10 Widening Project in Tucson)**
- ❖ **Arizona-Sonora 5-1-1**

Arizona-Sonora 5-1-1



Arizona-Sonora 5-1-1





Questions?