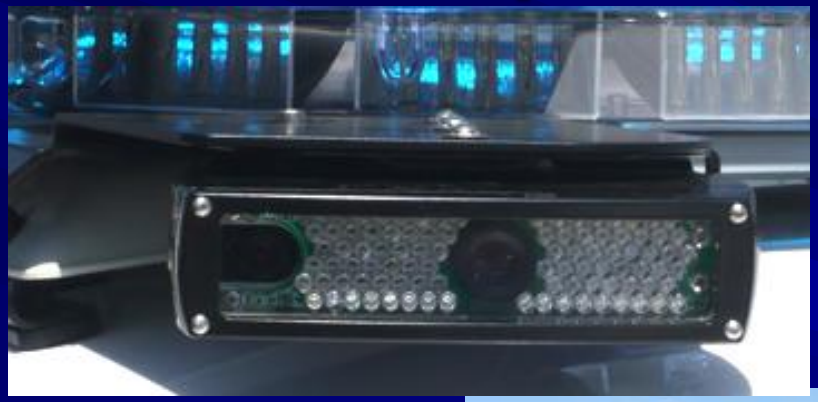
License Plate Readers

National Association for Justice Information Systems

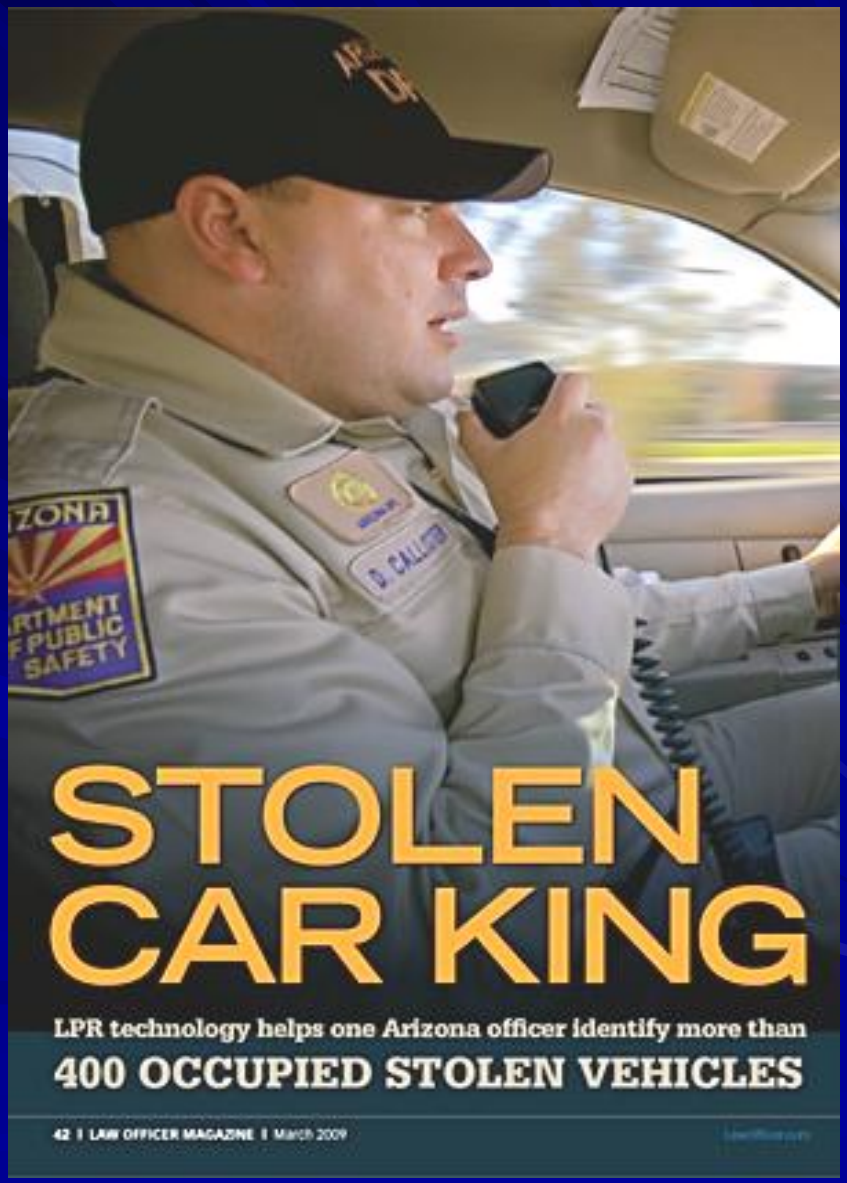
September 23, 2011



Why Use LPR?

Force Multiplier

- Operates in background. Officers can perform regular duties.
- Up to 5000 plates per shift vs. approximately 100 max by standard officer query.
- Automatically checks against specified data.
- Initial interest is *usually to find stolen cars* but other very valuable uses



LPR Capabilities

- **Today's LPR can read and check a plate in all types of lighting and at high speeds.**
  - **Checks can be made against *any* data base:**
  - **Vehicles associated w/wanted felons, parolees,etc.**
  - **Lost or Stolen Plates**
  - **AMBER/Silver Alerts**
  - **Any locally created databases**
    - **(Hit & Run Vehicles, Sex Offenders, Arsonists, Drug Trafficking, Parking Scofflaws, etc.)**
  - **Note: You must provide or build the database**

LPR Capabilities

- **Note: Queries are not checking a "live" database.**
- **Since LPR reads and retains all plates (whether wanted or not), the info can be stored for future review and query.**
- **Supports crime analysis and investigations**
- **LPR is also a very valuable Homeland Security tool**

How LPR Works

- Two cameras (IR and color), in a single housing; each vehicle usually has multiple cameras
- LPR captures plates in most weather, oncoming headlights, glare, bright sunlight and darkness
  - Heavy rain, snow & fog can challenge
- Uses complex algorithms and OCR (Optical Character Recognition) to read plates
- Compares the plate to multiple databases searching for matches
- Retains captured plate info

Alert Notification Screen

- Audible & visual alert
  If minimized, screen will pop up
- Matches must be confirmed
  Remember that the database is <u>not</u> live (LPR Hit may not still be in the system)
- Confirm the read and the info!

Mobile LPR

- **Advantages:**
  - **Quick to deploy**
  - **Unpredictable (Hard to avoid)**
  - **Can target problem spots or document proactively**
  - **Alert can be verified/confirmed by officer**
  - **More readily accepted**
  - **by public**
- **Disadvantage:**
  - **Car must be in the field**

Value of Collected Data

- **All reads provide:**
  - **Photo**
  - **Time/Date**
  - **GPS location**
- **Can be used numerous ways:**
  - **Investigations**
  - **Locating suspects**
  - **Homeland Security**

- **Which vehicle was Where When**

Escondido CA PD
Hit & Run Case

- **Pedestrian Struck and Killed by Car**
  - **Witness Information:**
    - **Gray Ford Taurus**
    - **Partial License Plate “5_ _ _ 611**

Efforts to identify or locate a suspect failed and the partial plate was entered into LPR database.

- Home
- Reports
- Admin
- System
- PIPS
- Alarms
- My Profile
- Print
- Sign Out

Login ID: 0307

Confidence: 97

Timestamp: 2/15/2008 1:40:29 PM

Location: EPD

5AFT611

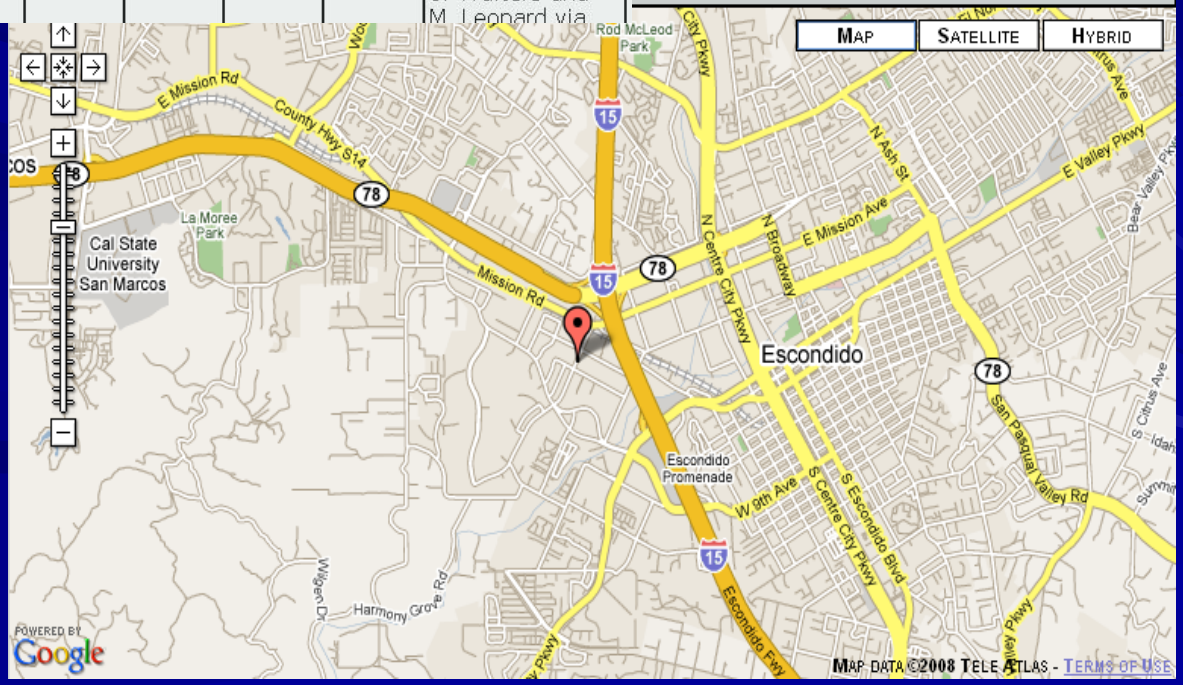
GPS: 33.1208416666667, -117.108295

Hit and Run - Impound for Evidence	5AFT611							Gray 1996 Ford Taurus - Case # 08-00023. FI driver and impound per 22655.5. Notify S. Walters and M. Leonard via

			Towed: 5AFT611 @ 2/15/2008 3:56:22 PM

- Gray Ford Taurus
- Partial Plate of 5___611

- Found LPR capture from three months prior to accident.
- Area checked, car located, suspect arrested.



Florida Rape Series

- More than 30 rapes over 3 years.
- Suspect rendered victims unconscious and there was no suspect vehicle info.
- Finally, a break: A victim provided four characters of a license plate.
- Even though victim got one character wrong, use of wildcard function identified a suspect vehicle within a few minutes.
- Surveillance established and suspect arrested as he targeted another victim.

The Power of the Photos

The Power of the Photos

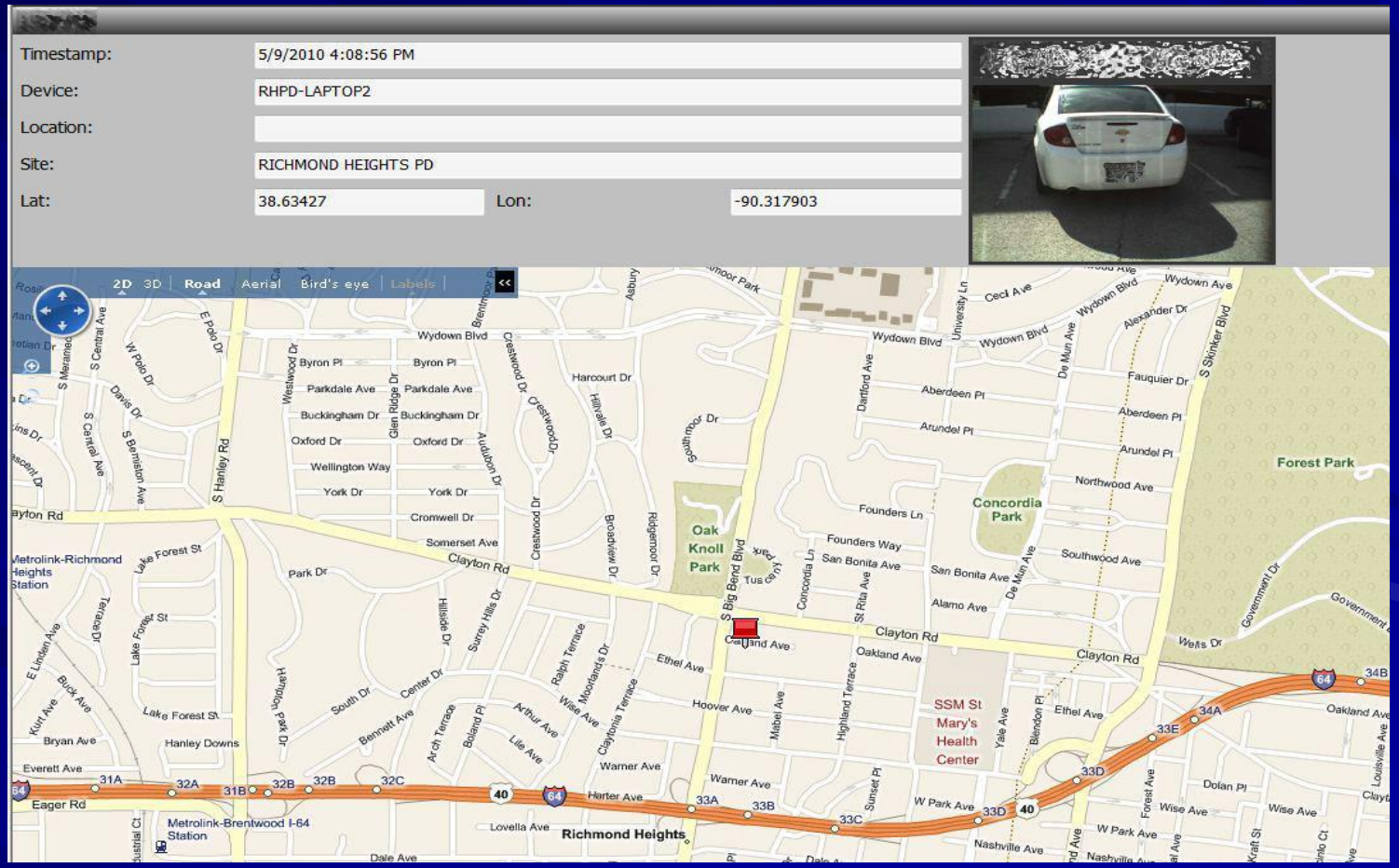
Combining LPR With Other Systems

- Richland Heights, MO PD – ATM Robbery
- Photos from ATM camera showed vehicle
- Unique damage visible in photo

Combining LPR With Other Systems

- ATM camera documented crime
- Victim provided partial plate

- **Check of LPR system using partial plate revealed 700 matches. Narrowed with photos. Once identified in LPR system, full plate available,**
- **Bottom Line – Use all your tools and LPR becomes even MORE valuable.**

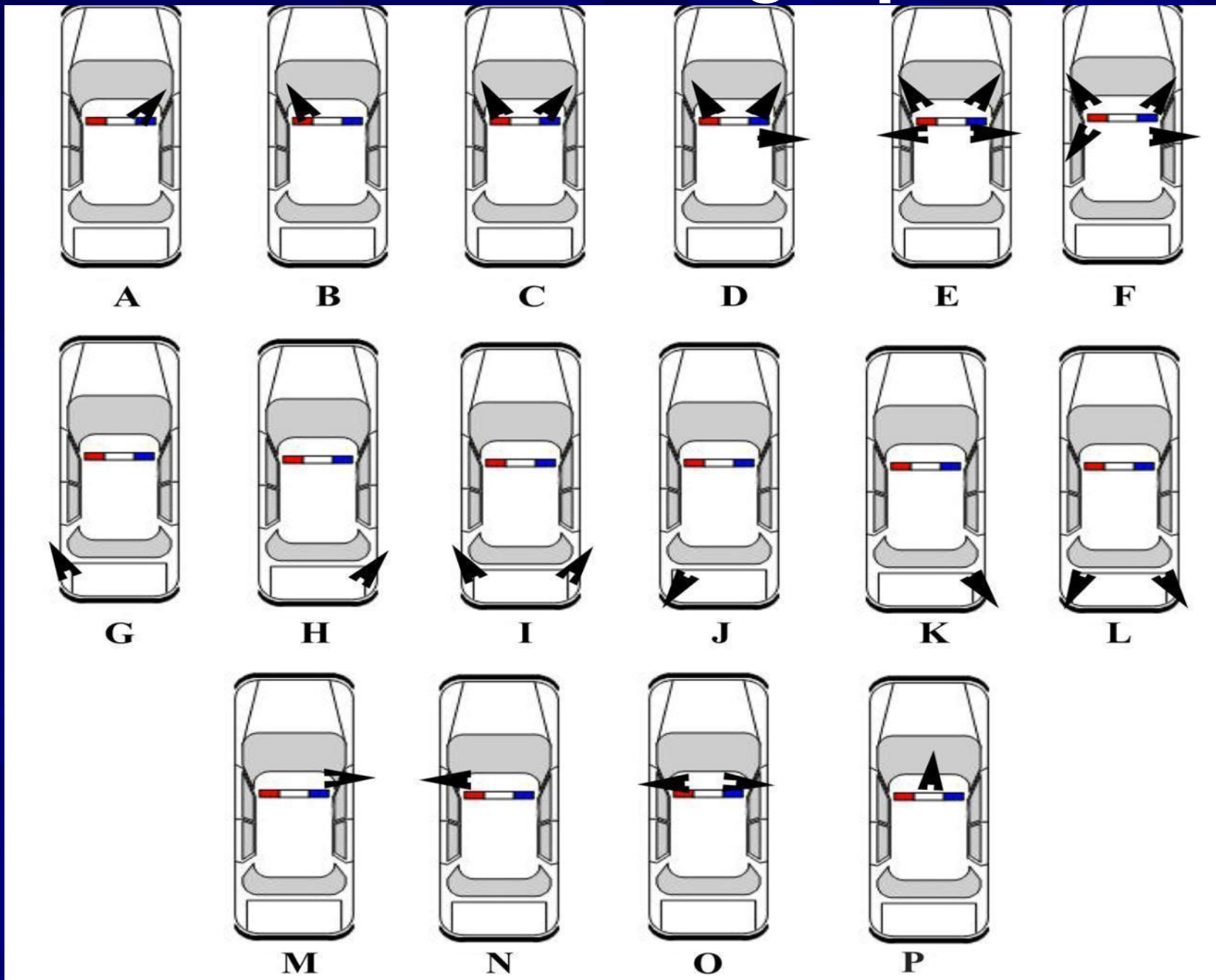


Homeland Security Applications

- **ID vehicles frequenting critical infrastructure**
- **Determine locations and traffic pattern of vehicles relevant to terrorism concerns**
- **Locate vehicles of interest to JTTF**
- **Significant Benefit: While supporting Homeland Security, LPR has ongoing all-crime functionality for law enforcement.**
- **Important – LPR is a valuable tool for both Homeland Security *and* fighting crime 24/7.**

Mobile Mounting Options

Mobile Mounting Options

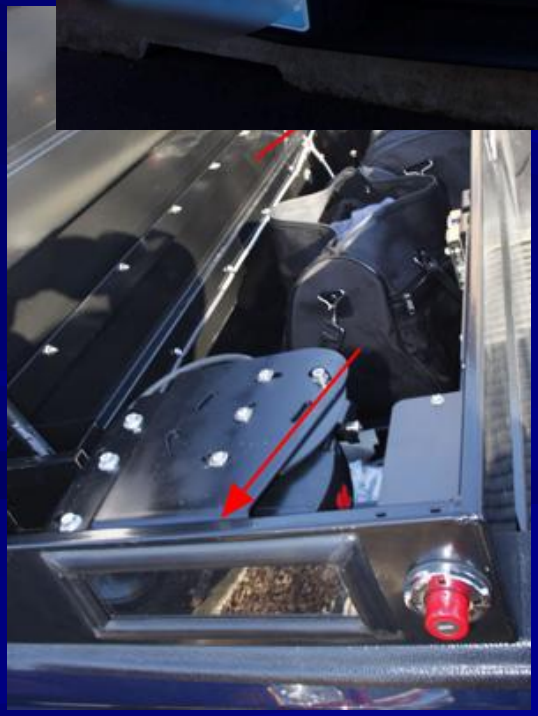


Covert LPR Applications

- Some agencies gather LPR data covertly
- May be of benefit in specific applications such as gathering information on a specific location or event where marked unit is problem.
- Can be left parked for a period of time to gather coming and going information.
- Downside: Specific use, usually not full-time, must use caution not to compromise.

Seattle PD Covert LPR System

Kent PD Covert Vehicle



Los Angeles Sheriff Covert Vehicle

Fixed Applications

- **Like mobile LPR, uses IR and color cameras**
- **Can establish perimeter**
- **Geo-fencing apps:**
  - **Critical infrastructure**
  - **Parks**
  - **Schools**
  - **High crime areas**

Fixed Applications

- **Challenges:**
  - **Installation**
  - **Public perception**
  - **Predictable**
  - **Require hardwire or wireless connection**
  - **Large amount of data generated**

Fixed Considerations - More

- Where will data alerts go, who responds, how are alerts controlled and updated?
- Buy-in from affected agencies.
- Site assessments:
  - Power
  - Connectivity
  - Infrastructure
  - Access and environmental concerns
  - Continual consideration of Cost Benefit

Combining Fixed and Mobile -The Potential

Privacy Questions

- **Sharing, Access, Retention, Analysis all raise questions of privacy. The concerns:**
  - **Not only 4th but 1st Amendment. The argument: Could dissuade lawful assembly and association**
  - **Also: Strips away potential privacy afforded by the sheer volume of data and traffic. Although little or no expectation of privacy in public area, technology enhances knowledge of activity.**

Dealing with the Public

- **The Court of Public Opinion can rule**
- **Be ready to answer the public's concerns**
- **Emphasize the positive**
- **LE must be careful about use/assumptions**

Evaluating Privacy Concerns

- **Consider the tech and non-tech parallel:**
  - **LPR does what officers are *already doing*. Manysimilarities but with tech efficiency.**

- **Great concern over potential for abuse but - <u>Reality Check</u>: Abuse potential is <u>not</u> unique to LPR– *Policy, training, auditing, check & balance can address and minimize problems in the same manner they have been used for other systems.***

Comparing Officer Initiated and LPR

Officer in Car

- Able to observe plates
- Check any plate
- Can pick and choose
- Can write down/record info
- Holds info until needed

License Plate Reader

- Always observing plates
- Check many plates
- Captures are unbiased
- Automatically captures info
- Holds data until needed

Comparing Officer Initiated & LPR

Officer in Car

- Can provide to investigator
- Past info may be relevant to crime later discovered
- Weakness – Must record, remember, recover and report when info needed.

License Plate Reader

- Accessible 24/7 to investigator
- Retrospective data may be of great value in series crimes or those with suspect vehicle info, particularly partial plate

US vs. Wilcox

- Defendant claimed LPR invaded his privacy interest in “anonymous and free movement across the city” – claimed 4th Amend. violation.
- US District Court Magistrate, N. Georgia held:
  - No 4th amendment protection
  - Law requires plate display – no privacy
  - Check of license plate is not a search
  - Cited rulings from 5th, 6th, 8th, 9th and 10th Circuits and the US Supreme Court
  - Noted that LPR is not a technology that invades privacy like thermal imaging

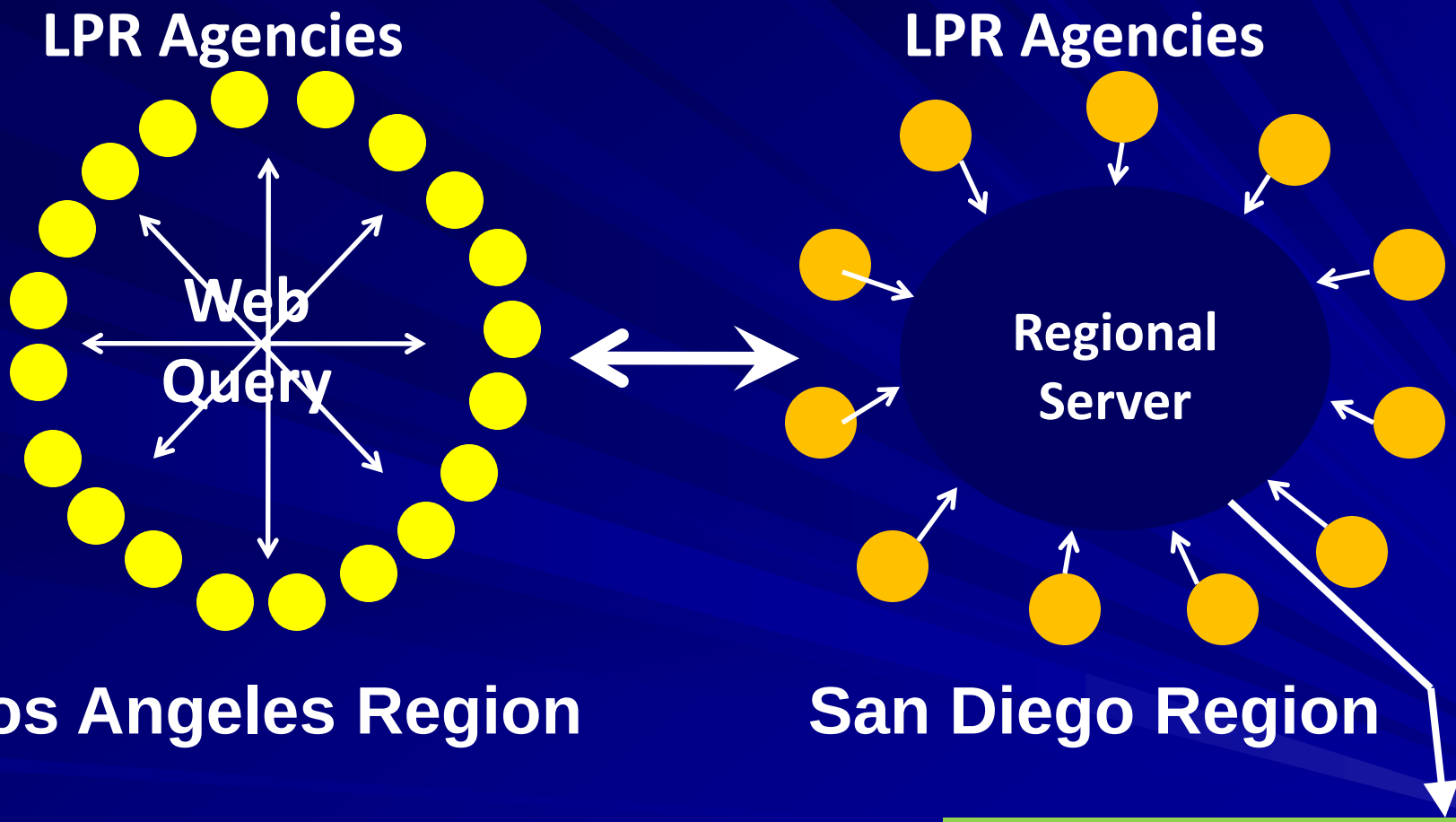
Retention Considerations

- **State law or other requirement**
- **Active time of investigation on cases**
- **The demand for storage and expense**
- **The impact on database effectiveness**
- **Public perception**

Data Sharing and Collaboration

- Coordinating agency efforts and sharing data can result in extensive benefits:
  - More effective alerts and analysis of information.
  - Economy of scale regarding purchases.
  - Lessons learned applicable to others.
  - Possible shared infrastructure (e.g. servers).

Los Angeles and San Diego



National Sharing – Roadmap

- Develop regional sharing capability.
- As regions develop across the country, begin to link sharing/query capability.
- Utilize a trusted broker, such as NLETS to serve as a “pointer” system.
- Query could be conducted in one state with indication of potential data in multiple regions.
- *In the interim:* Establish and utilize email groups. Can be a *very* powerful tool.

LPR Initiatives

- Leopard - LPR Data Standard/NIEM
- NLETS – National LPR Data Query Effort
- IACP – Technical Specifications
- DEA – National LPR and DICE
- AAMVA – License Plates & LPR

Leopard – LPR Data

- Funded by NIJ/Contracted to SPAWAR
- Objective: Develop interoperable LPR Web service that adheres to the National Information Exchange Model
- Status: Initial effort completed. Base level standard established. LPRD software released to LE community.
- Future: Software Funding has ended. User supported. Efforts are being integrated into IACP and NLETS work.

NLETS – LPR Data Query

- Funded by DHS
- Objective: Multi-jurisdictional sharing of LPR data through a pointer system.
- Not a repository, metadata for indexing.
- Status: Input from practitioners obtained. Meeting held w/vendors. Using Google group established under Leopard effort.
- Next steps – ongoing iterative process w/ LPR vendors and NLETS staff.

IACP Tech Specs

- Funded by NIJ
- Objective: Develop tech standards for LPR. Not just data but equipment and capability overall.
- Status: Subject matter experts have convened twice. A great deal of discussion regarding different environments and uses.
- Future: First two mtgs held. Fast tracking because of rapid adoption and use.

National LPR and DICE

- “The National LPR system”–Sec. Napolitano
- Funded and run by DEA. Focus is on smuggling problems along border.
- Data gathered primarily from BP checkpoints
- Data is also flowing from agencies in 16 states. DEA is encouraging participation.
- DICE – DEA Internet Connectivity Endeavor permits query from any LE agency. National deconfliction system.

AAMVA – Plates and LPR

- American Automobile Motor Vehicle Administrators
- Objective: Review plates and LPR technology. Consider challenges and understand issues.
- Status: First meeting held in DC. Assignments to participants. Draft overview being prepared.

LPR Data Issues

- LPR databases are experiencing challenges as numbers increase exponentially. 10-200 M
- Recognition of data value has resulted in extended retention and extensive query.
- Vendors and agencies have encountered issues as DB sizes grow and queries increase.
- Although most LPR data is viewed through proprietary query (e.g. BOSS), the data is *starting* to be considered/viewed with other data such as citations, FIs, etc.

LPR Data Issues - More

- Retention
- Policy
- Sharing/multijurisdictional query capability is rapidly becoming the expectation.
- Access to data – Fusion vs. pull on demand
- Time and GPS accuracy and reliance are very important – critical to criminal cases. Now being called into question.

Data Storage and Sharing

- Three regional models emerging.
- Each agency holds own data. Designated broker (one agency) ensures access to other agencies' data for all. e.g. LASD
- Single storage point with agencies sending to that single repository. Agencies not holding own data. All can access. e.g. Cincinnati PD
- Regional server with all agencies contributing but some agencies still holding own data, others sending direct. e.g. ARJIS

Trends

- GeoBranding
- Recognition of Fixed challenges
- Different Retention Periods for Fixed and Mobile
- Courts being exposed to LPR
- Real time and near real time use
- Vendors being stretched
- LPR Regions developing – Desire to share information.

LPRs – The Myths

- **LPRs target people unfairly.**
- **LPRs are too expensive for small agencies.**
- **Accuracy rate is THIS BIG!**
- **My cameras read all 50 states.**
- **HOT lists are really hot.**
- **Got a mobile computer, just add a camera.**
- **Bottom line – Do your homework!**

LPR Tips

- **Use Wildcards frequently.**
- **Remember Victimology 101 – Where was V?**
- **Target hot spots relentlessly – before & after.**
- **Move to wireless update/download.**
- **Keep LPR in field. Consider volunteers/reserves.**
- **Grid city at two different times [day/night]**
- **Save relevant LPR data to cold case file.**
- **Ensure accuracy of time & GPS data–Calibrate**
- **Anticipate counter measures.**

It's been more than 65 years since the annual line-of-duty police deaths totaled less than 100.

Let's Start Rolling Back the Clock—NOW!

The Life You Save May Be Your Own!

BELOW
100
Wear your belt.
Wear your vest.
Watch your speed.
WIN—What's Important Now?
Remember: Complacency Kills!

No matter what the Vehicle Code says, you're not exempt from the laws of physics.

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QUESTIONS