



Offering Sensor Network Services Using the Postal Delivery Vehicle Fleet

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This presentation is the opinion of the author and does not reflect the views of the Postal Regulatory Commission.



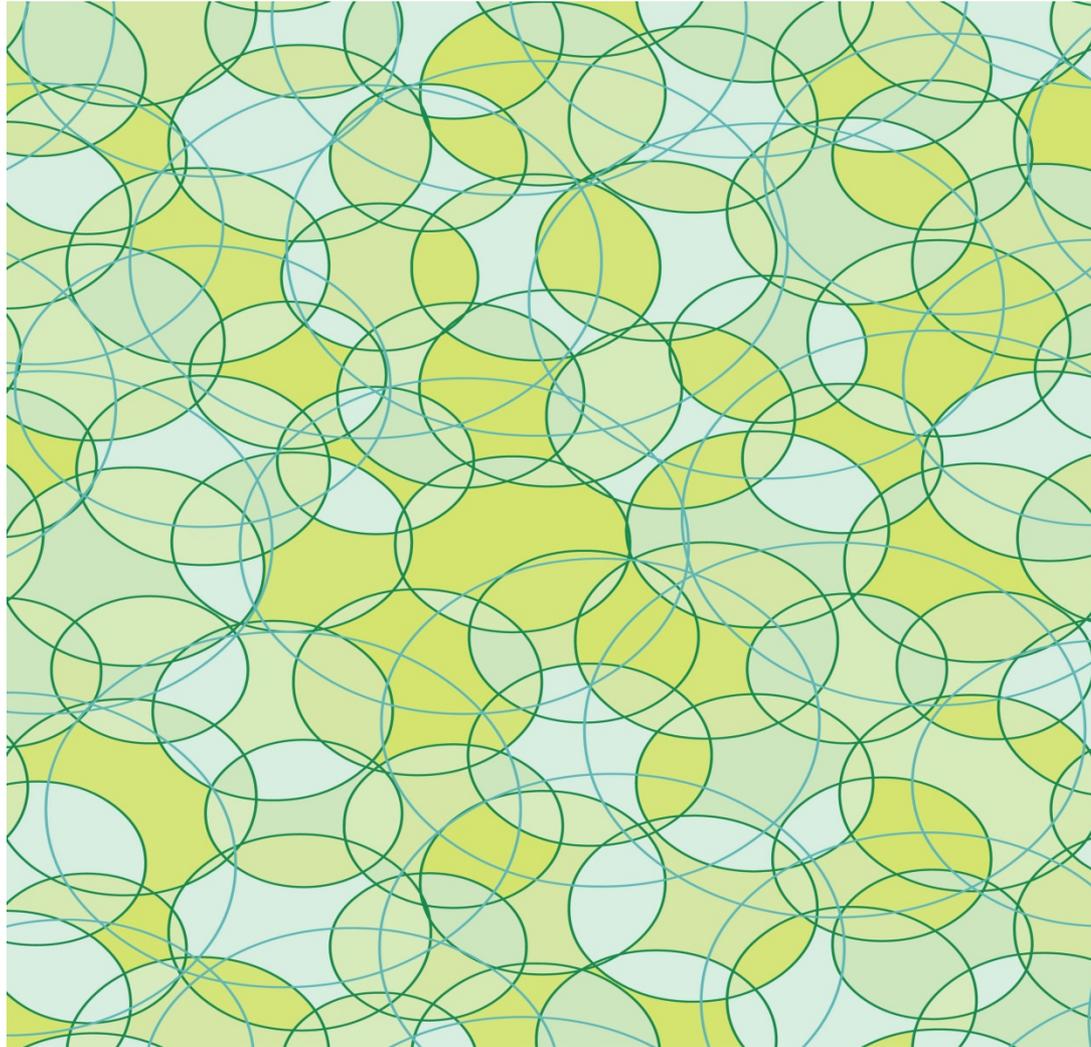
Postal Vehicle Sensor Networks Can Extract Economic Value From the Attributes of Postal Delivery Routes



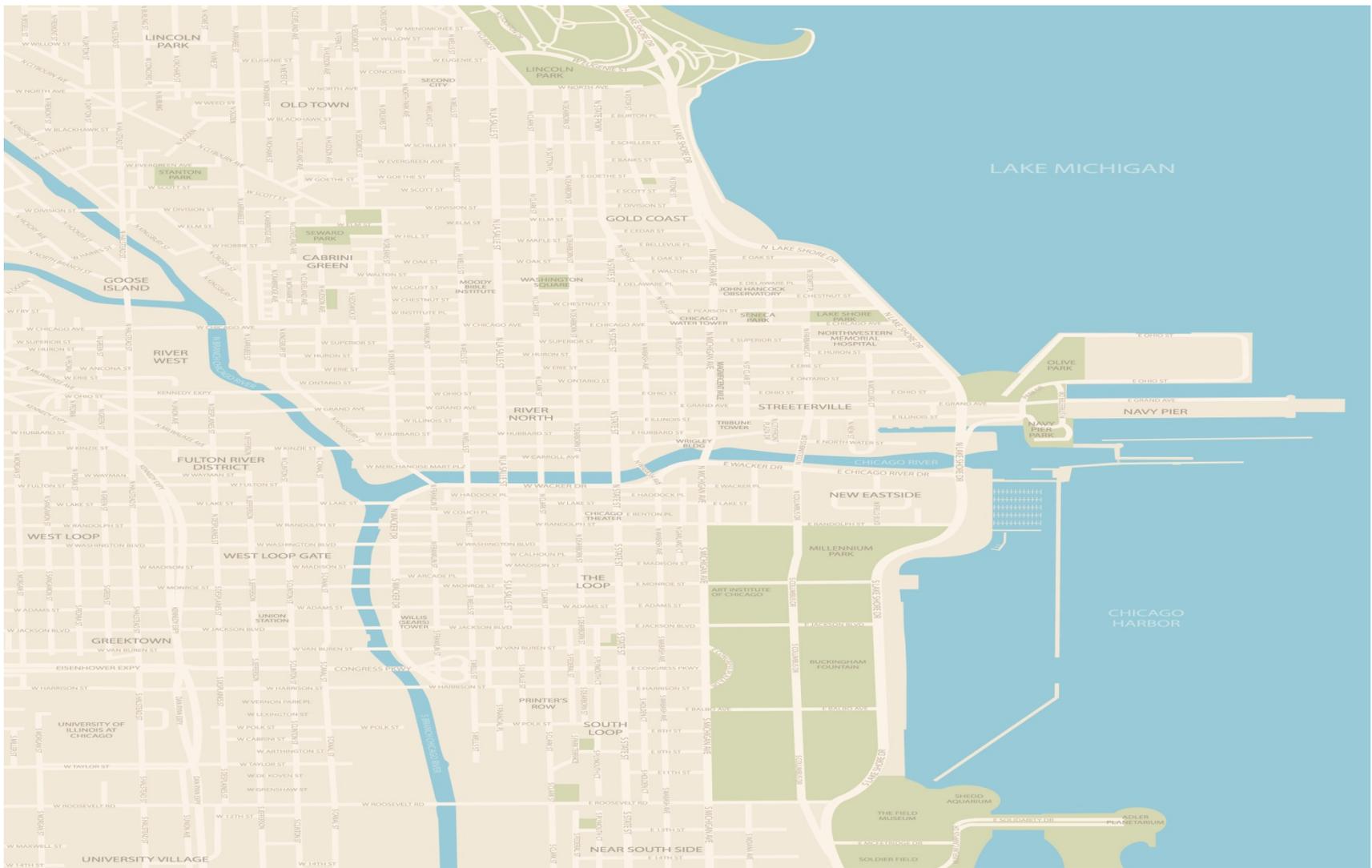
Postal Fleets tend to be large and geographically dispersed. Delivery routes follow the patterns of human activity.



The New Disciplines of Geoinformatics & Telecartography Link Useful Measurements to Locations (and Times)



Mobile Sensors Are Able to Provide Overlapping Fine Grain Detection Across a Broad Area.



A Network of Mobile Sensors Can Achieve a High Degree of Geographic Specificity and Selectivity Where Required.



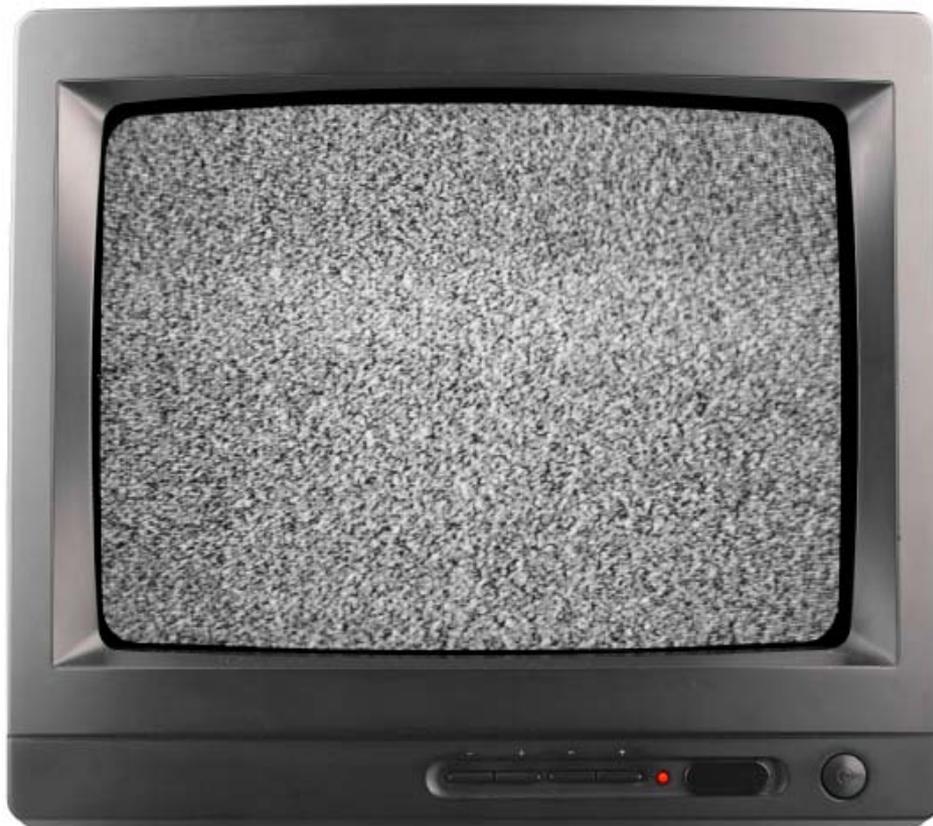
Postal Mobile Sensors Can Be Used to Rapidly Detect Chemical, Biological and Radiological Threats For Civil Defense Purposes.



Choosing Nearby Delivery Routes Permits the Monitoring of Specific Substances From Industrial Facilities or Other Sites.

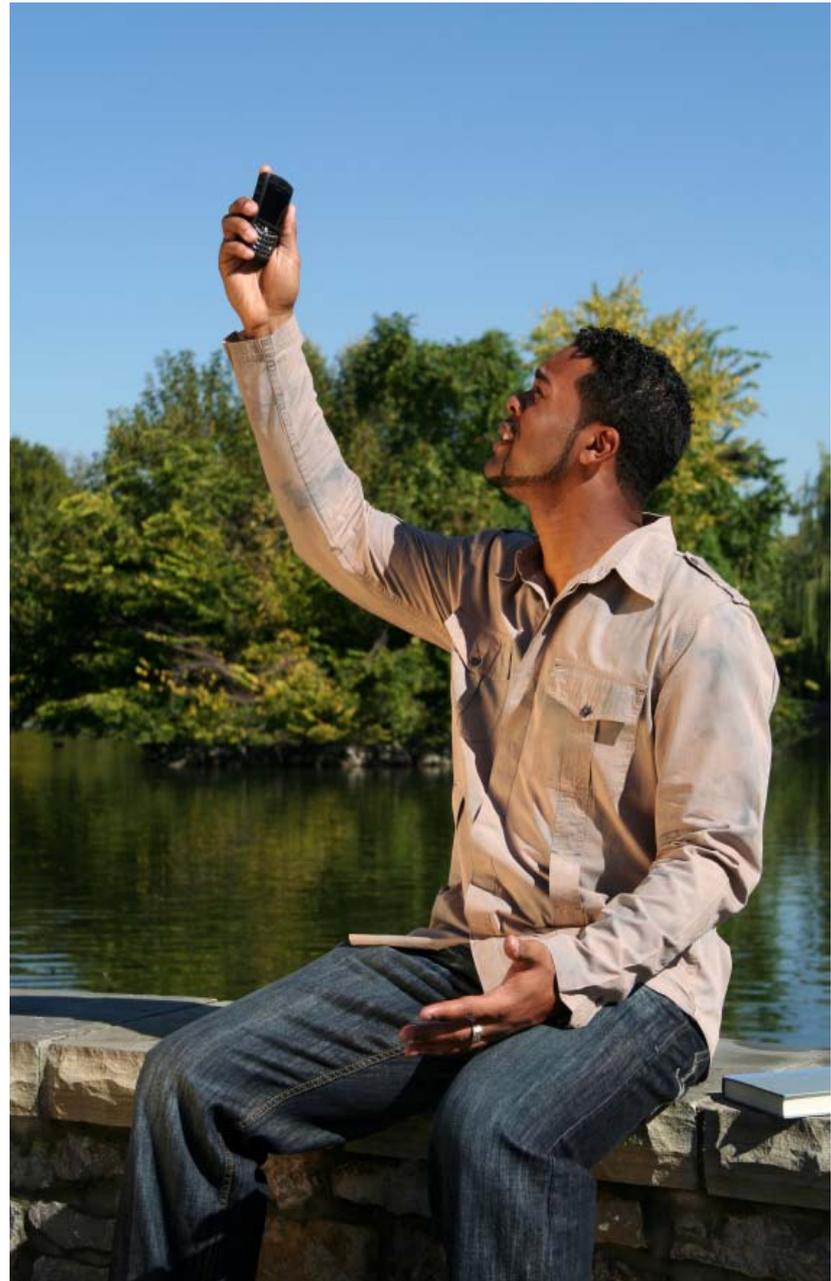


Vehicular Sensors Can Monitor Air Quality, Detect a Wide Range of Atmospheric Contaminants, and Create Air Quality Maps.



Areas of Poor Television and Radio Reception Can Be Identified and Mapped, Including Frequency Band Specific Measurements.

Areas of Weak or Impaired Wireless Network and Cell Phone Signal Coverage Can Be Identified and Mapped.





Collection of Ad Hoc Fine-Grain Weather Data Would Enable Improved Accuracy of Weather Forecasting.



Vehicular Sensing of Road Conditions and Pothole Mapping Would Provide a Means of Prioritizing Road Repairs.



Sensors to Detect Natural Gas or Tracer Additives Could Identify Wasteful or Dangerous Leaks.



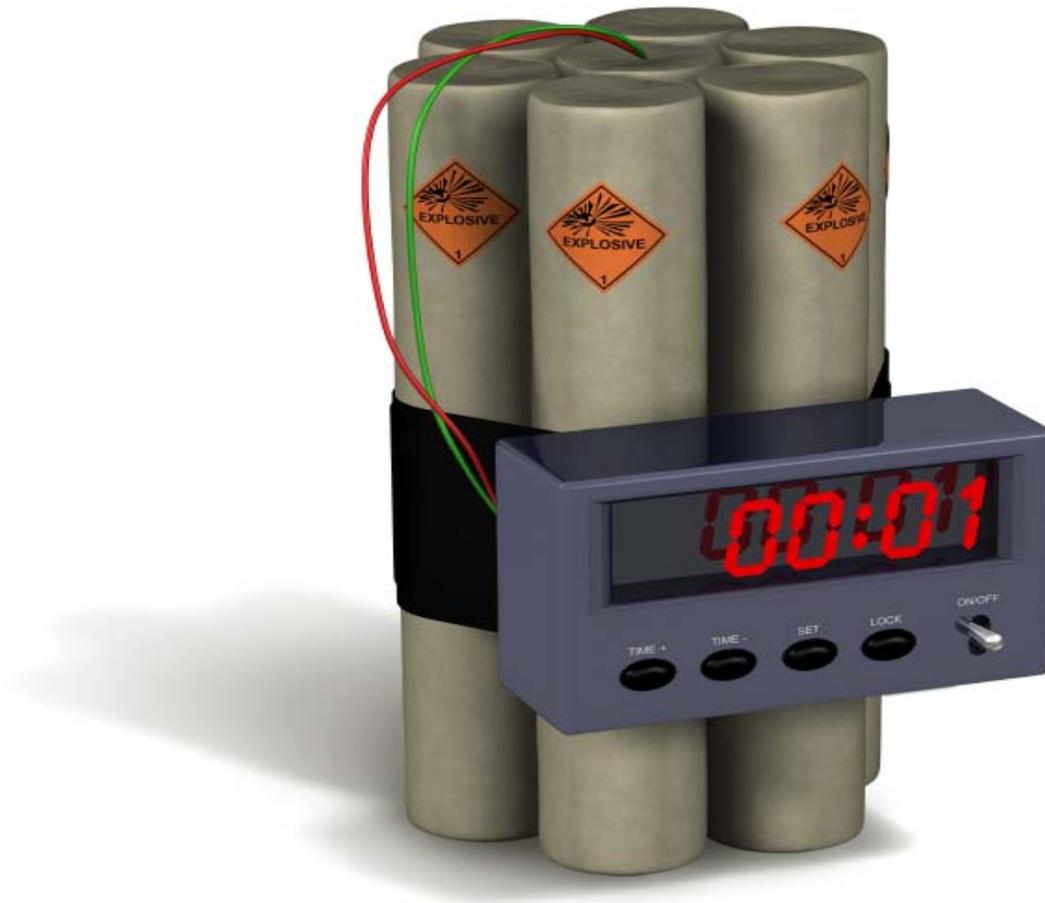
Scanning and Reading of License Plates Along a Route Could Identify Stolen Vehicles.



Sensors Could Readily Detect Illegal and Dangerous Methamphetamine Laboratories.



Sensors Could Detect Facilities Engaged in Illegal Drug Activities.



Postal Vehicle Sensors Could Identify Locations Likely to Contain Caches of Explosives or other Dangerous Materials.



Collecting Periodically Updated Street View Imagery Along a Route Would Be Valuable, But There are Privacy Implications.



Recording Acoustic Profiles Can Map Ambient Sound Levels in Cities, near Airports and Factories and For Other Purposes.



Periodic Dispersal of Insect Pheromones From Postal Vehicles
Could Provide Pest-Control Benefits.



Biological Surveys can Count and Classify Pollen, Bacteria, Insects or Biological Material Present on Airborne Dust.



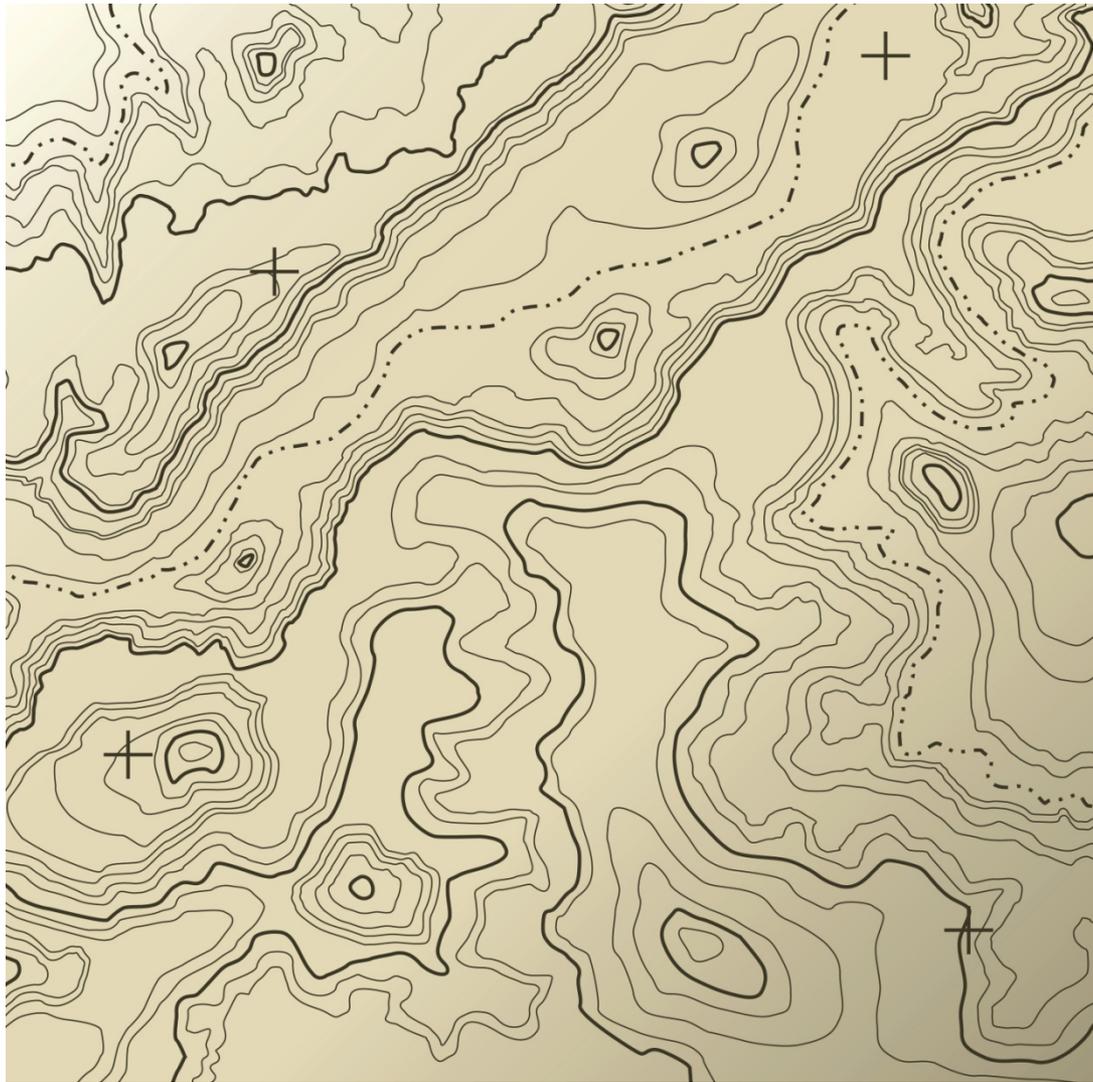
Nuclear Leaks from Nuclear Power Plants and Other Facilities Can Be Detected With Radiological Sensors.



Mapping of Electric Fields Could Help Address Health and Safety Concerns Associated with Such Exposure in Humans.



Postal Vehicle Sensors Could Collect Readings From Gas, Water and Electric Meters.



Small Changes and Short-Term Anomalies Become Apparent if You Build a Baseline Map or Series of Maps by Day or Season.

Proposed Evaluative Criteria

- The Needs of the Nation
- Compatibility with the primary obligations of the postal delivery function
- Technical feasibility
- Economic value
- Cost
- Revenue potential

Add'l Proposed Evaluative Criteria

- Identification of the customer base
- Ability to piggyback multiple sensors
- Ability to accommodate multiple customers
- Public Perception and societal acceptance
- Civil liberties and privacy concerns
- Legal risks

Other Vehicles Are Less Attractive

- Taxis
- Police Cars
- City Fleets
- Transit Buses and Sanitation Trucks
- Dynamically-Routed Delivery Trucks
(UPS/Fedex)

Possible Business Models

The postal operator could:

- Contract everything using a 3rd Party Vendor
- Lease Out Slots
- Provide Sensor Package and Comm. Link
- Act as Full-Service Vendor

Societal and Privacy Implications

- Law Enforcement Applications
- Civil Liberties Concerns
- Intrusive Applications
- Recent news reports: Google's collection of Wi-Fi payload data by its Street View cars



Any Sensor Applications Should Be Fully Consistent With the Trusted Role of the Postal Service in Society.

Conclusions

- Sensor network services offer a way for postal operators to both earn revenue and satisfy important national needs.
- These services warrant scrutiny and oversight given potential privacy and civil liberties risks.
- The concept could be evaluated thoroughly at small scale with a limited number of vehicles.