

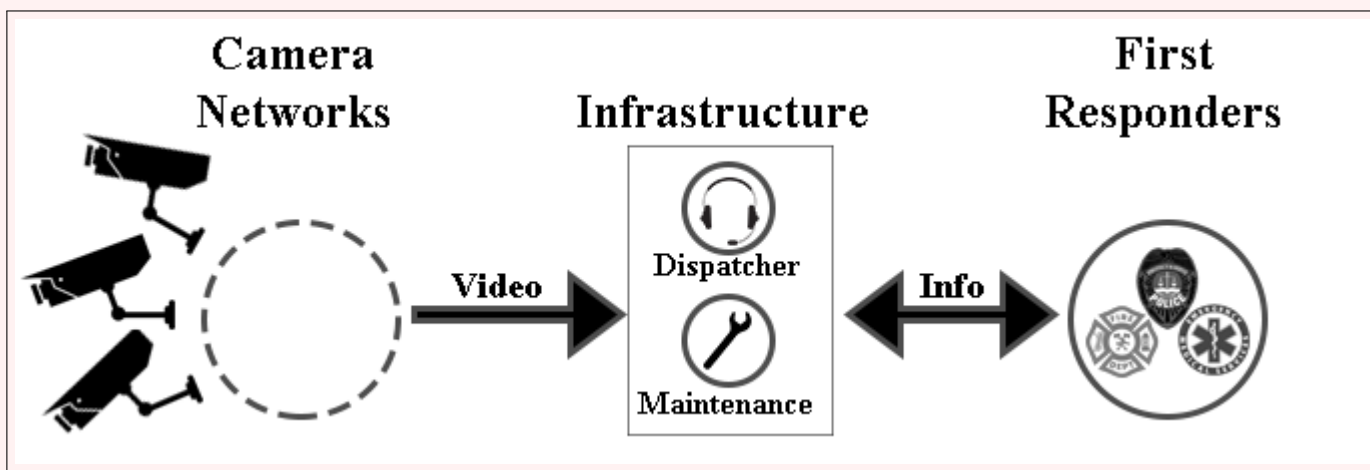
# Multitiered Video Analytics for Abnormality Detection and Alerting to Improve Response Time for First Responder Communications and Operations

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## Project Objective

- Develop a framework and video analytic algorithms for online learning of video characteristics and use them for abnormality alerting.
- Evaluate the impact of developed video analytics and alerting for public safety, specifically in reducing response time related to video surveillance.



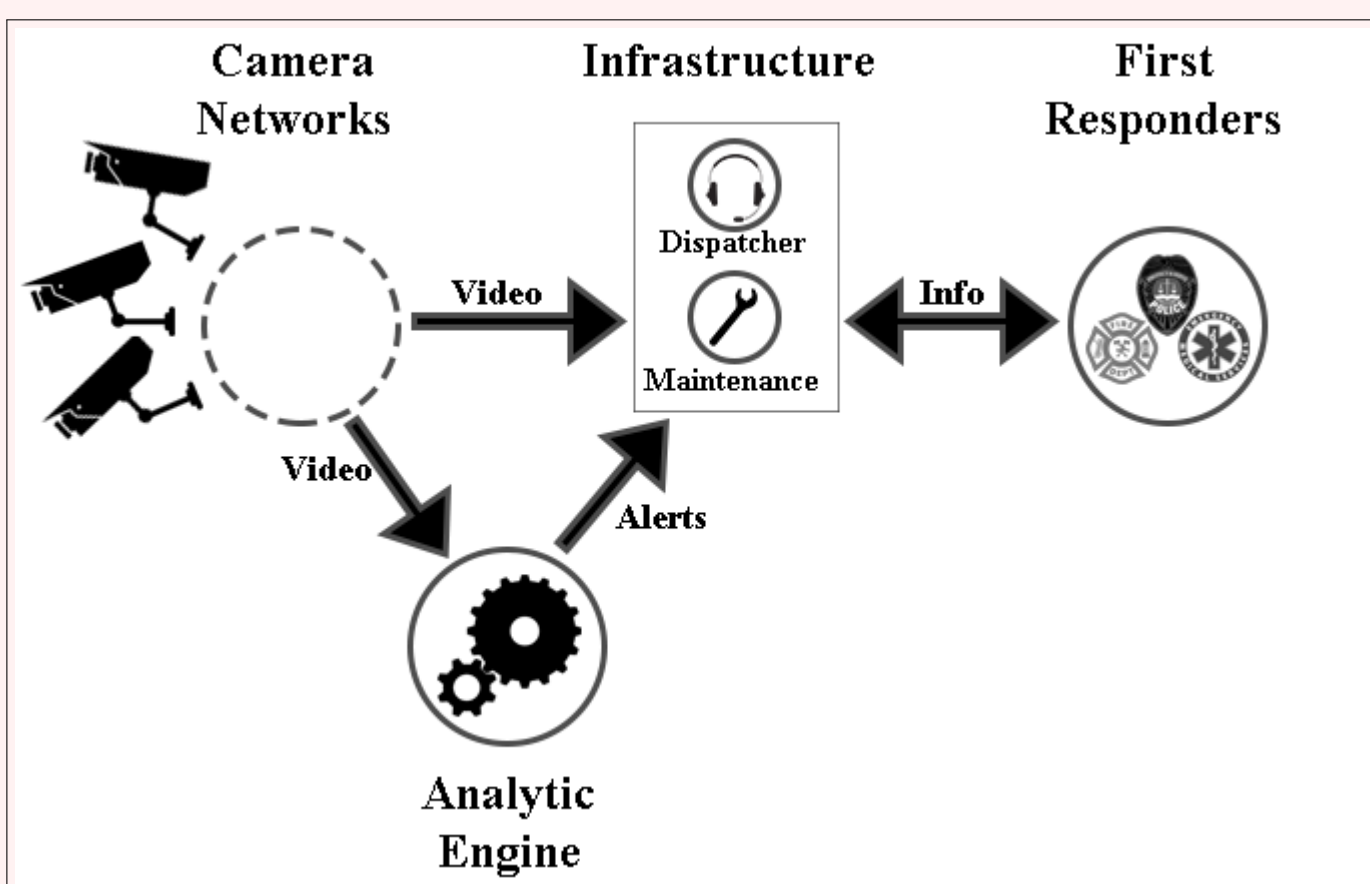
Use case: Dispatchers continuously review thousands of cameras for abnormalities such as non-functional cameras, unusual events, and suspicious behavior to communicate relevant information to first responders.

## Need

- Ability to perform proactive surveillance to quickly respond to incidents.
- Tools for automatic camera operational management and alerting.

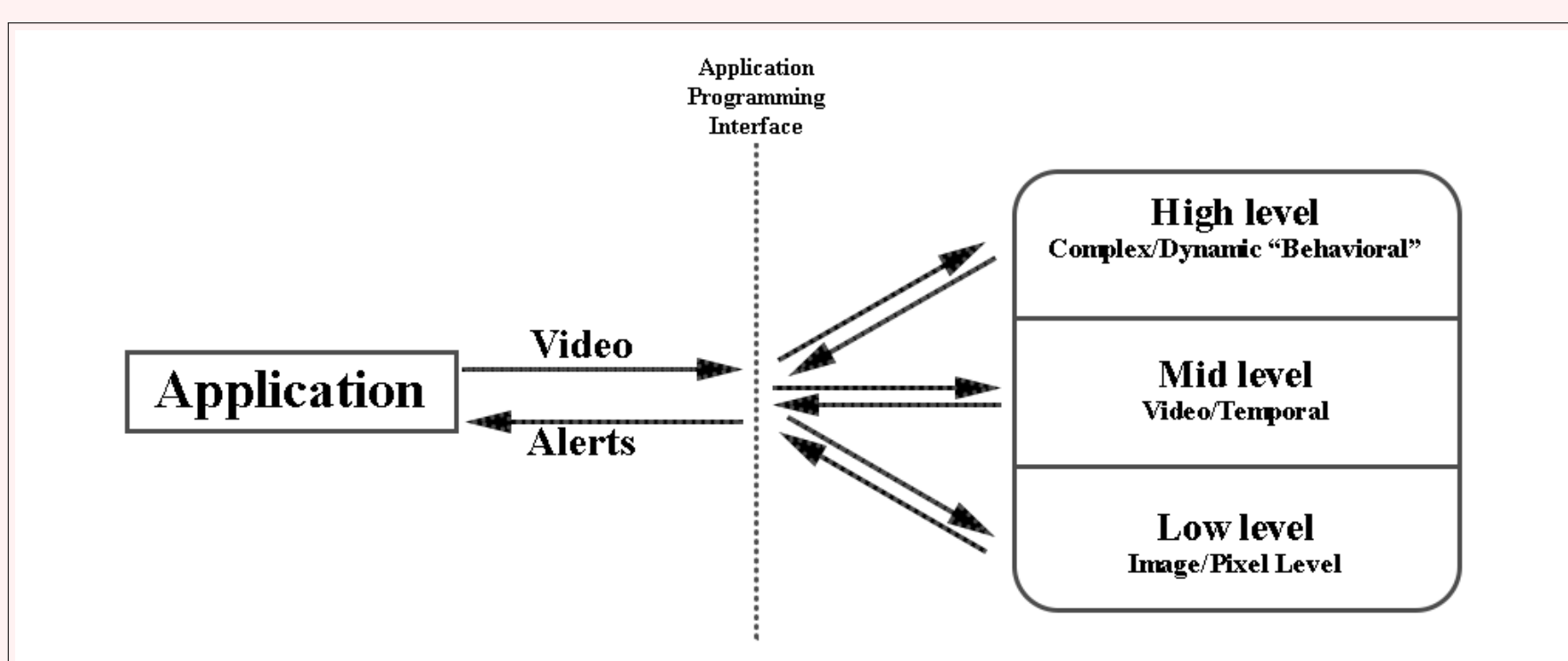
## Proposed Work

Analyze video and generate automatic real time alerts.



- Maintenance alerts
- Abnormal events
- Abnormal behavior

Enable quick relay of information to first responders through dispatchers.

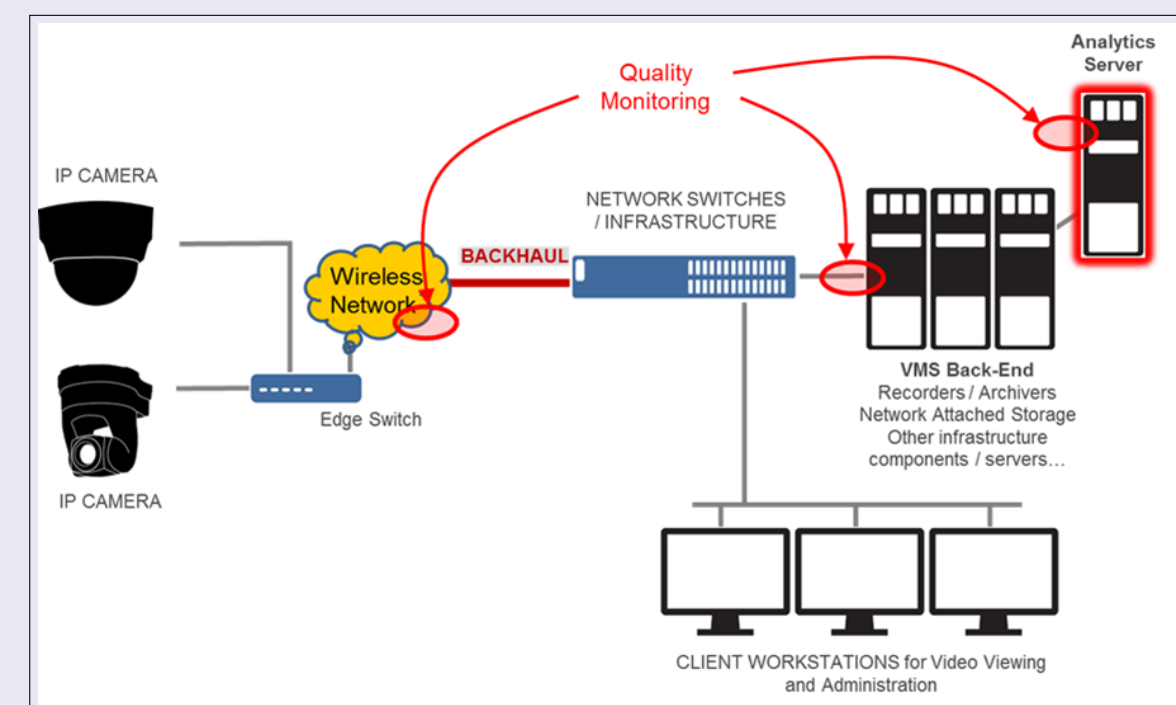
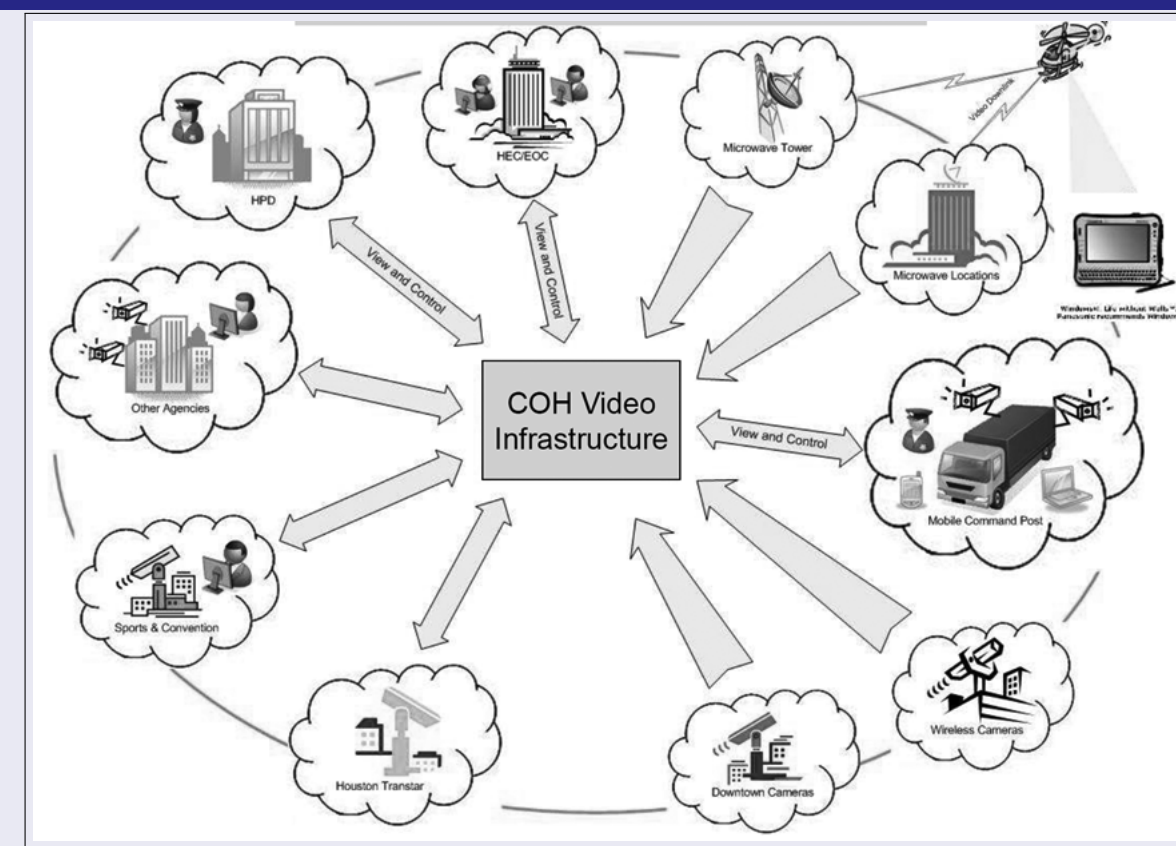


Low level alert	Mid level alert	High level alert
Blocked	Left baggage	Drunk person
Defocussed	Perimeter crossing	Suspicious groups
Moved	Opposite lane driving	
	Unusual motion	

## Partnership with City of Houston

- City of Houston began developing a Public Safety Video System (PSVS) to improve situational awareness of public venues, critical assets, and public safety areas of interest.
- To date, the City has implemented 850+ cameras in the region as well as gaining access to over 400 more through partnerships with other stakeholders.
- It is used by qualified Public Safety personnel for forensic purposes and live viewing on a routine basis.

## COH Public Safety Video Initiative



## Project KPIs and Goals

### Algorithm Development and Evaluation

- Simulated and real-world data to train, test, and evaluate algorithms for different levels of alerting.
- Understanding the accuracy of developed algorithms and computational performance of the overall system.

### Deployment and System Evaluation

- Deploy the analytics for continuous monitoring of cameras within the City of Houston PSVS.
- Benchmarking and performance characterization.
- Usability analysis.

## Impact on Public Safety

- Enhanced analytics development.
- Understanding of novel use cases for analytics.
- Best practices for applying analytics to video surveillance systems.
- PSIM integration requirements understanding.