

ITS OPERATIONAL TEST SUMMARY

Multi-Jurisdictional Live-Aerial Video Surveillance System—Virginia

FHWA Contact: Office of Traffic Management and ITS Applications, (202) 366-0372

Introduction

This ITS Field Operational Test demonstrated the use of live aerial video to improve traffic management operations. A rotary wing aircraft operated by Virginia's Fairfax County Police Department recorded the video. The aircraft transmitted the signal to ground stations for re-transmission and use by Fairfax County and the Virginia Department of Transportation (VDOT). VDOT used the video for incident management and traffic control. The test covered an 8-month period from July 1993 to April 1994.

Project Description

Three Fairfax County police helicopters were equipped with a video camera. The camera weighed less than 100 pounds, and had a 3-watt power output that limited transmission range to 20 miles. Figure 1 illustrates the configuration of the test system.

The six-power camera mounted on the helicopter took video coverage of the traffic situation as it

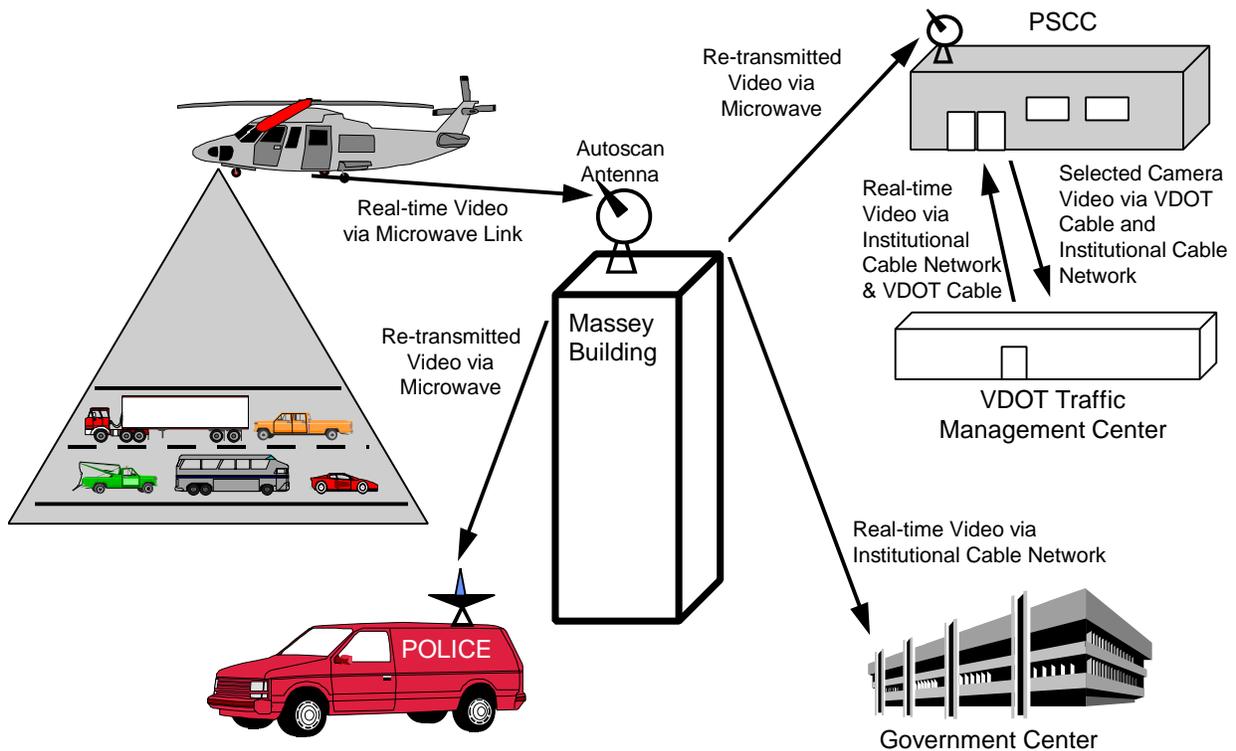


Figure 1: Live Aerial Video System High-Level Configuration

flew over the highways in the county. A transmitter on the helicopter sent the signal to a ground station (Massey Building in Fairfax City). The ground station received the signal via a pole-mounted rotating antenna. The ground station re-transmitted the signal to the Fairfax County

Public Safety Communications Center (PSCC) and a Fairfax County Police Department van. The ground station also sent the signal to the Fairfax County Government Center over a commercial cable link. The PSCC and the VDOT Traffic Management Center in Arlington exchanged video images via cable links.

The helicopter flew twice a day, during peak traffic hours, over a set flight path. The flight path was only interrupted for critical situations. Any change to the flight path required special coordination, since the helicopter was a police asset dedicated to law enforcement tasks. VDOT and the police coordinate very closely on a daily basis in response to incidents and congestion.

The project evaluation focused on three main objectives:

- Demonstrate a cost-effective technical approach to the capture and transmission of video images of traffic incidents and congestion throughout a major urban area
- Identify and develop resolutions for institutional issues related to privacy, security, and interagency sharing of equipment and information
- Demonstrate the utility of the video images for incident management and traffic control.

Results

The test found that the use of aerial video by a transportation agency offered distinct benefits for both real-time traffic operations and long-term analysis of traffic facilities and conditions. The key purpose of the system was the effective communication of traffic conditions to the traffic management agency, the motoring public, and decision makers. Real-time benefits resulting from enhanced communication during an incident included:

- Effective selection of alternate routes for motorists and emergency vehicles
- Rapid identification of secondary incidents
- Efficient deployment of response resources to the incident scene.

The test identified several institutional issues including:

- Ethical conflicts—showing of incident details to the general public
- Potential for a public organization to give or sell aerial video information to private traffic information services
- Potential for a private traffic information service to provide the same service to a public transportation agency.

Although no special events were handled with the use of live aerial video, it was clear that the benefits of having video for such events would be significant. Off-line capabilities included rapid, cost-effective analysis of current and future traffic conditions, and an illustrated view of a jurisdiction's incident response procedures.

Legacy

This service is being continued with cooperation from the Fairfax County Police Department and VDOT Northern Virginia Traffic Operations Center.

Partners

Virginia Department of Transportation

Fairfax County, Virginia

Federal Highway Administration

References

Demetsky, M. J., Evaluation of Live Aerial Video for Traffic Management (Draft), Virginia Department of Transportation, Transportation Research Council, July, 1994.