

VDOT INTERCHANGE USES ETHERNET SWITCHES TO MANAGE TRAFFIC FLOW INTO TUNNELS

An Industrial Ethernet Application

TECHNOLOGY TODAY

Traffic management systems today are increasingly taking advantage of state-of-the-art equipment to not only monitor, but manage traffic flow. Serial communications lines, which have been used for relaying traffic information in the past, are too slow to provide the type of information necessary for immediate response to traffic incidents. Ethernet™ is growing in popularity in the traffic industry where it is desired to proactively manage traffic incidents. Redundancy is also a high priority in today's traffic systems, as traffic incidents can occur 24x7.

ABOUT VIRGINIA D.O.T.

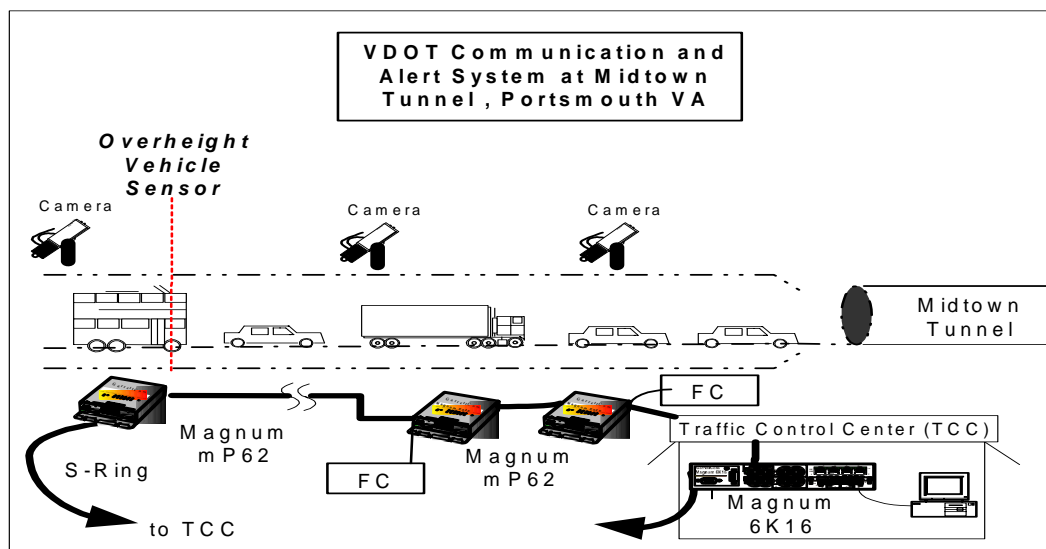
The state of Virginia has the third-largest state-maintained highway system in the US. The Virginia Department of Transportation (VDOT) has responsibility for building, maintaining and operating roads, bridges and tunnels throughout the state. The Pinners Point interchange in Portsmouth, Virginia, offers commuters easier access to the Midtown Tunnel to Norfolk, and provides a more direct route to the Portsmouth Marine Terminal while relieving traffic through the historic Port Norfolk neighborhood. It features a state-of-the-art high speed Intelligent Traffic Management system.

THE CHALLENGE

VDOT consulted with S.Rock/Estabrook Corp. to develop a system that could handle the traffic demands of this busy interchange. Tunnels and bridges pose particular challenges in traffic management. Once a traffic incident occurs, moving traffic around blockages is very difficult. Both prevention of incidents – such as overweight trucks entering tunnels – and early warnings to motorists that can route them around bottlenecks are critical to smooth traffic flow. Serial communications lines were simply not fast enough to allow traffic controllers to respond in time. A second challenge was availability. Traffic management cannot tolerate system downtime. Unlike serial lines, an Ethernet solution offered topological redundancy for high availability.

THE SOLUTION

Hardened Ethernet switches and fiber optic cabling provide the bandwidth and reliability necessary to relay vital information from the 170 Field Controllers (FC's), overweight vehicle detectors, traffic sensors that detect changes in traffic flow, and video cameras spaced along the roadways at Pinners Point to pinpoint incident sites. Now controllers stationed in the Traffic Control Center in Portsmouth can be virtually "there" when a traffic incident occurs.



Standard Ethernet bandwidths are 10, 100, and 1,000 megabits per second, and fiber optic cabling provides high-speed, noise-resistant, secure connectivity over the long distances required in a traffic application that includes highways, bridges and tunnels.

Virginia, D.O.T.

GarrettCom's Hardened Magnum™ mP62 switches in field cabinets and 6K16 managed switches are deployed along the Pinners Point roadway and in the Midtown Tunnel to relay information to the VDOT Traffic Control Center (TCC). The traffic controller consults video cameras spaced along the roadways to pinpoint the incident site. GarrettCom's S-Ring™ Redundancy Management Software facilitates rapid self-healing should a break in the Ethernet LAN communications ring occur. Combined with a fault detection facility to help pinpoint the break, S-Ring software keeps vital traffic information flowing in the VDOT traffic management system until the fault can be repaired.

THE RESULTS

VDOT controllers can now activate variable messaging signs and alarms, and even lower a gate to close the tunnel between the time an overheight vehicle alarm is initiated and the time the offending vehicle would otherwise enter the tunnel, thus reducing tunnel traffic jams and incidents.

Because of Ethernet's high bandwidth, traffic controllers can respond to incidents throughout the interchange within seconds, sending information to electronic message signs and highway advisory radio to give commuters and traveler's up-to-the-minute traffic information.

Controllers can also contact one of the center's Freeway Incident Response Teams, and alert or direct emergency personnel as needed.

ABOUT MAGNUM PRODUCTS

The **Magnum mP62 Managed Hardened Switch** has six 10/100 Mb switched RJ-45 ports and two 100 Mb fiber ports and operates in temperature-uncontrolled environments. It supports single-mode or multi-mode fiber media on a per-port basis to accommodate different fiber optic cabling distances between sites. Power input choices include: AC, -48VDC, 24VDC, 125VDC, with optional dual-source DC.

The **Magnum™ 6K16 Managed Switch** is highly configurable, providing two modular slots for user selection of 100 Mb and 10 Mb fiber ports, Gigabit fiber ports, and 10/100 copper ports, up to a maximum of 16 ports. Comprehensive management software includes Secure Web Management and secure access.

The **Magnum S-Ring Redundancy Manager Software** is based on industry standards, and provides fast fault-recovery in fiber and copper Ethernet LAN ring structures including Gigabit rings. It supports large (50+) rings over long distances using fiber media, and works with multi-vendor hubs and switches in the rings.

ABOUT GARRETTCOM

GarrettCom, Inc., is the leading manufacturer of industrial and carrier-class Ethernet LAN products. GarrettCom offers a comprehensive line field-deployed and control room rack-mount Ethernet Switches for use in heavy-duty telecommunications, power utilities, traffic control, COTS military and industrial automation environments. GarrettCom markets its products through a network of resellers, OEMs, system integrators, and distributors worldwide. For more information on GarrettCom and its products, visit www.GarrettCom.com.



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GarrettCom, Inc.

47823 Westinghouse Drive • Fremont, CA 94539 • PH: (510) 438-9071 • FAX: (510) 438-9072

Email: mktg@garrettcom.com • Web: www.GarrettCom.com