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FREEWAY CORRIDOR SURVEILLANCE AND CONTROL SYSTEM IN FORT WORTH

BY

Wallace E. Ewell

SUPERVISING TRAFFIC ENGINEER
TEXAS DEPARTMENT OF HIGHWAYS AND PUBLIC TRANSPORTATION
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INTRODUCTION

District 2 includes nine North Central Texas Counties with a total area of 7,027 miles and an estimated 1986 population of 1,334,000. Tarrant County, the sixth largest county in the District, contains 80% of the total population and approximately 80% of the registered vehicles. The population of Tarrant County has increased from 861,000 in 1980 to an estimated 1,066,000 in 1986, an increase of 24% in just 6 years! In fact, several of the cities in Tarrant County have experienced growth in excess of 80%. If these figures reflect a true indication of what lies ahead, we are in for real trouble on our highways!

We have reached the limits for expansion of many of our existing Tarrant County freeways. Most of our major facilities are in the reconstruction process now and due to restricted right-of-way, a good part of this work is taking place between retaining walls. It is apparent that since we are approaching the limits of our ability to expand existing facilities, we must find some way to optimize operating conditions on the existing system.

THE SOLUTION OFFERED BY TRAFFIC MANAGEMENT

Fortunately, some very far-sighted federal, state and city officials came to this realization over 15 years ago and started to plan for the congestion that is now becoming a reality in our District. Working together, Bob Hodge, the former District 2 Traffic Engineer, Herman Haenel, our Freeway Operations Engineer in Austin and Walt Cooper, Chief Transportation Engineer for the City of Fort Worth, and others, prepared a conceptual area wide Traffic Management System Planning document and obtained FHWA approval for this comprehensive plan.

This plan involves 191 miles of freeway and when completed will provide:

161	Miles of freeway with surveillance (6876 Loop Detectors).
80	Miles with ramp metering (207 ramps are involved).
80	Miles with frontage road signal control (95 signals).
45	Changeable Message Signs (CMS)
80	Television surveillance cameras (CCTV).
640	Lane control signals (at 160 locations).
6	Highway advisory radio (HAR) locations.
9	Satellite command post locations.
1	Traffic Management Center (command post)-shared with the City of Fort Worth.
1	Data collection facility at the District Headquarters.
300	Miles of highway with Courtesy Patrol Services.

The plan was coordinated with the District's twenty-year project development and control plan to allow for the incorporation of two-thirds of the Traffic Management System construction with the ongoing freeway reconstruction program.

It was estimated that the total construction cost of of the Traffic Management Projects will be approximately $53 million. However, bid prices on completed projects indicate that this figure may be a bit low. This estimate includes the cost of the satellite and Traffic Management Center computer systems, but does not include maintenance and operational expenses. The system is scheduled to be fully operational by the year 2004; although, the District will operate individual system elements as they become available. It was estimated that when fully operational, the cost of operation and maintaining the system will be $2.3 million a year. This obviously is a very expensive undertaking, but the benefit to the highway user is estimated to be a savings of 156,000 vehicle-hours of delay a day. We also expect to see a 12-20% increase in vehicles moved per hour, a 10 mph increase in travel speeds and a 30% reduction in accidents. More efficient freeways mean less time spent in traffic and this translates into a huge savings in fuel, air pollution available productive hours.

PLAN OVERVIEW

The area-wide traffic management plan includes four interrelated functional systems; a remote sensing or surveillance component to constantly monitor operational conditions on the freeways, an interactive control network to allow for the implementation of corrective actions as freeway conditions deteriorate, a joint city-state command post to co-ordinate response measures on the freeways and city streets and an area-wide communications network to link the other systems to the Traffic Management Center and to provide a centralized point of contact for other agencies.

System surveillance will be accomplished through the installation of loop detectors on the freeway main-lanes and ramps and strategically located closed-circuit television (CCTV) cameras. The detector loops will be used to monitor traffic volumes and speed and to detect wrong-way ramp usage. The loops can also be used to collect data for operational analysis and planning purposes. The CCTV cameras will be used to visually verify problems identified by the loop detectors, locate accidents and disabled vehicles and to monitor the effectiveness of the corrective measures implemented from the Traffic Management Center.

The interactive control network offers the system operators several options for correcting conditions on the freeways. Among these options are ramp metering to restrict the volume of traffic entering the freeway, changeable message signs (CMS) to warn motorists of upcoming problems and offer alternate routing information, control of frontage road traffic signals to modify timing for changes in volume, lane-use signals to allow for lane closures and highway advisory radio (HAR) to keep motorists advised of changing road conditions. The operator will also have the option of dispatching the District's courtesy patrol or an incident management team to problem locations. It may also be possible to provide real-time traffic advisory information to local radio, TV and government agencies via the District's computerized public information network.

STATUS OF THE STATE'S PORTION OF THE PROJECT (AS OF NOVEMBER 88):

We are basically on the schedule established by the planning document, although funding and other local issues have forced us to switch projects around. We have 1.5 miles of the system built, 22.4 miles under construction and 3.8 miles with the design work completed. This 27.7 miles represents approximately 35 % of the 80 freeway miles of I-35, I-20, I-30, SH-121, and SH-360 that will eventually be controlled.

SH-121 (from SH-183 to Grapevine) is completed and includes loop detectors and conduit.

The outside lanes of I-35W (Felix to Hattie St.) were completed in May of 1987. This project included loop detectors and mainline conduit installation on the frontage roads and ramps (5 miles total).

The I-30/I-35W interchange north increment - has been completed and included 1 mile of conduit and loop detectors.

The I-35W (Felix to Hattie) inside lane project is under construction at this time and is due completion in 1990. This project includes 57 lane control signals, 4 CMS and conduit connections to the satellite computer location. The CMS were installed early and are being used for traffic control for the remainder of the project.

I-30 (from Westridge to Penticost) is under construction now and includes 1.5 miles of mainline conduit, frontage road traffic signals and loop detectors.

I-30 (from Penticost to University Drive) includes 2 miles of conduit, signals and loop detectors. Construction is in progress at this time.

I-20 (Campus Drive to US 287) - includes 3.5 miles of conduit, loop detectors and traffic signals - this job is under construction now.

SH-360 (Abrams to I-20) - This job is under construction at this time includes 4 miles of conduit and loop detectors, 1 CMS and lane control signals.

I-20/I-35 Interchange - 4 miles of conduit, loop detectors and the satellite computer building are included in this project. Work is in progress at this time.

I-20 (Hemphill to McCart) - This job is under construction now and includes 2 CMS, lane control signals, conduit and detectors. This section of roadway will be connected to the same satellite computer building as the I-35 system. We included three additional radio-controlled CMS that will be used to provide motorists with alternate routing information during the series of construction projects on I-30 and I-20. Two of these signs will be located outside of the loop 820 connections, providing the opportunity to divert traffic if incidents or construction activities block lanes on any of the freeways.

We will also look for the opportunity to implement traffic management elsewhere on our system. This may be the construction or relocation of accident investigation sites, experimental HAR & CMS locations or frequent reviews of existing conditions to see if conventional operational improvements, such as signal re-timing and reallocation of lanes, can be made.

STATUS OF THE CITY OF FT. WORTH'S TRAFFIC MANAGEMENT EFFORT.

The City's Traffic Management project has two phases. The basement of the old city jail has been remodeled to provide a location for the Traffic Management Center. The systems installation phase is in progress and almost completed at this time. This involves the installation of conduit, computers, software design and traffic signal interconnections. It is overall 30% complete. The installation of conduit in the CBD is also almost complete. When completed in February 1989, the city system will include the control of 92 traffic signals in the southwest section of town. Also, 138 signals and 11 CCTV cameras in the CBD.

SUMMARY

These traffic surveillance and control systems will supplement the other Traffic Management efforts that the District is now actively engaged in. These present activities include a 24-hour courtesy patrol, ramp control at several locations, incident management, special event management, a Traffic Management Team, regular planning and operational meetings with the "T", our local transit company, excellent local government relations and an extensive public information program.

The problem of too many cars and not enough roads is not unique to Texas or to this District. We are sure that this plan will help us cope with the traffic woes to come and hopefully provide a better driving environment for the people who travel the highways in this District.

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