TCM Definition: ATMS/Incident Management Program

TCM Project Description and Air Quality Impacts:

Incidents such as vehicles running out of gas, flat tires, debris on the roadway, vehicle fires, stalled vehicles and minor and major accidents are believed to cause at least half of the traffic congestion. By reducing incident durations (time for incident detection, response and clearance), incident management eliminates much of this congestion.

The implementation of the Advanced Transportation Management System (ATMS) will reduce incident detection and response time through improved surveillance and communication. In addition, the efforts of the Incident Management Task Force will lead to the implementation of a Regional Incident Management Program that includes activities and steps designed to reduce incident durations through faster response and roadway clearance. This analysis considers the benefits of only freeway incident management.

	1996
TCM HC Reduction (Tons/Day)	0.93

Cost Impacts:

Estimated Capital Cost	$18,400,000

Regional Commitment:

TIP Tier I $18,400,000

Note:			
	R 166	Variable Message Signs	$4,700,000
	R 167	Comm. System - Downtown	$5,600,000
	R 168	Comm. System - I-85	$2,700,000
	R 169	Comm. System - I-75 South	$1,300,000
	R 170	Comm. System - I-75 North	$2,100,000
	R 171	Aerial Surveillance System	$ 750,000
	R 172	Incident Management Vehicles	$ 250,000
	R 173	Add. Incident Management	$1,000,000

Assumptions:
(a)   50% of congestion is caused by incidents
(b)   50% projected reduction in incident durations
(c)   20% cold starts

Calculations:

The air quality benefits of the Atlanta Regional Incident Management Program may be quantified as follows:

1. The program will likely reduce incident durations by 50 percent. This 50 percent reduction in incident duration will result in incident delay reduction of 75 percent, based on the following formula developed by ARC:

% reduction in incident delay = $1 - (1-X)^2$
    X = % reduction in incident duration

The formula was developed geometrically and is based on the attached schematic developed by Cambridge Systematics, Inc.

2. The 75 percent reduction in incident congestion will result in a 10 percent increase in average travel speeds on Atlanta's freeway system, based on the following formula developed by ARC:

% increase in speed = $(1/((1-Y/2)(1/S)+(Y/2F))-S)/S$
    Y = % reduction in incident congestion (75%)
    S = average travel speed before incident management (45.6 mph)
    F = free flow speed (60 mph)

The formula is based on the fact that at least half of freeway congestion is caused by incidents.

3. The 10% increase in average travel speed will raise freeway speeds from 45.6 mph to 50.2 mph.

4. The reduction in vehicle emissions is as follows:

a) Emissions prior to incident management:
    (45.6 mph emission rate for 20% cold starts)(VMT)
    = (0.97)(28,215,531) = 27,369,065 grams or 30.17 tons

b) Emissions after incident management:
    (50.2 mph emission rate for 20% cold starts)(VMT)
    = (0.94)(28,215,531) = 26,522,599 grams or 29.24 tons

c) Reduction in emissions = 0.93 tons

Caveats:

SCHEMATIC OF TRAFFIC FLOW DURING AN INCIDENT
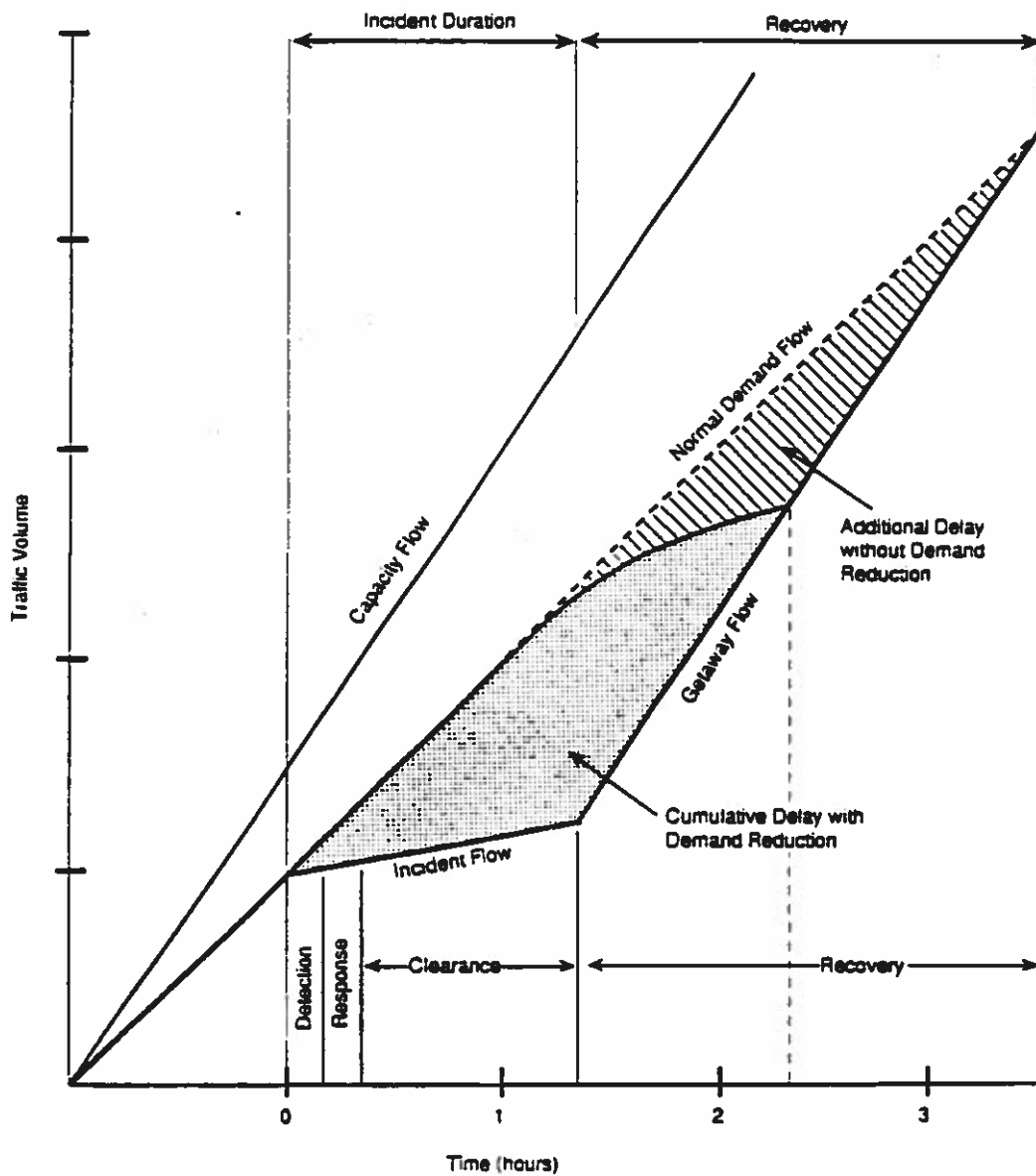
Reference: Cambridge Systematics, Incident Management, Alexandria, VA: Trucking Research Institute, October 1990.