

# CE474: Traffic Systems Design-Fall 2004

Class 17 – ITS/Arterial System Management  
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# Arterial System Management

## The Future: ITS Application

Technology	Deployment Level	Limiting Factors	Comments
Adaptive control strategies	Limited Deployment	Cost, technology, perceived lack of benefits	<b>Jury is still out</b> —has shown benefits in some cases, cost still a prohibitive factor, some doubt among practitioners on its effectiveness
Arterial information for ATIS	Moderate Deployment	Limited deployment of appropriate surveillance, difficulty in accurately describing arterial congestion	<b>Holds promise</b> —new surveillance technology likely to increase the quality and quantity of arterial information
Automated red light running enforcement	Moderate Deployment*	Controversial, some concerns about privacy, legality	<b>Successful</b> —but must be deployed with sensitivity and education
Automated speed enforcement on arterial streets	Limited Deployment*	Controversial, some concerns about privacy, legality	<b>Jury is still out</b> —public acceptance lacking, very controversial

# Arterial System Management

## The Future: ITS Application

Technology	Deployment Level	Limiting Factors	Comments
Integration of time-of-day and fixed-time signal control across jurisdictions	Widespread Deployment	Institutional issues still exist in many areas	<b>Successful</b> —encouraged by spread of closed-loop signal systems and improved communications
Integration of real-time or adaptive control strategies across jurisdictions (including special events)	Limited Deployment	Limited deployment of Adaptive Control Strategies, numerous institutional barriers	<b>Holds promise</b> —technology is becoming more available, institutional barriers falling
Integration with freeway (integrated management)	Limited Deployment	Institutional issues exist, lack of standards between systems preventing integration	<b>Holds promise</b> —benefits have been realized from integrated freeway arterial corridors
Integration with emergency (signal preemption)	Widespread Deployment	None	<b>Successful</b>
Integration with transit (signal priority)	See Chapter 5, "What Have We Learned About Advanced Public Transportation Systems?"	See Chapter 5, "What Have We Learned About Advanced Public Transportation Systems?"	See Chapter 5, "What Have We Learned About Advanced Public Transportation Systems?"

# Arterial System Management Adaptive Control Strategies

City/County	System	Number of Intersections
Los Angeles, CA	ATSC	1170
Oakland County, MI	SCATS	350+
Hennepin County, MN	SCATS	71
Arlington, VA	SCOOT	65
Minneapolis, MN	SCOOT	60
Anaheim, CA	SCOOT	20
Durham, NC	SCATS	unknown

# Adaptive control strategies

## Potential Delay Reduction Benefits

Location	System	Benefits Realized
Broward County, FL*	SCATS	Delay reduced by up to 42%, travel time reduced by up to 20%
Oakland County, MI	SCATS	Delay reduced by 6.6% to 32%, with an average of 7.8%
Newark, DE area	SCATS	Travel time reduced by up to 25%
Los Angeles, CA	ATSC	Delay reduced by 44%, travel time reduced by 13%
Minneapolis, MN	SCOOT	Delay reduced by up to 19% during special events

## How often do we “retime” the signals?

	As Needed	1 year or less	2 years	3-5 years	5+ years
# of agencies	62	53	21	41	18
% of agencies	31.8%	27.2%	10.8%	21%	9.2%

# Adaptive Signal Control - The Difference

Equipment/Task	Costs of SCOOT vs. Standard
Controllers	Same
Detectors	Increases
Loop siting, validation, and fine tuning	No O&M costs (one-time cost)
Signal plans/updates	Decreases
Central equipment and communications	Same as any computer system

# Adaptive Signal control – The Cost

System	Central Hardware (\$)	Central Software (\$)	Local Controllers* (\$)	Detectors*
SCATS <sup>†</sup>	30,000	40,000 - 70,000	4,000 - 6,000	5,000 - 7,000
SCOOT	30,000	unknown	unknown	5,000 - 7,000
OPAC	20,000 - 50,000	100,000 - 200,000	4,000 - 6,000	unknown
RHODES	50,000	500	unknown	unknown
ATCS	40,000 - 50,000	1,000 + license	8,000 - 10,000	5,000 - 10,000

# Arterial System Management - ATIS

Technology*	1999 Level of Deployment (Number of Sites)
Dedicated cable TV	5.0% (18)
Telephone system	5.8% (21)
Internet websites	7.8% (28)
Pagers/personal data assistants	2.8% (10)
Interactive TV	0.3% (1)
Kiosks	3.0% (11)
E-mail or other direct PC communication	4.4% (16)
In-vehicle navigation systems	0.3% (1)
Cell phone/voice	1.1% (4)
Cell phone/data	0.6% (2)
Facsimile	5.0% (18)
Other	1.9% (7)

# Arterial System Management – Enforcement

Site	Impact on Violations and Citations	Impact on Crashes
New York, NY	Violations reduced by 34%	Angle crashes reduced by 60-70% Some increase in rear-end crashes
Howard County, MD (2 sites)	Warnings reduced by 21-25% Citations reduced by 42-50%	Collisions reduced by 40%
Oxnard, CA	Violations reduced by 42% at sites Violations reduced by 22% city wide	Collisions reduced by 24%
San Francisco, CA	Citations reduced by 42%	Injury crashes reduced by 24%
Scottsdale, AZ	Violations reduced by 20%	Collisions reduced by 55%
Minnesota	Citations reduced by 29% for all vehicles Citations reduced by 63% for trucks	unknown
Fairfax, VA (9 sites)	Citations reduced by 44%	unknown

# Arterial System Management Signal Preemption

Percent of signals that allow for preemption for emergency vehicles	Number of agencies by type (percentage)		
	State DOT	County Agency	City Agency
100% to 25%	9 (17%)	26 (26%)	53 (29%)
1% to 24%	25 (47%)	38 (36%)	81 (45%)
0%	19 (36%)	41 (38%)	48 (26%)
Total (340 agencies).	53 (100%)	105 (100%)	182 (100%)

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- Discreet to use - sends out an invisible signal
- Mounts easily on dash like a radar detector
- Infrared signal not strobe like others on the market
- Plug into lighter & go
- Portable compact design
- Priced less than 1/2 of other competing products

- All Emergency Responders
- Volunteer 1st Responders
- Police & Law Enforcement Personnel
- Fire Fighters
- EMS Personnel
- Private Investigators
- Emergency Volunteers
- City & State Highway Workers
- Security Personnel
- Community Services
- Mass Transit
- Doctors
- Police
- ... and MUCH MORE!

Questions? Call FAC of America's  
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**1-877-770-MIRT x107**  
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