

AN INTRODUCTION TO
INTELLIGENT TRANSPORTATION SYSTEMS

1.212
SPRING 2003

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Mon/Wed 2:30 -4:00

BLOCK 1

_____ (Lectures 1, 2)

INTRODUCTION TO ITS

Basic Concepts

Continued

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February 7, 2005

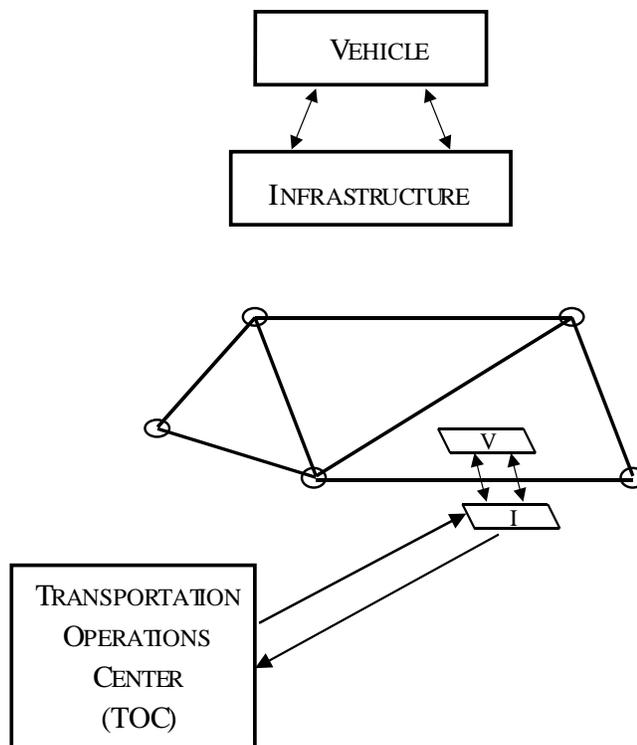
INSTITUTIONAL ISSUES

- ◆ Privacy/enforcement
- ◆ Anti-trust
- ◆ Who is in Charge?
 - ◆ Public/Private Partnership
- ◆ International Cooperation
- ◆ Tort Liability
- ◆ Procurement
- ◆ Marketplace

INSTITUTIONAL ISSUES

- ◆ Interagency Coordination and Cooperation
 - ◆ Metropolitan Area Traffic Management
 - ◆ Federal and State Departments and Agencies
- ◆ Adaptation of Existing Posers and Organizational Forms
- ◆ Collaborative vs. Adversarial Approaches
- ◆ Public/Private Partnership Agreements

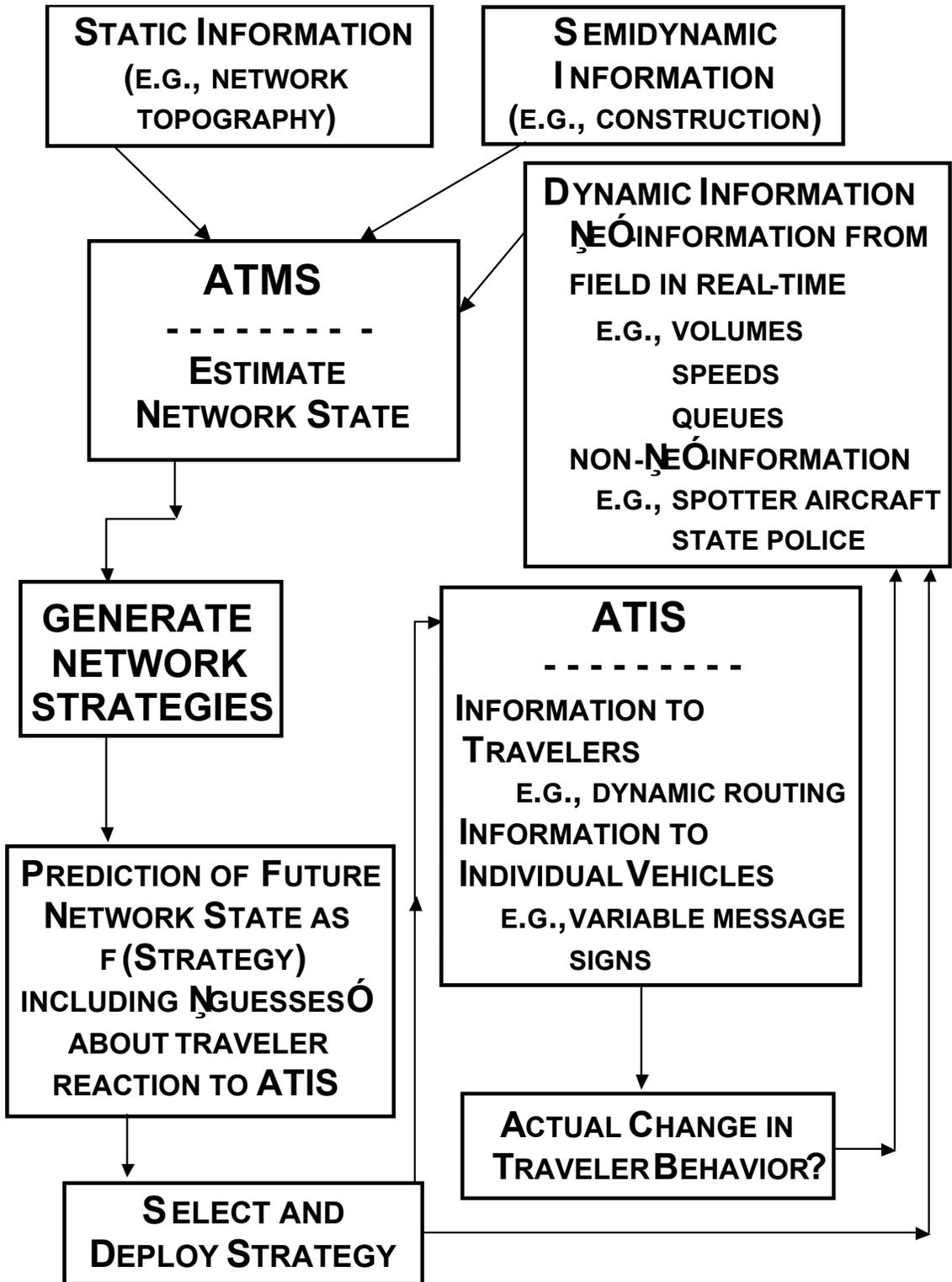
INTELLIGENT TRANSPORTATION SYSTEMS (ITS)



ATMS - - ADVANCED TRANSPORTATION MANAGEMENT
SYSTEM
(OPERATOR)

ATIS - - ADVANCED TRAVELER INFORMATION SYSTEM
(CUSTOMER)

DISCUSSION: What specific actions can ATMS take to improve network performance?



TRANSPORTATION AND CHANGE

Our transportation system provides fundamental and basic services to society, and has done so for thousands of years.

- ◆ However, as we begin the 21st century, the field is subject to many changes.
- ◆ These transitions occur on the dimensions of technology, systems and institutions and characterize the field in its broadest sense.

TRANSITIONS

- ◆ What are these transitions?
- ◆ What do they mean for the education of the “New Transportation Professional”?

CLIOS

Complex

Large-scale

Integrated

Open

Systems

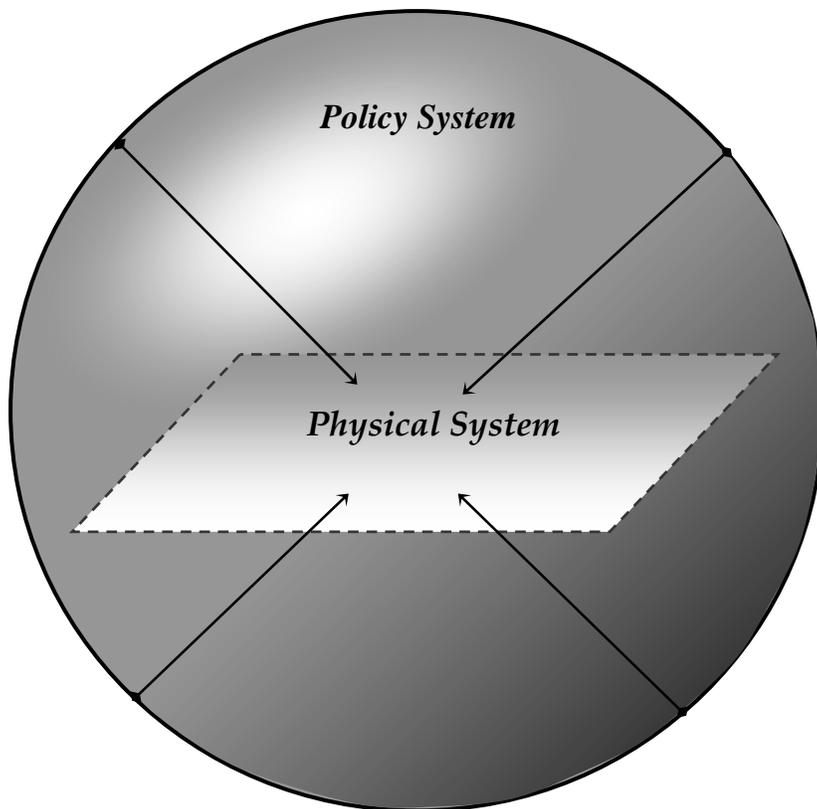
COMPLEXITY

Complexity as in CLIOS

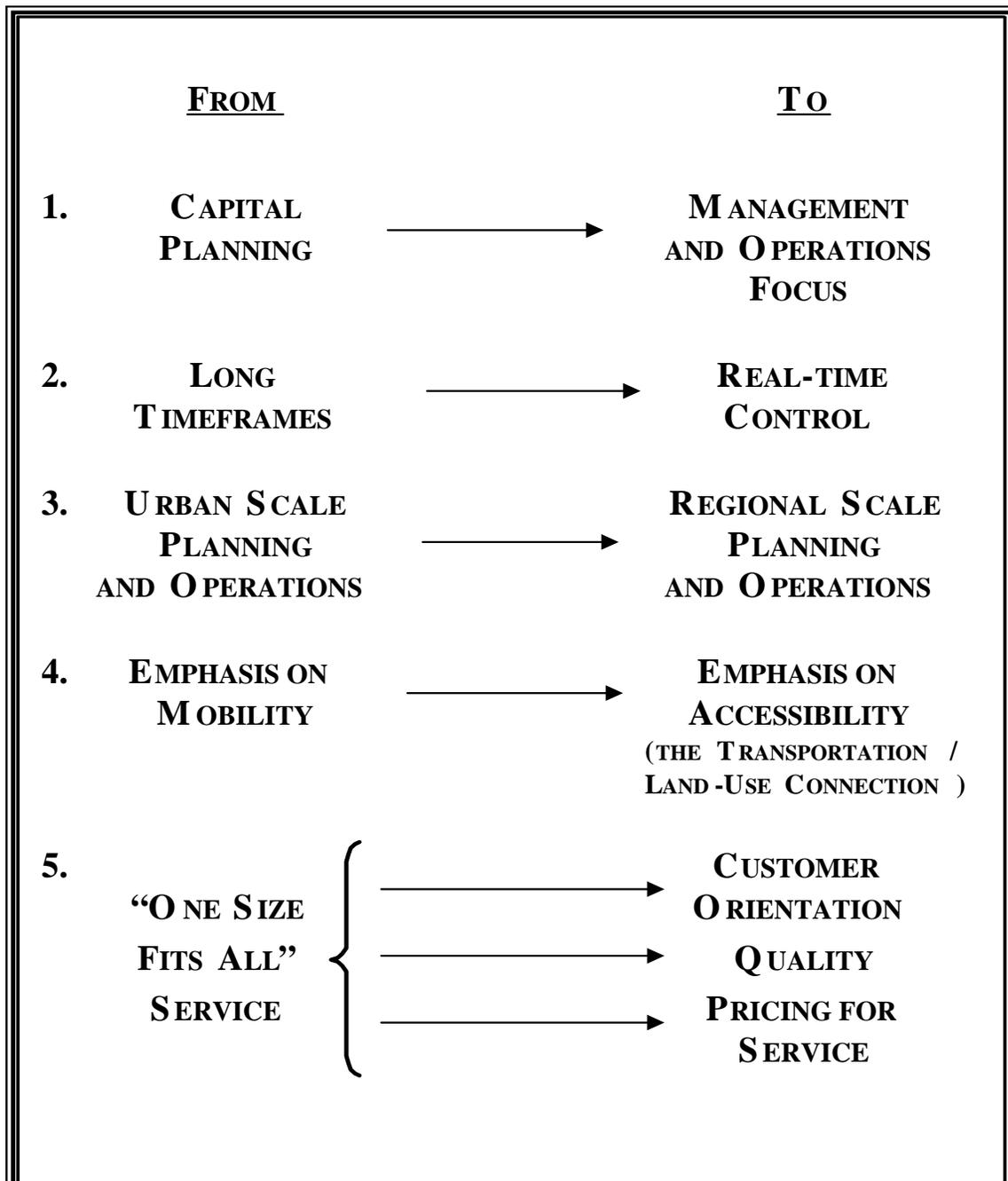
(Sussman, “The New Transportation Faculty: The Evolution to Engineering Systems”, *Transportation Quarterly*, Summer 1999):

- ◆ A system is *complex* when it is composed of a group of related units (subsystems), for which the degree and nature of the relationships is imperfectly known. Its overall behavior is difficult to predict, even when subsystem behavior is readily predictable. Further, the time-scales of various subsystems may be very different (as we can see in transportation -- land-use changes, for example, vs. operating decisions).

NESTED COMPLEXITY



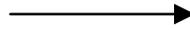
SUMMARY OF TRANSITIONS



FROM

TO

6. ALLOCATE
CAPACITY
BY QUEUING



ALLOCATE
CAPACITY
BY PRICING

7. AGGREGATE
METHODS FOR
DEMAND PREDICTION



DISAGGREGATE
METHODS FOR
DEMAND PREDICTION

8. EPISODIC DATA
FOR
INVESTMENT PLANNING



DYNAMIC DATA
FOR
INVESTMENT PLANNING
(AND OPERATIONS)

9. PUBLIC FINANCING
FOR
INFRASTRUCTURE
AND OPERATIONS



PRIVATE AND PUBLIC/
PRIVATE PARTNERSHIPS
FOR FINANCING
OF INFRASTRUCTURE
AND OPERATIONS
USING HYBRID RETURN
ON INVESTMENT
MEASURES

10. INFRASTRUCTURE
CONSTRUCTION AND
MAINTENANCE PROVIDERS



NEW HIGH-
TECHNOLOGY
PLAYERS

FROM

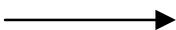
To

16. INDEPENDENT
CONVENTIONAL
INFRASTRUCTURE
PROJECTS



LINKED ADVANCED
INFRASTRUCTURE
PROJECTS REQUIRING
A SYSTEM
ARCHITECTURE

17. VEHICLES AND
INFRASTRUCTURE
AS INDEPENDENT



VEHICLES AND
INFRASTRUCTURE AS
ELECTRONICALLY
LINKED

18. REDUCING
CONSEQUENCES
OF CRASHES



CRASH AVOIDANCE

19. FROM
MODAL
PERSPECTIVE

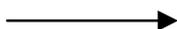


To
INTERMODAL
PERSPECTIVE



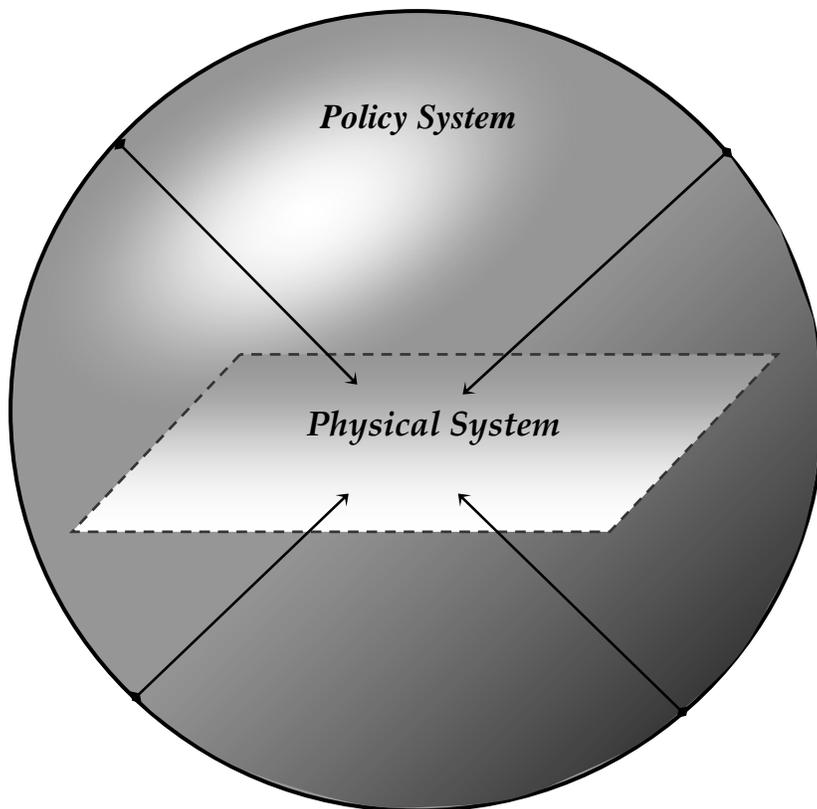
AND ON TO
SUPPLY CHAIN
MANAGEMENT

20. NARROW
TRANSPORTATION
SPECIALISTS



THE NEW
TRANSPORTATION
PROFESSIONAL

NESTED COMPLEXITY



THE T-SHAPED TRANSPORTATION PROFESSIONAL

