Introduction to Transportation Systems

SUMMARY

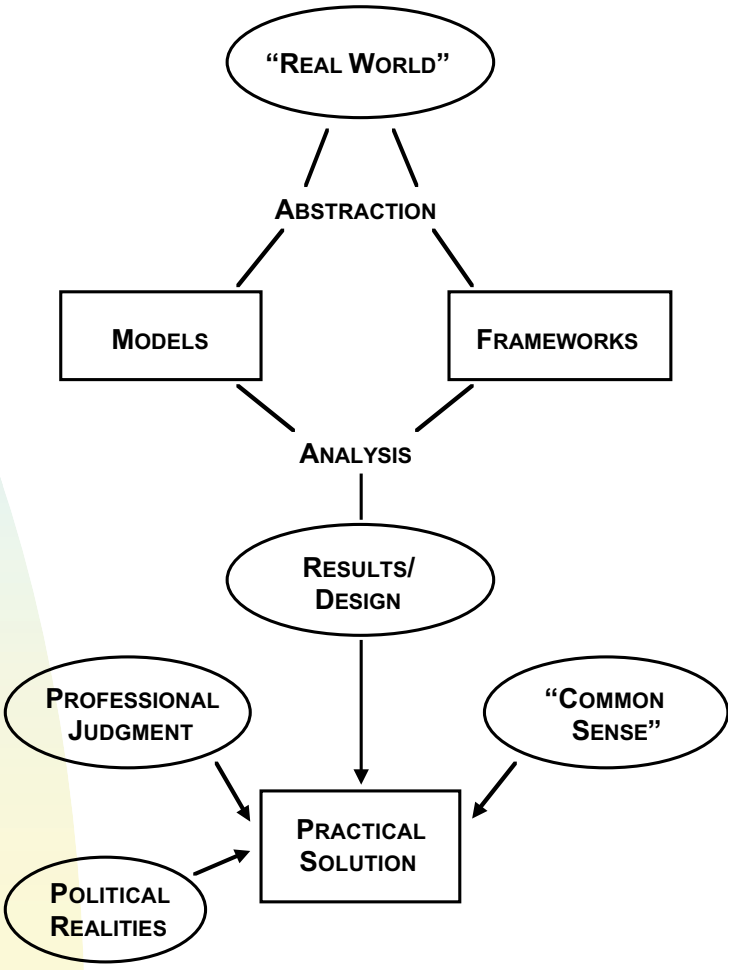
NOTE TO INSTRUCTORS: *These slides cover major ideas from the course, and should be supplemented with other materials presented by the instructor.*

SO WHERE HAVE WE BEEN IN 1.221?

- Concepts
  - CLIOS
  - 30 Key Points
- Freight Transportation
  - Total Logistics Costs (TLC)
  - LOS for freight modes
  - Operating issues
- Traveler Transportation
  - Automobiles
  - Urban Form and Transportation
  - ITS
  - Urban Public Transportation
  - Megacities
  - Intercity Traveler Transportation--Air, Amtrak, e.g.

SOME EMPHASIZED POINTS

- The Triplet of Technology/Systems/Institutions
- Level-of-Service (LOS)--freight and travelers--the importance of the customer
- The Cost/LOS trade-off
- Supply/Demand/Equilibrium
- The Vehicle-cycle
- Transportation as a component of a larger social-political-economic system--a force for good and otherwise


"Real World"
Abstraction
Models
Frameworks
Analysis
Results/
Design
Professional
Judgment
"Common
Sense"
Practical
Solution
Political
Realities

TRANSITIONS IN THE WORLD OF TRANSPORTATION: A SYSTEMS VIEW

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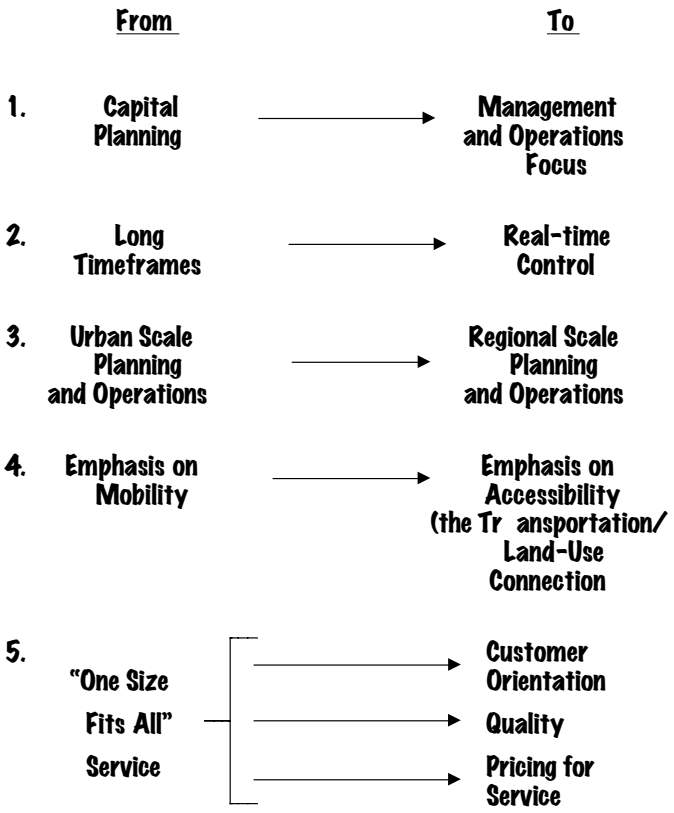
SUMMARY OF TRANSITIONS



SUMMARY OF TRANSITIONS (CONTINUED)

	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

SUMMARY OF TRANSITIONS (CONTINUED)

	From		To
11.	Static Organizations and Institutional Relationships	→	Dynamic Organizations and Institutional Relationships
12.	Professional Emphasis on Design of Physical Infrastructure	→	Professional Emphasis on Transportation as a Complex, Large-Scale, Integrated, Open System (CLIOS)
13.	Economic Development	→	Sustainable Development
14.	Computers Are "Just a Tool"	→	Ubiquitous Computing

15.	From	To	And On To
	Supply-Side Perspective	→ Supply/Demand Equilibrium Framework	→ Systems that Never Reach Equilibrium

SUMMARY OF TRANSITIONS
(CONTINUED)

	From		To		And On 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		