

# Strategic Plan for Advanced Travel Modeling at CMAP: Data Development

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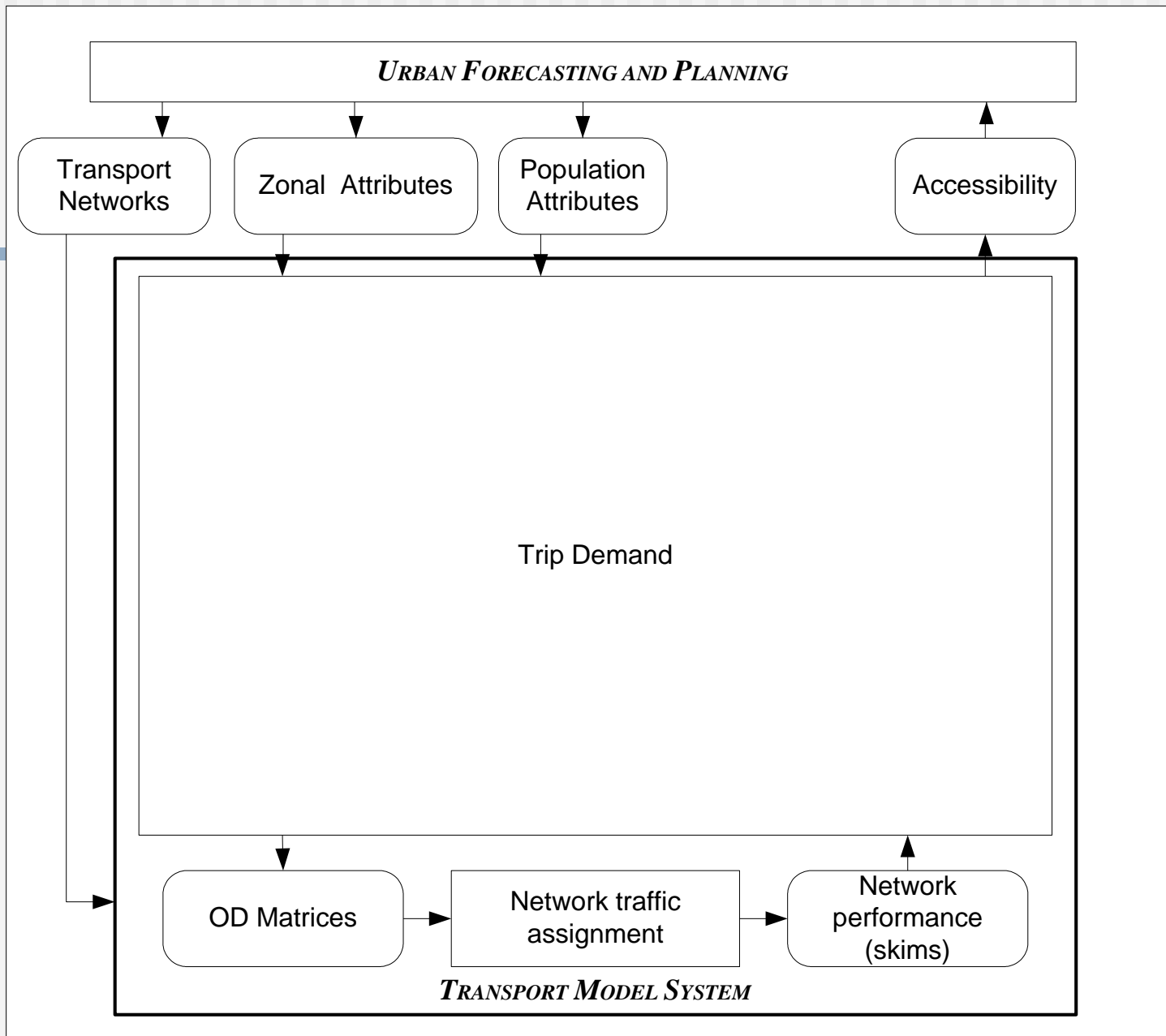
Residency  
March 8-11, 2010

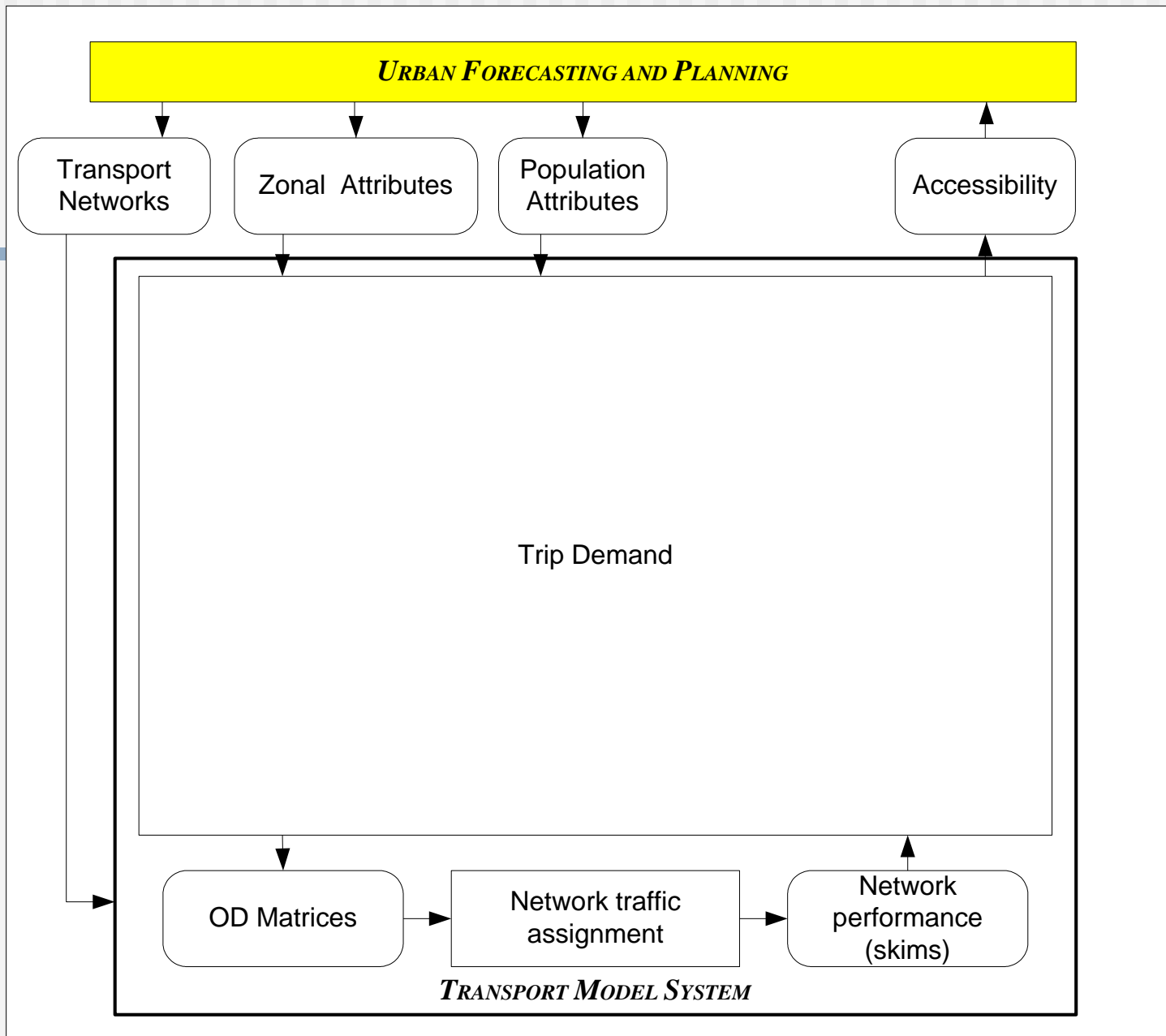
John L Bowman, Ph.D.  
John\_L\_Bowman@alum.mit.edu  
JBowman.net

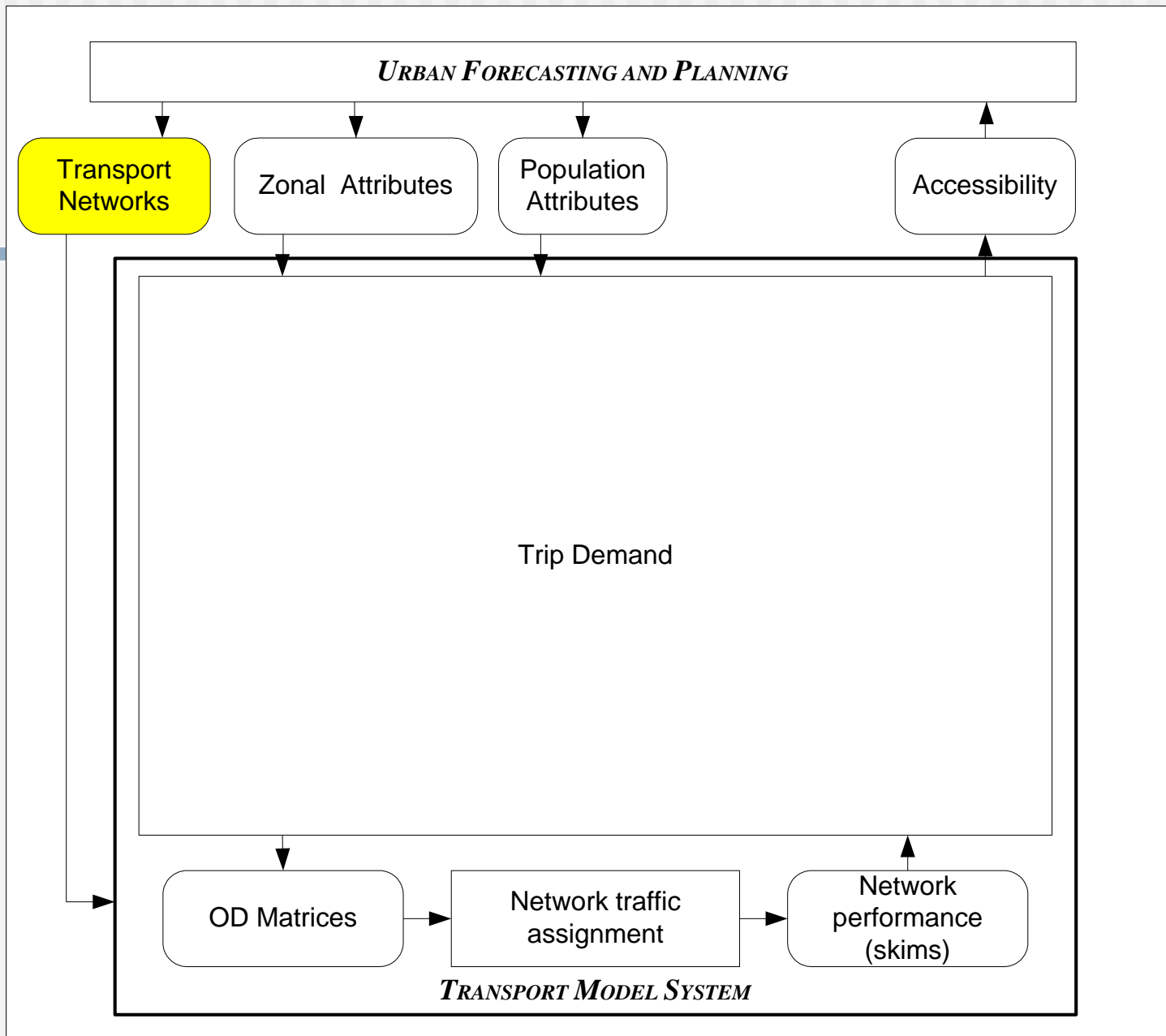
# Outline

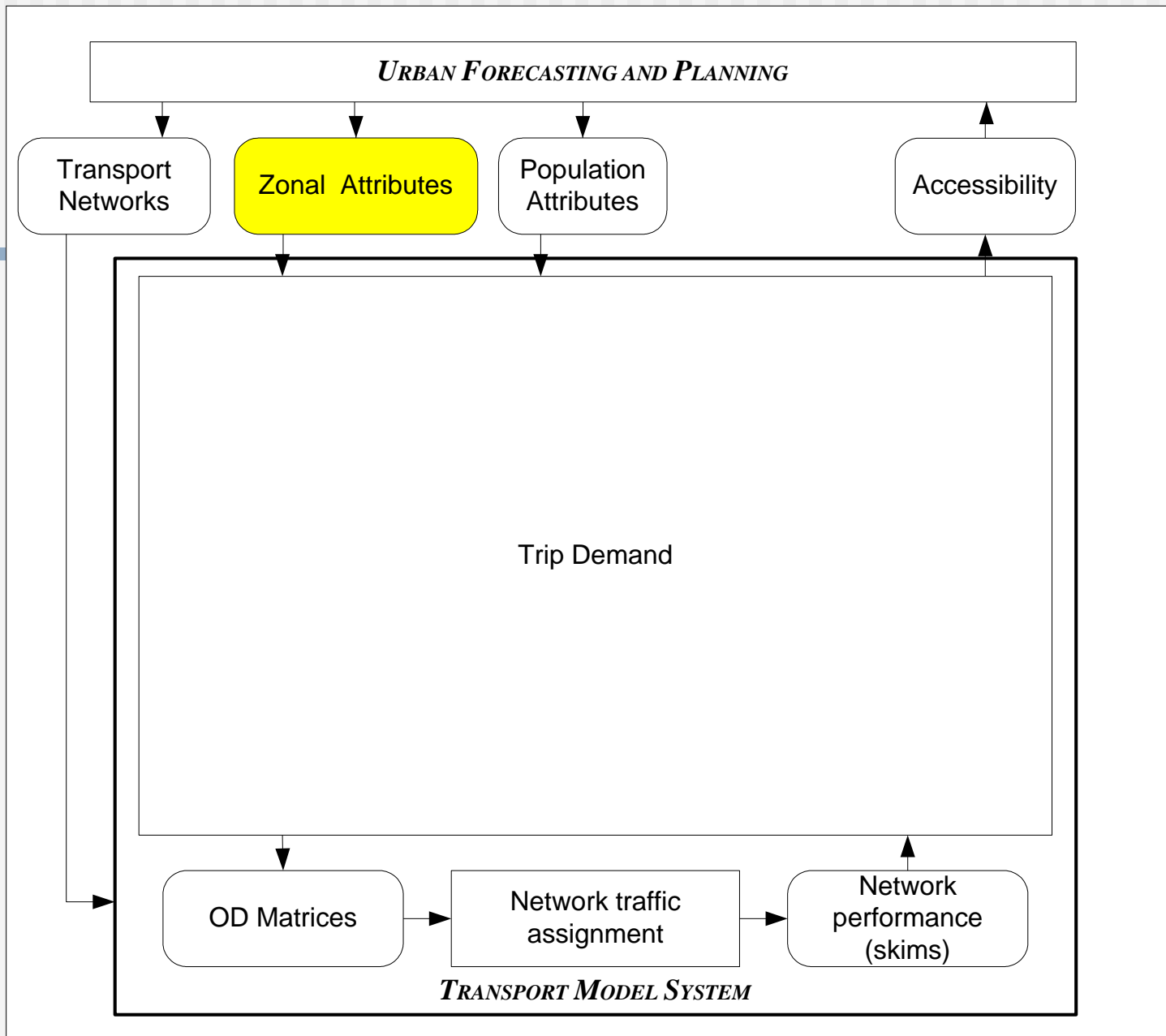
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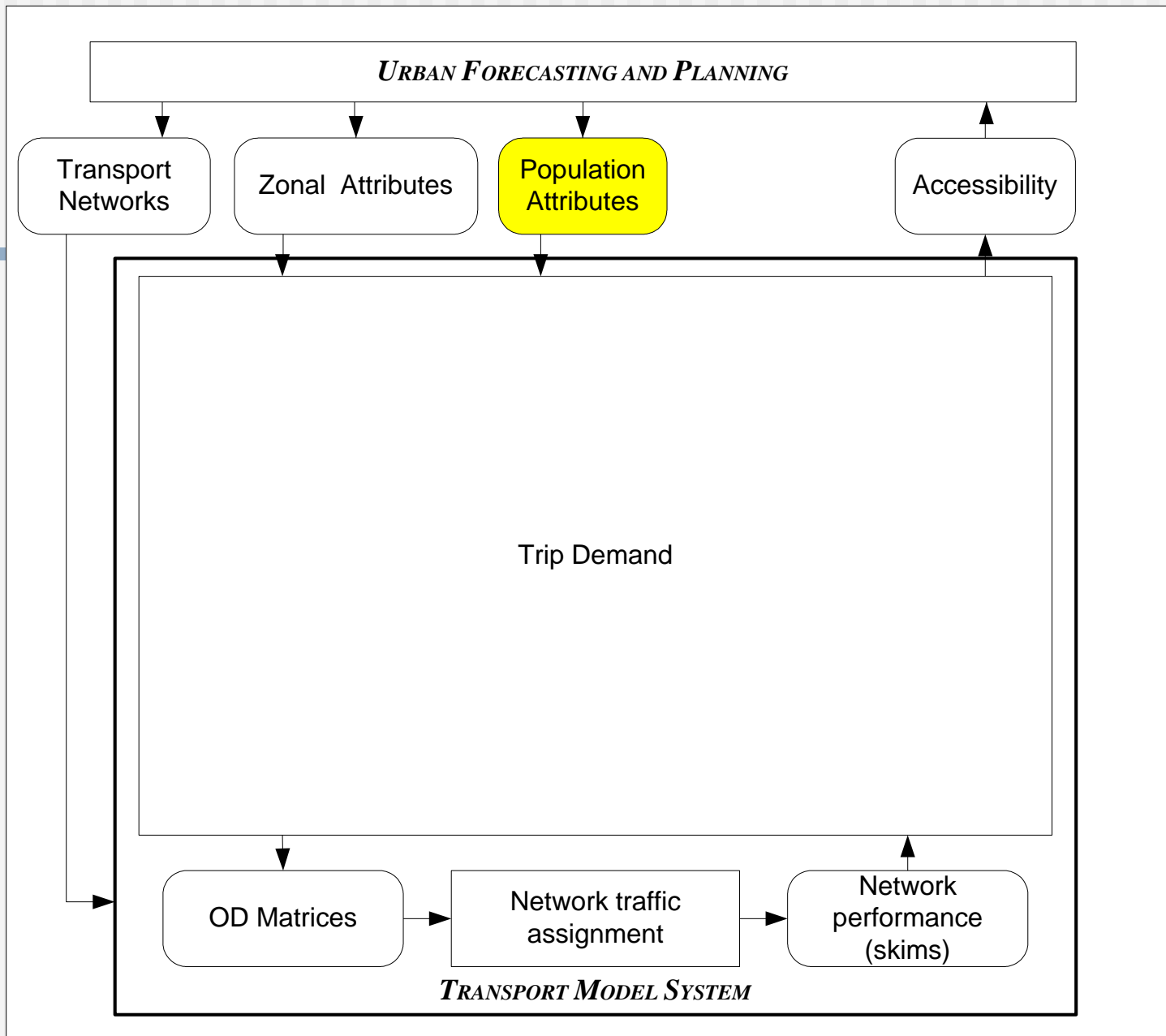
- Travel Model System
- Advanced Model Components
- Development Strategies
- Data Needs

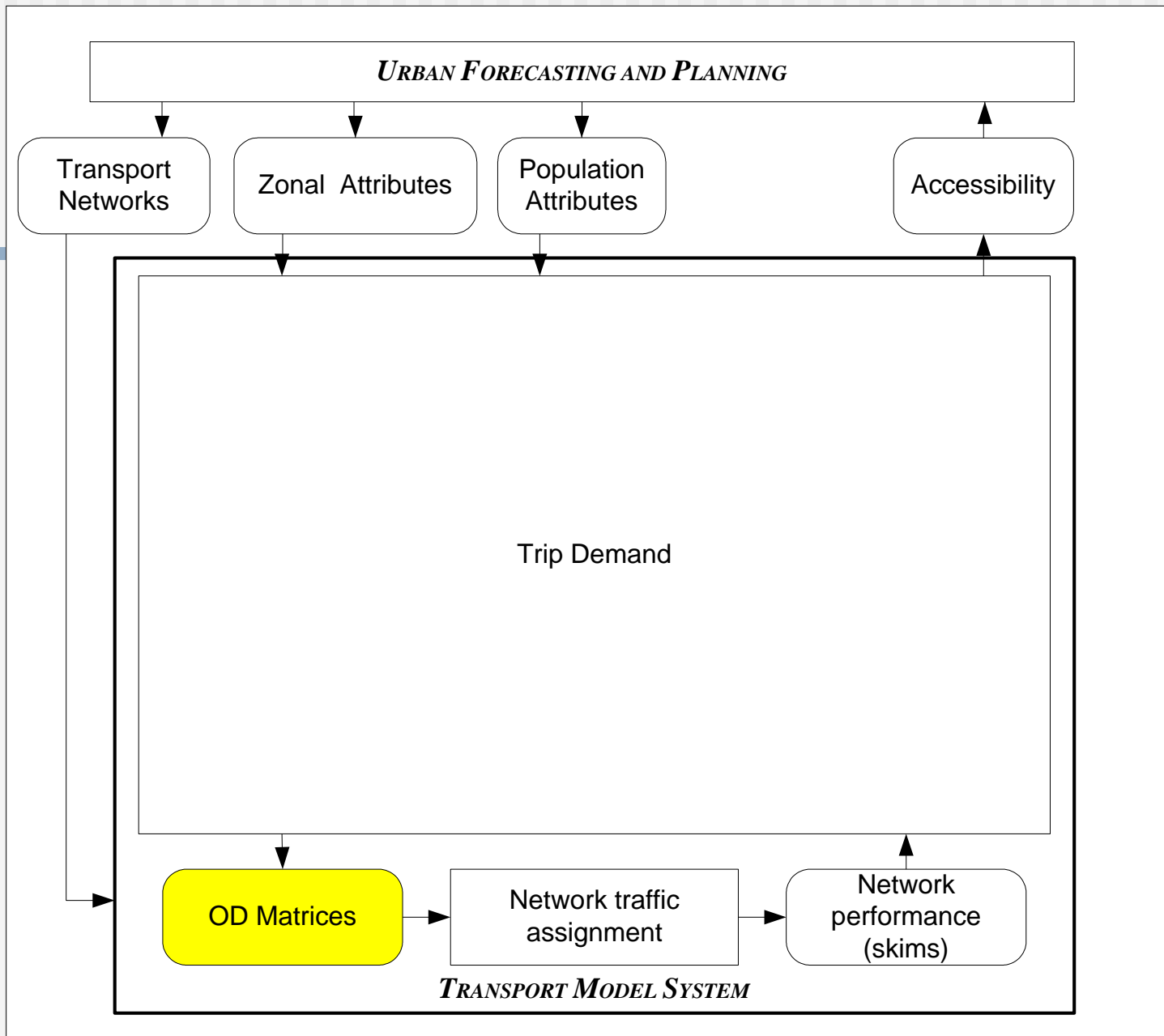




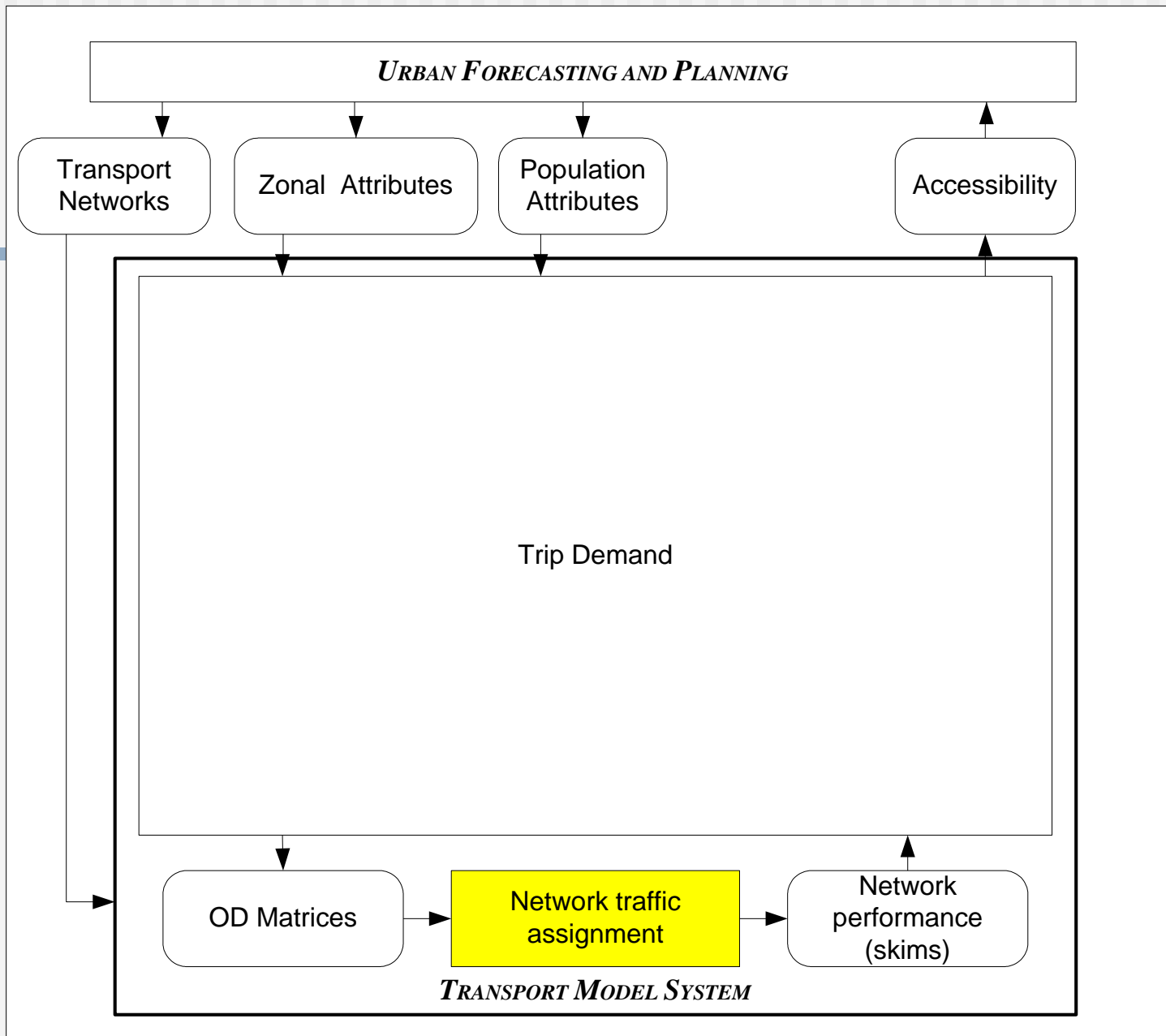


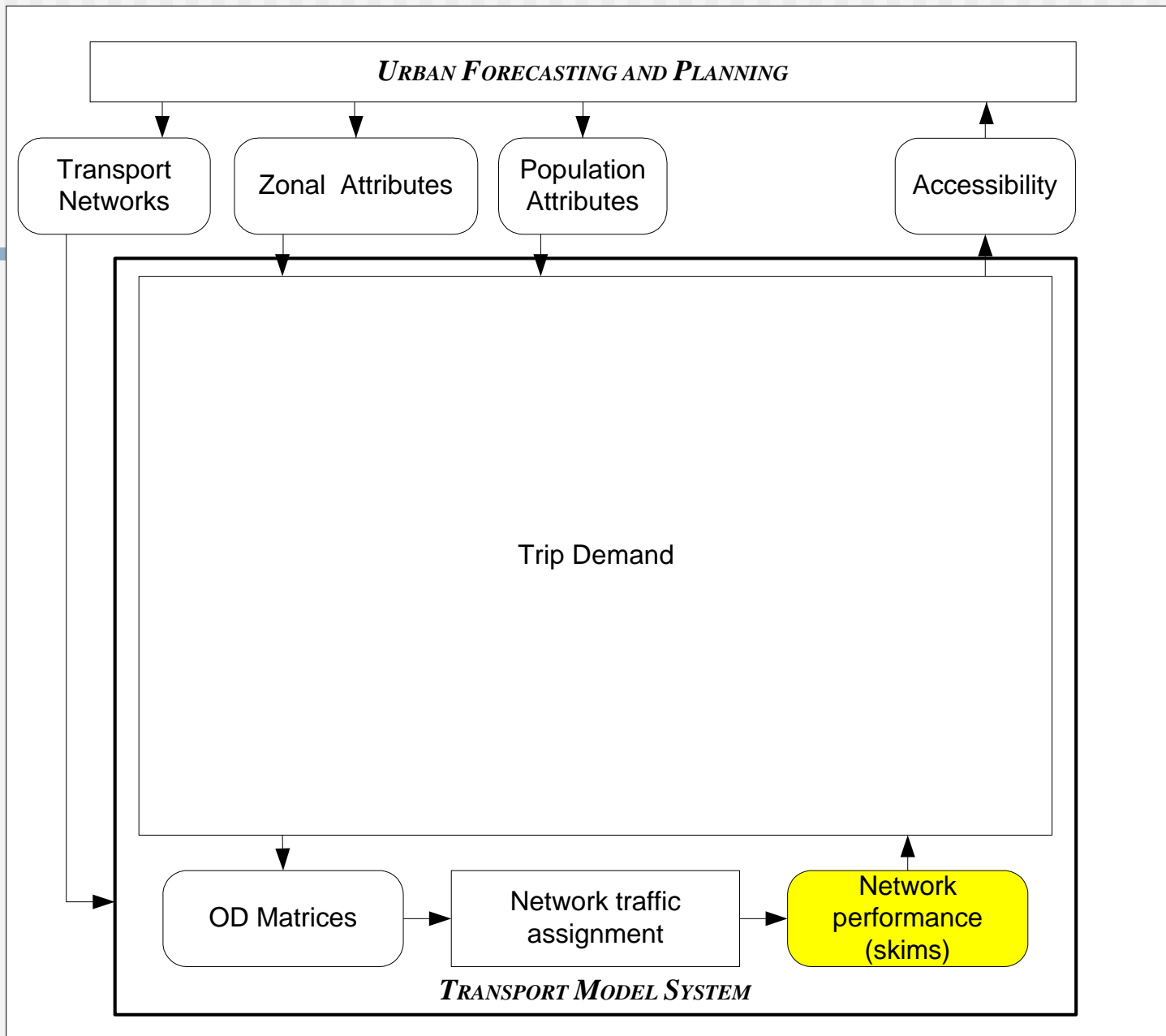


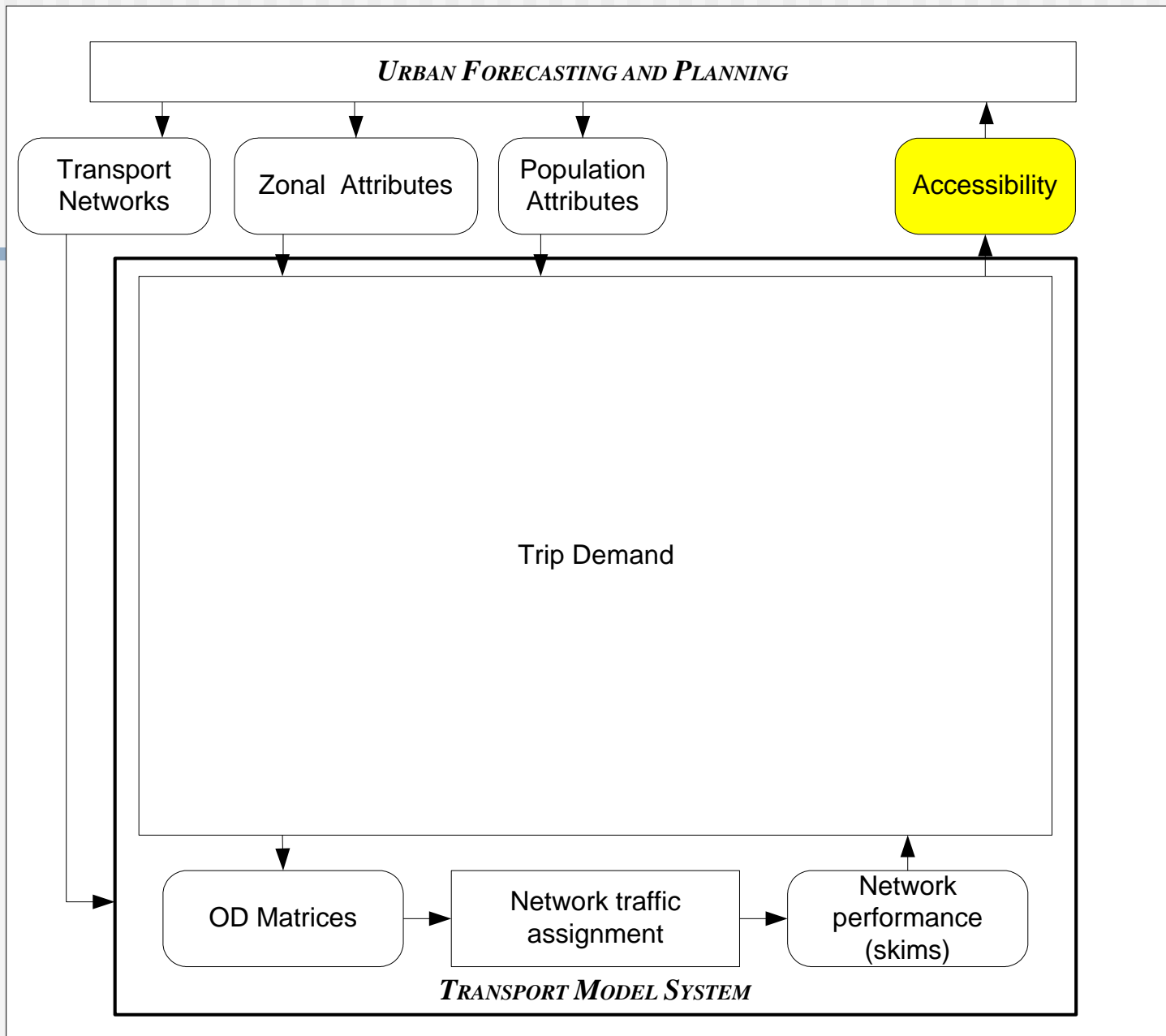


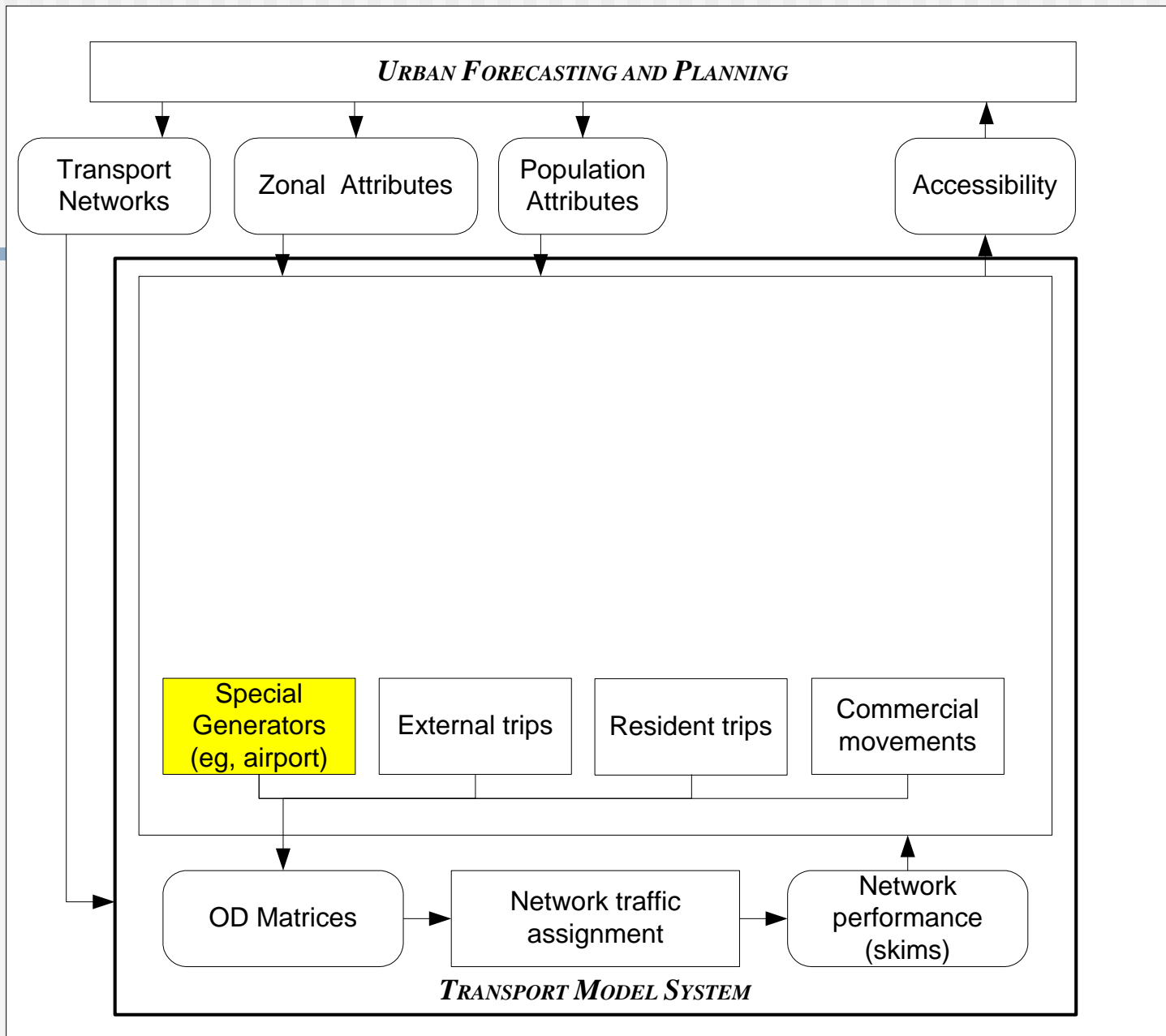


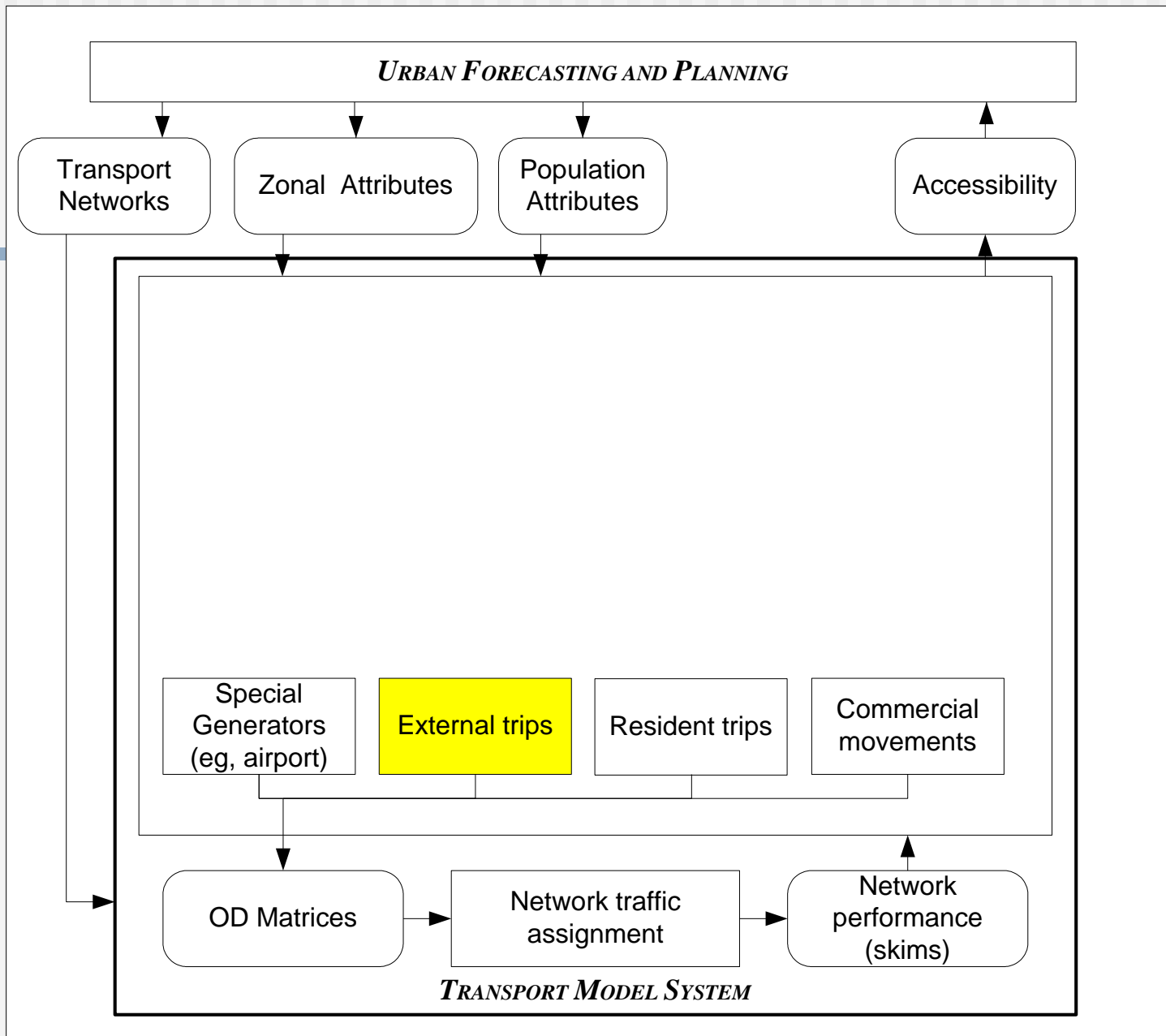


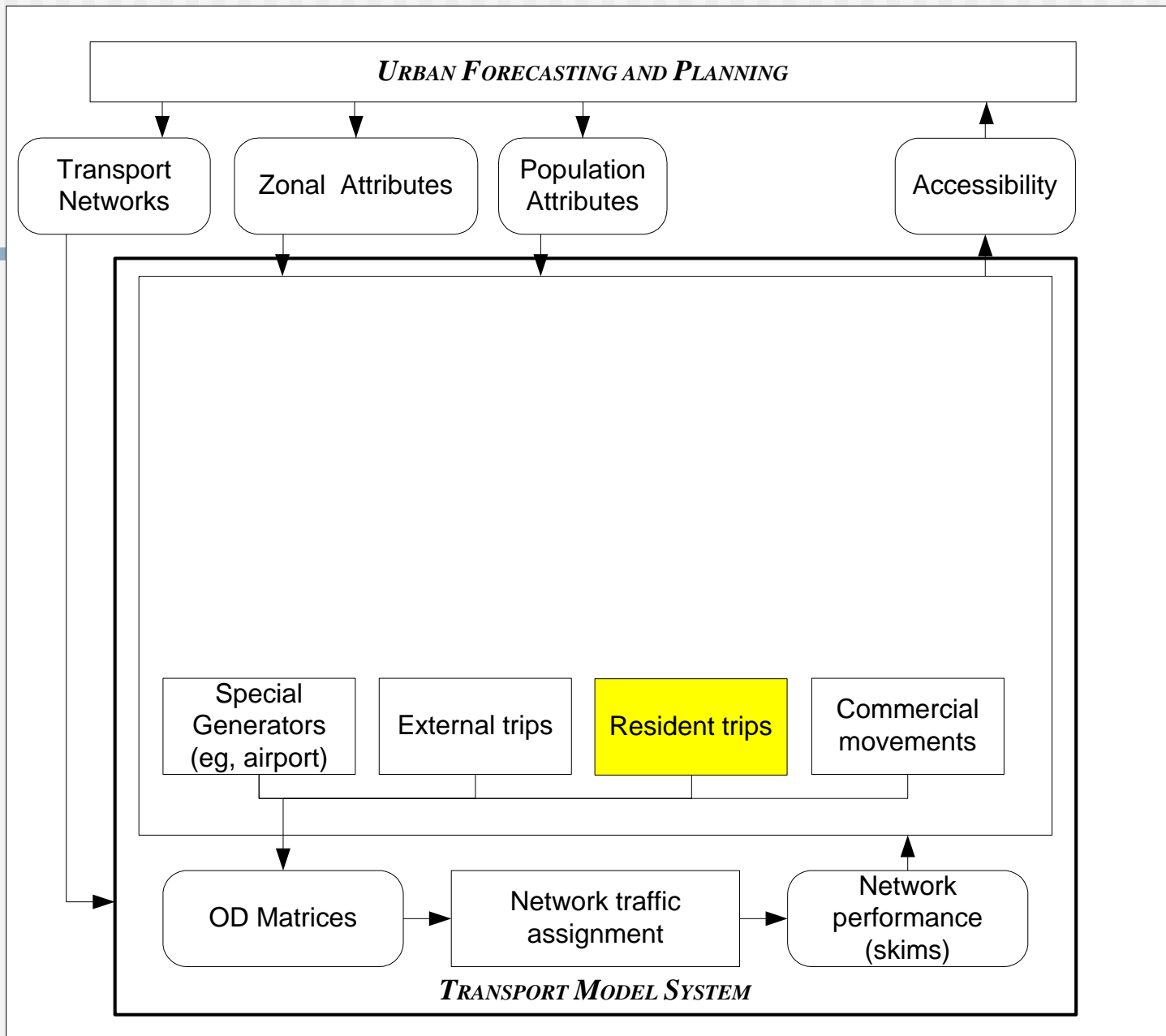


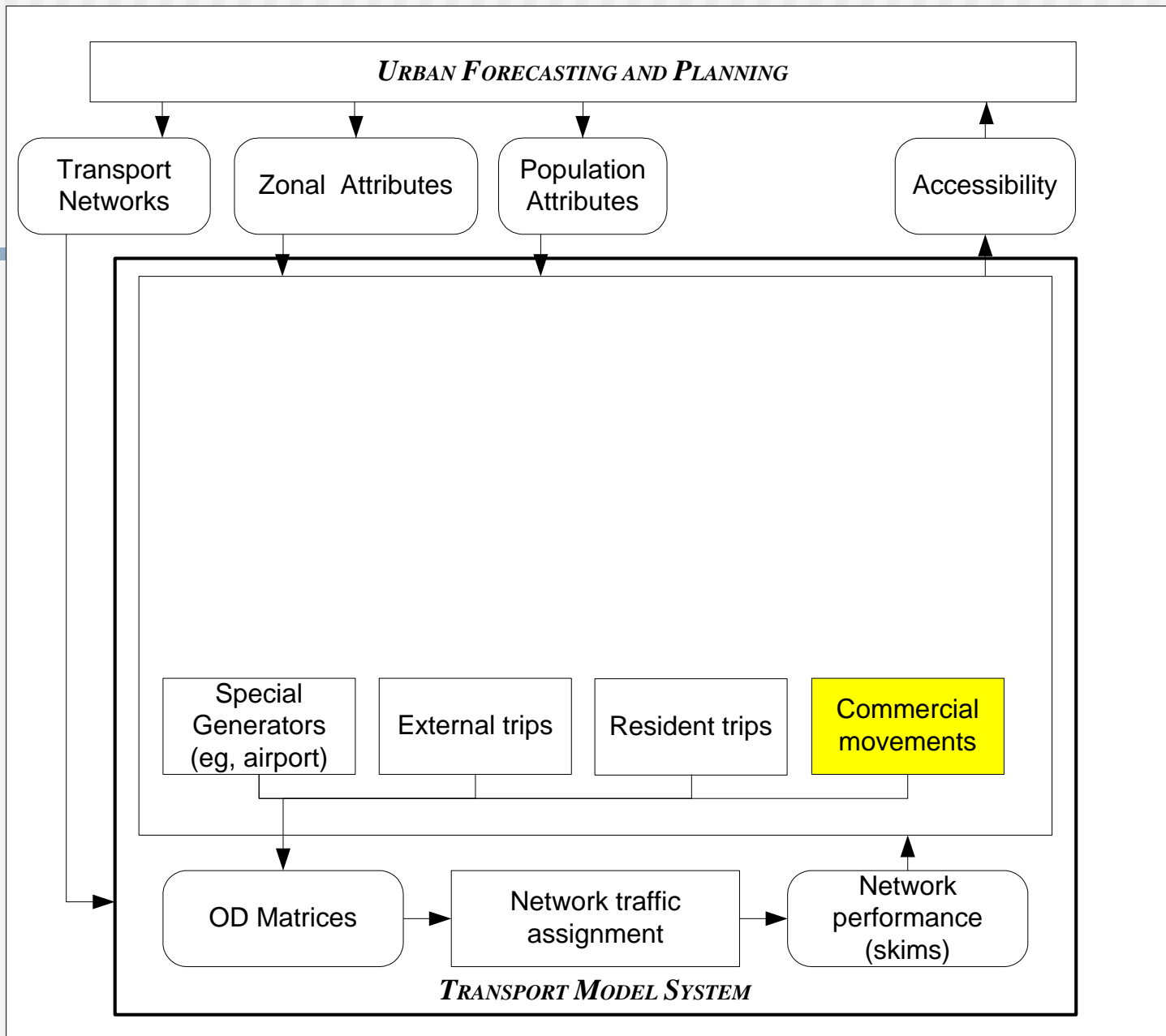










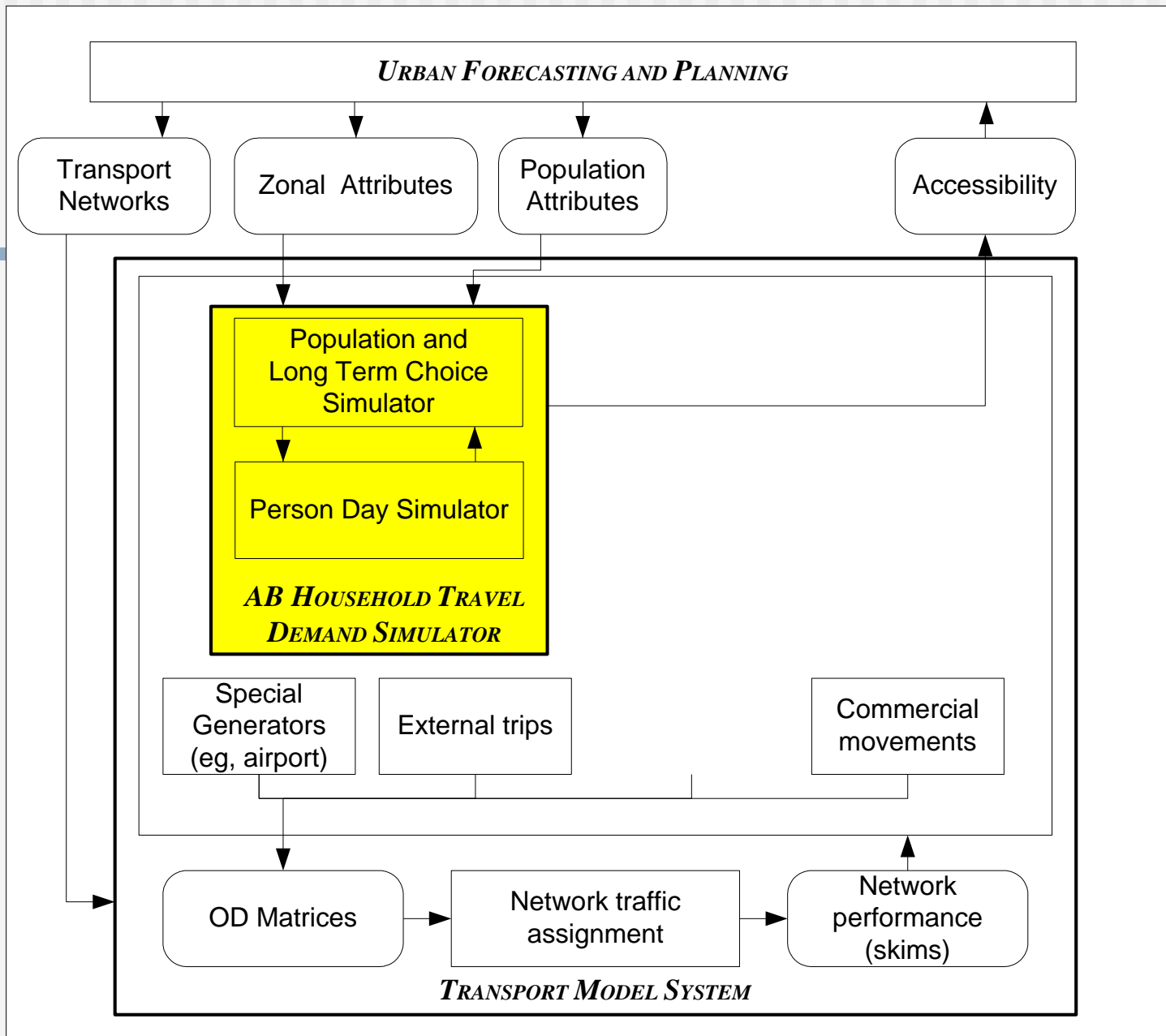


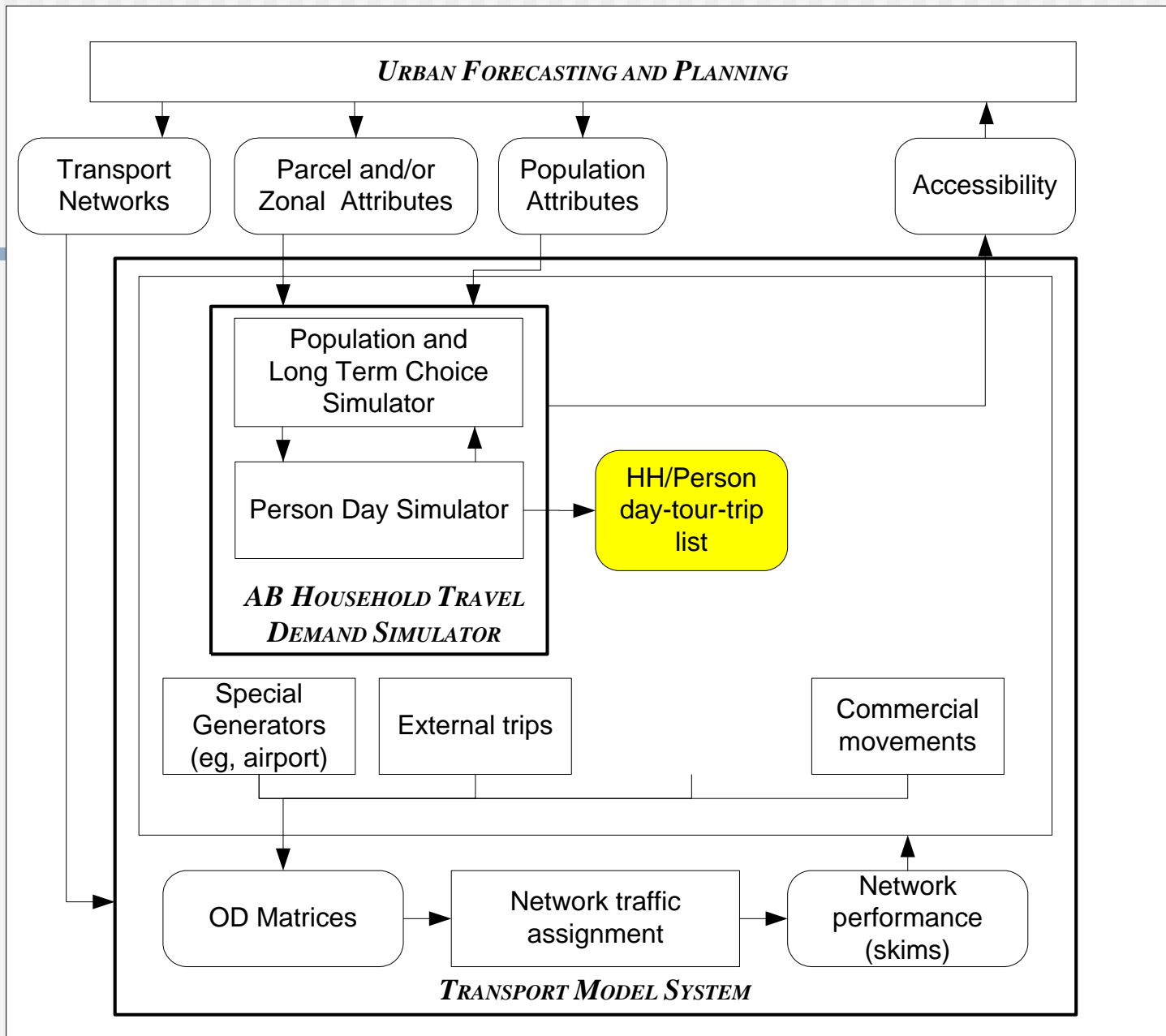
# Outline

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- Travel Model System
- **Advanced Model Components**
- Development Strategies
- Data Needs

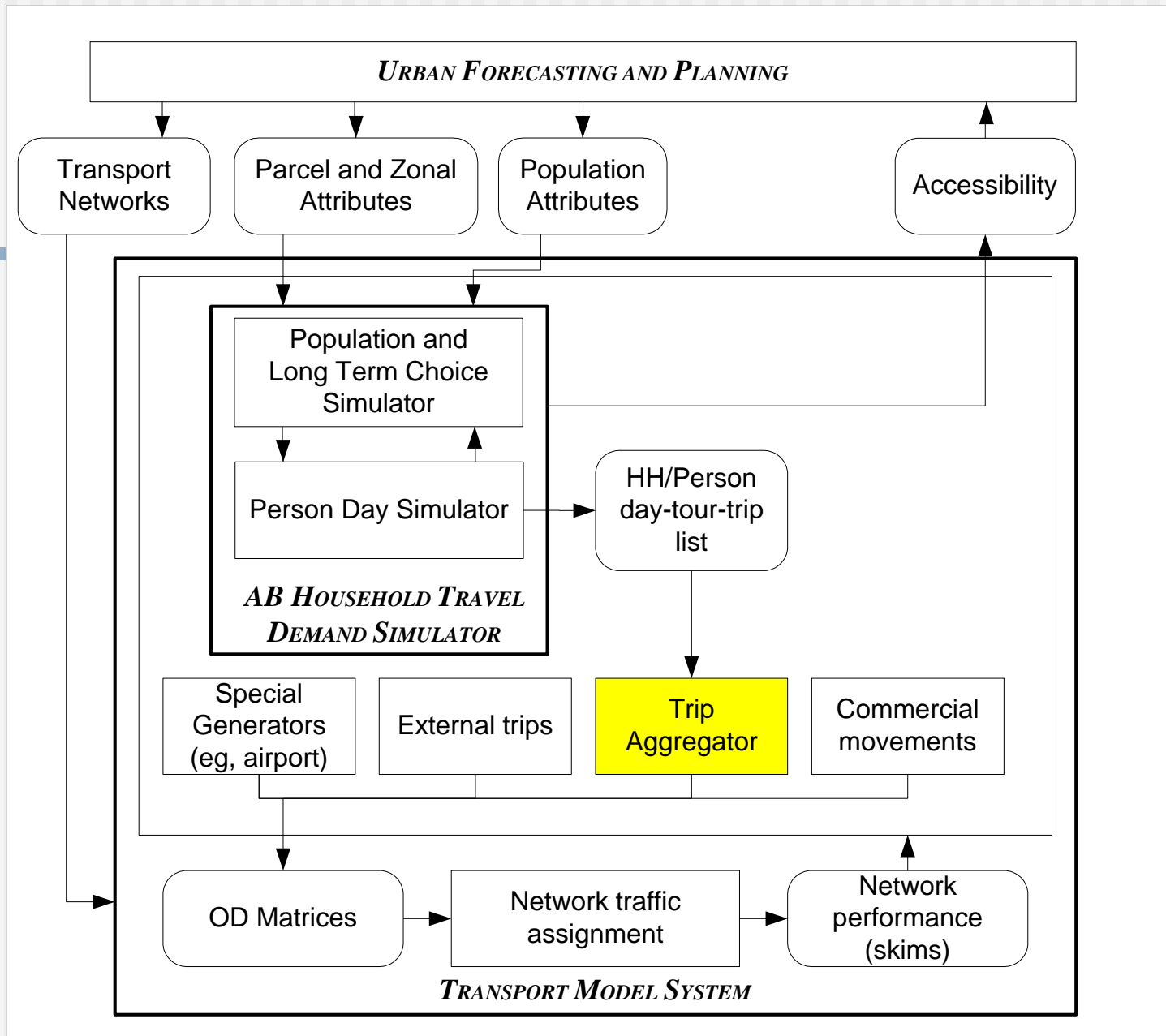


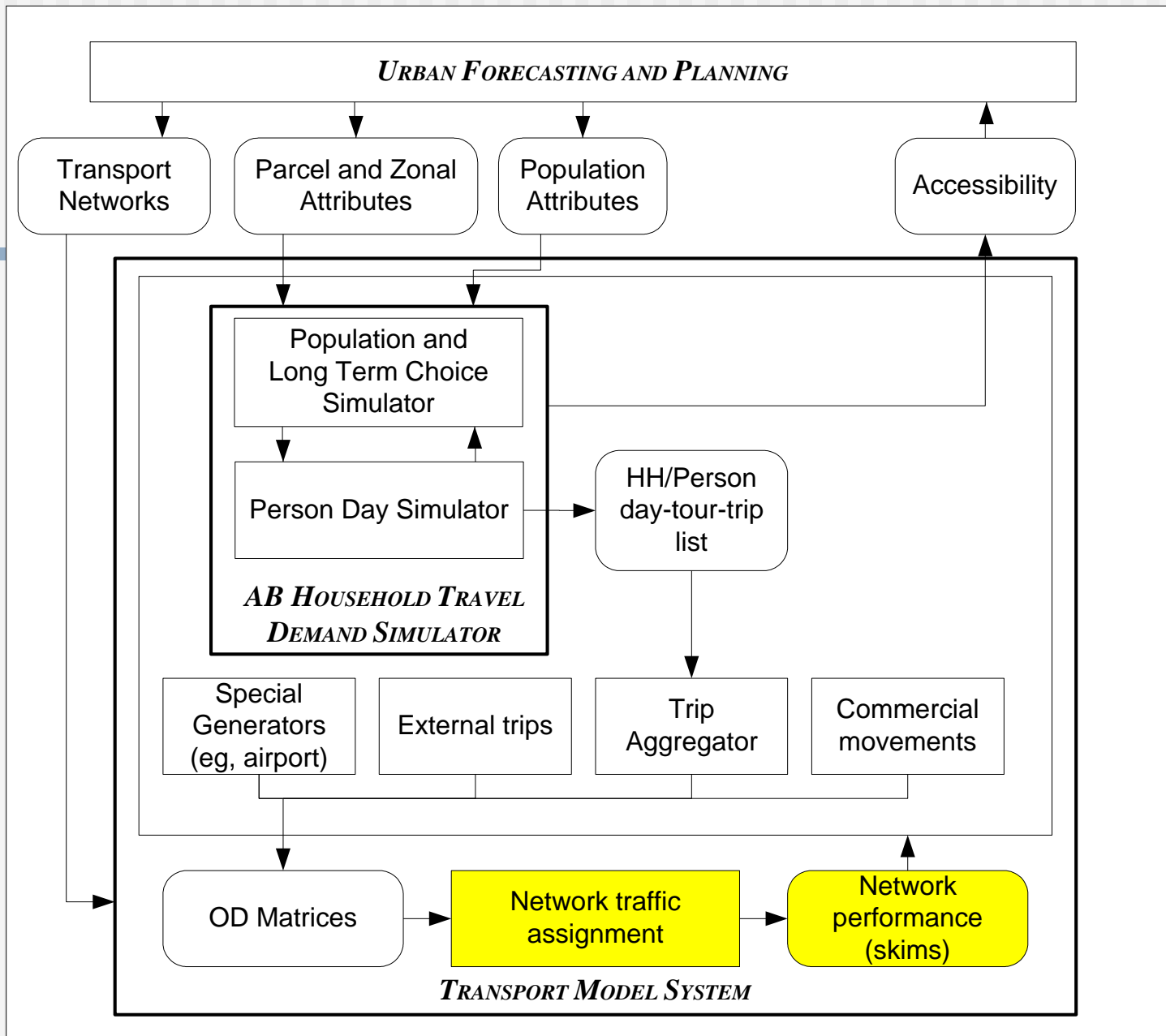


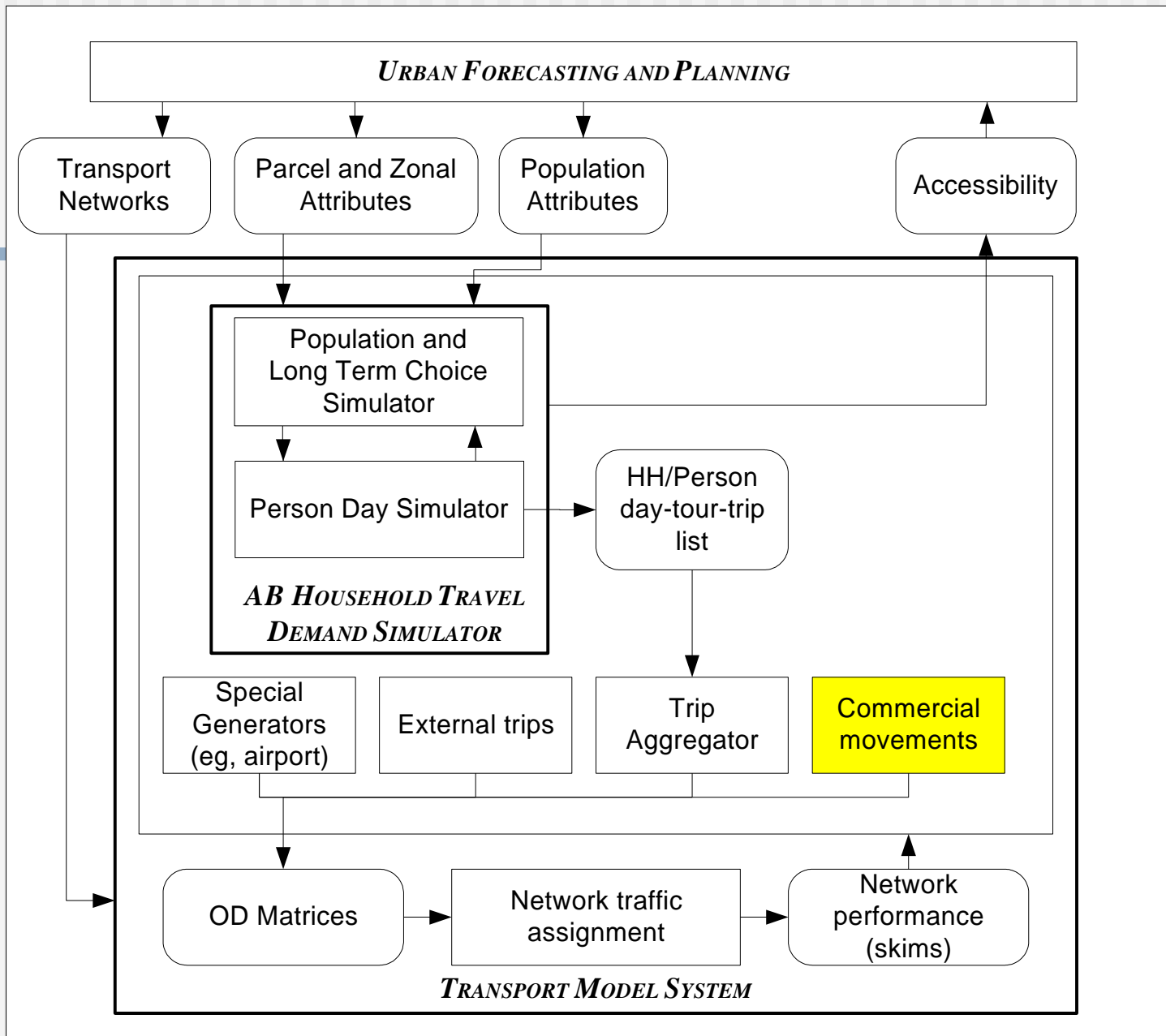


# HH/Person/Day/Tour/Trip List

<b>For each...</b>	<b>List includes...</b>
Household	Location, size, vehicles, etc
Person	Age, gender, usual work & school locations, etc
Day	Number of tours and stops
Tour	Purpose, destination, timing, main mode, number of stops
Trip	Origin, destination, origin purpose, destination purpose, mode, departure time, travel time





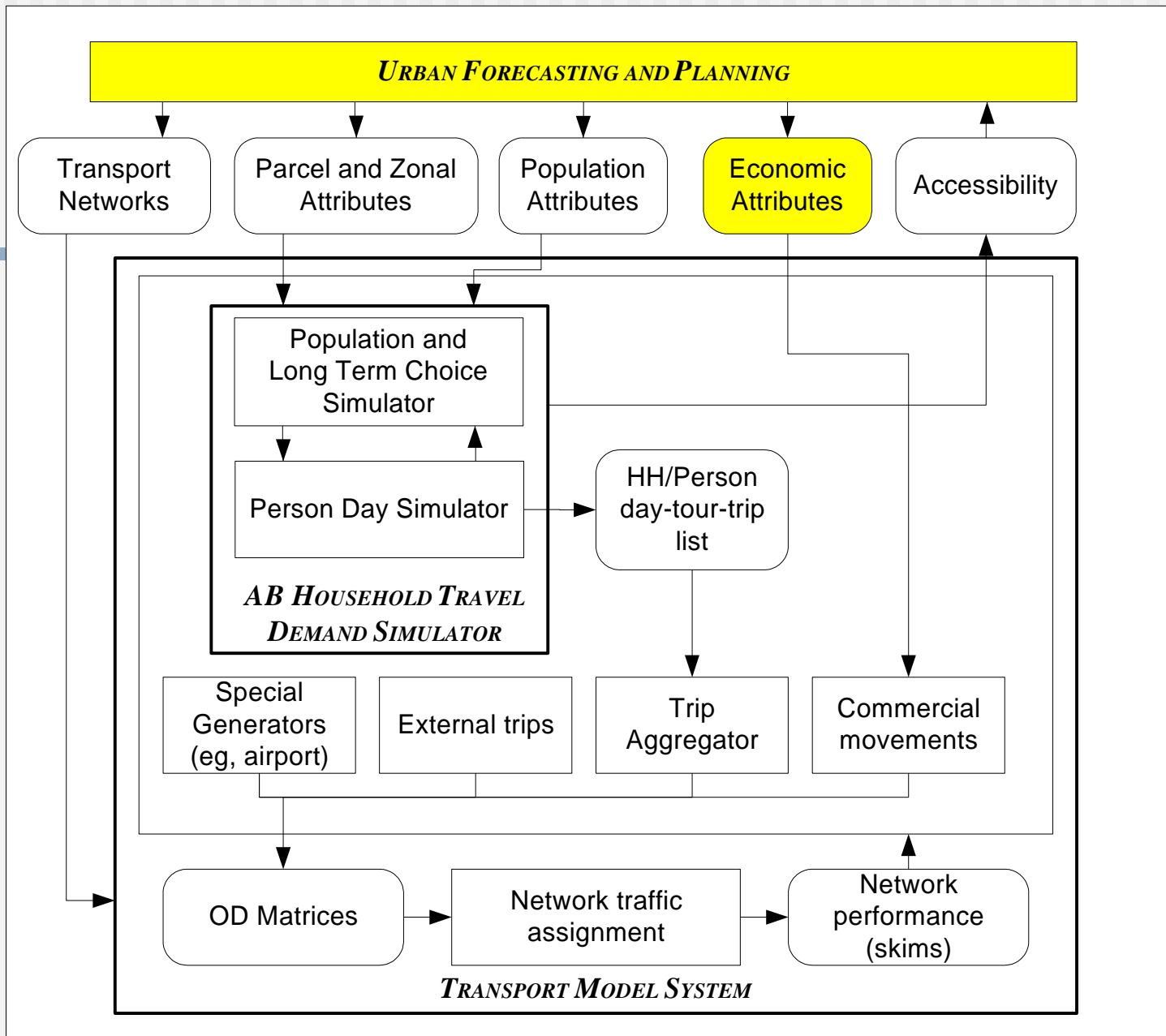


# Advanced models

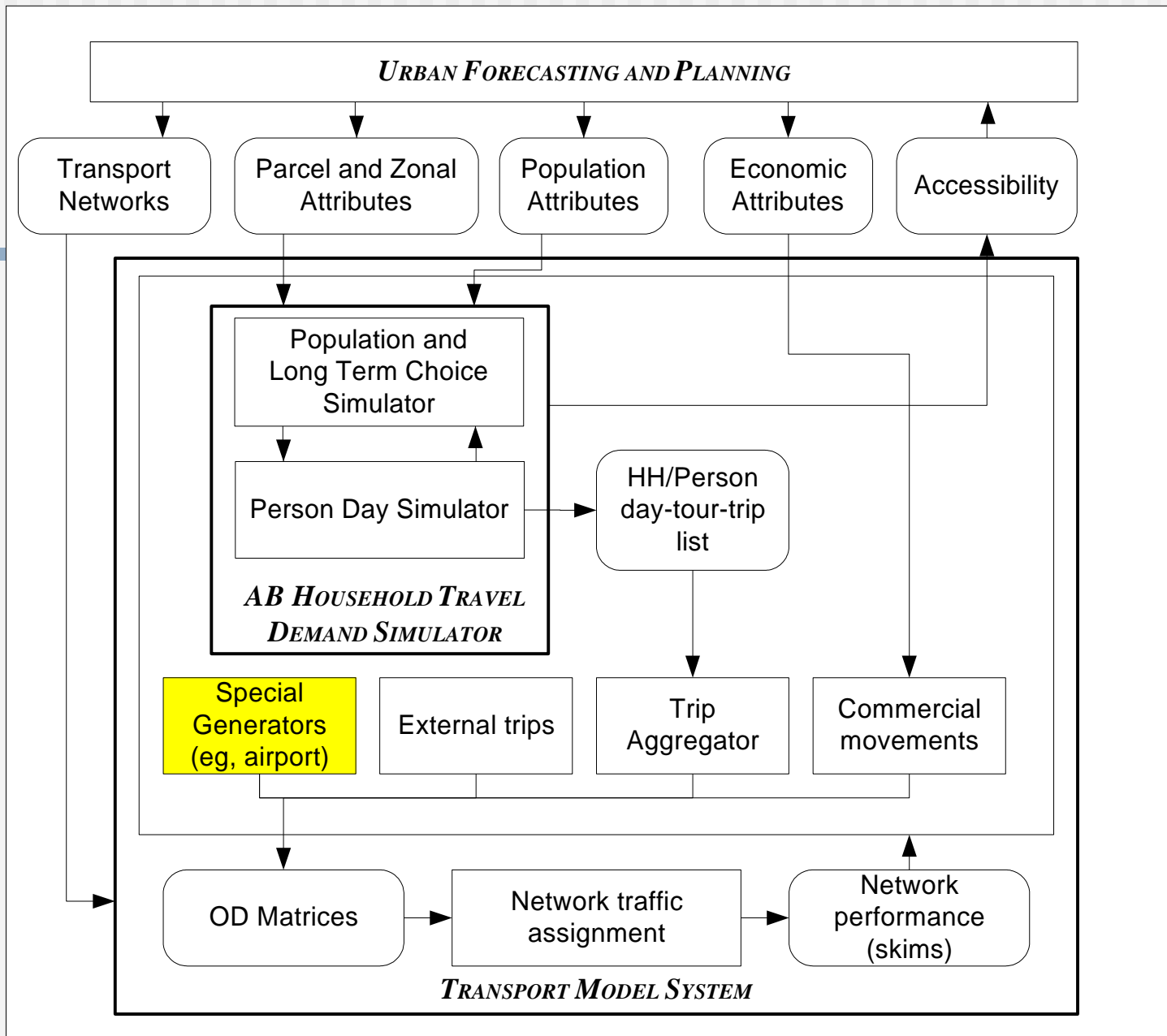
## Freight and commercial

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- logistics chain
  - inter-regional commodity long hauls
- tour-based
  - local services
  - freight distribution and collection





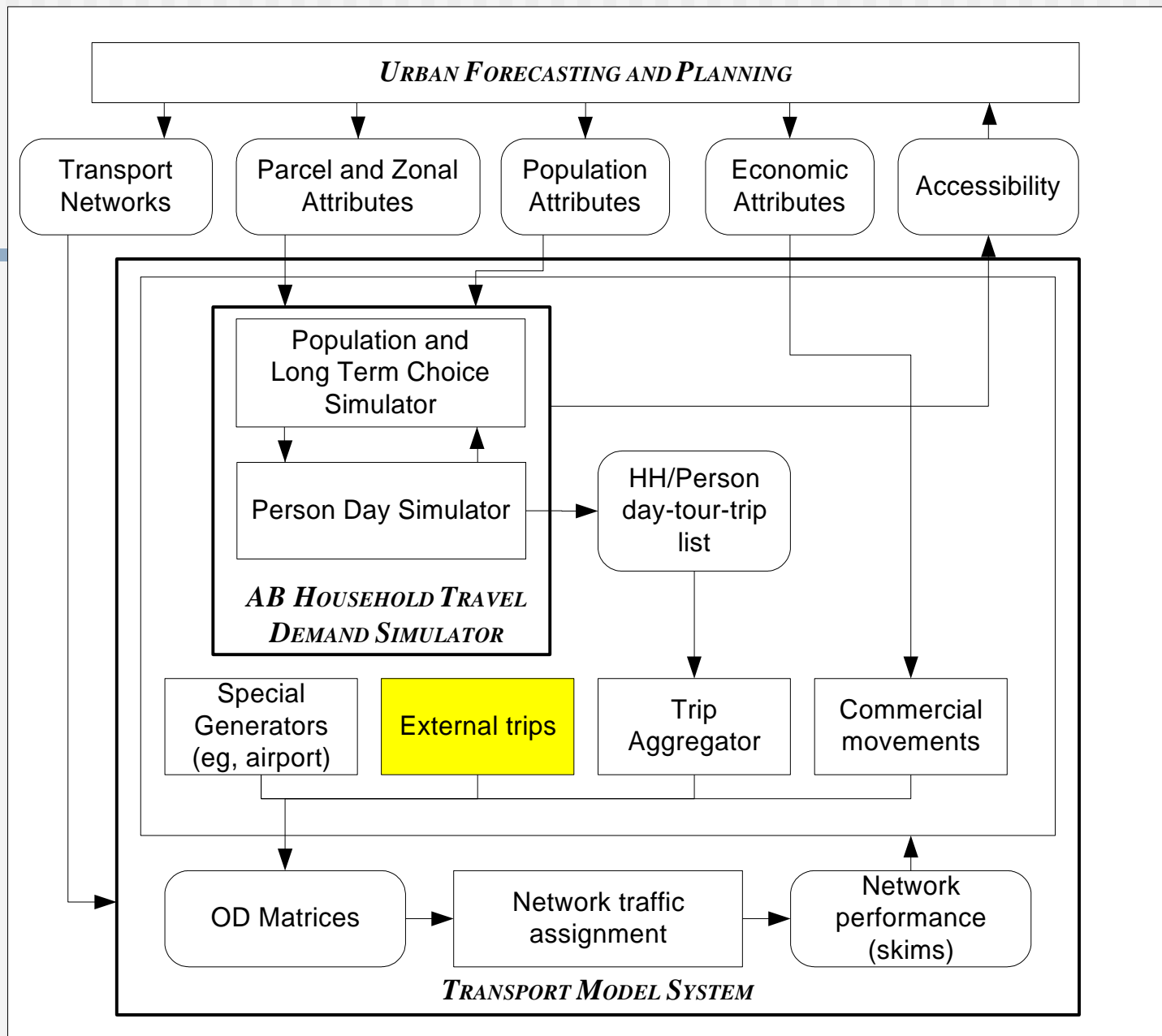


# Advanced models

## Airport access and egress

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- Model components
  - location choice
  - mode choice
  - time of day
- Traveler segments
  - business and personal
  - resident and visitor

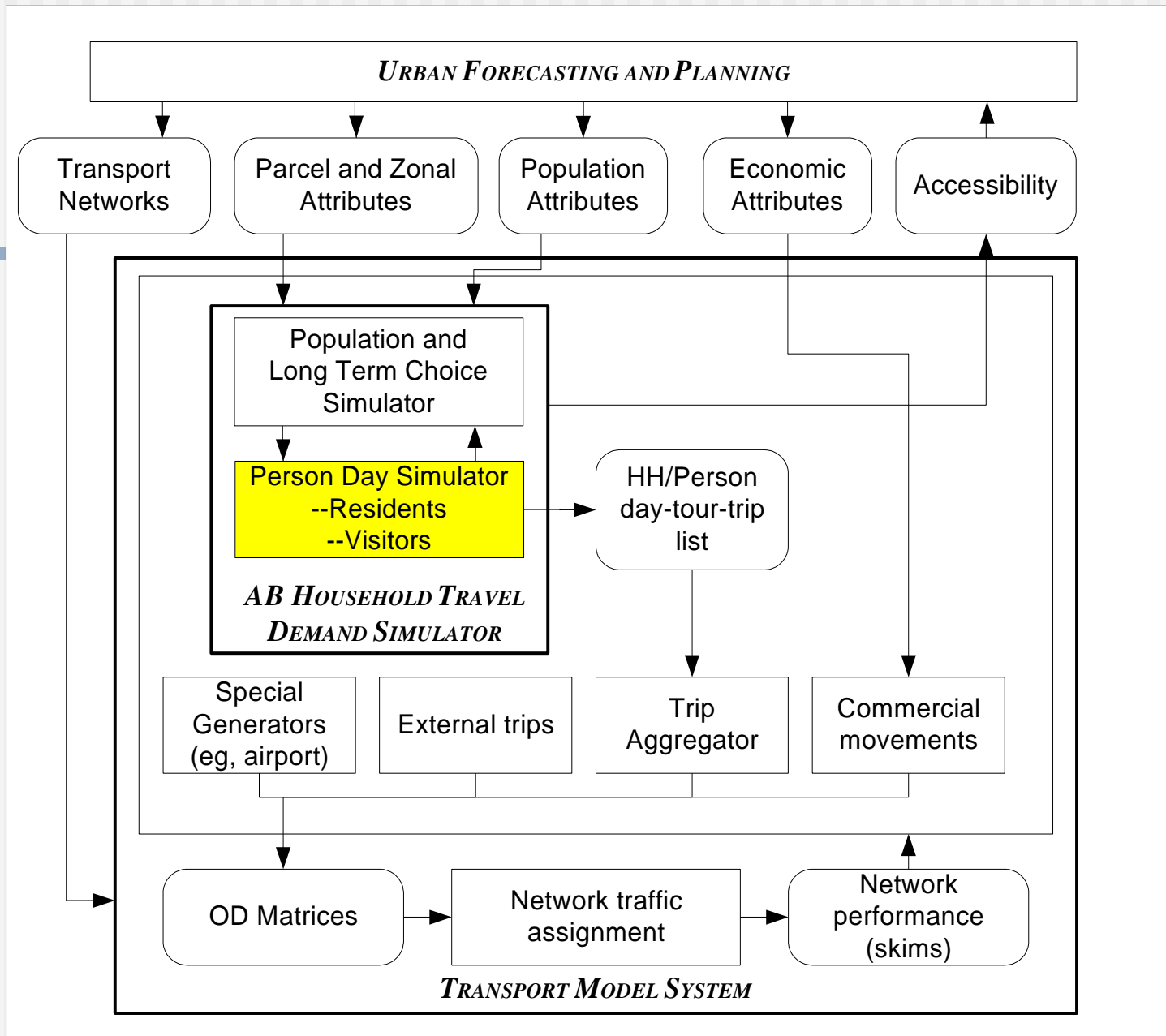


# Advanced models

## Inter-regional passenger

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- Model components
  - location
  - mode
  - time of day
- Traveler segments
  - Residents leaving region
  - Non-residents entering region
  - Through trips



# Advanced models

## Overnight visitors

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- Activity-based/tour-based
- Traveler segments
  - business
  - personal

# Outline

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- Travel Model System
- Advanced Model Components
- **Development Strategies**
- Data Needs

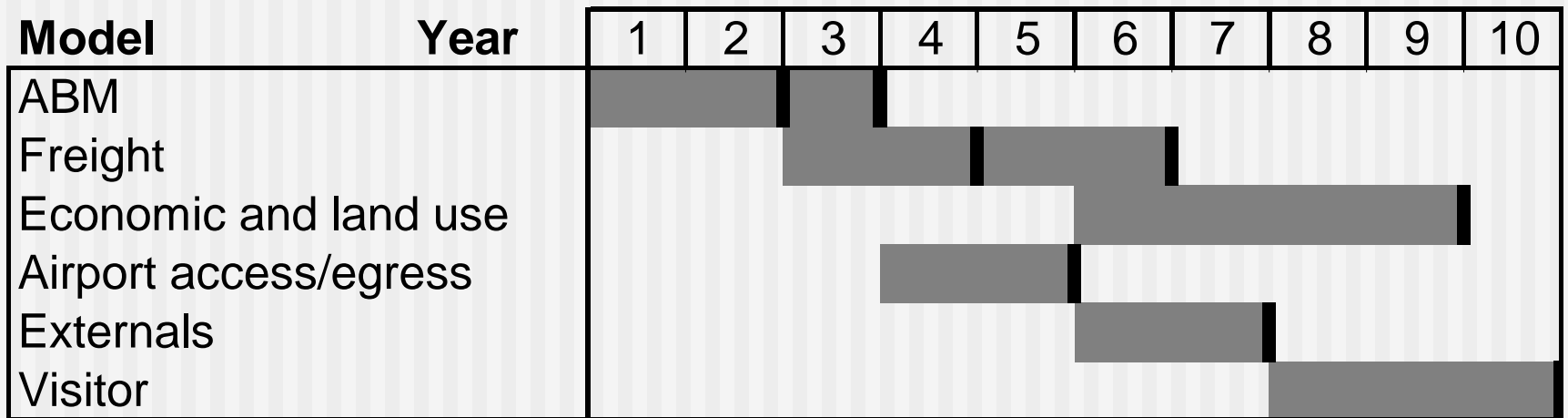
# Staged multi-year model development



Model	Year	1	2	3	4	5	6	7	8	9	10
ABM		■	■	■							
Freight				■	■	■	■	■			
Economic and land use							■	■	■	■	■
Airport access/egress					■	■	■	■			
Externals							■	■	■		
Visitor									■	■	■

model development ■

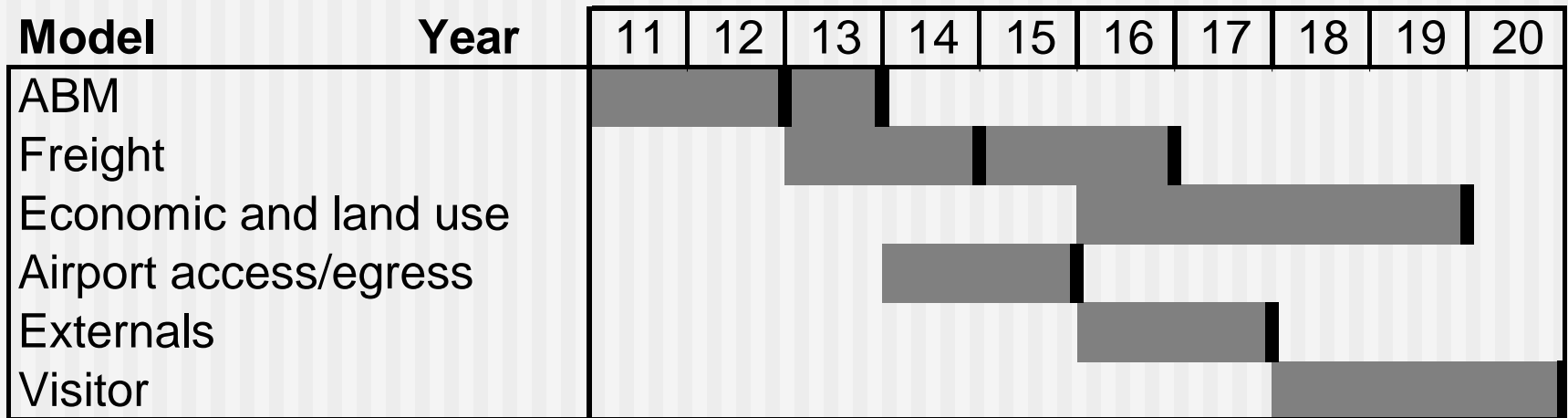




# Regular delivery of enhanced capabilities



model development   
 delivery point 

# Repeated multi-year cycle



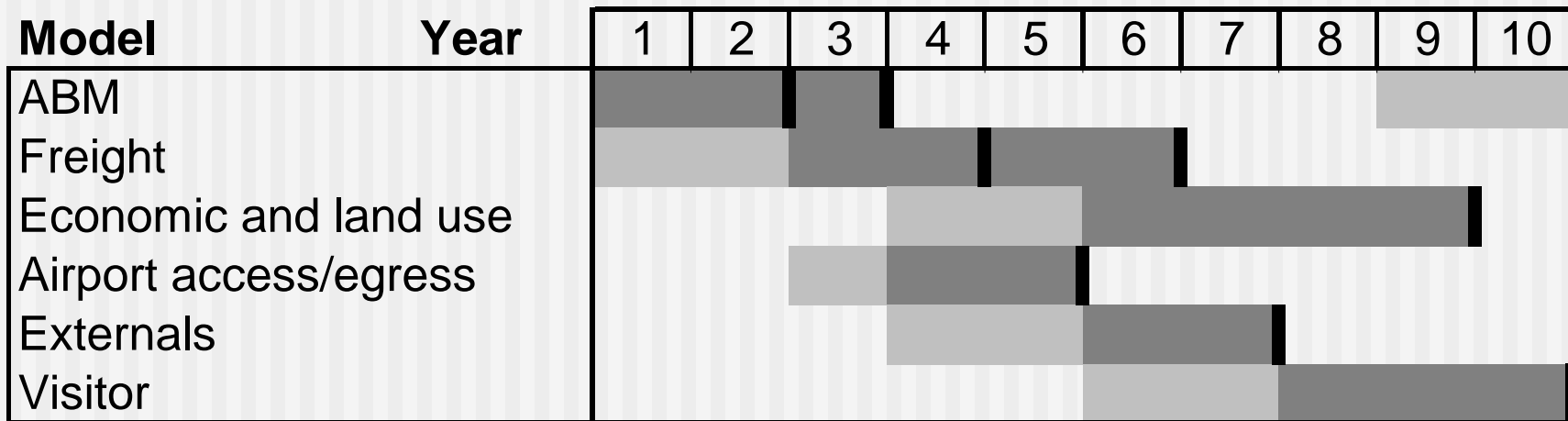
model development   
 delivery point 


# Repeated multi-year cycle Resident households (ABM)

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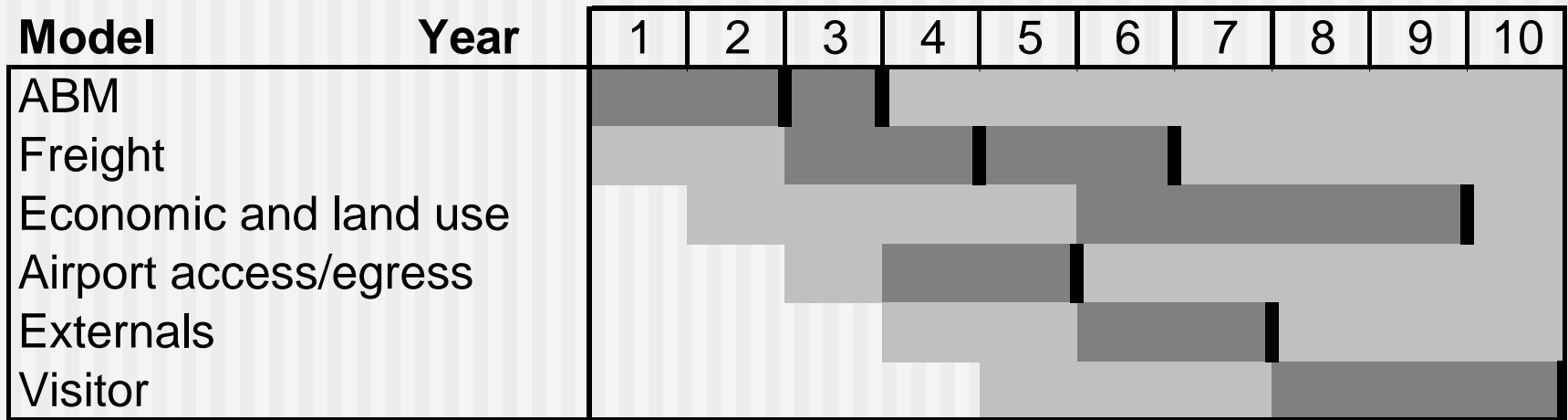
- Generation 1
  - zone-based?
  - static assignment
  - skims
- Generation 2
  - parcel or micro-zone based
  - dynamic assignment
  - on-the-fly path attributes

# Cyclical data development



model development   
 delivery point   
 data development 

# Continuous data development



model development [Dark Gray Box]  
 delivery point [Dark Gray Box with vertical line]  
 data development [Light Gray Box]

# Outline

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- Travel Model System
- Advanced Model Components
- Development Strategies
- Data Needs

# Data development challenges

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- Detailed spatial data (points/parcels)
- Travel behavior (surveys) of travelers crossing regional boundaries
  - personal
  - freight
- Long-haul freight behavior
  - logistics decisions and activity
  - movements
- Forecasts of travel model inputs
  - economic, land use, demographic
  - with spatial detail

# Data development challenges—parcel data

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- employment (by type)
- living quarters (HH, students, group qtrs)
- school classroom enrollment
- parking (capacity, prices)
- hotel and tourist attraction inventory
- freight facilities (ports, intermodal, terminals, warehouses)
- pedestrian attributes (e.g. transit access, street features)



# Data development

## Resident HH (Generation 1)

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- Household diary survey
- **Point, parcel or zonal attributes**
- Zone-to-zone transport times, costs and other attributes
- Census summary tables (ACS, CTPP) and micro sample
- **Aggregate control and validation values of household and person attributes**

# Data development

## Static assignment

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- Coded road and transit networks
- Traffic and transit counts
- Traffic link speeds
- Traffic OD travel times
- Pedestrian and bike counts
- Truck routes
- Transit on-board survey

# Data development

## Resident HH (Generation 2)

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- Household diary survey
- **Point or parcel attributes**

# Data development

## Dynamic assignment

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- Coded road and transit networks
  - lane details
  - traffic control devices
- Traffic and transit counts
  - queue data

# Data development

## Freight and commercial

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- Intra-regional tour-based
  - Survey of business enterprises' commercial movements
  - Point, parcel or zonal attributes
  - Zone-to-zone transport times, costs and other attributes

# Data development

## Freight and commercial

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- Inter-regional logistics chains
  - Public and private commodity flow data
  - Inventory of port, intermodal, terminal and warehouse facilities
  - Counts and surveys at port, intermodal, terminal and warehouse facilities
  - Count and **survey** of medium and large trucks entering and leaving the region
  - **Transponder records, GPS traces and/or dispatch records of truck movements**
  - National rail, truck, water and air networks

# Data development

## Airport access and egress

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- Survey of airport travelers
- Counts of air passengers
- Point, parcel or zonal attributes
- Zone-to-zone transport times, costs and other attributes

# Data development

## Inter-regional passenger

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- **Count and survey of travelers entering and leaving region in autos and small trucks**
- On-board count and survey of travelers entering and leaving region by rail
- Point, parcel or zonal attributes
- Zone-to-zone transport times, costs and other attributes



# Data development

## Overnight visitors

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- Visitor diary survey
- Point, parcel or zonal attributes
- Zone-to-zone transport times, costs and other attributes

