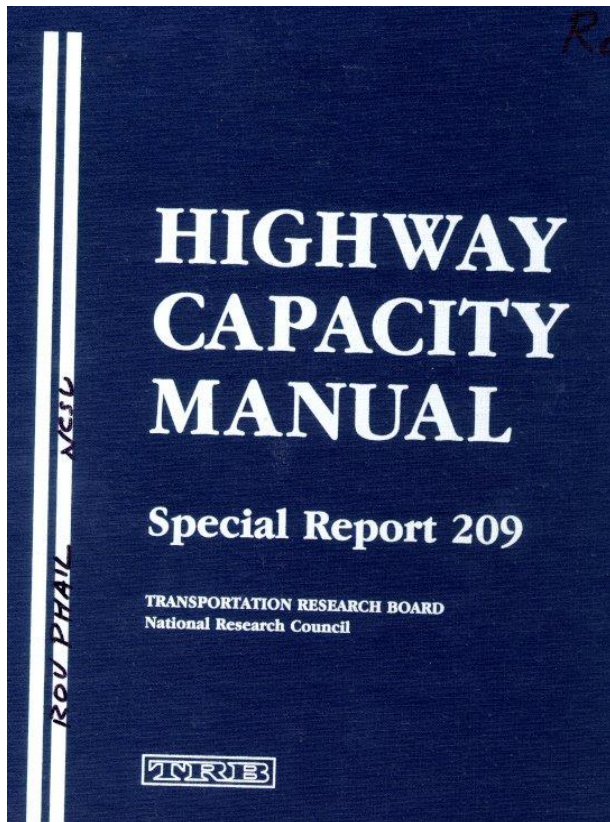


Freeways and Multilane Facilities



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Summary



- HCM2000- other sessions of interest
 - 108-Interrupted Flow (Today @ 3:45 pm)
 - 142-Planning, Transit, Peds & Bikes
(This evening @ 7:30 pm)
 - 332- Freeway Traffic Operations-- Capacity
Analysis Issues (Wednesday @ 8:00 am)
- Scope of Uninterrupted Flow in HCM2000
- What's new in Freeways and Multilane ?
- Questions

Scope: HCM2000 Uninterrupted Flow



- Concept versus Procedural Chapters
- Metric Units
- Multilane Highways ✓
- Freeways
 - Basic Segments ✓
 - Weaving Segments
 - Ramp Segments
 - Freeway Facilities ✓
- Two-Lane Highways

What's New - Multilane Highways ?



- Point of Reference--- 1997 HCM
- Renamed "Multilane Highways"
- New, reduced equivalency truck factors (E_T) on rolling terrain, ($3 \rightarrow 2.5$) , on mountainous terrain ($6 \rightarrow 4.5$) and on specific upgrades
- New driver population factor consistent with other uninterrupted chapters
- Minor changes in LOS thresholds... metric

What's New- Basic Freeway Sections?



- Renamed “Basic Freeway Segments”
- New, reduced equivalency truck and bus equivalency factors (E_T) -- identical to multilane factors
- Slight changes in LOS thresholds and free flow speeds (FFS)
- Capacity varies with FFS
- Density at capacity fixed at 28 pc/km/ln

New Capacity and LOS Thresholds

FFS (km/h)	CAPACITY (pc/hr/ln)
120	2,400
110	2,350
100	2,300
90	2,250

LOS	DENSITY THRESHOLDS (pc/km/ln)
A	7
B	11
C	16
D	22
E	28

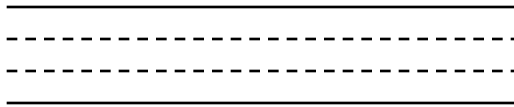
What's New- Freeway Systems ?



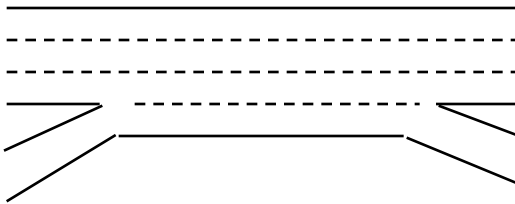
- Renamed “Freeway Facilities”
- **NEW** procedures provide quality of service for directional freeway facilities
- Can analyze multiple contiguous segments over multiple time intervals
- Integrates Basic, Ramp and Weaving methods into *undersaturated* analysis
- Extends those methods to *oversaturated* conditions

Segments >> Facilities >> Systems

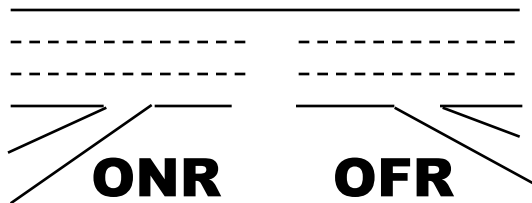
Basic- Chapter 23



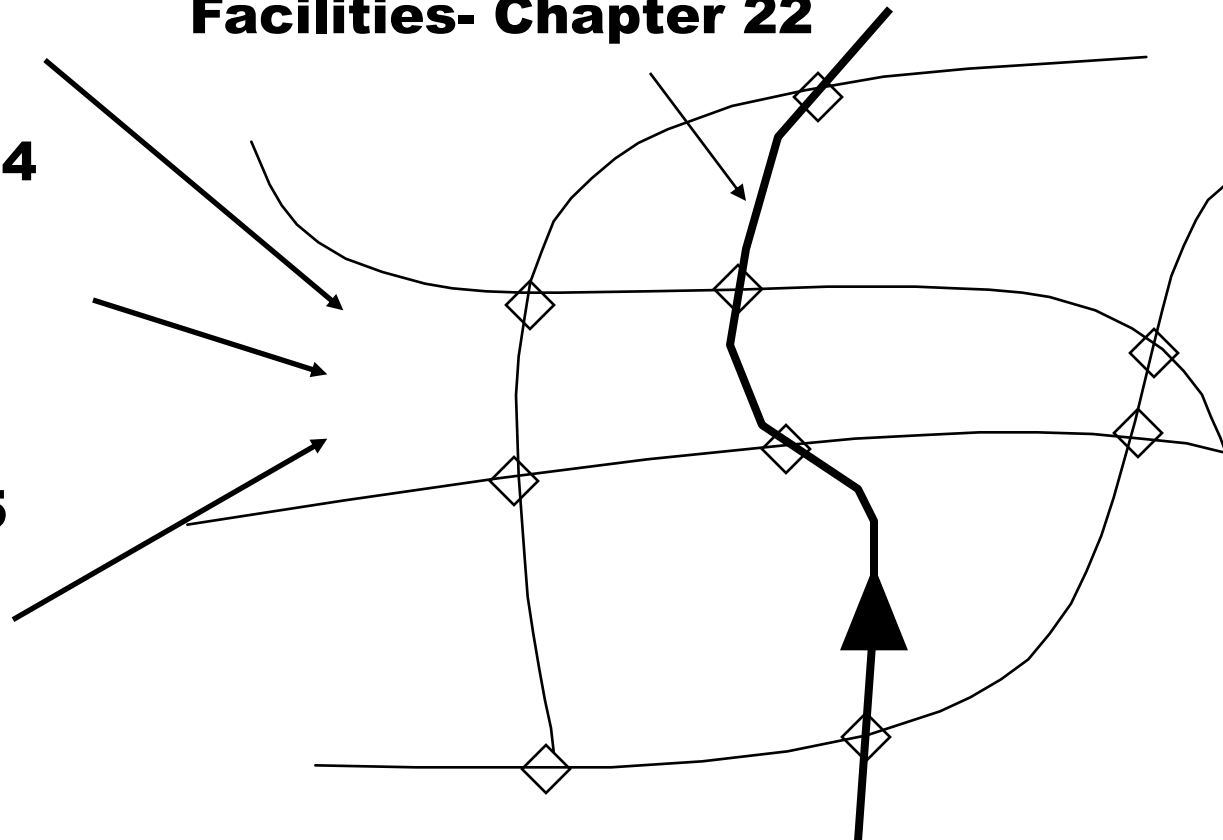
Weaving- Chapter 24



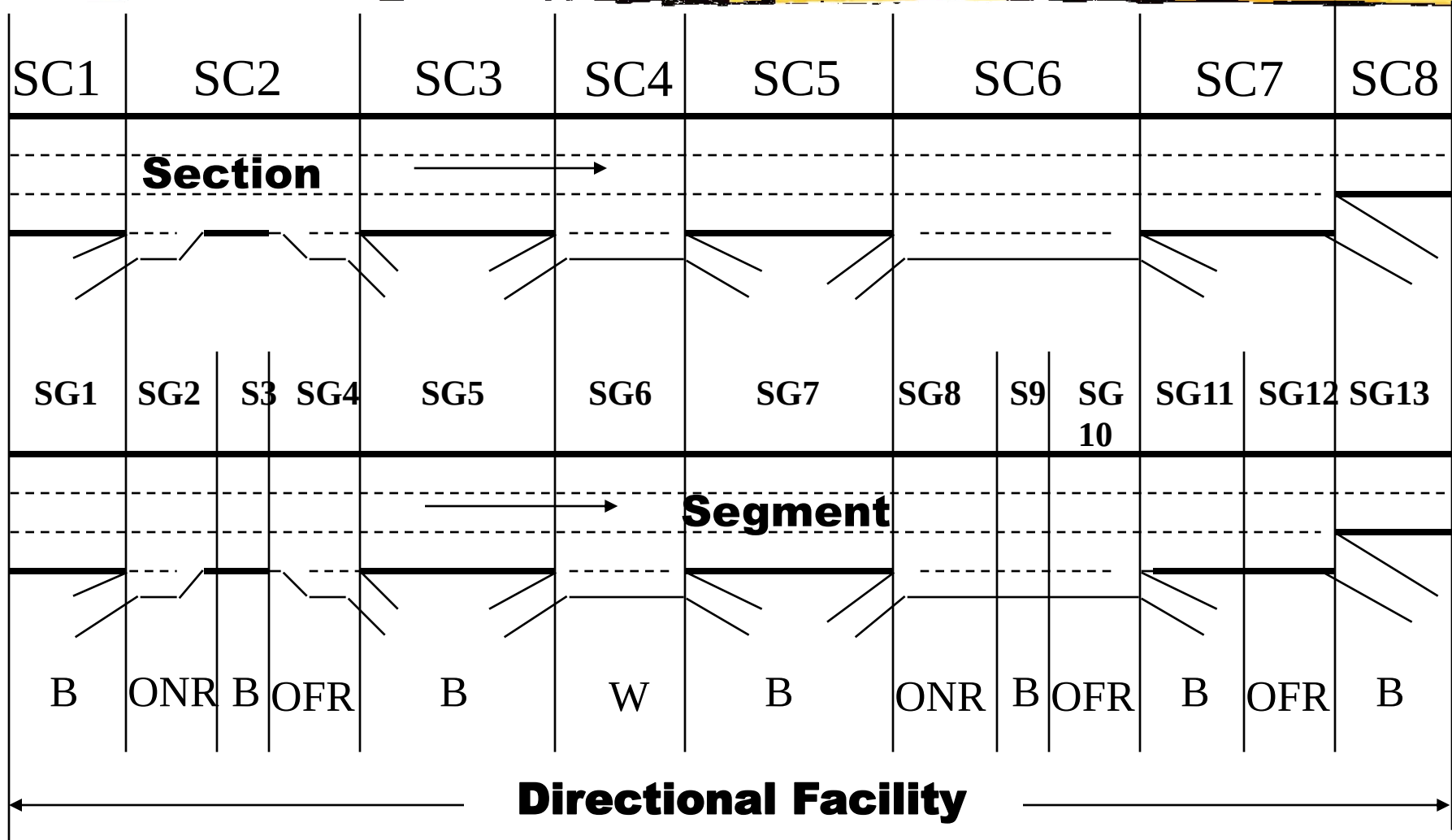
Ramps- Chapter 25



Facilities- Chapter 22



Segments >> Sections >> Facilities



Scope and Limitations of Chapter



- Freeway facilities 15-20 km in length
- No congestion at start/end of the analysis
- Preferably-- first and last segment uncongested all the time-- queuing within the facility
- Best for local oversaturation--system oversaturation problematic
- Computer implementation only

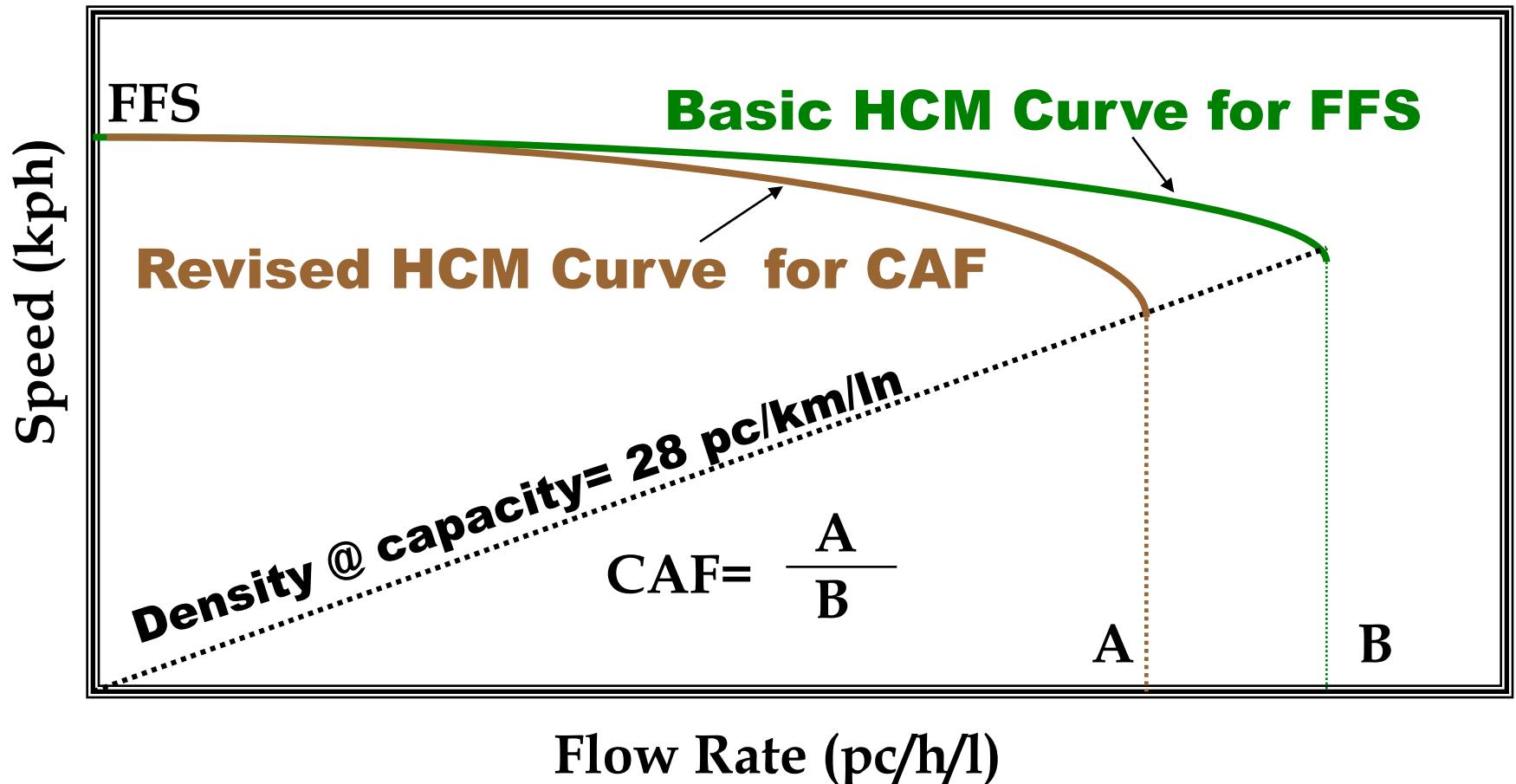
What's New- Freeway Systems ?



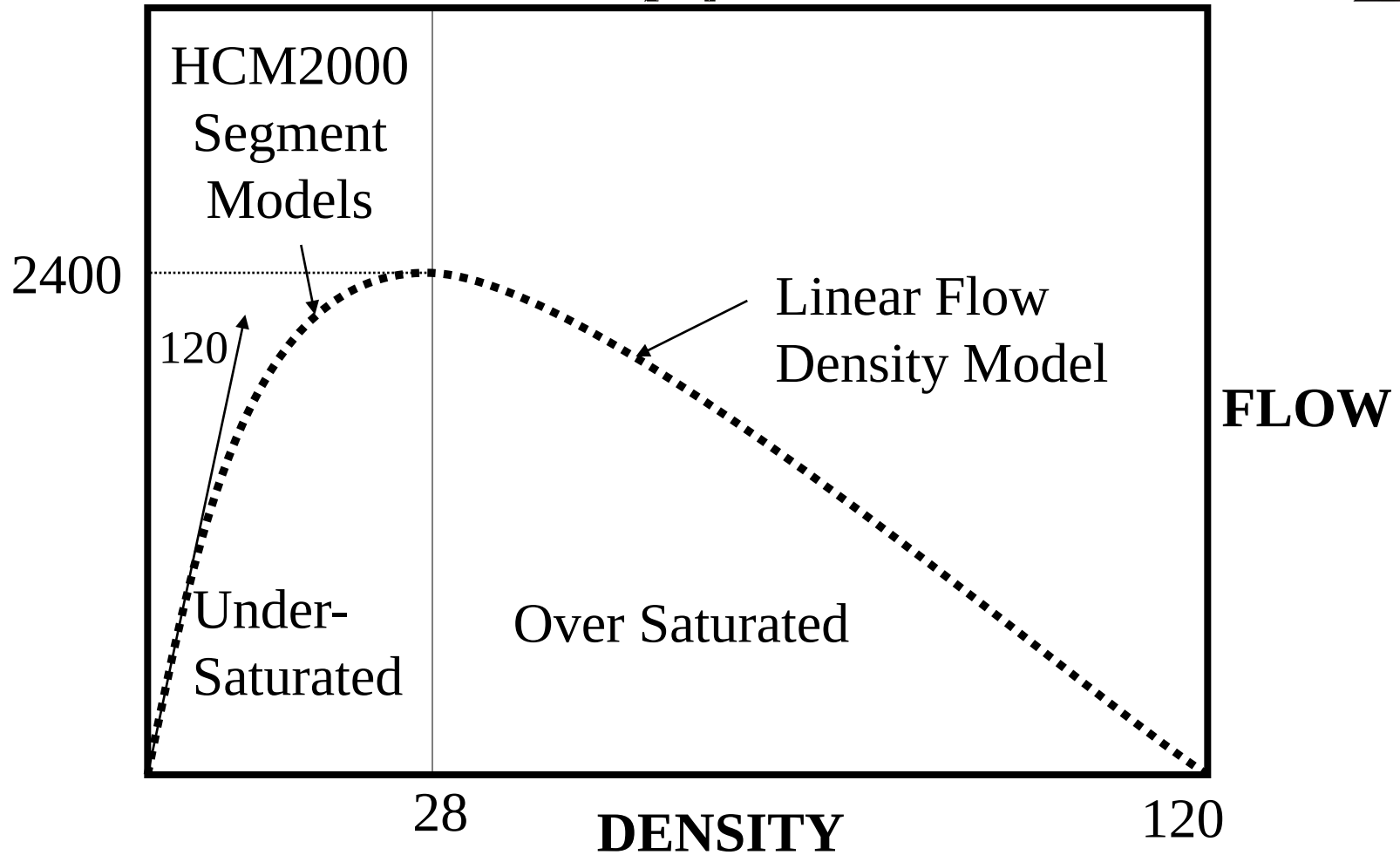
- Segment demand and/ or capacity may vary over consecutive time intervals
- Incidents, geometric improvements, ramp metering, construction effects can be tested
- Queue length on mainline and ramps estimated
- Limited HOV analysis
- Facility Performance measures given, but...

No Facility-Wide LOS

Capacity Adjustment Factor



Oversaturated Analysis



Performance Measures



- **At the segment level- by interval**
 - speed
 - density
 - capacity (vph)
 - LOS (from segment chapters)
- **At the facility level-- by interval & overall**
 - speed-- mainline
 - density-- mainline
 - veh-kms of travel-- mainline
 - veh-hrs of travel-- mainline + ramps
 - veh-hrs of total delay-- mainline + ramps

Freeway Facility PM's in HCM2000



- **Oversaturation: interval-specific output**
 - Segment flow vs segment demand (v/c , d/c)
 - Location of bottlenecks in each interval ($v/c=1$)
 - Time when queue starts in each interval (min)
 - Queue length on each segment at the end of each interval (m)
 - Time when queue dissipates in each interval (min)

Questions

