

# TriTAPT

## Trip Time Analysis in Public Transport

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### TriTAPT

- ▶ Goal
- ▶ Frame work
- ▶ Results

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### ▶ Goal

- Improve
  - Competitiveness
    - transit versus private car
    - quality of operation
    - travel time from origin to destination
    - choice traveler (buyers market)
  - Efficiency
    - cost per revenue km
  - Effectiveness
    - passenger per revenue km

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### ▶ Frame work

- Data collection (input):
  - Data about events and counts
  - Collected by:
    - On board processors
    - Roadside equipment
    - AVL systems
  - Stored in daily datasets per route
- Trip analysis:
  - Per route, route section, or common section
  - Information about quality and quantity,
  - Support for schedule planning
- Results (output):
  - Graphs, Tables, and Reports

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Results

- ▶ Quality
- ▶ Quantity
- ▶ Operational planning
- ▶ Process management
- ▶ Account for operation
- ▶ Performance index

Quality

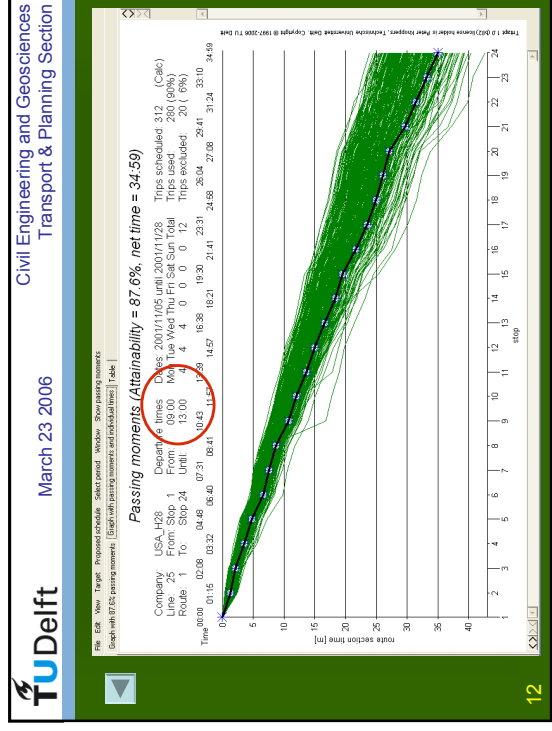
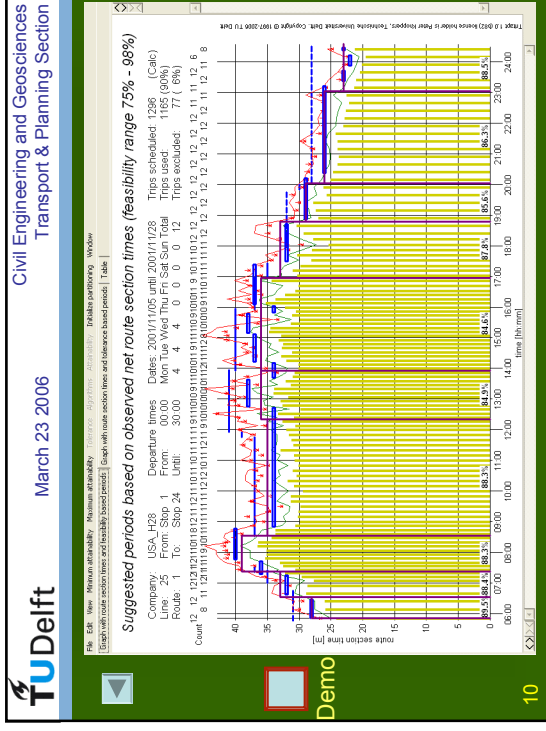
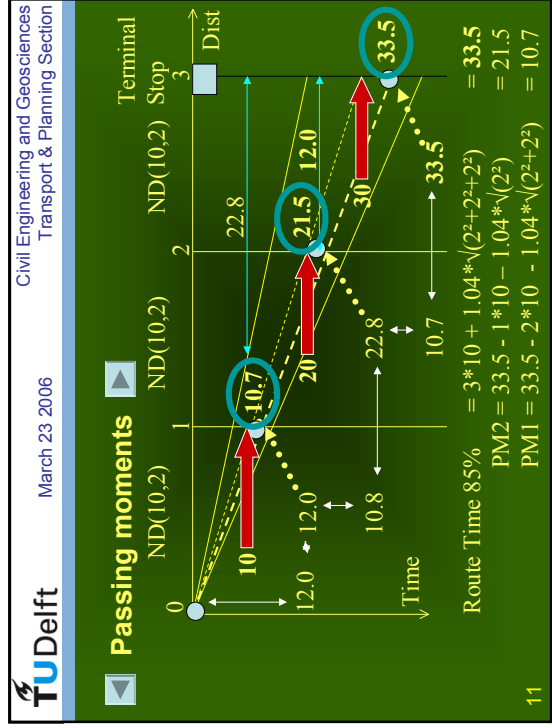
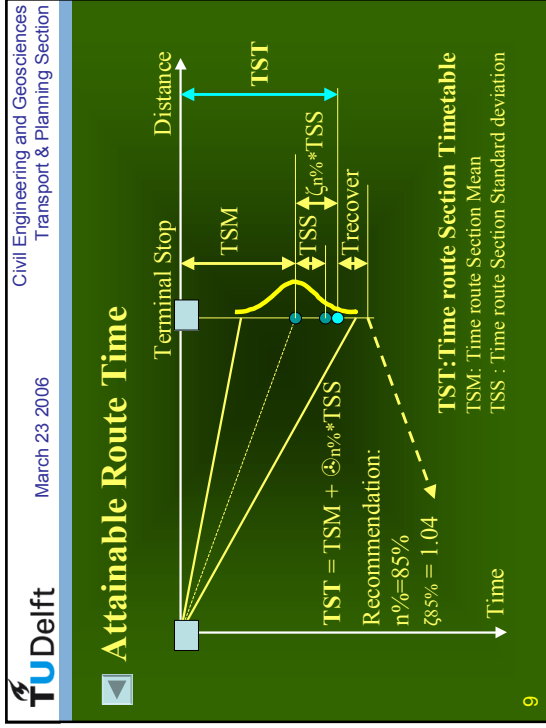
- ▶ Punctuality  
Deviations from schedule [sec]
- ▶ Regularity  
Deviations from planned interval [%]
- ▶ Speed  
Speed [km/h] (travel time)
- ▶ Comfort  
Seat availability (occupancy) [%]  
Waiting time

Quantity

- ▶ Passengers  
Unlinked trips  
Passenger kilometers
- ▶ Vehicles  
Vehicle kilometers  
Occupancy  
Average load  
Max load  
% Overloaded

Operational planning

- ▶ Attainability  
Desired feasibility
- ▶ Route time  
Required time in schedule per homogeneous period
- ▶ Homogeneous periods  
Successive trips that require the same route time
- ▶ Passing moments  
Distribution of time over the route  
Vehicles leaving stops on schedule will arrive on time  
(probability is equal to feasibility percentage)



## Process management

### Agency deliberation

(management, planners, dispatchers and drivers)

Goal:

- Discuss, understand and solve problems
- \* Quality of operation
- \* Quality of planning
- \* Efficiency
- \* Effectiveness

Increase motivation and cooperation

## Account for operation

### Inform about Quantity and Quality

#### Internal

Transit management  
(efficiency executed transportation)

#### External

Transit authority  
(effectiveness purchased transportation)

## Performance index

- 20% **Service supplied**
- 40% **Quality of services executed**
  - 50% Punctuality (begin and end; % on time, later, and early)
  - 20% Regularity (begin and end)
  - 20% Speed (operational, passing, running)
  - 10% Delay time
- 20% **Quality of planning**
  - 100% Attainability
- 10% **Quantity**
  - 50% Passenger Trips
  - 50% Average occupancy
- 10% **Comfort**
  - 50% Overcrowded
  - 50% Waiting time at boarding stop

Demo: 

Punctualiteit index  
Verkeersdienst

	#	%	score
Geplande ritten per dag	108.0	98.8	0.0
Herkende ritten per dag	103.5	88.9	13.3
Uitgevoerde ritten per dag	77.1	68.7	3.3
Passagiers per dag	72.1		
Stiptheid	#	%	score
Op tijd vertrokken bij beginhalte: 73.2	75.4	7.5	
Op tijd vertrokken bij eindhalte: 21.1	21.1	3.5	
Tot laat vertrokken bij beginhalte: 20.5	14.5	14.9	1.5
Op tijd aangekomen bij eindhalte: 23.8	24.5		
Te vroeg aangekomen bij eindhalte: 39.3	39.6		
Te laat aangekomen bij eindhalte: 10.6	10.6		
Ordegeheim		%	
Gemiddeld bij beginhalte: 52.4			
Gemiddeld bij eindhalte: 15.5			
Stiptheid			
Operationele snelheid	24.2		
Passeersnelheid (TSA)	19.8		
Bedrijfsnelheid (TDA)	27.3		
Reisnelheid (TSA+TDA)			
Verkeersdicht	999	18.339	
Gemiddeld per rit:			
Kwaliteit planning	#	%	score
Routefix gebaald per dag:	68.9	68.9	7.8
Kwantiteit			
Passagiers	#	score	
Per rit (in- en uitgestapt)	54.0	7.3	
Bezetting	#	%	
Gemiddeld over alle rit	17.7	3.8	0.0
Gemiddelde bezetting	32.3	64.7	4.4
Comfort			
Overbelasting	#	%	score
Overbelaste ritten per dag	16.7	15.5	8.5
Wachttijd op haltes	score		
Inslagpact: passagiers	rent		10.0

The end