Finding The “Right” PT System for Hamburg “HafenCity”

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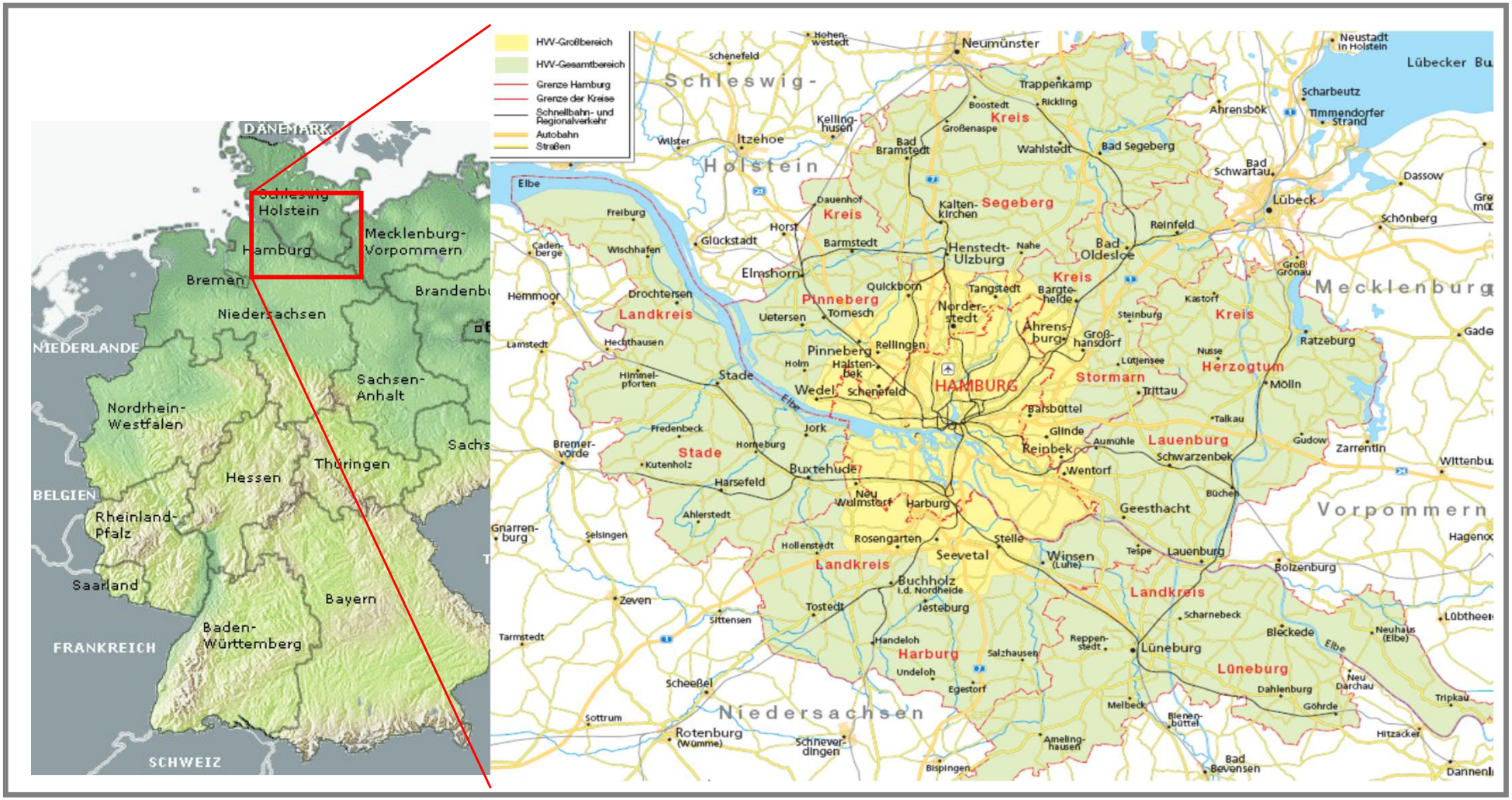
UITP World Congress Vienna, June 2009

Agenda

- Introduction
- Challenge
- Approach
- First Phase
- Second Phase
- Solution

Introduction

Public Transport Region Hamburg

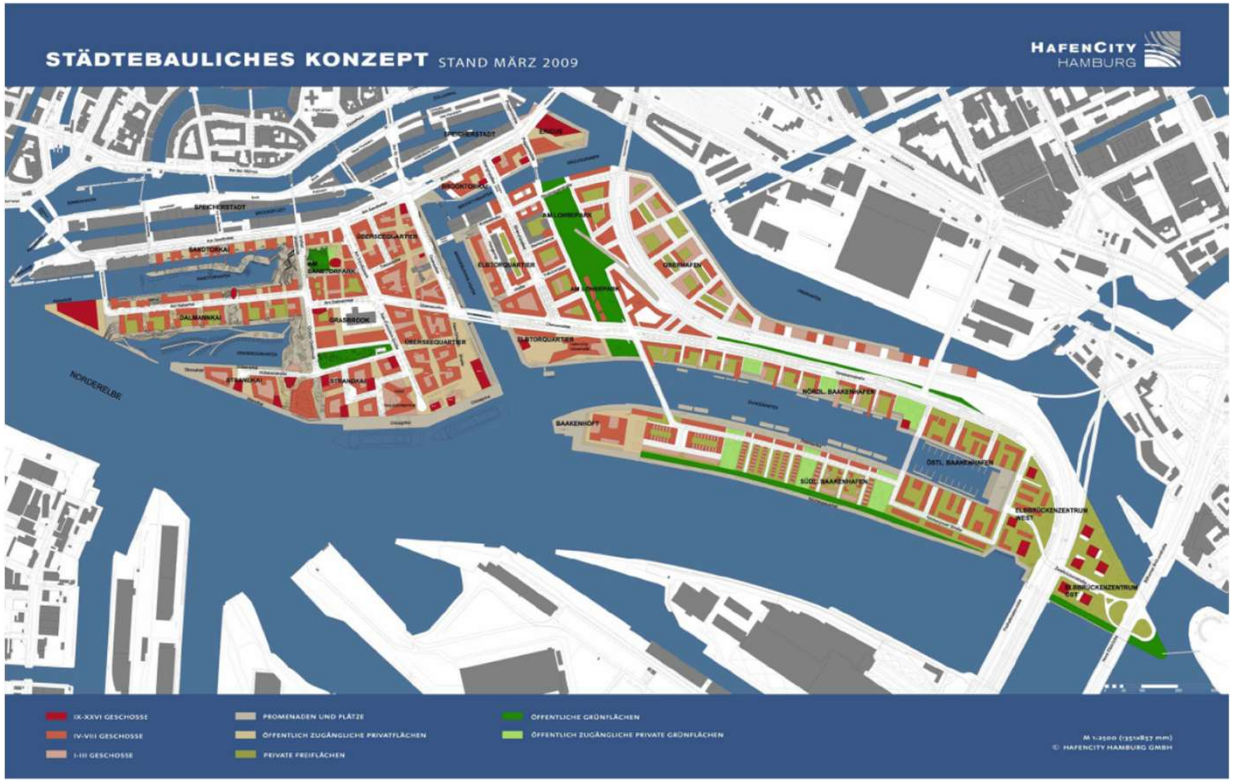


Hamburg: 1,7 Mio. inhabitants
Metropolitan Area: 3,3 Mio. inhabitants

Urban Development Area „HafenCity“ in Hamburg

Restructuring of no longer used port areas

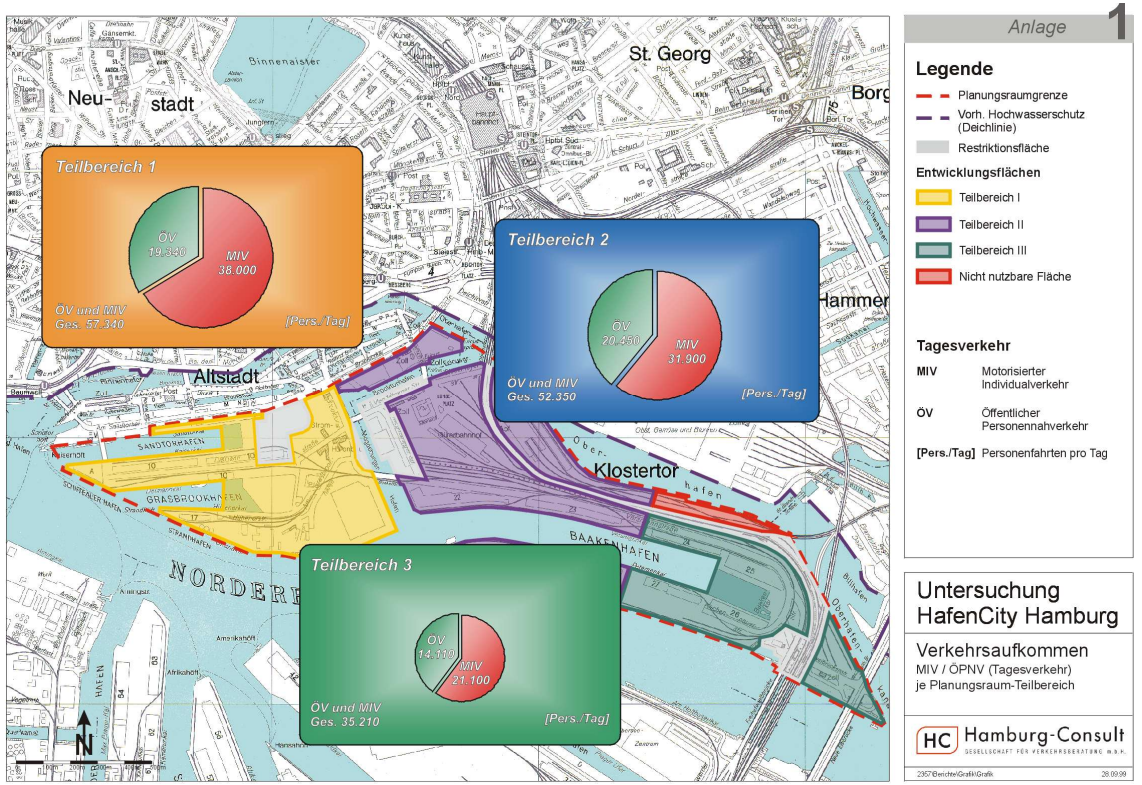
- One of the biggest urban development projects in Europe
  - Political decision in 1997 to develop „HafenCity“ until 2025
  - 1.5 square kilometres
  - Close to city center
  - Residences for 12,000 inhabitants
  - Working facilities for 40,000 employees in the service sector mainly



Challenge

Challenge: Finding the „right“ public transportation system

- A traffic volume of 145.000 trips per Day is predicted
- Modal share of public transport is assumed to reach 34 %
- High capacity public transport system is essential
- ➔ Systematic evaluation process necessary



Approach

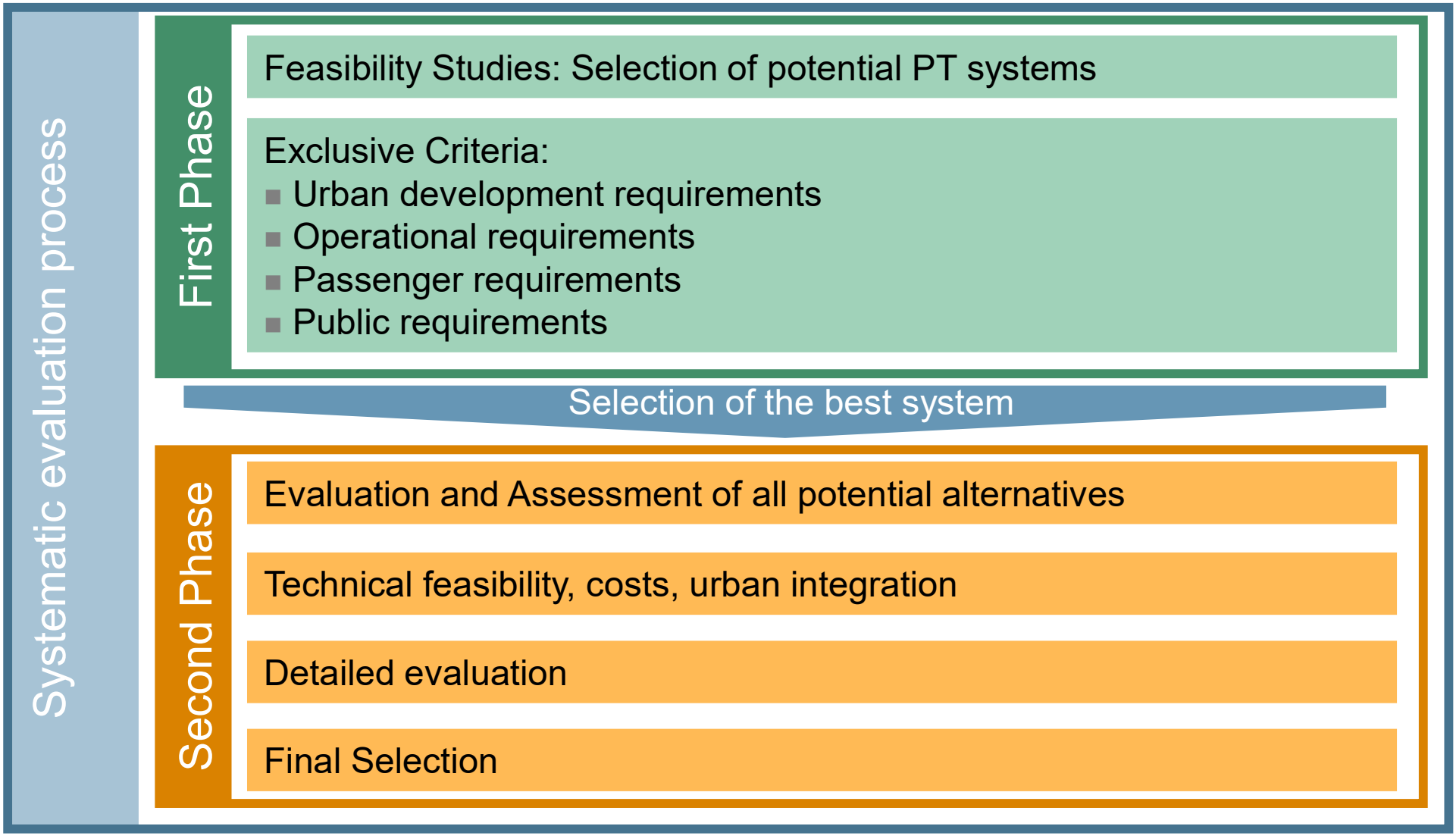
Approach

Land use planning procedure…

- necessary to get political decisions
- prerequisite to receive financial support from tax payers
- demands a systematic and comprehensive evaluation and assessment of alternatives

Systematic and comprehensive evaluation process

Two phase approach



First Phase

Feasibility Studies: Selection of potential PT systems

- Present urban and suburban PT systems in Hamburg
  - Bus
  - Metro (U-Bahn)
  - Suburban Railway (S-Bahn)
- Other potential PT systems
  - Light Rail Transit (LRT)
  - People Mover
  - Transrapid

Feasibility Studies For Any Potential System

Basic criteria

- Urban development requirements
  - Infrastructure feasibility
  - Integration in urban surrounding
- Operational requirements
  - Capacity
  - Operational costs
  - Operational feasibility
- Passenger requirements
  - Journey times
  - Integration in present network
- Public / Investor´s requirements
  - Capital expenditure
  - Constructional feasibility
  - Rate of return

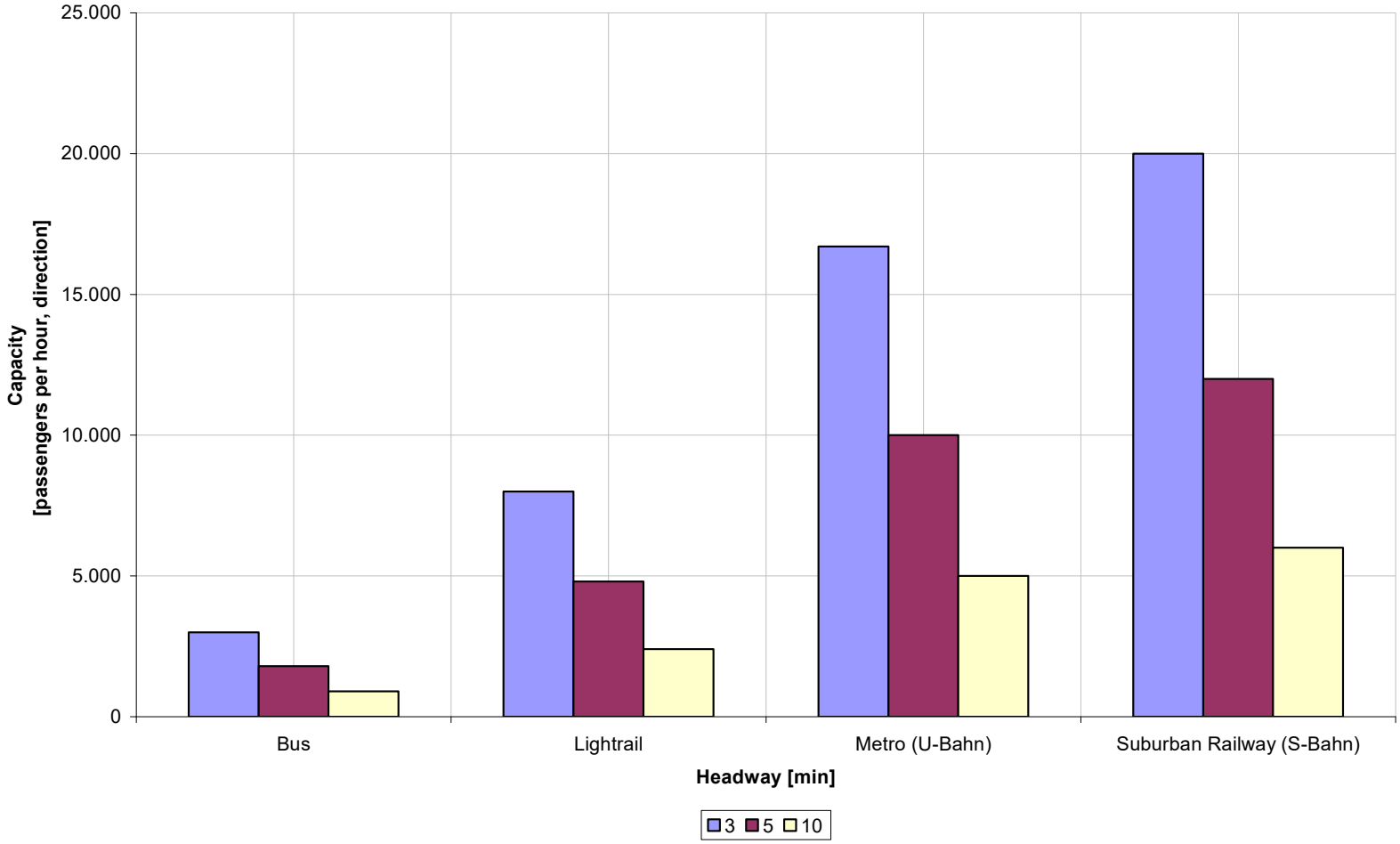
Operator´s view

Operating profit with low risk

- Investments / startup costs for new systems
  - Infrastructure
  - Depot
  - Vehicles
- Operating costs
  - Maintenance of infrastructure and vehicles
  - Vehicles
  - Labour
- Revenues
- Possibility of network expansions
- Practical approval

Basic criteria for Evaluation

Capacity (Example)



Passenger´s view

Fast, convenient and reliable connections

- Travel time
- Convenience
- Simplicity
- Reliability
- Safety and security
- Fares

General public´s view

Efficient system with low external impacts

- Financial impact for the community
  - Subsidies for investments and operation
  - Opportunity costs
- Environmental impact
  - Pollution and noise perception
  - Integration in urban surrounding
  - Contribution to protect climate
- Impacts on other transport systems / modes
  - Synergies
  - Safety
  - Interferences
- Innovation

First Phase: Feasibility Studies

Results

- **Transrapid,** developed for long distance transport, not appropriate as inner city passenger system.
- **H-Bahn**, people mover system connecting two parts of Dortmund university and bringing passengers to their terminal at Düsseldorf airport; however, isolated system and still not in series production.
- **S-Bahn Suburban Railway,** heavy rail, integration in city tunnel leads to extremely high investments; operational drawbacks at Jungfernstieg station.
- **Lightrail** (lowfloor), in Hamburg not existing: missing infrastructure; a network for Hamburg „HafenCity“ is too small to justify a brand new system.
- **High Performance Bus System**, limited capacity due to integration in network; not accepted from investors.
- **U-Bahn Metro**, basic requirements are fulfilled, advantages compared to other systems: integration in pt network and urban surrounding, capacity and flexibility.

Second Phase

Second Phase: Evaluation of all potential alternatives

Step 0:
Parlament‘s System Decision:
U-Bahn Metro

Evaluation and Assessment of 6 systems

Step 1:
Alternatives: What is thinkable?

Evaluation and assessment of 34 metro variants

Step 2:
Exclusion of variants: What is feasible?

Technical Feasibility, costs, urban integration of 6 variants

Stufe 3:
Ranking of variants: What is preferable?

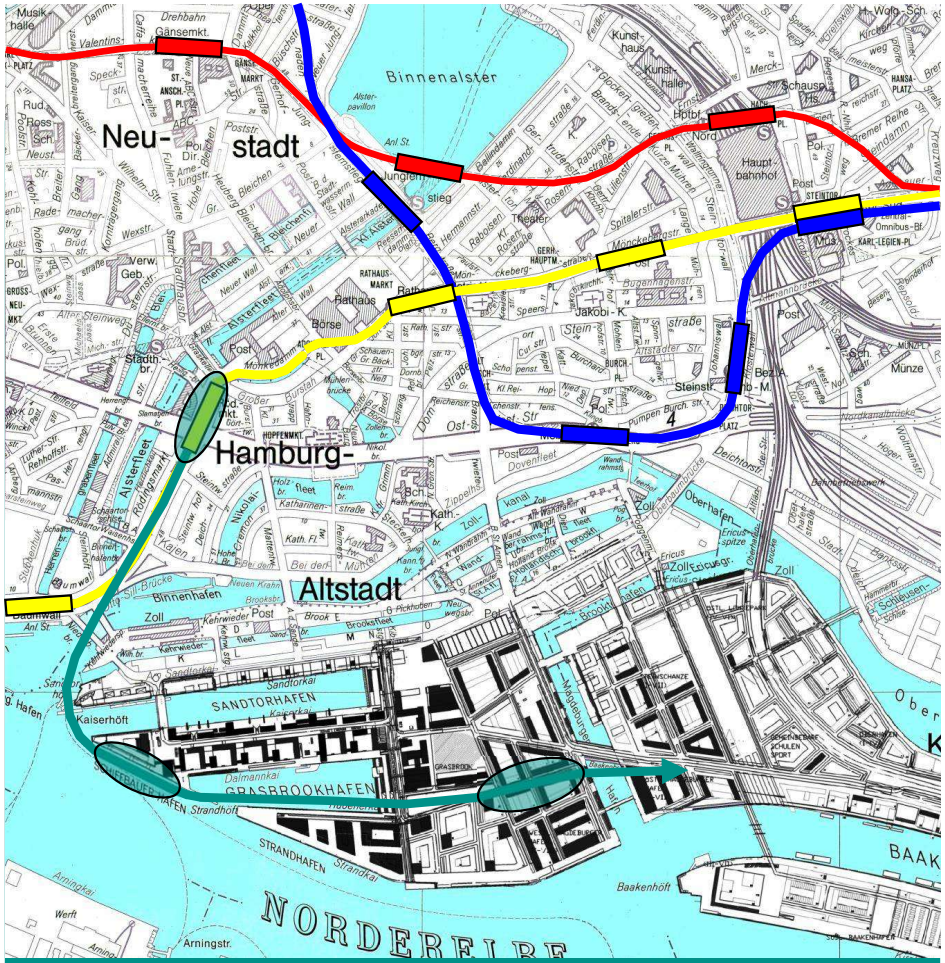
Detailed evaluation and assessment of remaining 3 variants

Prefered variant: Integration at station Jungfernstieg

Stufe 4:
Fixing routing and stops

Assessing alternative routing and stops
Decision: Stop Überseequartier and Stop Lohsepark

Exclusion of Variant “Rödingsmarkt“: Level Plus 1

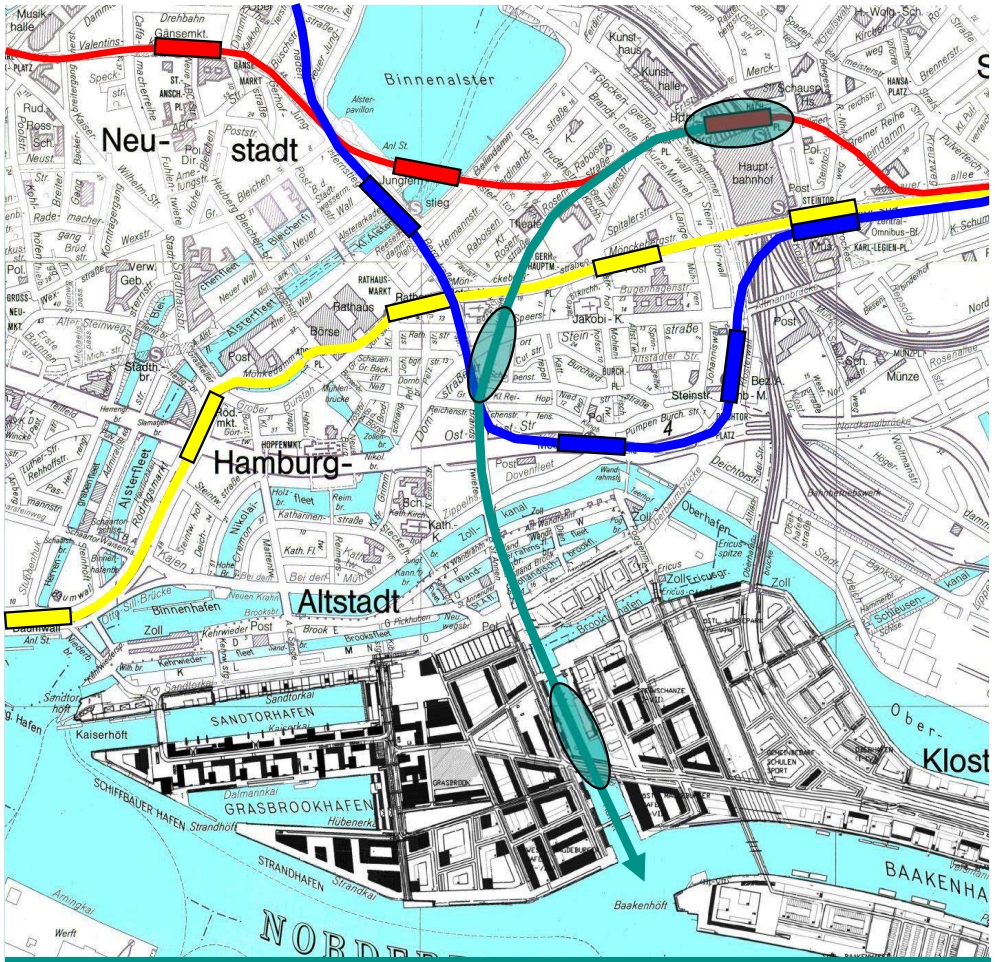


„Variant Rödingsmarkt“ (Level Plus 1)

- Risk of ships out of control
- Space need for metro reduces investment potentials real estate
- Noise emission
- Urban integration demanding

→ Concern on behalf of residents and investors

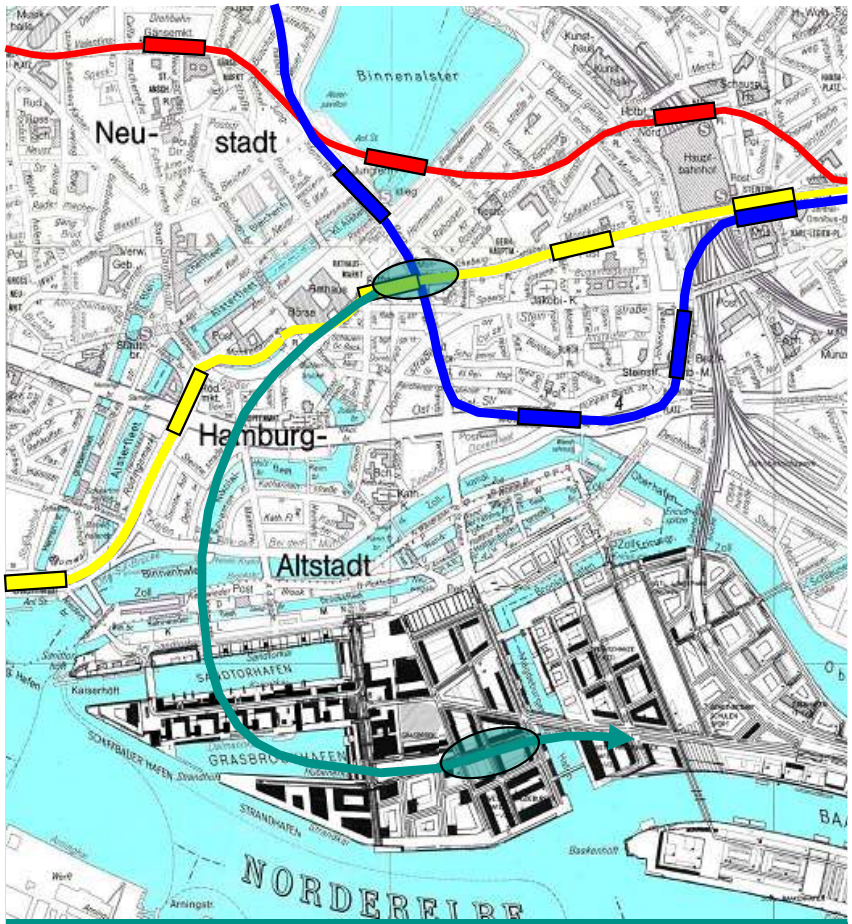
Exclusion of „Variant Central Station“



„Variant Central Station“

- High technical risks (crossing under high density urban area: Old theater Schauspielhaus, Hotel Europäischer Hof, insureance company, etc.)
- Big concern due to long 3 year construction period on behalf of railway passengers)
- Opening in 2011 very demanding because of complex construction work
- Accessibility of stop Domplatz unfavourable (30 m below surface)
- Poor Reachibility of public transport in Harbour City with only one stop

Exclusion of „Variant Town Hall“

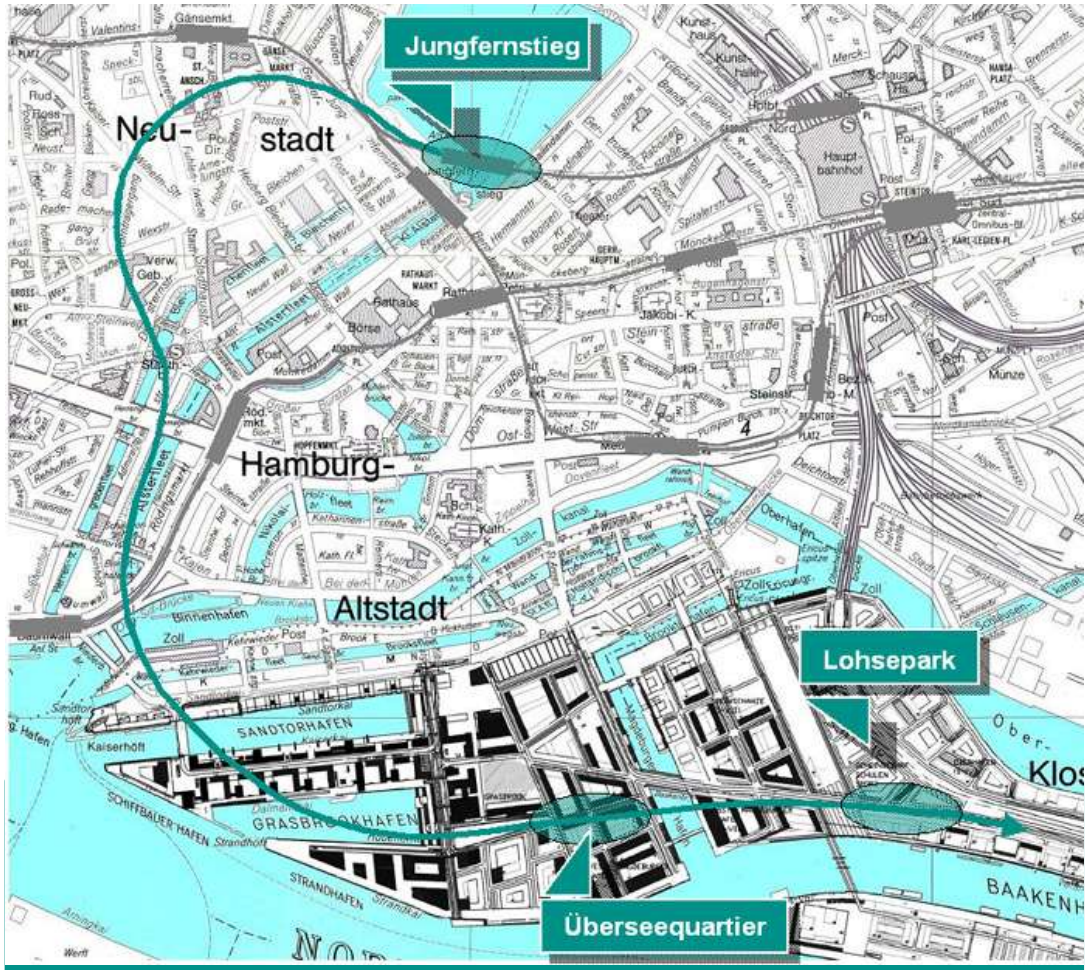


„Variant Town Hall“

- Technical risks due to very limited space available
- Conflicts with crossing under urban streets and places due to short distances
- Negative impact on private and public interests: Open construction in Hamburg central shopping area
- Long, 3 years lasting interruption of Metro Line U3

Solution

„Variant Jungfernstieg“



“Variant Jungfernstieg“

Advantage:

- Direct connection between Harbour City, City Center and Central Station
- Good Reachibility of Harbour City with two stops
- Limited impact of private and public users during construction period and later on
- High capacity and best integration in urban pt network of all remaining variants
- Future Extension in southern direction possible

However:

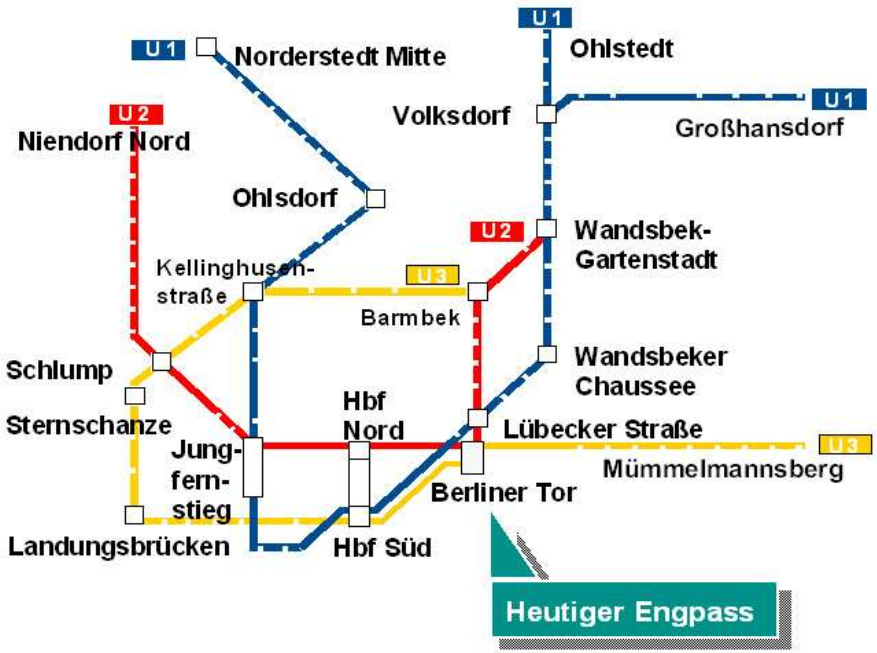
- Interruption of Line U2 for six months
- Construction Works in the area of Jungfernstieg

„Variant Jungfernstieg“: Location of Stops

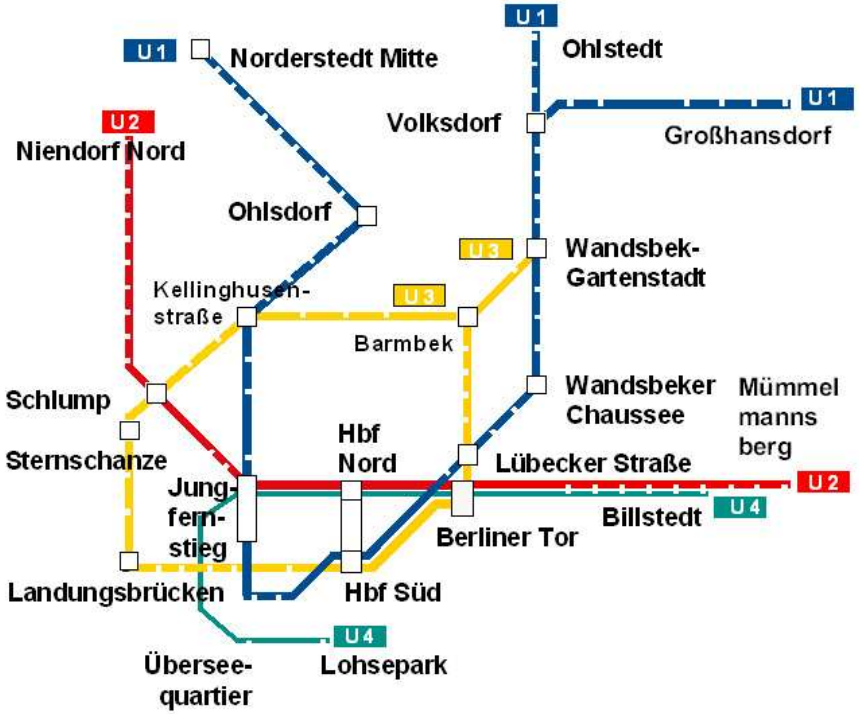
Prefered „Variant Jungfernstieg“

- Planning Approval from parliament
- Start of construction in 2007
- Opening in 2011

Current and Future Underground Network Hamburg



Current network



Future network 2011

What we can expect – Facts and Figures

- **Passenger Demand** Überseequartier - Jungfernstieg per day:
  - 22.000 in 2011
  - 33.500 finally after realising „HafenCity“
- **Capacity**:
  - Regular Service: 10 min-Headway, 5,000 passengers per hour, direction
  - Maximum: 2,5 min-Headway, 20,000 passengers per hour, direction
- **Travel Time:**
  - Lohsepark – Überseequartier 1 min.
  - Überseequartier – Jungfernstieg 3 min.
  - Überseequartier – Central Station min.
- **Accessibility for handicapped users given**
- **Maximum Speed:** 80 km/h

Thank you