

Snabba landtransporter - olika teknikval -



Dr. Henrik Ny (Associate Professor)

The SustainTrans Team
Blekinge Institute of Technology (BTH)

SJK Skåne, Malmö
2023-12-06



Upplägg för kvällen

- Hur jag hamnade här
- **Rapporten om snabba landtransporter för Sverige**
- Konferensen Maglev 2024
 - Filmen och Hemsidan
 - Presentationen från Kina 2022
 - Call for papers släpps nu!
- En tidig julklapp samt diskussion och frågor 😊

Rapporten om snabba landtransporter för Sverige

Fast Ground Transport for Sweden

AN INDEPENDENT OVERVIEW FOR STRATEGIC INVESTMENT DECISIONS



Final Version. January 2022



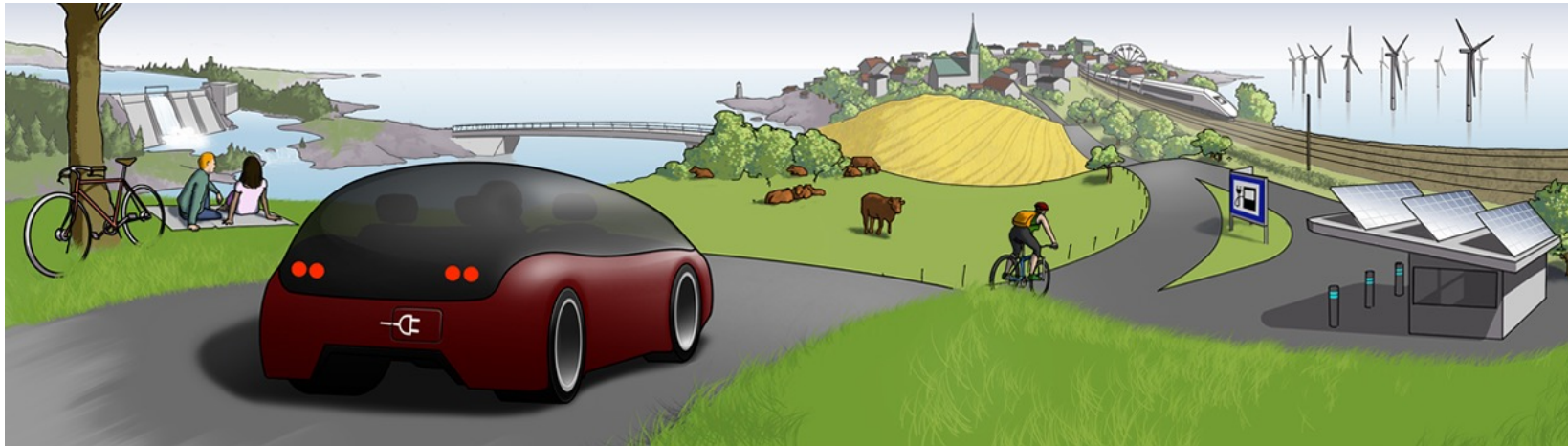
Dr. Henrik Ny

Blekinge Institute of Technology
Research Report 2022:01

Dr. Henrik Ny, BTH, www.bth.se/sustaintrans

Is Maglev an Interesting Option for a Sustainable Scandinavian Transportation Network?

- Reasoning based on a Swedish Case



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Blekinge Institute of Technology (BTH)

Maglev 2022, Beijing

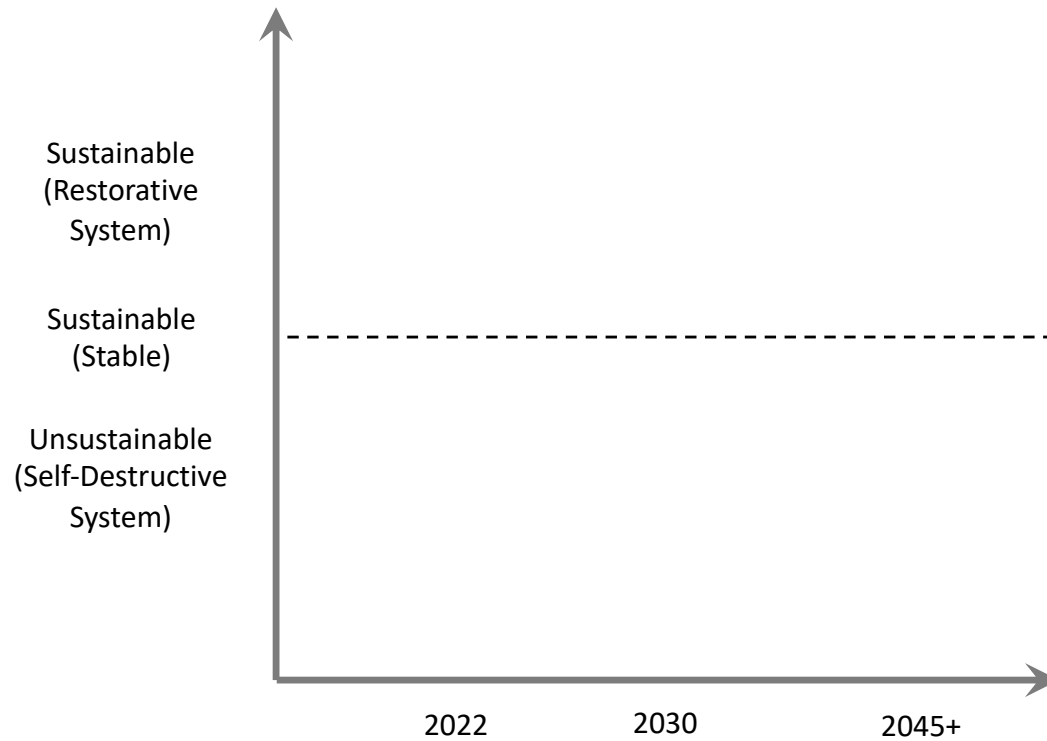


A Swedish Case Study

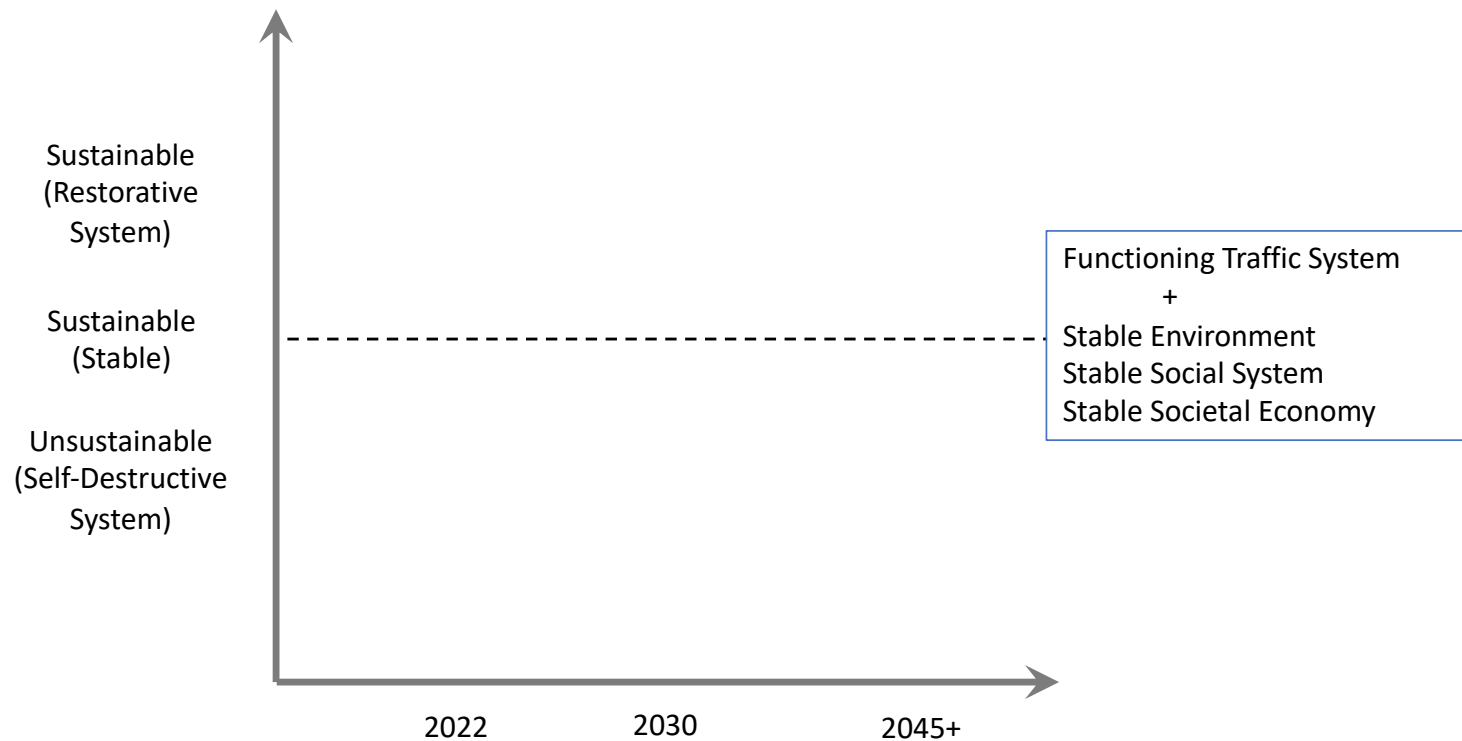


- Swedish train networks are crowded
- Solutions are not compared systematically
- What about future transport system scenarios?
- Let's make a STRATEGIC sustainability analysis
- And consider the consequences for Scandinavia

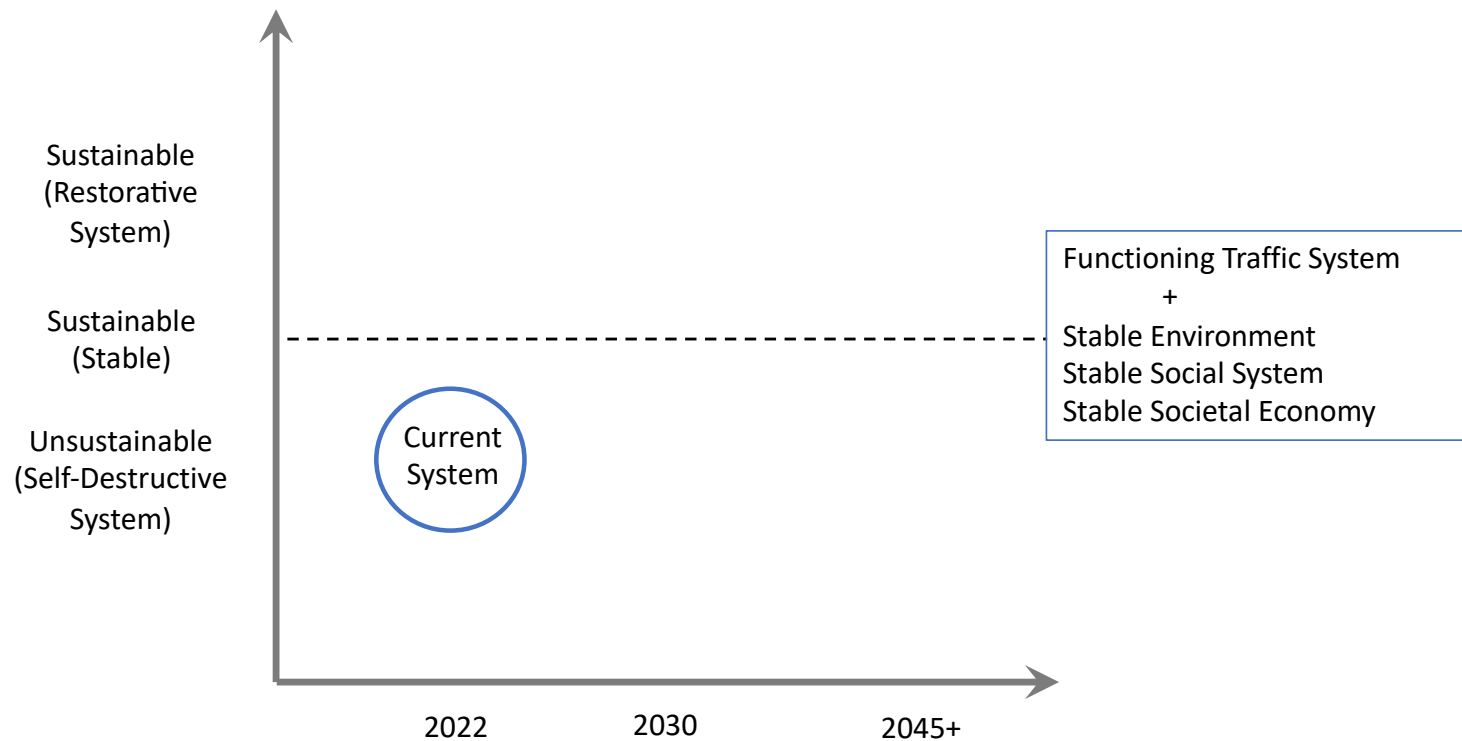
A Strategic Sustainability Assessment



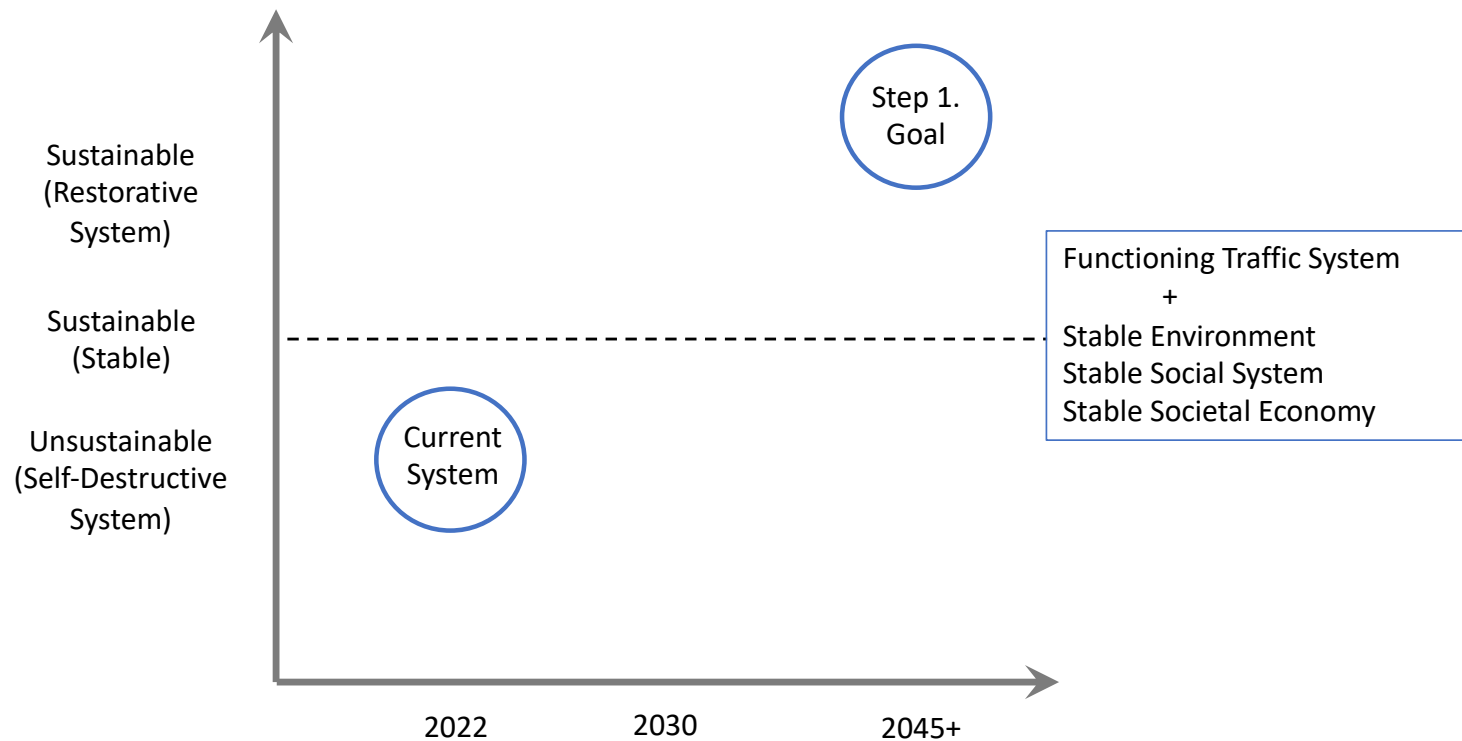
A Strategic Sustainability Assessment



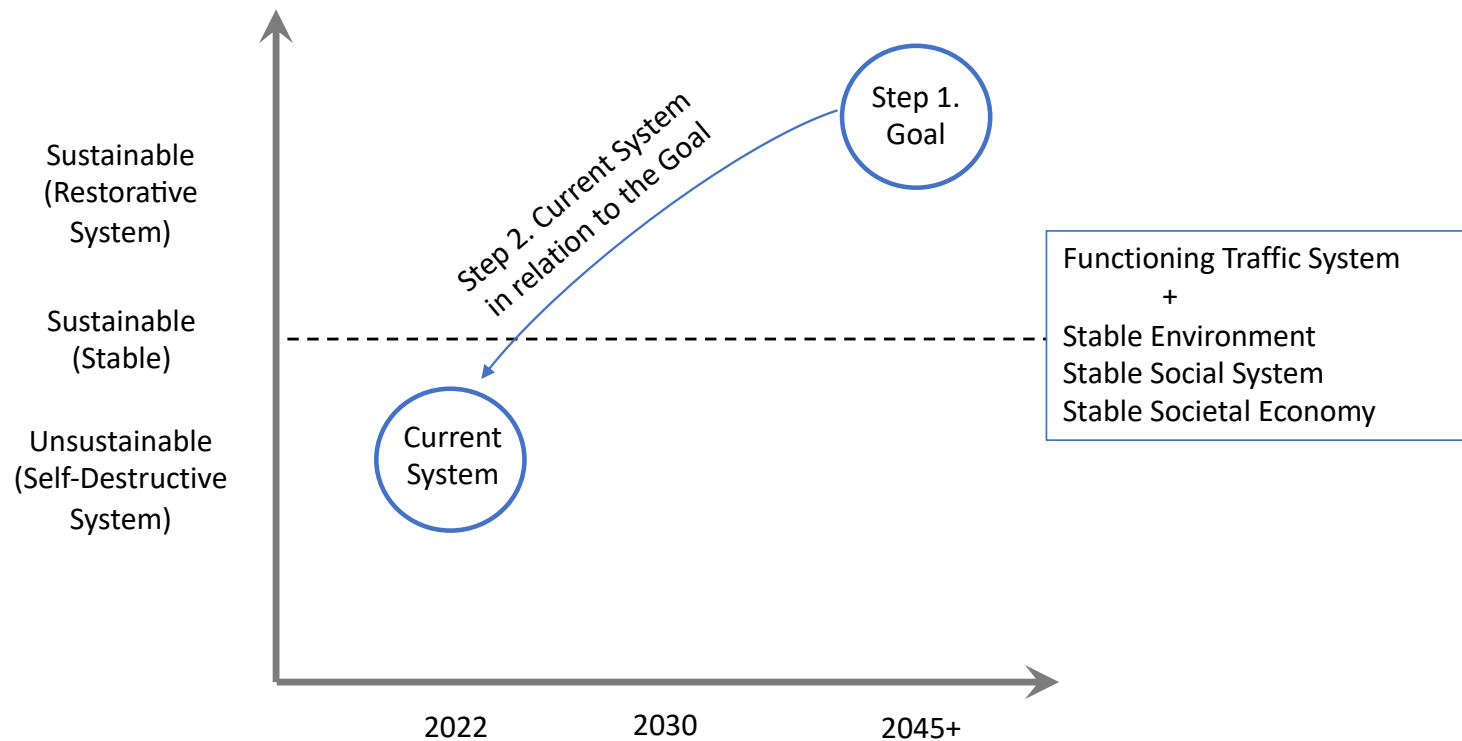
A Strategic Sustainability Assessment



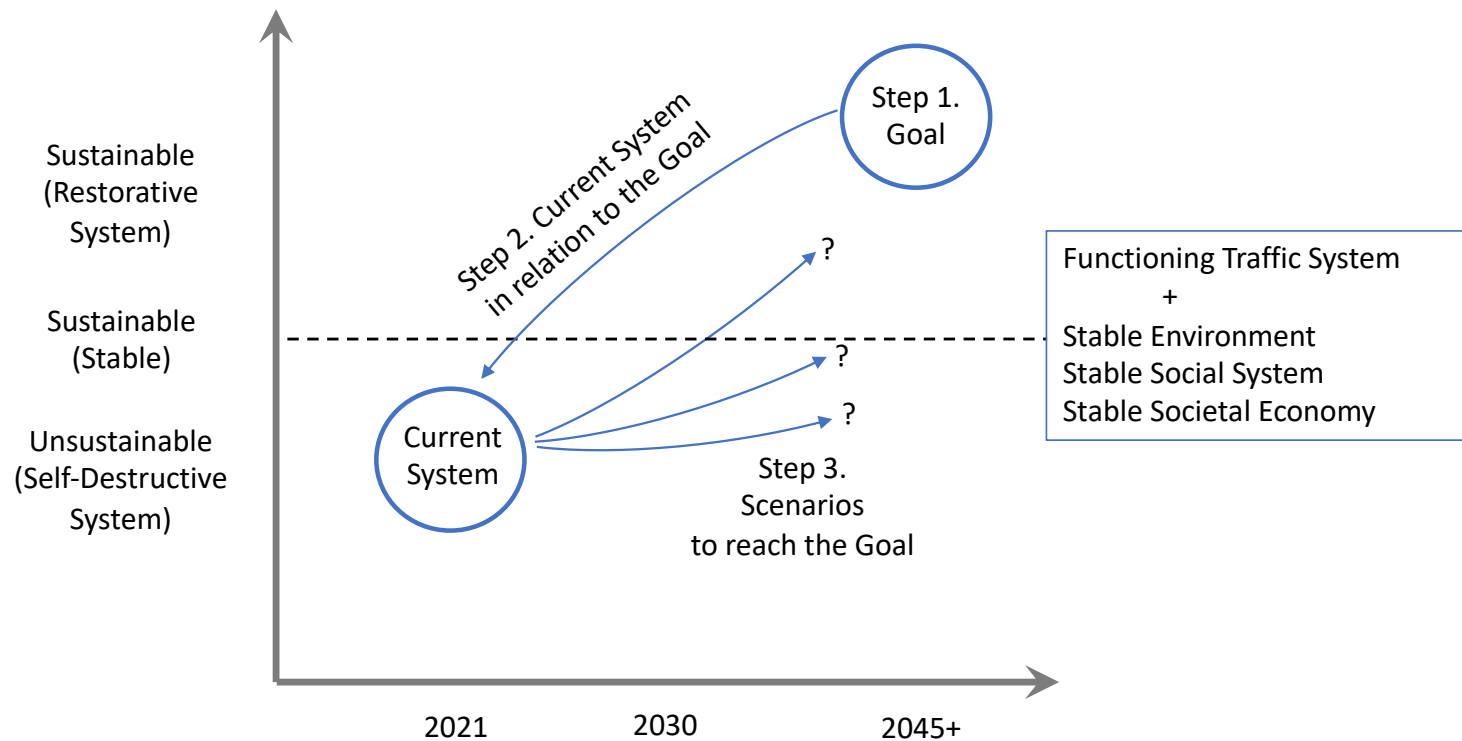
A Strategic Sustainability Assessment



A Strategic Sustainability Assessment



A Strategic Sustainability Assessment



Step 1. The Goal



In 2045 the following should be achieved:

1. Functioning Trp. System. Being efficient, fast, on time
2. Env. / Social Stability. Respecting env. and social limits
3. Economic Stability. Being prudent with tax money and resources

Step 2. The Current System



- | | | |
|-----------------------------|-----|--|
| 1. Functioning Trp. System. | No. | Crowded tracks and roads, delays
low freight capacity |
| 2. Env. / Social Stability. | No. | Large share inefficient transport
(car, flight) |
| 3. Economic Stability. | No. | Growth limitations
Insufficient track maintenance |

Steg 3. Scenario 1. Fix Existing System



- | | | |
|-----------------------------|-----|---|
| 1. Functioning Trp. System. | No. | Crowded tracks and roads, delays
low freight capacity |
| 2. Env. / Social Stability. | No. | Increasing share of car and flight |
| 3. Economic Stability. | No. | Growth limitations
Costly track maintenance
No economic growth benefits |

Steg 3. Scenario 2. New High Speed Rail



- | | | |
|-----------------------------|--------|---|
| 1. Functioning Trp. System. | Maybe. | Less crowding, better timeliness
higher freight capacity |
| 2. Env. / Social Stability. | Maybe. | Shift from car and flight to train
Emissions and impacts on nature areas |
| 3. Economic Stability. | Maybe. | Costly construction & track maintenance
Some economic growth benefits |

Steg 3. Scenario 3. New Maglev Trains



- | | | |
|-----------------------------|------|--|
| 1. Functioning Trp. System. | Yes! | Less crowding, better timeliness
higher freight capacity |
| 2. Env. / Social Stability. | Yes? | Big shift from car and flight to train
Some emissions & impacts on nature areas |
| 3. Economic Stability. | Yes! | Costly construction
Cheap track maintenance
High economic growth benefits |

Step 3. Scenarios. Detailed Analysis

Overarching future scenarios (each column is an alternative future scenario that includes various combinations of incentives and transport solutions with cars, traditional trains, domestic flights and high speed ground transport via HSR or Maglev)	Scenario 1.		Scenario 2. New High Speed Rail (HSR) System				Scenario 3.	
	No New sust Incentives	New Sust Incentives					SC Maglev	EMS Maglev
	Mixed Traffic		Mixed Traffic	No Mixed Traffic	Mixed Traffic	No Mixed Traffic	No Mixed Traffic	
Top Speed in km/h	150-250		250	320		320	500+	
Type of Track	Ballast Track		Ballast Track	Fixed Track	Bridge Track	Bridge Track	Bridge Track	
Sub Scenario number	Sc. 1.1	Sc. 1.2	Sc2.1	Sc2.2	SC2.3	SC2.4	SC3.1	Sc3.2
Future scenario assumptions								
- Extra train transport demand 2050?	+ 30-50%	+ 30-50%	+ 30-50%	+ 40-60%	+ 40-60%	+ 40-60%	+ 60-75%	+60-75%
- Build with 'Green Concrete'?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
- Include additions to the old track?	Yes	Yes	No	No	No	No	Yes	Yes
- Climate-Neutral Electricity?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
1. Effects for the Traffic System								
1.1 Shift of personal mobility fr car to train								
1.2 Shift of personal mobility fr flight to train								
1.3 Shift of freight fr trucks to train								
1.4 Integration with planned regional trains								
1.5 Adding to EU High Speed Rail Network								
1.6 Etc?								
2. Effects for People								
2.1 Travel time								
2.2 Travel reliability								
2.3 Traffic accident risk								
2.4 Unhealth (and premature deaths)								
2.5 Discrimination (no access to affordable trp)								
2.6 Etc?								

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- Climate-Neutral Electricity?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
3. Effects for the Environment								
3.1 Greenhouse gas emissions								
3.2 Fine Dust Emissions								
3.3 Biodiversity Loss								
3.4 Other Physical destruction								
3.5 Etc?								
4. Effects for Societal Economy & Resources								
4.1. Work Market Region Expansion								
4.2 Investment Costs								
4.3 Maintenance Costs								
4.4 Energy Use								
4.5 Concrete use								
4.6 Ballast and Embankment Material Use								
4.7 Metal Use								
4.8 Etc?								

Conclusions

The Maglev scenario is the most promising for Sweden:

- Meets transport demands
- The least environmental impacts
- The most benefits for the societal economy

An extension of the potential Swedish HSR or Maglev train networks to both Copenhagen and Oslo would likely give social, ecological and economic benefits, especially for Maglev.

But some questions remain to be investigated:

- The net effect from distance work and population growth?
- Could electric cars and electric flight become competitive to HSR/Maglev?
- Other unforeseen problems?

Thank you!



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Konferensen Maglev 2024

Maglev2024.com



△MAGLEV 2024△

COPENHAGEN / MALMÖ – THE GATEWAY TO SCANDINAVIA

Highlights

Engaging the Next Generation of Engineers
A Platform for All MagLeV Technologies
High International Media Impact
Sustainability Simulations for Future-Proofing



Exceptional Localization

The gate to Scandinavia
20 min to Copenhagen Airport
Excellent Conference facilities
People from around the world
Beautiful surroundings



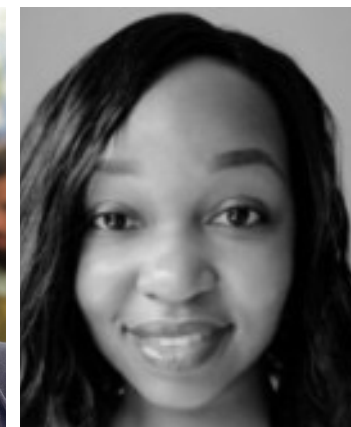
Experienced Organizational Team



Prof. Henrik Ny – BTH
Transport, Sustainability



Martin Prieto Beaulieu – BTH
Transport, Sustainability



Judith Oginga Martinsl – BTH
UN Habitat, Mobility, Planning



Lisa Wälitalo – BTH
Sustainability, Planning



Prof. Stefan Gössling – LU
Economics, Transport,
Sustainability



Prof. Karl-Henrik Robert – BTH
Sustainability, Business



Tracks and topics

Topic Tracks

Maglev Systems

- High speed maglev: projects and operation
- Magnetic bearings
- Vehicle levitation and guidance
- Guideway and infrastructure
- Propulsion, linear motors and energy supply

Maglev vs Wheel and Rail Technology

Hyperloop Systems

Other New Technologies

- New ideas on levitating device applications
- Prospecting ideas on transportation

Trans-topic Tracks

Societal Transport Planning

Sustainability Analysis

- Environmental impact
- Safety and operational control
- Education
- Economic planning / feasibility studies

Excellent Facilities

Congressional facilities of international standard

Top equipment, internet connections, etc

Multi-cultural staff

We speak your language (200+ nationalities in Malmö)



11
Rooms for larger
groups



16
Rooms for smaller
groups



444
Hotel rooms



1700
Standing



1500
Seated



Exceptional Field Trips

MagLev	Transport System Bögl
Space Technology	Esrang
Battery technology	northvolt
Education	BTH Campus
Automotive	Koenigsegg
Modern Art	Louisiana Museum of Modern Art
Nature	Kullen National Park
Scientific	Tycho Brahe Observatory
Historical	Copenhagen Historical City Center



Experiences for all senses



Free Exhibitions, activities and poster display

- Exhibition of Companies and Universities
- Poster display
- Student workshop presentation
- VR



Delegates from around the globe

- Reduced fees for students
- Reduced fees for pensioners



A conference to remember

- Gala dinner in the spirit of Alfred Nobel
- Exceptional Field trips
- Traditional Swedish Give aways

Authority Support



Local partners:

Karlskrona kommun

Malmö kommun



Regional partners:

Region Blekinge

Region Skåne



National sponsors:

Swedish Energy Agency

The Swedish Environmental Protection Agency

The Swedish Transport Administration

Vinnova, Sweden's innovation agency



Academic Support



Organizer:

Blekinge Institute of Technology



Local academic partners:

Malmö University

Lund University

Linne University

Technical University of Denmark – DTU



National academic partners:

The Swedish National Road and Transport Research Institute (VTI)

IVL Swedish Environmental Institute

The Swedish Research Council

Formas, Swedish Research Council for Sustainable Development

The Institute for Futures Studies



Business Support



Venue partner:
Nordic Choice Hotels



Gala dinner partner:
The Nordic Council

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NEWS**

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Business partners:
Stepwise
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Cemvision ab



Business sponsors:
North Volt
ABB
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Hybrit

Summary of Maglev 2024

Let's make Maglev fit for the Future – Together!

Engaging the Next Generation of Engineers

A Platform for All MagLev Technologies

High International Media Impact

Sustainability Simulations for Future-Proofing

**Welcome to
Malmö and Copenhagen
in September 2024!**



MAGLEV2024

September 2024

Organizer: Blekinge Institute of Technology, Sweden
Conference Chair: Ass. Professor Henrik Ny

Please contact us at: Maglev2024@bth.se

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Call for Papers

Topics

Maglev Technological Research and Development

1. Magnetic Levitation and Guidance
2. Linear Motors
3. Guideway and Infrastructure Technologies
4. Energy Storage and Supply
5. Reliability, Safety and Operational Control
6. Magnetic Elevators and Escalators
7. Magnetic Bearings (in several applications like Maglev Wind Turbines, Heart Pumps, etc)
8. Superconductors, Application of Superconductivity
9. Design Issues (stations, guideways, vehicles)
10. New Ideas on Levitating Device Applications
11. Standardization Issues.
12. Hyperloop

Maglev Projects and Implementations

13. High-Speed Maglev (including Hyperloop): Studies, Projects and Operation Results
14. Urban Maglev: Studies, Projects and Operation Results
15. Freight (Cargo) Maglev: Studies, Projects and Operation Results
16. Innovative Spin-off use (military use, marine systems, sportive devices)

Sustainability Assessments and Societal Impacts of Maglev and Competing Technologies

17. Strategic Sustainable Development Assessments (ecological, social, societal economic)
18. Environmental and Health Issues (electromagnetic fields, noise, vibrations, earthquakes)
19. Research and Education, Cooperation
20. Marketing and Transport Psychology Issues (comfort demand, travel time, human factors)
21. Architecture, Urban Planning, Societal Transport Planning
22. Impacts on Spatial and Regional Development, Transport Geography, GIS
23. History of Maglev Development (worldwide)

Call for Papers

Key Dates in 2024

- Jan 15: Abstract submission opens
- Feb 5: Registration opened (early bird price)
- Mar 5: Abstracts submission deadline
- Apr 5: Information for authors of successful and rejected abstracts.
- Apr 15: Registration opened (regular price)
- June 3: Full Papers submission deadline
- Sep 16: Conference registration deadline for participants
- Sep 18: Maglev 2024 Arrival Day (welcome reception)
- Sep 19-20: Maglev 2024 Conference
- Sep 20-21: Maglev 2024 Field trips and technical excursions
- (Sep 24-27: InnoTrans Berlin)

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