The importance of interoperability in European green corridors

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Overview

- What is a green corridor
- Key Performance Indicators (KPIs)
- Interoperability and KPIs
- Corridor benchmarking
- Conclusions

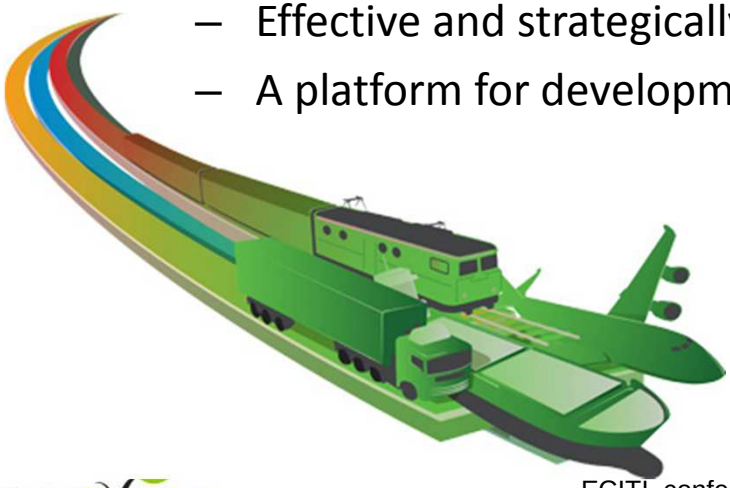
What is a green corridor?

EU Commission:

- Green Corridors are a European concept denoting long-distance freight transport corridors where advanced technology and co-modality are used to achieve energy efficiency and reduce environmental impact.

What is a green corridor?

- Definition by the Swedish Ministry:
  A green transport corridor is characterised by:
  - Sustainable logistic solutions
  - Integrated logistic concepts with utilisation of comodality
  - A harmonised system of rules
  - National/international goods traffic on long transport stretches
  - Effective and strategically placed transshipment points and infrastructure
  - A platform for development and demonstration of innovative logistic solutions



The SuperGreen project

- Theme title: Transport (including Aeronautics)
- Type of project: Coordination and Support Action
- Project full title: Supporting EU's Freight Transport Logistics Action Plan on Green Corridors Issues
- Project acronym: SuperGreen

Objectives

- ***Support and recommendations*** on Green Corridors to EU's Freight Transport Logistics Action Plan.
- ***Encourage co-modality*** for sustainable solutions.
- ***Overall benchmarking*** of Green Corridors based on selected KPIs covering all aspects related to transport operations and infrastructure (emissions, internal and external costs).
- Conduct a programme of ***networking activities between stakeholders*** to facilitate information exchange, dissemination of research results and communication of best practises and technologies.

Objectives, contd.

- ***Deliver studies*** addressing topics important for the further development of Green Corridors.
- ***Deliver policy recommendations*** at a European level for the further development of Green Corridors.
- Provide ***recommendations concerning new calls for R&D*** proposals to support development of Green Corridors (eliminate bottlenecks).

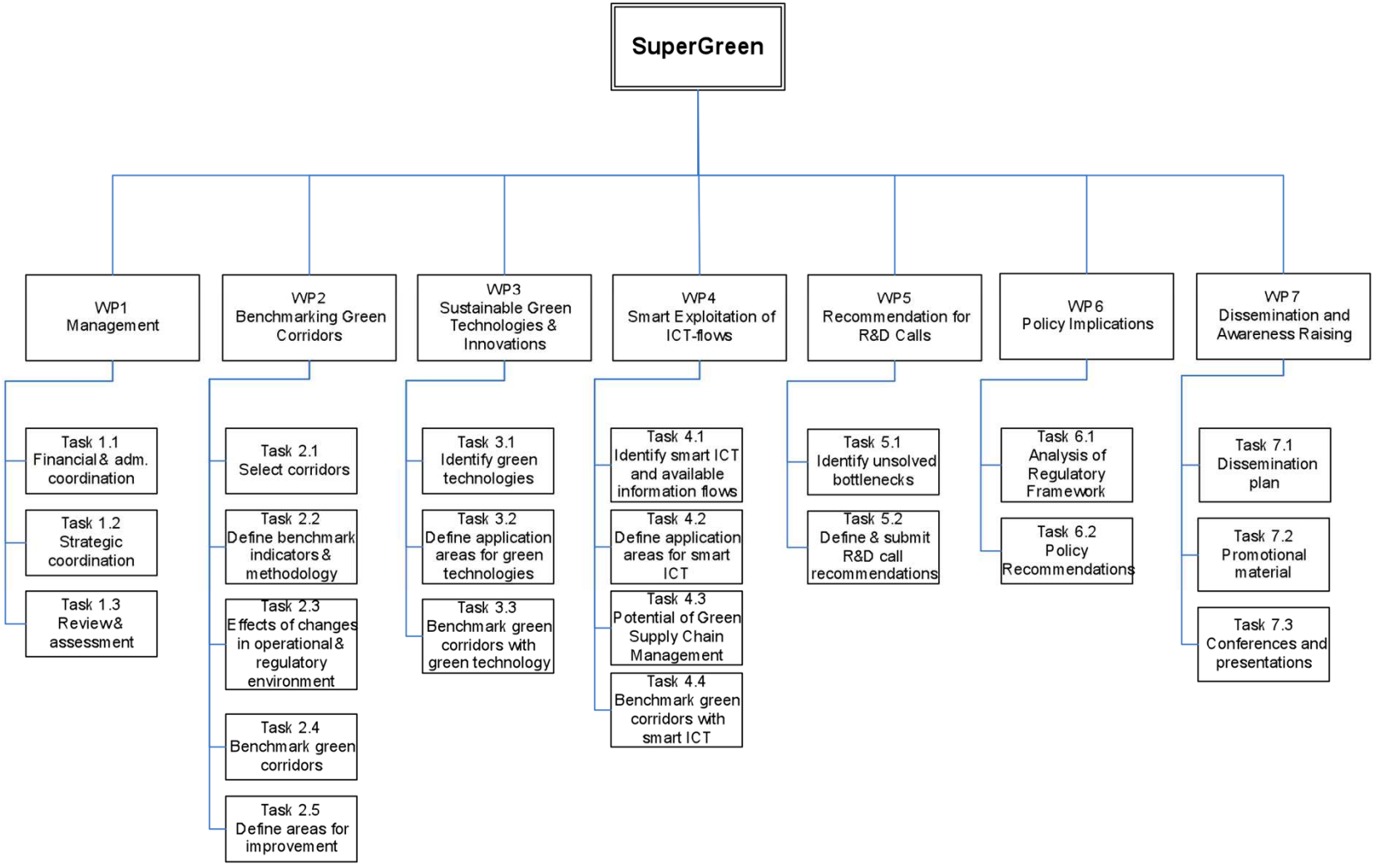
The consortium

Partner Number *	Partner name	Partner short name	Country
1 (Coordinator)	National Technical University of Athens	NTUA	Greece
2	Norsk Marinteknisk Forskningsinstitutt AS, MARINTEK	MAR	Norway
3	Sito Ltd (Finnish Consulting Engineers Ltd)	SITO	Finland
4	D'Appolonia S.p.A.	DAPP	Italy
5	Autoridad Portuaria de Gijon Gijón Port Authority-	PAG	Spain
6	DNV Det norske Veritas	DNV	Norway
7	via donau Österreichische Wasserstraßen-Gesellschaft mbH	VIA	Austria
8	NewRail - Newcastle University	UNEW	UK
9	CONSULTRANS	CONS	Spain
10	PSA Sines	PSAS	Portugal
11	Finnish Transport Agency	FMA	Finland
12	Straightway Finland Ry	SWAY	Finland
13	SNCF Fret Italia	SFI	Italy
14	Procter & Gamble Eurocor	PG	Belgium
15	VR Group	VRG	Finland
16	Lloyd's Register-Fairplay Research	LRFR	Sweden
17	Hellenic Shortsea Shipowners Association	HSSA	Greece
18	Dortmund University of Technology	DUT	Germany
19	TES Consult Ltd	TES	Ukraine
20	Turkish State Railways	TCDD	Turkey
21	DB Schenker AG	SCH	Germany
22	Norwegian Public Road Administration	NPRA	Norway

Duration & budget

- Official start: 15 Jan. 2010
- Duration: 3 years
- Total budget: 3,453,747 EUR
- EC contribution: 2,634,698 EUR

SuperGreen work package structure



KPI areas: 5 groups

- Efficiency
- Service quality
- Environmental sustainability
- Infrastructural sufficiency
- Social issues

KPIs hierarchy

Efficiency	Absolute unit cost Relative Unit cost
Service quality	Transport time Reliability Frequency of service ICT applications Cargo security Cargo safety
Environmental sustainability	CO_2-eq SOx NOx PM
Infrastructure sufficiency	Congestion Bottlenecks
Social issues	Land use - urban areas Land use - sensitive areas Traffic safety Noise

KPI importance

KPI	Input unit	Output unit	Grading of importance for Supergreen
Efficiency			
Absolute costs	ton, €	€/ton	3 Can manage without
Relative costs	ton, €, km	€/ton-km	1 Must have
Service quality			
Transport time	hours	hours	1 Must have
Reliability	Total number of shipments, On-time deliveries	%	1 Must have
ICT appl.	Availability, integration & functionality of cargo tracking & other services	graded scale	2 Prefer to have
Frequency	Services per week	number	1 Must have
Cargo security	Total number of shipments, Security incidents	%	2 Prefer to have
Cargo safety	Total number of shipments, Cargo safety incidents	%	2 Prefer to have
Environmental sustainability			
CO_2 emissions	ton, km	g/ton-km	1 Must have
NO_x emissions	kg, km	g/1,000 ton-km	2 Prefer to have
SO_x emissions	kg, km	g/1,000 ton-km	1 Must have
PM emissions	kg, km	g/1,000 ton-km	2 Prefer to have
Infrastructural sufficiency			
Congestion	ton, km, Average delay	hours/ton-km	2 Prefer to have
Bottlenecks	number & category	graded scale	2 Prefer to have
Social			
Corridor land use	Share of distance per area type	percent	2 Prefer to have
Traffic safety	Traffic safety incidents	percent	2 Prefer to have
Noise	Share of distance above level	percent	2 Prefer to have

Enter Interoperability

- Key element of EU transport policy

- In the strict sense: Focuses on rail transport
- In the broad sense: Applies to all modes and to the supply chain as a whole

Rail patchwork

- At least 4 major gauge systems
- At least 4 major electricification systems
- At least 20 train control systems
- Various clearance systems
- Incompatibilities even between systems that are similar in other respects

Interoperability directive

- Directive 2008/57/EC of 17 June 2008 aims to establish the conditions so as to achieve interoperability within the Community rail system.
- Conditions concern the design, construction, placing in service, upgrading, renewal, operation and maintenance of the parts of this system as well as the professional qualifications and health and safety conditions of the staff.
- The new Directive has superseded as of 19 July 2010 the previous Directive 96/48/EC on the interoperability of the European high-speed rail system as well as Directive 2001/16/EC on the interoperability of the European conventional rail system.
- Two areas:
  - Interoperability of the conventional rail system
  - Interoperability of the high speed rail system.

Technical Specifications for Interoperability (TSIs)

- control/command and signalling
- telematics applications for freight services traffic operation and management (including staff qualifications for cross-border services)
- freight wagons; and
- noise problems deriving from rolling stock and infrastructure.

ERTMS

- European Rail Traffic Management System
- Many different train control systems
- Example: the Thalys train sets running between Paris-Brussels-Cologne and Amsterdam have to be equipped with 7 different types of train control systems

ERTMS components

- ETCS, the European Train Control System, is an automatic train protection system (ATP) to replace the existing national ATP-systems

- GSM-R, a radio system for providing voice and data communication between the track and the train, based on standard GSM using frequencies specifically reserved for rail application with certain specific and advanced functions.

Relevance to green corridors

- Rail interoperability: of paramount importance
- Most of the selected KPIs are significantly influenced by whether or not a rail corridor can function smoothly or not.
- It is speculated that even moderate gains in this department could translate in significant gains for the attractiveness of rail vis-à-vis other, less environmentally friendly modes of transport.

Impact of interoperability on KPIs

- Object of detailed analysis
- However, one can make some predictions

- Relative cost KPI: HIGH
- Transport time KPI: HIGH
- Reliability KPI: HIGH/moderate
- Frequency KPI: HIGH/moderate
- CO2 and SOx KPIs: HIGH/moderate

Interoperability in other modes

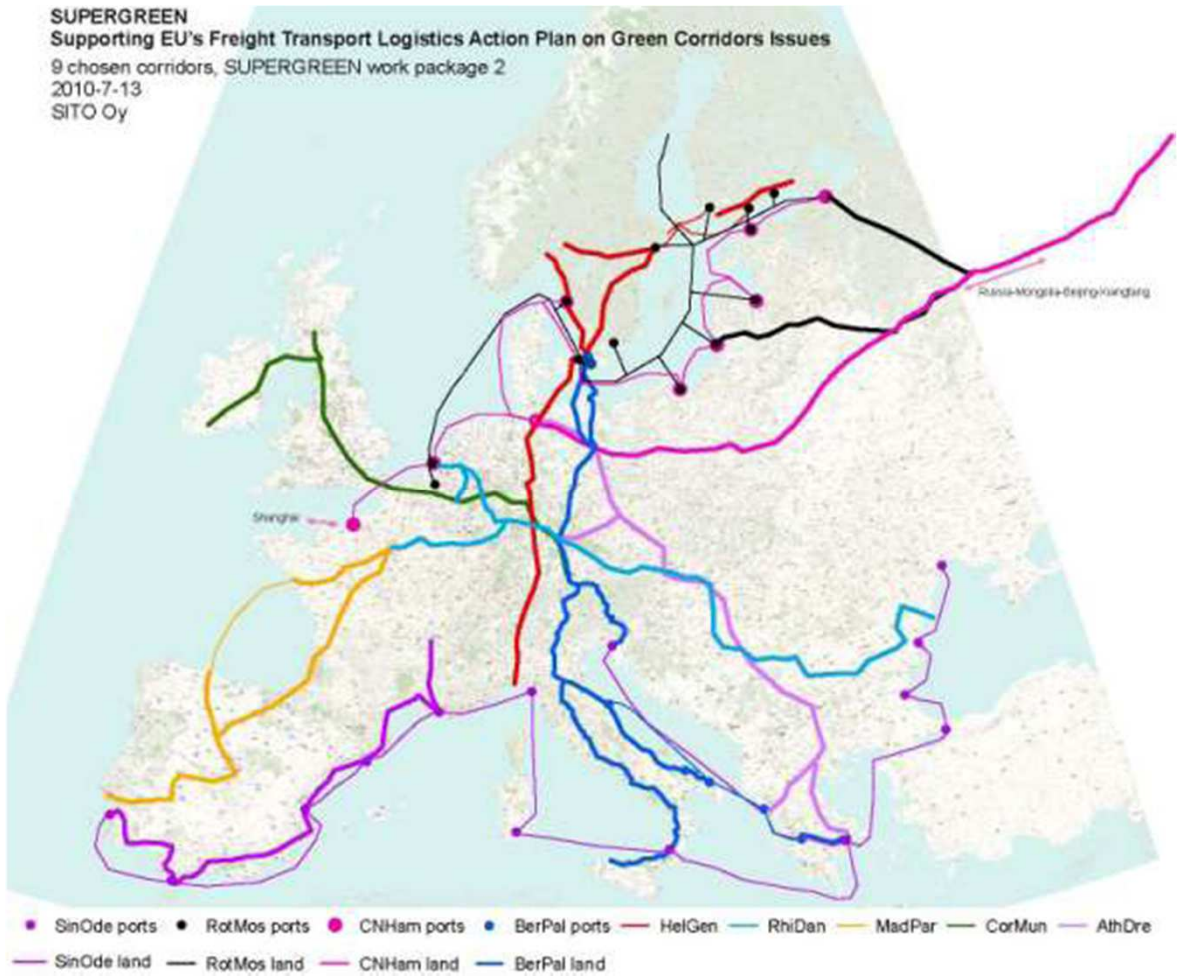
- Of equal importance, given drive for co-modality
- Interoperability in conventional technology
- Interoperability in ICT

- A corridor with little or no interoperability cannot be green

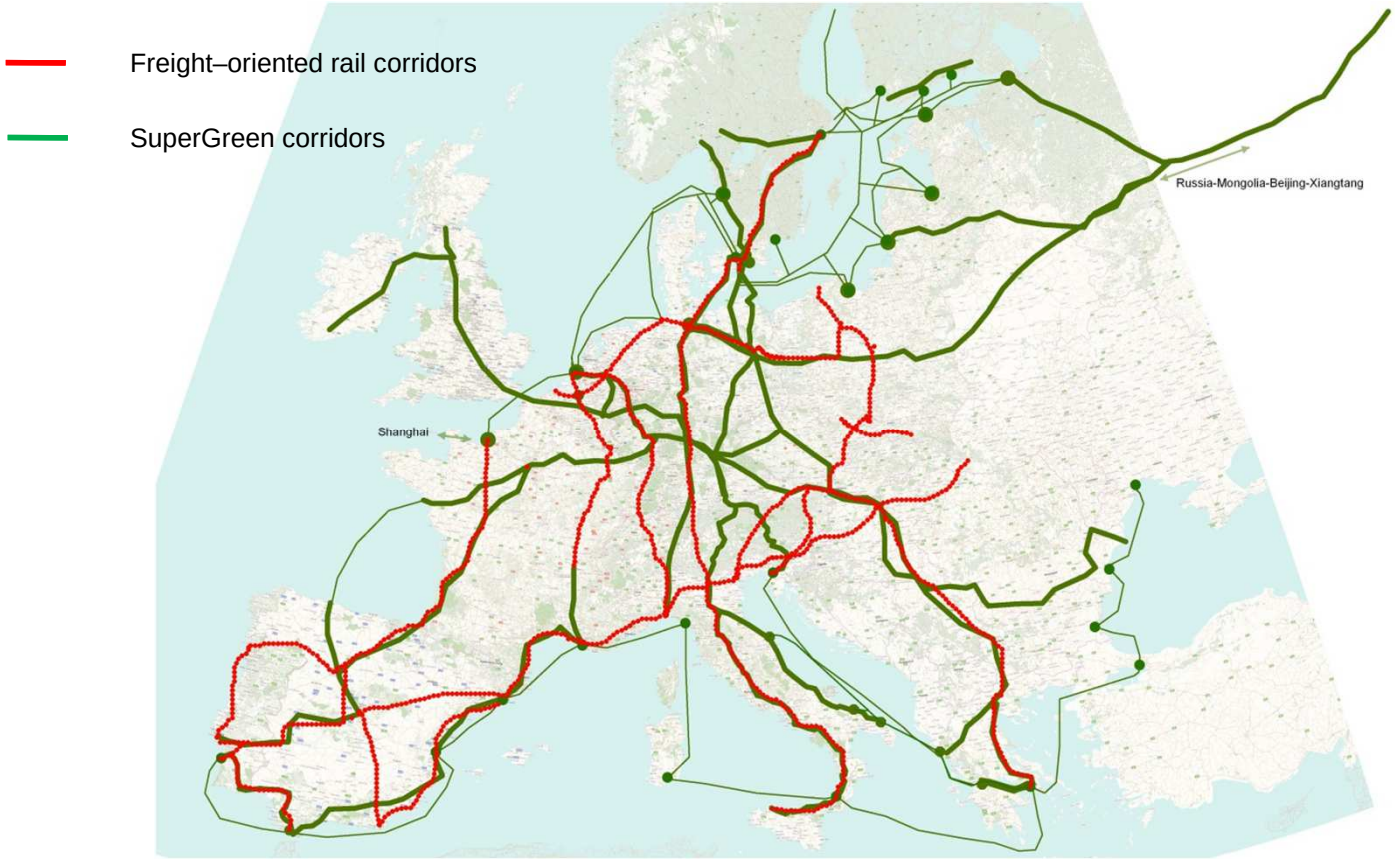
SuperGreen Corridors

BRIEF DESCRIPTION- BRANCHES	NICKNAME
Malmö-Trelleborg-Rostock/Sassnitz- Berlin-Munich-Salzburg-Verona-Bologna-Naples-Messina-Palermo Branch A: Salzburg-Villach-Trieste (Tauern axis) Branch B: Bologna-Ancona/Bari/Brindisi-Igoumenitsa/Patras-Athens	**Brenner**
Madrid-Gijon-Saint Nazaire-Paris Branch A: Madrid-Lisboa	**Finis Terrae**
Cork-Dublin-Belfast-Stranraer Branch A: Munich-Friedewald-Nuneaton Branch B: West Coast Main line	**Cloverleaf**
Helsinki-Turku-Stockholm-Oslo-Göteborg-Malmö-Copenhagen (Nordic triangle including the Oresund fixed link)- Fehmarnbelt - Milan - Genoa	**Edelweiss**
Motorway of Baltic sea Branch: St. Petersburg-Moscow-Minsk-Klapeida	**Nureyeev**
Rhine/Meuse-Main-Danube inland waterway axis Branch A: Betuwe line Branch B: Frankfurt-Paris	**Strauss**
Igoumenitsa/Patras-Athens-Sofia-Budapest-Vienna- Prague-Nurnberg/Dresden-Hamburg	**Two Seas**
Odessa-Constanta-Bourgas-Istanbul-Piraeus-Gioia Tauro-Cagliari-La Spezia-Marseille-Barcelona-Valencia-Sines Branch A: Algeciras-Valencia-Barcelona-Marseille-Lyon Branch B: Piraeus-Trieste	**Mare Nostrum**
Shanghai-Le Havre/Rotterdam-Hamburg/Göteborg-Gdansk-Baltic ports-Russia Branch:Xiangtang-Beijing-Mongolia-Russia-Belarus-Poland-Hamburg	**Silk Way**

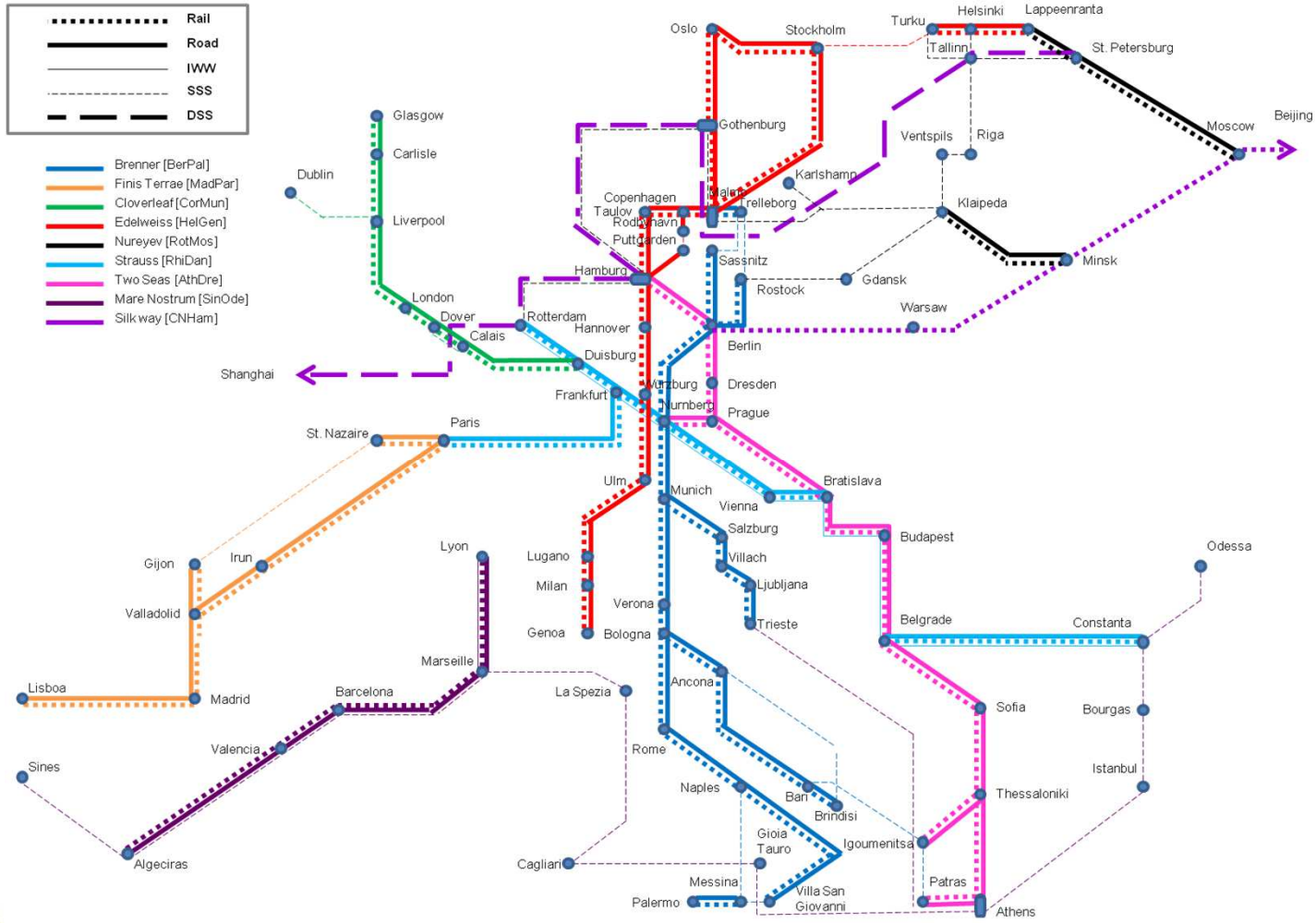
SuperGreen Corridors ii



Resemblance with freight-oriented rail corridor network



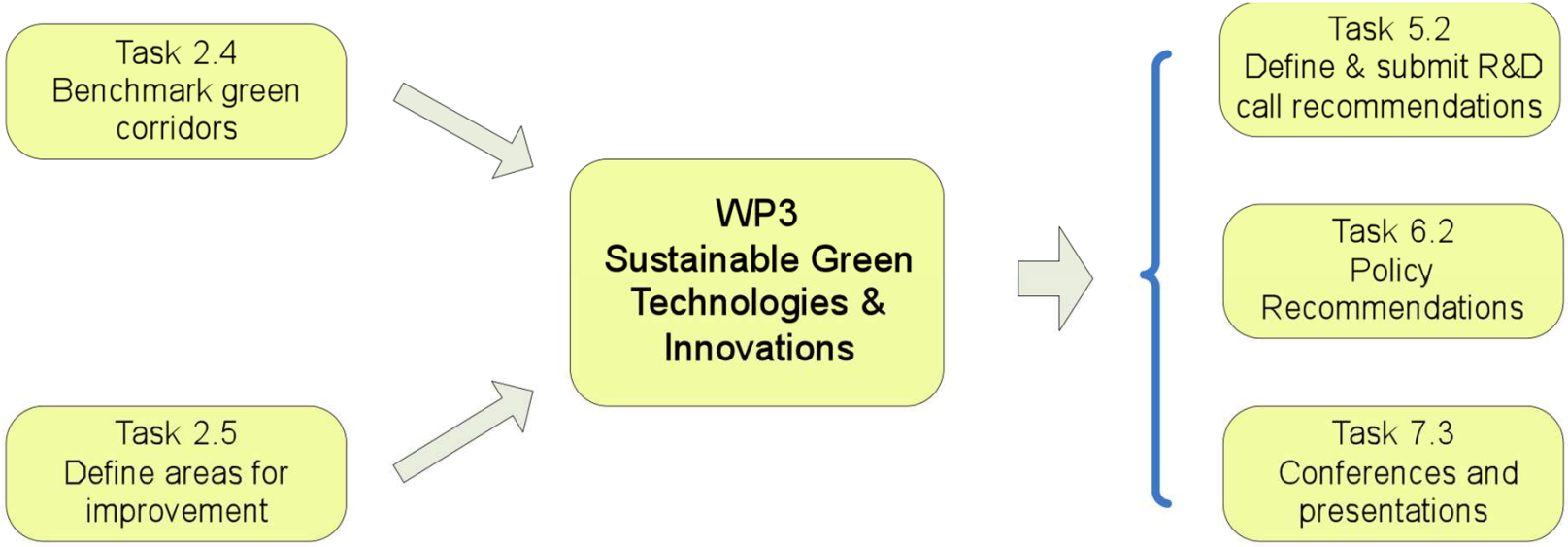
The corridors in metro format



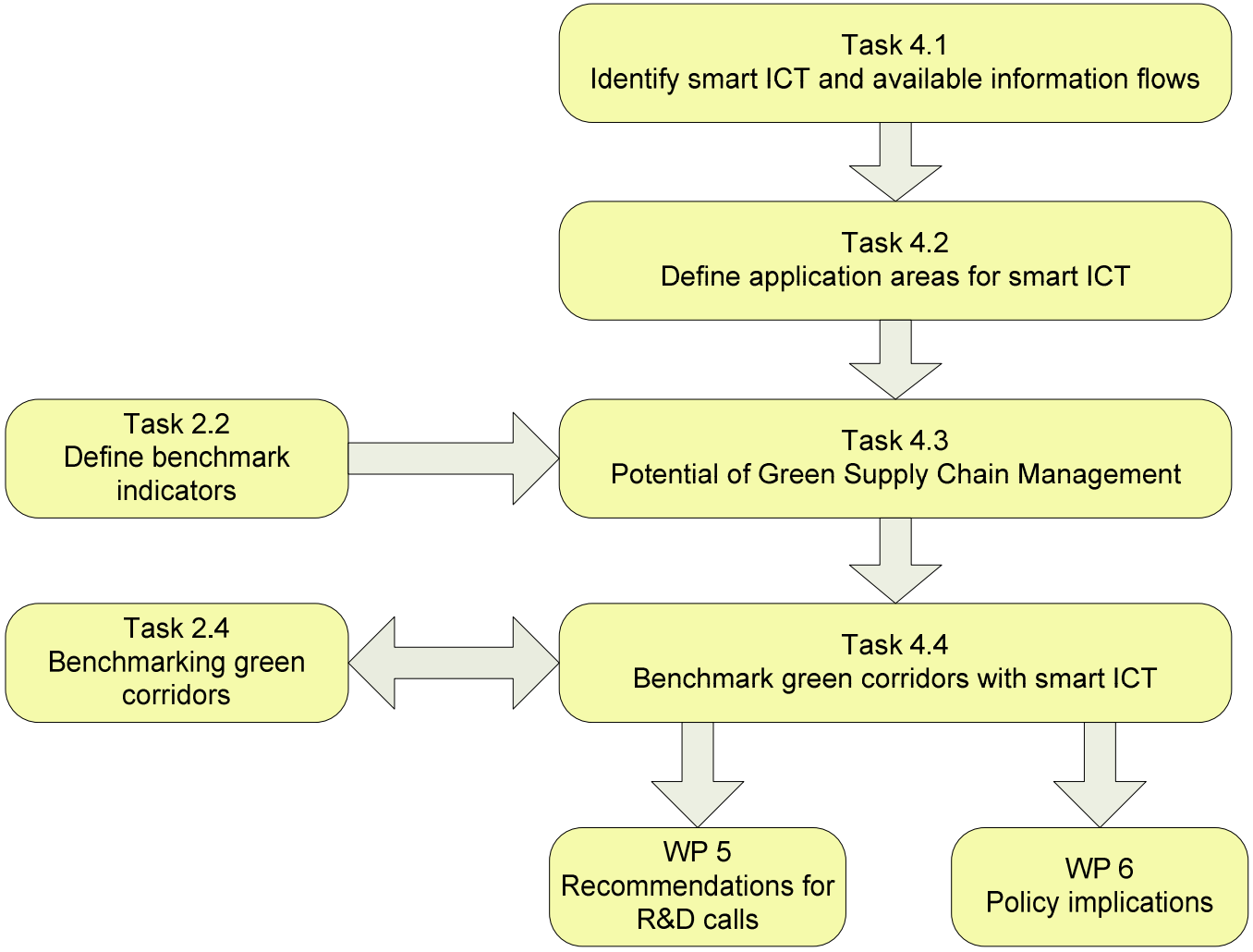
Benchmarking results (prelim.)

Corridor name	Mode of transport	CO2 *(g/tkm)*	SOx *(g/tkm)*	Cost *(€/tkm)*	Average speed *(km/h)*	Reliability *%*	Frequency *x times/year*
Brenner	*Intermodal*	10.62-42.11	0.020-0.140	0.03-0.09	9-41	95-99	26-624
	Road	46.51-71.86	0.050-0.080	0.05-0.06	19-40	25-99	52-2600
	Rail	9.49-17.61	0.040-0.090	0.05-0.80	44-98	60-95	208-572
	SSS	16.99	0.050-0.120	0.04-0.05	23	100	52-520
Cloverleaf	*Road*	68.81	0.091	0.06	40-60	80-90	4680
	Rail	13.14-18.46	0.014-0.021	0.05-0.09	45-65	90-98	156-364
Nureyev	*Intermodal*	13.43-33.36	0.030-0.150	0.10-0.18	13-42	80-90	156-360
	SSS	5.65-15.60	0.070-0.140	0.05-0.06	15-28	90-99	52-360
Strauss	*IWT*	9.86-22.80	0.013-0.031	0.02-0.44	-	-	-
Mare Nostrum	*SSS*	6.44-27.26	0.092-0.400	0.003-0.200	17	90-95	52-416
	DSS	15.22	0.22	-	-	-	-
Silk Way	*Rail*	41.00	-	0.05	26	-	-
	DSS	12.50	-	0.004	20-23	-	-

WP3: Sustainable green technologies and innovations



WP4: Smart exploitation of ICT flows



Smart ways to get connected

- Give us a call or send an email!

- Send an email to supergreen@martrans.org

  (SuperGreen friends email list: keeping track of the project)
- Visit our web site www.supergreenproject.eu

PUBLIC DOCUMENTS

Deliverable D2.1 - Selection of Corridors
Deliverable D2.2 - Definition of Benchmark Indicators and Methodology
Deliverable D2.3 - Effects of changes in operational and regulatory environment
Deliverable D2.4 - Version 1 - Benchmarking of Green Corridors
Deliverable D2.4 - Version 2 -Benchmarking of Green Corridors
Deliverable D2.5 - Definition of Areas for Improvement
Deliverable D3.1 - Identify Green Technologies (Year 1)
Deliverable D4.1 - Identify smart ICT and information flows (Year 1)
Deliverable D4.2 - Define application areas for smart ICT

http://www.supergreenproject.eu/info.html

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- Friends of SuperGreen page @ Facebook

Thank You!

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