

Elements for European logistics policy

A discussion paper



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Abstract <p>Following a Finnish initiative the European Commission is preparing a communication on logistics in 2006. To support the preparations Finland arranged the so called EULOC-process in which logistics experts from different countries were invited to participate. First, an industry foresight of European logistics in 2015 was created. Next, the mission, vision and policy priorities of the European logistics policy were discussed.</p> <p>The mission for European logistics policy was created from the viewpoint of citizens, companies, states and Europe. Seven vision elements were created. The driving visions are "Seamless systems" and "Intelligent regulation". The guiding and enabling visions are "Resources" and "Cost efficiency". The outcome visions are "Europe's competitiveness", "Equal business opportunity" and "Sustainability".</p> <p>According to the experts' views the priority areas of European logistics policy are</p> <ul style="list-style-type: none">Infrastructure – Seamless systems require investmentsResearch, development and training – Strengthen the competitiveness of the European UnionEnterprises – The reinforcement of logistic industryRegulation – Innovative and intelligentCost Efficiency – Effective logisticsSustainability – From environmental, social and economic viewpoint, a must in modern logisticsCo-Operation – A strategic issue in network societyPublic-Private Partnership – Agile solutions for investments.			
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Tiivistelmä Suomen aloitteesta Euroopan komissio valmistelee keväällä 2006 tiedonantoa logistiikasta. Valmistelun tueksi Suomi käynnisti ns. EULOC-proessin, johon kutsuttiin logistiikan asiantuntijoita eri maista. Aluksi luotiin näkemys Euroopan logistiikasta vuonna 2015 ja tämän jälkeen missio, visio ja painopisteet Euroopan logistiikkapolitiikalle. Euroopan logistiikkapolitiikan missio luotiin kansalaisten, yritysten, valtioiden ja Euroopan näkökulmista. Visioita hahmotettiin seitsemän. Näistä kehitystä edistäviä ovat ”Saumattomat järjestelmät” sekä ”Älykäs sääntely”. Ohjaavia ja mahdollistavia visioita ovat ”Kustannustehokkuus” ja ”Resurssit”. Edellisten ansiosta saavutetaan ”Kilpailukykyinen Eurooppa”, ”Tasapuoliset liiketoimintamahdollisuudet” sekä ”Kestävyys”. Asiantuntijoiden näkemyksen mukaan Euroopan logistiikkapolitiikan painopisteet ovat - infrastruktuuri, saumattomat järjestelmät tarvitsevat investointeja - tutkimus, kehitys ja koulutus, jotka vahvistavat EU:n kilpailukykyä - yritykset, logistiikka-alan liiketoimintaa on vahvistettava - sääntely, jonka tulee olla älykästä ja kehitystä edistävää - kustannustehokkuus, toiminnan kustannukset on tunnettava - kestävyys, joka sisältää ympäristön, ihmisen ja talouden - yhteistyö, joka on verkottuneessa toimintaympäristössä strateginen asia - julkisen ja yksityisen pääoman joustavat investoinnit.			
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Referat Europeiska kommissionen bereder på Finlands initiativ ett meddelande om logistik våren 2006. Som stöd för beredningen startade Finland den s.k. EULOC-processen, till vilken man bjöd in specialister på logistik från olika länder. Först skapade man en vision av logistiken i Europa 2015 och därefter mission, vision och tyngdpunkter för Europas logistikpolitik. Missionen för Europas logistikpolitik definierades ur medborgarnas, företagens, staternas och Europas synvinklar. Man skissade upp sju visioner. De av dem som främjar utveckling är ”Smidiga system” och ”Intelligent reglering”. Styrande visioner är ”Kostnadseffektivitet” och ”Resurser”. Tack vare de föregående når man ett ”Konkurrenskraftigt Europa”, ”Jämlika möjligheter till affärsverksamhet” och ”Hållbarhet”. Enligt specialisternas vision är tyngdpunkterna i Europas logistikpolitik - infrastruktur, smidiga system behöver investeringar - forskning, utveckling och undervisning som förstärker EU:s konkurrenskraft - företag, affärsverksamheten inom logistikbranschen bör förstärkas - reglering som bör vara intelligent och främja utvecklingen - kostnadseffektivitet, man bör känna till kostnaderna för verksamheten - hållbarhet som omfattar miljön, människan och ekonomin - samarbete som har en strategisk betydelse i en verksamhetsmiljö byggd på nätverk - smidiga investeringar med offentligt och privat kapital.		
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SUMMARY

Background

Following the Finnish initiative the European Commission agreed to give a communication on logistics to be handled during the Finnish EU presidency 2006. The Commission asked Finland to help them in the preparations of the "Communication on transport logistics to facilitate intermodal transport". The Ministry of Transport and Communications hired an experienced management consultant who has a proven method to create strategies.

The EULOC-process

In the method there are two groups of about 10 experts. The other group takes part in workshops and the other group comments on the outcomes by e-mail. First both groups were given a task to consider seven mega trends and to view their impacts on four levels. The mega trends to consider were 1) world wide competition, 2) impacts of technology, 3) economics change patterns, 4) corporations change, 5) future demographics are different, 6) cultures are changing and 7) increased environmental influence. The levels to view were changes in the global "big picture" of supply chains → the influence of these changes on supply chain management in Europe → the needed proactive policies → the needed new capabilities and competencies.

The first workshop concentrated on the summary of the experts' answers. The aim was to create an Industry Foresight (IF), a common view on how the world looks from logistics point of view in about ten years. In addition the mission and vision of European logistics policy were drafted. The outcomes of the workshop were sent to both groups for comments.

In the second workshop the IF-analysis was finalised by ranking the identified changes as important, extremely important or the most important. The mission and vision were finalised and the needed policies for different areas were compiled. After the workshop the experts in both groups appraised the importance and urgency of the needed policies.

Trends in logistics

The production will grow especially in the developing economies of China, India, Brazil and Russia. The amount of transported goods and the transport distances will grow. The centre of world economy is likely to shift in Asia because the markets there where is people. The control of global supply chains is demanding and it is possible that the decision making moves to Asia. The competition between the economic areas will intensify which makes the capacity of the infrastructure increasingly critical competitiveness factor. The growth of production and consumption in Eastern parts of Europe forces to shift part of the goods transport away from roads.

In products and services customer orientation defines the structures of supply chains. The chains are differentiated not only by the characteristics of the product but also by the needs and expectations of the customers. The system integration is both technological and organizational and it is knowledge oriented. Supply network engineering requires innovation both in products and processes. In western countries the services will increase while the production is moving to the other parts of the networks. There is a demand for accurate information about the environmental impacts of products and services. This will increase the importance of tracing and tracking in efficiency development and waste avoidance. The importance of reverse logistics will grow when the used products must be utilized or abolished in a controlled fashion.

In business network structures will displace old hierarchies. The global networks will bring about global business culture. Collaboration will become accustomed when enterprise resource planning and other systems are linked together. Operations will be outsourced. The tier structure with different layers of suppliers will develop based on cost efficiency and specialization. On the other hand it is believed that trade and industry will be dominated by few giants. Although the big players will become even bigger new specialized niche operators will have global markets.

Information and communication systems enable to control the vital information flows between planning, managing and executing supply chains. ICT enables to improve the security and service level of logistics at the same time as costs are reduced. New intelligent technologies and standardized interfaces are required. As radio frequency identification becomes common it gives significant possibilities to improve the tracking, tracing and security of deliveries.

Cost efficiency is always important. The transport costs will grow because of increased labour cost and oil price, congestion and infrastructure charges and tightening security demands. Also reverse logistics will influence cost efficiency. The logistics costs are not sufficiently known and thus decisions are based on partial information. The modelling of true costs must be developed. Logistics costs should be included in key performance indicators of companies.

Public policies aim to create an operating environment that fosters the competitiveness of trade and industry. Regulation is a necessary part of European mixed economies but it must be intelligent and further development and competition. The harmonisation of policies and regulations and the investments in infrastructure are precondition for abolishing the barriers of common market. Although the importance of regional authorities will grow in the regulation and investments of transport they must consider also the development of the global operating environment.

The authorities will promote innovations and their exploitation. From logistics point of view the main development areas are the supply chain management and new business models. In the supply chains further development is required e.g. in safety and security, tracing and tracking and intermodal operations. On the logistics business new abilities are needed e.g. in collaboration and risk sharing.

The mission of the European logistics policy

Citizen: To allow optimal access to high quality goods at low overall cost with minimal disturbance.

Companies: To create attractive conditions and level playing field for competitive business.

State: To provide the framework for states to promote efficient transport logistic services within a European context.

Europe: To improve substantially the efficiency and sustainability of transport logistics and network connections between Member States and externally.

The visions of the European logistics policy

Seven vision elements were created. The driving visions are “Seamless systems” and “Intelligent regulation”. The guiding and enabling visions are “Resources” and “Cost efficiency”. The outcome visions are “Europe’s competitiveness”, “Equal business opportunity” and “Sustainability”. Brief descriptions of the visions are in chapter 6.

The priority areas of European logistics policy

Seamless systems require infrastructure. Both the links and nodes of transport networks and the information infrastructure must be developed. The development needs are biggest in the new member states.

Research, development, education and training strengthen the competitiveness of the European Union. Both the training of logistics professionals and the funding of research must be ensured.

The logistics companies must develop. Incentives for innovative companies are required as well as mechanisms to improve the competitiveness of the small and medium size enterprises.

Innovative and intelligent regulation is needed but unnecessary regulation must be avoided. The authorities must ensure competition in transport market. Regulatory changes should have long term perspective so that actors have sufficient time to adjust. Impact assessment of new regulations must consider also logistics.

Efficient logistics is also cost efficient. The knowledge on the costs of logistics must be improved. Also the costs of using infrastructure and other public services must be known.

Modern logistics is sustainable. The tightening environmental demands must be related with the efficiency targets. Waste must be avoided and reverse logistics well managed. The aims of sustainable logistics need to be included in host policies such as trade or energy.

Co-operation is a strategic issue in the network society. Efforts must be put in the international standardization work of information exchange in logistics. Good practices need to be shared through electronic platforms.

Public-private partnerships make agile investment solutions possible. There needs to be analysis and recommendations on the optimum role and finance models of PPP arrangements. The aim must be to maximize the returns of the public-private investments. There is a triple helix for synergies in co-operation between public administration and regulators, business and academia.

Closing remarks

The results of the industry foresight covered most of the final conclusions and reflected the policy choices. The importance of logistics for the European competitiveness was emphasized throughout the EULOC process.

During the discussions the reason for infrastructure capacity shortage was not raised. However, the reason for congested roads and rails is not only the freight transport but mainly the passenger traffic which was not considered in this work. However, it is worth while to examine the transport system as a whole. Throughout the work process there was an expressed need for European transport and logistics professionals to start thinking, planning and acting in a more holistic way.

The results of the project present the view of the participants and as such can be disputable. The process has served the Commission as an expert discussion forum and the Commission has already started a new and wider project to cover the future of the logistics in Europe.

YHTEENVETO

Tausta Suomen aloitteesta Euroopan komissio lupasi valmistella logistiikasta tiedonannon, jota käsitellään Suomen pj-kaudella vuoden 2006 lopulla. Komissio antoi tiedonannon nimeksi ”Communication on transport logistics to facilitate inter-modal transport” ja pyysi Suomelta apua sen sisällön tuottamiseen. Liikenne- ja viestintäministeriö turvautui kokeneeseen johdon konsulttiin, jolla on toimivaksi osoittautunut menetelmä strategioiden luomiseen.

EULOC-prosessista

Menetelmässä on kaksi noin kymmenen asiantuntijan ryhmää, joista toinen osallistuu työkokouksiin ja toinen kommentoi tuotoksia sähköpostitse. Ensimmäisessä vaiheessa molempien ryhmien asiantuntijat saivat tehtäväkseen tarkastella seitsemää megatrendiä ja arvioida niiden vaikutuksia neljällä tasolla. Megatrendit olivat 1) maailman laajuinen kilpailu, 2) teknologian kehitys, 3) muutokset maailmantaloudessa, 4) yritysmaailman keskittyminen, 5) väestömuutokset, 6) kulttuurimuutokset ja 7) ympäristön merkityksen kasvu. Tarkastelutasot olivat muutokset toimitusketjujen globaalissa kokonaiskuvassa → näiden muutosten vaikutukset toimitusketjujen hallintaan → tarvittavat uudet politiikat → tarvittavat uudet kyvykkyydet.

Ensimmäisessä työkokouksessa tarkasteltiin konsultin yhteenvetoa asiantuntijoiden vastauksista. Tavoitteena oli luoda ”Industry Foresight” (IF), yhteinen näkemys siitä, miltä maailma näyttää logistiikan näkökulmasta noin kymmenen vuoden kuluttua. Lisäksi hahmoteltiin Euroopan logistiikkapolitiikan missiota ja visiota. Työkokouksen tulokset lähetettiin molemmille asiantuntijaryhmille kommentoitavaksi.

Toisessa työkokouksessa IF-analyysi viimeisteltiin luokittelemalla tunnistetut muutokset tärkeisiin, erittäin tärkeisiin ja kaikkein tärkeimpiin. Missio ja visio viimeisteltiin sekä kirjattiin eri osa-alueille tarvittavia politiikkoja. Työkokouksen jälkeen molempien ryhmien asiantuntijat arvioivat tarvittavien politiikkojen tärkeyttä ja kiireellisyyttä. Asiantuntijoiden priorisointi näkyy tässä loppuraportissa.

Logistiikan trendit

Tuotannon määrä kasvaa erityisesti Kiinan, Intian, Brasilian ja Venäjän kehittyvissä talouksissa. Kuljetusmäärät ja -etäisyydet kasvavat. Maailman taloudellinen painopiste siirtynee Aasiaan, koska markkinat ovat siellä missä ihmisetkin. Globaalien toimitusketjujen hallinta on haastavaa ja voi käydä niin, että päätösvalta siirtyy Aasiaan. Talousalueiden välinen kilpailu kovenee, jolloin infrastruktuurin kapasiteetin riittävyys on entistä kriittisempi kilpailukykytekijä. Euroopan itäosien tuotannon ja kulutuksen kasvu pakottaa siirtämään osan tavarakuljetuksista pois tieverkolta.

Tuotteissa ja palveluissa asiakaslähtöisyys määrittelee toimitusketjujen rakenteet; toimitusketjut differoidaan paitsi tuotteiden myös asiakastarpeiden ja odotusten perusteella. Teknologisesti ja organisatorisesti integroitujen toimitusverkkojen suunnitteluun tarvitaan sekä tuote- että prosessi-innovaatioita. Länsimaisissa palvelut lisääntyvät, kun tuotanto siirtyy verkostojen muihin osiin. Sekä tuotteiden että palvelujen ympäristövaikutuksista halutaan todellista tietoa, jolloin tuotteiden jäljityksen merkitys kasvaa sekä toimitusketjujen tehokkuuden parantamisessa että jätteiden välttämässä. Paluulogistiikka kasvaa, kun käytetyt tuotteet pitää hyödyntää tai hävittää hallitusti.

Liiketoiminnassa verkostorakenteet syrjäyttävät vanhat hierarkiat. Globaalien verkostojen myötä syntyy globaali liiketoimintakulttuuri. Yhteistoiminta tavanomaistuu kun toiminnanohjausjärjestelmiä ja muita järjestelmiä linkitetään yhteen. Toimintoja ulkoistetaan ja toimittajatasot kerrostuvat erikoistumisen ja kustannustehokkuuden perusteella. Toisaalta arvellaan, että kauppaa ja teollisuutta dominoivat harvat jättipelurit. Vaikka suurista tulee yhä suurempia, uusilla erikoistuneilla niche-toimijoillakin ovat globaalit markkinat.

Tieto- ja viestintäjärjestelmät (ICT) mahdollistavat elintärkeiden tietovirtojen hallinnan. Niillä on keskeinen rooli toimitusketjujen suunnittelun ja johtamisen sekä toteutuksen välillä. ICT:n avulla kyetään parantamaan kuljetusten turvallisuutta ja logistiikan palvelutasoa sekä karsimaan kustannuksia. Tarvitaan uusia älykkäitä teknologioita ja standardeja rajapintoja. Radiotaajuisten tunnistamisen (RFID) yleistyminen antaa merkittävästi mahdollisuuksia parantaa kuljetusten seuranta, jäljitystä ja turvallisuutta. RFID kuljetusalustoissa ja tuotteissa alentaa kustannuksia mm. tehostamalla tavaran vastaanottoa ja varastojen hallintaa sekä pienentämällä hävikkiä.

Kustannustehokkuus on aina tärkeää. Kuljetuskustannuksia kasvattavat työn ja öljyn hinnan nousu, ruuhkat ja infrastruktuurin käyttömaksut sekä kovenevat turvallisuusvaatimukset. Myös paluulogistiikalla on vaikutusta kustannustehokkuuteen. Logistisia kustannuksia ei nykyisin tunneta riittävän hyvin, jolloin päätöksiä tehdään puutteellisen tiedon perusteella. Todellisten kustannusten mallinusta on kehitettävä. Logistiikkakustannukset tulee sisällyttää yritysten avainmittareihin.

Viranomaispolitiikoilla pyritään luomaan elinkeinoelämän kilpailukykyä edistävä toimintaympäristö. Sääntely on välttämätön osa eurooppalaisia sekatalouksia, mutta sen tulee olla älykästä, kehitystä ja kilpailua edistävää. Poliitikkojen ja säädösten yhtenäistäminen sekä infrastruktuuri-investoinnit ovat edellytys yhteismarkkinoiden raja-aitojen poistumiselle. Vaikka alueellisten viranomaisten merkitys liikenteen sääntelyssä ja infrastruktuuri-investoinneissa kasvaa, heidän on otettava päätöksissään huomioon globaalien toimintaympäristön kehittyminen.

Viranomaiset edistävät innovaatioiden syntyä ja hyödyntämistä. Logistiikan kannalta keskeisiä kehittämisalueita ovat toimitusketjujen hallinta ja uudet liiketoimintamallit. Toimitusketjujen kehittämiskohteita ovat mm. turvallisuus (safety & security), seuranta ja jäljitys sekä intermodaalitoiminnot. Toisaalta organi-

saatioiden yhteistoiminnan suunnittelussa ja riskienjaossa kaivataan uutta osaamista.

Euroopan logistiikkapolitiikan missio

Kansalaisten saataville tarjotaan korkealaatuisia tuotteita edullisesti mahdollisimman vähäisin häiriöin.

Yritysten kilpailukykyiselle liiketoiminnalle luodaan houkutteleva tasapuolinen ja toimintaympäristö.

Valtioille tarjotaan yleiseurooppalaiset puitteet, joissa ne voivat edistää kuljetus- ja logistiikkapalveluiden tehokkuutta.

Euroopassa parannetaan merkittävästi kuljettamisen tehokkuutta ja kestävyttä sekä yhteyksiä jäsenmaiden välillä ja kolmansiiin maihin.

Euroopan logistiikkapolitiikan visiot

Visioita hahmotettiin seitsemän. Näistä kehitystä edistäviä ovat ”Saumattomat järjestelmät” sekä ”Älykäs sääntely”. Ohjaavia ja mahdollistavia visioita ovat ”Kustannustehokkuus” ja ”Resurssit”. Edellisten ansiosta saavutetaan ”Kilpailukykyinen Eurooppa”, ”Tasapuoliset liiketoimintamahdollisuudet” sekä ”Kestävyys”. Visiot on kuvattu lyhyesti luvussa 6.

Euroopan logistiikkapolitiikan painopistealueet

Saumattomat järjestelmät tarvitsevat infrastruktuuria. Sekä liikenneväyliin ja solmupisteisiin että tietoinfrastruktuuria on kehitettävä. Kehittämistarpeet ovat suurimmat uusissa jäsenmaissa.

Koulutus, tutkimus ja kehitys vahvistavat Euroopan kilpailukykyä. Sekä logistiikan osaajien koulutus että tutkimuksen rahoitus on varmistettava.

Logistiikka-alan yritysten on kehityttävä. Innovatiivisille yrityksille on luotava kannustimia. Pienten ja keskisuurten yritysten kilpailukyvyn parantamiseksi on luotava uusia mekanismeja.

Älykästä sääntelyä tarvitaan, mutta tarpeeton sääntelyä on vältettävä. Viranomaisten on huolehdittava kilpailusta kuljetusmarkkinoilla. Kehitystä edistävän sääntelyn tulee olla pitkäjänteistä, jotta toimijoille jää riittävästi aikaa varautua muutoksiin. Uusien säädösten vaikutusarvioinnissa on tarkasteltava myös niiden logistisia vaikutuksia.

Tehokas logistiikka on myös kustannustehokasta. Logistiikan kustannukset on tunnettava nykyistä paremmin. Myös infrastruktuurin ja muiden julkisten palveluiden käytön kustannukset on tunnettava.

Nykyaikainen logistiikka on kestävä. Tiukentuvat ympäristövaatimukset on suhteutettava tehokkuustavoitteisiin. Jätettä on vältettävä ja palautuvien materiaalien käyttö hallittua. Kestävän logistiikan tavoitteet on sisällytettävä ”isäntä”politiikkoihin (esim. kauppaa-, energia-).

Yhteistyö on verkostoyhteiskunnassa strateginen kysymys. Tiedonsiirtostandardien kansainväliseen kehitystyöhön on panostettava. Hyviä käytäntöjä on kyettävä jakamaan sähköisten tietopalvelujen avulla.

Julkisen ja yksityisen sektorin yhteistyö mahdollistaa joustavat hankinnat. Rahoitusyhteistyön malleja on analysoitu ja kehitettävä. Investointien tuotot on pyrittävä maksimoimaan. Julkisen vallan, elinkeinoelämän ja tiedeyhteisön yhteistyö hyödyttää kaikkia.

Lopuksi

Työprosessin aikana kirkastui näkemys siitä, että eurooppalaisten logistiikka-asiantuntijoiden ja päättäjien on alettava ajatella ja toimia kokonaisvaltaisemmin. Tulevaisuuden ennakoinnin tulokset kattoivat useimmat päätelmät ja politiikkavalinnat.

Prosessissa korostui jatkuvasti logistiikan merkitys Euroopan kilpailukyvyille. Tulokset edustavat mukana olleiden asiantuntijoiden mielipiteitä ja sellaisina ne voidaan kyseenalaistaa.

Keskusteluissa ei tullut esiin infrastruktuurin kapasiteettiongelmiin syy. Teiden ja ratojen ruuhkat eivät johdu vain tavaraliikenteestä vaan pääasiassa henkilöliikenteestä, jota ei tässä työssä tarkasteltu. Liikennejärjestelmää on kuitenkin tarkasteltava kokonaisvaltaisesti, kuten jo edellä todettiin.

Hanke palveli komissiota sen valmistellessa tiedonantoa koko Euroopan logistiikan tulevaisuudesta. Tämä loppuraportti päätettiin julkaista vain ns. työraporttina, koska asioiden viimeistelyvastuu on jo komissiolla.

1 FOREWORD

Finland will hold the Presidency of the EU for the second half of the year 2006. One of the main themes that Finland wants to promote and focus on is the European transport logistics policy, which is regarded as a key factor influencing European competitiveness. To concretize this initiative the Ministry of Transport and Communications Finland has organized the European transport logistics policy (EULOC) project.

The main objective of the project was to create a discussion paper that comprehensively represents the best global knowledge about the desired future of the European transport logistics and the necessary policies for its achievement.

This discussion paper will serve as one working document for the Commission in the spring 2006. This is the final report of the project which consisted of two workshops and several e-mail questionnaires. European key logistics experts were invited to join the project.

The project was organised in two expert groups: the workshop participants and the comment group. The experts' active and valuable input made this project possible.

The workshop participants were

- Prof. Michel Beuthe, Facultés Universitaires Catholiques de Mons, BE
- Mr. Graham Ewer, European Logistics Association, UK
- Prof. Hans-Dietrich Haasis, Universität Bremen, DE
- Mr. Lars Källström, BMT Transport Solutions GmbH, SE
- Mr. Michael Lloyd, The Alliance of Maritime Regional Interests in Europe, UK
- Prof. Lauri Ojala, Turku School of Economics and Business Administration, FI
- Dr. Lorant A. Tavasszy, TNO, NL

and the contributing participants of the comment group were

- Dr. Yvonne Bontekoning, Delft University of Technology, NL
- Dr. Tristan Chevroulet, Ecole Polytechnique Federale de Lausanne, CH
- Dr. Jarrod Goentzel, MIT Zaragoza Logistics Center, ES
- Mr. Stanislaw Krzyzaniak, Institute of Logistics and Warehousing, PL
- Prof. Tage Skjøtt-Larsen, Copenhagen Business School, DK
- Mr. Marco Sorghetti, European Association for Forwarding, Transport, Logistic and Custom Services, IT

In addition to the above mentioned experts the process was closely observed by Ismo Koskinen and Malcolm Colling from the Commission and Luise Rau from the German Ministry of Transport.

The organizers of the EULOC project were Juhani Tervala, Lassi Hilska and Jari Gröhn from the Ministry of Transport and Communications Finland and the consultants Tero J. Kauppinen and Jari Lindqvist from VIA Group.

2 THE WORKING PROCESS

The time schedule of the EULOC-project was very demanding. The first prework was sent to the experts in the middle of November 2005 and the final report was completed by the January 2006.

This process started by the prework for the first workshop. The prework was to create an Industry foresight type analysis with given megaforges. The environmental factors that affect the supply chain management were evaluated according to the different areas of the sector. The objective of the prework was to transform foresight into insight, thus merging the experts' views into one common vision.

The next step in the process was one day workshop where the Industry foresight was analyzed and the mission statement and vision created. After the workshop the results were sent to the experts for comments. After commentary round, the summary was drafted for the second workshop.

At the second workshop the Industry foresight and the mission were finalized. The vision elements and the visionary goals were also finalized in order to create concrete policy choices. After the workshop the results were sent again to the experts for comments. With these comments the first drafts of the final report was created and send for the last comment round.

This report presents the results of the project.

3 THE FRAMEWORK AND CONCEPTS

The framework used in EULOC-project was the vision into action (VIA) model. The framework has been developed by Tero J. Kauppinen (Kauppinen, 2002) and it has been internationally used as a tool in management development processes.

In the EULOC-project the three central concepts of VIA-model were used: Industry foresight, the mission statement and the vision. All these concepts are clearly related to each other. A mission statement is like a road in industry foresight. It directs and establishes boundaries for the role of the organization in its own business environment. The mission has no time limit; it is a never ending journey in the chosen direction. The vision is anchored in time, and it is the will of the preferred future that coordinates decisions and choices. In the case of EULOC the vision was anchored to the year 2015.

4 THE MISSION STATEMENT OF THE EUROPEAN TRANSPORT LOGISTICS POLICY

Citizen

To allow optimal access to high quality goods at low overall cost with minimal disturbance

Companies

To create attractive conditions and level playing field for competitive business

State

To provide the framework for states to promote efficient transport logistic services within a European context

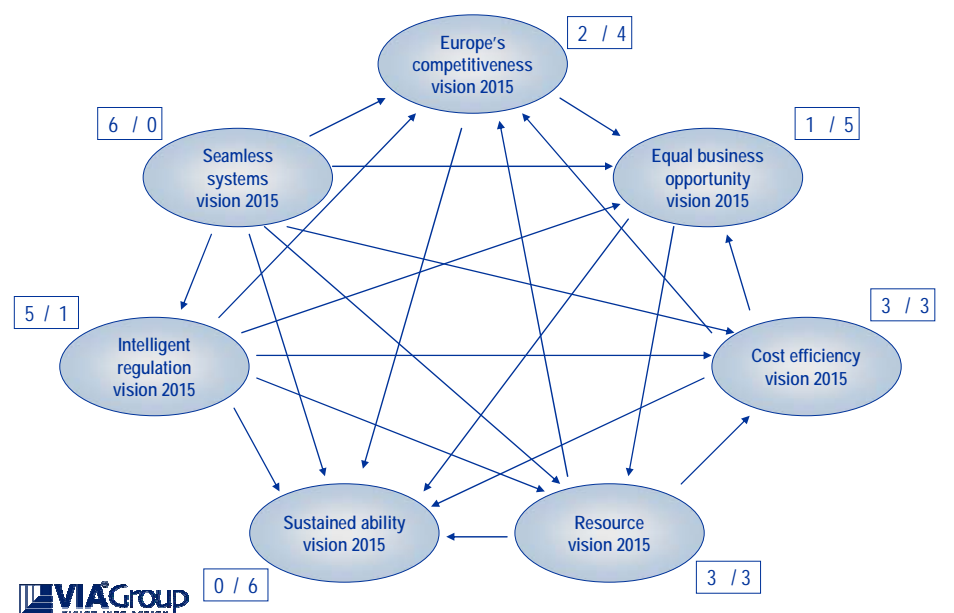
Europe

To improve substantially the efficiency and sustainability of transport logistics and network connections between Member States and externally

5 EULOC VISION ELEMENTS

1. Europe's competitiveness vision 2015
2. Equal business opportunity vision 2015
3. Cost efficiency vision 2015
4. Resource vision 2015
5. Sustainability vision 2015
6. Intelligent regulation vision 2015
7. Seamless systems vision 2015

5.1 Causality on vision elements



5.2 Analysis of causality

A. The Driving Visions

Seamless Systems Vision	6 - 0
Intelligent Regulation Vision	5 - 1

B. The Guiding and Enabling Visions

Cost Efficiency Vision	3 - 3
Resources Vision	3 - 3

C. The Outcome Visions

Europe's Competitiveness Vision	2 - 4
Equal Business Opportunity Vision	1 - 5
Sustainability Vision	0 - 6

It seems, based on the analysis above that visions created for seamless systems and intelligent regulation are causal and formative for the rest of the long term goal setting. Visionary goals of cost efficiency and resources act as enablers and at the same time are affecting the outcomes. Visionary outcomes are described in terms of Europe's competitiveness, equal business opportunities and sustainability.

6 EULOC VISIONS

Seamless Systems Vision 2015

Integrated and coherent logistics and transport systems are using compatible processes based on European and international standards.

Logistic policies are in line with regional development and trade objectives.

Transport pricing is broadly in line with social costs.

European electronic platforms are created for easy information exchange and dissemination of knowledge, including e.g. business transactions, e-administration and benchmarks.

Intelligent Regulation Vision 2015

Regulations serve to support the goals of European society, ensure a level playing field and limit negative impacts on man and nature.

Regulations are transparent and stable but open for improvements.

Regulations are created by efficient, transparent administrative procedures.

Regulation process includes dialogue with stakeholders and follow-up of effects.

Impact assessment of intended regulation covers also logistics.

Cost Efficiency Vision 2015

Europe has achieved the best logistics efficiency in the world and thrives to maintain it.

The logistics system is able to offer cost efficient solutions to differentiated needs.

The efficiency is achieved without compromising sustainability.

Resource Vision 2015

Resources are deployed optimally to provide the efficient and sustainable movement of goods to and from and within Europe.

Human resources are developed in parallel with improving technology and organizational change.

Europe's Competitiveness Vision 2015

Europe provides businesses with an efficient operational and technological environment to prosper in the global marketplace.

Education, training and research generate jobs, innovations, efficient management and administration.

Equal Business Opportunity Vision 2015

Europe offers an equal playing field for companies and individuals to thrive and prosper in stimulating environment across its regions.

Sustainability Vision 2015

Transport logistics objectives and policies of the EU are clear and sustainable.

Appropriate management mechanisms (including targets, monitors, incentives and steering mechanisms) are in place and they have proven to be working successfully with measurable results.

7 EUROPEAN POLICY CHOICES

The policy choices were first drafted at the second workshop. After that they were clustered under eight topics and sent for the experts for further comments. These clusters were then rated by the participants of the workshops. The rating was done by the importance and urgency of policy. The most important and urgent policies are here presented first.

7.1 Infrastructure – Seamless systems require investments

- Improvement and investment in transport & ICT infrastructure networks and in transport and associated equipment
- Improvement of infrastructure in the old and particularly in the new Member States
- EU transport infrastructure development to be established on the basis of socio-economic cost benefit analyses, incorporating sustainability considerations
- Adequate infrastructure across the enlarged EU

7.2 Research, development and training – Strengthen the competitiveness of the European Union

- Ensure funding for research and development
- Ensure the human resources for logistics development by education, training and research
- European education curricula to foster compatibility
- Availability of the research and development services and results
- Development of automation processes and technology to ensure optimal utilization of resources and meaningful and creative deployment of human input

7.3 Enterprises – The reinforcement of logistic industry

- Incentives for innovative companies
- Mechanisms of improving the competitiveness of the small and medium enterprises
- (see also the following policies)

7.4 Regulation – Innovative and intelligent

- Avoidance of unnecessary regulation
- Competition in transport market ensured by authorities
- Policy of liberalization to ensure efficient service production and multiplicity of services
- Effective mechanisms for protecting the market from too high concentration and monopolisation
- Clear long term perspective of regulatory changes (as in EURO-classification of car emissions) allowing industry and R&D to prepare for their future implementation

- Impact assessment procedures as mandatory part of the regulation development process (goals, distribution of costs and benefits)
- Knowledge management between regulatory authorities in different countries

7.5 Cost Efficiency – Effective logistics

- European research and development programmes to establish common base for total activity cost, including social cost
- Cost transparency for infrastructure use and other public services
- Incorporation of “correct” internal and external costs in logistics decisions

7.6 Sustainability – A must in modern logistics

- Tightening environmental guidance, balanced against the efficiency objectives
- Avoidance of waste and controlled re-use of old products and materials
- Promote the development and implementation of alternative fuels
- Embed (scan/evaluate, specify/negotiate, implement, monitor) sustainable transport logistics policy in host policies (finance, trade, environmental, social, energy maritime etc.)

7.7 Co-Operation – A strategic issue in network society

- Participation in international standardization work of information exchange in logistics
- Benchmark sharing through electronic platforms
- Integrated and coherent logistics practices between companies and authorities
- Foster smooth and fast integration and interoperability of different modalities
- Equal operating conditions (commonly applied regulations about noise, pollution, working hours, etc)

7.8 Public-Private Partnership – Agile solutions for investments

- Analysis and recommendations on the optimum role and finance models of public-private partnership arrangements
- Maximization of the returns on public-private investment
- Triple helix for synergies in cooperation between public administrations/regulators, business and academia.

8 CONCLUDING REMARKS

The results of the industry foresight covered most of the final conclusions and reflected the policy choices. The importance of logistics for the European competitiveness was emphasized throughout the EULOC process.

During the discussions the reason for infrastructure capacity shortage was not raised. However, the reason for congested roads and rails is not only the freight transport but mainly the passenger traffic which was not considered in this work. However, it is worth while to examine the transport system as a whole. Throughout the work process there was an expressed need for European transport and logistics professionals to start thinking, planning and acting in a more holistic way.

The results of the project present the view of the participants and as such can be disputable. The process has served the Commission as an expert discussion forum and the Commission has already started a new and wider project to cover the future of the logistics in Europe.

ANNEX 1: INDUSTRY FORESIGHT ANALYSIS

– From foresight to insight

The industry foresight offered a firm basis for the mission statement, visions and prioritized policy choices. This section of the report covers analysis and synthesis of the major environmental mega forces (*World Wide Competition, Impacts of Technology, Economic Change Patterns, Corporations Change, Future Demographics, Changing Cultures and Environmental Influence*) influence on

- The Big Picture of Supply Chains
- Supply Chain Management
- The Needed New European Transport Logistics Policies
- The Needed Capabilities and Competencies

The Industry Foresight is based on two preworks and Brussels and Helsinki workshops. In the analysis the different comments and ideas were clustered under main topics. After clustering the comments and ideas were prioritized in three groups: Most important = printed in RED & **BOLD**, Very important = printed in GREEN & *Italic*, Important = printed in BLUE & normal

ANALYZED MEGATRENDS

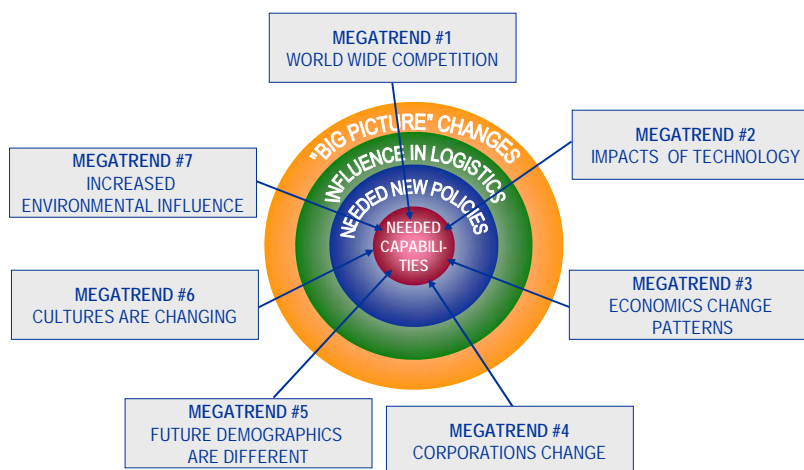


Figure 1.
Seven mega forces are analyzed by evaluating their influence on four levels.

A. HOW WILL THESE SEVEN MEGA FORCES INFLUENCE THE GLOBAL "BIG PICTURE" OF SUPPLY CHAINS?

Mobility and transportation

- **Globalization of supply chains will create global control problems, where both on producer and consumer side Europe has both advantages (multi-cultural) and disadvantages (small player, complex infrastructures) China's and India's economic growth will increase international transport –both container and airfreight**
- **The competition between US/Europe vs. Far East (mostly China, India, Russia, Brazil,) will increase; capacity becomes an important hindering factor (airports, ports, roads); the overall increase in trade and changes in the material flows require substantial investments in infrastructure**
- **The production and consumption in Eastern Europe will change the internal traffic in Europe: the pressure to reduce road traffic necessitate the increased use of rail, inland waterway and sea transport in Europe**
- **Safety & security issues must be taken into consideration, especially when facing terrorism and other threats including natural disasters,**
- *The demand for transport is increasing; and a multitude of needs must be satisfied*
- *Pressure to increase the use of more environmentally friendly transport models (rail, intermodal transport, inland waterways, and short sea transport)*
- *Higher taxation of freight transport on motorways*
- *Congestion on nodal points and external impacts will hinder transport*
- Globalization will increase mobility
- The transport distances will be longer (economy in Far East will grow rapidly)
- Global warming will affect seaports and coastal hinterlands, which support much industry
- Pressure to use alternative energy sources (vegetable oil, solar, biogas, wind etc.) to replace the use of fossil fuels
- Though in developed countries there may be limits to the further growth of mega-cities this has already had a profound effect on logistics. In the developing world the trend towards living in mega-cities will continue, at least for some decades.

The business structures

- **Network organizations will surpass the hierarchical structures of the past.**
- **Globalisation of business culture**

- *Work will increasingly be done by global project teams linked via advanced communications*
- *Commerce and industry will be dominated by big players; , mergers and acquisitions will continue Innovation happens in start-up companies; niche oriented service providers will emerge and become global players; there will be need for specialist and flexibly acting smaller companies*
- *Small and medium enterprises will have a bigger role in logistics networks*
- Networks vs. mega corporations; some industries maintain a network of small players whereas others polarize into global players. The former tend to be the specialized players tied to local industries, the latter the big third party logistics providers.
- Operations of supply chains is concentrating in fewer hands
- Global consolidation will produce global centres

Public policies

- **The strategy for regulation must be directed to enabling Europe's competitive position to generate the wealth needed to sustain European society at the level it needs. Commerce needs an enabling framework of legislation which allows it to function vigorously alongside the Society it sustains."**
- **The role of regions will increase in relation to transport regulation and key infrastructure investments.**
- *Monopolistic developments will be hindered by competition policy.*
- *Inability of small and medium enterprises to comply with increasing regulations, thus creating weak links in security environmental improvement of overall supply chain. Focus on sustainability: companies do not know what to expect from government but see it as a threat to their operations that new policies are emerging everywhere in different forms*
- *The role of public policies to provide strategic infrastructure is important. Even in the future, it looks unlikely that commerce alone might develop this except in partnership with states and we should recognise this. There are difficult decisions ahead on such matters as improving infrastructure in Central Europe: we should help this process by offering more objective criteria for these decisions.*
- Role of government needs to be reviewed
- EU and USA will try to fight the competition from East Asia by introducing more technical trade restrictions and import quota restrictions.
- Multinational corporations will influence legislation and international standards through lobbying and participation in ISO working groups. That will influence content of codes of conducts, CEN and ISO standards, environmental standards etc.

Products and services

- **Increased customization and responsiveness will determine the evolution of chain configurations; we see many new, different chain forms and also hybrid chains**
- **System integration technological and organizational and knowledge oriented**
- **supply network engineering requires innovation both in product and processes**
- *The strategy for improving framework conditions must be directed to enabling Europe's competitive position to generate the wealth needed to sustain European society at the level it needs. Commerce needs an enabling framework of legislation which allows it to function vigorously alongside the Society it sustains. "Government as an innovation agent)*
- Markets become more fragmented and customers more segmented
- The service industry will increase and the physical production decrease in western world; shifting in production networks
- Supply chain network design becomes a critical competitive advantage;
- Delivery of products and services to home will become more important as aging populations become less mobile, city distribution will change dramatically

ICT systems

- **The use of radio frequency identification (RFID) will increase dramatically and improve the possibilities of track-and-trace, inventory control, security control, etc.**
- **Mastering information flows becomes essential; intelligent technologies help to master complexity, common standards (architecture) is needed for information and identification of actions, especially for intermodal transport**
- *Mobile communication grows into identity determining how people act, function and expect others to respond –*
- Internet transforms existing distribution channels; web-automatic procedures make communication better between all steps of the supply chain; computer systems enable "intelligent talk" between systems; the role of middlemen will change. The internet sales will boom; the next generation of old people have grown up with computer and internet and they will use internet as a market place. Increased use of technology and information systems to monitor freight movements; increased need to control process and measure it.

Cost efficiency

- **Transport costs are increasing due to labour costs, congestion, oil prices and transport tolling, also the cost of ensuring safety and security may increase the total logistics cost**
- **Reverse logistics will become more important. Producers and importers will be forced to ensure an environmentally friendly take-back of end-of-life products and commercial returns.**
- *More costs will be involved in establishing return systems. The Waste Electrical and Electronic Equipment directive will encompass all products with chips and other electronic devices built into them.*
- *Understanding and internalization of external costs proceeds; transport costs increase, new (and less) materials are used for packaging and product life-cycle is optimized.*
- *Distribution and the organisation of logistics supply chains/networks are the areas for most attention for cost reduction.*
- The search for more cost-efficient transport forms (incl. increased unit sizes in air transport and container shipping) will help to keep unit transport costs low.
- In some types of operation (typically in continuous flow production, but also in large-scale transport operations, infrastructure and energy projects) the use of Life Cycle Costing is gaining ground
- Logistics cost savings have to a large part been realized

B. HOW WILL THESE CHANGES INFLUENCE LOGISTICS AND SUPPLY CHAIN MANAGEMENT

Public policies

- **Harmonisation of public sector policies and regulations and additional investments in infrastructure are important in abolishing border-effects.**
- **The Commission should take the initiative to raise the profile of logistics policies in Europe to ensure it's economic prosperity**
- *The road transport remains the most important mode of transportation; the Commission should continue to encourage the establishment of multimodal transport networks.*
- Regulators and public servants need to become sophisticated professionals, who understand the nature of supply chain as a source of competitive advantage
- Public sector could give a neutral negotiation and information exchange platform for competitors
- There need to be a balance between environmental issues and over restrictive regulation which increases costs disproportionately

The business structures

- **Organizations become more networked; systems like enterprise resource planning (ERP) need to be linked together between organizations; network organizations will outsource many activities to best in class players: the tier structure with different layers of suppliers will develop based on cost efficiency and specialization; while large players in logistics grow even larger, small and specialized companies will emerge. Collaboration will become common practice, where parties seek co-operation for example in IT, transport and warehousing to increase scalability**
- *A conscious effort must be made to assist small and medium enterprises to integrate more easily into the processes of larger companies.*
- Logistic integration proceeds to a holistic model of supply chain management in order to optimize performance
- Third party logistics providers will have a bigger role in serving for partnerships to increase the scales of flows
- Multipurpose warehouses in Europe will be replaced by specialised warehouses; cross-docking will increase
- Focus will be on supply chain operations instead of supply chain management; structures will be hybrid or flexible, use of different channels is made via supply chain operations
- (The production outsourcing requires planning and monitoring. Formerly outsourcing decisions were based on costs. Now competitiveness requires management control on outsourced functions)

Products and services

- **Supply chains have to be differentiated depending on the characteristics of the product, but also based on the different needs and expectations of different customer segments.**
- **Asset tracking will be of increasing importance to increase efficiency and avoid waste**
- *Products and services will be increasingly customized and delivered by new standards in terms of response time*
- *A degree of agility and resilience in supply chains will be essential*
- *Increased demand for data of environmental effects (all product and services)*
- New safe services must be developed for aging people
- An analysis of cargo flows and customer requirements will become an increasingly important part of logistics.

ICT systems

- **Radio frequency identification (RFID) on pallets, boxes and individual items will reduce costs of receiving goods, inventory control, and shrinkage**
- **ICT will play a critical role in
the move from supply chain management to operations
increasing security
increasing service levels
reducing costs**
- E-commerce will reduce old flows and generate new ones; E-commerce (business to business, business to consumer) will reduce old flows and generate new ones.
- Internet-commerce will increase the demand for small and shipments.

Cost efficiency

- **Call for better understanding of logistics cost, especially indirect types (examples) of logistics transaction cost**
- **To optimize logistics processes within and between companies**
- **We need to become smarter in modelling true costs; informed decisions need to take place; the use of key performance indicator could be extended to include costs factors. Improve performance management practices**
- Hi capacity to absorb external costs may be higher than anticipated
- Logistics will be outsourced and per unit cost will decrease

Research & development and training

- **Need for flexibility and innovation needs to be stressed in areas like security or food safety, collaborative planning, tracking and tracing, supply chain management, intermodal handling etc.**
- **New business models (financial risk co-operation)**
- **However, it is important that the research & development & training is turned into innovation and that the innovations rapidly spread through sectors, including logistics companies (innovation management)**
- Attention should be paid to alleviating the problem of internal company rates of return being set too high and pay-back periods set too long.
- Strong need for a comprehensive education programme in logistics, that deals not only with business, transportation and management, but also with energy policy, environmental issues, public policies and business ethics
- There is an urgent need to focus EU resources on specific research and development topics that are strategic to the industry -- not the usual

shopping list but those areas where 1) awareness of industry is low and 2) either threats or opportunities are high. Topics are tracking & tracing, food safety, security, Radio frequency identification (RFID), co-operation.

- Europe must not fall short in research and venture capital that fuel start-ups
- Large corporations need to use more resources in research and development and set the framework that small and medium enterprises need to fit in
- For Europe, it is fundamentally important to be a step ahead of competition; more resources into training logistics practitioners, and the use of technology need to be introduced.
- It is necessary to integrate the non-ethnic population in the working force by giving them language skills and vocational training.
- There is a good deal of research and technology development done in Europe and supported by the EU and national governments. This support should continue.

C. WHAT NEW POLICIES NEED TO BE ESTABLISHED?

Networking and co-operation

- **Support/stimulate networking and partnerships between private companies but also with public administrations and research & development institutions**
- Supply chain management has become more holistic; interlinking parties and partners should work well together with core process of supply chain management
- See that energy policies doesn't constrain networking
- Functioning open market improves supply chain management. Policies that motivate partners to co-operate are needed.
- Co-operation between competitors to promote innovation, knowledge sharing and transfer

Research and development

- **European wide targeted research & development programs should be strengthened**
- *Europe needs to provide targeted research and development funding through successive Framework Programs; link academia with venture community for start ups.*
- Encourage exchange programs and university cooperation
- Stimulate transfer to new techniques of supply chain operations (agent- based software, Radio frequency identification technology)

Standardization

- **New better, international European quality standards for processes are needed; customers, quality, ICT, training and data. European standards must be linked to International Standards to prevent duplication, and isolation and linked to standards for public policies such as quality public transport**
- Solutions – not only technology – need standards, and standards should be promoted properly.
- (Public policies that have an impact on logistics should become standards as well: quality requirements for public transport; car free city centres etc.)

Investments

- **Investments should be made in the framework conditions for logistics systems. This includes advanced infrastructure, education, labour flexibility, market regulation, international co-ordination mechanisms**
- **Local subsidies need to be replaced by risk capital, new financing models need to be developed in order to match with investment needs.**
- *The main source of infrastructure network investment should come from the public sector. Public-private partnerships should be used where practicable, but it is not a panacea.*
- *Intensifying pragmatic cooperation between Multilateral Institutions in general would be beneficial in this field (e.g. EU Commission, European Investment Bank, European Bank for Reconstruction and Development, World Bank, Asian Development Bank, Nordic Investment Bank), and sharing this process with the national infrastructure Ministries as well as Ministries of Finance.*
- (Investments in all modes infrastructure; public –private initiatives)
- Closer partnership between public policies and commerce to foster intermodality including regional planning
- Invest in new transport technologies that provide alternative to “all-road” freight.
- Invest in information and decision support technology
- Cities must invest in better public transportations; walking and bicycling must be promoted and made safer & easier

EU-policies

- **New logistics policies for the EU’s key metropolitan areas need to be developed**

- **Europe should implement the Lissabon strategy and make the supply chain support it; border-effect should not be the factor but co-operation should be build across the borders**
- *Abating border within Europe has been one of the main exercises in the EU process. The job is not finished. For instance borders still exist in the railway market.*

Regulation policies

- **Danger of making Europe too costly by over-regulating should be avoided.**
- **Linkage between competitiveness and logistics efficiency should be understood better both in firms but especially among policy makers; Government should work with industry to develop effective processes and regulation**
- **Regulation should be seen in a positive light and not viewed as a regrettable necessity or simply a cost burden on industry. For this to happen the regulation needs to be ‘intelligent’ and its role explained. Regulation is an essential part of the mixed economies that we all live in.**
- *Streamlining of (public) administrative processes.*
- *Regulator needs to be professional and strong to ensure competition;*
- Tax policies need to be harmonized (tax collection, refund of Value Added Tax (VAT), corporate and income taxes)

D. THE NEW NEEDED CAPABILITIES AND COMPETENCES

Public-private

- **Dialogue building between industry and government; Companies are uncertain about the many threats in the EU transport system –real dialogue on critical points in logistics between EU/national governments and industry is lacking**
- *Public-private cooperation needs to be intensified. Specialized clusters can be helpful in establishing new models and testing them. Public sector could act as a facilitator for co-operation between companies; optimize the link between logistics service providers and technology providers*
- *Europe needs transnational public-private partnerships ; including the participation of regions*

ICT

- **Training people to use systems**
- **Research & development capabilities and technological and related organizational competences in the logistics sector should be strengthened to allow adoption of new ICT**
- *Promoting standardized interfaces, processes and interoperability for ICT to facilitate easy connectivity, data query functionalities and data processing. Development of innovative software; Optimize the link between logistics service providers and technology providers!*

Networking and cooperation

- **A new frame of mind needs to be developed in order to succeed in co-operation – allowing firms to get used to horizontal co-operation**
- *Small and medium sized enterprises companies need to partner and work closely in the supply chain*
- Benchmarks of best practises
- Working together via intermodal logistics players will need to be developed

Competences

- **Advanced transportation planning and control systems**
- **Competence to develop and monitor differentiated distribution channels**

- *Effective competence development to respond the skill requirements of new supply chain management challenges; the skill requirements should be defined and assessed.*
- *Competencies in logistics/Supply chain management in service industries, incl. Public health, hospitals etc.*
- *Need for skills and competencies in off-shore production, outsourcing, inter-cultural understanding, technology*
- *Research & development , education and research in logistics should be redirected from local and regional thinking to knowledge exchange and knowledge creation more globally*
- *Supply network engineering*
- *A major education initiative is needed to improve urban traffic planning*
- *Competence to do environmental economic analysis*
- *Evaluation of network performance*
- *The importance of a widely recognised European system of logistic competence is most important. Such systems exist – and need pushing. Such a system would strengthen Europe international recognition as an area of logistics excellence, and provide a framework for updating and continuing professional development. Most of this area involves on building/using what we have with greater alacrity.*

Management skills

- **Improve the management skills needed; leadership in network environment requires a new set of management & leadership skills (knowledge, innovation, intercultural processes, co-operation management, complexity- information-**
- **Create awareness of strategic logistic issues at executive level**
- *Develop information management and decision support capabilities*
- *Expand management scope and skills to include reverse flows; build the skills to respond in terms of innovation and re-organization to new requirements*
- *Better transport management to utilize the transport capacity*
- *Awareness and clear strategies to cope with future challenges – accessibility of cities*