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ADVISORY UNIT ON MULTI-DISCIPLINARY ISSUES

INTERNATIONAL FUTURES PROGRAMME

OECD Futures Project:
Transcontinental Infrastructure Needs to 2030/2050

PROJECT DESCRIPTION

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OECD Futures Project on Transcontinental Infrastructure Needs to 2030/2050

Purpose

The purpose of this Project is to bring together experts from the public and private sector to take stock of the long-term opportunities and challenges facing transcontinental infrastructure worldwide (ports, airports, rail corridors, pipelines etc.) and to propose a set of policy options to OECD governments which aim to enhance infrastructures' contribution to economic and social development in the years to come. Particular attention will be paid to assessing the global infrastructure investment requirements for these sectors to 2030, and to examining the long-term challenges facing the world's major transit hubs. This Project follows on from work recently completed by the Futures Project on Infrastructure Needs to 2030 which covered telecoms, water, electricity and surface transport, but did not include ports, airports and other major infrastructures crossing or connecting continents.

Objectives

1. Identify and discuss the most critical factors that may affect the short and longer term prospects of transcontinental infrastructures (ports, airports, rail corridors, pipelines) including *inter alia* economic growth, trade, population, technology, impact of climate change, geopolitical factors, and government policies.
2. On the basis of available recent forecasts and scenario studies, assess the likely demand for infrastructure in the major areas of the world in ports, airports, rail corridors and pipelines to 2030/2050 and provide, under a range of different assumptions with respect to economic growth, trade, population, climate change etc., estimates of the level of infrastructure investment required in these activities over the long term future.
3. Identify possible future capacity shortfalls, critical congestion points, and vulnerability to risk of major disruption.
4. Explore the long-term challenges facing major regional/continental transit hubs and interconnecting rail corridors, and examine the scope and prospects for improvement via e.g. demand management measures, efficiency enhancement, supply chain efficiencies, technology substitution effects, demand management. Moreover, looking to the longer-term horizon to 2050, it will be necessary to examine the prospects for and implications of the emergence of new major shipping and rail routes.
5. Review traditional and new funding models (not least in the light of the latest financial and economic crisis) in order to identify the most promising approaches and highlight the conditions required for successful models to emerge.
6. Draw implications regarding the supportive measures that could be put in place to foster the development of promising business models and reduce obstacles to their successful implementation, including what options governments and international bodies might have

to provide a policy framework – legal, regulatory and institutional – which would be more conducive to the development of transcontinental infrastructures.

This document is intended to provide interested parties with first indications about the rationale, purpose, expected output, structure and management of the Project, as well as a tentative timetable for its completion. The Project Description will be discussed and further refined at the first meeting of the Steering Group scheduled for November 19, 2009. The final scope will take into account the views expressed by those institutions that actually participate and financially support the Project.

The present Proposal is based on (1) the results of the wide-ranging consultation of infrastructure experts and decision-makers carried out over the last few years by OECD Advisory Unit staff, (2) inputs from the Steering Group and experts invited to contribute to the two OECD reports on Infrastructure 2030 published in 2006 and 2007, and (3) inputs provided by participants at the exploratory meeting held at the OECD on November 18th, 2008.

Rationale

The economic crisis has turned a double spotlight on the role of infrastructure investment in the wider economy. First, because infrastructure investment has been identified by many governments as a highly suitable component of the financial packages that have been put together in recent weeks to stimulate economic activity and help counteract the slowdown. In the United States, for example, the incoming Administration has included massive infrastructure spending in its planned stimulus package. While the exact composition and amount remain unclear, it seems likely at the time of writing that over the short term a large share will be used for repair and maintenance. It is thought that some 64 billion USD of road and bridge projects are ready to start, as well as 12 billion USD worth of transit projects. In Europe, France and Germany for example have each earmarked some 8 billion Euros in their stimulus packages for investment in transport, energy and research. Second, it is important to maintain momentum in infrastructure spending. Should infrastructure investment stall severely in the next 1-2 years, the result could be to exacerbate supply shortages and congestion problems just as the recovery begins to take hold, thereby putting pressure on prices and compromising the upturn.

But also from a longer-term perspective, investment in infrastructure offers substantial opportunities as a vehicle to underpin economic growth, improve social welfare and meet sustainable development objectives. International trade is expected to decelerate sharply through 2009. However, it could well recover in 2010 and over the next couple of decades resume its expansion at an average annual rate of somewhere between 5% and 7% per year. But will there be sufficient capacity at airports and seaports, on transcontinental rail routes and pipelines etc. to handle the increased long-term flows of goods, passengers and services? Preliminary evidence suggests that for some key infrastructures and some major regions of the world this may not be the case.

- Worldwide, demand for air transport is expected to reach 7 billion passengers by 2020 (9 billion by 2025), while capacity is expected to be able to deal comfortably with only

about 6 billion. Some 93 airports catering for about two-thirds of world traffic are already considered capacity-constrained. Alone in Europe, more than 60 airports are likely to be unable to meet demand by 2025 and it is thought that at least 10 new major airports and 15 new mid-sized airports will need to be built. Asia will be the fastest growing aviation market. The Chinese government, for example, is planning to build 97 new regional airports by 2020 (45 of them by 2010) at an estimated cost of USD 62.5 billion.

- Seaborne trade, which has already doubled since the mid-1980s, is expected to continue to expand, putting continued pressure on port handling capacity around the world. Global container traffic is expected to increase at a rate of almost 8% per year to 2015, pointing to investment needs in the order of 73 billion USD alone in container berths. In Europe, between now and 2030, main ports are likely to see the volume of solid bulk goods increase by 85% and the handling of container goods by a massive 620%. Despite planned port facility expansion, Europe's container handling infrastructure is expected to come under severe strain. Congestion has also been rife at many major ports in North America and Asia, not only in the ports themselves but also on the infrastructures (road and rail) providing access to and exit from the port facilities.

- With the possibility of growing congestion at main ports and the risks to principal international shipping routes notably at potential bottlenecks (e.g. Bosporus, English Channel, Strait of Gibraltar, Strait of Malacca etc.) attention could turn increasingly to alternative transcontinental rail routes (e.g. Trans-Siberia, Canada-Alaska-Russia, Latin America). While such routes offer considerable potential time and cost savings, it is unlikely that they could handle substantial increases in freight traffic without major investments.

- Notwithstanding substitution effects or the relief that new transcontinental rail routes may offer, one of the main potential bottlenecks for freight capacity is likely to be in North America, and also in parts of Europe where insufficient rail capacity and inadequate interoperability between national networks are affecting capacity. As already discussed in Infrastructure to 2030, OECD, 2006-2007, large container terminals in North America and Europe are already facing difficulties in connecting efficiently to the hinterland.

- In the energy field, most recent estimates suggest that cumulative investment to 2030 in the upstream oil and gas sector is likely to amount to over 8 trillion USD. However, as non-OPEC oil and gas production peaks and starts to decline quite soon, the degree of concentration of reserves in resource-rich regions (Middle-East, Africa, Russia) will grow, lengthening transport routes for oil and gas supplies for many OECD countries. The uncertainties surrounding some of the existing pipelines as well as the financing, construction and operation of new transcontinental projects are considerable.

The Project

To function properly, the global economy will need adequate and properly functioning international infrastructure. Where will the principal bottlenecks and "hotspots" occur? How much investment will be required and how can adequate financing be mobilised to build the much needed additional capacity? How will the major transit hubs of the world develop? What can be done to raise capacity by improving the management of these infrastructures, raising efficiency and better managing the demand for them? The proposed OECD/IFP project sets out to answer these and other key questions about the future of international gateway infrastructure, building on the previous work performed for the "Infrastructure to 2030" exercise.

1. Sectoral coverage

It is proposed to concentrate on major seaports and airports, transcontinental rail corridors, oil and gas pipelines. Major new projects should be considered, but also existing transcontinental infrastructure systems that require heavy on-going investment for maintenance and upgrading.

2. Geographic coverage

The focus of interest remains OECD countries, but it is clear from the nature of the theme that the project needs to consider future developments in Asia, Africa, Latin America, Russia and Central and S.E Europe. Within the larger picture, there should also be scope for examining the infrastructures of selected major regional transit hubs (e.g. Switzerland/Austria, Scandinavia) where accessibility and issues of interoperability within cross-continental infrastructure networks (rail, gas) play a role.

3. Time horizon

The focal point for much of the project will be 2030. However, depending on the type of infrastructure and the nature of the theme, the horizon may range from 2015 to 2050.

4. Project structure

Work on the Project will be organised in a series of modules which will be carried out partly in sequence, partly simultaneously:

Module 1

Provide a first overview of available long-term projections and scenarios concerning likely demand for air transport, sea-borne trade, major transnational rail routes, oil and gas, which have been produced in recent years by governments, international organisations and business. Explore indications of possible capacity shortfalls and critical congestion points, and interconnections already particularly vulnerable to disruption either through unduly strong demand or through external factors (there being a long list of potential risk factors ranging from natural disasters and effects of climate change to technical accidents and terrorist activity).

Module 2

Using available forecasts and scenario studies (see Module 1), this second module will assess the likely demand for traffic, energy flows etc. through infrastructures in the major regions of the world – ports, airports, rail corridors, oil and gas pipelines, etc. – to 2030 and, in some sectors such as for example rail, to 2040/2050. This will require some adjustment to the assumptions underlying the projections and scenarios to reflect changed conditions and changing expectations with respect to economic growth, trade flows, climate change, government policy, and so on. Attention would need to be paid to interrelations between the different infrastructure sectors. In a second step, the module will endeavour to link these possible long-term trends in traffic and energy demand to costs of infrastructure construction, maintenance and upgrading, with a view to estimating global investment requirements to 2030 in each sector. [Within the same exercise, consideration could be given to performing a tentative update of the future infrastructure requirements estimated in the first phase of the previous Infrastructure to 2030 project.]

Module 3

The focus of Module 3 is on the longer-term future of major coastal and inland transportation and logistics hubs which serve as key nodes in moving traffic between and across continents. In the context of the demand and investment scenarios to be developed in Module 2, the key question will be: what are the long-term challenges and opportunities facing major hubs in the coming 2-3 decades? Despite the specificity of the different types of hub (hinterland ports, airports, inland regional hubs) most of them also face challenges of a more generic nature which are set to become increasingly complex in the coming years. For example, how will global supply and value chains develop over the coming years? How is competition between airports likely to evolve, and also between air and high speed railway connections? How will competition but also co-operation among major sea ports develop? On the longer term horizon there is also the prospect of new sea routes and new rail routes opening up, raising questions about future competition between different modes of transport. And the increasing role of LNG shipments offers interesting alternatives to gas pipelines. Climate change and environmental concerns will play an ever growing role in the operation and future expansion of maritime ports, sea ports and inland logistics hubs in light of the emissions, noise and land-use related issues that accompany them. And well-sequenced investment and co-ordinated planning with all relevant stakeholders – both public and private – will prove essential for enabling hubs to achieve their economic and environmental objectives Exploiting the potential for multimodal and intermodal transport will be a key dimension of the response to some of the challenges facing major transit hubs, as will be the ability to address problems of interoperability and interconnectivity (not only in rail but also in

transporting gas and ensuring that hubs can draw on sufficient electricity across borders to power their operations). In realising necessary improvements in operational efficiency, new technologies will need to move increasingly to the fore – for example, use of ICT in automated yard marshalling and inventory control, enhanced air traffic control systems, use of satellite technologies in managing and monitoring freight movements, on-board technologies for faster, more secure rail transport, and so on. And finally, public policy and regulations (concerning for example emission levels, demand management, security, container standards) will figure prominently among the factors shaping the longer-term future for the world's major transport and logistical hubs. To keep the project manageable, it is proposed to address this wide range of issues through selected case studies of transit hubs or specific infrastructure projects in Europe, North America, and Asia-Pacific.

Module 4

Financing the infrastructure requirements of major transit hubs and continent-crossing corridors will need to be shared by all actors - public (national, regional, local) and private alike. Pressures on public budgets in OECD countries are likely to mount over the coming decades as population ageing drives up health and other social spending, and other public budget items such as environmental improvements and security concerns come to the fore. Hence, the private sector can be expected to play an increasingly important role in infrastructure financing, frequently in tandem with the state. A wealth of experience has already been gathered with for example public-private-partnerships and much could be gained from reviewing what works well and what works less well. Also it would be worthwhile considering how the experience of the latest financial and economic crisis is likely to influence the future of PPPs and of various other funding models which have come to the fore in recent years. [For this purpose a specially designed workshop would be organised for interested project participants and invited experts.] There would also be opportunities for considering new funding models for R&D in infrastructure-related innovation. Hence, this module will explore traditional and new funding models in order to identify the most promising approaches and highlight the conditions required for successful models to emerge.

Module 5

This module will summarise the findings from the project; identify what steps might be taken to foster the development of promising business models and reduce obstacles to their successful implementation; and consider the options for governments and international bodies to provide a policy framework – legal, regulatory and institutional – which would be more conducive to the development of transcontinental infrastructures more generally.

5. Duration of the Project

This would be a 2-year project starting in the first quarter of 2009 and finishing with a final meeting in the last quarter of 2010 (and a published report in the first quarter of 2011).

6. Outputs

In addition to numerous intermediate outputs in the form of working papers and workshop summaries, the findings would be published as an OECD report and disseminated in the course of 2011.

7. Management of the Project

The Project will be organised and managed by the secretariat of the OECD's International Futures Programme. The Project Team will draw on in-house experts from relevant specialised Directorates at OECD, and also recognised international consultants and experts from universities and research institutes.

The Project Team will be advised by a Steering Group consisting of the sponsors of the Project who will be drawn from government, business, research and possibly foundations. The Steering Group will meet three times during the life of the Project.

8. Participation

Major public and private stakeholders in the infrastructure sector within the OECD area are invited to participate. These include all main players in the sector: from departments in charge of regulating infrastructure to port and airport authorities and research funding agencies, from engineering corporations to operators, banks or pension funds. But the invitation extends also to a broader range of entities, public or private, potentially interested in other aspects of the Project, e.g. new technologies, frameworks for services infrastructure, safety or security, the emergence of new suppliers or users of infrastructure services. Non-OECD stakeholders could also be invited on an ad hoc basis. The number of seats for each participating OECD country (public and private representatives together) is limited in order to avoid undue concentration of interests.

9. Budget

The cost of the Project is estimated at 800 000 Euros. To the extent that more or less funding is secured, the scope of the project will be adjusted accordingly, after discussion with the Steering Group.

10. Funding

The Project will be funded through voluntary contributions from interested government departments and agencies, and grants from the business sector and research institutions. Such financing has to be sufficient to cover, *inter alia*, the following costs: OECD Project Team salaries; commissioning of internal and external papers; organisation of four meetings of the Steering Group; production and distribution of the final report; Project-related travel; and possibly support for non-OECD participants.

11. Proposed Project Timetable and Key Milestones

Date	Milestone
18 Nov 2008	The Project Proposal is discussed with potential participants.
March 2009	Work begins on Module 1 – an overview of available long term projections and forecasts to 2030/2050 concerning the likely demand for air transport, sea borne trade, oil and gas, and major transnational rail corridors.
April 2009	Work on Module 1 continues. Work begins on Module 2 – projections of infrastructure investment needs to 2030.
19 Nov 2009	**First meeting of the Steering Group**: The revised work plan is discussed and next steps approved. The Project Team submits to the Steering Group a draft overview of existing recent long-term projections (Module 1), and a draft report on scenarios of transcontinental infrastructure investment needs to 2030 (Module 2). Options for a note on preliminary findings are discussed. A preliminary discussion is held on long-term challenges facing major coastal and inland transit hubs (Module 3) and on key issues and promising business models (Module 4).
20 Nov 2009	*Special workshop on the future of transport infrastructure funding models – an international exchange of experience to date (open also to government officials otherwise not participating in the Project)*
9 July 2010	**Second meeting of the Steering Group**: The Project Team submits to the Steering Group revised drafts of Modules 1, 2 and 3 and a draft report on promising business models and financing options (Module 4). A preliminary discussion of conclusions and policy options is held.
5 November 2010	**Third meeting of the Steering Group**: A draft report on findings and policy options (Module 5) is submitted to the Steering Group for discussion. The Project Team also presents proposals on publication and dissemination of results of the project.
First quarter 2011	**Publication of OECD report**

Between meetings of the Steering Group, participants will be invited to send to the Project Team any documents they may have which they think could contribute to the Project. They will also receive from the Project Team interim papers for comments.