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FINAL REPORT
Automated transport management systems implementation for optimizing logistics within the Asia-Pacific with an emphasis on ITS and GNSS application

APEC Transportation Working Group

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Introduction

There have been some drastic changes in the global commerce these last ten years resulting from reduction of barriers to commerce and liberalization of trade, and the dynamic development of export-oriented industries in the Asian-Pacific Region (APR). The massive transfer of the manufacturing facilities (including those of basic industries) from the Western Europe and the USA to Asia and development of a backflow of finished products along with the increasing consumption in developed countries, have become the most important incentive to development of the global transport and logistics market.

The APEC economies are heavily involved in that process accounting for more than 57% of the global GDP and 48% of the global trade.

The long-term goal for APEC, according to the Bogor Declaration 1994, is free and open trade and investment with the industrialized economies achieving the goal of free and open trade and investment no later than the year 2010 and developing economies no later than the year 2020. APEC's three main pillars of activity towards achieving of the Bogor Goals are trade and investment liberalization, business facilitation and economic and technical cooperation.

In order to achieve the Bogor Goals of free and open trade and investment in the Asian-Pacific Region, the basic principles of facilitating the trade were formulated in Shanghai 2001. One of the objectives within those Principles was **a 5% reduction of trade transaction costs within 10 years, facilitation of customs and administrative procedures that impede and delay movement of goods and increase general costs of goods movement within the region.**

Based on the analysis of individual action plans aimed to facilitated trade and results of the actions, it was decided to expand the transaction cost reduction approach and focus on the direct transport cost of goods and the cost of information support to the carriers. Therefore improvement of trade logistics through development of logistics chains was adopted as one of the key trade facilitation priorities.

As a result, **the supply chain development initiative was endorsed in Singapore in 2009, which is now one of the key transport and logistics initiatives within APEC.** The essence of the initiative is the eight supply-chain ‘bottlenecks’:

1. lack of transparency/awareness of the full scope of regulatory issues affecting logistics; Lack of awareness and coordination among government agencies on policies affecting logistics sector; Absence of single contact point or champion agency on logistics matters;
2. inefficient or inadequate transport infrastructure; Lack of cross border physical linkages (e.g. roads, bridges);
3. lack of capacity of local/regional logistics sub-providers;
4. inefficient clearance of goods at Customs; Lack of coordination among border agencies, especially relating to clearance of regulated goods ‘at the border’;
5. burdensome customs documentation and other procedures (including for preferential trade);
6. underdeveloped multi-modal transport capabilities; inefficient air, land, and multimodal connectivity;
7. variations in cross-border standards and regulations for movement of goods, services and business travelers;
8. lack of regional cross-border customs-transit arrangements.

A work plan was drafted aimed to eliminate each of the 'bottlenecks' through information and education activities including events within APEC projects.

During the last APEC summit in September 2012, foreign affairs and trade ministers of the APEC economies issued a joint statement outlining specific political initiatives aimed to ensure well-balanced, sustainable, comprehensive, innovation and secure economic growth in the region. Among other things, the statement emphasized the importance of reliable supply chains to support sustainable development and provide security to the region and the entire world in terms of economy, energy, food supply and environment. The statement also said: "To improve supply chain connectivity, protect interests of the business community and consumers, enhance the speed and quality of delivery of goods, as well as to guarantee transparency and opportunities for control over bulk cargoes, increase the ability to track dangerous goods and hazardous materials, supply chains should be considered as a single modern network equipped with smart technologies, including Intelligent Transportation Systems (ITS), monitoring systems based on Global Navigation Satellite Systems (GNSS), automated cargo identification systems based on RFID (radio frequency identification), and automated transport management logistic services".

Transportation and freight flow management and monitoring systems (SMM) using advanced technologies become increasingly important due to the following factors:

- globalization of transports, increased length of transport links, and more complex supply schemes;
- increased demand for new communications-related and integrated solutions;
- personification and development of service economies; requirement for fast response to client requirements, and increasing competition;
- requirement for reduced process and production cycles;
- longer and more complex logistics chains; focus on environment friendly and waste-free economic activities, etc.

This study covers the following subjects:

- description of the current state and development of the road and transport system in APEC economies;
- overview of transportation and freight flow management and monitoring systems implemented and operating in APEC economies;
- assessment of main advantages and socio-economic effectiveness of transportation and freight flow management and monitoring systems in APEC economies;
- analysis of general patterns and problems in implementation, operation and development of SMM in APEC economies;
- recommendations for development and improvement of SMM in APEC using GNSS and ITS technologies;
- recommendations for improvement of interaction between the existing and the future SMM in APEC economies to ensure their efficiency.

This general overview of SMM implementation and operation experiences in APEC economies was prepared based on open sources, APEC forums, conferences, ministerial meetings and workshops, as well as results of the questionnaire surveys of transport authorities, major logistics operators and transport companies that are active in APEC economies.

1. General overview of SMM implementation and operation in APEC economies

1.1. Brief description of the current status and development of road and transport systems of APEC economies

1.1.1. Role of APEC in the global economy and international trade

The Asia-Pacific Economic Cooperation forum is an international economic organization established to promote integration throughout the Asia-Pacific region including 21 economies at various stages of development. Although the APEC is the youngest of the three largest economic integration blocks (the other two are the EU and the NAFTA), it has already proven its effectiveness as a facilitator to trade and economic cooperation in the region. The APEC has been the fastest growing economic zone in the world over the last 20 years, and is expected to become the leader of the global economy in the 21st century. APEC members account for over 57% of the world's GDP, 48% of international trade, and about 40% of the world's population[1].

Table 1.1.1.1 provides data on population and GDPs of APEC members as well as their respective percentages in the world GDP and population.

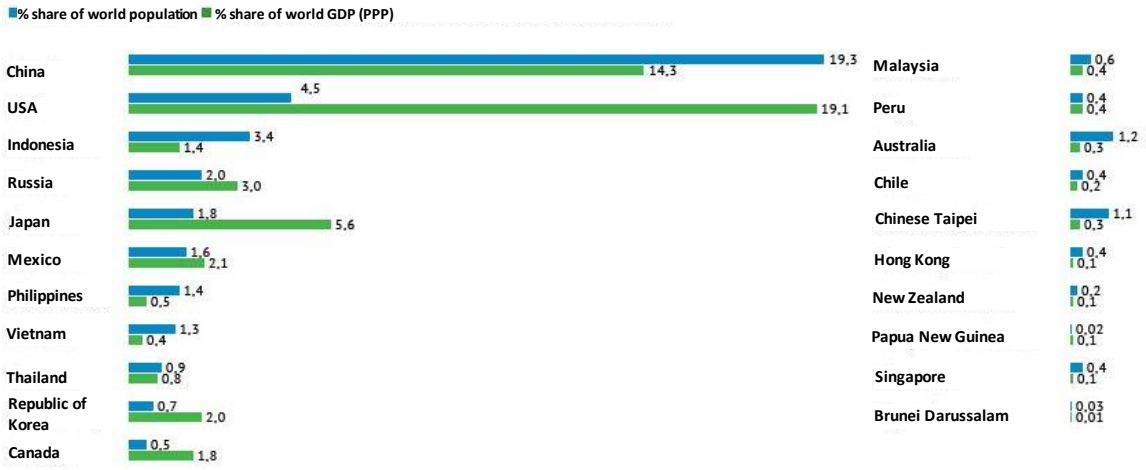
Table 1.1.1.1.

Population and Gross Domestic Product (GDP), by APEC member

APEC member economy	GDP based on PPP (international dollar billion)	Share of world GDP (PPP) (%)	Population (million)	Share of world population (%)
Australia	954.296	0.3	22.683	1.2
Brunei Darussalam	21.907	0.03	0.434	0.03
Canada	1443.108	1.8	34.826	0.5
Chile	316.516	0.38	17.403	0.4
China	12387.048	14.3	1353.821	19.3
Hong Kong, China	364.742	0.44	7.173	0.4
Indonesia	1208.542	1.4	244.468	3.4
Japan	4588.972	5.6	127.611	1.8
Republic of Korea	1629.904	2.0	50.010	0.7
Malaysia	472.942	0.4	29.038	0.6
Mexico	1743.474	2.1	114.872	1.6
New Zealand	126.628	0.15	4.463	0.2
Papua New Guinea	18.390	0.02	6.826	0.02
Peru	322.675	0.4	30.474	0.4
Philippines	411.903	0.5	97.737	1.4
Russia	2510.791	3.0	141.924	2.0
Singapore	327.557	0.40	5.366	0.4
Chinese Taipei	919.027	1.11	23.434	1.1
Thailand	643.266	0.8	64.460	0.9
USA	15609.697	19.1	314.311	4.5
Viet Nam	320.874	0.4	90.388	1.3

[1] APEC Forum 2012 (http://www.apec.primorsky.ru)

Source: IMF World Economic Outlook, April 2012

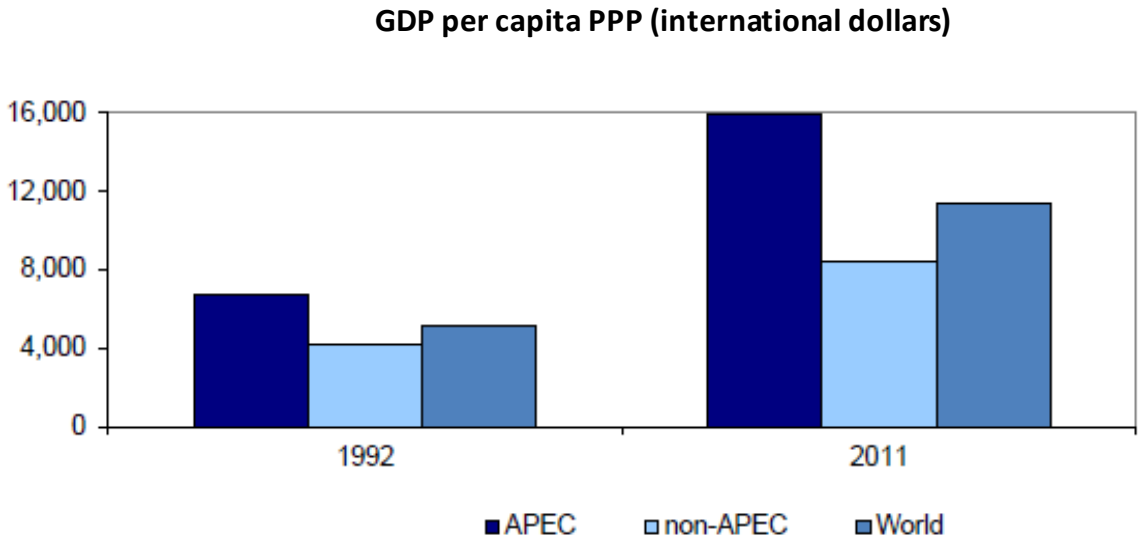


Source: IMF World Economic Outlook, April 2012

Fig. 1.1.1.2. APEC member economies and their shares of world GDP and population

In the last 20 years, the overall GDP in purchasing power parity (PPP) terms in APEC has increased almost three-fold from $14.8 trillion to $43.9 trillion. APEC's GDP has grown at an average 6.1 per cent per annum during that period in PPP terms – faster than the non-APEC economies' average growth (5.5 per cent) and the world's average growth (5.8 per cent) over the same period.

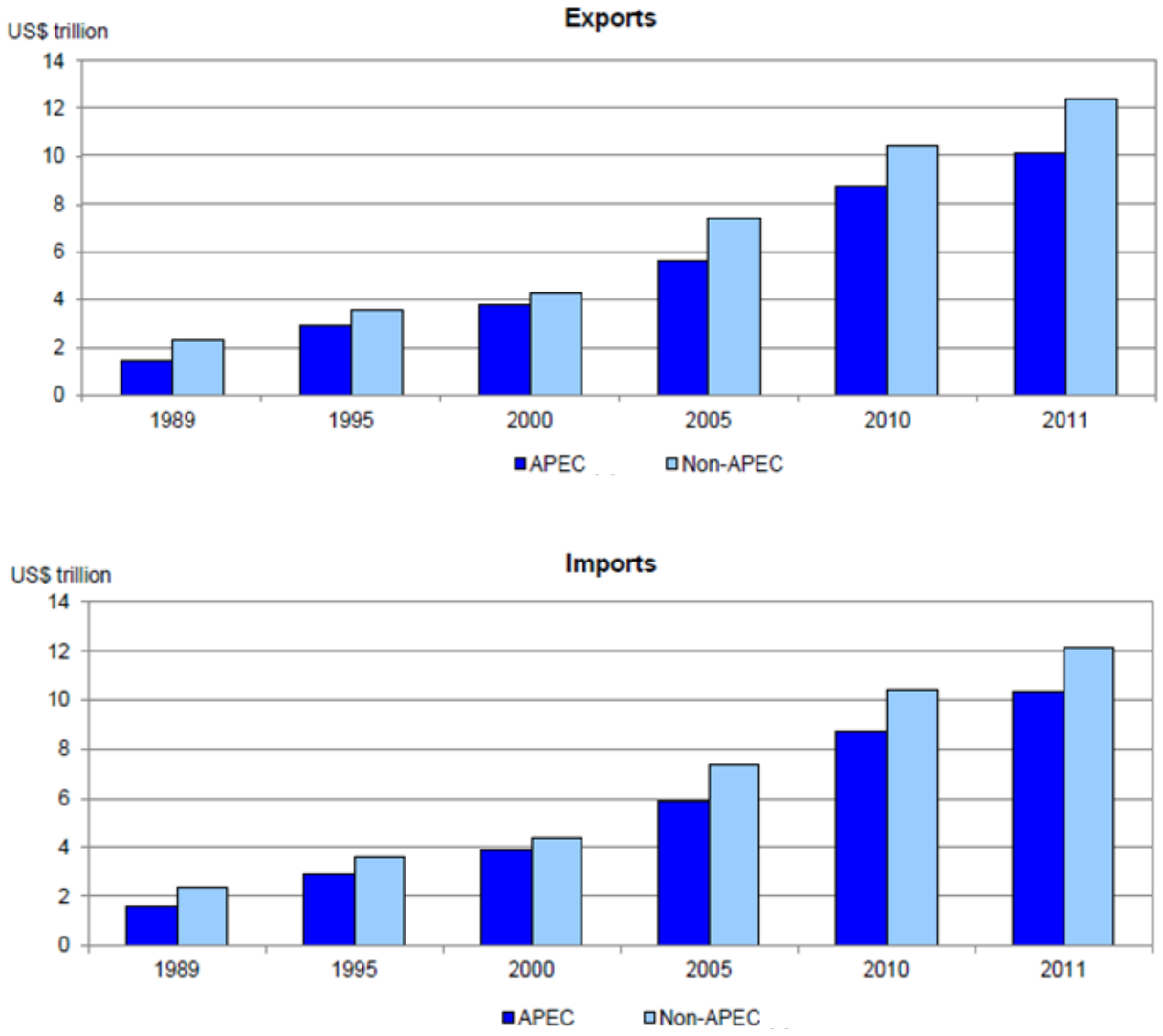
APEC's per capita GDP (in PPP terms) has risen from $6,719 to $15,889 over the last two decades which is higher than both non-APEC economies' average GDP per capita and the world's average GDP per capita.



Source: IMF World Economic Outlook, April 2012

Fig. 1.1.1.3. GDP per capita (PPP) of APEC members compared to other countries

Over the last decades, through continuous reduction of obstacles to trade and the focus on free and open trade, APEC have created a system supporting foreign trade systems of the member economies.



Sources: Global Trade Atlas (http://www.gtis.com), UN comtrade database (http://comtrade.un.org), IMF Direction of Trade Statistics & Balance of Payments 2011

Fig. 1.1.1.4. Evolution of APEC's exports and imports compared to other countries

Goods and services exported by APEC members to the world have increased from US$2.0 trillion in 1992 to US$10.1 trillion in 2011. Similarly, goods and services imported by APEC members have risen from US$2.0 trillion to US$10.3 trillion. Intra-regional merchandise exports and imports amongst APEC economies have been robust, both growing at an average of 8.1 per cent per annum since 1992. In 2011, intra-regional merchandise exports accounted for 67.2 per cent of APEC's total merchandise exports while intra-regional merchandise imports accounted for 65.1 per

cent. Table 1.1.2 below shows exports and imports of goods and services for each APEC economy and other countries.

Table 1.1.1.2.

Evolution of goods and services trade, by APEC member (US$ million)

Member economy	Exports						Share of world total (%)	Growth 1992 – 2011 (%)
	1989	1995	2000	2005	2010	2011		
Australia	46233	70094	83732	136527	260378	321991	1.4	9.0
Brunei Darussalam	1883	3388	3358	6249	9310	12312	0.1	9.1
Canada	133528	217246	317343	416559	457065	528865	2.4	6.3
Chile	9806	19234	22298	45732	78222	93126	0.4	11.6
China	57141	167910	279670	836731	1749647	2082382	9.3	18.4
Hong Kong, China	89546	206344	243165	356028	507182	577133	2.6	6.8
Indonesia	23815	50922	67338	98587	174545	224029	1.0	8.6
Japan	315436	509263	549439	699675	911332	968981	4.3	4.6
Malaysia	26085	85380	112098	161202	231509	262193	1.2	8.4
Mexico	30254	89320	179904	229899	313398	364866	1.6	9.6
New Zealand	11262	18119	17686	30429	40452	47781	0.2	6.6
Papua New Guinea	1602	3453	3056	5542	10198	12599	0.1	8.3
Peru	4324	6571	8422	19403	39161	50360	0.2	13.6
Philippines	13666	36417	41455	45532	65527	63492	0.3	4.8
Republic of Korea	71757	148828	203808	334164	553666	650405	2.9	10.4
Russia	н.д.	88376	112850	266213	445081	532034	2.4	14.0
Singapore	54344	145591	166279	285383	464384	538904	2.4	9.5
Chinese Taipei	73462	128062	167593	214790	302374	337723	1.5	6.5
Thailand	23591	71283	82396	129740	229591	268154	1.2	9.3
USA	490722	801305	1069560	1277756	1829009	2080081	9.2	5.9
Viet Nam	2472	7768	17185	36712	77280	96838	0.4	18.3
Total APEC	**1480930**	**2874875**	**3748636**	**5632853**	**8749312**	**10114247**	**45.0**	**8.4**
Other countries	2315670	3511225	4227064	7425547	10359688	12384053	55.00	8.7
Total world	**3796600**	**6386100**	**7977700**	**13058400**	**19109000**	**22498300**	**100.0**	**8.6**

Member economy	Imports						Share of world total (%)	Growth 1992-2011 (%)
	1989	1995	2000	2005	2010	2011		
Australia	54488	75449	87198	149182	244633	294935	1.3	8.8
Brunei Darussalam	859	2960	2196	2780	4745	7177	0.0	4.8
Canada	138333	197844	284209	380370	438411	552217	2.5	6.6
Chile	8979	18560	20187	37544	64376	69158	0.4	9.7
China	63050	157306	261126	744018	1587230	1979013	8.8	17.8
Hong Kong, China	82993	216114	239004	334612	493041	567170	2.5	6.5
Indonesia	21909	54169	49303	79750	161752	209790	0.9	8.2
Japan	287807	448485	485952	640226	851692	1023705	4.5	5.5
Malaysia	25217	92026	98903	136281	196952	225557	1.0	7.0
Mexico	30669	82168	191364	242643	326657	380217	1.7	9.0

Member economy	Imports						Share of world total (%)	Growth 1992-2011 (%)
	1989	1995	2000	2005	2010	2011		
New Zealand	11941	17607	17507	3280	38272	46226	0.2	7.0
Papua New Guinea	1876	1961	1889	3296	7778	9708	0.0	7.6
Peru	3434	9448	9705	15628	36023	44577	0.2	10.1
Philippines	12005	33995	39738	49917	66081	72001	0.3	5.8
Republic of Korea	70030	161074	194058	320934	521120	623753	2.8	9.9
Russia	н.д.	67373	50727	137320	322382	374709	1.7	12.9
Singapore	56538	145708	164587	255334	407436	480030	2.1	8.6
Chinese Taipei	66027	127611	166416	214223	289658	323092	1.4	6.2
Thailand	27449	89612	77214	144874	229383	280126	1.2	8.3
USA	595486	884906	1436995	1978021	2318079	2637137	11.7	7.5
Viet Nam	3032	10341	18889	41211	93286	137585	0.6	18.7
Total APEC	**1562121**	**2894718**	**3897165**	**5940945**	**8743990**	**10348883**	**46.0**	**8.5**
Other countries	275679	3627682	4343794	7386455	10405110	12171017	54.0	8.4
Total world	**3937800**	**6521400**	**8240000**	**13327400**	**19149100**	**22519900**	**100.0**	**8.4**

Source: The APEC Region Trade and Investment 2012. Australian Government. Department of Foreign Affairs and Trade

According to the table above, the leaders with the fastest growth in exports and imports of goods and services between 1992 and 2011 are China, Viet Nam and Russia. China and Viet Nam are far ahead of other APEC members in that respect, which is a sign of growth of both production and consumption.

1.1.2. Brief description of the transport and road system of APEC members

Transport networks are vital for expansion of cooperation between APEC members. Modern infrastructure and effective coordination between various transport modes are important for reliability of transport and logistics links which, in their turn, are essential for sustainable development of the region, and its security in terms of economy, energy, environment and food supply. Table 1.1.2.1 contains a brief description of the transport networks of the APEC region.

Table 1.1.2.1.
Brief description of the transport and road system of APEC members

APEC member	Area (km^2)	Roadways (km)	Railways (km)	Waterways (km)	Airports	Merchant marine capacity
Australia	7741220	823217[a]	38445[d]	2000[a]	467	41[b]
Brunei Darussalam	5765	2971[d]	-	209	1	9[b]
Canada	9984670	1042300[d]	46552[d]	636[a]	1453	181[b]
Chile	756102	80505[d]	7082[d]	-	476	42[b]
China	9596961	3860800[e]	86000[d]	110000[a]	497	2030[b]
Hong Kong, China	1104	2067[a]	-		2	1644[b]
Indonesia	1904569	437759[d]	5042[d]	21579[a]	676	1340[b]
Japan	377915	1210251[d]	27182[c]	1770[b]	175	684[b]
Malaysia	329847	98721[f]	1849[d]	7200[a]	117	315[b]
Mexico	1964375	366095[d]	17166[d]	2900	1724	52[b]
New Zealand	267710	93911[c]	4128[d]	-	122	15[b]
Papua New Guinea	462840	9349[a]	-	11000[a]	562	31[b]
Peru	1285216	13727[e]	1906[b]	8808[a]	191	22[b]
Philippines	300000	213151[c]	995[b]	3219[a]	247	446[b]
Republic of Korea	99720	103029[d]	3381[d]	1600[a]	114	786[b]
Russia	17098242	982000[c]	87157[e]	102000[c]	1218	1143[b]
Singapore	697	3356[c]	-	-	9	1599[b]
Chinese Taipei	35980	41475[c]	1580[c]	-	40	112[b]
Thailand	513120	180053[e]	4071[d]	4000[a]	103	363[b]
USA	9826675	6506204[d]	224792[e]	41009	15079[b]	393[b]
Viet Nam	331210	180549[d]	2632[d]	17702[a]	44	579[b]

Source: CIA World Fact Book 2012 (https://www.cia.gov)

Note: a – data for 2011; b – data for 2010; c – data for 2009; d – data for 2008; e – data for 2007; f – data for 2004.

At present, goods between APEC and Europe are mostly transported by sea. One of the key elements of the transoceanic container transports is the capacities of terminals at commercial seaports.

Table 1.1.2.2 provides a list of 20 major container ports of the world.

Table 1.1.2.2.

Biggest container ports in the world in 2011

Rank	Port, country	Volume 2010 (million TEUs)	Volume 2011 (million TEUs)
1	Shanghai, China	29.07	31.74
2	Singapore, Singapore	28.43	29.94

Rank	Port, country	Volume 2010 (million TEUs)	Volume 2011 (million TEUs)
3	Hong Kong, SAR China	23.70	24.38
4	Shenzhen, China	22.51	22.57
5	Busan, Republic of Korea	14.18	16.17
6	Ningbo-Zhoushan, China	13.14	14.72
7	Guangzhou, China	12.55	14.26
8	Qingdao, China	12.01	13.02
9	Dubai, United Arab Emirates	11.60	13.01
10	Rotterdam, Netherlands	11.14	11.88
11	Tianjin, China	10.08	11.59
12	Kaohsiung, Chinese Taipei, China	9.18	9.64
13	Kelang, Malaysia	8.87	9.60
14	Hamburg, Germany	7.91	9.04
15	Antwerp, Belgium	8.47	8.66
16	Los Angeles, USA	7.83	7.94
17	Keihin, Japan	7.48	7.64
18	Tanjung Pelepas, Malaysia	6.47	7.50
19	Xiamen, China	5.82	6.47
20	Dalian, China	5.24	6.40

Source: The Journal of Commerce, August 2012

According to the table above, 16 out of 20 major container ports are in the APEC Region including 15 ports in the Asian countries and one – in the USA. Moreover, most of the Asian ports are located in China.

Experts believe that the global container market has recovered from the global financial and economic crisis; therefore the market is expected to grow by 8% per annum through 2020.

The container turnover in Russia increased by 25% in 2011 versus 2010. Early 2012 showed the same trend.

Container traffic at Russian seaports increased 20% in 2011 reaching 4.6 million TEUs. However, despite the high growth rates, in absolute terms the container traffic figures cannot be compared to those of the major ports of the world.

Table 1.1.2.3.

Cargo tonnage and container turnover of the biggest Russian ports in 2011

Port	Cargo tonnage (million tons)	Container turnover (million TEUs)
Greater Port of Saint Petersburg	60	1.2
Novorossiysk Commercial Seaport	157	0.45
Vladivostok Commercial Seaport	6,5	0.44
Kaliningrad Commercial Seaport	3	0.3
Vostochny Port	16	0.3
Vladivostok Fishing Seaport	2,3	0.1
Taganrog Commercial Seaport	1,5	0.022
Vanino	6	0.067

Source: Freight information portal http://cargo.ru

Container traffic increased nearly by 50% at the ports of the southern Russia and by 29% in the Far East. Two thirds of Russian containers are handled at ports of the North-West Russia, mostly in Saint Petersburg, where the container traffic increased by 25% in 2011.

The container import increased by 23.5% reaching 22.7 million tons. The container export totaled 12 million tons in 2011 showing a 19% increase. The coastal shipping increased by 6.5% and reached 4.7 million tons.

The railway transports play a significant role in transportation of containers in Russia. Within 2011, over 290 thousand loaded containers (7.9 million tons) were delivered to the seaports of Russia by railway, which is 23% more than in 2010. Railway stations near ports handle 80% of export containers.

The overall container traffic via railways of Russia totaled 1.6 million TEUs (26.5 million tons) in 2011, which is 2.5% and 16.5% more than in 2010 in containers and tons respectively.

Container transportation by railway grew in imports which increased by 30% in 2011 as well as exports which increased by 14%. The growth in container traffic between China and Russia is particularly evident. For instance, the traffic totaled 340 thousand TEUs in 2011 which is 55% more than in 2010. The overall container traffic on the Trans-Siberian Railway increased by 27% up to 564 thousand TEUs, which was largely due the growth of traffic on the Chinese route.

The growth in container traffic is expected to continue. Russia will show greater growth rates than the rest of the world due to the current underdevelopment of container logistics.

1.1.3. Analysis of transport and logistics services in the APEC region

The Logistics Performance Index (LPI) which is calculated by the World Bank on a regular basis gives us the general picture of the status of logistics in the APEC Region based on the six key dimensions: 1) efficiency of the clearance process (i.e. speed, simplicity and predictability of formalities) by border control agencies, including customs; 2) quality of trade and transport related infrastructure (e.g. ports, railroads, roads, information technology); 3) ease of arranging competitively priced shipments; 4) competence and quality of logistics services (e.g., transport operators, customs brokers); 5) ability to track and trace international consignments; 6)Timeliness of shipments in reaching destination within the scheduled or expected delivery time.

The LPI is calculated by aggregating interviews of about 1000 specialists of international logistics companies using standard statistical methods.

The Global LPI Ranking for the APEC members is provided in table 1.1.3.1.

The table shows that some APEC economies are leaders of the Global LPI Ranking, and four of the economies are among the top 10: Singapore, Hong Kong, Japan and the USA.

Table 1.1.3.1.

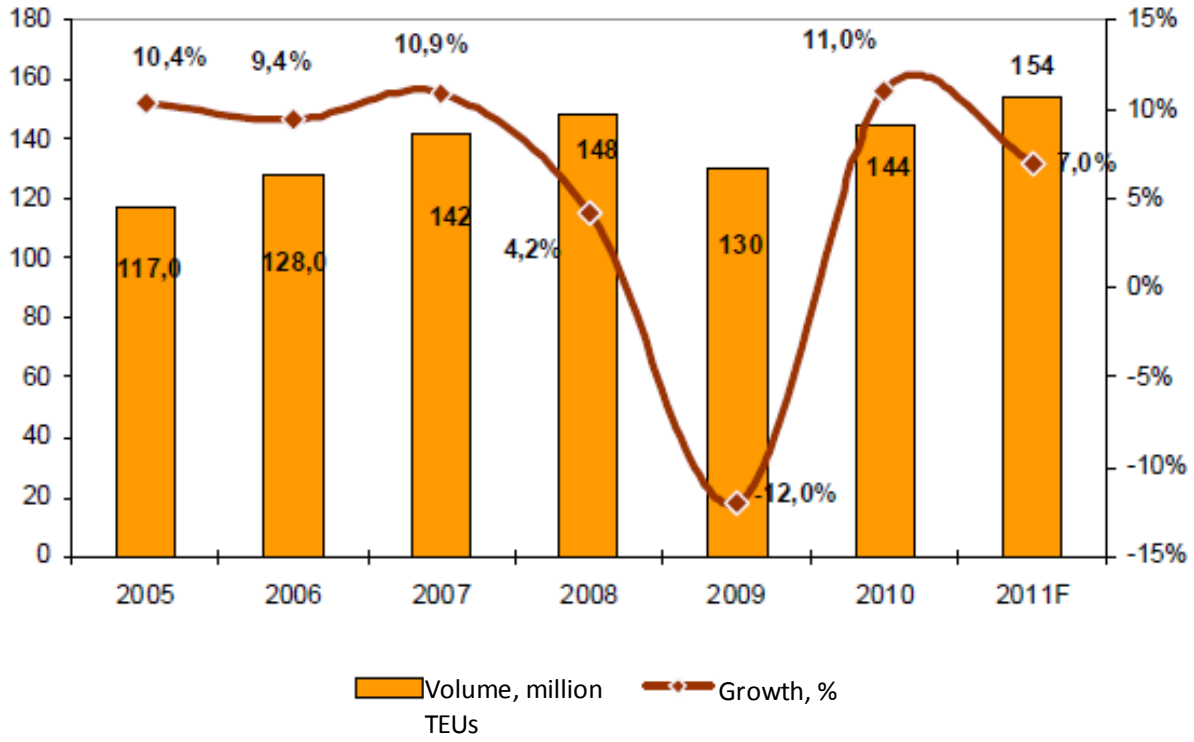
International LPI ranking of APEC members in 2012

International rank	Economy	LPI score	Customs	Infrastructure	International shipments	Logistics quality and competence	Tracking and tracing	Timeliness
1	Singapore	**4.13**	4.10	4.15	3.99	4.07	4.07	4.39
2	Hong Kong, China	**4.12**	3.97	4.12	4.18	4.08	4.09	4.28
8	Japan	**3.93**	3.72	4.11	3.61	3.97	4.03	4.21
9	USA	**3.93**	3.67	4.14	3.56	3.96	4.11	4.21
14	Canada	**3.85**	3.58	3.99	3.55	3.85	3.86	4.31
18	Australia	**3.73**	3.60	3.83	3.40	3.75	3.79	4.05
19	Chinese Taipei	**3.71**	3.42	3.77	3.58	3.68	3.72	4.10
21	Republic of Korea	**3.70**	3.42	3.74	3.67	3.65	3.68	4.02
26	China	**3.52**	3.25	3.61	3.46	3.47	3.52	3.80
29	Malaysia	**3.49**	3.28	3.43	3.40	3.45	3.54	3.86
31	New Zealand	**3.42**	3.47	3.42	3.27	3.25	3.58	3.55
38	Thailand	**3.18**	2.96	3.08	3.21	2.98	3.18	3.63
39	Chile	**3.17**	3.11	3.18	3.06	3.00	3.22	3.47
47	Mexico	**3.06**	2.36	3.03	3.07	3.02	3.15	3.47
52	Philippines	**3.02**	2.63	2.80	2.97	3.14	3.30	3.30
53	Viet Nam	**3.00**	2.65	2.68	3.14	2.68	3.16	3.64
59	Indonesia	**2.94**	2.53	2.54	2.97	2.85	3.12	3.61
60	Peru	**2.94**	2.68	2.73	2.87	2.91	2.99	3.40
95	Russia	**2.58**	2.04	2.45	2.59	2.65	2.76	3.02
128	Papua New Guinea	**2.38**	1.98	2.20	2.34	2.18	2.51	3.01
	Brunei Darussalam	n/a						

Source: IMF report "Connecting to Compete 2012. Trade Logistics in the Global Economy"

1.1.4. Prospects of transport and logistics services in the world including APEC economies

The global container market has recovered from the global financial and economic crisis, and has shown a steady growth in container traffic in the last few years.



Source: Drewry, Maersk, Kuehne+Nagel

Fig. 1.1.4. Evolution of world maritime container traffic for 2005-2011, million TEUs

The fastest growth of container traffic in 2010 was provided by transports from Asia, first of all from China, to Europe and America. On the other hand, the growth in container transportation between Europe and the North America was relatively slow.

Table 1.1.4.1.

International container traffic on the major routes of transportation for 2008-2009, million TEUs

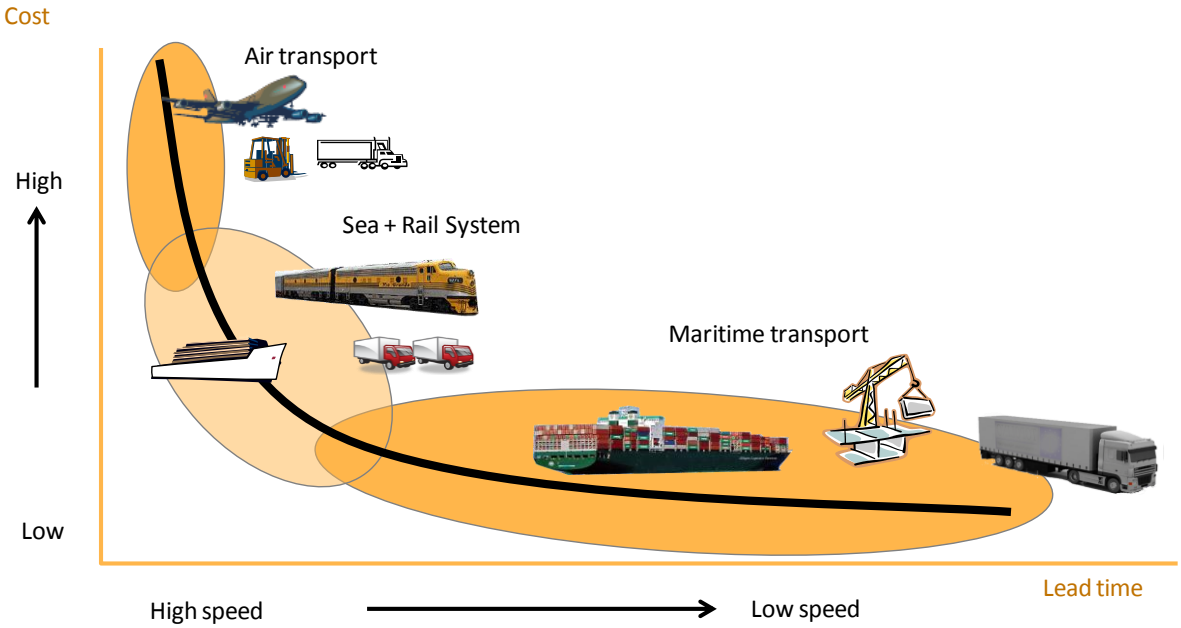
Route	2008	2009	2009/2008, %
Europe – Asia	8.16	9.3	114
Asia – Europe	16.7	11.3	67.7
Europe – North America	4.31	3.07	71.2
North America - Europe	2.91	2.33	80.1

Source: Containerisation International, Drewry

APEC economies account for the greatest part of the global container traffic. Container traffic within Asia is the largest in volume terms, and the busiest trade routes are: Asia – North America and Asia - Europe.

The most promising transport projects for all the APR countries are focused on alternative ways to deliver goods to Europe. At present, most of cargo transported between Europe, Russia and APEC (90%) countries goes by sea via the Suez Canal. But diversification of transport routes recognized by APEC economies as an important goal could produce a major economic effect through reduced transport and transaction costs. Russia could be one of the solutions providing such diversification, e.g. through improvement of Eurasian transport corridors and routes such as the Trans-Siberian Railway, the Baykal-Amur Railway and the Pacific ports of Russia, and development of new sea routes in addition to the traditional ones including the Northern Sea Route.

Most suppliers in APEC economies consider combined delivery of goods – by sea and railway transport – as the most promising solution for transports to Europe since this scheme would enable faster deliveries versus the sea routes, lower costs versus transportation by air, and more environment friendly transports altogether.



Source: Toshiba Logistics Co.

Fig. 1.1.4.1. Combined sea-rail transport concept by Toshiba Logistics Co.

Combined transport systems need visualization of transportation and freight flows as a pre-requisite. Therefore, APEC members have recognized the significance of making data bases available for the purposes of supply chain visibility.

In the future, industrialized countries with high consumption levels and developed logistics networks will interact with developing markets more actively; and start new transport links between the east and the west, and between the north and the south. The fast growth of developing markets will bring new routes between Asia, Europe, Americas and Africa. Demography will affect demand distribution as well. Asia has an advantage in that respect, especially China, as the country with the largest population, and India as the country with the fastest population growth. Huge amounts of goods will move between continents; management of the goods movement processes will require

advanced information, communication and navigation technologies to support continuous operation of logistics chains.

The new routes will change the layout of global supply chains. Trade operations will shift towards developing markets. Fast developing economies are becoming target markets for leading international logistics operators. There are dozens of thousands logistics providers in BRIC countries (Brazil, Russia, India, China). Larger logistics companies seek further growth through merging and take over operations, which leads to consolidation of the logistics market in developing countries.

Internet-commerce is growing at an exponential rate; now almost anyone can do business with anyone. Contacts between people on the planet will also grow creating new challenges for logistics. In the future, companies delivering general cargo will also offer packaging services to minimize the cargo damage risk and optimize the space in containers. Such services will provide obvious competitive advantages to many private Internet-traders and Internet-shoppers. Moreover, logistics companies will also offer customs clearance support.

Free trade zone agreements are becoming an important factor in development of international trade flows. First agreements of that kind were signed in Europe: the European Economic Community (EEC) was established in the 1950s and the European Freed Trade Association (EFTA) – in 1960. In 1976-1990, similar agreements were closed in the North and South Americas: Canada, Mexico and the USA signed the North American Free Trade Agreement (NAFTA), and Brazil, Argentina, Paraguay, Uruguay, and Venezuela entered in the Common Market of the South agreement (MERCOSUR). The Association of South East Asian Nations (ASEAN) with Brunei, Indonesia, Malaysia, Philippines, Singapore, and Thailand as members founded the ASEAN Free Trade Area (AFTA) in 1992. In 2010, China and ASEAN created the third largest free trade zone after the European Union (EU) and NAFTA. Why the free trade agreement between China and ASEAN has become effective, it will cover 1.9 billion consumers; the trade in the new zone will total roughly $1.2 trillion, and the overall GDP will amount to $6 trillion.

Various countries create special economic zones or free trade zones. Companies based in free trade zones get tax and customs privileges and enjoy simplified administrative procedures facilitating the trade. Free trade zones attract international investment since investors benefit from easier access to markets and lower transport costs. Creation of free trade zones has made for economic growth in a number of countries such as Chinese Taipei, Korea, and Singapore, which are among the leaders in innovation-based development.

Logistics providers of fast developing countries will achieve a significant increase in value added by 2030 (i.e. they will offer services that increase value such as packaging, tagging, and mounting). That would improve the logistics since a wider service range means a higher level and quality of services, creates conditions for sustainable growth, increased profits and competitiveness of logistics companies internationally.

Due to high competition the logistics market shows a high demand for innovations. A large number of logistics innovations came from the USA including containers, RFID, storage management technologies, and GPS. ‘Smart environment’ is a widely used term in Europe describing the concept of decentralized ‘smart’ logistics facilities in a service-oriented environment. Logistics data will be stored on RFID-tags fastened to products and which will make all the necessary details easily available, and the goods will make their way through transport networks themselves.

Most international logistics standards resulted from international cooperation. Logistics operators are using some of the standards and norms concerning supply chain management, e.g. consignment management, pallet size standards, electronic data exchange with clients, RFID, etc. Most of the standards were developed by the International Standard Organization (ISO). The standards help developing countries benefit from technologies which became available due to those standards, adapt their products and services to international requirements and demonstrate their ability to meet requirements of the global market.

The logistics sector of Russia may benefit greatly from the geographic position of the country as a link between Asia and Europe. Creation of special economic port zones could boost domestic and foreign trade with Asia, Europe and the North America. Russia connects the Chinese and the European markets and provides the shortest link from Europe to Asia. However, at present 90% cargo is moved between Europe and Asia by sea. In order to shift the traffic to the Russian land route, a network of railways and roads is to be developed in Russia to provide for fast and low-cost transportation of goods.

The Government of Russia is planning to reestablish the Northern Sea Route as the shortest sea link between Europe and East Asia and develop land links between Asia and Europe. The Shanghai Cooperation Organization (SCO) makes for development of transport communications between member countries, especially between Russia and China. Since China would benefit from land routes which would allow it to increase exports to Europe and Russia, it is in the interests of both Russia and China to develop the international transport route “Europe – West China”.

At present, logistics markets in most developing countries are fragmented, they lack transparency and efficiency. Creation of online-platforms would make for improved efficiency of freight flows. Such platforms are being used successfully in some industrialized countries already. They carry information on logistics companies and operate as a shipping exchange or a tender platform. Online platforms help to find optimal providers of particular services. Clients could also use such platforms to hold tenders and receive bids from logistics companies.

Companies in many developing countries often face customs problems which take up a lot of time and resources. Customs clearance could be more efficient if it could take place in the exporting country. A streamlined customs clearance process could reduce the amount of capital involved by providing for faster movement of goods and assets between countries. Countries doing commerce with each other have to enter into relevant agreements to enable such improvements.

Cooperation between logistics companies of APEC economies aimed to develop new transport corridors and the necessary infrastructure, and jointly determine the services to be offered on such routes, as well as coordinated planning, management and control of logistics processes would guarantee competitiveness of the companies in the future.

1.2. Overview of SMM implemented and operating in APEC economies

1.2.1. General SMM in APEC economies

Economic competition makes APEC economies always seek for methods to strengthen their positions on international markets. Therefore improved management and technologies in trade logistics is a way to improve performance of national economies, reduce costs and accelerate growth.

Systems for Management and Monitoring of Transportation and Freight Flows are an effective tool to ensure reliability and regularity of supply chains, reduce time and financial costs associated with logistics and provide high quality services to all the parties involved in the logistics process.

The need for such systems is obvious since the general trend of the global goods movement systems is containerization. At present, up to 70% of all goods are transported in containers and the global container traffic growths by 8-10% every year. The decades of massive development of container transportation have produced a powerful container fleet and high-tech logistics terminal centers, and now a container is a universal method to move goods by any transport mode, which is standardized in its key parameters and specialized by cargo types. At present, container transportation is the safest and the most reliable as well as one of the cheapest methods of goods transportation including multi-modal transports.

APEC economies have been working on creation and introduction of systems for monitoring of transportation and freight flows in global supply chains for several years, but the efforts were rather chaotic. Development of such systems in Asian countries is currently led by Japan, Korea and China, where a number of pilot projects have been implemented concerning cargo tracking in international supply chains.

Japan is a leader in creation and development of SMM, and the country promoting a global supply chain visualization initiative (SCM Visibility Initiative) within APEC involving navigation and automatic identification technologies. Japan has developed and introduced the Colins container logistics information system initially intended to support Japanese ports but later combined with the tracking system of the Japanese railway carrier company IT-FRENS designed to track railway containers. The Japanese government is planning further development of the Colins system to provide for exchange of container logistics data between Japan, China and Korean within a network for logistics information services in northeast Asia (NEAL-NET). Interaction of the monitoring systems will be provided for by common data format EPCIS, which is considered as a promising tool for creation of a global platform for visualization of supply chains in the APEC Region.

Japan has another successful project – NACCS, an automatic system for customs clearance and other operations of administrative bodies of private companies in respect of ships, planes or import/export cargo. Initially, there were two separate systems: Sea-NACCS for sea cargo, and Air-NACCS for air transports. However, after modernization in 2010, they were combined in one system along with the Port-EDI electronic document circulation system and a number of related systems which were used by ministries and agencies of the country. Japan is also a leader in advanced technologies for SMMs. For instance, all containers transported by railway have been equipped with RFID-devices since 2003.

Korea has the implemented the Global Cargo Tracking System (GTCS) which provides information on global tracking of cargo within the country and at various foreign

seaports. The system uses the GPS-tracker technology, RFID-tags and RFID-reader infrastructure. There is a comprehensive solution (Yes!U-Port) providing integration of the GCTS system with SP-IDC and Port-MIS, which was developed by the Ministry of Land, Transport and Maritime Affairs of Korea. SP-IDC (Shipping & Port – Internet Data Center) is a data portal for port logistics which allows all ports and government agencies of the country exchange port logistics information via a common center. The Port-MIS management information system covers all port operations including vessel traffic control and goods movement management.

There are multiple logistics information platforms **in China** including platforms created with participation of the national government. Over 120 electronic customs projects and over 42 electronic port projects were implemented by the end of 2011. The E-Port in Shanghai jointly implemented by the Chinese Customs Authority and the Shanghai Municipality was one of the largest projects of that kind. The web-portal of the system started operations in December 2004, and its patronage has reached 50,000 by now. The platform comprises over 46 software applications providing 'electronic customs', 'electronic logistics', and 'electronic trade' functionality. There are similar E-Port systems in Ningbo, Guangzhou and other Chinese ports. LOGINK, which is one of the largest logistics platforms in China, was launched by the Ministry of Transport and the Government of the Zhejiang province in cooperation with government departments, manufacturer associations, software developers and logistics providers. LOGINK provides free exchange of logistics data and services to all supply chain actors.

In 2005, **Hong Kong** launched a major initiative aimed to support and improve competitiveness of Hong Kong on the regional and global logistics market: the Digital Trade and Transportation Network (DTTN). DTTN is an advanced electronic logistics platform designed based on applicable standards and protocols providing for information exchange between actors in trade, logistics and financial industries in order to improve efficiency of operations throughout the supply chain. Moreover, there is also the ezTrack system in Hong Kong designed by GS1 Hong Kong, which tracks cargo flows and provides real time information on the progress of goods from the manufacturer to the final destination using an electronic platform based on EPC standard. The system is compatible with RFID and bar coding technologies, GSP and various sensors.

Singapore, in cooperation with GS1 Singapore, developed the application platform EPCIS providing for further expansion and connection of the Singapore network to the EPCIS networks in Hong Kong, Japan, China and Chinese Taipei. The platform gives Singapore companies a clear real-time picture of the progress of their goods within the supply chain.

In **Chinese Taipei,** advanced freight monitoring and management systems are developed and used by private companies. For the purposes of supply chain management, such systems can be integrated with systems of other logistics providers. Normally, SMM use technologies such as GIS, GNSS, remote sensing and wireless communication.

New Zealand, Malaysia and many other APEC economies lack national level SMM as well. Major manufacturing enterprises, and transport and logistics companies use their own freight monitoring systems.

Russia has a wide range of solutions for traffic and container freight monitoring based on GLONASS and GPS navigation and monitoring – from company level specialized industrial systems to larger, regional systems which are part of ITS. Normally, those solutions use GLONASS/GSM trackers communicating with satellites

and transferring data registered by sensors to the main server where the data can be used by monitoring service operators.

Introduction of information and communication technologies to optimize and facilitate customs clearance and border control procedures is the center of attention in most APEC economies.

For instance, the national customs services of **Australia** has been using Integrated Cargo System (ICS) since 2004, which is an electronic system designed to facilitate and register incoming and outgoing cargo. Communication with that system is provided by the software Customs Connect Facility (CCF), a unique product of the Australian customs services, and ImpexDocs.

Canada has several programs aimed to facilitate trade and provide continuous control of supply chains. For instance, there is the Free and Secure Trade (FAST) program - commercial clearance program designed to ensure safety and security while expediting legitimate trade across the Canada–U.S. border. FAST is a joint initiative between the Canada Border Services Agency (CBSA) and U.S. Customs and Border Protection.

When a FAST-approved driver arrives at the border, he or she presents three bar-coded documents to the border services officer (one for each of the participating parties: the driver, the carrier and the importer). The officer can quickly scan the bar codes while all trade data declarations and verifications are done at a later time, away from the border.

There is also a major ongoing initiative of the Canadian government which has been implemented for a number of years. The main objective of the initiative is to provide “the right information at the right time”, to detect high-risk shipments before they arrive at the border while expediting the processing of low-risk, legitimate trade. At present, air and maritime carriers transporting goods to Canada are required to transmit cargo and conveyance data electronically prior to arrival. With the full implementation of eManifest, Canada’s trade partners using all transport modes (aviation, maritime, road and railway transport) will have to submit such data to the Canada Border Services Agency before the arrival of their shipment at the border.

The USA is using a number of programs aimed to facilitate trade and transport such as PAPS (Pre-Arrival Processing System) and FAST (Free and Secure Trade) which are available to drivers USA, Canada, Mexico, etc.

Chile has an integrated customs operations system which allows declarations concerning goods transported by air, courier services, land and sea transport to be submitted and processed via the Internet.

Indonesia gives a lot of attention to further improvement of the national Single Window System which was fully implemented in five ports of the country in 2010, and to deployment of the Customs Advanced Trade System (CATS) and the National Integrated Logistics and Intermodal Transport System (NILITS) to provide for smooth management of goods traffic.

There is a global Single Window in **Korea** based on WCO SAFE principles. The Korean customs service is using IT technologies in all customs management areas in order to reduce logistics costs by complete elimination of paper documents, and optimization and facilitation of customs clearance. There is also the UNI-PASS system which is now nearing completion. This is a virtual community used by about 110 000 companies involved in trade, such as exporters and importers, customs agents and bank, as well as logistics sector companies such as carriers, forwarding agencies, shipping companies, airlines and customs warehouse operators.

Malaysia has also created their national Single Window to facilitate international trade. Now participants of trade operations can submit their information via a common service. The information then can be reused, and the processing of data from public and private sector participants of logistics processes is synchronized.

The **Mexican** customs has started a Single Window project that seeks to connect all the ministries involved in the international trade.

Single Window Systems has also been implemented in New Zealand, Taipei, Thailand (SWeL electronic logistics system) and many other APEC economies.

1.2.2. Overview and detailed case-study describing the model of existing transportation and cargo management approaches

At present, the leaders in application of systems for monitoring of transportation and freight flows in global supply chains are Asian countries such as Japan, Korea, etc. Therefore this report will describe SMM operating in those countries.

In 2009, the Ministry of Land, Infrastructure, Transport and Tourism of Japan developed and commissioned a pilot project called **Container Logistics Information Service (Colins),** a web-based information service designed to integrate information on container logistics and provide it to terminal operators, cargo owners, forwarding agents, carrier companies, etc. in real time (fig. 1.2.2.1).

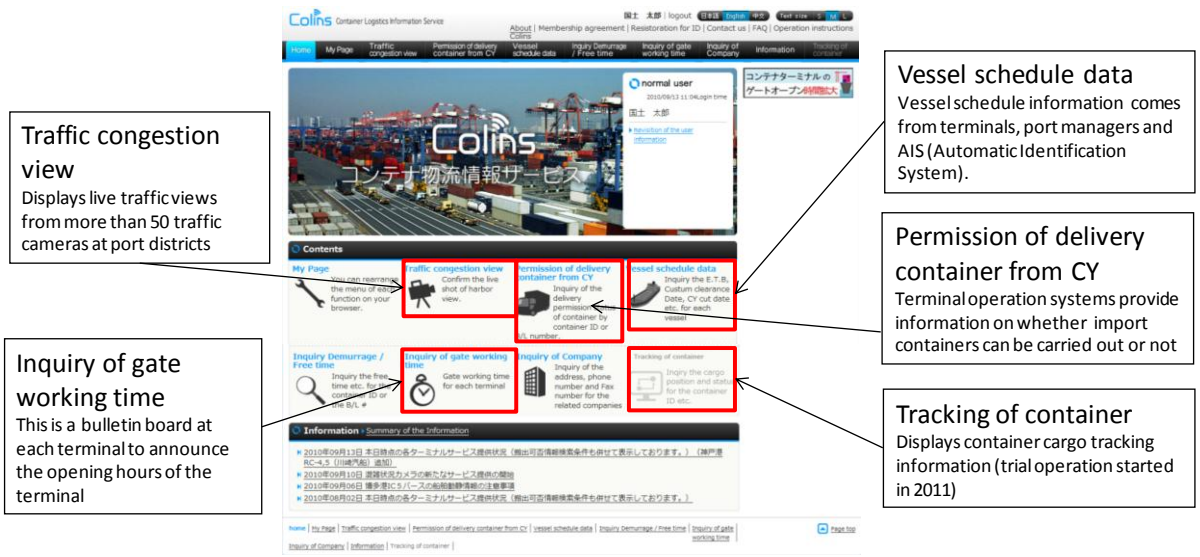


Fig. 1.2.2.1. Outline of Container Logistics Information Service (Colins)

Colins addressed a number of container logistics issues by providing a convenient tool for data exchange between supply chain participating parties.

The process of the Colins system is shown in fig. 1.2.2.2.

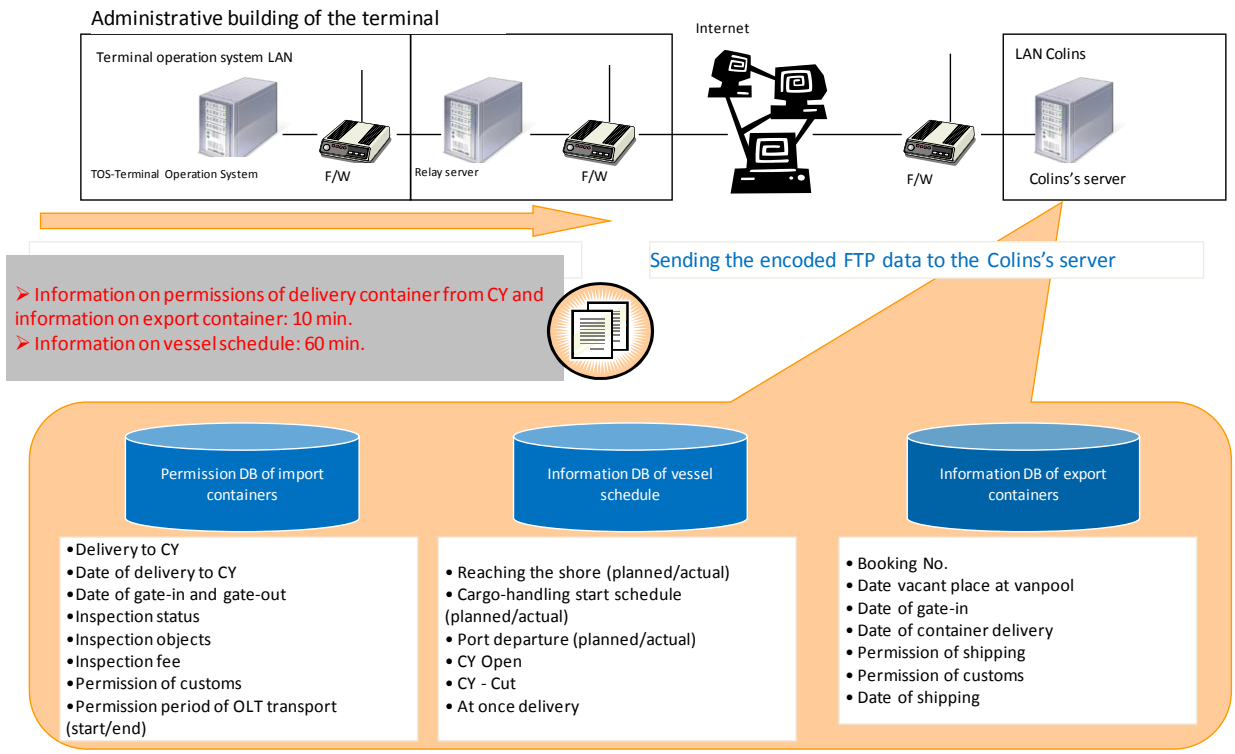


Fig. 1.2.2.2. The process of the Colins system

Initially, Colins was intended to support container logistics at ports. However, when the importance of visibility of the entire supply chain including land-based transports was recognized, Colins was combined with the IT-FRENS railway container positioning system. Colins and IT-FRENS started operating as a single system in May 2012, so now cargo owners and freight agents can track their cargo going from foreign to Japanese ports and along railway routes within Japan.

Communication between the systems for monitoring of transportation and freight flows on maritime and railway transport in Japan in shown in fig. 1.2.2.3.

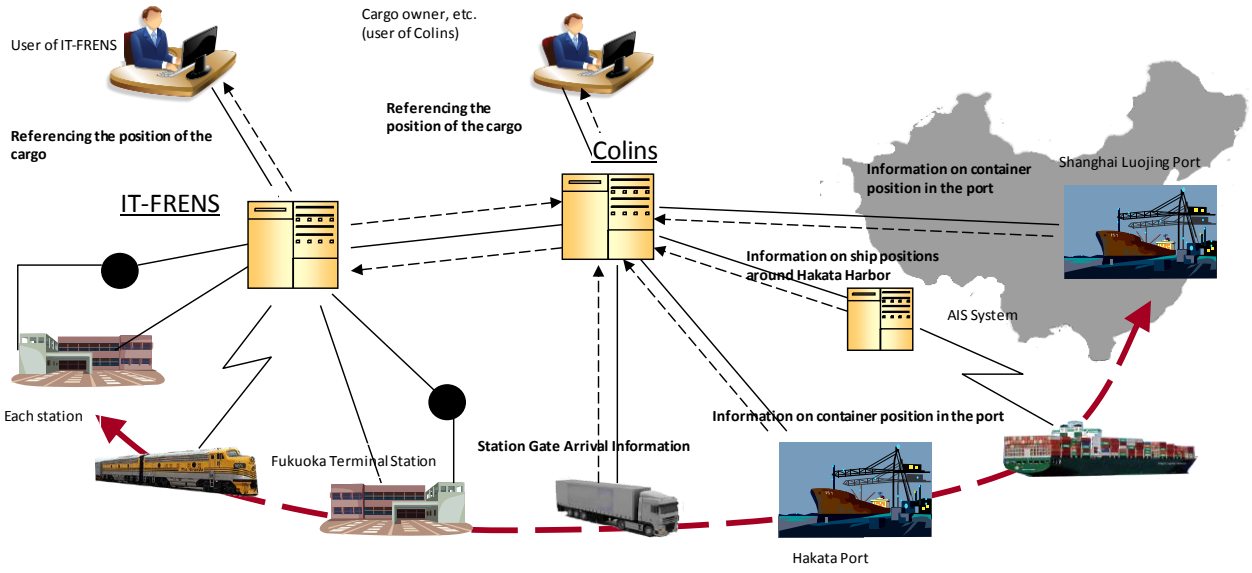


Fig. 1.2.2.3. Communication between the systems for monitoring of transportation and freight flows on maritime and railway transport in Japan

Fig. 1.2.2.4 shows information interaction between systems for monitoring of transportation and freight flows on maritime and railway transport in Japan.

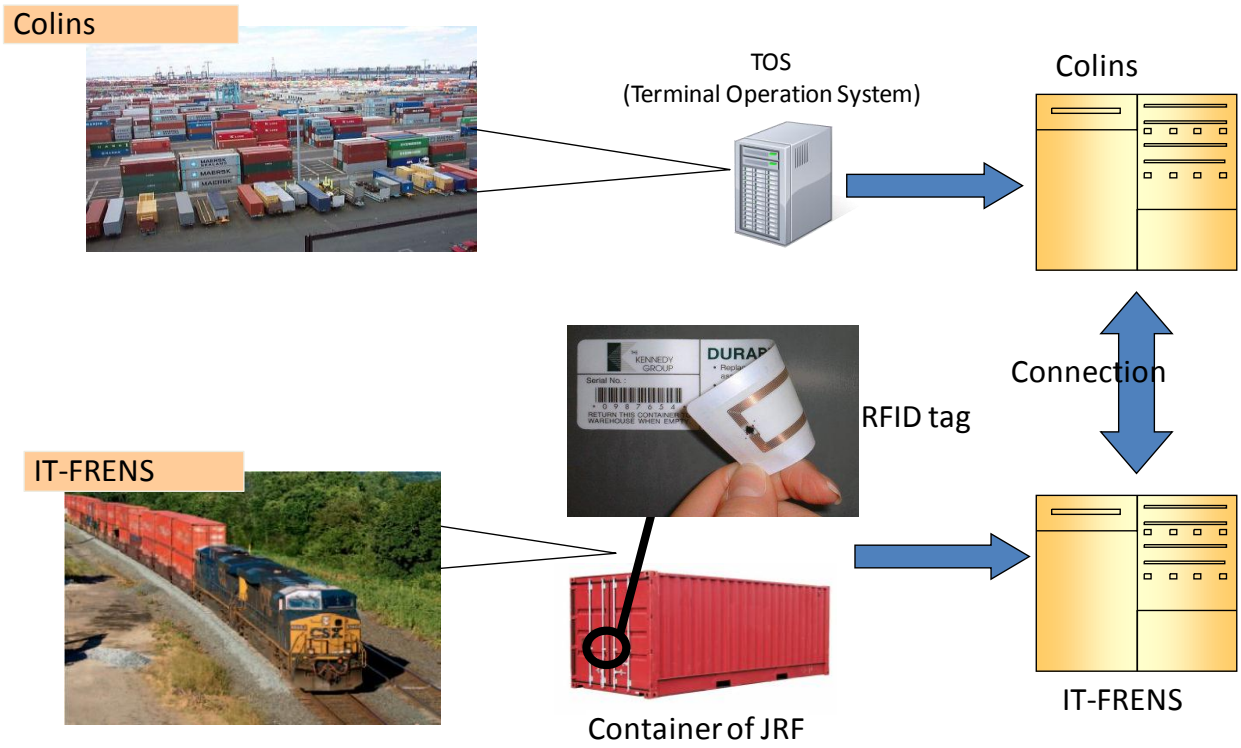


Fig. 1.2.2.4. Information interaction between systems for monitoring of transportation and freight flows on maritime and railway transport in Japan

The Japanese Government is planning further development of Colins to enable international exchange of information on location and status of containers.

В рамках конференции министров по транспорту и логистике Китая, Японии и Южной Кореи был разработан проект Североазиатской сети логистического информационного обслуживания NEAL-NET, предусматривающий объединение японской системы Colins, китайской LOGINK и корейской SP-IDC.

China, Japan and Korea agreed on cooperation focused on improvement of NEAL-NET through connection of new ports and gradual expansion of the amount and variety of the logistics information.

Japan has successfully implemented the NACCS which is an automated system for online processing customs clearance and other procedures carried out by administrative authorities or related private-sector services in respect of arriving/departing ships and aircraft or import/export cargo. With the former NACCS, that for the processing of procedures, etc. for air cargo (Air-NACCS) and that for the processing of procedures, etc. for sea cargo (Sea-NACCS) were each operated as an independent system. However, the system underwent a review on the occasion of the October 2008 upgrade of Sea-NACCS and February 2010 upgrade of Air-NACCS. The review led to Air-NACCS and Sea-NACCS being integrated, along with the Port EDI System managed and operated by the Ministry of Land, Infrastructure, Transport and Tourism, JETRAS managed and operated by the Ministry of Economy, Trade and

Industry, and other related ministry/agency systems also being integrated with NACCS. The main function of the new integrated system is to handle export/import procedures with air and maritime cargo in a single process.

Fig 1.2.2.5 shows users of NACCS.

NACCS is a network computer system that provides fast exchange of data required for customs clearance of cargo and connects customs stations, customs brokers as well as administrative bodies and commercial entities involved in the customs clearance process.

The principal goal of NACCS is to accelerate the customs clearance of goods by using the single window principle and eliminating the human factor from the process.

Electronic preparation of documents prevents errors which improves quality of the documents and reduces the number of documents returned for proper execution.

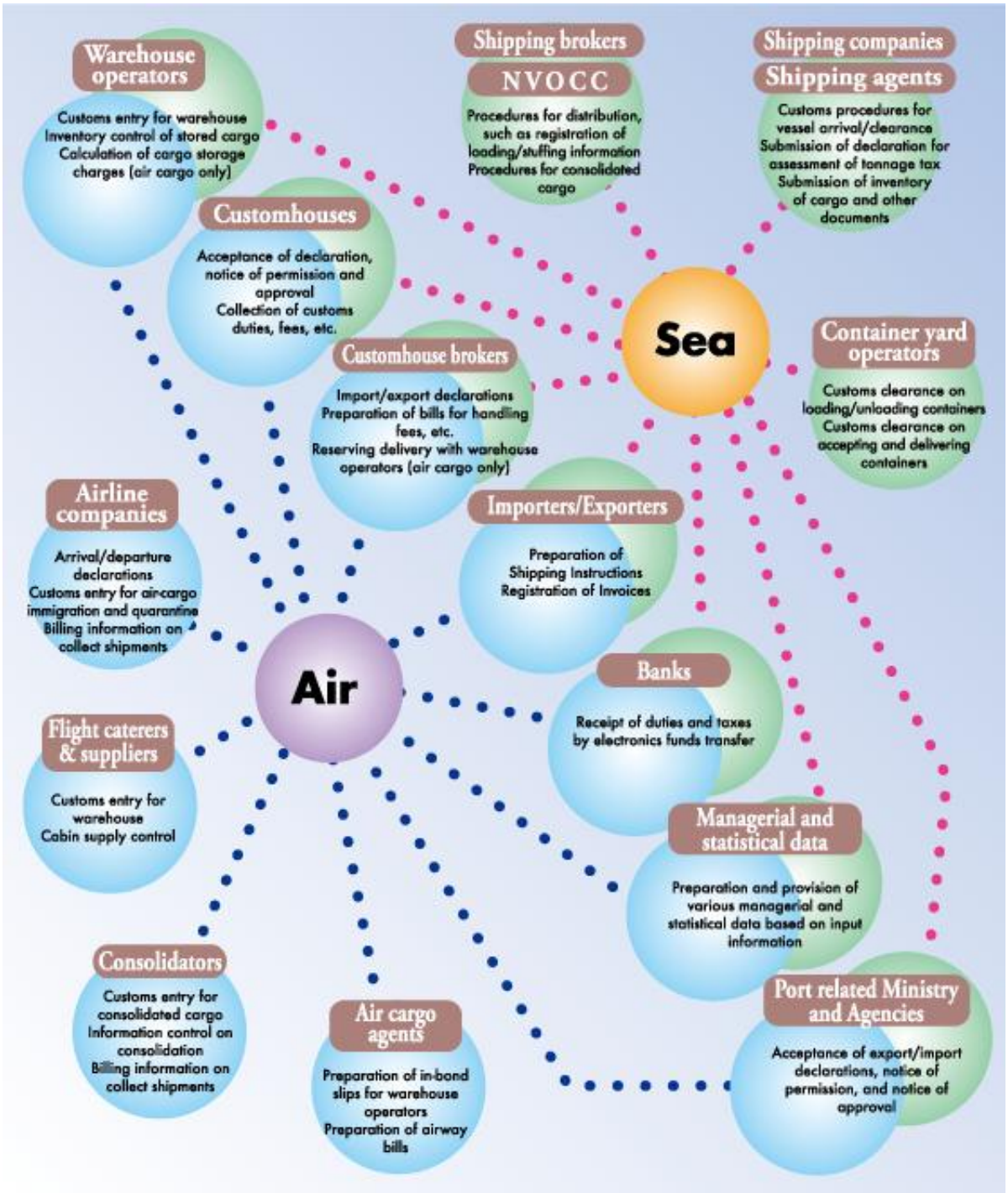


Fig. 1.2.2.5. Users of NACCS

The NACCS center was established on the 1st of October 1977. Initially, the center was a government corporation reporting to the Finance Ministry of Japan, but in 2008 the company was privatized.

NACCS comprises two subsystems:

1. Air-NACCS - for the processing of air cargo.
2. Sea-NACCS – for the processing of sea cargo.

The general operation algorithm of NACCS comprises the following phases:

1. An exporter/importer company enters into a service agreement with the NACCS center.
2. In respect of a particular cargo, a foreign trade actor has to submit a filled-in form to the NACCS center electronically stating there all the data required for customs clearance. The information is submitted via a dedicated channel or the Internet. Based on that form the system produces customs, phytosanitary and other documentation required for clearance of the cargo.

The NACCS center transfers the information to the supervisory authorities for verification and approval of the cargo. In addition, phytosanitary control services and other quarantine departments have to issue their approvals based on the electronic data. Banks are also participants of NACCS; they automatically transfer the data on customs and excise fees and duties to the customs authorities.

One of the key advantages of NACCS is the processing of all the documents based on the single-window principles, using computer-based data processing which has accelerated cargo clearance significantly.

In most cases (80%), the duration of the document verification procedure has reduced to a few minutes, after which the customs authorities issue their approval for export or import of the cargo. For the rest of the shipments (20%) the procedure takes longer.

Cargoes that need more thorough checking of inspection account for about 1-2% of the total amount of the outgoing shipments. Normally the customs authorities identify such consignments in advanced based on the electronic documentation submitted.

The statistics for cargo clearance at seaports shows that NACCS along with new cargo handling technologies make the cargo handling at ports much faster and allow consignments to be tracked in real time from their arrival at the port up to the departure of the ship carrying the goods.

The standard cargo processing times are:

- instant processing: 2-3 minutes;

- verification of documents (if necessary): 60 minutes;

- checking of cargo (if necessary): 12 to 48 hours.

Clearance at the customs terminal: 3 часа.

Average loading time after the documents have been processed: 24 hours.

Average ship unloading at port: 18 hours.

The state of the existing communication channels in Russia would allow that system to be implemented in Russia. Although there is a number of limiting factors (e.g. lack of legislation on single electronic signature), a common government system providing automated processes of freight data similar to the Japanese NACCS would make the customs clearance much simpler, improve the quality of customs

proceedings, and remove the adverse impact of human factor on the cargo processing. With such system in place, the traffic of goods via Russia would increase greatly. The implementation would take at least two years.

In 2007-2009, EPCglobal TLS IAG – the transport and logistics services industry action group of the non-commercial organization EPCglobal active in promotion and standardization of EPC technologies, implemented **a pilot program focused on testing out the use of EPCIS standards for the tracking of goods within an international transport chain**. The goal of the program was to demonstrate how EPC-codes, RFID-technologies and GS1 standards may be used in transport and logistics processes.

The special focus of the program was the EPCIS standard (Electronic Product Code Information Service) providing technical requirements for a standard interface used to access EPC-data. The EPCIS provides details on the location and status of the consignment, its progress through various organizations, and allows multiple access to such data for partners and various organizations irrespective of the technology. It should be noted, that the EPCIS standard does not depend on the exchange of data from RFID-tags, bar codes and other media.

Figure 1.2.2.6 shows phases of the pilot program discussed above.

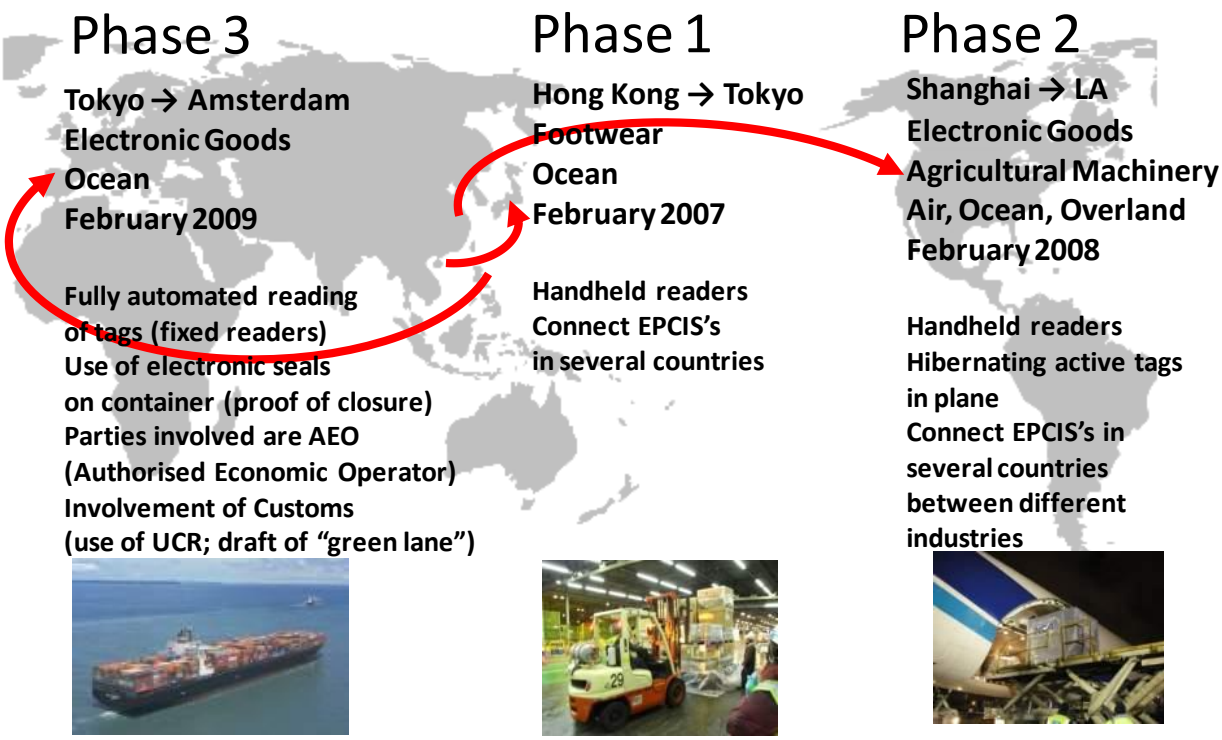


Fig. 1.2.2.6. Phases of the pilot program focused on testing out the use of EPCIS standards for the tracking of goods within an international transport chain

Phases 1 and 2 of the pilot program were focused on the testing of passive RFID-tags and UHF Gen 2 fastened to cardboard packaging, and active RFID-tags fastened to the packaging and trays, to test the data transmitted by the tags for reliability. Besides, several EPCIS standards were reviewed for mutual consistency. The tests confirmed that the EPCglobal standards can provide for visibility of supply chains and be highly efficient.

Phase 3 of the program was carried out from November 2008 till February 2009 on the sea routes between Japan and the Netherlands. That phase involved more containers than the two previous phases as well as automatic reading of RFID-tags. Moreover, UCR (Unique Consignment Reference) was also tested to find out if/how it could be used to make customs clearance more efficient.

The Korean Global Cargo Tracking System (GCTS) using GPS container trackers and RFID tags allows the tracking of cargo and trucks and the provision of real time information on their progress (fig. 1.2.2.7).

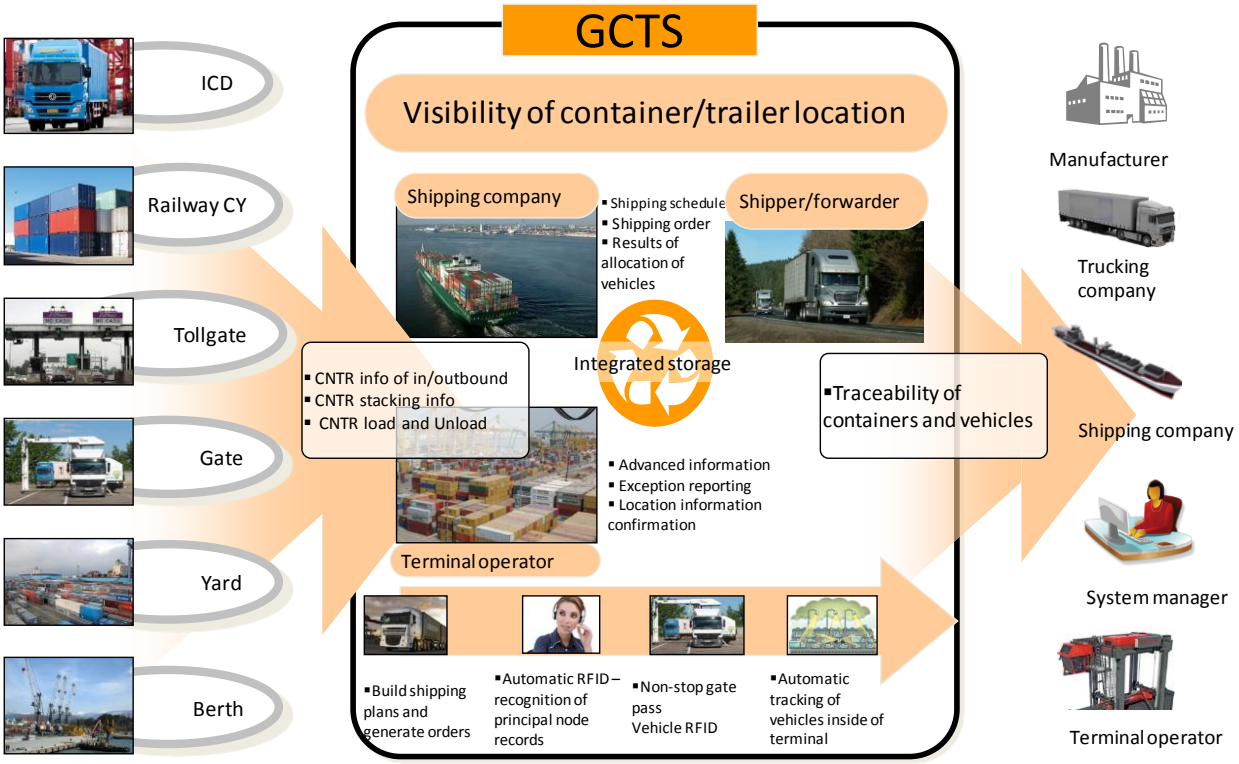


Fig. 1.2.2.7. Global Cargo Tracking System (GCTS), Korean monitoring system using GPS-trackers and RFID technology

Fig. 1.2.2.8 shows the layout of RFID-reader infrastructure of the Global Cargo Tracking System (GCTS) in Korea and seaports of various countries.

The RFID infrastructure comprises equipment installed at factories, motorway toll collection plazas, national and foreign seaports, which provide real time information on the progress of cargo (containers). The tracking data and the appropriate information system ensures high-quality information services to shippers including detailed data on exported and imported goods, the use of ports, ship arrival/departure reports, customs clearance, customs declarations, etc.

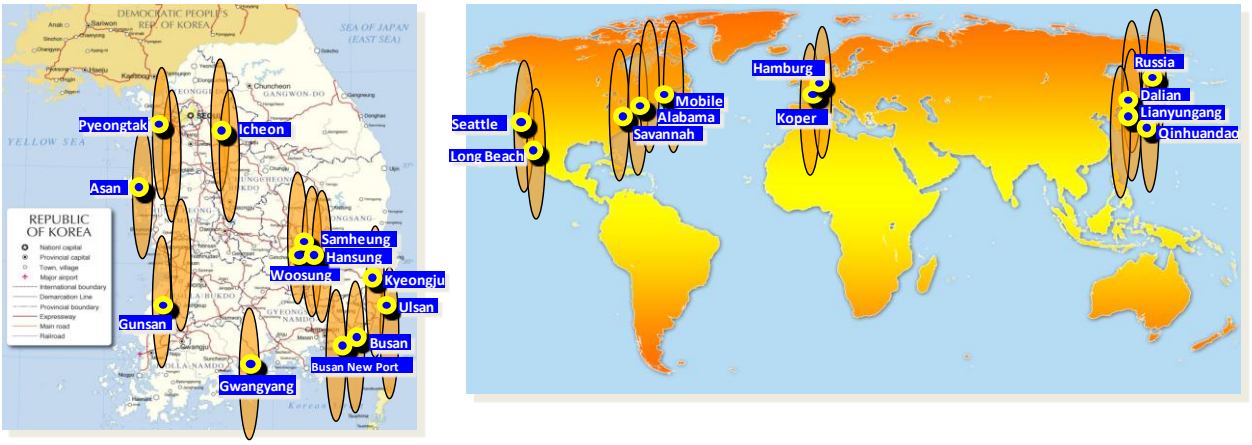


Fig. 1.2.2.8. Layout of RFID- infrastructure of the Global Cargo Tracking System (GCTS) in seaports of various countries

Moreover, Korea has implemented a pilot project focused on the tracking of containers going from Korea to Europe via the Trans-Siberian Railway. GPS and RFID technologies were used in that project as well (fig. 1.2.2.9).

The project revealed the following advantages of the Russian land-based route versus the sea route via the Suez Canal:

reduced time and financial cost of transports between Asia and Europe (it takes 35 days to deliver cargo from Korea to Finland by sea, while the Trans-Siberian Railway reduces the time down to 25 days; the length of the sea route from Japan to Europe is 20,800 km, while the Trans-Siberian route is only 13,000 km long);

participants of the supply chain can track their containers in real time, which improves safety and reduces the cargo loss risk;

improved business efficiency: the system makes it possible exactly to predict the cargo arrival time.

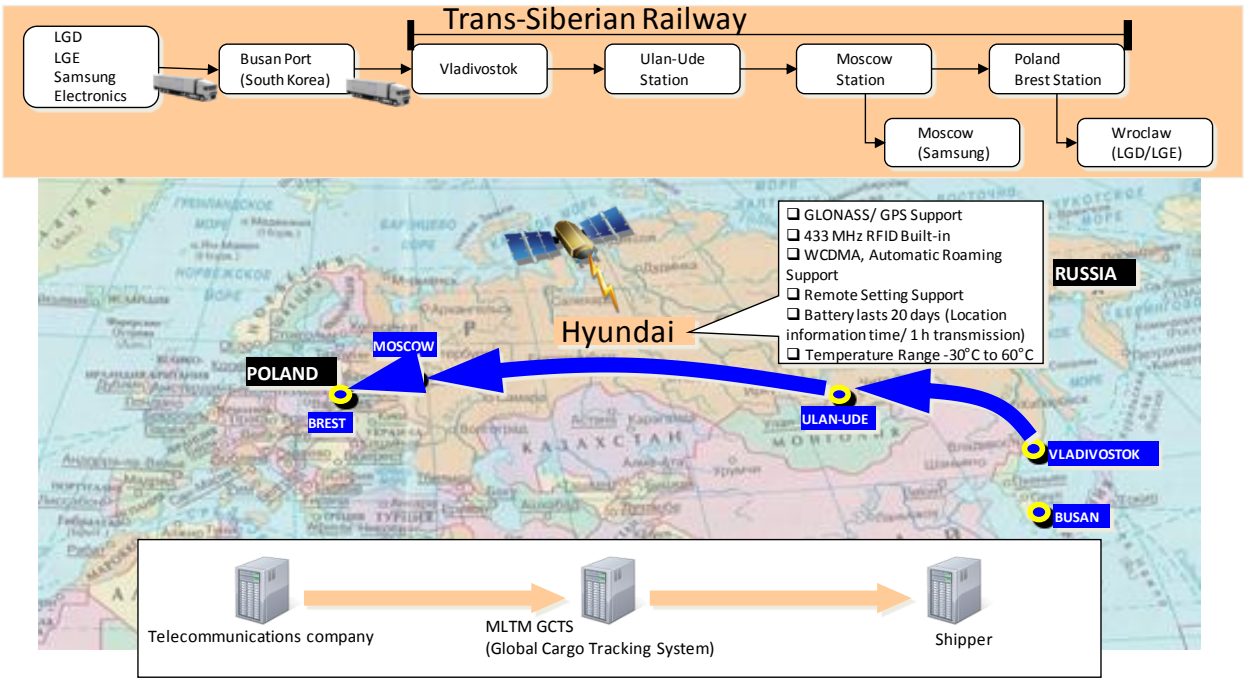


Fig. 1.2.2.9. Pilot project focused on the tracking of containers going from Korea to Europe via the Trans-Siberian Railway

GS1 Hong Kong in Hong Kong developed ezTrack, a web-application, a reliable and well-designed system enabling visibility of goods from their point of manufacturing to the market point and using an EPC-based electronic platform. The system is compatible with various technologies including RFID, bar coding, GPS, various sensors, etc. With that system in place, companies can get instant access to data vital for their operations. Operating principles of ezTrack are shown in fig. 1.2.2.10.

Fig. 1.2.2.10. Operating principles of ezTrack

1.2.3. Standard information exchange in supply chain management

The strong competition in the logistics sector makes companies seek for ways to become more efficient by offering the best services and minimizing costs. That brings the question of optimization of trade stock and supply chain management. Information technologies are the principal instrument to improve performance of a supply chain.

At present, there are various information systems used in supply chain management. There are two groups of such systems:

- Supply Chain Planning (SCP) systems; and

- Supply Chain Execution (SCE) systems (table. 1.2.3.1).

Differences between SCP- and SCE-systems are gradually being removed since developers of the former keep adding real time data processing functions to their products.

Table 1.2.3.1.

Use of information systems in supply change management

Supply Chain Planning	Supply Chain Execution
1. Advanced Planning and Scheduling	1. Warehousing Management

Supply Chain Planning	Supply Chain Execution
2. Joint Forecasting 3. Supply Chain Strategic Planning	Systems (bar codes) 2. Transportation Management Systems 3. Order Management Systems 4. *MES (Manufacturing Execution System)*

Source: http://www.itc.ua/print.phtml

The core of the first subgroup is (Advanced Planning and Scheduling (APS). APS plans and schedules replenishment of stock for all the nodes of a supply chain and form requirements for production and transportation of particular goods (as necessary). The basis for that is current demand forecasts, stock data, delivery schedules, locations of trade partners in relation to each other, etc. As those parameters change, APS performs a fast analysis of the changes and adjusts delivery and production schedules accordingly. Thus, a new order can be analyzed for feasibility, and relevant application can be produced for production and transportation of the goods ordered.

The first subgroup also include joint forecasting systems focused on partnership between suppliers and buyers which compares demand forecasts from the buyers with product availability forecasts from suppliers. The result of a well-balanced forecast approved both the parties. Such systems operate based on the standard for joint planning, forecasting and stock replenishment.

In addition to working management functions, SCP provide strategic planning of supply chain structure by producing supply chain plans, modeling various scenarios, evaluating operation levels, and comparing plans with the actual data.

The SCE subgroup is represented by three types of software:

1. Warehousing Management Systems (WMS) control availability of storage facilities, set rules for marshalling, packaging and storage, and evaluate the stock in real time. A WMS-system is a software and hardware complex providing effective control of accommodation and movement of goods within a warehouse and optimization of routes for loading and transport vehicles. A warehousing management system uses automatic identification and bin location warehousing principle. With the automatic identification by bar codes, each cargo is assigned a unique EAN number. Utilization of bar codes improves labor productivity and reduces costs;
2. Transportation Management Systems (TMS) form an optimal transportation plan for goods and materials (subject to required delivery deadlines, transport mode options, working hours, etc.), develop an optimal loading plan for the fleet, and track consignments in transit;
3. Order Management Systems (OMS) help customers form their orders according to their requirements. Moreover, OMS evaluate order feasibility and may suggest alternatives. If necessary, an OMS system sends order information to the APS system for a feasibility assessment. Once the order has been placed, the OMS system is tracking the order at all stages using data from WMS-, TMS- and MES-systems;
4. MES (Manufacturing Execution Systems) manage the manufacturing of ordered goods in addition to the tracking of transports and storage operations provided by other systems.

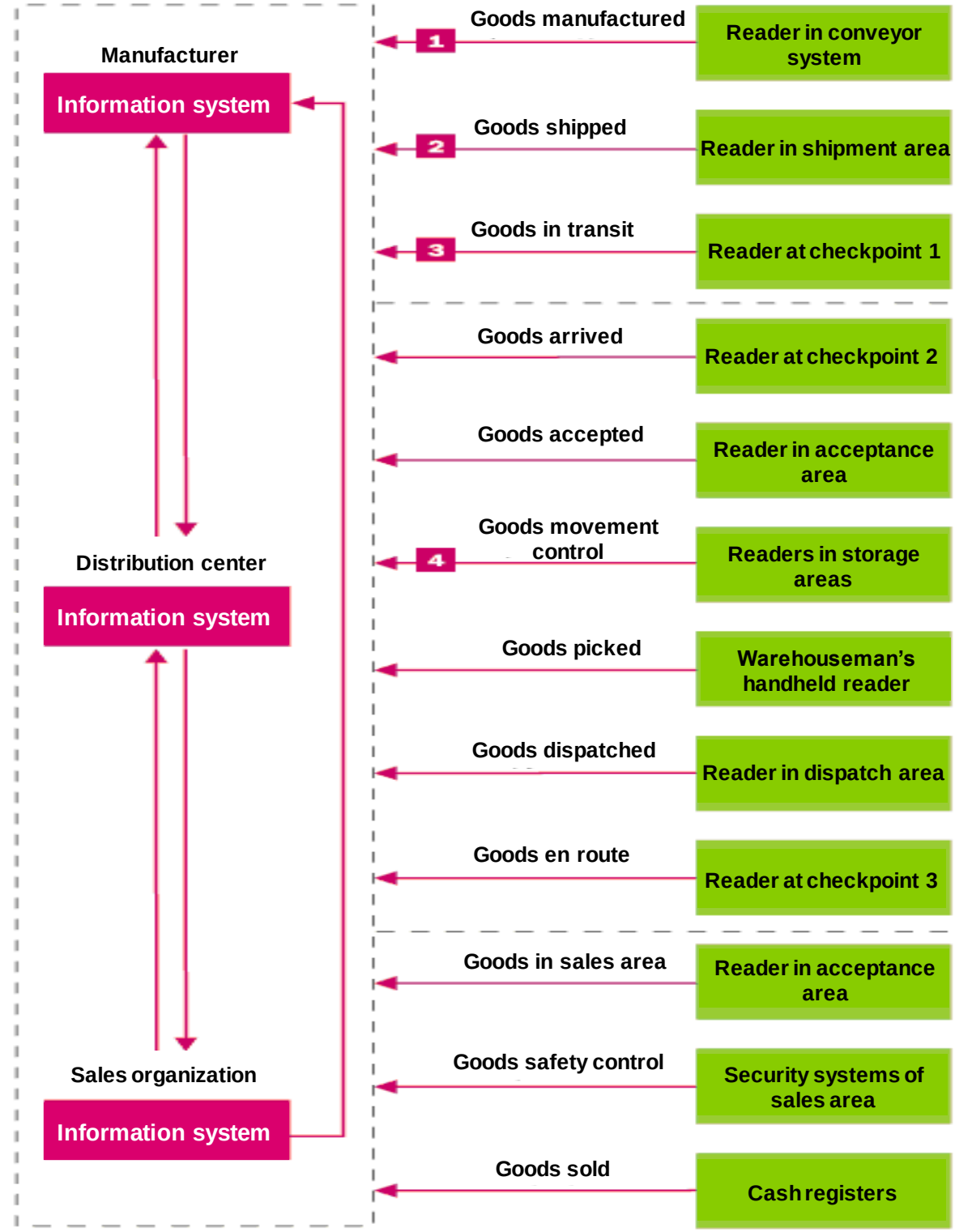
The most common automatic identification methods in supply chains are bar coding and the RFID technology using radio waves for automatic identification of physical objects.

RFID largely owes its popularity to its application in logistics management. Advantages of the RFID are as follows:

1. improved transparency of the global supply chain.
   If a product is equipped with a RFID-tag carrying its key parameters (e.g. name of product, manufacturer, product weight, expiry dates) by the manufacturer, each subsequent participant of the logistics chain will be able to add the necessary data. For instance, the supplier could enter the destination point; the warehouse – the location; and the retail outlet will enter data in accordance with the product ID system in use;
2. during the transportation, the RFID technology is utilized to control the progress of vehicles. Readers are installed at check points along the route which the vehicles passing by and send the data to control centers in real time, enabling the tracking of cargo within the logistics chain and coordination/adjustment in case of delayed arrival at destination. In addition, a RFID-tag also carries data on waybills, delivery notes, etc.;
3. reduced costs and faster turnover: according to RFID users (organizations), they have improved their labor productivity and efficiency of their sales network. Based on forecasts, RFID can reduce the stock by 10-30% and increase the turnover of goods by 1-2%;
4. improved data collection process: the key to effective interaction of companies that make a supply chain is integration of automated comprehensive systems. Apart from establishment of reliable information connections, the next important phase is to ensure a stable and sound data flow. RFID provides precise real time information on movement of consignments.

The result is the synergy effect improving operation performance of all the interacting parties.

Fig. 1.2.3.1 shows the information exchange process within a supply chain.



1 – Goods with RFID-tag; 2 – Unit load with RFID-tag;
3 – Vehicle with RFID-tag; 4 – Storage equipment with RFID-tag

Source: R. Bespalov. RFID applications in supply chain. 2007, No. 2.

Fig. 1.2.3.1. Information exchange process using RFID technology within a supply chain

Moreover, RFID offers several other advantages such as monitoring of product expiry dates, improved safety, and new product promotion opportunities, etc.

Some of the APEC economies have established special committees for development of a standardized information platform for supply chain visibility.

For example, the pilot projects focused on tracking of consignments in international supply chains utilizing EPCIS standards, which were implemented with support from the Japanese Ministry of Economy, Trade and Industry have demonstrated potential benefits of those systems as well as their operation issues, such as the need for synchronization of not just RFID-devices but also of related applications, middleware and the data bases used in real time data exchange.

Japan has a special committee for development of a standardized information platform for supply chain visibility which is aiming to provide compatibility of international codes and data bases. The Japanese government (the Ministry of Economy, Trade and Industry) has issued basic principles for the APEC information exchange framework, which might be extended and used globally.

Fig. 1.2.3.1 shows a standard information exchange framework for global supply chain management.

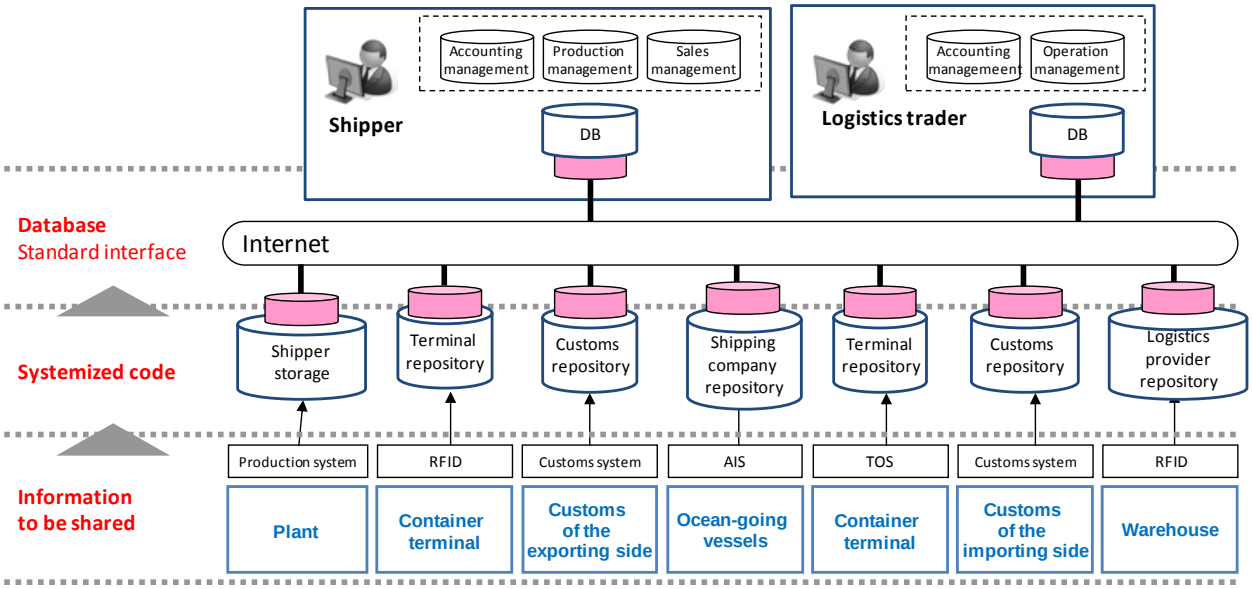


Fig. 1.2.3.1. Standard information exchange framework for global supply chain management in APEC region

Fig. 1.2.3.2 shows the data exchange process in global supply chain management.

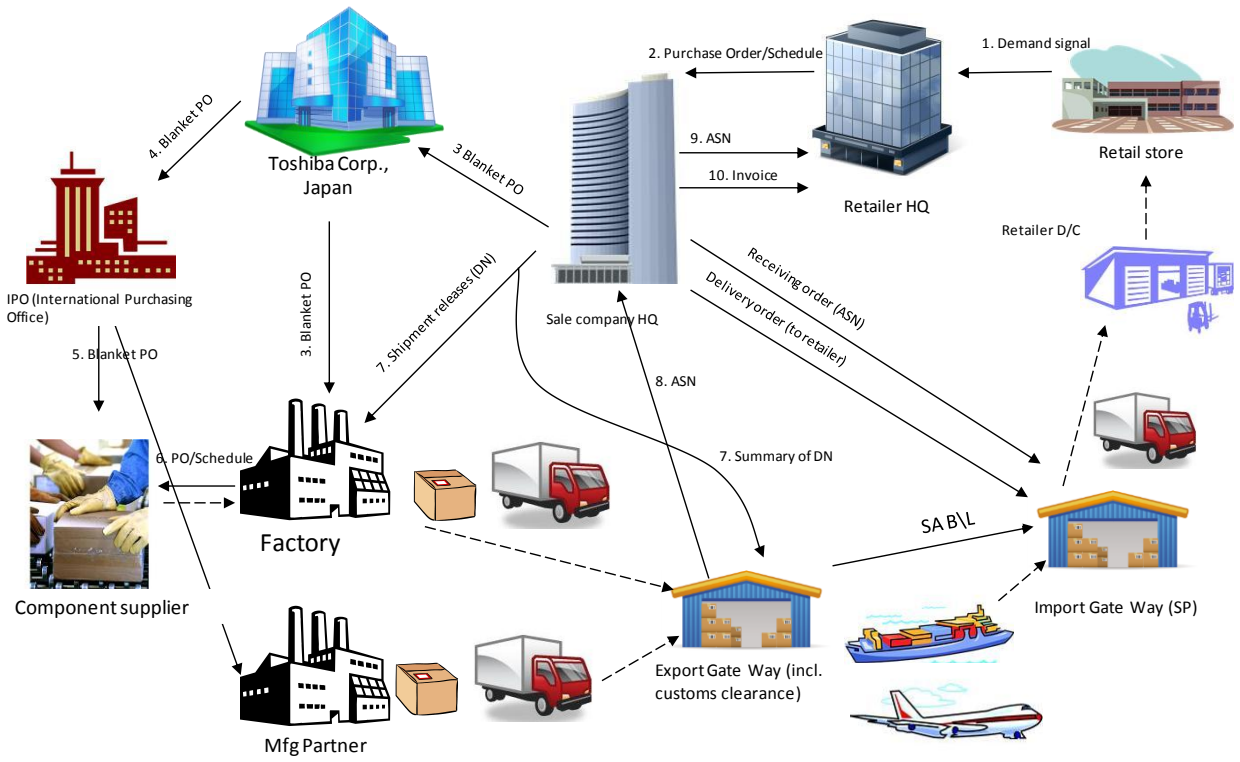


Fig. 1.2.3.2. Data exchange process in global supply management

Fig. 1.2.3.3 shows the data flows within Sea-NACCS (Nippon Automated Cargo and Port Consolidated System, Inc.) – a logistics platform based on Japanese standards.

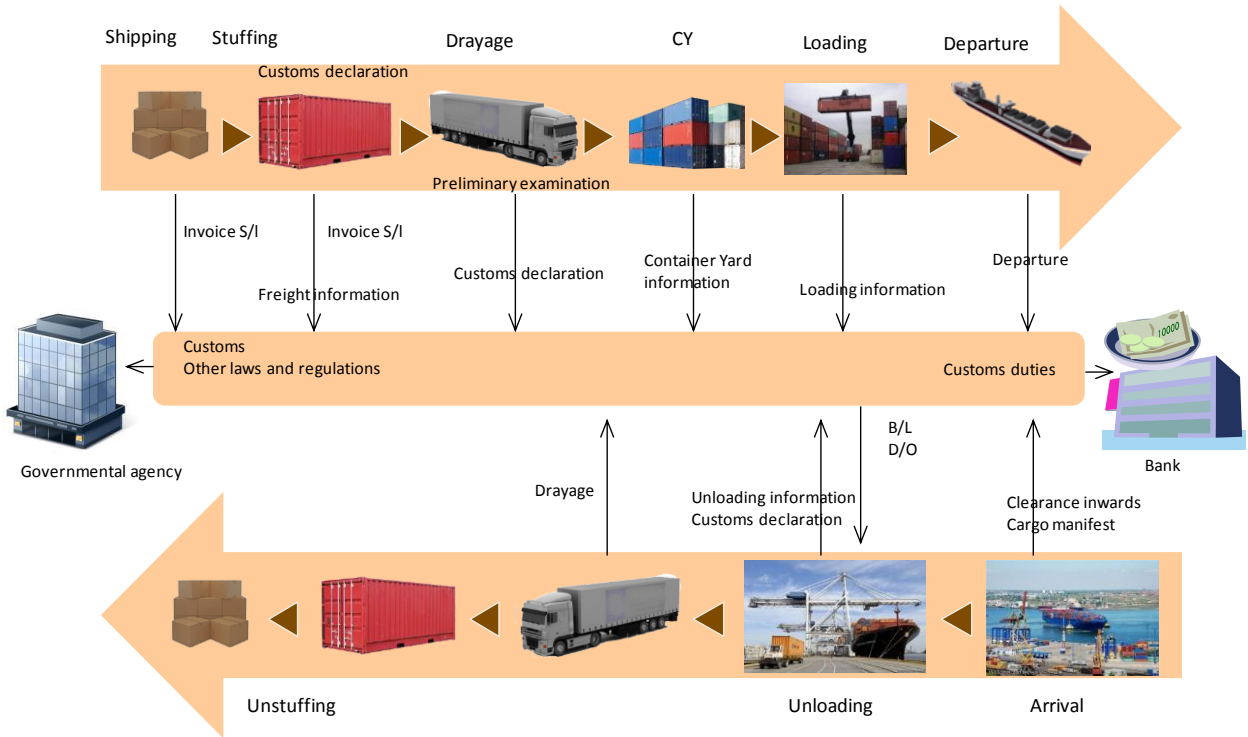


Fig. 1.2.3.3. Data flows within Sea-NACCS (Nippon Automated Cargo and Port Consolidated System, Inc.) – a logistics platform based on Japanese standards

The analysis performed in this section has identified priorities and tools for creation of a standardized information platform for supply chain visibility in APEC economies.

1.2.4. Overview and analysis of the utilization of advanced technologies such as GNSS, ITS, and RFID in SMM

The most important tasks that SMM fulfill are automated identification and location (positioning).

There are two approaches to each of the tasks, the only difference between them being the object which is either a vehicle or cargo (a consignment). Both approaches complement each other since advanced automated management systems can easily “link” the cargo to its vehicle.

The only reasonable approach selection criterion for any SMM is the significance and the cost of the cargo. If the cargo is more expensive than the identification and positioning device, it would be wise to identify and position the cargo rather than the vehicle. But otherwise, identification and positioning of the vehicle is recommended. The exception may be hazardous and highly important cargoes that require the tracking of their transportation parameters along with their location.

Let us discuss various technologies providing for automatic identification and positioning in SMM.

1.2.4.1. Automatic identification

In APEC economies, various technologies are utilized to identify goods and vehicles including:

optic identification;

radio frequency identification;

smart cards.

The optic identification in SMM is provided by bar coding and alphameric coding.

Bar coding has been one of the most common identification methods. Currently, there are different types of bar codes, most of them standard. Bar coding is widely used in logistics system for secondary identification (along with RFID and (or) alphameric identification) due to a number of significant drawbacks, namely:

bar codes are easily damaged;

the scanning technology is sensitive to the position of the bar code in space and its possible contamination;

just one code may be scanned at a time;

scanning problems occur when the surface the bar code is placed upon is not flat.

The wide spread of bar coding is due to its low cost as compared with other identification technologies.

Alphameric coding is used for identification of vehicles and cargo. The code of a vehicle may be its license plate number, and the code of a cargo – the container number. This technology is sensitive to contamination.

Fig. 1.2.4.1.1 shows an example of vehicle identification by the alphameric code (license plate number).

Fig. 1.2.4.1.1. Plate number recognition

Radio frequency identification (RFID) uses radio signals to read or record identification data from/onto RFID-tags. The technology is widely used in modern transport and logistics systems.

Fig. 1.2.4.1.2 shows vehicle identification using the RFID technology.

Fig. 1.2.4.1.2. RFID-tag for vehicle identification

Smart-card based identification provides for storage and processing of data in digital form. This technology seems a promising one for automatic identification of the cargo, vehicle and the party responsible for transportation of the cargo within logistics centers in combination with proximity reading. The technology has been standardized internationally but has not been utilized on an industrial scale.

The current utilization of advanced vehicle and cargo identification technologies is shown in table 1.2.4.1.1.

Table 1.2.4.1.1.

Utilization of advanced vehicle and cargo identification technologies:

Current practice

Identification technology	Identification object	
	Vehicle	Cargo
Bar coding	-	+
Alphanumeric coding	+	+
Radio-frequency identification	+	+
Smart-card identification	+	+

The most commonly used of the above technologies are:

- radio frequency identification as the principal vehicle and cargo identification technology;
- bar coding as an auxiliary cargo identification technology.

Fig. 1.2.4.1.3 shows an example of radio frequency identification and bar coding within a logistics process.

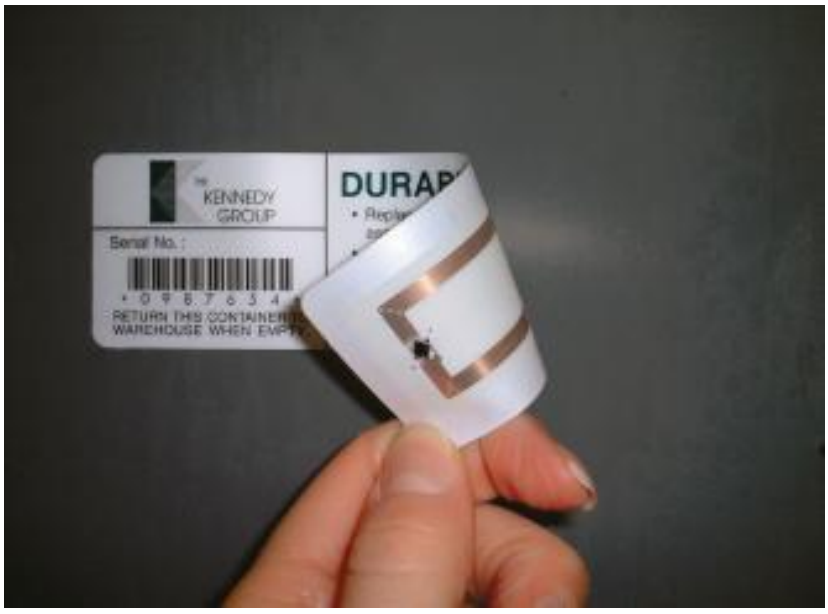


Fig. 1.2.4.1.3. Combination of a RFID tag and a bar code

There is the international standard ISO 17367:2009 “Supply chain applications of RFID – Product tagging” which is required to control the movements of goods at each stage of the chain from manufacturing, processing through distribution and sales. The standard defines the basic features of RFID when used in supply chains:

- product identification;
- additional data about the product on the RFID-tag;

- semantics and data syntax to be used;
- the data protocol to be used to interface with business applications and the RFID system, and;
- the air interface standards between the RF interrogator and RF tag.
- In addition to ISO 17367:2009 the following ISO standards are used:
- ISO 17363:2007 " Supply chain applications of RFID - Freight containers";
- ISO 17364:2009 "Supply chain applications of RFID - Returnable transport items";
- ISO 17365:2009 "Supply chain applications of RFID - Transport units";
- ISO 17366:2009 "Supply chain applications of RFID - Product packaging".

1.2.4.2. Positioning

The second major task fulfilled by SMM, apart from identification, is the positioning. The systems discussed above apply one of the two approaches to the task:

- positioning of the cargo;
- positioning of the vehicle carrying the cargo.

The positioning is done using the Global Navigation Satellite Systems (GNSS).

At present, there are four GNSS which are at different stages of development. They are:

- **GPS,** an American double application GNSS fun by 24 satellites on six orbital planes (with four satellites each);
- **GLONASS,** a Russian double application GNSS run by 24 satellites on three planes (with eight satellites plus one reserve satellite each);
- **Galileo,** a European GNSS under development. The system is to be managed by civilian agencies. There will be 27 navigation satellites on three planes;
- **Compass (Beidou 2),** a Chinese double application GNSS. The system is to have 5 satellites on a geostationary orbit (GSO), 3 satellites on three planes, and 27 satellites on three planes on medium orbits. All in all, Compass will have 35 satellites.

Table 1.2.4.2.1 shows the actual state of deployment and operation of the above listed GNSS with number of satellites as November 2012. The data on Galileo and Compass are preliminary since the systems are under development and satellites are being added.

Table 1.2.4.2.1.

GNSS orbit groups

	GPS	GLONASS	Galileo*	Compass**
Satellites in operation	30	24	2	-
Satellites being commissioned	-	-	2	12
Satellites undergoing maintenance	1	3	-	-
Reserve satellites	-	3	-	-
Satellites under testing	-	1	-	-
Satellites that are being removed from the system	-	-	-	-

** - According to ESA's Press Service, in August 2012 the third and fourth Galileo satellites were delivered to Kourou spaceport, French Guiana. The pair were launched*

on 12 October 2012.The satellites 3 and 4 joined the first pair of satellites launched a year ago to complete the validation phase of the Galileo program.

*** - Compass system will be deployed in two phases: Phase 1 – the system will be deployed for regional users and will utilize 12 satellites by 2015; Phase 2 – the system will be expanded into a global navigation system with 35 satellites by 2020.*

To transfer the location data, the SMM discussed in this report use various WWAN technologies based on standards CSD, GPRS, EDGE, EV-DO, and HSPA. Storage facilities often use the WiFi technology which is a wireless local area network (WLAN).

On-board computers and various trackers equipped with GNSS receivers and WWAN (WLAN) modems are used to provide the positioning and transfer the necessary data to logistics centers. There are also electronic tachographs or vehicle trackers designed to position goods vehicles as well as monitor cargo transportation parameters and driver's working hours.

GPS is the most widely used technology of the SMM discussed in this report. However, after the completion of GLONASS in 2011, double channel GSP/GLONASS receivers have been also used and provided more accurate positioning. Fig. 1.2.4.1.4 shows an example of a double channel positioning system.

Fig. 2.4.1.4. Dual-channel GPS/GLONASS positioning system

Logistics centers use various geographic information systems to visualize locations of vehicles and cargo, in accordance with standards for geospatial representation of information. Clients of such systems receive data while being in their working places. Fig. 1.2.4.1.5 shows an example of a vehicle location shown in a GIS.

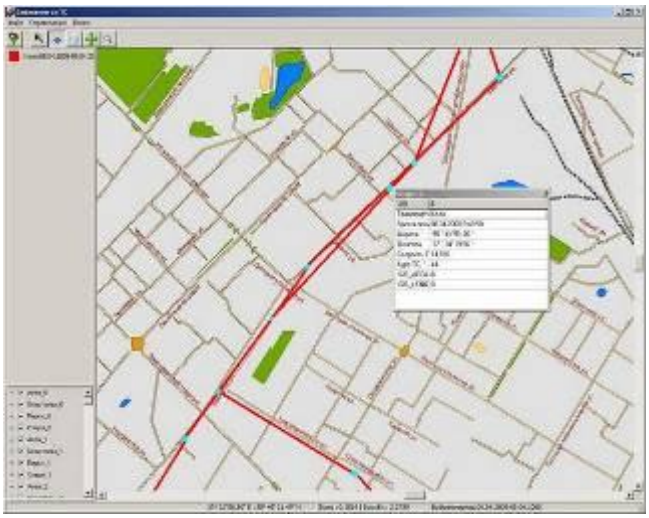


Fig. 1.2.4.1.5. Position of a vehicle shown in GIS

1.2.4.3. Practical application of advanced technologies in SMM

The most widespread technologies applied in supply chain management are RFID and GNSS (satellite navigation). In practice, the technologies are utilized comprehensively, which allows real-time and reliable management of the entire logistics process. Sea container transport management and monitoring systems are an example of such integrated utilization of the technologies in logistics. Each container is equipped with a RFID-tag, various sensors (opening control, sensors to control oxygen, temperature, pressure, smoke, etc.) and a micro-computer transmitting real-time information to the data center onboard the container carrying vehicle which, in its turn, sends the data to the logistics centers using satellite communication. A container equipped with such tracker module is now called a smart-container (fig. 1.2.4.3.1).

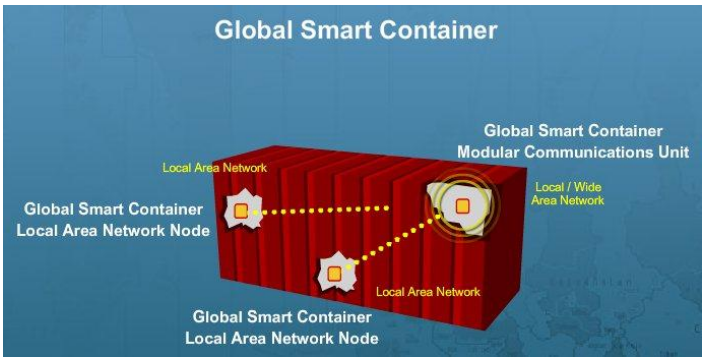


Fig. 1.2.4.3.1. Smart Container

Cargo owners and logistics center operators can monitor the position of smart-containers and make sure the cargo is safe in real time. Fig. 1.2.4.3.2 shows the layout of a tracker module.

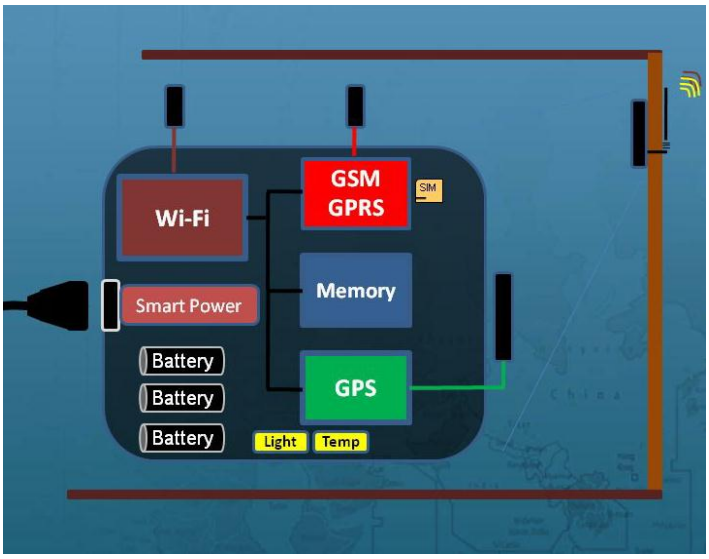


Fig. 1.2.4.3.2. Smart container module providing identification-positioning-communication

Tracker modules use RFID for automated identification, GPS – for positioning, and GPRS and WiFi – for data transmission.

The possibility of continuous monitoring of the progress of a smart-container, using the Google Maps services for example, as well as SMS or e-mail, is particularly important for transportation of perishable and valuable goods. Fig. 1.2.4.3.3 shows an example of such service.

Fig. 1.2.4.3.3. Cargo tracking on Google Maps

Obviously, in case of intermodal and multi-modal transports, it is best to place a tracker on the container. However, if the container is only transported by road, the best option would be to install a tracker with extended functionality on the truck. An example of that solution is a GPS/GLONASS tracker (fig. 1.2.4.3.4).

Fig. 1.2.4.3.4. GPS/GLONASS vehicle tracker

The tracker provides the positioning of a moving object using GPS and GLONASS, and has special interfaces enabling its utilization within road vehicle monitoring and control. Coordinates are transmitted via a GSM-channel. When such trackers are used in motor carrier companies, they control the itinerary of truck drivers, make for reduction of fleet operation and maintenance costs, which all in all reduces supply chain costs. The device can be operated by a remote control, which allows the driver to control it while being in the driver compartment and exchange voice messages with the dispatcher via a GSM-channel. Analog and digital sensors can be connected to the tracker to monitor transportation parameters and the special driver ID. The tracker has an off-line memory so it can operate outside the GPS signal coverage zone or in roaming.

1.3. Key advantages and socio-economic efficiency of SMM in the APEC Region

Modern systems for monitoring and management of transportation and freight flows provide a reduction in freight and fuel costs, make for optimized logistics, and reduce the impact of the environment, which all in all makes a significant economic and social effect.

Utilization of SMM helps to address the main problems associated with transports and logistics such as:

- excessive stock in warehousing facilities and long-term storage;
- non-optimal consignments and prices of goods;
- failure to follow delivery schedules;
- high percentage of defective and damaged goods; theft and falsification of goods; inefficient storage and security;
- high logistics costs;
- lack of access to data and opportunities to analyze and exchange information in real time to support vehicle and freight management decisions;
- poor quality of logistics services, etc.

The key purpose of SMM is an optimal supply chain management minimizing costs, reducing delivery times, and improving the quality of logistics services.

SMM is an innovation by its essence and functions, since it covers a wide range of applications, from fundamental research to widespread practical application. Satellite navigation is a catalyst to effective and safe development, and an important factor in securing competitiveness of national economies.

Analysis of application of advanced SMM technologies in APEC economies has shown, that combination of global satellite navigation systems, wireless data transfer and GIS technologies provides for:

- effective improvement of logistics communications and supply chain management methods;
- improved transparency of supply chains through reliable and accurate real time consignment information provided to each participant of the logistics process;
- optimization of transports through transport and storage cost reduction and faster turnover;
- improved analytical methods applied in supply chain management;
- secure and reliable automatic resource management through storage of important data on RFID-tags (manufacturer, destination, location, serial number, transport instructions, etc.);
- faster cargo processing through simultaneous reading of several RFID-tags;
- reduced manual cargo processing;
- reduced logistics document processing times and fewer errors in documents;
- real time tracking of cargo thus making supply chains controllable;
- real time adjustment of freight routes to reduce the impact of external factors;
- real time tracking of transportation and storage details of particularly important or hazardous goods;
- control of freight route to ensure the safety of cargo;

- monitoring of expiry dates of products;
- optimization of storage stock;
- validity control of cargo movement to prevent theft (including theft in storage facilities).

SMM are primarily designed to improve effectiveness of supply chain management by providing complete real time control of location and operation parameters of various transport modes.

The practice shows that implementation of SMM in APEC economies is producing a good socio-economic effect and enabling real time administration of vehicle and cargo flows. Navigation information systems reduce delays and travel distances by up to 10% and travel times – by up to 20%, and increase capacity of the transport network by 5 to 15 %.

Systems for management and monitoring of transportation and freight flows is a strong and effective tool providing transparency of supply chains, which, in its turn, enables:

- improved efficiency of cargo and vehicle flows;
- improved equality of the services due to reduced delivery times;
- reduction in stock throughout the supply chain;
- improved safety of transports;
- cleaner environment and reduced costs due to more efficient fleet management;
- more efficient communication with public authorities when fulfilling mandatory requirements and obtaining permits.

Fig. 1.3.1 shows the principal advantages of the transportation and freight flow monitoring system for logistics in APEC economies according to the concept developed by the Ministry of Transport of Korea.

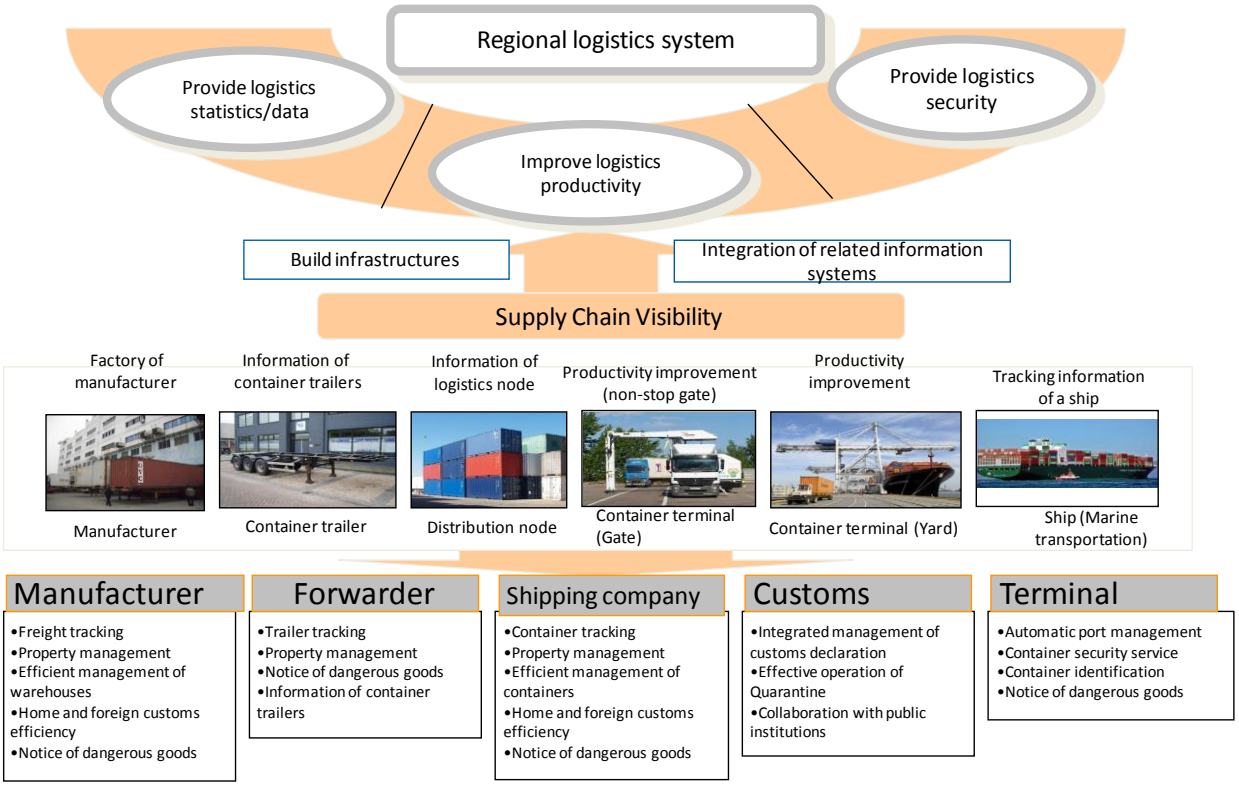


Fig. 1.3.1. Principal advantages of the transportation and freight flow monitoring system for logistics in APEC economies according to the concept developed by the Ministry of Transport of Korea

According to GCTS (Korea) the key advantages of global real time cargo/container tracking systems are as follows:

- more efficient logistics:
  - a network of RFID readers installed at factories, road tolling stations, national and international ports provides real time data on location of cargo (container);
  - coordination of internal supply chain system with cargo (container) tracking information reduces storage costs and improves efficiency of the logistics;
- high-quality services for consignors:
  - the high quality of services provided to consignors is achieved through the use of real time cargo movement data obtained via RFID and GNSS;
  - consignors are provided with complete information on import and export goods, port calls and ports, ship arrival and departure reports, customs statistics, customs declarations, etc.

The Colins project implemented in Japan is also a good demonstration of the main advantages of SMM (fig. 1.3.2). Introduction of Colins has made container terminals of Japanese ports much more efficient than before.

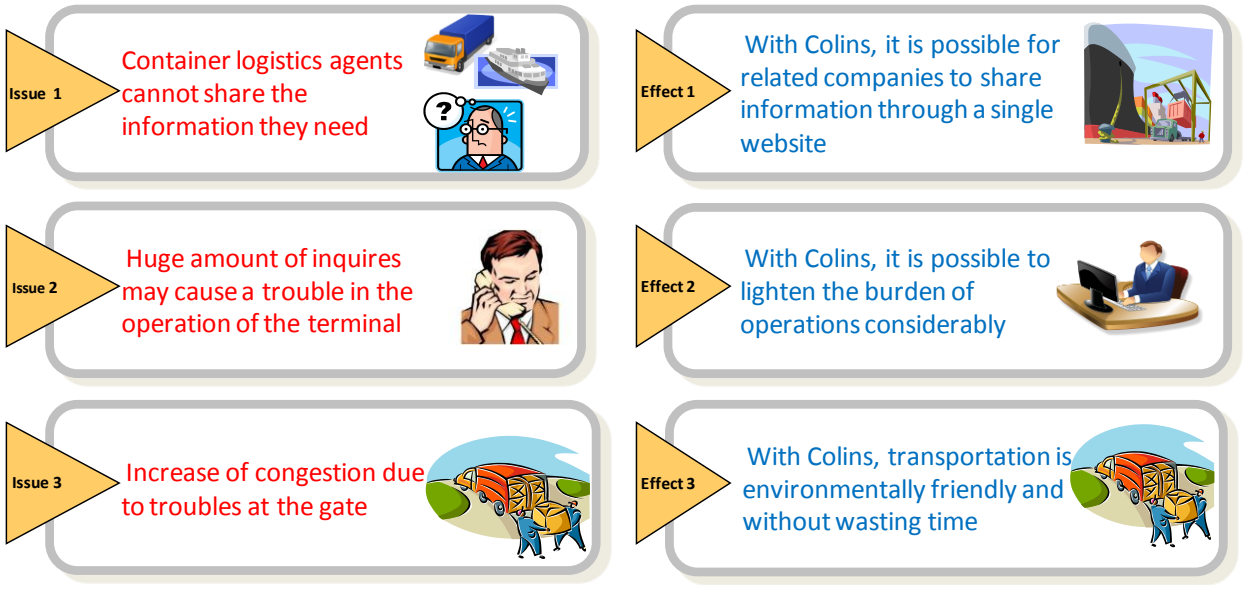


Fig. 1.3.2. Main advantages of SMM as demonstrated by the Colins project (Japan)

1.4. Common patterns and issues of implementation, operation and development of SMM in APEC economies according to open sources and the survey of transport agencies, carriers and logistics operators of APEC economies

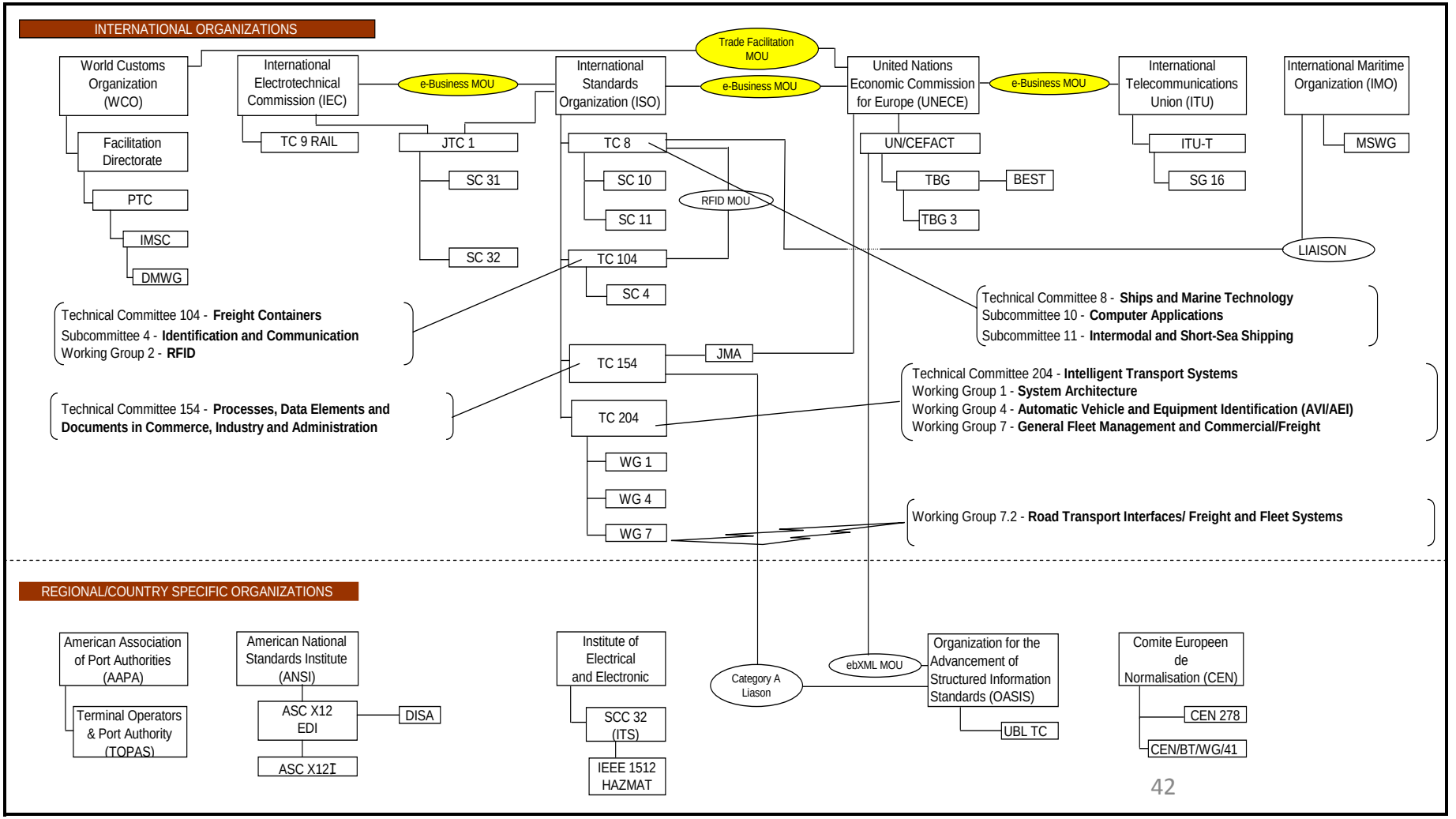
All in all, the trends in development of systems for management and monitoring of transportation and freight flows in APEC economies can be considered positive. Applications of standardized information solutions are expanding; most of the countries are successful in implementation of customs reforms, and the logistic support to trade operations is nearing the level of the global leaders in logistics. This leveling in part results from the global trend of consolidation and homogenization of services, especially in logistics, container transportation, air transport, express delivery of goods, and contract logistics. Moreover, the increasing global awareness of the role of the logistics in the general structure of national economies and its potential as a stimulator of economic growth also has a positive effect. That explains the increased activities of APEC governments in that area which are often preventive in their nature.

The requirement for SMM development in APEC economies varies. One should also remember that the global supply chain is only as strong as its weakest link; therefore elimination of one bottleneck may not bring all the expected benefits until other bases have been covered as well. The increasing complexity of the reforms is one of common trends. New projects normally target several sectors, affect more and more stakeholders and increasingly cover several countries. Implementation of such project requires investment in freight transport infrastructure always together with reforms of border control authorities and market stimulation efforts aimed to ensure competition of the services. Another common trend is continuously changing goals and priorities in logistics. Public authorities and international organizations have to be able to shift their attention and adapt to such changes.

All in all, customs procedures in APEC economies are being harmonized already: the customs clearance prior to arrival of the cargo, on-line filing of applications and post-clearance audit are widespread practices. The obstacle to connectivity of cross-border supply chains is lack of cooperation between businesses and public authorities within each of the APEC economies, as well as between the countries. The key factor in optimization of cross-border logistics is the spread of new technologies, first of all information and communication technologies supporting cross-border cargo transportation.

The main issues in creation, operation and development of systems for management and monitoring of transportation and freight flows are common for all the APEC economies. The principal issue for global supply chains is disparities in standards, protocols, data formats and the lack mechanisms for interaction between individual SMM. Other obstacles include underdeveloped multi-modal transportation and lack of interaction between various transport modes.

At present, there are several international organizations active in trade, transportation and customs management, as well as some regional and local organizations, working on standards for global supply chains. Some of the organizations are: the International Organization for Standardization, the World Customs Organization, the International Electrotechnical Commission, the International Maritime Organization, and the United Nations Economic Commission for Europe (fig. 1.4.1).



Acronyms KEY and Summarized Descriptions for Freight Standards Organizations follows.

Source: Nomura Research Institute

Note: MOU – Memorandum of Understanding

Fig. 1.4.1. International organizations involved in development of standards for global supply chains

The study of existing systems for management and monitoring of transportation and freight flows (SMM) in APEC economies produced a questionnaire for a survey of transport agencies and major logistics and transport companies of the APEC Region. The questionnaire is provided as Annex 1 to this report.

The main objective of the survey was to identify existing SMM in APEC economies including SMM that cover an entire country and communicate with SMM of other countries. Moreover, the questionnaire offered some technical questions concerning the present and planned application of navigation and global positioning systems, ITS elements, interfacing protocols, and common data formats in SMM. The most interesting results were answers to the questions concerning sources of financing for SMM, as well as priority legal, management and technical measures which, according to the respondents, were required to provide for communication between the existing and the projected SMM in the APEC region and their effective use.

The questionnaires were sent to specialists of transport agencies of all the APEC economies: Australia, Brunei, Canada, Chili, China, Hong Kong, Indonesia, Japan, Malaysia, Mexico, New Zealand, Papua New Guinea, Guinea, Peru, the Philippines, Korea, Russian Chinese Taipei, Thailand, the USA, and Vietnam.

1. Nomura Research Institute, Japan (consultant to the Ministry of Land, Infrastructure, Transport and Tourism of Japan);
2. Economic Analysis Directorate, Transport Canada;
3. Institute for Transport Science and Technology, Vietnam;
4. Ministry of Transport, Malaysia;
5. Ministry of Transport, New Zealand;
6. Institute of Transportation, the Ministry for Transport and Communications of Chinese Taipei;
7. Office of Transport and Traffic Policy, the Ministry of Transport of Thailand.

The forms filled in by the above listed respondents are provided in Annex 2 to this report.

The most instructive answers were received from Japan and Chinese Taipei, i.e. leaders of the region in implementation and application of SMM. Unfortunately, since responses were few, and answers were not always exhaustive or useful, the survey results do not allow a reliable assessment of general trends in development of SMM in APEC economies.

However, even the responses available show that GPS-technologies are widespread in SMM in most of the countries, and that some countries consider using satellite navigation systems such as GLONASS, Galileo, etc. Many countries widely use RFID and bar coding as well as electronic data interchange protocols (EDI). ITS elements such as automatic identification of vehicles and equipment are utilized quite a lot in some of the countries, while other countries are just planning to introduce them.

Moreover, using the survey results, the following priority measures aimed to develop SMM and provide compatibility of and communication between the existing and the future SMM in the APEC Region have been identified:

- development and harmonization of standards, protocols and data formats for SMM in cross-border logistics. That would require APEC to create a common mechanism for integration of the logistics data from major SMM or logistics providers of each country based on international standards;

- development and wider use of information and communication technologies in systems for management and monitoring of transportation and freight flows;
- optimization, facilitation and harmonization of customs procedures within the context of the global integration;
- addressing technical issues relating to data security and integration of heterogeneous data on cargo when providing for compatibility of and communication between the existing and the future SMM in the APEC Region;
- addressing legal issues relating to confidentiality of business data involved in the information interchange between various SMM;
- coordinated building of the legal platform to support compatibility of and communication between the existing and the future SMM;
- exchange of advanced practices in implementation and operation of SMM in APEC economies.

The answers from Vietnam and Malaysia also reveal the need to train specialists in logistics management, and the Canadian respondent mentions that implementation of pilot SMM projects in the region is an excellent method to test any proposed systems provided that customs requirements are always taken into account.

2. Recommendations for development and improvement of SMM in APEC economies

2.1. Conclusions based on the general overview and analysis of implementation and operation of SMM in APEC economies

The analysis of application of SMM in APEC economies has shown that the approach to transport processes has changed drastically over the last decade, and goods transportation management has become a highly profitable and well developed sector in APEC economies. The enabling factors were:

- the economic growth of APEC economies;
- good prospects of global logistics chains (channels);
- regionalization and formation of economic communities;
- expansion of technologies including GNSS, ITS, RFID, GPRS, WiFi, etc;
- reduced interference of governments in the economy.

The feature characteristic of the present development of APEC economies is the wide spread of economic integration processes. The need for integration arises from the actual internationalization of the economic life which has gained speed boosted by the technological revolution.

The international division of labor and cooperation produced a lot of transnational companies that use global logistics chains and channels in their business, first of all in goods distribution. The current trends in development of the global logistics channels are increased return on investment, reduced tariffs of third-party logistics providers in other countries, improved quality of the services and labor productivity. Development of international logistics channels is facilitated by major international transport and forwarding companies, insurance companies as well as global telecommunications networks.

Time, quality and cost are becoming the key factors in logistics systems. All transport operations must follow the main rules of logistics, i.e. to deliver goods “just in time”, “door to door” and safely irrespective of the number of national borders crossed. These requirements raise issues of information communications between carrier companies, logistics operators and consumers of transport services, which are often located in different countries and on different continents.

The analysis of SMM in APEC economies has revealed the following activities relating to transportation and freight flow management:

- planning and coordination of goods manufacturing, transportation, and storage activities;
- management of transportation and processing of goods.
- There are also three options for interaction of vehicle, cargo and information flows:
- information travels faster than vehicles and cargo. The overtaking of material flows by the information flow aims to eliminate bottlenecks in the logistics process. The forward information flow announces the arrival of a cargo in advance, while the backward flow brings order details;
- information travels along with vehicles and cargo flows. When data on quantity and quality of cargo accompanies the cargo, that allows fast cargo identification and shipment;

- lagging data on vehicle and cargo flows. Normally, the information flow falling behind the vehicle flow is only allowed when the latter needs explanation and assessment. The reverse information flow may bring data on acceptance of cargo in terms of quality and quantity, as well as on claims and mutual settlement of accounts.
- The principal data flow processing functions involved in management of transportation and freight flows are as follows:
- transportation of data flows within the system;
- accumulation and storage of data in a knowledge base;
- filtration of the flow: selective processing of some data and filtering of other data and cover documents;
- consolidation and separation of data flows within the structure of the system and in communication networks;
- various elementary information operations (data copying, replication, processing and systematization, search and provision of information, and creation of information models) and data flow management;
- conversion of data relating to logistics operation.
- At their current stage of development, transport-related information technologies demand the following basic things from the systems:
- systematic nature of services according to specific activities of users and their goals in terms of transport and logistics management;
- quality information services meeting the demand;
- reliable services, which means information support to logistics managers and participants of transport and logistics chains at the right time and in a form which is the most convenient for the users;
- complete information support to processes (operations) and delivery of required information to specific users;
- differentiation, i.e. each client must be provided the information that would help him/her to achieve his/her specific goals;
- modularity enabling the system to be configured to meet requirements of particular clients.
- Modules most commonly utilized in SMM include:
- APS (Advanced Planning and Scheduling): expanded planning with adaptive functions used within manufacturing facilities;
- CRM (Customer Relationship Management); SRM (Supplier Relationship management);
- SCM (Supply Chain Management);
- TMS (Transportation Management System);
- SCE (Supply Chain Execution);
- WMS (Warehouse Management System);
- YMS (Yard Management System): a system controlling incoming and outgoing cargo flows at a warehousing facility.

Based on the analysis, generalized a five-level hierarchical structure of a standard logistics system has been produced (see fig. 2.1.1).

At the first (the lowest) level, SMM supports transactions and operations. That includes acceptance of orders, stock distribution, cargo consolidation, the actual

transportation process (dispatching and delivery), provision of order status information to clients. The entire functional cycle of an order is controlled based on real time information. Given the volume of data flows and operations, capacity of the system is very important.

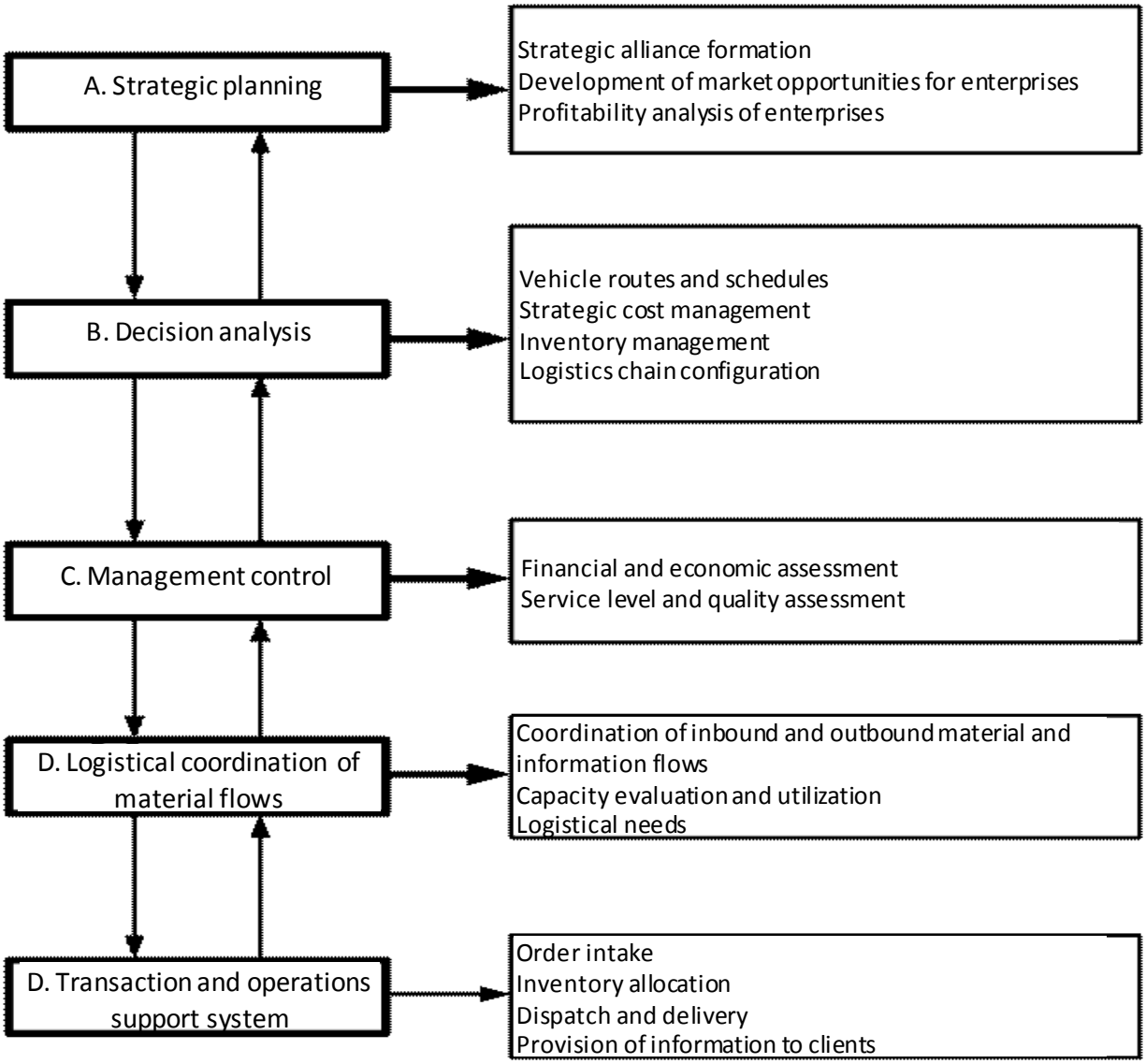


Fig. 2.1.1. Hierarchical structure of a standard logistics system

The second level involves coordination of incoming and outgoing flows. The system takes into account restrictions and loading of fleet, the relative availability of manufacturing, storage and transport resources, as well as manufacturing and supply requirements.

The third level (“The Managerial Control”) involves evaluation of operations results. Based on the results the logistics manager evaluates economic performance, service level, the quality of transport services, capacity, and other parameters.

The fourth level (“The Solutions Analysis”) involves analysis and assessment of possible impacts on the entire system. Normally, the analysis is focused on the following:

- vehicle routes and time schedules;

- strategic analysis and management of costs;
- stock management;
- transportation network configuration;
- integration of third-party logistics providers in transport and supply chains.
- The fifth and the last level (“The Strategic Planning”) involves information support to development and enhancement of the transportation strategy. Management decisions are long-term and concern:
- development of market opportunities;
- formation of strategic alliances;
- a logistics management strategy.
- The above factors are characteristic of APEC economies due to expansion of their market opportunities and long-term economic international agreements.
- In the logistics sector, SMM provide the following:
- continuous provision of reliable, adequate and updated information to authorities on the status of functional and information processes relevant to particular order;
- continuous provision of adequate real time information to the relevant functional units on the progress of products within the supply chain (bottlenecks, delivery time forecasts, etc.);
- ongoing evaluation of key parameters such as costs of particular operations and profit levels.
- The analysis revealed the following classes of logistics systems:
- expert systems, supporting decisions relating to choice of loading methods and routes;
- reference systems (legislation, technical info, standards);
- dispatcher and control systems, supporting movement and processing of cargo;
- planning systems, created at the administration level to support long-term decisions.
- The most important functions of SMM irrespective of their class are:
- automatic identification of cargo;
- identification of vehicles;
- real time monitoring of goods movements from suppliers to consumers;
- real time management of the progress of cargo along specified routes;
- storage and processing of large amounts of data;
- availability of intelligent tools for analysis of the logistics process and automatic decisions making aimed to improve the process.

A particularly important thing for goods vehicles on their way is utilization of ITS services. Onboard computers and electronic tachographs allow drivers, ship drivers, pilots and train divers to receive updated data on traffic conditions as an addition to other information instruments. The updated traffic condition information is required to make decisions fast and achieve the main goal of the logistics process, i.e. to deliver the cargo safely to the right address and within shortest possible time.

With the general globalization of the global economy, logistics companies often have to go through customs procedures that add to transportation costs. The current level of information technologies enables the single window format of customs

procedures, which, in combination with electronic submission of cargo information to customs authorities, reduces customs clearance time and makes it predictable.

2.2. Recommendations on development and improvement of SMM in APEC economies using GNSS and ITS technologies

As regards development of reliable SMM, the most 'experienced' countries are Japan, Korea, USA, Australia and China. APEC is actively promoting the supply chain visibility initiative, i.e. monitoring of supply chains suing advanced equipment. Russia suggests that GLONASS should be used more as one of the most effective tools to provide the positioning (tracking) of vehicles and cargo.

Formation of a technology platform supporting the logistics process and providing application and development of advance technologies could be recommended as a step towards development and improvement of SMM.

One of the principal issues here which could be of interest to public authorities, businessmen and scientists is the idea of common standards for emerging products and technologies, elimination of barriers to entry of new products and technologies into markets. That would also give businesses of the APEC Region an opportunity for preventive elimination of barriers in emerging markets.

Moreover, such mechanism could be useful for establishment of contacts with international companies and researchers from APEC economies. That would support international cooperation and make for further liberalization of trade. An open technology platform could be built within the framework of the Open Innovation Platform, the Japanese initiative supported by Russia.

The recommendations on creation of a common technology platform are as follows:

- a common standard for information support including forms of documents for storage, transportation, customs clearance, and classification of goods and vehicles;
- a common standard for onboard equipment and software including support to ITS user services and hazardous goods transportation monitoring;
- a common standard for cargo identification including RFID, bar coding and smart-cards;
- a common standard for vehicle identification including remote station RFID, alphameric coding, and smart cards;
- a common standard for vehicle positioning tools including GPS and GLONASS;
- a common standard (protocol) for means of communication between vehicles and logistics centers;
- a component supporting the planning and decision making during logistics activities;
- a simulation component as a tool to evaluate logistics options;
- a common technology and software support to the single window system when communicating with customs systems.

SMMs are recommended to be built based on the following principles:

1. Utilization of standard hardware and software modules. A hardware module is radioelectronic equipment unit manufactured as a separate product. A software module is a unified partially independent software element designed to perform a specific function within a software package. Adherence to hardware and software module application principles would:

- provide for compatibility of IT-equipment and software at various management levels;
- improve efficiency of logistics information systems;
- reduce their cost;
- reduce the time needed to create the systems.

2. Phased implementation principle. SMM as well as other automated systems are developing continuously. Therefore, the capacity for expansion of targets and tasks of a system should be provided at the design stage. One should also remember that implementation phasing i.e. selection of priority tasks has a great impact on further development of SMM and their effectiveness and efficiency.

3. Smooth interface principle. Information and material flows cross borders of legal jurisdictions and responsibility zones of various organizations or national borders. Smooth crossing of such connection points is one of the most important tasks of cargo and vehicle management.

4. System flexibility principle. This principle means taking into account specific requirements when using SMM in changing conditions.

5. System acceptability principle. The principle is applied to users of the man-machine dialog and involves certain requirements to a man-machine interface (data representation in a GIS, an intuitive interface, a standardized set of icons, etc.).

The above recommendations for development and improvement of SMM in APEC economies may be used in preparation of joint strategic and program documents enabling coordination of policies of different countries relating to management of goods and vehicle flows.

2.3. Recommendations for harmonization of approaches to transportation and freight flow management and improvement of compatibility of and communication between the existing and future SMM in APEC economies in order to improve their efficiency

Effectiveness of efforts to support the logistics process depends on the quality of SMM and makes a significant impact on performance of supply chains at corporate, national and international levels, defining the overall state of the national economy. Experience of the APEC economies using advanced technologies shows that development of logistics activities has become an important catalyst to the growth of companies and improvement of their competitiveness and one of the key factors in their prosperity. Effective functioning of logistics companies requires advanced management methods, improved coordination processes in logistics chains, as well as development and introduction of best information technologies to support all the key logistics company management processes and integration of the companies with their partners within the product distribution process.

Analysis of studies by Russian and foreign specialists concerning supply chain management and logistics has shown that effectiveness of a cargo and vehicle flow management system could be improved considerably by information technologies. However, there are still a number of theoretical and methodological issues relating to development of modern models, principles and methods to support justified administrative, project-related and investment decisions aimed to make SMM more efficient. For instance, theoretical and methodological frameworks for creation and introduction of IT in logistics processes need further refinement. There should be organizational and mathematical economic models to address tasks arising during product distribution. Moreover, there are no recommendations on how to improve efficiency of SMM based on information and functional logistics (integrated logistics).

Integrated logistics provides for the most effective achievement of goals of businesses and government. Profit maximization depends on several factors such as the companies' standing among competitors, competitive prices, costs, and the structure of the industry. Integral responsibility for the level of costs in this case does not mean just costs within the company, but includes responsibility for efficient and timely deliveries and the choice between manufacturing of some products and purchasing them from other suppliers. The management is based on the method of engagement of individual interconnected elements into an integrated process in order to prevent unnecessary material and time losses.

The logistics process must follow the fundamental principle of high economic effect. That can be achieved by high quality of services in terms of:

- time from order placement to delivery;
- reliability and feasibility of delivery at call;
- supply stability;
- order feasibility and partial feasibility;
- convenient order placement and confirmation;
- reasonable prices and regular information on service costs;
- efficiency of cargo handling technologies applied at storage facilities;
- quality of packaging, and transportation of palletized cargo and containers;
- reliability and flexibility of deliveries;
- availability of delivery method choices.

From that point of view, integrated logistics has the following features directly affecting efficiency:

- building and use of key competences which involves efficient combination of resources including IT;
- (strategic) preservation of stable key competences for a long-term horizon;
- opportunities for clients to benefit; willingness to pay for extra services that improve and accelerate the decision making.

Logistics chains involve six interaction areas that have an impact on the overall efficiency of the logistics process. They are:

- communication with suppliers;
- communication with consumers;
- work processes within a unit of a company;
- work processes between units of a company;
- communications between companies involved in a supply chain;
- communications between companies and customs authorities.

At present, the principal challenge in logistics is to coordinate manufacturing and consumption rates with availability of vehicles, border and customs clearance, storage, handling and distribution of products. This task cannot be fulfilled in accordance with the main logistics criterion – 'door to door' and 'just in time' – without an adequate IT infrastructure.

Addressing of supply chain management issues requires reliable data provided in a unified form, relating to how, when, where from, by which routes and by which transport modes goods are transported and will be transported in the foreseeable future. A systematic effect can only be achieved through unification and standardization of the document circulation and processing in APEC economies.

Therefore, management and communications form one intellectual and information process provided by simultaneous work of administrative bodies and communications subsystems with their respective automated systems. Therefore **the principle of integration of telecommunications and data transfer technologies with data sources and users** needs to be introduced instead of the previous principle of interfacing of various separate networks and data transfer and communication systems, which calls for infocommunications to ensure optimal functioning of the common information space.

All phases of cargo transportation planning (including development of logistics chains for particular consignments) need mathematical models to calculate scenarios involving various management actions.

New foundations are needed for commercial cooperation between railways and ports as well as other actors of the transport market in order to provide 'door to door' and 'just in time' logistics chains. Interaction of railways, seaports, cargo owners, forwarding agents, stevedore companies and other transportation process actors should be based on a clearly defined legal and financial responsibility.

Conditions are needed to enable optimal management of cargo, vehicle, information, financial and other flows so that the resources available are used in the most efficient manner based on transportation process management IT systems.

The most promising targets are:

- creation and introduction of new technologies that would provide for:
- fully automatic inspection of cargo and goods vehicles at origin points and on their way;

- fully automatic management of transportation and storage activities;
- minimized manual entry of data, e.g. through automatic reading of data on the cargo, condition of electronic locks and seals, etc.;
- transition to paperless processes through introduction of electronic digital signature;
- automated formation of all reference, report and analytical forms;
- development of SMM in what regards artificial intelligence based on workflow and production process knowledge bases, regulations and administrative documentation.

Satellite technologies should be utilized to provide the positioning of transport facilities and monitor cargo, vessels and other goods fleet, as well as operated along with radio communication and radar equipment to track and locate transport facilities. A technology needs to be developed to integrate satellite sounding in a single coordinate management system.

In the future, coordinate management should become the foundation for all transport industries and forwarding agents of APEC economies in order to provide on-line monitoring, prediction, and positioning of all moving cargo and goods vehicles and each link involved in the workflow.

3. Workshop Summary

3.1. Project Background

APEC economies are playing an important role in world's economy globalization processes where a great deal of attention is paid to development of an integrated international transportation and logistics system as a key link of the seamless supply chain. Automated Transportation Management Systems (ATMS) are proven to be effective tools of improvement of supply chain efficiency and thus, should be, developed and established to take advantage of each transportation mode and enhance overall system capacity.

Importance of achieving an APEC-wide target of a ten percent improvement in supply-chain performance by 2015 was repeatedly confirmed at APEC Leaders and Transportation Ministers meetings. Today to achieve the goals set within APEC one has to follow the global trends, e.g.: the consignors apply stricter requirements to the delivery time, and transportation service offering and quality; increased multimodal transportation; transportation standards are being unified for fast switching between cargo transportation modes; geo-reference and navigation systems are developing, international trade and customs treaties and conventions are expanding their coverage; transportation safety requirements are getting more rigid (accident rate and negative environmental footprint reduction); public-private partnerships become more and more popular in sourcing investments for implementation of transport infrastructure development projects from the sources other than state budget.

In 2010, the Committee of Trade and Investment formalized the APEC Supply-Chain Connectivity Framework and developed action plans to address the 8 key chokepoints. The project matches such APEC priorities as Chokepoint 2 encouraging the efficient use of transport infrastructure within the APEC region; Chokepoint 6 – encouraging enhancement of efficient land and multimodal connectivity.

Cooperation which is stated under General Principle 9 of the Osaka Action Agenda is achieved through intensified implementation of innovations in all transportation and logistics areas including ITS and GNSS location-based guidance and navigation systems. It is playing one of the key roles in improvement of transportation system quality which is of specific importance for trade facilitation.

Intermodal cargo flow may escalate substantially by adopting location-based ATMS, including use of GNSS, - the practice shows that cargo flow and in particular the railway cargo flow may go up by 20% using existing infrastructure.

What is particularly important is that project has contributed to studies on intensification and optimization of traffic avoiding costly investments into infrastructure construction during the times of economic uncertainty.

Project objectives aimed at resolution of an issue related to location-based transportation and relevant cargo flow management and optimization.

The main objectives of the project were as follows:

1. To analyze existing location-based logistics and transportation centers that allow improving on-line transportation and cargo flow management, reducing delivery cost and time.
2. To share experience and best practices in construction, harmonization of approaches of transportation and cargo flow monitoring and logistics management systems utilization.
3. To formulate recommendations for unified APEC-wide standards for transportation and cargo flow management systems.

4. To establish a mechanism of coordination of activities aimed at enhancement of global supply chain routes in the Asia-Pacific region through advanced ATMS technologies on the basis of APEC TPTWG and its IIEG and GIT expert teams.

The project has become a direct contribution to one of the major APEC priorities for 2012 that were announced in November, 2011 on APEC CEO Summit in Honolulu: establishment of reliable supply chains. The task was formulated in the following way: “Making commodities less costly and enhancing the reliability of their movement along the entire logistic chain, from producer to consumer, is a key factor in international trade”. This involves forming economically viable and secure supply chains, coordinating various types of transport, providing transport hubs and corridors with state-of-the-art information technology and satellite navigation systems, and harmonizing transportation security standards.

The Ministerial Statement in 2009 in Manila, Philippines, stressed the necessity of “implementation of selected integrated technologies in the management and operation of intermodal transportation such as ITS, the Global Navigation Satellite System (GNSS) and the Secure and Smart Containers (SSC).”

Also the project goes in line with the tasks placed by the Ministers in their Joint Ministerial Statement adopted at 7th Transportation Ministerial Meeting held in San Francisco in 2011 – “We also express our support for enhancing seamless interconnectivity among the modes and direct the TPTWG to continue its work to ensure the safe, secure and efficient movement of people and goods, while improving the conservation of natural resources and mitigating environmental impacts”. ”We particularly stress the importance of enhancing physical connectivity through reducing choke points and integrating markets through the implementation of the APEC Supply-Chain Connectivity Framework Action Plan, to which the transportation sector is a key contributor”.

And obviously this project aims at addressing Chokepoint 2: Inefficient or inadequate transport infrastructure; Lack of cross border physical linkages (e.g. roads, bridges); Chokepoint 6: Underdeveloped multi-modal transport Capabilities; inefficient air, land, and multimodal connectivity; as well as addresses a number of Chokepoint 3 issues: Lack of capacity of local/regional logistics sub-providers and Chokepoint 7: Variations in cross-border standards and regulations for movement of goods, services and business travelers regarding improvement of quality of APEC economies’ logistics services and management and logistics safety evolution.

Thus the project facilitated APEC transport system improvement and transportation service export enhancement by securing the transportation, expediting the cargo flows, and cutting transportation costs.

As already mentioned above the has significantly contributed to the APEC 2012 top priority policy direction – establishment of reliable supply chains. The “Development of Intelligent Supply Chains” initiative seeks to bring more attention to the application of modern technologies in transportation making the overall supply chain greener, smarter and more efficient and visible.

3.2.Workshop Summary and Recommendations

Delegates from 9 APEC economies (China, Japan, Malaysia, the Philippines, Russia, Chinese Taipei, Thailand, the USA, Viet Nam) as well as from Israel and Turkey met on 27-29th 2012 in Sochi, Russia to participate in the workshop on Automated transport management systems implementation for optimizing logistics within the Asia-Pacific with an emphasis on ITS and GNSS application. The workshop in conjunction with technical

tour was conducted as the key element of APEC Project S TPT 01 12T. The Workshop was co-organized by the APEC Secretariat, the Russian Federal Space Agency (Roscosmos), Russian Fund of Education Programs «Economics and Management» and JSC “NIS” with support of Ministry of Transport of the Russian Federation and Ministry of Economic Development of the Russian Federation.

The three-day Workshop (1.5-day - presentations and 1.5 day – technical tour) became an open platform for discussing the findings of the study as well as best practices and experience in ATMS utilization in the participating economies. We had speakers from APEC economies (China, Japan, Malaysia, the Philippines, Russia, Chinese Taipei, Thailand, the USA, Viet Nam) who delivered presentations on existing transportation and cargo flow monitoring and logistics management systems in each economy. The technical tour provided the participants with an opportunity to take a closer look to the facilities of the transport infrastructure used to prepare the 2014 Winter Olympics in Sochi, as well as to the multimodal transportation monitoring system for the equipment and cargos brought in to enable the Olympic Games.

Following up the information presented at the Workshop, active discussions and practical experience obtained during the technical tour the participants formulated **draft recommendations to the APEC Transportation Working Group** for harmonization of approaches to transportation and freight flow management and improvement of compatibility of and communication between the existing and future SMM in APEC economies in order to improve their efficiency:

1. **To encourage proposals for development and harmonization of national standards, protocols and data formats for monitoring and management systems in cross-border logistics with a goal to optimize customs procedures within the context of global integration.**

2. **To encourage facilitation of data and experience exchange of advanced practices in implementation and operation of monitoring and management systems of transportation and freight flows in APEC economies.**

3. **To encourage development and harmonization of standards for information support, including documentary requirements and forms for storage, transportation, customs clearance and classification of goods and vehicles.**

4. **To encourage harmonization of standards for onboard equipment and software, including support to ITS user services and hazardous goods transportation monitoring.**

5. **To encourage harmonization of standards for cargo identification, vehicle identification, including remote station RFID, bar coding, alphametric coding and smart cards, positioning tools including GPS and GLONASS.**

6. **To encourage development of a common technology and software support to the "single window" system when communicating with customs systems.**

7. **To encourage creation of a platform for management systems to track and trace freight and transport in and out of the APEC economies such as ITS and GNSS.**

8. **To encourage creation of more efficient, collaborative and integrated structures to support the various data management for the Government, Service Providers, Cargo Owners/Producers and Users i.e. achieving "Virtual Logistics Capability" for the benefits of APEC economies.**

9. **APEC should encourage the convening of a joint workshop together with IIEG of TPTWG and Customs and other relevant for a to assess progress towards development of standards for interconnectivity and interoperability of ITS and GNSS technologies.**

10. **APEC should encourage additional research by various scientific experts to assess the status and progress of harmonizing, coordinating and implementing ITS and GNSS technologies.**

11. **APEC should work to encourage the provision of additional incentives to continue development and harmonized implementation of ITS and GNSS technologies.**

3.3. Workshop Agenda

Workshop Agenda

Automated Transport Management Systems Implementation for Optimizing Logistics within the Asia-Pacific with an Emphasis on ITS and GNSS Application

27 – 29 November 2012
Sochi, Russian Federation

TIME	ACTIVITY	COMMENTS
Day 1 – 27.11.2012		
07.00-08.30	Breakfast	Marins Park Hotel
09.00-09.30	Registration	Sanatorium "Chernomorye"
Plenary Session (Part 1) Moderator – Alexey Sapetko, APEC Secretariat		
09.30-10.05	Welcome speech	Sanatorium "Chernomorye"
09.30-10.05	JSC «NIS»	Olga Nugaeva, Russia
09.30-09.40	APEC Secretariat	Alexey Sapetko, APEC Secretariat
09.40-09.50	Roscosmos	Anna Prokopchik, Russia
09.50-10.00	Ministry of Transport RF	Artur Karlov, Russia
10.00-10.10	Group photo	
10.15-10.45	Coffee-break	
Plenary Session (Part 2) Moderator – Alexey Sapetko, APEC Secretariat		
10.45-11.15	Welcome speech	
10.45-10.55	Research Institute of Transport Infrastructure	Alexey Vorontsov, Russia

TIME	ACTIVITY	COMMENTS
10.55-11.05	Nomura Research Institute	Shinichi Ishii, Japan
11.05-11.15	JSC «NIS»	Alexander Boreyko, Russia
Session 1. Existing transportation and cargo flow monitoring and logistics management systems in APEC economies Moderator – Artur Karlov, Russia		
11.15-11.35	APEC Initiatives and priorities	Artur Karlov, Russia
11.35-12.10	Results of the preliminary study by Project Executers.	Alexey Vorontsov, Russia
12.10-14.30	APEC economies presentations:	
12.10-12.25	Existing water transportation monitoring and management systems in China.	Du Zhongping, People's Republic of China
12.25-12.45	Global Supply Chain Visibility Initiatives in Japan.	Shinichi Ishii, Japan
12.45-13.00	The Existing Transportation And Cargo Flow Monitoring And Logistics Management Systems.	Subestheran Suparmaniam, Malaysia
13.00-13.20	Current logistics information services in Chinese Taipei.	Jaching Chou, Chinese Taipei
13.20-13.45	Case Study: Thailand.	Parinya Tanadtang, Thailand
13.45-14.00	Current status on Logistics in Vietnam.	Thang Pham Truong, Vietnam
14.00-14.15	Group photo	
14:30-15:30	Lunch	Sanatorium "Chernomorje"
Session 2. Development and deployment of automated transportation management systems for the purposes of logistics optimization, exchange of the best practices Moderator – Yaroslav Domaratsky, Russia		
15.30-16.30	APEC economies presentations :	Sanatorium "Chernomorje"
15.30-15.40	Development and deployment of ATMS for Logistics Optimization in China.	Li Bin, People's Republic of China
15.40-15.50	Implementation of industry specialized navigation information systems on the large fragment (14 000 а/м)	Alexander Lyapin, Russia
15.50-16.00	Application of satellite navigation technologies in preparation for the Olympic games in Sochi in 2014. Experience and perspectives.	Vitaliy Poltaratskiy, Russia
16.00-16.10	ERA-GLONASS platform structure, unification of	Yaroslav Domaratskiy, Russia

TIME	ACTIVITY	COMMENTS
	subscriber equipment, additional opportunities for end users.	
16.10-16.30	Remote sensing, GPS monitoring technoloiges for logistics purposes in the USA and Canada.	Patrick Sherry, USA
16.30-17.00	Coffee-break	Sanatorium "Chernomorje"
Session 3. Specificsofstate regulation and approaches for harmonizing regulatory and legal frameworks of APEC member economies Moderator–Shinichi Ishii, Japan		
17.00-18.00	APEC economies presentations :	Sanatorium "Chernomorye"
17.00-17.10	The Existing Transportation And Cargo Flow Monitoring And Logistics Management Systems in the Philippines.	Andrew Basallote, The Philippines
17.10-17.30	GLONASS Government Policy, Status and Modernization.	Tatyana Mirgorodskaya, Russia
17.30-18.00	Day Outcomes	
18:30 – 22:30	Welcome Reception	Marins Park Hotel
Day 2 – 28.11.2012		
07.00-08.30	Breakfast	Marins Park Hotel
08.45-09.15	Registration	Sanatorium "Chernomorje"
Session 4. Economic effectiveness of utilizing automated transportation management systems for optimizing freight flow logistics Moderator – Patrick Sherry, USA		
09.15-10.15	APEC economies presentations :	Sanatorium "Chernomorye"
09.15-09.30	Russian policy in the field of development and deployment of automated transportation management systems and GNSS for the purposes of logistics optimization.	Anatoliy Popov, Russia
09.30-09.45	Establishing of new transport corridors trends for optimizing cargo flows in APEC economies.	Svetlana Vorontsova, Russia
09.45-10.00	Effects achieved by usage of transport monitoring sectoral systems.	Roman Osipov, Russia
10.00-10.15	Development of navigation systems for operation control over freight road transportation on the GLONASS basis.	Andrey Ismailov, Russia
10.15-10.30	Benefits of adopting GNSS and ITS in logistics services.	Jaching Chou, Chinese Taipei
10:15-10:45	Coffee-break	Sanatorium "Chernomorye"

TIME	ACTIVITY	COMMENTS
10:45-11.15	Discussion of the Workshop Outcomes	
11.15-12.15	Discussion of preliminary recommendations	
12:30-13:30	Lunch	Sanatorium “Chernomorye”
Technical Tour		
14:00-14:30	Transfer	From Sanatorium “Chernomorye”
	Group 1 Logistics and Transportation Centre office Hall	Group 2 Sanatorium “Chernomorye” Meeting room
14:30-15:00	Goals and objectives of the Logistics and Transportation Centre. Current status of the project. Alexander Boreyko, Russia	Operation of the Automated Transport Management System Logistics and Transportation Centre’s entire software and hardware package in railway and water transportation. Sergey Kosenko, Russia
15:00-15:30	Technological management chain of multimodal transportation by Automated Transport Management System Logistics and Transportation Centre. Alexander Belka, Russia	Hardware and software facilities of the Automated Transport Management System Logistics and Transportation Centre, its functions. Denis Korovushkin, Russia
15:30-15:40	Transfer	From Sanatorium “Chernomorye”
	Group 1 Sanatorium “Chernomorye” Meeting room	Group 2 Logistics and Transportation Centre office Hall
15:30-16:00	Operation of the Automated Transport Management System Logistics and Transportation Centre’s entire software and hardware package in railway and water transportation. Sergey Kosenko, Russia	Goals and objectives of the Logistics and Transportation Centre. Current status of the project. Alexander Boreyko, Russia
16:00-16:30	Hardware and software facilities of the Automated Transport Management System Logistics and Transportation Centre, its functions. Denis Korovushkin, Russia	Technological management chain of multimodal transportation by Automated Transport Management System Logistics and Transportation Centre. Alexander Belka, Russia
16:30 – 16:45	Outcomes, questions and answers	Outcomes, questions and

TIME	ACTIVITY	COMMENTS
	Svetlana Vorontsova, Russia	answers Alexander Boreyko, Russia
16:45-17:00		Transfer to the Sanatorium “Chernomorye”
18:00-20:00	Dinner	
Day 3 – 29.11.2012		
Technical Tour		
09:00-10:00	Transfer	From Marins Park Hotel
10:00-10:20	Review of the transport infrastructure facility	RWY Station Vesyoloye (Freight Yard No. 1)
10:20-10:30	Transfer to Checkpoint №5	
10:30-10:40	Demonstration of Olympic facilities	
10:40-11:00	Transfer to the seaport Port Sochi – Imereti	
11:00-11:20	Review of the transport infrastructure facility	The seaport Port Sochi – Imereti
11:20-11:30	Transfer to Olympic facilities	The Coast cluster
11:30-11:50	Review of Olympic facilities	The Coast cluster
11:50-12:00	Transfer to “Amshencky dvor” cafe	
12:00-13:00	Lunch	“Amshencky dvor” cafe
13:00-14:30	Transfer to the Mountain Cluster with a stop at the viewing point	
14:30-14:45	Demonstration of the springboard facility	
14.45-15:00	Transfer to Esto-Sadok	
15:00-15:40	Review of Esto-Sadok hub, ski lifts and runs	
15:40-16:00	Transfer to “Medvezhiy ugol” cafe	
16:00-16:30	Coffee-break	“Medvezhiy ugol” cafe
16:30-18:00	Transfer back to Marins Park Hotel	
18:00-21:00	Final speech. Gala dinner.	

3.4. List of Workshop Participants

List of speakers and experts (with job titles and contact details):

Economy	Speaker	Gender	Title and Organization	Email
APEC Secretariat	Alexey Sapetko	M	Program Director, APEC Secretariat	as@apec.org
China	Du Zhongping	M	Director, Research Institute of Highway Ministry of Transport National Center of ITS Engineering & Technology	duzhongping@cttic.cn
Japan	Shinichi Ishii	M	Senior Consultant, Nomura Research Institute	s-ishii@nri.co.jp
Malaysia	Subestheran Suparmaniam	M	Principal Assistant Secretary	subestheran@mot.gov.my
Republic of the Philippines	Andrew Basallote	M	Assistant Director General II, Civil Aviation Authority of the Philippines	andybasallote@yahoo.com
Russia	Alexey Vorontsov	M	Director General, Research Institute of Transport Infrastructure	nipirti@mail.ru
Russia	Svetlana Vorontsova	F	Deputy Director General, Research Institute of Transport Infrastructure	nipirti@mail.ru
Russia	Anna Prokopchik	F	Senior Expert, Federal Space Agency	anna.prokopchik@gmail.com
Russia	Alexandr Boreyko	M	Head of LTC Department JSC “Navigation-information systems”	boreikoae@nis-glonass.ru
Russia	Olga Nugaeva	F	Director of Department of International Cooperation JSC “Navigation-information systems”	NugaevaOM@nis-glonass.ru
Russia	Denis Korovyshkin	M	JSC “Navigation-information	korovushkindv@nis-glonass.ru

Economy	Speaker	Gender	Title and Organization	Email
			systems”	
Russia	Alexander Belka	M	Director, Logistics and Transportation Centre	Belkaaa@tdog2014.com
Russia	Vitaly Poltoracky	M	Head of Development Department, JSC “M2M telematics”	vpol@m2m-t.ru
Russia	Sergey Kosenko	M	Head of Office in Moscow, “SeverTransAvtomatika” Ltd	SKosenko@transsys.ru
Russia	Roman Osipov	M	Deputy Head of Project Management Department, JSC “Navigation-information systems”	osipovra@nis-glonass.ru
Russia	Andrey Ismailov	M	Head of planning and monitoring department, “Transnavigatsiya”	trn@transnavi.ru
Russia	Arthur Karlov	M	Ministry of Transport	KarlovAV@mintrans.ru
Russia	Yaroslav Domoratsky	M	Program Office Director,NP “GLONASS”	yaroslav@glonassunion.ru
Russia	Anatoliy Popov	M	Ministry of Transport	
Russia	Alexander Lyapin	M	FSUE “Pochta Rossii”	Alexander.Lyapin@russianpost.ru
Russia	Tatyana Mirgorodskaya	F	Senior Engineer, FSUE TSNIImash	tatyana.mirgorodskaya@glonass-iac.ru
Russia	Valentina Furtas	F	Director of Transport Infrastructure Development Institute, Moscow branch	+7 (495) 864 55 23
Russia	Elena G. Nogova	F	Head of Passenger and Freight Transportation Forecasting & Modeling, Transport Infrastructure development Institute	+7 (812) 648 19 65
Chinese Thaipei	Jaching Chou	M	Senior	sltcvjaching@gmail.

Economy	Speaker	Gender	Title and Organization	Email
			Transportation Analyst, Institute of Transportation, Ministry of Transport and Communications	com
Thailand	Parinya Tanadtang	M	Head of Group of innovation application for planning, Ministry of Transport	katan_tu@hotmail.com
USA	Patrick Sherry	M	Director, Associate Professor, University of Denver	psherry@du.edu
Viet Nam	Pham Truong Thang	M	Director, Science&Technology Centre for Urban Transport and Railways, Ministry of Transport	thangpt19@gmail.com

List of active participants (with job titles and contact details):

Economy	Participant	Gender	Title and Organization	Email
China	Li Bin	M	Director, China Transport Telecommunications & Information Center	libin@itsc.com.cn
Japan	Akira Iwata	M	General Manager of Moscow branch, Nomura Research Institute	a-iwata@nri.co.jp
Japan	Andrey Rodionov	M	Research director, Nomura Research Institute	a-rodionov@nri.co.jp
Malaysia	Muhammad Naim Saad	M	Assistant Secretary, Ministry of Transport	muhammadnaim@mot.gov.my
Republic of the Philippines	Ruby Manzo	F	Senior Transportation Development Officer, Department of Transportation and Communications	rdmanzo.dotc@gmail.com
Russia	Yuliya Egorova	F	Press Centre, Ministry of Economic Development	julia@egorova.cc
Russia	Alexey Ozerov	M	Head of Foreign Economic Activities	a.ozerov@vniias.ru

Economy	Participant	Gender	Title and Organization	Email
			Department, JSC "Research & Design Institute for Information Technology, Signalling and Telecommunications on Railway Transport"	
Russia	Viktoriya Kisel	F	Head of PR events Department, JSC "NIS"	KiselVV@nis-glonass.ru
Russia	Sergey Bichkov	M	Head of IT Department, Ltd "SeverTransAvtomatika"	bsv@satran.ru
Russia	Andrey Varnaev	M	Head of IT Department, Transportation Directorate of the Olympic games	Offis-sochi@tdog2014.com
Russia	Ivan Kuzmenko	M	Director General, "Navigator-Yug" Ltd	kid27@mail.ru
Russia	Alexander Drozdov	M	Head of Capital Construction Department, JSC "Research & Design Institute for Information Technology, Signalling and Telecommunications on Railway Transport"	a.ozerov@vniias.ru
Russia	Alexander Tkachenko	M	IT Department, Transportation Directorate of the Olympic games	a.e.tkachenko@me.com
Russia	Valeriy Ozik	M	Russian Fund of Education Programs "Economics and Management"	ov@group-adk.ru
Russia	Michael Shchetinin	M	Russian Fund of Education Programs "Economics and Management"	schetinin@group-adk.ru
Russia	Alexander Kiryanov	M	Deputy Head of LTC Department JSC "Navigation-information systems"	kiryanovap@nis-glonass.ru
Russia	Dmitry Vesovshchyk	M	Deputy Head of Technical Support Department, JSC "Navigation-information	vesovshchukdv@nis-glonass.ru

Economy	Participant	Gender	Title and Organization	Email
			systems”	
Thailand	Saritpong Boriboonsook	M	Director, Transport and Traffic Information Technology Center, Ministry of Transport	ritiamorn@yahoo.com
USA	Manali Gadgil	F	Research assistant, University of Denver	manalisatish@yahoo.com
Viet Nam	Sang Ho Anh	M	Senior Official, Science and Technology Department, Ministry of Transport	hoanhsang@gmail.com
Israel	Paula Green	F	Regional Sales Manager Cellocator Division, Pointer Telocation Ltd.	Paulag@pointer.com
Turkey	Olcay Taysi	M	General Manager, Sade Teknoloji Arge	olcay.taysi@sadearge.com
Turkey	Tufan Ozdogan	M	Regional Manager, Sade Group	tufan.ozdogan@sadearge.com

3.5. Workshop Presentations Summaries

Below are summaries of the presentations delivered during the workshop.

«Russian Initiatives in Transport Sector for APEC 2012»

Mr Artur Karlov, Head of the Russian Delegation to APEC TPTWG, Counselor of International Cooperation Department, Ministry of Transport of the Russian Federation.

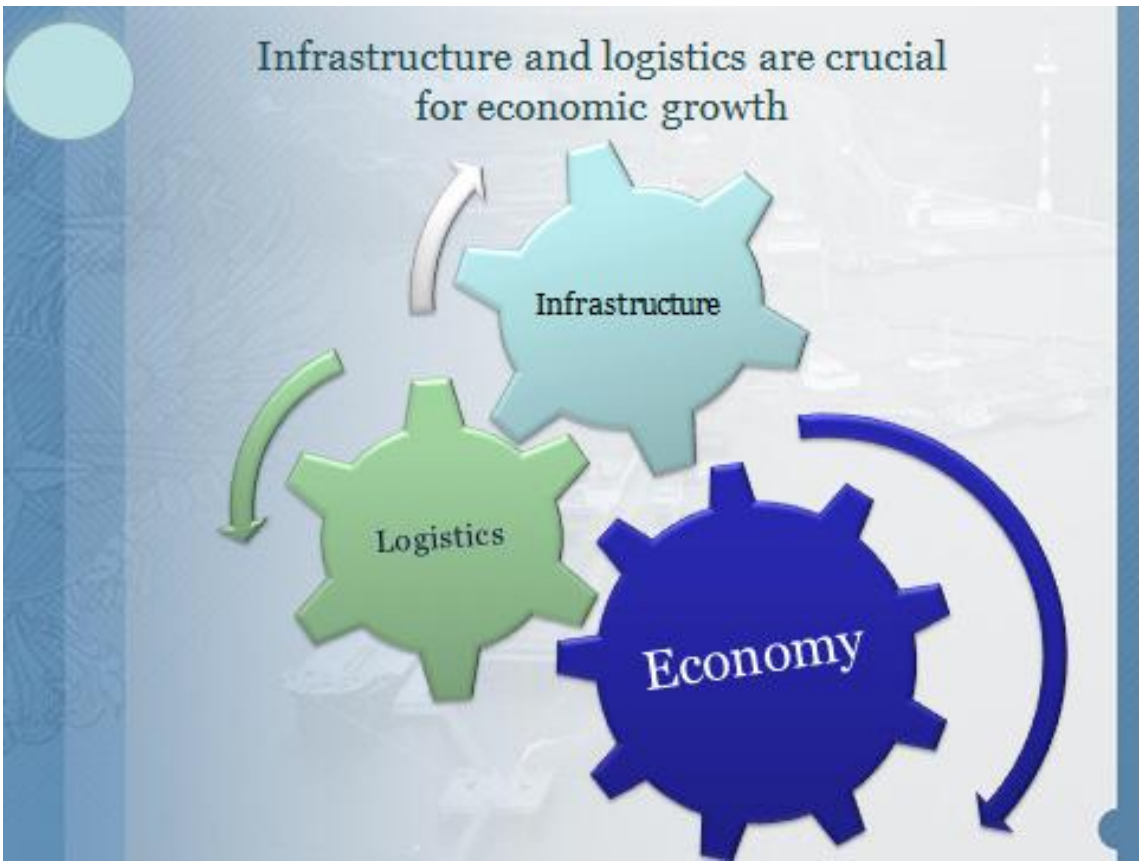
The presentation was dedicated to different ways of modernization of the supply chains – as they play an important role in international trade and economic growth. It gave a detailed aspects of Russian Initiatives in Transport Sector for APEC.

Mr Karlov presented the supply chains issue in APEC from two points of view – in economic terms and in terms of a technical «transport» approach. The speaker stressed that the infrastructure and logistic services are the basis of the supply chains.

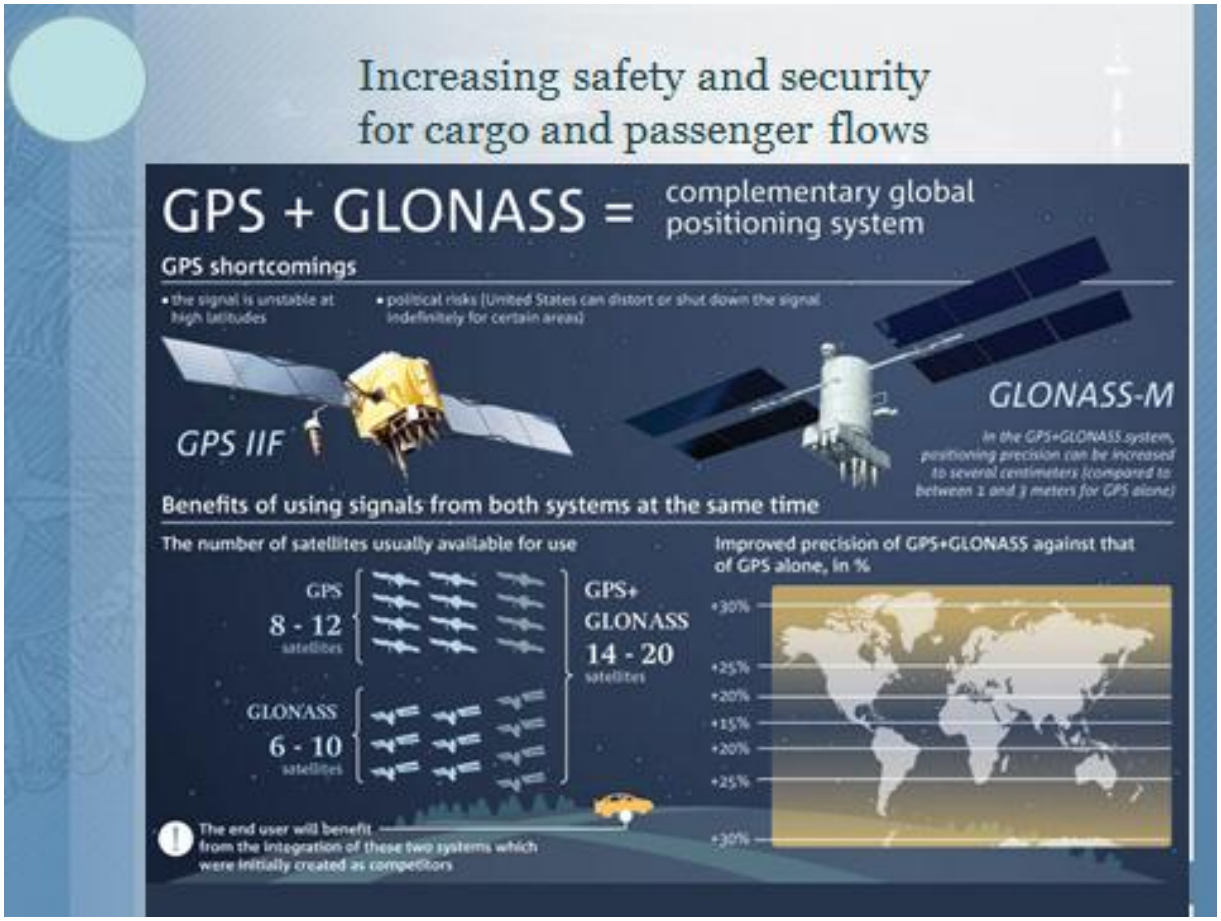
In the first part of his report he described the technologies of the new Intelligent Supply Chains system. This initiative aims to ensure the quality and speed of delivery as well as to provide visibility and control over transportation of any type of cargo. Mr. Karlov drew attention to the fact that the «Supply Chain should be seen as a single modern mechanism equipped with the latest “intelligent” technologies to sustain the interests of producers and consumers, ensure the quality and speed of delivery, provide visibility and control over transportation of any type of cargo. Priority should be given to optimizing supply chains via equipping them with modern technology such as ITS, GNSS-based monitoring devices, transport management centres, etc. enhancing overall efficiency of supply chains, preferably, in its weakest links».

Mr Karlov described the benefits of using signals from both GPS and GLONASS systems at the same time – that makes supply chains more safe and secure.

Diversification of global supply chain routes is also a way of modernization in this domain. The strategic aim for the Russian Federation is to attract at least 10 % of cargo, that is currently transferred through the Suez channel.




Strategic aim for the Russian Federation –
to attract at least 10 % of cargo, that is currently transferred
through the Suez channel
Potential Volume of Cargo Transshipment
10 %
25 mln. TEUs are transferred annually by the sea route through the Suez channel between Eastern Asia and Europe
9

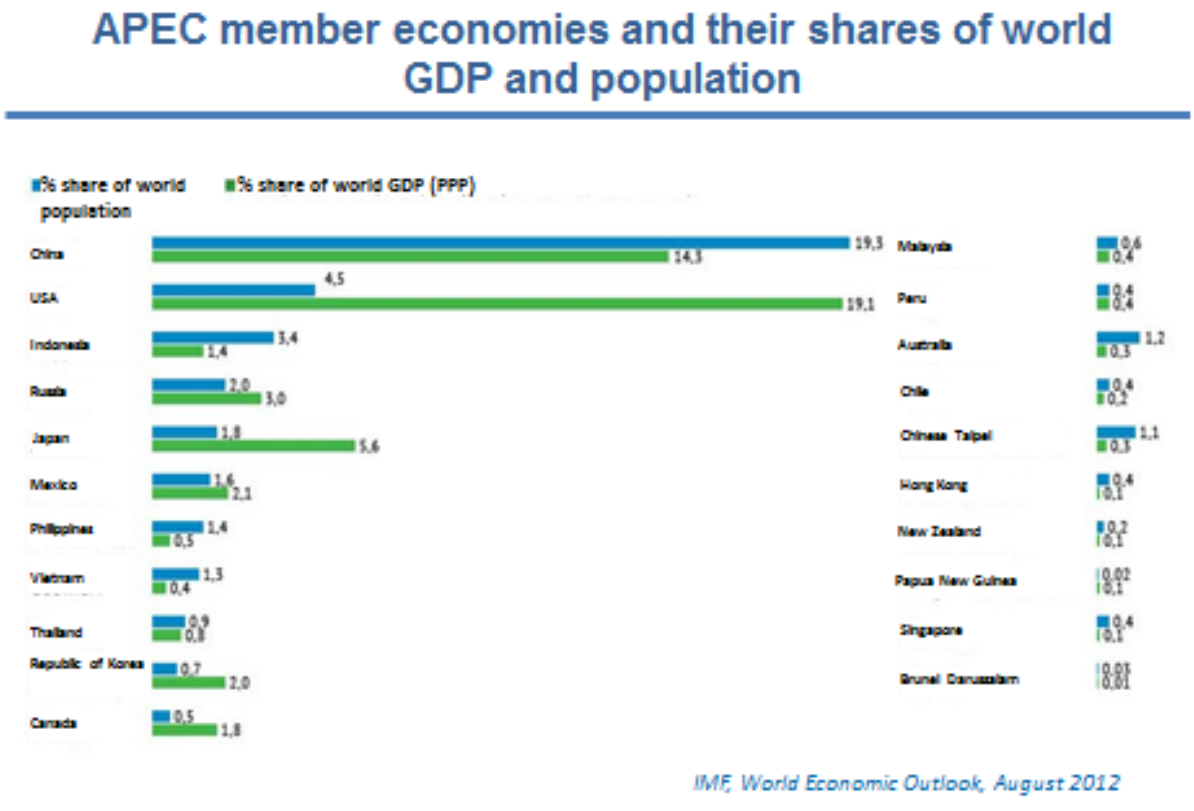

Increasing safety and security
for cargo and passenger flows
GPS + GLONASS = complementary global positioning system
GPS shortcomings
• the signal is unstable at high latitudes
• political risks (United States can distort or shut down the signal indefinitely for certain areas)
GPS IIF
GLONASS-M
In the GPS+GLONASS system, positioning precision can be increased to several centimeters (compared to between 1 and 3 meters for GPS alone)
Benefits of using signals from both systems at the same time
The number of satellites usually available for use
GPS
8 - 12
satellites
GLONASS
6 - 10
satellites
GPS+ GLONASS
14 - 20
satellites
Improved precision of GPS+GLONASS against that of GPS alone, in %
+30%
+25%
+20%
+15%
+20%
+25%
+30%
The end user will benefit from the integration of these two systems which were initially created as competitors

Mr Alexey Vorontsov, Research Institute of Transport Infrastructure Development., Russia

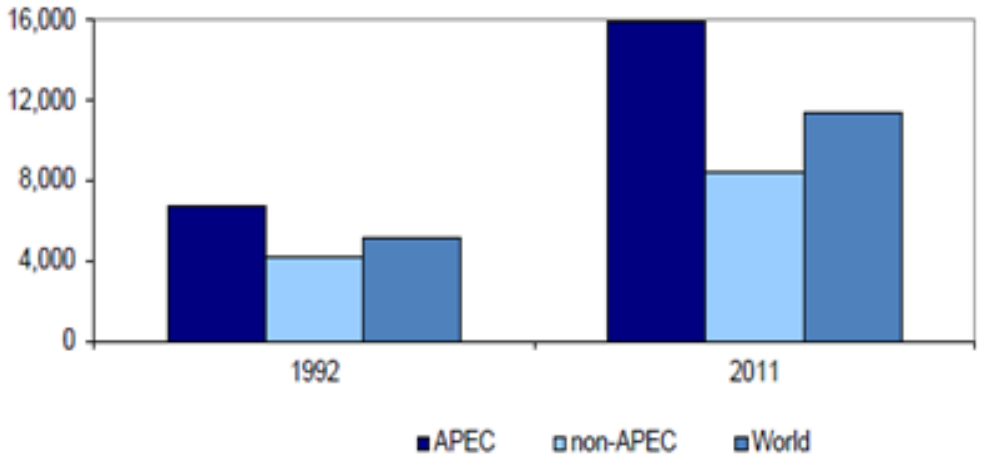
Mr. Vorontsov in his presentation revealed the main features of Automated Transport Management Systems Implementation for Optimizing Logistics within the Asia-Pacific.

He described the practical aspects of automated logistics management, used in APEC economies and gave examples of projects for mass automated data processing. In particular - NACCS (Nippon Automated Cargo and Port Consolidated System, Inc.) – a logistics platform based on Japanese standards, ezTrack**,** Korean Global Cargo Tracking System (GCTS), etc. As an example of the new technologies Mr. Vorontsov presented a tracker module used for smart container identification, positioning and communication.

The speaker also presented recommendations on creation of a common technology platform for SMM, including common standards for information support (forms of documents for storage, transportation, customs clearance, and classification of goods and vehicles); for onboard equipment and software including support to ITS user services and hazardous goods transportation monitoring; for cargo identification including RFID, bar coding and smart-cards; for vehicle identification including long range RFID, alphanumeric coding, and smart cards; for vehicle positioning tools including GPS and GLONASS; for means of communication between vehicles and logistics centers; a component supporting the planning and decision making during logistics activities. He also proposed to use a simulation component as a tool to evaluate logistics options and a common technology and software support to the single window system when communicating with customs systems.



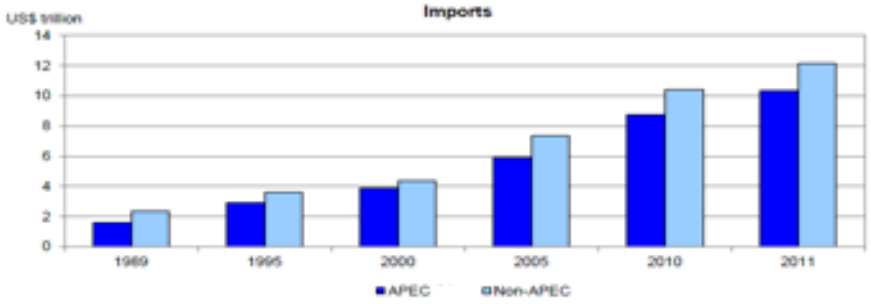
GDP per capita (PPP) of APEC members compared to other countries PPP (international dollars)



IMF, World Economic Outlook, August 2012

3

Evolution of APEC's exports and imports compared to other countries



IMF Direction of Trade Statistics & Balance of Payments 2011

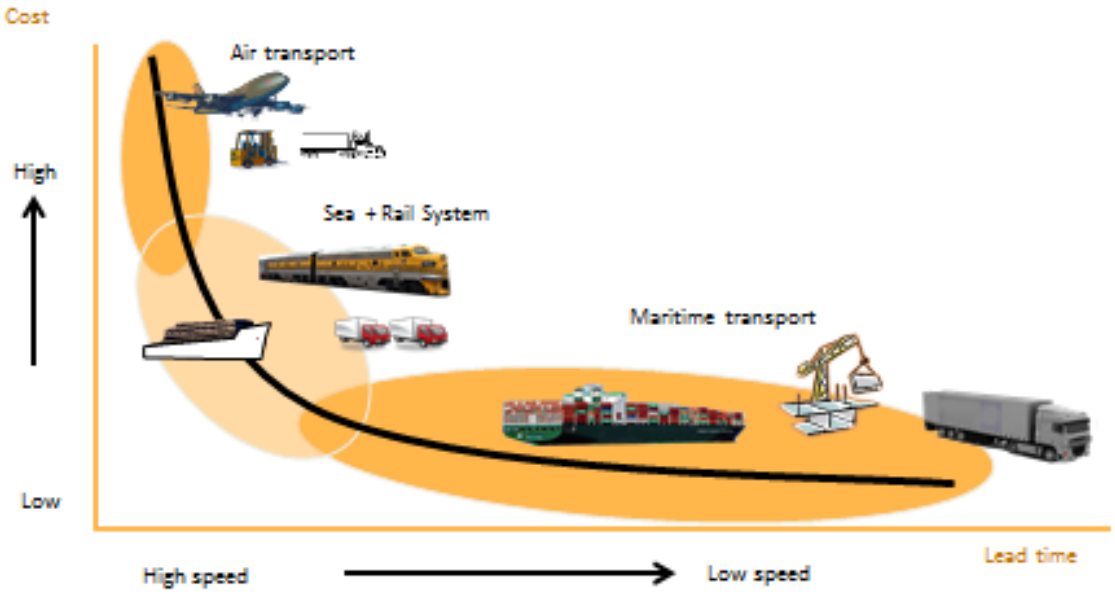
4

Evolution of world maritime container traffic for 2005-2011, million TEUs

Drewry, Maersk, Kuehne+Nagel

5

Combined sea-rail transport concept by Toshiba Logistics Co



Toshiba Logistics Corp.

7

Positioning with GNSS

GNSS orbit groups (11.2012)

	GPS	GLONASS	Galileo	Compass
Satellites in operation	30	24	2	-
Satellites being commissioned	-	-	2	12
Satellites undergoing maintenance	1	3	-	-
Reserve satellites	-	3	-	-
Satellites under testing	-	1	-	-
Satellites that are being removed from operation	-	-	-	-

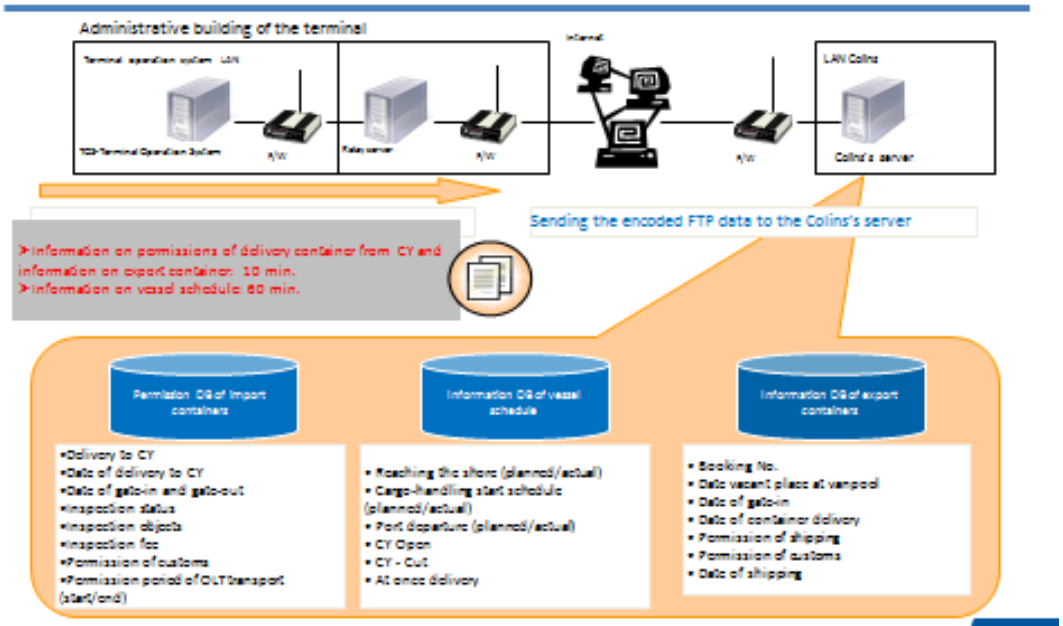
GPS + GLONASS = reliable positioning!

9

Outline of Container Logistics Information Service (Colins)

11

Colins operation



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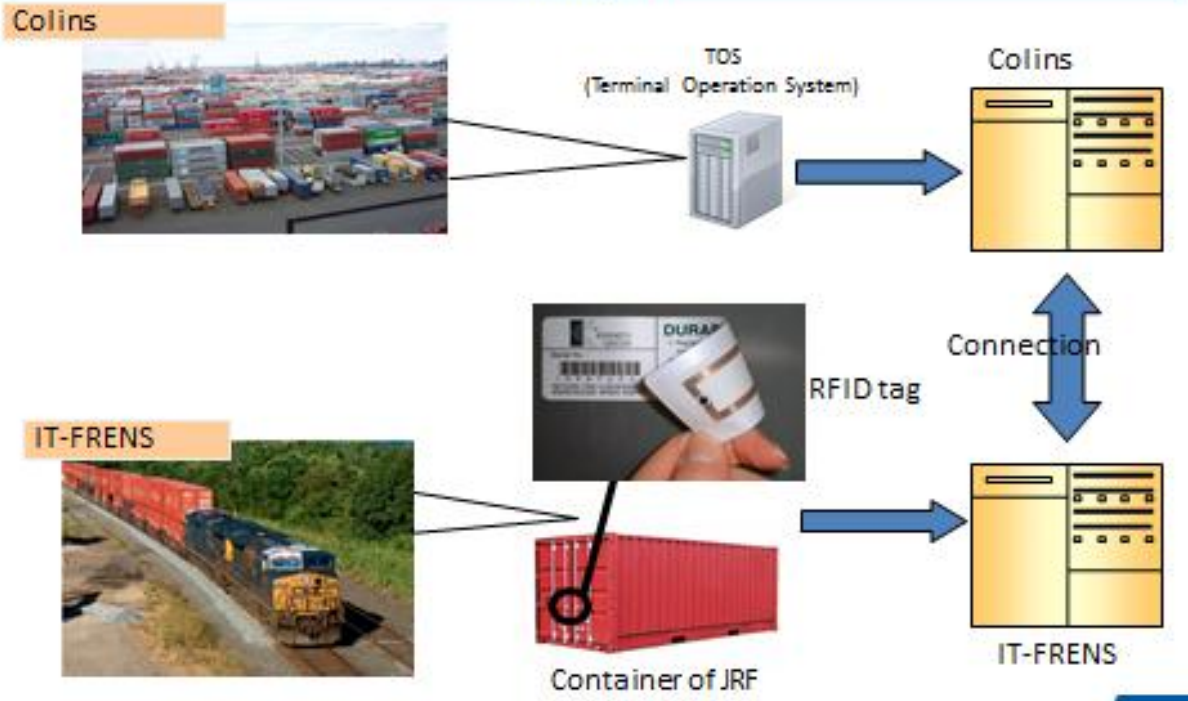
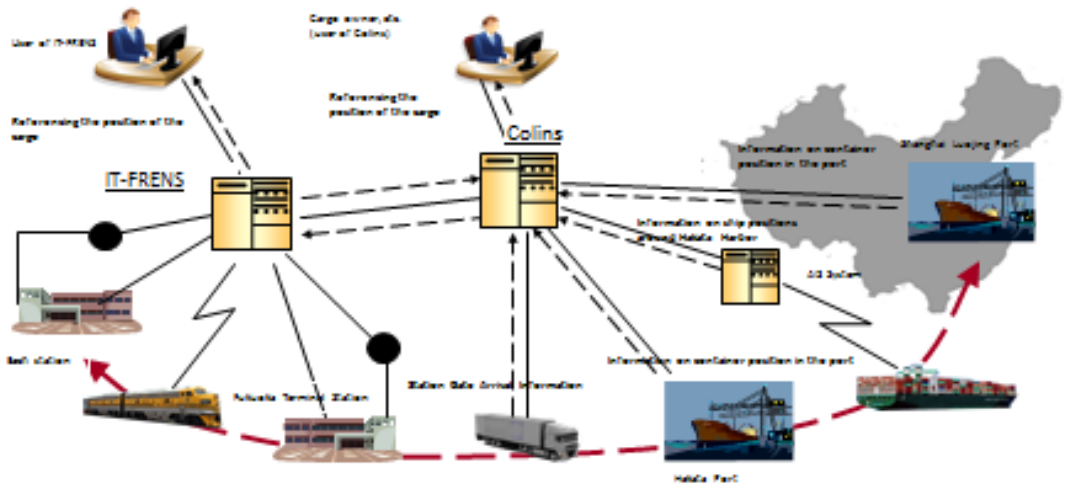
Information interaction between systems for monitoring of transportation and freight flows on maritime and railway transport in Japan



13

Communication between the systems for monitoring of transportation and freight flows on maritime and railway transport in Japan



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Phases of the pilot program focused on testing out the use of EPCIS standards for the tracking of goods within an international transport chain

Phase 3

Tokyo → Amsterdam
Electronic Goods
Ocean
February 2009

Fully automated reading of tags (fixed readers)
Use of electronic seals on container (proof of closure)
Parties involved are AEO (Authorised Economic Operator)
Involvement of Customs (use of UCR; draft of "green lane")

Phase 1

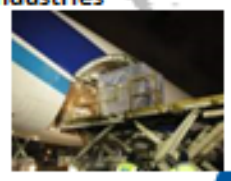
Hong Kong → Tokyo
Footwear
Ocean
February 2007

Handheld readers
Connect EPCIS's in several countries

Phase 2

Shanghai → LA
Electronic Goods
Agricultural Machinery
Air, Ocean, Overland
February 2008

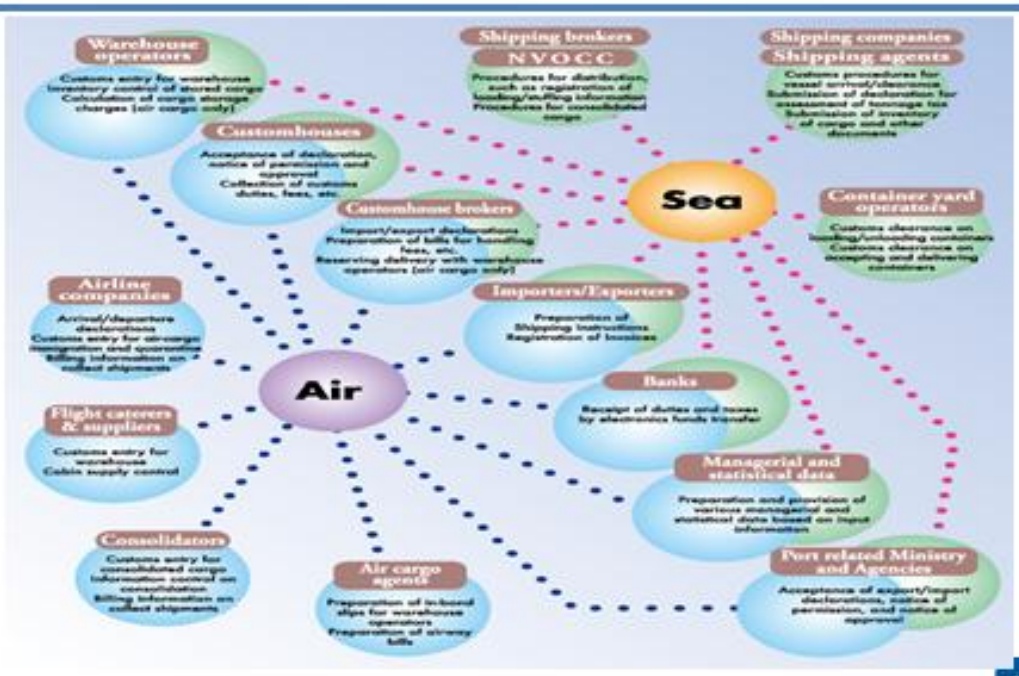
Handheld readers
Hibernating active tags in plane
Connect EPCIS's in several countries between different industries



Source: Nomura Research Institute

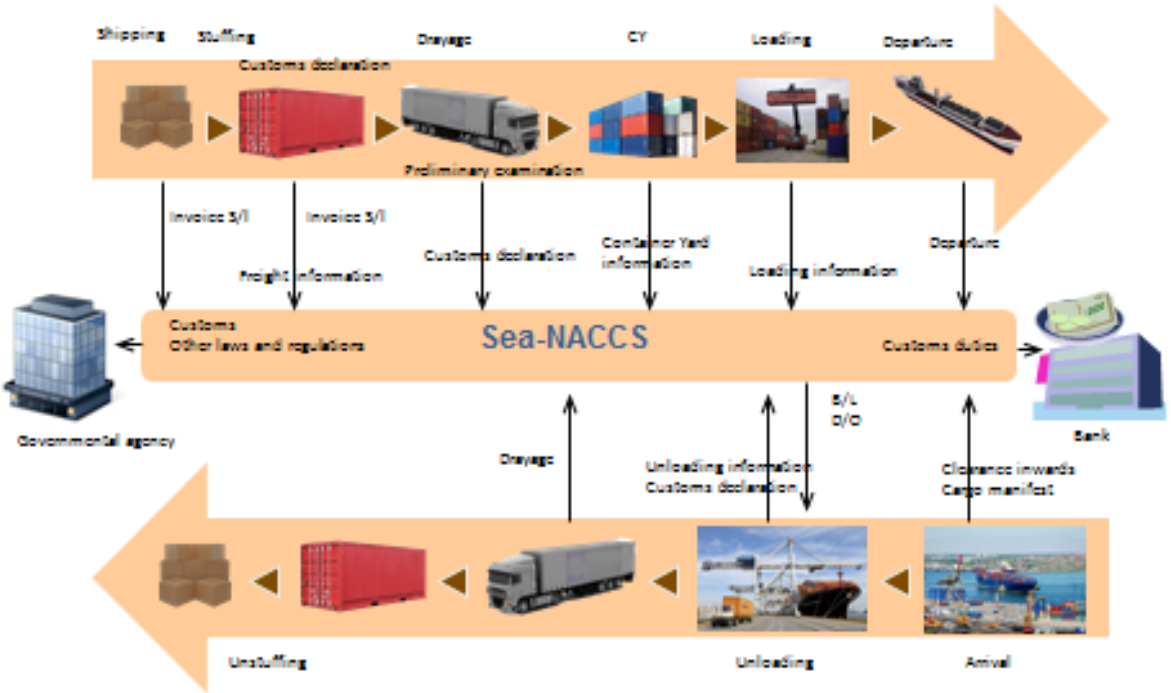
15

Users of NACCS



17

Data flows within Sea-NACCS (Nippon Automated Cargo and Port Consolidated System, Inc.) – a logistics platform based on Japanese standards

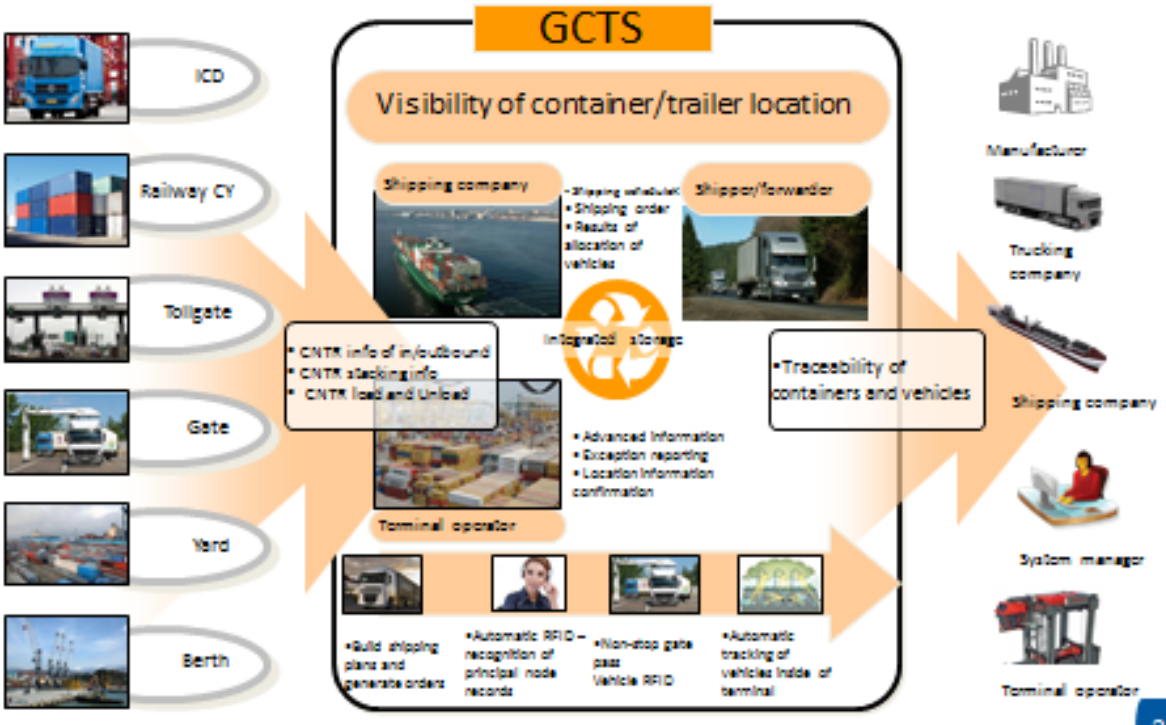


18

ezTrack operating principles

19

Global Cargo Tracking System (GCTS), South Korean monitoring system using GPS-trackers and RFID technology



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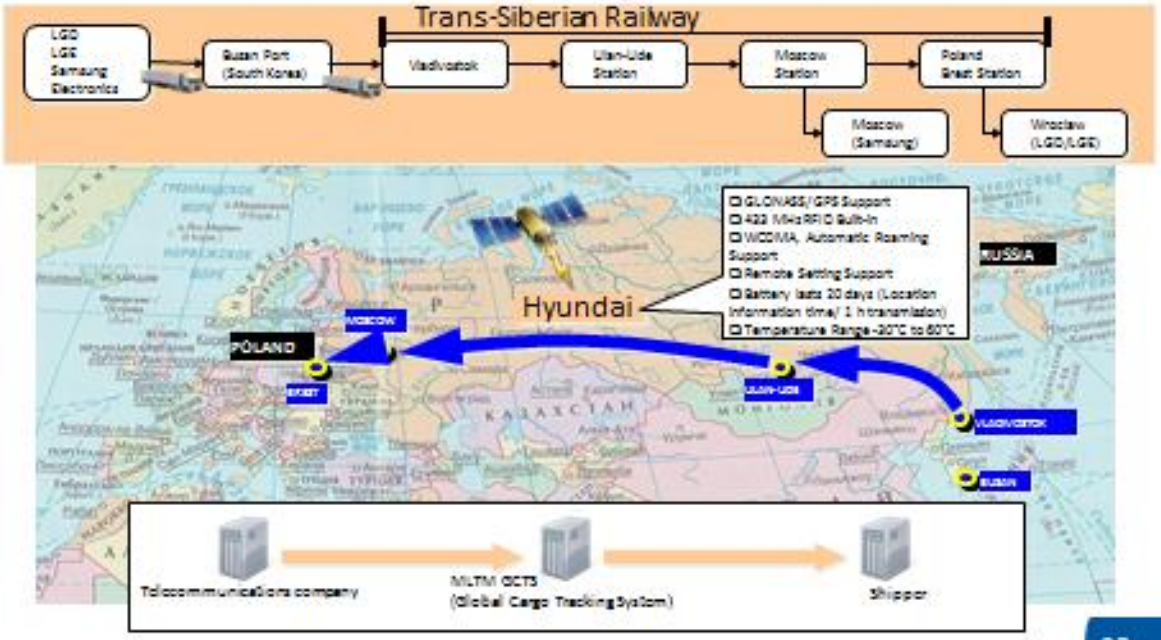
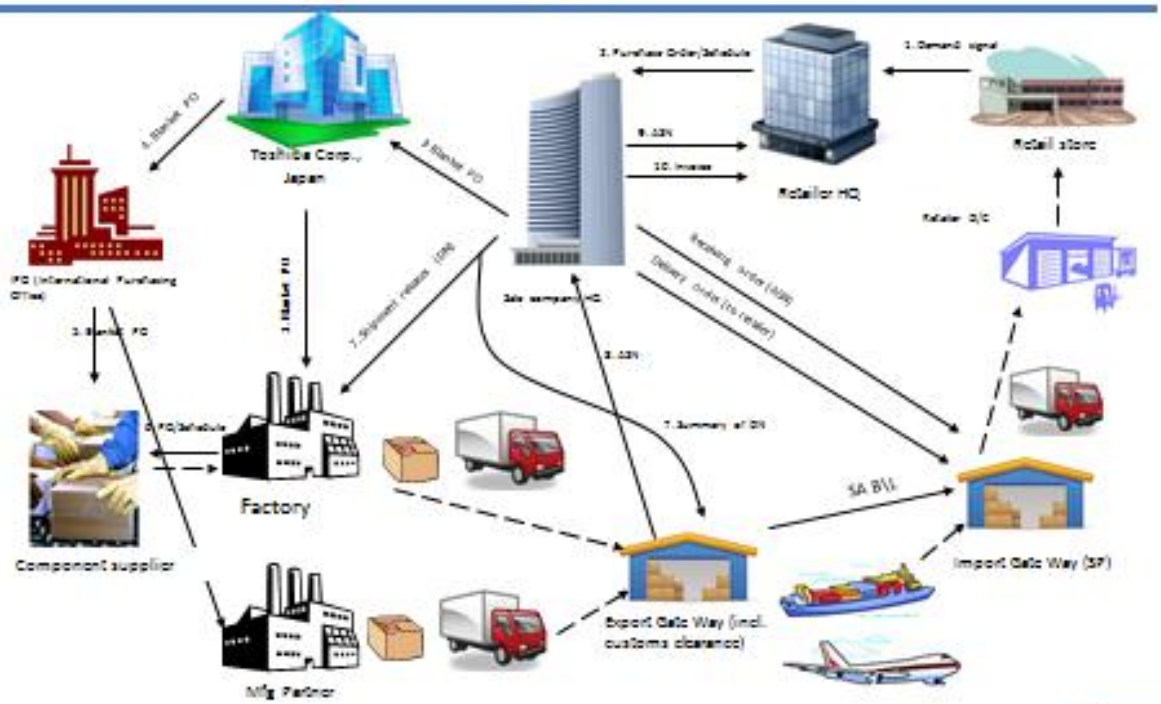
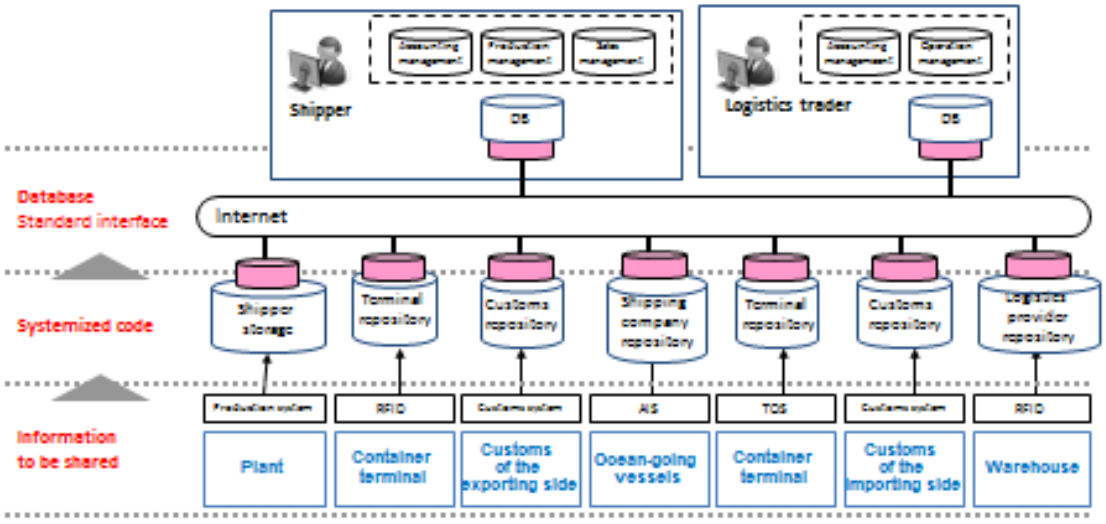
Pilot project focused on the tracking of containers going from South Korea to Europe via the Trans-Siberian Railway



Data exchange process in global supply chain management



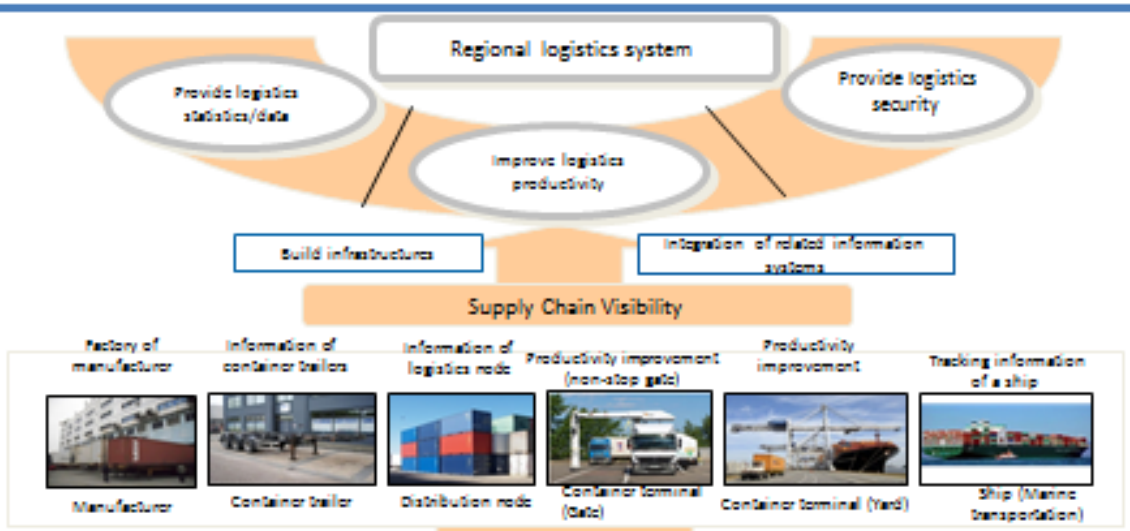
Standard information exchange framework for global supply chain management in APEC member economies



Source: Nomura Research Institute

26

Key advantages of the system for monitoring of transportation and freight flows for logistics in APEC member economies according to the concept developed by the Ministry of Transport of South Korea



Manufacturer

- Freight tracking
- Property management
- Efficient management of warehouses
- Home and foreign customs efficiency
- Notice of dangerous goods

Forwarder

- Trailer tracking
- Property management
- Notice of dangerous goods
- Information of container trailers

Shipping company

- Container tracking
- Property management
- Efficient management of containers
- Home and foreign customs efficiency
- Notice of dangerous goods

Customs

- Integrated management of customs declaration
- Effective operation of Quarantine
- Collaboration with public institutions

Terminal

- Automatic port management
- Container security service
- Container identification
- Notice of dangerous goods

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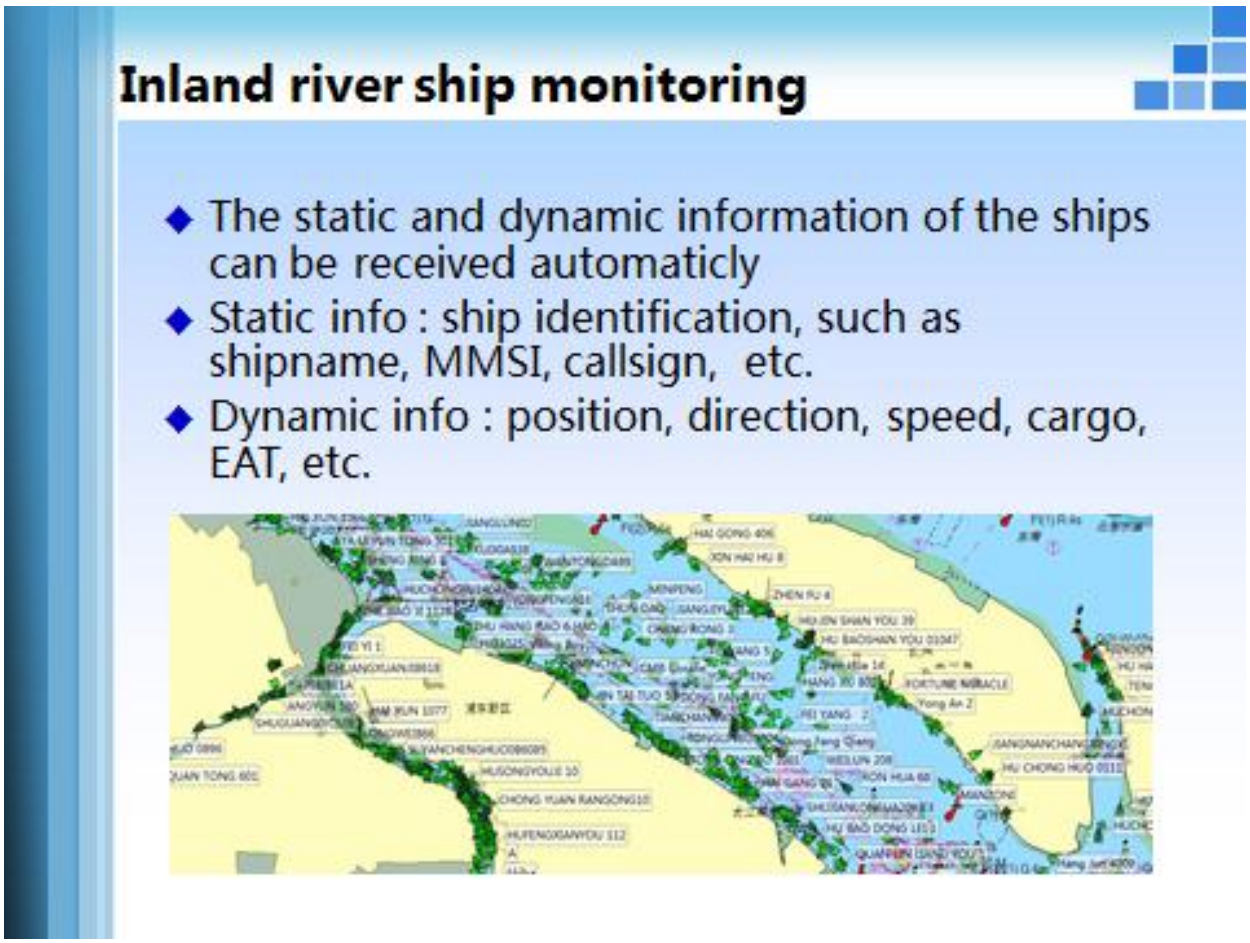
«Existing Water Transportation Monitoring and Management in China»

Mr. Du Zhongping, Director, Research Institute of Highway Ministry of Transport National Center of ITS Engineering & Technology, China.

The first part of his report was dedicated to coastal and inland river ship monitoring. It covers more than 12000 ships and includes and automatically tracks the static information of the ships (shipname, MMSI, callsign) and the dynamic one (position, direction, speed, cargo, EAT). As for the Costal ship monitoring, it is concentrated in north China Sea and Tianjing Port.

The speaker described the system of long range ships identification and tracking through GNSS and satellite communication. He also presented COSCO ship monitoring and management system, used by more than 600 ships.

In the next part of the presentation Mr. Zhongping Du focused on the ways of optimization of the waterways on the basis of the water traffic flow analysis. The second part of his presentation concerned technical issues of ship locating, including AIS - a navigation system for locating, identifying and tracking marine vessels. Mr Zhongping Du emphasized that as it works means of a global network of low-earth orbit (LEO) satellites, can provide a low-cost and reliable data communication service in ship tracking. In conclusion of his speech he presented Compass - Chinese satellite navigation system and Inmarsat C ship monitoring system.



Costal ship monitoring

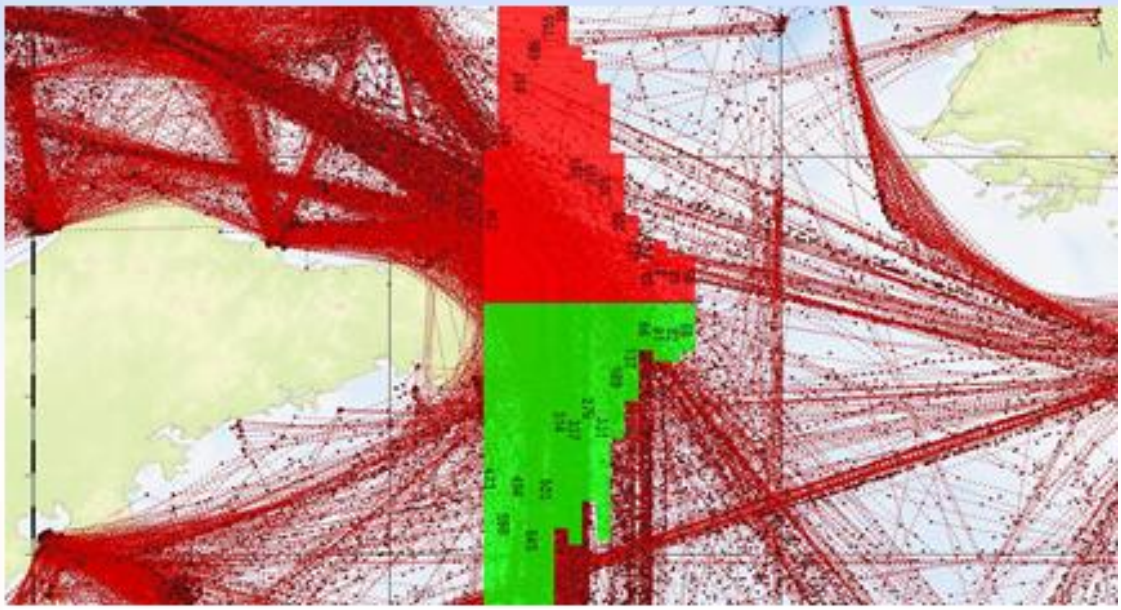
- Ships in north China Sea and Tianjing Port, which is a import part of NEAL-NET

Long range ships identification

- COSCO ship monitoring and management system
- More than 600 ships operating information

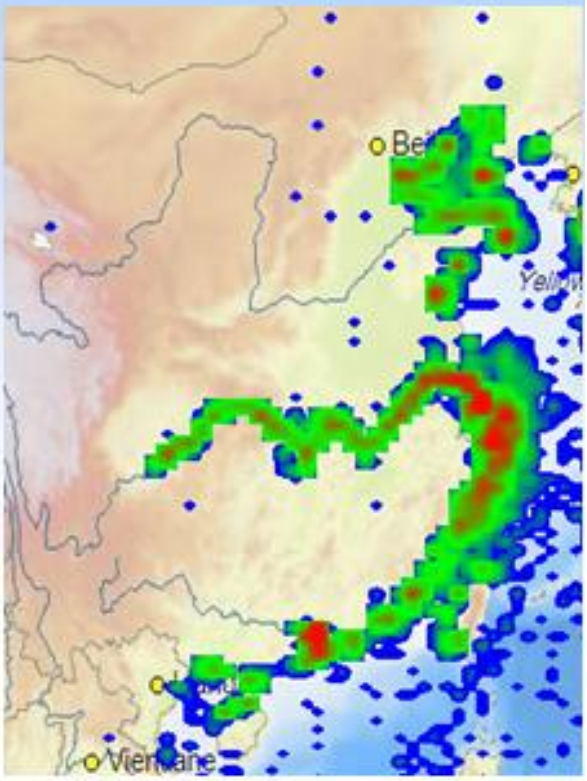
Water traffic flow analysis

- The busiest Chengshantou waterway in Shandong
- Optimal waterway planning by analyzing the water traffic flow in the area



Hazardous goods distribution on water

- The hazardous ship and goods location statistics
- From blue, green to red color indicating the grown density of hazardous ship and goods location

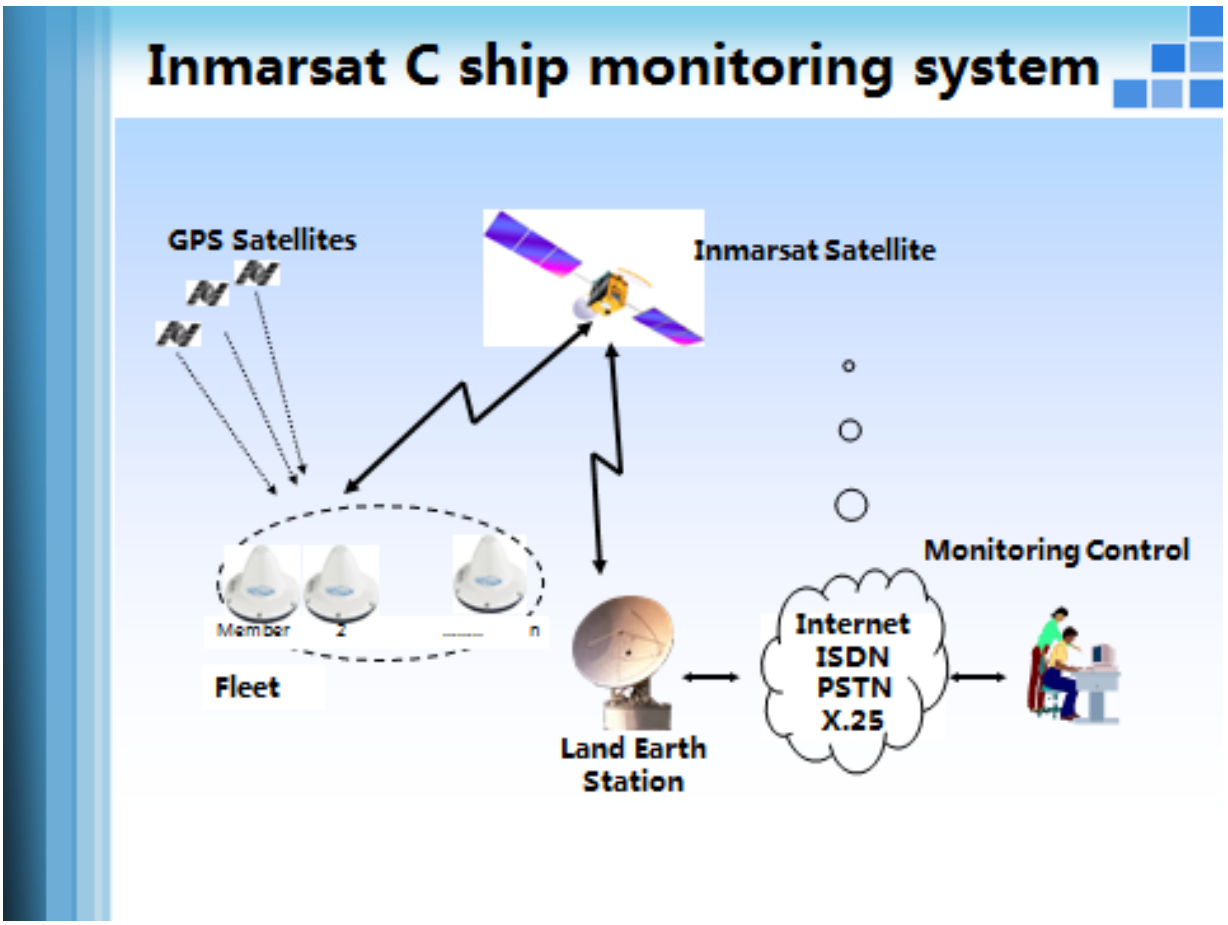


Automatic Identification System

- AIS is a navigation system for locating, identifying and tracking marine vessels
- All the SOLAS ships are equipped with AIS shipborned terminals
- China has invested millions of dollars to build a full coverage AIS network
- Over 30,000 transportation ships and 70,000 fishy ships are equipped with AIS terminals

Compass Navigation System

- Compass is a Chinese satellite navigation system
- The second generation of Compass will provide global service
- It is planned to offer services to customers in the Asia-Pacific region recently
- Is has been wildly used in fishy management and water transportation.



«SCM Visibility Initiatives in Japan»

Dr. Shinichi Ishii, Senior Consultant, Nomura Research Institute, Japan

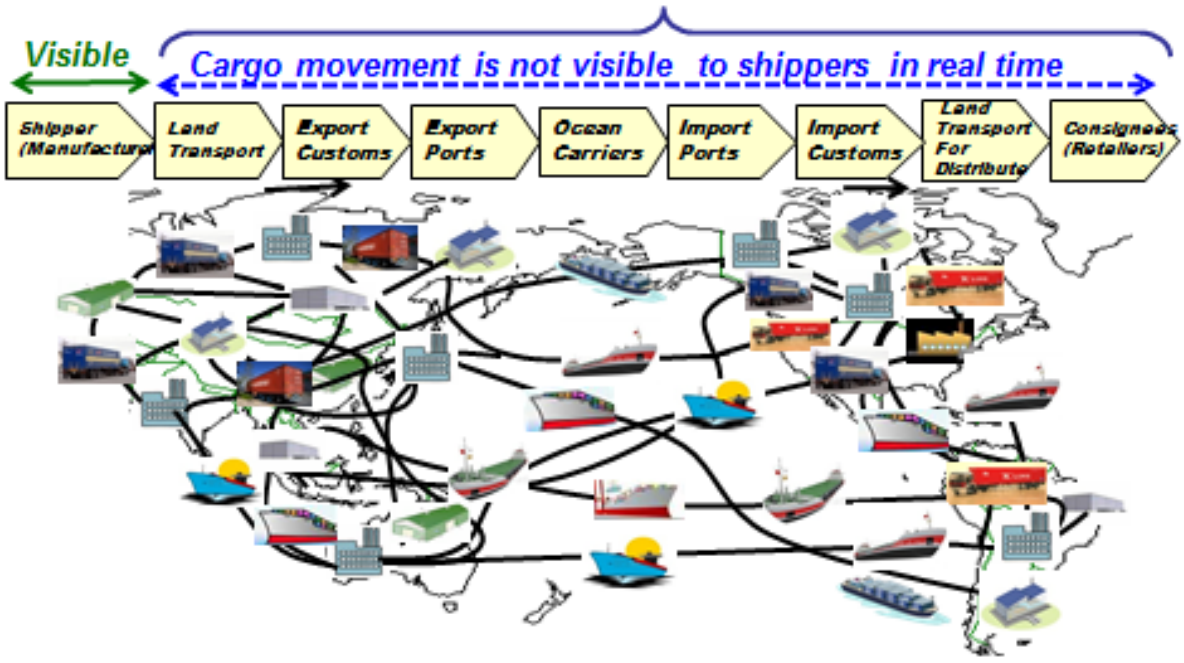
The speaker elaborated on the issues of Supply Chain Visibility, emphasizing the benefits of the COLINS (Container Logistics Information Services) tracking system.

Dr. Shinichi Ishii presented the results of the joint Japan/China pilot project on using of a shared tracking system. It was conducted by using international container cargo between Japan and China. The project starts from shipper‘s factory to consignee’s warehouse which includes all entities of supply chain, and implements from December 2011 to March 2012. Preliminarily results of this project demonstrated the Increase in efficiency of inquiry response by use of a shared pilot information system. More than that, according to Dr Shinichi Ishii, all of cargo between port of China side and the warehouse of the Japan side consignee's hand is considered as minimum stock by this system, that is why the consignee can reduce minimum stock level. Finally, it showed the Reduction of lead time between complete unloading and customs clearance report for an average of 1 hour thanks to the information system which performs a customs clearance report automatically. This system recognizes container unloaded completely from vessel by the RFID reader.

The final part of his presentation was dedicated to the large products visibility and harmonization of international standards in this field.

1. Supply Chain Visibility Initiatives

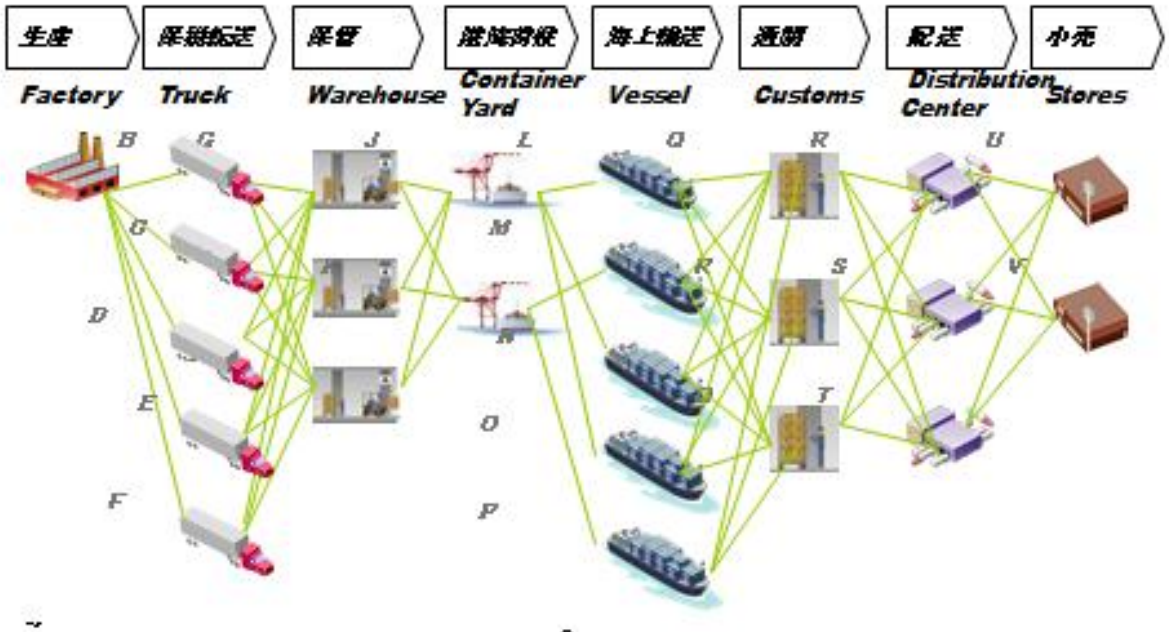
Complexity makes Global Logistics Invisible



5

1. Supply Chain Visibility Initiative

A lot of players – Every SC participant gives up!

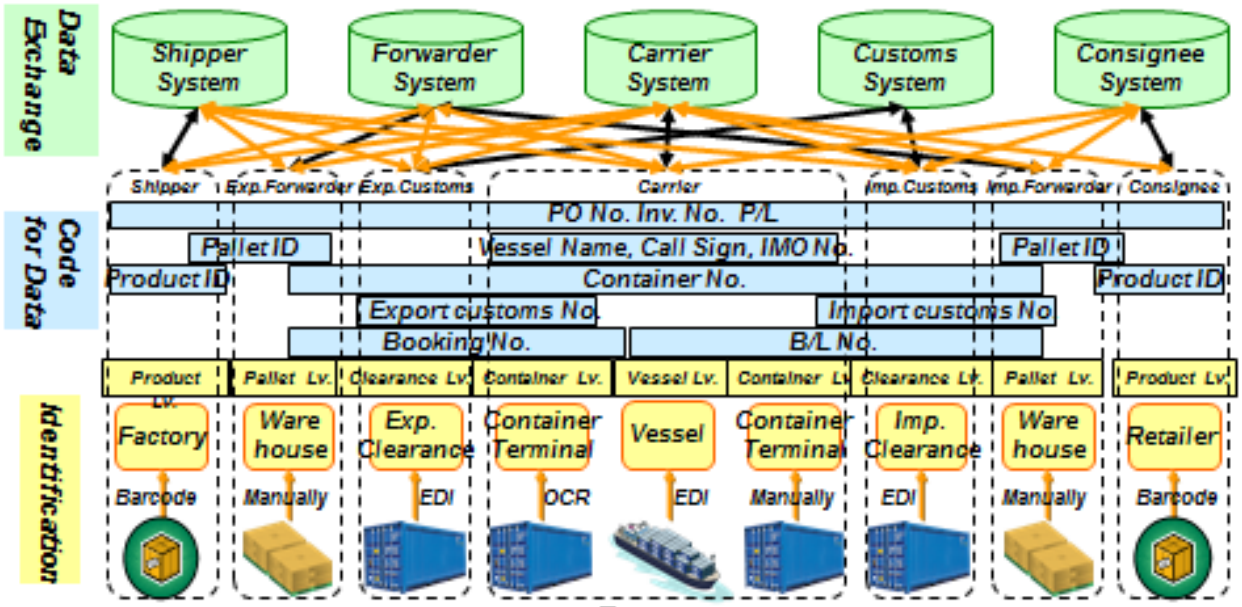


6

1. Supply Chain Visibility Initiative

Challenges of establishing a visibility platform

- Possible to establish a visibility platform by utilizing standardized database
  - Ensure interoperability among standards currently used
  - Set up an operational rule; a data set, code structure



1. Supply Chain Visibility Initiative

Brief History of Supply Chain Visibility Initiative

APEC SCV Feasibility Study (Phase 1~3)

CY 2010 (Japan)

- SOM1
  - APEC ICT Global Value Chain Workshop, ECSG
- SOM2
  - Supply Chain Connectivity Framework, CTI
- SOM3
  - Supply Chain Visibility Workshop, SCSC
  - Supply Chain Connectivity Action Plan, CTI
- Ministerial Meeting
  - Joint Statement

CY 2011 (U.S.)

- Phase 1 Questionnaire survey (APEC funding)
  +
- Phase 2 Pilot project (Self funding)

Establish best practices

CY 2012 (Russia)

- Phase 3 Workshop (APEC funding)

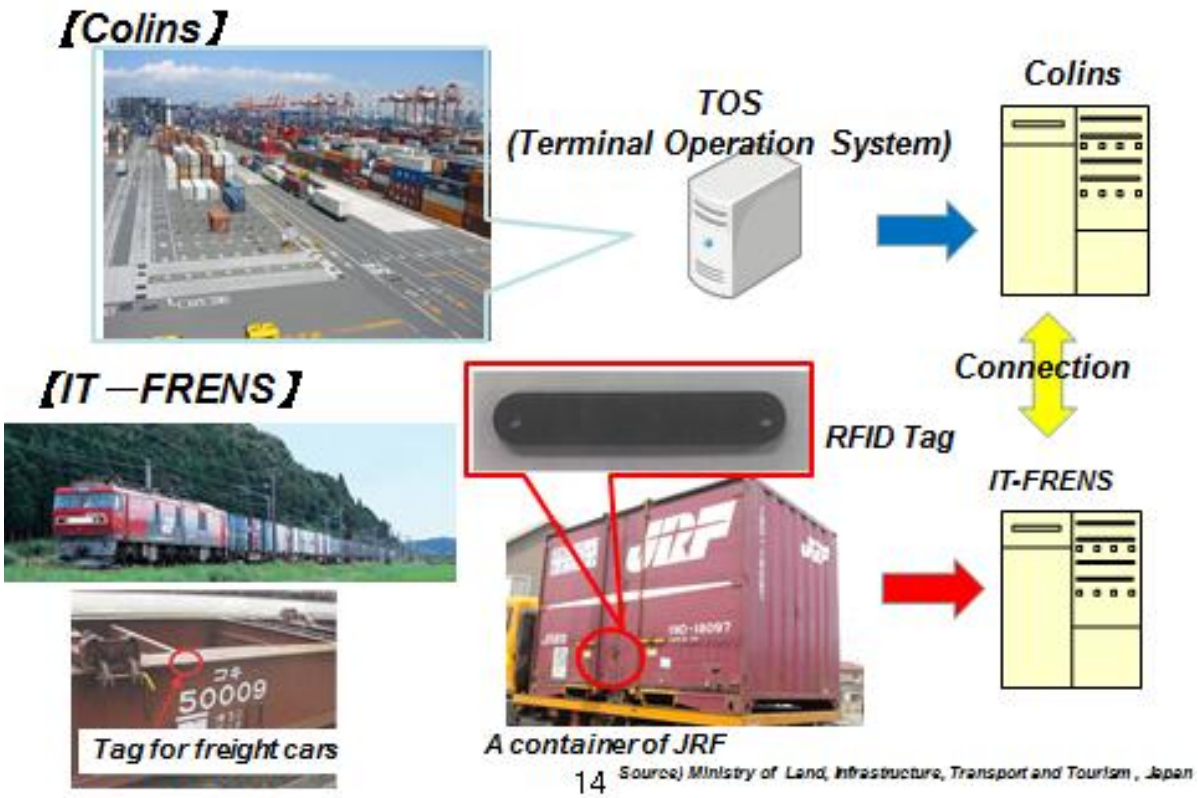
APEC recommendation In Kazan On May

Japan - ASEAN

CY 2013

1. Strengthen business competitiveness
2. Reduce the burden on the environment
3. Achieve both security improvement and trade facilitation

Colins and IT－FRENS data source



Source) Ministry of Land, Infrastructure, Transport and Tourism , Japan

3. The pilot demonstration, Japan – China in 2011/12

Expected impact from pilot project

	Present problem	Result of Pilot project
Increase in efficiency of inquiry response	■ Inquiry response using a telephone, FAX and e-mail such as the arrival to a container terminal at Export process, ATA and, arrival and a departure of Container Terminal at Import process.	■ By use of a shared pilot information system, information sharing of the persons concerned becomes possible, and an inquiry reduces them.
Minimum stock level reduction (Assume contingency of supply chain to avoid stock out situation)	■ The cargo in the warehouse of the Japan side consignee's hand is considered as minimum stock.	■ All of cargo between port of China side and the warehouse of the Japan side consignee's hand is considered as minimum stock by this system. Consignee can reduce minimum stock level.
Reduction of lead time between complete unloading and customs clearance report	■ Lead time between complete unloading and customs clearance report is 2 to 3 hours.	■ The information system which performs a customs clearance report automatically is developed. This system recognizes container unloaded completely from vessel by the RFID reader. The lead time reduction for an average of 1 hour is possible by this system.

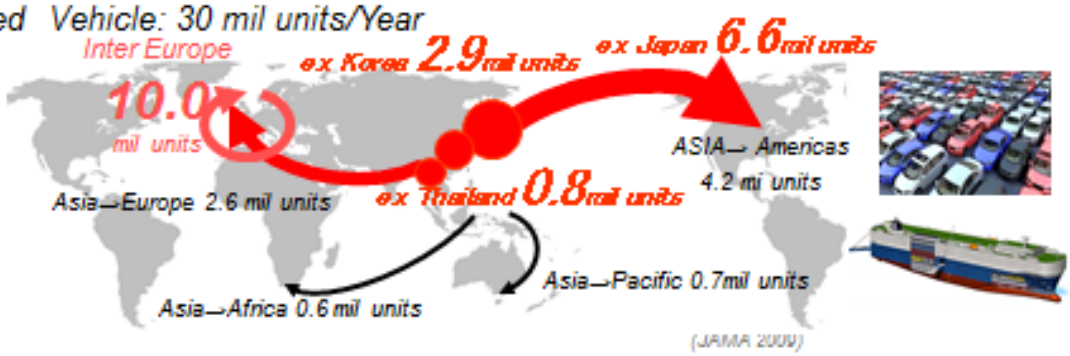
4.Visibility for Automotive Logistics(Large products Visibility)

Volume of New Manufactured Vehicle Transport in Marine Transportation

Container: 66 mil TEU/Year

(Global Insight 2007)

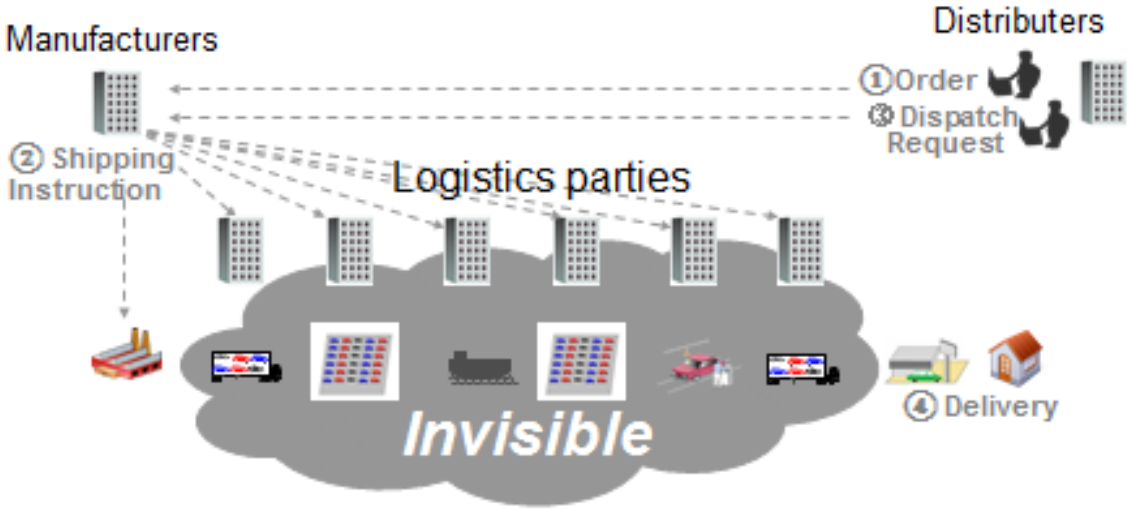
Finished Vehicle: 30 mil units/Year



(JAMA 2008)

4.Visibility for Automotive Logistics(Large products Visibility)

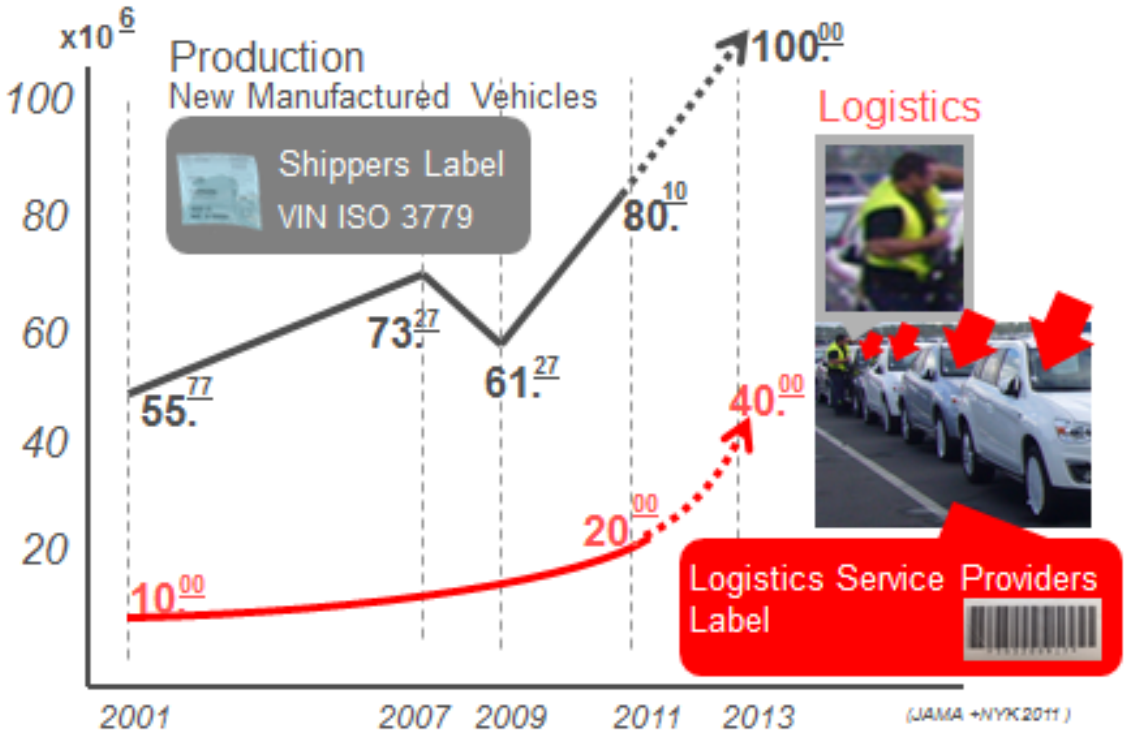
Issues



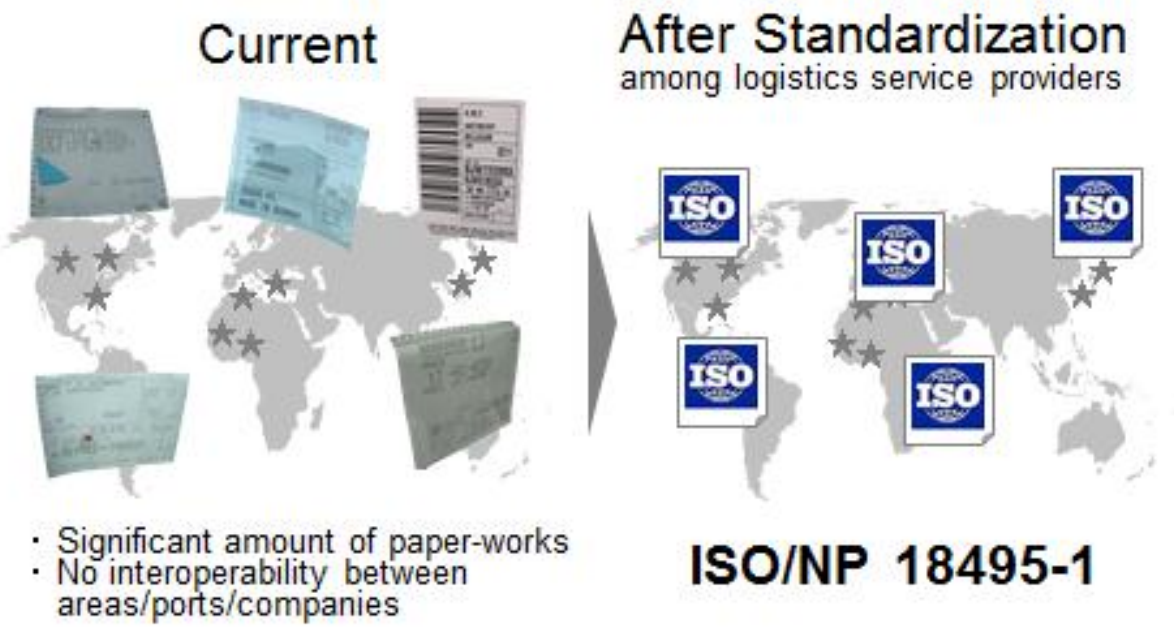
- Unnecessary additional cost
- Increase the required minimum stock level
- Slow response to the end customer

4.Visibility for Automotive Logistics(Large products Visibility)

Needs of Logistics labels



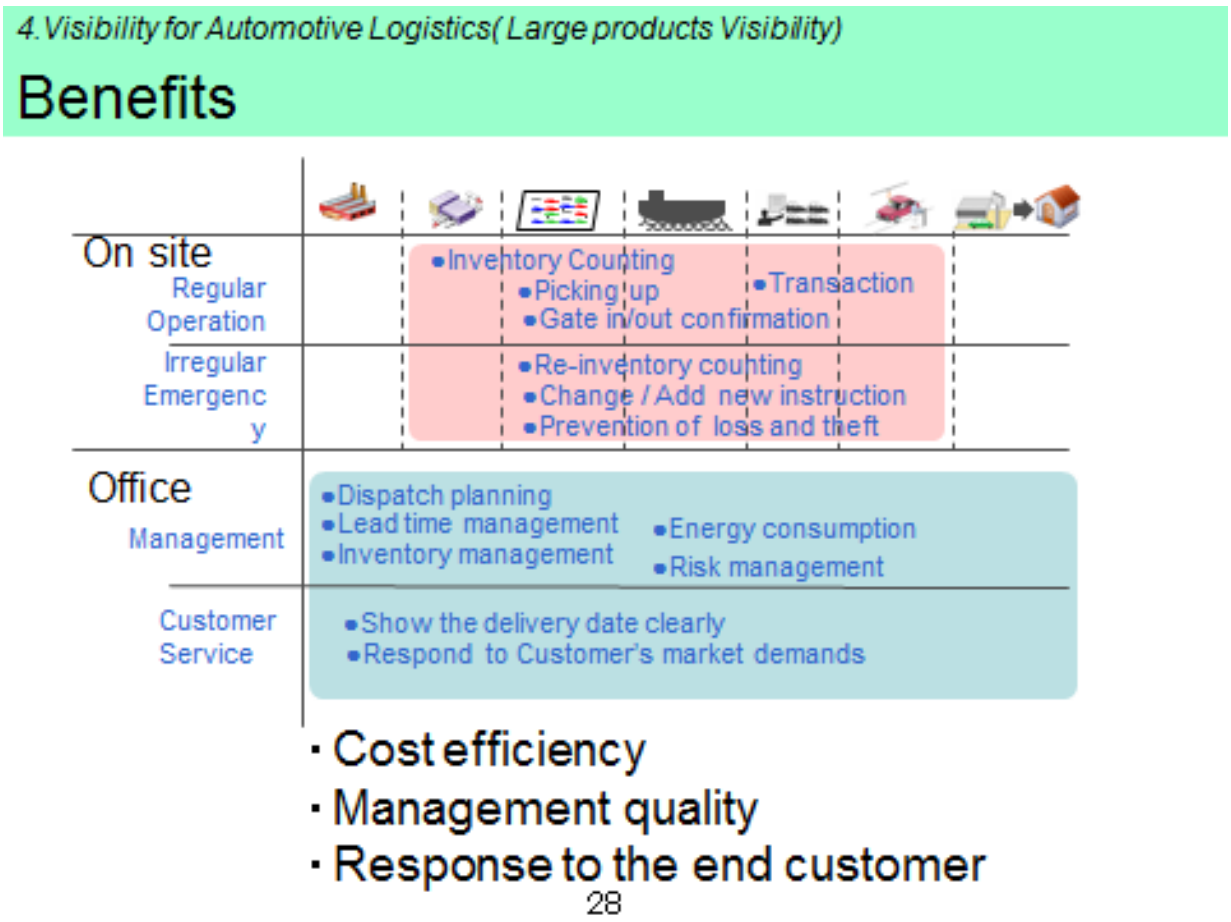
25



- Significant amount of paper-works
- No interoperability between areas/ports/companies

ISO/NP 18495-1

27



«The Existing Transportation And Cargo Flow Monitoring And Logistics Management Systems»

Mr Subestheran Suparmaniam, Principal Assistant Secretary, Ministry of Transport, Malaysia

Mr. Subestheran Suparmaniam described the Malaysian systems of transportation and cargo flow monitoring and transportation and logistics management systems describing the organization of the Klang Port and it's infrastructure.

The speaker first presented Malaysian transport legislation practice and laws. He proceeded with describing the systems of management and monitoring (SMM) existing in Malaysia - Smart Card Security System (SCSS), Container Gate Security System (CGSS), GPS and Highway Monitoring & Management System (HMMS).

Describing SCSS, Mr. Subestheran Suparmaniam stressed that it provides security checks at all security points to increase the efficiency of port operations and ensures minimal interruption during documentation or clearance process. Malaysia also has a plan to link it to the Customs Information System (SMK) and Gate Security System (GCS). As for using GPS in Malaysia, it is used in fleet monitoring and surveillance systems. It became become one of the requirements for handling dedicated shipment for international companies. Mr. Subestheran Suparmaniam mentioned that using of CGSS services for vehicle authorization and authentication to enter the port. It is integrated with heavy duty barrier gates and captures detailed information of all exits and entries. Finally, Highway Monitoring & Management System (HMMS) with its camera systems is used for traffic flows monitoring and provides data resources for enforcement units such as police department.

Scope

- **Location** • Port Klang, Malaysia
- **Infrastructure** • Physical Facilities
- **Infostructure** • Management and Monitoring System (SMM)

Total Cargo Throughput 2011 (Port Klang)

Dry Bulk = 10.0

Liquid Bulk = 8.0

General Cargo = 9.8

Containerised Cargo = 167.0

- Million Teus
- Source: MOT

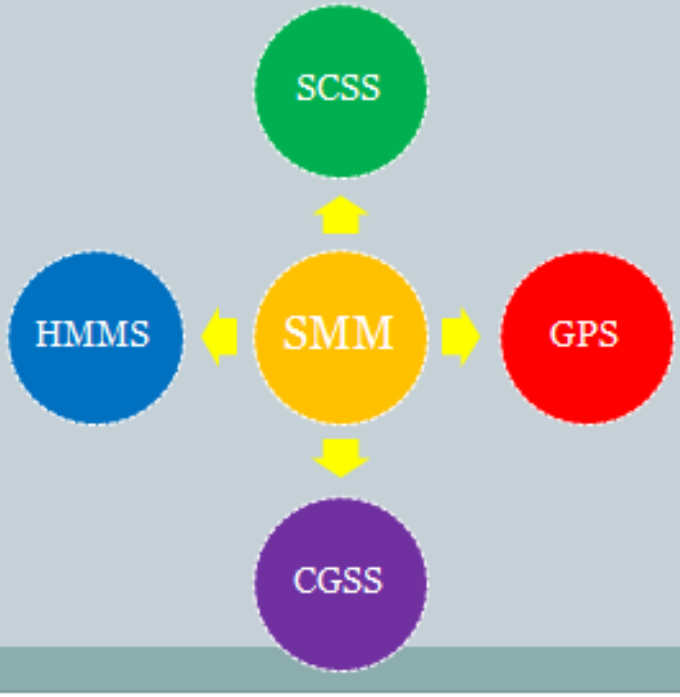
Regional Industrial Park

- Port Klang Free Zone (PKFZ)
- 1000 acre (4.0 km square)
- Located along the straits of Malacca, port Klang

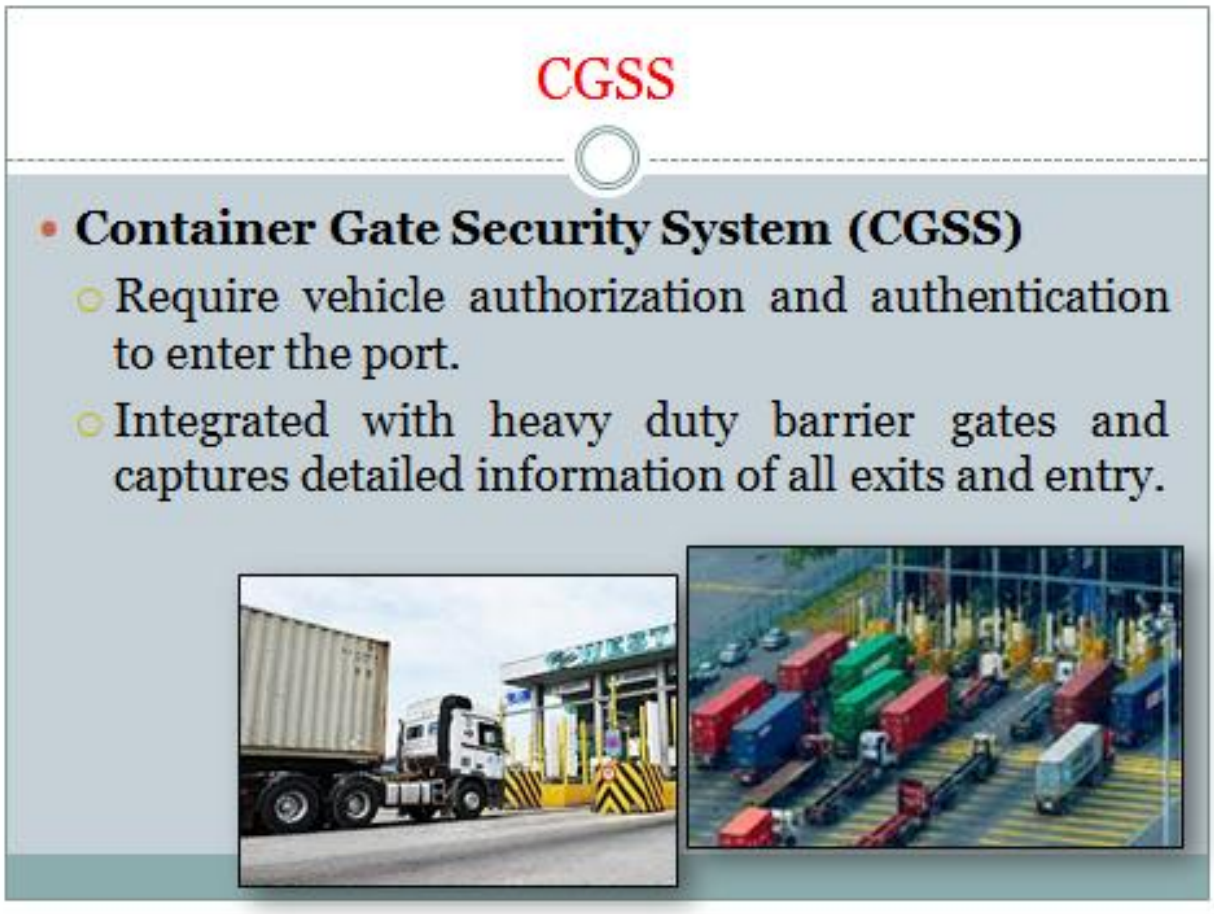
Existing Systems For Management & Monitoring (SMM) in Malaysia

- Private driven / initiatives: Industry players
- Private ownership of such systems is still in the minority in term of numbers
- Only companies with international / regional outlook and listed companies (stock exchange)

Existing Systems for Monitoring



- GPS system has been used by one of the haulier's company in Malaysia.
- Currently, GPS become one of the requirement for handling dedicated shipment (international companies).



«Current Logistics Information Services in Chinese Taipei»

Mr Jaching Chou, Senior Transportation Analyst, Institute of Transportation, Ministry of Transport and Communications, Chinese Taipei

Mr Jaching Chou elaborated in his presentation on the following issues:

Logistics Service Development in Chinese Taipei;

Logistics Information Service and SMM;

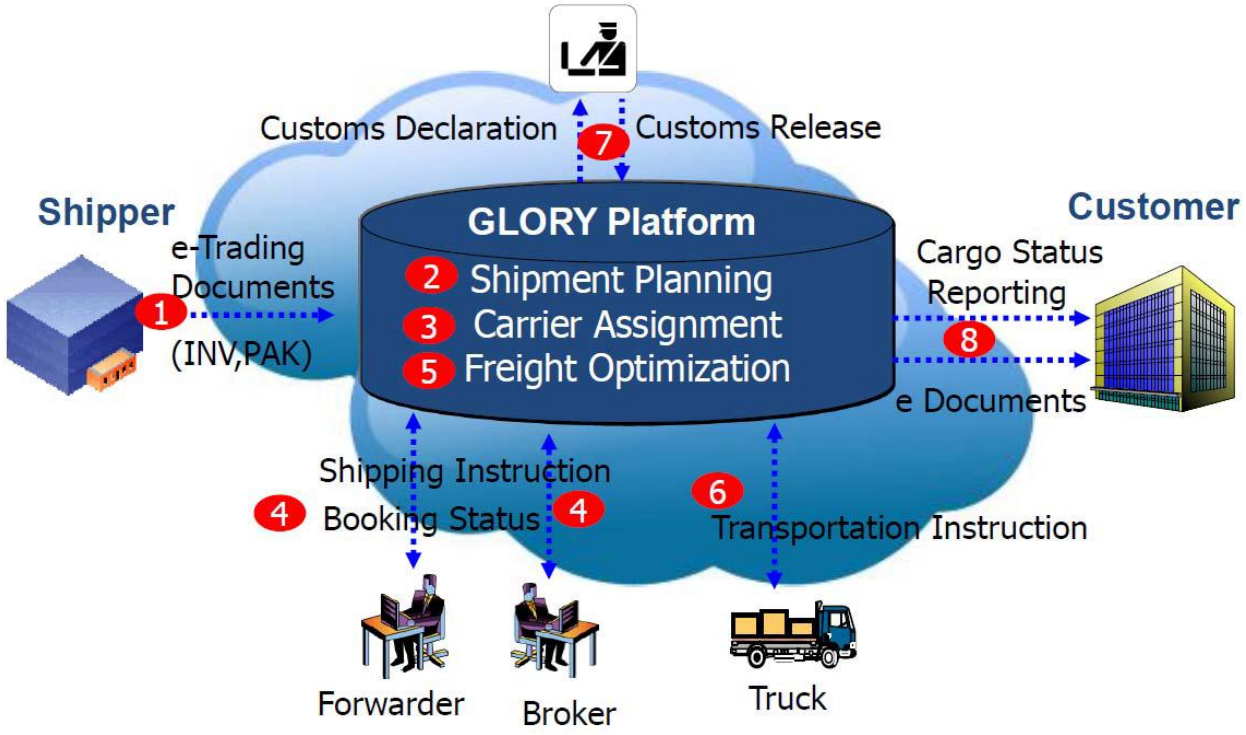
Truck Fleet Management System;

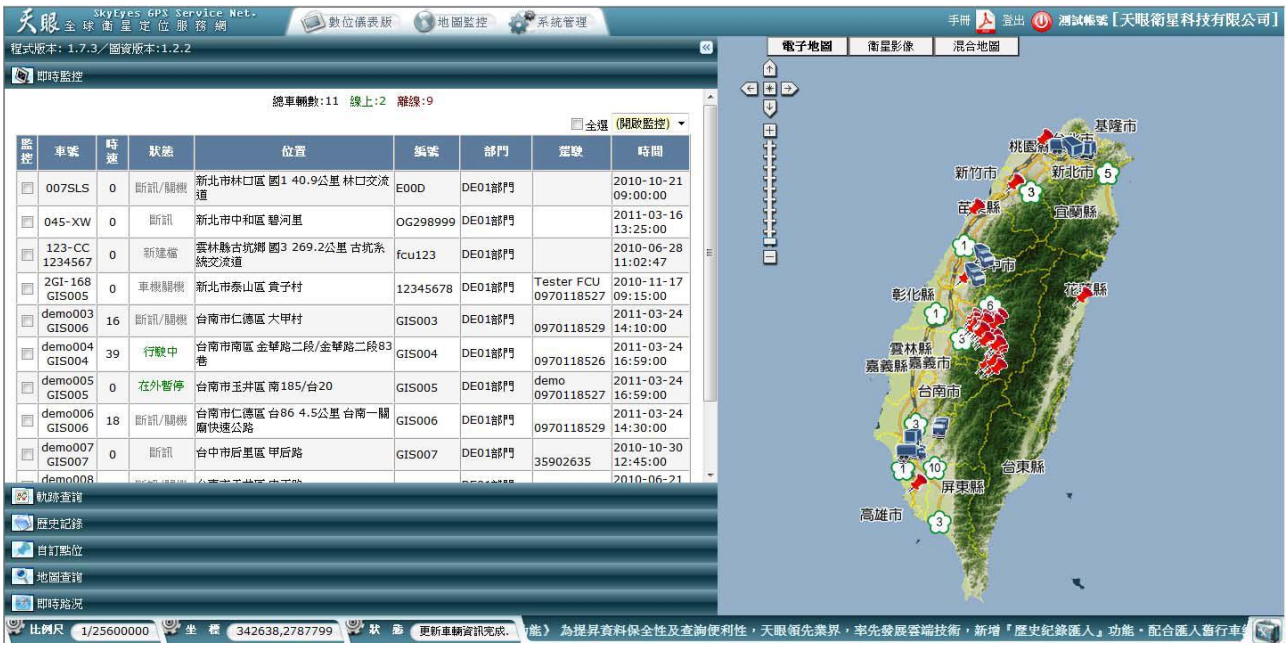
Current Status of SMMs in Chinese Taipei.

Regarding the history of logistic service development, the speaker compared the situation prior 1990, when mostly first-party logistics (1 PL) and second-party logistics (2 PL) were used, and more recent times, when third-party logistics (3PL) and fourth-party logistics (4PL) have been introduced. Modern system includes a lot of different services, such as consulting services, import/export services, transportation delivery services and warehousing.

The next part of this report concerned information services used to manage logistics. In particular – logistics information service and SMM. The speaker mentioned several information platforms that are being established in private sector (including Logistics System Platform) and Trucking Fleet Management System (e-FMS).

A large part of the presentation was dedicated to the current legislation and legal issues associated with SMMs. The main point here is that there will be issues regarding the sensitivity and confidentiality of business information exchange among SMMs. Therefore, there might need certain format of agreement or regulation in this regard.


Customs Declaration
7
Customs Release
Shipper
e-Trading
Documents
1
(INV,PAK)
GLORY Platform
2 Shipment Planning
3 Carrier Assignment
5 Freight Optimization
Customer
Cargo Status
Reporting
8
e Documents
Shipping Instruction
4
Booking Status
4
6
Transportation Instruction
Forwarder
Broker
Truck


SkyEyes GPS Service Net.
天眼 全球衛星定位服務網
數位儀表版
地圖監控
系統管理
手冊
登出
測試帳號【天眼衛星科技有限公司】
程式版本: 1.7.3／圖資版本:1.2.2
即時監控
總車輛數:11 線上:2 離線:9
全選 (開啟監控)
監控 | 車號 | 時速 | 狀態 | 位置 | 編號 | 部門 | 駕駛 | 時間
007SLS | 0 | 斷訊/關機 | 新北市林口區 國1 40.9公里 林口交流道 | E00D | DE01部門 | | 2010-10-21 09:00:00
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demo004 GIS004 | 39 | 行駛中 | 台南市南區 金華路二段/金華路二段83巷 | GIS004 | DE01部門 | 0970118526 | 2011-03-24 16:59:00
demo005 GIS005 | 0 | 在外暫停 | 台南市玉井區 南185/台20 | GIS005 | DE01部門 | demo 0970118527 | 2011-03-24 16:59:00
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demo007 GIS007 | 0 | 斷訊 | 台中市后里區 甲后路 | GIS007 | DE01部門 | 35902635 | 2010-10-30 12:45:00
軌跡查詢
歷史記錄
自訂點位
地圖查詢
即時路況
比例尺 1/25600000
坐標 342638,2787799
狀態 更新車輛資訊完成.
電子地圖
衛星影像
混合地圖
基隆市
桃園縣
新竹市
新北市
苗栗縣
宜蘭縣
中市
彰化縣
花蓮縣
雲林縣
嘉義縣
嘉義市
台南市
台東縣
屏東縣
高雄市

«Case Study: Thailand Existing Transportation and Cargo Flow Monitoring and Logistics Management Systems in APEC Economies»

Dr. Parinya Tanadtang, Office of Transport and Traffic Policy and Planning, Ministry of Transport of Thailand

Dr. Tanadtang in his report presented the issue of development and deployment of automated transportation management systems for the purposes of logistics optimization, exchange of the best practices. He also touched the specifics of state regulation and different approaches for harmonizing regulatory and legal frameworks of APEC member economies.

The speaker pointed out that today the total “transport chain” from the first origin to the final destination must be regarded as a whole, in order to be able to compare alternatives realistically. So to ensure the efficiency of this chain and gain operational control over it, liner companies became port operators and providers of “door-to-door” services and several levels of logistics services providers were created.

Summarizing his speech, he concluded, that the best approach in optimizing logistics is to keep it simple, and to avoid building unnecessarily complicated models; therefore, at first it is necessary to develop an optimization model at a sufficient level of detail to allow valid comparison of options, and to use the model to identify a preferred option. The main point is that modeling can be an extremely powerful tool for planning managing logistics and supply chains. Finally, modeling is generally cheaper, safer, and more flexible than full-scale testing on an operational logistic systems.

การขนส่งสินค้าภายในประเทศ

หน่วย:พันตัน

การขนส่งสินค้า	2545	2546	2547	2548	2549	2550	2551	2552	2553	2554*
ทางถนน	434,918	440,018	435,147	430,275	427,581	428,123	424,456	423,677	419,318	405,537
ทางรถไฟ	8,889	10,521	12,883	11,760	11,579	11,055	12,807	11,133	11,288	10,667
ทางน้ำภายในประเทศ	31,382	30,055	43,389	42,306	40,340	47,229	47,687	41,561	48,185	46,130
ชายฝั่งทะเล	28,198	27,222	36,975	34,254	31,574	31,216	29,615	29,311	29,004	31,071
ทางอากาศ	107	103	114	120	122	110	106	103	121	131
รวม	503,494	507,919	528,508	518,715	511,196	517,733	514,671	505,785	507,916	493,536

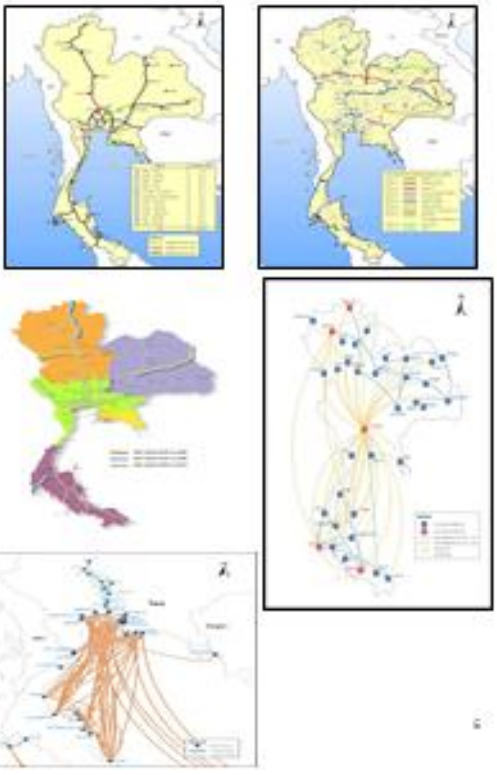
http://vigportal.mot.go.th/portal/site/PortalMOT/stat/indexURL/ (2012)

National Model (NAM) Of OTP

Mode	พ.ศ. 2554 (2011)	พ.ศ. 2560 (2017)	พ.ศ. 2565 (2022)	พ.ศ. 2570 (2027)	พ.ศ. 2575 (2032)	พ.ศ. 2580 (2037)
Road	433,184	474,050	508,140	545,485	586,553	631,807
Rail	12,995	14,222	15,244	16,364	17,601	18,955
Water	71,690	78,454	84,122	90,270	97,073	104,557
Air	64	71	78	86	95	106
Total	517,933	566,797	607,584	652,205	701,322	755,425

National Model(NAM)

Zoning of NAM



Transport Forecast of 2011 and 2037

Passenger Demand

Unit: 1000persontrip/day

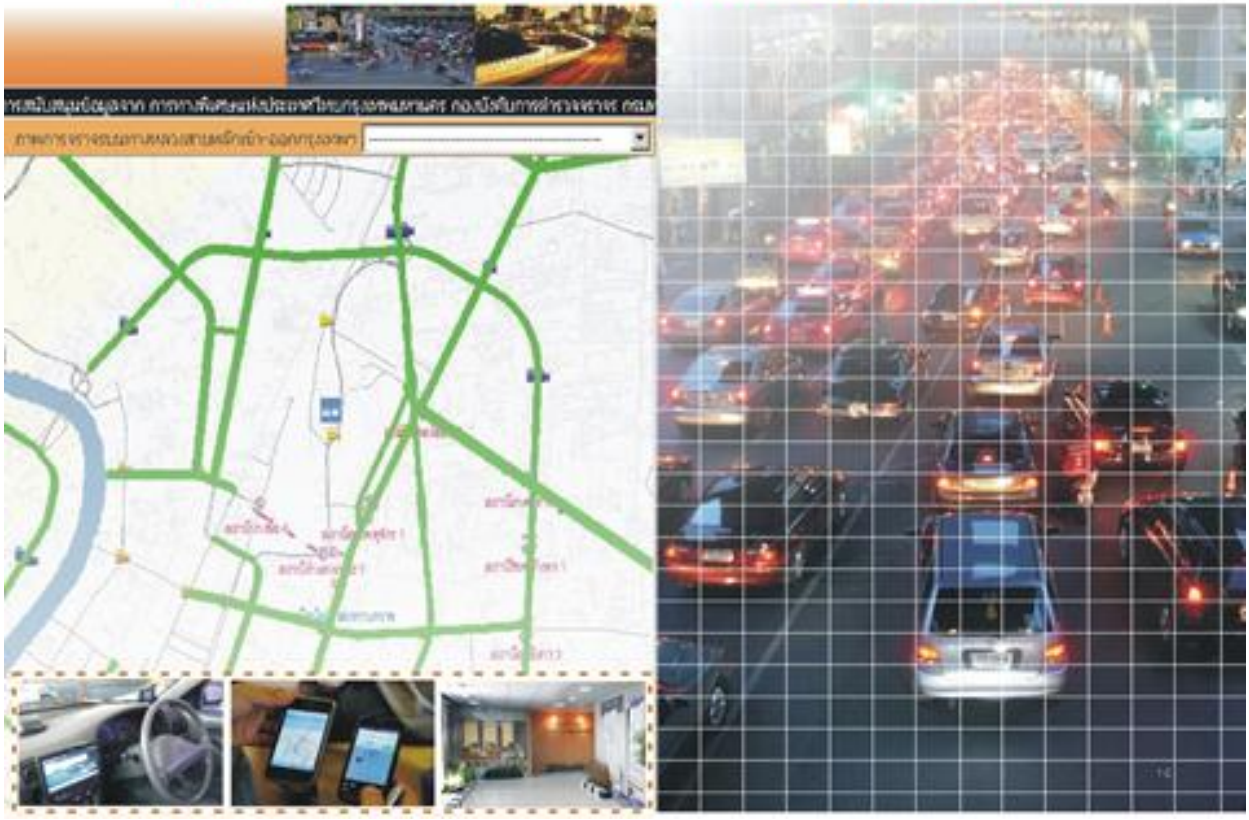
Mode	2011	2037
Private Car	1,258	3,576
Public Bus	949	2,699
Rail	152	432
Air	91	260
Total	2,450	6,967

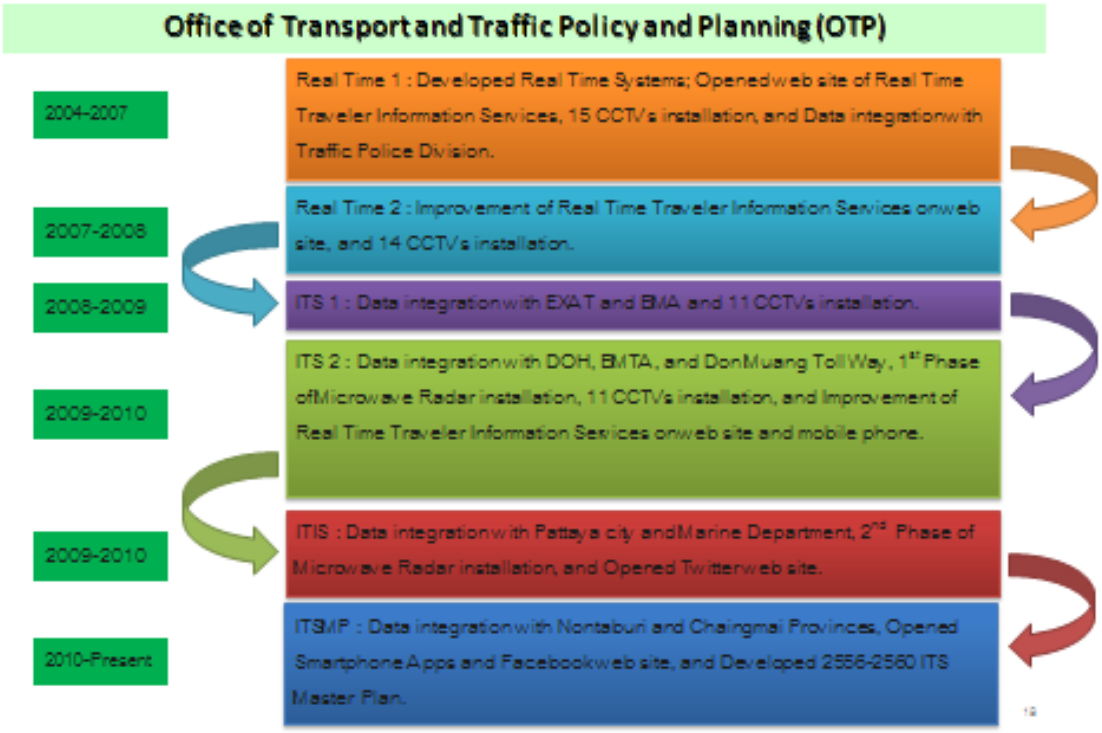
Vehicle Demand

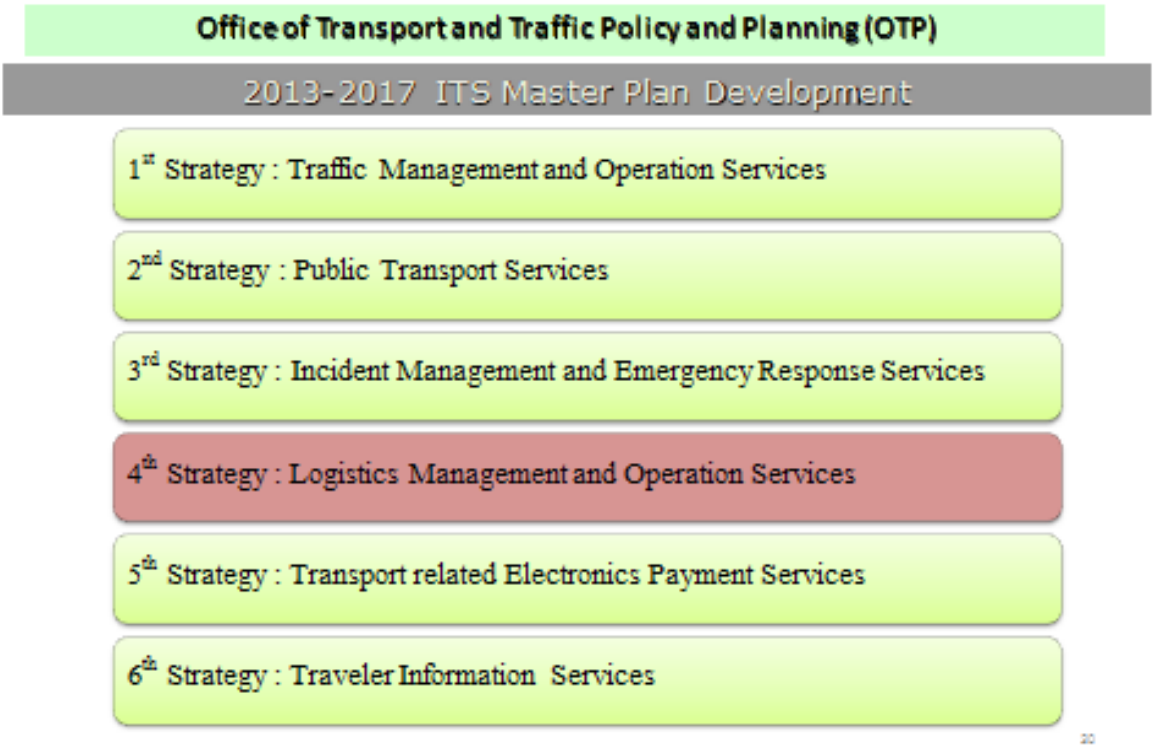
Year	Mil. Veh-Kms	Mil. Veh-Hrs	Speed Km/hr.
2011	335.50	4.23	79.37
2037	749.51	11.08	67.63

Source : NAM (2011)

ITS Development In Thailand

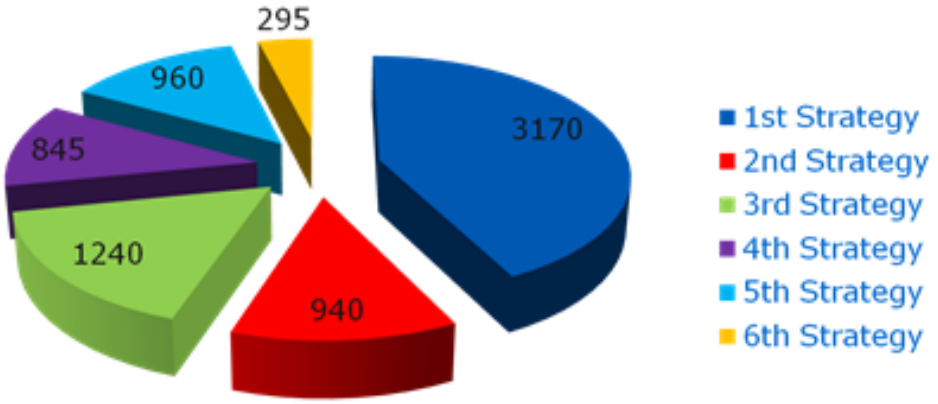



Office of Transport and Traffic Policy and Planning (OTP)
2004-2007
Real Time 1 : Developed Real Time Systems; Opened web site of Real Time Traveler Information Services, 15 CCTVs installation, and Data integration with Traffic Police Division.
2007-2008
Real Time 2 : Improvement of Real Time Traveler Information Services on web site, and 14 CCTVs installation.
2008-2009
ITS 1 : Data integration with EXAT and BMA and 11 CCTVs installation.
2009-2010
ITS 2 : Data integration with DOH, BMTA, and Don Muang Toll Way, 1st Phase of Microwave Radar installation, 11 CCTVs installation, and Improvement of Real Time Traveler Information Services on web site and mobile phone.
2009-2010
ITIS : Data integration with Pattaya city and Marine Department, 2nd Phase of Microwave Radar installation, and Opened Twitter web site.
2010-Present
ITSMP : Data integration with Nontaburi and Chaingmai Provinces, Opened Smartphone Apps and Facebook web site, and Developed 2556-2560 ITS Master Plan.


Office of Transport and Traffic Policy and Planning (OTP)
2013-2017 ITS Master Plan Development
1st Strategy : Traffic Management and Operation Services
2nd Strategy : Public Transport Services
3rd Strategy : Incident Management and Emergency Response Services
4th Strategy : Logistics Management and Operation Services
5th Strategy : Transport related Electronics Payment Services
6th Strategy : Traveler Information Services

Office of Transport and Traffic Policy and Planning (OTP)

2013-2017 ITS Master Plan Budgets



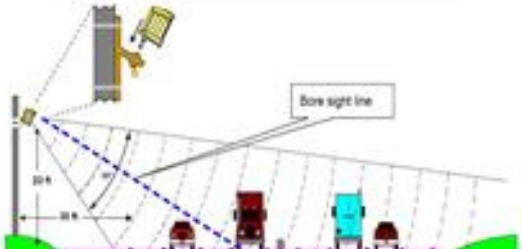
Total Budgets 7,450 Million Baht

Office of Transport and Traffic Policy and Planning (OTP)

Installation of Traffic Sensors on Road Network in Bangkok

Image Processing Camera

CCTV System



Office of Transport and Traffic Policy and Planning (OTP)

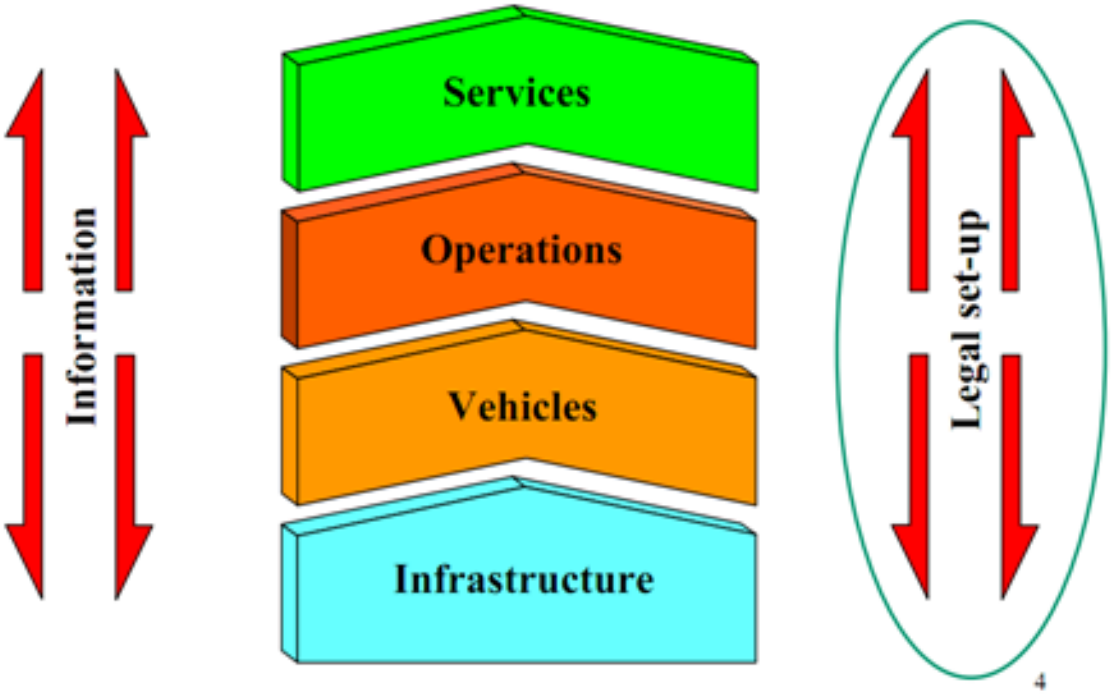
Traffic Information Dissemination System via Mobile Phone System

Traffic image

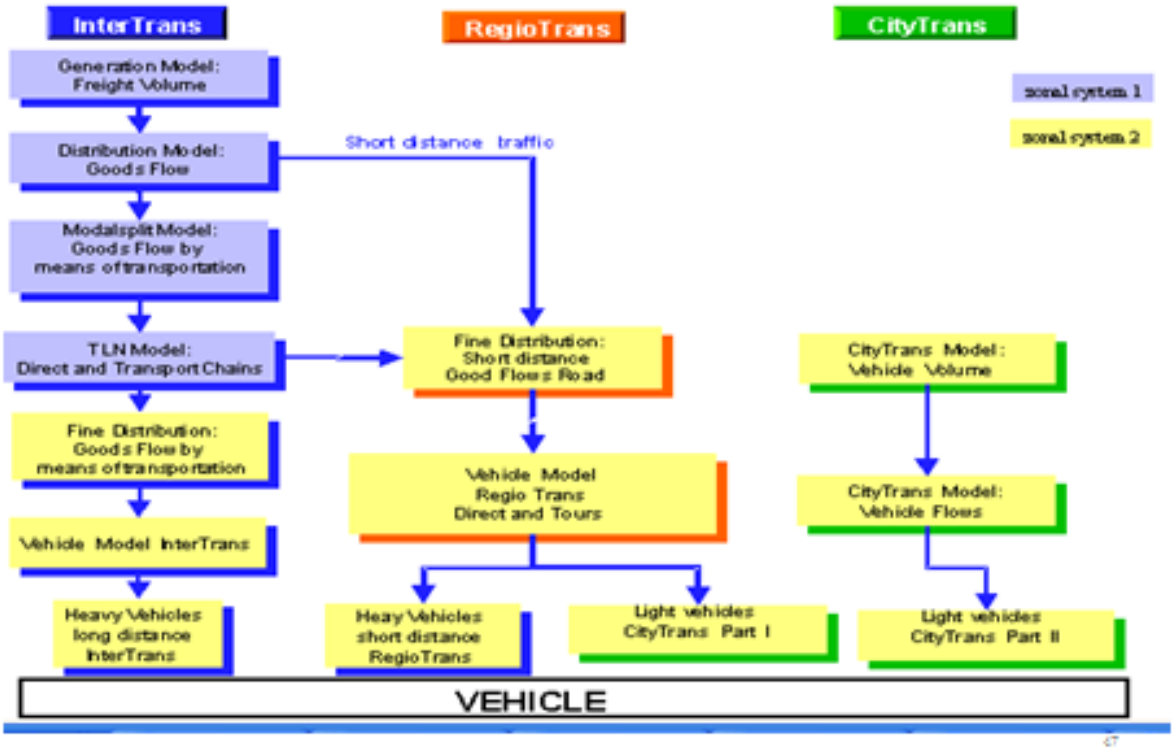
Drawing Map

Road Network Map

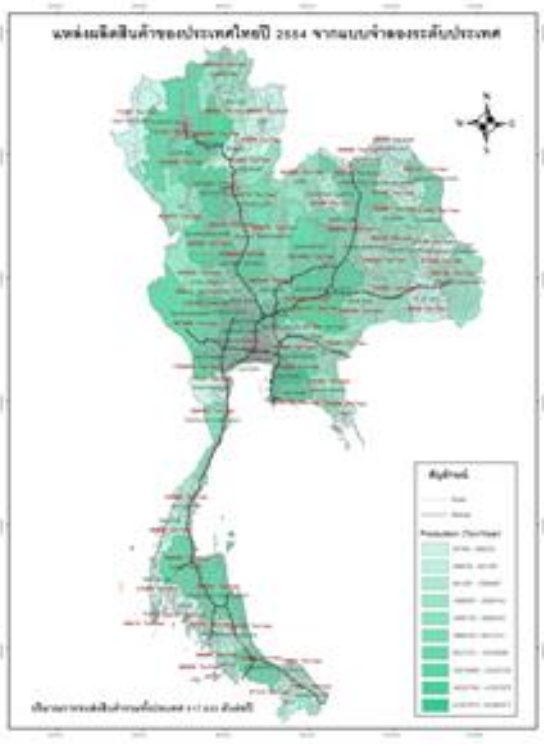
Moving goods…



Structure of NAM



Target: All Commodity flow in 2014



«*Current Specifics of State Regulation in Vietnam Concerning Logistics Management and Cargo Flow Monitoring»*

Mr. Pham Truong Thang, Ministry of Transport , Vietnam

This report Mr. Pham Truong Thang treats the organization of logistic services in Vietnam and it's state regulation.

Describing the conditions that must be met by the operators, the speaker mentioned some restrictions, existing for the foreign companies (they can act only through establish joint venture companies in which the ratio of capital contribution of foreign investment not exceeding 49%, 50% or 51%). These restrictions will be lifted in 2014.

The statistics given by Mr. Pham Truong Thang shows that in spite of the restrictions, over 70% of the value of logistics activities in Vietnam are created by the foreign companies. Besides, local companies exploit only a few pieces of the supply chain (mainly delivery). Mr. Pham Truong Thang pointed out some weak points of the logistics services in Vietnam. As it is newly established in this country, it has small scale. The network between companies is weak. Mr. Pham Truong Thang noted that prices of logistic services in Vietnam compared to some countries in the region are relatively cheap, but the quality and service are lower and not sustainable. Also legal knowledge and international financial are weak. As the factors affecting the logistics market in Vietnam the speaker described transportation system, human resources and information infrastructure. Talking about the latter, the speaker mentioned that although Vietnamese enterprises in recent years has tried to bring information technology in their operation, but most of companies in the information system do not meet service requirements and lack of utility facilities that many customers require. Today logistics service in Vietnam is in the stage of partnership development. In addition to first-party logistics (1PL) and the 2nd party logistics (2PL), Vietnam has begun development of 3rd party Logistics (3PL) integrated missions, combined the transfer, storage and information processing.

Asia-Pacific Economic Cooperation

CLASSIFICATION OF LOGISTICS SERVICES IN VIETNAM

2. Logistics services concerned the transportation

- Sea transport service
- Inland river transport service
- Air transport service
- Rail transport service
- Road transport service
- Pipeline transport service

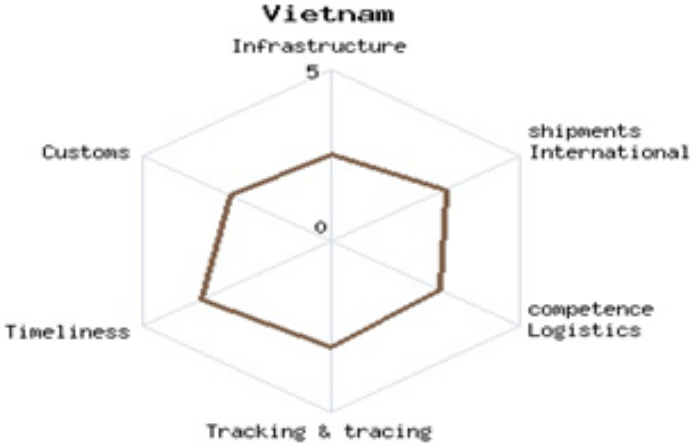
3. Other logistics services

- Inspection services and technical analysis
- Postal service
- Trading service
- Retail trade including management of cargo storage, collection, distribution and delivery.
- Other trucking services support…

Asia-Pacific Economic Cooperation

Logistics Performance Index

- According to World Bank logistics performance index (LPI) of Vietnam in September 2011 is 2.96. Rated 53 on the total number of 155 countries assessed (by the 2010), and ranked 5th in ASEAN.



Asia-Pacific Economic Cooperation

- **Statistical results of logistic activities in Vietnam:**
  - Logistic services account 2-4% of GDP
  - Service prices increase 20-25% / year
- **Factors affecting the logistics market in Vietnam**
  - First : Transportation
  - Second : Human Resource
  - Third : Information infrastructure

Asia-Pacific Economic Cooperation

- **In the first 6 months of 2012, freight transport in Vietnam was estimated at 433.6 million tons, increased 10.1%, and 92 billion tons/km, decreased 7.6% over the same period last year, including:**
  - Transport abroad reaches 18.8 million tons, downs 11.3% and 58.5 billion tons/km, decreases 12.1%.
  - Local transport of cargo reaches 410.2 million tons for six months, reaches 12.2% over the same period last year and 29.8 billion tons/km, increases 3.2%.
  - Inland transportation is estimated about 414.8 million tons, increases 12.5% and 33.5 billion tons/km, increased 1.8%
  - Road transport of cargo reaches 341.5 million tons, increases 12.6% and 18.3 billion tons/km, up 9.7%;
  - River transport of cargo reaches 66.4 million tons, increases 6% and 6.9 billion ton/km, increases 6.3%;
  - Sea transport of cargo reaches 22.1 million tons, decreases 13.5% and 64.6 billion tons/km, decreases 14.2%;
  - Rail transport of cargo 3.5 million tones, decreases 6% and 2 billion tons, down 5%.

«Development and Deployment of ATMS for Logistics Optimization in China»

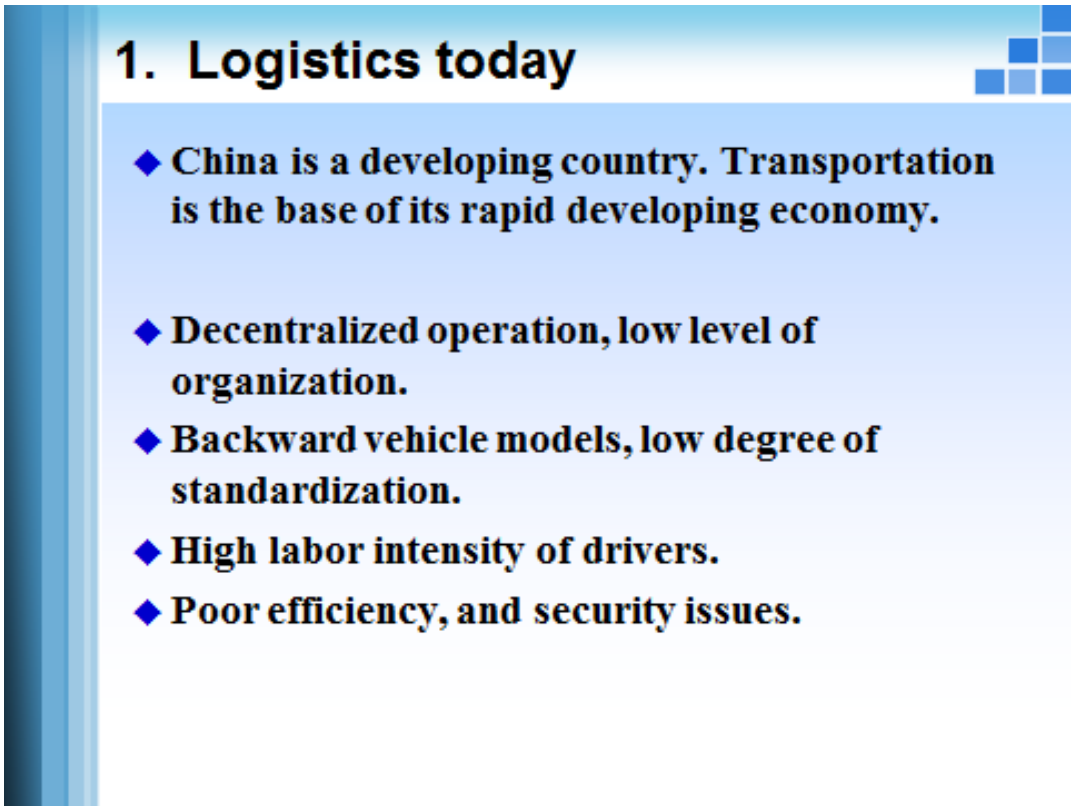
Mr Li Bin, Director of China Transport Telecommunications & Information Center, China

The report is dedicated to the situation with logistics and the ways of its improvement in China. Describing the state of affairs in it today, Li Bin pointed out that transportation is the base of the country's rapid developing economy. As the weak points in this sector he named decentralized operation, low level of organization, backward vehicle models and low degree of standardization, its poor efficiency, and some security issues. The speaker showed some ways of development in this field.

Presenting intelligent management systems for logistics existing in China he described LOGINK - the system that serves as an electrical data-exchanging basic network which offers open, sharing, free logistics receipts exchange and services exchange. Representing China it jointly participates in NEAL-NET, and EU missions, by providing logistics information services of exchange, software, credits, tracks and deals.

Mr. Li Bin also described freight IC Card which has been launched in Guangdong, Gansu, and Shanxi. Also vessel crew card has been applied across the country. The speaker presented monitoring systems used in the country – GPS, GPRS/3G and RFID.

The last part of the presentation concerned the ways of development and projects for the future. Mr. Li Bin presented pilot projects and demos (like transport credit information sharing, regional public logistics information platform, intermodal transport coordination service, and drop and pull transport pilot projects. In conclusion Mr. Li Bin shared ITS action plan for 2020. It includes adoption of intelligent traffic control and management measures, Intelligent Traffic Safety and Emergency (ITSE), comprehensive travel information services, intelligent public transportation, advanced freight transport management and electronic payment for transportation.



2. Current missions ongoing

- Develop freight forwarders, and non-vehicle operators, etc.
- Develop leading enterprises, establish industrial alliance.
- Drop and pull transport.
- Construction of freight field station.
- Hazardous goods transportation management, and freight overload enforcement.

2. Logistics E-HUB

- LOGINK system is an electrical data-exchanging basic network which offers open, sharing, free logistics receipts exchange and services exchange.
- Originated by MOT
- National Node Zhejiang Province
- Regional Exchange Node

7. Dynamic Monitoring on Carriers

2. Pilot projects and demos

- Transport credit information sharing.
- Regional public logistics information platform.
- Intermodal transport coordination service.
- Drop and pull transport pilot projects.
- Development & demonstration on Logistics information exchange basic network and application services

ITS Application in China

ITS action plan for 2020

1. Intelligent Traffic Control and Management
2. Intelligent Traffic Safety and Emergency
3. Comprehensive Travel Information Services
4. Intelligent Public Transportation
5. Advanced Freight Transport Management
6. Electronic Payment for Transportation

«Application of GLONASS Satellite Navigation Technologies for Operational Control and Management of Postal Service vehicles. Deployment of the Automated Vehicle Monitoring System (AVMS)»

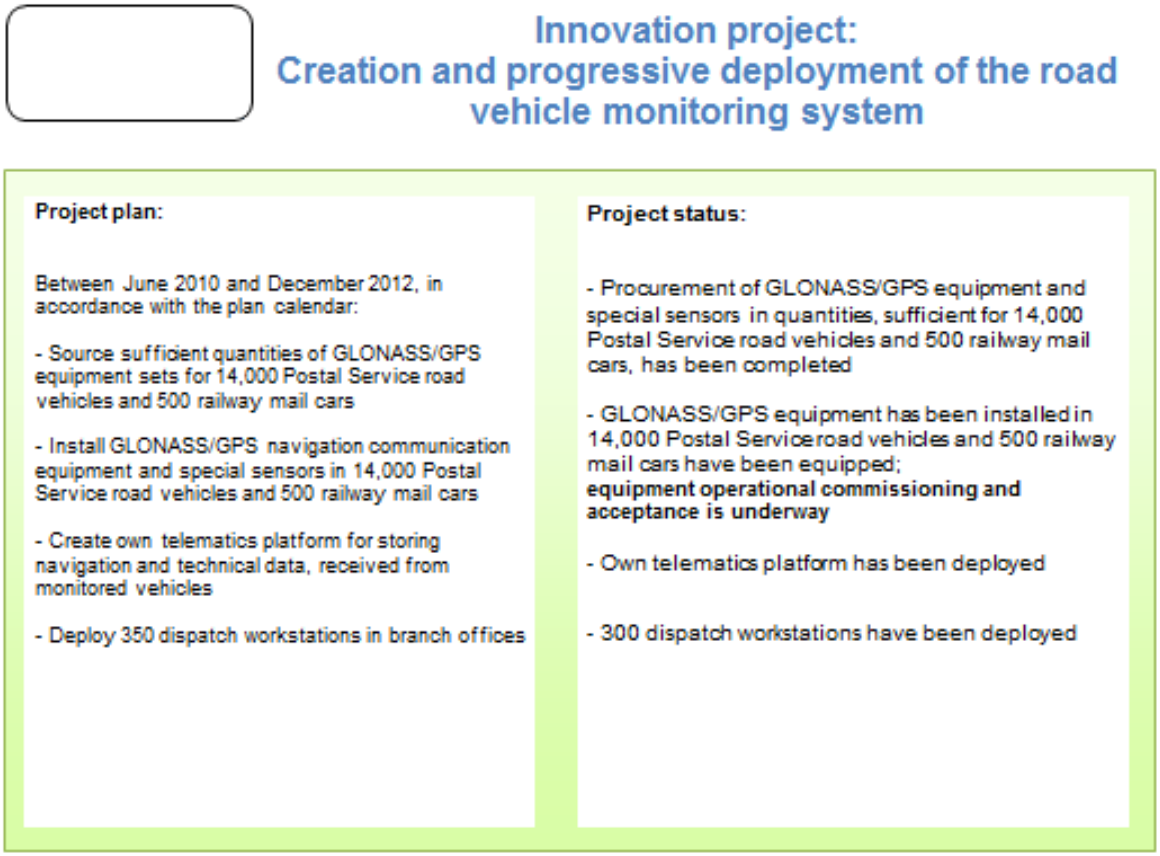
Mr Alexander Lyapin, FSUE "Pochta Rossii", Russia

The report touched the technologies used by Russian postal services. In the first part the speaker described Automated Vehicle Monitoring System. It is directed at reducing postal service vehicles operational costs, maintaining set mail delivery times, enhancing the safety of postal service transportation and establishing infrastructure basis for adoption of modern postal delivery optimization technologies, creation of the system for control over Postal Service transportation by road and rail.

Mr. Lyapin described some projects initiated in the period from June 2010 to December 2012. They include supply of sufficient quantities of GLONASS/GPS equipment sets for 14,000 Postal Service road vehicles and 500 railway mail cars; installation of GLONASS/GPS navigation communication equipment and special sensors in 14,000 Postal Service road vehicles and 500 railway mail cars; creation of own telematics platform for storing navigation and technical data, received from monitored vehicles, deployment of 350 dispatch workstations in branch offices. Theses plans were realized practically in full.

It is planned to upgrade postal service transport vehicles in 2 phases. The first one covers procurement, installation, and set-up for 10 000 road vehicles (70% coverage of own Postal Service fleet). The second one procurement, installation, and set-up for another 4000 road vehicles and 500 railway mail cars (100% coverage of own Postal Service fleet).

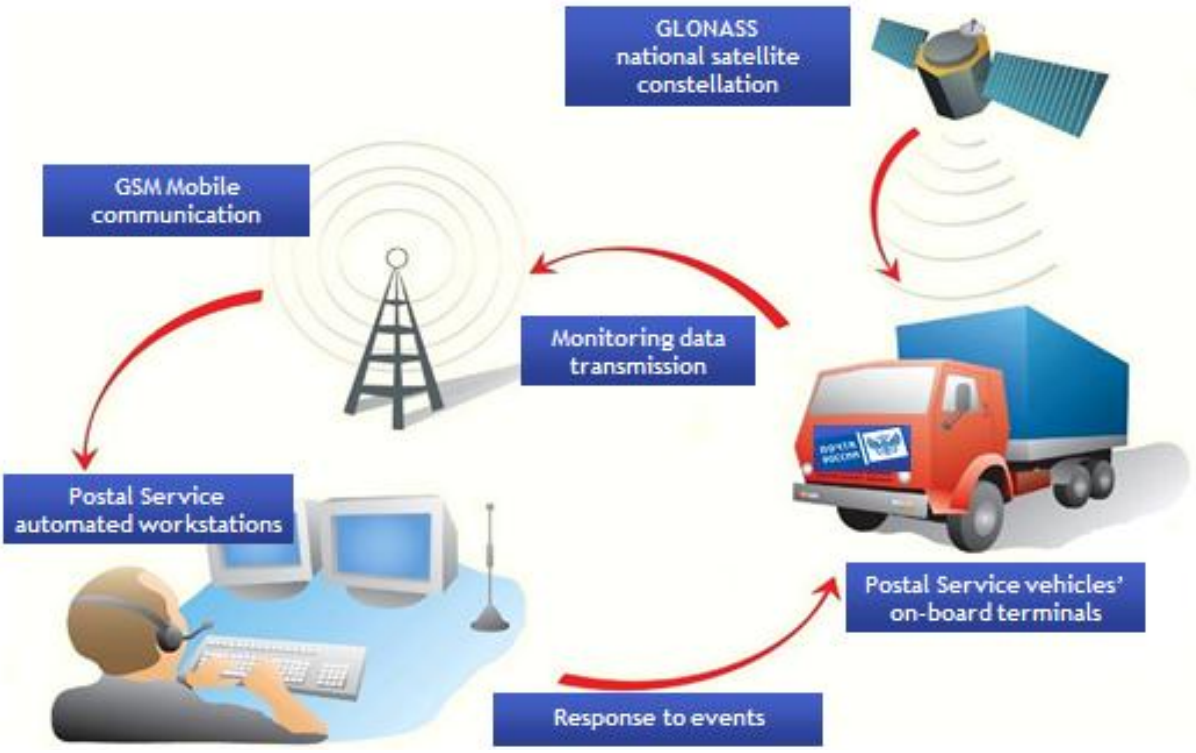
Mr. Lyapin proved the effectiveness of AVMS deployment project by stating the fallowing facts: expected transportation cost savings for own Postal Service fleet are at least 20%, and its pay-back period is no more than 2.5 years.



Structure of the Russian Post own Postal Service fleet to be equipped with GLONASS/GPS devices in 2011 - 2012

Branch	Vehicles	Equipped First phase	Upgraded Second phase
Postal Service branches (82)	13,132	9,538	3,594
EMS Russian Post	722	356	366
Main long-distance mail transport center	146	106	40
Total:	14,000	10,000	4,000

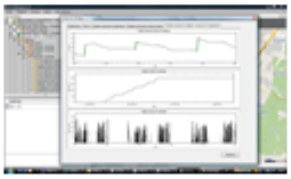
Russian Post Automated Vehicle Monitoring System: Concept of operation



Core AVMS functions

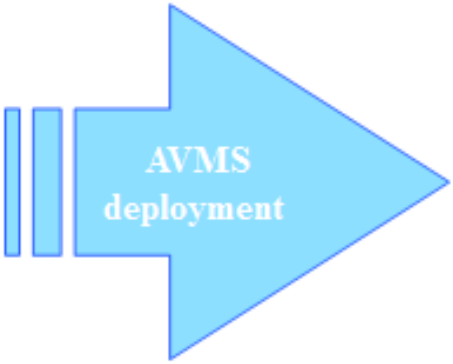
- Vehicle route, schedule, and timetable planning

- Control over efficient vehicle use (idle time, distance traveled)
- Control over completion of route assignments
- Vehicle operational management and dispatch
- Detection of speed limit violations
- Ensuring the safety of Postal Service transportation



- Control over fuel consumptions
- Tracking vehicle and equipment operating hours
- Generation of reports on vehicle and personal performance for completed reporting periods

Project effectiveness



Expected transportation cost savings for own Postal Service fleet are **at least 20%**

Projected pay-back period is **no more than 2.5 years** from the start of AVMS operation

«Role of Satellite Navigation Technologies in Preparation for the 2014 Winter Olympics in Sochi»

Mr. Vitaliy Poltaratskiy, Head of Development Department, JSC "M2M telematics", Russia

Mr. Poltaratskiy described in detail:

Freight transportation management objectives in run-up to and during the 2014 Winter Olympics;

Operation of the L&TC AMS freight vehicle management (FVM) subsystem

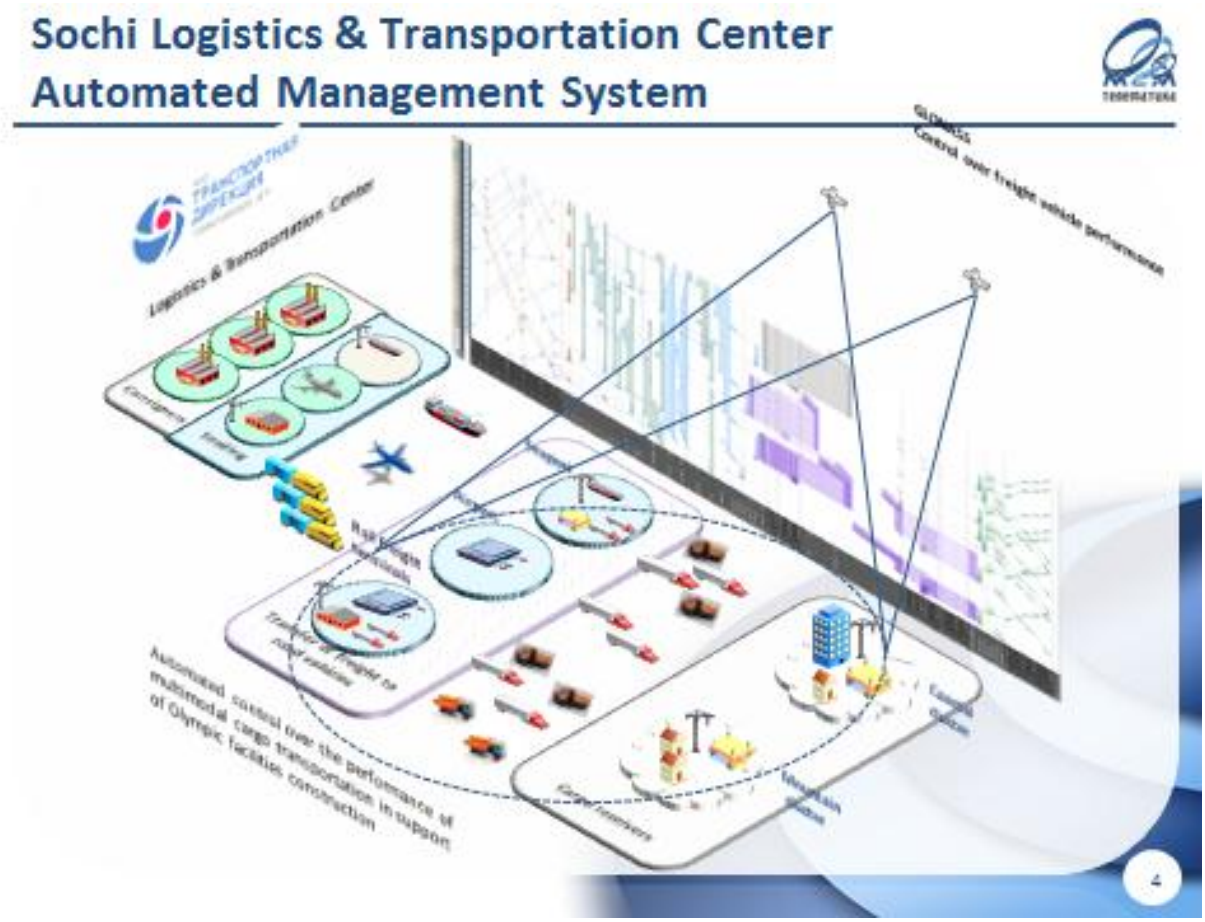
L&TC AMS FVM subsystem performance;

Operation of the L&TC AMS special-purpose vehicle monitoring and control (SPVMC) subsystem;

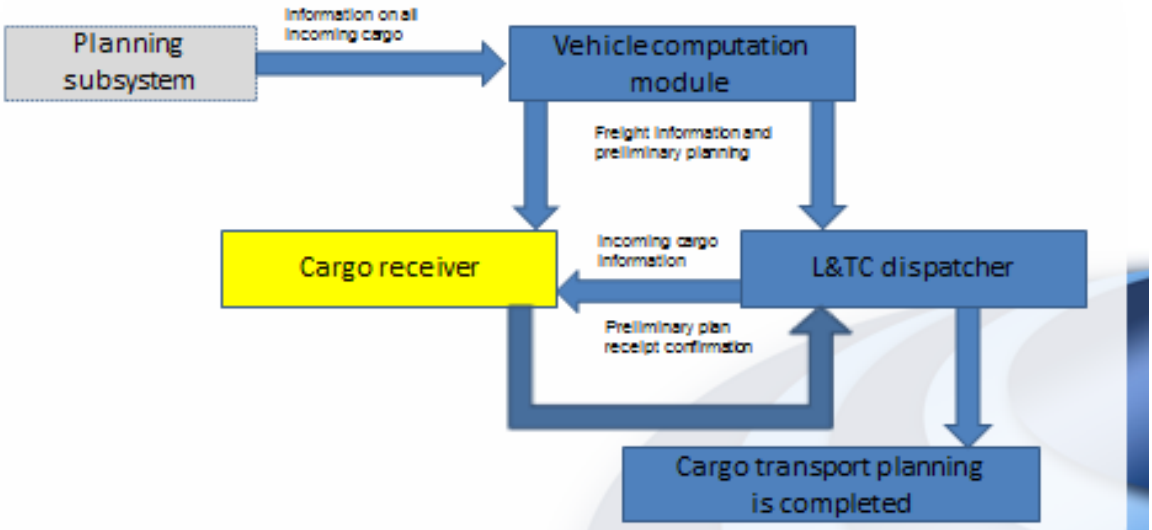
L&TC AMS SPVMC subsystem performance;

Operation of the L&TC AMS MDS subsystem;

L&TC AMS MDS subsystem performance.

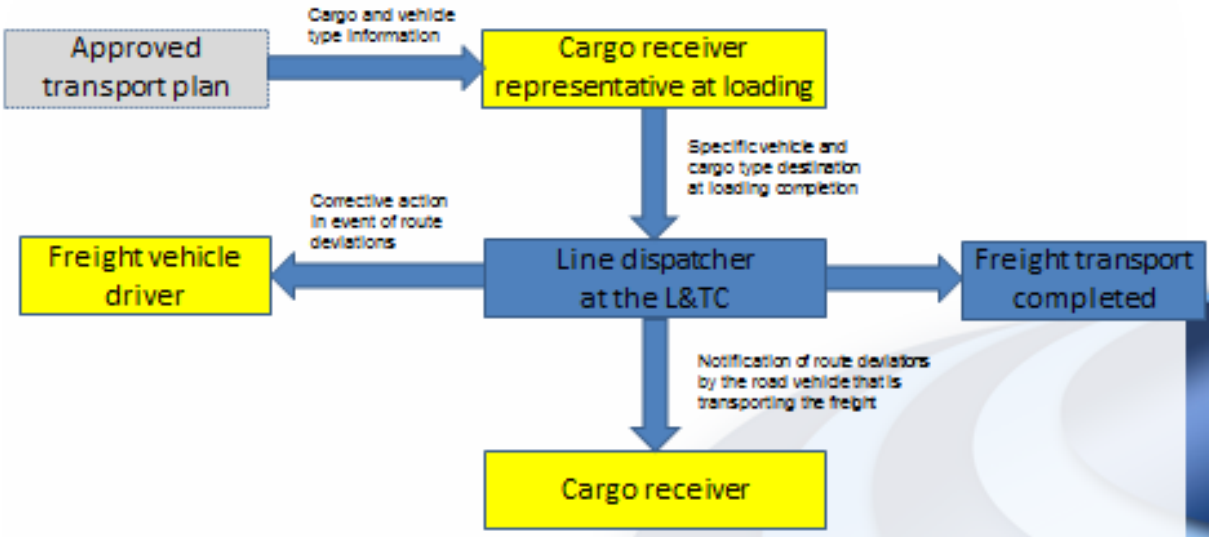


Operation of Sochi L&TC AMS freight vehicle management subsystem



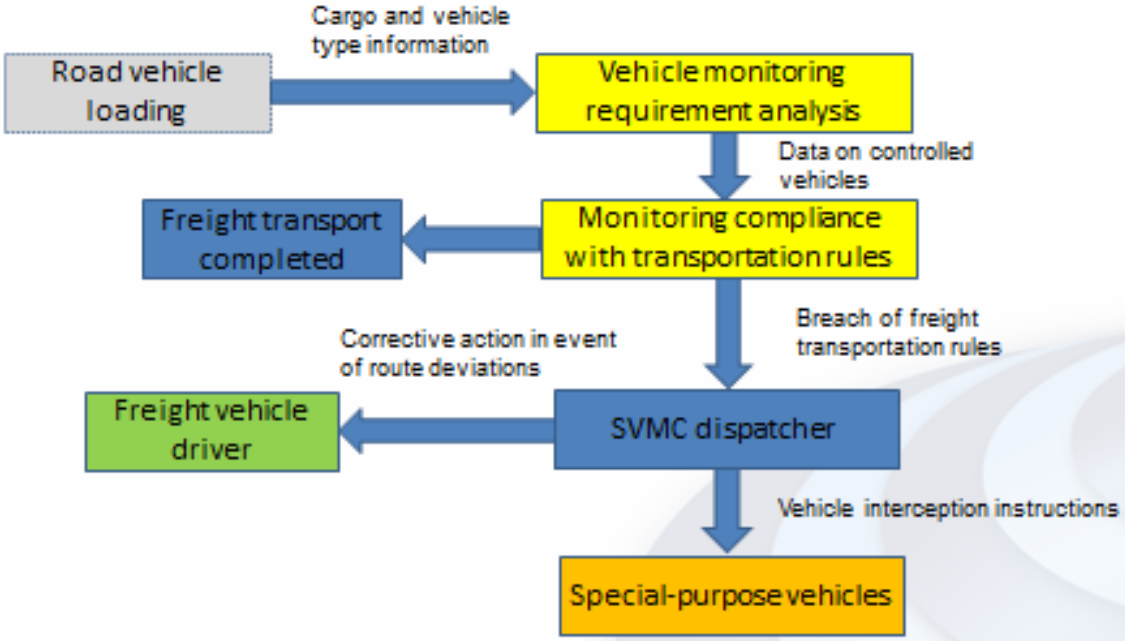
Planning

Operation of Sochi L&TC AMS freight vehicle management subsystem



Cargo transport monitoring and control

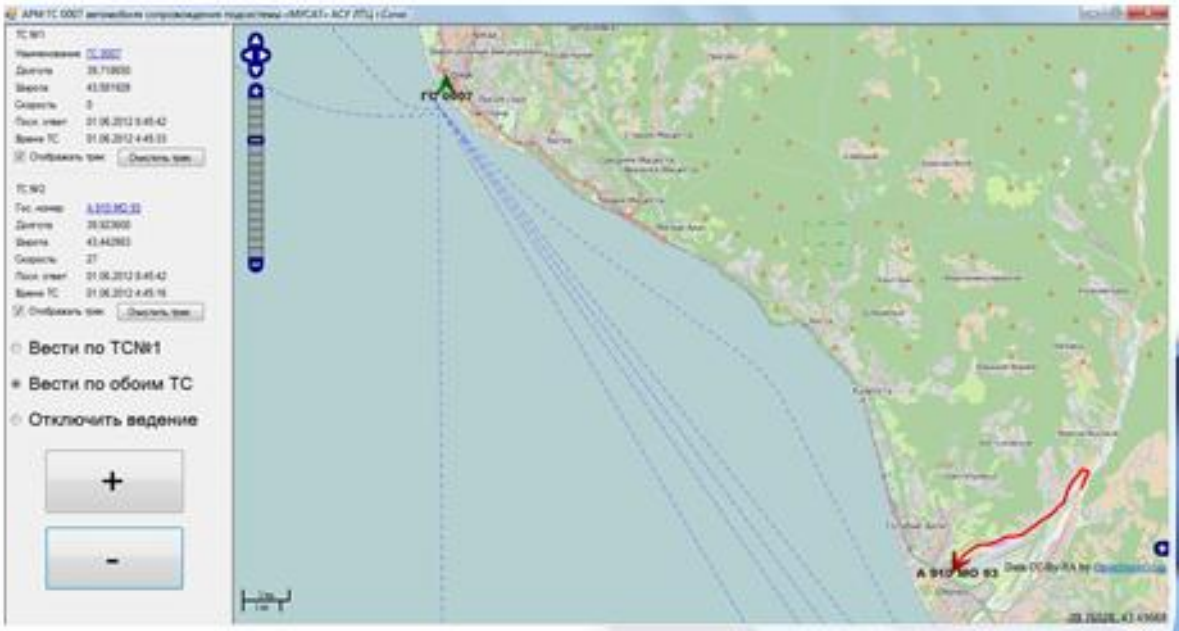
Operation of Sochi L&TC AMS special-purpose vehicle monitoring and control (SVMC) subsystem



Enforcement of transportation rules

10

Operation of Sochi L&TC AMS special-purpose vehicle monitoring and control (SVMC) subsystem



Olympstroy Group special-purpose vehicle workstation interface

12

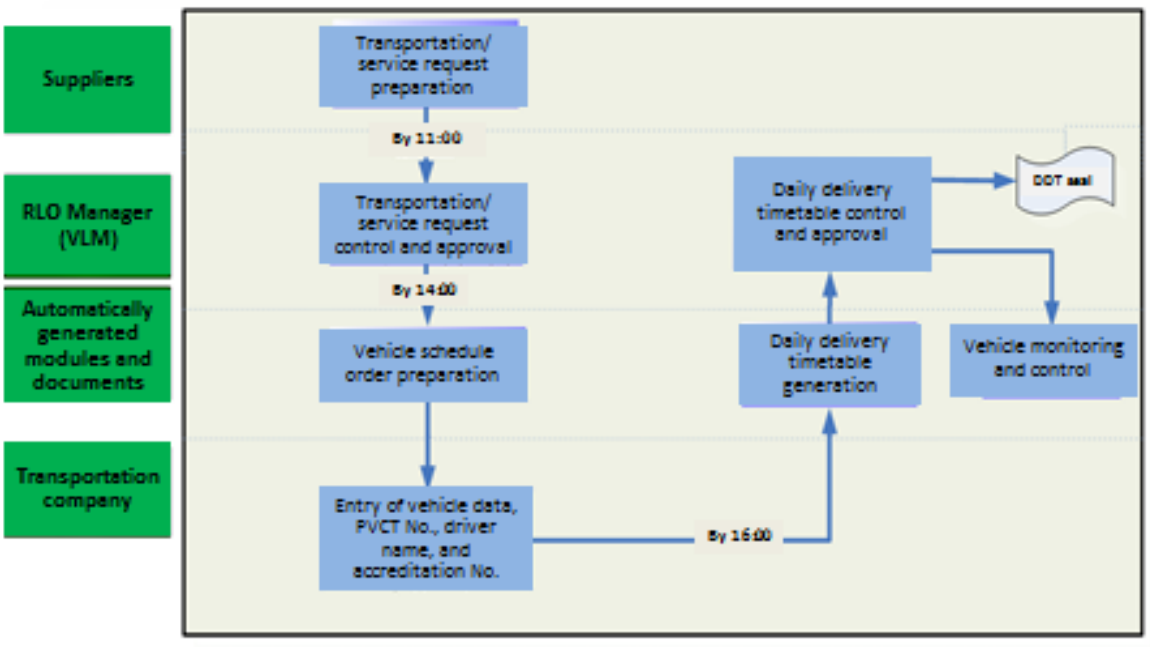
Operation of Sochi L&TC AMS MDS subsystem

- 4,000 road freight vehicles
- 14 specially protected Olympic construction sites
- Seven Olympstroy Group interception vehicles
- Three vehicle inspection checkpoints
- One central personnel activity audit post
- Control over route deviations
- Control over bypassing checkpoint inspection
- Control over turning off GLONASS equipment

Performance

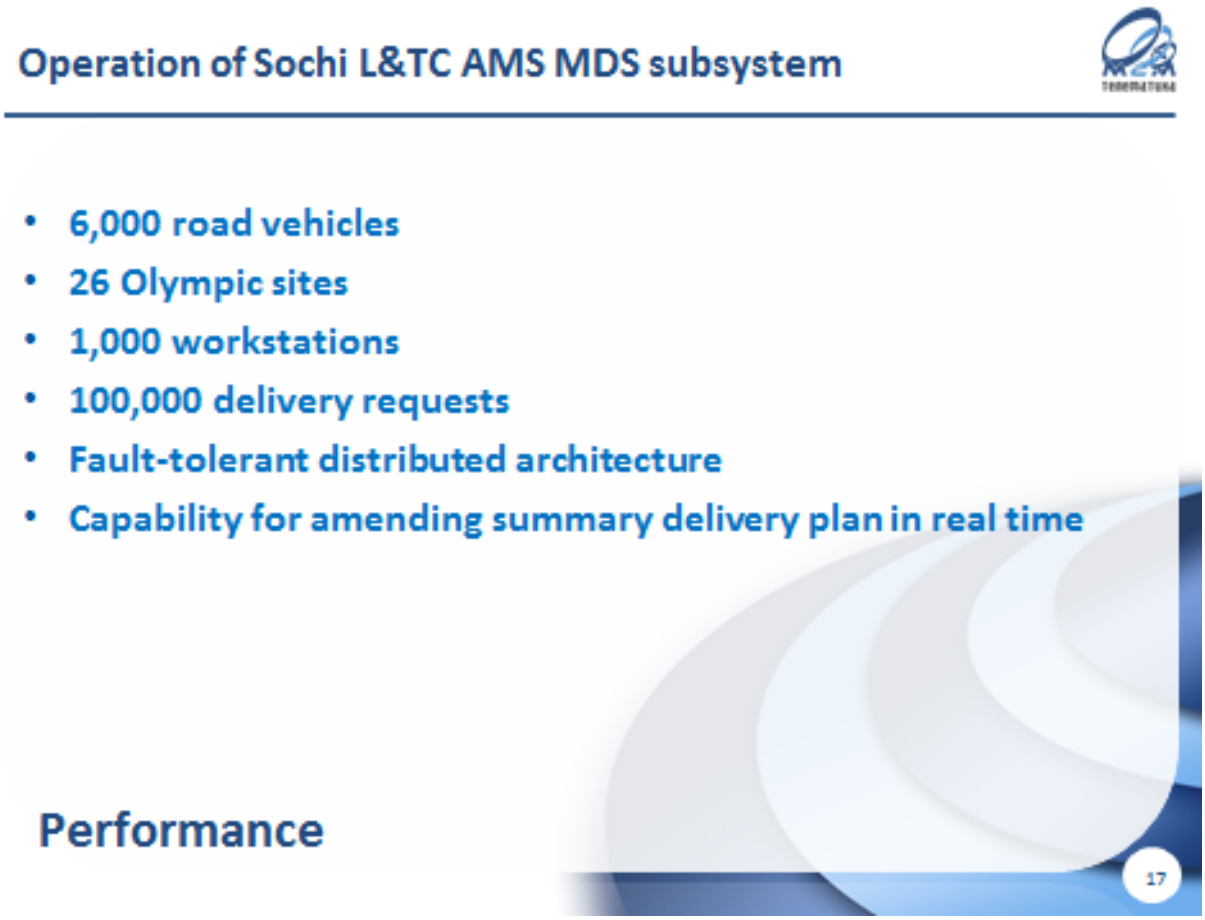
13

Operation of Sochi L&TC AMS MDS subsystem



Reserving time for unloading at the site

14



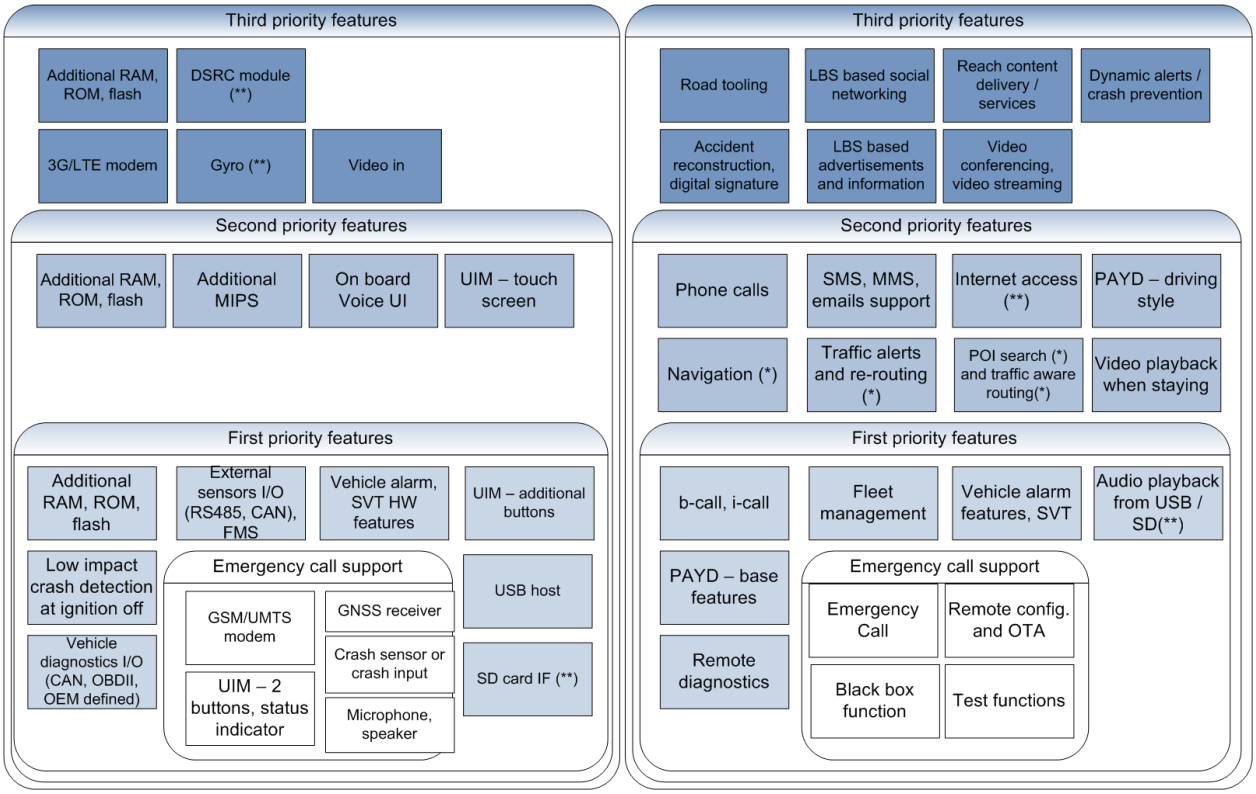
«ERA-GLONASS System Architecture IVS Unification End-User Advantages»

Mr Yaroslav Domaratsky, Project Office Director*, *JSC "NIS"

In his report Mr. Domaratsky presented ERA- GLONASS system architecture IVS. He began with presenting GLONASS union and its members - "MTS", "Vimpelcom", "Megafon", "RTComm.ru" (Rostelecom), LLC Yandex, JSC "Navigation-Information Systems", "GLONASS/GNSS-Forum" Association, LLC "Summa-Telecom" and its development.

In conclusion the speaker noted that capabilities of ERA GLONASS infrastructure can be used to facilitate the development of interoperable telematics systems, like fleet management systems for transportation transit corridors, passenger transportation, heavy, hazardous cargo forward and deliveries, tolling systems, stolen vehicle recovery service and digital tachographs.

The capabilities of ERA GLONASS infrastructure make it possible to introduce innovative products based on Insurance Telematics Services. Those are road traffic accident reconstruction Service for Compulsory Insurance and Pay-as-You-Drive/Pay-as-You-Use Insurance Programs for Voluntary Insurance.



“Global Supply Chain Virtual Warehousing and Cross Docking Case Study Using Global Track Tracking Systems”

Professor Patrick Sherry, National Center for Intermodal Transportation, the USA

Professor Patrick Sherry elaborated on the systems of automated transport in freight. In particular - Positive Train Control (PTC) system Adopted by Congress in 2008 and planned for implementation in 2015 and Remote Control Locomotives (RCL) system Adopted Voluntarily in many Yard Switching operations over the last 7 to 10 years. PTC sends up-to-date visual and audible information to train crew members about areas where the train needs to be slowed or stopped. This information includes the status of approaching signals, the position of approaching switches, speed limits at approaching curves and other reduced-speed locations, speed restrictions at approaching crossings and speed restrictions at areas where work is being performed on or near the tracks. PTC communicates with the train’s onboard computer, allowing it to audibly warn the engineer and display the train’s safe braking distance based on the train’s speed, length, width, weight and the grade and curvature of the track. If the engineer does not respond to the ample audible warning and screen display, the onboard computer will activate the brakes and safely stop the train

Remote control units are considered operationally safe by the FRA, used extensively in yard operations today. It helped to reduce the size of yard switching crews by almost half. The speaker however recognized that some safety issues still present, due to operator error.

The second part of this presentation dealt with practical cases.

PTC

- Positive Train Control
  - Adopted by Congress in 2008
  - Planned for implementation in 2015
  - US Carriers are installing the equipment in new locomotives
  - Nothing operational at this time except in some short lines in the north.

PTC

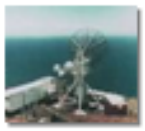
- PTC sends up-to-date visual and audible information to train crew members about areas where the train needs to be slowed or stopped. This information includes the status of approaching signals, the position of approaching switches, speed limits at approaching curves and other reduced-speed locations, speed restrictions at approaching crossings and speed restrictions at areas where work is being performed on or near the tracks. PTC communicates with the train's onboard computer, allowing it to audibly warn the engineer and display the train's safe braking distance based on the train's speed, length, width, weight and the grade and curvature of the track. If the engineer does not respond to the ample audible warning and screen display, the onboard computer will activate the brakes and safely stop the train

Remote Control Locomotives

- Adopted Voluntarily in many Yard Switching operations over the last 7 to 10 years
- Remote control units are considered operationally safe by the FRA
- Used extensively in yard operations today.
- Reduced the size of yard switching crews by almost half
- Some safety issues still present, due to operator error

Legislation

- **(CNN)** -- California is the latest state to allow testing of Google's self-driving cars on the roads, though only with a human passenger along as a safety measure.
- Gov. Edmund "Jerry" Brown signed the autonomous-vehicles bill into law Tuesday afternoon alongside Google co-founder Sergey Brin and State Sen. Alex Padilla, who authored the bill, at Google's headquarters in Mountain View, California. The bill, SB 1298, will set up procedures and requirements for determining when the cars are road-ready.



System Planning Corp

- Founded by leading Pentagon scientist Dr. Easley
- Over 40 years of high technology systems developed for the Dept. of Defense, Dept. of Homeland Security and Armed Services
- About $80 million annual sales, more than 800 customers with thousands of contracts completed
- Scientific and Systems engineering development and support
- World class radar physics and systems development
- TriData - Renowned First Responder Consulting Group
- **GlobalTrak**

• ITI Executive Masters Program

- ITI recognizes the need for a seamless transportation system that integrates all modes—surface, water, and air. It's education programs, therefore, focus on preparing leaders and managers who will have a positive influence on a transportation industry that is becoming increasingly more intermodal and interdependent.

  The ITI Executive Masters Program is a fully accredited Master of Science in Intermodal Transportation Management from the University of Denver for mid-to senior-level transportation professionals and public-sector administrators and planners.

• NCIT National Center for Intermodal Transportation

- From single modal perspectives, the United States has developed one of the best transportation systems in the world. However, because each mode of transportation evolved independently of the others, they are not well integrated. As a result, it is difficult to transfer passengers and freight from one mode to another. Furthermore, some modes are over utilized, creating delays and hazards, while other modes are under utilized and have excess capacity. At NCIT, we believe that the overall contribution of the national transportation system can be increased by the creation of an intermodal system based on a more balanced and rational use of all modes of transportation. As such, the theme of NCIT is to promote the development of a safe and efficient national intermodal transportation system.

12

GLOBALTRAK

UNIVERSITY OF DENVER

End-to-End Visibility
Seamless technology fusion

- Passive and active RFID, RTLS, GPS, wireless and logistics/inventory management applications
- Provides true real-time visibility across entire supply chains - from raw material acquisition through manufacturing, warehousing and inter-modal distribution

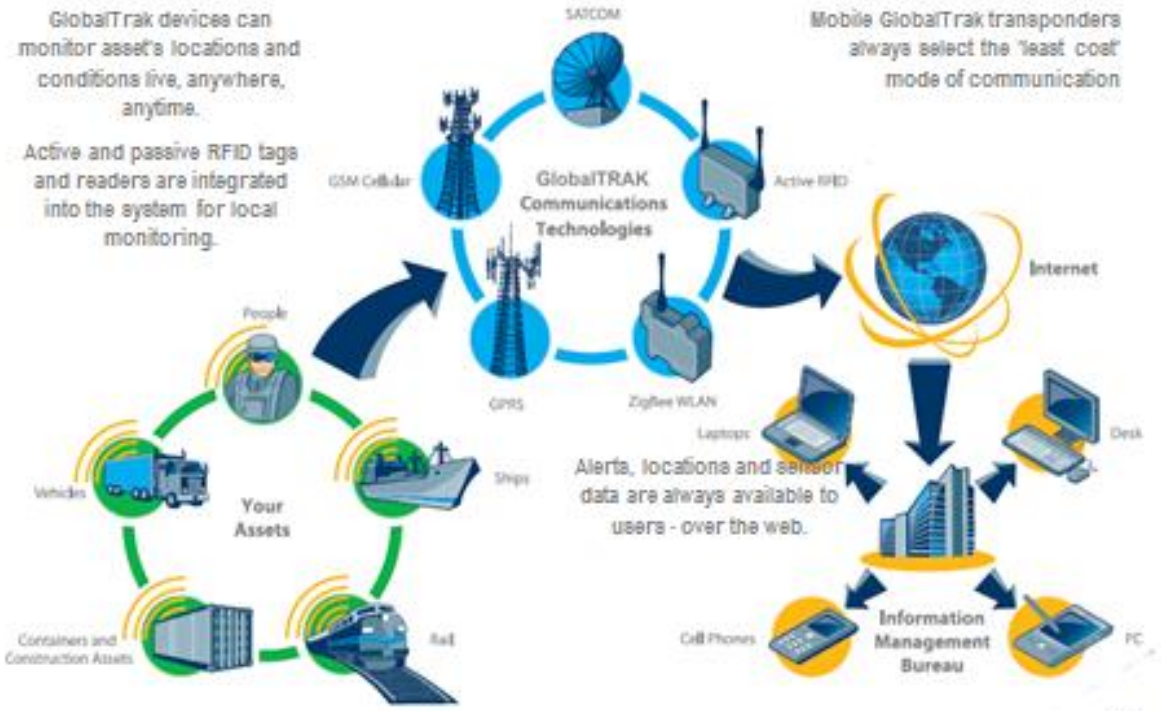
GLOBALTRAK

UNIVERSITY OF DENVER

How does GlobalTrak collect the data?

GlobalTrak devices can monitor asset's locations and conditions live, anywhere, anytime.

Active and passive RFID tags and readers are integrated into the system for local monitoring.



Mobile GlobalTrak transponders always select the "least cost" mode of communication

15

Monitoring Devices

- GlobalTrak Plus – Interior Mount (External Sat Antenna)
  - Ruggedized marine certified enclosure and antenna
  - LEO Satellite, Cell, ZigBee, GPS, integrated sensors
- GlobalTrak Plus - Exterior Mount
  - Quick magnetic mount
  - LEO Satellite, Cellular, ZigBee, GPS, integrated sensors
- GlobalTrak Lite
  - Works inside trucks, containers, and cargo itself
  - Reefer Interface Option
  - Cell, Assisted-GPS, ZigBee, sensor pack
- GlobalTrak SatLite
  - One-Way Satellite, simple to install, easy to use

Peripherals

- GlobalTrak Remote Sensor Node
  - Fits in cargo or on pallet
  - ZigBee, Temp, Humidity, Motion, Shock, & Door Open
- TydenBrooks ZigBee communicating e-Seals
  - e-Strap and e-Bolt

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16

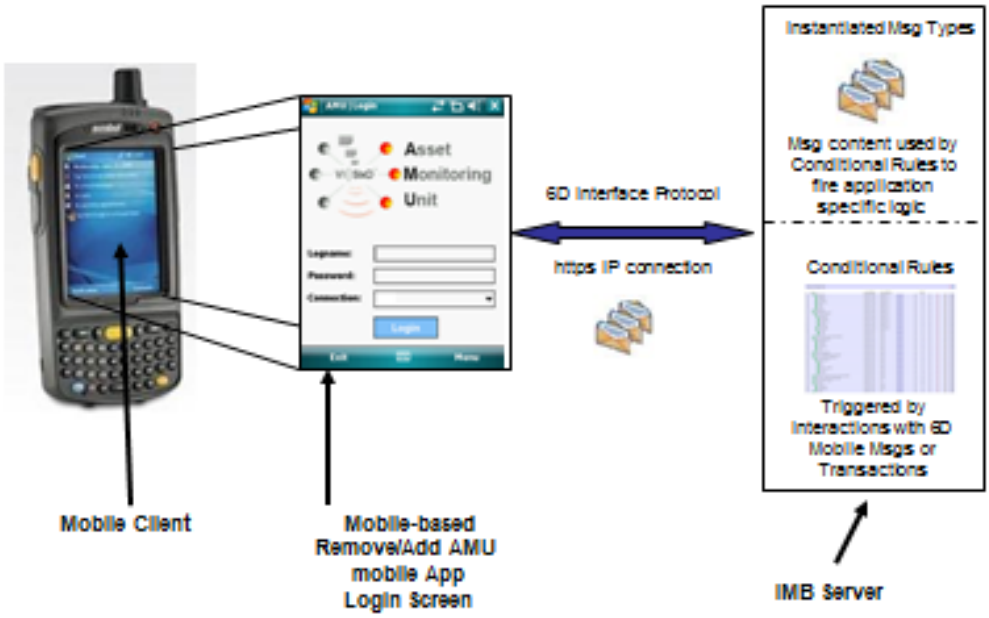
Information Management Bureau (IMB)

Stakeholder Community Platform

Key Features

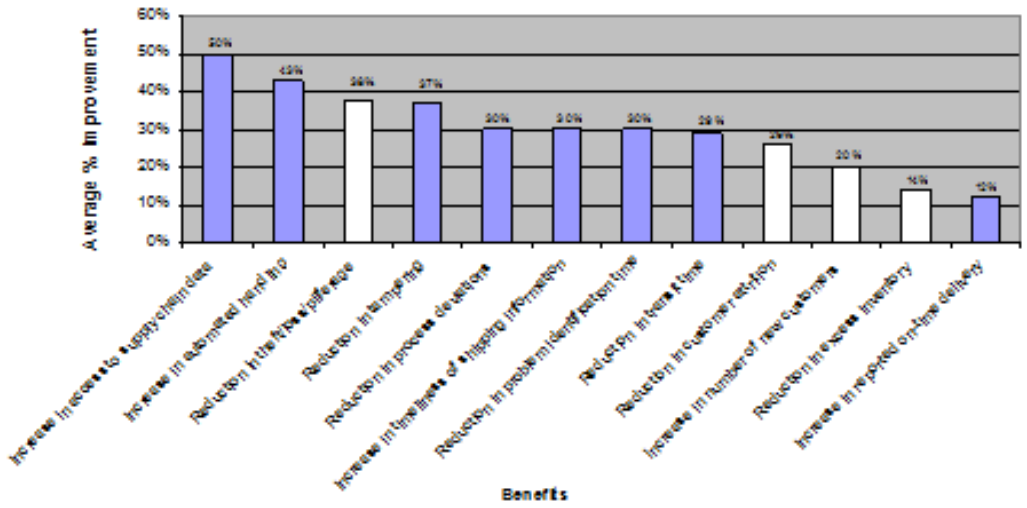
- Serves as a multi-tenant "system of systems" where users share information on a discretionary basis
- Web Software as a Service (SaaS)
- Event driven
- Cargo asset management
- Mapping, geozoning, tracking
- Mobile inventory management
- Document management and processing
- Stakeholder configurable intelligence using complex business rules

IMB Mobile Computing Platform



Military Unit Movements

Benefits of Security and Visibility

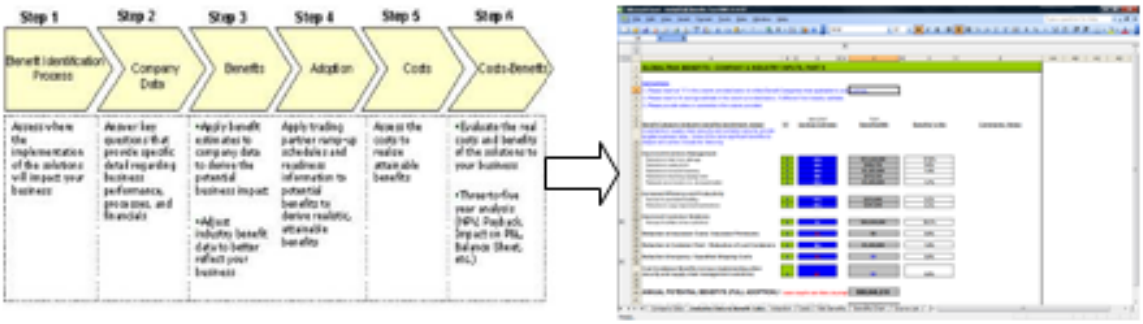


Most significant in terms of potential dollar value are labeled in white boxes.

Source: *Innovators In Supply Chain Security: Better Security Drives Business Value* (July 2006) and GlobalTrak's Value Analyzer 2

Business Analysis Tool: GlobalTrak Value Analyzer

- Financial tool for the GlobalTrak value proposition and ROI
- Incorporates data from recent studies performed by M.I.T, Stanford, A.T. Kearney, and Aberdeen Group
- Uses up to 25 company parameters and calculated ROI over an N year adoption period



GLOBALTRAK

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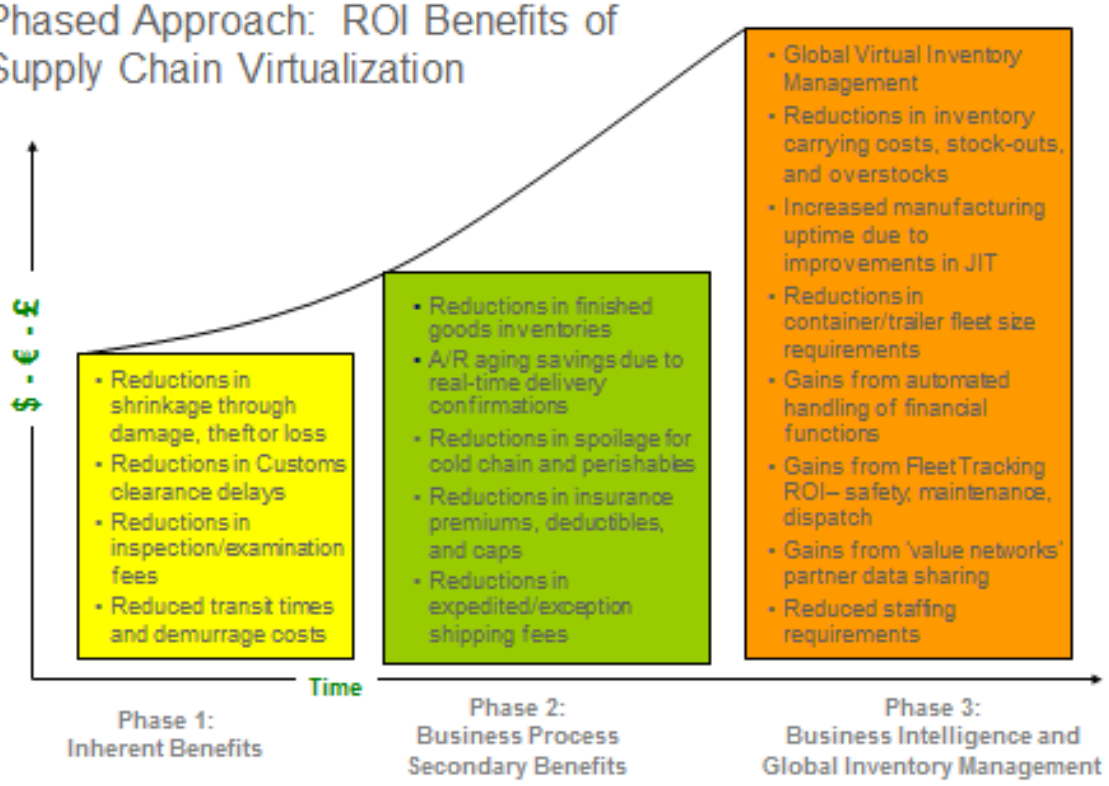
Phased Approach: ROI Benefits of Supply Chain Virtualization



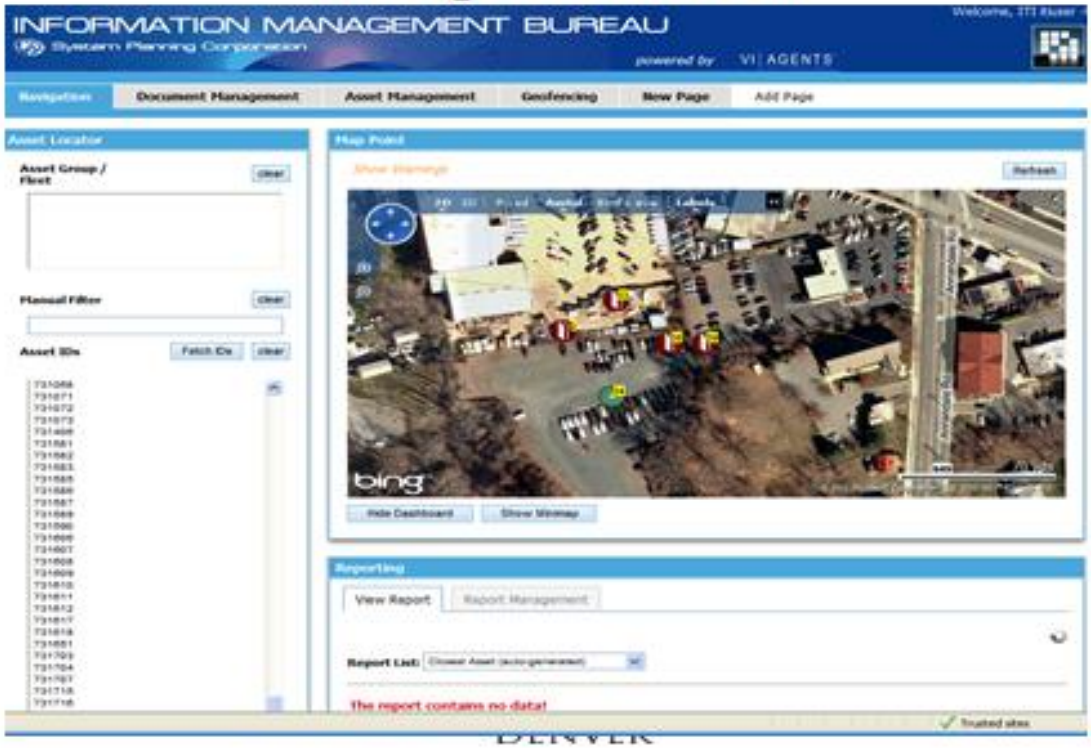
GlobalTrak® seeks a Russian partner to perform service and develop technology for CIS applications.

- Can be any of the following:

- Russian Space Agency
- Aerospace Company
- Russian Telecommunications Company
- Russian Software Development Company
- Operational Company involved with intermodal transportation
- Security Provider
- Insurance Company
- Device manufacturer

- Contact Rocque Kramer at rkramer@sysplan.com

Image Context



«The Existing Transportation And Cargo Flow Monitoring And Logistics Management Systems in the Philippines»

Mr Andrew Basallote, Assistant Director General II, Civil Aviation Authority of the Philippines

This report was dedicated to the description of transportation and cargo flow monitoring and logistics management systems in the Philippines. The speaker first presented the regulation system in this field. He stressed that no government agency oversees the industry in his country, and the Civil Aeronautics Board (CAB), an agency attached to the Department of Transportation and Communications, regulates only the airfreight. Specifically, it certifies public convenience and necessity (CPCN) to domestic carriers; gives foreign carriers Permit (FACP) to foreign carriers; and issues letters of authority to airfreight forwarders, general sales agents, cargo sales agents who are fit, willing and able to perform service as required by public convenience and necessity. Another government agencies in this field are the Philippine Shippers Bureau (PSB) - an agency under the Department of Trade and Industry, and the Land Transportation Franchising and Regulatory Board (LTFRB). Specifically, PSB accredits sea freight forwarders categorized as non-vessel operating common carrier, international freight forwarders and domestic freight forwarder. LTFRB issues permits to truckers.

As there is likewise no monitoring of the entire industry, the speaker made a conclusion that there is no assurance that the operators, though registered, are compliant to the standards set by the accrediting government agency. According to Mr. Basallote this concern has been raised many times by the industry.

The speaker concluded that there is a need for a framework or structure for consultation between the government and the industry until a single authority can

oversee the industry to improve the efficiency of the logistics chain, and they should be created a single agency that will oversee the industry.

SITUATIONER (1/4)

- No single government agency oversees the industry
- The Civil Aeronautics Board (CAB), an agency attached to the Department of Transportation and Communications, regulates the airfreight
- Specifically, the CAB issues the ff:
  - Certifies of Public Convenience and Necessity (CPCN) to domestic carriers;
  - Foreign Carriers Permit (FACP) to foreign carriers; and
  - Letters of Authority to airfreight forwarders, general sales agents, cargo sales agents who are fit, willing and able to perform service as required by public convenience and necessity

SITUATIONER (2/4)

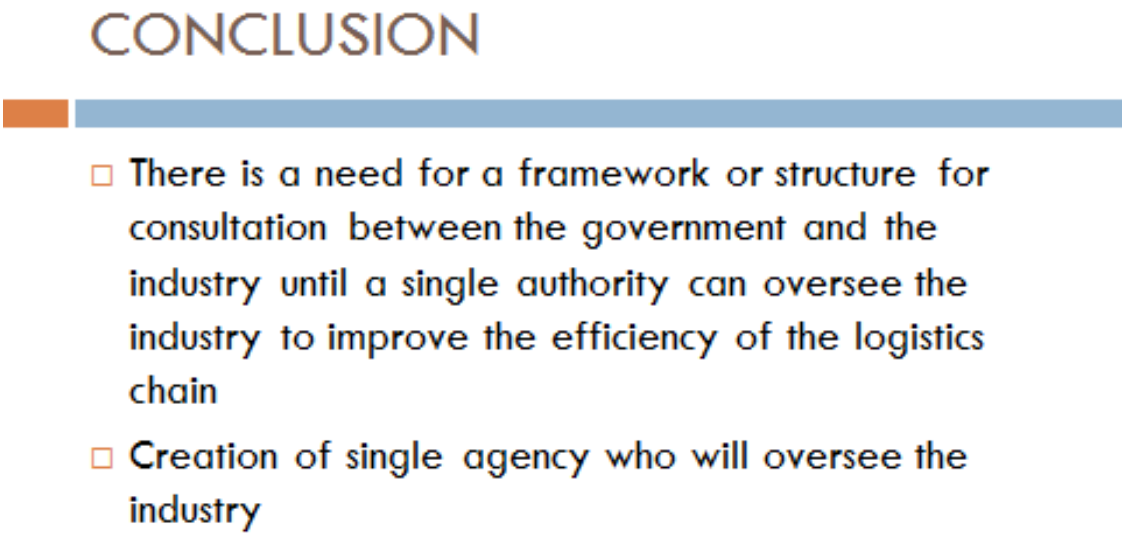
- The Philippine Shippers Bureau (PSB)
  - An agency under the Department of Trade and Industry
  - Regulates the sea freight per Executive Order NO. 514
  - Specifically, the PSB accredits :
    - Sea freight forwarders categorized as non-vessel operating common carrier
    - International freight forwarder
    - Domestic freight forwarder
  - PSB conducts consultation, dialogue, and negotaition with its international and regional counterparts as well as shipping and transport associations on matters of mutual interests to exporters, importers, and other commercial users of sea transport, particularly on freight rates, adequacy of services and reasonable terms and conditions of carriage

SITUATIONER (3/4)

- The Land Transportation Franchising and Regulatory Board (LTFRB)
  - An agency under the Department of Transportation and Commnications, issues permits to truckers
- Specifically, LTFRB issues, ammends, revises, suspends or cancerls Certificates of Public Convenience (CPC) or permits authorizing the operation of public land transportation services provided by motorized vehicles, and to prescribe the appropriate terms and conditions.

SITUATIONER 4/4

- With the present organizational structure, policies are fragmented
- The industry operators have to deal with different government agencies
- There is likewise no monitoring of the entire industry
- There is no assurance that the operators, though registered, are compliant to the standards set by the accrediting government agency
- This concern has been raised many times by the industry



«GLONASS Government Policy, Status and Modernization»

Ms Tatiana Mirgorodskaya, Central Research Institute for Machine Building, Information and Analysis Center for Positioning, Navigation and Timing, Russia

The speaker described in detail the GLONASS State Policy adopted in Russia, presented GLONASS Program Results, depicted GLONASS Program 2012-2020. In conclusion she elaborated on GLONASS Status and Modernization Efforts and on International Cooperation in this field.

Summarizing the report the speaker stressed that GLONASS Program is among priorities of the Russian Government policy. It is open service is free for all users, and supposed to become one of key elements of the international GNSS infrastructure for worldwide user benefits.

Presidential Decree

The Presidential Decree № 638 of May, 17, 2007

"On Use of GLONASS Global Navigation Satellite System for the Benefit of Social and Economic Development of the Russian Federation"

- Access to GLONASS civil signals is free and unlimited for both Russian and international users
- Federal organizations, Federal subjects' executive authorities, local self-governments and authorities, neglecting their organizational and legal status, shall use navigation equipment utilizing GLONASS signals
- Russian Federation Government shall approve and adopt the GLONASS Federal Program by 2011

3

State Policy Basic Principles

Basic Documents:

- Presidential Decree, May 17, 2007
- GLONASS Federal Program
  - 2002 – 2011 -finished
  - 2012 – 2020 - approved 3 March, 2012
  - Contracts awarded

Basic Principles

- GLONASS is a dual use system
- GLONASS free of charge worldwide
- GLONASS mandatory use for Russian critical infrastructure and governmental applications
- Promotion of GLONASS commercial use
- GNSS compatibility and interoperability

Federal GLONASS Program is a basis for GLONASS State Policy in PNT

4

GLONASS Program Results 1/2

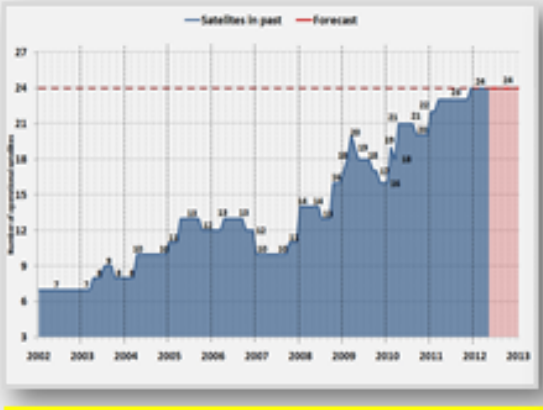
Constellation recovery

- 2002 6-7 SV operational
- 2012 24 SV operational

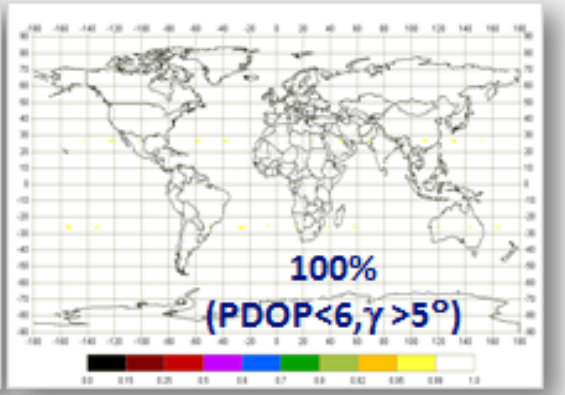
Availability improvement

- 2002 18%
- 2012 100%

Number of operational satellites



Average daily availability



- GLONASS recovered
- GLONASS recognized worldwide

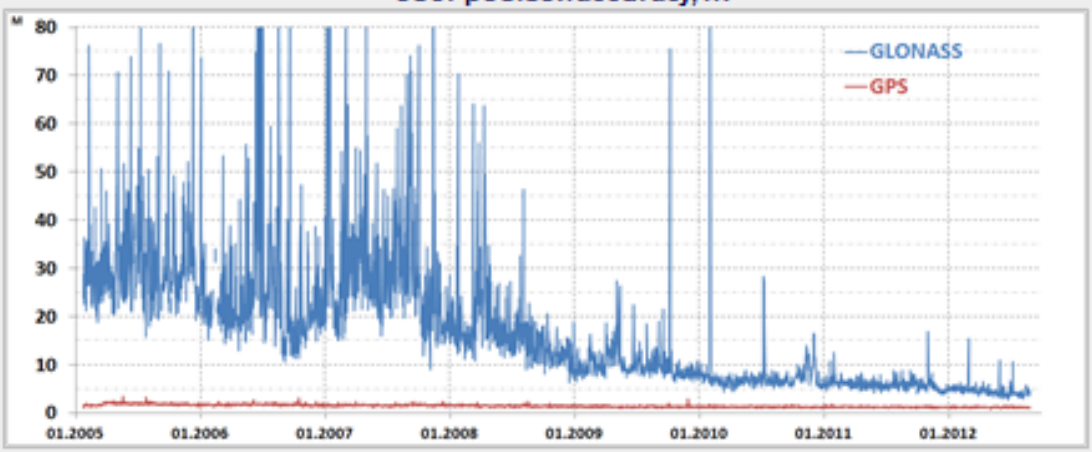
5

GLONASS Program Results 2/2

Accuracy improvement

- 2002 35 m (1 σ)
- 2012 2,8 m (1 σ)

User position accuracy, m



- Performance is comparable to that of GPS
- Open for cooperation

6

Program Goals

- **Mass introduction of domestic navigation technologies**
- **Guaranteed provision of navigation services to meet continuously growing requirements of all categories of users**
  - for the national security purposes
  - for social and economic benefit
  - for pursuing leadership in satellite navigation

  by means of
  - Sustainment and
  - Further development of GLONASS:
    - improvement of performance
    - broadening functional capabilities
    - conditions and domains of usage
    - consolidated evolution of system's components

Key Quality Indicator of Program – guaranteed provision of announced GLONASS performance characteristics

9

GLONASS Program Customers

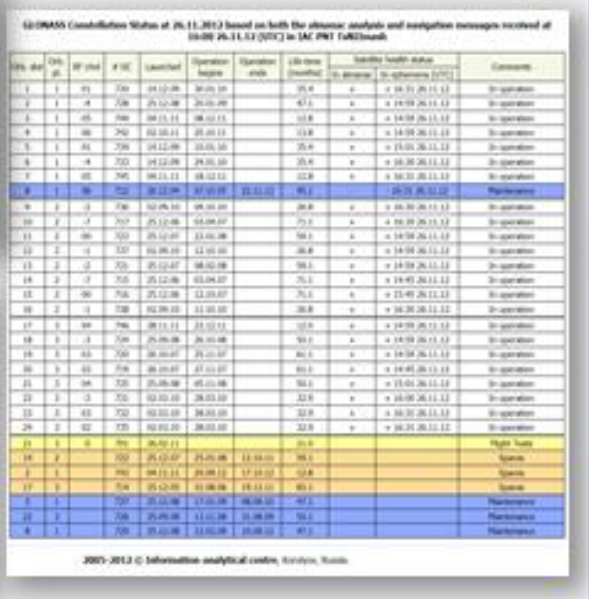
- Federal Space Agency (ROSCOSMOS) – Program Coordinator
- Ministry of Transportation – applications
- Ministry of Defense
  - GLONASS ground control development and operation
  - User equipment and applications development for Armed Forces
- Ministry of Industry and Trade
  - Chipsets and civil user equipment development
- Ministry of Internal Affairs
  - User equipment and applications development for police
- Ministry on Emergency Situations
  - User equipment and applications for search and rescue service
- Federal Agency of Technical Regulations and Metrology (ROSSTANDART)
  - UTC (SU), Earth rotation parameters, geodesy system, metrology tools for GLONASS calibration
- Federal Service of State Register, Cadaster and Mapping

10

GLONASS Constellation Status
(26.11.2012)

GLONASS constellation status, 26.11.2012

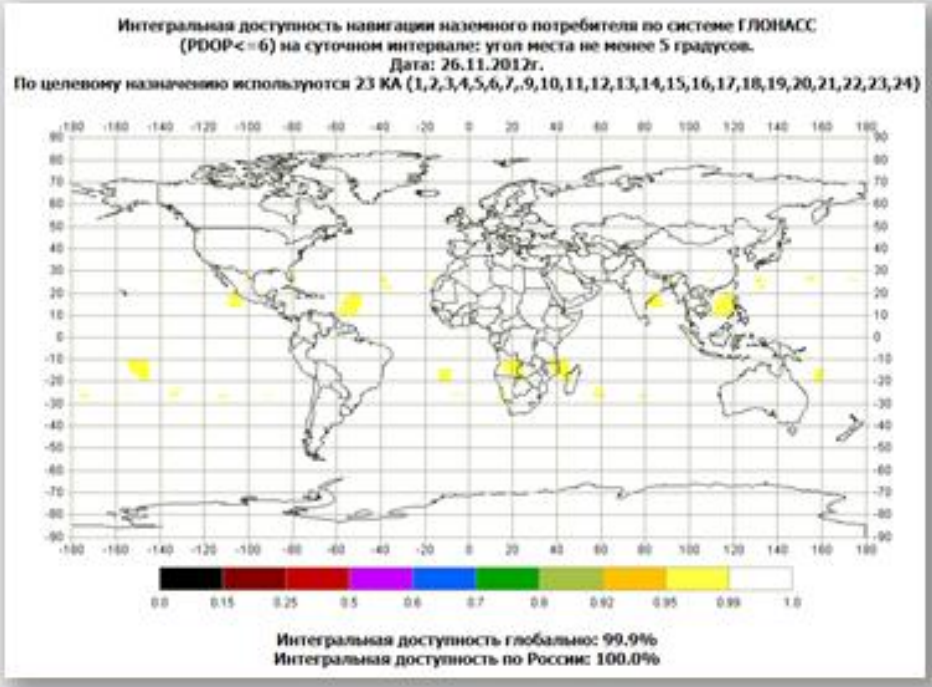
Total satellites in constellation	31 SC
Operational	23 SC
In commissioning phase	-
In maintenance	4 SC
Spares	3 SC
In flight tests phase	1 SC



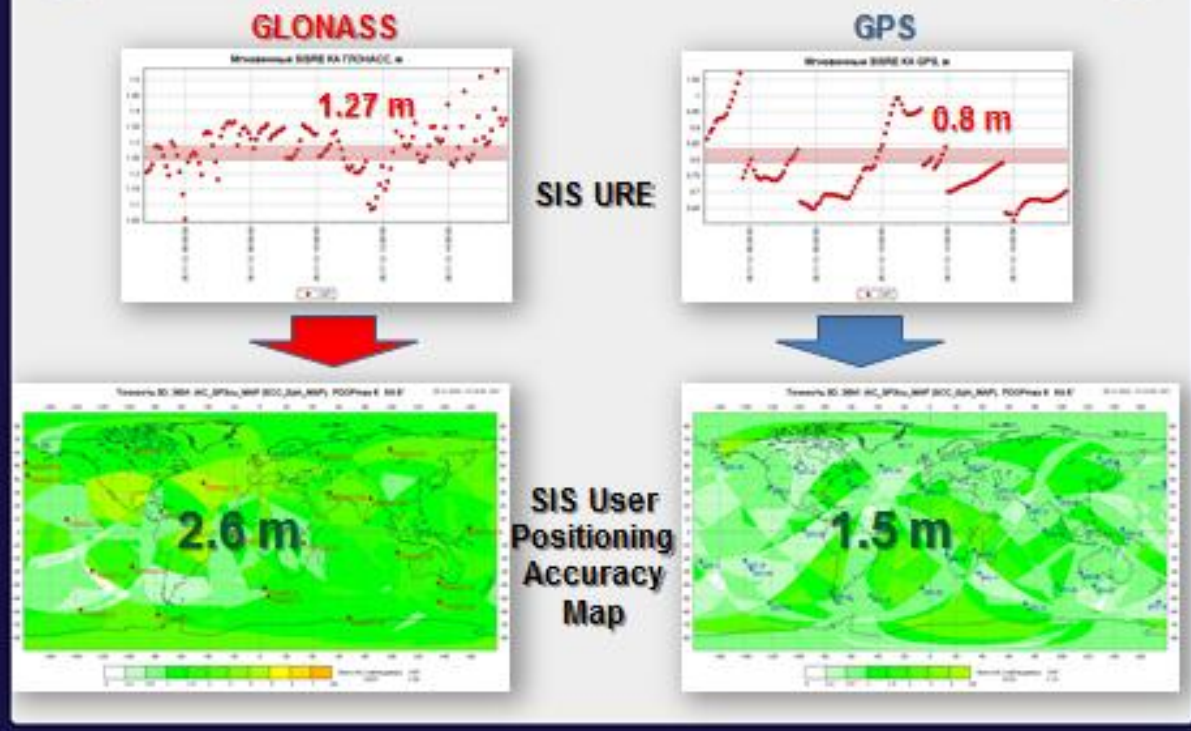
The constellation provides global continuous navigation

3

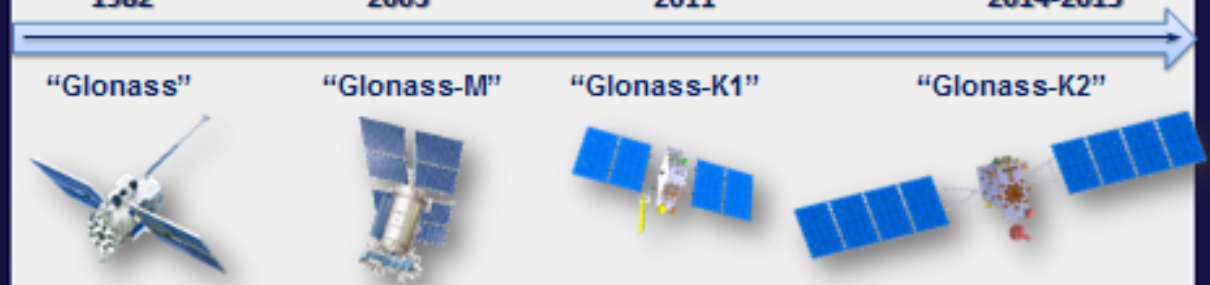
GLONASS Availability
(26.11.2012)



SIS Positioning Accuracy (26.11.2012)



GLONASS Modernization



- 3 year design life
- Clock stability - $5*10^{-13}$
- Signals: L1SF, L2SF, L1OF, (FDMA)
- Totally launched 81 satellites
- Real operational life time 4.5 years

- 7 year design life
- Clock stability 1*10-13
- Signals: Glonass + L2OF (FDMA)
- Totally launched 36 satellites

- 10 year design life
- Unpressurized
- Expected clock stability ~10…$5*10^{-14}$
- Signals: Glonass-M + L3OC (CDMA) – test
- SAR

- 10 year design life
- Unpressurized
- Expected clock stability ~5…$1*10^{-14}$
- Signals: Glonass-M + L1OC, L3OC, L1SC, L2SC (CDMA)
- SAR

16

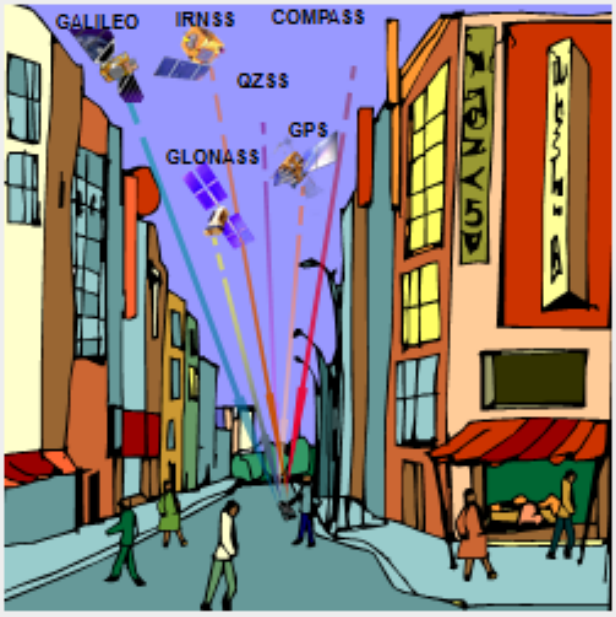
Major Goals of International Cooperation

International Cooperation on GNSS

- Provision of Compatibility and Interoperability of GNSS
- Promoting Global Use of GLONASS
- Pursuing Leadership of GLONASS, Enhancement of the System Performance

19

Goal – Interoperability of civil GNSS Services



- Ideal interoperability provides for navigation using one signal of each of the four (or more) systems with no increase on cost or complexity of user equipment

Interoperability –together is better than separately

20

«GLONASS for Russian Transportation System»

Mr Anatoly Popov, Ministry of Transport of the Russian Federation,

Mr. Popov depicted practical aspects of the use of GLONASS technology in Russian transportation system. Describing the goals of the transportation system the speaker stressed that one of its main objectives is to capitalize on transit potential and build a modern logistics network. And utilization of GNSS and ITS is a key driver of logistics management system development. As GLONASS constellation has been fully deployed in 2011, now the mission is to foster mass GLONASS applications. Transportation management systems are the major of them**.** It can is used for every means of transport. The overall railway fleet equipped with GLONASS and GPS-enabled devices amounts to 14,000 units where 12,732 are GLONASS-enabled. First of all JSC Russian Railways fits GLONASS-enabled equipment into locomotives, staff cars of long distance passenger trains, motor car units of the suburban trains, maintenance and repair, diagnostics, and metering trains, laboratory cars. GBAS elements(LKKS-A-2000) have been deployed at 38 civil airports. 45 local differential correction stations have been deployed to generate high precision reference grids and support train maneuvering. 48 monitoring and correction stations have been procured and deployed to cover sea and river port approaches.

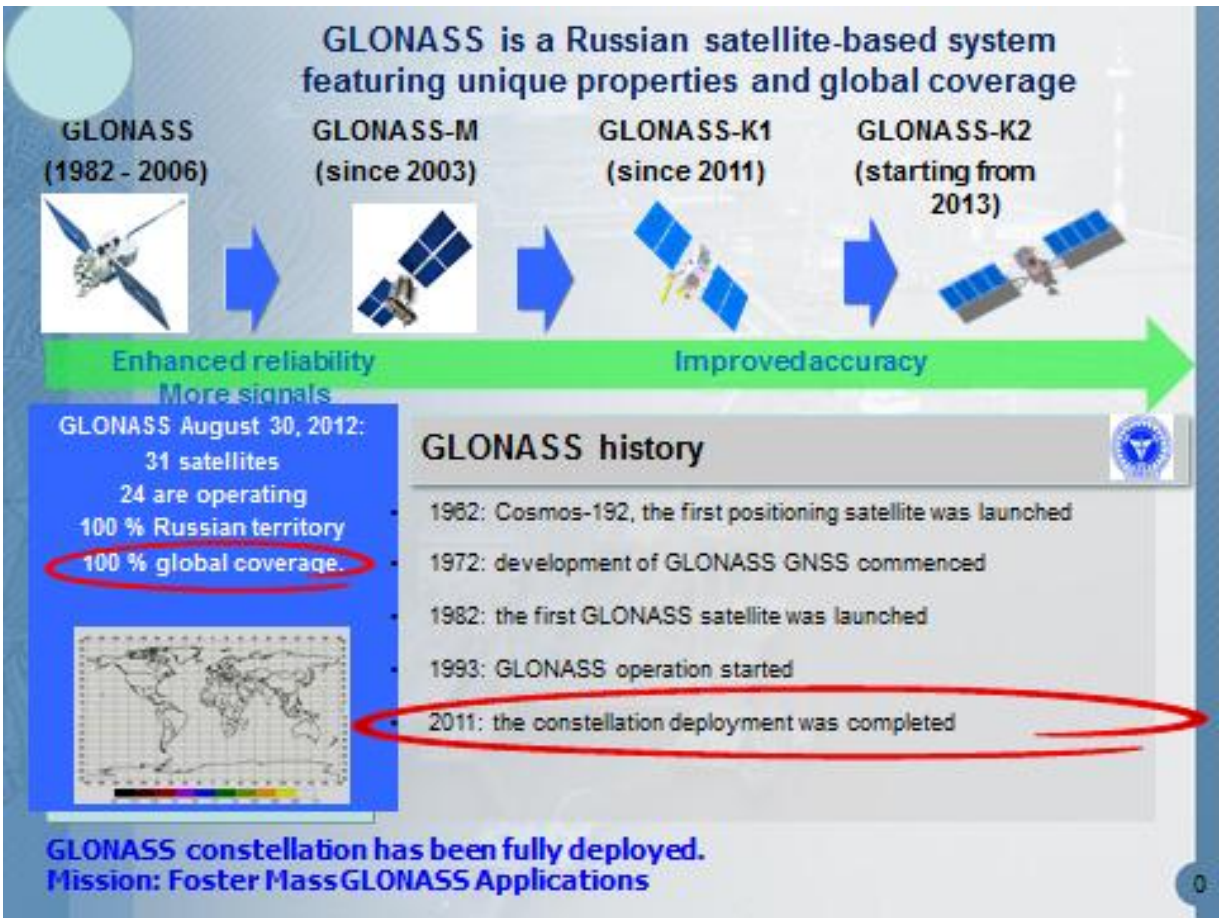
Russian Transportation System Development Objectives

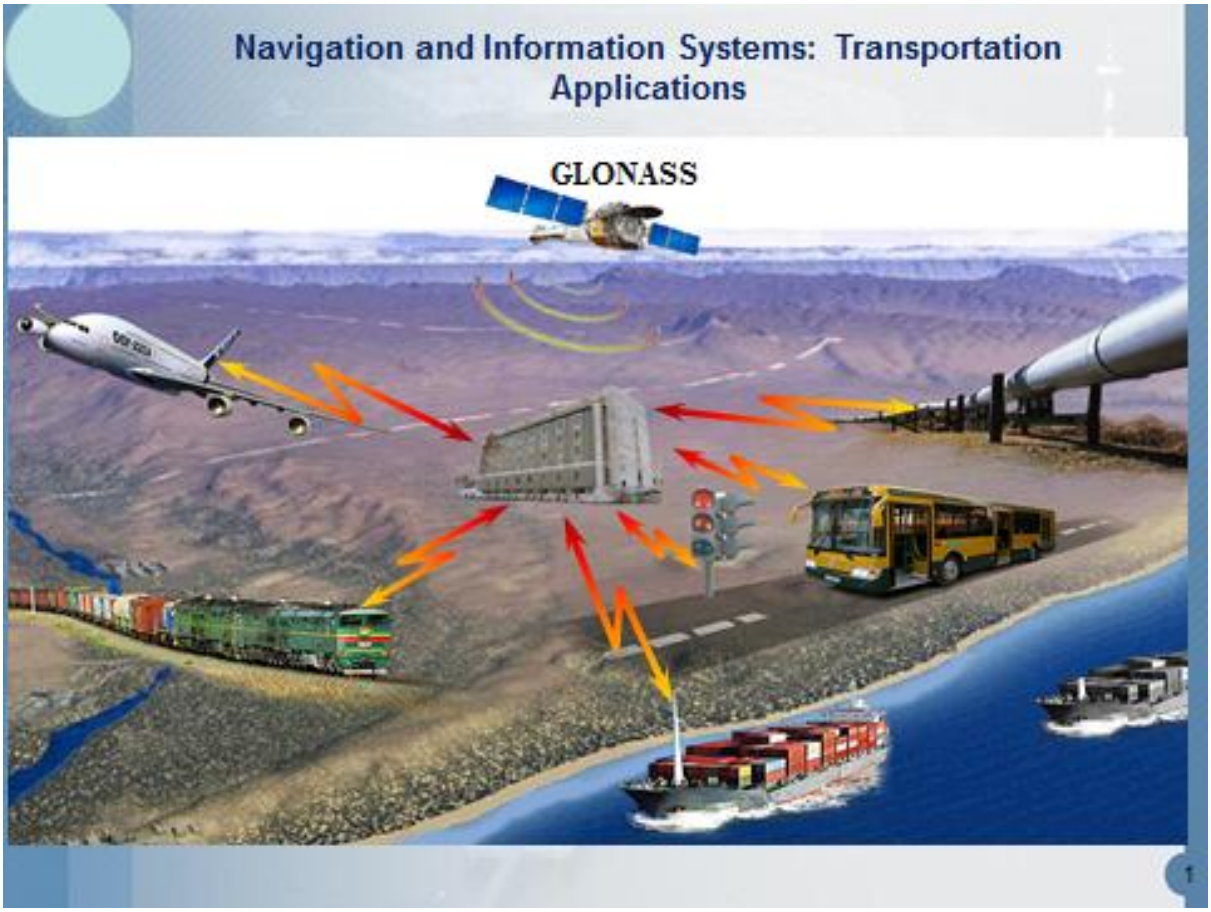
Russian Federation Transportation Strategy till 2030 sets goals and objectives Russian transportation system is expected to achieve

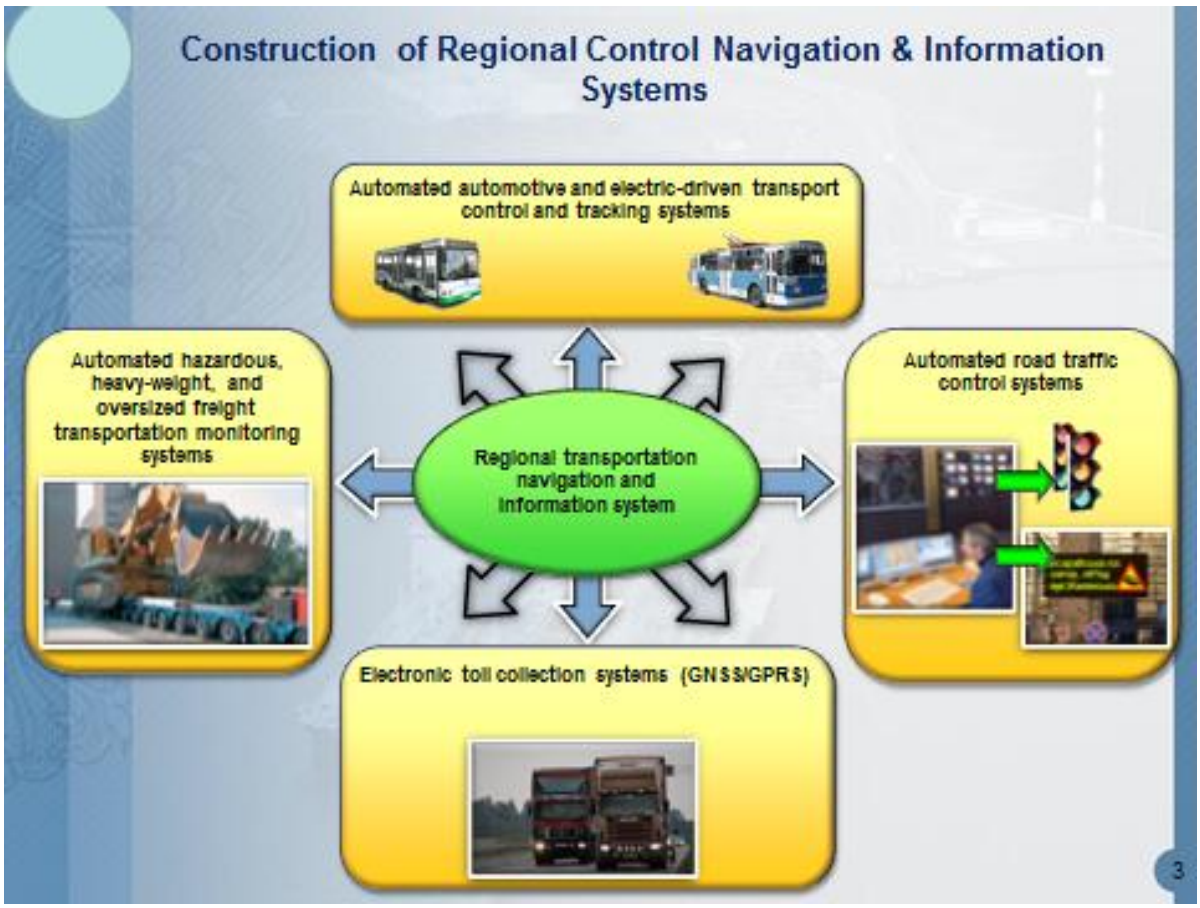
2

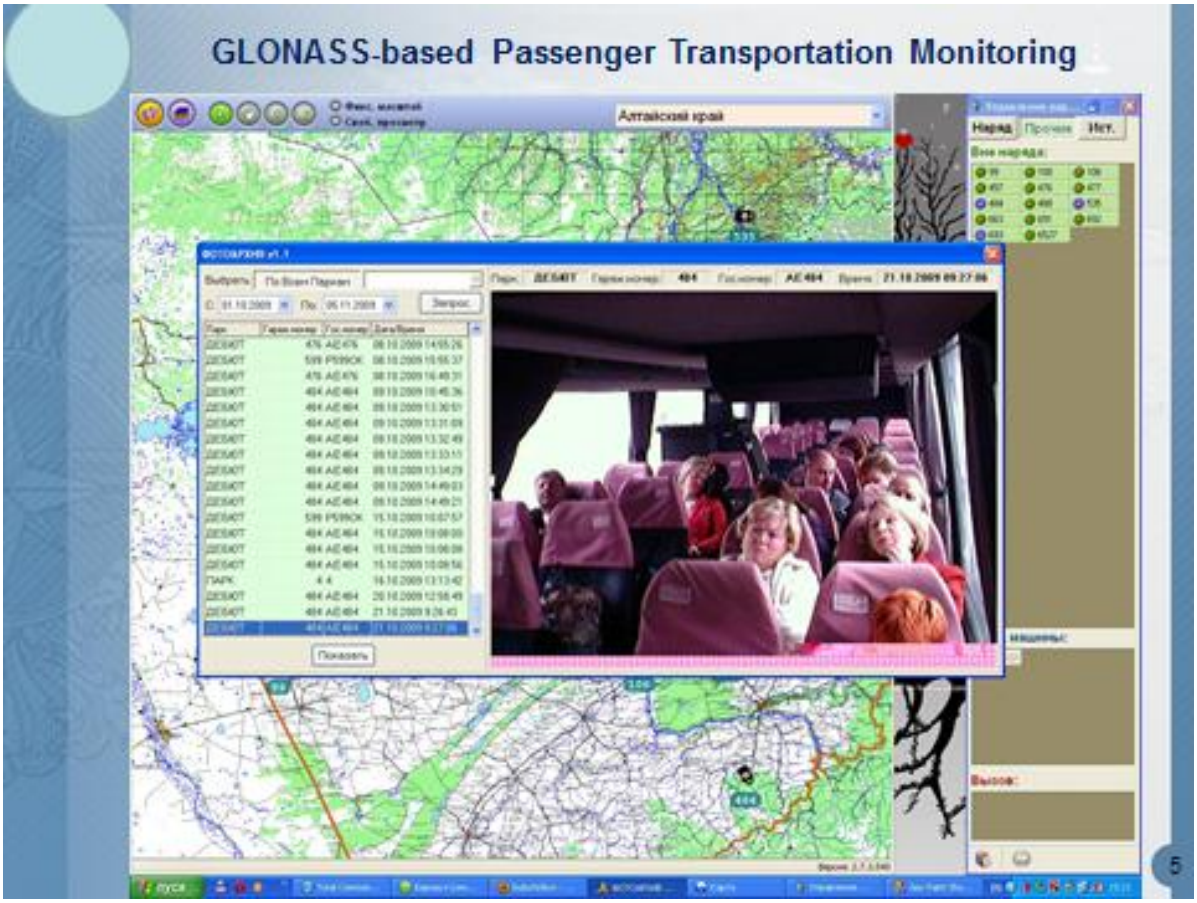
Russian Transit Potential

One of the main objectives of the Russian Transportation System is to capitalize on transit potential and build a modern logistics network


GLONASS is a Russian satellite-based system featuring unique properties and global coverage
GLONASS (1982 - 2006)
GLONASS-M (since 2003)
GLONASS-K1 (since 2011)
GLONASS-K2 (starting from 2013)
Enhanced reliability
More signals
Improved accuracy
GLONASS August 30, 2012:
31 satellites
24 are operating
100 % Russian territory
100 % global coverage.
GLONASS history
1962: Cosmos-192, the first positioning satellite was launched
1972: development of GLONASS GNSS commenced
1982: the first GLONASS satellite was launched
1993: GLONASS operation started
2011: the constellation deployment was completed
GLONASS constellation has been fully deployed.
Mission: Foster Mass GLONASS Applications


Navigation and Information Systems: Transportation Applications
GLONASS


Construction of Regional Control Navigation & Information Systems
Automated automotive and electric-driven transport control and tracking systems
Automated hazardous, heavy-weight, and oversized freight transportation monitoring systems
Regional transportation navigation and information system
Automated road traffic control systems
Electronic toll collection systems (GNSS/GPRS)
3


GLONASS-based Passenger Transportation Monitoring
5

ERA GLONASS, Emergency Response System (similar to EU eCall)

The Ministry of Transport (MoT) was nominated by a resolution adopted by a Cross-ministerial working group for force construction and development of GLONASS and approved by Russian Government Praesidium to act on behalf of the government as customer and coordinator of activities under the contract for ERA GLONASS construction.

6

Benefits of GLONASS +GPS

Automotive navigation testing in urban environment with closely-spaced high buildings

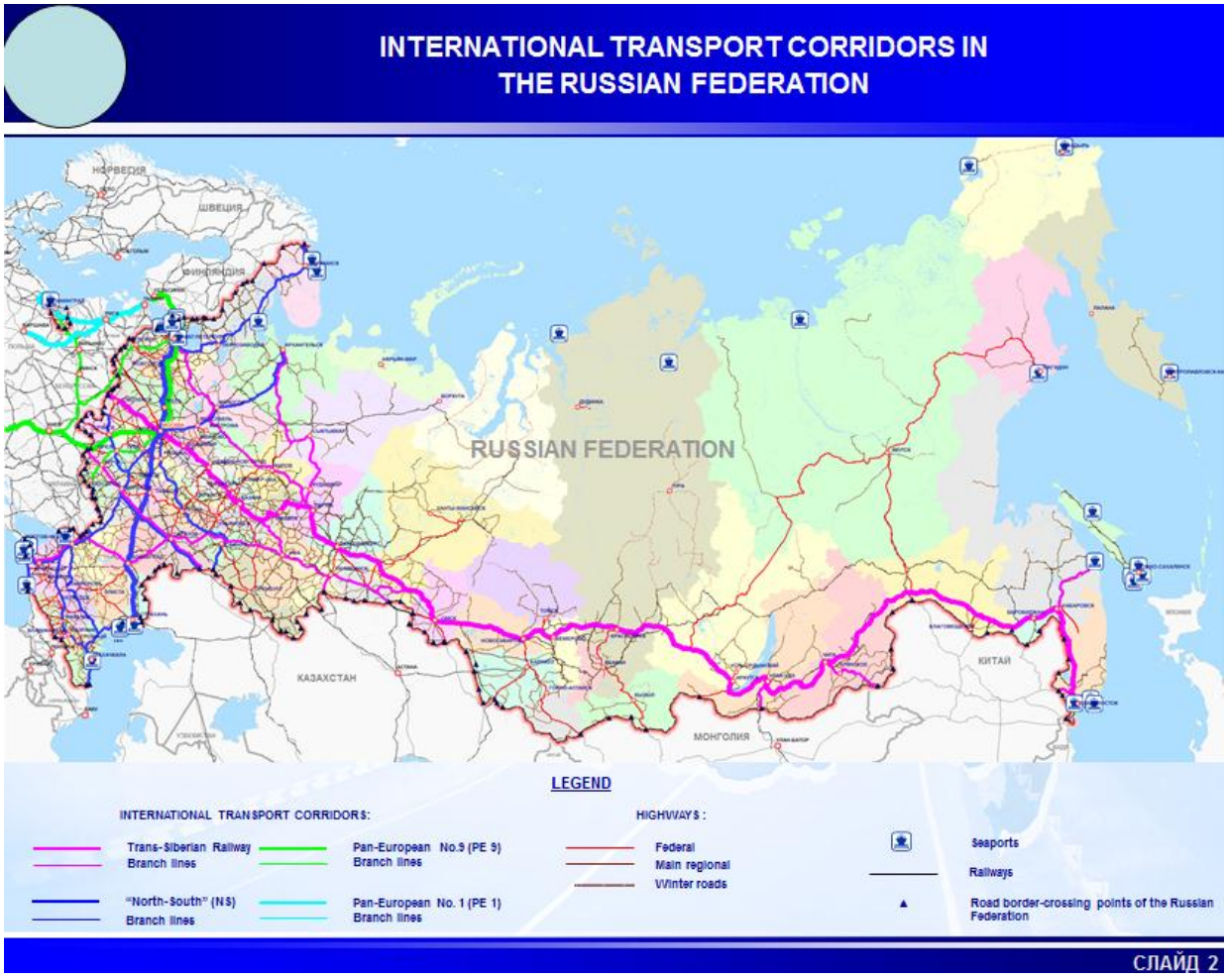
25

«Development of New International Transport Corridors for Optimizing Freight Transportation in APEC Member Economies»

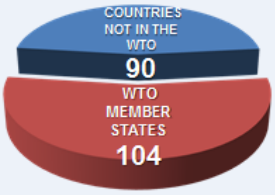
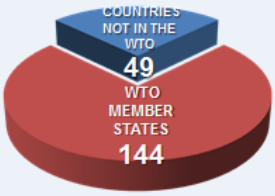
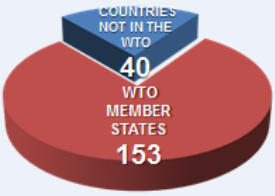
Ms Svetlana Vorontsova, First deputy director general, Research Institute of Transport Infrastructure, Russia

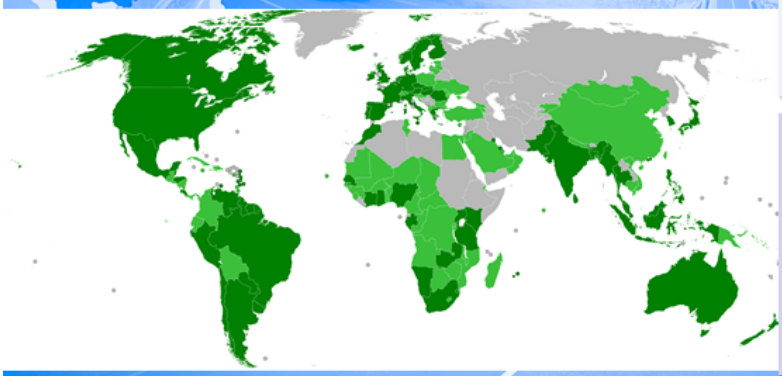
The speaker in the first part of the presentation made it clear that the transport potential of Russia is underused – its share in the world total exports and imports of transportation services is less than 2%. This is largely due to the fact that domestic carriers account for less than 40% of the total volume of export and import freight traffic of Russia. China accounts for more than 30% of Russian machinery and equipment imports, 45% of imported electrical goods (in tons). China is the largest target market for Russian round timber, sawn wood, and iron ore; it ranks 3rd in fertilizer imports behind Brazil and India. APEC members are leaders in terms of shares in Russia's export/import container traffic.

According to the statistics presented by the speaker Russia is among the countries having high logistics costs, which significantly impairs the efficiency of production and trade, it adversely affects the competitiveness of Russian companies and the country as a whole. For example, at present, most of cargo transported between Europe, Russia and APEC economies goes by sea via the Suez Canal. In order to change this situation the Transport Strategy of the Russian Federation provides for the development of the East-West international transport corridor as an alternative overland route to deliver goods from APEC economies to Europe.



WTO MEMBERS ACCOUNT FOR ABOUT 97% OF WORLD TRADE. MORE THAN 90% of RUSSIA'S FOREIGN TRADE IS ACCOUNTED FOR BY WTO MEMBERS.

WTO members as of 15 April 1994	WTO members as of 1 January 2002	WTO members as of 15 November 2011
		



THERE ARE 193 UNITED NATIONS (UN) MEMBER STATES

THE WTO HAS 153 MEMBERS. THE OBSERVER STATUS IS GRANTED TO ABOUT 30 STATES AND MORE THAN 60 INTERNATIONAL ORGANIZATIONS, INCLUDING UN, IMF, AND WORLD BANK

СЛАЙД 7

THE MOST PROMISING ROUTES FOR THE DEVELOPMENT OF RUSSIA'S TRANSIT POTENTIAL

- EUROPE – ASIA-PACIFIC REGION, SERVED BY THE EAST-WEST INTERNATIONAL TRANSPORT CORRIDOR USING RAIL AND ROAD NETWORKS IN THE EUROPEAN RUSSIA, THE TRANS-SIBERIAN RAILWAY, FAR EAST PORTS, AND APPROACH ROADS TO THE RUSSIAN-CHINESE BORDER;

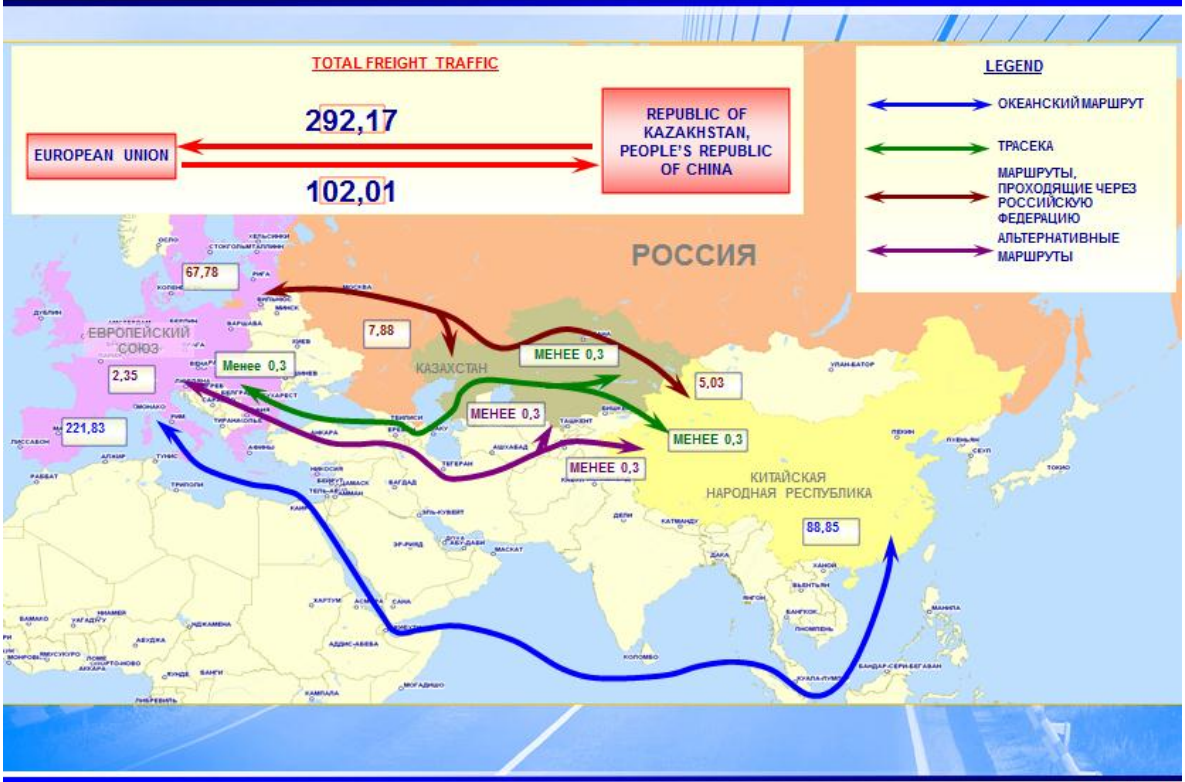
- NORTH EUROPE – SOUTH ASIA, SERVED BY THE NORTH-SOUTH INTERNATIONAL TRANSPORT CORRIDOR USING ROADS, RAILWAYS AND INLAND WATERWAYS LINKING THE RUSSIAN COAST OF THE BALTIC SEA WITH THE CASPIAN SEA AND ENABLING THE USE OF IRAN'S AND INDIA'S TRANSPORT SYSTEMS;

- NORTH EUROPE – ASIA-PACIFIC REGION, USING THE NORTHERN SEA ROUTE;

- EUROPE – ASIA – NORTH AMERICA, USING TRANSPOLAR AIR ROUTES.

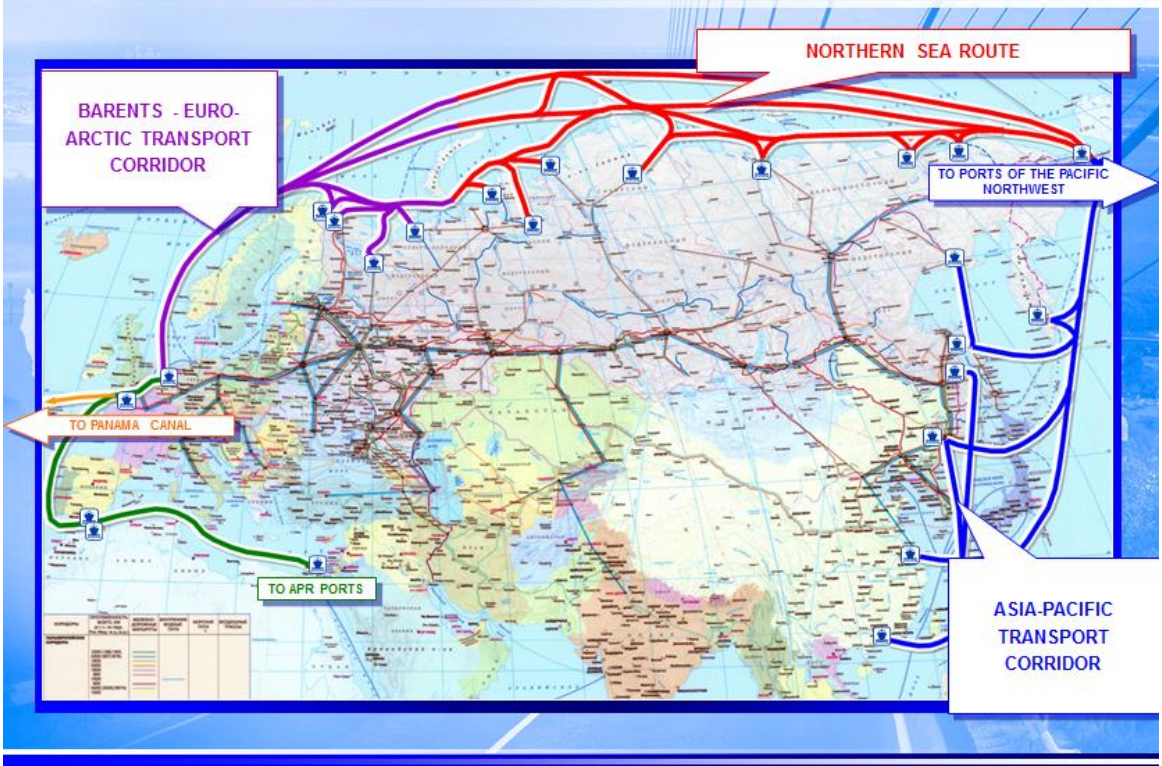
СЛАЙД 9

TRANSIT FREIGHT TRAFFIC ON THE ROUTE EUROPE – CHINA, KAZAKHSTAN FOR 2030 (MILLION TONS)

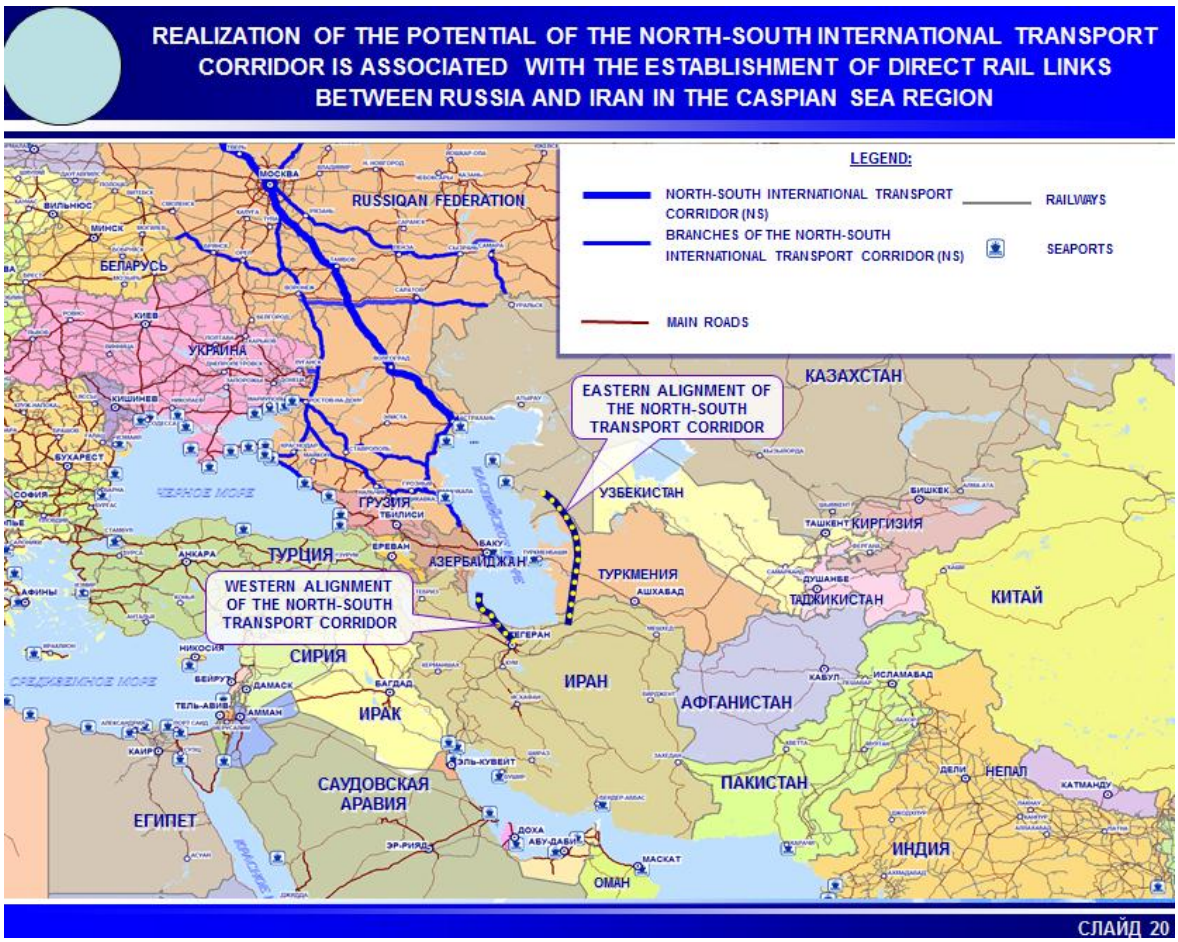


СЛАЙД 11

NORTHERN SEA ROUTE



СЛАЙД 17



«Development of GLONASS-based Road Transport Dispatch Control Navigation Systems»

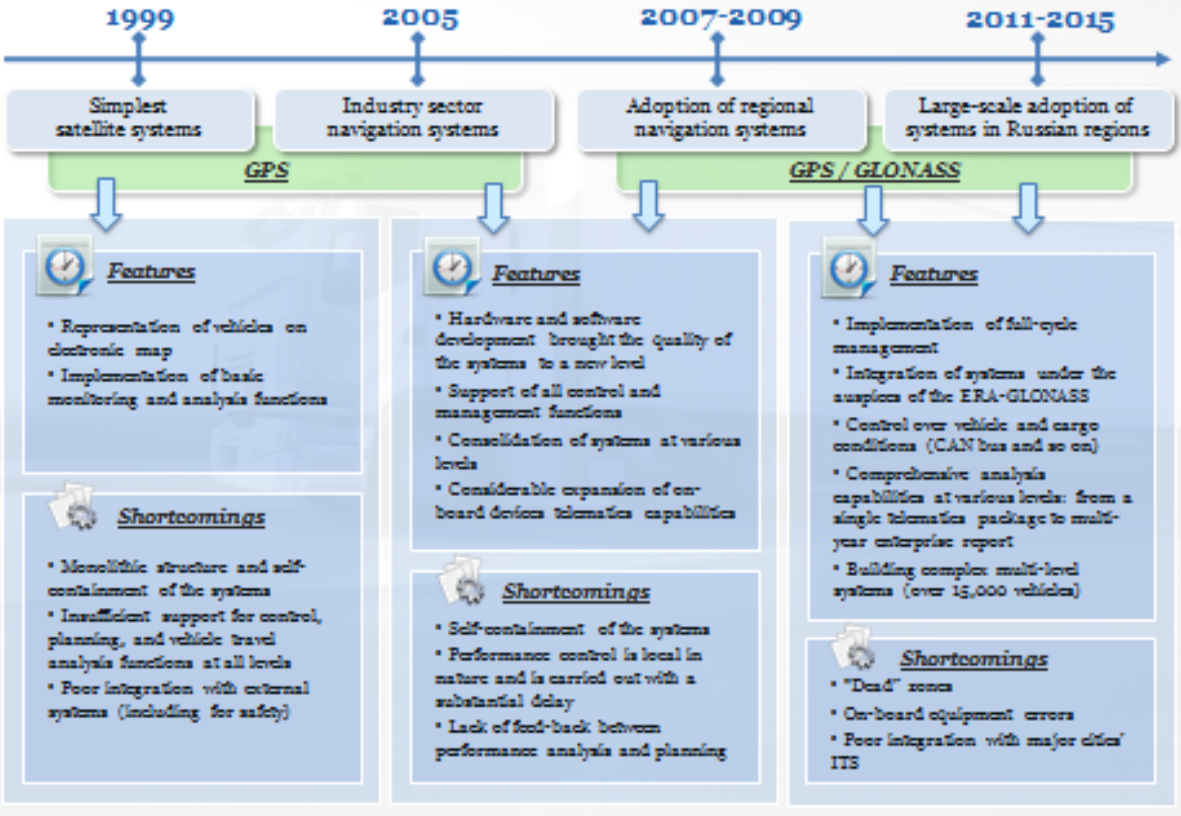
Mr Andrey Ismailov, Head of Planning and Monitoring Systems Development Department, NPP Transnavigatsia, Russia

The speaker showed the using of GLONASS-based navigation systems for transport dispatch control in historical aspect – from 1999 and including projects for 2015. He demonstrated ITS structure and role of freight transportation systems. In conclusion he presented the benefits from navigation systems development for freight transportation. From the point of view of the consignors their objectives are following: effective control over the progress of freight transportation, continuous monitoring of cargo location, dynamic response in critical situations and objective information on compliance with transportation contract provisions. From the point of view of transportation companies and individual carriers they give automation of planning and control over carrying out shift assignments, efficient utilization of freight vehicles, enhanced safety of vehicle route operations and objective control of compliance with transportation contract provisions. Finally, for dispatch services they give continuous monitoring of vehicle location with capability for display on an electronic map, automated control over travel routes and timetables, dynamic correction of deviations from transportation timetables, real-time communication with drivers, automated generation of documents, reports on transportation timetable performance and freight volumes

Regulatory documents on GLONASS adaption for road transportation in Russia 3

1) Purpose, structure, and characteristics of ***cartographic*** support subsystem
2) Purpose, structure, and characteristics of on-board navigation communication ***equipment***
3) Requirements for hourly timetable **construction freight** transportation dispatch management system architecture, functionality, and objectives
4) Requirements for **solid household waste removal** transport dispatch management system architecture, functionality, and objectives
5) Requirements for **urban and suburban hazardous cargo transportation** systems' architecture, functionality, and objectives
6) Requirements for **petroleum products** transportation dispatch management system architecture, functionality, and objectives
7) Requirements for **container transportation** systems' architecture, functionality, and objectives
8) Requirements for **street cleaning** vehicle dispatch management systems' architecture, functionality, and objectives
9) Requirements for **inter-regional hazardous cargo transportation** systems' architecture, functionality, and objectives

Development stages of road freight transportation navigation systems in Russia 4



ITS structure and role of freight transportation systems

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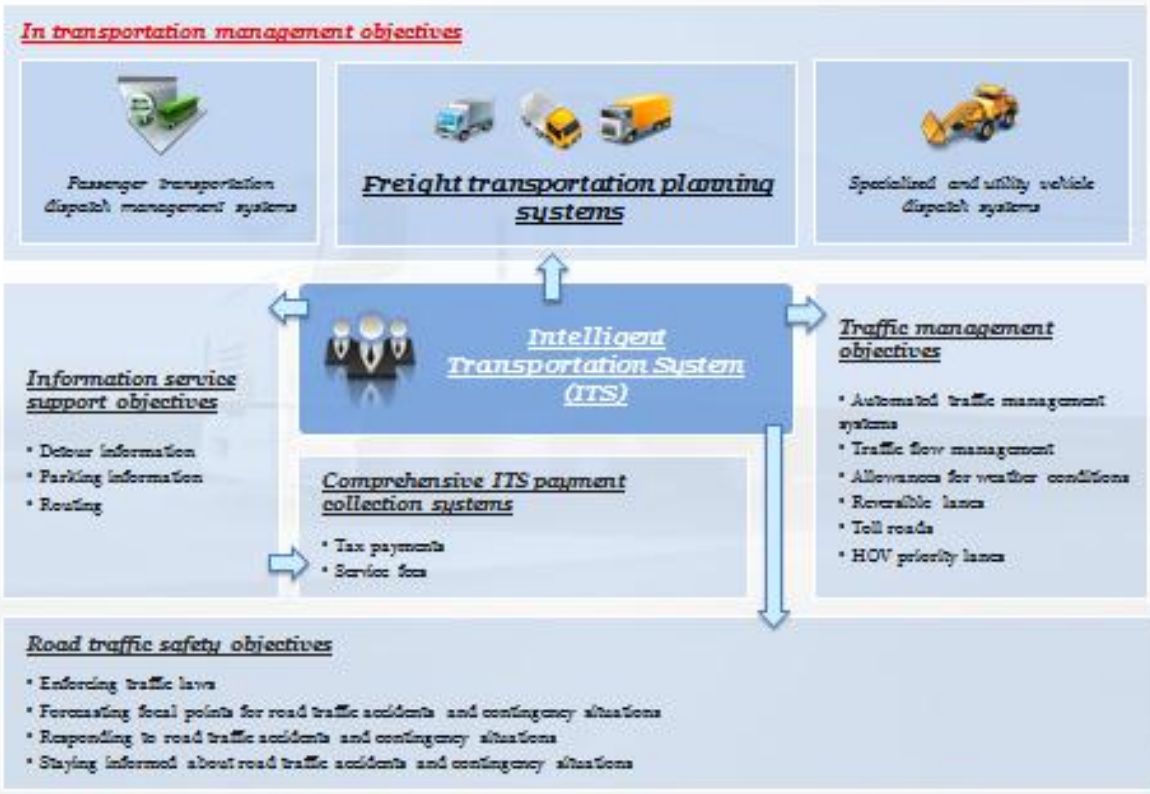
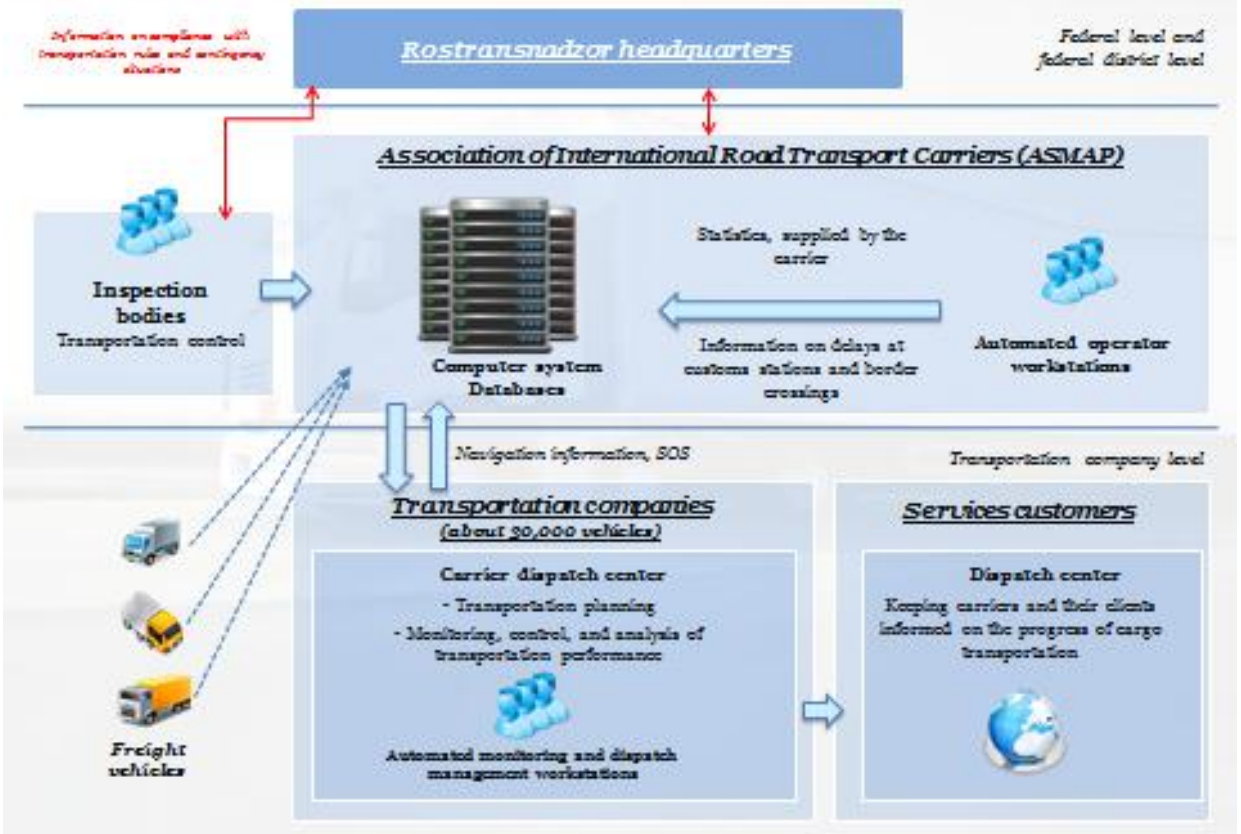


System levels (on example of ASMAP Navigation)

6



Freight transportation AMS subsystems (example)

7

Principal AMS subsystems

Auxiliary subsystems

- **Security** — Access, audit
- **Database management** — Database Management Systems
- **Integration** — Extract, Transform, Load - mechanisms
- **Licensing** — License and access control
- **Settings** — Precise adjustment of system parameters

...

Technology subsystems

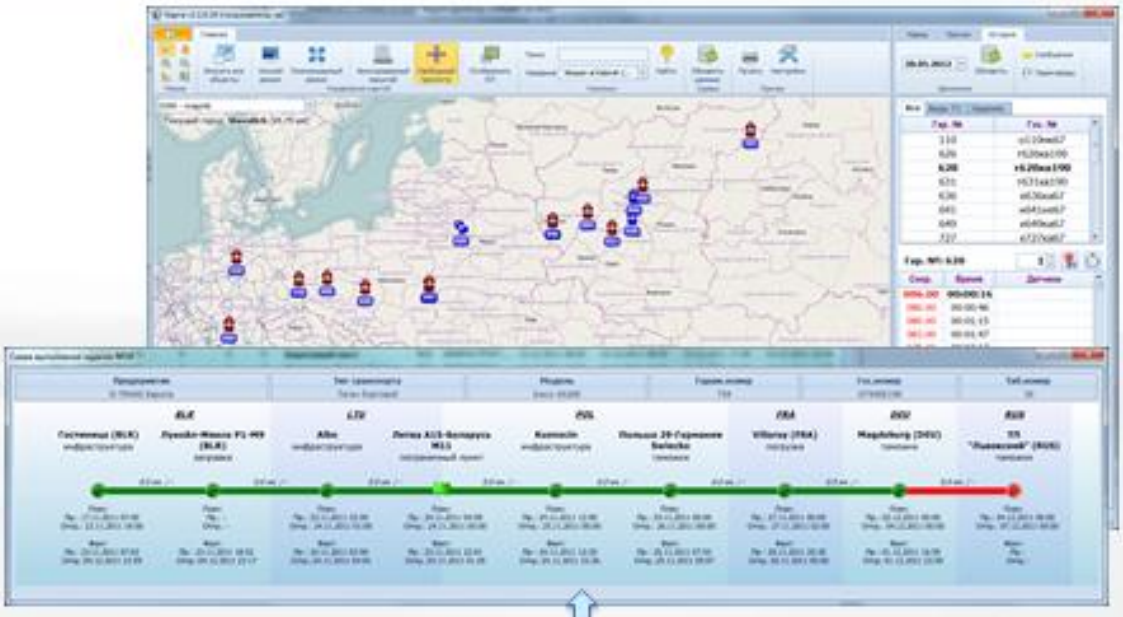
- **Telematics data** — Telematics data storage
- **Processing telematics data** — Initial processing
- **Reference information** — Key references
- **Diagnostics** — On-board equipment diagnostics
- **Virtual zones** — Virtual zone type assessment and maintenance
- **Communication** — Communication component driver-dispatcher
- **Safety** — Implementation of ERA-GLONASS strategies
- **Notifications** — Violations and advisory messages
- **Planning** — Implementation of business processes
- **Connecting plan and reality** — Matching planned and actual transportation performance
- **Analytics** — Complete analysis of movements at various levels
- **Decision-making support subsystems** — Models and rules

...

Implementation examples (ASMAP Navigation)

8

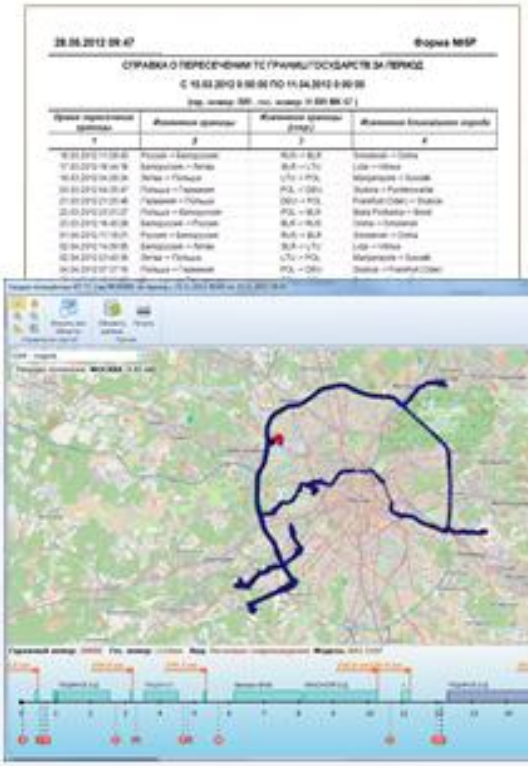
Modern software development environments allow for full implementation of the modular approach to software development



Full-function ***transportation plan performance*** diagram with progress indication (movement timetable)

Implementation examples (ASMAP Navigation)

9



Analytics at various levels (from analysis of the distance traveled by a specific vehicle to complex reports for the entire enterprise)
Example displays fuel consumption based on CAN bus data

Detailed diagram of transportation plan performance

Outlook for development and conclusions

10

Principal benefits from navigation systems development (freight transportation):

Consignors:

- ✓Effective control over the progress of freight transportation
- ✓Continuous monitoring of cargo location
- ✓Dynamic response in critical situations
- ✓Objective information on compliance with transportation contract provisions

Transportation companies and individual carriers:

- ✓Automation of planning and control over carrying out shift assignments
- ✓Efficient utilization of freight vehicles
- ✓Enhanced safety of vehicle route operations
- ✓Objective control of compliance with transportation contract provisions

Dispatch services:

- ✓Continuous monitoring of vehicle location with capability for display on an electronic map
- ✓Automated control over travel routes and timetables
- ✓Dynamic correction of deviations from transportation timetables
- ✓Real-time communication with drivers
- ✓Automated generation of documents, reports on transportation timetable performance and freight volumes

«Experience of building Logistics & Transportation Center Automated System»

Mr Sergey Kosenko, Head of Office in Moscow, "SeverTransAvtomatika" Ltd, Russia

The speaker covered in his presentation the following issues:

Planning materials and equipment deliveries by all modes of transport for Olympic facilities construction;

Accreditation of motor carriers, transporting cargo for Olympic construction;

Monitoring materials and equipment deliveries by all modes of transport to the Sochi transport hub;

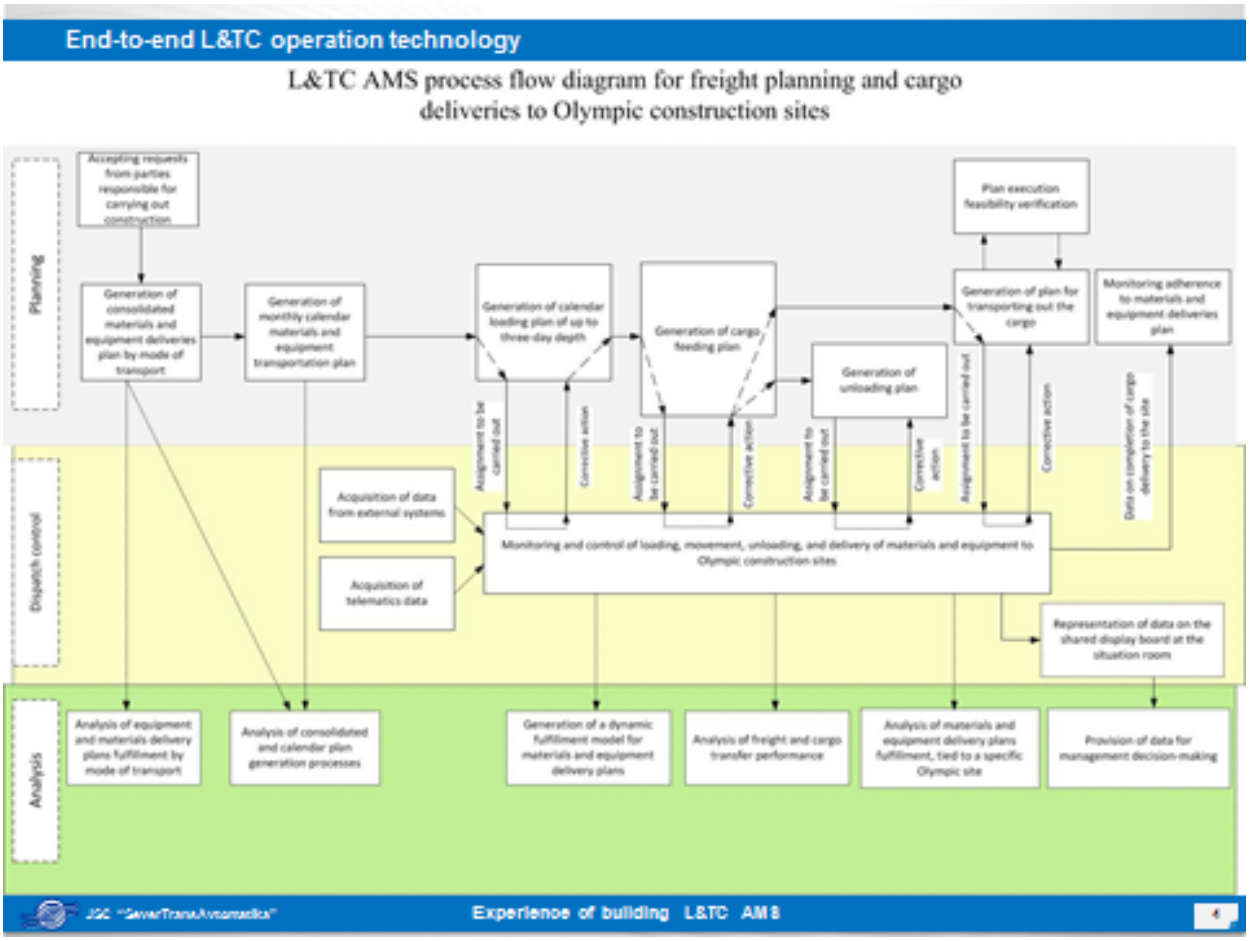
Monitoring freight terminal performance and transfer of cargo at the Sochi transport hub;

Monitoring cargo deliveries by road vehicles to Olympic facilities construction sites;

Comprehensive dispatch control over transportation and freight operations;

Keeping the parties responsible for the Olympic construction program updated on the progress of cargo deliveries to construction sites;

Control and analysis of the fulfillment of plans for materials and equipment deliveries for Olympic facilities construction.



1. Planning materials and equipment deliveries

All parties, responsible for the Olympic construction (more than 60), have a secure connection to the L&TC AMS.

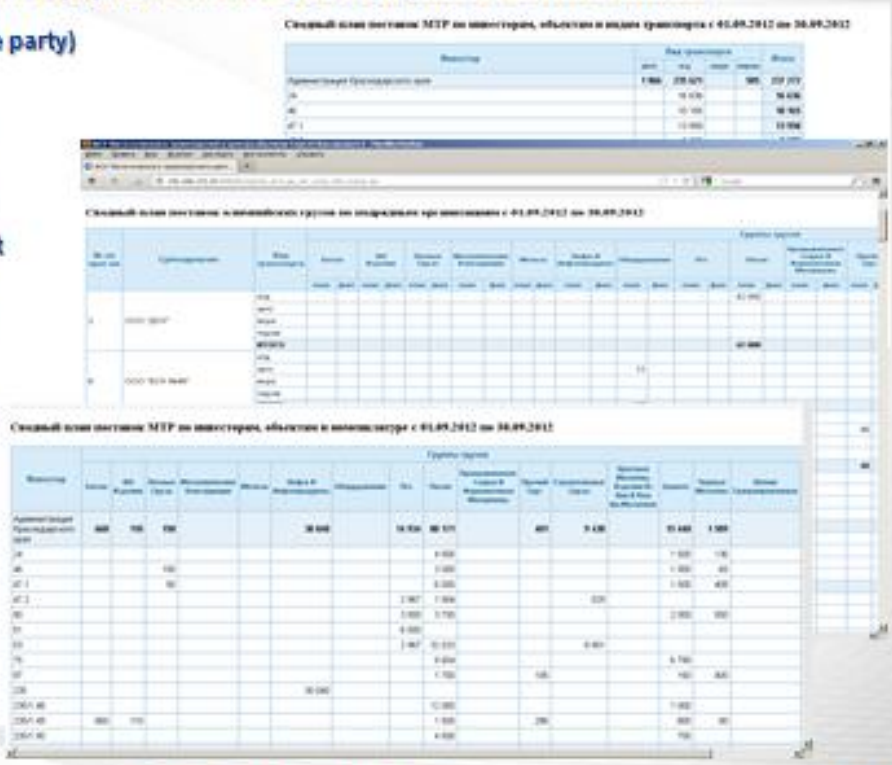
In accordance with the RF Government Resolution No. 792, dated 05 October 2010, the parties responsible for carrying out Olympic construction prepare monthly plans for materials and equipment deliveries to their sites.

1. Planning materials and equipment deliveries

Consolidated materials and equipment deliveries plan is prepared in various versions:

By investor (responsible party)
By construction site
By subcontractor
By mode of transport
By cargo calcification

The volume of monthly materials and equipment delivery plan includes more than 500 items, 2.5 million tonnes for 30 contractors, more than 70 construction sites, 18 cargo groups, and more than 80 consignees



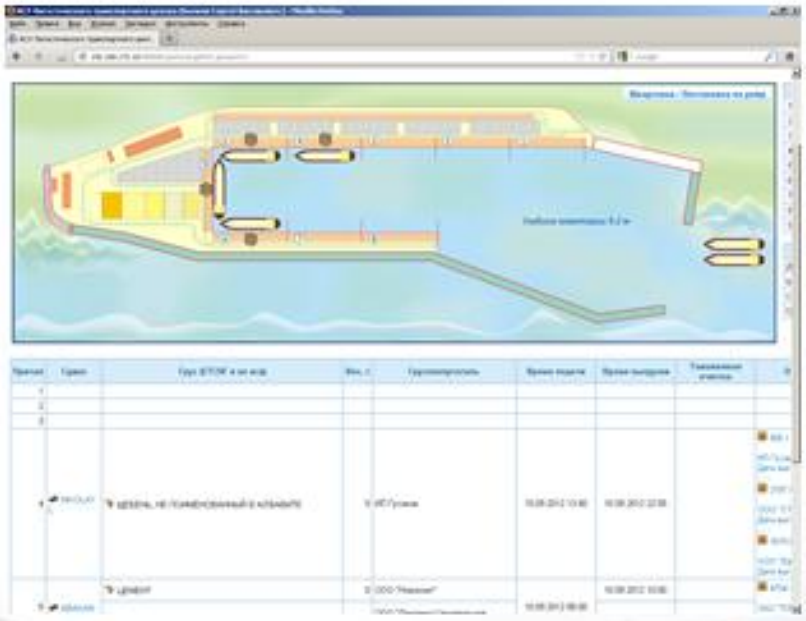
3. Monitoring cargo deliveries to the Sochi transport hub

Monitoring cargo deliveries by rail is carried out on the basis of data received from the Russian Railways automated systems per Electronic Data Exchange Agreement.

Data on location of Olympic cargo can be obtained both for the entire North Caucasus Railway range in a process graphic form, as well as for each rail station with itemization down to the railcar and railroad waybill.

4. Transfer of cargo to road transport vehicles

Registration of sea vessel unloading is carried out at the Sochi Imeretinsky seaport.



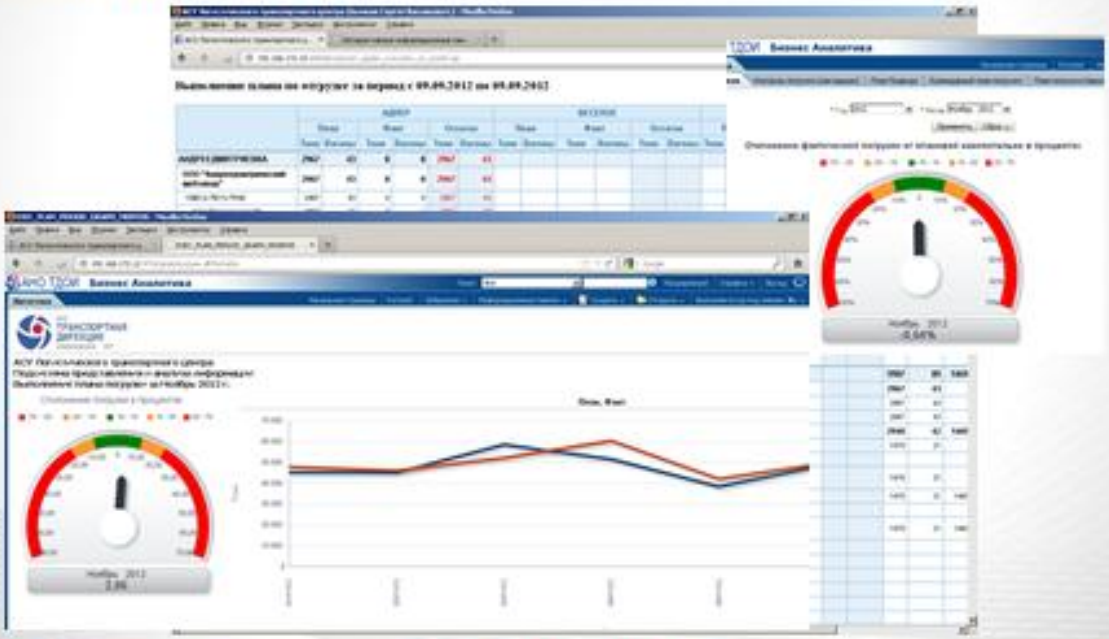
4. Transfer of cargo to road transport vehicles

Registration of the loading of cargo into accredited vehicles is carried out with the aid of portable terminals. Every day, loading of more than 1,000 vehicles is registered at four freight terminals.

Casio DT-X30

8. Control and analysis of materials and equipment delivery plans fulfillment

Analytical processing and provision of data is carried out with the aid of the Oracle Business Intelligence analytics tool. Visual representation of data in the form of graphs and diagrams allow rapid transportation progress assessment, and interactive HTML report output format aids management decision-making by permitting critical areas and causes of problem causes to be identified with just a few clicks.



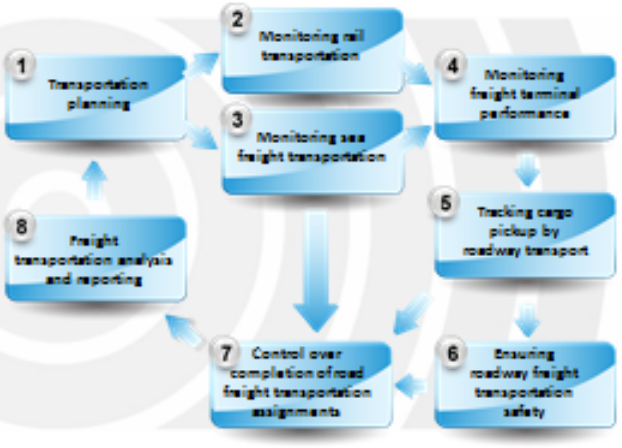
«Hardware and Software of Logistics & Transportation Center Specifications and Functions»

Mr Korovushkin Denis, Technical Director of the LTC Program, JSC «Navigation Information Systems», Russia

The speaker presented and depicted in detail the principles of functioning of different kinds of hardware and software for tracking and information management. The speaker described it on the examples of Evropeysky Business Center, some cargo staging points **(**Freight terminal No. 1 Rosselhozakademia, Freight terminal No. 2 Sochinsky, station Veseloe, Freight terminal station Sochi, Freight terminal station Adler, Sochi Imeretinsky seaport) and Olympstroy checkpoints (Dispatch center in Adler airport, Olympic Park checkpoint No. 2, Olympic Park checkpoint No. 5, Checkpoint 29km A-149 Adler – Krasnaya Polyana (Medvezhiy Ugol).

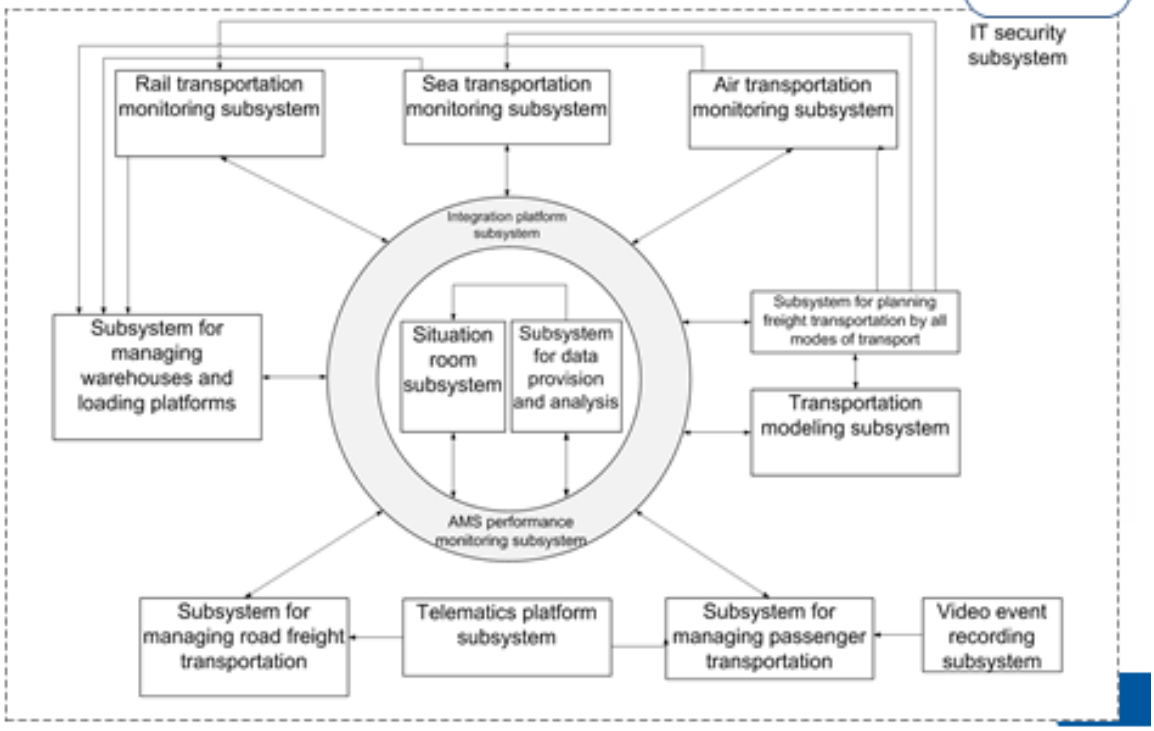
System structural composition

1. Telematics platform subsystem
2. Subsystem for data provision and analysis
3. Situation room subsystem
4. Subsystem for planning freight transportation by all modes of transport
5. Rail transportation monitoring subsystem
6. Sea transportation monitoring subsystem
7. Air transportation monitoring subsystem
8. Subsystem for managing warehouses and loading platforms
9. Subsystem for managing road freight transportation
10. Transportation modeling subsystem
11. Subsystem for managing passenger transportation
12. IT security subsystem
13. Video event recording subsystem
14. Integration platform subsystem, including AMS performance monitoring subsystem
15. Subsystem for monitoring and management of specialized Olympstroy vehicles
16. MDS (OCOG) deliveries timetable planning



2

System structural composition



Physical structure and geographical distribution of system components

Automation objects – Freight Transportation deployment phase

Evropeysky Business Center
- Data processing center (DPC)
- Dispatch center (DC)
- Workstations

Cargo staging points
- Freight terminal No. 1 Rosselhozakademia
- Freight terminal No. 2 Sochinsky, station Veseloe
- Freight terminal station Sochi
- Freight terminal station Adler
- Sochi Imeretinsky seaport

Olympstroy checkpoints
- Dispatch center in Adler airport
- Olympic Park checkpoint No. 2
- Olympic Park checkpoint No. 5
- Checkpoint 29km A-149 Adler – Krasnaya Polyana (Medvezhiy Ugol)

Olympstroy company (8) and specialized (7) vehicles

Rodtransnadzor checkpoints (3)

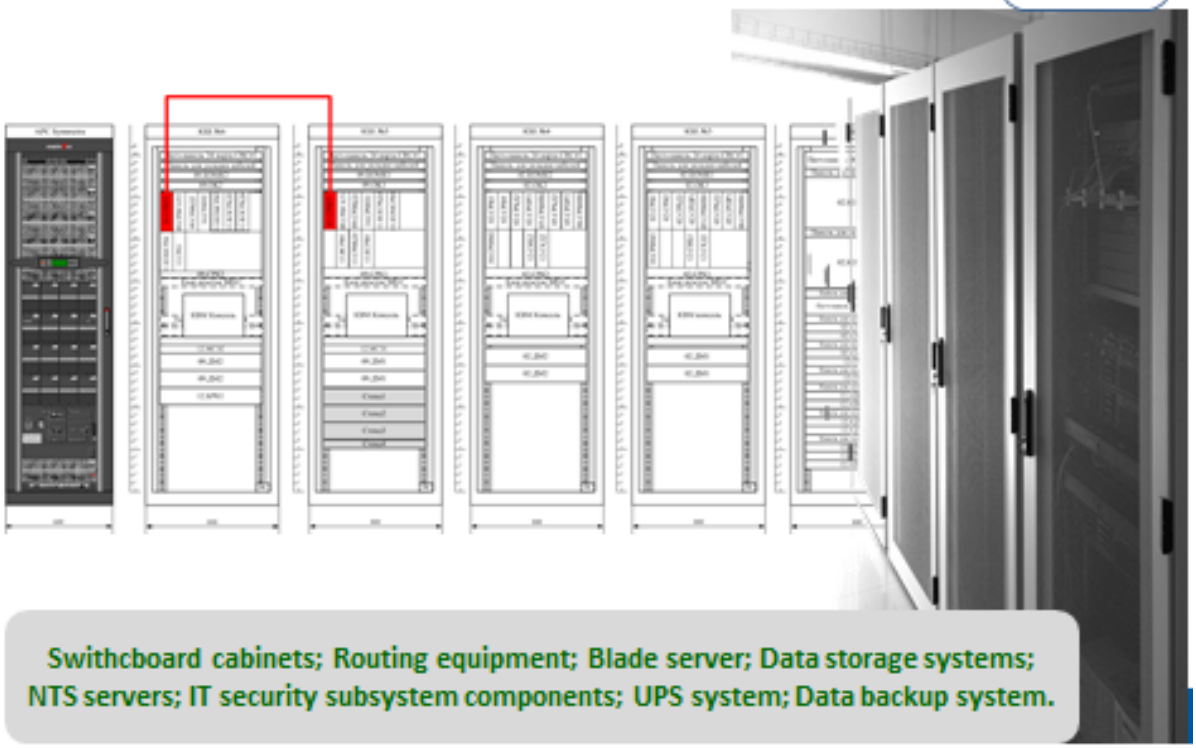
4

Physical structure and geographical distribution of system components

Automation objects – Freight Transportation deployment phase

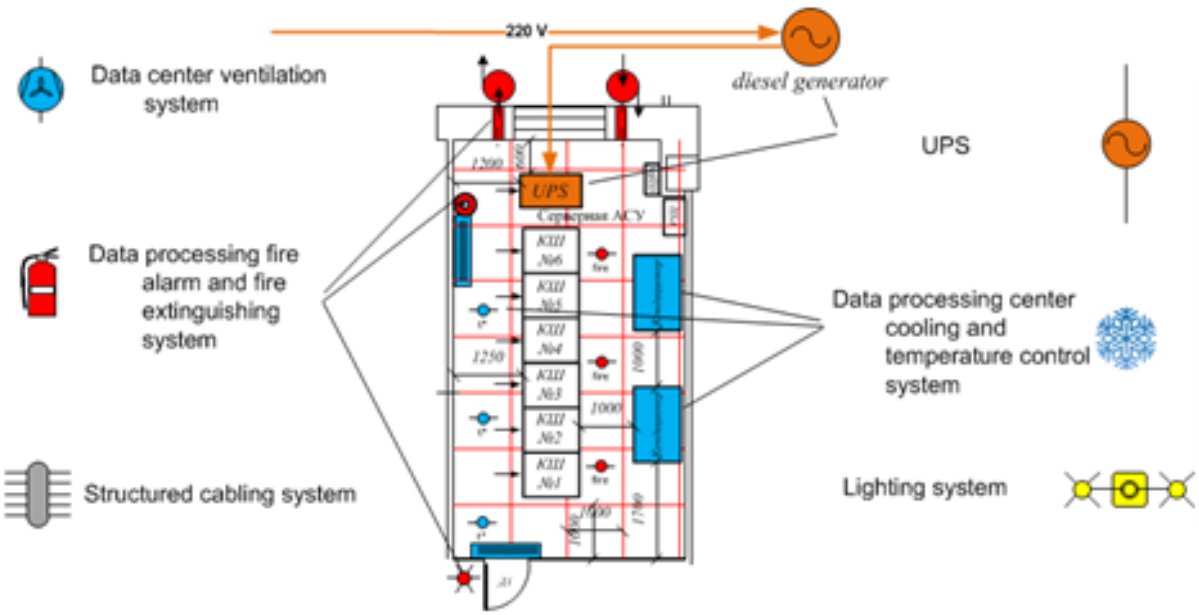
5

Hardware and software at Evropeysky Business Center – DPC

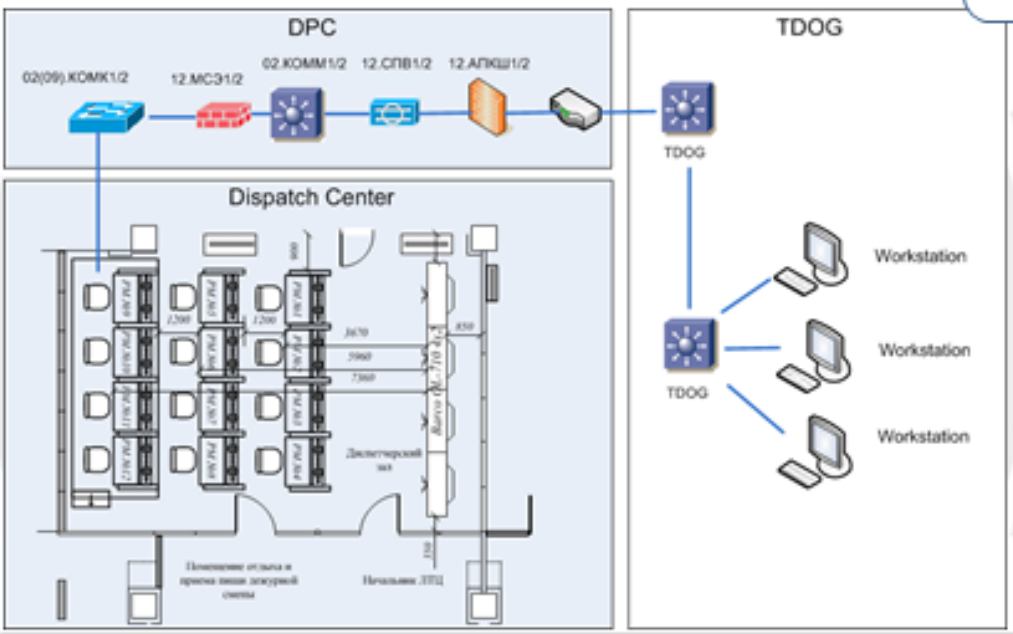


Switchboard cabinets; Routing equipment; Blade server; Data storage systems; NTS servers; IT security subsystem components; UPS system; Data backup system.

Hardware and software at Evropeysky Business Center – utility systems



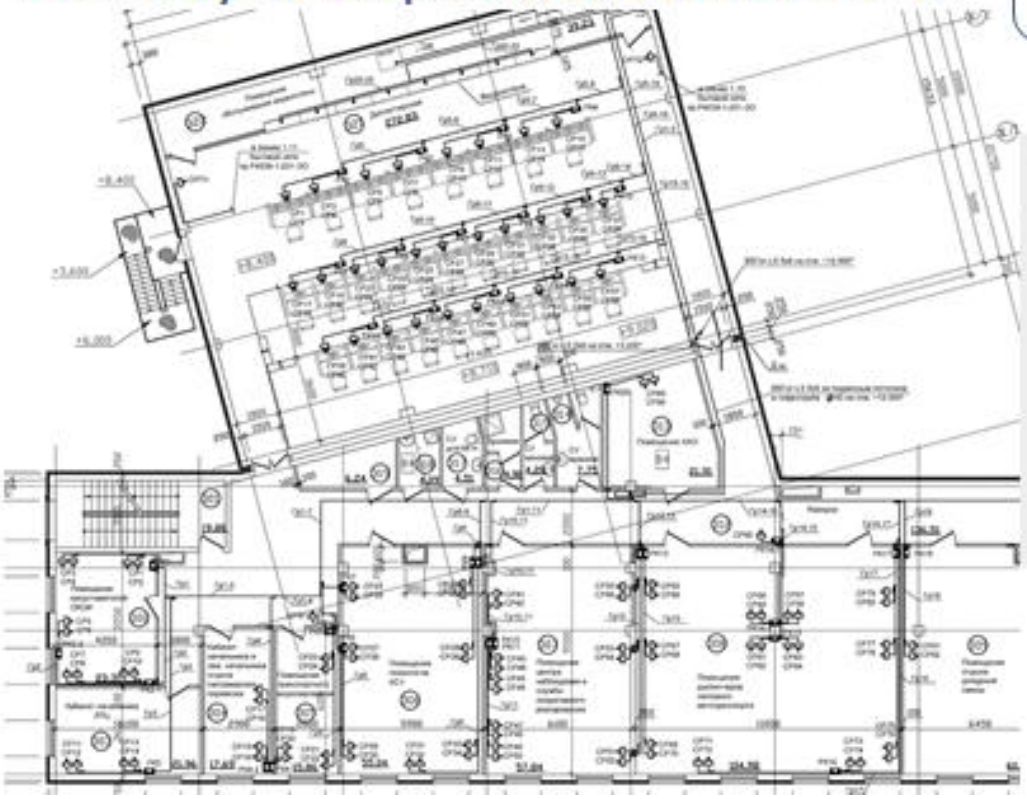
Hardware and software at Evropeysky Business Center – Dispatch Center and workstations



1) Specialized furniture for dispatchers; 2) Ventilation, air-conditioning, and lighting systems, podium; 3) Video wall; 4) Workstations, connected to UPS and diesel backup generator

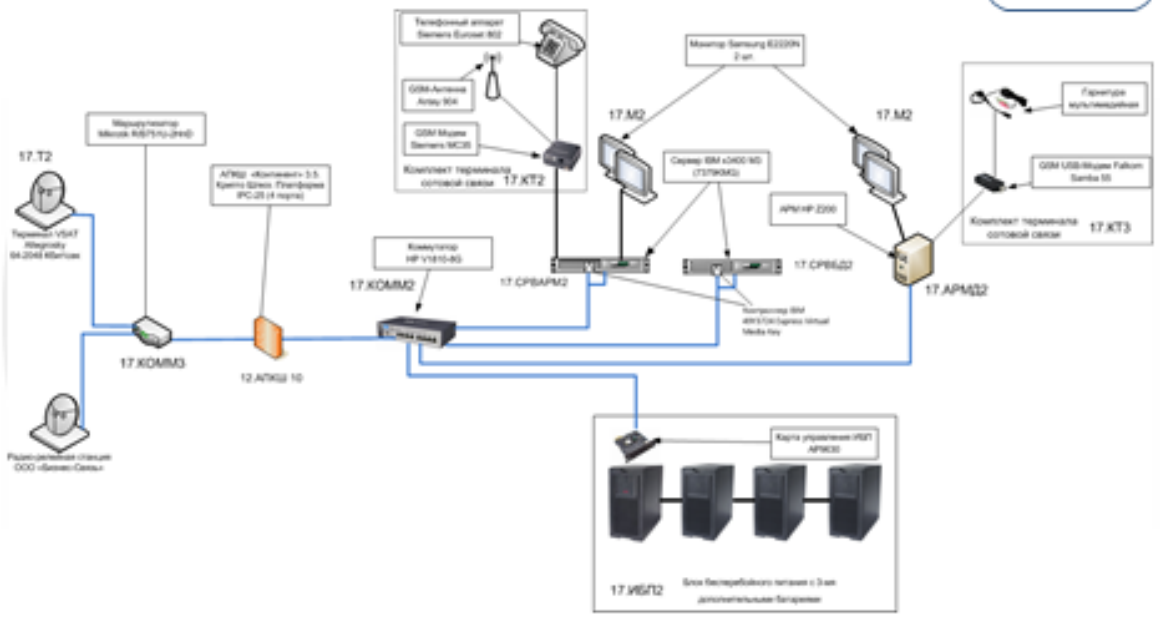
10

Hardware and software at L&TC building, 123 Plastunskaya St. – Dispatch Center and workstations



11

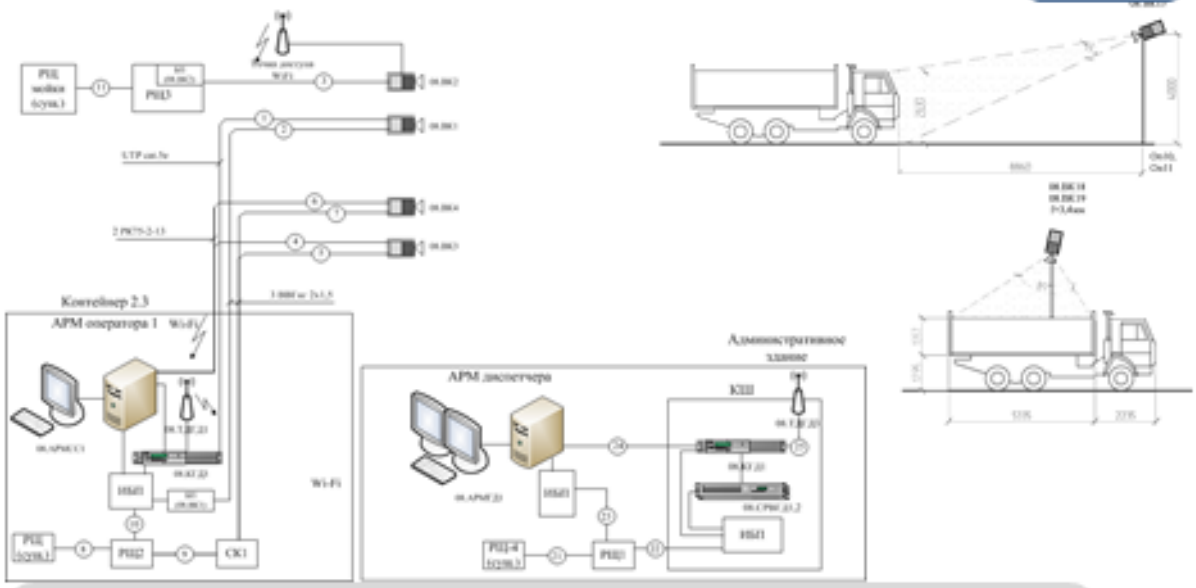
Hardware and software at Olympstroy checkpoints



1) Operator workstations; 2) Database and application servers, switching equipment; 3) Communication equipment and networks; 4) UPS; 5) IT security subsystem

13

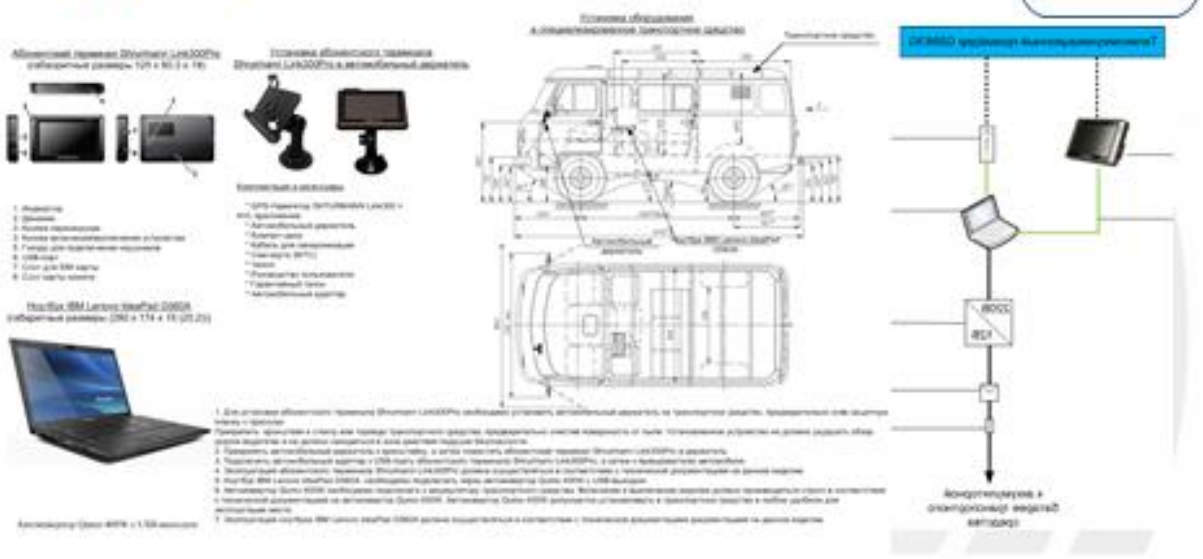
Hardware and software at cargo staging points



1) System for video recording entry/exit; 2) License plate recognition system; 3) Freight terminal dispatcher workstations; 4) Storage servers and switching equipment; 5) Communication equipment and networks; 6) Portable cargo matching terminals; 7) UPS; 8) IT security subsystem

12

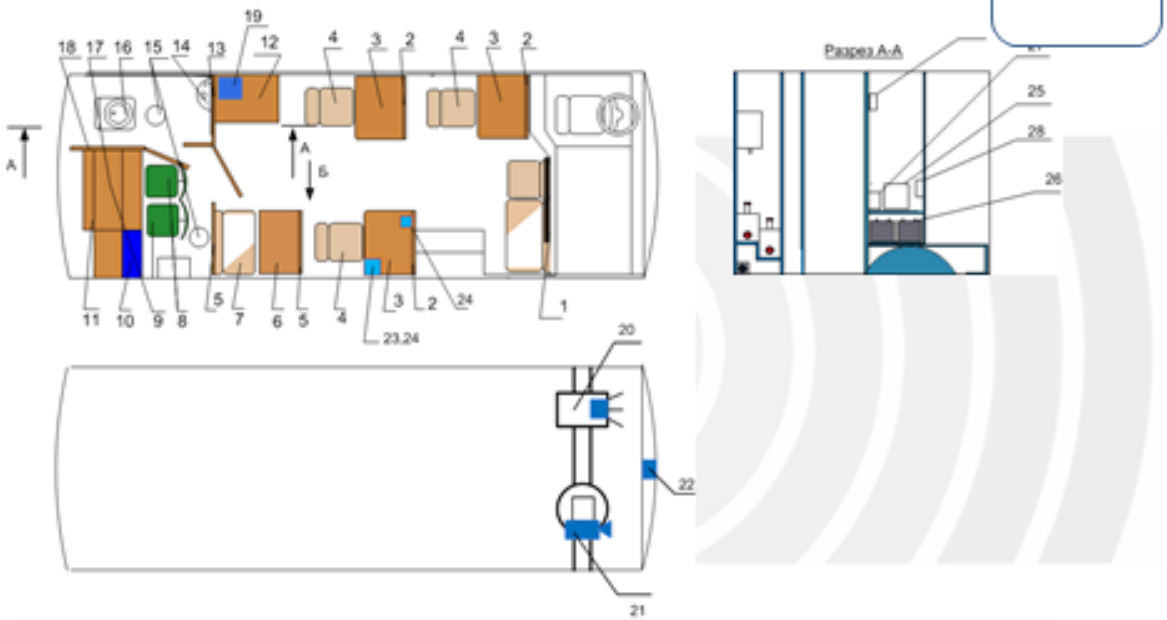
Hardware and software for specialized Olympstroy vehicles



1) Portable navigation equipment with message exchange capabilities; 2) Notebook with pursuit map display; 3) converter with a socket

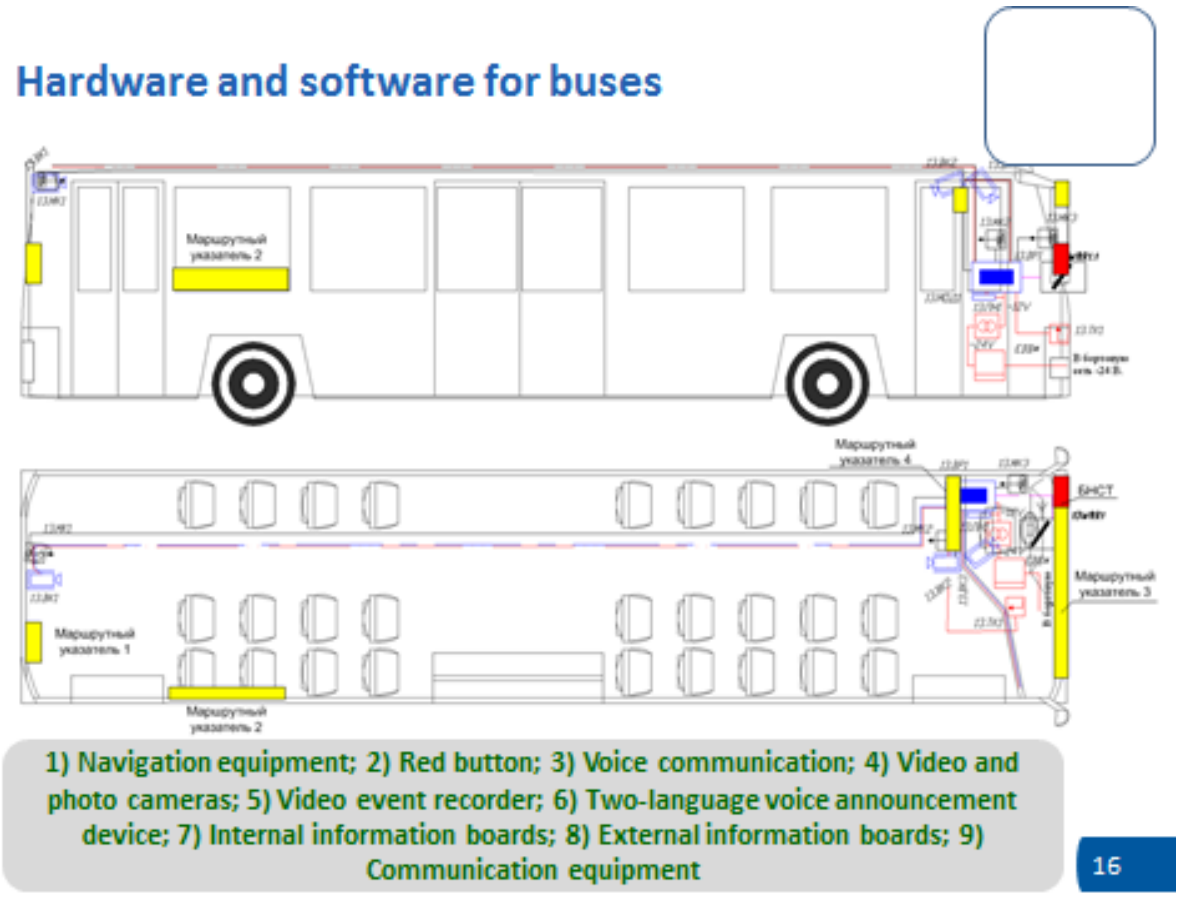
14

Hardware and software for MDC



1) Structured cabling system and communication equipment; 2) Workstations, printers, and screens; 3) Exterior video monitoring; 4) Navigation equipment; 5) UPS system; 6) Water supply; 7) Household furnishings

15



«Benefits of Adopting GNSS and ITS into Logistics Services»

Mr Jaching Chou, Senior Transportation Analyst, Institute of Transportation, Ministry of Transport and Communications, Chinese Taipei

Mr. Chou describes the following issues:

The future logistics for 2020, 2030, 2050.

What ITS can benefit Logistics ? and how ?

Experiences from Chinese Taipei:

– ITS Master Plan

– ITS and its GNSS Applications

– EPS

– ITS Performance

SMM is widely used in Chinese Taipei. By integrating technologies in GIS, GNSS, remote sensing, and wireless communication, these SMMs provide comprehensive solutions for real time freight monitoring and management. Some SMMs will use real time traffic information provided by ATIS (advanced traveler information system) of ITS for logistics route planning

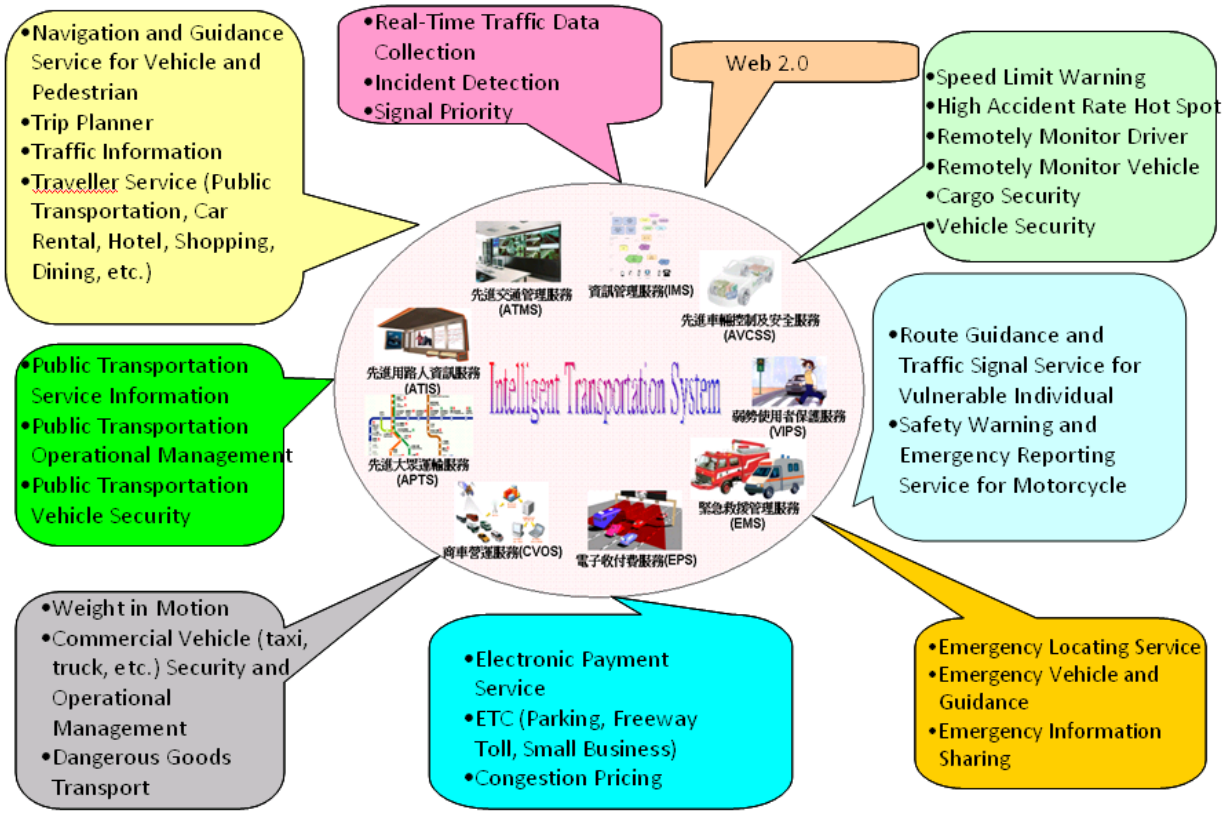
– ITS and Telematics

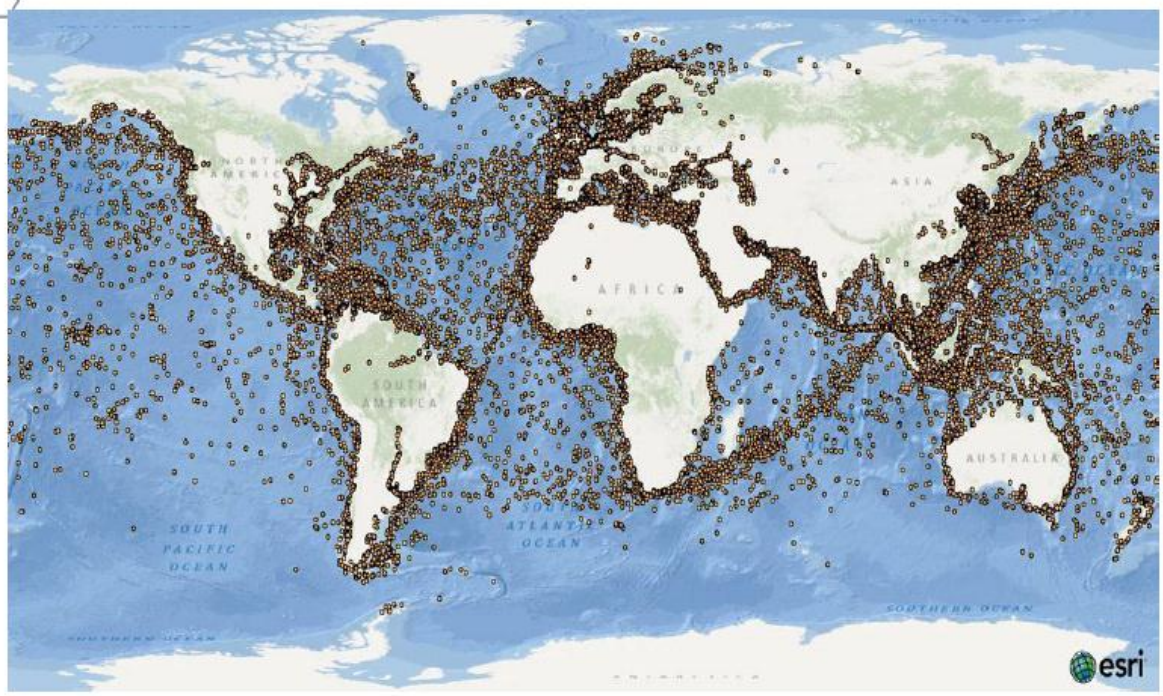
– Chinese Taipei Telematics Industry Association (TTIA) TTIA was established in Dec. 2010 and its mission is to expedite

the development of the Chinese Taipei telematics industry and to

strengthen its global competitiveness.

• Ongoing technologies could benefit ITS and logistics.


•Navigation and Guidance Service for Vehicle and Pedestrian
•Trip Planner
•Traffic Information
•Traveller Service (Public Transportation, Car Rental, Hotel, Shopping, Dining, etc.)
•Real-Time Traffic Data Collection
•Incident Detection
•Signal Priority
Web 2.0
•Speed Limit Warning
•High Accident Rate Hot Spot
•Remotely Monitor Driver
•Remotely Monitor Vehicle
•Cargo Security
•Vehicle Security
先進交通管理服務 (ATMS)
資訊管理服務(IMS)
先進車輛控制及安全服務 (AVCSS)
先進用路人資訊服務 (ATIS)
Intelligent Transportation System
弱勢使用者保護服務 (VIPS)
先進大眾運輸服務 (APTS)
緊急救援管理服務 (EMS)
商車營運服務(CVOS)
電子收付費服務(EPS)
•Public Transportation Service Information
•Public Transportation Operational Management
•Public Transportation Vehicle Security
•Route Guidance and Traffic Signal Service for Vulnerable Individual
•Safety Warning and Emergency Reporting Service for Motorcycle
•Weight in Motion
•Commercial Vehicle (taxi, truck, etc.) Security and Operational Management
•Dangerous Goods Transport
•Electronic Payment Service
•ETC (Parking, Freeway Toll, Small Business)
•Congestion Pricing
•Emergency Locating Service
•Emergency Vehicle and Guidance
•Emergency Information Sharing


NORTH AMERICA
EUROPE
ASIA
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SOUTH ATLANTIC OCEAN
SOUTHERN OCEAN
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Annex 1. Questionnaire developed for the study of existing systems for management and monitoring of transportation and freight flows in APEC member economies

Questionnaire

Study of existing systems for management and monitoring of transportation and freight flows (further SMM) in APEC member economies

Country	**Transportation agency, logistics/transportation company**

No	Question	Answer/choice
1.	Are SMM utilized in your country's economy?	□ No □ Yes
		Comment
	Please list principal SMM, used by transportation and logistics companies and other high-volume shippers in your country:	
		Comment
2.	If your country has national SMM, please indicate their ownership structure:	□ Ministry of Transport or other government entity □ Transportation companies □ Logistics companies □ Major enterprises that shape the freight flows
		Comment
3.	Please indicate sources of financing for building national SMM (kindly list the sources of financing for establishment of each SMM):	□ Ministry of Transport or other government entity □ Transportation companies □ Logistics companies □ Major enterprises that shape the freight flows
		Comment
4.	Were changes to your Country's transport legislation and laws were required for establishment of SMM?	□ No □ Yes
		Comment
5.	Please indicate SMM operator and source of financing for its ongoing operations:	□ Ministry of Transport or other government entity □ Transportation companies □ Logistics companies □ Major enterprises that shape the freight flows □ Revenue from service fees, paid by all transportation market participants
		Comment
6.	A) If there are multiple SMM in your country, please list the protocols used to support their interoperability?	A) □ No □ Yes

		Comment
	B) Is common data reporting format used for multiple SMM in your country?	Б) □ No □ Yes
		Comment
7.	Do your country's SMM interact with other countries' SMM?	□ No □ Yes
		Comment
	What protocols and data formats are used in this interaction?	
		Comment
8.	Please list the protocols and data formats are used by your country's SMM to interact with transportation and logistics companies and cargo shippers?	
		Comment
9.	Please list priority issues with SMM operations, addressing which, in users' opinion, can increase its effectiveness?	
		Comment
10.	A) Which navigation and global positioning systems are used by SMM in your country?	
		Comment
	B) Use of which navigation and global positioning systems is planned for the future?	
		Comment
11.	A) Which intelligent transportation system (ITS) elements in your country interact with SMM?	
		Comment
	B) Which ITS elements are expected to be connected to SMM in the future?	
		Comment
12.	Please list priority legal, management, and technical steps that must be taken for setting up interaction among existing and future SMM in the APEC region, and their effective use?	
		Comment

Annex 2. Questionnaires filled in by the respondents from APEC economies

Questionnaire

Study of existing systems for management and monitoring of transportation and freight flows (further SMM) in APEC member economies

Country	Transportation agency, logistics/transportation company
Japan	Nomura Research Institute: Consulting firm for the Ministry of Land, Infrastructure, Transport and Tourism and Transportation and Logistics Industry

No.	Question	Answer/choice
1.	Are SMM utilized in your country's economy?	■ Yes □ No
	Comment Some parts of Commercial vehicles, rolling stockes and trailer, Vesseles. Not all or most of these transportation.	
	Please list principal SMM, used by transportation and logistics companies and other high-volume shippers in your country:	
	Comment Fresh food (Agricultural and fishery industry), high-end appareal,electronic and presicious products industries, Automotive industry, Medical products industry, Petro-chemical, dengours goods transport,	
2.	If your country has national SMM, please indicate their ownership structure: (a) MLIT has been developing very basic prototype system for Container Visibility in Japan by bein g named with 'COLINS: Container Logistics Information Service ' (b) NACCS (Nippon Automated Customs Clearance System) by the subsidiary of Ministry of Finance, Japan Customs Authority	■ Ministry of Transport or other government entity ■ Transportation companies ■ Logistics companies □ Major enterprises that shape the freight flows
	Comment (c) Major Transportation companies(Three Majors in Japan) for parcel and courier can monitor all the cargoes they transport. (d) Japan Railway Cargo has equipped all containers with RFID devices since 2003 (e) Major Ocean Carriers have also container tracking system during the journey in the Ocean	
3.	Please indicate sources of financing for building national SMM (kindly list the sources of financing for establishment of each SMM):	■ Ministry of Transport or other government entity ■ Transportation companies ■ Logistics companies □ Major enterprises that shape the freight flows
	Comment (a) The Government has financed it till now, but it is planned to take it over to the private sector in the future. (b) NACCS is financed by the Subsidiary of Ministry of Finance, Japan Customs Authority. (c) , (d), (e) are financed by themself.	

4.	Were changes to your Country's transport legislation and laws were required for establishment of SMM?	□ Yes ■No
	Comment No regulation and legislation are needed except the law for Ristriction and prohibition of individual private information	
5.	Please indicate SMM operator and source of financing for its ongoing operations:	■ Ministry of Transport or other government entity ■ Transportation companies ■ Logistics companies □ Major enterprises that shape the freight flows □ Revenue from service fees, paid by all transportation market participants
	Comment The same answer as Question Number 3.	
6.	A) If there are multiple SMM in your country, please list the protocols used to support their interoperability:	A) ■ Yes □ No
	Comment COLINS : SMTP, FTP, web base NACCS : SMTP, Traditional EDI(UN/EDIFACT) protocol Protocols of Other private companies systems are not open	
	B) Is common data reporting format used for multiple SMM in your country?	B) ■ Yes □ No
	Comment COLINS, NACCS, Other Private Companies systems are not interoperable.	
7.	Do your country's SMM interact with other countries' SMM?	■ Yes □ No
	Comment Colins just started to connect with the container tracking system in Shanghai, China and now is looking for a next potential neighborhood country who want to connect each other. NACCS joined the PAA(Pan-Pacific Alliance) network	
	What protocols and data formats are used in this interaction?	
	Comment In practical term, just trial connection network.	
8.	Please list the protocols and data formats are used by your country's SMM to interact with transportation and logistics companies and cargo shippers?	
	Comment ftp, HTTP, SMTP,TCP/IP	
9.	Please list priority issues with SMM operations, addressing which, in users' opinion, can increase its effectiveness?	

	Comment User request to develolp international standard for data concept, dataformat and exchange rules.
10.	A) Which navigation and global positioning systems are used by SMM in your country?
	Comment GPS
	B) Use of which navigation and global positioning systems is planned for the future?
	Comment Location management of container ,trailer, chaisys Monitoring petro tanks, dangerous goods
11.	A) Which intelligent transportation system (ITS) elements in your country interact with SMM?
	Comment Currently no ITS sysytem.
	B) Which ITS elements are expected to be connected to SMM in the future?
	Comment Automated Equipment Identifiers, Automated Vehicle Identifiers, Heavey Truck Monitoring (Planned) sysytem
12.	Please list priority legal, management, and technical steps that must be taken for setting up interaction among existing and future SMM in the APEC region, and their effective use?
	Comment 1. Standard deveopment 2. Best Practices and their awareness 3. Legal and standard harmonization 4. Conbination and Harmonizatin between Cusotms and Tranport

Questionnaire

Study of existing systems for management and monitoring of transportation and freight flows (further SMM) in APEC member economies

Country	**Transportation agency, logistics/transportation company**
Canada	Transport Canada – Economic Analysis

No.	Question	Answer/choice
1.	Are SMM utilized in your country's economy?	x□ Yes □ No
	Comment	
	Please list principal SMM, used by transportation and logistics companies and other high-volume shippers in your country:	
	Comment We have all types from EDI messaging, Radio Frequency (RFID) , bar code readers, GPS and satellite tracking.	

2.	If your country has national SMM, please indicate their ownership structure: SMM is company and/or industry-based. Governments provide satellite only for remote areas or areas not covered by commercial satellites. Government allocate spectrum space for cell and other communication users..	**x**□ Ministry of Transport or other government entity **x**□ Transportation companies □ Logistics companies □ Major enterprises that shape the freight flows
		Comment
3.	Please indicate sources of financing for building national SMM (kindly list the sources of financing for establishment of each SMM): Private Equity raised by satellite providers, cell phone companies and transport companies	□ Ministry of Transport or other government entity **x**□ Transportation companies □ Logistics companies □ Major enterprises that shape the freight flows X Others
		Comment
4.	Were changes to your Country's transport legislation and laws were required for establishment of SMM?	x□ Yes □ No
		Comment **Yes but mostly from a point of view of mobile transport units like trucks - human factor poinbt of view and distraction for drivers.**
5.	Please indicate SMM operator and source of financing for its ongoing operations:	□ Ministry of Transport or other government entity □ Transportation companies □ Logistics companies □ Major enterprises that shape the freight flows **x**□ Revenue from service fees, paid by all transportation market participants
		Comment

6.	A) If there are multiple SMM in your country, please list the protocols used to support their interoperability:	A) **x**□ Yes □ No
	Comment EDI protocol RFID – communication protocol Cell phones communications protocols Satellite communications Transponders technologies as well Cloud technologies Cluster technologies	
	B) Is common data reporting format used for multiple SMM in your country?	B)x □ Yes □ No
	Comment To a certain extent yes on non-commercial and non-sensitive information. Geocoding for instance is common. Railway messaging is also common format.	
7.	Do your country's SMM interact with other countries' SMM?	x□ Yes □ No
	Comment United States and Mexico	
	What protocols and data formats are used in this interaction?	
	Comment Common technologies so common standards.	
8.	Please list the protocols and data formats are used by your country's SMM to interact with transportation and logistics companies and cargo shippers?	
	Comment EDI messaging is still used for the marine shipping and rail sectors. Trucking use EDI still for customs and automotive sectors. Satellite and GPS are used internally by transport companies and sometimes shared with customers. RFID are used by transport and shippers. Celle phone technologies are used by all.	

9.	Please list priority issues with SMM operations, addressing which, in users' opinion, can increase its effectiveness?
	Comment *Cost of operation per message and per fixed rate per month. Replacement costs to migrate to newest technologies.*
10.	A) Which navigation and global positioning systems are used by SMM in your country?
	Comment Don't know
	B) Use of which navigation and global positioning systems is planned for the future?
	Comment Don't know
11.	A) Which intelligent transportation system (ITS) elements in your country interact with SMM?
	Comment Transponders, GPS/satellite, driver's decision systems, train positioning systems, traffic monitoring systems, RFID messaging and cluster communications on security messaging and for sensitive cargo, bar coding for customs clearance and for inventory control, central dispatch system.
	B) Which ITS elements are expected to be connected to SMM in the future?
	Comment Cloud technologies sand cluster technologies will be implemented and integrated,.
12.	Please list priority legal, management, and technical steps that must be taken for setting up interaction among existing and future SMM in the APEC region, and their effective use?
	Comment

	Pilot projects is a good way to test and especially that customs requirements are always involved in those processes.

Questionnaire

Study of existing systems for management and monitoring of transportation and freight flows (further SMM)in APEC member economies

Country	**Transportation agency, logistics/transportation company**
VIETNAM	**Institute of Transport Science and Technology**

No	Question	Answer/choice
1.	Are SMM utilized in your country's economy?	☒Yes ☐No
	In Vietnam, capacity for the utilization of information and communications technology (ICT) applications is also generally limited, particularly at the local level.	
	Please list principal SMM, used by transportation and logistics companies and other high-volume shippers in your country:	
	Development of technology for the sector, mainly in information technology as IT systems, software, TMS (Transport management system,) or WMS (warehouse management system). These systems will help enterprise to save costs and improve business efficiency. Computerization as a management tool has been used on Port EDI and on Customs EDI etc. VICT is the only port operator using the EDI system, on standalone basis, which processes automated container billing, automated inventory management (container yard operation), automated gate operation (truck arrival and departure check), automated vessel operation (container loading and unloading management), and CFS stock management. The EDI system, however, becomes more meaningful, if it is electronically linked with all the users engaged in logistics administration and business, e.g., port authority, port operators, customs authority, immigration, quarantine, shipping lines, shipping agents, freight forwarders, consignors etc. We start to use Intelligent Transportation Systems (ITS), GPS-based monitoring systems and automated transport management logistic services. Modern satellite technologies have proven effective in managing road traffic flows. The same is true of intelligent transportation systems, which can speed up traffic in cities, and by easing traffic congestion increase transport safety.	
2.	If your country has national SMM, please indicate their ownership structure:	☒ Ministry of Infomation and Communications ☒ Ministry of Transport ☒Transportation companies ☒ Logistics companies ☒ Major enterprises that shape the freightflows
	Logistics service in Vietnam is in the stage of: ➢ Partnership development ➢ Corporation between manufacturers, suppliers with consumers and stakeholders. In addition to first-party logistics (1PL) is the owner, the 2nd party logistics (2PL) is a supplier - single operation, Vietnam has begun development of 3rd party Logistics (3PL) integrated missions, combined the transfer, storage and information processing Comment • A major of the 3PL in Vietnam direct to : ➢ 4th party (4PL) concentrate on management of supply chain from the manufacture, import and export shipment to the place of consumption; ➢ 5th party (5PL) was formed in order to manage the entire supply chain of distribution on e-commerce platform. ➢ In order to promote increased demand by 2020, strategic planners said that logistics services increased along with domestic and international trade.	

3.	Please indicate sources of financing for building national SMM (kindly list the sources of financing for establishment of each SMM):	☒ Ministry of Infomation and Communications ☒ Ministry of Transport ☐ Transportation companies ☐ Logistics companies ☐Major enterprises that shape the freightflows
	Government are continuing to build the legal framework and to invest main IT infrastructures; the association of logistics that make good opportunities for orientation and development of enterprises	
4.	Were changes to your Country's transport legislation and laws were required for establishment of SMM?	☒Yes ☐ No
	☐ Decree 91/2009/NĐ-CP on vehicle tracking system ☐ Circular 14/2010/TT-BGTGT using GPS on transportation monitoring The basic legal documents of logistics operation in Vietnam - Commercial Law on 14 April, 2005 - Decree of Government No. 140/2007/ND-CP on May 9th, 2007 Regulate commercial Law for condition of Logistics services business and liability limitation of trader in Logistics service business.	
5.	Please indicate SMM operator and source of financing for its on going operations:	☒ Ministry of Infomation and Communications ☒Ministry of Transport or other governmententity Transportation companies ☒ Logistics companies ☒ Major enterprises that shape the freightflows ☒Revenue from service fees, paid by all transportation market participants
	Companies operation in field of logistics in Vietnam: • There are about 1.200 companies work in the field of logistics • 25-30 leading forwarders in the world invest in business logistics under various forms • A lot of Vietnamese companies are small investors. Some State companies are relatively strong as Viconship, Vintrans, Vietrans are trying to enter into global logistics operations. For the moment their companies only work as agent of foreign transport and logistics companies. • It is estimated that over 70% of the value of logistics activities in Vietnam created by the foreign companies. Local companies exploit only a few pieces of the supply chain mainly delivery while foreign companies can provide a full package of logistics with high added value .	
6.	A) If there are multiple SMM in your country, please list the protocols used to support their interoperability:	A) ☒ Yes ☐ No
	Protocol 1: Designation of corridors, routes and point of entry and exit (border crossings) Protocol 2: Charges concerning transit traffic Protocol 3: Frequency and capacity of services and issuance of quotas and permits	
	B) Is common data reporting format used for multiple SMM in your country?	B) ☐ Yes ☒No
	Comment	
7.	Do your country's SMM interact with other countries' SMM?	☒Yes ☐No
	• Logistics service in Vietnam is in the stage of: ➢ Partnership development	

	➢ Corporation between manufacturers, suppliers with consumers and stakeholders. In addition to first-party logistics (1PL) is the owner, the 2nd party logistics (2PL) is a supplier - single operation, Vietnam has begun development of 3rd party Logistics (3PL) integrated missions, combined the transfer, storage and information processing
	What protocols and data formats are used in this interaction?
8.	Please list the protocols and data formats are used by your country's SMM to interact with transportation and logistics companies and cargo shippers?
	Protocol 1: Designation of corridors, routes and point of entry and exit (border crossings) Protocol 2: Charges concerning transit traffic Protocol 3: Frequency and capacity of services and issuance of quotas and permits
9.	Please list priority issues with SMM operations, addressing which, in users' opinion, can increase its effectiveness?
	In order to develop the logistics market, Vietnam concentrates on several aspects as follows: ➢ *Development of human resource for logistics field by developing courses and formations in universities* ➢ *Development of technology for the sector, mainly in information technology as IT systems, software, TMS (Transport management system,) or WMS (warehouse management system). These systems will help enterprise to save costs and improve business efficiency.* ➢ *Planning for long-term transport infrastructure, customs clearance points, seaports, airports and warehouses.* ➢ *Government are continuing to build the legal framework, the association of logistics that make good opportunities for orientation and development of enterprises* ➢ *Customs is an important step but also a weakness; this is considered a breakthrough facilitate business activities in the context of global integration. Vietnam is trying to establish one border customs system, customs clearance with the list of electronic tariffs harmonization, transparency and pays special attention to the facilitation of customs inspection.*
10.	A) Which navigation and global positioning systems are used by SMM in your country?
	VINASAT-1, VINASAT-2, GPS
	B) Use of which navigation and global positioning systems is planned for the future?
	Comment
11.	A) Which intelligent transportation system (ITS) elements in your country interact with SMM?
	Improving traffic flow, reducing emissions and synchronizing traffic signals for public safety and transportation vehicle priority are just a few of the uses for intelligent transportation systems (Intelligent traffic solutions collect information at signals all around the city, correlate the real-time da can automatically regulate traffic policies across a city. ITS includes a range of applications tha benefit cities such as: • **Intelligent Traffic Signal Management** - Actively managed and coordinated traffic signals can reduce congestion and moderate traffic speeds, smoothing traffic flow and reducing auto emission levels. • **Information and Alerts** - Variable message signs can quickly broadcast information such as weather, road conditions, stolen vehicle and other timely local information to drivers. • **Automated Parking Meters** – Real-time centralized management of meters, improving revenue capture, improving parking availability, and providing payment option flexibility for visitors
	B) Which ITS elements are expected to be connected to SMM in the future?
	• **Video Analytics** - Real-time video enables traffic controllers to identify problems, record and ticket red light runners, gather traffic analytics information and enforce special traffic zones. Public safety workers may also access the video to identify traffic conditions so they can route

	around congested roads when responding to an emergency. • **Real-Time Public Transit Information** - Up-to-the-minute information on busses and other public transportation vehicles can be published to the web and bus stations, improving schedule accuracy and helping increasing ridership.
12.	Please list priority legal, management, and technical steps that must be taken for setting up interaction among existing and future SMM in the APEC region, and their effective use?
	➢ *Development of human resource for logistics field by developing courses and formations in universities* ➢ *Development of technology for the sector, mainly in information technology as IT systems, software, TMS (Transport management system,) or WMS (warehouse management system). These systems will help enterprise to save costs and improve business efficiency.* ➢ *Planning for long-term transport infrastructure, customs clearance points, seaports, airports and warehouses.* ➢ *Government are continuing to build the legal framework, the association of logistics that make good opportunities for orientation and development of enterprises* ➢ *Customs is an important step but also a weakness; this is considered a breakthrough facilitate business activities in the context of global integration. Vietnam is trying to establish one border customs system, customs clearance with the list of electronic tariffs harmonization, transparency and pays special attention to the facilitation of customs inspection.*

Questionnaire

Study of existing systems for management and monitoring of transportation and freight flows (further SMM) in APEC member economies

Country	**Transportation agency, logistics/transportation company**
MALAYSIA	**MINISTRY OF TRANSPORT**

No.	Question	Answer/choice
1.	Are SMM utilized in your country's economy?	□ **Yes** □ No
	Comment **Only companies with international dealings.**	
	Please list principal SMM, used by transportation and logistics companies and other high-volume shippers in your country:	
	Comment **Many of the manufacturing and transport companies listed on the first board of Stock Exchange with a global / regional outlook.**	
2.	If your country has national SMM, please indicate their ownership structure:	□ Ministry of Transport or other government entity □ **Transportation companies** □ **Logistics companies** □ **Major enterprises that shape the**

		freight flows
	Comment **Ownership of such systems is still in the minority in terms of numbers.**	
3.	Please indicate sources of financing for building national SMM (kindly list the sources of financing for establishment of each SMM):	□ Ministry of Transport or other government entity □ Transportation companies □ Logistics companies □ Major enterprises that shape the freight flows **None of the entities above**
	Comment **Not easy to obtain financing locally. One of the few sources includes National Development Bank. Some companies may source financing from commercial banks in Singapore.**	
4.	Were changes to your Country's transport legislation and laws were required for establishment of SMM?	□ Yes □ **No**
	Comment **Can be made part of the licensing structure in the context of road and rail under the Land Public Transport Act 2010.**	
5.	Please indicate SMM operator and source of financing for its ongoing operations:	□ Ministry of Transport or other government entity □ **Transportation companies** □ **Logistics companies** □ **Major enterprises that shape the freight flows** □ Revenue from service fees, paid by all transportation market participants
	Comment **Will be updated later.**	
6.	A) If there are multiple SMM in your country, please list the protocols used to support their interoperability:	A) □ **Yes** □ No
	Comment **Usually customized systems which are specific to the needs of a**	

	particular company.	
	B) Is common data reporting format used for multiple SMM in your country?	B) ☐ Yes ☐ **No**
	Comment **Only for the customs clearance digital system, Dagang Net.**	
7.	Do your country's SMM interact with other countries' SMM?	☐ Yes ☐ **No**
	Comment **At the moment, no.** **But this will have to start in 2015 with the advent of APEC.**	
	What protocols and data formats are used in this interaction?	
	Comment **None.**	
8.	Please list the protocols and data formats are used by your country's SMM to interact with transportation and logistics companies and cargo shippers?	
	Comment **Will be updated later.**	
9.	Please list priority issues with SMM operations, addressing which, in users' opinion, can increase its effectiveness?	
	Comment **Reliability, accuracy and ease of access. Design apps which allow mobile access through smart phones and tablettes.**	
10.	A) Which navigation and global positioning systems are used by SMM in your country?	
	Comment **Not in possession of the details. One company has indicated a reliance on google earth / maps.**	
	B) Use of which navigation and global positioning systems is planned for the future?	
	Comment **Will be updated later.**	
11.	A) Which intelligent transportation system (ITS) elements in your country interact with SMM?	
	Comment **Will be updated later.**	
	B) Which ITS elements are expected to be connected to SMM in the future?	
	Comment **ITS is not sufficient ubiquituous in order for this connection, even in the near future.**	
12.	Please list priority legal, management, and technical steps that must be taken for setting up interaction among existing and future SMM in the APEC region, and their effective use?	
	Comment **i. Probably no legal changes are necessary yet.** **ii. Education of management of its importance.**	

	iii. Budgetary moves to ensure investment in the requisite technology. **iv. Agreement on standards and protocols.** v. **Buying into the system contractually.**

Questionnaire

Study of existing systems for management and monitoring of transportation and freight flows (further SMM) in APEC member economies

Country	Transportation agency, logistics/transportation company
New Zealand	Ministry of Transport

No.	Question	Answer/choice
1.	Are SMM utilized in your country's economy?	□ Yes
		Comment Individual companies and freight forwarders have their own SMM systems, but there is no single SMM for the entire country
	Please list principal SMM, used by transportation and logistics companies and other high-volume shippers in your country:	
		Comment Not applicable
2.	If your country has national SMM, please indicate their ownership structure:	□ Transportation companies □ Logistics companies □ Major enterprises that shape the freight flows
		Comment As above, there is no whole-of-country SMM, but the Ministry of Transport is aware of the SMM's that are utilized by transport companies, logistics companies and major enterprises
3.	Please indicate sources of financing for building national SMM (kindly list the sources of financing for establishment of each SMM):	□ Transportation companies □ Logistics companies □ Major enterprises that shape the freight flows
		Comment Not applicable
4.	Were changes to your Country's transport legislation and laws were required for establishment of SMM?	□ No
		Comment Not applicable
5.	Please indicate SMM operator and source of financing for its ongoing operations:	□ Transportation companies □ Logistics companies □ Major enterprises that shape the freight flows
		Comment Not applicable
6.	A) If there are multiple SMM in your country, please list the protocols used to support their interoperability:	A) □ Yes □ No

	Comment There are multiple systems, we are unaware of the protocols used to support them	
	B) Is common data reporting format used for multiple SMM in your country?	B) □ No
	Comment Unknown by MoT	
7.	Do your country's SMM interact with other countries' SMM?	□ Yes □ No
	Comment Unknown by MoT	
	What protocols and data formats are used in this interaction?	
	Comment Unknown by MoT	
8.	Please list the protocols and data formats are used by your country's SMM to interact with transportation and logistics companies and cargo shippers?	
	Comment Unknown by MoT	
9.	Please list priority issues with SMM operations, addressing which, in users' opinion, can increase its effectiveness?	
	Comment Unknown by MoT	
10.	A) Which navigation and global positioning systems are used by SMM in your country?	
	Comment Unknown by MoT – however we expect GPS is the primary system.	
	B) Use of which navigation and global positioning systems is planned for the future?	
	Comment Unknown by MoT	
11.	A) Which intelligent transportation system (ITS) elements in your country interact with SMM?	
	Comment Unknown by MoT	
	B) Which ITS elements are expected to be connected to SMM in the future?	
	Comment Unknown by MoT – (we would be guessing to answer this question).	
12.	Please list priority legal, management, and technical steps that must be taken for setting up interaction among existing and future SMM in the APEC region, and their effective use?	
	Comment No existing SMM exists in New Zealand	

Questionnaire

Study of existing systems for management and monitoring of transportation and freight flows (further SMM) in APEC member economies

Country	**Transportation agency, logistics/transportation company**

Chinese Taipei	***Institute of Transportation, Ministry of Transportation and Communications***

No.	Question	Answer/choice
1.	Are SMM utilized in your country's economy?	☒ Yes □ No
		Comment
	SMM is widely used in Chinese Taipei. By integrating technologies in GIS, GNSS, remote sensing, and wireless communication, these SMMs provide comprehensive solutions for real time freight monitoring and management.	
	Please list principal SMM, used by transportation and logistics companies and other high-volume shippers in your country:	
		Comment
	There are several SMM service providers from private sector, such as eLocation, SkyEyes, EZTrack and eCarCenter, WaveGIS Locator R, SNG Ca, etc. These services are intergrated with other logistics service providers, such as TradeVan, Toplogis, Prolink, etc., for supply chain management. Some SMMs are developed and operated by enterprises for their internal use.	
2.	If your country has national SMM, please indicate their ownership structure: ***There is no national level of SMM in Chinese Taipei at this time.***	□ Ministry of Transport or other government entity □ Transportation companies □ Logistics companies □ Major enterprises that shape the freight flows
		Comment
3.	Please indicate sources of financing for building national SMM (kindly list the sources of financing for establishment of each SMM): ***The answer for this question is not available since there is no national SMM in Chinese Taipei at this moment.***	□ Ministry of Transport or other government entity □ Transportation companies □ Logistics companies □ Major enterprises that shape the freight flows
		Comment
4.	Were changes to your Country's transport legislation and laws were required for establishment of SMM?	□ Yes ☒ No
		Comment
5.	Please indicate SMM operator and source of financing for its ongoing operations:	□ Ministry of Transport or other government entity □ Transportation companies □ Logistics companies □ Major enterprises that shape the freight flows ☒ Revenue from service fees, paid by all transportation market participants
		Comment
	Most SMM's source of financing is from service fee paid by all transportation market participants, unless it is operated by enterprise itself.	
6.	A) If there are multiple SMM in your country, please list the protocols used to support their interoperability:	A) □ Yes ☒ No
		Comment
	Although there are several SMM service providers in Chinese Taipei, however messages are not exchanged during operation. Therefore, there are no protocols used for interoperability at this moment.	
	B) Is common data reporting format used for multiple SMM in	B) □ Yes

	your country?	☒ No
	Comment ***At this moment there is no common data report format used for multiple SMM in Chinese Taipei. Although most SMMs use similar message format between on board units (OBUs) and control centers, but the reporting format has been customized based on users' or customers' requirement, And GPRS and 3G wireless communications are two major means used between OBUs and SMMs.***	
7.	Do your country's SMM interact with other countries' SMM?	□ Yes ☒ No
	Comment	
	What protocols and data formats are used in this interaction?	
	Comment ***The answer for this question is not available since there is no such interaction at this moment.***	
8.	Please list the protocols and data formats are used by your country's SMM to interact with transportation and logistics companies and cargo shippers?	
	Comment ***Currently, XML and Web service are mainly used by SMMs in Chinese Taipei to interact with logistics service providers and cargo shippers in real time.***	
9.	Please list priority issues with SMM operations, addressing which, in users' opinion, can increase its effectiveness?	
	*Comment**.*** ***In urban downtown area, GNSS service level is sometimes downgraded because of high-rise buildings or overpass roads while using GPS alone. To alleviate this issue, altitude and heading data from GNSS NMEA-0183 sentence are often used. However, accuracy and stability of these two GNSS parameters could be further improved.***	
10.	A) Which navigation and global positioning systems are used by SMM in your country?	
	Comment ***At this moment, global positioning system (GPS) is mainly used by SMMs in Chinese Taipei.***	
	B) Use of which navigation and global positioning systems is planned for the future?	
	Comment ***To pursue even higher integrity and availability of GNSS service for special requirement such as dangerous goods shipment, other GNSS services, such as GLONASS, Galileo, Beidou, will be considered and evaluated in the future.***	
11.	A) Which intelligent transportation system (ITS) elements in your country interact with SMM?	
	Comment ***Some SMMs will use real time traffic information provided by ATIS (advanced traveler information system) of ITS for logistics route planning.***	
	B) Which ITS elements are expected to be connected to SMM in the future?	
	Comment ***ATMS (advanced transportation management system) of ITS could interface with SMM to provide proactively traffic management for special cargo shipment, such as dangerous goods. If public transport were also used for cargo shipment, then SMM might need to interface with APTS (advanced public transportation system)of ITS for real time cargo tracking.***	
12.	Please list priority legal, management, and technical steps that must be taken for setting up interaction among existing and future SMM in the APEC region, and their effective use?	
	Comment ***1. From legal perspective, there will be issues regarding the sensitivity and confidentiality of business information exchange among SMMs. Therefore, there might need certain format of agreement or regulation while using those data exchanged.***	

	2. From industrial supply chain point of view, cooperation of SMM in APEC region provides a platform for the information integration of cross-border logistics service, which will provide seamless logistics information. Therefore, to achieve even higher logistics efficiency, we would like to encourage APEC economies to establish a mechanism to integrate logistic information from major SMMs or logistics service providers in each economy using international standards, such as that of UN, IATA, IMO, and OGC. ***3. To echo the environment protection, we also suggest that carbon footprint issue is also to be considered in cross-border transportation, and use it as one of factors to evaluate the performance of intermodal cargo transportation.*** ***4. From technical aspect, information security and integration of heterogeneous cargo information are two major priority issues while setting up interaction among existing and future SMMs in the APEC region.***

Questionnaire

Study of existing systems for management and monitoring of transportation and freight flows (further SMM) in APEC member economies

Country	Transportation agency, logistics/transportation company
THAILAND	OFFICE OF TRANSPORT AND TRAFFIC POLICY AND PLANNING MINISTRY OF TRANSPORT

No.	Question	Answer/choice
1.	Are SMM utilized in your country's economy?	☑ Yes ☐ No
	In Thailand, we have Masterplan of Logistic No.1 [2007-2011] and No.2 [2012-2016]	Comment
	Please list principal SMM, used by transportation and logistics companies and other high-volume shippers in your country:	
	Principal depend on North-South Economic Corridor and East-West Economic Corridor from World Bank Research.	Comment
2.	If your country has national SMM, please indicate their ownership structure: National Area Model have 2 part; i) Transportation [Vehicle-Kilometer, Vehicle-Hour] ii) Freight [Tons-Kilometer, Tons-Hour]	☑ Ministry of Transport or other government entity ☐ Transportation companies ☐ Logistics companies ☐ Major enterprises that shape the freight flows
	National Area Model (NAM) is Transport & Logistic Model for planning of Thailand [from 1997 to present]	Comment
3.	Please indicate sources of financing for building national SMM (kindly list the sources of financing for establishment of each SMM): Government Budget [Budget Bureau]	☑ Ministry of Transport or other government entity ☐ Transportation companies ☐ Logistics companies ☐ Major enterprises that shape the freight flows
		Comment

4.	Were changes to your Country's transport legislation and laws were required for establishment of SMM?	☑ Yes ☐ No
	In Thailand, we have new law that call "Multimodal Transport Law". [start 2005]	*Comment*
5.	Please indicate SMM operator and source of financing for its ongoing operations: In Ministry of Transport of Thailand, we have 3 operator: i) Department of Land Transport ii) Marine Department iii) Department of Civil Aviation	☑ Ministry of Transport or other government entity ☐ Transportation companies ☐ Logistics companies ☐ Major enterprises that shape the freight flows ☐ Revenue from service fees, paid by all transportation market participants
	Hovarer, we have two agencies for infrastructure i) Department of Highway ii) Department of Rural Road and one agency for planning is Office of Transport and Traffic Policy and Planning	*Comment*
6.	A) If there are multiple SMM in your country, please list the protocols used to support their interoperability:	A) ☑ Yes ☐ No
	Reduce % Logistic cost / GDP → Phase one (2007 – 2011) target 19% → 15% [Real is 15.2% in 2011 → Phase two (2012 – 2016) target Not define yet	*Comment*
	B) Is common data reporting format used for multiple SMM in your country?	B) ☑ Yes ☐ No
	– Transport Data Format [1997 – Present] – Freight Data Format [1997 – Present]	*Comment*

7.	Do your country's SMM interact with other countries' SMM?	☑ Yes ☐ No
	Interact very clost with ABL countries	*Comment*
	What protocols and data formats are used in this interaction?	
	Harmonize code of Import - Export goods	*Comment*
8.	Please list the protocols and data formats are used by your country's SMM to interact with transportation and logistics companies and cargo shippers?	
	For National Area Model (NAM) - follow Harmonize code of Import - Export and commodity flow	*Comment*
9.	Please list priority issues with SMM operations, addressing which, in users' opinion, can increase its effectiveness?	
	- Apply Multimodal Transport concept for reduce Logistic cost	*Comment*
10.	A) Which navigation and global positioning systems are used by SMM in your country?	
	- Bar code - RFID - GPS	*Comment*
	B) Use of which navigation and global positioning systems is planned for the future?	
	- smart phone with satelite System - Web base Application	*Comment*

11.	A) Which intelligent transportation system (ITS) elements in your country interact with SMM?	
	Comment: This year, we have one pilot project apply GPS with freight train for check scheduling.	
	B) Which ITS elements are expected to be connected to SMM in the future?	
	Comment: - smart phone with satelite system	
12.	Please list priority legal, management, and technical steps that must be taken for setting up interaction among existing and future SMM in the APEC region, and their effective use?	
	Comment: Level 1 Value stream / product / process [Flow of work, material, information, money] Level 2 Asset & Infrastructure dependencies [Fixed & mobile assets] Level 3 Organizations & Inter-organizational network power dependencies [commercial wellbeing, contractual & stakeholder relationships] Level 4 Social and natural environment [Safety, security & natural environment]	

Annex 3. RESULTS OF PARTICIPANT FEEDBACK

APEC Project Feedback Survey: Workshop

Project Name/Number: S TPT 01 12T – Automated Transport Management Systems Implementation for Optimizing Logistics within the Asia-Pacific with an Emphasis on ITS and GNSS Application

Date 28/11

How useful were these elements of the project to you and your economy?

	VERY USEFUL	SOME-WHAT USEFUL	NOT VERY USEFUL	COMMENTS (Continue on back if necessary)
Overall project	✓			
Insert elements of the project: e.g. name of expert presenter, survey, creation of best practices, field trip etc.				

1. Overall, how was the project?
   5 excellent — (4) good — 3 satisfactory — 2 not good — 1 bad
   Explain: _____

2. How were the facilitators/experts?
   5 excellent — (4) good — 3 satisfactory — 2 not good — 1 bad
   Explain: Well Verse in Subject matter

3. How well did the project meet its objectives?
   5 excellent — (4) good — 3 satisfactory — 2 not good — 1 bad
   Explain: _____

4. How appropriate were the participants for the project?
   5 — (5) — 3 — 2 — 1

excellent good satisfactory not good bad

Explain:

5. How could this project have been improved?

6. How will this workshop benefit or change your work, organization and/or economy?

The information very good & really helpful for future development my economy

7. What, if any, changes do you plan on implementing when you return to your home economy?

Yes- It is good to propose to my home economy especially for the benefits of industry players

8. What needs to be done next by APEC? How can we support and build on the project results?

guidance & assistance

9. Any other comments or suggestions?

Participant information (identifying information is optional):

Name:

Organisation/Economy:

Gender: M / F

Thank you. Your evaluation is important in helping us assess this project, improve project quality and plan next steps.

APEC Project Feedback Survey: Workshop

Project Name/Number: S TPT 01 12T – Automated Transport Management Systems Implementation for Optimizing Logistics within the Asia-Pacific with an Emphasis on ITS and GNSS Application

Date 22/11/12

How useful were these elements of the project to you and your economy?

	VERY USEFUL	SOME-WHAT USEFUL	NOT VERY USEFUL	COMMENTS (Continue on back if necessary)
Overall project	/			
Insert elements of the project: e.g. name of expert presenter, survey, creation of best practices, field trip etc.				Andrew Kaslov presentation of his paper is fantastic.

1. Overall, how was the project?
   5 excellent 4 good 3 satisfactory 2 not good 1 bad
   Explain: Good in terms of sharing information & best practices in APEC economies.

2. How were the facilitators/experts?
   5 excellent 4 good 3 satisfactory 2 not good 1 bad
   Explain:

3. How well did the project meet its objectives?
   5 excellent 4 good 3 satisfactory 2 not good 1 bad
   Explain:

4. How appropriate were the participants for the project?
   5 4 3 2 1

excellent good satisfactory not good bad

Explain:

5. How could this project have been improved?

Needs more paper presentations by the experts ie. Japan, India, US.

6. How will this workshop benefit or change your work, organization and/or economy?

7. What, if any, changes do you plan on implementing when you return to your home economy?

Usage of GNSS in term of transportation

8. What needs to be done next by APEC? How can we support and build on the project results?

9. Any other comments or suggestions?

Participant information (identifying information is optional):

Name: [illegible]

Organisation/Economy: MOT, Malaysia

Gender: M / F

Thank you. Your evaluation is important in helping us assess this project, improve project quality and plan next steps.

APEC Project Feedback Survey: Workshop

Project Name/Number: S TPT 01 12T – Automated Transport Management Systems Implementation for Optimizing Logistics within the Asia-Pacific with an Emphasis on ITS and GNSS Application

Date 23/Nov 2012

How useful were these elements of the project to you and your economy?

	VERY USEFUL	SOME-WHAT USEFUL	NOT VERY USEFUL	COMMENTS (Continue on back if necessary)
Overall project	✓			
Insert elements of the project: e.g. name of expert presenter, survey, creation of best practices, field trip etc.				
Artur Kasilov.	✓			
Pariny Tonud Tang	✓			
Supt Bung Yoromsap	✓			

1. Overall, how was the project?
   5 excellent — (4) good — 3 satisfactory — 2 not good — 1 bad

   Explain: _____

2. How were the facilitators/experts?
   5 excellent — (4) good — 3 satisfactory — 2 not good — 1 bad

   Explain: _____

3. How well did the project meet its objectives?
   5 excellent — (4) good — 3 satisfactory — 2 not good — 1 bad

   Explain: _____

4. How appropriate were the participants for the project?
   (5) — 4 — 3 — 2 — 1

excellent good satisfactory not good bad

Explain:

5. How could this project have been improved?

6. How will this workshop benefit or change your work, organization and/or economy?

Thailand will be. interesting to improved ITS for control Traffic and Accident on Road (Vehicle) and From Chair? .
We would interest choosing the Technology and Another Instrument .

7. What, if any, changes do you plan on implementing when you return to your home economy?

8. What needs to be done next by APEC? How can we support and build on the project results?

9. Any other comments or suggestions?

Powerpoint Document.

Participant information (identifying information is optional):

Name: Mr. Sarit pong Boribaonsook

Organisation/Economy: OPP / ministry of Transport / Thailand.

Gender: M / F

Thank you. Your evaluation is important in helping us assess this project, improve project quality and plan next steps.

APEC Project Feedback Survey: Workshop

Project Name/Number: S TPT 01 12T – Automated Transport Management Systems Implementation for Optimizing Logistics within the Asia-Pacific with an Emphasis on ITS and GNSS Application

Date 28 MAY 2017

How useful were these elements of the project to you and your economy?

	VERY USEFUL	SOME-WHAT USEFUL	NOT VERY USEFUL	COMMENTS (Continue on back if necessary)
Overall project	✓			Benefits of adopting GNSS and ITS in logistics sector
Insert elements of the project: e.g. name of expert presenter, survey, creation of best practices, field trip etc.				by Mr. Jiashing Chang of Chinese Taipei;

1. Overall, how was the project?
   5 excellent (4) good 3 satisfactory 2 not good 1 bad
   Explain: Topics & discussions were relevant towards the objectives of the workshop

2. How were the facilitators/experts?
   5 (4) good 3 satisfactory 2 not good 1 bad
   Explain: Facilitators gives/provides value added explanation on the topics

3. How well did the project meet its objectives?
   (5) excellent 4 good 3 satisfactory 2 not good 1 bad
   Explain: Presentations were appropriate and very informative.

4. How appropriate were the participants for the project?
   5 (4) 3 2 1

excellent good satisfactory not good bad

Explain:

5. How could this project have been improved?

None

6. How will this workshop benefit or change your work, organization and/or economy?

We can adopt some of the best practices of other economies

7. What, if any, changes do you plan on implementing when you return to your home economy?

Use of ITS and GNSS in the transportation chain

8. What needs to be done next by APEC? How can we support and build on the project results?

Follow-up the progress of the recommendations

9. Any other comments or suggestions?

none

Participant information (identifying information is optional):

Name: Arleen Bacallate

Organisation/Economy: Civil Aviation Authority / Philippines

Gender: M / F

Thank you. Your evaluation is important in helping us assess this project, improve project quality and plan next steps.

APEC Project Feedback Survey: Workshop

Project Name/Number: S TPT 01 12T – Automated Transport Management Systems Implementation for Optimizing Logistics within the Asia-Pacific with an Emphasis on ITS and GNSS Application

Date_____

How useful were these elements of the project to you and your economy?

	VERY USEFUL	SOME-WHAT USEFUL	NOT VERY USEFUL	COMMENTS (Continue on back if necessary)
Overall project	✓			
Insert elements of the project: e.g. name of expert presenter, survey, creation of best practices, field trip etc.				
ASTC - Initiative and priorities.	✓			
Development of navi-gation for Operation Area. - GLONASS base	✓			
Benefit of adapting GNSS and ITS for Logistic Services.	✓			

Remote sensing, GPS Monitoring. Very useful.

1. Overall, how was the project?

5	4	3	2	1
excellent	good	satisfactory	not good	bad

Explain: _____

_____

2. How were the facilitators/experts?

5	4	3	2	1
excellent	good	satisfactory	not good	bad

Explain: _____

_____

3. How well did the project meet its objectives?

5	4	3	2	1
excellent	good	satisfactory	not good	bad

Explain: _____

_____

4. How appropriate were the participants for the project?

5	4	3	2	1

excellent good satisfactory not good bad

Explain: _____

5. How could this project have been improved?

6. How will this workshop benefit or change your work, organization and/or economy?

7. What, if any, changes do you plan on implementing when you return to your home economy?

8. What needs to be done next by APEC? How can we support and build on the project results?

9. Any other comments or suggestions?

Participant information (identifying information is optional):

Name Ho Anh Hang

Organisation/Economy: Vietnam

Gender M F

Thank you. Your evaluation is important in helping us assess this project, improve project quality and plan next steps.

APEC Project Feedback Survey: Workshop

Project Name/Number: S TPT 01 12T – Automated Transport Management Systems Implementation for Optimizing Logistics within the Asia-Pacific with an Emphasis on ITS and GNSS Application

Date 28 Nov 12

How useful were these elements of the project to you and your economy?

	VERY USEFUL	SOME-WHAT USEFUL	NOT VERY USEFUL	COMMENTS (Continue on back if necessary)
Overall project	✓			
Insert elements of the project: e.g. name of expert presenter, survey, creation of best practices, field trip etc.	✓			

1. Overall, how was the project?

5	4	3	2	1
excellent	good	satisfactory	not good	bad

Explain: _____

_____

2. How were the facilitators/experts?

5	4	3	2	1
excellent	good	satisfactory	not good	bad

Explain: _____

_____

3. How well did the project meet its objectives?

5	4	3	2	1
excellent	good	satisfactory	not good	bad

Explain: _____

_____

4. How appropriate were the participants for the project?

5	4	3	2	1

excellent good satisfactory not good bad

Explain:

5. How could this project have been improved?

To add Best Practices
to add more participants for International Organization

6. How will this workshop benefit or change your work, organization and/or economy?

Yes

7. What, if any, changes do you plan on implementing when you return to your home economy?

To develope an opportunity to collaborate among APEC, bilateral cooperation program (project) with Russia

8. What needs to be done next by APEC? How can we support and build on the project results?

Same as above 7

9. Any other comments or suggestions?

Participant information (identifying information is optional):

Name: Shinichi Ishii

Organisation/Economy: JPN

Gender: M / F

Thank you. Your evaluation is important in helping us assess this project, improve project quality and plan next steps.

APEC Project Feedback Survey: Workshop

Project Name/Number: S TPT 01 12T – Automated Transport Management Systems Implementation for Optimizing Logistics within the Asia-Pacific with an Emphasis on ITS and GNSS Application

Date 23/11/2012

How useful were these elements of the project to you and your economy?

	VERY USEFUL	SOME-WHAT USEFUL	NOT VERY USEFUL	COMMENTS (Continue on back if necessary)
Overall project	V			
Insert elements of the project: e.g. name of expert presenter, survey, creation of best practices, field trip etc.				

1. Overall, how was the project?

5 excellent 4 good 3 satisfactory 2 not good 1 bad

Explain: That's a great project for exchange of information

2. How were the facilitators/experts?

5 excellent 4 good 3 satisfactory 2 not good 1 bad

Explain: They are prof. of this Job

3. How well did the project meet its objectives?

5 excellent 4 good 3 satisfactory 2 not good 1 bad

Explain: Working place, working tools are ready all we need.

4. How appropriate were the participants for the project?

5 4 3 2 1

excellent good satisfactory not good bad

Explain:

5. How could this project have been improved?

If this project can make new realtionships between countries it can be improved.

6. How will this workshop benefit or change your work, organization and/or economy?

We meet new people according to our job. whole of APEC members

7. What, if any, changes do you plan on implementing when you return to your home economy?

8. What needs to be done next by APEC? How can we support and build on the project results?

9. Any other comments or suggestions?

Participant information (identifying information is optional):

Name: Oktay TAYSI

Organisation/Economy: JADE GROUP TURKEY

Gender: M / F

Thank you. Your evaluation is important in helping us assess this project, improve project quality and plan next steps.

APEC Project Feedback Survey: Workshop

Project Name/Number: S TPT 01 12T – Automated Transport Management Systems Implementation for Optimizing Logistics within the Asia-Pacific with an Emphasis on ITS and GNSS Application

Date 24/11/12

How useful were these elements of the project to you and your economy?

	VERY USEFUL	SOME-WHAT USEFUL	NOT VERY USEFUL	COMMENTS (Continue on back if necessary)
Overall project	✓			
Insert elements of the project: e.g. name of expert presenter, survey creation of best practices, field trip etc.				
Alexey Voinikov	✓			
Shinichi Ishii	✓			

1. Overall, how was the project?
   5 excellent 4 good 3 satisfactory 2 not good 1 bad
   Explain: Nice Organization / Program

2. How were the facilitators/experts?
   5 excellent 4 good 3 satisfactory 2 not good 1 bad
   Explain: Experts have rich experience

3. How well did the project meet its objectives?
   5 excellent 4 good 3 satisfactory 2 not good 1 bad
   Explain: Depend on policy / technologies in every countries

4. How appropriate were the participants for the project?
   5 4 3 2 1

excellent good satisfactory not good bad

Explain: Real practice is very useful

5. How could this project have been improved?

Add how to be standard of ~~ABC~~ APEC

6. How will this workshop benefit or change your work, organization and/or economy?

1) I am improved my vision about ATMS

2) I am get some idea to develop my country about ATMS

7. What, if any, changes do you plan on implementing when you return to your home economy?

Discuss with my staff about I new ATMI and set policy how to modify and implement them.

8. What needs to be done next by APEC? How can we support and build on the project results?

Develop more information that I present on this workshop

9. Any other comments or suggestions?

Best Workshop ☆☆☆

Participant information (identifying information is optional):

Name: Ms. PARINYA TANADTANG

Organisation/Economy: OTP / Ministry of Transport / Thailand

Gender: (M) / F

Thank you. Your evaluation is important in helping us assess this project, improve project quality and plan next steps.

APEC Project Feedback Survey: Workshop

Project Name/Number: S TPT 01 12T – Automated Transport Management Systems Implementation for Optimizing Logistics within the Asia-Pacific with an Emphasis on ITS and GNSS Application

Date 28 Nov. 2012

How useful were these elements of the project to you and your economy?

	VERY USEFUL	SOME-WHAT USEFUL	NOT VERY USEFUL	COMMENTS (Continue on back if necessary)
Overall project	✓			
Insert elements of the project: e.g. name of expert presenter, survey, creation of best practices, field trip etc.				
Experts	✓			
Best practice	✓			
Field trip	✓			

1. Overall, how was the project?
   (5) excellent 4 good 3 satisfactory 2 not good 1 bad
   Explain: Very informative

2. How were the facilitators/experts?
   (5) excellent 4 good 3 satisfactory 2 not good 1 bad
   Explain: Experts are well knowledgeable in their fields

3. How well did the project meet its objectives?
   (5) excellent 4 good 3 satisfactory 2 not good 1 bad
   Explain: The objectives of the project was met

4. How appropriate were the participants for the project?
   5 (4) 3 2 1

excellent good satisfactory not good bad

Explain:

5. How could this project have been improved?

6. How will this workshop benefit or change your work, organization and/or economy?
share or introduce to my organization the recent development or technologies in ITS & GNSS

7. What, if any, changes do you plan on implementing when you return to your home economy?
Push for a single authority to oversee and improve the efficiency of the logistics industry in the Philippines

8. What needs to be done next by APEC? How can we support and build on the project results?
APEC should conduct the same workshop in member countries so that more people will benefit from it.

9. Any other comments or suggestions?

Participant information (identifying information is optional):

Name: Ruby Mano

Organisation/Economy: Philippines

Gender: M / (F)

Thank you. Your evaluation is important in helping us assess this project, improve project quality and plan next steps.

APEC Project Feedback Survey: Workshop

Project Name/Number: S TPT 01 12T – Automated Transport Management Systems Implementation for Optimizing Logistics within the Asia-Pacific with an Emphasis on ITS and GNSS Application

Date 11/28/2012

How useful were these elements of the project to you and your economy?

	VERY USEFUL	SOME-WHAT USEFUL	NOT VERY USEFUL	COMMENTS (Continue on back if necessary)
Overall project	X			
Insert elements of the project: e.g. name of expert presenter, survey, creation of best practices, field trip etc.				

1. Overall, how was the project?
   5 excellent 4 good 3 satisfactory 2 not good 1 bad
   Explain: _____

2. How were the facilitators/experts?
   5 excellent 4 good 3 satisfactory 2 not good 1 bad
   Explain: _____

3. How well did the project meet its objectives?
   5 excellent 4 good 3 satisfactory 2 not good 1 bad
   Explain: _____

4. How appropriate were the participants for the project?
   5 4 3 2 1

excellent good satisfactory not good bad

Explain:

5. How could this project have been improved?

6. How will this workshop benefit or change your work, organization and/or economy?

THIS WORKSHOP PROVIDES GREAT Platform for economies to share experiences and this does benefit CHINESE TAIPEI's furture work.

7. What, if any, changes do you plan on implementing when you return to your home economy?

We will review current operational means of logistics by existing logistic industry according to the outcome from this workshop.

8. What needs to be done next by APEC? How can we support and build on the project results?

We like to suggest that industry experience or practices from industry representation can be introduced (invited) and to ~~ed~~ share with economies in adopting ITS and GNSS to improve logistics efficiency.

9. Any other comments or suggestions?

Participant information (identifying information is optional):

Name JAEHING CHUL

Organisation/Economy CHINESE TAIPEI

Gender (M) / F

Thank you. Your evaluation is important in helping us assess this project, improve project quality and plan next steps.

APEC Project Feedback Survey: Workshop

Project Name/Number: S TPT 01 12T – Automated Transport Management Systems Implementation for Optimizing Logistics within the Asia-Pacific with an Emphasis on ITS and GNSS Application

Date 28 November 2012

How useful were these elements of the project to you and your economy?

	VERY USEFUL	SOME-WHAT USEFUL	NOT VERY USEFUL	COMMENTS (Continue on back if necessary)
Overall project	X			
Insert elements of the project: e.g. name of expert presenter, survey, creation of best practices, field trip etc.				
Global Supply Chain Hiroshi Ishi	V			
Forecast Environment Setting Tatyana Mezentseva	V			
Benefits of adopting GNSS Judy Chen, Shuen Tsai	X			

1. Overall, how was the project?
   (5) excellent 4 good 3 satisfactory 2 not good 1 bad

   Explain: The Project is very useful for us

2. How were the facilitators/experts?
   (5) excellent 4 good 3 satisfactory 2 not good 1 bad

   Explain: Many excellent experts from economies attended workshop and sharing experiences

3. How well did the project meet its objectives?
   (5) excellent 4 good 3 satisfactory 2 not good 1 bad

   Explain: The project meet it objectives in giving ~~member~~ with date information on logistics

4. How appropriate were the participants for the project?
   (5) 4 3 2 1

excellent good satisfactory not good bad

Explain: all participants pay much attention on logistics

5. How could this project have been improved?

Implementing priority measures aimed to develop SMEs in the APEC Region

6. How will this workshop benefit or change your work, organization and/or economy?

Our Economy can learn experience and lessons learnt during the Workshop from economies

7. What, if any, changes do you plan on implementing when you return to your home economy?

We will apply widely ICT and E-MSE in our industries

8. What needs to be done next by APEC? How can we support and build on the project results?

Widely recommend technology platforms

9. Any other comments or suggestions?

No

Participant information (identifying information is optional):

Name: PHAM TRONG TRANG

Organisation/Economy: Ministry of Transport VIETNAM

Gender: (M) / F

Thank you. Your evaluation is important in helping us assess this project, improve project quality and plan next steps.

Annex 4. PICTURES


APEC Workshop
APEC Workshop