

Richard Vahrenkamp
Transportation and Creation of an Integrated European
Economy Since 1945

Lecture University of Lisboa, 9 October 2009



University of Kassel

Some 16.000 students

3.000 at the Department of
Economics and Management

I am professor for Logistics



Logistics and Transportation

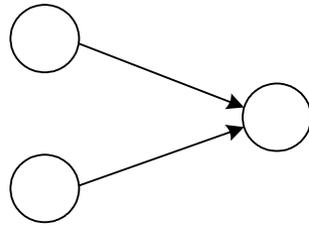
Transportation relies heavily on infrastructure, as railroads, trucks on expressways, airplane networks and the Internet.

Mark Rose has contributed many important books on the history of infrastructure. So here in the university is the right place to speak on infrastructure and its role in transportation, logistics and high performance logistics.

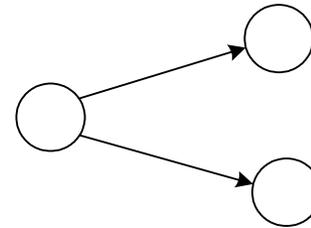
(Traditional) logistics deals with the transportation of goods (on railroads, on roads, on ships or on planes), the storage in warehouses and the transshipment at warehouses, ports and airports.

Transportation

Collecting



Distributing



One can distinguish the transportation services in the following way:
There are transportations to collect goods, for example the procurement of materials a factory needs (procurement logistics).
On the other hand transportation serves to distribute goods from a factory (or a warehouse) to customers or to retail outlets (distribution logistics).

Logistics and the First World

When you see the definition of logistics you can ask:

Are logistic services possible everywhere in the world?

The answer is: no! You need infrastructure to perform logistic operations.

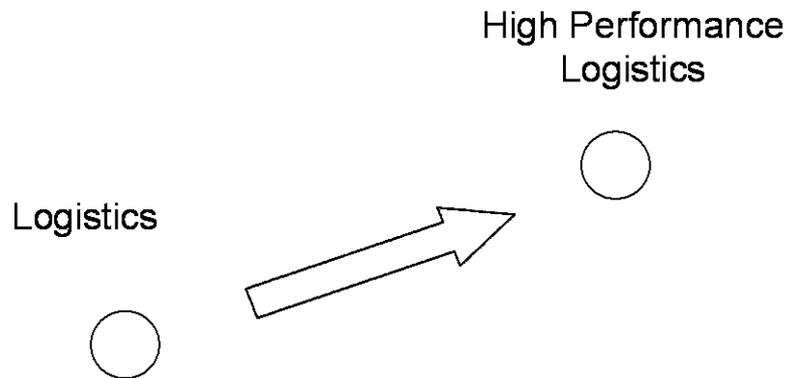
In many countries of the world there is a severe lack of infrastructure, as ports for ships needing deep water, as roads, as warehouses.

Examples are countries in Africa, but also India!

The big container vessels cannot reach Indian ports, because they need deep water ports.

High performance logistics

High performance logistics enhances the traditional logistics with regard to the quality of logistic services, as speed of operations and a zero level of failures. It broadens the view of a single firm to all the firms in the (international) supply chain with the aim of cooperation: supply chain management.



In my lecture I will identify the driving factors towards high performance logistics in Europe 1945 - 2000. There will be economic factors and factors of the European transportation policies.

The Consumer Oriented Economy

The consumer oriented economy as driver towards high performance logistics:

Driver 1: The consumer goods industry and retail trade

Driver 2: The automobile industry

Both industries have faced a strong differentiation and diversification of their products since 1950 (in the US 30 years former), called mass customization, imposing a high load on logistic services in the procurement of material and in the distribution of finished goods into the retail outlets.

Think of the 20 yards of shelve space filled with cereals in your shopping mall.

Consumer Goods and Automobile Industry

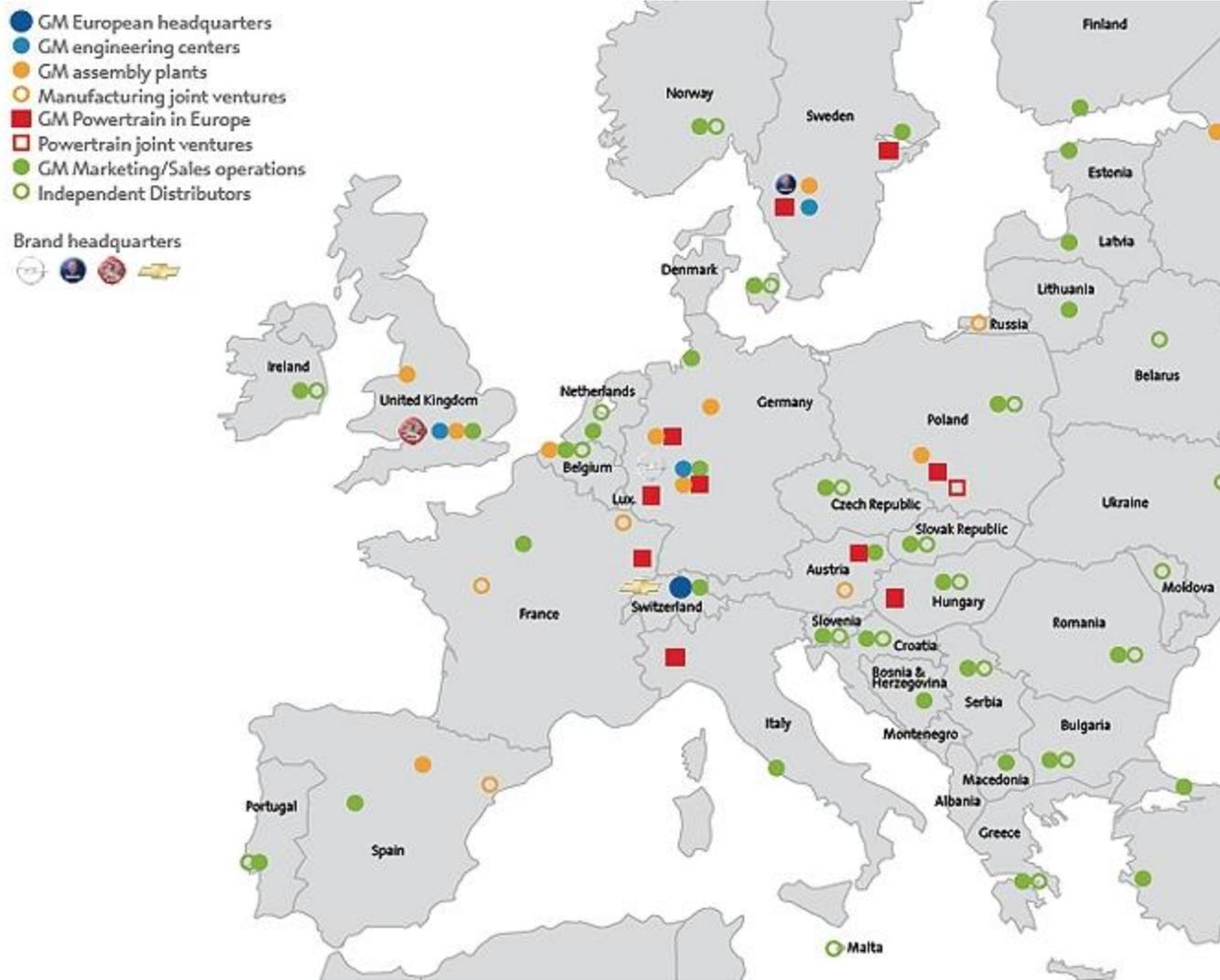
The development in the distribution of consumer goods 1950 - 2000 inducing transportation:

- Forming chains in the retail trade.
- Establishing distribution systems with central warehouses and regional warehouses.
- Synchronizing marketing actions with the punctual delivery of goods to the outlets.

The development of the automobile industry 1950 - 2000 inducing transportation:

- Outsourcing of production steps to suppliers.
- Outsourcing of warehouse operations to logistic companies.
- Supply with material by the just-in-time-concept where speed and quality is necessary.
- Spread of plant locations in Europe and all over the world - globalization.

Locations of General Motors in Europe



Mass Motorization in Europe: Iconographic Cars

One important aspect of the mass consumption society is mass motorization. It started in Europe in the 1950s.

Citroen 2CV in 1948



Foto Hartmut910/Pixel.de

Volkswagen in 1948



Foto Karl-Heinz Laube/
Pixel.de



Fiat 500 in 1957

Foto Petra Discherl/Pixel.de

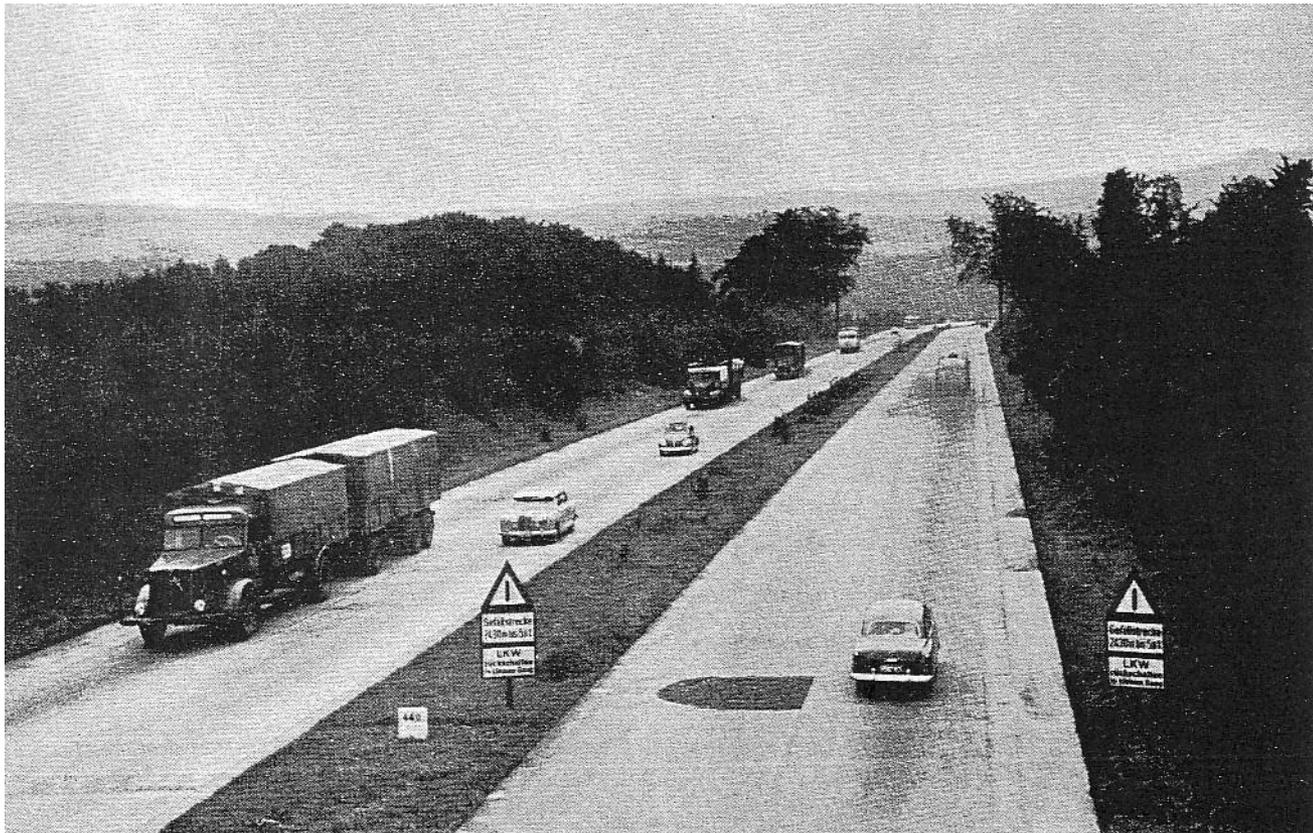
Mass Motorization



The mass motorization in the 1950s
let to traffic jam,
unsafe roads and high rates of accidents.

Automobile Lobby

The automobile lobby put strong pressure on European governments to improve roads and to build a network of expressways to attain quick and safe traffic.



A network of expressways in Europe

Country	Germany	France	Italy	UK
Year				
1960	2671	174	1065	202
1970	6061	1533	3913	1183
1980	9225	5264	5900	2683
1990	10809	6824	6193	3180

Table: Length (km) of expressways

In the table, data on the growth of expressway networks in France, Great Britain, Italy and West Germany between 1960 to 1990 are shown. France and Great Britain started from a low level in the 1960s to build expressways whereas Italy and West Germany started already from a high level due to certain programs in the fascist era before 1945.

Financing the Expressways



A network of expressways for cars and trucks

The pressure to build expressways made the car lobby, but on the growing network of expressways high quality truck transportation of became possible: Door-to-door transport without transshipment became quick and reliable with costs far below the cost of railroad transportation. In this respect the network of expressways became the infrastructure of the consumer oriented economy. The logistic systems supported by railroad transportation declined.

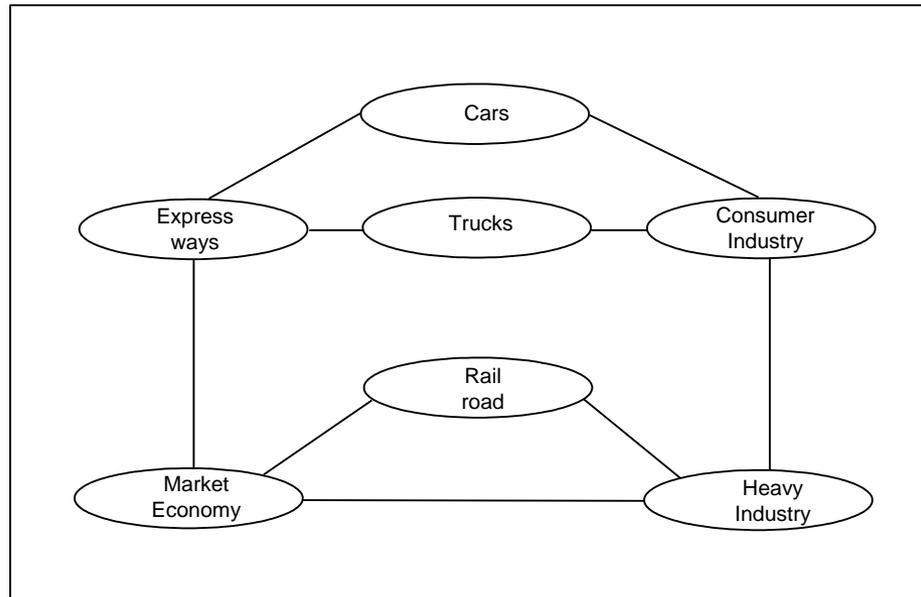
The Structure of the Consumer oriented Economy

The following chart depicts the main elements of a consumer oriented economy with the dominant consumer good industry, the automobile industry, the network of expressways and the traffic of cars and trucks on these. The so-called heavy industries, namely coal and steel production, and transportation by railroad play only a minor role.

If we take the elements of the consumer good industry, automobile industry, truck transport, and expressway network altogether, we derive the following theorem:

The consumer oriented economy relies heavily on high performance logistics and vice versa: There is no high performance logistics without a consumer oriented economy.

This theorem can be supported by the comparison of a consumer oriented economy with a communist economy.



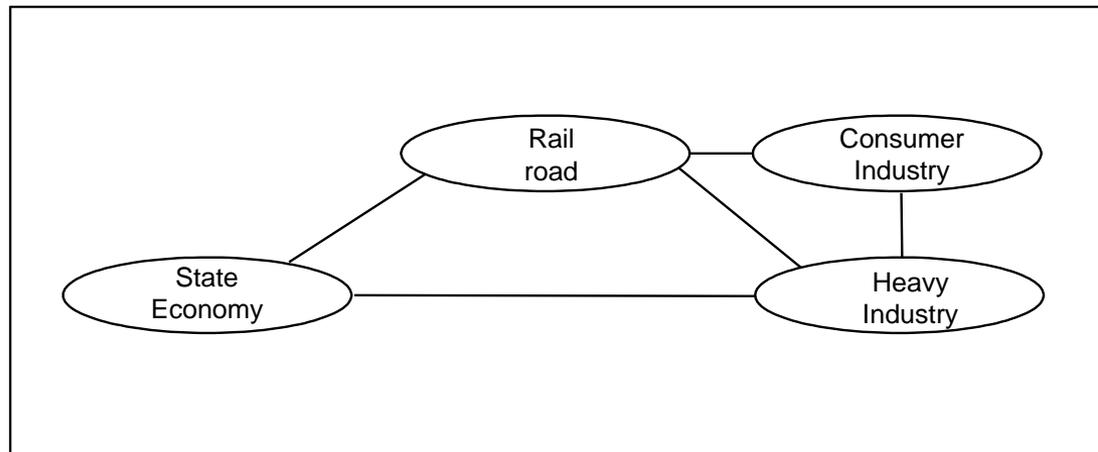
Structure of the Communist Economy

In a communist economy, the importance of the sectors is different:

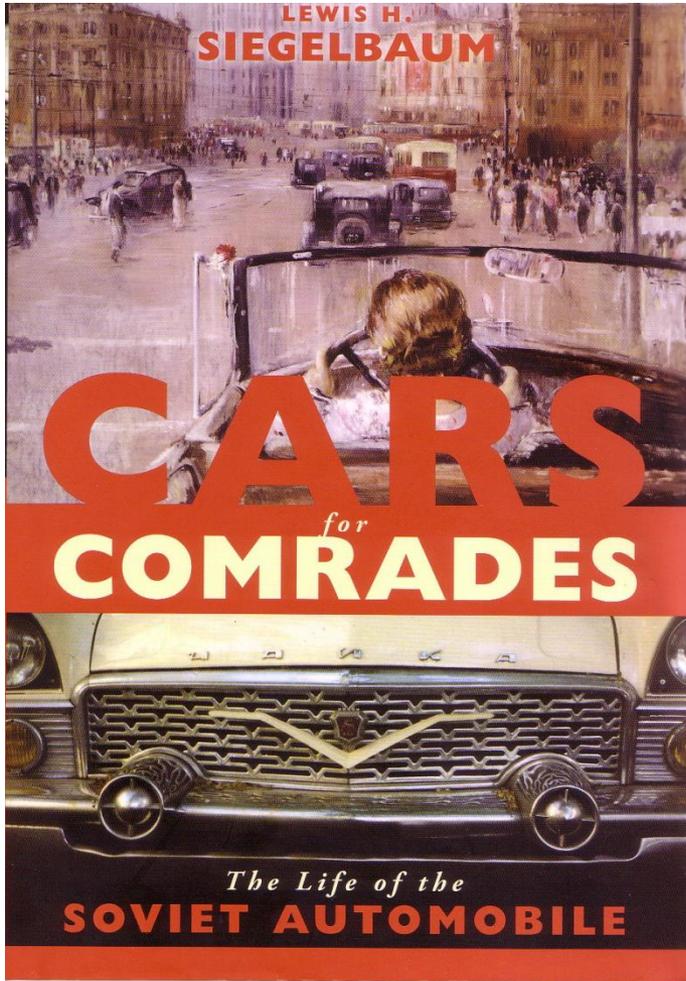
The heavy industries and transport by railroad play a dominant role. But the consumer good sector is weak. There are only short strips of expressways, but no network.

The car density per capita is low. So there is no high performance logistics to serve the car factories or the shopping malls. The supply of consumer goods is not steady and not punctual, but rather only accidental with amounts not adjusted to the demand.

Think of the long delivery time for a car – in East Germany that was 13 years!



Structure of the Communist Economy 2



Soviet Remake of US Packard Caribbean of the 1950s

Since the 1920s in Russia the problem of „roadlessness“ was discussed but never solved. The weak car industry could not exert pressure for roads. Neither roads nor expressways were built. In the 1950s programs were envisioned to build expressways from Moscow to the western countries in the communist bloc: to Hungary, Poland, Rumania... But they were never built!

European institutions supporting exchange of goods and international transportation

At the end of WW II, Europe's borders were high barriers for the exchange of goods. To cross a border was impossible for a loaded truck. The cargo had to be unloaded at the border and then to be reloaded behind the border to another truck.

In Europe, several institutions tried to facilitate the exchange of goods. The Economic Commission for Europe was founded in 1947 and had, as a subsidiary body, the Inland Transport Committee which formulated, in 1949, the Convention on Road Traffic under the title "Freedom of Road".

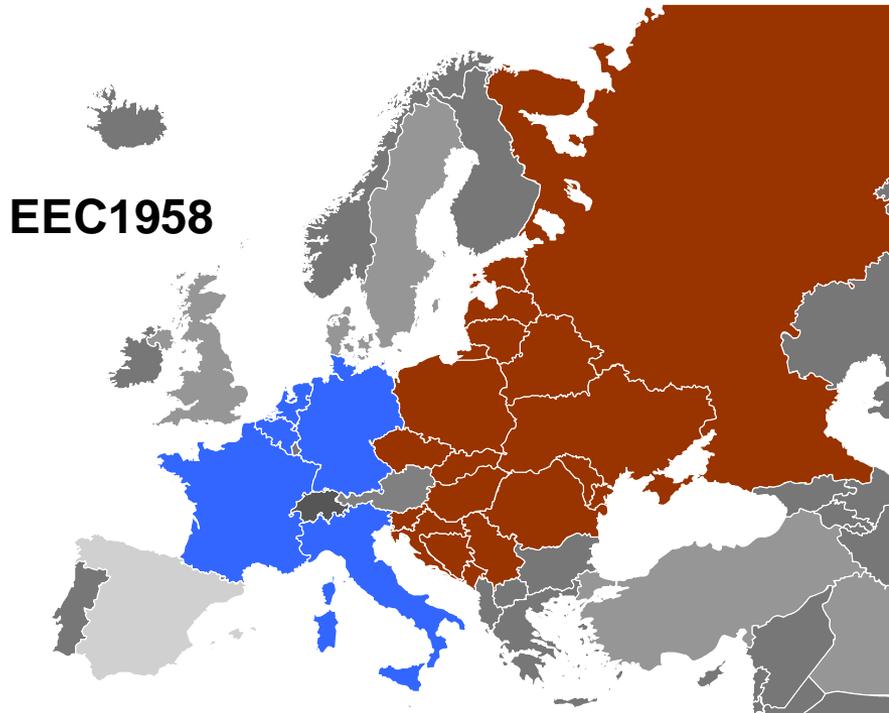
European institutions supporting exchange of goods and international transportation 2



In 1953, the Conference of the West European Transport Ministers (CETM) was founded. This conference had the goal to support the exchange of goods and international transportation and it thus implemented policies to unify regulations concerning truck transportation, such as maximal weight and maximal length of a truck.

Since 1974, the CEMT has also made agreements on multilateral quotas. Now, the CEMT comprises all European states from Turkey to Russia,

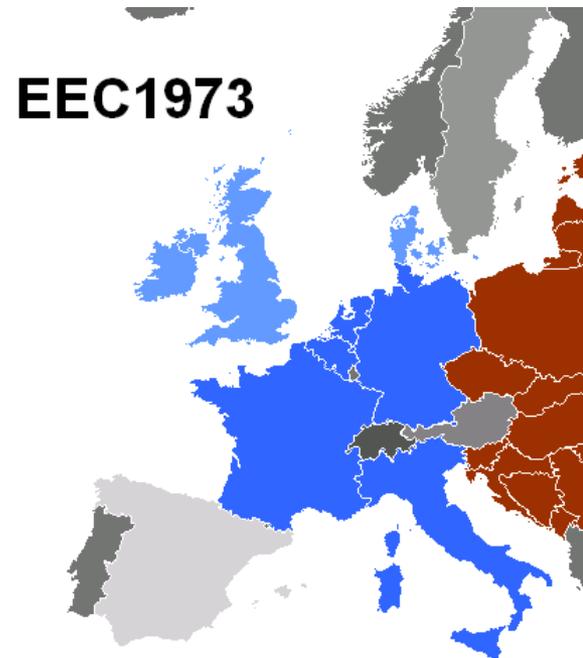
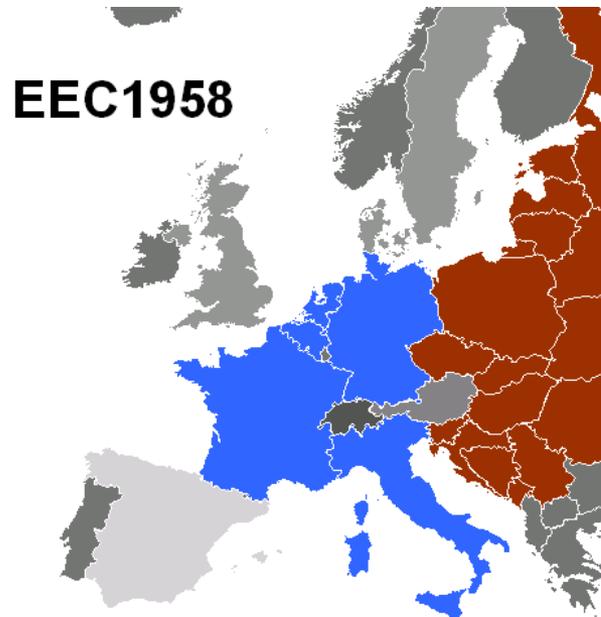
European institutions supporting exchange of goods and international transportation 3



In 1958, at the height of the cold war, the European Economic Community (EEC) was founded by France, Italy, Germany, Netherlands, Belgium and Luxemburg. The EEC made agreements on quotas for international truck transports. Quotas were made both bilaterally and multilaterally, but they comprised only a small amount of trucks.

The European Economic Community (EEC) and the European Union (EU) as promoters to transportation and high performance logistics 1

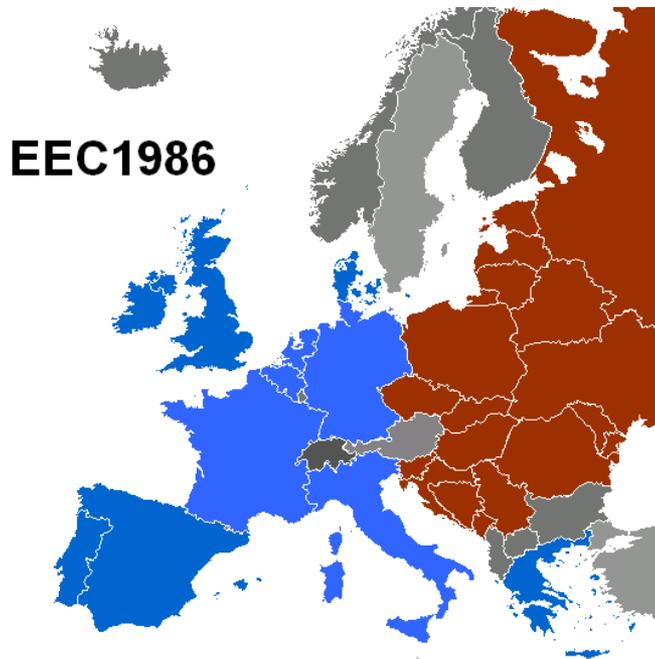
Since its foundation in 1958, new members joined the EEC. In 1993, the EEC became the European Union (EU).



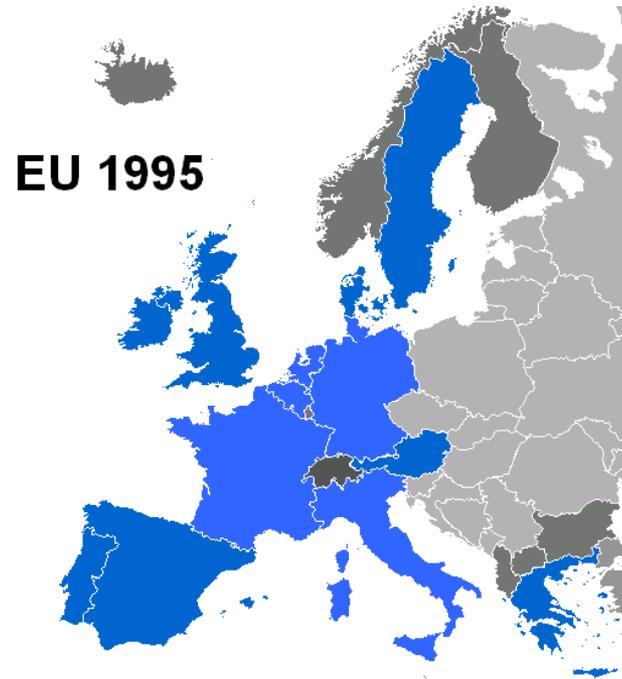
England, Ireland, Denmark

The European Economic Community (EEC) and the European Union (EU) as promoters to transportation and high performance logistics 1

Since its foundation in 1958, the EEC joined new members and became in 1993 the European Union (EU).



Spain, Portugal, Greece



Austria, Sweden

The European Economic Community (EEC) and the European Union (EU) as promoters to transportation and high performance logistics 2

Since the 1930s, truck transport had been regulated to secure stable conditions on the transportation market. In the European countries the regulation was varying. Some countries had tight regulations against the trucks, some to support the trucks. Some countries distinguished commercial carriers from private ones (on own account), but Sweden did not. Some countries demanded licenses for private carriers (England), others did not (Germany). Some countries fixed prices for truck transportation, some set minimum and maximum prices.

Some countries linked the regulation with the goal to protect the railroad. Different to the US, in Europe the railroad was seen as a high value for the public.

The European Economic Community (EEC) and the European Union (EU) as promoters to transportation and high performance logistics 3

When the EEC was founded in 1957, the Treaty of Rome demanded that there be no discrimination in the field of traffic and that cross-border traffic should be supported.

These goals were translated into policy for trucks within two fields:

liberalization: free access to markets and the prohibition of cartels and power abuse and

harmonization: every member state of the EEC would have equal taxes on trucks and equal safety and social regulations for the drivers, e.g. the hours of driving per day.

The European Economic Community (EEC) and the European Union (EU) as promoters to transportation and high performance logistics 4

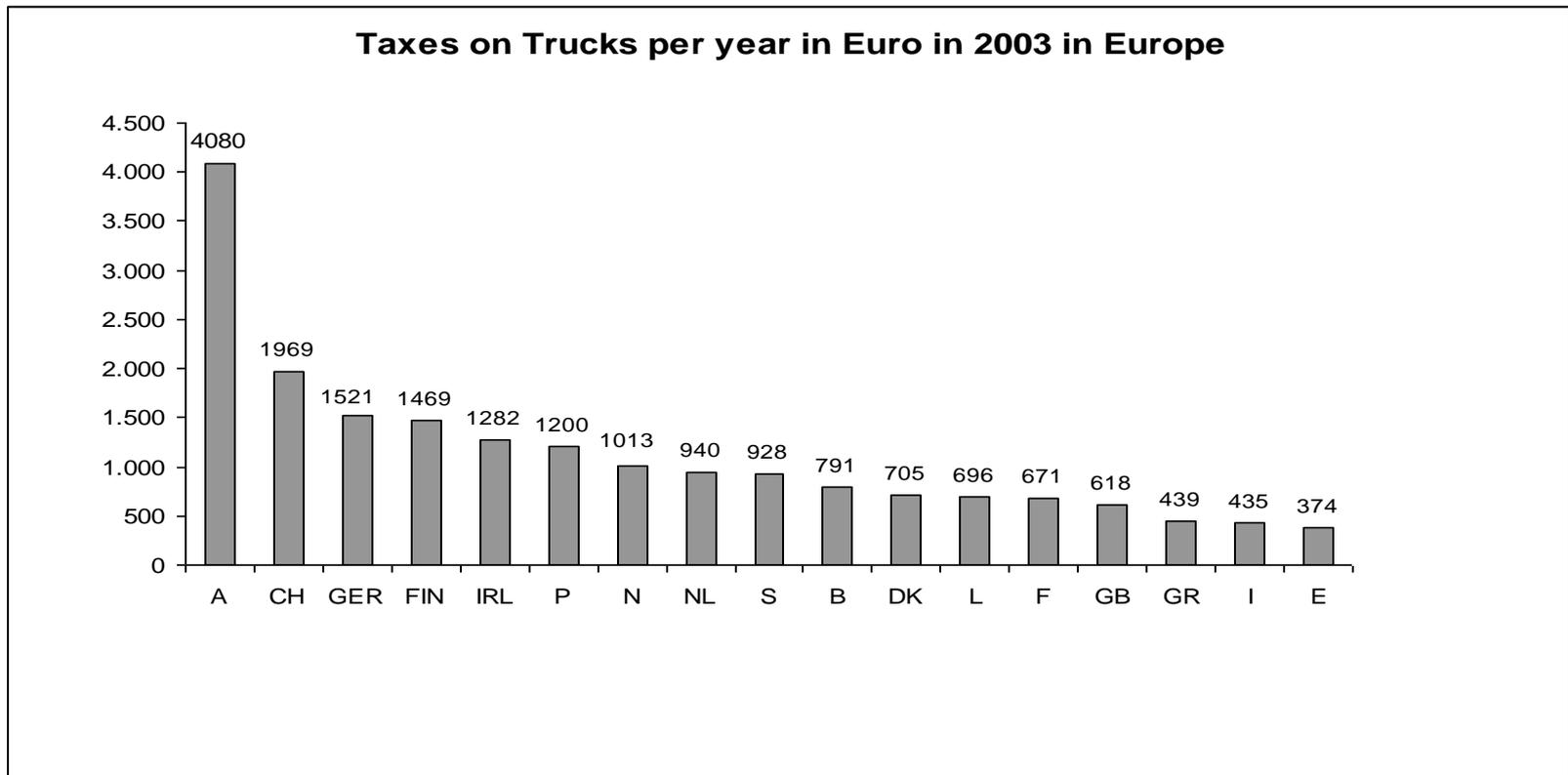
In the EEC, there was a conflict between states supporting the railroads - Germany, Italy and France - and states that demanded liberalization of truck transport - Great Britain, Netherlands and Denmark.

By 1988, the supporters of liberalization had prevailed. The number of trucks allowed to cross the borders (inside the EEC) rose sharply, imposing competition on the national transport markets. Since 1994, the prices for cross border truck transport were not regulated and left to the market.

In Germany, where a strict policy against truck transportation had dominated since 1950, the maximum number of trucks allowed to operate was canceled in 1998.

The European Economic Community (EEC) and the European Union (EU) as promoters to transportation and high performance logistics 5

Whereas the policy of liberalization was successful (majority rule), the policy of harmonization had only few breakthroughs. An effort to harmonize the taxes failed (veto rule).



The European Economic Community (EEC) and the European Union (EU) as promoters to transportation and high performance logistics 6



The impact of the EEC on the transportation system one can study at instances when certain new members were integrated into the EEC: Spain and Czechoslovakia.

The European Economic Community (EEC) and the European Union (EU) as promoters to transportation and high performance logistics 6



The first case is Spain. Spain was ruled by Francisco Franco from 1937 to 1975. During this time, Spain had expressways covering less than 1,000 kilometers. When Spain joined the EEC in 1986, the length of the expressway network expanded to 4,000 kilometers by 1990. The average number of trucks crossing the border each day to France jumped from 3,800 in 1986 to 20,000 in 2000.

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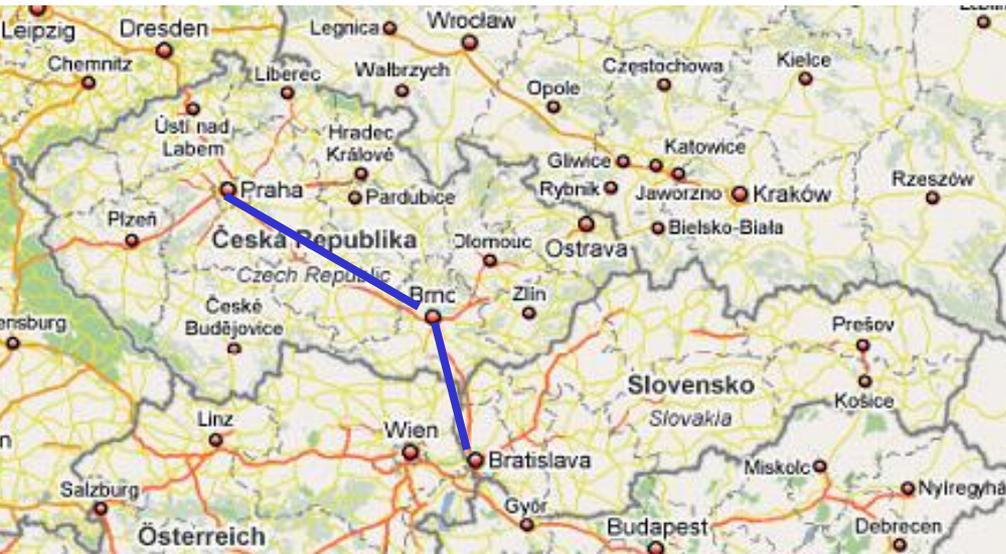
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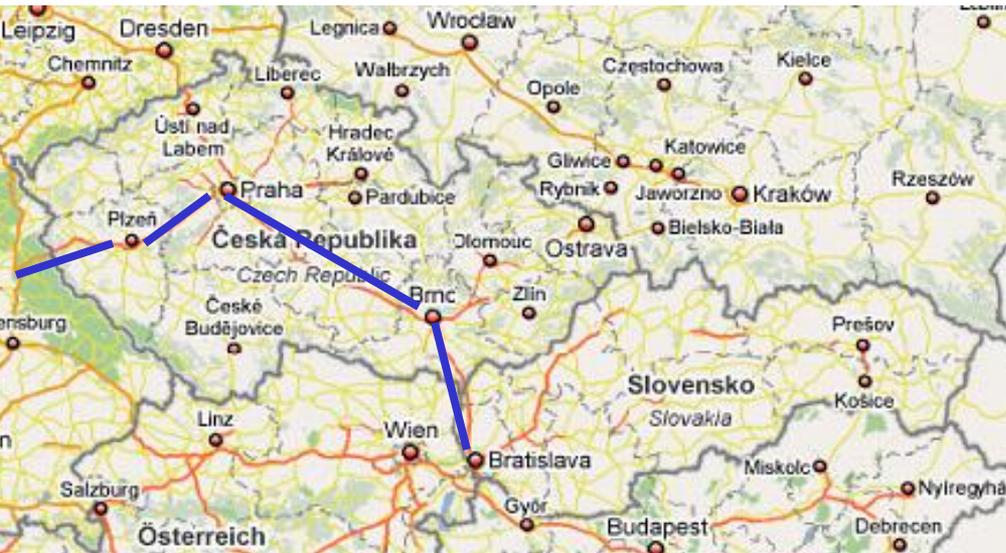
The European Economic Community (EEC) and the European Union (EU) as promoters to transportation and high performance logistics 7



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The other case is Czechoslovakia. In 1980, only 300 kilometers of expressways were in operation traversing the route Prague – Brno – Bratislava. After the breakdown of communism, the country, by 1992, was building the route between Prague and Pilsen and into Germany. This expressway opened in 2006. In 2004, the Czech Republic joined the EU and a new line was started to connect Prague with Dresden.

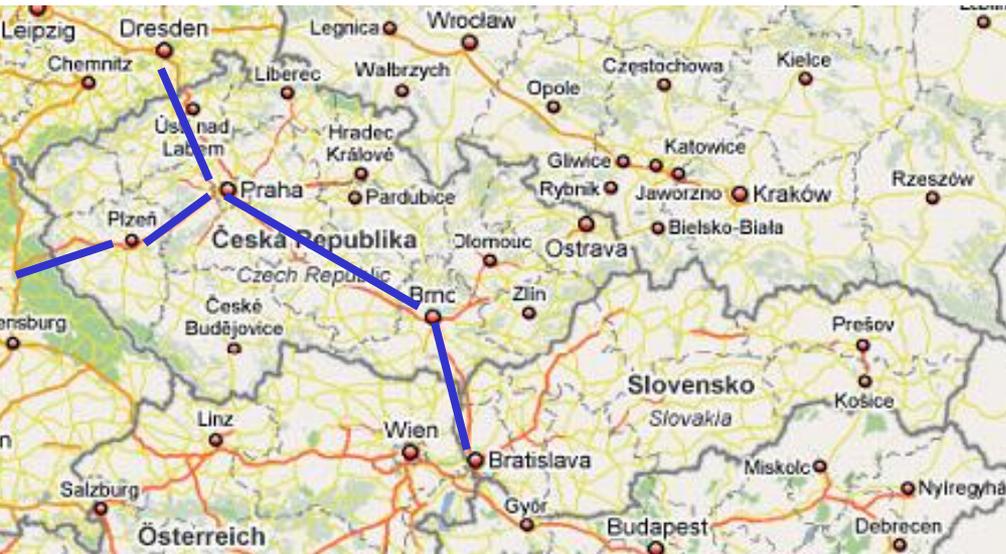
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The European Union (EU) as promoter to transportation and high performance logistics 8

The foundation of the European Union, by 1993, had a strong impact on transportation and high performance logistics. When trucks crossed the border, there was no custom control, nor any other controls. So, free traffic for trucks became a reality since 1993!

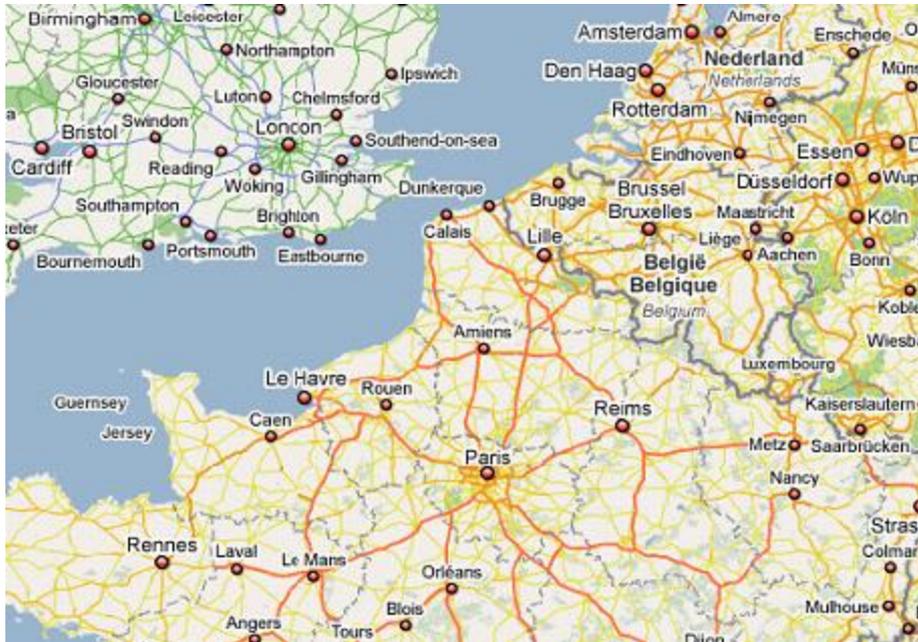
A second change was the admission of products. Before 1993, a producer or a trader needed a permit for every member state and every consumer product.

But in the European Union, one permit was sufficient for all member states.

This procedure simplified logistics: production, packing

and distribution became standardized and the transportation of goods became quicker.

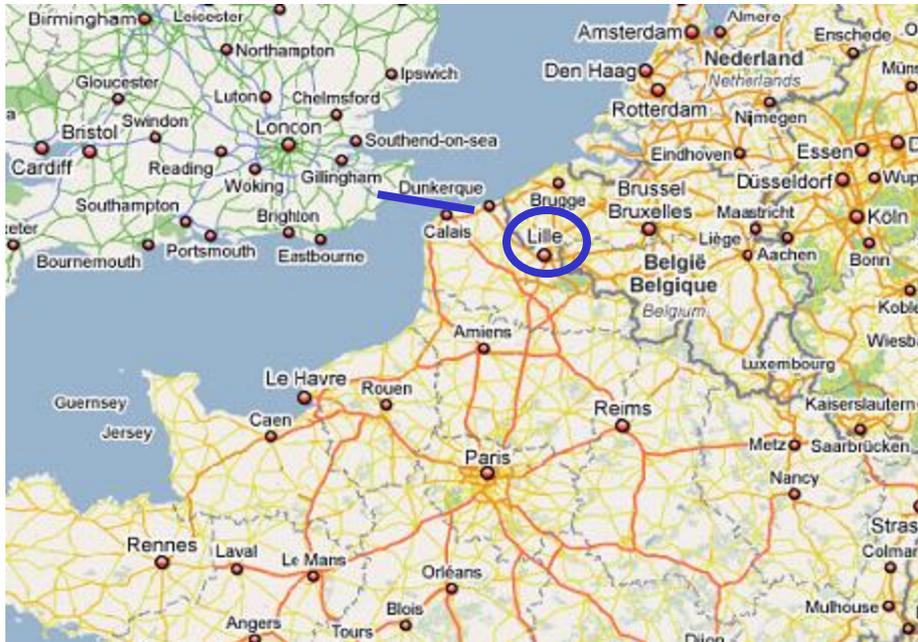
The European Union (EU) as promoter to transportation and high performance logistics 9



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With these policies, the European Union supported distribution systems for consumer goods that served the customers regardless of political borders. Consider the region between London, Paris and Cologne. This region includes the inhabitants of Belgium and of the Netherlands and consists of about 100 million customers. The tunnel under the Channel, opened in 1994, connects the expressways of France with those of Great Britain. If one locates a warehouse in Lille, it can serve all 100 million customers.

The European Union (EU) as promoter to transportation and high performance logistics 9



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The Role of Parcel Services in high performance logistics

Along with the liberalization of transport markets in the US in the 1970s and 1980s, the parcel services UPS and FedEx developed in the US and expanded their business globally. The parcel services defined a special segment of the transportation market: the **parcel** with limits to weight and to size. They used a network of cargo flights for long-distance transport that was independent of passenger airplanes. In the 1970s, the parcel services started operation in Europe.

The parcel services set a **shining example** for the logistic industry and pushed high performance logistics:

- They defined the standard parcel and set up the goal of standardization.
- They speeded up transport and introduced overnight service.
- They implemented policies to ensure quality.
- They were the first industry to use bar codes. The parcels could be traced in the system by means of bar codes.
- They introduced simple price models so that the customer could calculate the transportation costs in advance.

The parcel services were very successful and enjoyed high growth rates up to 2000. They competed against the less than truck load segment in the transportation industry. Many shipments shifted from being shipped by the less than truck load segment to instead being shipped by a parcel services.

Conclusion: The Logistics Revolution in the 1990s

In the 1990s several developments in Europe came together and culminated in the **logistics revolution**:

- 1) The liberalization of the transportation markets for trucks and airplanes.
The liberalization of the postal services.
They shifted from railraod carriers to trucks and planes.
The liberalization of the telecommunication markets.
- 2) Radical reduction of costs for telecommunications and for computing services through liberalization, the Internet and the personal computer. Thus, in logistics networks one could set up networks for information interchange parallel to the physical flow of goods. These information networks serve to control and supervise the physical flow of goods – the most important policy to secure high performance logistics.
- 3) The breakdown of communism in 1989 and the foundation of the European Union in 1993 led to a new orientation of logistics systems throughout Europe.
- 4) High concentration of market power in the retail trade induced custom-made logistics systems for the supply of outlet chains.

Conclusion: The Logistics Revolution in the 1990s 2

- 5) Logistics service providers were integrated in the supply chains as the key elements to setting up and to supervising high performance logistics. The logistics service providers operate warehouses and control the transshipment and the transportation of supply.
- 6) The Internet became popular in the 1990s and pushed the parcel services with business-to-consumer commerce. Example here is Amazon, and the consumer-to-consumer commerce of Ebay.
- 7) On the markets for consumer goods, a new category arose: fast-moving consumer goods, such as fashion clothing and electronic devices. The shops for fast-moving consumer goods ordered their supply frequently and in small amounts, benefitting the parcel services.

Expressways and the Internet in the Cold War

In the historic development of these infrastructures in the US from 1950 to 1990 there is a nice connection between the network of expressways and the Internet in the age of the cold war between USA and Russia and the danger of an atomic strike.

In 1955 US President Eisenhower sent a message to the Congress and proposed a large network of Interstate expressways should be built.

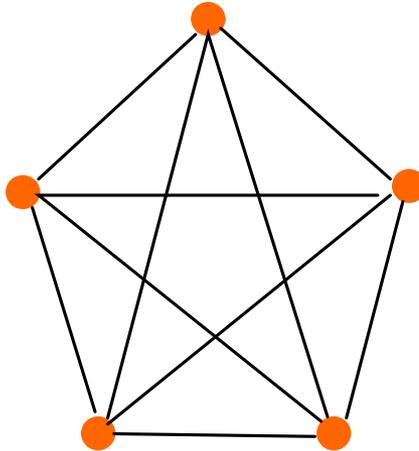
Eisenhower justified this project with four considerations:

1. To improve safety on the highways: Each year 36 thousand people were killed on highways.
2. To reduce transportation costs: The bad condition of the highways raised the cost of transportation by 1 cent per vehicle mile.
3. For the next 10 years up to 1965 a strong increase of vehicles traveling on the road is expected and means to reduce traffic jams has to be taken in account.
4. In the case of an atomic attack the road network must permit quick evacuation of the target areas and mobilization of defense forces.

Here you have the first link to atomic war.

Expressways and the Internet in the Cold War 2

In the 1960s the M.I.T. and the Pentagon developed the **Arpanet** (*Advanced Research Projects Agency Network*), the nucleus of the Internet. The expressway network served as paradigm for this development:



Like vehicles independently move in the expressway network and find their destination, in the Arpanet packages of information find their way from the node of origin to the node of destination. In the 1970s the modern Internet protocol TCP/IP was developed and the Pentagon recognized that the military part of Arpanet was robust, including the capability to withstand losses of large portions of the underlying networks in an atomic attack.

In the 1990s when personal computers became affordable and widely used the Internet evolved to an important infrastructure.

Thank you for your attention!