ENGLESKI JEZIK
ZA
SAOBRAĆAJ I TRANSPORT

VII semestar

ENGLESKI JEZIK - SAOBRAĆAJ I TRANSPORT

školska godina 2023/2024 fond časova 2+0

VII semestar – stručni kurs za studente na odseku: Saobraćaj i transport

predavač: Ivana Mirović kabinet 109 (blok F)
Email: miriv@uns.ac.rs
http://ivanamirovic.wix.com/pocetna

konsultacije: četvrtak 11:00

Udžbenik:
Skripta: Materijal za studente odseka Saobraćaj i transport, Ivana Mirovic, može se preuzeti na Teams-u

PREDISPITNE OBAVEZE:
Test (maksimalno **40 poena**) Može se polagati samo jednom tokom semestra, na času. Proverava se znanje iz sledećih oblasti: vokabular, tvorba reci, pasiv, upotreba veznika.

ISPIT: maksimalno **60 poena**.
Student izvlači ispitno pitanje (ceduljica sa naslovom jednog od tekstova obrađenih tokom kursa), čita tekst i odgovara na pitanja koja postavlja nastavnik. (Pitanja su slična onima koja se nalaze u skripti.)
Studenti koji su redovni i aktivni tokom semestra imaju mogućnost da umesto usmenog dela ispita urade prezentaciju na odabranu temu iz oblasti saobraćaja i transporta.

FORMIRANJE KONAČNE OCENE: prema skali koja je prihvaćena na Fakultetu.
(51 – 100 poena)

Transport – Some Basic Notions

Transport, or transportation (A.E.) is the movement of objects like people, goods, signals and information from one place to another.

The field of transport has several aspects: they can be divided into infrastructure, vehicles, and operations. Infrastructure includes the transport networks (roads, railways, airways, canals, pipelines, etc.) that are used, as well as the nodes or terminals (such as airports, railway stations, bus stations and seaports). The vehicles such as automobiles, trains, airplanes generally ride on the networks,. The operations deal with the control of the system, such as traffic signals and ramp meters, railroad switches, air traffic control, etc, as well as policies, such as how to finance the system (e.g. use of tolls or gasoline taxes in the case of highway transport).

Modes of transport

Modes are combinations of networks, vehicles, and operations, and include walking, the road transport system, rail transport, ship transport and modern aviation.

Transport and communications

Transport and communication are both substitutes and complements. The growth in transport would be impossible without communication, which is vital for advanced transportation systems, from railroads which want to run trains in two directions on a single track, to air traffic control which requires knowing the location of aircraft in the sky. Thus, it has been found that the increase of one generally leads to more of the other.

Transport, energy, and the environment

Transport is a major use of energy. Most transport burns hydrocarbons. If partially burned, these create pollution. Though vehicles have been getting cleaner because of environmental regulations, this has been offset by more vehicles and more use of each vehicle. Low-pollution fuels can reduce pollution. The most popular low-pollution fuel at this time is liquified natural gas. Hydrogen is an even lower-pollution fuel, but producing and storing it economically is currently not feasible. Other alternative renewable energy sources such as biodiesel are being researched heavily.

Another tack is to make vehicles more efficient, which reduces pollution and waste by reducing the energy use. If electricity can be gotten to the vehicle, electric motors are the most efficient of all. Another method is to generate energy using fuel cells, which are two to five times as efficient as the heat engines traditionally used in vehicles. A trivial, but very effective method is to streamline ground vehicles, which spend up to 75% of their energy on air-resistance. Another method is to recycle the energy normally lost to braking, but this leads to a more complex vehicle.

(from: Wikipedia, the free encyclopedia)

Practice

I Answer the questions:

1. What is transport?
2. What are the three aspects of the field of transport? What does each of them include?
3. What are the different modes of transport?
4. How are the areas of transport and communications related?
5. What can you say about transport and pollution?
6. How can pollution be reduced?

II Group these words under the appropriate heading:

roads, canals, railway stations, automobiles, pipelines, airports, airplanes, traffic signals, ramp meters, seaports, airways, railroad switches, bus stations, trains, air traffic control, railways

vehicles	networks	nodes	operations (control)

III Complete these notes using the words:

vehicles, nodes, finance, canals, airplanes, railway stations, system, tolls, railroad switches, railways

Transport

1. Infrastructure:

a) networks (e.g., roads, ……railways, airways, ……., pipelines)

b) …… or terminals (e.g., airports, ……., bus stations, etc.)

2…… (e.g., automobiles, trains, ……., etc.)

3. Operations:

a) control of the …….. (e.g., traffic signals, ……., air traffic control)

b) how to …… the system (e.g., ……., gasoline taxis)

IV Complete the sentences:

1 The field of transport can be divided into ....., vehicles, and operations.

2. Transport and communication are both ..... and complements.

3. The growth in transport would be ..... without communication.

4. Communication is vital for advanced transportation systems, e.g., railroads which want to run trains in two directions on a ..... track.

5. Transport is a ..... use of energy

6. If partially burned, hydrocarbons create .....

7. Low-pollution fuels such as liquefied natural gas can ..... pollution.

8. Renewable energy ..... are being researched heavily.

IV Match the two halves of the conversations. Imagine who is speaking and where they might be.

1. A return to Manchester, please.
2. I can't believe it. We've been stuck in this traffic jam for hours!
3. Tickets, please.
4. The 19.30 Los Angeles flight will be delayed by one hour due to poor weather conditions.
5. We generally got up early and went round the deck before breakfast.
6. Can you stop at the next lay-by? I think there is something wrong with my seatbelt.

a) Look, I'm really sorry, but I had it a minute ago.
b) Oh, well.... why don't we go and have a look round the Duty Free shop?
c) And did you ever have dinner with the captain?
d) Will you be coming back today?
e) Can you wait a second because I think there's a petrol station just a bit further on?
f) There are probably roadworks ahead.

Modes of transport

I Combine the words that go together

a	get on/off	1	car
b	get into / out of	2	bicycle
c	drive	3	train, bus
d	ride	4	motorbike
e	catch/miss	5	plane

II Complete the table using the words bellow:

passengers, boot, steering wheel, driver, seat belt, first class cabin, pilot, flight attendant, number plate cockpit, aisle

	car	plane	both
things			
people			

III Choose the right word or phrase

1. Do you ever *ride / drive* a bicycle?
2. A lot of people *travel by / travel with* public transport because it is cheap.
3. Let's *bring / take* a taxi, we don't want to be late!
4. When I come home from work I always get stuck in a traffic *bloc / jam.*
5. The flight was very uncomfortable, I felt relieved when the plane touched the *road / runway.*
6. The *platform / pavement* was crowded with people waiting for the train.
7. The bus mounted a pavement and injured a *walker / pedestrian*
8. The train was very crowded because there were only four *wagons / coaches*

GRAMMAR

16 Passive 1

Explanations

Passive: form

- To make the passive we use *be* and a past participle. Compare the active and passive forms in these examples:

■ Present simple	*The Government **builds** hundreds of houses every year.* *Hundreds of houses **are built** every year.*
■ Present continuous	*The authorities **are questioning** two men.* *Two men **are being questioned** by the authorities.*
■ Present perfect	*We **have chosen** Helen as the new president.* *Helen **has been chosen** as the new president.*
■ Past simple	*The police **arrested** one protester.* *One protester **was arrested**.*
■ *will*	*They **will play** the match on Wednesday evening.* *The match **will be played** on Wednesday evening.*

- Notice how the object in the active form (*hundreds of houses, two men, Helen*) moves to the front in the passive sentence and becomes the subject.

Passive: use

- Focus on important information
  Compare:
  (active) ***The Government** built hundreds of houses last year.*
  (passive) ***Hundreds of houses** were built by the Government last year.*

  In the active sentence more emphasis is given to who did the action – the Government.
  In the passive sentence more emphasis is given to the thing affected by the action – the number of houses.
  Emphasized information usually comes at the beginning of the sentence.

- Spoken and written
  The passive is used more in writing and formal speech.

Using *by* and *with*

- The person or organization that does the action is called 'the agent'. If we want to say who does the action then we use *by*.
  Hundreds of houses were built last year.
  *Hundreds of houses were built **by the Government** last year.*
  A lot of stones were thrown.
  *A lot of stones were thrown **by angry football fans**.*

- The thing that is used to perform an action is called 'the instrument'. If we want to include this we use *with*.
  *The windows were broken **with a baseball bat**.*

2 Complete each sentence with a passive verb.

a) The police questioned George.
George ...was questioned..... by the police.

b) Millions of people watch this programme.
This programme ..... by millions of people.

c) They will finish our new house at the end of the month.
Our new house ..... at the end of the month.

d) They've elected a new president.
A new president ..... .

e) They're rebuilding the damaged stadium.
The damaged stadium ..... .

f) They've closed the mountain road.
The mountain road ..... .

g) Students write most of this magazine.
Most of this magazine ..... by students.

h) A burglar stole my laptop.
My laptop ..... by a burglar.

i) Somebody will meet you at the bus station.
You ..... at the bus station

j) United won the cup last year.
Last year the cup ..... by United.

3 Underline the errors in these sentences. Rewrite each sentence.

a) Many pet dogs are losing every year.
...Many pet dogs are lost every year.....

b) The injured man was been taken to hospital.
.....

c) A new bridge is be built across the river.
.....

d) All the food at the party was ate.
.....

e) Nothing will being decided before next Saturday.
.....

f) The match is playing on Friday evening.
.....

g) The robber unlocked the door by a false key.
.....

h) This book was writing by Sam's father.
.....

4 For every question, complete the second sentence so that it means the same as the first, using no more than three words.

a) Archaeologists have discovered a new tomb in Egypt.
A new tomb ..has been discovered.... by archaeologists in Egypt.

b) The President will open the new sports stadium on Saturday.
The new sports stadium ..... by the President on Saturday.

c) Picasso painted this portrait.
This portrait ..... Picasso.

d) They will announce the results of the competition tomorrow.
The results of the competition ..... tomorrow.

e) They're redecorating our school during the summer holidays.
Our school ..... during the summer holidays.

f) The police in New York have arrested three terrorists.
Three terrorists ..... in New York.

g) Our company sells more than 1,000 cars every week.
More than 1,000 cars ..... our company every week.

h) They're building a new museum in the city centre.
A new museum ..... in the city centre.

5 Rewrite each sentence with a passive verb, and so that the names of people are not mentioned.

a) The authorities have closed the casino.
The casino has been closed.

b) The clubs have postponed the match.
.....

c) People all over the world speak English.
.....

d) The authorities have opened the new swimming pool.
.....

e) Someone left this purse in the classroom yesterday.
.....

f) The city council has banned traffic from the city centre.
.....

g) People have elected a new government.
.....

h) Someone broke into the flat last week.
.....

Passive: kako ce izgledati na ispitu

Prebacite date recenice iz aktiva u pasiv:

1. Someone will inform the students about the test.
2. We have corrected all the mistakes.
3. Our engineers plan all the elements very carefully.
4. They finished the new road in record time.
5. They are loading the containers on the train.

cycling in copenhagen - the easy way

Every morning at around 7am Copenhagen comes to life. Men in business suits, women fashionably dressed in the latest styles down to their high heel shoes and parents carrying their children in a cargo bike all hop on their bikes and get off to work or school.

By Lasse Lindholm, City of Copenhagen

Actually, 37 per cent of everybody working or studying in Copenhagen prefers the bike in the morning - and the equivalent number of people living in Copenhagen is as high as 55 per cent. That makes cycling the most popular means of transport and 1.2 million kilometres are covered daily by cyclists in the city, where cycle tracks are an integrated part of the traffic design.

From A to B

While many guests in the Danish capital seem to think that Copenhageners must be really concerned with the environment since so many use a bike, it's just not the reason why Copenhageners ride. Many Copenhageners are of course focused on environmental issues but, when asked, only 1 per cent of Copenhageners mention it as the main reason.

Cycling is the preferred means of transport because it's the quickest and easiest way to get around town. It's the glue that keeps our lives together – allowing us to connect our everyday tasks in a smooth manner. While this tells us a bit about the Copenhagener mindset it also demonstrates that given the right support, cities around the world can be modelled to be more sustainable.

Creating a city of cyclists

But how do you create a city of cyclists? First of all you need to make cycling competitive and safe. In Copenhagen there is a coherent network of segregated lanes designated as cycle tracks in all city areas. That means you can ride from one part of the city to another almost without leaving the cycle track, which in most cases also ensures less travel time than going by car or bus.

Surfing green waves and snow

Two good examples from Copenhagen are the green waves for cyclists and the snow removal policy.

Previously the traffic lights in Copenhagen were coordinated for cars. Now they've been adjusted to favour cyclists along many main traffic arteries. This means that at a speed of 20 kph, cyclists can surf a wave of green traffic lights through the city without putting a foot down. Efficient for car drivers? No. But definitely an advantage for cycling citizens.

Should it snow in winter, city policy mandates that snow be removed from the cycle tracks before it is cleared from the car lanes – with the exception of car lanes on the four largest roads, which are cleared at the same time as the cycle tracks. This top priority helps explain why 80 per cent of Copenhagen cyclists still choose bikes in January.

Perception is (also) reality

Performing over the long haul has been the essence in the Danish capital.
Copenhagen – as a city of cyclists – wasn't designed and constructed overnight. It has been in the making for decades and the consistency in prioritizing cyclists on the street scene goes a long way to explaining why there are more bikes than citizens in Copenhagen today.

From: http://denmark.dk/en/green-living/bicycle-culture/cycling-in-copenhagen---the-easy-way/

Video: Copenhagen's design details: https://vimeo.com/73122441

Practice

I Are the following statements about Copenhagen true or false:

1. In Copenhagen you are not allowed to carry children on your bicycle for safety reasons.
2. The main reason why Copenhageners ride bicycles is their concern for the environment.

3. Cycling is the most popular means of transport in the Danish capital.
4. The quickest and easiest way to get from one part of Copenhagen to another is by bicycle.
5. Following the example of Copenhagen we can make a more sustainable city.
6. Cycle tracks in Copenhagen are connected all around the city.
7. The traffic lights throughout the city are coordinated for cars going at about 50kmh.
8. Not many people ride their bicycles in January.
9. Snow is removed from the bicycle tracks and from four largest roads at the same time.

II. Complete the sentences using the following words:

prefers, ensures, tracks, previously, smooth, access, removal

1. A large percent of people in Copenhagen ..... bicycle as a means of transport.
2. The whole city is connected with a network of bicycle .....
3. Riding a bike ..... less travel time than going by car or bus.
4. Snow ..... policy in Copenhagen is rather unusual.
5. .....the traffic lights were coordinated for cars.
6. They made ..... for bicycles in public spaces a priority.

III Answer the questions:

Part 1

- Who are the people who use bicycles in Copenhagen? How are they described in the first paragraph?
- What is the most popular means of transport in Copenhagen? How many kilometers do cyclists in Copenhagen cover daily?

Part 2

- What is the reason that so many people use bicycles in Copenhagen? What do guests in the city think? Is that the real reason?
- What is the percent of people who say that environmental issues are the main reason they use bicycles?
- Why is cycling the preferred means of transport in Copenhagen?
- Why is the example of Copenhagen interesting and important?

Part 3

- How can you create a city of cyclists? What do you need to do first?
- What do city planners need to do?
- Is it usually faster to travel by bicycle or by bus in Copenhagen?

Part 4

- What are the two good examples from C?
- What was the situation with city lights before?
- How are they adjusted now? Is it more efficient for car drivers or for cyclists?
- What is the snow removal policy in C? Where is the snow removed first?
- What percent of people use bicycle in January?

Discussion

Decide whether the following statements give reasons FOR or AGAINST the use of bicycles:

If you ride a bicycle you don't use petrol or other fossil fuels, so you are not emitting carbon dioxide into the atmosphere and contributing to climate change. Ride on!	On a bicycle you don't get stuck in traffic jams. Much of the time a bicycle is a much quicker way to cross a city than almost all other forms of transport.
Sadly many people don't cycle because it's dangerous. Outside Amsterdam or Copenhagen, road systems often aren't designed with cyclists in mind. Car drivers go too fast, or aren't properly trained how to share the roads with cyclists.	It is hard to know what makes cycling so enjoyable. Maybe the combination of fresh air, the smooth motion and the exercise. Anyway, you soon realise why people get obsessed!
Cycling in the rain is not many people's idea of a good time. You get wet, dirty, and cold. Not a good way to arrive anywhere!	Cyclists are exposed to the pollution from all the cars, buses and lorries on the road, and this can take the pleasure out of cycling.
A bicycle is easy to steal. Even with the best lock, you might go back to find your bike only to find its gone.	We all know cycling is great exercise. As one doctor told me, in his experience the longest living people are ballroom dancers and cyclists.

for the standardized evolution of IN. In addition, regional IN standardization activities in Australia, Europe, Japan, and North America have focused on providing inputs to CCITT to develop global international IN standards and then using the CCITT IN results as the basis for regional standardization, as appropriate.

This article provides a description of the CCITT IN results to date, which includes the first set of IN Recommendations and possible future directions. Bell Communications Research's (Bellcore's) IN work, referred to as the Advanced Intelligent Network (AIN), is also discussed in relation to the CCITT IN Recommendations. In addition, IN activities of the European Telecommunications Standards Institute (ETSI) and the Telecommunications Technology Committee (TTC) of Japan are described.

CCITT IN Results

This section describes the CCITT IN results in terms of CCITT's IN goals and objectives, the methodology used to develop the CCITT IN Recommendations, the target services and supported capabilities, the specified IN architectures and interfaces, and potential IN evolution.

Goals and Objectives

The goal of the CCITT program of work for IN is to define a new architectural concept that meets the needs of telecommunication service providers to "rapidly, cost effectively, and differentially satisfy their existing and potential market needs for services," and to "improve the quality and reduce the cost of network service operations and management".

The CCITT objectives for this new architectural concept are as follows:

- IN should be applicable to all telecommunications networks, e.g., public switched telephone networks (PSTNs), including integrated services digital networks (ISDNs), both narrowband and broadband, packet–switched public data networks, and mobile networks.
- IN should enable service providers to define their own services, independent of service–specific developments by equipment suppliers.
- IN should enable network operators to allocate functionality and resources within their networks and efficiently manage their networks, independent of network–specific developments by equipment suppliers.
- IN should be introduced starting from the existing networks and the current CCITT Recommendations.
- IN should evolve to reflect implementation experiences, new technological opportunities, and market evolution.

(Taken from: *IEEE Communications Magazine*, March 1993)

Unit 9

FASTER INTERCHANGE

One solution to the problem of gearing Europe's intermodal rail terminals to match the predicted growth in bimodal container and swapbody traffic throughputs is to harness advanced automation techniques to the terminal transfer and handling process. As such, two automation projects were on display within the exhibition area of EuroModal 92, from German and French sources. German company, Krupp Industrietechnik, unveiled details of its Fast Handling System (FHS) for improving efficiency in combined terminals operations.

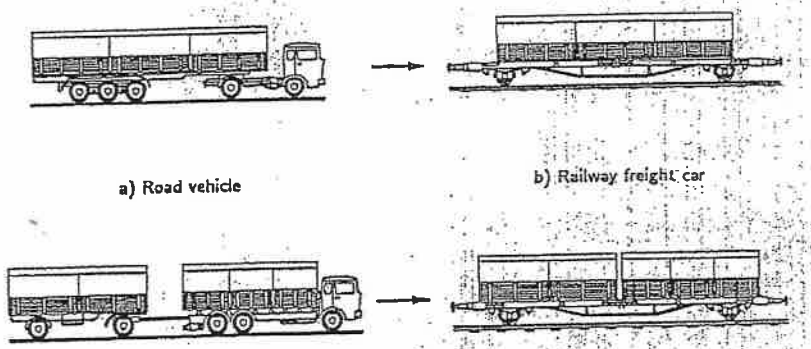

Figure 1. – A swapbody traffic throughput on vehicles

Modular in design, the FHS incorporates a gantry crane–based handling system for the loading/discharge of train loads, crossways and longitudinal conveyors, a high–rack storage system, and store handling devices. A number of aisles, from one to six, could be provided according to capacity requirements. Based on the latest hydraulic technology, automatic positioning and control engineering and data processing systems, the FHS is designed to offer extremely fast handling of block trains. Krupp claims, in fact, that it would take just 15 minutes to handle 40 containers in a 600 m–length train.

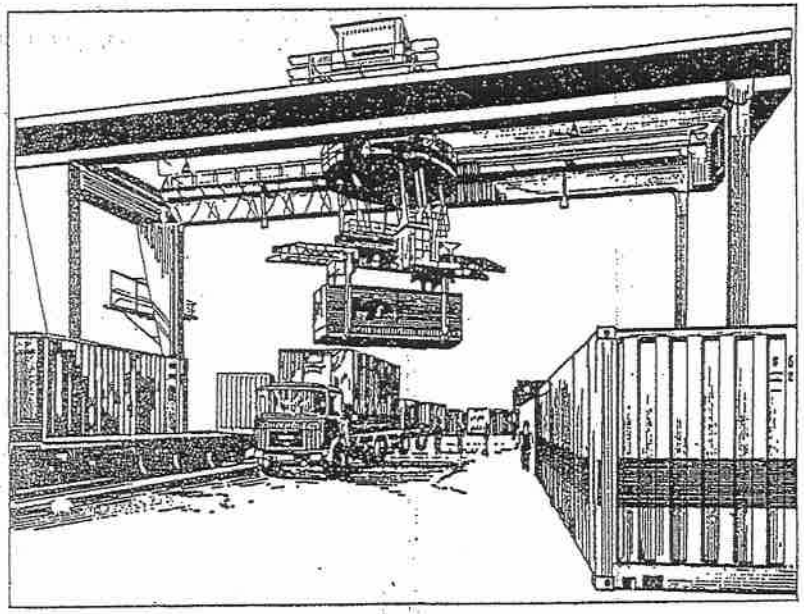

Figure 2. Technology D_{16}: A gantry crane on rails

The most novel feature of the FHS concept is that loading and unloading takes place while the train moves slowly through the handling system. As the train enters the system, the units for offloading are located and identified electronically. In the main aisle, overhead gantry cranes (~~featuring horizontal telescopic jibs~~) grab individual containers, swapbodies and trailers, and lift them free, placing them on a conveyor transport system. These units are then sent either to a high–rack system for intermediate storage inside the terminal, or are moved to the truck loading area. Having collected new units, the train then leaves the FHS and continues its journey.

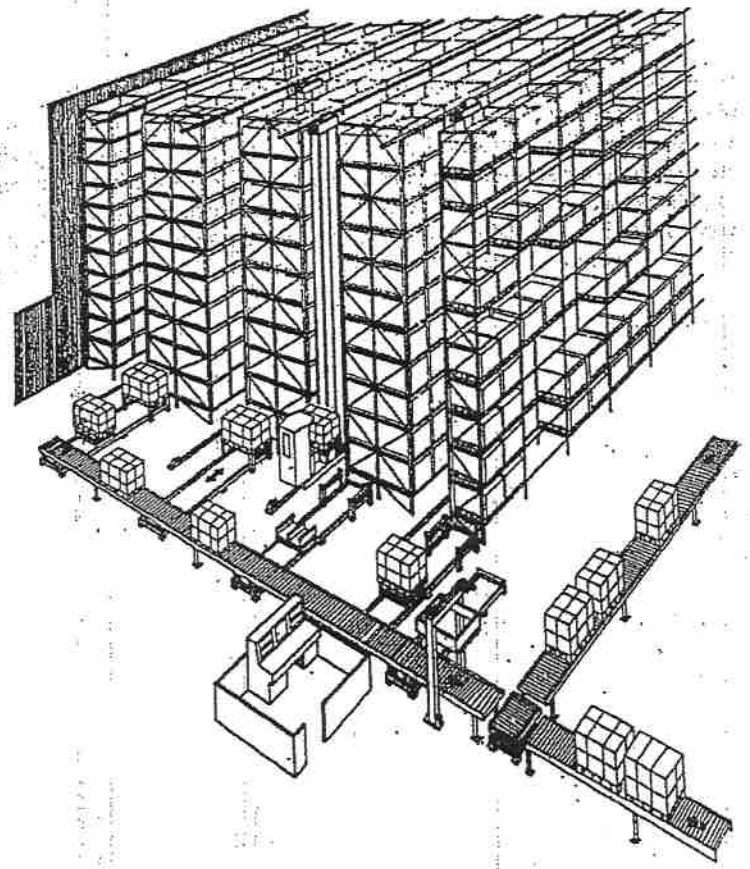

Figure 3. A high–rack storage system

Following 18 months of development, Krupp believes that the FHS is ready to be field tested and expects to announce a pilot scheme with the German Railways in the next few months. The first installation will be probably in the Ruhrgebiet and Duisburg is a likely choice, although locations in eastern Germany (including Dresden) are under review. The cost of a FHS would vary according to the capacity required, but Krupp says a 'standard' size facility would require an investment of around DM 50–60 (US$ 30–36) million.

Faster interchange – Practice

I Complete the text using the following words:

handle, handling, extremely, requirements, devices, gantry, aisles, positioning, technology, conveyers, combined, unveiled, processing, unloading, storage

Krupp 1)..... details of its fast 2)..... system (FHS) for improving efficiency in 3)..... terminal operations.

It uses the latest hydraulic 4)....., automatic 5)..... and data 6) .....systems.

FHS incorporates: 7) ..... crane handling system for loading and 8)..... of trains, 9)....., a high-rack 10).....

system and store handling 11) .....

There are one to six 12) ..... depending on capacity 13).....

The system is 14) ..... fast: it can 15) .....

40 containers in just 15 minutes.

II Put sentences in the correct sequence:

- The train enters the FHS (fast handling system).
- Units are sent to a high-rack storage system.
- The train leaves the FHS.
- The cranes place the units on the conveyor transport system.
- Units for offloading are identified
- Overhead gantry crane grabs the containers
- The train collects new units.

III Answer the questions:

- What system did German company Krupp present?
- What is this system called?
- The system is modular in design. What does that mean?
- What does it incorporate?
- What is the number of isles? What does it depend on?
- Krupp claims that the system is extremely fast. How fast is it?
- What is the most novel feature of this system?
- What happens as the train enters the system?

- What is the function of the overhead gantry cranes?
- What happens with these units next?
- What happens with the train?

A Brief Overview of Intermodal Transportation

Tolga Bektas[1], Teodor Gabriel Crainic[1,*]

[1] Interuniversity Research Centre on Enterprise Networks, Logistics and Transportation (CIRRELT), Université de Montréal, C.P. 6128, succursale Centre-ville, Montréal, Canada H3C 3J7 and Chaire de recherche industrielle du CRSNG en management logistique, ESG, Université du Québec à Montréal, C.P. 8888, succursale Centre-ville, Montréal, Canada H3C 3P8

Abstract. This paper focuses on Intermodal Freight Transportation broadly defined as a chain made up of several transportation modes that are more or less coordinated and interact in intermodal terminals to ensure door-to-door service. The goal of the chapter is to present intermodal transportation from both the supplier and the carrier perspectives, and identify important issues and challenges in designing, planning, and operating intermodal transportation networks, focusing on modeling and the contributions of operations research to the field.

Keywords. Intermodal transportation, freight transportation, operations research

Acknowledgements. Partial funding for this project has been provided by the Natural Sciences and Engineering Research Council of Canada (NSERC) through its Discovery Grants and Chairs and Faculty Support programs.

---

* Corresponding author: Teodor-Gabriel.Crainic@cirrelt.ca

Dépôt légal – Bibliothèque nationale du Québec,
Bibliothèque nationale du Canada, 2007

I. Introduction

In today's world, intermodal transportation forms the backbone of world trade. Contrary to conventional transportation systems in which different modes of transportation operate in an independent manner, intermodal transportation aims at integrating various modes and services of transportation to improve the efficiency of the whole distribution process. Parallel to the growth in the amount of transported freight and the changing requirements of integrated value (supply) chains, intermodal transportation exhibits significant growth. According to the U.S. Department of Transportation (2006), the value of the multimodal shipments, including parcel, postal service, courier, truck-and-rail, truck-and-water, and rail-and-water increased from about $662 billion to about $1.1 trillion in a period of nine years (1993 to 2003).

Major players in intermodal transportation networks are *shipper*s, who generate the demand for transportation, *carrier*s, who supply the transportation services for moving the demand, and the intermodal network itself composed of multimodal services and terminals. The interactions of these players and their individual behavior, expectations, and often conflicting requirements determine the performance of intermodal transportation systems. The goal of this chapter is therefore to be informative on intermodal transportation, from both the supplier and the carrier perspective, identify important issues and challenges in designing and operating intermodal transportation networks, and point out major operations research contributions to the field. A more in-depth discussion of these topics may be found in, for example, Crainic and Kim (2007), Macharis and Bontekoning (2004), and Sussman (2000).

The chapter is structured as follows. Section II presents the basics on intermodal transportation, with an emphasis on its foremost components: containers, carriers, and shippers. We then discuss, in Sections III and IV, respectively, the major issues and challenges of intermodalism from the shippers and carriers perspective. Section V provides a brief description of intermodal terminals and the operations performed therein. Section VI is dedicated to the case of rail intermodal transportation, as an illustration of the main discussion.

II. Intermodal Transportation

Many transportation systems are *multimodal*, that is, the infrastructure supports various transportation modes, such as truck, rail, air, and ocean/river navigation, carriers operating and offering transportation services on these modes. Then, broadly defined, *intermodal*

transportation refers to the transportation of people or freight from their origin to their destination by a sequence of at least two transportation modes. Transfers from one mode to the other are performed at *intermodal terminals*, which may be a sea port or an in-land terminal, e.g., rail yards, river ports, airports, etc. Although both people and freight can be transported using an intermodal chain, in this chapter, we concentrate on the latter.

The fundamental idea of intermodal transportation is to consolidate loads for efficient long-haul transportation (e.g., by rail or large ocean vessels), while taking advantage of the efficiency of local pick-up and delivery operations by truck. This explains the importance of container-based transportation. Freight intermodal transportation is indeed often equated to moving containers over long distances through multimodal chains. Intermodal transportation is not restricted, however, to containers and intercontinental exchanges. For instance, the transportation of express and regular mail is intermodal, involving air and land long-haul transportation by rail or truck, as well as local pick up and delivery operations by truck (Crainic and Kim 2007). In this paper, we focus on container-based transportation.

An intermodal transportation chain is illustrated in Figure 1. In this example, loaded containers leave the shipper's facilities by truck to a rail yard, where they are consolidated into a train and sent to another rail yard. Trucks are again used to transport the containers from this rail yard to the sea container terminal. This last operation may not be necessary if the sea container terminal has an interface to the rail network, in which case freight is transferred directly from one mode to the other. Containers are then transported to a port on another continent by ocean shipping, from where they leave by either trucking or rail (or both) to their destinations.

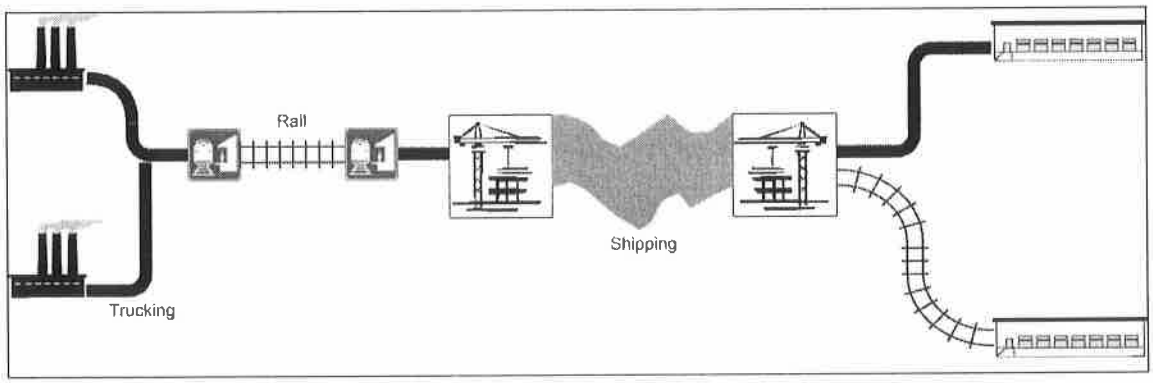

Figure 1. An intermodal transportation network

Intermodal transportation – Practice

I Complete the sentences using the following words:

delivery, backbone, fundamental, destination, chain, freight

1. The goods arrived to their ..... in London on time.
2. They studied the intermodal ..... which included several modes of transport.
3. Intermodal transportation is the ..... of modern world trade.
4. The use of containers is ..... for modern transport.
5. Both people and ..... can be transported using intermodal chains.
6. They use trucks for local pick up and .....

II Answer the questions about the text Intermodal transportation

1. Is intermodal transportation important today? What word from the text suggests that?
2. What is the difference between conventional and intermodal transportation?

3. How is intermodal transportation defined in the text?
4. What happens in the intermodal terminals? Is intermodal transporation related to people or freight?

5. What is the basic idea of intermodal transportation?
6. When we talk about freight intermodal transportation what do we usually think of?
7. What is another example of intermodal transportation (not using containers)

8. Describe one intermodal chain. What different options are possible?

III Watch this video about an intermodal terminal in Luxemburg.

1. What are the important characteristics of this terminal?
2. What new technology is used here?

https://www.youtube.com/watch?v=iZ4nshHnpI0&ab_channel=CFLmultimodal

II.1 Containers

A *container*, as defined by the European Conference of Ministers of Transport (2001), is a "generic term for a box to carry freight, strong enough for repeated use, usually stackable and fitted with devices for transfer between modes". The fact that the standards on container dimensions were established very early also explains its popularity. A standard container is the 20-foot box, which is 20 feet long, 8'6" feet high and 8 feet wide. This is refereed to as a *Twenty-foot Equivalent Unit* (*TEU*). However, the widely used container size is the 40-foot box (a number of longer boxes are sometimes used for internal transport in North America). Containers are either made of steel or aluminum, the former being used for maritime transport and the latter for domestic transport.

Intermodal transportation relies heavily on containerization due to its numerous advantages. First, containerization offers safety by significantly reducing loss and damage, since the contents of a container cannot easily be modified unless except at origin or destination. It is worth mentioning in this respect that the safety level of container transportation is currently being significantly increased by electronic sealing and monitoring to address preoccupations with terrorist treats, illegal immigration, and smuggling. Second, due to its standard structure, transfer operations at terminals are fast and performed with a minimal amount of effort. This results in reduced cargo handling, and thus a speed-up of operations not only at the terminals, but through the whole transport chain. Third, containers are flexible enough to enable the transport of products of various types and dimensions. Fourth, containerization enables a better management of the transported goods. Due to these reasons, the use of containers significantly decreases transport costs.

Containerization has had a noteworthy impact on both land transportation and the way terminals are structured. An example for the former can be seen in rail transportation, where special services have been established by North-American railways, enabling container transportation by long, double-stack trains. As for the latter, ports and container terminals have either been built or undergone major revisions to accommodate continuously larger container ships and efficiently perform the loading, unloading, and transfer operations. Container terminal equipment and operating procedures are continuously enhanced to improve productivity and compete, in terms of cost and time, with the other ports in attracting ocean shipping lines.

Containers – practice

I. Complete the text with the following words:

repeated, enhance, safer, accommodate, freight, steel, impact, stackable, numerous, established, devices, reduce, economical, double-stack,

A container can be defined as a box to carry ..... strong enough for ..... use, usually ..... and fitted with ..... for transfer between modes. They are made of ..... or aluminum.

Containers have ..... advantages in intermodal transportation. They ..... loss and damage, save cost and make transfer ..... and more .....

Containerization has had significant ..... on land transportation. Special services have been ..... to enable transportation of containers by long ..... trains. In addition, terminals have been constructed to ..... loading, unloading and transfer operations.

II. Find in the text words that mean the same as:

- is called
- the one mentioned first
- the one mentioned second
- because of
- many
- what is inside
- at this time, now
- make smaller
- influence
- make better

III Answer the questions:

1. How is a container defined?
2. What are the dimensions of a standard container?
3. What is a container made of?

4. What are the advantages of a container? (There are four advantages mentioned in the text)
5. What is the impact of containerization?

IV Watch the video about containers and answer these questions:

1. What do they say about the situation before containers were used?
2. What equipment is mentioned for moving the containers?
3. Why do they mention ISO?
4. What are the benefits of using new technology here?

https://www.youtube.com/watch?v=2JcHMhtH6_s&ab_channel=TicketToKnow

Green mobility solutions

https://www.weforum.org/agenda/2022/10/3-ways-cities-can-promote-new-greener-mobility-services?fbclid=IwAR2f3Ot78hOchn9OcQGh2j0R1_a93mulmOguly9tCb8nFACQsyfVlaLLSX0

New mobility services – everything from bike and e-scooter rentals to car-sharing and smart parking systems – are growing rapidly and could reduce congestion, pollution, and dependence on privately owned cars. That's a big win for city governments, which are offering bike lanes and other incentives to encourage adoption.

But rolling out these services effectively requires careful planning, and that isn't always happening. There are three main ways cities can encourage new, green mobility options for the long-term, without reducing mass-transit ridership.

1. Make the most of micromobility

Cities can use the full potential of micromobility – the services that let users rent e-scooters, bikes, and mopeds for single trips – by focusing initially on areas with limited or no mass-transit. While electrified bus, streetcar, and light-rail systems are by far the most efficient and environmentally friendly modes of motorized urban transportation, they don't take people everywhere they want to go. Micromobility can provide the last leg of commutes, especially in cities with a lower density of train stations.

To boost synergies between new mobility and mass-transit, cities can set up micromobility hubs at subway stations. Use of micromobility also tends to flourish when space to ride is designated, such as bike lanes that run alongside city streets.

2. Use cars more efficiently

Geographically large and less dense cities are likely to remain car-dependent for the foreseeable future, but car-based mobility services, such as car-pooling, car-sharing and ride-hailing, as well as on-demand buses can help reduce the pressure on parking. Ride-hailing services can, however, add to congestion, as many of the cars drive around seeking customers. And vehicles used in hailing and sharing services will generate emissions if they're not electric.

Parking spaces can be better used through smart payment systems – online platforms and apps that match drivers with available spots and enable payment – reducing traffic caused by cars searching for somewhere to park. In the future, new technology under development – based on satellites or sensors embedded in the ground – could identify which parking spaces are free and transmit this data to cloud-based platforms, further accelerating autonomous services.

3. Make long-term green mobility plans and stick to them

To work effectively, measures to promote new modes of green mobility need to be part of a wider plan. Cities such as Paris are already implementing these strategies. The French capital announced in 2020 that it would become a "15-minute city" – one in which residents can easily reach essential services in that time by bike or on foot. Amsterdam, which regularly scores highly for urban mobility, announced in 2019 that it would remove 11,000 parking spaces by 2025 to make the city greener and more accessible.

Practice

I Find the words with the same meaning

rapidly	have
reduce	need
own	at the beginning
require	lower
single	produce
initially	quickly
remain	go faster
generate	one
accelerate	stay
essential	most important

II Complete the sentences using the following words:

adoption, hubs, mass-transit, ride-hailing, match, encourage, commutes, foreseeable

1. New mobility services and could reduce congestion, pollution and ..... on privately owned cars.
2. City governments are offering bike lanes and other incentives to encourage .....
3. There are three main ways cities can .....new, green mobility options.
4. Cities can use the full potential of micromobility by focusing initially on areas with limited or no .....
5. Micromobility can provide the last leg of .....
6. To boost new mobility cities can set up micromobility ..... at subway stations and bike lanes that run alongside city streets.
7. Geographically large and less dense cities are likely to remain car-dependent for the .....future.
8. Car-pooling, car-sharing and....., can help reduce the pressure on parking but they generate emissions if they're not electric.
9. Smart payment systems, online platforms and apps, can ..... drivers with available spots and enable payment.

III Answer the questions:

1. What new solutions are mentioned in the text?
2. What problems can be reduced if new types of mobility are implemented in cities?
3. Can you explain the term micromobility?
4. How can cities use the full potential of micromoblility?
5. What are the advantages and disadvantages of using electrified bus, streetcar, and light-rail systems for mass urban transportation?
6. What can be done to boost synergies between new mobility and mass-transit in cities?
7. What car based mobility services are mentioned in the text? What are their advantages and disadvantages?
8. How can new technologies help in using parking spaces more efficiently?
9. What are the examples of long term green mobility plans that are mentioned in the text? What do you think about them?

Roundabouts

What is a roundabout?

A modern roundabout is a circular intersection where drivers travel counterclockwise around a center island. There are not traffic signals or stop signs in a modern roundabout. Drivers entering the roundabout yield to traffic already in the roundabout, then enter the circulating roadway and exit at their desired street, so they function differently from older circular intersection types.

In a modern roundabout, drivers enter the intersection by navigating a gentle curve. A main feature of the modern roundabout is a raised central island. The circular shape is designed to control the direction of traffic and reduce speeds to 15 to 20 mph. It also reduces the likelihood of t-bone (right angle) or head-on collisions.

Studies by the Federal Highway Administration (FHWA) have found that roundabouts can increase traffic capacity by 30 to 50 percent compared to traditional intersections.

Roundabout basics

Roundabouts are designed to make intersections safer and more efficient for drivers, pedestrians, and cyclists. There are two basic types of roundabouts: single-lane and multi-lane.

There are a few key things to remember about driving through roundabouts:

- Yield to drivers already in the roundabout
- Stay in your lane; do not change lanes
- Do not stop in the roundabout
- Avoid driving next to oversize vehicles

Benefits of roundabouts

Roundabouts have many important benefits over other intersection control types.

Improve safety

Studies have shown that roundabouts are safer than traditional stop sign or traffic signal controlled intersections.

Roundabouts reduced injury crashes by 75 percent at intersections where stop signs or traffic signals were previously used for traffic control. There are several reasons why roundabouts help reduce the likelihood and severity of collisions:

- **Low travel speeds.** Drivers must slow down and yield to traffic before entering a roundabout. Speeds in the roundabout are typically between 15 and 20 miles per hour. The few collisions that occur in roundabouts are typically minor and cause few injuries since they are at such low speeds.
- **No light to beat.** Roundabouts are designed to promote a continuous, circular flow of traffic. Drivers need only yield to traffic before entering a roundabout; if there is no traffic in the roundabout, drivers are not required to stop. Because traffic is constantly flowing through the intersection, drivers do not have the incentive to speed up to try and "beat the light" as they might at an intersection with a traffic signal.
- **One-way travel.** Roads entering a roundabout are gently curved to direct drivers into the intersection and help them travel counterclockwise around the roundabout. The curved roads and one-way travel around the roundabout eliminate the possibility for "T-bone" and head-on collisions.

Contrary to many peoples' perceptions, roundabouts actually move traffic through an intersection more quickly, and with less congestion on approaching roads. Roundabouts promote a continuous flow of traffic. Unlike intersections with traffic signals, drivers don't have to wait for a green light at a roundabout to get through the intersection. Traffic is not required to stop – only yield – so the intersection can handle more traffic in the same amount of time.

Practice

I Answer the questions:

1. How would you define a roundabout?
2. What are the physical characteristics of a roundabout?
3. In what way is a roundabout different from a traditional intersection?
4. What key things should drivers know about roundabouts?
5. What are the advantages of roundabouts over a traditional intersections?
6. What benefits of roundabouts are mentioned in the text?

II Complete the text about the benefits of roundabouts using the following words:

severity, injuries. yield, intersection, eliminate, counterclockwise, entering, speed

Roundabouts help reduce the likelihood and ..... of collisions. In a roundabout drivers must slow down and ..... to traffic before entering a roundabout. The collisions that occur in roundabouts are typically minor and cause few ..... since they occur at such low speeds. Because traffic is constantly flowing through the intersection, drivers don't have the incentive to ..... up to try and "beat the light," like they might at a traditional ..... Roads ..... a roundabout are gently curved to direct drivers into the intersection and help them travel ..... around the roundabout. The curved roads and one-way travel around the roundabout ..... the possibility for T-bone and head-on collisions.

III Find the words in the text that have opposite meaning:

counterclockwise -
enter -
increase -
single -
slow down -
like -

IV Make a list of key words that you need to know if you talk about roundabouts: e.g. counterclockwise, ...

Upotreba veznika

Dve kraće rečenice se mogu spojiti veznikom.

Ukoliko koristimo veznike kao što su ***when, after, before, while, until***
pokazujemo da između radnji opisanih ovim rečenicama postoji određeni **vremenski** odnos.
Npr
When they improved their IT system, they got much better results

when – dve radnje se odvijaju u istom vremenskom periodu
When you enter this area you should wear protective clothing.

after – jedna radnja se dešava posle druge
After they finished the experiment, they wrote a report .

before – jedna radnja se dešava pre druge radnje
Before he started this course, he knew very little about electric motors.

while - jedna radnja se dešava paralelo sa drugom radnjom
While they were waiting for the bus, it started to rain.

until – jedna radnja traje sve dok druga ne počne
The virus is not activated until you open the infected file.

Although i **Even though** imaju isto značenje = iako, mada
Npr:
1. It was raining.
2. They went for a walk.

Although it was raining, they went for a walk.
Even though it was raining, they went for a walk.

Despite i **in spite of** imaju isto značenje = uprkos
Ako pogledamo iste primere:
1. It was raining.
2. They went for a walk.

Sa ovim veznicima spojićemo ih:
In spite of the rain they went for a walk.
Despite the rain they went for a walk.

Sa ovim veznicima rečenica se menja jer oni „traže" iza sebe imenicu (the rain) a ne celu rečenicu . Zbog toga možemo da spojimo rečenice i na ovaj način:
In spite of the fact that it was raining, they went for a walk. (the fact je ovde imenica koja je potrebna iza **in spite of**)

Veznici koji povezuju **uzrok i posledicu** su **since** (= pošto) i **therefore** (= stoga)
Npr:
3. They were tired.
4. They went home.

Since they were tired, they went home.
(Pošto su bili umorni, otišli su kući.)
Ili:
They were tired, therefore they went home.
(Bili su umorni, stoga su otišli kući.

Veznici koji izražavaju **kontrast** su **while** i **whereas** (isto značenje = dok)
Npr:
5. He likes football.
6. His brother likes volleyball.
Možemo da spojimo:
He likes football while his brother likes volleyball.
He likes football whereas his brother likes volleyball.

Nasuprot tome rečenice:
7. He likes football.
8. His brother likes football.
Možemo da spojimo:
Both he and his brother like football.
Both = oba, i jedan i drugi

Veznik **however** = međutim (ne: bilo kako bilo!!!) se koristi da poveže rečenicu koja je na neki način kontradiktorna sa onim što je prethodno rečeno, npr:
9. They worked hard.
10. They could not solve the problem
They worked hard. However, they could not solve the problem.

Vežbe za veznike

I Dopunite rečenice odgovarajućim veznikom

***in spite of / despite* (znače isto) ili *although / even though* (znače isto)**

1. .....the rain, we still went to the park.
2. ..... it was raining, we decided to go for a walk.
3. ..... the fact that it wasn't easy, I finished the homework.
4. ..... the restaurant has a good reputation, the food was terrible.
5. .....I waited for a long time, he didn't come
6. He finished on time ..... the initial problems.
7. They solved the problem..... it was not easy.

whereas / while* (znače isto) ili *both

1. They interviewed ..... students and teachers.
2. They worked for two hours ..... we finished in only 40 minutes.
3. Our engineers investigated ..... the position and the type of the device.
4. I wake up at 7 every day ..... my brother doesn't get up before midday.

since, therefore oba veznika iskazuju uzročno-posledične odnose. Obratite pažnju na njhovo mesto u rečenici:

since + uzrok + nastavak rečenice (posledica).....

uzrok + **therefore** + posledica....

1. ..... this material is very expensive, it is not often used.
2. Our experts studied every aspect of the problem ..... there were no surprises.
3. ..... he was the strongest candidate, he got a scholarship in Japan.
4. The system is highly sensitive .....it records all the changes.
5. ..... we had no other option we accepted this offer.

when, while, until, after

1. The phone can't be used again ..... it is recharged.

2. ..... you were watching TV, I finished my homework. 3. You must study regularly ..... you study engineering.

4. You can ask questions ..... Mr Sloane finishes his presentation.

II Dopunite rečenice odgovarajućim veznikom – primer kako će izgledati zadatak na testu:

however, before, although, while, despite, until, even though, when, therefore

1. ..... the restaurant has a good reputation, the food was terrible.
2. I waited..... everyone left the room. Then I left, too.
3. I played a lot of tennis ..... I was on holiday
4. People in our group did the job early ..... the people in other groups did not finish on time.
5. They tried to solve the problem. ....., they could not find the solution.
6. You must hand in your project ..... you go on holiday.
7. They have a very systematic approach..... they don't make mistakes.
8. ..... his good results, the boss does not really like him.

Special report: transport in Britain

Congestion charges

A traffic congestion charge will soon operate in central London. Simon Jeffery explains how the scheme will work

Friday February 14, 2003

What will motorists have to pay to drive in central London?

The London mayor, Ken Livingstone, has authorised plans for a congestion charge of £5 each weekday for motorists to enter a central area of the capital from 7am to 6.30pm. Around 230 cameras positioned on the zone's entry points will match car number plates against a database of vehicles whose drivers have paid the charge. Any motorist who has not paid by the end of the day will be fined £80.

The scheme will be introduced on February 17, when school holidays should mean that reduced traffic levels will minimise any teething troubles.

How do I pay?

You can pay online at cclondon.com or by telephone on 0845 900 1234, and in some garages and newsagents. The charge can be paid in advance - or on the day itself - and for entire weeks, months or years. Regular drivers can register for fast track payment to speed up the process, and even pay by text message. But the scheme hit a setback when a deal to allow drivers to register at post offices collapsed after the Post Office raised its fee for dealing with the charge from £250,000 to £1m a year.

What if I don't pay?

There is the £80 fine, reduced to £40 if you pay within 14 calendar days from the date on the notice. Those who fail to pay within 28 days will incur a penalty of £120. Surveys suggest that a significant proportion will not pay. A poll organised by London radio station LBC found one third of people prepared to break the law and ignore the £5 fee. Others believe that the combination of number plate reading cameras and a registration database will not work

Go

Go to:..

Special report: transport in Britain

Transport in Britain archived articles

Liverpool transport goes back in time

Charge zone copes with school run

Rail firm cashes in on fines remission

Letters: Very sorry about this ...

Conflicting warnings over tube crash

Derailment still a mystery, says LU

David Mckie: Trains in a sorry state

Congestion charge is hurting, say shops

Worry over level of congestion payments

RMT plans more walkouts

Critics regroup as road chaos fails to materialise

What the papers say

Bill for outside advice on railways triples to £39m

Congestion charge opens to reduced traffic

'Ken Livingstone should be ashamed of himself'

sufficiently well to catch non-payers so the charge is not worth paying. Whether this is correct or not will be seen after February 17.

Why bring in the scheme at all?

To cut down on what Mr Livingstone calls the "chronic traffic congestion" in central London. He hopes the charge will result in 10-15% fewer vehicles on the road, making central London safer for cyclists and pedestrians, less polluted and easier to drive through for those who are prepared (and able) to pay.

It will raise around £150m a year for the mayor's other transport policies plus an extra £30m in fines, though its revenue-generating potential should not be overstated. Including feasibility studies the scheme is estimated to cost £600m.

Congestion charging also represents a long-term failure in London transport policy, being a stick to beat people out of their cars rather than the carrot of vastly improved public transport, such as more attractive underground and suburban train services, or better provision for cyclists. But with 85-90% of current traffic levels, bus travel within central London should become quicker, if not in the areas outside it. There are also now more buses in London than at any time since 1965 (with 200 a year on order).

Who opposes it?

Motorists' groups and the some small business groups, though the London Chamber of Commerce supports the scheme. The Federation of Small Businesses, however, argues that the charges will add disproportionate costs to firms that need to make deliveries or drive within the congestion zone. Meat traders at Smithfield market - the only significant wholesale market within the zone - argue that the charge is an unnecessary overhead that may deter customers and ultimately drive the market from its historic location just outside the City of London.

A common complaint is that improvements to public transport need to be in place before the scheme will actually work. The mayor's transport body predicts that only 2% of motorists will switch to the tube.

Has this been tried before?

No, London will be the first city to experiment with a scheme of this type on this scale, though cenral area charging is one of a number of anti-congestion policies that has operated in Singapore since the 1970s. The government's independent transport advisers have also suggested that all cars should be fitted with a satellite tracking meter to charge drivers up to 45p a mile as part of radical proposals to slash congestion through the entire country.

Congestion charges – practice

I Answer the questions about the text:

1. When was the scheme introduced?
2. How much did the motorists have to pay?
3. When does the scheme apply (Every day? All day?)
4. How does the scheme work?
5. When was it introduced? Why?
6. How can the drivers pay?
7. What if somebody does not pay?
8. Why was the scheme introduced?
9. Has this been tried before?
10. What do you think about this solution?

II Here is a more recent text about congestion charge in London. Complete the text using these words:

charge, advance, charged, electric, increases, bicycles, enter, within, discounts

London's Congestion Charge applies between 7am and 6pm Monday to Friday and 12pm to 6pm on Saturdays, Sundays and bank holidays.

As you ..... the Congestion Charge Zone, you will see a large letter "C" in a red circle on signs and painted on the road. The Congestion Charge costs £15 if you pay in ..... or on the same day. A slightly higher rate of £17.50 is ..... if you pay up to three days after you travel.

You can pay the London Congestion Charge online in advance or ..... three days after you travel. Drivers can also pay via Auto Pay, Transport for London's Pay to Drive in London app or by telephone.

Drivers who don't pay the Congestion Charge within three days of travel will be sent a Penalty Charge Notice (PCN) for £160. If the PCN is paid within 14 days, the fee is £80. You must pay the charge within 28 days or challenge the PCN. If you do not pay or challenge the PCN within 28 days, the fee ..... to £240.

People living in London's Congestion ..... Zone receive a 90% **residents' discount.** Congestion Charge ..... are also available for vehicles with nine or more seats, and a Cleaner Vehicle Discount applies to vehicles with ..... batteries or hydrogen fuel cells.

Motorbikes, mopeds and ..... are exempt from paying London's Congestion Charge.

...

ScienceDaily®
Your source for the latest research news

Trucks a significant cause of severe accidents, study finds

Date: December 5, 2013

Source: Taylor & Francis

Summary: Trucks are responsible for 4,500 deaths per year in the United States. Truck crashes also cause huge losses in productivity, property and personal injury. New research just published details how trucks account for 8% of US highway traffic, yet are involved in 11% of fatal road crashes.

FULL STORY

The percentage volume of trucks on the road was key in affecting severity of crash, even to the extent that lower traffic volume with higher truck percentage increases risk of fatal accident. An increase of 1% truck volume results in a disproportionately higher increase in severe crash probability.

Credit: © Gudellaphoto / Fotolia

Trucks are responsible for 4,500 deaths per year in the United States. Truck crashes also cause huge losses in productivity, property and personal injury. New research just published in the International Journal of Injury Control and Safety Promotion details how trucks account for 8% of US highway traffic, yet are involved in 11% of fatal road crashes.

Previous research has revealed little other than that severity of crash bears a direct relation to abuse of drink and drugs, or inattention whilst driving. This study examined a Tennessee sample of truck crashes over a 5 year period in relation to different environmental factors, and used a model to determine crash severity outcomes.

1,134 crashes were examined -- 101 single-vehicle, and 1,033 multi-vehicle crashes. Crash severity was categorized as couched property damage only, non-incapacitating injury, incapacitating injury, and fatal. Factors affecting crash were categorised into groups of differing characteristics -- traffic, driver, vehicle, environmental, and geometric. The authors considered 15 traffic factors ranging from condition of the driver, speed, vehicle characteristics, location etc.

The main finding of the study was that overall, the percentage volume of trucks on the road was key in affecting severity of crash, even to the extent that lower traffic volume with higher truck percentage increases risk of fatal accident. An increase of 1% truck volume results in a disproportionately higher increase in severe crash probability.

Speed was exposed as the other significant factor in determining severity of crashes, with severity escalating as speeds increase. Speeds above 45mph were shown to double the risk of a fatal crash.

Driver characteristics showed that male drivers had a higher incidence of fatal crashes, due to increasing likelihoods of men to speed, act aggressively, or drive whilst impaired due to fatigue or substance abuse. Impaired drivers are almost 7 times more likely to be involved in a fatal crash, and have a far greater risk of a severe crash whilst weakened by inferior reactions and poor judgement.

Considering vehicle type, longer combination trucks were most at risk of a severe crash due to restricted right hand side view of the driver. Type and use of safety belt bore a direct relationship to severity of crash. Vehicles moving forward with acceleration were found to be more at risk of severe crash than one doing a manoeuvre, which was at certain greater risk of a property only crash.

Only one significant environmental factor emerged during the study: weather. Increasingly inclement weather intensified risks of severe crash, with extreme conditions such as snow doubling the threat.

This study strives to provide scientific data affecting the severity of truck involved crashes. By doing so, the authors have given a potential basis for number and severity of crashes to be reduced.

Story Source:

The above post is reprinted from materials provided by **Taylor & Francis**. *Note: Materials may be edited for content and length.*

Journal Reference:

1. Chunjiao Dong, Stephen H. Richards, Baoshan Huang, Ximiao Jiang. **Identifying the factors contributing to the severity of truck-involved crashes**. *International Journal of Injury Control and Safety Promotion*, 2013; 1 DOI: 10.1080/17457300.2013.844713

Cite This Page: MLA APA Chicago

Taylor & Francis. "Trucks a significant cause of severe accidents, study finds." ScienceDaily. ScienceDaily, 5 December 2013. <www.sciencedaily.com/releases/2013/12/131205220041.htm>.

TRUCKS – practice

I Find the words that have similar meaning:

1. huge
2. severity
3. due to
4. significant
5. likelihood
6. impaired
7. fatigue
8. inclement

a) because of
b) feeling tired
c) very big
d) seriousness
e) important
f) chance
g) damaged or weakened
h) unpleasant

II Complete the sentence using the following words

property, fatal, vehicle, significant, acceleration, impaired, huge, severity, due to, inclement, likelihood,

1. Truck crashes also cause ..... losses in productivity, property and personal injury.
2. The main finding of the study was that the percentage volume of trucks on the road was key in affecting ..... of crash.

3. Speed was exposed as the other ..... factor in determining severity of crashes,

4. Speeds above 45mph were shown to double the risk of a ..... crash.

5. Male drivers had a higher incidence of fatal crashes, ... increasing likelihoods of men to speed, act aggressively, or drive whilst..... due to fatigue or substance abuse.

6. Considering ..... type, longer combination trucks were most at risk of a severe crash.

7. Vehicles moving forward with .....acceleration were found to be more at risk of severe crash than one doing a manoeuvre.

8. Increasingly .....weather intensified risks of severe crash.