Action 3.1: Mapping ongoing public and private investments
ACTION 3.1: MAPPING ONGOING PUBLIC AND PRIVATE INVESTMENTS

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1 Introduction

Zagreb, the capital of Croatia, as the most important and biggest traffic hub in Croatia is starting point and destination of most roads and railway tracks for which is necessary to coordinate and redefine passenger flows as well as urban, suburban and long-distance traffic in and out the city.

Zagreb is a SE European city situated in the middle of the triangle of Vienna – Budapest – Venice. It has always been and remains a part of the cultural circle of Europe. This city with a tradition celebrated its 900th birthday in 1994. City districts are legal entities and are the upper level of local self-government in the City of Zagreb. The scope of their activities is regulated by the Statute of the City of Zagreb. 17 city districts have been founded on the territory of the City of Zagreb.

Transport in Zagreb, the capital of Croatia, relies on a combination of city-managed public transport and individual transportation. Public transport is composed of 19 inner-city tram lines and 120 bus lines, both managed entirely by Zagrebački električni tramvaj. Croatian Railways manages the parallel Zagreb commuter rail system. The city’s demand is served by the Zagreb Airport, which brings more than 2,000,000 passengers per year.

Transport in Zagreb is a complex system, which consists of all forms of transport. Communication network in Zagreb is made up as a radial-circular system. Transport in Zagreb, relies on a combination of city-managed public transport and individual transportation. Due to the shape of the city, most of the trips done in the city are east-west. Public transport is managed by the company Zagrebački električni tramvaj (ZET), part of the Zagreb Holding, a city company managing utilities and other city services. ZET’s trams used to span the entire city, but due to only two expansions (the Dubec and Prečko routes) in the last 20 years during which time the city grew extensively, trams today are confined to the inner city circle. However, a bus network supplements the tram and services a large part of the Zagreb metropolitan area even outside the borders of the city. Other transport means are also available, such as the Sljeme cable car (closed for re-construction since 2007) or the Zagreb Funicular.

Existing traffic picture outlines network of highways which ends at Zagreb detour, highway route from Karlovac (southwest) gathers traffic from highway A1 Split – Zagreb and A6 Rijeka – Zagreb, route from Varaždin (north) gathers traffic from highway A4, A2 from Krapina, A3 from Bregana and fast road Zagreb – Velika Gorica (south) where new A10 highspeed road is being built from the direction of Sisak.

In railway traffic most important tracks are Botovo – Zagreb - Rijeka (corridor Vb) and track Savski Marof - Zagreb - Vinkovci - Tovarnik (Corridor X).

Track Botovo - Zagreb – Rijeka is important railway route because it connects central part of Croatia with regions Gorski kotar and North Coast, but also connects european regional integrations like Alps - Adriatic Sea and Mediterranean - Danube region.

The existing track from Botovo which is placed between Hungary and Croatia, through cities Koprivnica, Križevci and Vrbovec reaches to Dugo Selo on east part of Zagreb city. The track from Rijeka and Karlovac on southwest entrance to Zagreb with its elements and capacity for long time now don’t satisfy demand of contemporary passenger and cargo
transport. Railway network in the city area complements directions from Slovenia and Slavonija region (corridor X) and from direction of cities Krapina and Varaždin.

2 Description of transportation services provided in the hub and legal background

2.1 ZET Transportation system

Zagreb Municipal Transit System or ZET (Zagrebački Električni Tramvaj) is a branch of Zagreb Holding, specialized for passenger transportation in the city of Zagreb and one part of Zagreb County. It uses buses, trams and cable car to organize a transportation of passengers and also provides special transportation to people with disabilities. It is exclusively owned by the city of Zagreb and it is mainly financed through its budget.

ZET, aside from its primary function, passenger transportation, in more than one century of its existence, greatly influenced the development of Zagreb, and this influence continues to grow by covering important day routes people take in Zagreb and suburban areas with its extensive tram and bus system. However, ZET continues to follow the city development and connects many newly built districts, and together with the City District Councils adapts the routes and stations to address the needs of citizens.

Thanks to financial support of the City and citizens of Zagreb many projects came through in the last couple of years which contributed to substantial progress in the development of public transportation system. So far, 70 new, modern, low-floor trams were purchased in 2008 and 214 low-floor buses were acquired during 2009.

The radio connection system is modernized and traffic monitoring and control are also computerized by introducing vehicle location system. The infrastructure for 147 displays is set up on tram and bus stations, on which passengers are able to receive real-time arrival information.

Since July 2007 ZET service users can buy a ticket by using mobile phones (sending SMS). A project of electronic ticketing introduced smart cards.

Realization of all projects that ZET and the City of Zagreb have, when it comes to quality of public transportation service, should not only meet but also surpass European standards.

- Bus system

ZET’s bus transport is confined to Zagreb, Velika Gorica, Zaprešić, and the districts Bistra, Luka, Klinča Sela and Jakovlje, places near Zagreb from which many people travel to Zagreb for work, school etc. ZET runs 132 day lines and 4 night lines. There are 2103 bus stations, 1614 of which are in Zagreb. On work days 284 buses are used on regular bus lines, Saturdays 185, and Sundays and holidays 123 buses.
Every year ZET’s buses transport about 94,000,000 passengers (data from 2008).

The rolling stock consists of MAN, Mercedes Benz and Iveco-Irisbus buses placed in bus depots Podsused, Dubrava and Velika Gorica. New vehicles are mostly low-floor ones, which enable the usage of public transport for all users. In the years 2008 and 2009 ZET purchased 214 new low-floors buses - articulated and solo.

The city government decided that ZET should take over transportation of school children which was put into practice on the 3rd of September 2007. For this purpose ZET acquired 23 new MAN school buses and 2 minibuses, completely equipped for their transportation.

In the year 2007 ZET started to use biodiesel and from 2009 CNG. According to development plans, buses are going to use only bio fuels in the next couple of years which is Zagreb transit system’s contribution to pollution reduction and elimination of harmful substances produced by fossil fuels.

Other transport operators (bus carriers) in the hub are:

- Samoborček d.o.o. (www.samoborcek.hr)
- Meštrović prijevoz d.o.o. (www.mpz.hr)
- Darojković promet d.o.o. (www.darojkovicpromet.hr)
- Presečki d.o.o. (www.presecki.hr)
- Čazmatrans Nova d.o.o. (www.cazmatrans.hr)
- others

They placed their routes to connect suburban areas with Zagreb city terminals.

Timetable for each individual operator is different and information is provided on their web site.

- Tram system

Tram service is basic type of public transport in Zagreb. Regular tram transport includes 116,346 meter long tracks, 193 lead cars and 41 trailers. 15 day lines run during the day on 148 km long tracks and 4 night lines on 57 km long tracks. The city has 164 switches for rerouting of traffic and 256 tram stations. Trams in Zagreb transport 204,000,000 passengers a year. (Data from 2008)

Trams are garaged in two tram depots. Depot in Trešnjevka consists of 9213.11m long tracks, 28 of which are used for parking, and 87 switches. Depot in Dubrava has 8500 m long tracks with 30 gauges and 75 switches. This depot deploys 3 types of trams and one type of trailer.

ZET’s development plans for the near future consist of having 4 types of trams in the rolling stock: NT 2200, NT 2200-K, 2100 and modern 301 (KT4).
Funicular for the Upper City (Gornji Grad) is the oldest transportation system of organized public transport in Zagreb. It is one year older than a horse-dragged tram. In comparison to other funicular railways intended for public transport, Zagreb’s 66 meter long funicular is the shortest in the world. Although its participation in public transport is minor, its dimensions (two cars) and spaciousness make it a significant transportation vehicle. It passes 4000 kilometers a year and carries around 750.000 passengers. In more than one century of its existence there was not a single accident, injured passenger, and therefore it is called by far the safest public transportation system, not only in Croatia but also world wide. Since it kept its original appearance and construction, and most of its technical characteristics, the Zagreb funicular is protected as a cultural monument by law.

### 2.2 Air transport

**Zagreb airport**

The purpose of existence, operation and development of Zagreb Airport Ltd. is to meet the requirements of the community, thus fulfilling a significant social role. Zagreb Airport provides safe and regular air transport of people and goods by its modern organization, management and infrastructure, as well as expertise and high professionalism of all its employees.

The connecting role of Zagreb Airport is of vital economic and political significance. Zagreb Airport is connected with the city of Zagreb, with other parts of Croatia, as well as with Europe and rest of the world.

Zagreb Airport is important for social stability on the local level. It constantly realizes planned development aims on the principles of profitability.

Through development of economic activities, compatible with its own operations, Zagreb Airport is also an unavoidable prerequisite for global development, and a driver of air traffic development in the Republic of Croatia.

Considering the geographical position and orientation of Croatia towards European and other integrations, Zagreb Airport follows this integration process with regards to development.
In 1966 a new passenger terminal of 5,000 sqm was built, the runway was extended to 60,000 sqm and modern administrative airport headquarters were built along with control tower for the needs of Regional Air Traffic Control as well as a whole range of other buildings and service facilities.

In 1974 Zagreb Airport was reconstructed. The runway was extended to 3,250 m, the equipment and the radio-navigation units were modernized. Within the frame of the reconstruction a part of passenger terminal was enlarged, the aircraft taxiway was extended and new commercial facilities were opened.

In last couple of years the air transport in/out of Zagreb Airport grew dynamically. New equipment was introduced to operate the existing traffic volume. New airport maintenance buildings were built - a new technical base and a technical warehouse, cargo loaders, mobile baggage loading equipment, etc.

Zagreb is linked to more than 20 largest European cities. A large number of tourists from the European countries and from other continents are landing at Zagreb Airport and continuing their journey to the Adriatic Sea, the Plitvice Lakes, continental part of Croatia and to other attractive regions. The peek of the traffic today exceeds 2 million passengers.

Zagreb Airport finally has a defined long-term development plan, so called Master Plan, up to year 2030. Such plan has become inevitable, since traffic transport grows very fast and Croatia, as a young country, wants to have its safe position in the European traffic net.

Zagreb Airport has 6 ticket offices (Croatia Airlines, Air France, Turkish Airlines, Quatar Airlines, Aeroflot and one for Germanwings and EasyJet only) for transnational traffic.
2.3 Rail transport

In Zagreb hub there are 15 tracks with 192.6 km of total length, 14 stations and 10 stops. Croatian Railways transports 13 million passengers/year, of which 80% is in urban and suburban traffic system.

In the city area there are two significant pan-european corridors (Vb i X). X. corridor: Salzburg – Ljubljana – Zagreb – Beograd – Skoplje – Solun; part of corridor Xa: Graz – Maribor – Krapina - Zagreb and a part of corridor Vb: Budimpešta – Zagreb – Rijeka.

Railway system should ensure full access of cargo and passengers on these corridors and also conduct functions linked to urban and suburban traffic in Zagreb and its surrounding areas. In order for railway traffic system to comply with transport demand, considerable transformation should be made. The term city transportation is used for transport in the area within the hub, and term suburban railway traffic encompass area which gravitates to Zagreb and is on driving distance of 40 to 60 minutes to city centre.

Today’s solution doesn’t comply with new demand and has to be changed and transformed according to new needs. In Zagreb centre there are potential possibilities for uplifting tracks on railway viaducts on the area from Savska Bridge over West Station and main Station to Heinzelova Street. By doing this, center of the city would be free for new possibilities (roads, parking places, commercial purpose etc.)

By building a new technical-passenger station on existing Borongaj station, a new possibility for moving facilities for wagon/coach maintenance from Zagreb main station to Borongaj station would be made.

City counts around 700,000 inhabitants and with a narrow surrounding it approaches one million. Gravity area of city with million inhabitants is starting point for every day trips to work, school and other needs and this demands frequent railway urban and suburban transport as well as a large number of stops and stations.

Existing corridors of railways tracks which go through Zagreb facilitate quality urban and suburban railways which can fit in city’s public transportation system. Existing network of tracks and stations is not entirely adjusted to needs of public urban and suburban rail traffic and therefore it should be modernized.

Local passenger traffic
The most intensive traffic is on longitudinal corridor which goes through the hub (east-west direction) on relation Dugo Selo – Zaprešić (Savski Marof) via Zagreb Main Station. Average is 22-25 000 per day, as for the radial directions to Sisak and Karlovac, the number is 11-12 000/day. We have to mention that on route to Sisak, Velika Gorica city is situated and has over 20 000 passengers who travel by bus and private cars because the railway station is situated very far from the city centre. Similar situation is in Karlovac and because of that railway isn't used in its full capacity.

So far the intensive city traffic was established on longitudinal line through the city which is spread from Savski Marof over Zagreb Main Station to Dugo Selo. Existing lines are:

- Zagreb Main Station – Savski Marof – Sutla 25,5 km
- Zagreb Main Station – Dugo Selo 20,8 km

Zagreb Main Station conducts services on transnational level with 2 ticket offices; information desk; 2 stationary tables with train schedules; 2 tables providing information on temporary changes in train schedules. There are also 9 ticket offices for regional/local domestic transport. Information is available 24/7 on the station, over the phone and on web page.

With 16 electromotor trains, the Zagreb suburban railway mainly covers the eastern and western parts of Zagreb. It mostly operates on the same tracks used for long-distance trains. These trains normally operate every 15 minutes, but reach only a portion of the city’s suburbs.

International routes that connect Zagreb with Vienna, Budapest, Belgrade, Frankfurt, Sarajevo, Zurich, Ljubljana and Munich consist of 22 international trains of which 4 are EC and 18 high speed. Croatian railways, in time table 2012/2013, have 7 17 trains of which 695 trains (10 IC, 22 high speed, 17 fast trains, 538 local trains and 107 which operates from/to Zagreb) are for domestic transport and 22 trains on international level.

It is essential to make long term PSO contracts on offering services on routes with low traffic density and also long term contracts on difference between incomes and expenditures of railway transport (subventions).
3 Investments into mobility and the City’s infrastructure

Development of transport system has been falling behind the growing needs of the city’s mobility. Within the overall investment plans, special attention is being given to mobility requirements of persons with special needs.

- an important investment: extension of Radnička road in eastern part of the City is almost finished, connecting the city with the already completed new bridge (Domovinski most) across Sava and with regional motorways;
- in cooperation with the scientific community, feasibility studies for building a tunnel through the mountain Medvednica (to position Zagreb as the gravity centre of the region to the north as well). This was done for light rail system, two new bridges across Sava and the northern belt road on the slopes of Medvednica;
- Croatian railways already having an important role in the City's public transportation system, will become even more important for the City of Zagreb;
- Together with the Government, the City of Zagreb will enter a project of reconstructing the Zagreb Airport.

**Investments in Zagreb Bus Station**

- New Tourist Information Centre (TIC) has been opened in the premises of Zagreb Terminal. TIC will provide all information about the City of Zagreb, and trained staff will provide high quality and professional service. This new Centre is one of the first similar centres in Croatia, which will hold promotional materials of Croatian National Tourist Board.

**Investments in Zagreb Airport**

- By construction of the most modern infrastructure and implementation of new technologies, within the frame of Master Plan, Zagreb Airport will become regional hub of air traffic in this part of Europe. Zagreb Airport is also establishing the cooperation with companies from Far East and North America by new marketing strategies.
- New passenger terminal, the extension of installed capacities for aircrafts, passengers and cargo handling, technical equipment and integrated quality system of Zagreb Airport all ensure continuity of development.
- Existing conditions of section for lodgment waste from airplane toilets is not satisfactory. Therefore it is necessary to build centralized infrastructure for waste disposal and filling planes with clean water. Financing from state funds is 50%.
- Independent extensions/platforms should be built along with infrastructure for gathering and collecting used deicing fluids. Financing from state funds is 50%.
- Due to enhancement of commercial operations at Zagreb airport it is necessary to make upgrade of existing platforms for aviation and transform it into a platform for commercial aviation. Project documentation is finished and already has building permissions.
• Platform upgrade for commercial aviation. Evaluated cost for upgrading amounts to 2 million Euro. Financial assets planned from EU funds are 80% and from state budget 20%.

**Investments in rail in Zagreb hub**

• By the end of 2014 complete implementation of electronic ticketing is planned and also implementation of new sale channels.
• Modernization of route to Novska in time period of two years.
• Construction of new technical-logistical centre for rail transport.
• By the end of 2016, 150 new motor cars in total vehicle fleet.
• In March this year on Zagreb Main station a new signal infrastructure is planned for implementation and therefore, the Station will be closed for 10 days. Passengers will be transported by buses, and trams in that time period. Construction is planned from 1st till 10th March 2013.
Picture 1: New tracks to be built in Croatia (HŽ Infrastructure plans)
Picture 2_Tracks to be reconstructed in Croatia (HŽ Infrastructure plans)
Tracks to be electrified in Croatia (HŽ Infrastructure plans)
4 Conclusions

- Regarding the size and complexity of the hub system it covers the area of City Zagreb. City Zagreb is responsible for the main bus and tram operator named ZET which gives services for the first zone (inside the City), and also second and third zone (outside the city). Timetable of ZET operator is harmonized with us, the HŽ Passenger Transport, who provides passengers with rail services in local, regional and international routes. Zagreb as a hub is important with his rail services because it is situated on international corridors like X. corridor (track that connects Salzburg – Ljubljana – Zagreb – Beograd – Skoplje – Skopje), then X.a corridor (Graz – Maribor – Krapina – Zagreb) and V.b corridor (Budimpešta – Zagreb – Rijeka). Inside the hub Zagreb there is 15 existing railway tracks with total length of 192,6 km.

- Regarding the Priorities of interventions in relation to hub integrations, hub regional accessibility, hub transnational connectivity we have to mention that informatization instructions and service and giving the in time information is priority.

- Time table harmonization we consider very important, so far we managed to combined timetables of ZET and Passenger transport but not on all routes and not in all cases. Therefore collaboration is needed in future also. Ticketing service in Zagreb Main Station aren’t adjusted with ICT, the international tickets are issued by hand. Modernization and digitalization of ticketing system is in progress.

- The State is in governance of HŽ Passenger Transport and gives financial funds for services and all that is necessary for business activities of Operator. HŽ Passenger Transport also must consult with Ministry of Transport regarding all the investments and future projects.

Present picture of traffic on wider Zagreb city area is very complex.

Upgrading traffic offer (organization, infrastructure) will be done with new highway ring around the hub, with participating urban and suburban railway system in public transport system and make Zagreb recognizable, especially in terms of traffic safety and quality of services which it provides to its users.

Corridor X has a significant meaning for traffic connections of central Europe with SEE countries. For Croatia, Slovenia and Austria this corridor is of exceptional significance because it directly connects Zagreb with Maribor and Graz. By the year 2030 it is planned that this corridor will transport 2 million passengers per year.

Therefore, concept of railway traffic in Zagreb and region is established on next principles and criteria:

- Separating cargo and passenger transport on main corridors which pass through town.
- Separating long distance from public passenger transport on most frequent routes which go through the city center.
- Concentration of maintenance capacities in one location outside the city center.
- Modernization of existing and building new stations in accordance with standards for urban equipment.
• Purchase of new electro motor and diesel motor trains.
• Installing system of remote guidance and contemporary signal devices.
• Implementing ticket sale online, modernize ticketing system, harmonizing time tables with other operators and establishing tariff union.