5. Air quality

5A. Present Situation

Describe the present situation in relation to ambient air quality, including any relevant disadvantages or constraints resulting from historical, geographical and/or socio-economic factors which may have influenced this indicator area. Topographical constraints should also be mentioned where relevant. Where available, information/data should be provided from previous years (5 – 10) to show trends.

Make reference to:
1. Number of days per year on which EU target value for ozone was exceeded (8h mean);
2. Number of days per year on which EU limit values were exceeded for PM\(_{10}\) (daily mean);
3. Annual mean concentration of NO\(_2\), PM\(_{10}\) and PM\(_{2.5}\);
4. Assess the contribution from local sources and from long-range transport for annual mean concentration of NO\(_2\), PM\(_{10}\) and PM\(_{2.5}\).

(max. 1,000 words)

Characteristics of the Ljubljana basin

The Ljubljana basin is characterised by a lack of ventilation, frequent ground-level and elevated inversions and a relatively closed system of local air circulation. More than 60% of weather conditions indicate temperature inversions, when the air is cooler at ground level than in the upper layers of the atmosphere. Cool air at the bottom of the basin does not mix with the rest of the air, and only stronger winds can inject fresh air masses and mix the air in the basin. Ljubljana has a significant heat island (the centre of the city is several degrees warmer than the outskirts). As a result the air from all sides moves towards the city centre, from where it rises to a barrier layer.

For that Ljubljana cannot be compared to certain other better ventilated European cities. We are therefore directing considerable efforts towards the careful planning and implementation of measures to improve the air in the city.

Figure 1: View of the city from a balloon – visible inversion layer – archive photograph from 2006; today this situation occurs significantly less as a result of the implementation of effective measures.

Ljubljana is the centre of the Ljubljana Urban Region (LUR), with a population of more than 500,000, and lies at the crossroads of two important pan-European transport corridors.

The 1980s and 1990s were marked by migrations to the urban periphery, while jobs remained largely concentrated in the city. After Slovenia became independent in 1991, Ljubljana became the destination for a large number of daily commuters. Today more than 130,000 vehicles enter the city from
neighbours municipalities every day, to which must be added a significant number of suburban travel for business, shopping, leisure, etc. Because of its position at the crossroads of pan-European transport corridors V and X, the city is also exposed to additional transit traffic.

Over the last decade Ljubljana has therefore made a clear commitment to sustainable mobility based on public transport, cycling and walking.

Monitoring air quality

The quality of ambient air is monitored by permanent automatic meters at three measuring stations and with periodic measurements in various locations around the city and on its outskirts. Two of the measuring stations operate as part of the national measurement network (Ljubljana Bežigrad, Ljubljana Faculty of Biotechnology). The Ljubljana Bežigrad measuring station is the most representative location for Ljubljana. The second measuring station is in a quiet part of the city (1.5 km away from the Ljubljana bypass and about 400 m from a residential area). The third measuring station (Ljubljana Center) is located next to the city's busiest road and measures air pollution from traffic (traffic type).

In 2012 two representative measuring stations showed values within the permitted limits.

![Measuring stations](image)

**Figure 2:** Measuring stations – Ljubljana Center, Ljubljana Bežigrad and Ljubljana Faculty of Biotechnology

Air quality in Ljubljana

This year Ljubljana marked 45 years of continuous air pollution measurement. Through carefully planned measures in the past, such as the introduction of district heating and gasification, we have completely eliminated SO₂ air pollution, a problem from past decades. In 2013 91,188 or 72.4% of all dwellings were connected to the district heating system.

There are also two large thermal power plants, which, due to effective measures in the past, do not significantly affect air quality. The same applies to other industrial facilities where, because of the requirements of IPPC legislation, all necessary measures have been taken to achieve atmospheric emissions within permitted limits.

The air in the city is significantly better today, but we are faced with a new challenge – air pollution from traffic – which is actually a problem in large cities throughout the world. Our current efforts are therefore focused on strengthening public transport and promoting other environmentally friendly modes of transport, while private motorized traffic is increasingly being directed towards the city’s periphery.
Air quality in accordance with the following indicators:

Table 1: Number of days per year when the EU limit value for ozone was exceeded (8-hour average)

<table>
<thead>
<tr>
<th>Year</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Days</td>
<td>48</td>
<td>42</td>
<td>44</td>
<td>45</td>
<td>42</td>
<td>42</td>
<td>40</td>
<td>41</td>
<td>43</td>
<td>46</td>
</tr>
</tbody>
</table>

Average annual ozone concentrations in recent years do not show significant deviations. Minor fluctuations are the consequence of weather conditions, particularly in summer – the long hot summer in 2003, the rainy summer in 2004, the mild summers and prevailing north-easterly air circulation in 2008–2012.

Table 2: Number of days when PM10 concentrations exceed daily limits

<table>
<thead>
<tr>
<th>Year</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lj. Bežigrad – most representative station</td>
<td>70</td>
<td>47</td>
<td>46</td>
<td>36</td>
<td>30</td>
<td>43</td>
<td>63</td>
<td>27</td>
</tr>
<tr>
<td>Lj. Faculty of Biotechnology</td>
<td>/</td>
<td>/</td>
<td>/</td>
<td>/</td>
<td>25</td>
<td>32</td>
<td>51</td>
<td>21</td>
</tr>
</tbody>
</table>

The number of days of exceedance indicates considerable fluctuations. These are the consequence of weather conditions, in particular long-lasting inversions during the winter, when particles remain in the basin for several days or weeks because of the lack of ventilation. **In 2012 values recorded are within the permitted limits.**

Table 3: Average annual NO₂ concentration

<table>
<thead>
<tr>
<th>Year</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lj. Bežigrad</td>
<td>27</td>
<td>29</td>
<td>28</td>
<td>29</td>
<td>31</td>
<td>35</td>
<td>31</td>
<td>22</td>
</tr>
</tbody>
</table>

High concentrations are recorded in particular during stable weather with temperature inversions in winter, when polluted air remains in the area of transport routes.

Table 4: Average annual PM10 concentration

<table>
<thead>
<tr>
<th>Year</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lj. Bežigrad</td>
<td>37</td>
<td>33</td>
<td>32</td>
<td>30</td>
<td>29</td>
<td>30</td>
<td>32</td>
<td>26</td>
</tr>
<tr>
<td>Lj. Faculty of Biotechnology</td>
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<td>/</td>
<td>/</td>
<td>/</td>
<td>26</td>
<td>27</td>
<td>30</td>
<td>27</td>
</tr>
</tbody>
</table>

Table 5: Average annual PM2.5 concentration

<table>
<thead>
<tr>
<th>Year</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lj. Faculty of Biotechnology</td>
<td>/</td>
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<td>/</td>
<td>/</td>
<td>/</td>
<td>/</td>
<td>24</td>
<td>21</td>
</tr>
</tbody>
</table>

Measurement of PM2.5 in Ljubljana began in 2010 at one station.
Estimated impact of local sources and long-distance transport to average annual concentrations of NO$_2$, PM10 and PM2.5

The impact of individual sources on PM10 particles was determined this year, with the following distribution identified:

- Burning wood – 29%
- Secondary particles – 28%
- Transport – 24%
- Resuspension – 16%
- Undefined source – 3%

Emissions from individual sources depend on the time of the year. In winter the predominant impact is from individual furnaces (because of Ljubljana’s basin position it derives from the wider regional catchment area) in summer the dominant impact is resuspension. In the last two years, as a result of the economic crisis and the increase fossil fuels prices, the use of firewood and waste wood has increased, with a particular impact on PM10 emissions in winter. The contribution from traffic, which is largely locally conditioned, is the same throughout the year. PM10 values are thus only exceeded in winter, which is linked to weather conditions and individual furnaces.

Preliminary reviews indicate that the impact of long-distance transport on PM10 equals the share of 25 – 30%.

Modelling the dispersion of pollutants

Since air quality assessments do not on their own provide complete information about air pollution, this year we’ve begun model-based assessment of the dispersion of pollutants. We’ll study the dispersion of pollutants from an individual source or group of sources of atmospheric emissions both spatially and temporally. The final results will be completed in 2014. Preliminary results are shown in the following figure:
In addition to monitoring air quality at permanent measuring stations, we also carry out other research and measurements.

To monitor the effectiveness of measures we have introduced special measurements of black carbon.

This year we have implemented measurements of black carbon, which exceed standard range of measurements under Directive 2008/50/EC. The advantage of these measurements is that they enable analysis and differentiation of the impact of traffic from other sources of pollution. The instrument for black carbon measuring (aethalometer) only measures primary particles (directly emitted from exhausts into the atmosphere) and not the secondary particles (formed in the atmosphere under the influence of pollution). Black carbon measurements enable us to accurately determine the impact of local pollution – something that standard measurements of particles do not show. This is also a parameter which has a significant closer connection with the effects of polluted air on people’s health. We are currently implementing measurements of black carbon in the area of Slovenska Street (the city’s central backbone) where in September we changed the traffic regime (limiting access for private motorized traffic) and we are measuring the effect of this activity on the quality of air in the city.

5B. Past Performance

Describe the plans and measures implemented over the last five to ten years for the improvement of ambient air quality. Comment on which measures have been most effective.

Particular reference should be given to:

1. Existence and implementation status of an air quality management plan;
2. Local measures taken to improve air quality and quantify their effect on air quality;
3. Information to the public (both inhabitants and tourists) on air quality levels (e.g. web pages, information screens) in order to increase public awareness and behavioural change.
1. Air quality management

Efforts to achieve cleaner air in Ljubljana date back to the 1960s, when the first measuring station began to operate in the city.

In 2007 Ljubljana adopted its Environmental Protection Programme (2007-2013), in which two of the four strategic goals are directly linked to improvement of the air in Ljubljana and its surroundings:

- Ensuring energy efficiency and the use of RES.
- The establishment of a sustainable mobility system, based on effective public transport and the use of other environmentally friendly modes of mobility;

In 2009, we adopted the Operational Programme for the Protection of Ambient Air against PM10 Pollution, which focuses on two sets of measures:

- reducing the impact of individual furnaces;
  - prohibition of the use of solid fuels for heating where a connection to district heating or natural gas network is possible;
- introducing sustainable mobility;
  - improving public transport, promoting clean vehicles, the establishment of ecological zones, etc.

The first set of measures was in greater detail defined in the Sustainable Energy Action Plan (2011–2020), and the second set in the Sustainable Mobility Plan (SMP)(2012–2020).

At the national level, the environment ministry in cooperation with the city, a draft Decree on the Ambient Air Quality Plan for Ljubljana with measures has prepared to be submitted for public consultation this October. The plan includes measures designed above all to reduce PM10 pollution and also provides clear starting points for the functioning of the national Eco Fund, which over the next three years will offer subsidies for the implementation of measures to improve air quality.

2. Local measures to improve air quality

Creation of the ecological zone – a green oasis in the city centre

The city centre was closed to all motor vehicles in 2007 and the ecological zone is being gradually enlarged every year. Today the area covers more than 30 city streets or 91,244 m². Pedestrian areas in the city centre have been increased by almost 620% over the past five years.
We have not only closed the ecological zone to motorized traffic, we have completely renovated it and transformed it into a pedestrian- and cyclist-friendly area.

Figure 4: The city centre before and after the creation of the ecological zone. Black carbon values are significantly lower in the ecological zone, and noise is down by 6 dB. Citizens are also very satisfied with the measure; almost 30% of them ranked the closure of the area to traffic as the most significant innovation in the city (Ninamedia, 2013).
Figure 5: We have refurbished riverbanks of the Ljubljanica river and built five new bridges to connect both sides of the river and to shorten the distances in the city center. This has created a high-quality public space enabling full accessibility and shorter routes for pedestrian and cyclists. Transport within the zone is provided by Kavajki electric vehicles. Two special taxis adapted to carry disabled passengers are also allowed to enter the zone. We have created 100 parking spaces for motorcycles at the entrances to the zone. The »Refurbishment of the Banks and Bridges of the River Ljubljanica« project - part of the ecological zone - was chosen from among 347 projects from 36 European countries for the main European Prize for Urban Public Space 2012.
We modified the traffic regime in September 2013, limiting transit motorized traffic along Slovenska Street and giving priority to public transport, cyclists and pedestrians.

Figure 6: Traffic regime modification on Slovenska street. Two traffic lanes are being replaced by widened pavements with cycle paths on either side of the road. The new layout of Slovenska street will be enhanced by an avenue of trees, giving it an additional green character and at the same time directly connecting the city centre to the Tivoli, Rožnik and Šišenski hrib Landscape Park. Project will be completed in 2014. Value of the project: € 3.000.000.
Comprehensive regulation of public areas in the city to reduce a private motorized traffic.

- Completion of the inner ring road
To reduce traffic on streets near the ecological zone, in 2012 we completed the inner ring road with the construction of a new two-level bridge, enabling better traffic flow. City buses have also been redirected to the ring road (€16,500,000).

- Removing private cars to underground car parks

Figure 7: The main city centre car park has been replaced by a pedestrian area and event space for major civic and national events, while parking is now available in a new underground car park. Similar arrangements are being made in other areas up until now used for car parking.

- Introduction of yellow lanes reserved for public transport on main entry roads
- Regulation of junctions—priority for pedestrians and cyclists
- Reorganisation of roads into one-way traffic zones and 30 km/h zones
- Round-trip service with Kavalir electric minibus

Figure 8: With the modification of the traffic regime on Slovenska street, an electric minibus round-trip service was introduced in the area, with a frequency of 10 to 15 minutes. During the winter the electric minibus will also be available on call. Use of the minibus is free of charge.

We are improving public transport every year.
With the Urbana smart card we’ve introduced a modern electronic payment system that allows free transfers within 90 minutes of payment for the first ride.

Figure 9: The Urbana electronic city card - for easier, faster and more flexible payment and use of public transport. Urbana can also be used to pay for other city services - the bicike(LJ) bikesharing system, car parking, the funicular railway to Ljubljana Castle, library services, P+R system, etc.

Greening the city’s public transport fleet

We are gradually acquiring new buses with PM10 content that is as low as possible. Twenty vehicles running on compressed natural gas (methane) are currently operating in the city. In 2011 the first large public CNG filling station in Slovenia opened in the city.

Slika 10: By 2017 a further 80 methane-powered buses (€29 million) will have joined the vehicle fleet, leading to a reduction of PM10 emissions by more than 20 tonnes a year.

Other measures:

- Optimisation of public transport routes and connection with routes with suburban municipalities;
- In 2010 we set up bus arrival displays at bus stops and developed an IT tool for the reliable forecast of arrivals;
- We have introduced a free "transport on demand" services for public transport passengers with disabilities, which includes transport by low-floor buses between selected stops;
- Public transport users can also plan their routes using the Google Transit online route planner;
- We have set up a website called “Let’s Go”, a guide to the cycling, hiking and running trails in the Ljubljana urban area (City of Ljubljana + 16 municipalities);
- We’ve established information points for quality mobility called MOB-i-LNICE;
- We are introducing a priority system for buses at junctions.
Gradual establishment of P&R systems within the context of regulation of public transport in the region.

In 2011 we established the Bicike(LJ) 24-hour bikesharing system, with 33 stations and 308 bicycles.

Figure 11: The project brings together the 16 municipalities of the LUR and is financially supported by the EU. A further 23 locations are planned, eight of them in the City of Ljubljana. The financial perspectives for 2007–2013 envisage the construction of seven P&R locations. There are currently four P&R locations in the region (marked in red), three of them in the City of Ljubljana. The inset shows the locations in the City of Ljubljana.

Integrated approach to promoting cycling in the city

In 2011 we established the Bicike(LJ) 24-hour bikesharing system, with 33 stations and 308 bicycles.
• Creation of cycling infrastructure – Expansion of areas dedicated to cyclists. Between 2006 and 2013 we created 42 km of new cycle lanes and added 837 additional bicycle racks, 127 of them in the last year. There are currently 190 km of cycle lanes and 9,000 bicycle racks in Ljubljana, and cycling is experiencing significant growth.

Assessment of impact of measures on air quality

<table>
<thead>
<tr>
<th>CO / SO₂ / PM10 / NO₂</th>
<th>2003</th>
<th>2012</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO (mg/m³) – average annual (Ljubljana Bežigrad)</td>
<td>0.9</td>
<td>0.5</td>
<td>-44%. decrease</td>
</tr>
<tr>
<td>SO₂ (µg/m³) - max. daily (Ljubljana Bežigrad)</td>
<td>59</td>
<td>25</td>
<td>-58%. decrease</td>
</tr>
<tr>
<td>PM10 (µg/m³) – average annual (Ljubljana Bežigrad)</td>
<td>46</td>
<td>26</td>
<td>-44%. decrease</td>
</tr>
<tr>
<td>NO₂ (µg/m³) - povprečna letna (Ljubljana Bežigrad)</td>
<td>32</td>
<td>22</td>
<td>-31%. decrease</td>
</tr>
</tbody>
</table>

3. Active informing the public about air quality

Daily updated online information about current air quality in the city from all three measuring stations is available to the public on the website:


and on the website of the Ministry of Agriculture and the Environment:


We also inform citizens about air quality in the Ljubljana magazine and other publications and at
regular meetings of neighbourhood communities, and we carry out many other educational activities such as exhibitions at events, etc. The "Ljubljana, smart city" project, which serves to inform, educate and actively involve citizens, includes numerous activities (exhibitions, prize competitions, surveys, etc.). This year we actively participated in the 12th European Mobility Week.

Figure 13: Transparent and continuous access to data on emissions into the environment from TE-TOL, the largest producer of combined heat and power in Slovenia, is also available from TE-TOL's innovative mobile portal. World Summit Award selected the TE-TOL mobile portal and thus Slovenia as one of the five best examples in the world in the area of mobile environmental content in 2010. In 2013, the mobile portal TE-TOL became a national winner and the representative of Slovenia in the global initiative for the Energy Globe Award.

In 2013 we additionally created an air quality index which is available to the public online.
# Data for City of Ljubljana

**Type of data:** hourly values

**As at:** 08.03.2013

## Tivolska-Vošnjakova – 08.03.2013 – hourly values

<table>
<thead>
<tr>
<th>Time</th>
<th>Index SO2</th>
<th>Index NO2</th>
<th>Index PM10v</th>
</tr>
</thead>
<tbody>
<tr>
<td>24:00</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>1:00</td>
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<td>23:00</td>
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</tbody>
</table>

## Pollution index:

- low
- medium
- high
- very high

More on pollution indices...
5C. Future Plans

Describe the short and long term objectives for the future, proposed plans and the proposed approach and measures for their achievement. Quantify the effects of proposed measures on air quality.

Emphasise to what extent plans are supported by commitments, budget allocations, and monitoring and performance evaluation schemes.

(max. 800 words)

To improve air quality, measures will be implemented in the coming years above all in the fields of sustainable mobility and energy, in accordance with:

- Sustainable Mobility Plan (2012–2020)
- Air Quality Plan for the Ljubljana Urban Agglomeration – reduction of PM10 (currently in the draft phase).

Regulation of transit motorized traffic through Ljubljana is the responsibility of the State, as is regulation of traffic on the bypass and some sections of entry roads leading into the city. Here, our efforts are oriented above all towards constructive dialogue with the State.

**Sustainable Mobility Plan 2012–2020**

The objective is to replace the use of cars with efficient and comfortable public transport and other forms of non-motorised mobility. By 2020, we will have redistributed the shares of selected means of transport as shown in the table below:

<table>
<thead>
<tr>
<th>LEVELS OF HEALTH RISK</th>
<th>INDEX</th>
<th>EXPLANATION OF LEVELS OF HEALTH RISK</th>
</tr>
</thead>
<tbody>
<tr>
<td>NEGLIGIBLE</td>
<td>1, 2, 3</td>
<td>Atmospheric pollution is negligible. Small likelihood of health impacts in susceptible subjects.</td>
</tr>
<tr>
<td>LOW</td>
<td>4, 5, 6</td>
<td>Mild effect, small likelihood of action required. Risk is greater for susceptible individuals.</td>
</tr>
<tr>
<td>MEDIUM</td>
<td>7, 8, 9</td>
<td>Susceptible individuals perceive poorer air quality. At this level of pollution, measures need to be adopted to reduce pollution. Outdoor exercise not recommended in areas with an increased level of pollution. Asthmatics note additional or increased breathing difficulty when using inhaler.</td>
</tr>
<tr>
<td>HIGH</td>
<td>10</td>
<td>The level of pollution is so high that it represents a risk to susceptible subjects.</td>
</tr>
</tbody>
</table>

Figure 14: Air quality index – on the basis of measurements of three pollutants (SO2, NO2 and PM10) at several points which have been continuously monitored for several years. The index helps define the limits at which potential health impacts can occur, particularly in more susceptible subjects such as asthmatics and cardiovascular disease sufferers. The health risk levels (low, medium, high, very high) are the result of monitoring the incidence of illness in a sample that included more than 30 million people across 26 European countries.
Sustainable mobility measures to 2015:

**Promoting walking:**
- Expansion of the network of city centre routes where pedestrians have priority;
- In residential areas we will continue to create new squares and parks and rearrange access roads according to the shared space principle;
- We’ll continue with the creation of safe routes.

**Promoting cycling:**
- We’ll increase bicycle use for transport to work by 40%;
- We’ll increase bicycle use among students by 50%.

**Promoting the use of public passenger transport:**
- We’ll increase the use of buses and trains by commuters by 50%;
- We’ll increase shopping in the city centre by 30%;
- We’ll increase the number of visitors using public transport to attend major events by 50%.

**Reducing car use:**
- Differentiated parking policy measures;
- We’ll draw up mobility plans for at least 10 biggest employers;
- On the three main roads into the city, we’ll guarantee faster journey times for city buses at rush hours.

Operational implementation of sustainable mobility will be realised through the annual budget of the City of Ljubljana. Funds for 2014 are estimated at €24,800,000.

**Electromobility strategy (2013)**

We’ve highlighted 10 measures for developing electromobility. Over the next three years we’ll carry out a number of pilot projects to promote electromobility, while the majority of measures are aimed at establishing adequate infrastructure.

**City cycling strategy to 2020**

- Further development of cycling infrastructure;
- Expansion of the Bicike(LJ) system – to major shopping centres on the city outskirts and the bypass.

**Navigability of the Ljublanica river – development of river transport**

Expert Guidelines for navigability of the Ljublanica has been prepared, and will be the basis for the development of river transport in the future.

**Further expansion of the ecological zone**

In 2013 and 2014 we will focus on remodelling the area along one section of Slovenska street, where a...
modified traffic regime was introduced in September this year. Between now and January 2014 we will monitor the effects of the new traffic regime and record the responses of the public and enhance the area with temporary installations – greenery in troughs, pocket parks; construction work will be completed in 2014 (€3,000,000).

**Half of the city’s buses will be powered by methane by 2017**, and electric vehicles and methane-powered vehicles will gradually replace the entire fleets of public companies.

**In 2014 we’ll renovate the City Administration’s vehicle fleet – we’ll use 45 methane/CNG-powered vehicles (estimated value €1,500,000).**

**We’ll construct new P&R systems**: the LUR P&R hubs project is financially supported by EU funds. A further 23 locations are planned, eight of them in the City of Ljubljana (estimated value €48.000.000).

**Ljubljana Passenger Centre**
Construction of a new intermodal hub. The aim is to increase public transport use in Ljubljana.

**Other measures and sustainable mobility objectives at the level of the Ljubljana Urban Region**

Because we know that measures at the city level will not suffice to achieve our ambitious goals, we’ve established active connections with municipalities within the region and prepared **Expert Guidelines for the Regulation of Public Transport in the Region**. We have highlighted six key projects:
- creation of 38 intermodal transfer points within the LUR (by 2017);
- establishment of modern high-speed public transport routes (by 2020);
- modernisation of railway infrastructure (by 2026);
- design and implementation of additional connections for cyclists and pedestrians (by 2020);
- promotion of public transport.

**Efficient energy use**

Measures in the energy sector are defined in the **SEAP** (up to 2020). The main emphasis in the field of transport is on the introduction of electromobility:
- Provision of 1,400 charging stations for electric vehicles (€2,000,000);
- Installation of CNG filling stations for private cars (€1,300,000).

Objectives by 2020 in the field of the supply energy for heating:
- expansion of the district heating and natural gas;
- connection of 10,000 individual furnaces burning extra light fuel oil to the gas network;
- connection of 1,000 individual furnaces burning extra light fuel oil to the district heating system.

If measures are not sufficient to achieve the set objectives, we’ll introduce congestion charge for vehicles entering the city (€5,000,000).

**5D. References**

List supporting documentation, adding links where possible. Further detail may be requested during the clarification phase. Documentation should not be forwarded at this stage.

(max. 400 words)
Air quality report for 2012:
http://www.arso.gov.si/zrak/kakovost%20zraka/poro%c4%8dila%20in%20publikacije/KAKOVOST%20ZRAKA%202012.pdf

Online information on air quality in Ljubljana:

Index of air quality in Ljubljana:
http://www.okolje.info/?link=dbViewOmsValue&option=com_content&Itemid=181

Ready for tomorrow - Environmental protection programme for the City of Ljubljana (2007–2013):

The transport policy of the City of Ljubljana was adopted at the session of the City Council of the City of Ljubljana on 24 September 2012: http://www.ljubljana.si/si/mol/mestna-uprava/oddelki/gospodarske-dejavnosti-promet/

In 2010, in conjunction with the Regional Development Agency of the Ljubljana Urban Region, we prepared expert guidelines for the regulation of public transport in the region: http://www.rralur.si/fileadmin/user_upload/projekti/Promet/PozivBrosura/JPP_brochure_ang.pdf

Operational programme for the protection of ambient air from PM10 air pollution:

Measures for sustainable mobility in Ljubljana are presented on the website of the CIVITAS Elan initiative for cleaner and better transport in cities: http://www.civitas.eu/index.php?id=66&sel%20menu=35&city%20id=87

Information on the Bicike(LJ) bikesharing system: http://en.bicikelj.si/

The Let’s Go website to promote environmentally friendly modes of transport such as walking and cycling: http://www.gremonapot.si/


Vision of Ljubljana 2025, including 93 major city projects:

Ljubljana, smart city:
http://www.ljubljanapametnomesto.si/

Promotional film about the Kavalir – citizens and visitors can use two electric vehicles free of charge within the city environmental zone:

Exhibition dedicated to the 40th anniversary of air quality measurement in Ljubljana:
http://www.lukatarina.net/Vdihni_Ljubljano/vdihni_ljubljano_razstava.htm

The mobile portal of Termoelektrarna-Toplarna Ljubljana, allowing permanent access to information on current production and emission of substances into the air:
Activities during this year's European Sustainable Mobility Week – Clean air – it’s your move!:  

Cyclists on the bridges of sustainable mobility:  

Urban Master Plan – Strategic Plan and Implementing Plan 2011–2027:  
[https://urbanizem.ljubljana.si/index3/](https://urbanizem.ljubljana.si/index3/)

Website for electric vehicle users:  

Civitas Elan:  

European Prize for Urban Public Space 2012:  

Urbana smart card:  
[http://www.jhl.si/en/lpp/?m=51&k=1636](http://www.jhl.si/en/lpp/?m=51&k=1636)

Access City Award 2012:  

Mobile Ljubljana brochure:  

Ljubljana Passenger Centre:  
[http://ljubljanski.projekti.si/potniski-center-ljubljana.aspx](http://ljubljanski.projekti.si/potniski-center-ljubljana.aspx)

Euro test – City Cards:  

Urbana tourist card:  

Ljubljana and the CHAMP project:  
[http://www.champ-cycling.eu/en/The-Champs/Ljubljana/English/Ljubljana-local-UK](http://www.champ-cycling.eu/en/The-Champs/Ljubljana/English/Ljubljana-local-UK)