SECOND TRACK OF THE DIVAČA – KOPER RAILWAY
Baltic-Adriatic corridor and Mediterranean corridor
In 2012, 17.9 million tonnes of goods were transported to the Port of Koper, of which 10.4 million tonnes was transported by rail. This is a 5% increase compared to 2011.

The adopted national spatial plan for the Port of Koper envisages expansion to a capacity of 35-40 million tonnes.
# Technical elements of the existing railway

**Characteristics of the existing track:**
- constructed in 1968
- length 45 km
- slope 24 %
- speed 70 – 80 km/h

**Measures for the modernisation of the existing track**

- Existing line
- Existing stations
- Reconstruction of the station
  - Existing electrical power stations
  - Increase of installation power and implementation of remote control
  - New electrical power stations
- Measures on the catenary

**Source:** Expert task – Additional measures for increasing capacity of the Divača – Koper railway
Current situation

Cargo capacity

<table>
<thead>
<tr>
<th>In 2012</th>
<th>t/year</th>
</tr>
</thead>
<tbody>
<tr>
<td>net</td>
<td>10.38</td>
</tr>
<tr>
<td>gross</td>
<td>20.59</td>
</tr>
<tr>
<td>net/train</td>
<td>436.25</td>
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<tr>
<td>capacity</td>
<td>14.20</td>
</tr>
<tr>
<td>difference</td>
<td>3.82</td>
</tr>
<tr>
<td>utilisation rate</td>
<td>0.73</td>
</tr>
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</table>

Transport capacity

<table>
<thead>
<tr>
<th>In 2012</th>
<th>train/day</th>
</tr>
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<tbody>
<tr>
<td>passenger</td>
<td>10</td>
</tr>
<tr>
<td>locomotive</td>
<td>7</td>
</tr>
<tr>
<td>cargo</td>
<td>66</td>
</tr>
<tr>
<td>TOTAL</td>
<td>83</td>
</tr>
<tr>
<td>capacity*</td>
<td>82</td>
</tr>
<tr>
<td>difference</td>
<td>-1</td>
</tr>
<tr>
<td>utilisation rate</td>
<td>1.01</td>
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</tbody>
</table>

The existing track runs through the first water protection area – water source Rižana, which supplies the entire coastal region with water.

- insufficient capacity for development needs of the Port of Koper
- low maximum running speed
- loss of altitude in course of the existing track
- high maximum longitudinal slope
- poor load capacity of the lower part of the track (poor load capacity of soil, landslides)
- high operational and maintenance costs
- high risk of environmental accidents with severe consequences (fires, spillage of hazardous liquids etc.)
- high risk of longer traffic interruptions because of damage to the track or environmental accidents

Source: Statistical review of traffic volume in the Port of Koper and on the motorway and railway between Divača and Koper
Objectives:

The purpose of the project is to ensure an up-to-date and high-capacity connection between the Port of Koper and the railway network in Slovenia and the wider European railway network in order to:

- secure further development of the Port of Koper;
- increase cargo and transport capacity of the railway track from Koper to the junction in Divača;
- increasing reliability of operation of the railway track from Koper to Divača;
- improving exploitation characteristics and consequently reducing costs of operation of the railway track from Koper to Divača;
- increasing the level of transport safety;
- reducing driving times;
- reducing environmental impact and reducing environmental risks;
- redirecting cargo from the roads to railway;
- enabling and increasing the use of a more environmentally-friendly form of transport;
- boosting competitiveness of the economy;
- improving Slovenia’s efficiency for inclusion in modern transport links in the EU.
Studying and evaluating variants

1996  Feasibility study: Increasing the capacity of the single track railway line Divača – Koper

Main conclusion of the study:

"It is not possible to manage the projected traffic and create capacity reserves on the railway needed for the positive development of the Port of Koper only with technological reorganisation of the existing railway and with works on the existing infrastructure. Only the construction of a second track is a sustainable solution for the capacity problem."

Three groups of variants of the course of the new track are presented in the study as part of a discussion on the construction of the new track:

- fully parallel course of the second track along the existing track,
- partly parallel course and partly new course,
- completely new course of the track, which makes it two single-track railway lines.
First round of evaluation of variants

Assessed as the most favourable one was variant 4 with 47.8 km of railway, while in the optimisation procedure variant 4.1 was made with 51 km of railway. This variant was somewhat longer, but it represented a more favourable investment.

Source: Comparative study of variants from 1999
Assessment of the variant selected by the Nature Protection Office

Due to the high concentration of natural assets and protected areas of ecological importance through which the railway would run, variant 4.1 is unacceptable from the aspect of environmental protection.

The Karst Edge is envisaged to be protected in full as a national park as part of the Kras Regional Park, while variant 4.1 crosses it two times along its entire length, which would mean degradation of the environment and natural assets.

Source: Comparative study of variants from 1999
The project was continued with studying of other possible tunnel routes, after which variant I/2 was designed, which represented a new course with tunnels.

On the basis of guidelines and taking into account opinions from public presentations and discussions on variant I/2, a modified variant I/3 was designed, which was endorsed by all local communities and relevant ministries.

Source: Technical bases for the site plan of the second track of the Divača - Koper railway for variant M/2
Basic information about the 2nd track Divača - Koper

Characteristics of the new track:
• length 27.1 km
• max. longitudinal slope 17 %
• max. speed 160 km/h
• clearance GC
• load 255 KN/axle or 80KN/m (cat. D4)
• tracks 60 E1, mostly slab track
• electrified 3 kV DC
• telecommunication system ERTMS/ETCS level 2

Course of the second track of Divača – Koper railway

Tunnels:
- T1, 6,714 m
- T2, 6,017 m
- T3, 330 m
- T4, 1,954 m
- T5, 128 m
- T6, 358 m
- T7, 1,163 m

Viaducts:
- V1 - Gabrovica, 452 m
- V2 – Vinjan, 647 m
- Train formation track, cca. 1.2 km

Glinščica I bridge, 74 m
Glinščica gallery, 41 m
Glinščica II bridge, 104 m

Source: Project documentation for acquisition of building permit for the second track Divača - Koper
### Basic elements of the second track and capacity

<table>
<thead>
<tr>
<th></th>
<th>27.101 km</th>
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<th>8</th>
<th>20.472 km</th>
<th>78.54%</th>
<th>6,714 m</th>
<th>2</th>
<th>1,099 m</th>
<th>647 m</th>
<th>3</th>
<th>205 m</th>
<th>104 m</th>
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<tbody>
<tr>
<td>course length:</td>
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<tr>
<td>$V_{\text{max}}$:</td>
<td></td>
<td>to 160 km/h</td>
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<tr>
<td>$R_{\text{min}}$ (v = 160 km/h):</td>
<td>1,404.3 m</td>
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<tr>
<td>$R_{\text{min}}$:</td>
<td></td>
<td>600 m</td>
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<tr>
<td>$i_{\text{max}}$ – rail inclination:</td>
<td></td>
<td>17 %</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Capacity</th>
<th>Without investment</th>
<th>With investment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Existing track</td>
<td>Modernised existing track</td>
</tr>
<tr>
<td>Transport</td>
<td>72 (82)* trains a day</td>
<td>102 trains a day</td>
</tr>
<tr>
<td>Cargo</td>
<td>9.2 (14.26)* million net tonnes a year</td>
<td>14.2 million net tonnes a year</td>
</tr>
</tbody>
</table>

* Numbers in brackets refer to projections after modernisation of the existing track
Longitudinal section

Source: PGD project documentation for the second track of Divača – Koper railway
Cross section of long tunnels with a service tube

**Main tunnel tube:**
- min. horizontal clearance: 5.00 m + 2 corridors 0.75 m each
- min. vertical clearance: 6.50 m
- excavation profile: 69 m² with drainage, 71 m² without

**Service tunnel tube:**
- min. horizontal clearance: 3.60 m
- min. vertical clearance: 2.50 m
- excavation profile: 40 m² with drainage, 44 m² without

**Distance between centres of the tubes 25.00 m**

Source: Project for acquisition of building permit for tunnel T1
Viadukt Gabrovica

Vir: študije in PGD projekt viadukta Gabrovica
Vinjan Viaduct

Source: studies and project for acquisition of building permit for Vinjan Viaduct
Conclusion

- The existing track Divača – Koper has reached its maximum capacity;
- Modernisation of the existing track prolongs the possibility of development for a few years;
- Risks related to the traffic and operational costs on the existing track are increasing;
- Development of the Port of Koper without the second track is at risk;
- Both projects (expansion and modernisation of the Port of Koper and the second track) are interdependent;
THANK YOU FOR YOUR ATTENTION!