Road Infrastructure in Bosnia and Herzegovina in the Aftermath of the May 2014 Floods

June 2014
Global Aftermath of the May 2014 Floods

- Economic damage
- Material damage
- Environmental damage
- 23 fatalities
- Social damage
Road Infrastructure (km)

<table>
<thead>
<tr>
<th>Category</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motorway</td>
<td>95</td>
</tr>
<tr>
<td>Trunk roads</td>
<td>3,816</td>
</tr>
<tr>
<td>Regional roads</td>
<td>4,815</td>
</tr>
<tr>
<td>Local roads</td>
<td>15,000</td>
</tr>
</tbody>
</table>
Spatial Distribution of Floods
Effects of Floods on Road Infrastructure – Macro Level

- Spatial
- Social
- Economic
- Environmental

Macro level
Effects of Floods on Road Infrastructure – Micro Level

- Landslides below and above the finished road level
- Damages to slopes of embankments and through cuts
- Washing and carrying away of the carriageway
- Damages to bridge structures
- Damages of tunnel concrete linings
- Damages to drainage structure
- Destruction of traffic signs, markings and equipment
Specific Examples

Site:
Nemila, M17, Topčić Polje, Lašva km 3+880

- Landslide from slope 20 meters above the finished road level,
- Earth material constantly falling on the carriageway.
Specific Examples

Site: Kosova, M17, Karuše – Ozimica km 9+050-9+270

- Landslide approx. 300 meters above the finished road level,
- Movement of the entire hill,
- 200 meters of road totally destroyed.
Specific Examples

Site:
Topčić Polje, M17, Topčić Polje – Lašva km 1+600,

- Runoff of large quantities of water,
- Runoff of large quantities of silt,
- Water constantly covering the carriageway,
- Regional road R465 also covered.
Specific Examples

Site:
Priboj – Simin Han km 14+420 – 14+650

- Landslide below and above the finished road level,
- Total destruction of the road base,
- Mined area.
Specific Examples

Site:
M18, Priboj – Simin Han km 11+900 – 12+100

- Landslide below the finished road level,
- Carriageway collapsed,
- Mined area.
Specific Examples

Site:
M18, channel of the Drinjača River, Kladanj – Vlasenica, km 6+500 – 11+500

- Water caused damage to walls and embankment slopes below the finished road level,
- Individual areas,
- Approx. 500 meters in length.
Specific Examples

Site: M1.8, channel of the Drinjača River, Pelagićevo – Srebrenik km 16+210

- Leakage through tunnel lining,
- Tunnel tube deformation,
- Risk of the entire tunnel profile collapsing.
Site: M17, channel of the Bosna River, Karuše – Ozimica, km 16+600 and 15+750

- Damage to the road embankment,
- Erosion of the embankment and narrowing of the bank revetment,
- Risk of the entire road base collapsing.
Specific Examples

Site: M4, Doboj – Orahovica km 11+312

- Damage to the bridge structure,
- Breaking of the abutment,
- Loss of a part of the linear bearing.
Damage estimates to the B&H roads from the May 2014 floods

Damage estimates were made in accordance with the methodology that is used by different EU agencies, UNDP, as well as international financial institutions like World Bank.

<table>
<thead>
<tr>
<th>Category</th>
<th>Length (km)</th>
<th>Damaged roads (km)</th>
<th>Repair estimate costs (EUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motorway</td>
<td>95</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Trunk roads</td>
<td>3,816</td>
<td>82</td>
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<tr>
<td>Local roads</td>
<td>15,000</td>
<td>1000</td>
<td>105.000.000,00</td>
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<tr>
<td>Total</td>
<td>257.000.000,00</td>
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<td></td>
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</tbody>
</table>
• Thanks on your attention!

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