Croatian Motorways Maintenance and Tolling Ltd.
Maintenance Sector
Overview

• The existing motorway network in Croatia is 1,313 km in length and is operated by four companies. Two of these companies, jointly responsible for 1,112 km of the network are state owned.

  The two state owned motorway companies are:

• - Hrvatske Autoceste d.o.o. (HAC) who operate 925,80 km of the network; and

• - Autocesta Rijeka Zagreb d.d. (ARZ) who operate 187,03 km of the network.
MOTORWAYS IN THE REPUBLIC OF CROATIA

Mreža autocesta / Motorway network

Ukupan broj tunela / Total number of tunnels

> 1 KM  > 2 KM  > 5 KM
7  3  3

Ukupna duljina tunela / Total length of tunnels
55,72 KM

Udio tunela u ukupnoj mreži / Portion of tunnels in total network
4,2 %

Najduži tunel / The longest tunnel
Mala Kapela A1
5,8 KM

Broj nezgoda u tunelima / Number of accidents in tunnels
71
3,1 %

Udio nezgoda u tunelima u ukupnom broju nezgoda / Portion of accidents in tunnels in the total accidents
Some key figures
Ownership structure

**Republic of Croatia**
- 100%

**HAC**
- Financing, construction, and management of the Croatian motorways (excluding those managed by ARZ).

**ARZ**
- Financing, construction and management of the Rijeka-Zagreb motorway under a concession agreement.

**HAC-ONC**
- Providing supporting services to HAC and ARZ
- Routine maintenance and toll collection
Total employment

• According to the latest figures total employment in the three project companies is as follows:
  • - HAC-ONC has 2,830 workers, as of 6 May 2016;
  • - HAC has 206 workers, as of the beginning of May 2016; and
  • - ARZ has 39 workers, as of 30 April 2016.
• HAC-ONC thus accounts for 92.1 % of the total employment in the three project companies taken together. HAC represents 6.6 % and ARZ represents 1.3 %.
HAC ONC Employment structure

- Maintenance sector (1,727 workers)
- Tolling sector (942 workers)
- Department for ICT (53 workers)
- Dept. for economy, finance & joint works (40 workers)
- Department for internal control (33 workers)
- Department for procurement (8 workers)
- Department for safety at work (8 workers)
- Management office (6 workers)
- Department for HR and public relations (5 workers)
- Group for quality and standardisation (4 workers)
- Management of the company (4 workers)
HAC ONC Organogram
HAC ONC toll motorway infrastructure

- A1 Bosiljevo - Split - Ravča (389 kilometres)
- A1 Vrgorac - Ploce (11 kilometres)
- A3 Bregana - Zagreb - Lipovac (307 kilometres)
- A4 Zagreb - Goričan (97 kilometres)
- A5 Osijek - Đakovo - Sredanci (56 kilometres)
- A5 Sredanci – Bosnia Herzegovina border (3 kilometres)
- A6 Zagreb Lucko - Rijeka Grobnik (146 kilometres)
- A7 Matulji – Rupa (18 kilometres)
- A10 Bosnia Herzegovina border - Metkovic - Ploce (7.5 kilometres)
- A11 Zagreb - Lekenik (30 kilometres)
# Highway infrastructure in numbers

<table>
<thead>
<tr>
<th>Line item</th>
<th>Description</th>
<th>Unit</th>
<th>Total for HAC ONC</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Highway length</td>
<td>km</td>
<td>1.112,83</td>
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<tr>
<td>2</td>
<td>Pavement surface</td>
<td>m²</td>
<td>28.309.964,00</td>
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<td>3</td>
<td>Number of tunnels</td>
<td>pcs</td>
<td>42</td>
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<tr>
<td>4</td>
<td>Total tunnels length (both tubes)</td>
<td>m'</td>
<td>84.640,00</td>
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<tr>
<td>5</td>
<td>Number of rest area</td>
<td>pcs</td>
<td>76</td>
</tr>
<tr>
<td>6</td>
<td>Number of junctions</td>
<td>pcs</td>
<td>95</td>
</tr>
<tr>
<td>7</td>
<td>Number of long bridges, overpasses, viaducts and other</td>
<td>pcs</td>
<td>48</td>
</tr>
<tr>
<td>8</td>
<td>Number of overpasses in junctions</td>
<td>pcs</td>
<td>95</td>
</tr>
<tr>
<td>9</td>
<td>Number of head toll plazas</td>
<td>pcs</td>
<td>11</td>
</tr>
<tr>
<td>10</td>
<td>Total number of toll plazas</td>
<td>pcs</td>
<td>66</td>
</tr>
<tr>
<td>Highway</td>
<td>Toll plaza</td>
<td>Junction</td>
<td>Rest area facilities</td>
</tr>
<tr>
<td>--------</td>
<td>------------</td>
<td>----------</td>
<td>----------------------</td>
</tr>
<tr>
<td>A1</td>
<td>35</td>
<td>33</td>
<td>33</td>
</tr>
<tr>
<td>A3</td>
<td>17</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td>A4</td>
<td>9</td>
<td>12</td>
<td>4</td>
</tr>
<tr>
<td>A5</td>
<td>4</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>A6</td>
<td>6</td>
<td>8</td>
<td>5</td>
</tr>
<tr>
<td>A7</td>
<td>1</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>A10</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>A11</td>
<td>3</td>
<td>6</td>
<td>0</td>
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<tr>
<td>DC 102</td>
<td>1</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>77</td>
<td>95</td>
<td>76</td>
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</table>
# HAC ONC Equipment

<table>
<thead>
<tr>
<th>Type</th>
<th>Number</th>
<th>Age</th>
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<tbody>
<tr>
<td>Personal vehicles</td>
<td>89</td>
<td></td>
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<tr>
<td>Light vans</td>
<td>52</td>
<td></td>
</tr>
<tr>
<td>Light Trucks</td>
<td>121</td>
<td>1 from 1990s, 28 from 2000-2005</td>
</tr>
<tr>
<td>Box Trucks</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Flatbed trucks</td>
<td>10</td>
<td>4 from 2000-2005</td>
</tr>
<tr>
<td>Tipper trucks</td>
<td>91</td>
<td>19 from 1990s, 24 from 2000-2005</td>
</tr>
<tr>
<td>Crash cushion</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Tunnel Maintenance Vehicle</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>UNIMOG and similar</td>
<td>55</td>
<td>2 from 1980s, 12 from 1990s</td>
</tr>
<tr>
<td>Salt spreader for trucks (demountable)</td>
<td>109</td>
<td>12 from 1990s, 32 from 2000-2005</td>
</tr>
<tr>
<td>Salt spreader for UNIMOG</td>
<td>52</td>
<td>6 from 1990s</td>
</tr>
<tr>
<td>Salt spreader for tractor</td>
<td>16</td>
<td>-</td>
</tr>
<tr>
<td>Snow plough for trucks</td>
<td>159</td>
<td>-</td>
</tr>
<tr>
<td>Snow plough for UNIMOG</td>
<td>69</td>
<td>-</td>
</tr>
<tr>
<td>Snow plough for Tractor</td>
<td>14</td>
<td>-</td>
</tr>
<tr>
<td>Snow blower</td>
<td>11</td>
<td>1 from 1990s, 4 from 2000-2005</td>
</tr>
<tr>
<td>Loader/backhoe</td>
<td>26</td>
<td>2 from 1990s, 13 from 2000-2005</td>
</tr>
<tr>
<td>Mobile lifting platform</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>Water tankers lorry mounted</td>
<td>20</td>
<td>1 from 1990s, 15 from 2000-2005</td>
</tr>
<tr>
<td>Mechanical road sweeper</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>Refuse trucks</td>
<td>19</td>
<td>3 from 1990s, 10 from 2000-2005</td>
</tr>
<tr>
<td>Breakdown/recover trucks</td>
<td>20</td>
<td>10 from 2000-2005</td>
</tr>
</tbody>
</table>

Part of the activities on regular maintenance in 2016.

<table>
<thead>
<tr>
<th>Line item</th>
<th>Activities performed</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Activities in respect to the traffic safety</td>
</tr>
<tr>
<td>1.1</td>
<td>Traffic accident</td>
</tr>
<tr>
<td>1.2</td>
<td>Guardrail replacement</td>
</tr>
<tr>
<td>1.3</td>
<td>Guardrail repair</td>
</tr>
<tr>
<td>1.4</td>
<td>Guardrail installation on official service passes</td>
</tr>
<tr>
<td>1.5</td>
<td>Wire fence replacement</td>
</tr>
<tr>
<td>1.6</td>
<td>Wire fence repair</td>
</tr>
<tr>
<td>2</td>
<td>Activities related to the cleanliness and landscaping</td>
</tr>
<tr>
<td>2.1</td>
<td>Pavement cleaning with machinery</td>
</tr>
<tr>
<td>2.2</td>
<td>Manual pavement cleaning</td>
</tr>
<tr>
<td>2.3</td>
<td>Cleaning the terrain parts</td>
</tr>
<tr>
<td>2.4</td>
<td>Grass cutting with machinery</td>
</tr>
<tr>
<td>2.5</td>
<td>Manual grass cutting</td>
</tr>
<tr>
<td>3</td>
<td>Activities on winter road maintenance service</td>
</tr>
<tr>
<td>3.1</td>
<td>Work hours of own machinery</td>
</tr>
<tr>
<td>3.2</td>
<td>Work hours of leased machinery (40 tipper trucks)</td>
</tr>
<tr>
<td>3.3</td>
<td>NaCl consumption</td>
</tr>
<tr>
<td>3.4</td>
<td>CaCl2 consumption</td>
</tr>
</tbody>
</table>
Consumption comparison of NaCl per sections
Consumption comparison of CaCl$_2$ per sections

![Bar chart showing consumption comparison of CaCl$_2$ per sections for 2016/2017 and 2015/2016. The chart includes sections A1, A3, A4, A5, A6, A7, A11, and D102. The x-axis represents the sections, and the y-axis represents the consumption in tons (t). The bars for 2016/2017 are in blue, and the bars for 2015/2016 are in red.]
Highway network owned by HAC and ARZ is maintained by HAC ONC with 1,705 employees organized in:

- three operational sections with 26 centers for regular maintenance
- fire brigade with six fire stations and four fire substations
- six expert departments
HAC ONC together with HAC and ARZ has made a Standard of regular maintenance of highways in order to achieve

- the highest level of traffic safety
- highest possible level of service
- retention of useful features of buildings
- minimum impact on environment

Regular maintenance standard determines

- methods and frequency for checking the status of all elements of highways
- methods and frequency of works that would retain the required level of functionality of the highway elements
- criteria and parameters for works for periodic maintenance and reconstruction maintenance performance
REGULAR MAINTENANCE STANDARD

- Monitoring and inspections of highways
- Pavement maintenance
- Building (incl. bridges, overpass etc.) maintenance
- Drainage maintenance
- Winter maintenance
- Fire brigades
- Terrain maintenance
- Maintenance of traffic signs, signals and equipment
- Maintenance of electric power facilities, electrical systems, equipment and installations
- Other works
Forming part of the standard is:

- list of regular maintenance works depending on method, frequency and priority
- technology description
- work norms for each line item in work nomenclature
Planning of works

- Works are planned based on the standard works of regular maintenance

- For each centers for regular maintenance, maintenance course and HAC ONC exist

- Annual Plan of Regular Maintenance Works

### Monthly plans of regular maintenance work
Monitoring the performance of regular maintenance work

The monitoring of the execution of works is done in the form of percent (ratio of executed and planned quantities) on a monthly, periodic and annual basis.

<table>
<thead>
<tr>
<th>Šifra Grupe: 1</th>
<th>Šifra</th>
<th>Opis stavke</th>
<th>Jmj</th>
<th>(GR) Planirano za razdoblje</th>
<th>Realizirano za razdoblje</th>
<th>Izvršeno ukupno % (za period)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1.1.1.1</td>
<td>Ophodnja autoceste</td>
<td>h</td>
<td>130.090,00</td>
<td>130.549,60</td>
<td>100,35</td>
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<tr>
<td></td>
<td>1.1.1.2</td>
<td>Dežurstvo ophodarske službe</td>
<td>h</td>
<td>97.529,00</td>
<td>96.930,10</td>
<td>99,39</td>
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<td></td>
<td>1.1.1.3</td>
<td>Intervencija ophodara - uklanjanje posljedica prometnih nesreća i izvanrednih događaja</td>
<td>h</td>
<td>8.174,96</td>
<td>7.826,25</td>
<td>95,73</td>
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<tr>
<td></td>
<td>1.1.2</td>
<td>Redovan pregled stanja autoceste – Odgovorne osobe</td>
<td>h</td>
<td>13.330,00</td>
<td>15.227,50</td>
<td>114,23</td>
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<tr>
<td></td>
<td>1.1.3</td>
<td>Vođenje, kontrola prometa i nadzor pogona tunela</td>
<td>h</td>
<td>237.008,00</td>
<td>236.923,75</td>
<td>99,96</td>
</tr>
<tr>
<td></td>
<td>1.1.4</td>
<td>Fizička zaštita mosta Krk</td>
<td>h</td>
<td>26.352,00</td>
<td>26.352,00</td>
<td>100,00</td>
</tr>
</tbody>
</table>
Other important routine maintenance activities

• Removing damaged and abandoned vehicles and other items from the highway
• Taking measures to protect the highway
• Taking action to ensure safe traffic
• Informing the public about the state and the passage of the highway, exceptional events and meteorological conditions that are important for safe traffic
• Intervention in the event of traffic accidents
• Taking environmental protection measures against the highway
Quality Assurance Policy

- The company has obtained certifications and operates in line with standards ISO 9001, ISO 14001 and OHSAS 18001

- We follow environmental protection regulations

- Our services are adjusted to meet the needs of motorway users

- Health and safety of motorway users is our priority
THANK YOU FOR ATTENTION

April 2017.