The current situation of noise regulation in Japan

Ministry of Land, Infrastructure, Transport and Tourism (MLIT), JAPAN

2017.11
1. EQSs Situation of Road Traffic Noise
2. History of vehicle noise regulation
3. Current vehicle noise regulation
4. Regulation for Replacement Silencers
5. Campaign for exclusion of Illegally Modified Automobiles
6. Challenges about Automobile Noise
7. Summary
1. EQSs Situation of Road Traffic Noise

◆ Environmental Quality Standards (EQSs) for Noise
  - Environmental Quality Standards (EQSs) for Noise are designated as the standards to be maintained for the purpose of human health, in accordance with the Basic Environment Law.

  **General Area**

<table>
<thead>
<tr>
<th>Categories of Area</th>
<th>Standard Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Daytime (6:00-22:00)</td>
</tr>
<tr>
<td>Area AA (where silence is especially required, e.g. hospitals)</td>
<td>50dB or less</td>
</tr>
<tr>
<td>Area A (for residence exclusively), Area B (for residence mainly)</td>
<td>55dB or less</td>
</tr>
<tr>
<td>Area C (for commerce)</td>
<td>60dB or less</td>
</tr>
</tbody>
</table>

  **Road Side Area**

<table>
<thead>
<tr>
<th>Categories of Area</th>
<th>Standard Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Daytime (6:00-22:00)</td>
</tr>
<tr>
<td>Area A facing road with two or more lanes</td>
<td>60dB or less</td>
</tr>
<tr>
<td>Area B facing road with two or more lanes and Area C facing road with one or more lanes</td>
<td>65dB or less</td>
</tr>
</tbody>
</table>

  **Space Adjacent to Road Carrying Arterial Traffic**

<table>
<thead>
<tr>
<th>Standard Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daytime (6:00-22:00)</td>
</tr>
<tr>
<td>70dB or less</td>
</tr>
</tbody>
</table>
1. EQSs Situation of Road Traffic Noise

◆ Situation of Road Traffic Noise

(1) Achievement rate of EQS for Noise

Although it needs to be taken into account the difference of evaluated residences of each year, achievement rate of Environment Quality Standards for Noise is gradually improved.

<table>
<thead>
<tr>
<th>Year</th>
<th>Evaluated Residences</th>
<th>Below EQS both day and night</th>
<th>Below EQS in daytime only</th>
<th>Below EQS in nighttime only</th>
<th>Exceeded EQS both day and night</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY2010</td>
<td>5,758 thousand</td>
<td>5,260 (91.3%)</td>
<td>222 (3.9%)</td>
<td>248 (4.3%)</td>
<td>0.5%</td>
</tr>
<tr>
<td>FY2011</td>
<td>6,116 thousand</td>
<td>5,612 (91.8%)</td>
<td>224 (3.7%)</td>
<td>252 (4.1%)</td>
<td>0.5%</td>
</tr>
<tr>
<td>FY2012</td>
<td>6,645 thousand</td>
<td>6,151 (92.6%)</td>
<td>228 (3.4%)</td>
<td>238 (3.8%)</td>
<td>0.4%</td>
</tr>
<tr>
<td>FY2013</td>
<td>7,209 thousand</td>
<td>6,695 (92.9%)</td>
<td>231 (3.2%)</td>
<td>253 (3.5%)</td>
<td>0.4%</td>
</tr>
<tr>
<td>FY2014</td>
<td>7,794 thousand</td>
<td>7,265 (93.2%)</td>
<td>241 (3.1%)</td>
<td>256 (3.3%)</td>
<td>0.4%</td>
</tr>
<tr>
<td>FY2015</td>
<td>8,185 thousand</td>
<td>7,663 (93.6%)</td>
<td>242 (3.0%)</td>
<td>248 (3.0%)</td>
<td>0.4%</td>
</tr>
</tbody>
</table>

[ ]: Evaluated Residences (within 50m from both edges of road)

Unit: thousand of residences (percentage)
1. EQSs Situation of Road Traffic Noise

- In FY2015, 6.4% of evaluated residences exceed EQSs for noise in any of day or night or both day and night.
- 10.7% of evaluated residences facing trunk roads exceed EQSs for noise in any of day or night or both day and night.

Results of the Achievement of EQSs for Road Traffic Noise (FY 2015)

<table>
<thead>
<tr>
<th>Category</th>
<th>Below EQS both day and night</th>
<th>Below EQS in daytime only</th>
<th>Below EQS in nighttime only</th>
<th>Exceeded EQS both day and night</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number of residences 8,185 thousand</td>
<td>7,663</td>
<td>242</td>
<td>248</td>
<td>33 (0.4)</td>
</tr>
<tr>
<td>Number of residences facing trunk roads 3,450 thousand</td>
<td>3,083</td>
<td>177</td>
<td>171</td>
<td>20 (0.6)</td>
</tr>
<tr>
<td>Number of residences not facing trunk roads 4,734 thousand</td>
<td>4,580</td>
<td>65</td>
<td>77</td>
<td>13 (0.3)</td>
</tr>
</tbody>
</table>

Unit: thousand of residences (percentage)

[ ]: Evaluated Residences (within 50m from both edges of road)
1. EQSs Situation of Road Traffic Noise

◆ Situation of Road Traffic Noise

(2) Number of Complaints Related to Vehicle Noise (Since FY2010)

Number of Complaints Related to Vehicle Noise has been almost unchanged.

Source: Research of the Implementation of Noise Regulation Act by MOE, Japan
2. History of vehicle noise regulation

- **Constant speed test** *(introduced in 1951)*
  - Constant speed test for vehicles of categories M and N was abolished when UN-Regulation No.51 was introduced in Japan.

- **Acceleration test** *(introduced in 1971)*
  - Acceleration test for vehicles of categories M and N was abolished and replaced by 'acceleration test' and 'ASEP' when UN-Regulation No.51 was introduced in October 2016.

- **Stationary test** *(introduced in 1986)*
  - Noise regulation value has been gradually strengthened.

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**Transition of Acceleration noise regulation value on passenger cars**

<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(dB)</td>
<td>84</td>
<td>82</td>
<td>81</td>
<td>78</td>
<td>76</td>
<td>72</td>
<td>70</td>
</tr>
</tbody>
</table>

For UNR No.51 was introduced in Japan.
3. Current vehicle noise regulation

**Scope**  
M and N category

**Outline of the Amendment**

<table>
<thead>
<tr>
<th>Previous regulations in Japan</th>
</tr>
</thead>
<tbody>
<tr>
<td>● Constant speed test</td>
</tr>
<tr>
<td>● Acceleration test</td>
</tr>
<tr>
<td>(Full throttle acceleration)</td>
</tr>
<tr>
<td>● Stationary test</td>
</tr>
<tr>
<td>(Absolute value)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Current regulation in Japan (harmonizing with R51-03)</th>
</tr>
</thead>
<tbody>
<tr>
<td>● Constant speed test is <strong>not applied</strong>.</td>
</tr>
<tr>
<td>● Acceleration test</td>
</tr>
<tr>
<td>(Normal driving condition in urban traffic)</td>
</tr>
<tr>
<td>● Additional Sound Emission Provisions (ASEP)</td>
</tr>
<tr>
<td>● Stationary test</td>
</tr>
<tr>
<td>* New Type Approval Vehicles: <strong>Measurement only</strong></td>
</tr>
<tr>
<td>* In use car: <strong>Relative value</strong></td>
</tr>
<tr>
<td>● Compressed air noise (GVWR &gt;2.8t)</td>
</tr>
</tbody>
</table>

**Date of enforcement**

<table>
<thead>
<tr>
<th></th>
<th>Phase 1</th>
<th>Phase 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Type Approval Vehicles</td>
<td>1 October, 2016 (already introduced)</td>
<td>1 September, 2020 (N2 : 2022)</td>
</tr>
<tr>
<td>(Except the import vehicle)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other than above mentioned</td>
<td>Not applied</td>
<td>1 September, 2022 (N2 : 2023)</td>
</tr>
</tbody>
</table>

※ “GVWR” means technically permissible maximum laden mass.
3. Current vehicle noise regulation

【Regulation value】

(Same as UNR51-03))

Phase 3 will be reviewed if necessary.

Japan does not adopt Phase 3 for the time being.

<table>
<thead>
<tr>
<th>Veh. Cat.</th>
<th>Vehicles used for the carriage of passengers</th>
<th>Phase 1</th>
<th>Phase 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>M1</td>
<td>PMR*1 ≤ 120</td>
<td>72</td>
<td>70</td>
</tr>
<tr>
<td></td>
<td>120 &lt; PMR ≤ 160</td>
<td>73</td>
<td>71</td>
</tr>
<tr>
<td></td>
<td>PMR &gt; 160</td>
<td>75</td>
<td>73</td>
</tr>
<tr>
<td></td>
<td>PMR &gt; 200, no. of seats ≤ 4, H-point height &lt; 450 mm from the ground</td>
<td>78</td>
<td>74</td>
</tr>
<tr>
<td>M2</td>
<td>GVWR*2 ≤ 2.5 t</td>
<td>72</td>
<td>70</td>
</tr>
<tr>
<td></td>
<td>2.5 t &lt; GVWR ≤ 3.5 t</td>
<td>74</td>
<td>72</td>
</tr>
<tr>
<td></td>
<td>GVWR &gt; 3.5 t &lt; Pn*3 ≤ 135 kW</td>
<td>75</td>
<td>73</td>
</tr>
<tr>
<td></td>
<td>GVWR &gt; 3.5 t &lt; Pn &gt; 135 kW</td>
<td>75</td>
<td>74</td>
</tr>
<tr>
<td>M3</td>
<td>Pn ≤ 150 kW</td>
<td>78</td>
<td>74</td>
</tr>
<tr>
<td></td>
<td>150 kW ≤ Pn ≤ 250 kW</td>
<td>78</td>
<td>77</td>
</tr>
<tr>
<td></td>
<td>Pn &gt; 250 kW</td>
<td>80</td>
<td>78</td>
</tr>
<tr>
<td>N1</td>
<td>GVWR ≤ 2.5 t</td>
<td>72</td>
<td>71</td>
</tr>
<tr>
<td></td>
<td>GVWR &gt; 2.5 t</td>
<td>74</td>
<td>73</td>
</tr>
<tr>
<td>N2</td>
<td>Pn ≤ 135 kW</td>
<td>77</td>
<td>75</td>
</tr>
<tr>
<td></td>
<td>Pn &gt; 135 kW</td>
<td>78</td>
<td>76</td>
</tr>
<tr>
<td>N3</td>
<td>Pn ≤ 150 kW</td>
<td>79</td>
<td>77</td>
</tr>
<tr>
<td></td>
<td>150 kW ≤ Pn ≤ 250 kW</td>
<td>81</td>
<td>79</td>
</tr>
<tr>
<td></td>
<td>Pn &gt; 250 kW</td>
<td>82</td>
<td>81</td>
</tr>
</tbody>
</table>

*1 PMR (Power to Mass Ratio) means following formula.
\(<Maximum \text{ output power (kw)} / \text{Mass of a vehicle in running order(kg)}) \times 1000\>

*2 GVWR : Technically permissible maximum laden mass (t)

*3 Pn : Rated Maximum net power (kW)
4. Regulation of Replacement Silencers

- Regulation has requirements of silencers and prohibits illegal modification that has impact on noise.

Requirements based on “The Announcement that Prescribes Details of Safety Regulations for Road Transport Vehicles”

- **When type approval**
  - A silencer shall be no damage nor corrosion
  - A silencer shall be constructed so that the noise reducing mechanism thereof is not removed easily

- **When in-use**

  Adding to above requirements,
  - A whole or a part of the silencer shall not be removed
  - A main body of the silencer shall not be cut off
  - A noise reducing mechanism inside the silencer shall not be removed
  - A silencer mounted on motor vehicles shall prevent acceleration running noise level effectively

→ A silencer shall be checked and marked by certificated organizations.
  
  A silencer which is not checked is clearly prohibited by this marking requirements.
MLIT addresses “Campaign for exclusion of Illegally Modified Automobiles” in June.
In this campaign, MLIT and related organizations execute intensive street inspection.

<Summary of result of FY2016>
1. Street inspection
   • Performed in cooperation with National Police Agency, National Agency for Automobile and Land Transport Technology (NALTEC), Light Motor Vehicle Inspection Organization, and so on.
     Number of inspection: 2,839
     Number of automobiles inspected: 142,426
     Number of order to maintenance: 1,708

2. Raise Awareness Activities to automobile users
   • Publicity by posters and leaflets (about 140,000 posters and about 650,000 leaflets)
   • Publicity by media (newspaper, public relations magazine, TV, web, etc.)
   • Lecturing tour by District Transport Bureau (218 times)
   • Publicity by displaying banners on bus (341 bus companies)
   • Questionnaire survey about recognition of illegal modification (Target 7,500 persons)
6. Challenges about Automobile Noise

(1) Noisy vehicles
   • Issue
     ➢ There are some extremely loud vehicles. On the other hand, almost of the vehicles are not noisy.

   • Idea for Solution
     ➢ Strict test for noisy vehicles, and simple test for silent vehicles.

(2) Noise of out of test range
   • Issue
     ➢ There is possibility of existence of noisy vehicles when speed of the vehicles is out of the range of test, which is under 20 or over 70(80)km/h.

   • Idea for Solution
     ➢ Setting proper speed range of ASEP based on actual driving data
(Reference) Example of Running Situation

Route:
● Road in the city ~ Expressway ~ Road between cities
● Road between cities ~ Expressway ~ Road in the city
(total distance: 83.3km)
Driving time and distance of each speed category

- City Road (mainly)
- Expressway

- Result of 8 surveyed cars
(3) Illegal modification

• Issue
  ➢ Possibility of illegally modified automobiles

• Idea for Solution
  ➢ Continuous crackdown on illegal modification
  ➢ Prohibition of apparently malicious component (intentional illegal device for the purpose of fulfilling the sound requirement to obtain type-approval, for example)
Achievement rate of Environment Quality Standards for Noise is gradually improved in Japan.

As measurements for automobile noise, MLIT executes not only strengthening automobile noise regulation and replacement silencer regulation, but also doing crackdown on illegal modification.

We will continue to do various measurements for further reducing automobile noise.