Situation in Europe

Noise from neighbours is a major problem affecting people’s quality of life

The implications of neighbour noise are adverse effects on:
- Comfort
- Health, cf. WHO (*)
- Conflicts

EU population approx. 500 million people

Rough estimate: Up to about 50 million people exposed to neighbour noise causing adverse effects on quality of life.

Note: The diagram shows data from three “random”, uncoordinated surveys.

(*) WHO (1946) defines health as “a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.”
### Regulatory sound insulation requirements in Europe are different!!

#### Existing situation:

<table>
<thead>
<tr>
<th>Country</th>
<th>Descriptor</th>
<th>Austria</th>
<th>Belgium</th>
<th>Czech Rep.</th>
<th>Denmark</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Airborne</strong></td>
<td></td>
<td>$R''_w$</td>
<td>$R''_w + C$</td>
<td>$R''<em>w + C</em>{50-3150}$</td>
<td>$D_{nT,w}$</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$D_{nT,w}$</td>
<td>$D_{nT,w} + C$</td>
<td>$D_{nT,w} + C_{300-5000}$</td>
<td>$D_{nT,w} + C_{500-1000}$</td>
</tr>
<tr>
<td><strong>Impact</strong></td>
<td>$L''_{nw}$</td>
<td>$L''<em>{nw} + C</em>{100-2500}$</td>
<td>$L''_{nw} + C_i$</td>
<td>$I_{co}$</td>
<td>$I_{back}$</td>
</tr>
<tr>
<td><strong>Recommendations</strong></td>
<td></td>
<td>$&lt; 50$</td>
<td>$&lt; 50$</td>
<td>$&lt; 50$</td>
<td>$&lt; 50$</td>
</tr>
<tr>
<td><strong>Special rules</strong></td>
<td></td>
<td>$&gt; 9$</td>
<td>$&gt; 5$</td>
<td>$&gt; 5$</td>
<td>$&gt; 5$</td>
</tr>
</tbody>
</table>

#### Summary situation in Europe

- Several descriptors applied for both airborne and impact requirements
- Big differences in regulatory requirements, especially for impact sound
- Big differences in classification schemes
- Present descriptors insufficient for light-weight buildings
- Sharing experience about constructions and acoustic performance is inefficient due to diversity of rules, descriptors, requirements, classes
- Trade barriers

---

COST Action TU0901
Integrating and Harmonizing Sound Insulation Aspects in Sustainable Urban Housing Constructions

29 countries:

AT, BE, HR, CZ, DK, EE, FI, MK, FR, DE, GR, HU, IS, IT, LT, MT, NL, NO, PL, PT, RO, RS, SK, SI, ES, SE, CH, TR, UK

Approximately 88 MC & WG members

Institutions in non-COST countries:
RMIT / Australia, NRCC / Canada, Univ. Canterbury / NZ

Main Objectives

- Propose harmonized descriptors for airborne and impact sound insulation
- Propose a European acoustic classification scheme for dwellings

Secondary Objectives

- Include low frequency range adequately
- Prepare a uniform questionnaire on annoyance by neighbours’ noise
- Deduce some kind of correlation between sound insulation and annoyance
- Establish a catalogue of sound insulation data for construction solutions found in the different participating countries
- Produce an on-line compendium on good workmanship practice
COST TU0901 Working Groups

- **WG1: Harmonized sound insulation descriptors and classification schemes in Europe**
  
  **Topics:** Common descriptors, classification schemes, harmonization, rating and prediction methods (ISO and EN standards) for airborne and impact sound insulation of dwellings.

- **WG2: Subjective evaluation of sound insulation - Laboratory tests and harmonized field surveys**
  
  **Topics:** Collection and interpretation of social surveys and psychoacoustic evaluation of neighbour noise: annoyance, health, quality of life, correlation with acoustic comfort.

- **WG3: Design and acoustic performance of building constructions for multi-storey housing**
  
  **Topics:** Collection construction details and insulation data. Create database with traditional and "robust" innovative solutions for new dwellings and improvement of existing dwellings.

### WG1 – Tasks and Time Schedule

- The main goals for WG1 are to propose a new set of harmonized sound insulation descriptors and a uniform classification scheme for dwellings.
- Obstacles encountered (for instance measurement methods, prediction possibilities, implementation) should be addressed at the proper place.

<table>
<thead>
<tr>
<th>WG1 ASPECT</th>
<th>06</th>
<th>12</th>
<th>18</th>
<th>24</th>
<th>30</th>
<th>36</th>
<th>42</th>
<th>48</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>START</strong></td>
<td>11/2009</td>
<td>2010</td>
<td>2011</td>
<td>2012</td>
<td>2013</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Collect and analyze descriptors in use</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Summarize advantages/disadvantages of various descriptors</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Analyze and discuss consequences for measurements and predictions</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Make proposals and present results also 1 ISO/IEC 16717, ISO 140, ISO 16032, EN 12354 etc</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Verify proposals with results W2 and W53, and adjust</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Translate current requirements in requirements for new descriptors (input W53)</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Discuss appropriate classification scheme</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Prepare a proposal for a classification scheme</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Discuss and propose how to involve authorities and industry</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Involve building authorities and industry</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
</tbody>
</table>
WG1 – Argumented proposal for future descriptors

- Collected opinions and comments on various advantages and disadvantages of possible sound descriptors from 28 countries
- Proposal in preparation for best quantity, frequency range and assessment procedure to describe acoustic performance in dwellings

Example: more and more relevant arguments for $D_{nT}$

WG2 – Tasks and Time Schedule

- The main goals for WG2 are related with subjective evaluation of annoyance due to neighboring noise in dwellings. Two different approaches were originally suggested: harmonized survey and performing auralisation and listening tests.
- The main obstacle found is that there is very little existing previous research experience related to auralisation and listening tests, thus changing WG2 final outputs: A draft listening test procedure to be developed for neighbour noise – test signals created by auralisation
WG2 – Draft questionnaire produced

- A draft questionnaire was produced and presented in Florence meeting (STSM participation)
- The questionnaire has been significantly improved and will be tested/validated in countries of WG2
- “Society response to noise” on one hand and “detection of acoustic problems in buildings as such” on the other hand can be successfully obtained by questionnaire

WG3 – Tasks and Aims

To prepare an European database of:
- sound insulation performance of existing dwelling types
- sound insulation performance of new dwelling types
- "robust" solutions for new dwellings
- guidelines for improving workmanship
- guidance for upgrading existing dwellings

The aims and deliverables will be undertaken via “PROJECT MOSAIC”.

**WG3 – some examples**

WG3 members were asked to identify the typical current constructions being used in their countries at this time and send description and sketches. To assist, a template spreadsheet was sent. The isometric drawings were prepared by Edinburgh Napier University, UK. 12 countries provided data and drawing details.

**Focus of TU0901 work in the next scientific period**

- **Producing scientific outputs** from all WGs
  - WG1: Proposal to standardisation committees of preferred descriptors; Preliminary classification system approach; Present consequences of proposed descriptors (using also WG3); Planning involvement of national building authorities.
  - WG2: Validation/revision of questionnaire; Preparation of guidelines for laboratory listening tests.
  - WG3: Continue to collect construction solutions and sound insulation performance data for existing and new dwellings.

- **Publications**
  - Make structured lists of existing publications (including standards) and describe relevance for the WGs and TU0901 objectives.
  - Discuss and prepare a TU0901 publication strategy.

- **Funding**
  - Review again research needs and funding; identify & describe gaps.
  - Make joint and separate applications for research funds as appropriate. If necessary, influence research programs.
THE END…

or rather THE BEGINNING…

Thanks for your attention..... 😊

For more information, visit www.tu0901.eu

Kick-Off meeting November 2009