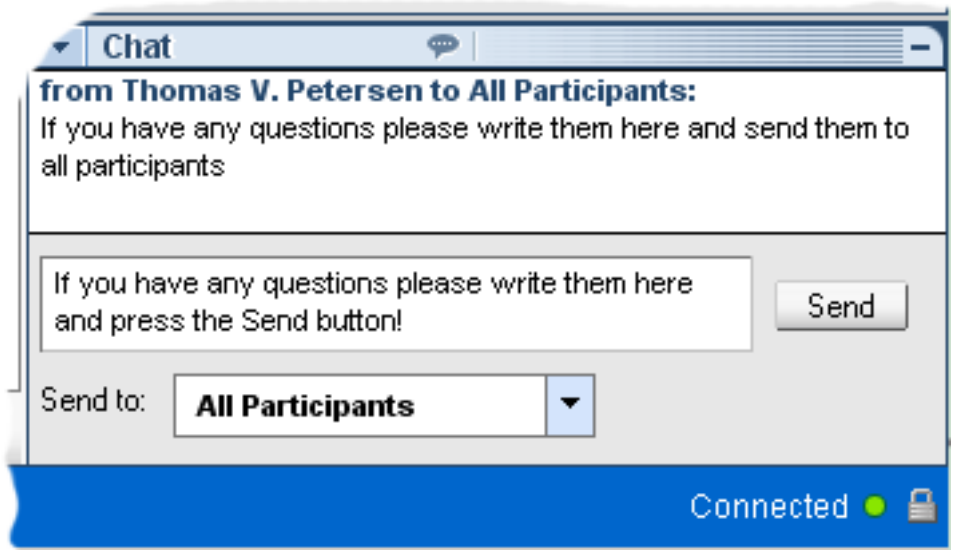
Teleconference

Two possibilities:

1. **Use headphones or loudspeakers.**
   (sound via Voice over Internet Phone – VoIP – possible delay).
   Listening only.

To ask questions or make comments use the Chat window.

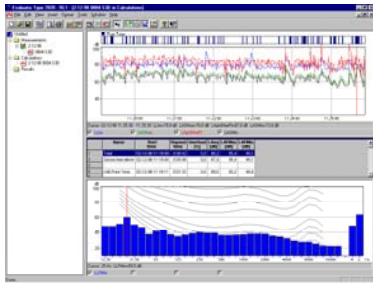


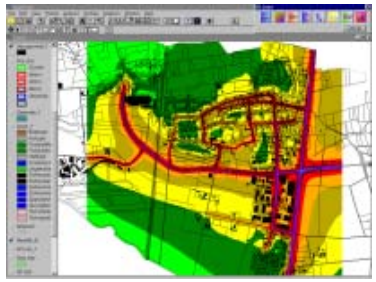
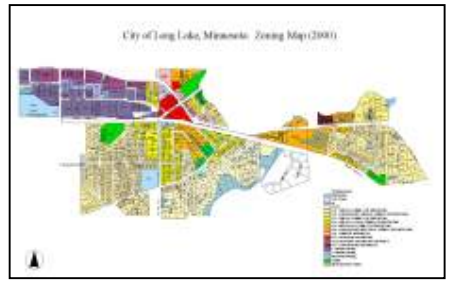
2. **Call Brüel & Kjær HQ on +45 45 800 500 and ask for this meeting. Listening and talking.**

Brüel & Kjær

Introduction to Lima 7812

WebEx Course, 21st September 2006
Hosted by Brüel & Kjær University, Denmark

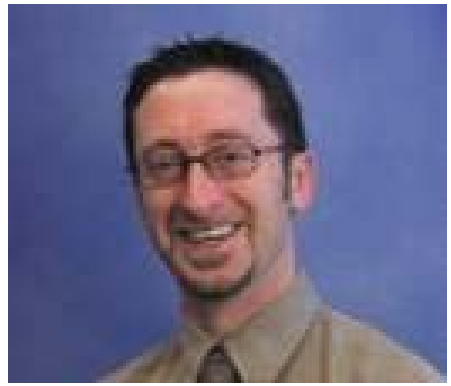



Brüel & Kjær

Your Guide Today

Douglas Manvell:

- Environmental Application Specialist
- 18 years with Brüel & Kjær environmental solutions
- 11 years experience with environmental noise calculation software
- Close monitoring of EU legislation since 1998
- Member of:
  - ISO TC43/SC1/WG45 (revising ISO 1996 environmental noise assessment)
  - ISO TC43/SC1/WG52 (revising ISO 3891 airport noise monitoring)
- Author of several scientific papers on environmental noise

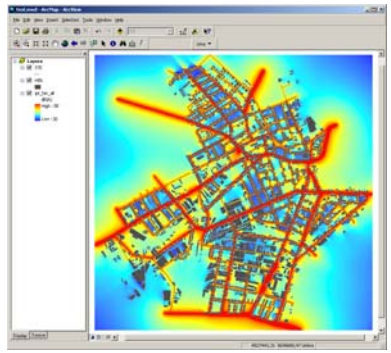


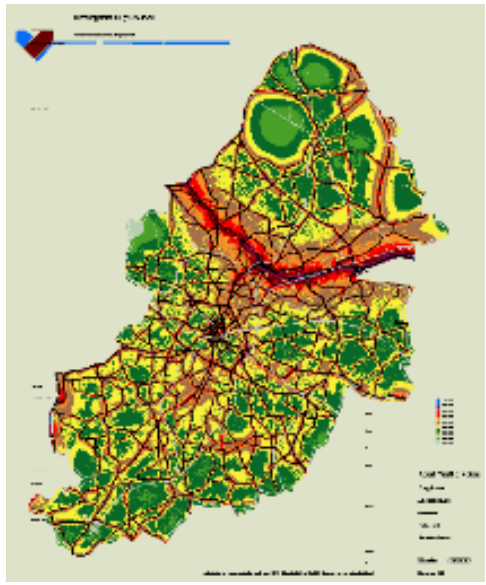
Course Description

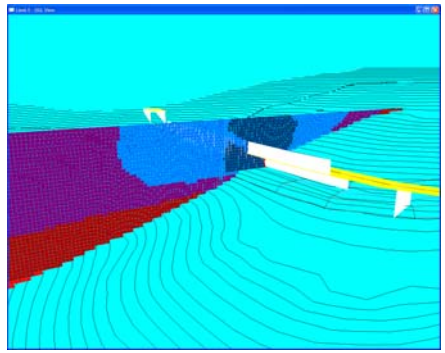
- For persons who have recently purchased Lima Type 7812 software, or are considering doing so
- Objective: Give an overview of Lima's functions
- Description: brief training in Lima Type 7812 software for environmental noise calculation and mapping
- Duration: 1 hour
- Prerequisites Knowledge of fundamental acoustics

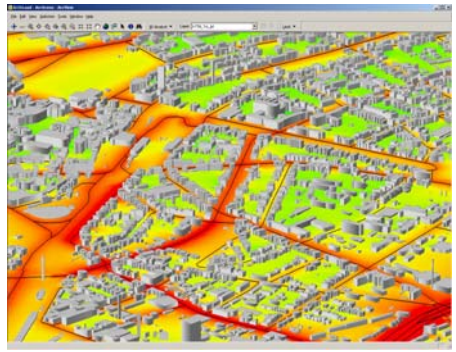
Agenda

- Introduction
- What is Lima 7812?
- Overview of Lima's functions
- Product configurations available
- Users
- New features in Lima 7812 Ver. 5.1
- Further information
- Conclusion
- Questions & Answers



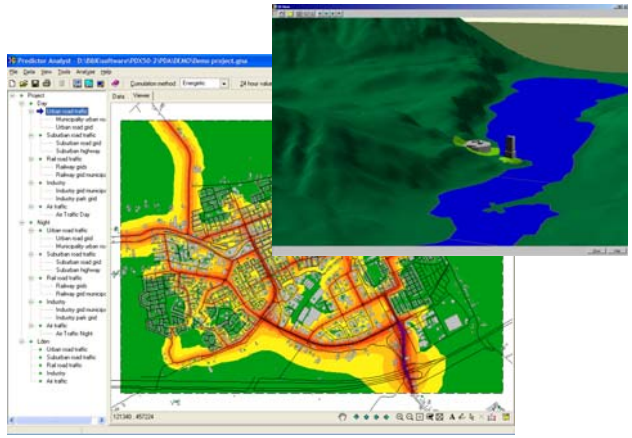


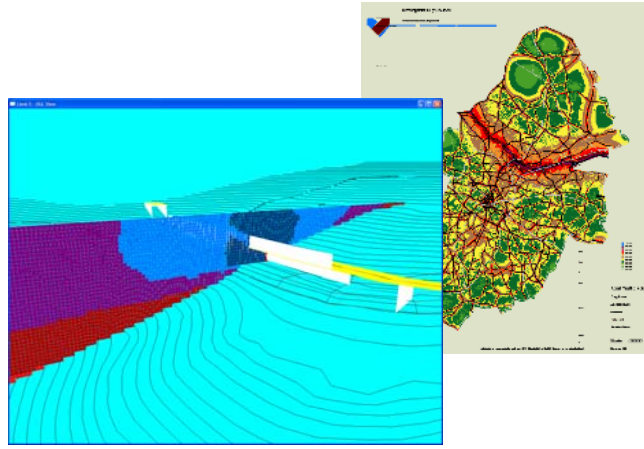




Brüel & Kjær Prediction Partnership - Summary

- Partnership of some of the world's foremost environmental noise prediction software experts
  - Best calculation software, support and advice
  - Development capability and software to cover the wide variety of requirements in global calculation market, now and in future
  - Wide range of quality products to match specific requirements
  - Expert local advice, backed up by knowledgeable support staff, always available to help
  - Secure economic base for future development
- Our Vision – Your Benefit:
  - Brüel & Kjær aims to be the world's no. 1 environmental noise prediction software supplier and your preferred partner for solving environmental noise and vibration issues





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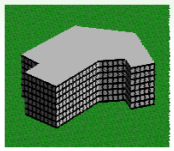
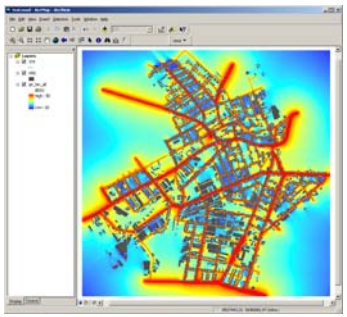
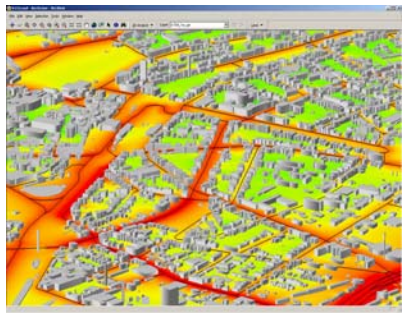
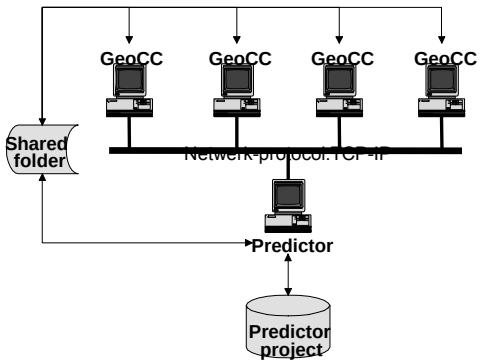
Our Calculation Software Portfolio

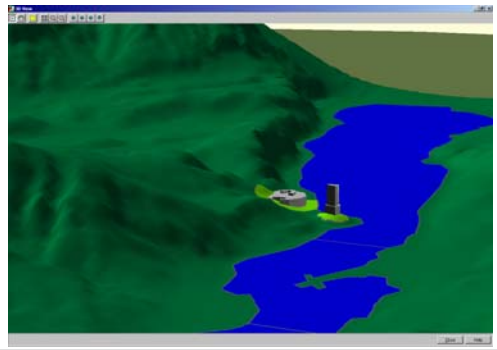


- A range of products for all applications:
  - **Predictor:** Multi-purpose, easy to use software with cutting edge user interface & features
  - **Lima:** Open system with advanced data processing and modelling, and cutting edge features





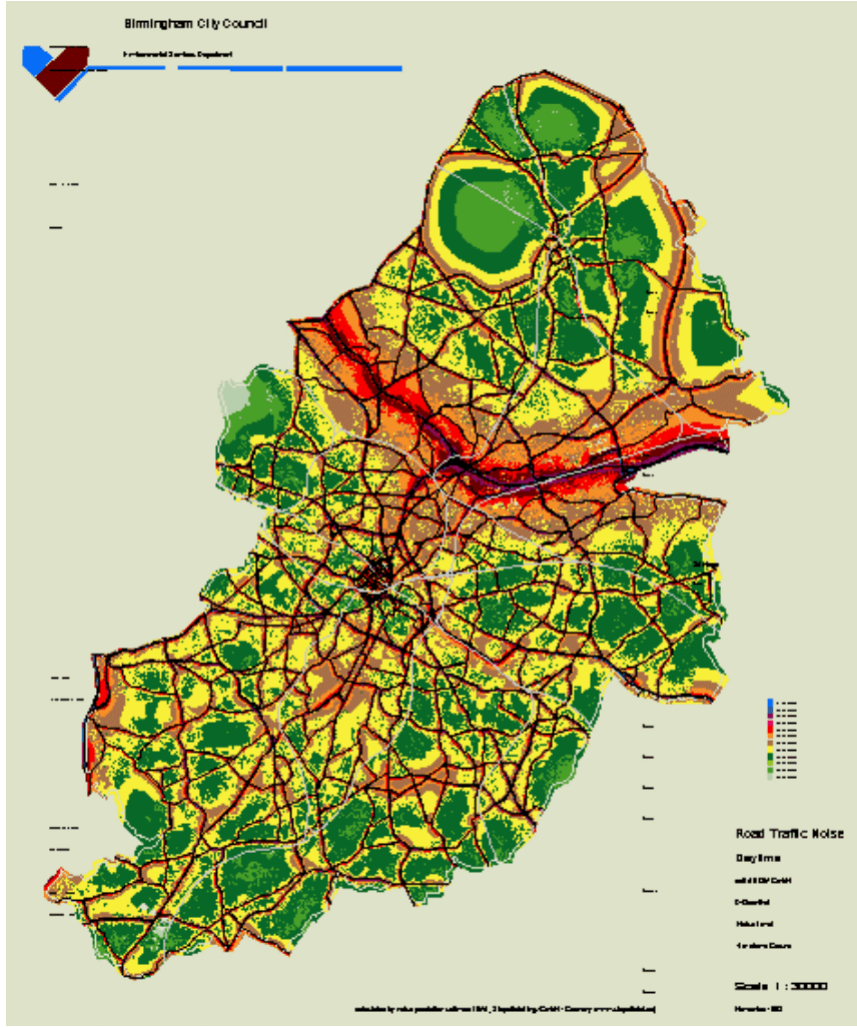




Brüel & Kjær

Lima

The most powerful noise calculation system available



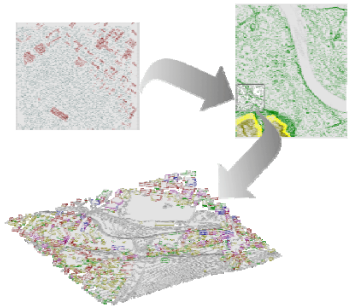
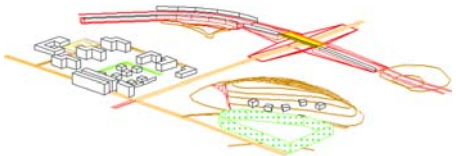
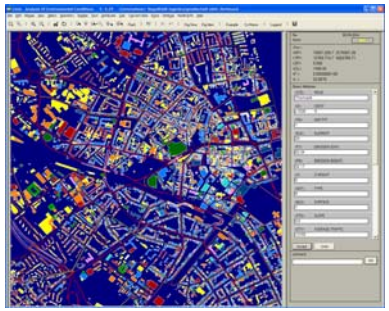
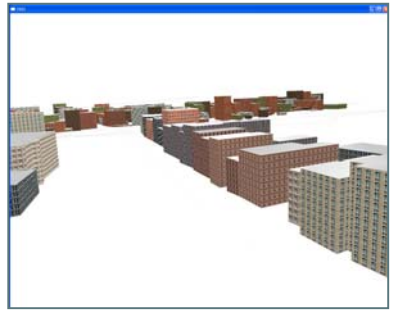
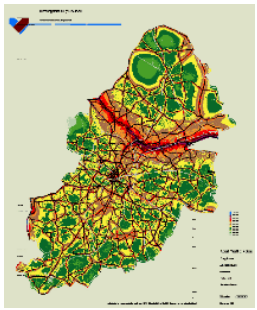
Init

Brüel & Kjær

Lima

Lima - the most powerful noise calculation system available for:

- Advanced model creation - saving days of work
  - Many data exchange formats, market-leading geometric editing
- Advanced modeling - getting the details right
  - Market's fastest, complex 3D modelling – even on a large scale
- Advanced analysis - your magnifying glass
  - Powerful analyses of model quality and noise levels, population noise exposure and annoyance, uncertainty
- Advanced reporting - the quality you expect from quality software
  - Plots, advanced rendered 3D views, audio-visual presentation, professional project documentation
- Handling large models - reaching the parts others cannot reach
  - Global reference software with tiling and controlled calculation optimisation

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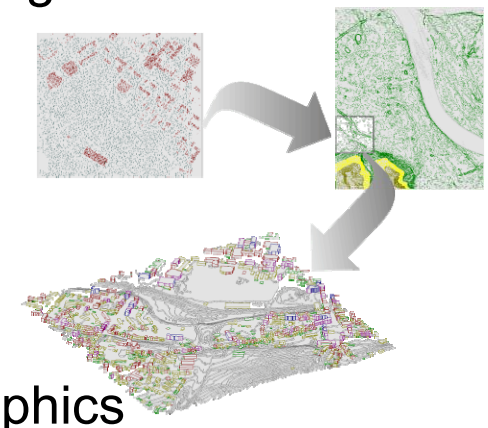
Calculation Speed Comparison

- Independent test report (Euronoise 2006 papers) to compare software on same PC with same model for CRTN method:
  - Up to 200 times difference in calculation speed
  - 10 times faster than next best with same result quality
  - Only 2 software could cope with 1km^2 model in time limit
  - Lima is the best (and the same cores are used in Predictor):
  - i.e. calculation software is not a commodity – there are great differences

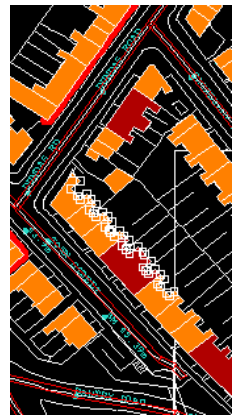
Software	A(*)	B	C(*)	D	E
Calculation time/point (full calculation): s	11,2	518,4	13,3	2393,3	68,3
Optimisation time-saving: %	88%	99%	0%	94%	54%
Optimsation quality reduction: dB	0,35	1,09	0	0,45	1,49
Calculation time/point (optimised calculation): s	1,3	5,2	13,3	143,6	31,4

Advanced Model Creation

- Import of data in many formats to speed up modeling, e.g.:
  - Import of buildings from GIS (Shape)
  - Import of AutoCAD data (DXF)
  - Import of traffic flow data (Access)
  - Combining several data sources

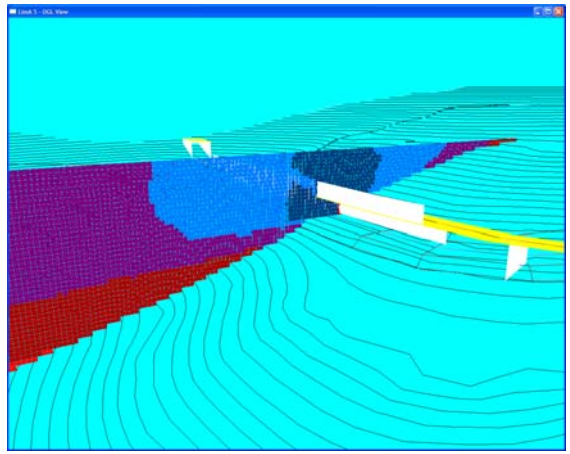


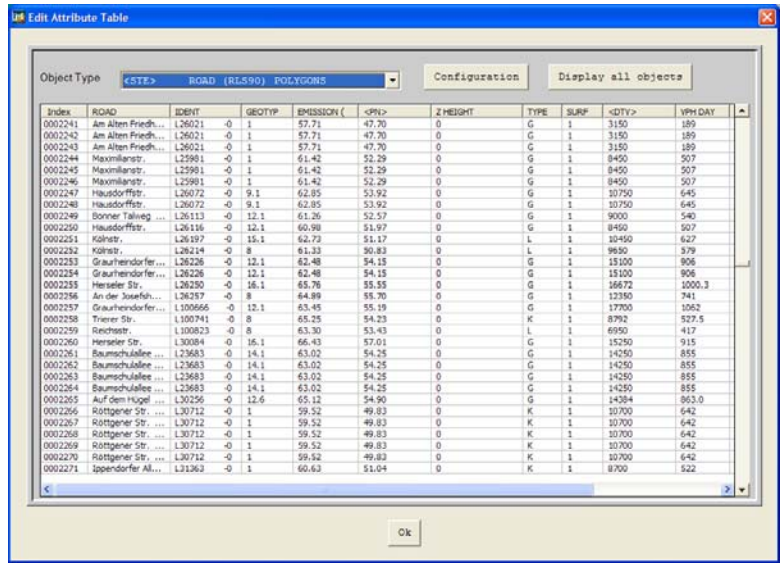
- Concatenation creates useable models from vector graphics
- Simplification of geometry for faster calculations
- Pre- & user-defined macros for automation of modelling chores

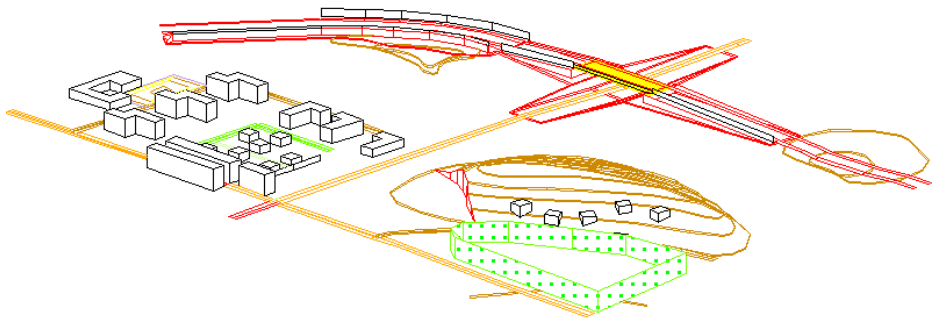


Advanced Modelling

- Automatically create directive sources on facades
- Accurately and realistically model:
  - cantilever bridges
  - screens on bridges
- Force roads to follow surface contours
- Automatically determine source levels from measurements by reverse engineering
- Various model data previews prevent unnecessary calculations
- State-of-the art calculation speeds through:
  - efficient implementation of algorithms
  - advanced source-selection routine
  - optimisation of calculation error







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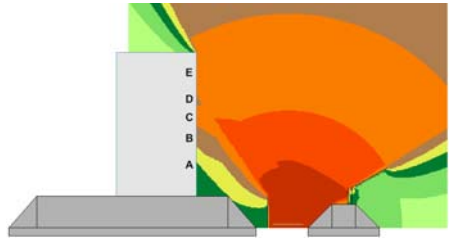
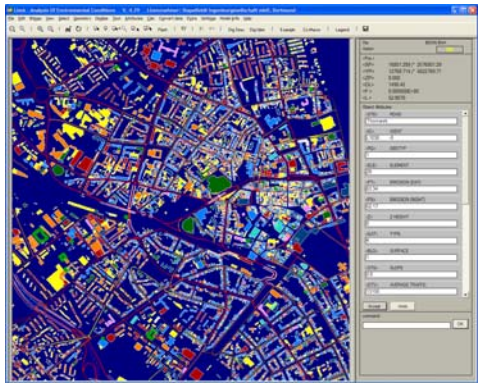
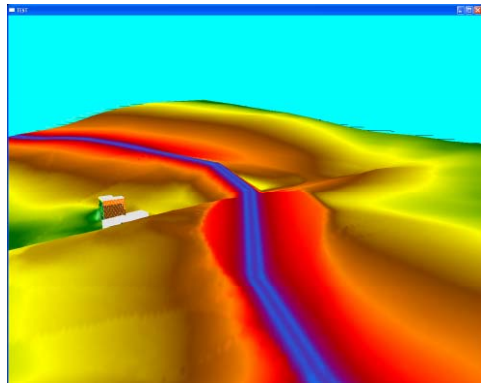
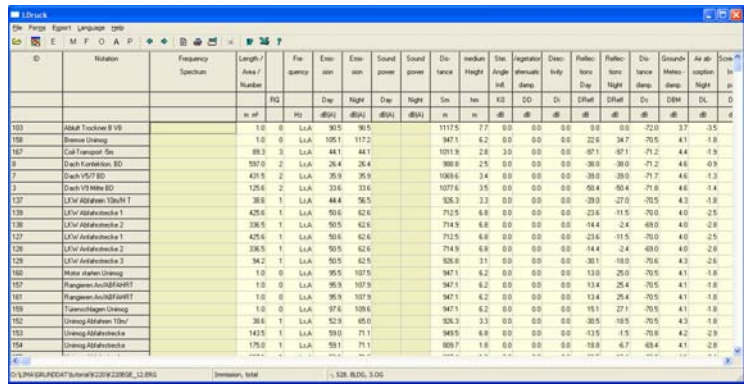
Advanced Analysis

- Rapid noise contours at high levels of detail
- Multi-million point calculation grids
- Interactive level-at-a-point
- Vertical and horizontal contours incl façade levels
- Calculation details for in-depth investigations and verification
- Visual model analysis through object attribute colour-coding
- In-built annoyance, noise exposure, uncertainty tools





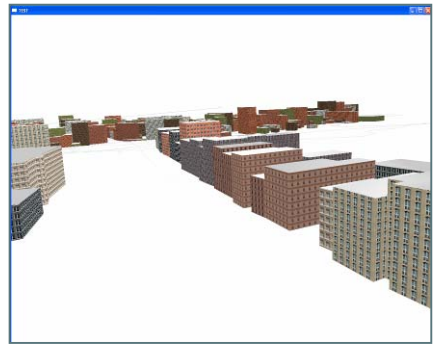


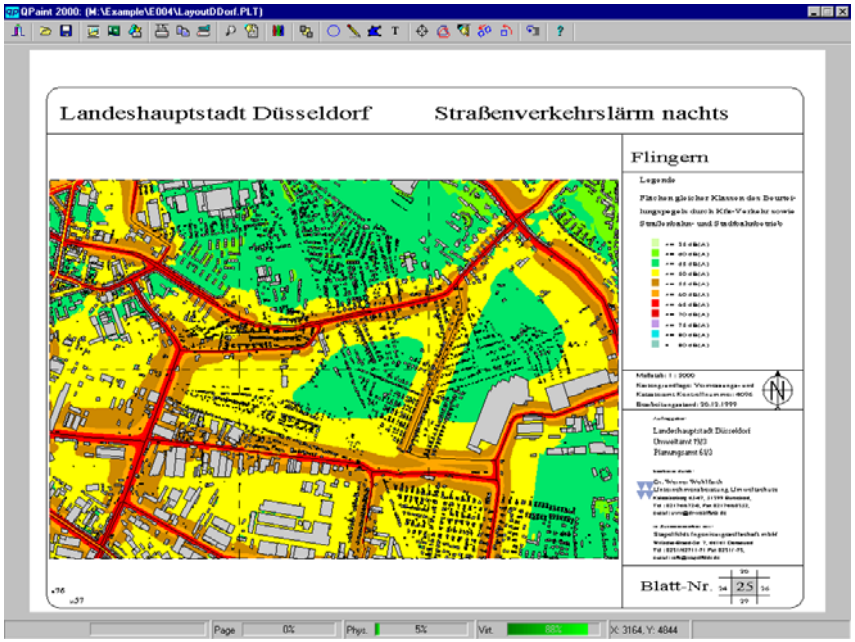


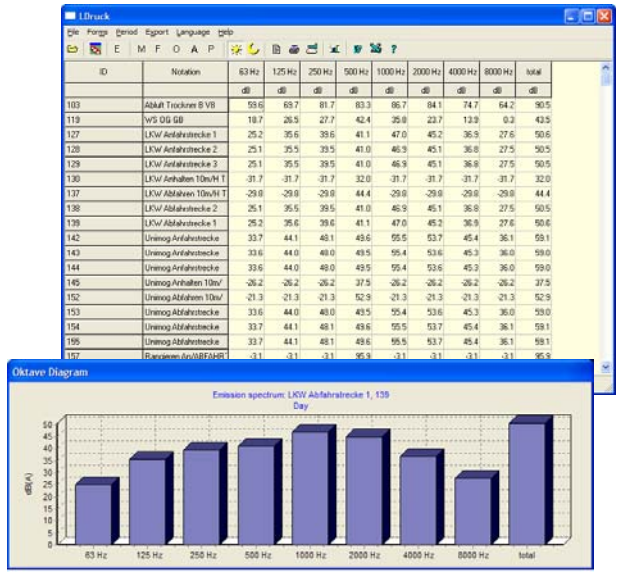
Brüel & Kjær

Advanced Reporting

- Noise maps with plotter driver for detailed posters
- Advanced model data presentation integrated with Excel
- Wide range of report tables & formats
- 3-D views
- OpenGL interface



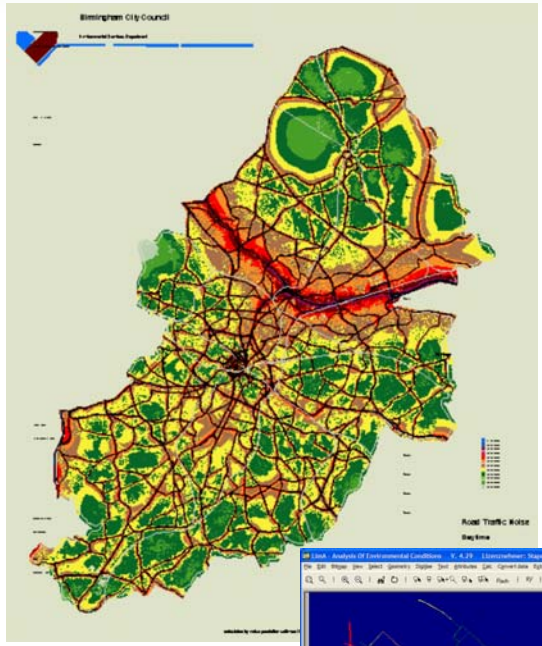




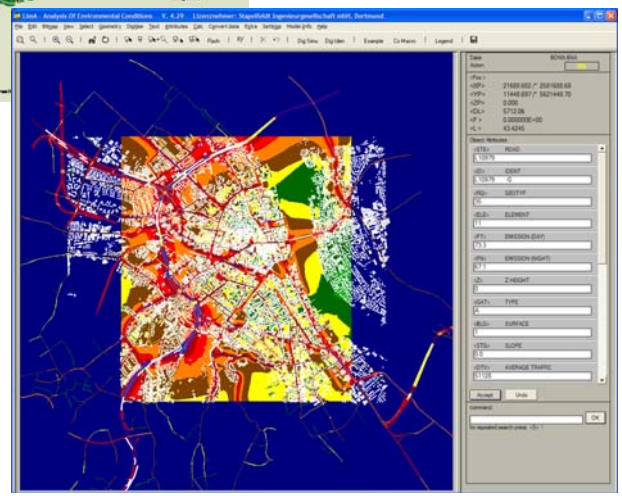
Brüel & Kjær

Handling Large Models

- Rapid model build-up
- Rapid model calculation
- Advanced model analysis
- Professional model reporting



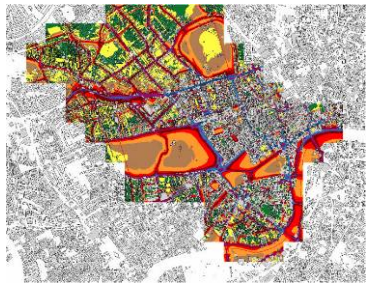
- Lima does it all!



- Example: 8 km by 5 km urban area

What is Lima 7812?

- The most powerful noise calculation system available:
  - **Advanced modelling** facilities for easier, better & more efficient model building
    - » Automated data manipulation, geometric handling and import allows efficient large, accurate calculations from existing data, without the need for GIS & Auto-CAD skills
    - » Open – easier integration with existing external data, calculation components and software (e.g. use as a GIS calculation engine)
    - » Advanced combination and optimisation of data from several sources & formats
    - » A range of tools to accurately and efficiently deal with complex acoustic problems
    - » Unlimited modelling capability
    - » Pre- and user-defined macros for automated modelling tasks reduces human error
  - State of the art **calculation power** for mapping even large agglomerations
    - » Fast algorithms and a huge capacity allows rapid, yet accurate, calculations
    - » Highly flexible, for in-depth analyses, even with difficult situations
  - Powerful **analysis of noise and population data** meets EU END demands without need for GIS tools
  - Matches existing and future needs with **latest developments** (e.g. Harmonoise)



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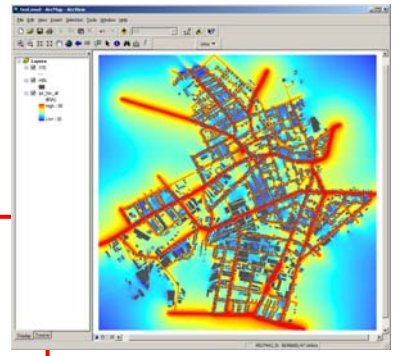
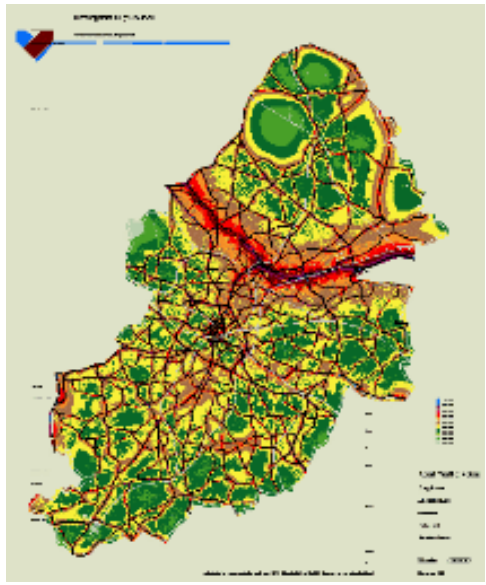
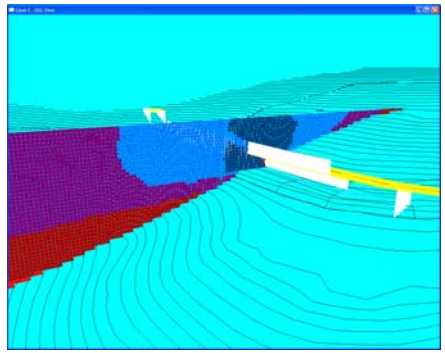
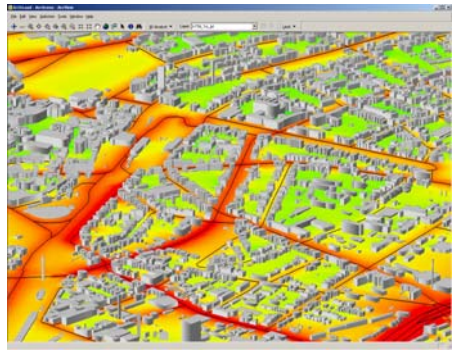








The Lima Portfolio

Lima Advanced Type 7812 C

≥1M obstacles/terrain edges per tile

All functions of the Lima Type Plus 7812 B package plus ECAC 29

Fixing emission quotas and moving-point analysis

Configurable to customer hardware

Lima Plus Type 7812 B

≤180,000 terrain edges per tile

All functions of the Lima Type 7812 A package plus

Interactive 3D graphics, superposition, statistics, annoyance analysis, noise exposure and conflict maps, soundscaping, barrier optimisation, best-/worst-case analysis

DXF and SHP data exchange

Lima Type 7812 A

≤60,000 terrain contour edges

All methods

DXF import/export format

Lima Advanced Calculation Client License Pack BZ 5553

2 additional calculation licenses

Lima Aircraft Module BZ 5441

ECAC 29, AzB, AzB-L, LBF, DIN 45684

Simulation of moving-point source

Lima Data Exchange Module BZ-5442

DXF, MapInfo, etc.

Maintenance Contracts

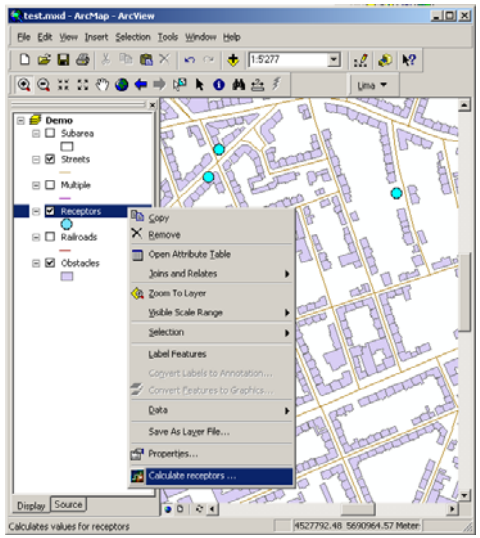
Product Upgrades

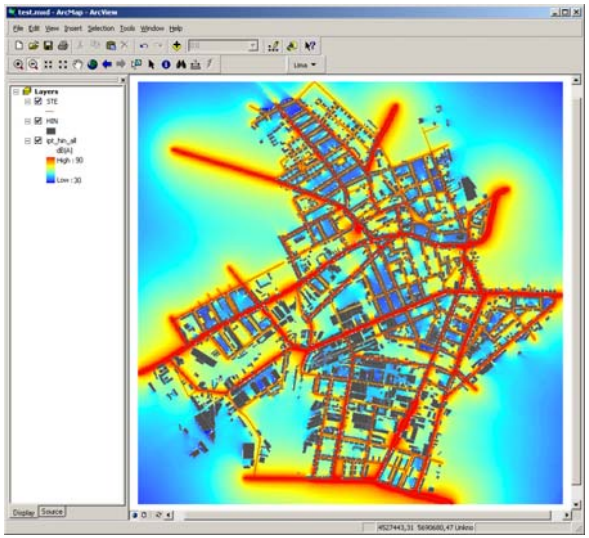
Customised Products

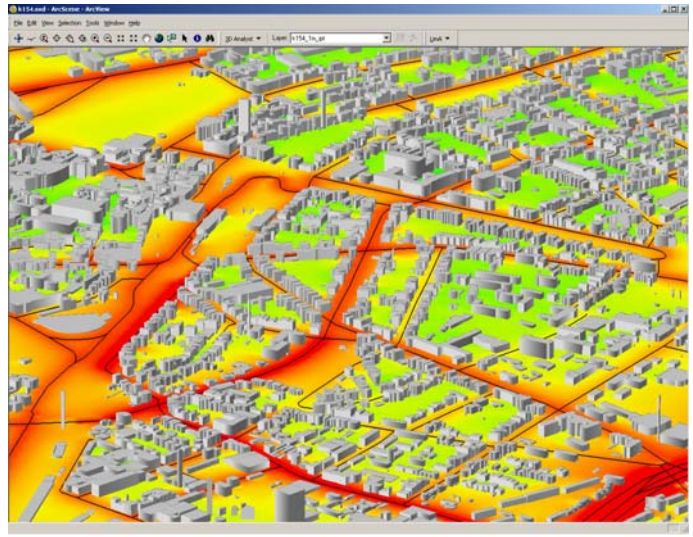
e.g. LimaArc

Lima^{Arc} WT 9686

- WT 9686 “LimaArc ArcGIS Extension (add-on)”
  - Embeds Lima 7812 in ArcGIS
  - User makes noise calculations based with familiar GIS GUI
  - Functionality depends on ArcGIS options (e.g. Spatial Analyst for contours, 3D for 3D view)







Brüel & Kjær

Main New Features in Lima Ver 5.0

- Calculation of the overall **uncertainty** of results, based on average of uncertainties of input parameters
- **Harmonoise**
- Compliance with **QA** Methods for noise calculation software:
  - Nordtest Method "Framework for the Verification of Environmental Noise Calculation Software" ACOU 107 (2001)
  - Draft German Standard DIN 45687
- **Interactive 3D** tool
- Import of **Type 2250** Hand-held Analyzer data and **Environmental Noise Management Server** Type 3642 data
- **Soundscaping**: Audio-visual presentation of noise levels at selected receiver points
- Increased Calculation **Capacity**
- **Calculation client** dual-license pack for increased calculation speed in a network

Main New Features in Lima Ver 5.1

Due for release later this year:

- Import of ESRI grid files also in TXT format
- Supports **German regulations** VBUS, VBUSch, VBUF and VBUI
- Improved **OpenGL view** for 3D model and result viewing
- Can limit the calculation of grid result to those areas where the noise level exceeds a user-defined minimum value, thus speeding up the process for large areas
- Model Quality Assurance tools “DIAGNOSE 2”, “RGEMIP” and “QS-CHECK” may be combined to allow a new calculation with crisp calculation parameters at any calculation points
- Improved **documentation** and **workflow** on a range of functions

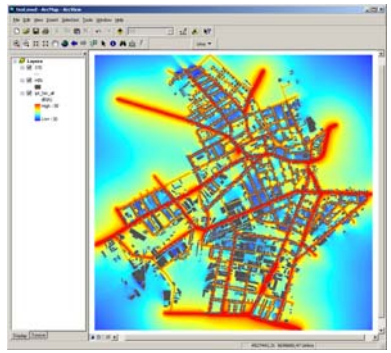
Lima Users

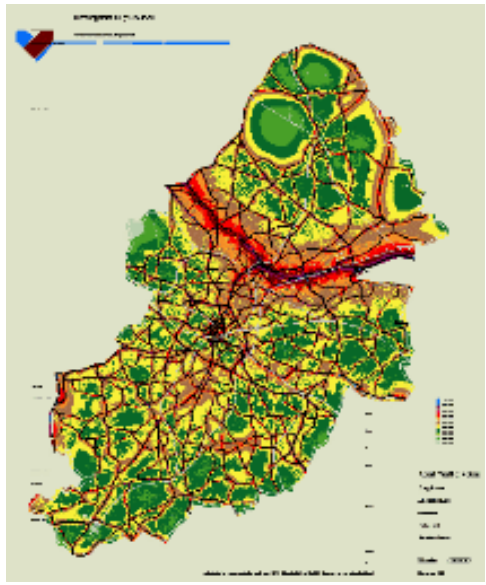
- Several customers have given us permission to use their names as references, including:
  - Senatsverwaltung Berlin, D
  - Birmingham City Council, UK
  - Stadtverwaltung Bonn, D
  - Freie und Hansestadt Hamburg, D
  - Stadtverwaltung Stuttgart, D

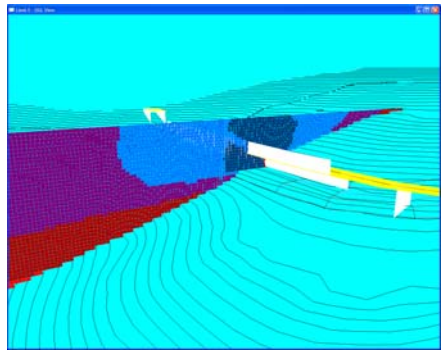
- In addtion, there over 300 licenses of Lima have been sold:
  - all over the world
  - For many applications (industrial noise, large scale noise mapping, impact assessment, noise management

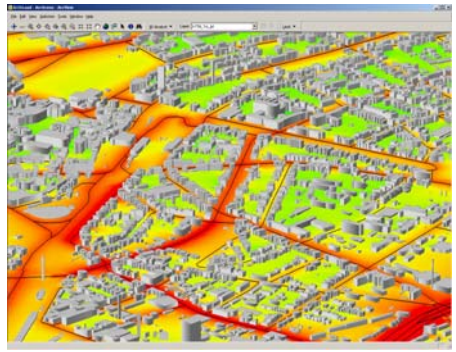
Agenda

- Introduction
- What is Lima 7812?
- Overview of Lima's functions
- Product configurations available
- Users
- New features in Lima 7812 Ver. 5.0
- Further information
- Conclusion
- Questions & Answers



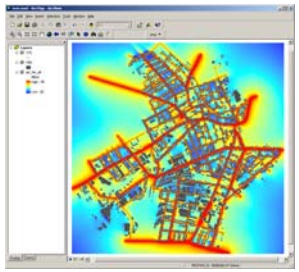
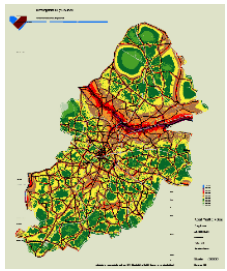
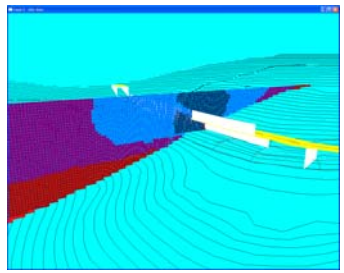
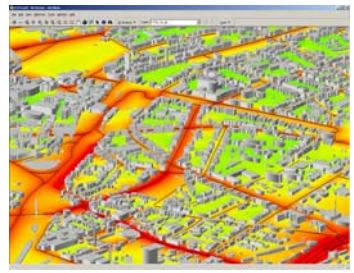






Conclusions

- The Brüel & Kjær Prediction Partnership includes some of the world's foremost environmental noise prediction software experts, offering:
  - The best calculation software, support and advice
  - Largest, experienced development group to meet current & future requirements
  - Wide range of quality products to match specific requirements
  - A secure economic base for future development & support
- **Lima Type 7812:**
  - The most powerful noise calculation system available
  - Open system with advanced data processing and modelling, and cutting edge features
- Brüel & Kjær aims to be the world's no. 1 environmental noise prediction software supplier and your preferred partner for solving environmental noise and vibration issues
- For information on tools for noise mapping in cities and on the latest developments, contact Brüel & Kjær (e.g. via our ENM Knowledge Centre website)
- For further information and training, we refer to:
  - The Lima FAQ pages on WWW.BKSV.COM
  - the 2-day Brüel & Kjær course Lima Type 7812 offered June 21-22 at Nærum, Denmark

Brüel & Kjær

Brüel & Kjær Course “Lima (Type 7812) Intro”

- When: 21st – 22nd June 2007
- For persons who have recently purchased Lima Type 7812 software, or are considering doing so, for:
  - calculating and mapping environmental noise for Noise Policy making
  - Environmental Impact Assessments
  - fulfillment of EU Directives (e.g. IPPC 96/61/EC, Assessment of Environmental Noise Directive 2002/49/EC, etc.)

  E.g. Local Authority Environmental Officers, Consultants, Environmental Officers in Industry, etc.
- Objectives:
  - To give an overview of Lima’s functions
  - To give the participants hands-on experience of using Lima
  - To explain and demonstrate good practice when using Lima
  - To give an overview of relevant legislation, standards, practice and theory
- Duration: 2 days, directly following the Environmental Noise Management Course
- Location: Brüel & Kjær Headquarters, Nærum, Denmark
- Prerequisites: Knowledge of fundamental acoustics

Any Questions?