

What is Environmental Noise Management?

Environmental Noise Management Solutions
Brüel & Kjær University, Denmark

www.bksv.com
Brüel & Kjær Sound & Vibration Measurement A/S.
Copyright © 2009. All Rights Reserved.



Brüel & Kjær
Incorporating LDS and Lockhart

Agenda

- What is environmental noise management?
- The 4 generations of environmental noise management

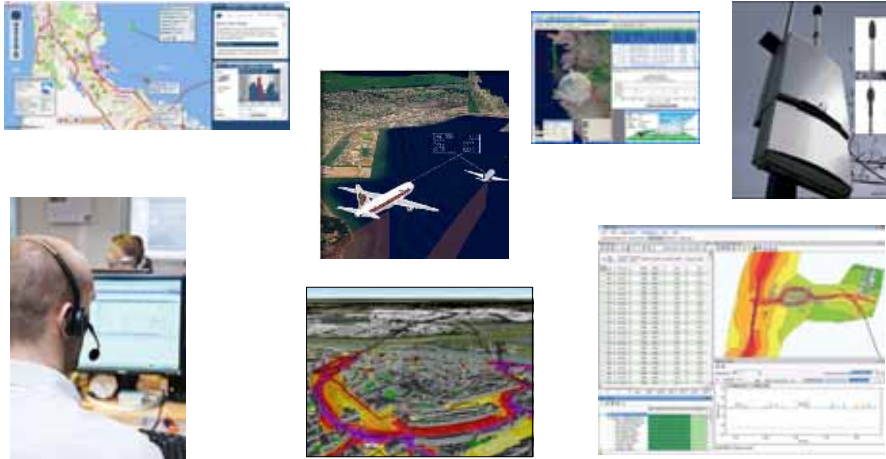


www.bksv.com, 2

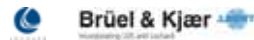


Brüel & Kjær
Incorporating LDS and Lockhart

Brüel & Kjær and Lochard Join Forces



www.bksv.com, 3



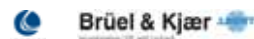
Brüel & Kjær and Lochard Join Forces

- Two market leaders combine strengths to give you better solutions and service:
 - Now no.1 in airport AND urban noise management
 - Strong local presence – worldwide
 - State of the art airport and urban noise management solutions and services
 - Together we offer products:
 - » for all aspects of outdoor environment management
 - » that are the preferred solutions by a wide range of experts around the world



Brüel & Kjær 

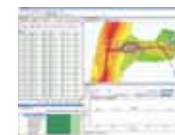
www.bksv.com, 4



Our Offerings

- NoiseOffice:
Subscription based services to improve noise management at airports
- Software Modules:
Subscription-based environment applications
- Air quality modules for airports
- High-quality, robust noise monitoring terminals & microphones
- ANOMS and ENM:
State of the art airport and urban noise management systems
- Lima & Predictor:
Powerful noise calculation software

NoiseOffice™
Airport Noise Service Solution

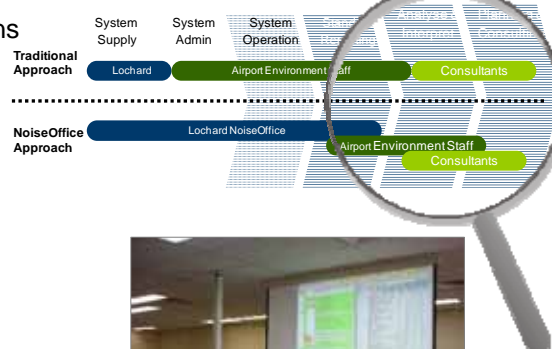


www.bksv.com, 5

Brüel & Kjær
Working it all out

NoiseOffice

- Managed Noise Solutions
 - Business outcomes
 - Not just technology
- Total Package:
 - Technology provision
 - Hosting
 - Management
 - Operations
 - Reporting
 - Consultant Portal
- Benefits:
 - Simplifies business
 - Results beyond question
 - Savings in total cost of ownership



www.bksv.com, 6

Brüel & Kjær
Working it all out

Modules

- Software as a service
 - Subscription based – no capital outlay
 - Web based centrally hosted – no deployment
- Focussed objectives – easy to use
- Long term contracts – partnering to success
- Current modules:
 - WebTrak
 - WebTrak Fly Quiet
 - AirTrak CarbonManager
 - Flight Ops
- Future modules:
 - NoiseSentinel

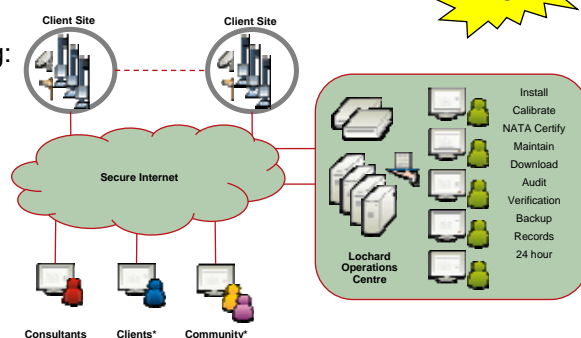


www.bksv.com, 7

Brüel & Kjær

NoiseSentinel

- Providing long term outdoor noise monitoring for consultants
- Simplifies operations and improves quality:
 - Equipment - supply, installation & maintenance
 - Operation – collection, verification & data management
 - Integration – noise levels, sound recording, weather & cameras
 - Access – secure data download to Excel and Evaluator
- Cheaper, easy financing: reduces capital outlay with a predictable, small monthly fee
- Improved satisfaction: Lets you focus on data analysis and advice



www.bksv.com, 8

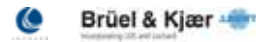
Brüel & Kjær

Modern, Robust Noise Monitoring Terminals

- Modern, robust noise monitoring terminals for all applications, needs and budgets
- A wide range of standard and customised accessories – whatever you need, we can deliver a solution

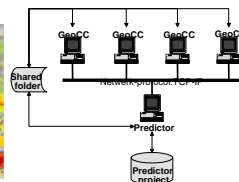
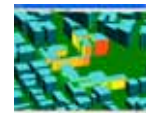


www.bksv.com, 9

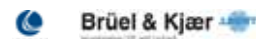


The Broadest Calculation Software Portfolio

- A product for every situation
 - Predictor 7810 – the intuitive solution, mature and modern
 - Lima 7812 – the most advanced noise calculation system available
- A growth path that gives you the product you need as your needs change
- Common functions and benefits:
 - Global reference software with tiling and controlled calculation optimisation
 - Fastest calculations – independently tested
 - Advanced geometry handling to easily model real-life



www.bksv.com, 10



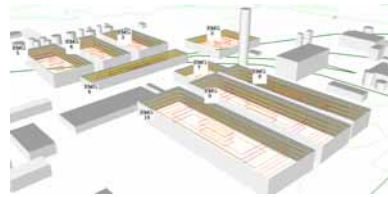
Major Calculation Software Release

New

- Predictor Version 7:
 - Next generation software
 - incorporating powerful Lima performance
 - Improved efficiency and usability



- Lima Version 6:
 - Strengthening its position as the most advanced system
 - including workflow automation
 - Making complex tasks easier



www.bksv.com, 11

Brüel & Kjær
Measurement, Control and Calibration

Portable Noise Monitoring – Type 3655

New

- ← High-speed Internet communication
- ← Auto-calibration
- ← Up to 32GB Data Storage
- ← Automated SMS Text Messaging
- ← Class 1 accuracy to IEC 61672
- ← Hot swap Li-Io batteries
- ← Remote 3G broadband operation
- ← 3 different configurations for different needs



..... weighing less than 7kg

www.bksv.com, 12

Brüel & Kjær
Measurement, Control and Calibration

Managing Environmental Noise

- Many and varied tasks:
 - noise complaints
 - noise abatement
 - noise policing
 - noise mapping
 - noise planning & management
 - reporting & information
 - data handling



Different actions and methods



www.bksv.com, 13



Brüel & Kjær
Measuring it, and so on

Managing Environmental Noise

- Many different sources:
 - transportation noise
 - Industrial noise
 - neighbourhood noise
 - different recreational activities



Different evaluation approaches

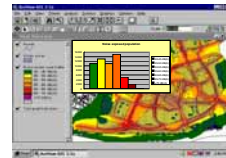
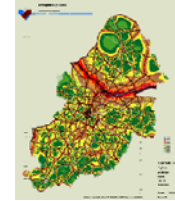
www.bksv.com, 14



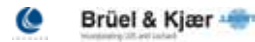
Brüel & Kjær
Measuring it, and so on

Noise Mapping

- Map of current and future situation
 - Often calculated
 - Sometimes based on measurements
- Different types of maps, e.g.:
 - Long-term vs “peak” data, often source-related
 - Population noise exposure statistics
- Interaction with GIS and GIS data

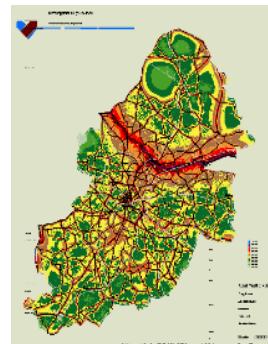
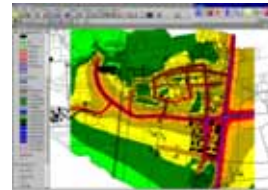
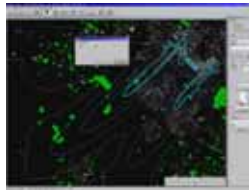


www.bksv.com, 15

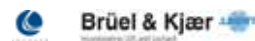


Noise Planning

- Policy making
- Noise zoning
- Land use planning
- Intermodal studies
- Based on some calculation
- Soundscaping



www.bksv.com, 16



Noise Abatement

Photographs courtesy of
Tex-Cote, USA
ITS, Leeds University, UK

- Activated by noise limit exceedance identification or action plan
- Reduction techniques:
 - Administrative e.g. stop operation, reduce speed
 - Technical e.g.: silencers, barriers, double glazing
- Reduction areas
 - At receiver e.g. insulation
 - In propagation path e.g. barriers
 - At source e.g. quiet road surface
- Guided by measurements and calculations



www.bksv.com, 17

Brüel & Kjær
Measurement, test and control

Noise Policing

- Active enforcement of legislation
- Many techniques:
 - Spot checks of limits e.g.:
 - » Motorcycle noise re silencers
 - Noise monitoring
 - » Permanent
 - » Semi-permanent

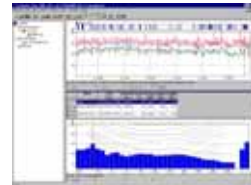


www.bksv.com, 18

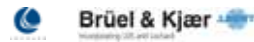
Brüel & Kjær
Measurement, test and control

Noise Complaint Handling

- Activated by complainant:
 - Spot-checks
 - Manned measurements
 - Monitoring
 - User-activated monitoring
 - Event correlation
 - In-depth analysis
- Result: OK or not
- May lead to monitoring, abatement, ...



www.bksv.com, 19

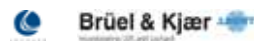


Noise Reporting & Information

- Reports - integrated in tools
- Information to the Public – dedicated web-solutions

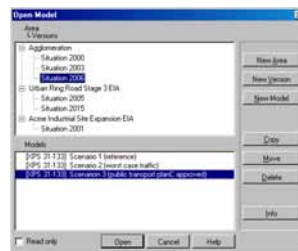
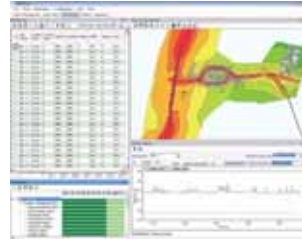
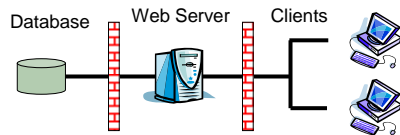


www.bksv.com, 20

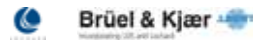


Data Handling

- Import/export
- GIS
- Database
- Security
- Flexibility
- Scenarios & timelines
- Integrate in tools/organisation

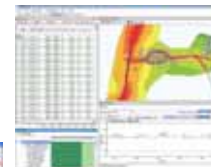


www.bksv.com, 21

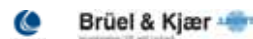


A Range of Solutions from Brüel & Kjær

- Noise calculation software: Predictor 7810 and Lima 7812
- Sound Level Meters and Analyzers, e.g.:
 - 2250/2270 Handheld Analyzer
 - 2240 Sound Level Meter
- Post-processing Software e.g.:
 - Evaluator 7820
 - 2250 Utility Software BZ5503
- Noise monitoring and management systems: 7843 ENM Software and wide range of NMTs
- Diverse solutions:
 - PULSE Road Surface measurement system
 - Matron Complaints Analysis System
 - 3638 Exhaust Noise Inspector
 - Soundscaping equipment



www.bksv.com, 22



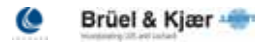
A Complete Solution

Standard products and configurable services:

- System Installation ensures a trouble free start-up
- On-site training for optimal utilisation of your investment
- System maintenance to ensure continued trouble-free operation in an ever-changing world
- Additional training & advice to get the most out of your system
- Calibration & repair to ensure correct results and high up-time
- Hosting of the server eases installation, improves technical support and offers alternative financing of purchase



www.bksv.com, 23

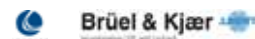


Environmental Noise Management Evolution

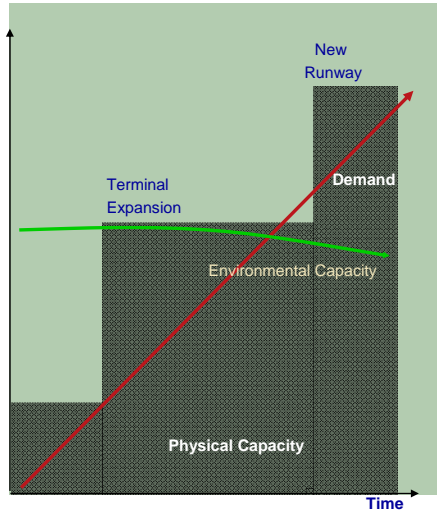
- The 4 generations of environmental noise management
 - Developed for airports
 - Suitable for other applications



www.bksv.com, 24

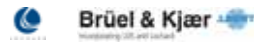


Environmental Capacity (Airport Example)



- Traditional master planning focus is on physical capacity – terminals, runways etc
- EIS studies don't identify the capacity impact
- Environmental capacity can become the limiting factor
- Environmental capacity degrades over time
- Mastering environmental capacity enables airports to continue to grow

www.bksv.com, 25



Lochard Law of Environmental Capacity

$$E = T - I$$

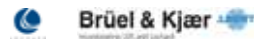
Where

- E = Environmental Capacity
- T = Community tolerance
- I = Environmental impact

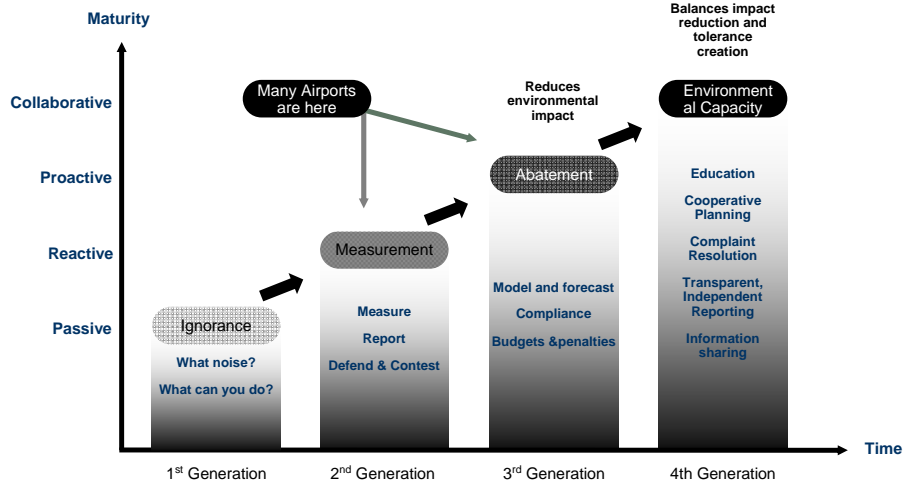
Environmental capacity is generated by...

- **Reducing environmental impact** by proactive management of operations
- **Increasing community tolerance** through collaboration with stakeholders

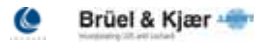
www.bksv.com, 26



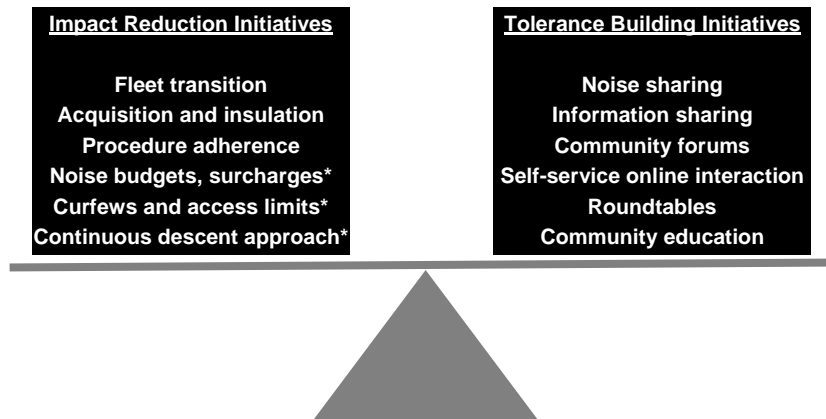
Fourth Generation Environment Management



www.bksv.com, 27

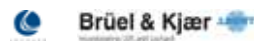


Balanced Program



* Not commonly used in the US

www.bksv.com, 28



Summary

- Environmental noise management
 - All aspects of dealing with noise under your jurisdiction
 - Common overall methodology and terminology:
 - Many and varied tasks:
 - » noise complaints
 - » noise abatement
 - » noise policing
 - » noise mapping
 - » noise planning & management
 - » reporting & information
 - » data handling
 - Many different techniques
- The 4 generations of environmental noise management
 - Developed for airports, suitable for other applications
 - Growth may be constrained by environmental capacity
 - » Strategic impact can be overlooked during master planning
 - » $E = T - I$
 - Fourth generation environment management:
 - » Collaborative approach with real empowerment and information sharing
 - » Balanced programme of initiatives – Impact and Tolerance
 - » New concepts, new technologies