Traffic Induced Vibrations

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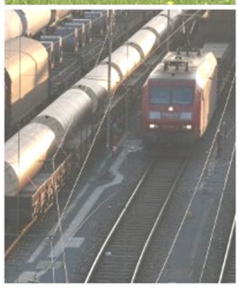
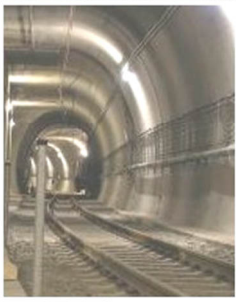
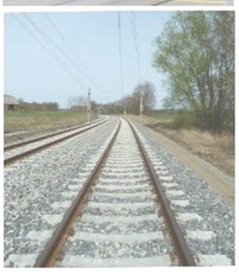
Rail traffic as well as road traffic have been increased considerably in the past few decades. Simultaneously people become more sensitive concerning sound and vibration. These opposed interests must already be considered within e, g. the scope of the planning approval for railway lines or building constructions. Therefore, the engineering and consultant office Baudynamik Heiland & Mistler GmbH develops concepts for the dynamic design of new or existing traffic routes. It includes the protection of noise and of structural vibrations.



We offer:

- Measurements of Emission and Immission
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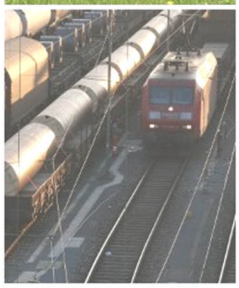
- Measurements of transfer function during train passages or with artificial excitation
- Vibration prediction
- Calculation and design of Vibration mitigation measures

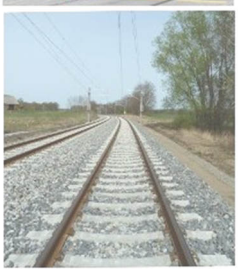
Year	Reference Projects (Extract)
2014-2015	**ABS Oldenburg-Wilhelmshaven, Germany** Vibration measurements in several buildings as an adequate sample after start of rail service on the 25 km long section of the line. Assessment of new vibration immission data caused by trains.
2014	**EÜ Königsstraße, Hannover, Germany** Preliminary vibration study on the immissions in neighbouring buildings during track building works on a railway bridge.
2013-2016	**Bf Hamburg Altona, Hamburg, Germany** Vibration Prognosis in different cases of project planning. Following assistance during the permit procedures for the chosen planning layout.
2013-2014	**ABS 4, Aachen Eilendorf, Eschweiler (Germany)** Measurement and Prognosis of vibrations and secondary airborne sound.

Year	Reference Projects (Extract)
2012-2014	**Wehrhahnlinie, Düsseldorf, Germany** QA measurements and testing of insertion loss of a mass spring system inside the new built Wehrhahnlinie underground tunnel.
2012	**European Research Project RIVAS** Measurement of the insertion loss of elastic sleeper pads on track and in the testing area using the shaker Butterfly® as an artificial excitation. The investigation is part of the research project RIVAS (Induced Vibration Abatement Solutions).
2012	**Katzenbergtunnel, Germany** QA measurements and verification of the insertion loss of the mass-spring-system in the new Katzenberg Tunnel.
2012	**Kaiser-Wilhelm-Tunnel, Koblenz-Perl, Germany** Dynamic dimensioning of the mass-spring-system in the tunnel.
2012	**Underground Lines U5 and U6, BVG Berlin, Germany** Feasibility Study for a mass-spring-system for the new U5 and U6 lines in Berlin.
2012	**New Motel One, Cologne, Germany** Prognosis of vibrations and secondary airborne noise due to underground railway traffic. Evaluation of structural dynamics of the planned foundation for the new Motel One building in Cologne.
2012	**Underground Line U3, Berlin, Germany** Investigation by measurement and evaluation of vibrations and secondary airborne noise.
2012	**Erschütterungsprognose für einen Neubau in Hilden, Germany** Prognosis and assessment of vibrations due to rail traffic for a new office and commercial building planned near the railway track.
2011	**DB Research Project, Link Berlin–Cottbus, Germany** In-situ testing with vibration exciter (Dynpact®) and trains to verify the efficacy of vibration isolating sleeper pads.



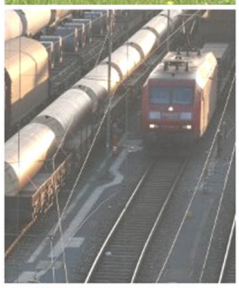




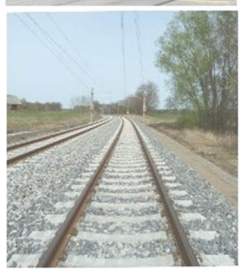


Year	Reference Projects (Extract)
2011-2012	**Mass-Spring-System in the „Katzenberg“ Tunnel, Germany** Vibration measurements, prognosis and design of a mass-spring-system for the new highspeed tracks.
2012	**Underground U5, Berlin, Germany** Feasibility Study for a mass-spring-system for the new U5 line in Berlin.
2011	**Vibration Prognosis for a new building in Cologne, Germany** Measurement and prognosis of vibrations caused by freight trains in an existing building which is to be replaced by a new apartment building.
2011	**Holbeinviertel, Frankfurt am Main, Germany** Evaluation of vibrations caused by trains in the so-called "Holbeiviertel" in Frankfurt/Main for the new development plan.
2010-2012	**Eisenbahn Knoten Halle, DB Halle/Saale, Germany** Vibration investigation to prepare the planning permission process for all 5 planning sections. Vibration measurement, prognosis and assessment of vibrations and secondary airborne noise.
2011	**DB Research Project, Cologne, Germany** In-situ testing with vibration exciter (Dynpact®) and trains to verify the efficacy of vibration isolating sleeper pads.
2010-2011	**Luxtram, Luxembourg City, Luxembourg** Dimensioning of vibration isolation for an approximately 10 km long new tram track through Luxembourg city.
2010	**Spectral Dynamic Force Density of „Siemens Combino“** Determination of the Spectral Dynamic Force Density of the tram type „Siemens Combino Classic Straba“ in Erfurt. Vibration prognosis according to FTA Report (FTA-VA-90-1003-06).









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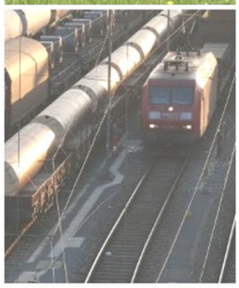
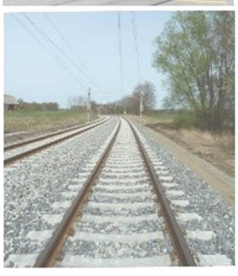
2010	**Rhein-Ruhr-Express, DB Project, Germany** Preliminary enquiries in preparation of the planning permission process for all sections between Cologne and Dortmund. Vibration Measurements during 20,000 train passages at 120 measurement section locations.
2009-2016	**ABS 46/2 Betuwe Line, Germany** Vibration investigation for a 48 km track extension of a main European railway line from two to three tracks and design of 10 km of mitigation measures.
2009	**Underground Station Hamburg Billwerder, Germany** Vibrations study for a new modul including measurements and vibration prognosis.
2008	**Erdinger Ringschluss Los 1-4, Germany** Prognosis of vibrations for the official planning approval.
2008	**Dresdener Verkehrsbetriebe, Germany** Vibration investigation of different track systems by forced excitation.
2006-2008	**TTY Airport MRT Line, Taiwan** Vibration investigation (site measurements, studies and track design) of 52 km track including 10 km vibration mitigation measures.
2003-2007	**Transrapid Research Program, Germany** Basic vibration investigation with artificial excitation system.
2003-2007	**Liliencarree Wiesbaden, Germany** Vibration investigation and prognosis for road traffic exitation.
2007	**U 55 Cologne Hürth, Germany** Prognosis of vibration for the official planning approval.



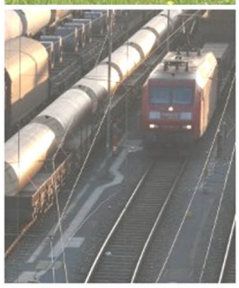




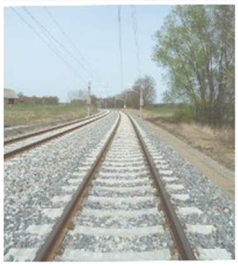


Year	Reference Projects (Extract)
2001-2007	**North-South Connection, Berlin, Germany** Admittance measurements in the tunnel, vibration measurements with artificial excitation, design of mass-spring-systems from 6 to 23 Hz, assessment of serviceability and acceptance measurements.
2005-2006	**MSB, Main Staition – Airport Connection, Munich, Germany** Basic vibration investigation for the maglev system.
2003-2006	**Underground U306 Bochum, Germany** Dynamic design of a 7 Hz mass-spring-system for the subway traffic.
2006	**Student Residence, Stuttgart, Germany** Vibration investigation and prognosis of tramways in the surrounding area of a residential accomodation for students.
2005	**Forum Duisburg, Germany** Vibration measurement and prognosis for a building complex containing offices and a shopping mall close to an underground line.
2001-2005	**Housing Estate Erdbeerfeld, Dortmund, Germany** Vibration investigation and prognosis.
2000-2003	**Rail connection Cologne–Bonn, Germany** Dynamic design of a 7 Hz mass-spring-system for the high speed (ICE) track.
2003	**RWE Gas Tower, Dortmund, Germany** Examination and evaluation of vibrations according to DIN 4150 for a new skyscaper nearby an underground line.
2003	**High Speed Line in Taiwan** Stress analysis of track switches.
2003	**Stuttgart 21** Dynamic design of a 6 Hz mass-spring-system for the planned new underground main station.









Year	Reference Projects (Extract)
2002-2003	**Metrorapid Los 3** Vibration measurements for preserving evidence and calculating the minimum immissions to be expected as part of the planning permission process.
1998-2002	**A+T Parkkolonnaden, Potsdamer Platz, Berlin** Unterfahrung des Gebäudekomplexes von einer U-Bahn und S-Bahn, Erschütterungstechnische Untersuchung und Prognoseberechnungen.
2001	**Underground U2 Berlin, Germany** Vibration and noise measurements for preserving evidence.
1998	**Underground U2 Berlin, section of Märkisches Ufer** Dimensioning of a mass-spring-system and ballast mats. Inspection and quality assurance of both vibration isolation systems.

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