



# Wavetrain Systems AS

March 2023

Investor Presentation

Confidential and not for distribution



### Threat

- Risks at rail level crossings



- Many Level crossings are unprotected<sup>1</sup>
- Protection of crossers is a growing concern

### Solution: Wavetrain Level Crossing Protection (WLXP)

- The WLXP detects and warns of approaching trains
- All equipment at the crossing, simple installation, no service interruption during installation or operation
- Detects trains through acoustic signals
- Sensors on the rail itself
- Continuous operation
- Detected signals digitized for interpretation and activation
- CENELEC SIL4 certified sensors
- Redundancy for reliability, availability, maintainability and safety



### Benefits

- Unprecedented speed of installation
- No service interruptions during a typical system installation
- Competitive cost, minimal maintenance, overall certified CENELEC SIL 2/ IEC 61508, sensor CENELEC SIL4

Wavetrain delivers cost-effective risk reduction at level crossings

(1) <https://www.unece.org/fileadmin/DAM/trans/doc/2016/sc2/ECE-TRANS-SC2-2016-id05e.pdf>

## Market Size and position

## Market Drivers

## End Client Examples

### Wavetrain Level Crossing Protection (WLXP)



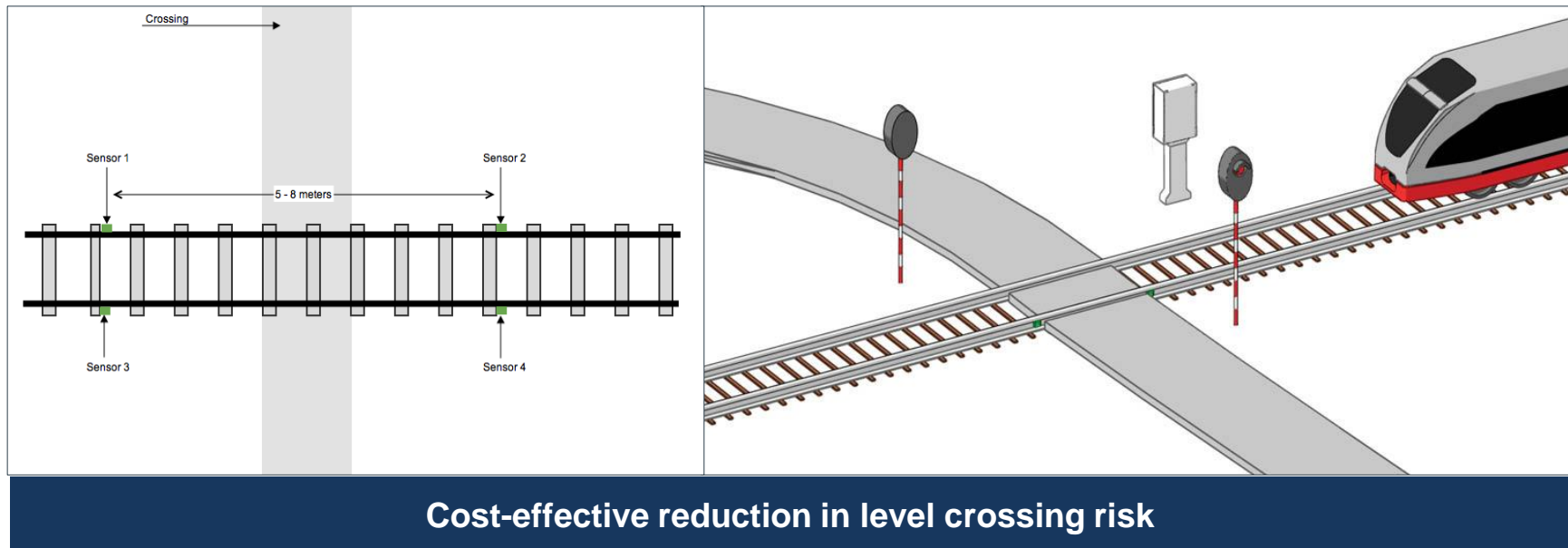
- Around 1.000.000 level crossings world-wide addressable market
- Euro 50 billion
- **Only** CENELEC SIL2 Certified supplier world-wide

- Growing population leads to increased traffic at level crossings
- Growing population demands growth in rail traffic
- Increased focus on safety at level crossings

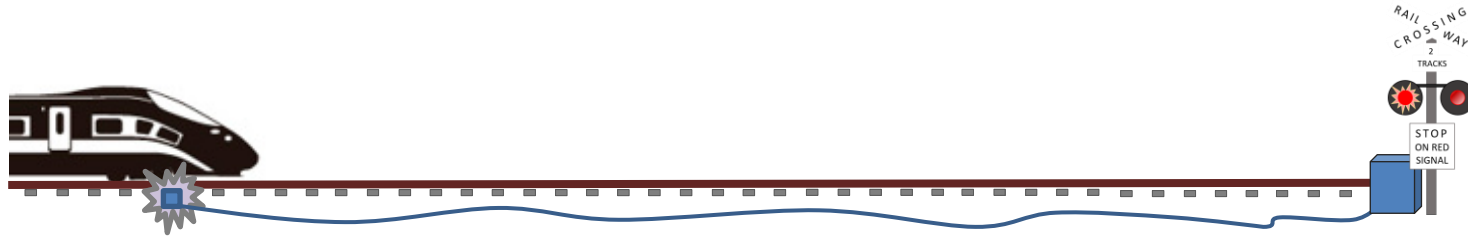
- Railway infrastructure owners seek solutions that can increase safety at hundreds of thousands of unprotected crossings world-wide: Network Rail (UK), SNCF RESEAU (FR), Bane NOR (N)

Railway safety is a large and growing market

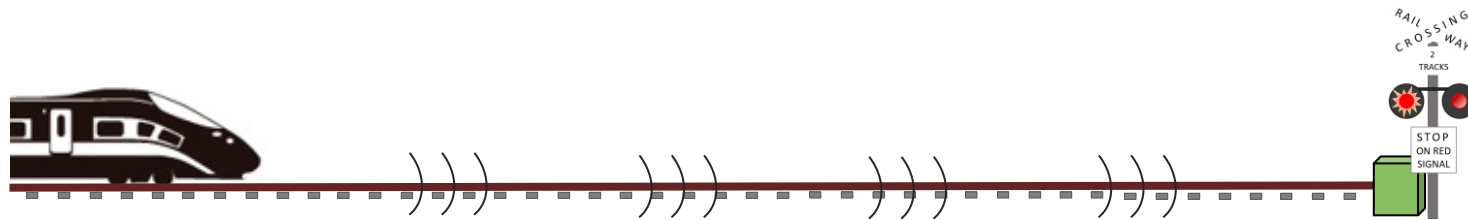
- System to detect trains through sound interpretation of acoustic signals in the rail
  - Four sensors for a single track, eight sensors for double track
  - Connected to a single control unit with advanced and proprietary software
  - Output drives warning measures
- CENELEC SIL2 certified for nine consecutive generations (EN 50126, EN 50128, EN 50129)
- IEC 51608 certified for seven consecutive generations
- Patented in more than 20 countries
- Warning measures supplied upon request for selected markets (i.e.UK)



# Why the WLXP is different



- In a conventional system, the warning cycle is initiated as the train reaches a certain place, the strike-in location



- The WLXP does not use any axle counters or other switching devices far from the level crossing
- It does not warn when the train is at a specific location along the tracks
- Instead, it will analyse the sound that the train is inducing into the rails as it is rolling
- The WLXP does not need any distant devices to achieve this
- All system components are at the level crossing

- **Only CENELEC SIL2 Certified supplier world-wide**
  - Requirement for roll-out
- **Installation time and resources significantly below competition**
- **Installation and maintenance cost significantly below competition**
- **No need to stop trains for maintenance or equipment replacement**
  - **Cost of service interruption during installation/maintenance huge**
- **Autonomous, not reliant on costly enterprise interfacing**
- **Type Approved UK 2022, operational system 2023**
- **No known competitors in this market segment**
- **Compliant with UK regulatory requirements**
- **Type Approval from the UK to be cross accepted in other markets**
  - **Reduces time to market significantly**

## UK, Network Rail, WLXP Status

- NR is in dire need of the WLXP to increase the number of protected level crossings
- NR has patiently been awaiting Wavetrain progress for the much needed system
- Product Type Approval for the WLXP achieved April 2022
- NR integration of the Type Approved WLXP into their own infrastructure for operational use is being finalised by NR, expected Q1 2023
- There are fourteen Routes making up the NR infrastructure. A Route has sole responsibility for a large section of the UK railway. All Route executives meet once a month for updates and information sharing. Wavetrain was invited and presented the WLXP at the monthly meeting in mid-February 2023
  - A rare and privileged opportunity for Wavetrain to reach out to NR stakeholders
  - Building relationships to Route stakeholders is a vital step towards sales
- NR has confirmed the installation of an integrated system for operational use early 2023 in East Midlands, an important milestone for further sales and roll-out
- Wavetrain estimates potential revenue for the UK market to be in the range of NOK 1 billion to 3 billion

# Products and Applications Catalogue



Product	Description	Application	Pricing NOK thousand	Gross Margin %
WLXP	Train detection system for level crossings	Rail sector	500 <sup>1</sup>	69%
Broken Rail Detection	Pending	Rail sector		

*(1) Volume sales will reduce price  
Certain markets may require 3<sup>rd</sup> party products add-ons to the WLXP, i.e. warning measures, off-grid power solutions*



- **Selling train detection systems for level crossings, SW & HW**
- **In-house development of core safety applications for the railway market**
- **Manufacturing and assembly using certified suppliers**
- **Local partner or customer to install and maintain according to local requirements**

# Office Locations

- Headquarters Lysaker, Norway
- 10 full-time employees and a team of loyal consultants



**Headquarters are based at Lysaker, Norway. Dormant subsidiaries in UK and Australia  
Production through certified suppliers**

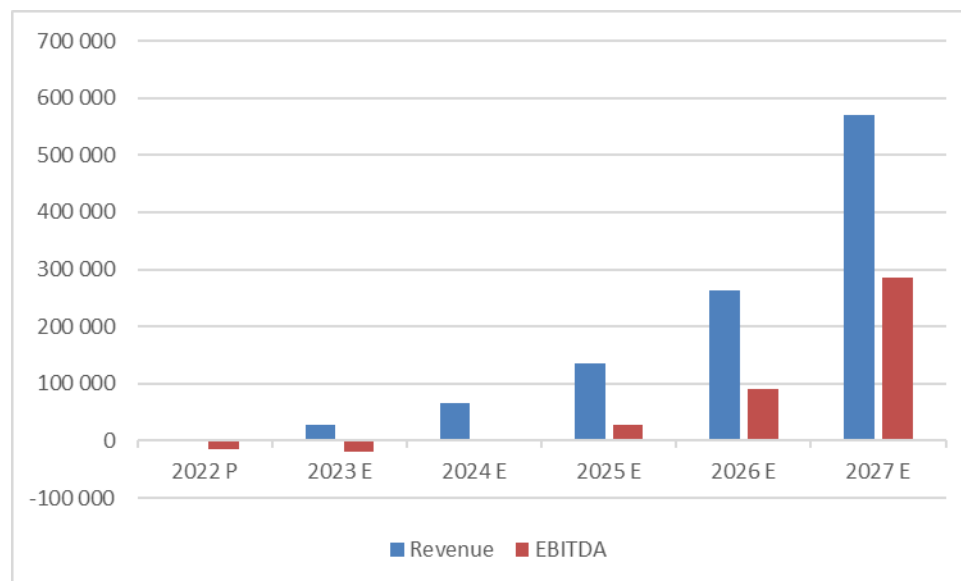
# Management Team



Name	Background
<b>Pål Bratlie</b> <i>CEO</i>	<ul style="list-style-type: none"><li>■ Joined Wavetrain as CEO in March 2023</li><li>■ Executive Vice President for various divisions in Kongsberg Defence &amp; Aerospace since 2009</li><li>■ Pål has vast experience as an executive leader with an impressive track record in international business.</li><li>■ Master of Science in Electrical Engineering, with a focus in microelectronics and safety, from the University of California, Santa Barbara</li></ul>
<b>Håkon Heier</b> <i>Advisor</i>	<ul style="list-style-type: none"><li>■ Wavetrain as CEO 2015 - 2023</li><li>■ CEO of Motorola Solutions Norway 2008-2015</li><li>■ 20+ years of international management, engineering and sales in industry</li><li>■ Various management positions in Telenor, ProCaptura, Nera, ABB</li><li>■ Master of Science from the Norwegian University of Science and Technology (NTNU), 1983</li></ul>
<b>Ørjan Sommerseth</b> <i>CTO</i>	<ul style="list-style-type: none"><li>■ Joined Wavetrain in 2014</li><li>■ 20+ years of experience Founder/ Developer of business and technology</li><li>■ Extensive experience from the computer science industry</li><li>■ Various management positions in Sysdeco, Software Innovation, EVRY</li><li>■ Cand. Scient. and Lecturer, The University in Oslo, Information Technology, 1995</li></ul>
<b>Erik Berger</b> <i>CFO</i>	<ul style="list-style-type: none"><li>■ Joined Wavetrain in 2015, CEO June-Aug 2015, CFO from January 2017</li><li>■ 20+ years' experience working with early-stage companies both in operational roles and as a PE/VC investor</li><li>■ Extensive international practice</li><li>■ Engineer Technical Cybernetics, Oslo Metropolitan University 1987 – EUR ING 1992</li><li>■ MBA, EM LYON, France, 1993</li></ul>

NOK million	2013A	2014A	2015A	2016A	2017A	2018A	2019A	2020A	2021A	2022P	2023E	2024E
<b>Revenues</b>	16,6	25,4	0	0,5	0,9	0	0	0	0	1,3	27	65
<i>% growth</i>	-	53%	-	-	80%	100%	-	-	-	-	1985%	140%
<b>EBITDA</b>	1,5	-1,6	-19,9	-13,6	-11,6	-10,4	-14,0	-12,0	-11,6	-15,2	-19,3	0,4
<i>% margin</i>	9%	-6%	-	-2.720%	-1.289%	-	-	-	-	-1.172%	-71%	1%

- Revenue 2013-14 is sales to Network Rail (UK) from first generation, non-certified WLXP
- Revenue 2015-22 is sales of test systems
- CENELEC SIL1 certificate achieved in March 2015 and CENELEC SIL2 in June 2015 from Lloyds Register
- Numbers from the Broken Rail Application not included
- Balance sheet 2022 preliminary in NOK million
  - Total assets: 75
  - Equity: 44,6
  - Debt: 30,4



# Shareholding structure

	%	Shares	Ordinary	Pref A	Pref B
NORDIC TECHNOLOGY GROUP AS	83,6 %	33 734 842	32 025 731	1 227 059	482 052
S. MUNKHAUGEN AS	5,9 %	2 361 161	839 817	573 977	947 367
SKIPS AS TUDOR	2,1 %	854 104	604 104	250 000	0
LJM AS	1,9 %	747 789	497 584	144 942	105 263
MOGER INVEST AS	1,3 %	535 947	390 684	40 000	105 263
Others	5,2 %	2 098 423	1 536 152	190 386	371 885
	100,0 %	40 332 266	35 894 072	2 426 364	2 011 830

# Risks and Mitigations



	Risks	Mitigations
Economic risk / Political risk	<ul style="list-style-type: none"> <li>Conservative industry, delayed type approvals, slow market adoption</li> <li>Primary market UK has some challenges, e.g., political changes, strikes, price increase, change of organization Network Rail</li> </ul>	<ul style="list-style-type: none"> <li>The use of advisors well known in the industry</li> <li>Primary market is Network Rail, UK due to lead position and market size</li> <li>Cooperation with Railsupport and Ricardo for safety certifications</li> <li>Promote the product, brand and patents</li> <li>Participate at conferences and exhibitions</li> <li>Meet the tier one railway owners</li> <li>Re-engage dormant Wavetrain UK subsidiary</li> <li>Local manufacturing</li> <li>Local partners</li> </ul>
Competition	<ul style="list-style-type: none"> <li>Competitors with SIL 3 and 4</li> <li>New entrants with SIL 2</li> <li>Do nothing</li> </ul>	<ul style="list-style-type: none"> <li>Competitive advantages, installation &amp; cost, detection technology</li> <li>First mover advantage</li> <li>Patents</li> <li>NR is a strong reference</li> </ul>
Wavetrain	<ul style="list-style-type: none"> <li>Wavetrain is a growth company with outstanding debt, limited revenue, negative results</li> <li>May need additional funding</li> <li>Intellectual property rights</li> </ul>	<ul style="list-style-type: none"> <li>Wavetrain is part of the listed Nordic Technology Group AS</li> <li>Wavetrain has a strong brand and international patent portfolio and is supported by Bryn &amp; Aarflot in related matters</li> </ul>
Production - Partners	<ul style="list-style-type: none"> <li>Global shortage of semi-conductors and components</li> <li>Trustworthy Partners</li> </ul>	<ul style="list-style-type: none"> <li>Renowned production partner(s)</li> <li>Partner with companies with a relationship with the clients</li> </ul>



Product and processes approved by accredited organizations

RAILSUPPORT AS



ISO 9001, ISO14001, ISO 27001, ISO 45001,  
CENELEC SIL2, IEC 51 608, Vibration, EMC, CE

## Share issue of Preference Shares “Offer shares”

- NOK 40 million

### 1. Loan from NTG to be converted

- NOK 20 million

### 2. Cash equity

- NOK 20 million

## Financing planned from Eksfin

- Working capital
- Project financing

## Rights of Preference Shares “Offer shares”

- (i) first, each of the Offer Shares shall be entitled to a distribution of NOK 9.50;
- (ii) second, each of the Series B Preference Shares shall be entitled to a distribution of NOK 9.50;
- (iii) third, each of the Series A Preference Shares shall be entitled to a distribution of NOK 12.00; and
- (iv) fourth, each of the Series A Preference Shares and the ordinary shares shall be entitled to a distribution per share equal to NOK 9.50, being the amount received by each Series B Preference Shares (catch-up); and
- (v) fifth, all shares shall receive any and all excess distributions pro rata to the number of shares

### Put Option:

12 months duration

Convert Offer Shares in Wavetrain to ordinary shares in Nordic Technology Group AS (1:1)

For details see “Application Form for private placement of shares”



# Disclaimer



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