



EFCA
FUTURE LEADER OF THE YEAR
2020

Personal details / Entry Form

Full name: Magnus Hedly

Nationality: Norwegian

Birthday: 14.02.1991

Age as of 31/03/2020: 29

Company: Trimble Solutions Sandvika AS

Location: Sandvika, Norway

Member Association: Trimble Solutions Sandvika AS

Contact details

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Section A. EMPLOYER'S RECOMMENDATION

Magnus started in Trimble Solutions Sandvika in August 2017. Prior to this, as a student engineer, he had become interested in a Trimble optimization tool for road and rail corridors called Quantm. His reason for joining Trimble was to change the way the road/rail design industry selects the most environmentally friendly and cost effective solutions for new and upgrading existing transportation corridors.

Magnus's passion for design and his extraordinary drive to move the industry showed quickly in his ability to influence project managers and infrastructure owners in changing the way they approach corridor selection. His extraordinary curiosity in finding relevant projects, using his free time to research solutions and his ability to influence experienced designers in looking at new methods and work processes gave success. Magnus, in the course of his three years with Trimble, has made a significant impact on how corridor design is performed, especially in Norway and Sweden with The road and railway authorities (Nye Veier, Statens Vegvesen, Bane NOR and Trafikverket). Major road and rail authorities now require the methods Magnus has proposed. In addition, he has worked with international infrastructure owners like Italferr in Italy and major international consulting groups like NCR, Skanska, Atkins, Jacobs and Acciona.

Magnus's high level of technical expertise, his work ethic together with his ability to engage at an owner and project manager level and also at an end user level has been impressive. He is both a good leader and a team player. He is able to activate those around him to perform at their maximum and involving the rest of the organization to help him reach his goals. He is very structured and result driven. He is truly an influencer in our industry and is set to make an even more significant contribution in the future. He is one of the few unique people that help to make a better world.

Name: Patrick Mc Gloin

Job title: Solution Sales Manager Civil Design EU

Managerial relationship to candidate: Teammates

Section B. THE PROJECT | WORLD RECORD IN PLANNING TIME

B.1 Project description:

The application will successively demonstrate the path of the FL’s leadership towards the implementation, development, leadership and growth of new planning methodology combined with the BIM software Trimble Quantm to achieve the world record in reduced early phase planning time, lower construction cost and CO₂ footprint emissions.

The following five-industry challenge from Mckinsey Global Institute [research](#) and [Dodge Analytics](#) is today’s global pain points in the civil engineering and construction sector. FL have been leading the international implementation to contribute to make planet earth more efficient and sustainable. The FL’s influence and collaboration drive across every region of the world to develop methods and solutions to meet global challenge within the civil engineering and construction sector will be shared in the following presentation.

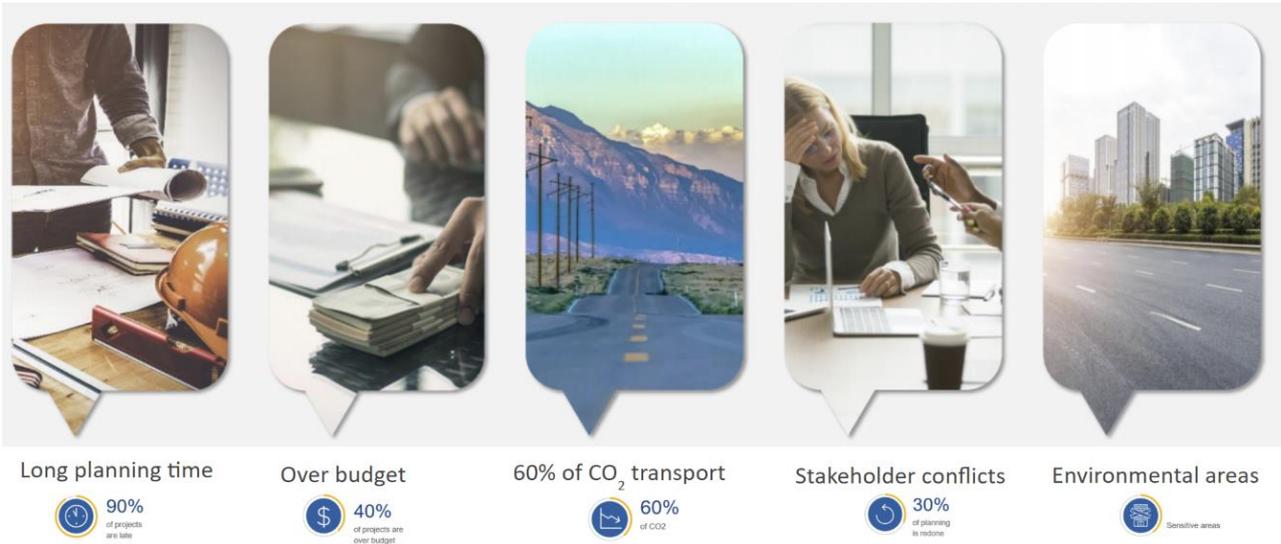


Figure 1 Industry Challenge’s RIF and Trimble

What is Quantm planning solution and how has the FL implemented the method it in the world’s most complex infrastructure to solve the five-industry challenges?

Quantm Software helps you plan a new rail, road or highway project more rapidly with lower construction costs. Quantm is the most advanced alignment planning solutions in the industry. The system has demonstrated that the earthworks and structures, such as bridges, tunnels and retaining walls are very sensitive to small changes in an alignment.

Even moving an alignment only vertically, or within very narrow corridors can make a major difference in costs. The advanced complex algorithm performs a true tri-dimensional optimization by applying millions of permutations and combinations and thus achieving a reduction in the overall capital cost of an alignment.

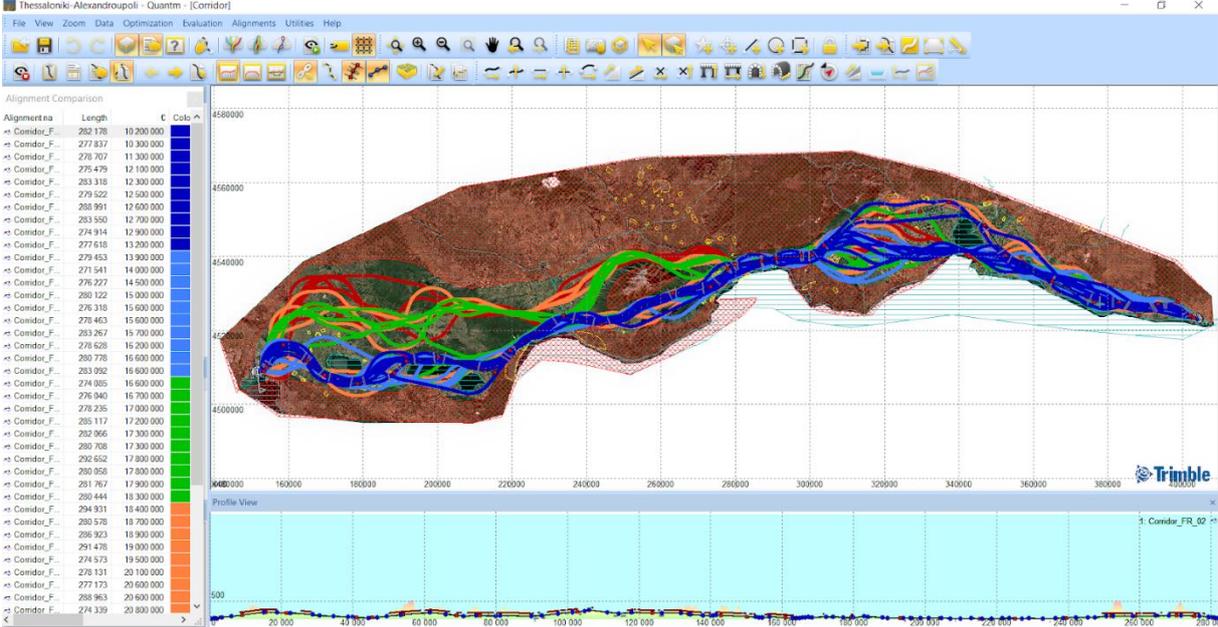


Figure 2 Early phase scoping

This sensitivity, coupled with the complexity of projects where many variables have to be considered simultaneously, results in the manual process being highly unlikely to find the optimal solution. These variables include: terrain; geometric standards; avoid zones to address social and environmental concerns

The FL spent 2018 and 2019 influencing, implementing and educating hundreds of planners, engineers, contractor and students to do their analysis in the most professional way to achieve the optimal results during scoping, feasibility and value engineering.

Road and Railway planners consistently achieve substantial alignment construction cost savings, as well as reducing the planning cycle time and improving the consultative process associated with environmental analysis and community opinion. Planners have the ability to demonstrate that all possible alternatives have been considered when applying Trimble Quantm Professional. The cost of not using Quantm can be extensive delays to a project, dissatisfied community, litigation, or the project even being postponed or canceled because the projected cost of construction means that the project is no longer deemed economically viable.

The planning process is becoming increasingly complex with alignments being influenced by terrain, design standards, environmental analysis, public consultation, community influence, cultural heritage, crossing rules for existing features, geology, noise mitigation and unit costs. The conventional approach, while supported by CAD (design) or GIS (Geographic Information Systems), is fundamentally a manual process that relies on the planner being able to balance all of these issues in locating an alignment.

Quantm investigates millions of alternatives, driven by and based on the input of the planners and engineers. It then compiles and summarizes the results, enabling planners and engineers to concentrate their time and skills on the analysis and decision making. In addition to being able to define special treatment zones that protect areas of cultural heritage or environmental sensitivity, the system allows planners to integrate the input from the various workgroups involved in the environmental analysis and provides a detailed audit of the process taken to arrive at a preferred alignment(s).

This ability to prioritize environmental and community constraints and document the steps to objectively determine the solution that best balances economic, social and environmental issues is unique to the Quantm system.

The speed of Quantm Professional allows the avoid/mitigate constraints to be defined iteratively, enabling planners to prioritize no-go zones and determine the alignment implications of each addition and at what point the design standards of the project may be compromised by the constraints created by these zones.

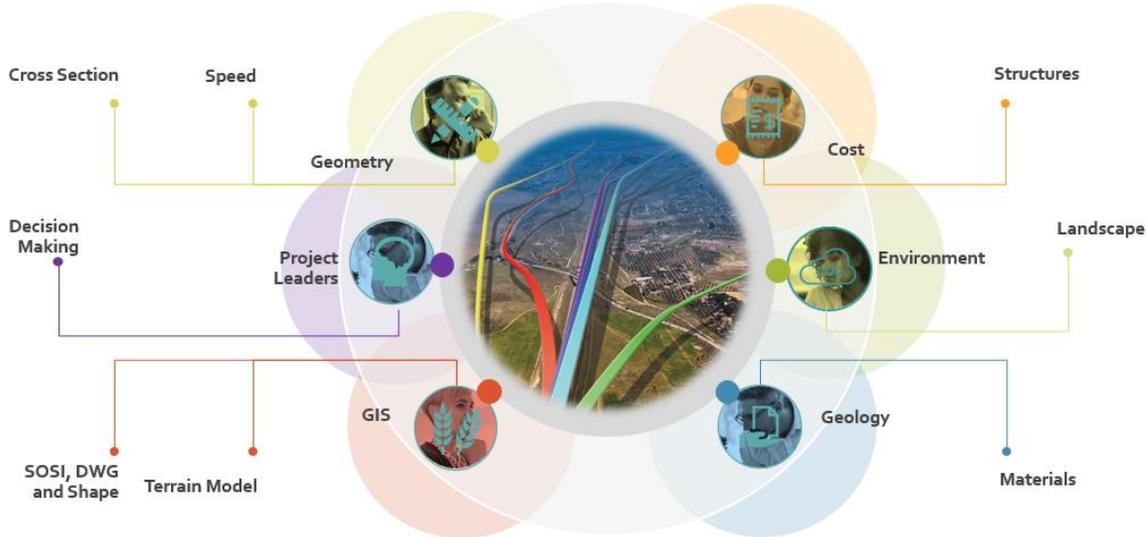


Figure 3 Quantm disciplines involved

Quantm also allows planners to carry out comprehensive sensitivity analysis to determine the effect of changes to grade, radii, creation of new zones, CO₂ estimates and earthworks limits to determine the balance between construction cost and operating cost, with the associated environmental and operational impacts.

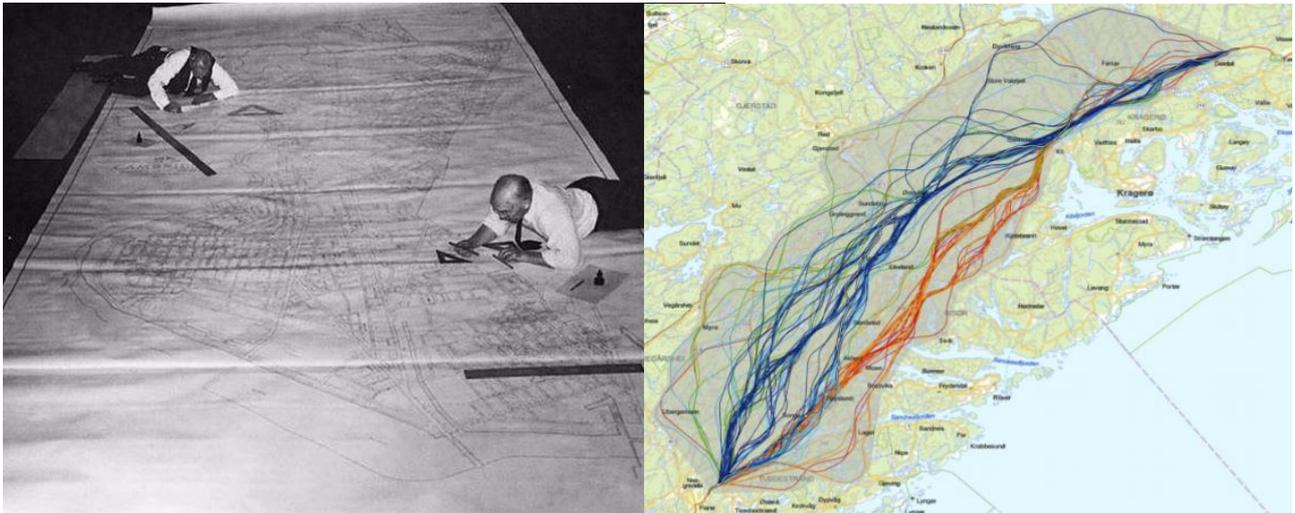
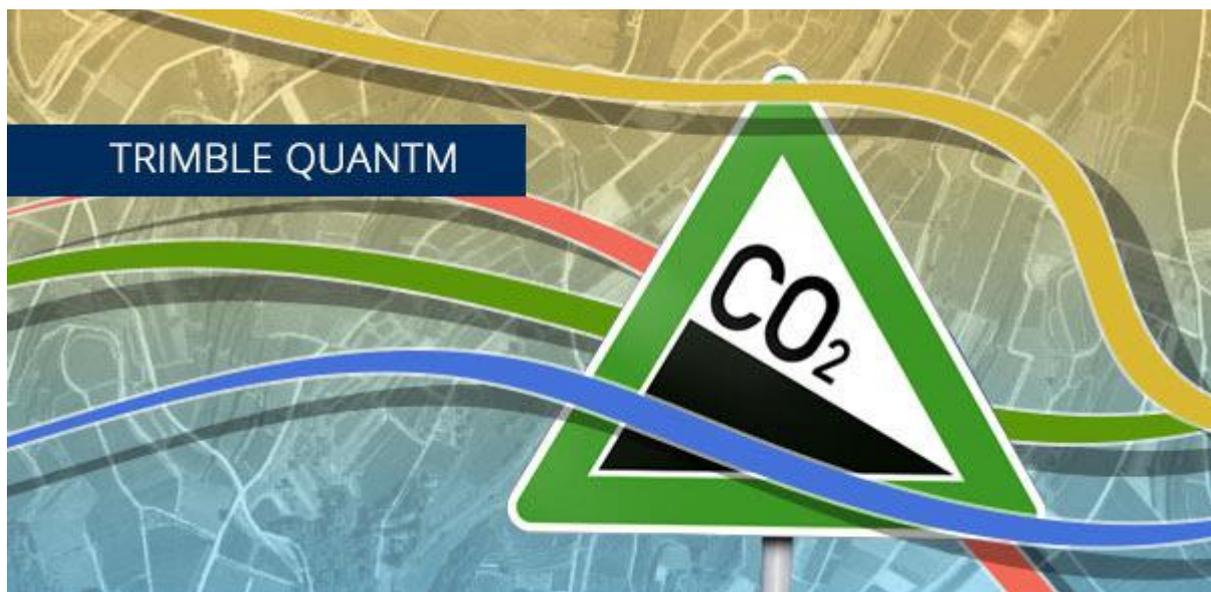


Figure 4 what was... What is...

B.2 Innovative characteristics of the projects:

The most recent development and innovation is the [new CO₂ calculator](#), which is used to reduce emissions due to the Paris Agreement and fulfil contract requirements to estimate and reduce footprints emissions from the construction phase and from future traffic and operations.



The CO2 calculator, planned and developed by the FL and his team was release Q3 2019 and has been revolutionary due to the fast calculations and alignment comparison where both cost and CO2 can be compared for all route options the early and late project phase.

Quantm was nominated to the wise technology price in 2018, won the DKT talent price for CO2 2019 and is awarded with the scholarship from NFV (The Nordic Road Forum) in 2020 for footprint emission calculation and will be a part of the standardization of CO₂ values in European infrastructure projects.



Alignment Summary

Excel Worksheet

KORRIDOR_RFV_1_01

Item	Quantity	€	%	CO2 %
Source				
Cut (m ³)	1 080 000	79 900 000	7	10 800 12
Tunnel Debris (m ³)	17 200	0	0	0
Import (m ³)	0	0	0	0
Borrow (m ³)	0	0	0	0
Destination				
Fill (m ³)	843 000	21 100 000	2	8 430 10
Export (m ³)	0	0	0	0
Dump (m ³)	244 000	20 700 000	2	2 440 3
Template Materials				
Mass Haul (m ³ km)	1 010 000	86 000 000	7	10 100 12
Ret. Wall (m ²)	11 220	89 800 000	8	11 200 13
Culvert (m)	0	0	0	0
Bridge (m)	1 777	516 000 000	43	13 600 16
Tunnel (m)	344	162 000 000	14	10 300 12
Footprint Area (m ²)	421 000	34 000 000	3	340 0
Linear (m)	14 593	57 000 000	5	0
Cadastral	0	0	0	0
Fixed Cost		0	0	0
Construction Cost		1 190 000 000	0	87 000
Traffic Cost		0	0	412
Total cost		1 190 000 000		87 000

CO2 Report

Alignment: KORRIDOR_RFV_1_01

Traffic Composition

Cars (Petrol) 50.000 %

Cars (Diesel) 20.000 %

Trucks 15.000 %

Cars (Other) 10.000 %

Cars (Emission Free) 5.000 %

Total 100.000 %

Traffic Flow

Average Speed 100 (km/hr)

Daily Traffic Flow 10000,000

Environmental Impact

Fuel Consumption 173287,014 litres

CO2 Emissions 411,522 tonnes

Daily Annual

Recalculate Recalculate All

Report Vehicle Parameters

OK Cancel

Alignment Comparison

Alignment na	Length	%	Color	CO2 (Construction)	CO2 (Traffic)
KORRIDO...	14 593	2	Blue	87 000	412
KORRIDO...	15 663	0.0	Black	122 000	437

B.3 The FL's role in, and specific contribution to, the project/product:

The FL's has been promoted to the Quantm Product Owner early 2020, at the age of 28 and will be the leader and decision maker for the planning software worldwide. FL is responsibility to lead the technical development of the product Quantm, maximizing the end customer value, including BIM-workflows and integrations across the entire world. Responsible for the short and long-range plan. Reporting the following to Business Director and CEO; Business strategy, resources, product design, market analysis, customer liaisons, anticipation client needs, product roadmap, prioritizing of backlog, define vision, evaluate development and ensure efficient progress improvements. Lead the agile team and be responsible for defining stories and prioritizing the team backlog to streamline the execution of program priorities while maintaining the conceptual and technical integrity of the features and components delivered to end users and clients.

The FL will also support development in development countries and participate as technical manager for 40.000 km Feasibility study in Africa.

Another passion the FL have is to engage and support student. Now there is eight bachelor theses, two master theses that uses the FL as advisor. The FL is also responsibility for technological labs in Norway where hundreds of students learn new technologies and prepare themselves for their career.

B.4 Communication with the client/end user:

The FL are supporting the end users and clients in any technical or project related way, as well as R&D projects to make sure they have the set of tools and knowledge to fulfil project requirements, but also add additional value out of the main contract to the communities.

The FL have direct communication with CEO's and project leaders in lots of organizations and cooperation companies to track progress and always try to improve the relationship in order to make the optimal solutions, technologies and methodology's together. It's always easy to reach the FL, and both ears are at place to listen to every person that has anything at their mind.

B.5 Describe the project end results and the benefits to the client/end user:

Summary characteristics of the reference project's approach to solve the industry challenges where FL have had a leading advices position for the technical solution:

- *Utilize new technology to reduce planning time with 50%*
- *Select optimal corridor to reduced cost up to 25% by selecting the low cost alignment which take all constrains into account in one single analyses*
- *Calculate CO₂ from construction phase and future use and operation to influence design solution*
- *Mythology to validate, document and compare 1000 route options in order to provide all stakeholders with enough information to take best possible decisions.*
- *Consider sensitive areas such as animal areas, culture heritage and environmental constrains as well as eliminating geology risks by detailed helicopter scanning of the sub layers to have the ground conditions and constrains as an input during scoping and corridor selection*

Section C. CLIENT'S APPRECIATION OF THE CANDIDATE

Name of Quantm Project 1: The East Link Project, Sweden

What is the name of the Quantm project and what was the mission?

The East Link Project, Linkoping. A part of the future high-speed rail system in Sweden. The mission is to investigate possible station placements including new high-speed tracks through the city of Linkoping, a feasibility study.

Working relationship with the candidate (Magnus Hedly):

Describe your working relationship with the candidate during the project, and evaluate Mr. Hedly performance, including his communication skills, support, leader skills, technical assistance and general performance.

Magnus is always there when you need him! He responds fast, is engaged, proposes new ideas and has great knowledge about the Quantm software and how it can be used in projects like this.

End Result:

Achieved End results with Trimble Quantm and how did Mr. Hedly contribute to the final project results.

The result by using Quantm did already start to show the first day of the project. The whole project group gathered and discussed the first result created by the software, a great way to kick start this feasibility study. To have the possibility to look at and discuss possible corridors, costs, constructions, geometries etc. so early in the project is unique. The software really did speed up the workflow throughout the whole project. I've created over 100 scenarios and evaluated thousands of possible routes.

Without Magnus eminent teaching and support abilities, I would not be able to navigate this software with such speed and accuracy. The Quantm software and the support from Magnus in this project did not meet my expectations, it exceeded them.

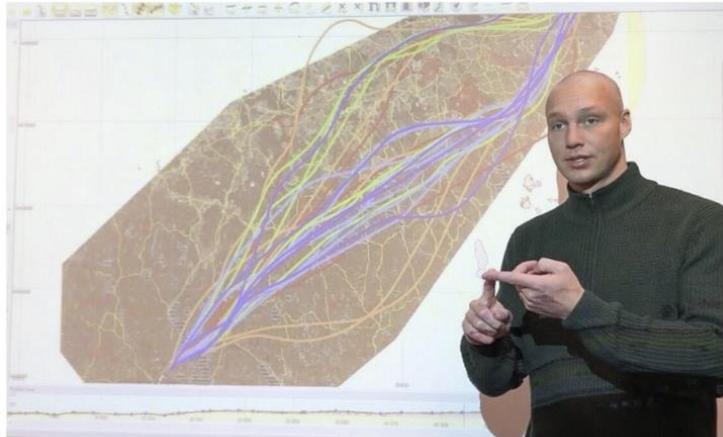
≡ Europe



“Advanced studies”

I strongly believe that we wouldn't be able to perform an advanced corridor study of this magnitude without using Quantm

Mark Lidback
Railway designer, Atkins



Name and signature: Mark Lidback

Job title: Investigator/Railway designer

Company: Atkins Sweden, member of the SNC-Lavalin Group.

Name of Quantm Project 2: E18 Dørdal – Grimstad KDP

The mission of the project was to find the best corridor for further planning of two parts of the motorway E18, Dørdal – Tvedestrand and Arendal – Grimstad. The criteria for ranking the different corridors was among other things cost benefit and minimal impact on nature diversity, cultural heritage and agriculture.

[Trimble Quantm](#) was used early in the project to find alternative corridors and also to eliminate corridors.

Working relationship with the candidate (Magnus Hedly):

Our first meet with Magnus was at the introduction course for Quantm. He guided us through all basic use of the program. Later in the project he assisted us when we needed. He was always available and met us with a smile and positive energy. If he couldn't help us directly he always checked up the problem to try to find a solution.

End Result:

End results with Quantm was good and we used the results to work further with centerlines and roadmodels in Novapoint. The results from Quantm also helped us to eliminated areas where it seemed to be expensive to build new roads. Magnus contribute to the result by being available for questions when we needed and to find solutions when we ran into problems with the program.

Scandinavia



“Evaluate all options”

|| In a few hours, Quantm can find hundreds of path options, which of course is impossible manually

Lars Kastet
Road planner, Asplan Viak



Name and signature

Lars Kastet

Job title: Civil engineer

Company: Asplan Viak

Name of Quantm Project 3: Intercity Dovrebanen, Brumunddal-Moelv

Working relationship with the candidate (Magnus Hedly):

Mr. Hedly is a smiling and helpful person. He was knowledgeable and could answer most of what we needed help with. Thinks he didn't know, he run a quick check one and provided quick feedback. Communication was direct and precise. Support was quick and helpful. Before we ran analyzes, he took the time to review with us. We really appreciated that.

The overall impression is extremely good. Which makes me want to recommend Magnus for training, support, development and project leader roles in other projects.

End Result:

We have found a cheat and low CO2 corridor that we will continue to work on in the next investigation much faster than in the past with original tool. I will also use Quantm in other projects in my portfolio.

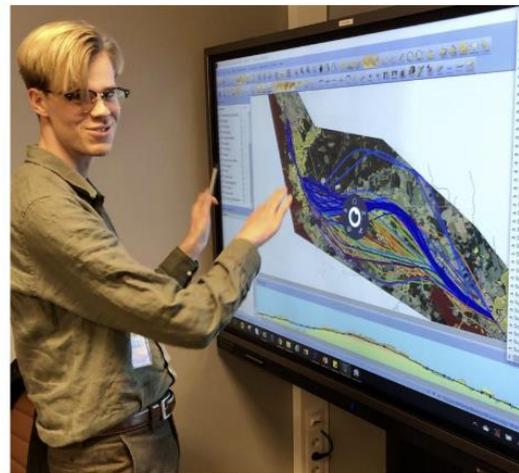
≡ Norway



“High Speed Railway planning”

Research reports shows us up to 25% cost saving and 50% faster planning with use of Trimble Quantm.

Morten Berg
Design Manager InterCity, Bane NOR



Name: Morten Berg

Job title: Design Manager Intercity

Company: Banenor SF

 Digitalt signert
av Morten Berg
Dato: 2020.04.28
12:56:17 +02'00'

Curriculum Vitae



Personal information

First name(s) / Family name(s)
Business Address
Phone number(s)
E-mail address
Nationality
Date of birth

Magnus Hedly
Lille Bislett 16
+47 47304800
Magnus_hedly@trimble.com
Norwegian
14.02.1991

Work experience

Dates
Occupation or position held
Main activities and responsibilities

01.02.2020 - Present
International Quantm Product Manager
Lead the technical development of the product Quantm, maximizing the end customer value, including BIM-workflows and integrations across the entire world. Responsible for the short and long-range plan. Reporting the following to Business Director and CEO; Business strategy, resources, product design, market analysis, customer liaisons, anticipation client needs, product roadmap, prioritizing of backlog, define vision, evaluate development and ensure efficient progress improvements. Lead the agile team and be responsible for defining stories and prioritizing the team backlog to streamline the execution of program priorities while maintaining the conceptual and technical integrity of the features and components delivered to end users and clients.

Name and address of employer
Type of business or sector

Trimble Solutions Sandvika AS, Leif Tronstads Plass 4
Civil Engineering and Construction (CEC)

Work experience

Dates
Occupation or position held
Main activities and responsibilities

01.09.2017 – Present (Continue this role beside Product Manager)
Technical Sales Engineer Feasibility Study, Planning and Scheduling, EAME
The TSE is the customer-facing technical expert who collaborates with sales, client services, professional services, product, development and support in complex infrastructure projects to

Name and address of employer
Type of business or sector

ensure proposed deals include technical solutions that accurately address customer needs are appropriately supported by key customer technical decision-makers.
Trimble Solutions Sandvika AS, Leif Tronstads Plass 4
Civil Engineering and Construction (CEC)

Work experience

Dates
Occupation or position held
Main activities and responsibilities
Name and address of employer
Type of business or sector

15.06.2016-15.06.2017
Summer Student at Norconsult testing out Software in Railway Projects. Bachelor degree about Quantm for Norconsult, Trimble and NITO.
Test Software for the company to solve pain points
Norconsult AS Sandvika, Vestfjordgaten 4
Civil Engineering

Mother tongue(s)

Norwegian, Swedish

Other language(s)

Understanding				Speaking				Writing	
Listening		Reading		Spoken interaction		Spoken production			
x	Russian	x	Russian						
x	German	x	German						
			Danish	x	Danish			x	Danish
x	English	x	English	x	English	x	English	x	English

Social skills and competences

Friendly, Empathy, Respect, Active listening, Conscientious, Ambitious, Flexible, cooperative, adaptable and creative

Organisational skills and competences

Teamwork, Teachable, Cooperative, Negotiation techniques, Problem-solving, mentoring, Effective communication, Conflict resolution, Responsibility, Commercial Awareness, Decision Making, Leadership, Tactics and planning skills, Criticism handling, Trustworthiness, Ethics, Results Orientation and goal driven.

Programming languages Common operating systems Software proficiency Technical writing Project management Data analysis.

Technical skills and competences

Gaming, Common operating systems Software, proficiency Technical writing, Product management, Project management, Data analysis, Business Intelligence, license handling, Engineering, Company processes, IT.

Computer skills and competences

Software specialist, Analytics, Social Media, Graphic Design, Microsoft Office package, Google package, Spreadsheets and Excel, Email Communication, Marketing Automation, Data Visualization, Video editing, Web Training guides, FAQ's, Presentation tools like PPT and Prezi. In depth software BIM skills; Quantm, TILOS, Novapoint, Quadri, TBC, Works Manager, SketchUp, Grasshopper, Tekla, SiteVision, OpenFormats ++.

Other skills and competences

Try-Fail-Success, Work Load Capacity, Stamina. Company responsible for teaching students software in Norway. Approximately 250 per year. Supporting 10 Bachelor degrees and adviser for up to 5 Master Degrees every year.

Hobbies and activities

Activity contact for disable people, traveling, nature, skydive, diving, extrema sport, Ice hockey/Bandy (former professional player (captain on the Norwegian national team)

<p>Professional mentality</p> <p>Papers/Articles published/cooperation/about the solution</p>	<p>Transforming the way the world works</p> <ul style="list-style-type: none"> - https://www.novapoint.com/nye-veier-gar-nye-veier-pa-e18 - https://www.novapoint.com/optimal-road-alignment-best-possible-road-project - https://construction.trimble.com/customer-stories/cowi-makes-use-new-tool-find-optimal-localization-new-road - https://www.novapoint.com/atkins-sweden-uses-trimble-quantm-new-high-speed-railway-project
<p>Public speaking experience</p> <p>Membership of professional organisations</p>	<p><u>Keynote speaker, international conferences and events:</u></p> <ul style="list-style-type: none"> ● Time-effective route analysis and cost estimating for road and rail. 400 participants. BIM level 3 - Civil Construction Continuum Conference Copenhagen November 2017 ● Best road project – Best road alignment. 5000 participants. Dimensions 2018, Las Vegas, USA. <p>National events:</p> <ul style="list-style-type: none"> ● CO2 reductions from early phase of projects. 400 participants. Trimble user meeting Norway 2018 ● Feasibility and scheduling. 400 participants. Trimble user meeting Norway 2018 ● Generate the optimal railway corridor in one day with lowering CO2. 350 participants. DKT (The wise Talent) – top five Award Engineering Talent in Norway. In 2019, the CO2 calculator was awarded the 1st price of youth development in Norway at the same conference. <p><u>Other presentations:</u></p> <ul style="list-style-type: none"> ● 30 professional BIM software training sessions ● 15 online webinars for thought leaders ● Multiple presentations in 2020 delayed due to COVID-19 <p>NITO – Norwegian Engineering and technology organization Membership number: 52396694</p>

Applicants for FIDIC FL competition

Contributions to consulting engineering industry

Doing support, webinars and visiting old and new projects to establish relationships and make sure all parties are updated on new methods and technologies. The FL is always contributing to internal, external and national meetings and conferences to meet other influencers and keep the environment in the industry up both in a professional and social way.

Contribution to consulting engineering associations

NITO awarded the FL with a scholarship during the bachelor task about Quantm and was able to travel to dimensions in USA to present the work in 2016 and 2018. Also working close with all RIF members in order to share knowledge, do presentations and support all kind of initiatives to drive the people, companies and the industry forward together.