

RESEARCH DOCUMENT



Suicides involving train-person collision in the Netherlands

How to decrease the number of suicide attempts
on train tracks while increasing safety?

**SUICIDES INVOLVING TRAIN-PERSON COLLISION IN THE NETHERLANDS –
HOW TO DECREASE THE NUMBER OF SUICIDE ATTEMPTS ON THE TRAIN TRACKS
IN THE NETHERLANDS WHILE INCREASING SAFETY?**

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Table of contents

Introduction	1
Research questions & Research approach	2
Main research question	2
<i>How to decrease the number of suicide attempts on the train tracks in the Netherlands while increasing safety?</i>	2
Sub questions	2
Discussion	15
Conclusion	16
References	17

INTRODUCTION

As any other great invention, the locomotives took their place all over the world, allowing freight and people to travel through different regions with incredible ease.

As much as the train makes the transportation more practical and travel relatively fast, there is always a down side of it. The train speed, that for most people can be seen as a positive aspect of this invention, can be also seen as a way to end up a life for others.

Aiming to investigate the aspects around people attempting suicide in the tracks in the Netherlands, this document is structured in a way that the following question can be answered: “How to decrease the number of suicide attempts on the train tracks in the Netherlands while increasing safety in these spots?”.

To answer the main question, the current document presents information gathered by using the Development Oriented Triangulation Framework method, that aims to structure the research in topics in sub-questions to answer the main question stated above.

As a result of the answered research questions, a discussion is presented bringing arguments to the fact even though we are trying to handle a gigantic issue, there is hope and knowledge and technology available to improve safety on the train tracks.

RESEARCH QUESTIONS & RESEARCH APPROACH

Main research question

How to decrease the number of suicide attempts on the train tracks in the Netherlands while increasing safety?

Sub questions

1. How does a suicide that happens on a train track impact people in general, as well as the families of victims and the rail company?
2. Why does people attempt to commit suicide by jumping in front of a train?
3. How impactful is it for the rail company when an incident like that happens?
4. What are the measures that the company has taken to prevent suicide from happening on the train tracks?
5. Is it possible to identify and present information of the areas where those incidents happen more often?
6. What are the measures that countries facing the same issue have taken to prevent suicide?
7. What kind of technological approach could the railway company in the Netherlands possibly use to increase safety?

The questions below were answered and structured based on the Development Oriented Triangulation Framework. This method aims to help to structure the topics in the research and communicate about it.

1. How does a suicide on a train track impact the train driver, the family of the victims and the railway companies?			
Strategy	Technique	Approach	Goal
Library	Literature study	Gather information from different sources, websites and articles published about the topic	Obtain information from different perspectives: The train driver, the family of the victim and the railway company
Field	Interview	Have an interview with NS Company, where this question was asked	Understand the topic from an employee perspective (safety and security department)

Results

Literature study

According to the journal of Affective Disorders, “*train suicides lead high costs as a result of driver and bystander trauma and delay to the service*”. (Houwelingen, Kerkhof, & Beersma, 2010). Those incidents involving person-train collision had a significant increase over the years, causing more trauma for the train drivers and family of the victims.

In march of 2014, an article published by the website NL Times showed that train drivers tend to come back to work only after 3 days after the incident of someone getting killed by a train. However, they can ask for extra time to recover if need it.

Although the drivers come back to work shortly after an incident, it is important to highlight the fact that many of them only present problems later in their lives. The following piece of text is an example of what have happened to Jacques, an ex-train driver:

“When Jacques first became a train driver, it was a way to make his daily bread. But he had no idea that 20 years later, his job would leave him with post-traumatic stress syndrome”. (NL Times, 2014).

Aiming to bring attention to the impact of the suicide on train tracks in the life of train drivers, the article reports real cases, as the case of the ex-train driver Jacques. The next following piece of text is an another example of what have happened to him, after he quit his job due to the suicide of a boy on the tracks: *“Jacques, from Vlaardingen, started hyperventilating and got panic attacks and didn't dare to board the train anymore. He got another job at the NS, but landed in a psychiatric facility years later, he had daily treatments for a year”. (NL Times, 2014).*

It is visible that train drivers are directly affected by suicides on the train tracks. In 2020, the website country economy demonstrated that in that year 1910 suicides occurred in the Netherlands, in which 185 suicides per year were train suicides. (countryeconomy.com, 2020)

Interview

During the interview with the Safety and security department of NS it was possible to gather information from an employee. The interviewee showed his perspective about the topic and answered all the questions with details.

According to the interviewee, when a person jumps in front a train a lot of impact is caused. Besides the trauma caused by the collision with a person, the train driver has to follow a standard procedure: *“When someone jumps in front of the train the machinist/ conductor cannot leave the area until the police arrives. According to the law, they are suspicious of a crime that have happened”. (NS Safety and Security department, 2022).* When all the law procedure is done, they are free to go, as described below:

“They get assistance on how to go through that and process what happened. Some of them sees it 2 or 3 times in a month. But some of them sees 1 every 5 years. They usually come back to work 3 days after the incident, or whenever they feel okay. NS gives them the necessary assistance and the space to recover. However, we have some people that have psychological problems after that as well. The usually NS finds another job for them inside the company”. (NS Safety and Security department, 2022)

The interviewee also mentions the impact on the victim's family, stating that most of the time they are not even aware about what was happening until they are notified by the authorities.

For NS as a company, the delay caused by the incident is estimated in 3 hours. That implies in more delays, cancelations and a huge impact on the revenue of the organization.

2. Why does people attempt to commit suicide by jumping in front a train?			
Strategy	Technique	Approach	Goal
Library	Literature study	Use researches and articles already published to get familiarity with the topic	Have a basic understanding of the most common reasons why people jump in front of a train
Field	Interview	Ask the interviewee about situations that he has seen and observations he has made during his career at NS	Find out whether or not there is a pattern in people's behavior

Results

Literature study

According to the British journal of psychiatry in an article published in 2019, motivations for contemplating or attempting suicide on the train tracks were perceptions of quick and certain lethality (54 and 37%, respectively), besides the easy access to rail settings. (Cambridge University Press, 2019).

Interview

During the interview the NS Safety and Security department reported that the most common reasons why people attempt suicide by jumping in front of a train is depression and issues at home: *“from what I we have seen is that usually they have issues, problems that they think they cannot solve, problems at home, problems related to money or even with studies. They are not able to see a way out of this situation, so they choose this way”*. (NS Safety and Security Department, 2022)

3. What are the impacts for the rail company when an incident like that happen?

Strategy	Technique	Approach	Goal
Library	Literature study	Collect online information about the impacts of an incident for the company	Identify and report the impact of delays, cancellations and financial loss

Results

Literature Study

The rail suicide prevention from London recently published on their website the impacts of rail suicide. Suicides can impact drastically the victim's family, passengers, staff and the wider community.

As described previously, a suicide event on the railway affects directly the staff of the train company, having as its main witness the driver. Besides that, according to the same website, *"Customers can also be traumatized and as a result of their experience never travel by rail again"* (Rail Suicide Prevention UK, 2022).

Although delays and cancellations impact significantly the journey of all passengers that depend on the train to arrive in many locations, a suicide on the railway can cause a location to get a poor reputation, hugely impacting the railway company financially. (Rail Suicide Prevention UK, 2022).

The financial impact for the railway company in the Netherlands (ProRail/NS) is a loss that can reach up to **175 million euros** annually. (Prorail, n.d.)

4. What are the measures the company in the Netherlands has taken to prevent suicide from happening on the train tracks?

Strategy	Technique	Approach	Goal
Library	Literature study	Search for information publicly available from the Dutch railway company	Have information about measures that the company has implemented over the years
Field	Interview	Ask the interviewee about measures that he is aware of	Know the measures that NS has implemented
Field	Observation	Observation of the train stations and tracks	Find out If the measures are effective

Results

Literature Study

In order to prevent people from walking too close to the tracks, the Dutch organization responsible for the maintenance and extension of the national railway network, implemented the following measures:

- Fences and vegetation to make the track more difficult to be accessed (Currently the fences have the length of 2300 kilometers along the track).
- Installation of cameras and extra lights
- Trip mats that prevent people from walking on the tracks
- Warning signs
- Specific parts of the tracks are under 24-hour CCTV surveillance

Besides physical barriers and measures that prevent people from walking on the tracks, ProRail tries to use data to predict the locations where people tend to approach the tracks the most. (Prorail, n.d.).

Interview

In the interview, the Safety and security department of NS was asked about the measures that the company has been taking over the years to prevent suicide from happening on train tracks:

“NS has been doing a lot to prevent suicide in the past few years. They have invested in blue lights that come from Japan. The idea was that blue light can have an effect on people’s state of mind. We have those lamps in a few spots in the Netherlands. That helps people to think clearly. We also have spikes that prevent people to walk through it on the rail. We often check the areas where people tend to jump, to see if there is anyone attempting it. We have several cameras as well. But that is all we can do. We try to pay attention on cameras, but it is too much to cover”. (NS Safety and Security Department, 2022)

Observation

In order to gather information about events that occur on the train tracks and platforms, we made use of observations. Those observations resulted in data about the physical measures that the railway company has implemented in the risk areas. From what was observed, there are indeed fences and vegetation near the train tracks in many locations, as mentioned in the literature study.

However, it is noticeable in the same risk areas the lack of extra (updated) preventive measures besides warning signs. The images below are 2 examples of preventive measures that are not efficient, but are still in use in high risk areas in the Netherlands:

Figure 1

Suicide on train tracks preventive sign



A sign at a railroad crossing in the Netherlands promoting a suicide crisis line (113)

Google Images

Figure 2*Warning sign in a crossing road*

The Netherlands has hundreds of unmanned level crossings. Photo: Bert Spiertz / HH

5. Is it possible to map the areas where those incidents happen more often?

Strategy	Technique	Approach	Goal
Library	Literature study	Search for areas mapped as high risk locations	Find out where are the main locations and what is the type of location
Library	Expert Interview	Ask if he knows where those locations are	Find a pattern of those locations, the reason why that is a chosen location for people to attempt suicide

Results

Literature Study

Suicide on train tracks usually happens in remote areas, where there is no sign of people around. However, studies reveal that a significant number of these suicides happen in areas nearby psychiatric hospitals. (Houwelingen, Kerkhof, & Beersma, 2010). The research still

brings attention to the fact that 53% of the train suicides were people receiving mental healthcare, and half of this number was register as inpatients. (Van Houwelingen and Kerkhof, 2008, as cited in Houwelingen, Kerkhof, & Beersma, 2010).

Besides knowing the surroundings of where people tend to attempt suicide on train tracks the most, it is relevant to know the type of locations where that happens.

The following data demonstrates the type of location where those incidents happen more often and the respective percentages.

The totalized data over the years 2004–2007 showed the following distribution:

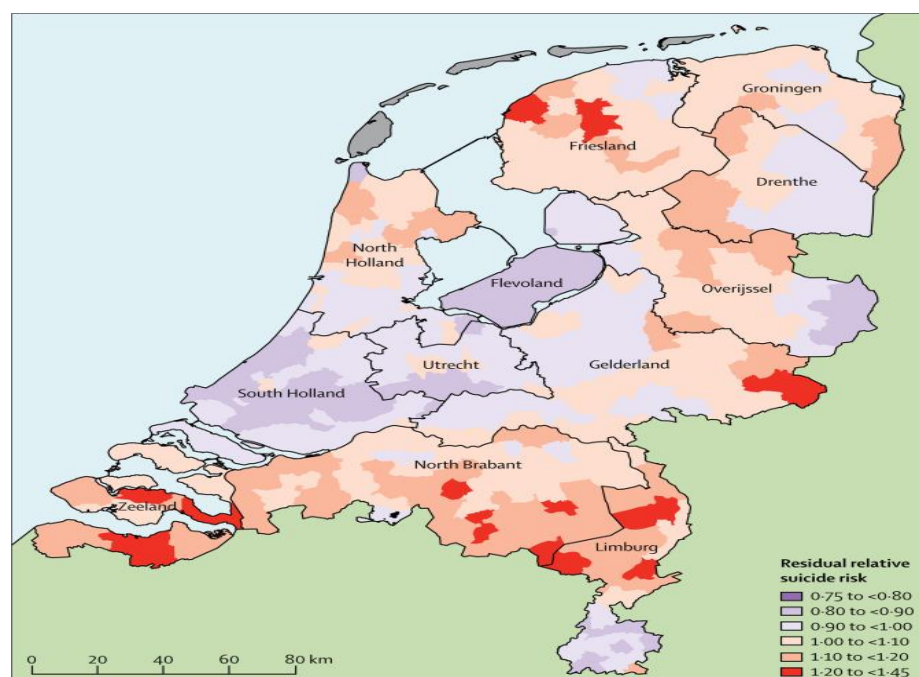
- Attempts in train platform 18.7%
- Attempts in level crossing 25.7%
- Attempts in an open track 55.6%. (Houwelingen, Kerkhof, & Beersma, 2010).

Although there is no map yet made specifically about suicide rate on train tracks, is known that train suicides account for 10–14% of all suicides in the Netherlands (Houwelingen, Kerkhof, & Beersma, 2010).

The following map illustrates the residual relative suicide risk in the Netherlands per region. The areas marked in red are the most critical regions, with the highest number of suicides in the country.

Figure 3

Suicide map in the Netherlands



6. What are the measures that countries facing the same issue have taken to prevent suicide?

Strategy	Technique	Approach	Goal
Library	Literature study	Research about the countries with the highest suicide rate by train in the world	Find out which country faces a similar situation that the Netherlands faces
Workshop	Brainstorm	Brainstorm about the main founds	Find a measure, technology or approach already in use, that we could use in the Netherlands

Results

Literature Study

In Japan, hundreds of people commit suicide by jumping in front of the train each year. In 2008, nearly 2000 people committed suicide on train tracks in the country, they accounted for 6 % of the suicides in the whole world. (The New York times, 2009).

In 2009, the country started installing special blue lights above station platforms. At that time, experts were skeptical that those installations would have any positive effect. (The New York times, 2009).

In 2019, 10 years after the article published by The New York Times, BBC published the article "*Can blue lights prevent suicide at train stations?*", proving the efficiency of this technological approach.

The blue lights are effective to bring people to their own state of mind, having a calming effect on people. According to BBC, the suicides in Japan had a decrease of 84% after the implementation of the blue lights (BBC, 2019).

Beside the Blue light, researches point out that the lighting linked to a movement sensor are useful in situations where motion is detected in specific parameters. (RestrailToolbox, 2019). Sensors are proven to be effective to detect people, specially when it is dark. During interview, the Safety and Security department of NS affirmed that when it is dark, the train driver cannot see people hidden behind the bushes and the collision is almost certain. This

affirmation leads us to think that more than a blue light should be implemented along the tracks.

According to the research “Identifying measures with the highest potential to reduce suicides on Finnish railways”, recently published, the measures categorized as top priority and with the highest potential to reduce suicides on finish railways include the improvement of the camera surveillance and implementation of detection systems as radars and sensors that can precisely detect people. (Silla, 2022)

7. What kind of technological approach could the railway company in the Netherlands possibly use to increase safety?			
Strategy	Technique	Approach	Goal
Library	Literature study	Search for technologies that are used to detect people and what is the most effective way of calming someone down	Know which technologies we currently have in the market that could be used along the tracks
Library	Expert Interview	Ask about the latest measures adopted by NS	Be aware of what is already being used and what is planned to be done
Workshop	Brainstorm	Discuss how can we use technology to implement the necessary changes on the train tracks	Figure out ways of implementing a solution, considering all the information we have

Results

Literature study

Based on countries that face exactly the same issue that the Netherlands faces (as Japan and Finland), it is noticeable that safety on the train track can be improved.

The combination of the blue lights with the installation of precise sensors that are used to detect people can be a powerful improvement to increase safety on the train tracks.

Interview

According to the NS Safety and Security Department during interview, the blue lights used in Japan are already in being studied in the Netherlands, and the idea is that the railway company will install them in all the high risk areas.

Brainstorm

Next to the blue lights, together as a group, we could analyze different kinds of sensors. Our idea was to search for the most reliable and precise human sensor in the world and find out how those sensors would be use to prevent suicide attempts on the railway in the Netherlands.

The brainstorm sections lead us to think that 2 types of sensors could be used:

The proximity sensor: *NOVELDA UWB Proximity Sensor provides reliable detection of human motion in the zone of interest. You are always detected inside the defined zone, and never detected outside.* (Novelda, n.d.)

Occupancy sensor: *NOVELDA UWB Occupancy Sensor enables energy savings due to its unique quality of detecting human motion. It allows you to set the time-out for when the lights turn off as low as to two minutes.* (Novelda, n.d.)

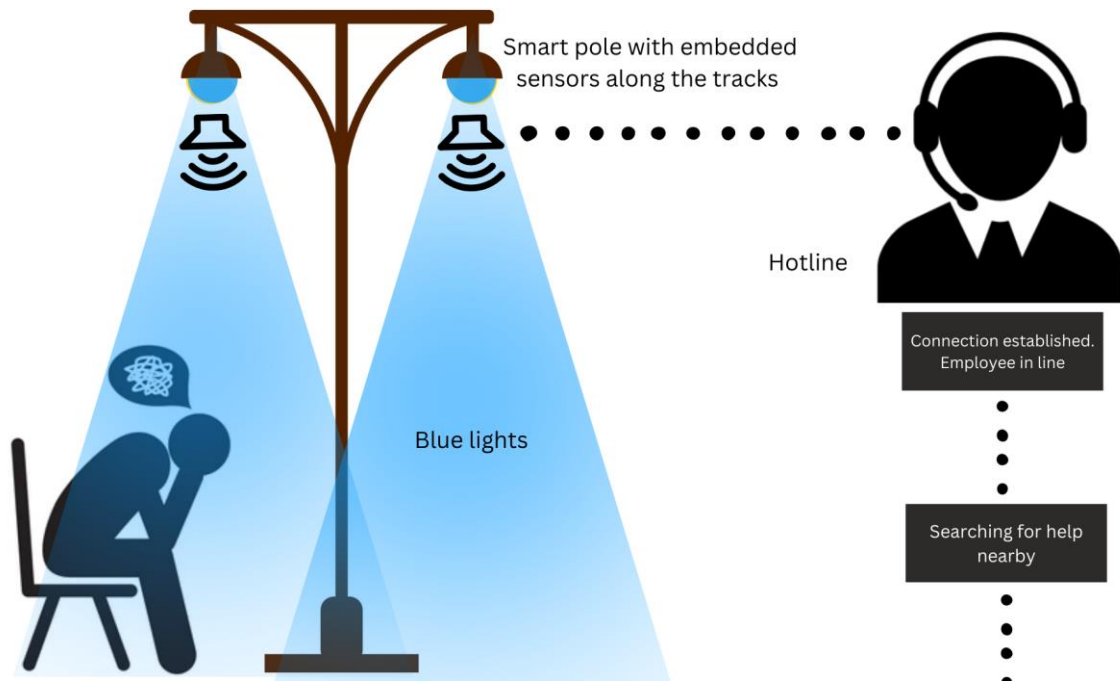
Both sensors are produced in Norway and have the latest technology in sensors in the world. In combination with the blue lights, those sensor would be able to detect human presence and occupancy of any configurable area needed by the railway company.

However, part of our brainstorm also considered the importance of talking to someone that has suicidal feelings. According to the website Samaritans *“People who have felt suicidal will often say what a huge relief it was to be able to talk about what they were experiencing”*. (Samaritans, n.d.). Thinking about that, we considered of extreme importance that a person with suicidal thoughts close to a train track in a remote area could be assisted.

For that reason, we strongly believe in a solution that contains a smart pole that is able to connect people in need to a person that could help, in this case a person from the railway company. The image below is a simple illustration of the combination of the blue lights, sensors and the hotline:

Figure 4

Brainstorm image – Combination of blue lights, hotline and sensors



DISCUSSION

The outcomes of this research have provided valuable insights about suicide attempts on train tracks in the Netherlands. However, the results displayed in this document should be interpreted with caution due to the limitations that this research presents.

The main limitation of this research is trying to report facts about a delicate topic that involves many different parts and perspectives.

Japan can be seen as a great example of country that faces the same issue as the Netherlands, with the difference that the country is constantly investing in preventive measures. The blue light installed by the Japanese in all the train stations reduced 84% of the suicide rate involving trains in the country, proving to be an effective way to calming a person.

In the Netherlands, preventive measure are outdated and still see warning signs, fences and vegetation as their main way of preventing someone to attempt suicide on the train tracks.

In other words, the Netherlands should be able to invest less in procedures after an incident and invest more in preventing them to happen. The Netherlands has the fourth richest population in the world (Beatrice Clarke, 2014), and plenty of resources to invest in the necessary technology to improve safety along their train tracks.

CONCLUSION

Suicide on the train tracks is something that affects direct and indirectly hundreds of people every year in the Netherlands. The alarming numbers of people jumping in front of the trains are not an exclusive problem of the Netherlands, but of many developed countries.

Over the years, the railway companies tried to implement strategies and measures that would prevent someone to attempt taking their own lives by a train, but due to the increase of these numbers, the railway companies stopped investing in preventive measure and started investing in post-traumatic/post-accident procedures.

Despite the efforts on adding fences and vegetation to prevent a train-person collision to happen, it is evident the lack of technological measures that would drastically reduce the numbers if implemented.

Therefore the suicide attempts on the train tracks should be treat as a real problem that the modern society faces. It necessary bring back the awareness that incidents involving train-person collision are not standard and that the Dutch society has the technology and the necessary means to change the statistics.

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